CONTEC

CONPROSYS

Reference Manual

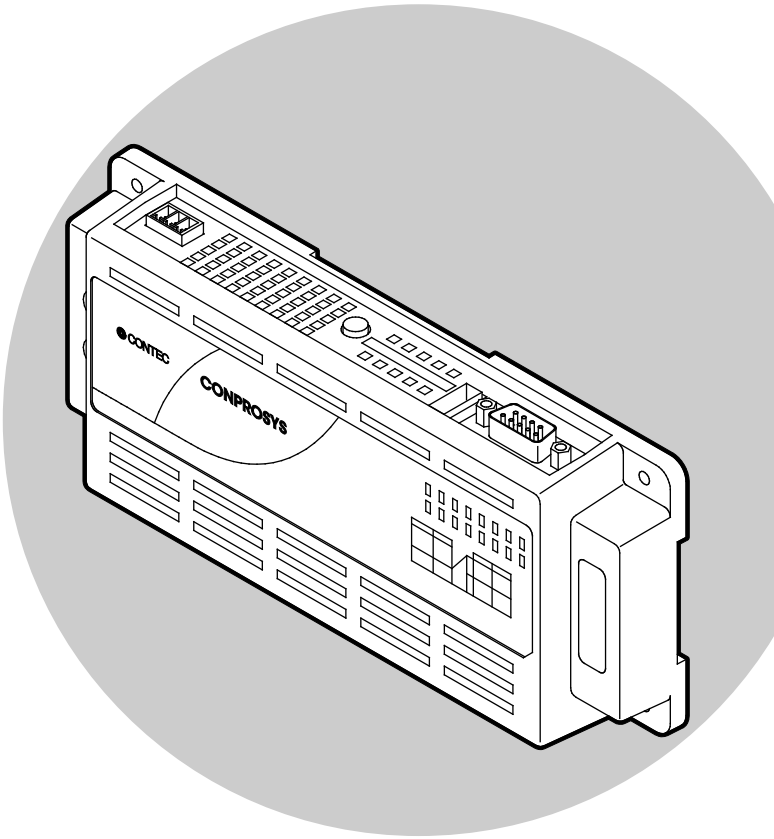
(Software)

M2M Gateway Series

Integrated type

Firmware version 3.0.0 or later

CONTENTS



CONTEC CO., LTD.

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Introduction

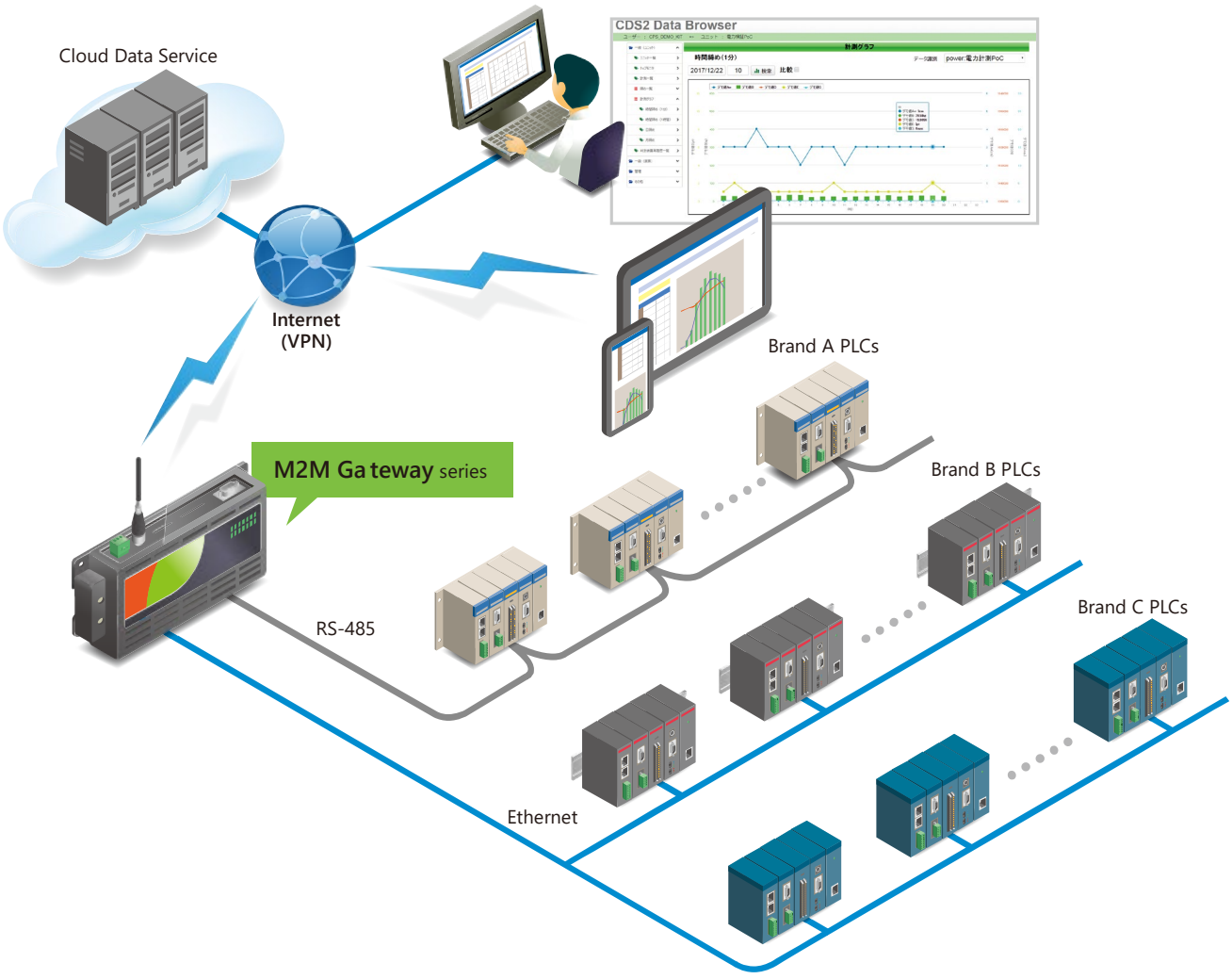
This section provides necessary information of the product such as the product configuration and manuals before actual use.

1.Product Outline

Add M2M Gateway series to your current facilities where devices are controlled by PLC, and data from the devices can be collected and linked with IoT system such as Cloud service.

The controller features the capability of collecting data from several PLCs from various makers.

1. An Example Of System Composition



* Even several different device types from various makers are used, and with multiple interfaces and communication protocols, the M2M Gateway series can collect data, monitor facilities, and accumulate data of operations.

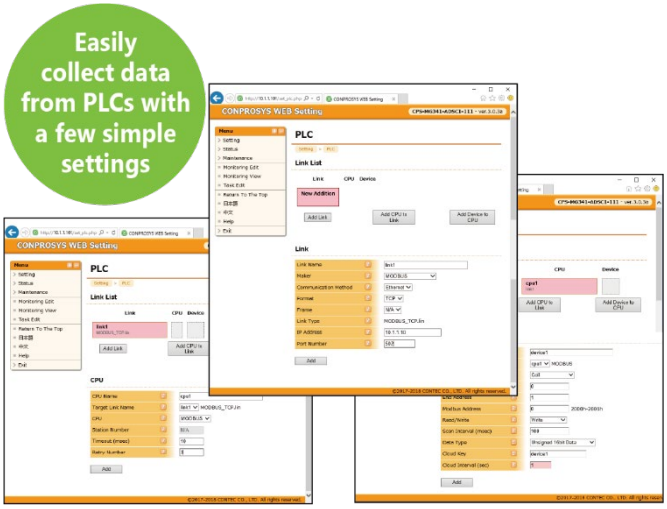
2. Gateway Series Function

Support multi-vendor

- Data can be collected from several PLCs from various models or makers including Mitsubishi and OMRON, and even in the environment where there are several interfaces and communication protocols.

Collect data by easy setting

- With simple configurations, data can be collected from multiple PLCs from various makers or models.



- With easy settings, information can be sent to cloud.

Monitor PLC device memory

- The setting values and control results can be read and monitored from PLC device memory.

Remote-monitor facilities through cloud

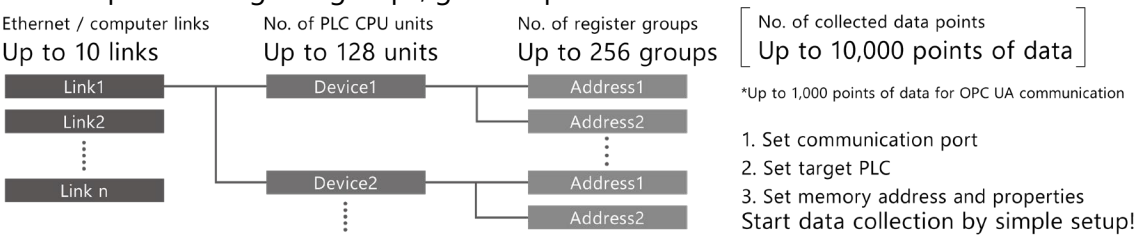
- The setting values and control results can be collected all at once.
- Facilities in a remote location or overseas can be monitored.
- Performances of devices can be accumulated.

Collect data on-premises

- Data can be summarized easily with data collecting software for Windows PC provided free of charge.
- Collected data can be used with Modbus/TCP communication supported SCADA

Link Up to 10 Systems and 256 Register Groups

- Connect up to 10 PLCs using an Ethernet connection or up to 128 PLCs using a serial connection. Connect up to 256 register groups, gather up to 10000 data.



  - In case of computer links, the number of devices that can communicate is limited by hardware specifications.

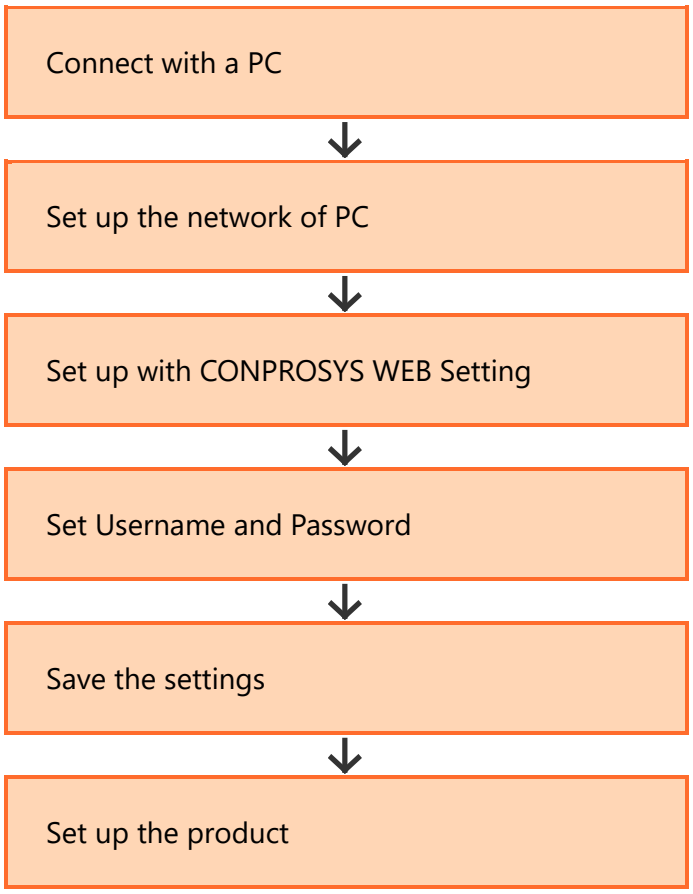
2.Manual Composition

This manual is composed as follows:

Chapters	Descriptions
Introduction	Manuals on the product are introduced. Read them as required.
Safety Precautions	Safety precautions are listed.
Setting the Computer Network	**PC setup** This chapter describes the network settings with PC before using the product.
CONPROSYS WEB Setting	**CONPROSYS WEB Setting** This chapter describes the function settings in the CONPROSYS WEB Setting.
Easy Data Process and Control	**CONPROSYS VTC** Collecting data or calculation can be done easily via web browser.
Monitoring Edit	**CONPROSYS HMI** Create a monitoring page and the performances, errors, operations, or standstill can be checked.
Tag Edit	**Tag Edit page** This section describes Tag Edit page. With this function, monitoring TAG/STAG/LTAG/LSTAG, editing their initial values, and TAG import/export in CSV format file can be executed.
Collecting PLC information	**Collecting information from PLC** The followings are descriptions of the settings for easy collecting data from several PLCs from various makers.
Transferring Measured Data to Server OPC UA Setting the Auto Send Mail Connecting to Azure IoT Hub MTConnect FTP communication MQTT Publish and Subscribe BACnet Router Function Connecting to FacilityView	**Detailed settings for each function** Detailed settings for each function in the CONPROSYS WEB Setting are described.
Set Up Troubleshooting	This chapter describes troubleshooting when the product does not function properly.
Appendix	The specification of the data format and others are listed.
Customer Support and Inquiry	Services and inquiry.
Index	Index of the manual.

3.Procedure Until Ready To Use

The followings show the standard procedure until the product is ready to use.



*This procedure can be different depending on the user's environment or system types.

4.Related Manuals

The manuals related to the product are listed below.

Read them as necessary along with this document.

◆ Must Read The Following Manuals.

Name	When to Read	Contents	How to Get
Product Guide	Must read this after opening the package.	This lists the product configuration and describes the precautions.	Included in the package (Printed matter)
Setup Manual	Read this when setting up the product.	This describes the required items for setup and configuration procedure.	Download from the Contec website (PDF)
Reference Manual (Hardware)	Read this when operating the product.	This describes the hardware aspects such as functions and settings.	Download from the Contec website (PDF)
Reference Manual (Software)	Read this when setting up the “CONPROSYS WEB Setting”.	This describes how to set each function of “CONPROSYS WEB Setting”.	Download from the Contec website (PDF)

◆ Read The Following Manuals As Necessary.

Name	When to Read	Contents	How to Get
CONPROSYS Cloud Data Service 2 (CDS2) Manual	Read this to understand the outline of the CONPROSYS Cloud Data Service 2.	This describes the outline and specification of the CONPROSYS Cloud Data Service 2 as well as how to operate the product.	Download from the Contec website (PDF)
CONPROSYS Cloud Data Service 2 Concise Manual	Read this when using the CONPROSYS Cloud Data Service 2.	This describes the procedure to start monitoring measured data in Cloud Data Service 2.	Download from the Contec website (PDF)

◆ Download Manuals

Download the manuals from the following URL.

Download https://www.contec.com/download/

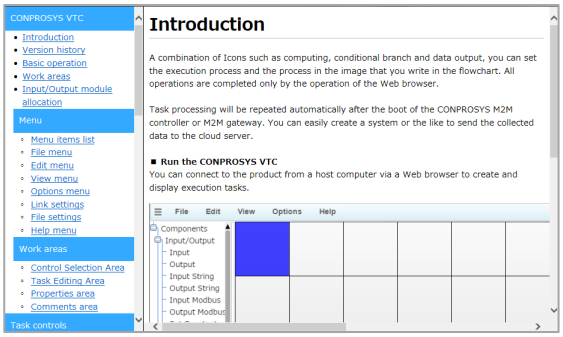
5.Online Help

We offer the detailed information on “CONPROSYS VTC” for assembling processing tasks such as calculation and control as well as on “CONPROSYS HMI” for operating and editing the monitoring screen through the Online Help.

Consult the Online Help as necessary.

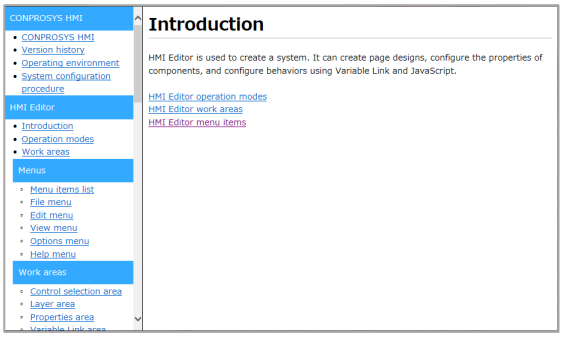
◆ CONPROSYS VTC (Visual Task Control).

Online Help https://doc.conprosys.com/help/task/V1/en/



◆ CONPROSYS HMI (Human Machine Interface)

Online Help https://doc.conprosys.com/help/hmi/V1/en/



6.Check The Firmware Version

Before running the product, visit our website to check the firmware version and update to the latest one if necessary.

Updating firmware to the latest version will resolve troubles and stabilize the operation.

Download https://www.contec.com/download/

* Refer to the "**Firmware Update (page 140)**" for further details.

Safety Precautions

Understand the following definitions and precautions to use the product safely. Never fail to read them before using the product.

1.Safety Information

This document provides safety information using the following symbols to prevent accidents resulting in injury or death and the destruction of equipment and resources.

Understand the meanings of these labels to operate the equipment safely.

⚠DANGER	Signal word used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	Signal word used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	Signal word used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

2.Handling Precautions

⚠ CAUTION

- The specifications of the product are subject to change without notice for enhancement and quality improvement. Even when using the product continuously, be sure to read the manual in the CONTEC's website and understand the contents.
- Do not modify the software.
  CONTEC will bear no responsibility for any problems, etc., resulting from modifying the software.
- Regardless of the foregoing statement, CONTEC assumes no responsibility for any errors that may appear in this document or for results obtained by the user as a result of using the software.

3.Security Warning

When connecting to the network, be aware of security-related problems. See the examples of Security measures below and set up the product properly along with the network devices.

1. Information Security Risks

- Unauthorized access from the outside through a network could cause the system halt, data damage, or exposure to malware. *1
- Invaded and used as a stepping stone, a device might attack the others through networks. (a victim becomes an assailant)
- Information might leak without realizing due to the connection to the network.
- Secondary damages such as harmful rumors, liability in damages, social credibility fall, and opportunity loss are expected led by the troubles described above.

*1: Malware (Malicious Software) is software that brings harm to a computer system and performs unintended operations.

2. Security Measures – e.g.

- Do not keep using the default password. (Refer to the product manual for the password setting).
- Set a strong password.

  Combined with upper and lowercase letters, and numbers so that it cannot be easily analogized by others.

- Change the password periodically.
- Disable unnecessary network services and functions.
- Restrict access to the network with network devices. *2
- Restrict ports to be released on the network with network devices. *2
- Create a closed network connection using such as dedicated network or VPN*3

*2: Inquire for setting procedure to manufacturers.

*3: VPN (Virtual Private Network) a secured network that wards off unauthorized access by protecting the communication path with authentication and encryption.

Unfortunately, there are no perfect ways to avert unauthorized access or close a security hole that are endlessly found day and night.

Please understand that risks are always involved with the Internet connection, and we strongly recommend a user should constantly update information security measures.

Set the Computer Network

This section describes how to connect the product with a PC, set the network, and check the communication.

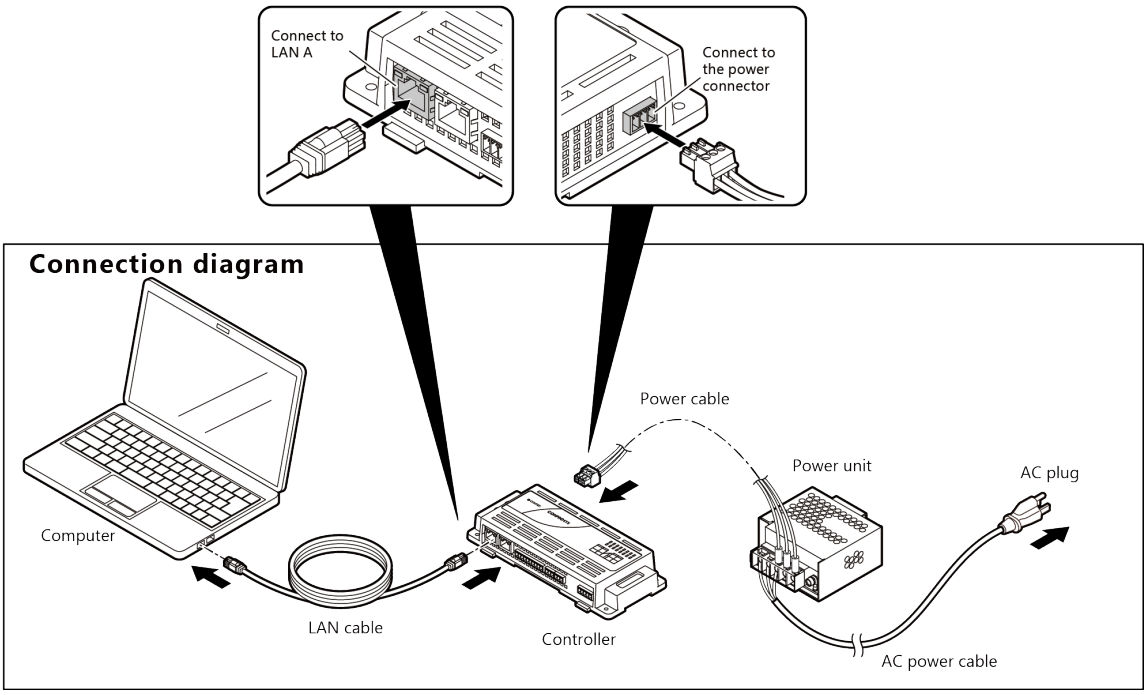
1.Connect With a PC

To set the product, you need to first set up the network between the PC and the product in order to establish communication.

First, connect the product with the PC.

1 Follow the instructions below to connect the computer, the controller, and the power unit.

* Refer to "**Reference Manual (Hardware)**" for how to create a power cable.



2 Connect the power unit with AC plug, then turn on the computer.

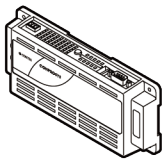
* After connecting the power unit with AC plug, it takes a few minutes for the controller to complete the start-up. (approx. 1-2 min)

2.Set the Computer Network

Follow the “Computer Network Setting Procedure” described below and set the network to make the IP addresses as shown.

Computer

IP address	10 . 1 . 1 . **200**
Subnet mask	255 . 0 . 0 . 0



Controller

IP address	10 . 1 . 1 . **101**
Subnet mask	255 . 0 . 0 . 0

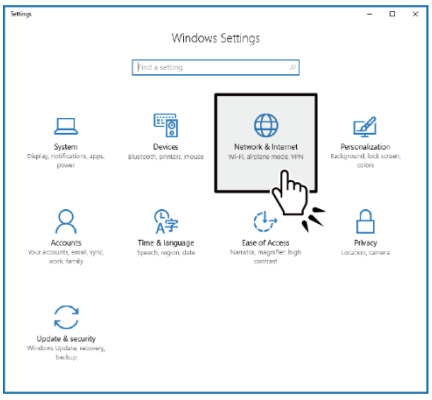
* The factory default setting

The product must set a unique IP address for the bold part (**200** or **101**) that is not used by other devices on your network.

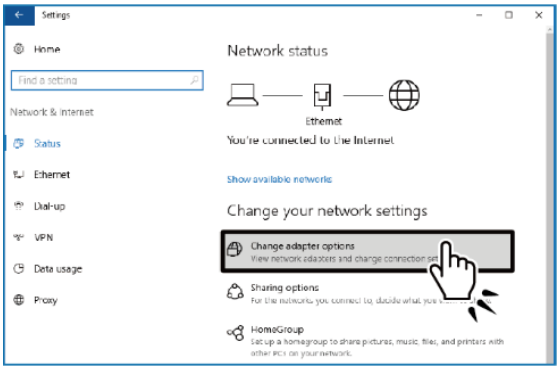
* If proxy is set to your PC, do not use the proxy.

1. Computer Network Setting Procedure (for Windows 10)

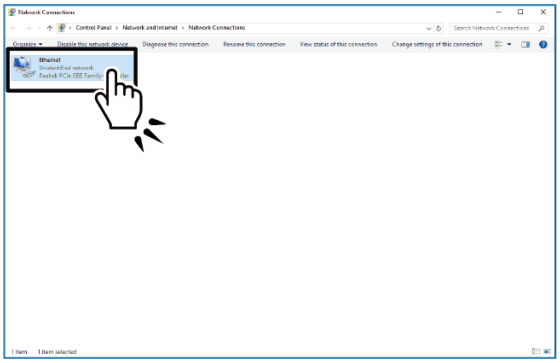
1 Click the [Network & Internet] on [Windows Settings] screen.



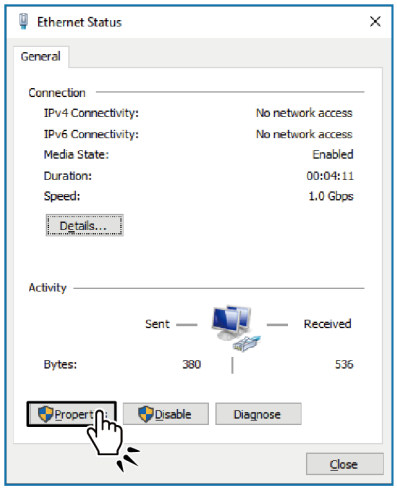
2 Click the [Change adapter options] in [Network status].



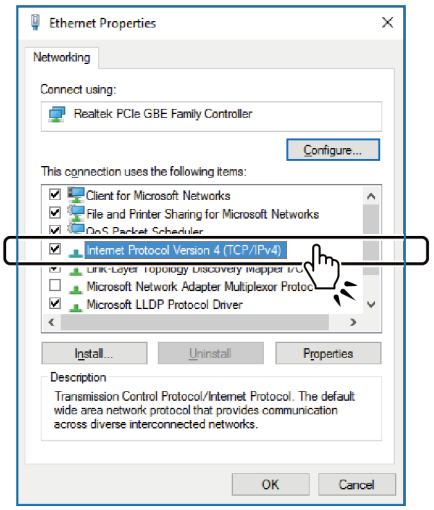
3 Double-click the appeared [Ethernet]



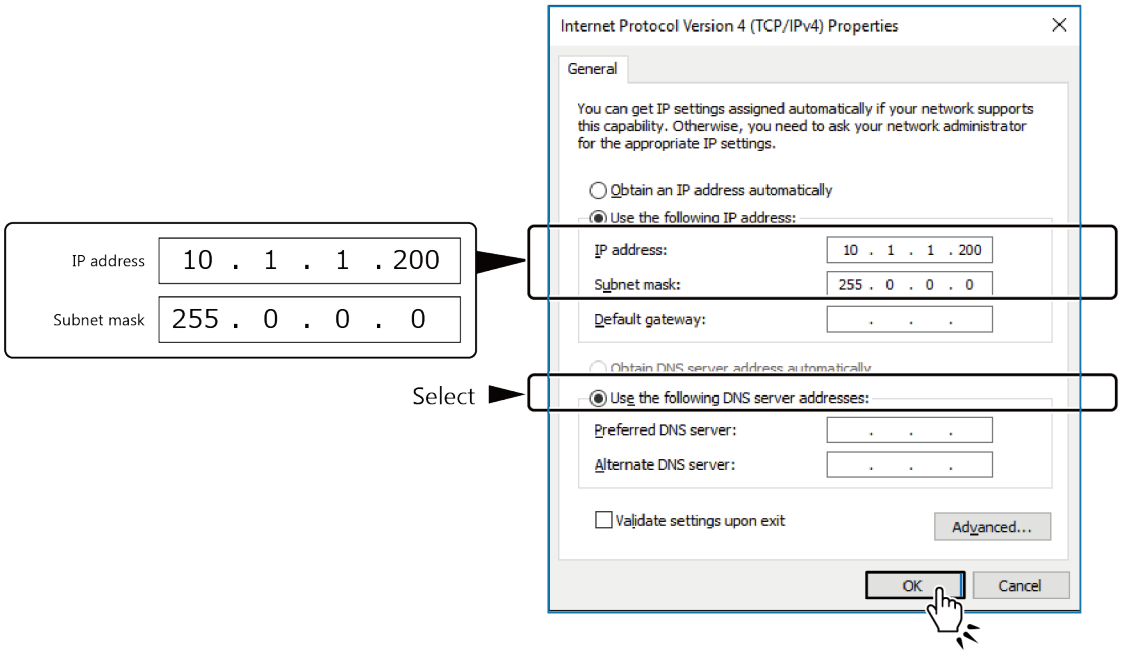
4 Click the [Property] in [Ethernet Status] dialog box.



5 Double-click the [Internet protocol version 4(TCP/IPv4)] in [Ethernet Properties] dialog box.



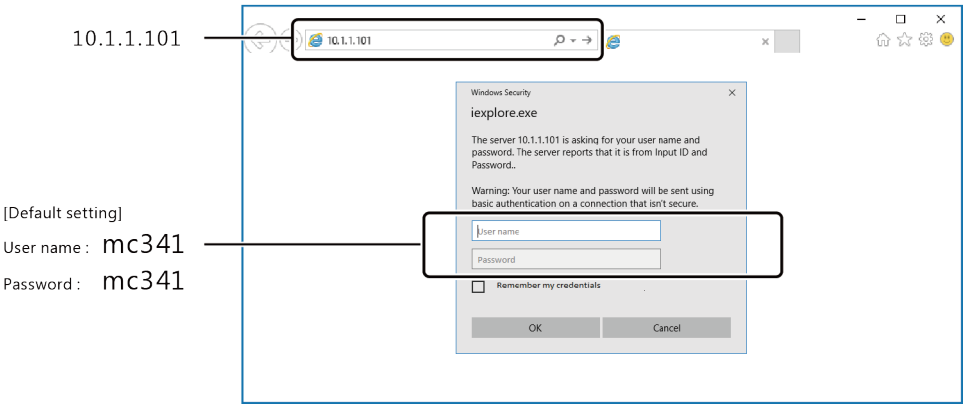
6 In the [Internet protocol version 4 (TCP/IPv4) property], set IP address and Subnet mask as shown below.



7 Click the [OK] → the [OK] → the [Close] to close the dialog box and complete the network setting.

3.Check Communication

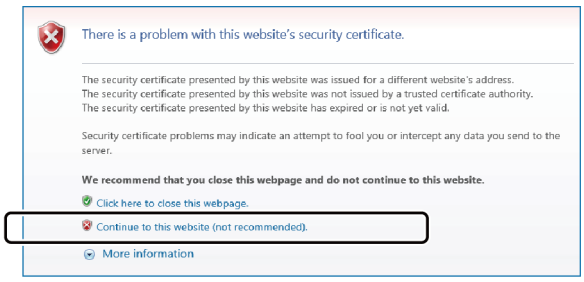
1 Start the Internet Explorer 11 on your computer. Enter IP address (10.1.1.101) of the controller in the address bar, then press [Enter] key.
The dialog box asking for the User name and Password appears, enter them and click the [OK].



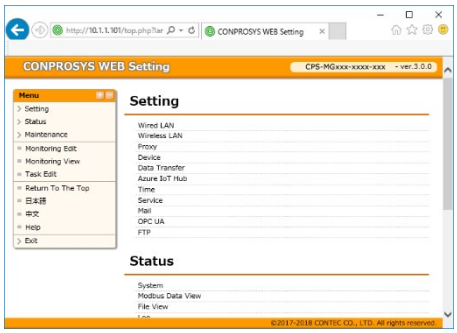
* Refer to "**Compatible Web Browser (page 29)**" for details of compatible web browser.

* For an actual operation, change User name and Password in [User name and Password] from the Maintenance menu.

* After entering IP address and pressing [Enter] key, the "Security certificate" might appear on the screen. Choose "Continue to this website".



2 If [Status menu] of Web browser menu appears, it indicates the success of the communication between the computer and the controller.



CONPROSYS WEB Setting

This section describes the product system and functions.

1.CONPROSYS WEB Setting Outline

The functions of the product can be set easily with the “CONPROSYS WEB Setting” through a browser.

1. Compatible Web Browser

CONPROSYS WEB Setting is compatible with the following browsers.

Compatible Web browser	Supported Version
Microsoft Internet Explorer	Ver. 11 or a later version
Google Chrome	Ver. 52 or a later version
Mozilla Firefox	Ver. 55 or a later version

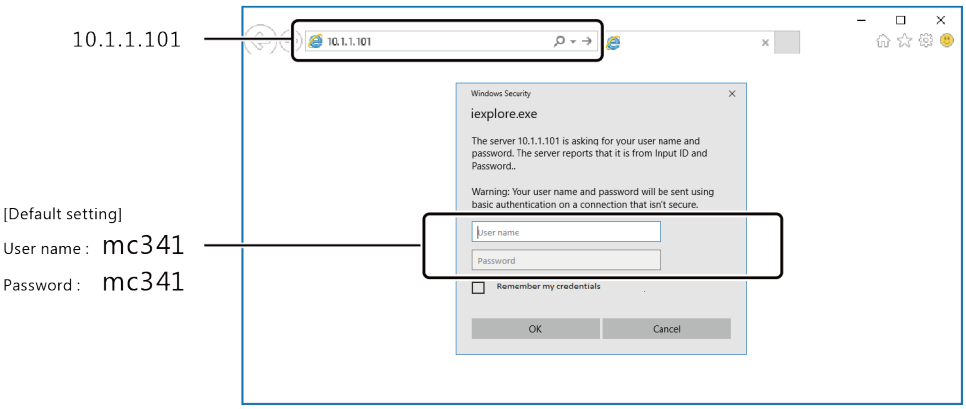
* Problems may arise due to the use of incompatible browser. Be sure to use the web browser that is compatible.

2. Start Up CONPROSYS WEB Setting

Start the Web browser on your computer that is connected with the controller. Enter IP address (10.1.1.101) of the controller in the address bar, then press [Enter] key.

The dialog box asking for the User name and Password appears, enter them and click the [OK].

* Refer to “**Setup Manual**” for how to connect the controller with your computer.



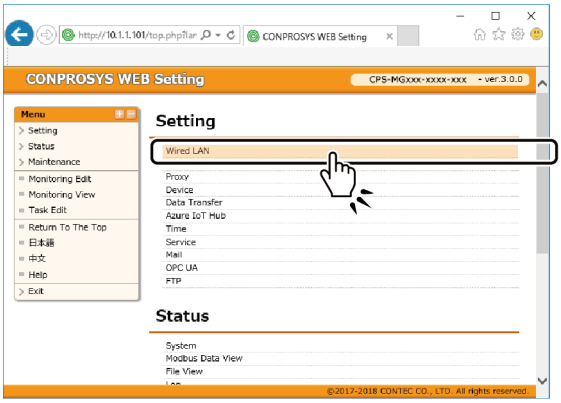
* After entering IP address and pressing [Enter] key, the “Security certificate” might appear on the screen. Choose “Continue to this website “then.

3. CONPROSYS WEB Setting Basic Operation

◆ CONPROSYS WEB Setting Page Structure

Click the menu item on the left side of the screen. This opens a page to set the details of the menu on the right side of the screen.

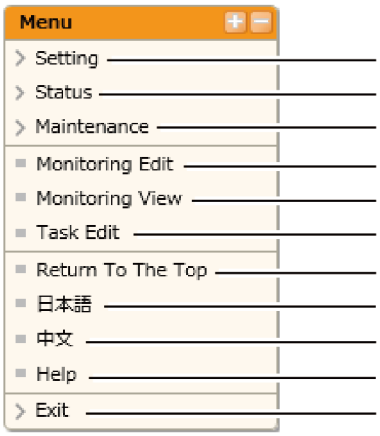
Settings can also be done by clicking each item displayed on the menu.



Settings can also be done by clicking each item displayed on the menu.

◆ Menu Composition

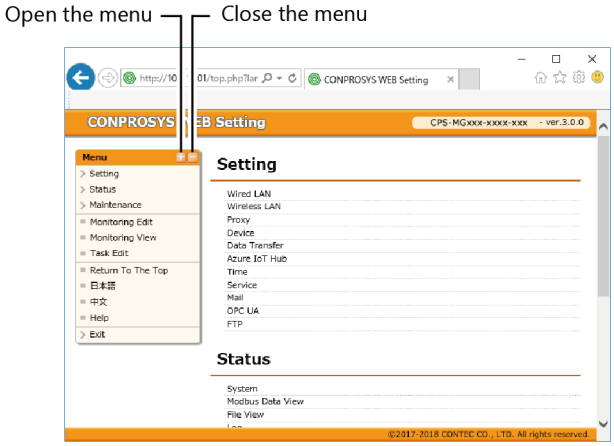
The menu is composed as follows:



This is a menu selection of settings.
This is used to check the status of the system.
This is used for system maintenance.
This is used to create and edit monitoring pages (CONPROSYS HMI).
This is used to display the monitoring pages.
This is used to create and edit processing tasks (CONPROSYS VTC).
This is used to return to the top page of CONPROSYS WEB Setting.
This is used to switch the language displayed to Japanese.
This is used to switch the language displayed to Chinese.
This is used to display Online Help.
This is used to reboot or shut down the product.

Click the [+] on the “Menu” to open a selection and display all the menus.

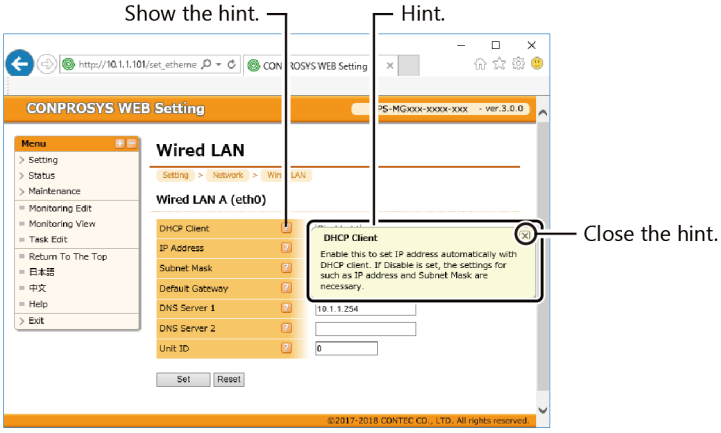
Click the [-] to close the menus.



◆ Displayed Details

Click the [?] to see a setting hint on the displayed details.

Click the [X] shown on the up-right to close the hint.



2.Menu Function List

Menu Functions are listed below.

Menu item name	Function	Description
Setting		
Network		
Wired LAN	Set up the network such as “IP address”.	Page 34
Wireless LAN	Set up the wireless LAN setting such as “IP address”.	Page 36
3G	Set up 3G communication.	Page 39
LTE	Set up LTE communication.	Page 42
Proxy	Set up the proxy server	Page 45
Router Function	Set up router function.	Page 46
IP Filter	Set up IP filter.	Page 53
Device	Select the function of digital input, counter input, or serial communication.	Page 56
Data transfer	Set up the destination of the measured data to be transferred.	Page 60
Azure IoT Hub	Set up Azure IoT Hub for the device.	Page 65
Time	Set up the name of NTP server that obtains the time and date.	Page 66
Service	Enable or disable the specified service to be operated in the product.	Page 68
Mail	Set up SMTP server to send a mail.	Page 71
SMS	Set up SMS.	Page 74
OPC UA Server		
Setting	Set up OPC UA server.	Page 76
Certificate	Download, issue and upload application instance certificates.	Page 78
OPC UA Client		
Connection	Set up OPC UA client.	Page 80
Certificate	Download, issue and upload application instance certificates.	Page 82
Write	Set up the OPC UA client write data.	Page 84
Read	Set up the OPC UA client read data.	Page 86
MTConnect	Set up MTConnect.	Page 88
FTP	Set up FTP.	Page 89
PLC	Set up PLC.	Page 92
MQTT		
Connection	Set up communication with MQTT-Broker.	Page 102
Publish	Set up MQTT Publish.	Page 107
Subscribe	Set up MQTT Subscribe.	Page 114

Menu item name	Function	Description
BACnet	Set up BACnet.	Page 119
FacilityView		
Connection	Set up communication with FacilityView.	Page 127
Transfer	Set up FacilityView Transfer.	Page 128
Status		
System	Display the product information.	Page 131
OPC UA Client	Displays the status condition of the OPC UA client function.	Page 133
Modbus Data View	Display each register value of Modbus.	Page 134
File View	Display collected data.	Page 137
Log	Display collected communication log.	Page 139
Maintenance		
Firmware Update	Update the firmware.	Page 140
Configuration File	Backup and restore the configuration file.	Page 141
User/ Password	Set a user name and a password when logging in the product through a Web browser.	Page 142
Network Test	Network reachability can be checked with ping command.	Page 145
User's Restrictions	Select Permit or Prohibit for the functions.	Page 146
Certificate	Download, issue, and upload certificates.	Page 147
Monitoring Edit	Display the monitoring edit page (CONPROSYS HMI).	Page 147
Monitoring View	Display the monitoring page (CONPROSYS HMI)	Page 150
Task View	Display the task program edit page (CONPROSYS VTC).	Page 151
Tag Edit	Display the edit page of tag value and a comment.	Page 152
Exit		
Save and Reboot	Save the settings and reboot the product.	Page 152
Save and Shut down	Save the settings and shut down the product.	Page 153
Save	Save the settings.	Page 153
Reboot	Reboot the product.	Page 154
Shut down	Shut down the product.	Page 154
Forced Reboot	Forcibly reboot the product without terminating the running process.	Page 154
Repair SD and Reboot	Repair the SD card and reboot the product.	Page 155

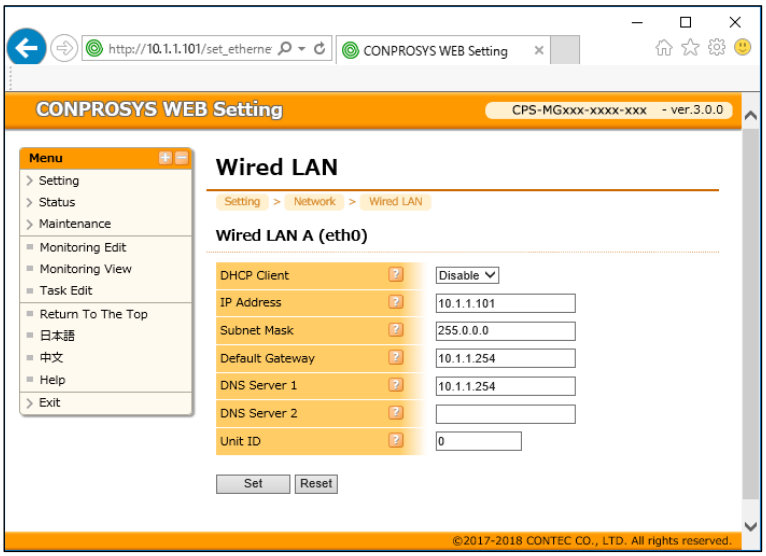
3. Function Details

1. Wired LAN

Set up wired LAN.

Setting items of wired LAN differ depending on models.

- CPS-MG341-ADSC1-111, CPS-MG341G-ADSC1-111 : display only LAN A (Operate as HUB)
- CPS-MG341-ADSC1-931, CPS-MG341G-ADSC1-930, CPS-MG341G5-ADSC1-931 : display both LAN A and LAN B (Both contain IP address respectively. Not operate as HUB)



◆ DHCP Client

Select how to set IP address.

[Enable]: Get IP address automatically with DHCP client.

[Disable]: Set up IP address and Subnet mask and so on.

[Setting]: Disable, Enable
[Default]: Disable

◆ IP Address

Set up IP address.

This is enabled when [Disable] is set for DHCP client.

[Setting]: IP address
[Default]: 10.1.1.101

◆ Subnet Mask

Set up Subnet mask.

This is enabled when [Disable] is set for DHCP client.

[Setting]: Subnet Mask
[Default]: 255.0.0.0

◆ Default Gateway

Set up IP address of default gateway.

This is enabled when [Disable] is set for DHCP client.

Leave it blank when this is not set.

[Setting]: IP address
[Default]: No settings

◆ DNS Server

Set up IP address of DNS server.

This is enabled when [Disable] is set for DHCP client.

Leave it blank when this is not set.

[Setting]: IP address
[Default]: No settings

◆ Unit ID

Set up unit ID to be used in F&eIT protocol.

Unit ID is fixed to 0 when F&eIT protocol is not used.

[Setting]: 0 – 254 (numeric values)
[Default]: 0

2. Wireless LAN

Set up wireless LAN.

Wi-Fi function can be added with a USB wireless LAN adapter to a USB port.

* Refer to "**Compatible USB wireless LAN adapter (page 244)**" regarding a compatible USB wireless LAN adapter.

◆ DHCP Client

Select how to set IP address.

[Enable]: Get IP address automatically with DHCP client.

[Disable]: Set up IP address and Subnet mask and so on.

[Setting]: Enable, Disable
[Default]: Enable

◆ IP Address

Set up IP address.

This is enabled when [Disable] is set for DHCP client.

[Setting]: IP address
[Default]: No settings

◆ Subnet Mask

Set up Subnet mask.

This is enabled when [Disable] is set for DHCP client.

[Setting]: Subnet Mask
[Default]: No settings

◆ Default Gateway

Set up IP address of default gateway.

This is enabled when [Disable] is set for DHCP client.

Leave it blank when this is not set.

[Setting]: IP address
[Default]: No settings

◆ DNS Server

Set up IP address of DNS server.

This is enabled when [Disable] is set for DHCP client.

Leave it blank when this is not set.

[Setting]: IP address
[Default]: No settings

◆ Unit ID

Set up unit ID to be used in F&eIT protocol.

Unit id is fixed to 0 when F&eIT protocol is not used.

[Setting]: 0 － 254 (numeric values)
[Default]: No settings

◆ ESSID

Set up ESSID.

Scan access point in the area and when AP exists, [←] button is displayed. Press the button to show the ESSID list. Specify ESSID from the list and it is entered automatically in the form.

[Setting]: 2 to 32 letters of alphanumeric letters, “_”, and “-”.

[Default]: No settings

◆ Cipher

Select a cipher from the drop-down list.

[Setting]: NONE, WEP, WPA-PSK(AES), WPA-PSK(TKIP), WPA2-PSK(AES),
WPA2-PSK(TKIP), WPA/WPA2-PSK(AUTO)

[Default]: Disable

◆ Encryption Key

Enter an encryption key when using a cipher.

[Setting]: WEP (128bit) ..... 26 digits in hex.
WPA type cipher.....8 to 63 letters of alphanumeric letters, "_", and "-",
or 64 digits in hex.

[Default]: No settings

◆ Alive Monitoring

Executes a ping at specified cycle to target address. When the ping fails, access points are scanned.

[Setting]: Disable, Enable
[Default]: Disable

◆ Target address

Enter the target address (IP address or domain name).

[Default]: No settings

◆ Cycle (min)

The cycle to execute a ping can be selected from 1 to 60 minutes.

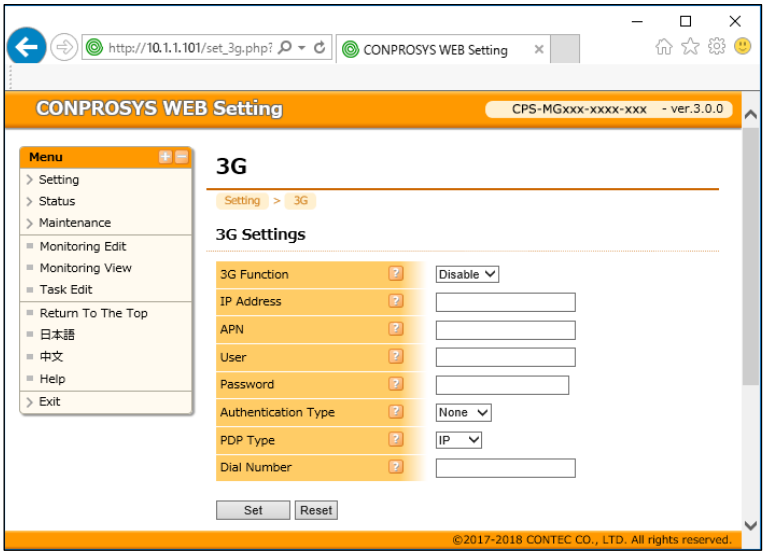
[Setting]: 1, 5, 10, 30, 60
[Default]: 5

3. 3G

Set up 3G communication.

With your SIM card, enter the necessary information.

* This function is only available for the 3G support model CPS-MG341G-ADSC1-111, CPS-MG341G-ADSC1-930.



◆ 3G Network

Enable this when using 3G network.

[Setting]: Disable, Enable
[Default]: Disable

◆ IP Address

Enter settings when specifying PDP address.

[Setting]: IP Address
[Default]: 0.0.0.0

◆ APN

Set APN for 3G connection specified by the 3G service provider.

[Setting]: Domain name
[Default]: No settings

◆ User

Set a user name for 3G connection specified by the 3G service provider.

[Setting]: 1 to 32 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, and [@] at sign.
[Default]: No settings

◆ Password

Set a password for 3G connection specified by the 3G service provider.

[Setting]: 0 to 30 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [‘] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Authentication Type

Select an authentication type from [None], [PAP], or [CHAP] for 3G connection specified by the 3G service provider.

[Setting]: None, PAP, or CHAP
[Default]: None

◆ PDP Type

Select PDP type either “IP” or “PPP” for 3G connection specified by the 3G service provider.

[Setting]: IP, PPP
[Default]: PPP

◆ Dial Number

Enter the dial number for 3G connection specified by the 3G service provider.
“*99***#1” is used if it left blank.

[Setting]: 0 to 16 letters of one-byte alphanumeric character, [#] sharp mark, and [*] asterisk mark.
[Default]: No settings

◆ PIN Code

Enter the PIN code if the SIM card is locked.

[Setting]: 4- to 8-digit number
[Default]: No settings

◆ Alive Monitoring

Execute a ping at the specified cycle to target address. When the ping fails, 3G restarts.

[Setting]: Enable, Disable
[Default]: Disable

◆ Target Address

Enter the target address (IP address or domain name).

[Default]: No settings

◆ Cycle (min)

The cycle to execute a ping can be selected from 5 to 60 minutes.

[Setting]: 5, 10, 30, 60
[Default]: 5

◆ PIN Unlock Code

If "+CPIN: PUK" is displayed under [Status] → [Log] → [3G AT command log], the PIN is locked and the PIN unlock code (PUK) must be entered. (This will be necessary if the PIN code is entered incorrectly three times.)

Note that, for some SIM cards, entering the PUK incorrectly 10 times may cause the SIM card to become irreversibly locked.

[Setting]: 8-digit number
[Default]: No settings

◆ New PIN Code

Enter a PIN code to set as the new PIN code.

If "OK" is displayed after pressing the "Execute" button, the PIN lock will be released and the new PIN code will be set.

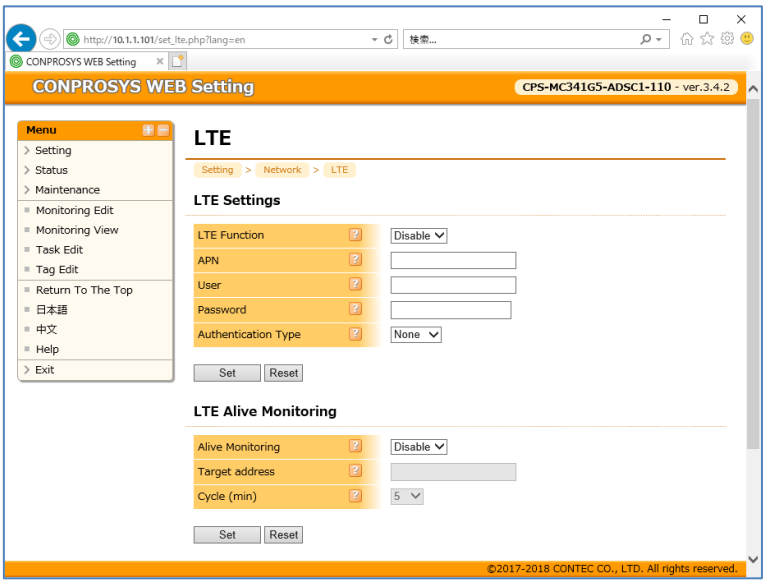
[Setting]: 4- to 8-digit number
[Default]: No settings

4. LTE

Set up LTE communication.

With your SIM card, enter the necessary information.

* This function is only available for 4G support model CPS-MG341G5-ADSC1-931.
* If your SIM card is for an LTE device or a SIM card that allows you to select the access point name (APN), be sure to enter the details of your LTE device in the "APN" section below.



◆ LTE Function

Enable this when using LTE function.

[Setting]: Disable, Enable
[Default]: Disable

◆ APN

Set APN for LTE connection specified by the LTE service provider.

[Setting]: Domain name
[Default]: No settings

◆ User

Set a username for LTE connection specified by the LTE service provider.

[Setting]: 0 to 32 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, and [@] at sign.
[Default]: No settings

◆ Password

Set a password for LTE connection specified by the LTE service provider.

[Setting]: 0 to 30 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [‘] single quotation mark, [\] JPY mark, or backquote [`].

[Default]: No settings

◆ Authentication Type

Select an authentication type from [None], [PAP], or [CHAP] for LTE connection specified by the LTE service provider.

[Setting]: None, PAP, CHAP
[Default]: None

◆ PIN Code

Enter the PIN code if the SIM card is locked.

[Setting]: 4- to 8-digit number
[Default]: No settings

◆ Alive Monitoring

Execute a ping at the specified cycle to target address. When the ping fails, LTE restarts.

[Setting]: Disable, Enable
[Default]: Disable

◆ Target address

Enter the target address (IP address or domain name).

[Default]: No settings

◆ Cycle (min)

The cycle to execute a ping can be selected from 1 to 60 minutes.

[Setting]: 1, 5, 10, 30, 60
[Default]: 5

◆ PIN Unlock Code

If "+CPIN: PUK" is displayed under [Status] → [Log] → [LTE AT command log], the PIN is locked and the PIN unlock code (PUK) must be entered. (This will be necessary if the PIN code is entered incorrectly three times.)

Note that, for some SIM cards, entering the PUK incorrectly 10 times may cause the SIM card to become irreversibly locked.

[Setting]: 8-digit number

[Default]: No settings

◆ New PIN Code

Enter a PIN code to set as the new PIN code.

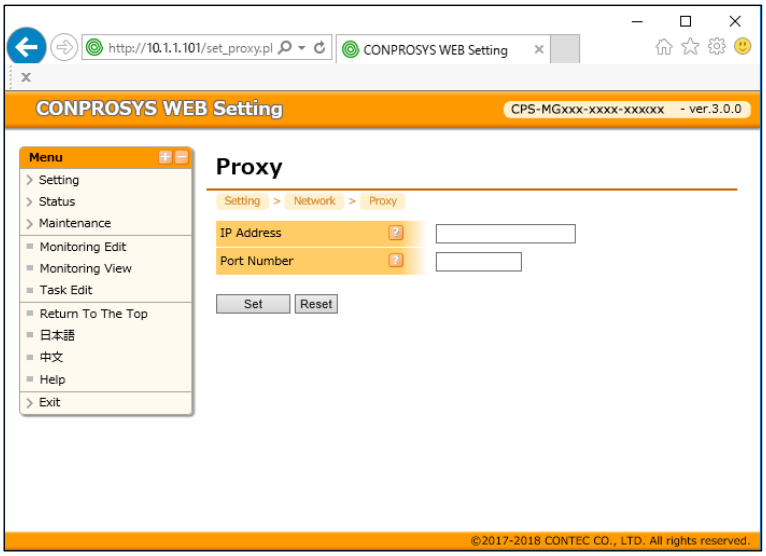
If "<OK>" is displayed after pressing the "Execute" button, the PIN lock will be released and the new PIN code will be set.

[Setting]: 4- to 8-digit number

[Default]: No settings

5. Proxy

Set up IP address and port number of Proxy server.



◆ IP Address

Set up Proxy server IP address.

When the proxy server is not used for data transfer, leave it blank.

When transferring data via proxy, set both of IP address and a port number.

[Setting]: IP address
[Default]: No settings

◆ Port Number

Set up Proxy server port number.

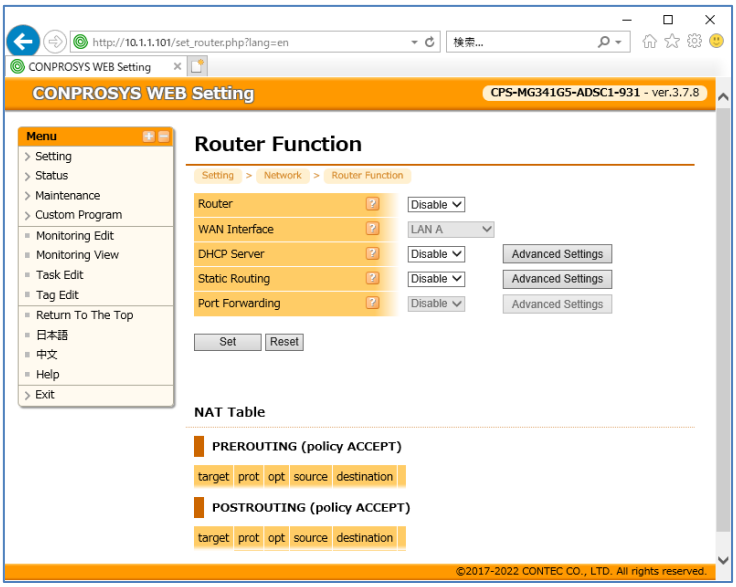
When the proxy server is not used for data transfer, leave it blank.

When transferring data via proxy, set both of IP address and a port number.

[Setting]: 0 − 65535 (numeric values)
[Default]: No settings

6. Router Function

Set up router function.



◆ Router

Enable this when using the router function.

[Setting]: Disable, Enable
[Default]: Disable

◆ WAN Interface

Specify WAN interface when using the router function.

[Setting]: LAN A, LAN B, 3G, LTE, Wireless LAN
[Default]: LAN A

◆ DHCP Server

Enable this when using DHCP server.
Click the [Advanced Settings] button and set the details of DHCP server.

[Setting]: Disable, Enable
[Default]: Disable

◆ Static Routing

Enable this when using the static routing.

Click the [Advanced Settings] button and set the details of the static routing.

[Setting]: Disable, Enable
[Default]: Disable

◆ Port Forwarding

This can be enabled and set when the router function is enabled.

Enable this when using the port forwarding.

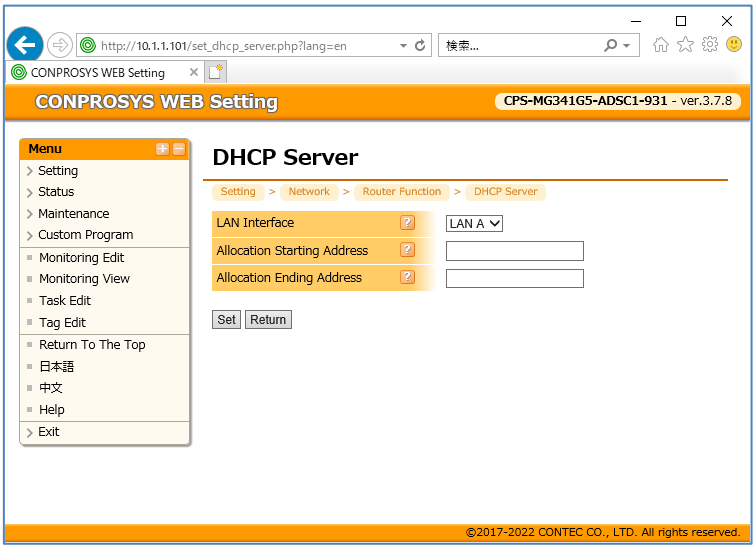
Click the [Advanced Settings] button and set the details of the port forwarding.

[Setting]: Disable, Enable
[Default]: Disable

◆ Advanced Settings – DHCP Server

Set up DHCP server.

Click the [Advanced Settings] button to display the detailed items regarding the "DHCP Server".



LAN Interface

Specify LAN interface that allocates DHCP.

[Setting]: LAN A, LAN B

[Default]: LAN A

Allocation Starting Address

Specify the starting address that allocates DHCP.

[Setting]: IP address

[Default]: No settings

Allocation Ending Address

Specify the ending address that allocates DHCP.

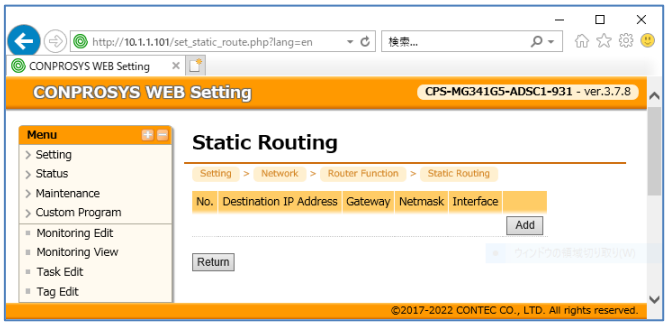
[Setting]: IP address

[Default]: No settings

◆ Advanced Settings – Static Routing

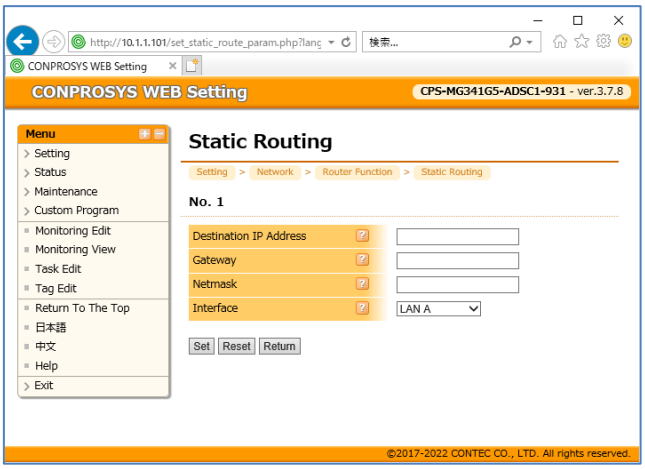
Set up static routing.

Click the [Advanced Settings] button to display the settings list screen.



Click the [Add] button to add a setting to "Static Routing".

Up to 32 settings are possible.



Destination IP Address

Specify the destination IP address of the static routing.

[Setting]: IP address

[Default]: No settings

Gateway

Specify the gateway address of the static routing.

[Setting]: IP address

[Default]: No settings

Netmask

Specify the netmask of the static routing.

[Setting]: Subnet Mask

[Default]: No settings

Interface

Specify the interface of the static routing.

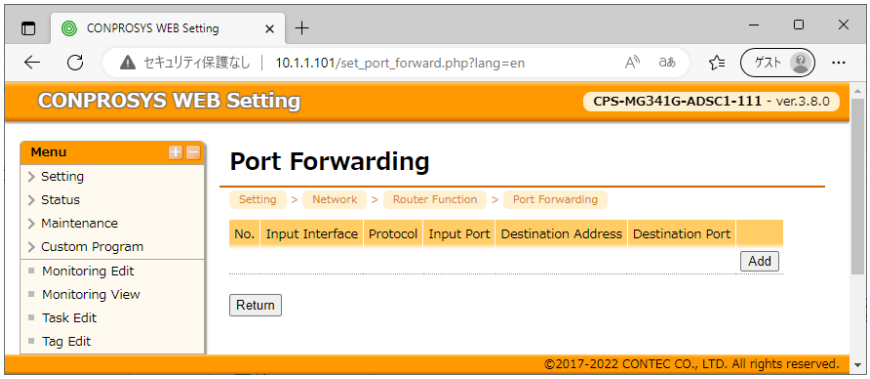
[Setting]: LAN A, LAN B, 3G, LTE, Wireless LAN

[Default]: LAN A

◆ Advanced Settings – Port Forwarding

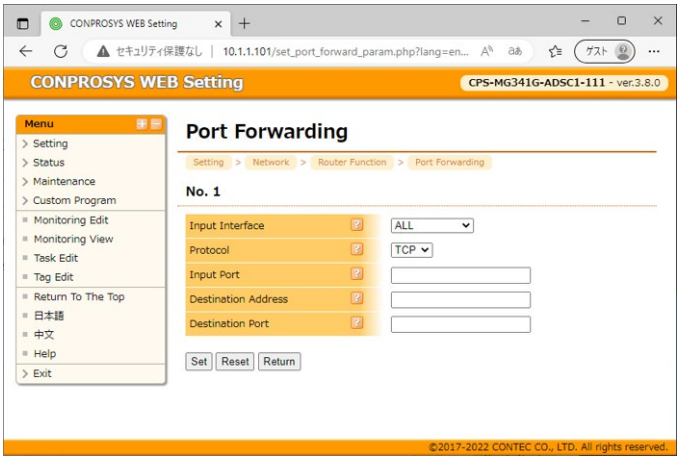
Set up port forwarding.

Click the [Advanced Settings] button to display the settings list screen.



Click the [Add] button to add a setting to "Port Forwarding".

Up to 32 settings are possible.



Input Interface

Specify the input interface for forwarding.

[Setting]: LAN A, LAN B, 3G, LTE, Wireless LAN, ALL

[Default]: ALL

Protocol

Select the target protocol.

[Setting]: TCP, UDP

[Default]: TCP

Input Port

Specify the input port for forwarding.

[Setting]: 0-65535 (numerical value)

[Default]: No settings

Destination Address

Specify the destination IP address for forwarding.

[Setting]: IP address

[Default]: No settings

Destination Port

Specify the destination port for forwarding.

[Setting]: IP address

[Default]: No settings

7. IP Filter

Set up IP Filter. When the setting is enabled, input packets except the following are dropped.

DHCP service

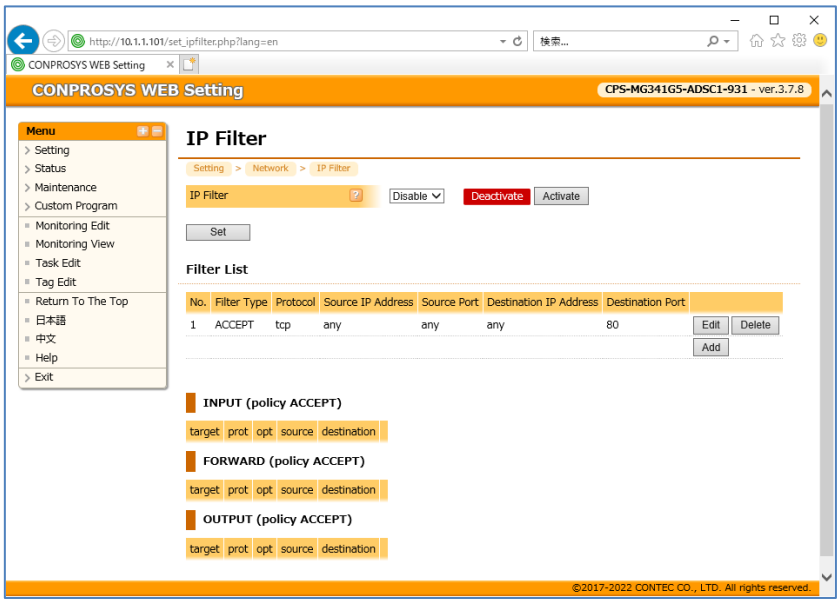
DNS service

NTP service

Packets accepted by rules added to the filter list

- All output packets are accepted.

The Web page connection permission setting is registered as the default value.



◆ IP Filter

With IP filter is activated and to boot the product, enable this.

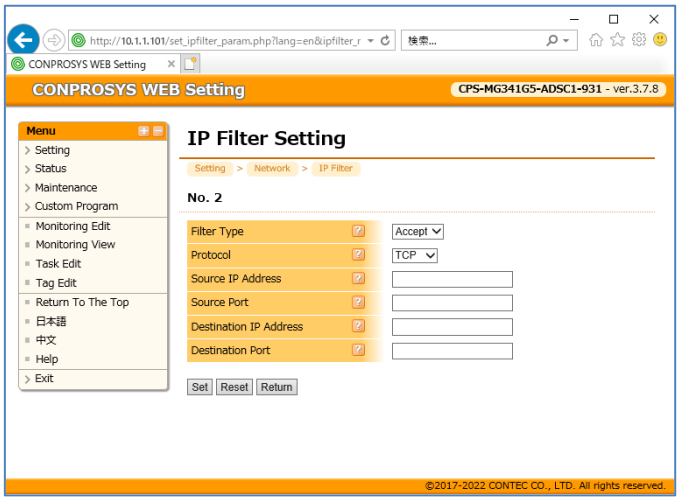
The IP filter can be activate or deactivate by clicking the [Activate] or the [Deactivate] buttons.

[Setting]: Disable, Enable

[Default]: Disable

Click the [Add] button to add a setting to "IP Filter List".

Up to 64 settings are possible.



◆ Filter Type

Specify the filter type.

[Setting]: Accept, Drop

[Default]: Accept

◆ Protocol

Specify the protocol from TCP / UDP / ICMP / ALL.

[Setting]: TCP, UDP, ICMP, ALL

[Default]: TCP

◆ Source IP Address

Specify the source IP address to apply filter.

If not specified, all IP addresses are applied.

[Setting]: IP address

[Default]: No settings

◆ Source Port

Specify the source port to apply filter.
If not specified, all ports are applied.

[Setting]: 0-65535 (numerical value)
[Default]: No settings

◆ Destination IP Address

Specify the destination IP address to apply filter.
If not specified, all IP addresses are applied.

[Setting]: IP address
[Default]: No settings

◆ Destination Port

Specify the destination port to apply filter.
If not specified, all ports are applied.

[Setting]: 0-65535 (numerical value)
[Default]: No settings

8. Device

Set up digital input, counter input, analog input, and serial communication.

◆ Digital Input Signal

Input functions can be switched in the digital input signal on the display.

The signals whose functions are limited by this setting will be hidden from OPC UA, CONPROSYS VTC, and CONPROSYS HMI.

With CPS-MG341-ADCS1-*** digital input 0 and counter 0, digital input 1 and counter 1, share the same terminals.

With CPS-MG341-ADSC1-931 an external power supply or a built-in power supply can be chosen as the power supply for digital input.

◆ Digital Input Power

The digital input power type can be chosen from built-in power or external power.

[Setting]: Built-in power, external power
[Default]: Built-in power

◆ Digital Filter

Preventing wrong recognition of input signals from being affected by noise or chattering. The digital filter checks the input signal level during the sampling time of 1/4 cycles of digital filter setting time. When the signal level remains the same for the digital filter setting time (four time sampling), the digital filter recognizes that signal as the normal input signal.

[Setting]: Filter function unused, 0.25µsec - 131.072msec
[Default]: Filter function unused

◆ DI/CNT2, DI/CNT3

Digital input and counter input functions can be switched.

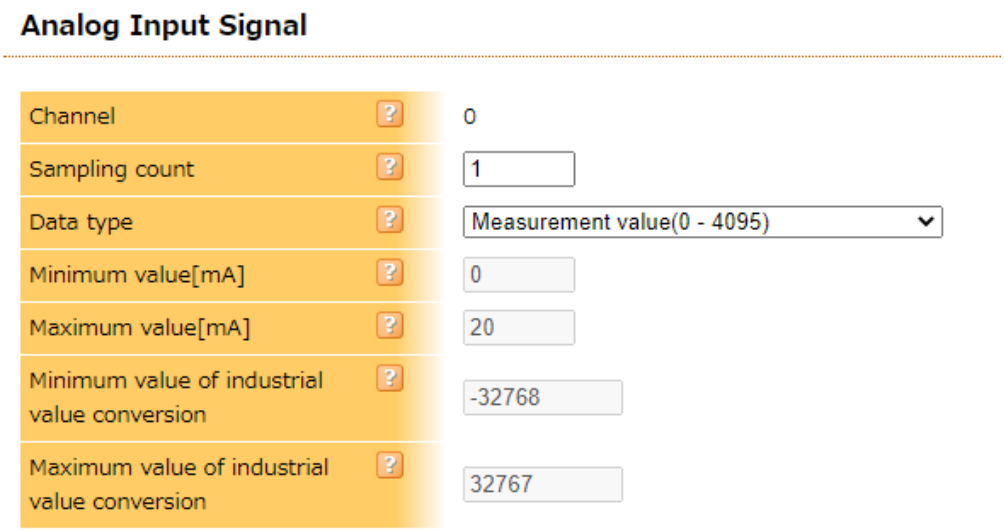
Digital input and counter share the same terminals.

[Setting]: Digital input, counter input, or digital input and counter input.
[Default]: Digital input and counter input

◆ Analog Input Signal

Set up analog input signals.

The contents of this setting can be applied to all the functions that use analog input signals.



◆ Sampling Count

The average of the analog input values sampled for the specified number of times is used.

◆ Data Type

Decide whether the measurement value or the industrial value conversion to be used.

When the measurement value is selected, the analog input value will be the one obtained in the range of the resolution (unit: LSB).

When the industrial value conversion is selected, the value will be the converted one set in the Minimum/Maximum value and the Minimum/Maximum value of industrial value conversion.

CPS-MG341-ADCS1-***

[Setting]: [Measurement value (0 to 4095)], [Industrial value conversion (-32768 to +32767)]

[Default]: [Measurement value (0 to 4095)]

◆ Minimum Value - Maximum Value

Set the minimum value and the maximum value of inputs for the industrial value conversion.

(Unit: 1V or 1mA)

Set the values from the range specified in analog inputs.

You cannot set the minimum value that is bigger than the maximum value.

CPS-MG341-ADCS1-***

[Setting]: 0mA - 20mA

[Default]: Minimum Value = 0mA, Maximum Value =20mA

◆ Minimum Value of Industrial Value Conversion Maximum value of Industrial Value Conversion

Set the minimum value and the maximum value for the industrial value conversion.

The value obtained by converting the analog input value of the minimum value - the maximum value into the minimum value of industrial value conversion - the maximum value of industrial value conversion is used.

If the analog input value is less than the minimum value, the value set in the minimum value is used.

If the analog input value is bigger than the maximum value, the value set in the maximum value is used.

[Setting]: -32768 to +32767

[Default]: Minimum Value =-32768, Maximum Value =32767

◆ Serial Communication

This function is available with CPS-MC341-ADSC1-930, CPS-MC341-ADSC1-931 and CPS-MG341G5-ADSC1-931.

Set up COM B of serial communication port to be used either for a task script or FANUC CNC.

[For a task script]: set the serial communication on the task edit screen.
[For FANUC CNC]: set the serial communication in accordance with CNC setting.

◆ COM B

Decide whether COM B of serial communication port to be used for a task script or for FANUC CNC.

[Setting]: for a task script or FANUC CNC
[Default]: for a task script

◆ BaudRate

Select baud rate when COM B is used for FANUC CNC.

[Setting]: 50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2400, 9600, 19200, 38400, 57600, 115200, 230400, 921600
[Default]: 4800

◆ Data Bit

Select data bit when COM B is used for FANUC CNC.

[Setting]: 5, 6, 7, 8
[Default]: 8-bit

◆ Parity Bit

Select parity bit when COM B is used for FANUC CNC.

[Setting]: None, Even, Odd
[Default]: None

◆ Stop Bit

Select stop bit when COM B is used for FANUC CNC.

[Setting]: 1 bit, 2-bit
[Default]: 2-bit

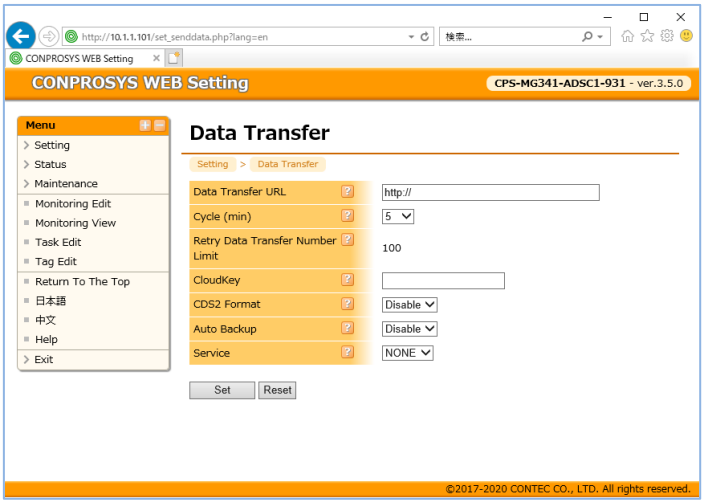
◆ Flow Control

Select flow control when COM B is used for FANUC CNC.

[Setting]: Software, Hardware, None
[Default]: Software

9. Data Transfer

Set up the definition to measure data and the server to send data.



◆ Data Transfer URL

Enter URL to transfer data.

It is used for data transfer service as well as for cloud transfer from CONPROSYS VTC.

If you are sending data to CONTEC cloud service, enter URL in the “Data transfer URL”, select CDS2 format “Enable”, and click the “set”.

* As for Data transfer URL, enter the “Measured data upload URL” that is listed on the mail sent to you after completing CDS2 contract.

[Setting]: URL
[Default]: http:// (No settings)

◆ Cycle (min)

Set up a cycle to transfer data. Setting details are used in data transfer service.

[Setting]: 1, 5, 10, 15, 20, 30, 60
[Default]: 5

◆ Retry Data Transfer Number Limit

The maximum number of files that can be transferred simultaneously. It is set automatically in accordance with data transfer cycle (min).

[Setting]: 20 files is the maximum when one minute is set for data transfer cycle. 100 files for other cycles.
[Default]: 100

◆ CloudKey

Set CloudKey to identify the required data.

CloudKey is added to a head column of sending data.

When CDS2 is used for a destination, set the setting according to cloud server.

The CDS2 is the service for Japan domestic only.

[Setting]: 1 to 10 of one-byte alphanumeric character and [_] underline.
[Default]: No settings

◆ CDS2 Format

When CDS2 is used for a destination, select CDS2 format “Enable”.

The format of data sent by transfer service is changed.

[Setting]: Disable, Enable
[Default]: Disable

◆ Auto Backup

Backup files are set into the SD card upon transferring data to the data transfer URL.

The files can be downloaded from [File view] in [Status].

[Setting]: Disable, Enable
[Default]: Disable

◆ Service

Select the service to transfer data.　For CDS2, select the "NONE".

When CHS is selected and saved, "Data Transfer URL" and "CDS2 format" are dynamically changed.

[Setting]: NONE, CHS
[Default]: NONE

◆ Server Connection Timeout (sec)

Set the timeout period until the system connects to the server.

[Setting]: 10 - 300 (numeric values)
[Default]: 20

◆ Data Transfer Timeout (sec)

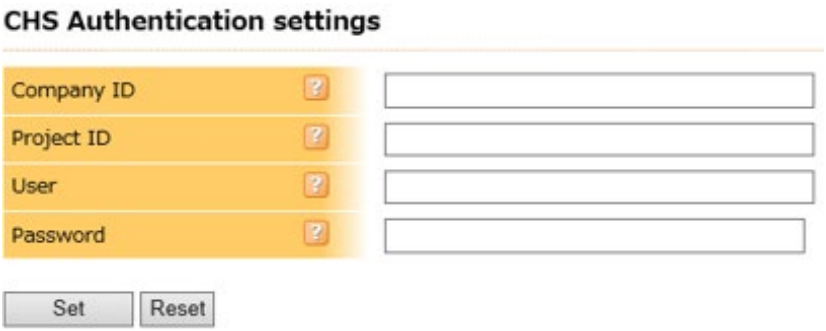
Set the timeout period until the data transfer is completed.

[Setting]: 30 - 3600 (numeric values)
[Default]: 60

◆ Service-CHS

Refer to CHS Help regarding the link between CONPROSYS and CHS (CONPROSYS HMI System).

◆ CHS Authentication settings



◆ Company ID

Enter the company ID which registered in CHS.

[Setting]: 1 to 16 of one-byte alphanumeric character
[Default]: No settings

◆ Project ID

Enter the project ID which registered in CHS.

[Setting]: 1 to 16 of one-byte alphanumeric character
[Default]: No settings

◆ User

Enter the user ID which registered in CHS.

[Setting]: 1 to 40 of one-byte alphanumeric character
[Default]: No settings

◆ Password

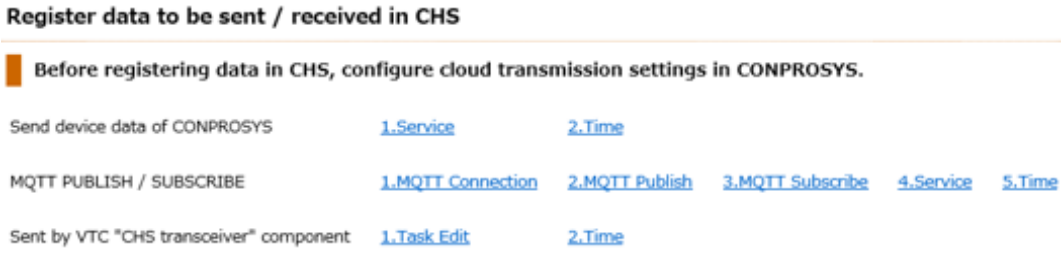
Enter the password which registered in CHS.

[Setting]: 1 to 64 of one-byte alphanumeric character, symbols
[Default]: No settings

◆ Register data to be sent / received in CHS

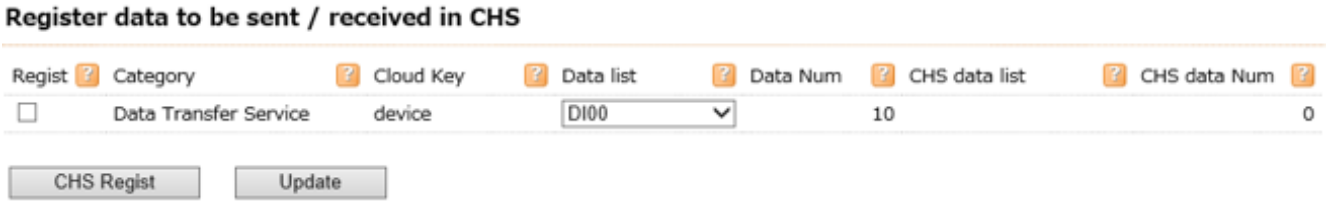
Before registering data in CHS, configure cloud transmission settings in CONPROSYS.

The link to setting page appears if there are no cloud transmission settings.



The page changes to the authentication button if there are cloud transmission settings.

When authentication succeeds, the list of could transmission settings and the list of CHS registered data will be displayed.



◆ Regist

Check off the desired cloud key for sending data to CHS. This is not displayed if there are no cloud transmission settings.

◆ Category

This indicates the type of cloud transfer.

The [unknown] will be displayed when data are registered in CHS, however, not set in CONPROSYS.

◆ Cloud key

This indicates the cloud key that has been set. Identical cloud key cannot be used.

◆ Data list

This is the data list to send data to cloud by CONPROSYS.

◆ Data Num

This indicates the number of data to be sent by CONPROSYS.

◆ CHS data list

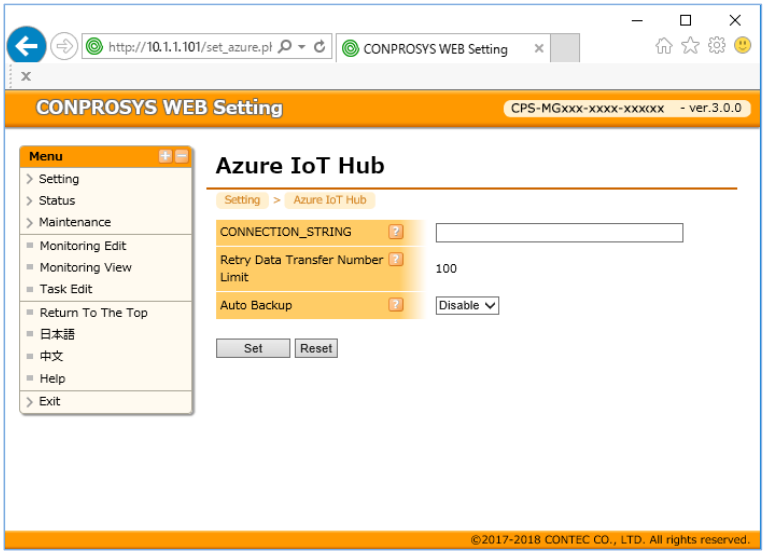
This is the data list that are registered in CHS.

◆ CHS data Num

This indicates the number of data that are registered in CHS.

10. Azure IoT Hub

Set up the details of the device registered in Azure IoT Hub.



◆ CONNECTION_STRING

Enter connection string of the device ID registered in Azure IoT Hub.

[Setting]: 0 - 256 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Retry Data Transfer Number Limit

This is the maximum number of files that can be resent simultaneously. It cannot be changed.

[Setting]: 20 files is the maximum when one minute is set for data transfer cycle. 100 files for other cycles.
[Default]: 100

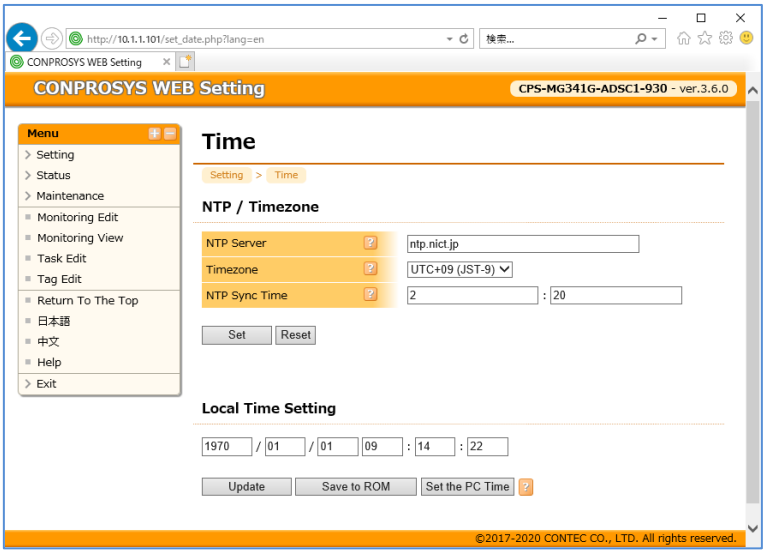
◆ Auto Backup

Enable this to create backup files into the SD card upon transferring data to the Azure IoT Hub.

[Setting]: Disable, Enable
[Default]: Disable

11. Time

Set up the name of NTP server that obtains the time and date.



◆ NTP Server

Set the address of NTP server when using NTP.

[Setting]: Domain name or IP address
[Default]: ntp.nict.jp

◆ Time Zone

Select the time zone. Time zone setting is also reflected to the date in the data generated.

[Setting]: UTC-11 - UTC+12
[Default]: UTC+09(JST-9)

◆ NTP Sync Time

Set the time for synchronization using NTP. Synchronization is daily performed at the specified time.

[Setting]: 0 : 00 - 23 : 59
[Default]: 2 : 20

◆ System Time

This displays the current system time.

◆ Local Time Setting

To change the system time, select the time and click “Update”.

By clicking “Update”, the set time is saved in temporary storage space.

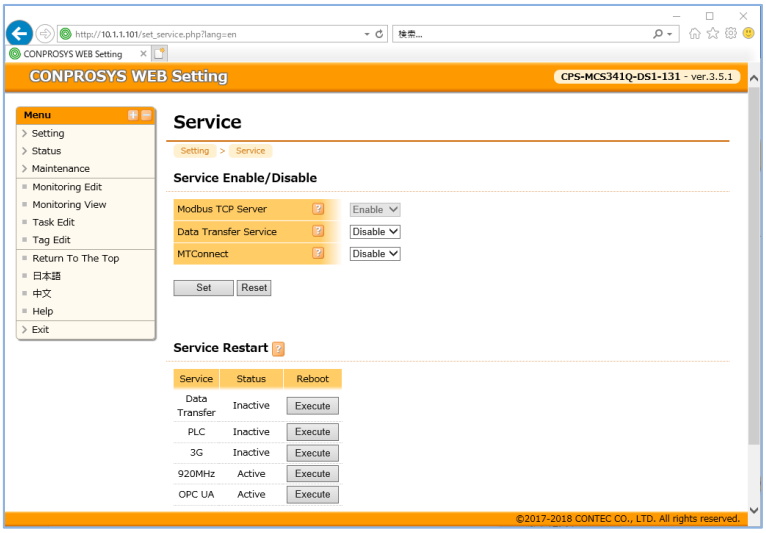
With the product models containing a battery, time can be kept even when the product power is off.

By clicking “Set the PC Time”, the PC time is automatically set in the form.

[Setting]: Setting: 1970-01-01 00:00:00 - 2038-1-19-03:14:07
[Default]: No settings

12. Service

Set up services to be operated in the product.



◆ Modbus TCP Sever

Run Modbus TCP sever.

The maximum number of connectable TCPs : 5　　Port number : 502

[Setting]: Fixed
[Default]: Enable

*Disable is unavailable

◆ Data Transfer Service

Enable this to transfer I/O data of the device to the server at the certain time cycle.

Set the destination of the data to be sent in [Data transfer URL] and the data sending intervals in [Cycle (min)].

The product without a RTC built-in battery starts the service after completing time synchronization with NTP server.

[Setting]: Disable, Enable
[Default]: Disable

◆ MQTT Client

Enable this to communicate with MQTT-Broker.

Set up MQTT “Connection”, “Publish”, and “Subscribe” in each of the setting page.

For the controller without a built-in RTC battery models, the service starts after completing time synchronization with NTP server.

[Setting]: Disable, Enable
[Default]: Disable

◆ MTConnect

MTConnect is a communication protocol for machine tools.

To stop MTConnect, select Disable and click the [set].

* The MTConnect function is available with CPS-MG341G-ADSC1-930, CPS-MG341-ADSC1-931 and CPS-MG341G5-ADSC1-931.

[Setting]: Disable, Enable
[Default]: Disable

◆ Router Log Function

By enabling, iptables logs are displayed in [Status] → [Log] → [Router log].

[Setting]: Disable, Enable
[Default]: Enable

Select the log you want to retrieve.

[Setting]: Dropped packets only, All logs
[Default]: Dropped packets only

◆ FacilityView

Enable this to communicate with FacilityView.

Set up FacilityView “Connection” and “Transfer” in each of the setting page.

[Setting]: Disable, Enable
[Default]: Disable

◆ Web Server

Select the communication method that the web server allows.

[Setting]: HTTP/HTTPS, HTTP, HTTPS
[Default]: HTTP/HTTPS

◆ Service Restart

The Service Restart is available to restart the specified services in the current user settings (WEB Setting).

Use these buttons for function operational checks.

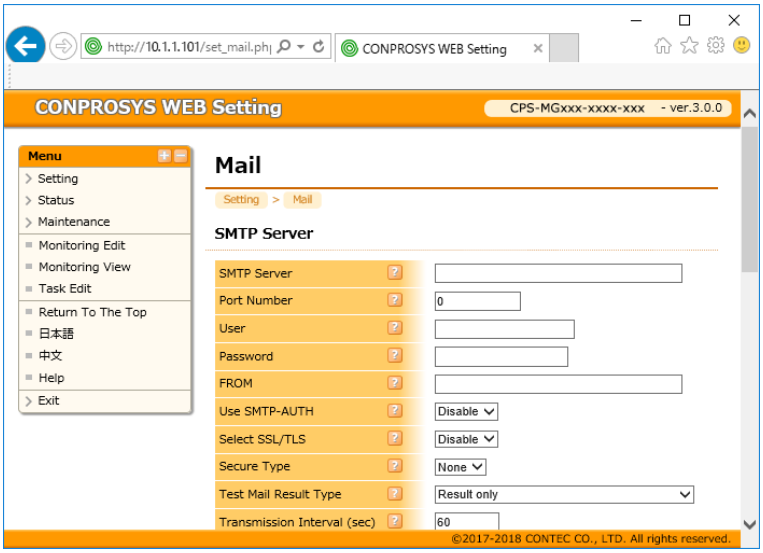
After the settings have been completed, save them to ROM first. Then activate the actual operations.

* The services that can be updated by executing the service restart.
  - Data Transfer: Data Transfer setting, Time setting
  - PLC : PLC setting
  - 3G :3G setting (except Alive Monitoring setting)
  - 920MHz : 920MHz setting (Basic setting only)
  - OPC UA Server : OPC UA Server setting
  - LTE : LTE setting (except Alive Monitoring setting)
  - MQTT : MQTT Connection, Publish, Subscribe settings
  - NTP Time Sync : NTP Sync Time setting
  - BACnet : BACnet setting
  - Web Server : Web Server setting
  - OPC UA Client : OPC UA Client setting

13. Mail

Set up SMTP server setting.

Set the setting in accordance with the server to connect.



◆ SMTP Sever

Set up the address of SMTP server to send emails.

[Setting]: Domain name or IP address
[Default]: No settings

◆ Port Number

Enter the port number of SMTP Server.

[Setting]: 0 – 65535 (numeric values)
[Default]: 0

◆ User

Enter the user name of SMTP server.

[Setting]: 0 - 256 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, and [@] at sign.
[Default]: No settings

◆ Password

Enter the password of SMTP Server.

[Setting]: 0 to 64 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [’] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ FROM

Enter the FROM details of the sending mail.

[Setting]: Up to 256 letters.
[Default]: No settings

◆ SMTP-AUTH

Enable this when using SMTP-AUTH in SMTP server.

[Setting]: Disable, Enable
[Default]: Disable

◆ Select SSL/TLS

Select Enable when SMTP server uses secured connection.

[Setting]: Disable, Enable
[Default]: Disable

◆ Secure Type

Select a secure type when SMTP server uses secured connection.

[Setting]: None, SSL, TLS
[Default]: None

◆ Test Mail Result Type

Select the type to display the communication details upon sending a test mail.

[Setting]: Results only, a message from CONPROSYS to SMTP server, a message between CONPROSYS and SMTP server.
[Default]: Results only

◆ Transmission Interval (sec)

When sending fails, the mail is stored in a Resend folder (Mail) and is resent at the specified interval “cycle (second)”.

[Setting]: 0 - 300 (numeric values)
[Default]: 60

◆ Resend Times

When resending fails more the specified times, stored mails are discarded. Mails within the specified resending times are stored in a Resend folder.

[Setting]: 0 - 10 (numeric values)
[Default]: 3

◆ Max Number of Resend Mail File

The maximum number of mails that can be stored in a Resend folder (Mail). When mails exceed the maximum limit, the exceeded mails are discarded instead of resending.

[Setting]: 0 － 300 (numeric values)
[Default]: 300

◆ Test Mail Address

Send a test mail to the specified address.

Click the “Execute” button to send a test mail.

[Setting]: 0 - 256 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, and [@] at sign.
[Default]: No settings

◆ Mail Address

Up to 10 destinations can be set per address.

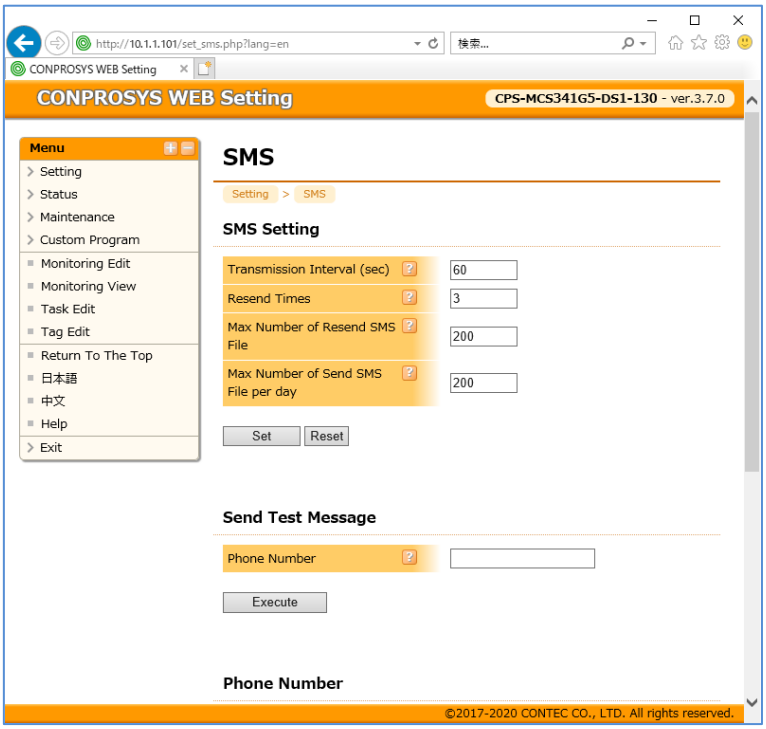
[Setting]: 0 - 256 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, and [@] at sign.
[Default]: No settings

14. SMS

Set up SMS.

* This function is only available with the CPS-MG341G5-ADSC1-931 model and the CPS-MG341G-ADSC1-930 model.

* Check the "See Confirmed SIM Cards" in the following site for confirmed SIM cards.
https://www.contec.com/products-services/daq-control/iiot-conprosys/gateway/lineup/



◆ Transmission Interval (sec)

When sending a message by SMS fails, the SMS message is stored in a Resend folder (SMS) and is resent at the specified interval (second).

[Setting]: 0 - 300 (numeric values)
[Default]: 60

◆ Resend Times

When resending fails more the specified times, stored SMS messages are discarded.

SMS messages within the specified resending times are stored in a Resend folder.

[Setting]: 0 - 10 (numeric values)
[Default]: 3

◆ Max number of Resend SMS File

The maximum number of SMS messages that can be stored in a Resend folder (SMS).
When the messages exceed the maximum limit, they are discarded instead of resending.

[Setting]: 0 - 200 (numeric values)
[Default]: 200

◆ Max Number of Send SMS File per day

The maximum number of SMS messages that can be sent per day.
When the messages exceed the maximum limit, they are discarded instead of sending.
When [0] is set, the maximum number will be unlimited.
The number of sending messages is cleared at 0 : 00 daily.

[Setting]: 0 - 200 (numeric values)
[Default]: 200

◆ Send Test Message

Click the [Execute] button to send a SMS message to the specified phone number.

[Setting]: Phone Number (up to 15 one-byte alphanumeric characters)
[Default]: No settings

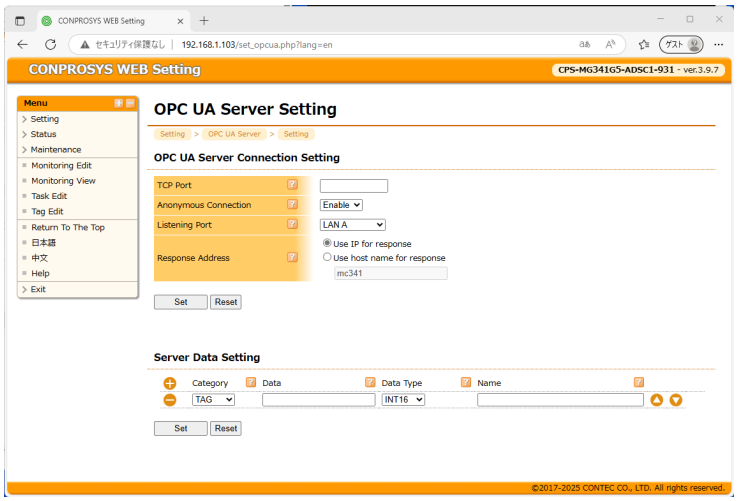
◆ Phone Number

Up to 10 phone numbers for sending SMS messages can be registered.

[Setting]: Phone Number (up to 15 one-byte alphanumeric characters)
[Default]: No settings

15. OPC UA Server Setting

Set up OPC UA server.



◆ TCP Port

The port setting of OPC UA server can be done from TCP Port.

The port number can be set with between 0 and 65535 or empty value.

When the port number is unspecified, the default port 4840 is used.

[Setting]: 0 - 65535 (numeric values)
[Default]: No settings

◆ Anonymous Connection

Enable or disable the anonymous connection to OPC UA server. Execute the saving and rebooting to enable the settings.

[Setting]: Disable, Enable
[Default]: Enable

◆ Listening Port

Specify the port for OPC UA server to listen. When specifying other than “All”, access will be available to only selected port. Execute the saving and rebooting to enable the settings.

[Setting]: LAN A, LAN B, 3G, Wireless LAN, ALL
[Default]: LAN A

◆ Response Address

Specify the address expression included in the data to which OPC UA server responds.

[Setting]: Use IP for response, Use host name for response
[Default]: Use IP for response

Specify a host name when using a host name for response.

[Setting]: Domain name [0 to 128 letters of one-byte alphanumeric character, hyphen (-), period (.), and vertical bar (|)]
[Default]: mc341

Execute the saving and rebooting to enable the settings.

◆ Server Data Setting

The items can be increased or decreased with the “+” and “-” buttons.

Up to 200 items are configurable.

The order of the setting items can be changed by clicking the “▲▼” buttons.

◆ Category

Select the category of data.

[Setting]: TAG, DTAG, STAG, EXTAG

[Default]: TAG

◆ Data

Select the target.

[Setting]: Select from data list. Range of the selected category (TAG: TAG00~TAG499, DTAG: DTAG00~DTAG499, STAG: STAG00~STAG499, EXTAG: EX0000~EX0999)

[Default]: No settings

◆ Data Type

Select the data type.

[Setting]: INT16, UINT16, INT32, UINT32

[Default]: INT16

◆ Name

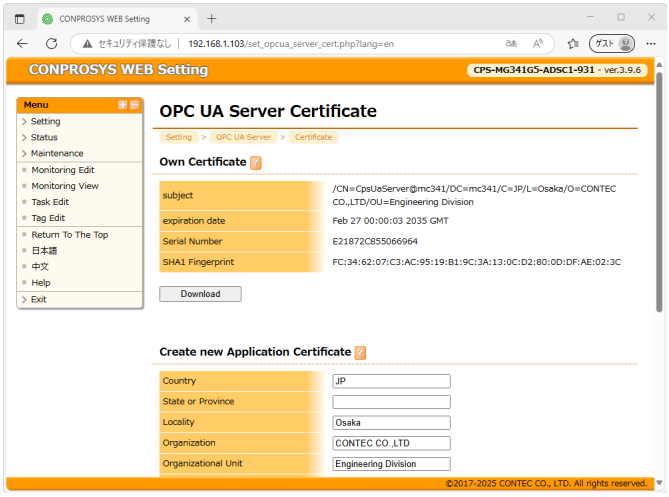
Set the display name.

[Setting]: 1-32 alphanumeric characters, underline(_) and hyphen(-)

[Default]: No settings

16. OPC UA Server Certificate

Download, issue and upload application instance certificates.



◆ Own Certificate

Displays information about the application instance certificate used by the OPC UA server.

When establishing the session of the OPC UA client, and authentication of the user ID or certificates is carried out, uploading the application instance certificate of the client is required beforehand.

Need to save and reboot to valid the settings.

◆ Create new Application Certificate

Application instance certificates for OPC UA servers can be issued.

Time synchronization must be completed.

The Subject field can be set to any value except CommonName.

The validity period is 10 years (3650 days) from issuance.Clicking the [Issue] button will renew the above Own Certificate. The renewed certificate will become valid after restarting the service or restarting the device after saving the settings.

Country

[Setting]: 2 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, [’] single quotation, and [:] colon.

[Default]: JP

State or Province

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

Locality

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: Osaka

Organization

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: CONTEC CO.,LTD

Organizational Unit

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: Engineering Division

CommonName

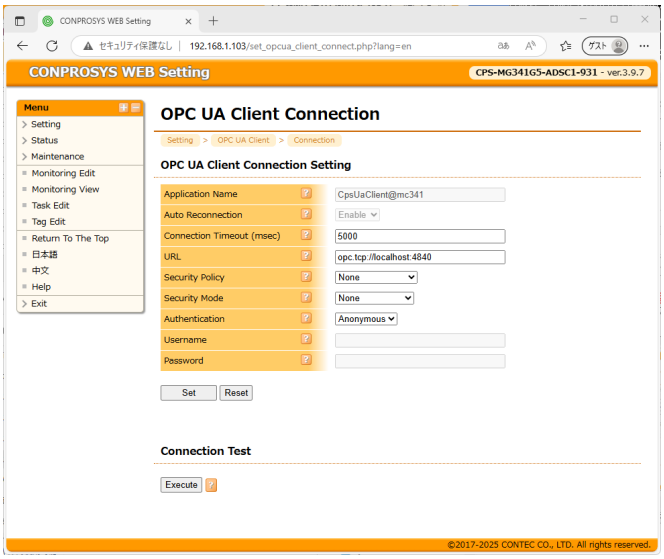
[Default]: CpsUaServer@mc341

◆ Trusted List

To establish a session, an OPC UA client might require the application instance certificate of the server.
Need to save and reboot to valid the settings.
Uploaded certificates can be viewed on the list.
To delete the uploaded certificate, select the certificate from the list and click the [del].

17. OPC UA Client Connection

Set up OPC UA client.



◆ Application Name

Displays the OPC UA client application name.

[Setting]: Can not change.
[Default]: CpsUaClient@mc341

◆ Auto Reconnection

Run automatic reconnection to the OPC UA server. Can not to be set Disable.

[Setting]: Can not change
[Default]: Enable

◆ Connection Timeout (msec)

Set the timeout period for connecting to the OPC UA server.

[Setting]: 100-10000 (numerical value)
[Default]: 5000

◆ URL

The endpoint URL of the OPC UA server to connect to. Set the IP address.

[Setting]: endpoint URL
[Default]: opc.tcp://localhost:4840

◆ Security Policy

Select the security policy to be used for the connection.

[Setting]: None, Basic128Rsa15, Basic256, Basic256Sha256
[Default]: None

◆ Security Mode

Select the message security mode to be used for the connection.

[Setting]: None, Sign, SignAndEncrypt
[Default]: None

◆ Authentication

Select the authentication mode to be used for the connection.

[Setting]: Anonymous, UserName
[Default]: Anonymous

◆ Username

Set the username used for the authentication.

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, [’] single quotation, and [:] colon.
[Default]: No settings

◆ Password

Set the password used for the authentication.

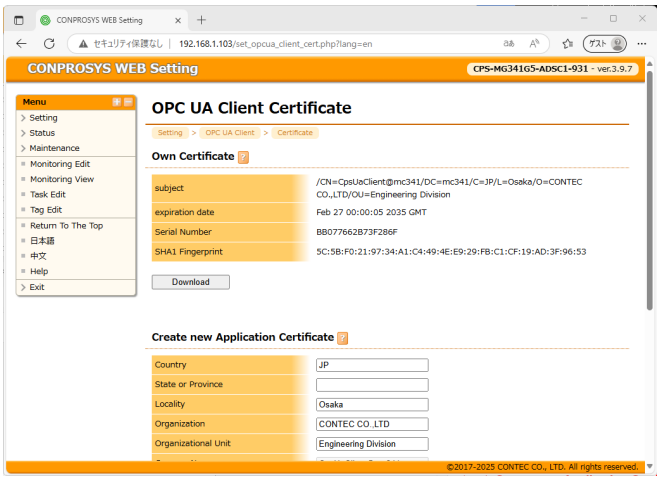
[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, [’] single quotation, and [:] colon.
[Default]: No settings

◆ Connection Test

By clicking the \"Execute\" button, test the connection to the OPC UA server using the connection settings.

18. OPC UA Client Certificate

Download, issue and upload application instance certificates.



◆ Own Certificate

Displays information about the application instance certificate used by the OPC UA client.
When establishing the session of the OPC UA server, and authentication of the user ID or certificates is carried out, uploading the application instance certificate of the client is required beforehand.
Need to save and reboot to valid the settings.

◆ Create new Application Certificate

Application instance certificates for OPC UA clients can be issued.
Time synchronization must be completed.
The Subject field can be set to any value except CommonName.
The validity period is 10 years (3650 days) from issuance.Clicking the "Issue" button will renew the above Own Certificate. The renewed certificate will become valid after restarting the service or restarting the device after saving the settings.

Country

[Setting]: 2 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, [’] single quotation, and [:] colon.
[Default]: JP

State or Province

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

Locality

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: Osaka

Organization

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: CONTEC CO.,LTD

Organizational Unit

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen,
[ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: Engineering Division

CommonName

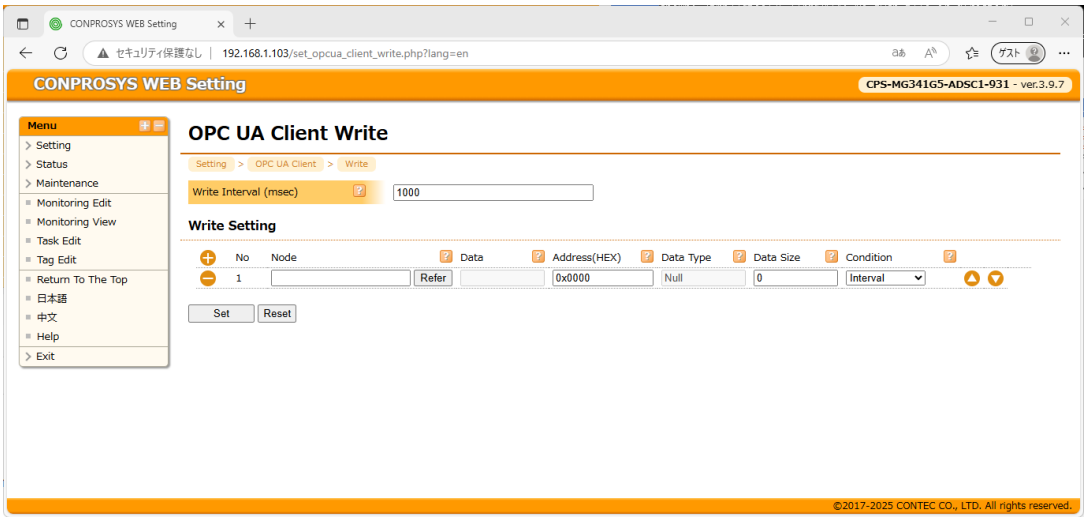
[Default]: CpsUaClient@mc341

◆ Trusted List

To connect to an OPC UA server, you must upload the application instance certificate of the server.
Need to save and reboot to valid the settings.
Uploaded certificates can be viewed on the list.
To delete the uploaded certificate, select the certificate from the list and click the "del".

19. OPC UA Client Write

Set up the OPC UA client write data.



◆ Write Interval (msec)

Set the interval time for node write operations.

Set within the range of 10 to 60,000 milliseconds.

[Setting]: 10-60000 (numerical value)

[Default]: 1000

◆ Write Setting

The items can be increased or decreased with the “+” and “-” buttons.

Up to 100 items are configurable.

The order of the setting items can be changed by clicking the “▲▼” buttons.

◆ Node

Please enter the target node ID. Nodes can be selected via the reference button.

Cannot be pressed until node information acquisition is complete.

◆ Data

Displays the target.

◆ Address (HEX)

Specifies the offset from the Modbus area (0x2000) in hexadecimal.
Set the value in the range of 0x0000 to 0x27FF.

[Setting]: 0x0000-0x27FF (HEX)

[Default]: 0x0000

◆ Data Type

Displays the data type of the node.

◆ Data Size

Displays the data length (in bytes) of the node.
When the data type is String, the data length must be specified.

[Setting]: 1-60000 (numerical value)

[Default]: No settings

◆ Condition

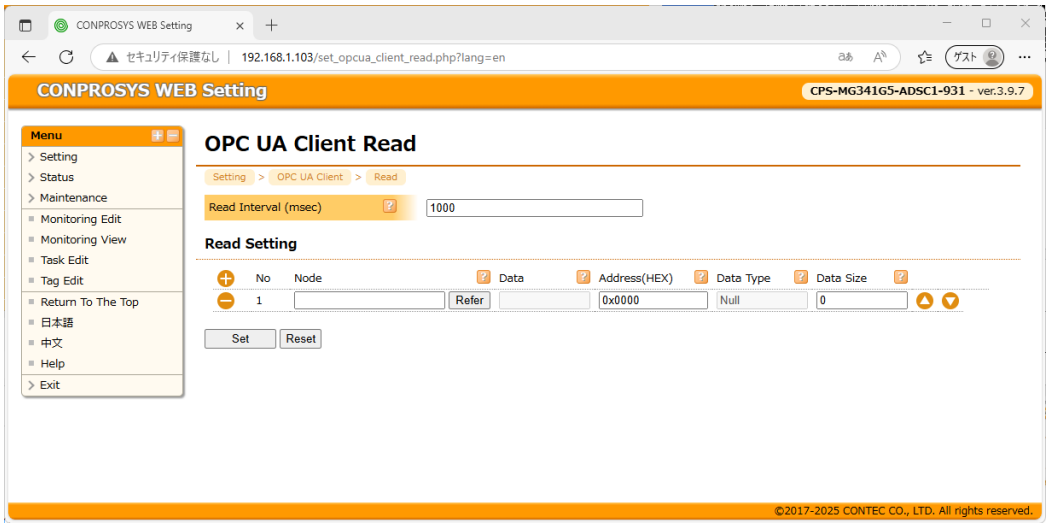
Select the condition for node write operations.

[Setting]: Interval, Data Change

[Default]: Interval

20. OPC UA Client Read

Set up the OPC UA client read data.



◆ Read Interval (msec)

Set the interval time for node read operations.

Set within the range of 10 to 60,000 milliseconds

[Setting]: 10-60000 (numerical value)

[Default]: 1000

◆ Read Setting

The items can be increased or decreased with the "+" and "-" buttons.

Up to 100 items are configurable.

The order of the setting items can be changed by clicking the "▲▼" buttons.

◆ Node

Please enter the target node ID. Nodes can be selected via the reference button.

Cannot be pressed until node information acquisition is complete.

◆ Data

Displays the target.

◆ Address (HEX)

Specifies the offset from the Modbus area (0x2000) in hexadecimal.
Set the value in the range of 0x0000 to 0x27FF.

[Setting]: 0x0000-0x27FF (HEX)

[Default]: 0x0000

◆ Data Type

Displays the data type of the node.

◆ Data Size

Displays the data length (in bytes) of the node.

When the data type is String, the data length must be specified.

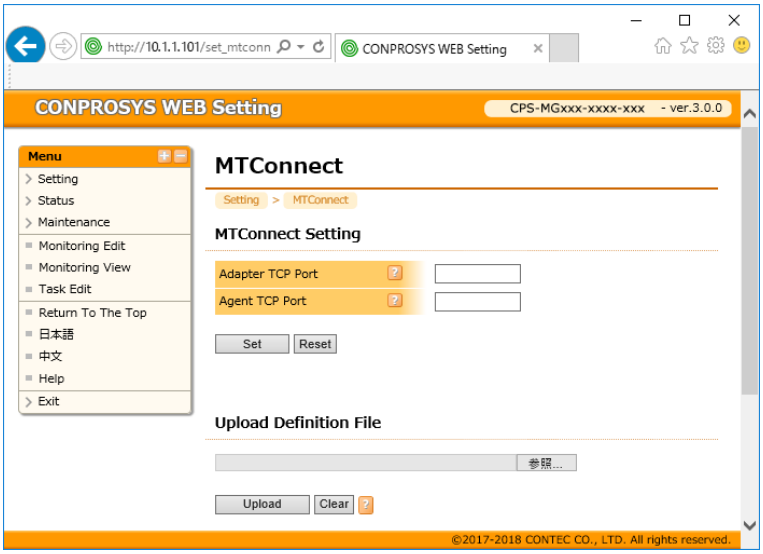
[Setting]: 1-60000 (numerical value)

[Default]: No settings

21. MTConnect

This uploads the definition file of MTConnect.

* The MTConnect function is available with the CPS-MG341G-ADSC1-930, CPS-MG341-ADSC1-931 and CPS-MG341G5-ADSC1-931 model.



◆ Adapter TCP Port

Choose the port number of Adapter

[Setting]: 0 - 65535 (numeric values)
[Default]: 7878

◆ Agent TCP Port

Choose the port number of Agent.

[Setting]: 0 - 65535 (numeric values)
[Default]: 5000

◆ Upload Definition File

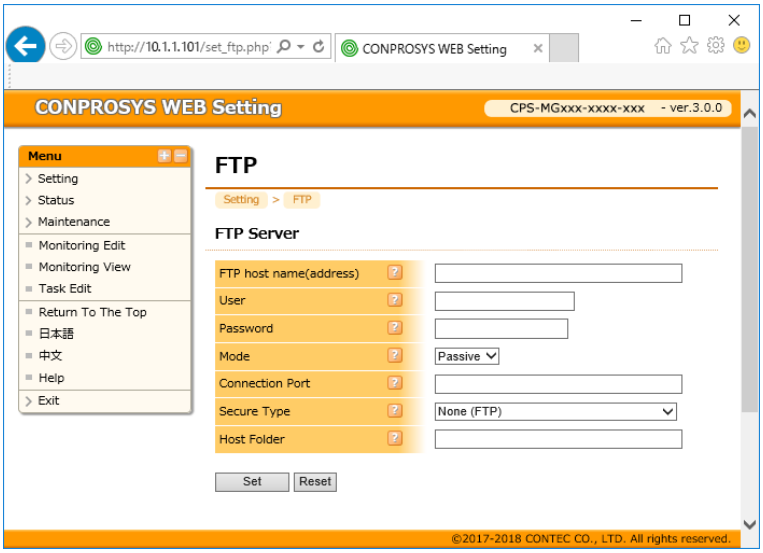
The device definition files used by the agent can be uploaded. (Up to 5 files) “sample.xml” is a sample definition file that is included in the product. You can download the sample.xml, however, it cannot be deleted.

◆ Definition File List

To download the definition file, select the file from the list and click the [Download].

22. FTP

FTP Server setting makes CONPROSYS a client and the product can connect to the FTP server. Files are sent and received by task. For the details, please see "**the sample (10) Receive a file from and send it back to FTP server.(page 199)**" of the task program.



◆ FTP Server

Select the FTP server from Server 0, Server 1, Server 2, Server 3, or Server 4 for setting.

[Setting]: FTP Server0, FTP Server 1, FTP Server 2, FTP Server 3, FTP Server 4
[Default]: FTP Server0

◆ FTP Host Name (address)

Enter the host name (address) of FTP server.

[Setting]: Domain name or IP address
[Default]: No settings

◆ User

Enter the user name of FTP server.

[Setting]: 0 - 32 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [.] period, [@] at sign and [|] vertical bar.
[Default]: No settings

◆ Password

Enter the password of FTP server.

[Setting]: 0 to 30 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [‘] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Mode

Select a mode to be passive or active.

[Setting]: Passive mode, Active mode
[Default]: No settings

◆ Connection Port

The connection port number can be set with between 0 and 65535.

[Setting]: 0 - 65535 (numeric values)
[Default]: No settings

◆ Secure Type

Select the security type from None, FTPS (Explicit), or FTPS (Implicit).

[Setting]: None, FTPS (Explicit), FTPS(Implicit)
[Default]: None

◆ Host Folder

Enter the host folder name to be opened. If it is left blank, the open folder specified by server is used.

[Setting]: 0 - 50 letters of one-byte alphanumeric character, [_] underline, [-] hyphen, [/] slash and [.] period.
[Default]: No settings

◆ Server Connection Timeout (sec)

Set the timeout period until the system connects to the server.

[Setting]: 10 - 300 (numeric values)
[Default]: 20

◆ Data Transfer Timeout (sec)

Set the timeout period until the data transfer is completed.

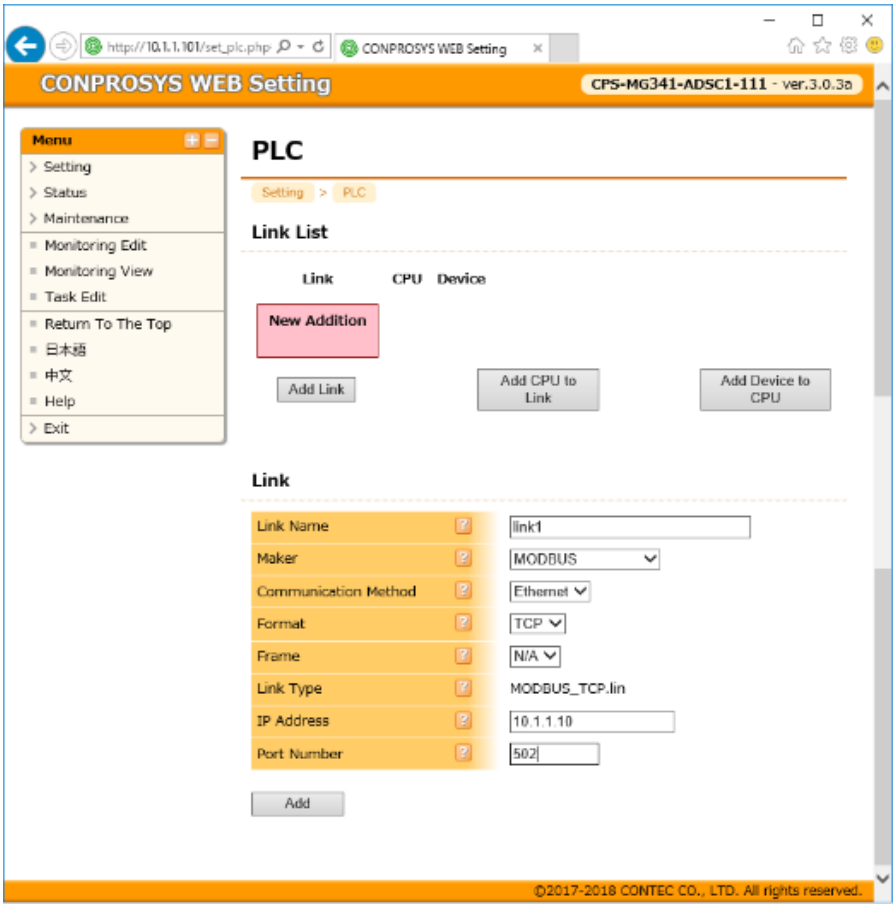
[Setting]: 30 - 3600 (numeric values)

[Default]: 60

23. PLC (Link config)

Set up a PLC link

Click the [Add Link] button to open the setting page.



◆ Link Name

Decide a link name. The link name is specified for CPU setting. The link name is specified for CPU setting.

[Setting]: 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen.

The name cannot be set with only numbers.

[Default]: No settings

◆ Maker

Select a maker name of PLC from the list

[Setting]: Mitsubishi A series, Mitsubishi A(A1SJ) series, Mitsubishi A(AJS1) series, Mitsubishi Q series, Mitsubishi IQ-F series, Mitsubishi IQ-R series, Mitsubishi FX series, OMRON C series, OMRON CS series, OMRON CJ series, TOYOPUC, PANASONIC, KEYENCE, MODBUS

[Default]: No settings.

◆ Communication Method

Select Ethernet or Serial in accordance with the used PLC.

[Setting]: Ethernet / Serial
[Default]: Ethernet

◆ Protocol

Select a TCP or UDP in accordance with the used PLC.

[Setting]: TCP / UDP
[Default]: No settings

◆ Format

Select a format from the list in accordance with the used PLC.

[Setting]: In accordance with PLC
[Default]: No settings

◆ Frame

Select a frame from the list in accordance with the used PLC.

[Setting]: In accordance with PLC
[Default]: No settings

◆ Link Type

The link types correspond to selected maker name, communication method, format and frame are allocated automatically and the file name is displayed.

[Setting]: No settings
[Default]: No settings

◆ IP Address

When the communication method is Ethernet connection, enter IP address of PLC.

[Setting]: IP address
[Default]: No settings

◆ Port Number

When the communication method is Ethernet connection, enter PLC port number.

[Setting]: 0 - 65535

[Default]: No settings

◆ Transmission Source Port Number

Specify the transmission source (CONPROSYS port number from 1 to 65535.

When specifying 65535, use an arbitrary port number.

[Setting]: 1 - 65535 (numeric values)

[Default]: No settings

◆ Serial Port

When the communication method is serial communication (RS-232C/RS-485), select COM port for PLC communication.

[Setting]: /dev/com00, /dev/com01, /dev/com02

[Default]: No settings

◆ Baud Rate

When the communication method is serial communication (RS-232C/RS-485), select a baud rate from the list for PLC communication.

[Setting]: In accordance with PLC

[Default]: No settings

◆ Data Bits

When the communication method is serial communication (RS-232C/RS-485), select a data bit from the list for PLC communication.

[Setting]: 7, 8

[Default]: No settings

◆ Stop Bit

When the communication method is serial communication (RS-232C/RS-485), select a stop bit from the list for PLC communication.

[Setting]: 1, 2

[Default]: No settings

◆ Parity

When the communication method is serial communication (RS-232C/RS-485), select parity from the list for PLC communication.

[Setting]: None, Even, Odd

[Default]: No settings

◆ Sum Check

When the communication method is serial communication (RS-232C/RS-485), select a sum check from the list for PLC communication.

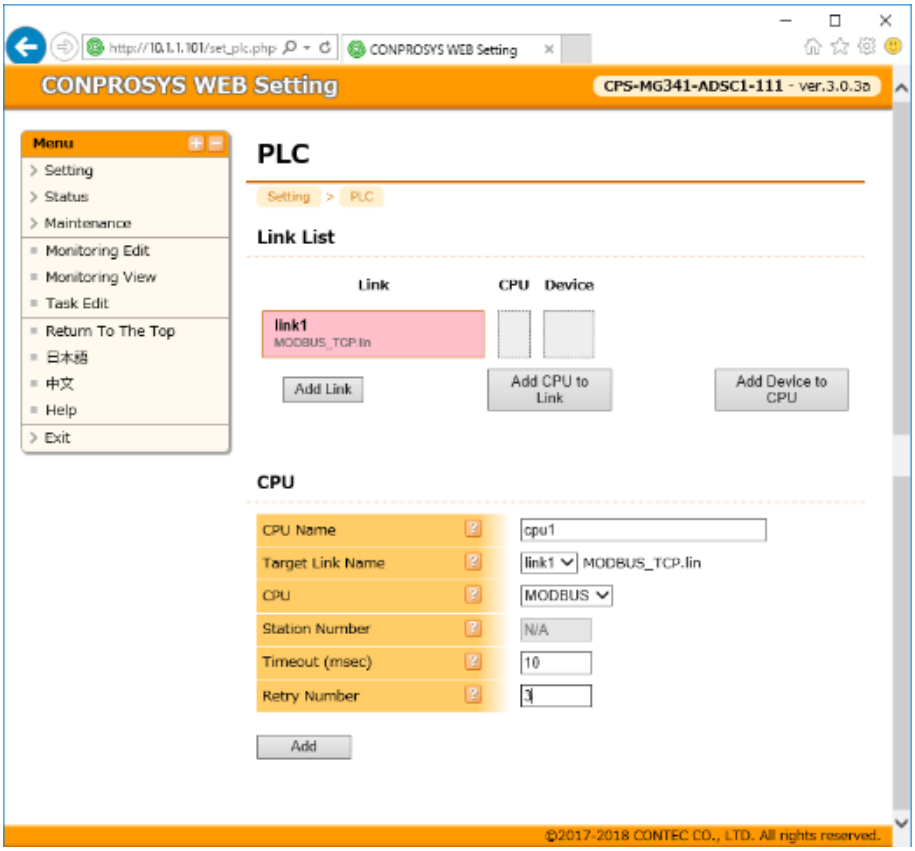
[Setting]: Enabled, Disabled

[Default]: No settings

24. PLC (CPU config)

Set up PLC CPU.

Click the [Add CPU to Link] button to open the additional setting page.



◆ CPU Name

Decide a CPU name. The CPU name is specified for device setting.

[Setting]: 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen.
The name cannot be set with only numbers.

[Default]: No settings

◆ Target Link Name

The set link name is displayed. Select the link (link name) for CPU setting.

[Setting]: Select a name from the drop-down list.

[Default]: No settings

◆ CPU

CPU corresponds to the set link (link name) is displayed in the list.

[Setting]: In accordance with PLC

[Default]: No settings

◆ Station Number

Enter the station number from 0 to 255 for serial communication. (Entering the number is not necessary when “N/A” is shown in the field).

[Setting]: 0 - 255

[Default]: No settings

◆ Timeout

Enter the timeout (msec) period on serial communication from 0.1 - 30,000.

[Setting]: 0.1 - 30,000

[Default]: 0.5

◆ Retry

Enter the retry times from 0 to 30.

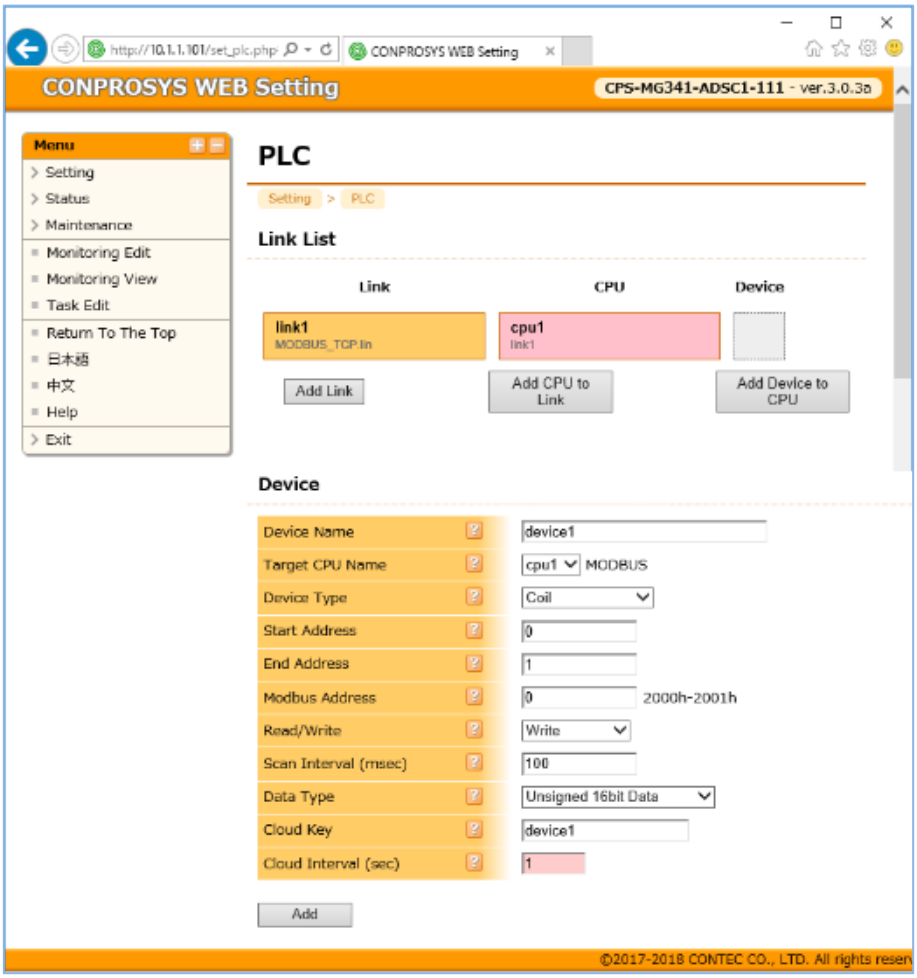
[Setting]: 0 - 30

[Default]: 1

25. PLC (DEVICE config)

Set up a PLC device.

Click the “add” [Add Device to CPU] button to open the additional setting page.



◆ Device Name

Decide a device name.

[Setting]: 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen.

The name cannot be set with only numbers.

[Default]: No settings

◆ Target CPU Name

The set CPU name is displayed. Select CPU (CPU name) for device setting.

[Setting]: Select a name from the drop-down list.

[Default]: No settings

◆ Device Type

Device type corresponds to the set CPU (CPU name) is displayed in the drop-down list.

[Setting]: In accordance with CPU

[Default]: No settings

◆ Start Address

Specify Start address of PLC for communication in decimal. If selecting the following bit device, specify a bit address in the last two digits.

- OMRON CS/CJ/CP Series

Device: Bit device

- KEYENCE

Device: R, MR

- PANASONIC

Device: X, Y, R, L

[Setting]: Only a positive integer can be set.

[Default]: No settings

◆ End Address

Specify End address of PLC for communication in decimal. If selecting the following bit device, specify a bit address in the last two digits.

- OMRON CS/CJ/CP Series

Device: Bit device

- KEYENCE

Device: R, MR

- PANASONIC

Device: X, Y, R, L

[Setting]: Only a positive integer can be set.

[Default]: No settings

◆ Modbus Address

Specify Modbus address that maps PLC value to CONPROSYS in decimal.

[Setting]: 0 - 10240 (DEC)

[Default]: No settings

◆ Read/Write

Select either to read data of Modbus address or write data of Modbus address.

Read: This reads data of Modbus address.

Write: This writes data of Modbus address.

TriggerRead: This reads data of Modbus address when the flag is on by PLC trigger of task.

TriggerWrite: This writes data of Modbus address when the flag is on by PLC trigger of task.

EventWrite: Writing data in Modbus address makes the flag on. This writes data of Modbus address when the flag is on.

[Setting]: Read/Write/TriggerRead/TriggerWritite/EventWrite

[Default]: No settings

◆ Scan Interval

Specify an interval (msec) of communication with PLC.

[Setting]: 10 - 60,000
[Default]: No settings

◆ Data Type

Select the data type from the drop-down list.

[Setting]: Unsigned 16bit data, Signed 16bit data, Unsigned 32bit data (BE), Unsigned 32bit data (BE), Unsigned 32bit data (LE), Unsigned 32bit data (LE)
[Default]: No settings

◆ Cloud Key

When using CDS2 of cloud serve for “Data Transfer URL”, enter Cloudkey for data transmission service. The Cloudkey is added at the beginning of the data.

[Setting]: Up to 10 letters. Available letters: alphanumeric letters, underscore, regular expression: [A-Za-z0-9_]
[Default]: No settings

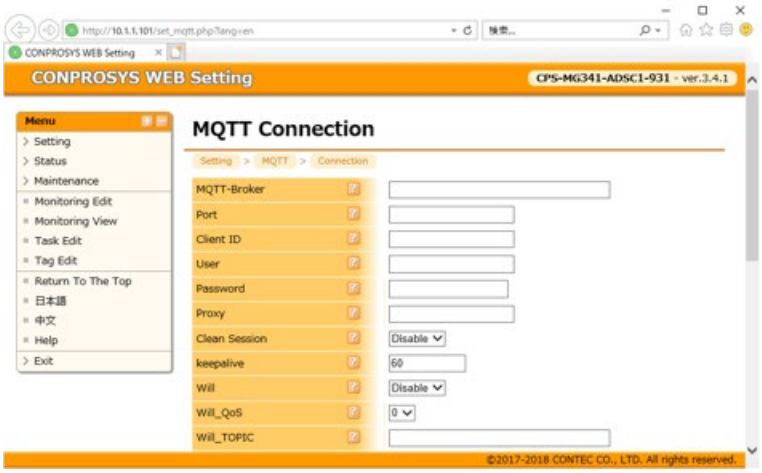
◆ Cloud Interval

Specify an interval (sec) of data transfer.

[Setting]: 10 - 3600
[Default]: No settings

26. MQTT Connection

Set up communication with MQTT-Broker.



◆ MQTT-Broker

Set up a host name and an IP address of connecting Broker connect.

[Setting]: IP address or domain name [0-128 letters of one-byte alphanumeric character, (-) hyphen, (.)period, and vertical bar (|)]
[Default]: No settings

◆ Port

Set up a port number of connecting Broker.

[Setting]: 0 - 65535 (numeric values)
[Default]: No settings

◆ Client ID

Set up a Client ID to identify this product.

A unique ID needs to be set for the connecting Broker.

If a null character is set, the serial number of the product will be automatically used.

[Setting]: Up to 256 alphanumeric characters. The serial number will be automatically set if a null character is used.

[Default]: Serial number of the product

◆ User

Set User name when User name/Password Authentication for the connecting Broker is set.

Enter a user name.

[Setting]: 0 to 256 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [‘] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Password

Set this up when User name/Password Authentication is set for the connecting Broker.

Enter a user name

[Setting]: 0 to 256 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [‘] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Proxy

You can specify SOCKS5 proxy in the following format to connect as necessary.

[The format of SOCKS5 proxy]:

```
socks5h://[username[:password]@]host[:port]
```

[Setting]: SOCKS5 Protocol URL
[Default]: No settings

◆ Clean Session

Enabling or Disabling the Clean Session.

If the Clean Session is disabled, QoS 1 and QoS 2 messages are stored in the Broker side even when the product is disconnected from the Broker. These messages can be retrieved after a reconnection.

If this is enabled, the messages cannot be stored in the Broker side when the product is disconnected from the Broker.

[Setting]: Disable, Enable
[Default]: Disable

◆ keepalive

Set a cycle of sending a PINGREQ command to the Broker.

Connections with the Broker are checked at the specified cycle.

[Setting]: 1 - 300 (numeric values)
[Default]: 60

◆ Will

Enabling or Disabling the Will.

When the Will is enabled, the string specified in Will_Payload is sent to Will_TOPIC if the product is disconnected from the Broker.

[Setting]: Disable, Enable
[Default]: Disable

◆ Will_QoS

Set QoS to send a message when the Will is enabled.

- QoS 0: Send a message only one time.
- QoS 1: Send a message to be reached at least one time.
- QoS 2: Send a message precisely to be reached one time.

[Setting]: 0 - 2
[Default]: 0

◆ Will_TOPIC

Specify TOPIC to send a message when the Will is enabled.

[Setting]: 1-1024 letters of string
[Default]: No settings

◆ Will_Payload

Specify Payload when the Will is enabled.

[Setting]: 1-1024 letters of string. The default will be automatically set if a null character is used.
[Default]: { “SN”:” The serial number of the product”, “S” : “DISCONNECT” }

◆ Encrypted connection

Enabling or Disabling the encryption for communication.
When the encryption is enabled, SSL / TLS are used for communication.

[Setting]: Disable, Enable
[Default]: Disable

◆ Private key

When the encrypted connection is enabled, the Private key can be set as necessary.

[Setting]: Select one from the file dialog.
[Default]: No settings

◆ Client Certificate

When the encrypted connection is enabled, the Client Certificate can be set as necessary.

[Setting]: Select one from the file dialog.
[Default]: No settings

◆ CA Certificate

When the encrypted connection is enabled, the CA Certificate can be set as necessary.

[Setting]: Select one from the file dialog.
[Default]: No settings

◆ Encryption algorithm

Select the algorithm for Encryption/Decryption.
When the algorithm is selected, the data portion in the message can be encrypted to send.
The receiver has to decrypt the encrypted message sent from the product.

[Setting]: Select one from the dropdown list
[Default]: No settings

◆ Encryption password

Set the Encryption password for sending data.

[Setting]: 0 to 256 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, [“] double quotation mark, [’] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

◆ Decrypted password

Set the password to decrypt the received data.

The Encryption algorithm should be set within the payload according the following format.

```
"ALG": "AES-256-CBC.BASE64 or AES-256-CBC.BASE64.NOSALT"
"E_DATA": " Encrypted DATA "
```

[Setting]: 0 to 256 letters of one-byte alphanumeric character and symbols, except [ ] space, [CR+LF] Carriage Return and Line Feed, ["] double quotation mark, ['] single quotation mark, [\] JPY mark, or backquote [`].
[Default]: No settings

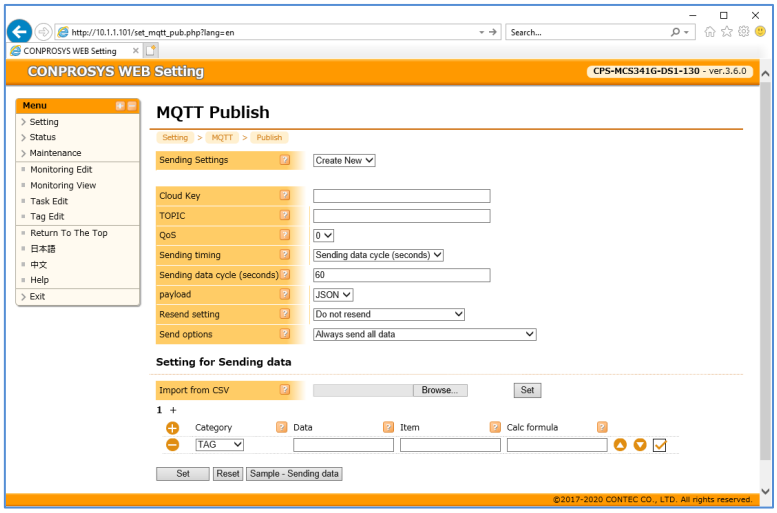
◆ Send a Test Message

Enter TOPIC and click the [Execute] button. A test message can be sent to the connecting Broker.

The test string is "CONPROSYS_MQTT_TEST_MESSAGE".

27. MQTT Publish

Set up MQTT Publish.



◆ Sending Settings

Select the "Create New" for a new setting. Select the Cloud Key to edit the setting previously created.
Up to 16 settings can be created.

[Setting]: Select one from the dropdown list.
[Default]: Create New

◆ Cloud Key

Cloud Key is a setting name to send data.
Set the Cloud Key with a null character or up to 10 alphanumeric characters.

[Setting]: 0 - 10 alphanumeric characters
[Default]: No settings

◆ TOPIC

Set up TOPIC.

[Setting]: 1-1024 letters of string
[Default]: No settings

◆ QoS

Set QoS to send a message.

- QoS 0: Send a message only one time.
- QoS 1: Send a message to be reached at least one time.
- QoS 2: Send a message precisely to be reached one time.

[Setting]: 0 - 2
[Default]: 0

◆ Sending timing

Select the timing of sending data.

- Sending data cycle (seconds) : Send data at every specified number of seconds.
- Task Trigger: Send data when the task “MQTT PUB Trigger” is executed.

[Setting]: Select one from the dropdown list.
[Default]: Sending data cycle (seconds)

◆ Sending data cycle (seconds)

Data are sent at every specified number of seconds when the timing is set to Sending data cycle (seconds).

[Setting]: 1 - 600 (numeric values)
[Default]: 60

◆ payload

Specify payload format to send data.

- JSON:

Data specified in CONPROSYS WEB Setting are dynamically changed into JSON format to be sent.

- STAG:

Value of STAG specified is sent.

[Setting]: JSON , STAG
[Default]: JSON

◆ STAG

When STAG is set for "payload" setting, specify the STAG number to send value.

[Setting]: STAG00
[Default]: STAG00 - STAG499

◆ Resend setting

Set whether to keep data in the product at the time of disconnection and send them later when the controller is reconnected. Resending data can be kept for three days up to 16MB.
If the data exceeds 16MB, the oldest data in each Cloud Key will be deleted.

- Do not resend : Data will not be stored when the product is disconnected from the Broker.
- Resend "Latest Data -> Resend data" :
  Each time the latest data are sent at the specified cycle first, then the resend data will be sent. If the specified sending cycle comes while resending data, the latest data will be sent first, then resending data restarts.
- Resend "Resend data -> Latest data" :
  The resend data are sent first, then the latest data will be sent. If the specified sending cycle comes while resending data, the data will be added to the end of the resending data. Sending timing is maintained in chronological order.

[Setting]: Select one from the dropdown list.
[Default]: Do not resend

◆ Send options

Set up Send options.

- Always send all data : All data are always sent even when there is no change in data.
- Send changed data only : When there is no change in data from the previous sending time, those data will not be included in the sending strings.

[Setting]: Select one from the dropdown list.
[Default]: Always send all data

◆ Option when sending change data

Select the sending option when there are no changes in all data.
"Message ID", "Cloudkey", "Time", and "Serial number of the product" are for headers.

[Setting]: Select one from the dropdown list.
[Default]: When there is no change data - Do not send

◆ Import from CSV

Import the Setting for Sending data from CSV file.

From the selection button, select CSV file in the following format.

[CSV file format] :

```
DATA,NAME,TYPE,CALC,USE
XXXX,XXXX,XXXX,XXXX,XXXX
...
```

DATA : Data

NAME : Item

TYPE (For M2M Gateway only) : Type

When the category is not selecting PLC : 0

When the category is selecting PLC :

0 : Unsigned 16bit data

1 : Signed 16bit data

2 : Unsigned 32bit data (BE)

3 : Signed 32bit data (BE)

4 : Unsigned 32bit data (LE)

5 : Signed 32bit data (LE)

6 : Floating-point 32bit data (BE)

7 : Floating-point 32bit data (LE)

CALC : Calc formula

USE : 1 (Enable) or 0 (Disable)

Click the [Set] button to save the settings.

◆ Export to CSV

Export the Setting for Sending data to CSV file (letters/CR code: crlf with utf-8-bom).

Export the saved contents of each cloud key with the following format.

[CSV file format (File name : (cloud key_)pubdata.csv)] :

```
DATA,NAME,TYPE,CALC,USE
XXXX,XXXX,XXXX,XXXX,XXXX
...
```

DATA : Data

NAME : Item

TYPE (For M2M Gateway only) : Type

When the category is not selecting PLC : 0

When the category is selecting PLC :

0:Unsigned 16bit data

1 : Signed 16bit data

2 : Unsigned 32bit data (BE)

3 : Signed 32bit data (BE)

4 : Unsigned 32bit data (LE)

5 : Signed 32bit data (LE)

6 : Floating-point 32bit data (BE)

7 : Floating-point 32bit data (LE)

CALC : Calc formula

USE:1 (Enable) or 0 (Disable)

Click the [Set] button to save the settings.

◆ Setting for Sending data

Select sending data when "JSON" is specified for "payload" setting.

The items can be increased or decreased with the “+” and “-” buttons.

Up to 3000 items are configurable.

The order of the setting items can be changed by clicking the “▲▼” buttons.

Checking off the box can enable or disable data individually. Disabled data are not included in the sending payload.

◆ Category

Select the category of setting data. As for PLC, the device names that are set for “Read”, “TriggerRead”] in [PLC Setting (P)” can be used.

[Setting]: Select one from the dropdown list.
[Default]: TAG

◆ Data

Select data to send. This is ignored when setting a non-existent target in the list.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

◆ Item

Set any string with a null character or up to 20 alphanumeric characters.

[Setting]: Up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

◆ Type

This can be set when the category is PLC.　Set up the type of PLC data.

[Setting]: Select one from the dropdown list.
[Default]: Data format specified in the PLC settings.

◆ Cal formula

Set up Cal formula when the category is not SATA.

Send the calculation result of the set conversion formula. The result will not be sent if the calculation failed.

[Setting]: Calculation formula with up to 128 characters
[Default]: No settings

- Available symbols or marks

+,-,*,/,%,|,&,^,<,<=,==,!=,>=,>,(,),:,?,<<,>>,!,&&,||

- Available data

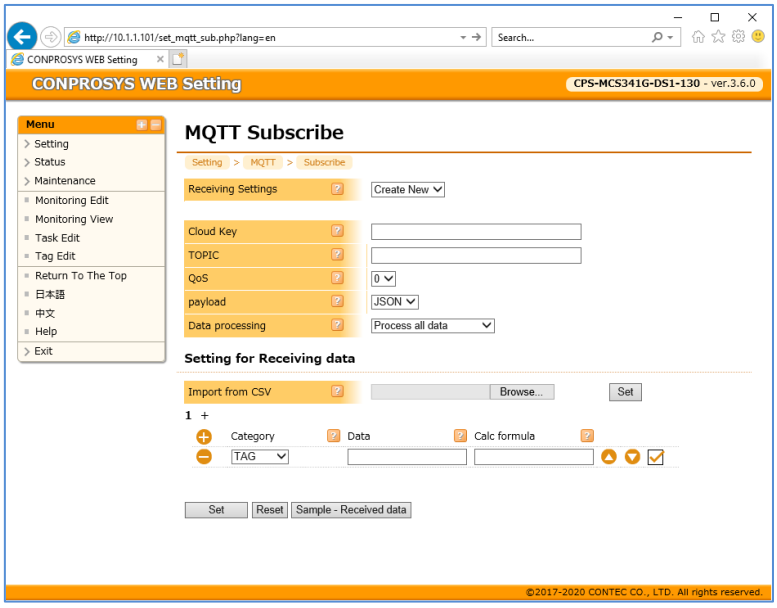
TAG,MODBUS,DEVICE,DATA(Selected data)

Sample

- DATA*TAG00
- DATA+10
- MODBUS0001<<1

28. MQTT Subscribe

Set up MQTT subscribe.



◆ Receiving Settings

Select the “Create New” for a new setting. Select the Cloud Key to edit the setting previously created.

Up to 16 settings can be created.

[Setting]: Select one from the dropdown list.
[Default]: Create New

◆ Cloud Key

Cloud Key is a setting name to receive data.

Set the Cloud Key with a null character or up to 10 alphanumeric characters.

[Setting]: 0 - 10 alphanumeric characters
[Default]: No settings

◆ TOPIC

Set up TOPIC.

[Setting]: 1-1024 letters of string
[Default]: No settings

◆ QoS

Set QoS to send a message.

- QoS 0: Send a message only one time.
- QoS 1: Send a message to be reached at least one time.
- QoS 2: Send a message precisely to be reached one time.

[Setting]: 0 - 2
[Default]: 0

◆ payload

Specify payload format to receive data.

- JSON:

Write received JSON string into data that are specified in CONPROSYS WEB Setting. As for the JSON format, check the CONPROSYS Reference Manual or Data example in Receiving Format.

- STAG:

Write received data into specified STAG.

[Setting]: JSON , STAG
[Default]: JSON

◆ STAG

When is payload set for STAG, specify the STAG to write the payload that is received.

[Setting]: STAG00
[Default]: STAG00 - STAG499

◆ Data processing

Set up Data processing.

- Process all data : Process all of the received data.
- Process only new data : Process only new data since the previous processing. Receiving data should contain time stamp (ISO8601 extended form).

Perform processing if there is no time stamp. If no time zone is specified, processing will be performed with the time zone set in the product.

[Setting]: Select one from the dropdown list.
[Default]: Process all data
[Time stamp format (ISO8601 extended form)]:

- “T”:”YYYY-MM-DDThh:mm:ss.sss”
- “T”:”YYYY-MM-DDThh:mm:ss.sss+timezone”

◆ Import from CSV

Import the Setting for Receiving data from CSV file.

From the selection button, select CSV file in the following format.

[CSV file format] :

```
DATA,TYPE,CALC,USE
XXXX,XXXX,XXXX,XXXX
...
```

DATA : Data

TYPE (For M2M Gateway only) :Type

When the category is not selecting PLC : 0

When the category is selecting PLC :

0 : Unsigned 16bit data

1 : Signed 16bit data

2 : Unsigned 32bit data (BE)

3 : Signed 32bit data (BE)

4 : Unsigned 32bit data (LE)

5 : Signed 32bit data (LE)

6 : Floating-point 32bit data (BE)

7 : Floating-point 32bit data (LE)

CALC : Calc formula

USE : 1 (Enable) or 0 (Disable)

Click the [Set] button to save the settings.

◆ Export to CSV

Export the Setting for Receiving data to CSV file (letters/CR code: crlf with utf-8-bom).

The confirmed setting contents are exported per cloud key.

Export the setting with the following format.

[CSV file format (File name : (cloud key_)subdata.csv)] :

```
DATA,TYPE,CALC,USE
XXXX,XXXX,XXXX,XXXX
...
```

DATA : Data

TYPE (For M2M Gateway only) : Type

When the category is not selecting PLC : 0

When the category is selecting PLC :

0 : Unsigned 16bit data

1 : Signed 16bit data

2 : Unsigned 32bit data (BE)

3 : Signed 32bit data (BE)

4 : Unsigned 32bit data (LE)

5 : Signed 32bit data (LE)

6 : Floating-point 32bit data (BE)

7 : Floating-point 32bit data (LE)

CALC : Calc formula

USE : 1 (Enable) or 0 (Disable)

◆ Setting for Receiving data

Select receiving data when "JSON" is specified for "payload" setting.

The items can be increased or decreased with the “+” and “-” buttons.

Up to 3000 items are configurable.

The order of the setting items can be changed by clicking the “▲▼” buttons.

Checking off the box can enable or disable data individually. Not performed when disabled data are received.

◆ Category

Select the category of setting data. Device Names that are set for "Write", "TriggerWrite", and "EventWrite" in [PLC Setting (P)"] can be used.

[Setting]: Select one from the dropdown list.
[Default]: TAG

◆ Data

Select data to receive. This is ignored when setting a non-existent target in the list.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

◆ Type

This can be set when the category is PLC.　Set up the type of PLC data.

[Setting]: Select one from the dropdown list.
[Default]: Data format specified in the PLC settings.

◆ Cal formula

Set up Cal formula when the category is not SATA.

Write the calculation result of the set conversion formula. The result will not be written if the calculation failed.

[Setting]: Calculation formula with up to 128 characters
[Default]: No settings

- Available symbols or marks

+,-,*,/,%,|,&,^,<,<=,==,!=,>=,>,(,),:,?,<<,>>,!,&&,||

- Available data

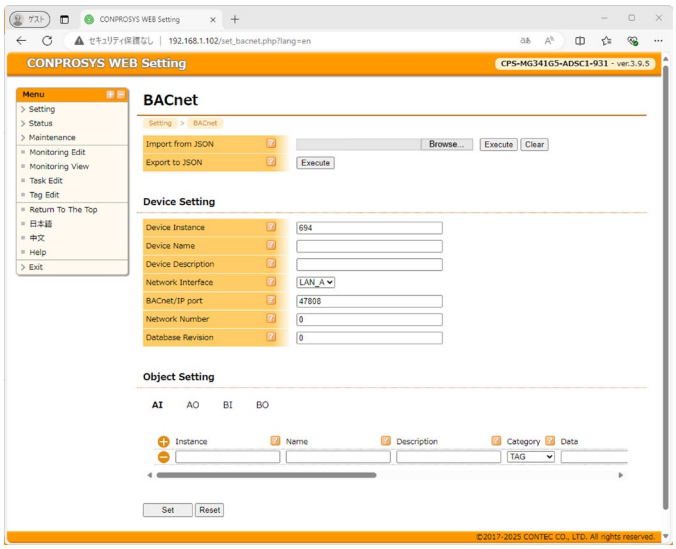
TAG,MODBUS,DEVICE,DATA (Selected data)

Sample

- DATA*TAG00
- DATA+10
- MODBUS0001<<1

29. BACnet

Set up BACnet Device setting.



◆ Import from JSON

Import device settings and object settings from a JSON file.

Select the JSON file from the Choose File button.

Click the Execute button to import the settings.

After importing, click the Set button at the bottom.

*Refer to “BACnet Configuration File Format (Page331)” for the JSON file format.

◆ Export to JSON

Export device settings and object settings to a JSON file.

◆ Device Instance

Set the value in the range of 0 to 4194302.

[Setting]: 0-4194302 (numeric values)

[Default]: 694

◆ Device Name

Set in the range of 1 to 32 characters.

[Setting]: 1 to 32 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

◆ Device Description

Set with a null character or up to 64 characters.

[Setting]: 0 to 64 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

◆ Network Interface

Specify the network interface to use.

[Setting]: LAN A, LAN B, WLAN, LTE
[Default]: LAN A

◆ BACnet/IP port

Set the value in the range of 0 to 65535.

[Setting]: 0-65535 (numeric values)
[Default]: 47808

◆ Network Number

Set the value in the range of 0 to 65534. Leave it blank when this is not set.

[Setting]: 0 - 65534 (numeric values)
[Default]: 0

◆ Database Revision

Set the value in the range of 0 to 65535. Leave it blank when this is not set.

[Setting]: 0 - 65535 (numeric values)
[Default]: 0

◆ Object Setting

The following object settings are possible by switching tabs.

AI: Analog Input Object

AO: Analog Output Object

BI: Binary Input Object

BO: Binary Output Object

The items can be increased or decreased with the “+” and “-” buttons.

If the setting is one line, the initial value (unset) is set by clicking the "-" button.

The order of the setting items can be changed by clicking the “▲▼” buttons.

◆ AI

Instance

Set the value in the range of 0 to 4194302.

[Setting]: 0-4194302 (numeric values)

[Default]: No settings

Name

Set in the range of 1 to 32 characters.

[Setting]: 1 to 32 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].

[Default]: No settings

Description

Set with a null character or up to 64 characters.

[Setting]: 0 to 64 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].

[Default]: No settings

Category

Select the category of setting data. If the PLC settings have been completed, PLC_{device name} will be selectable.

[Setting]: TAG, MODBUS, PLC_{device name}

[Default]: TAG

Data

Select the target.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

Type

Set the type of data.

[Setting]: Unsigned 16bit Data, Signed 16bit Data, Unsigned 32bit Data(BE) , Signed 32bit Data(BE) , Unsigned 32bit Data(LE) , Signed 32bit Data(LE) , FLOAT (BE), FLOAT (LE)
[Default]: Unsigned 16bit Data

Unit

Select the unit.

[Setting]: Select from drop-down list
[Default]: NO_UNITS

cov

Set the value in the range of 0 to 3.4E+38.

[Setting]: 0 to 3.4E+38 (positive range of float type)
[Default]: 1

◆ AO

Instance

Set the value in the range of 0 to 4194302.

[Setting]: 0-4194302 (numeric values)
[Default]: No settings

Name

Set in the range of 1 to 32 characters.

[Setting]: 1 to 32 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Description

Set with a null character or up to 64 characters.

[Setting]: 0 to 64 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Category

Select the category of setting data. If the PLC settings have been completed, PLC_{device name} will be selectable.

[Setting]: TAG, MODBUS, PLC_{device name}
[Default]: TAG

Data

Select the target.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

Type

Set the type of PLC data.

[Setting]: Unsigned 16bit Data, Signed 16bit Data, Unsigned 32bit Data(BE) , Signed 32bit Data(BE) , Unsigned 32bit Data(LE) , Signed 32bit Data(LE) , FLOAT (BE) , FLOAT (LE)
[Default]: Unsigned 16bit Data

Unit

Select the Unit.

[Setting]: Select from drop-down list
[Default]: NO_UNITS

cov

Set the value in the range of 0 to 3.4E+38.

[Setting]: 0 to 3.4E+38 (positive range of float type)
[Default]: 1

Relinquish Default

Set the value in the range of -3.4E+38 to 3.4E+38.

[Setting]: -3.4E+38 to 3.4E+38 (float range)
[Default]: 0

◆ BI

Instance

Set the value in the range of 0 to 4194302.

[Setting]: 0-4194302 (numeric values)
[Default]: No settings

Name

Set in the range of 1 to 32 characters.

[Setting]: 1 to 32 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Description

Set with a null character or up to 64 characters.

[Setting]: 0 to 64 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Category

Select the category of setting data. If the PLC settings have been completed, PLC_{device name} will be selectable.

[Setting]: TAG, MODBUS, PLC_{device name}
[Default]: TAG

Data

Select the target.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

Type

Set the type of PLC data.

[Setting]: Unsigned 16bit Data, Signed 16bit Data, Unsigned 32bit Data(BE) , Signed 32bit Data(BE) , Unsigned 32bit Data(LE) , Signed 32bit Data(LE) , FLOAT (BE) , FLOAT (LE)
[Default]: Unsigned 16bit Data

◆ BO

Instance

Set the value in the range of 0 to 4194302.

[Setting]: 0-4194302 (numeric values)
[Default]: No settings

Name

Set in the range of 1 to 32 characters.

[Setting]: 1 to 32 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Description

Set with a null character or up to 64 characters.

[Setting]: 0 to 64 characters, except [CR+LF] Carriage Return and Line Feed, [”] double quotation mark, [’] single quotation mark, [\] JPY mark, backquote [`].
[Default]: No settings

Category

Select the category of setting data. If the PLC settings have been completed, PLC_{device name} will be selectable.

[Setting]: TAG, MODBUS, PLC_{device name}
[Default]: TAG

Data

Select the target.

[Setting]: Select one from the data list. To set the range directly, use up to 20 one-byte alphanumeric characters, underline [_], and hyphen [-].
[Default]: No settings

Type

Set the type of PLC data.

[Setting]: Unsigned 16bit Data, Signed 16bit Data, Unsigned 32bit Data(BE) , Signed 32bit Data(BE) , Unsigned 32bit Data(LE) , Signed 32bit Data(LE) , FLOAT (BE) , FLOAT (LE)
[Default]: Unsigned 16bit Data

Relinquish Default

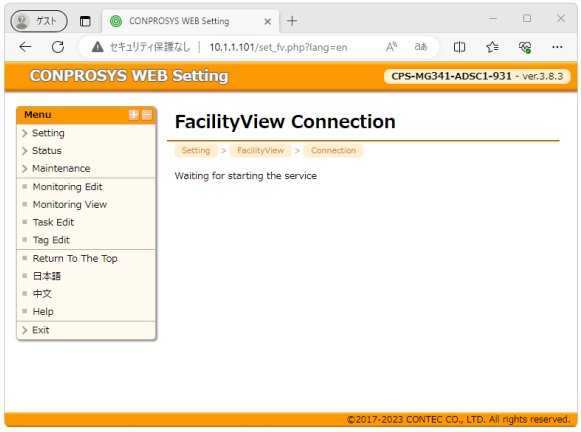
Set a value of 0 or 1.

[Setting]: 0 or 1 (numerical value)
[Default]: 0

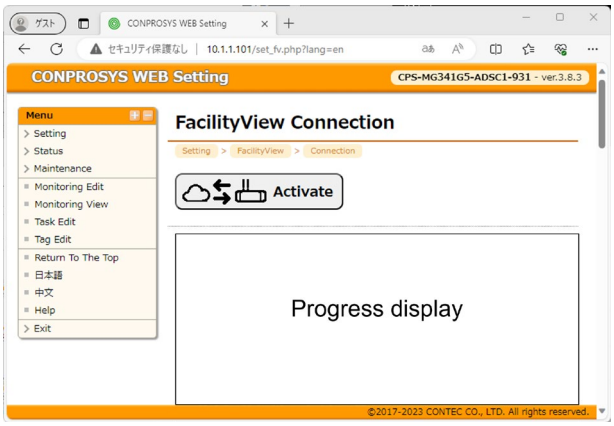
30. FacilityView Connection

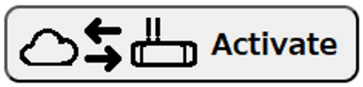
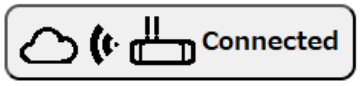
Set up communication with FacilityView.

[FacilityView Service: Disable]



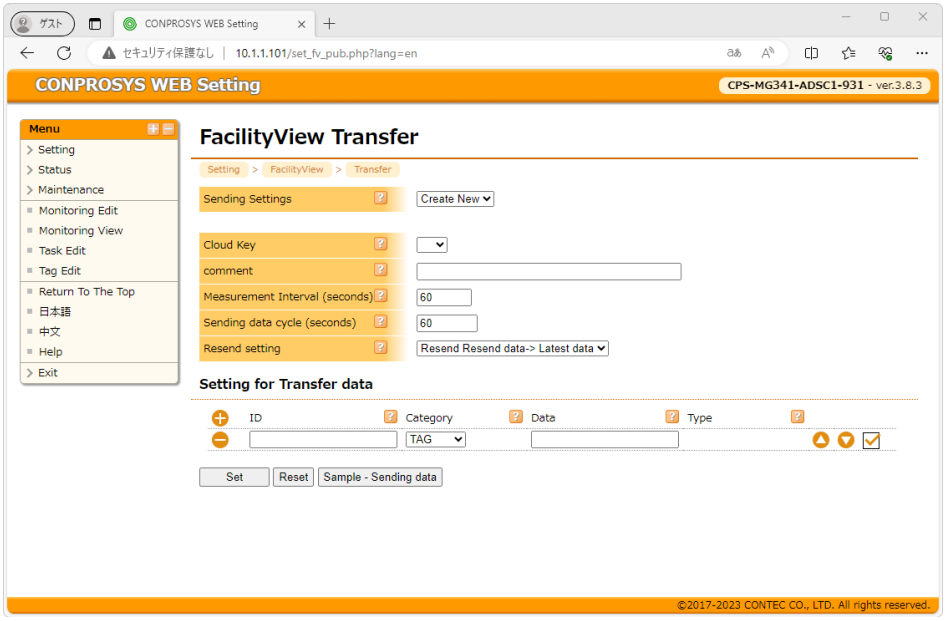
[FacilityView Service: Enable]



Display Area	Display Contents	Description
Status display	Waiting for starting the service	Indicates that the FacilityView service is not enabled or that the service has not started immediately after startup.
Execution button		Without activation information, press the button to start activation. Button operation is disabled during activation. ROM storage is required to save activation information.
		With activation information already present, pressing the button deletes the current activation information and starts activation. Button operation is disabled during activation. ROM storage is required to save activation information.
Progress display	-Progress status and error details -Remaining time until timeout	Displays the activation progress status and the response status from FacilityView. During activation, it displays the time remaining until the timeout to receive the results.

31. FacilityView Transfer

Set up FacilityView Transfer.



◆ Sending Settings

Select "Create New" to set a new sending data settings, and select the Cloud Key to edit the settings once created.

Up to 10 items can be created.

[Setting]: Select one from the dropdown list.
[Default]: Create New

◆ Cloud Key

Select one of 00 to 10.

[Setting]: Select from 00 -10.

[Default]: No settings

◆ Comment

Set a comment.Set to empty or 20 or fewer alphanumeric string.

[Setting]: 0-20 alphanumeric characters

[Default]: No settings

◆ Measurement Interval (seconds)

Set interval time between 1 and 60 seconds to measure data.

[Setting]: 1-60 (numerical value)

[Default]: 1

◆ Sending data cycle (seconds)

Set interval time between 60 and 3600 seconds to send measured data to FacilityView.

[Setting]: 60-600 (numerical value)

[Default]: 60

◆ Resend setting

When disconnected, set whether to retain data in CONPROSYS and resend it when connected to the server again. The resend data is stored for 3 days.

- Do not resend : Data is not retained when disconnecgted.
- Resend, Resend data-> Latest data:
  When connected to the server again, send the retained data first, then the latest data. If the new data need to be sent, added it to the end of the retained data.

[Setting]: Do not resend, Resend, Resend data-> Latest data

[Default]: Resend, Resend data-> Latest data

◆ Setting for Transfer data

The items can be increased or decreased with the "+" and "-" buttons.

Up to 200 items are configurable.

The order of the setting items can be changed by clicking the "▲▼" buttons.

Checking off the box can enable or disable data individually. Disabled data are not included in the sending payload.

◆ ID

Set any string of 1 to 20 characters. This string is included in the transfer data.

[Setting]: Up to 20 characters, underline(_) and hyphen(-)

[Default]: No settings

◆ Category

Select the category of data.

[Setting]: TAG, STAG, DEVICE, PLC_{device name}

[Default]: No settings

◆ Data

Select the target. Ignored if the target does not exist in the list.

[Setting]: Select from data list. Up to 20 characters, underline(_) and hyphen(-).

Category=TAG:TAG00~TAG499

Category=STAG:STAG00~STAG499

Category=DEVICE:Available Device IO

Category=PLC_{device name}:MODBUS address of the target PLC device configuration

[Default]: No settings

◆ Type

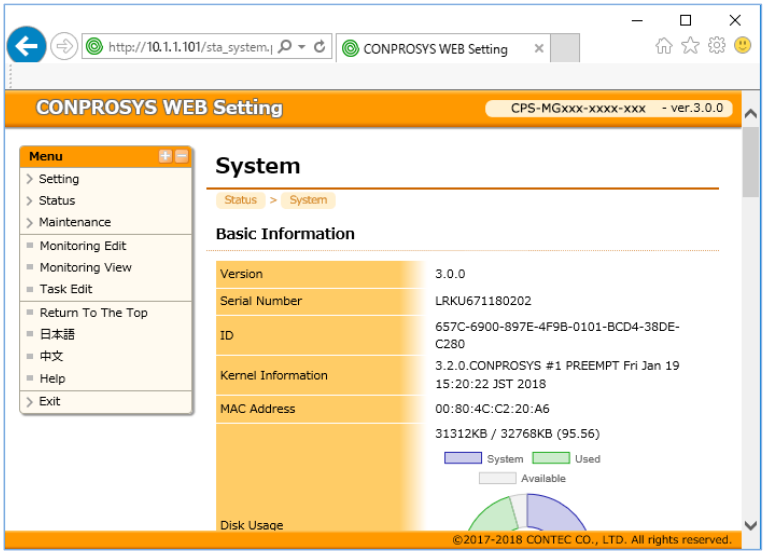
This can be set when the category is PLC.　Set up the type of PLC data.

[Setting]: Unsigned 16bit data, Signed 16bit data, Unsigned 32bit data (BE), Unsigned 32bit data (BE), Unsigned 32bit data (LE), Unsigned 32bit data (LE)

[Default]: No settings

32. System

Display the system information details of the product.



◆ Version

Display the firmware version.

◆ Serial Number

Display the serial number.

◆ ID

ID necessary for CDS or CDS2 registration of cloud server is displayed.

◆ Kernel Information

Display the kernel information.

◆ MAC Address

MAC address of LAN is displayed.

◆ Disk Usage

Display the currently used amount of disk.

◆ Memory Usage

Display the currently used size of memory.

◆ Battery Residual Capacity

Display whether the battery for RTC runs out.

◆ 3G

Display the radio wave intensity and the technical standards conformity information.
Each intensity indicates as follows:

The wave intensity is evaluated in 31 levels. When the wave cannot be found, “Not found” is viewed.

Value	RSSI
0	-113 dBm or less
1	-111 dBm
2 - 30	-109 - 53 dBm
31	-51 dBm or greater

* If the value is close to 0, it indicates the radio wave environment is poor, and if it is close to 31, the radio wave environment is favorable.

◆ LTE

Display the radio wave intensity (RSRP) and the technical standards conformity information of the product. The wave intensity is evaluated in 98 levels. Each intensity indicates as follows:

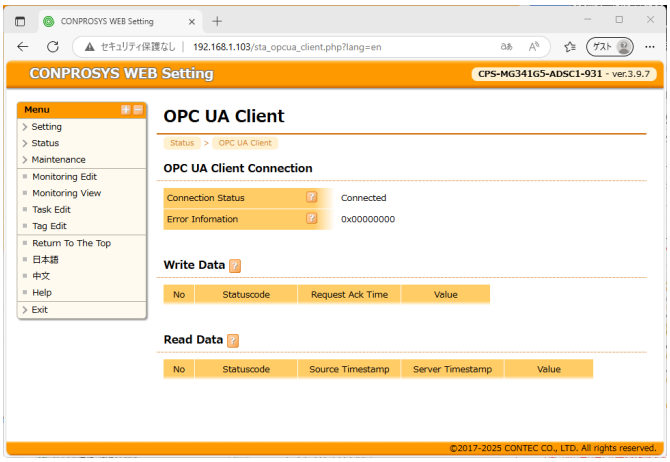
If the value is greater than 33, communication will be stable as the radio wave environment is favorable. When the wave cannot be found, “Not found” is viewed.

Value	RSSI
0	-141 dBm or less
1 - 96	-140 - 45 dBm
97	-44 dBm or greater

*As for the CPS-MG341G5-ADSC1-931, the radio wave intensity (RSRP or RSSI) is displayed according to the network connection state.

33. OPC UA Client

Displays the status condition of the OPC UA client function.



◆ Connection Status

This shows the status of the connection with the OPC UA server.

◆ Error Information

This shows the error code of the communication status.

◆ Write Data

This shows the latest status of the configured write node.

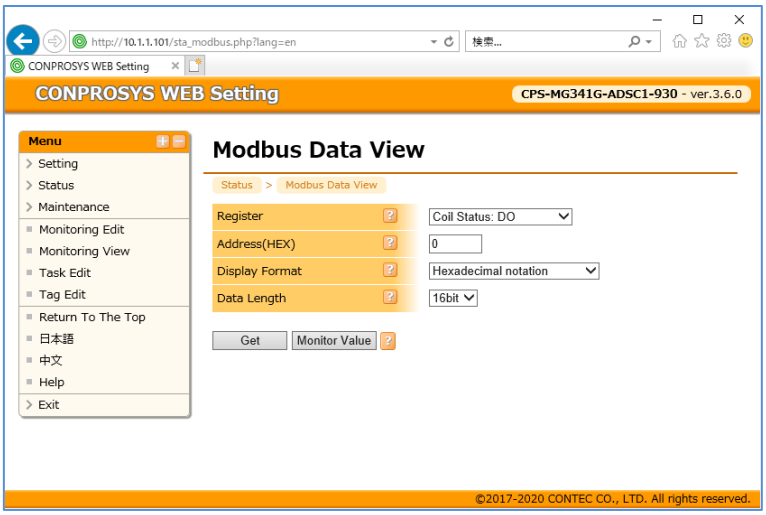
◆ Read Data

This shows the latest status of the configured read node.

34. Modbus Data View

Display each register value accessible in Modbus TCP.

Select the register from a pull-down menu and specify the address. Click the “get” to get a value. Specify the address with the values between 0 and FFFF (Hex).



◆ Register

Select a register type to display.

◆ Address

Enter a register address (Hex) to display.

Addresses differ depending on the product.

See the list below to check the address corresponding to your product.

- CPS-MG341-ADSC1-111
- CPS-MG341-ADSC1-931
- CPS-MG341G-ADSC1-111
- CPS-MG341G-ADSC1-930

Register	Address	Name	Description
Coil	0	DO-0	0: OFF 1: ON
	1	DO-1	
	2	not in use	
	3	not in use	
	4	not in use	
	5	not in use	
	6	not in use	
	7	not in use	
	8 and higher	not in use	
Input status	0	DI-0	0: OFF 1: ON
	1	DI-1	
	2	DI-2	
	3	DI-3	
	4	not in use	
	5	not in use	
	6	not in use	
	7	not in use	
	8 and higher	not in use	
Input register	0	AI-0	Unit: LSB 12-bit resolution
	1	AI-1	
	2	CNT0	Upper 16-bit
	3	CNT0	Lower 16-bit
	4	CNT1	Upper 16-bit
	5	CNT1	Lower 16-bit
	6 - 1FFF	not in use	
	2000 – 47FF	PLC communication for Read/Write OPC UA Client for Read/Write	
	4800 - 4FFF	not in use	
	5000 and higher	System information *Refer to Appendix 6, Modbus status information	
Holding register	0 and higher	not in use	
	2000 - 47FF	PLC communication for Read/Write OPC UA Client for Read/Write	

◆ Display Format

Select a format to display data.

When selecting [Coil Status (Coil) : DO] or [Input status : DI], the converted value will be displayed in the conversion display line.

When selecting [Input register AI/CNT] or [Holding register : AO], the converted value will be displayed in each cell.

[Setting]: Hexadecimal notation / Decimal notation(Signed) / Decimal notation(Unsigned) / Floating decimal / ASCII

[Default]: Hexadecimal notation

◆ Data Length

Select a data length to display data.

When selecting [Coil Status (Coil) : DO] or [Input status : DI], the converted value will be displayed in the conversion display line.

When selecting [Input register AI/CNT] or [Holding register : AO], the converted value will be displayed in each cell.

[16bit] is not selectable when [Floating decimal] is chosen for the display format.

[Data length] becomes unavailable when [ASCII] is chosen for the display format.

[Setting]: 16bit / 32bit / 64bit

[Default]: 16bit

◆ Monitor Value

At a regular cycle, the displayed Modbus data are re-obtained and updated in the table.

Clicking the button switches to execute or stop the action.

◆ Change Value

Data within the range of Modbus addresses 0x2000 - 0x47FF can be changed.

Select the cell you wish to change and click the [Change Value] button, or double-click the desired cell to open the window.

Enter a value in the [Setting Value] and click the [Change] button. This write the value in the address of the specified cell.

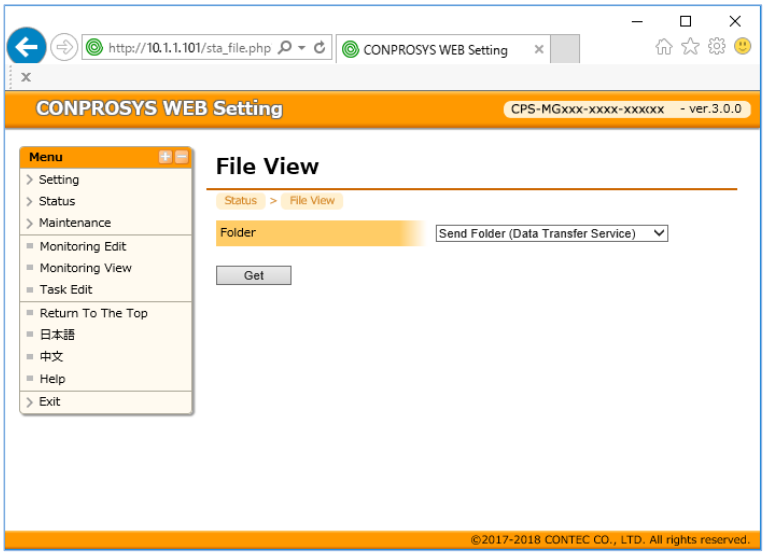
The function of the [Monitor Value] will be paused while the [Change Value] window is displayed.

[Setting]: Depending on the format selected in the display format and the data length.

35. File View

View the file in the specified folder.

Select the folder that stores the data to view. Click the [Get] to open a cvs file.



Selectable names and description are listed below.

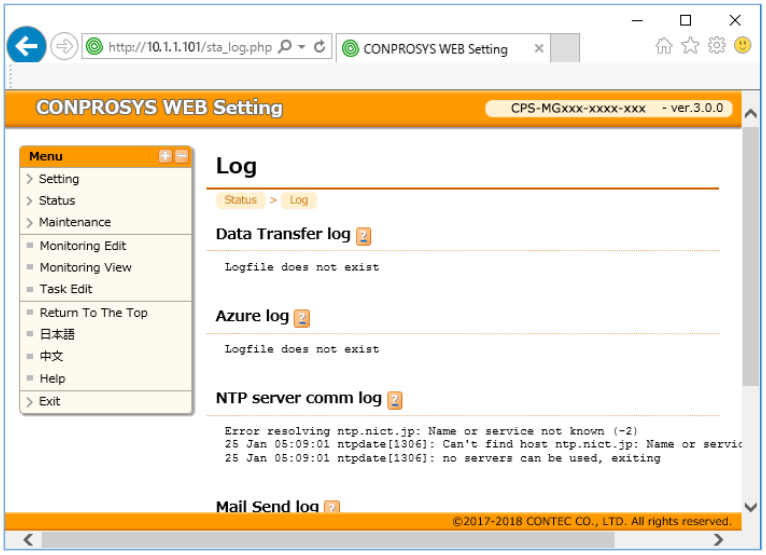
Folder Name	Description	Measured data file name
Send folder (Data transfer service)	Store files to be sent to a server by data transfer service.	YYYYMMDDhhmmss.csv
Send folder (Task)	Store files to be sent to a server by task.	YYYYMMDDhhmmss_file number.csv
Send folder (PLC)	Store files to be sent to a server by PLC communication service.	YYYYMMDDhhmmss_PLC device name.csv
Send folder (Mail)	Store mails to be sent by task.	YYYYMMDDhhmmssffffff.mail
Send folder (SMS)	Store mails to be sent by SMS.	YYYYMMDDhhmmssfff.sms
Send folder (Azure)	Store files to be sent to Azure IoT Hub by task.	YYYYMMDDhhmmss _azure file number.csv
Send folder (FTP)	Store files to be sent to FTP server by task.	(File name *1).csv
Send folder (Task-CHS)	Store files that failed to be sent to CHS.	Cloud Key_YYYYMMDDhhmmss.csv
Send folder (FacilityView)	Store files to be sent by FacilityView.	Cloud Key_YYYYMMDDhhmmss.csv
Resend folder (Transfer service)	Store files that failed to be sent to a server by transfer service.	YYYYMMDDhhmmss.csv
Resend folder (Task)	Store files that failed to be sent to a server by task.	YYYYMMDDhhmmss_file number.csv

Folder Name	Description	Measured data file name
Resend folder (PLC)	Store files that were failed to be sent to a server by PLC communication service.	YYYYMMDDhhmmss_PLC device name.csv
Resend folder (Mail)	Store mails that failed to be sent by task.	YYYYMMDDhhmmssfff.sms
Resend folder (SMS)	Store mails that failed to be sent by SMS.	YYYYMMDDhhmmss _azure file number.csv
Resend folder (Azure)	Store files that failed to be sent to Azure IoT Hub. (stored in converted json format)	YYYYMMDDhhmmss _azure file number.json
Resend folder (FTP)	Store files that failed to be sent to FTP server.	(File name *1)_ YYYYMMDDhhmmss.csv
Resend folder (Task-CHS)	Store files to be sent to CHS by task.	Cloud Key_YYYYMMDDhhmmss.csv
Resend folder (MQTT)	Store files that failed to be sent by MQTT.	{Cloud Key_}YYYYMMDDHH.csv
Resend folder (FacilityView)	Store files that failed to be sent by FacilityView.	Cloud Key_YYYYMMDDhhmmss.csv
Task SD card folder	Store data collection files set in SD area of task.	file number.csv
Task RAM folder	Store data collection files set in RAM area of task.	
Task SD backup folder	Store backup files created from task.	YYYYMMDD_file number.csv
Auto Backup folder	Store backup files (json file and csv file) created by enabling Auto backup in Data transfer setting. Files of the previous day are compressed at AM 3:59 once a day.	Date.tgz

*1 File name specified by user in Task can be viewed.

36. Log

Server communication log displays the communication log from the server.

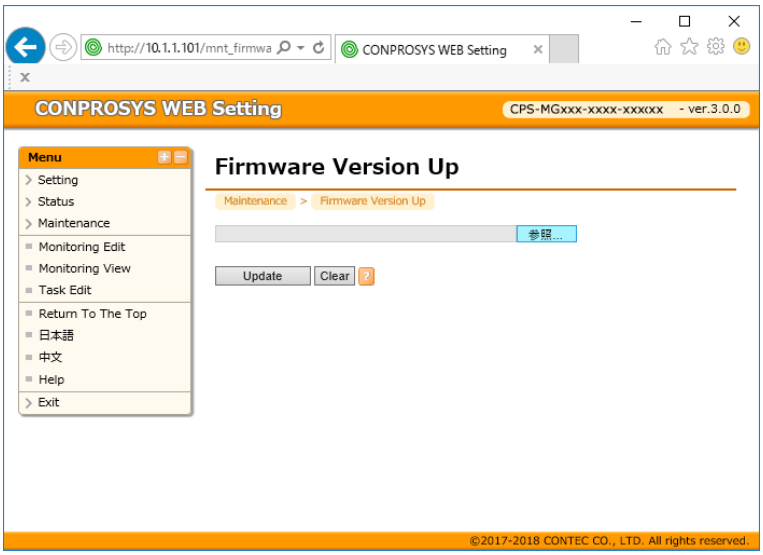


Sever connection log shows the communication logs listed below.

Folder Name	Description
Data Transfer log	Show the latest communication log from the server specified as the data transfer URL.
Azure log	Show the latest sending data log to Azure IoT Hub.
NTP server communication log	Show the latest communication log from the specified NTP server.
Mail send log	Show the latest communication log from the specified SMTP server.
3G AT command log	Show the latest AT command log at startup and when the 3G function restarts.
LTE AT command log	Show the latest AT command log at startup and when the LTE function restarts.
SMS Send log	Show the latest SMS Send log.
FTP communication log	Show the latest communication log from the FTP server that is set in FTP setting.
MQTT communication log	Show the latest communication log, publishing and subscribing conversion logs of MQTT. Publishing and subscribing will be logged per Cloud Key in the event of an error.
CHSResponse log	Displays the data changed in CHS or the latest error for writable tags of services, PLCs and tasks (CHS S/R). Logs are displayed per Cloud Key.
Router log	This shows the latest iptables logs. The log to be acquired can be selected by [Setting] → [Service] → [Router Log Function].
BACnet log	Show the latest BACnet log.
FacilityView comm log	This shows the latest communication log from the FacilityView.
OPC UA Client comm log	This shows the latest communication log from the OPC UA Server.

37. Firmware Update

Update the firmware.



◆ Firmware Update

Firmware update file can be downloaded from the CONTEC website.

From "Browse" button, specify the firmware and update it by clicking "Update" button.

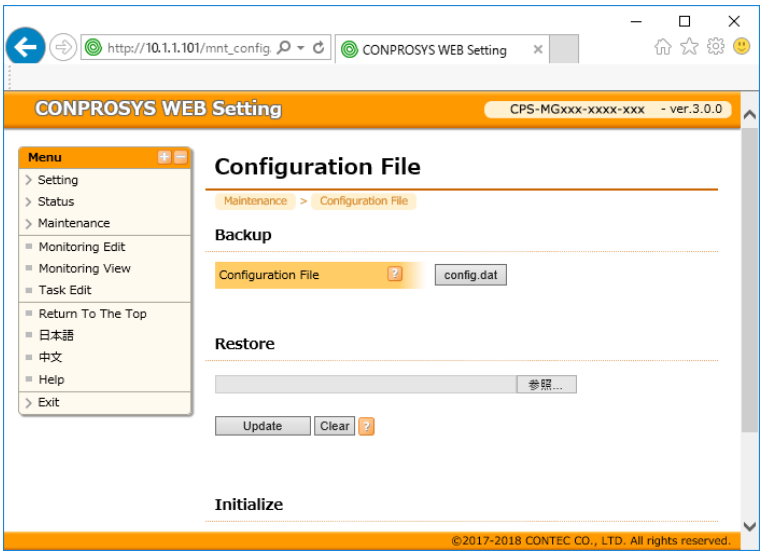
Download https://www.contec.com/download/

⚠ CAUTION

- The file is compressed by ZIP format. Decompress it and use the bin file extension.
- ST1 and ST2 LEDs of the product keep flashing while updating.
  Do not turn off the power while LEDs are flashing. Otherwise, data get damaged and it disables the product to startup.
- Firmware cannot be downgraded.

38. Configuration File

Back up, restore and initialization of the configuration files can be performed.



◆ Backup

By clicking “Download”, the backup file can be downloaded into the specified [Location].

If the same backup file is found when downloading the file into SD card, it is rewritten.

When a file opens on a browser, right-click on the link and select the item to store in a file.

◆ Restore

From “Browse” button, specify the file to restore and click the “Update”.

The downloaded backup file (configuration file) can be uploaded to the device and the original settings at the time of backup can be restored.

The configuration of the selected items will be reflected.

By clicking “Deselection", selected items are all cleared.

The browsing file can have any name.

◆ Initialize

For initialization, initialize all settings to their factory defaults.

Each setting can be reset to its default by clicking the “Execute”.

With a check box, select “Restore the network settings”, and the settings of wired LAN (such as IP address) alone can be remained.

After rebooting, settings return to default.

39. User/Password

Add or delete a user to log in CONPROSYS WEB Setting through a Web browser.

Users can be grouped as “Administrator”, “User”, or “Guest”, and the password per user needs to be set.

Available functions when logging in with each group name are listed below.

When logging in as “User”, functions availabilities can be changed by Permit/Prohibit in the User's Restrictions setting. See and check the “Availability” in the list below.

*Refer to **“User's Restrictions (page 146)”** for detailed information on the setting.

In the “Availability” line, “○” indicates Permit, and “-” indicates Prohibit.

In the “Default” line, “○” indicates the functions that “User” can use in the default setting.

Function		Administrator	User		Guest
			Default	Availability	
Setting (Network)	Wired-LAN	○	○	○	-
	Wireless LAN	○	○	○	-
	3G	○	○	○	-
	LTE	○	○	○	-
	920	○	-	○	-
	Proxy	○	○	○	-
Setting	Module	○	-	○	-
	Device	○	-	○	-
	Data Transfer	○	○	○	-
	Azure IoT Hub	○	○	○	-
	Time	○	○	○	-
	Service	○	-	○	-
	Mail	○	○	○	-
	SMS	○	○	○	-

	FTP	○	○	○	-
	OPCUA	○	-	○	-
	MTCONNECT	○	-	○	-
	PLC	○	○	○	-
	MQTT	○	○	○	-
	BACnet	○	-	○	-
	FacilityView	○	-	○	-
Status	System	○	○	-	○
	Modbs	○	○	-	○
	File View	○	○	-	-
	Log	○	○	-	-
	License	○	○	-	-
Maintenance	Firmware Update	○	-	-	-
	Configuration File	○	-	-	-
	User/Password	○	-	-	-
	Network Test	○	○	-	-
	User's Restrictions	○	-	-	-
Monitoring Edit		○	-	○	-
Monitoring View		○	○	-	○
Task Edit		○	-	○	-
Tag Edit		○	-	-	-
Exit	Save and Reboot	○	○	-	-
	Save and Shutdown	○	○	-	-
	Save	○	○	-	-
	Reboot	○	○	-	-
	Shutdown	○	○	-	-

◆ User Name /Password

Set a user name and password per added user. Users can be grouped as “Administrator”, “User” or “Guest”, and the password per user needs to be set.

For “Guest” group, pages regarding status can only be accessible.

For “User” group, pages regarding status and some setting pages can only be accessible.

[Setting]: 1 to 31 letters of one-byte alphanumeric character, [_] underline, and [-] hyphen.

◆ Group

Added users can be grouped.

For [Administrator] group, all device settings are configurable.

For [User] group, status and some device settings can be configurable.

For [Guest] group, pages regarding status can only be accessible.

[Setting]: Administrator, User, Guest
[Default]: Administrator

◆ User List

Added users can be deleted by clicking the “del”.

[Preset user]: User name: mc341, Password: mc341, Group, and Administrator

◆ Administrator page

When logging in as a user group or a guest group, you can go to administrator page by logging in from “Admin Page” of the side menu.

A user in a guest group can also log in as a user group from “User Page” of the side menu.

◆ Login/Password

For login password setting, user can set whether User name/Password is enabled or disabled.

When setting to disable, the user can access Web page without user name and password.

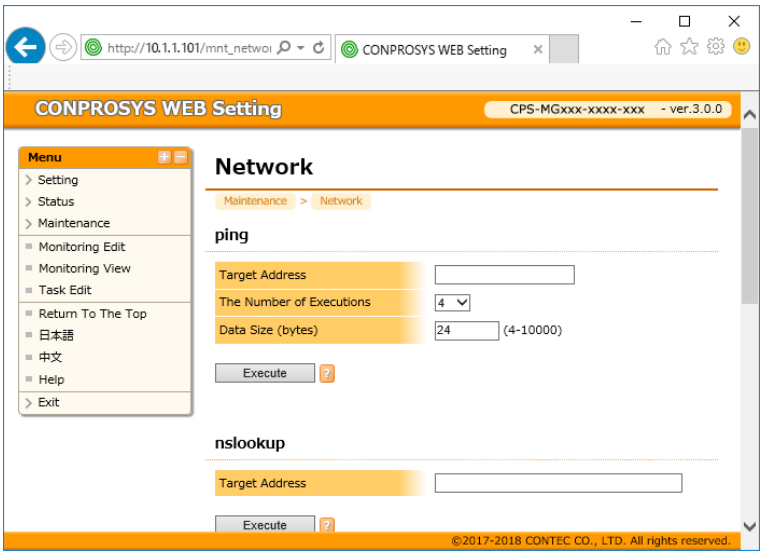
[Setting]: Enable, Disable
[Default]: Disable

⚠ CAUTION

- Change a password from the default setting and make your own password.
- Changed settings become available after rebooting.

40. Network

Test the network communication.



Network reachability can be checked with commands, including ping, lookup, ipconfig, net stat, route, and resolve.conf.

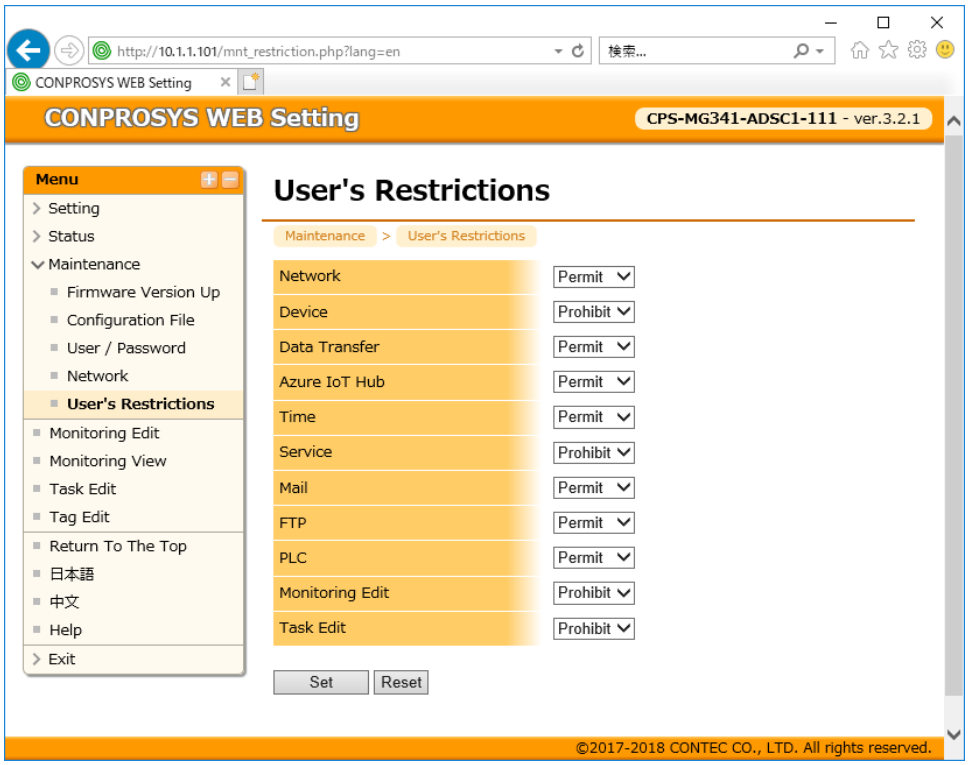
- ping ...Display a checking result of reachability to input hostname.
- lookup ...Display a result of DNS look up for input hostname.
- ipconfig ...Display a confirmation result of the network environment.
- net stat ...Display a list of network connection.
- route ...Display a routine table.
- resolv.conf ...Display DNS information.

41. User's Restrictions

"User's Restrictions" can be viewed in a menu when only logging in as "Administrator" and this sets the functions to be permitted or prohibited.

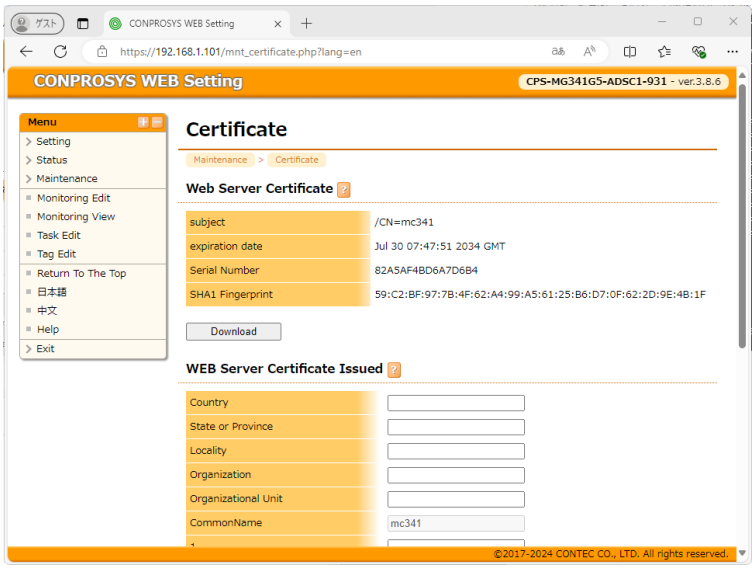
These settings are the functions that can be used or monitored by logging in as "User".

The function selected as "prohibit" in User's Restrictions will not be displayed in the menu when logging in as "User".



42. Certificate

Download and issue a web server certificate and upload a trusted root certificate.



◆ Web Server Certificate

Displays information about the self-certificate used by the web server.

By default, it displays certificates that have already been issued.

This can be changed from the certificate issuing function below.

Click the Download button to download the WEB server certificate (server.crt).

◆ WEB Server Certificate Issued

Any self-certification can be issued.

Time synchronization must be completed.

The Subject field can be set to any value except CommonName.

The validity period is 10 years from issuance. At least one IP address of the device to be accessed via HTTPS must be set in the Device IP Address field. Clicking the “Issue” button will renew the above web server certificate. The renewed certificate will become valid after restarting the service or restarting the device after saving the settings.

Country

[Setting]: 2 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, [’] single quotation, and [:] colon.

[Default]: No settings

State or Province

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

Locality

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

Organization

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

Organizational Unit

[Setting]: 0 to 64 letters of one-byte alphanumeric character, [.] period, [-] hyphen, [ ] half-width space, [,] comma, [=] equal, ['] single quotation, and [:] colon.
[Default]: No settings

CommonName

[Default]: mc341

Device IP address

[Setting]: IP address
[Default]: No settings

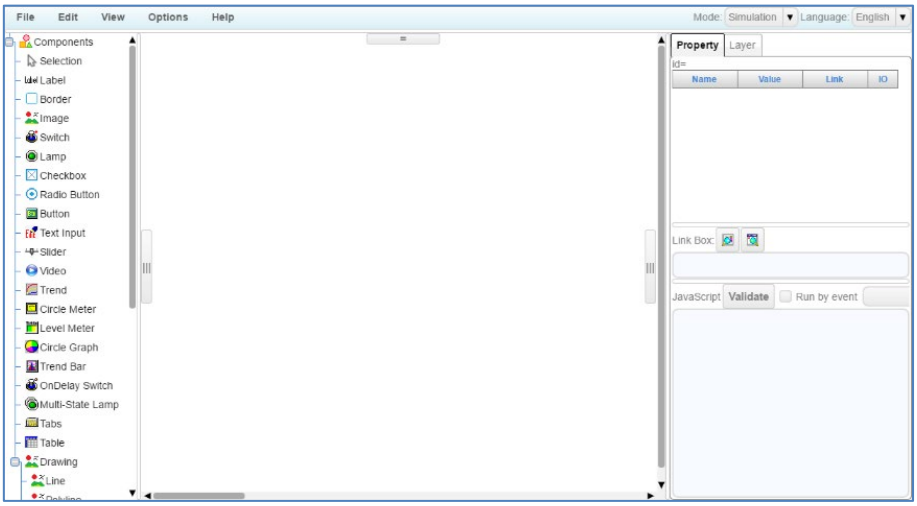
◆ Trusted Root CA Certificate

The Root CA Certificate bundle trusted by the system can be checked by pressing the View button. In addition, users can upload their own certificate bundle (in PEM format) by clicking the Upload button.

43. Monitoring Edit

The page can be created and edited on the monitoring edit page.

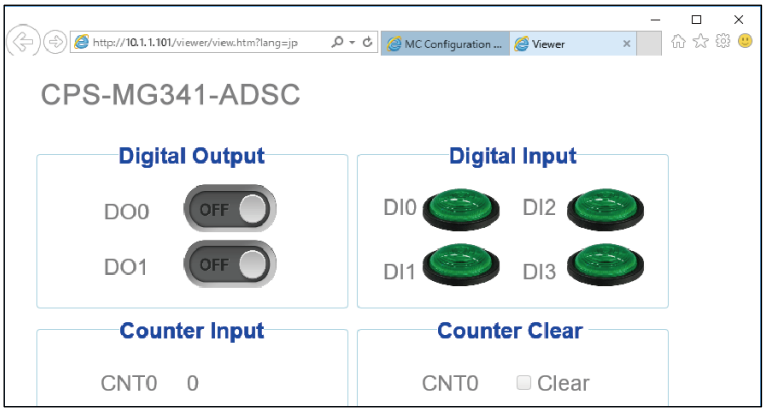
Create your own monitoring page by placing control items on the screen.



*Refer to “**Monitoring Edit (page 206)**” for details.

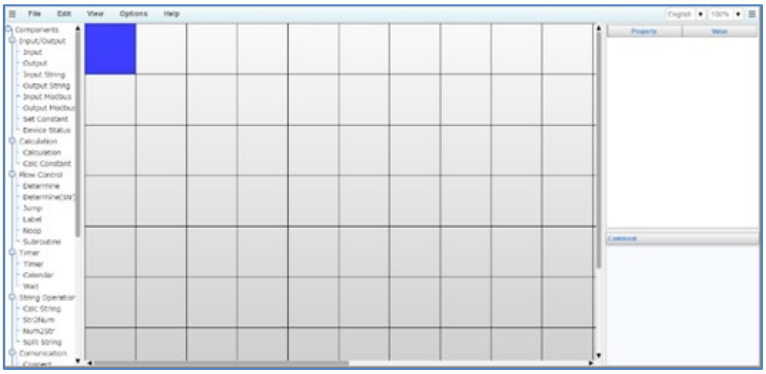
44. Monitoring View

Displays the monitoring screen (CONPROSYS HMI). Input signal status can be monitored on the page.



45. Task Edit

With intuitive operations, various task processing programs can be created on the task editing page "CONPROSYS VTC".

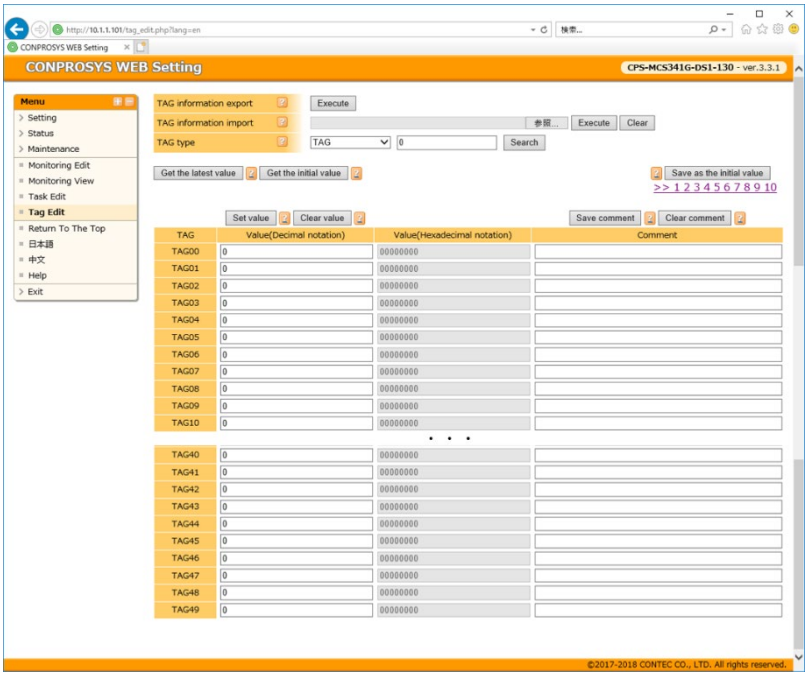


*Refer to "**Easy Data Process and Control (page 156)**" for details.

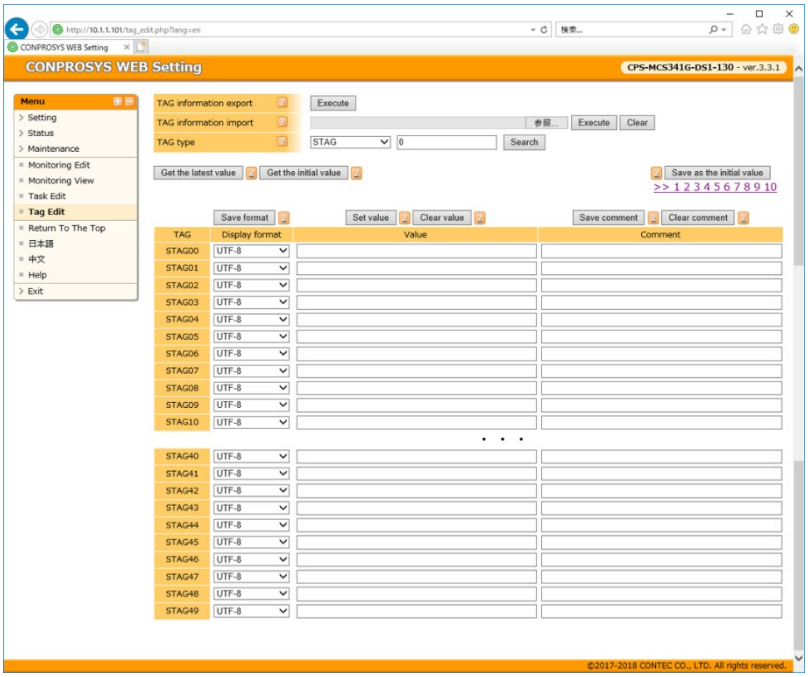
46. Tag Edit

This function monitors TAG/STAG/LTAG/LSTAG and edits their initial values, also a comment can be added.　50 tags can be viewed at one time.

[TAG]



[STAG]

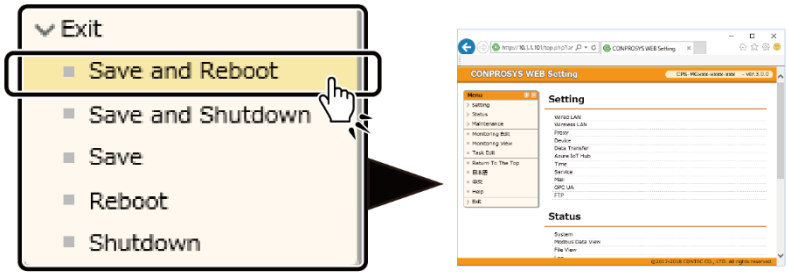


- Refer to **"Tag Edit (page219)"** for detailed information of Tag Edit page.

47. Save and Reboot

Save the settings and reboot the product.

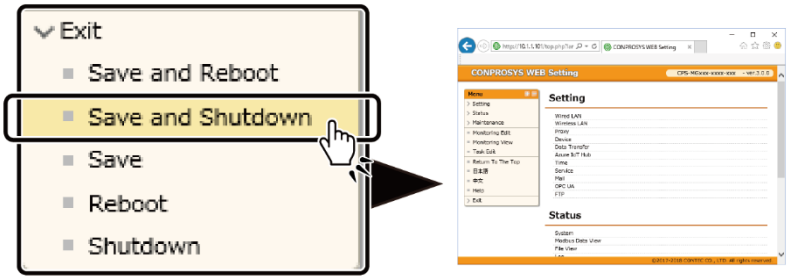
Click the [OK] in the dialog box to execute the save and reboot.



48. Save and Shutdown

Save the settings and shut down the product.

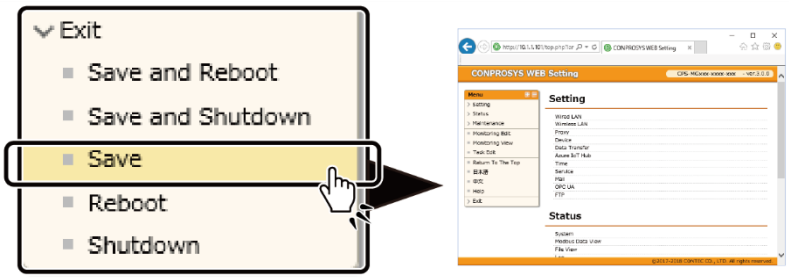
Click the [OK] in the dialog box to execute the shutdown.



49. Save

Save the settings.

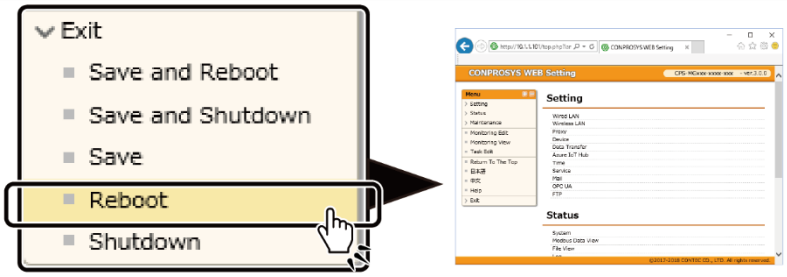
Click the [OK] in the dialog box to execute the save.



50. Reboot

Reboot the product.

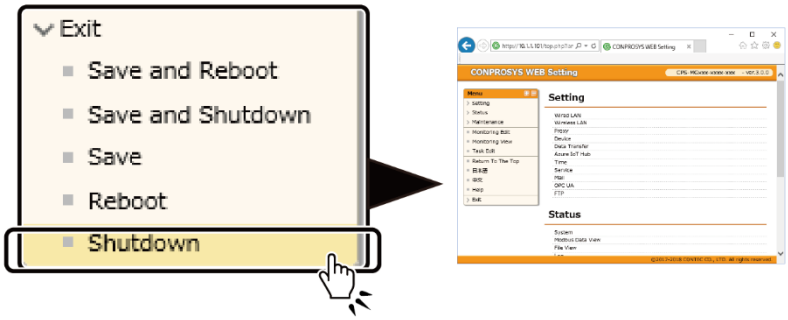
Click the [OK] in the dialog box to execute the reboot.



51. Shutdown

Shut down the product.

Click the [OK] in the dialog box to execute the shutdown.

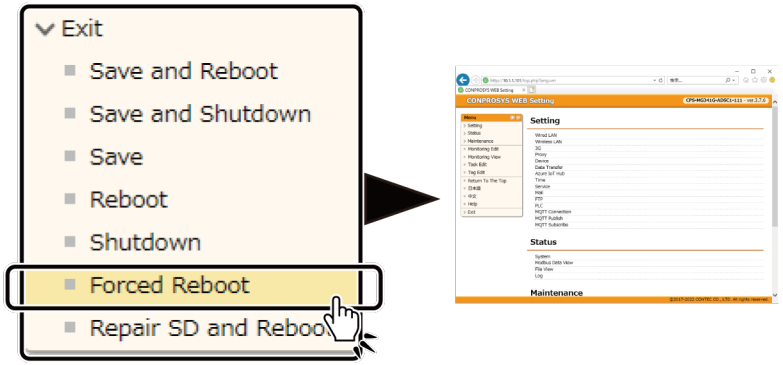


52. Forced Reboot

Forcibly reboot the product without terminating the running process.

Click the [OK] in the dialog box to execute the forced reboot.

- Please note that if executed during ROM rewriting by saving settings or firmware update, system files and user settings may be corrupted, and the device may not start up properly.



53. Repair SD and Reboot

Repair the SD card and reboot the product.

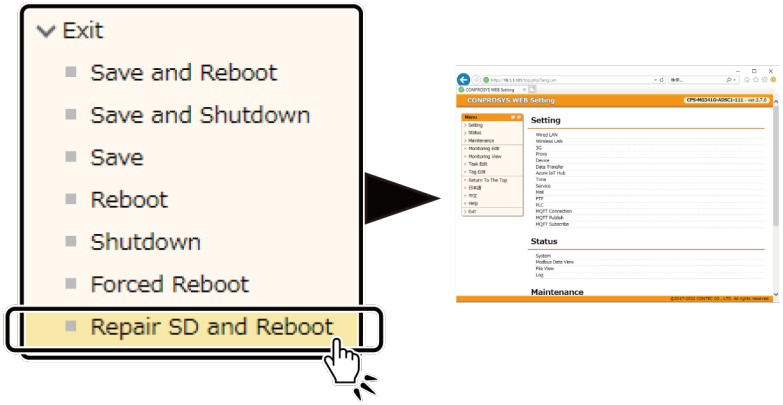
Click the [OK] in the dialog box to execute the repair SD and reboot.

After the SD card is repaired, a log is output and a reboot is executed after 30 seconds.

The bottom of the log also displays the results of the execution.

When [RESULT : 0] is output : No repairable errors.

When [RESULT : 1] is output : A repairable error has been detected or an internal inconsistency has been detected. Errors that are attempted to be repaired are output as a file (FSCKXXXX.REC) in the top directory of the SD card. Since the equipment is not affected, there is no problem in deleting the repair file when it is not needed.



Easy Data Process and Control

This section describes the CONPROSYS VTC (Visual Task Control), with which collecting data or calculating can be done easily through a web browser.

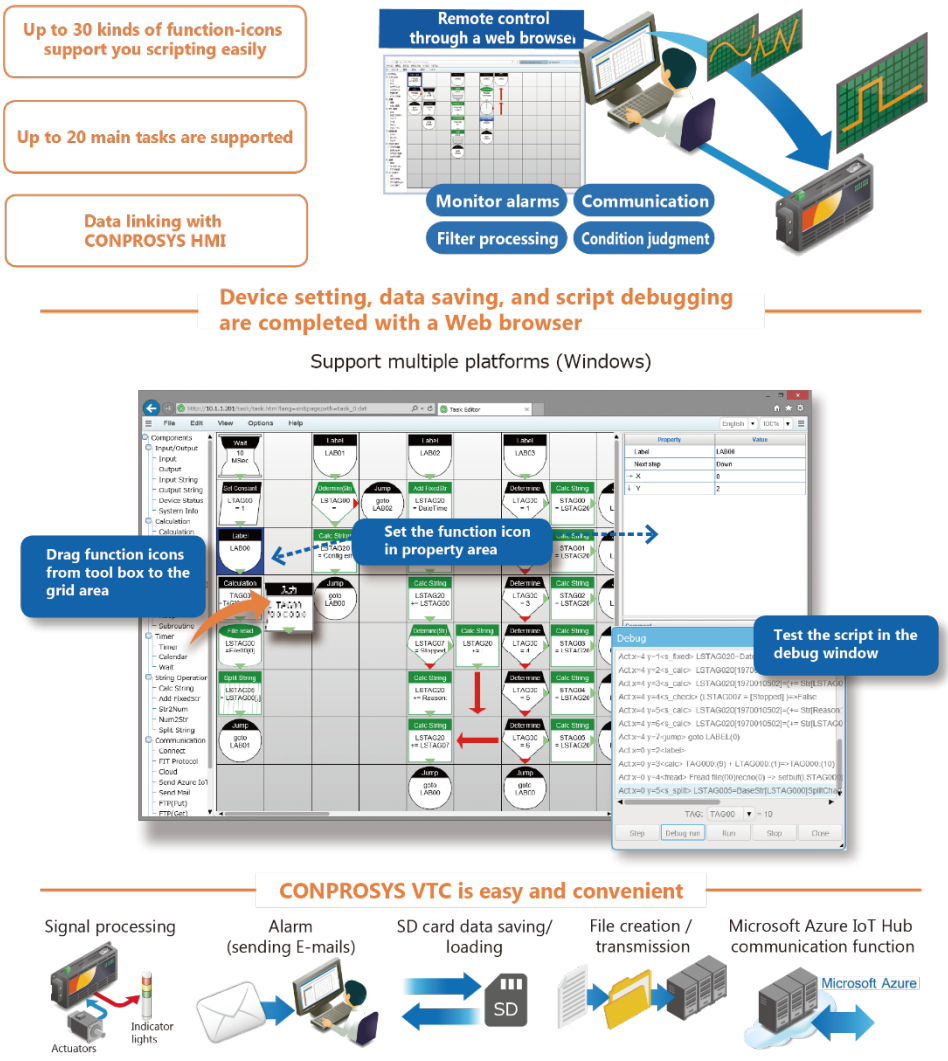
1.CONPROSYS VTC Outline

1. What You Can Do With CONPROSYS VTC

With intuitive operations by simply dragging and dropping task controls from the tool box to the setting area, various task processing programs can be created.

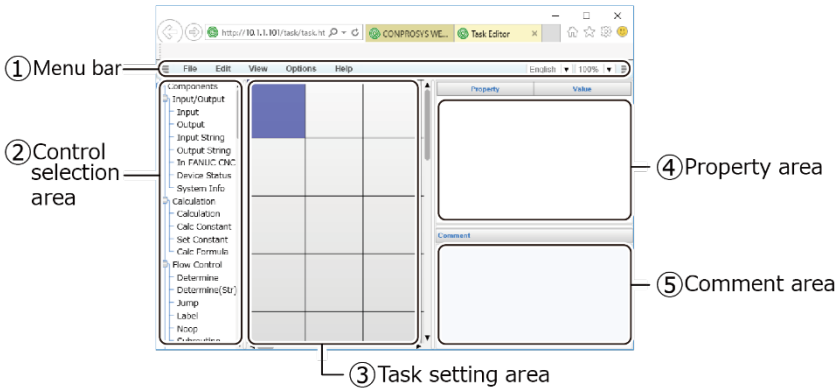
Neither the knowledge of language programming nor the special development environment is necessary.

Settings including I/O with devices, calculation, flow control, string operation, data transfer to Cloud, and file operation can be done easily like drawing a flowchart on the page through a web browser.



2. Work Area

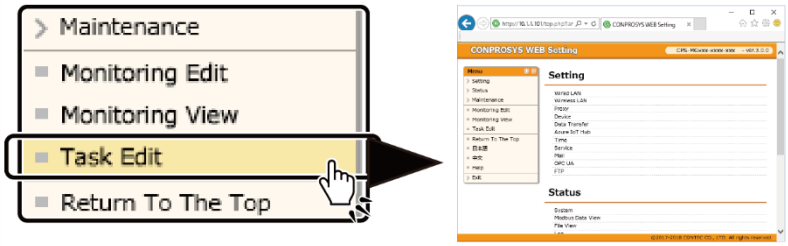
CONPROSYS VTC has the following work areas.



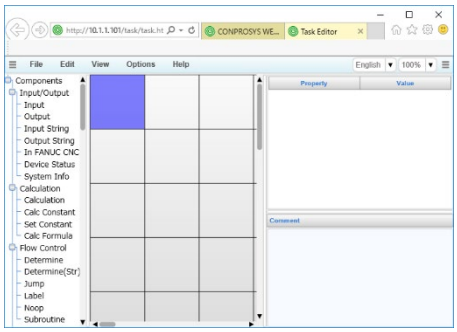
No.	Name	Function
1	Menu bar	The menu bar is used to execute commands with menu buttons.
2	Control selection area	The task controls can be selected to place on the task setting area.
3	Task setting area	This area is where the task controls are placed and set.
4	Property area	You can modify the property variables of controls with this area.
5	Comment area	This are can be used to add comments to the task controls.

3. Create Processing Tasks

From CONPROSYS WEB Setting, click the [Task Edit].



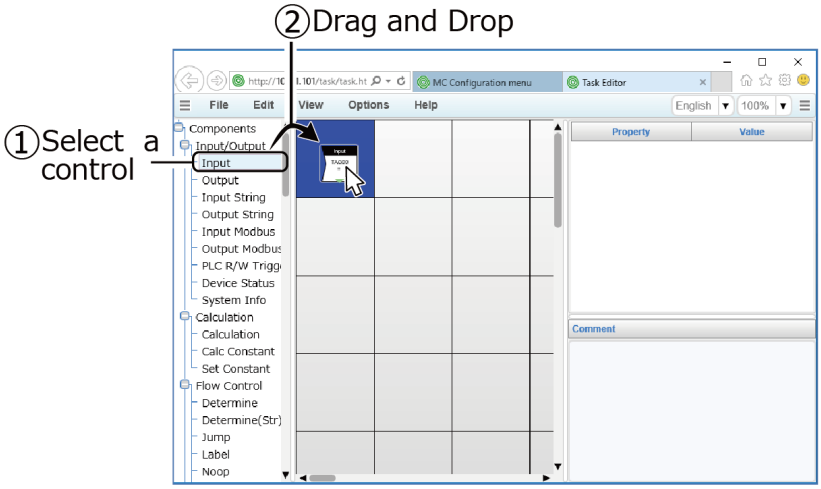
CONPROSYS VTC starts up to create a processing task.



4. Basic Procedure for Creating Processing Tasks

◆ Place Task Controls

1. Select a necessary task control from Control selection area.
2. Drag and drop it onto the task setting area.



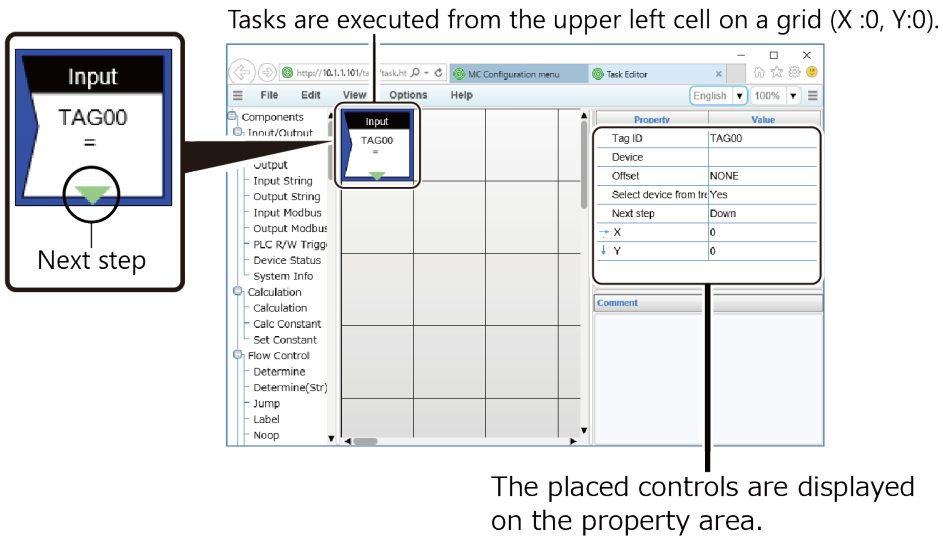
◆ Set Property

The property of placed controls is displayed on the property area.

Each control contains the parameter that represents a specific function and decides the direction (Next step) to execute the next task.

Tasks are executed from the upper left cell on a grid (X: 0, Y: 0). The next step to execute is determined by the direction set in the control.

If the next step is located outside of the page, the first task (0, 0) is proceeded.

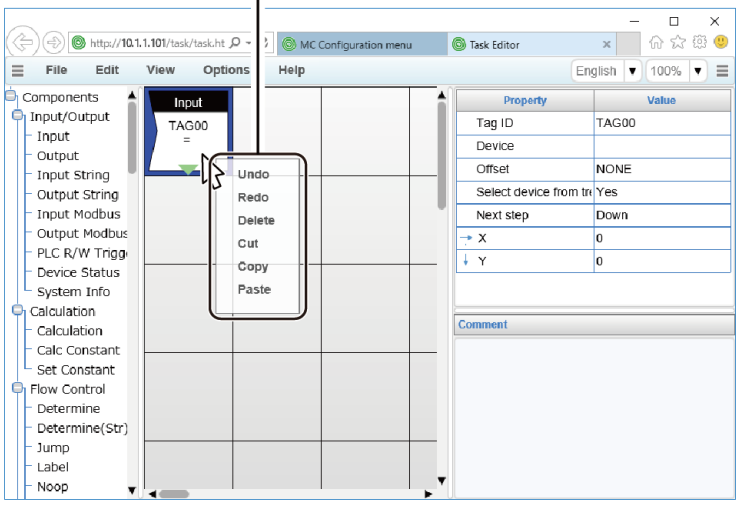


* In this example, the processing is given to the following control after reading the data that is obtained from a device to TAG00.

◆ Copy and Delete Controls

Right-click the placed control to show the editing menu. In this menu, such as coping or deleting controls can be performed.

Right-click on the mouse

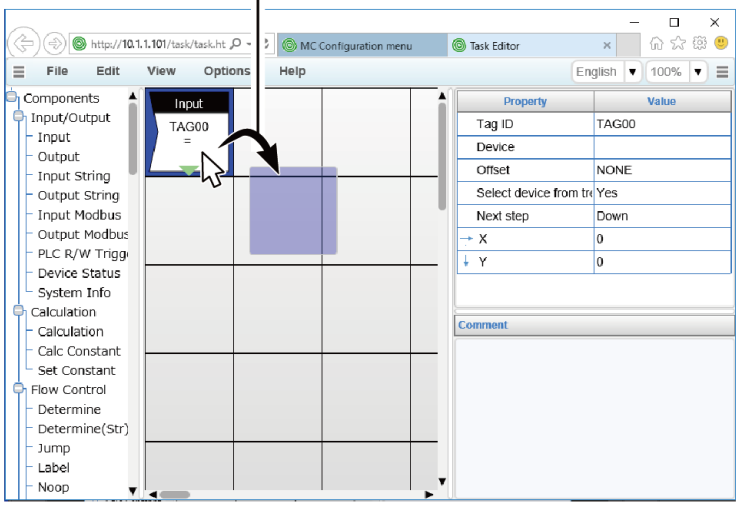


◆ Move Controls

The placed control can be moved by drag and drop.

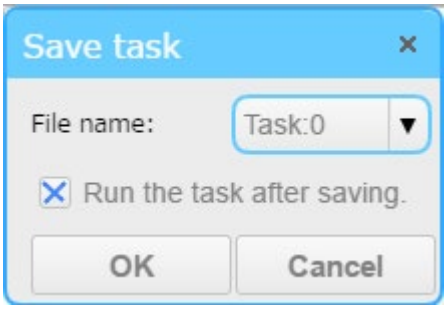
Create the tasks by following the procedure described above to place controls on the task setting area.

Move a control by Drag and Drop



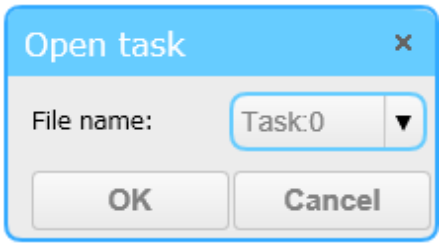
◆ Save a Task Processing

From Menu command, select the "File" – "Save task" to open a dialog to save the created task processing with the specified number.



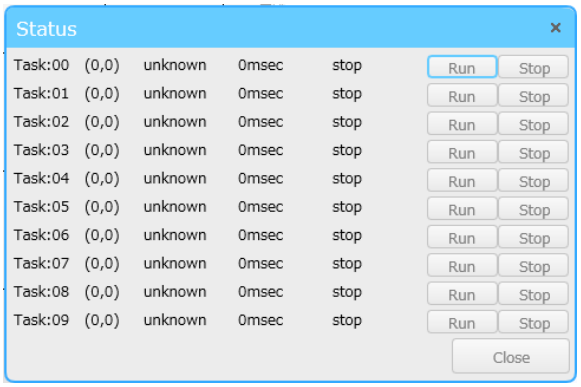
◆ Open a Saved Task

From Menu command, select the "File" – "Open task" to open a dialog and select the number in the dialog to open a saved task.



◆ Run a Task Processing

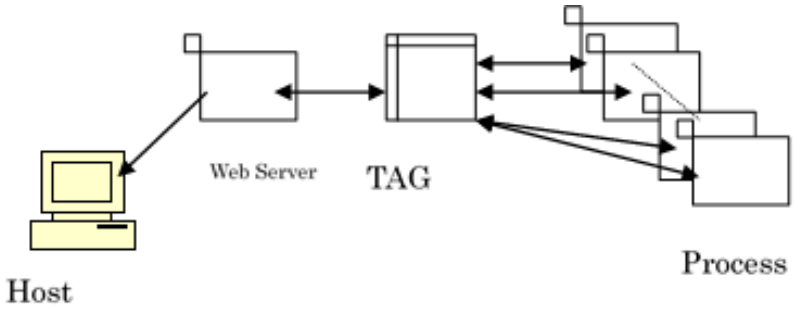
From Menu, go to "View" – "Status" and "Run" to apply the changes and run the task.



- You can create executing tasks up to 20 that work simultaneously.

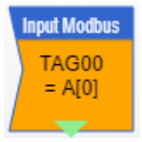
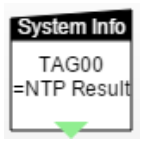
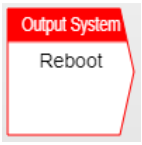
5. Internal Variables

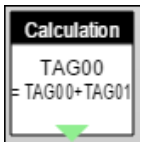
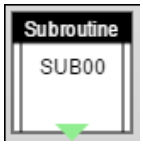
- The monitoring screens, task processing, and other operations can use TAGs that store numeric values and STAGs that store character strings.
- Data range is 1.7E +/- 308 (significant figures 15) for TAG, and up to 2048 byte can be used for STAG.
- The TAGs used by task processing are the same as the TAGs used in the monitoring screens.
- To log TAG value or when the value is converted to string, it is rounded off by the 4th decimal place.
- TAG values updated from the monitoring screen can be referenced in task processing.
- Task processing can use LTAGs (Local TAGs) in addition to standard TAGs.
- LTAGs are TAGs that can be used locally within individual tasks.
- Use LTAGs to prevent interference between TAG variables used in different tasks.
- The area of each LTAG is the same one as TAG, STAG's.

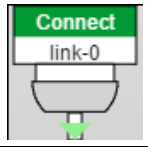
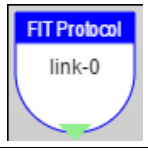


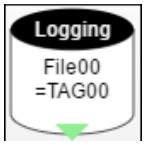
2.Summary Of Available Controls

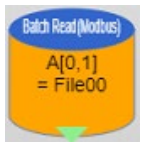
See the task controls below for task editing.

Controls	Name	Description
	Input	Input the value from the device to the specified TAG.
	Output	Output the value to device from the specified TAG.
	Input String	Input the string from the specified LINK to the specified STAG.
	Output String	Output the string from the specified STAG to the specified LINK.
	Input Modbus	This control is only available in the M2M Gateway series. Input the value from Modbus to the specified TAG.
	Output Modbus	This control is only available in the M2M Gateway series. Output the value from the specified TAG to Modbus.
	In FANUC CNC	This control is specifically used to support FANUC CNC series. Get the value from CNC of FANUC and store to the TAG or STAG.
	PLC R/W Trigger	This control is only available in the M2M Gateway series. Executes reading / writing of the specified PLC device.
	Device Status	Read the device status to the specified TAG.
	System Info	Store the system information to the specified TAG or STAG.
	Output System	Execute a "reboot" or "shutdown" of the product.

Controls	Name	Description
	Calculation	Calculate two TAG values.
	Calc formula	Define an arithmetic expression and substitute the result into the TAG.
	Calc Constant	Calculate the fixed value and TAG value.
	Set Constant	Set constant value to the specified TAG.
	Conditional Calc	Calculate only when the set conditions are satisfied.
	Range Calc	Calculate TAG within the specified range.
	Determine	Conditional branch of the result from comparison between TAG value and the value.
	Determine (String)	Perform a comparison on the specified STAG.
	Jump	Jump order to the specified label or return from sub-routine.
	Label	Create a label. Set the destination point for a jump control.
	Noop	No operation. It is used to append a control to a control.
	Subroutine	Call a selected subroutine and execute a process.

Controls	Name	Description
	Timer	Branch execution at the specified time.
	Calendar	Branch execution at the specified date or day of the week.
	Wait	Delay execution for the specified time.
	Time Count	Count time elapsed from the set conditions, and store the result in the TAG.
	Time Calc	For the set STAG time, assign the result of addition/subtraction of the TAG value to STAG, or assign the time difference(unit: seconds) of the STAG to TAG.
	Calc String	Store the result of an operation on a character string in the specified STAG.
	Add Fixed Str	Add the specific strings such as carriage-return and time in the specified STAG.
	Str2Num	Convert the character string in the specified STAG to a numeric value.
	Num2Str	Convert the specified TAG to a character string.
	Split String	Split a character string at separator positions.
	Connect	Open or close communication link.
	FIT Protocol	Send or receive data using the F&eIT protocol.

Controls	Name	Description
	Cloud	Send files to Web server.
	CHS S/R	Send or receive data with CHS.
	CHS CSV Download	Download CSV files from the file library of CHS, parse them as data, and write them into TAGs.
	Send Azure IoT	Send files to Azure IoT Hub.
	Send Mail	Send mails.
	Send SMS	Send SMS.
	FTP (Put)	Send a file to the FTP server with the specified name.
	FTP (Get)	Receive a file with a specified name from the FTP server.
	MQTT PUB Trigger	Send collected data by MQTT.
	BACnet RP	Requests BACnet ReadProperty service for the target device.
	BACnet WP	Requests BACnet WriteProperty service for the target device.
	Logging	Save collected data in the file.

Controls	Name	Description
	Logging (String)	Save string in the file.
	Batch Logging	Save data stored in the specified range TAG into file.
	Batch Logging (Str)	Save data stored in the specified range STAG into file.
	Batch Logging (Modbus)	Save Modbus data in the specified range as a decimal value into file.
	File read	Obtain data from file.
	Batch Read	Obtain data from file and store them in the specified range TAG.
	Batch Read (Str)	Obtain data from file and store them in the specified range STAG.
	Batch Read (Modbus)	Obtain data from file and store them in the specified range Modbus.
	File operation	Log File Action.

Refer to "**Online Help**" for the details of CONPROSYS VTC operation and functions.

Online Help https://doc.conprosys.com/help/task/V1/en/

3.Input/Output Module Allocation

Some of the task controls need to be specified directly with the hardware details such as Device IDs. The information differs depending on the products.

See the list of Input/Output module numbers related to each product.

- CPS-MG341-ADSC1-111
- CPS-MG341-ADSC1-931
- CPS-MG341G-ADSC1-111
- CPS-MG341G-ADSC1-930

Input Module	Device ID	Channel	Bit
DI-0	0	0	0
DI-1	0	0	1
DI-2	0	0	2
DI-3	0	0	3
AI-0	1	0	All
AI-1	1	1	All
CNT-0	2	0	All
CNT-1	2	1	All

Output Module	Device ID	Channel	Bit
DO-0	0	0	0
DO-1	0	0	1

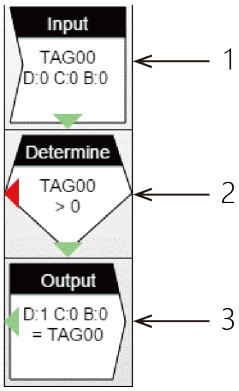
4.Sample

Listed below are samples of task processing.

Name	Description	Page
Sample (1)	If the value of the input data is non-zero, output the value to a different channel.	Page 170
Sample (2)	If the value of the input data is non-zero, increment the value and output to a different channel.	Page 172
Sample (3)	Send a data request (“REQ00”) via serial communication and receive the reply data.	Page 175
Sample (4)	Check on the data received via serial communications.	Page 178
Sample (5)	Get bytes 5 to 10 of the data received via serial communications.	Page 180
Sample (6)	Increment the counter for the data received via serial communications by one.	Page 182
Sample (7)	Generate a packet based on the data received via serial communications (add a header) and send to a different host via socket communications.	Page 186
Sample (8)	The example is when the value of CNT-0 is saved in a file per minute in RAM and the file is transferred to Web server, then clear to 0	Page 191
Sample (9)	The example is when the value of DI00 is changed, send mail in accordance with the input.	Page 196
Sample (10)	Receive a file from and send it back to FTP server.	Page 199
Sample (11)	TriggerRead and TriggerWrite for PLC communication	Page 201
Sample (12)	EventWrite for PLC communication	Page 204

5.1. Sample (1)

◆ If the value of the input data is non-zero, output the value to a different channel.



1 Read the data to TAG number 00.

Property	Value
Tag ID	TAG00
Device type	Input
Device ID	0
Channel	0
Bit	0
Select device from tree	No
Next step	Down
→ X	0
↓ Y	0

2 Go to the below step if the value of TAG number 00 is greater than zero.
Otherwise, go to the step on the left. If a control goes outside the page, execution starts again from the initial instruction (0, 0).

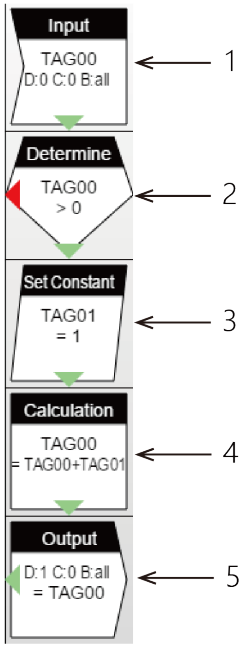
Property	Value
UsrValue	TAG00
Condition	>
Limit	Fixed Value
Fixed Value	0
True	Down
False	Left
→ X	0
↓ Y	1

3 Output the value in TAG number 00 to device 1, channel 0.

Property	Value
Tag ID	TAG00
Device type	Output
Device ID	1
Channel	0
Bit	0
Select device from tree	No
Next step	Left
→ X	0
↓ Y	2

2. Sample (2)

◆ If the value of the input data is non-zero, increment the value and output to a different channel.



1 Read the data to TAG number 00.

Property	Value
Tag ID	TAG00
Device type	Input
Device ID	0
Channel	0
Bit	all
Select device from tree	No
Next step	Down
X	0
Y	0

2 Go to the below step if the value of TAG number 00 is greater than zero.
Otherwise, go to the step on the left.
If a control goes outside the page, execution starts again from the initial instruction (0, 0).

Property	Value
UsrValue	TAG00
Condition	>
Limit	Fixed Value
Fixed Value	0
True	Down
False	Left
X	0
Y	1

3 Set 1 to the TAG number 01 variables.

Property	Value
Tag ID	TAG01
Value	1
Next step	Down
X	0
Y	2

4 The value of TAG number 00 is added to that of TAG number 01 and it is as 00.

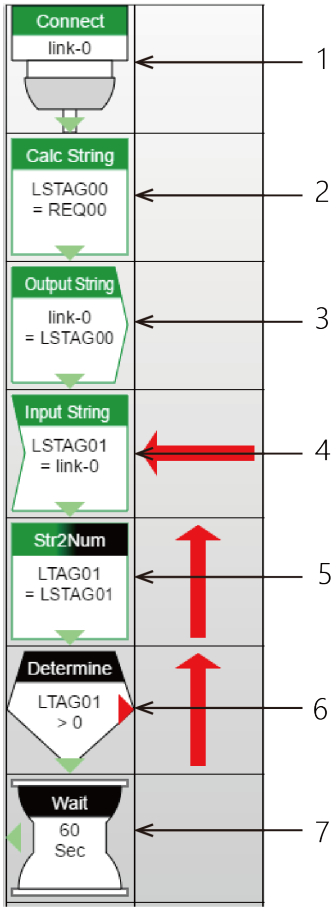
Property	Value
TargetValue =	TAG00
Value1	TAG00
(+-*/%)	+
Value2	TAG01
Next step	Down
X	0
Y	3

5 Output the value in TAG number 00 to device 1, channel 0.

Property	Value
Tag ID	TAG00
Device type	Output
Device ID	1
Channel	0
Bit	all
Select device from tree	No
Next step	Left
→ X	0
↓ Y	4

3. Sample (3)

◆ Send a data request (“REQ00”) via serial communication and receive the reply data.



1 Open the link.
This example opens Link No “Link-0”.
Execution proceeds to the next step after completing “Open”.

Property	Value
Link No	link-0
Connect	Connect
Action	Wait
Next step	Down
→ X	0
↓ Y	0

2 Set a string “REQ00” in LSTAG00.

Property	Value
TargetValue =	LSTAG00
Action	=
Str	Fixed Value
Fixed value (str)	REQ00
Next step	Down
→ X	0
↓ Y	1

3 Write (transfer) data to link.
Write data in LSTAG00 to Link-0.

Property	Value
Link No	link-0
Tag ID	LSTAG00
Next step	Down
→ X	0
↓ Y	2

4 Read (receive) data from link.
Receive data from link-0 and save in LSTAG01.

Property	Value
Link No	link-0
Tag ID	LSTAG01
Next step	Down
→ X	0
↓ Y	3

5 Get the size of the received data.
Set the data length of LSTAG01 in LTAG01.

Property	Value
TargetValue =	LTAG01
Action	Get length
Str	LSTAG01
Next step	Down
→ X	0
↓ Y	4

6 Check the data length.
If the received data length is greater than zero, go to the step below. Otherwise, branch to the right.

Property	Value
UsrValue	LTAG01
Condition	>
Limit	Fixed Value
Fixed Value	0
True	Down
False	Right
→ X	0
↓ Y	5

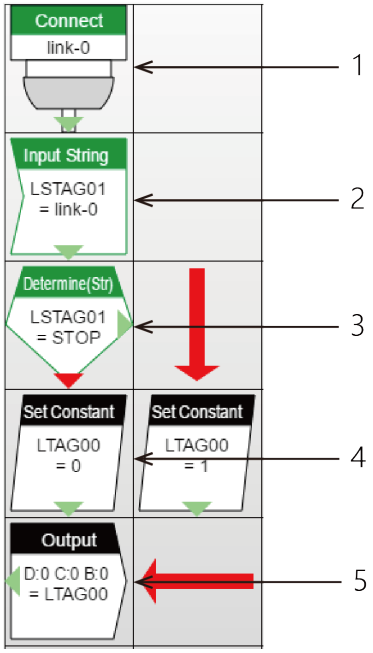
7 Wait for 60 seconds.

Property	Value
Wait time	Fixed Value
Fixed Value	60
Scale	Sec
Next step	Left
→ X	0
↓ Y	6

4. Sample (4)

◆ Check on the data received via serial communications.

Output "1" from a DO if the received string was "STOP".



1 Open the link.
This example opens Link No "Link-0".
Execution proceeds to the next step after completing "Open".

Property	Value
Link No	link-0
Connect	Connect
Action	Wait
Next step	Down
→ X	0
↓ Y	0

2 Read (receive) data from link.
Receive data from link-0 and save in LSTAG01.

Property	Value
Link No	link-0
Tag ID	LSTAG01
Next step	Down
→ X	0
↓ Y	1

3 Check whether the string is correct.
Check whether the LSTAG01 string = “STOP”.
If so, go to the step on the right. If not, go to the step below.

Property	Value
UsrValue	LSTAG01
Condition	=
Limit	Fixed Value
Fixed Value	STOP
True	Right
False	Down
X	0
Y	2

4 Set value in TAG.
Set LTAG00 to 1

Property	Value
Tag ID	LTAG00
Value	1
Next step	Down
X	1
Y	3

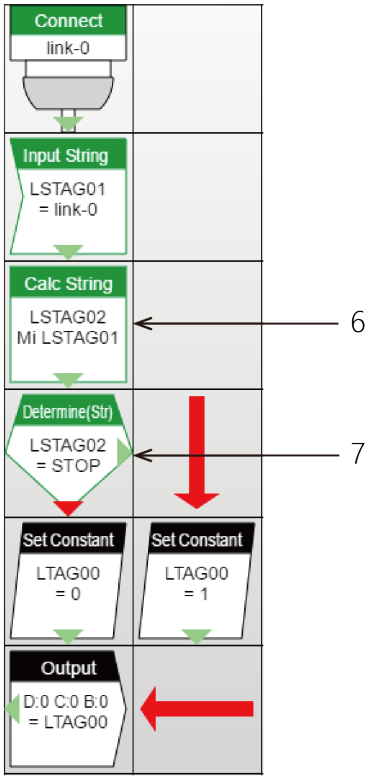
5 Output to device.

Property	Value
Tag ID	LTAG00
Device type	Output
Device ID	0
Channel	0
Bit	0
Select device from tree	No
Next step	Left
X	0
Y	4

5. Sample (5)

◆ Get bytes 5 to 10 of the data received via serial communications.

Modify steps [6] and [7] from sample 4.



1 Get bytes 5 to 10 of the received data.
From 5 bytes of data stored in LSTAG01, 10 bytes data is set to LSTAG02.

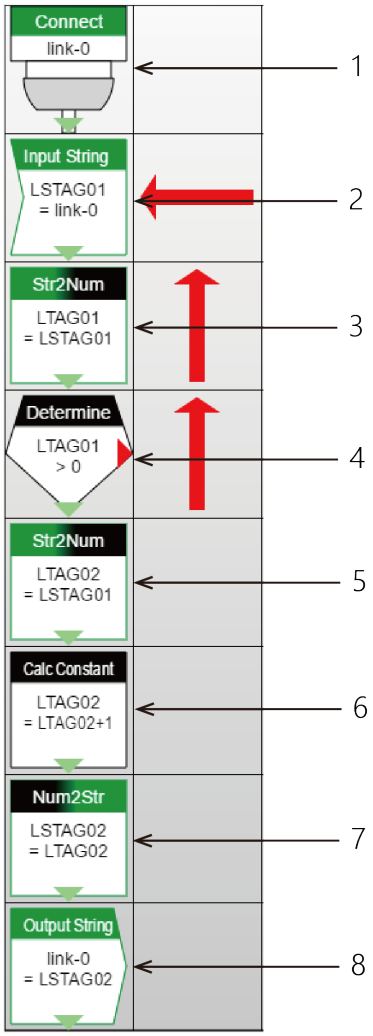
Property	Value
TargetValue =	LSTAG02
Action	Mid
Str	LSTAG01
Size	Fixed Value
Fixed value (size)	10
Offset	Fixed Value
Fixed value (offset)	5
Next step	Down
→ X	0
↓ Y	2

2 Check whether the character string is correct.
Check whether the LSTAG02 character string = “STOP”.
If so, go to the step on the right. If not, go to the step below.

Property	Value
UsrValue	LSTAG02
Condition	=
Limit	Fixed Value
Fixed Value	STOP
True	Right
False	Down
X	0
Y	3

6. Sample (6)

◆ Increment the counter for the data received via serial communications by one.



1 Open the link.
This example opens Link No “Link-0”.
Execution proceeds to the next step after completing “Open”.

Property	Value
Link No	link-0
Connect	Connect
Action	Wait
Next step	Down
→ X	0
↓ Y	0

2 Read (receive) data from link.
Receive data from link-0 and save in LSTAG01.

Property	Value
Link No	link-0
Tag ID	LSTAG01
Next step	Down
→ X	0
↓ Y	1

3 Get the size of the received data.
Set the data length of LSTAG01 in LTAG01.

Property	Value
TargetValue =	LTAG01
Action	Get length
Str	LSTAG01
Next step	Down
→ X	0
↓ Y	2

4 Check the data length.
If the received data length is greater than zero, go to the step below. Otherwise, branch to the right.

Property	Value
UsrValue	LTAG01
Condition	>
Limit	Fixed Value
Fixed Value	0
True	Down
False	Right
→ X	0
↓ Y	3

5 Convert the received data from ASCII characters to a numeric value.
Convert the ASCII character data in LSTAG01, starting from byte 0, to a numeric value and save in LTAG02.

Property	Value
TargetValue =	LTAG02
Action	Ascii Str >> Number
Str	LSTAG01
Offset	Fixed Value
Fixed value (offset)	0
Next step	Down
→ X	0
↓ Y	4

6 Increment the numeric value by one.
Add one to the LTAG02 value and save the result in LTAG02.

Property	Value
TargetValue =	LTAG02
Value	LTAG02
(+-*/%)	+
Constant	1
Next step	Down
→ X	0
↓ Y	5

7 Convert the numeric value to a string.
Convert the LTAG02 value to a string and save the result in LSTAG02.

Property	Value
TargetValue =	LSTAG02
Action	Number >> Ascii Str
Value	LTAG02
Next step	Down
→ X	0
↓ Y	6

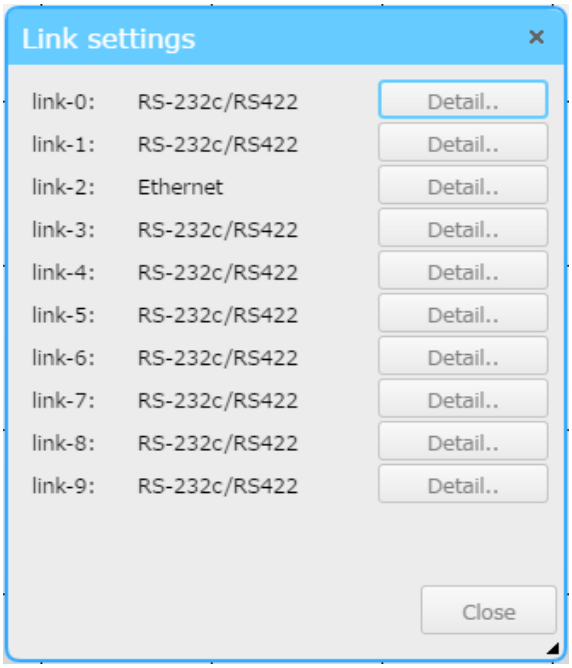
8 Write (transmit) data to link.
Write data in LSTAG02 to Link-0.

Property	Value
Link No	link-0
Tag ID	LSTAG02
Next step	Down
→ X	0
↓ Y	7

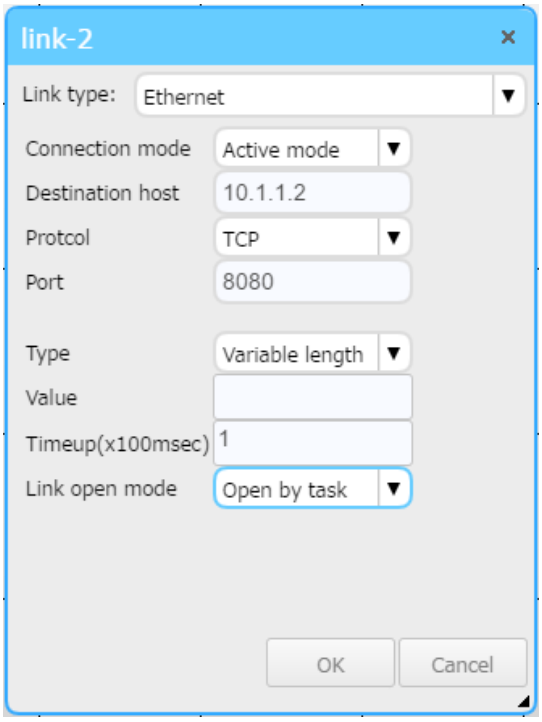
7. Sample (7)

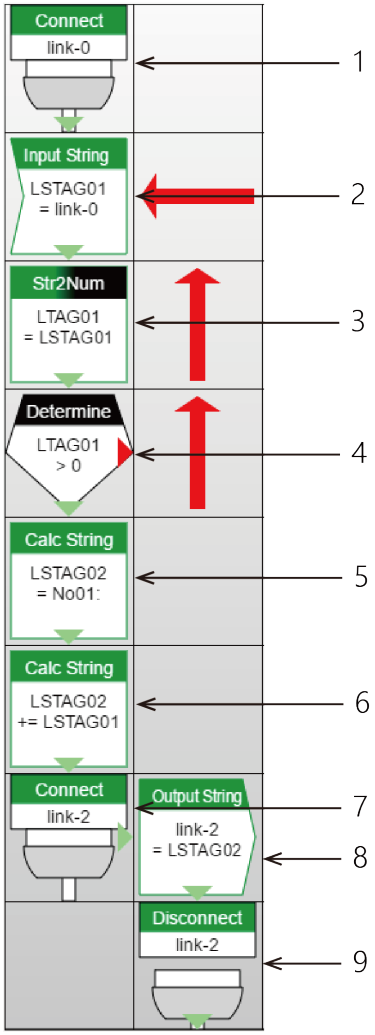
◆ Generate a packet based on the data received via serial communications (add a header) and send to a different host via socket communications.

Send the data received from Link-0 via the Link-2 Ethernet connection.



This example establishes a socket connection to port 8080 on host 10.1.1.2 and then sends the data.





1 Open the link.
This example opens Link No “Link-0”.
Execution proceeds to the next step after completing “Open”.

Property	Value
Link No	link-0
Connect	Connect
Action	Wait
Next step	Down
X	0
Y	0

2 Read (receive) data from link.
Receive data from link-0 and save in LSTAG01.

Property	Value
Link No	link-0
Tag ID	LSTAG01
Next step	Down
→ X	0
↓ Y	1

3 Get the size of the received data.
Set the data length of LSTAG01 in LTAG01.

Property	Value
TargetValue =	LTAG01
Action	Get length
Str	LSTAG01
Next step	Down
→ X	0
↓ Y	2

4 Check the data length.
If the received data length is greater than zero, go to the step below. Otherwise, branch to the right.

Property	Value
UsrValue	LTAG01
Condition	>
Limit	Fixed Value
Fixed Value	0
True	Down
False	Right
→ X	0
↓ Y	3

5 Create the header.
Insert the header “No01:” in LSTAG02.

Property	Value
TargetValue =	LSTAG02
Action	=
Str	Fixed Value
Fixed value (str)	No01:
Next step	Down
→ X	0
↓ Y	4

6 Append the received data to the header.
Append LSTAG01 (the received data) to LSTAG02.

Property	Value
TargetValue =	LSTAG02
Action	+=
Str	LSTAG01
Next step	Down
→ X	0
↓ Y	5

7 Connect to (Open) the link.
This example connects to (opens) Link No “Link-2”.
Execution proceeds to the next step after completing “Open”.

Property	Value
Link No	link-2
Connect	Connect
Action	Wait
Next step	Right
→ X	0
↓ Y	6

8 Write (send) the data to the link.
Write the data in LSTAG02 to Link-2.

Property	Value
Link No	link-2
Tag ID	LSTAG02
Next step	Down
→ X	1
↓ Y	6

9 Close the link.
This example closes Link No “Link-2”.
Execution proceeds to the next step after completing “Close”.

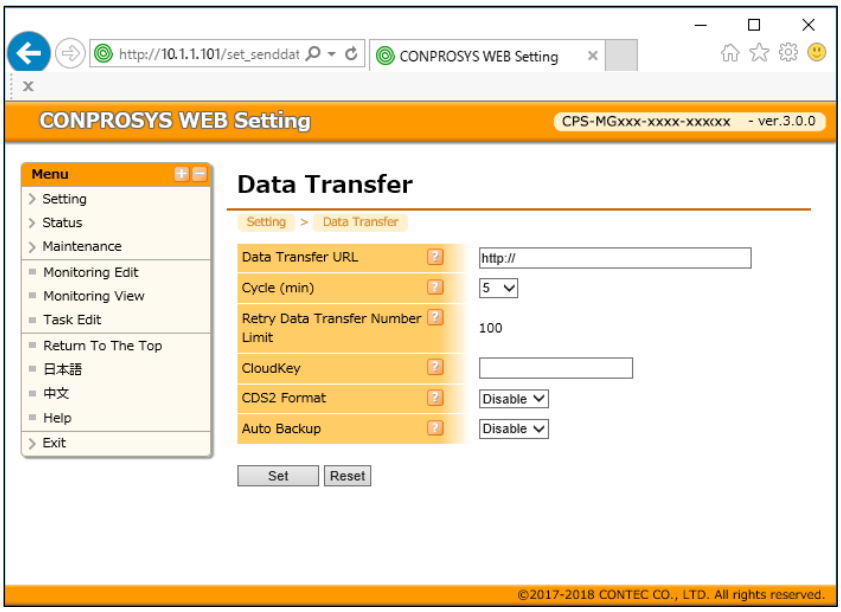
Property	Value
Link No	link-2
Connect	Disconnect
Action	Wait
Next step	Down
→ X	1
↓ Y	7

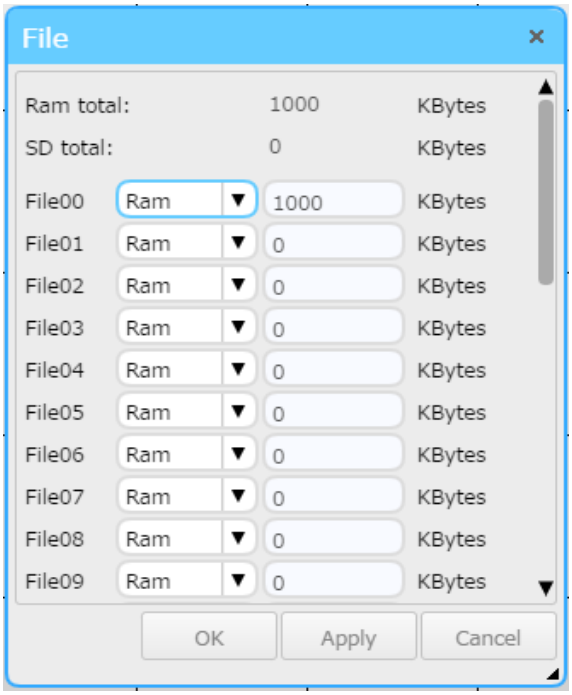
8. Sample (8)

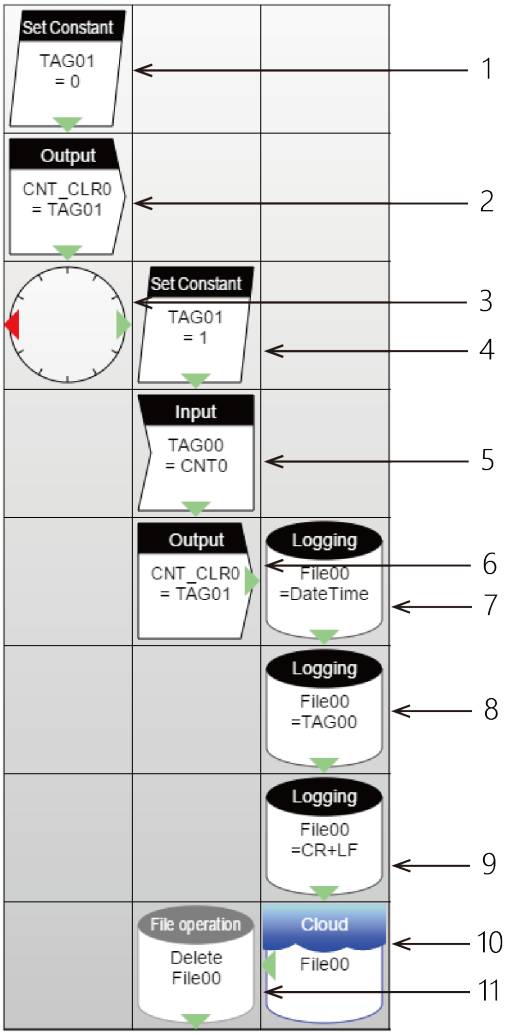
◆ The example is when the value of CNT-0 is saved in a file per minute in RAM and the file is transferred to Web server, then clear to 0.

Data is saved in a file in RAM

This example shows data transfer to Web server.







1 Set value that resets clear-register of CNT-0 to TAG1.

Property	Value
Tag ID	TAG01
Value	0
Next step	Down
→ X	0
↓ Y	0

2 Reset clear-register of CNT-0.

Property	Value
Tag ID	TAG01
Device	CNT_CLR0
Select device from tree	Yes
Next step	Down
→ X	0
↓ Y	1

3 One action per minute.
In the example below, the following actions is conducted at 00 second per minute.

Property	Value
Hour	*
Min	*
Sec	00
Action	one time
True	Right
False	Left
X	0
Y	2

4 The value to be set in TAG1 will be set upon CNT-0 clearing.

Property	Value
Tag ID	TAG01
Value	1
Next step	Down
X	1
Y	2

5 CNT-0 value is read into TAG00.

Property	Value
Tag ID	TAG00
Device	CNT0
Select device from tree	Yes
Next step	Down
X	1
Y	3

6 CNT-0 value is reset to 0.

Property	Value
Tag ID	TAG01
Device	CNT_CLR0
Select device from tree	Yes
Next step	Right
X	1
Y	4

7 Date and Time data are added in File00.

Property	Value
Target file	File00
Value	DateTime
Next step	Down
→ X	2
↓ Y	4

8 CNT-0 data is added in File00.

Property	Value
Target file	File00
Value	TAG00
Next step	Down
→ X	2
↓ Y	5

9 Add a carriage-return to File00.

Property	Value
Target file	File00
Value	CR+LF
Next step	Down
→ X	2
↓ Y	6

10 Send File00 to Web server.

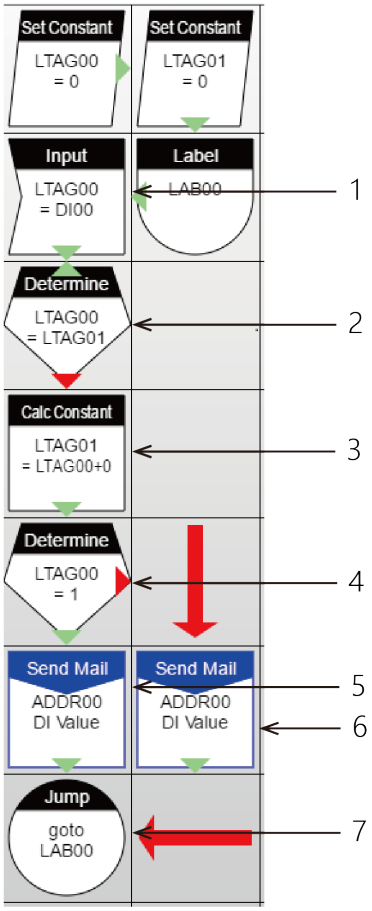
Property	Value
Target file	File00
Next step	Left
→ X	2
↓ Y	7

11 Delete File00.

Property	Value
Operation	Delete
From	File00
Next step	Down
→ X	1
↓ Y	7

9. Sample (9)

◆ Send a mail according to the input when DI00 value has been changed.



1 Enter DI00 value into LTAG00.

Property	Value
Tag ID	LTAG00
Device	DI00
Offset	NONE
Select device from tree	Yes
Next step	Down
→ X	0
↓ Y	1

2 Compare LTAG00 (current DI value) and LTAG01 (previously changed DIvalue). If the current value is changed, go to the step below. If it is the same, go up and get the DI value again.

Property	Value
UsrValue	LTAG00
Condition	=
Limit	LTAG01
True	Up
False	Down
X	0
Y	2

3 Update the LTAG01 (previously changed DI value).

Property	Value
UsrValue	LTAG00
Condition	=
Limit	Fixed Value
Fixed Value	1
True	Down
False	Right
X	0
Y	4

4 Determine the changed DI value. Change the mail contents according to the result.

Property	Value
UsrValue	LTAG00
Condition	=
Limit	Fixed Value
Fixed Value	1
True	Down
False	Right
X	0
Y	4

5 Send mail when DI00 is 1.

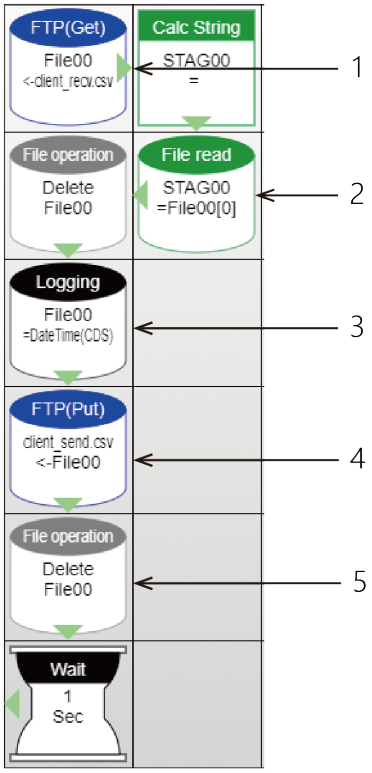
Property	Value
To	ADDR00
CC	NONE
BCC	NONE
Subject	Fixed Value
Fix value (Subject)	DI
Body	Fixed Value
Fix value (Body)	Change to 1
Attached	NONE
Next step	Down
→ X	0
↓ Y	5

6 Send mail when DI00 is 0.

Property	Value
To	ADDR00
CC	NONE
BCC	NONE
Subject	Fixed Value
Fix value (Subject)	DI
Body	Fixed Value
Fix value (Body)	Change to 0
Attached	NONE
Next step	Down
→ X	1
↓ Y	5

10. Sample (10)

◆ Receive a file from and send it back to FTP server.



1 Get client_recv.csv from the server and set it into File00.

Property	Value
Destination file	File00
Target file name	Fixed Value
Fixed Value	client_recv.csv
Next step	Right
→ X	0
↓ Y	0

2 Set the File00 [0] into STAG00.

Property	Value
Target file	File00
Row number	Fixed Value
Fixed Value	0
Read buffer	STAG00
Next step	Left
→ X	1
↓ Y	1

3 Write DateTime (CDS) into File00.

Property	Value
Target file	File00
Value	DateTime(CDS)
Append char	CR+LF
Next step	Down
→ X	0
↓ Y	2

4 Send the File00 as client_send.csv to the server.

Property	Value
Destination file name	Fixed Value
Fixed Value	client_send.csv
Target file	File00
Next step	Down
→ X	0
↓ Y	3

5 Delete the File00.

Property	Value
Operation	Delete
From	File00
Next step	Down
→ X	0
↓ Y	4

11. Sample (11)

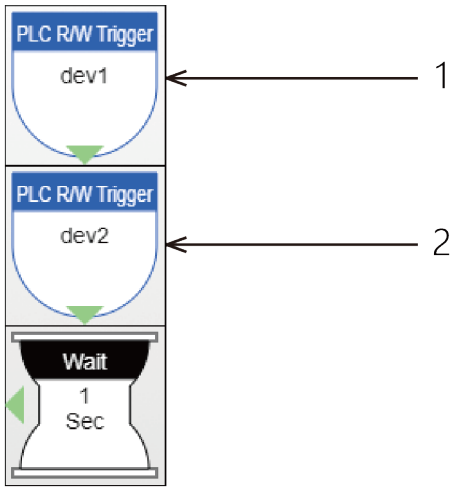
◆ TriggerRead and TriggerWrite for PLC communication

Reading and Writing for PLC can be done by setting a flag of PLC communication trigger.
This checks whether flags are set at scan interval.

In the [Device setting], of CONPROSYS WEB Setting, the device setting can be done as listed below.

Device name	dev1	dev1
Unit name	unit1	unit1
Cpu name	MODBUS	MODBUS
Device type	HoldingRegister	HoldingRegister
Start address	0	0
End address	0	0
Modbus remap address	0	0
Read/Write	TriggerRead	TriggerRead
Scan Interval(msec)	10	10
Data type	unsigned 16bit data	unsigned 16bit data
Cloud key	dev1	dev1
Cloud interval(sec)	60	60

task1



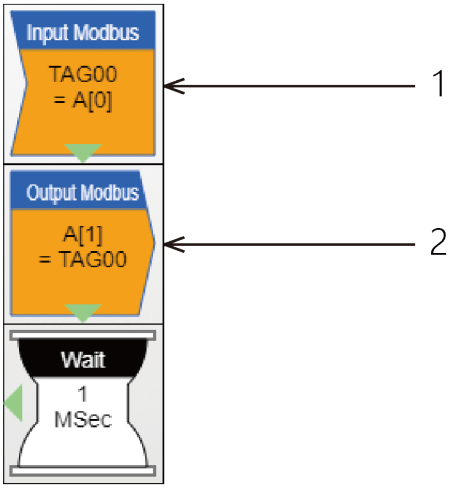
1 Set dev1 flag.

Property	Value
Device to trigger	dev1
Next step	Down
→ X	0
↓ Y	0

2 Set dev2 flag.

Property	Value
Device to trigger	dev2
Next step	Down
X	0
Y	1

task2



1 In TAG00, enter address 0 data of input register (0x2000-).

Property	Value
Tag ID	TAG00
Modbus Address(Dec)	Fixed Value
Fixed value (address)	0
Number of tags	Fixed Value
Fixed value (size)	1
Data format	Unsigned data(16bit)
Next step	Down
X	0
Y	0

2 In address 1 of input register (0x2000-), enter TAG00 value.

Property	Value
Modbus Address(Dec)	Fixed Value
Fixed value (address)	1
Number of tags	Fixed Value
Fixed value (size)	1
Tag ID	TAG00
Data format	Unsigned data(16bit)
Next step	Down
→ X	0
↓ Y	1

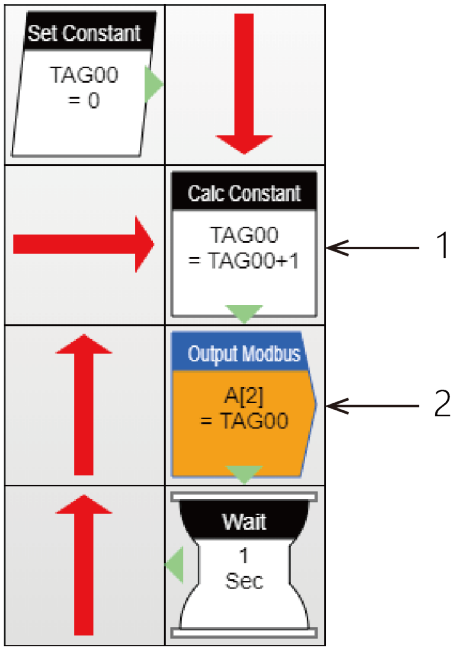
12. Sample (12)

◆ EventWrite for PLC communication

In the DEVICE config (detail) of the device setting, when EventWrite is chosen from Read/Write, write data in Modbus address to set the flag to be on. If the flag is already on, write data of Modbus address for PLC.

In the [Device setting] of the [Maintenance menu], the device setting is supposed to be done as listed below.

Device name	dev1
Unit name	unit1
Cpu name	MODBUS
Device type	HoldingRegister ▼
Start address	2
End address	2
Modbus remap address	2
Read/Write	EventWrite ▼
Scan Interval(msec)	10
Data type	unsigned 16bit data ▼
Cloud key	dev1
Cloud interval(sec)	60



1 Add 1 in TAG00.

Property	Value
TargetValue=	TAG00
Value	TAG00
(+-*/%)	+
Constant	1
Next step	Down
X	1
Y	1

2 Enter TAG00 in Modbus address (2).

Property	Value
Modbus Address(Dec)	Fixed Value
Fixed value (address)	2
Number of tags	Fixed Value
Fixed value (size)	1
Tag ID	TAG00
Data format	Unsigned data(16bit)
Next step	Down
X	1
Y	2

Monitoring Edit

This section describes the CONPROSYS HMI (Human Machine Interface), with which you can create a monitoring screen through a web browser and check the operations, errors, or standstill in the facilities.

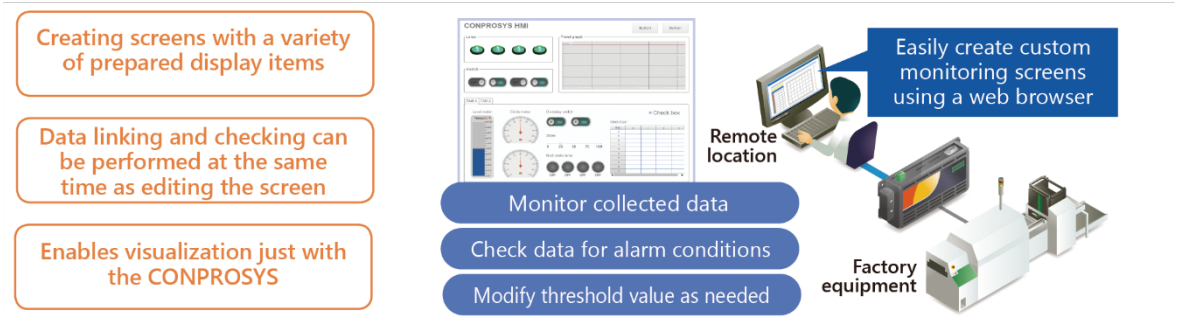
1.CONPROSYS HMI Outline

1. What You Can Do With CONPROSYS HMI

Place the supplied controls on the page and create a monitoring screen. Input signal status can be monitored on the screen. The screen can be created through a Web browser.

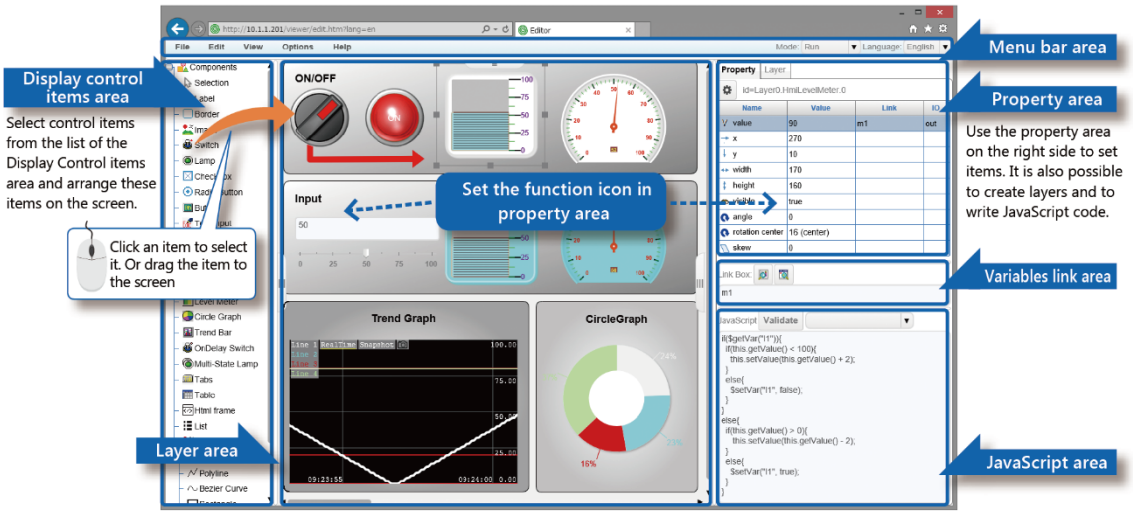
Neither the knowledge of language programming nor the special development environment is necessary. Just drag and drop a number of controls on the page to create the screen.

Control settings or linking data with a sensor can be done on the property screen.



Device setting, data saving, and script debugging are completed with a Web browser

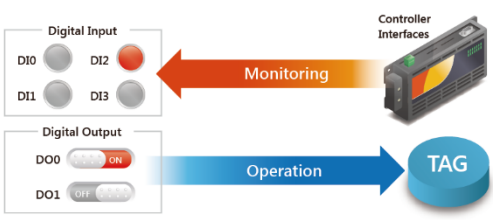
Support multiple platforms (Windows, Android)



The screen above is the image when creating the monitoring screen.
The factory default setting is a white background.

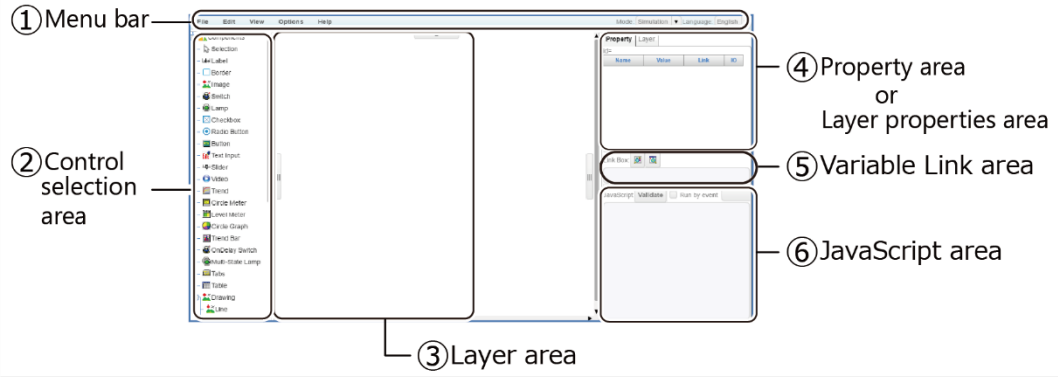
Data linking with CONPROSYS VTC

It is possible to use internal variables (TAGs) to link with CONPROSYS VTC. This makes it possible to display the results of processing with VTC and to apply the HMI operations to VTC flow control.



2. HMI Editor Work Areas

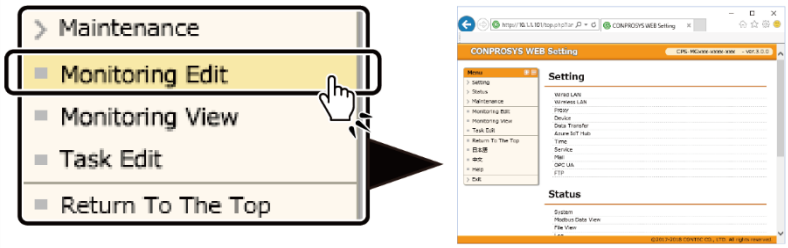
HMI Editor has the following work areas.



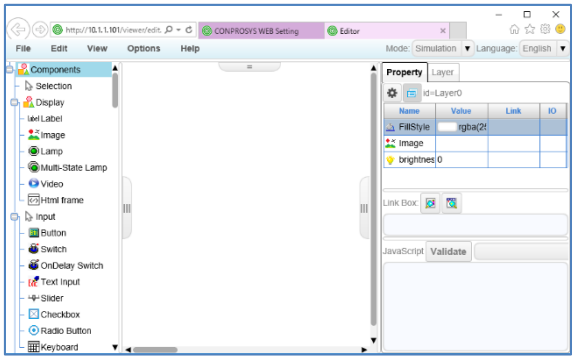
No.	Name	Function
1	Menu bar	The menu bar is used to execute commands with menu buttons.
2	Control selection area	Select the controls to place on the layer area.
3	Layer area	This area is where the page is designed.
4	Properties area	Modify the property variables of controls on this area.
	Layer properties area	Add or delete layers, and modify layer properties on this area.
5	Variable Link area	This area is for linking control properties and variables.
6	JavaScript area	This area is used to configure the behavior of JavaScript for controls.

3. Create a Monitoring Screen

From the CONPROSYS WEB Setting, click the [Monitoring edit].



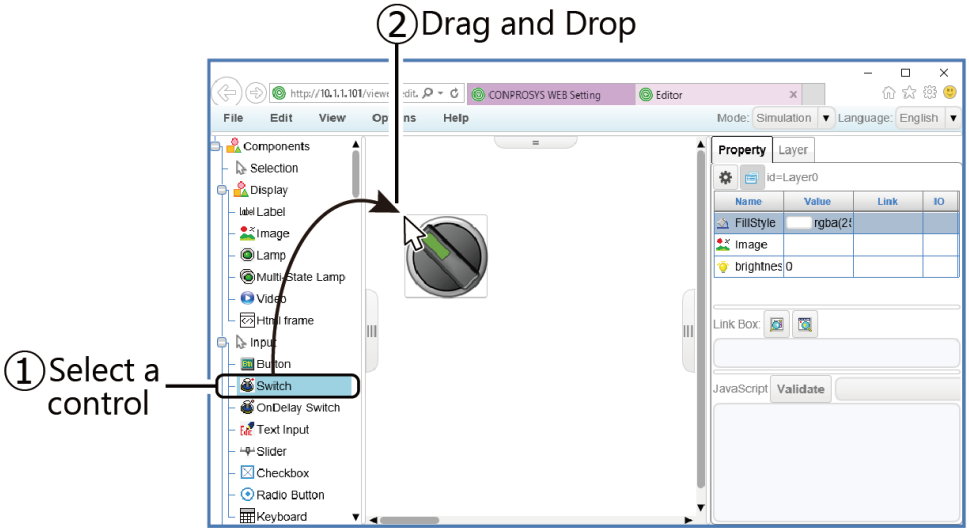
CONPROSYS HMI starts up and you can create the monitoring screen.



4. Basic Procedure for Creating a Monitoring Screen

◆ Place a Control

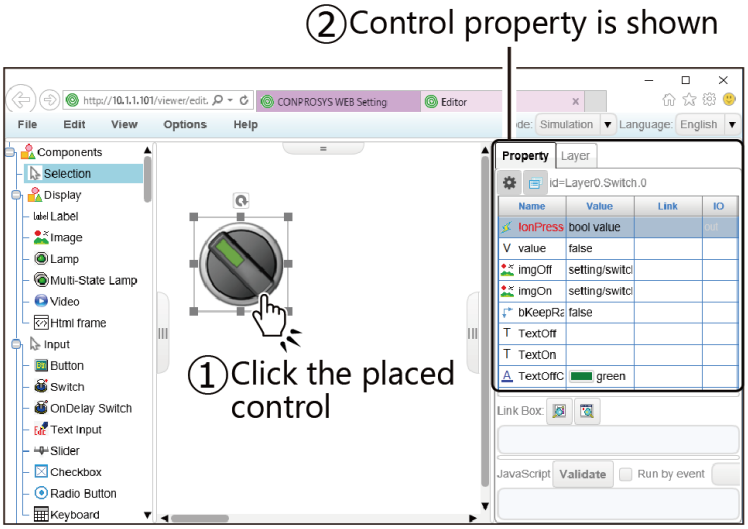
(1) Select a control from the Components tree displayed on the left. (2) Drag and drop it on the Layer area.



◆ Configure the Properties of Controls

(1)Click the placed control. (2)The property of the control is shown in the “Property” on the right side of the screen.

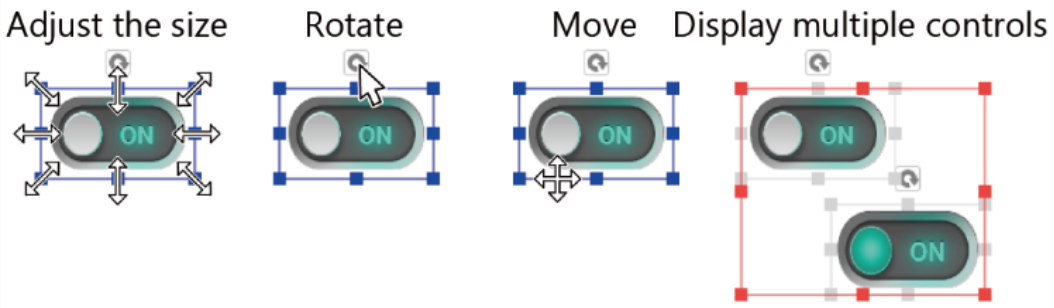
The properties area allows you to change the values, set the data to link with I/O devices or other controls.



◆ Align the Position or Adjust the Size of Controls

Click the placed control to activate. Drag the border to change the position, adjust the size or the angle.

Controls can be selected together and changed or adjusted simultaneously.



◆ Copy and Delete Controls

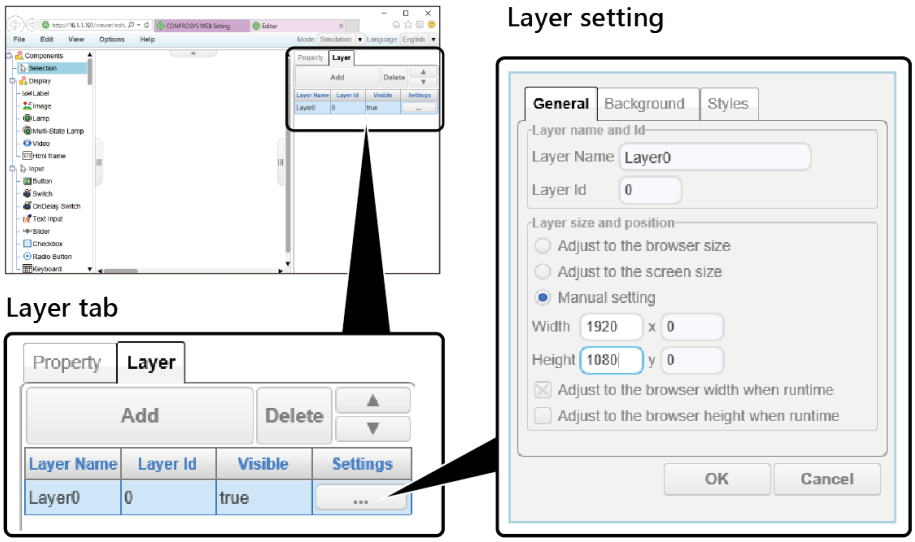
Right-click the activated control to show the editing menu. In this menu, such as coping or deleting controls can be performed.

◆ Configure the Layer

Select “Layer” tab at the upper right on the screen to open the layer properties.

In the “Settings” of the layer properties area, click the [...] button to open the dialog box.

You can set a size of monitoring screen or the background here.

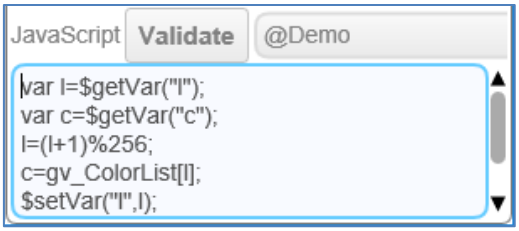


◆ JavaScript

You can enter code using JavaScript as necessary.

If a particular control logic is needed to run the system, code the behaviors of the system using JavaScript in “JavaScript” area.

Refer to “**Online Help**” for usable JavaScript functions for each control.

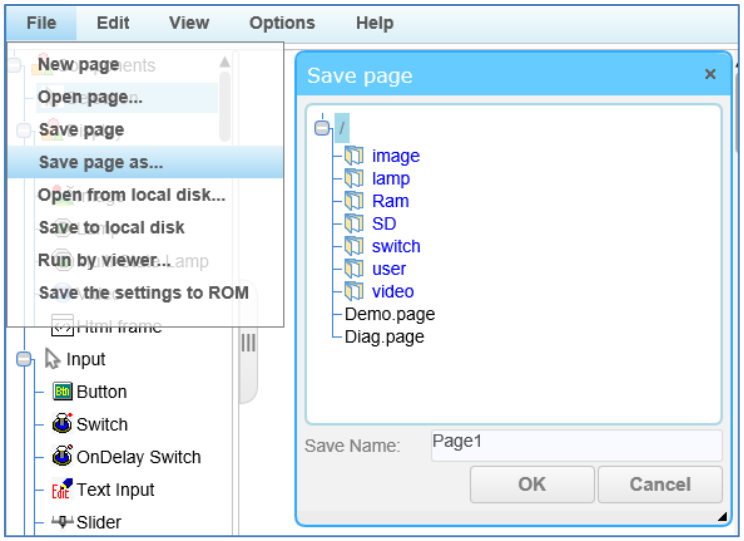


◆ Save the Settings to ROM.

After creating the monitoring screen, save the file with a new name.

After saving, perform “Save to ROM” in [File] before shutting down the power.

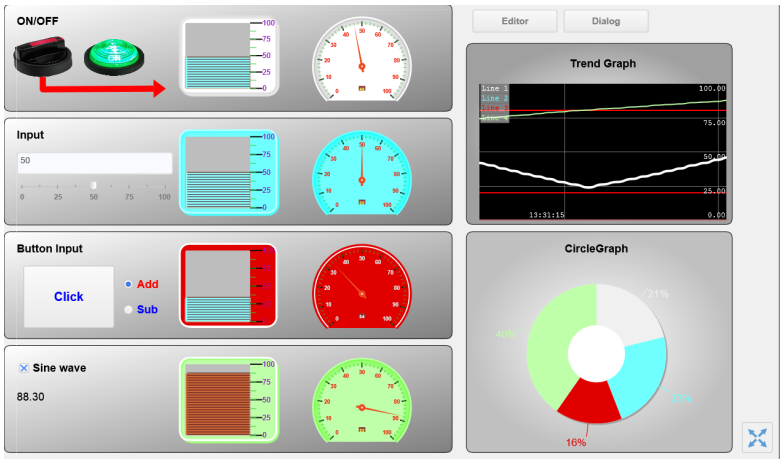
* If you do not save the settings to ROM, the contents return to those before setting upon rebooting or shutting down.



◆ Display the Created Screens

From WEB menu, click the “Monitoring view” in “Status menu” and the monitoring screen appears.

The page that is saved in “user/Page1.page” on the monitor can be viewed.



*When viewing the screen with a specific name, specify the URL listed below through a browser.

http://<IP address>**:**<port number>**/viewer/view.htm?pagepath=**<page file path>**&lang=** <language>

<Page file path>: Specify a name of the page. An example: /user/Page1.page

<Language>: Specify the language to view. An example: jp indicates Japanese. Specifying the language can be omitted.

2.Summary of Available Controls

CONPROSYS HMI provides the following controls.

Control	Name	Description
	Label	This control displays a string.
	Border	This control is a border with a title.
	Image	This control displays an image.
	Switch	This control is a switch that can output an ON/OFF status.
	Lamp	This control is a lamp that can display an ON/OFF status.
	Checkbox	This control is a checkbox that can output an ON/OFF status and display a string.
	Radio Button	This control is a radio button to select a single condition from multiple conditions.
	Button	This control is a clickable button that displays a text string.
	Text Input	This control is used to input and display text.
	Slider	This control is used to output data with a slider.
	Video	This control is used to play videos.
	Trend	This control is used to display chronological data as a graph.
	Circle Meter	This control is used to display data as a circle meter.
	Level Meter	This control is used to display data as a level meter.
	Circle Graph	This control is used to display data as a circle graph.
	Trend Bar	This control is used to display data as trend lines or bars.
	OnDelay Switch	This control is a switch that can output an ON/OFF status after being pressed in specified seconds.
	Multi-State Lamp	This control is a lamp that can display multiple differing status values.
	Timer	This control is used to keep counting between the maximum value and the minimum value periodically.
	Calendar	This control is used to display and set the date.
	Clock	This control is used to display the current time.
	Drop-down List	This control is used to display the value in drop-down list format.
	Keyboard	This control is used to display and inputs the value in software keyboard format.
	Number to Color	This control is used to convert a number to a color string.
	Number to Bits	This control is used to convert numbers and binary values.
	Tabs	This control is used to create multiple tabs that can be displayed by switching.
	Table	This control is used to display data in table format.
	Html frame	This control is used to display another Html document in the frame.
	List	This control is used to display data by a list.

Control	Name	Description
	Line	This control is used to draw a line on the page.
	Polyline	This control is used to draw a polyline on the page.
	Bezier Curve	This control is used to draw a Bezier curve on the page.
	Rectangle	This control is used to draw a rectangle on the page.
	Round Rectangle	This control is used to draw a rounded rectangle on the page.
	Polygon	This control is used to draw a polygon on the page.
	Ellipse	This control is used to draw a circle or ellipse on the page.
	Pipe	This control is used to draw a pipe-style continuous line on the page.

Refer to "**Online Help**" for the details of CONPROSYS HMI operation and functions.

Online Help https://doc.conprosys.com/help/hmi/V1/en/

3.Internal Variables Specification

The internal variables that can be used for CONPROSYS HMI are listed below.

Variable name	Type	Access	Data range	Description
TAG00~TAG499	Value	read/write	1.7E +/- 308 significant figures: 15	It is the range for keep values. When TAG value is obtained in HMI, it is rounded off by the 4th decimal place.
STAG00~ STAG499	String	read/write	2048 byte	It is the range for keep strings. The character code is UTF8.
DI00~DI03	Device	read	0 - 1	The value of digital input 0 - 3 bits.
DO00~DO01	Device	read/write	0 - 1	The value of digital output 0 – 1 bits.
AI0~AI1	Device	read	0 - 4095	The value of analog input 0 - 1 channels (LSB)
CNT0~CNT1	Device	read	0 - 16777215	The value of counter 0 - 1 channels.
CNT_CLR0~ CNT_CLR1	Device	read/write	0 - 1	The clear flag of counter 0 - 1 channels.
MODBUS0~ MODBUS10239	MODBUS	read/write	0 - 65535	The value of MODBUS Remap address 0 -10239
ProductName *1	FANUC_CNC	read	Rely on a DPRNT content prescribed in the CNC program.	The name of the parts processed by machine.
ProductResultNumber *1	FANUC_CNC	read	Rely on a DPRNT content prescribed in the CNC program.	The total number of parts processed by machine.
value01~ value10 *1	FANUC_CNC	read	Rely on a DPRNT content prescribed in the CNC program.	These nodes can store value data in any type (10).
String01~ string10 *1	FANUC_CNC	read	Rely on a DPRNT content prescribed in the CNC program.	These nodes can store string data in any type (10).
PrintOutput *1	FANUC_CNC	read	Rely on a DPRNT content prescribed in the CNC program.	Store several string data of the DPRNT contents with commas (,).

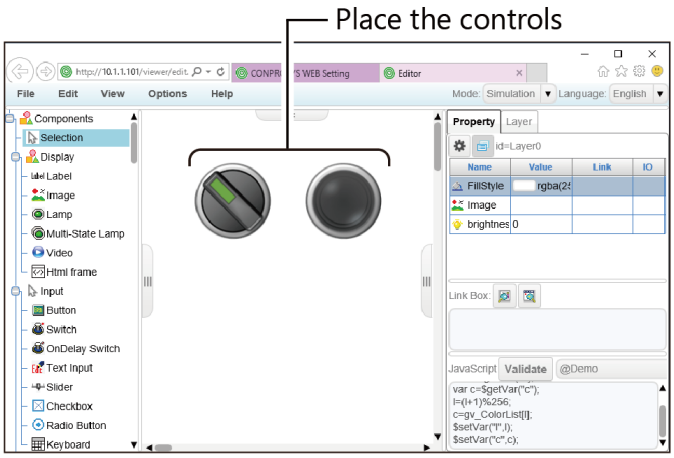
*1 Only available with the product MTConnect controller.

4.Sample

1. Sample of Input / Output Monitoring Screen.

This section describes how to create an example screen of “Display digital input status” and “Display and Control digital output status”.

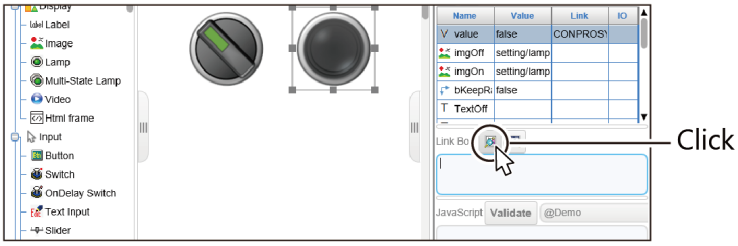
1 From the control tree, drag the switch and the lamp, then drop them onto the layer area.



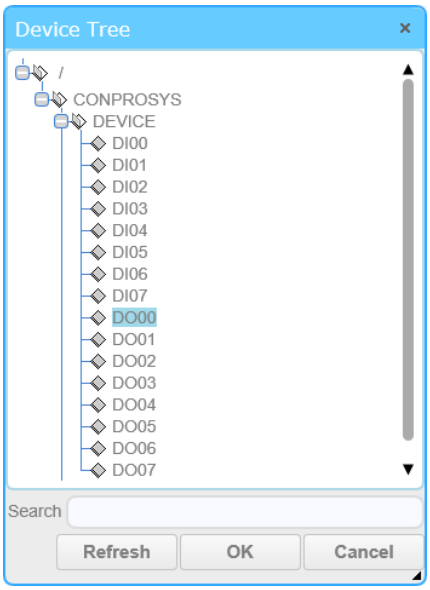
2 To digital output, link the switch with device “DO00”.

- Click the switch to activate and then select the line of “!onPressed” from the property.

- Click the left button of [Link] to show the “Device Tree” window.



- The list of usable devices are displayed. Simply selecting the device from the list can link data. Choose “DO00” from the Device Tree and click the [OK].

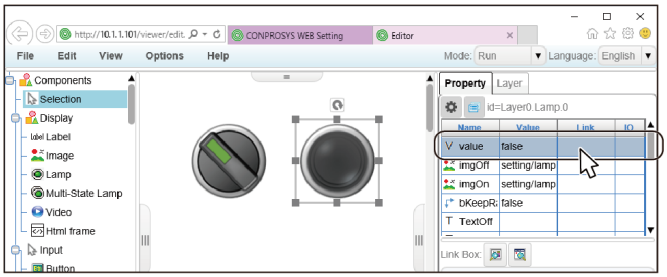


3 Select [Run] in the [Mode:] at the right side of the Menu, input/output with the device and link with the processing task begin.
With the [Simulation] remained selected, input/output with the device or link with proceeding task will not be applied. This only links the controls.

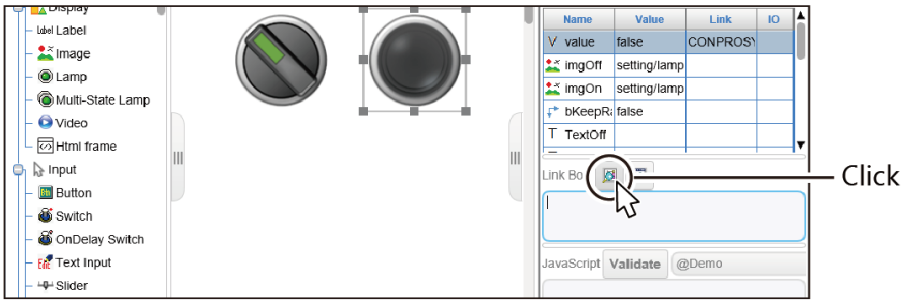
Above completes the setting. Output condition of DO00 is switched in accordance with the “value” of the switch by clicking the switch.

4 To digital input, link the lamp with the device “DIO00” by following the procedure described in the digital output.

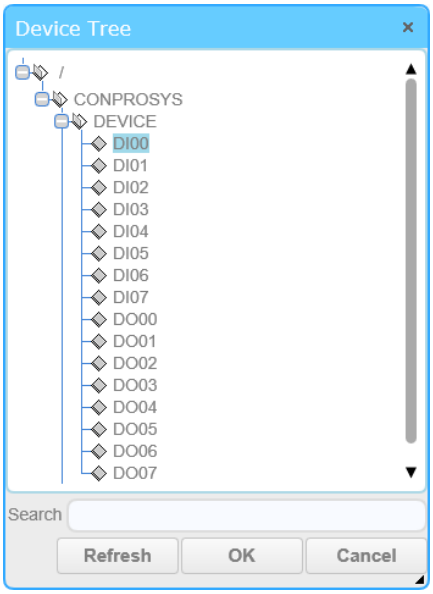
- Click the lamp to activate and then select the line of “value” from the property.



- Click the left button at [Link] to show the “Device Tree” window.



- Choose “DI00” from the Device Tree and click the [OK].



Input status of DI00 are displayed to the lamp.

This condition is updated regularly.　You can change the updating cycle in [Options] menu.

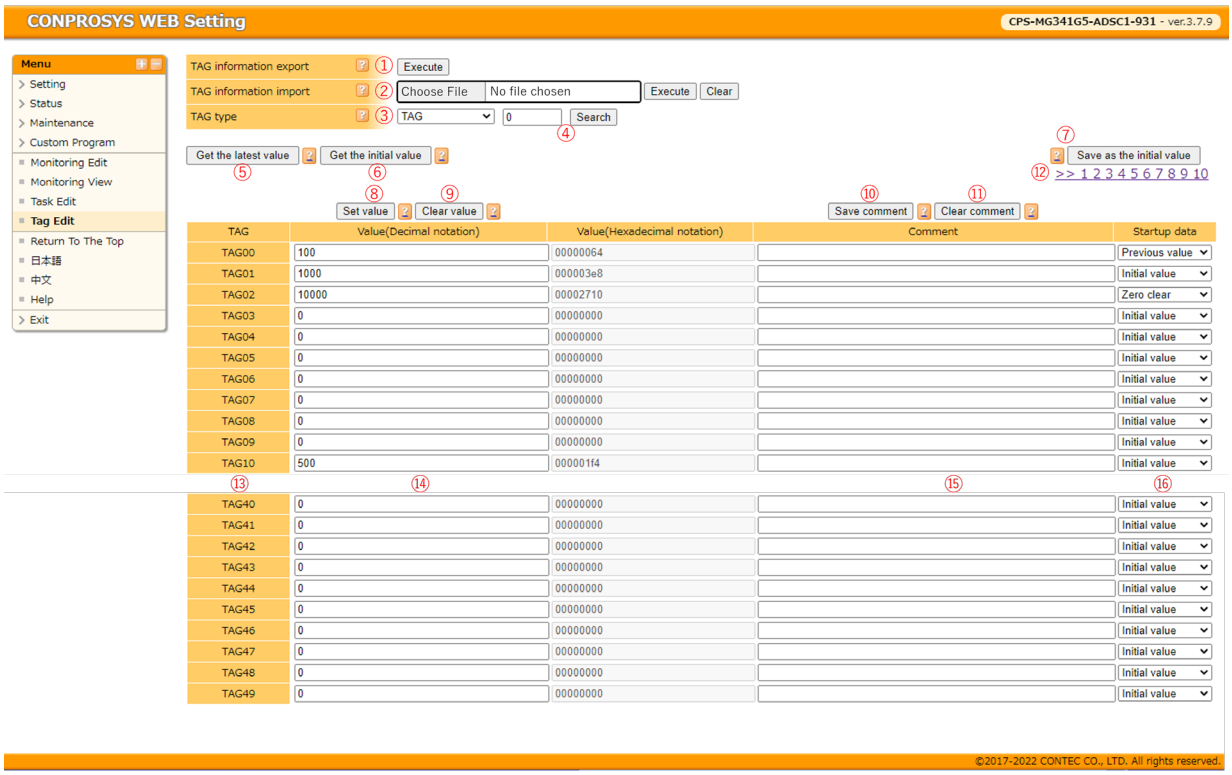
Tag Edit

This section describes Tag Edit page.　With this function, monitoring TAG/STAG/LTAG/LSTAG, editing their initial values, and TAG import/export in CSV format file can be executed.

1.Overview of Tag Edit

1. Tag Edit Page

◆ Edit Page <TAG, LTAG>



No.	Name	Function
1	TAG export	This outputs TAG value, comment, and display format on the displayed page in csv format, then download to the local host.
2	TAG import	Click the “choose file” button and select a csv file to import.
3	TAG type	Select TAG type to be displayed. The page is displayed in accordance with the selected TAG type as the type changes.
4	Search	Enter a tag number and click the “Search” button. This displays the specified number as the starting TAG on the page.
5	Get latest value	This gets the latest value of the selected TAG type and changes it in the specified display format and updates the Value column.
6	Get initial value	This displays the initial value according to the selected TAG type. When the value is not set, or the value does not exist, “0” for TAG/LTAG and “null character” for STAG/LSTAG will be displayed respectively.
7	Save as initial value	This saves data displayed on the “Value” and the “Comment” columns as initial values of TAG. The specified display format is also saved and decided to be the default display format for “Get initial value, Switch TAG types, Switch pages, and TAG Search”.

No.	Name	Function
8	Set value	This sets the contents displayed in the “Value” column as the present value (the latest value) of TAG.
9	Clear value	This clears all the contents displayed in the “Value” column. The value after clearing becomes 0.
10	Save comment	This saves the contents displayed in the “Comment” column.
11	Clear comment	This clears all the contents displayed in the “Comment” column.
12	Switch page	Press the “>>” to switch the present 50 tags to the next 50 tags.
13	The number of display TAGs	50 tags can be viewed at one time.
14	Value	According to the display format, values can be entered by text-inputting. *1
15	Comment	Comments can be entered by text-inputting. (Up to 20 characters can be entered) The edited comments will be displayed in HMI tree when TAG of VTC is selected.
16	Startup data *2	From the following options, select the value to set to TAG on startup. Initial value： The value saved as the initial value of TAG will be used. Previous value： The value from the last time operation stopped will be restored and used. *3 Zero clear： The value will be set to 0. The startup data settings are saved when the “Save as initial value” or “Save comment” button is clicked.

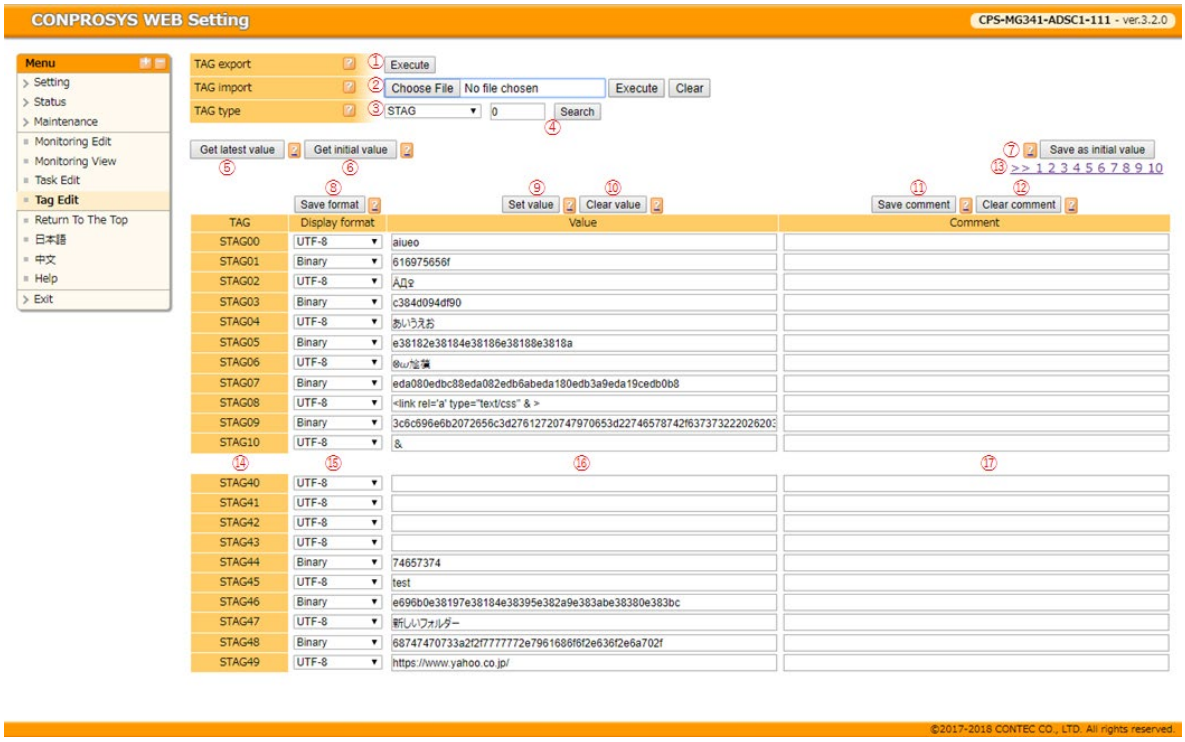
*1

TAG type	Display format	Input range	Available characters
TAG or LTAG	Decimal	1.7e±308 The number of significant figures is 15. However, the fourth decimal place and below are rounded off, and the value actually reflected to TAG is up to the third decimal place.	0-9, ., +, −, e, E
	Hexadecimal	0- FFFFFFFF In integer notation, use FFFFFFFF for those exceeding the above range.	0-9, A-F, a-f However, it is unable to edit directly.

*2 This function only available with CPS-MG341G5-ADSC1-931.

*3 The previous value is backed up for 10 seconds, and the last value backed up is restored.

◆ Edit Page <STAG, LSTAG>



No.	Name	Function
1	TAG export	This outputs TAG value, comment, and display format on the displayed page in csv format, then download to the local host.
2	TAG import	Click the “choose file” button and select a csv file to import.
3	TAG type	Select TAG type to be displayed. The page will be displayed in accordance with the selected TAG type as the type changes.
4	Search	Enter a tag number and click the “Search” button. This displays the specified number as the starting TAG on the page.
5	Get latest value	This gets the latest value of the selected TAG type and changes it in the specified display format and updates the Value column.
6	Get initial value	This displays the initial value according to the selected TAG type. When the value is not set, or the value does not exist, “0” for TAG/LTAG and “null character” for STAG/LSTAG will be displayed respectively.
7	Save as initial value	This saves data displayed on the “Value” and the “Comment” columns as initial values of TAG. The specified display format is also saved and decided to be the default display format for “Get initial value, Switch TAG types, Switch pages, and TAG Search”.
8	Save format	Click the button to save the selected display format. The format saved in this function is decided to be the default display format for “Get initial value, Switch TAG types, Switch pages, and TAG Search”. When the display format is changed and the TAG has the initial value settings, it is converted and saved according to the selected display format.
9	Set value	This sets the contents displayed in the “Value” column as the present value (the latest value) of TAG.

No.	Name	Function
10	Clear value	This clears all the contents displayed in the “Value” column. The value after clearing becomes 0.
11	Save comment	This saves the contents displayed in the “Comment” column.
12	Clear comment	This clears all the contents displayed in the “Comment” column.
13	Switch page	Press the “>>” to switch the present 50 tags to the next 50 tags.
14	The number of display TAGs	50 tags can be viewed at one time.
15	Display format	Select a data display format of TAG. The selectable formats are UTF-8 or Binary.
16	Value	Values can be entered by text-inputting according to the display format. *1
17	Comment	Comments can be entered by text-inputting. (Up to 20 characters can be entered) The edited comments will be displayed in HMI tree when TAG of VTC is selected.

*1

TAG type	Display format	Input range	Available characters
STAG or LSTAG	UTF-8	Up to 2048 bytes	No restriction
	Binary	Up to 2048 bytes (Little Endian)	0-9, A-F, a-f, Space

2. TAG Export/Import

The details of TAG export and import are described here.

◆ TAG Export

This outputs TAG value, comment, and display format on the displayed page in csv format (characters, terminal symbol : crlf with utf-8-bom) then download to the local host.

The name of the file to be exported is formatted in “yyyymmddhhss_TAG number_setting.csv”.

An example)201903261520_STAG00_49_setting.csv / 201903261520_LTAG50_99_TASK10_setting.csv”

◆ TAG Import

Click the “choose file” button and select a csv file to import. The name of the file is arbitrary.
After selecting the file, click the “Execute” button to start importing.
After selecting the file, click the “Clear” button to clear the selected state of the import file.
Note that the followings are checked before executing import. The causing factors will be displayed if importing is determined to be unable to execute.

- Adequacy of the import data (whether it contains wrong format)
- Parallel run check (whether the import is already in progress)

Import reads the uploaded file (csv) and reflects each value in the following.

- The TAG value is written to the value of each TAG stored in the shared memory (interpretation of the value upon writing conforms to the display format in csv).
- Write comments to the comment area saved in temporary settings
- Write display formats to the display format saved in temporary settings

◆ CSV File Format

Example1) Exporting when displaying TAG00-49 (on the first page)

-Text Editor

```
----------------------------
TagName,DispFormat,Value,Comment
TAG00,,255,"""TAG00コメント"""
TAG01,,1024,"""TAG01こめんと"""
～
TAG49,,-10,"""comment"""
----------------------------
```

-Excel

TagName	DispFormat	Value	Comment
TAG00		255	"TAG00 comment"
TAG01		1024	"TAG01 comment"
~			
TAG49		-10	"comment"

Name	Description
TagName	TAG name.　Set TAG name to set data. (Formats are TAG*/STAG*/LTAG*-TASK*/LSTAG*-TASK*)
DispFormat	Display format (UTF-8/Binary).　Use this to interpret string data. Use STAG/LSTAG only.　Set 0 for UTF-8, and 1 for Binary. Set "null character" for TAG/LTAG. (See Example 1)
Value	TAG value.　Set a setting value for TAG. As for a string (including Binary data), enclose it with double quotation marks.
Comment	Set a setting comment for TAG.　Set a setting comment for TAG. Enclose it with double quotation marks.

Example 2) Exporting when displaying LSTAG50-99-TASK10 (on the second page)

```
----------------------------
TagName,DispFormat,Value,Comment
LSTAG50-TASK10,0,"""あいうえお""","""テストコメント"""
LSTAG51-TASK10,1,"""e38182e38184e38186e38188e3818a""","""Binary保存テスト"""
～
LSTAG99-TASK10,0,"""⊗𠮟""","""4byte文字てすと"""
----------------------------
```

Example 3) Importing such data as the following can be executed. (missing or mixed in a random order))

```
----------------------------
STAG400,0,"""インポートテスト""",
TAG45,,1.14,"""こめんと"""
TAG03,,-1,"""ff"""
LSTAG80-TASK19,1,"""616975656f""","""aiueo"""
----------------------------
```

Example 4) Importing including such data as following cannot be executed.

```
----------------------------
STAG400,,"""インポートテスト"""          // Display format is unspecified for STAG/LSTAG
TAG45,0,1.14,"""こめんと"""              // Display format is specified for TAG/LTAG
TAG03,,"""文字列""",                     // String is used instead of value for TAG/LTAG
LSTAG100-TASK19,1,"""616975656f""","""aiueo"""   // Non-existent TAG name or TASK number
LTAG01-TASK00,                           // Elements are missing
----------------------------
```

⚠ CAUTION

- TAG initial value settings
  The contents of the initial settings are executed when starting the CONPROSYS. Therefore, the more contents in the settings, the longer the start-up time may take.
- TAG import
  In order to properly recognize the character code, CSV files must have UTF-8 BOM. When editing on Windows Excel, it is necessary to save as “CSV UTF-8 (separate with a comma)” as shown in the following figure.
- Importing cannot be executed with a CSV file saved directly.
- The format of CSV to import
  Data should be entered in order as follows;
  “TAG name, Display format, TAG value, Comment”
  Importing fails when the order is wrong or data is insufficient.
  Note that the line “TagName DispFormat Value Comment” given to the starting of the exported data is an explanatory line that indicates the order of data entry, therefore it is not a problem if the line does not appear at the time of importing.
  The TAG name should be a configurable TAG.

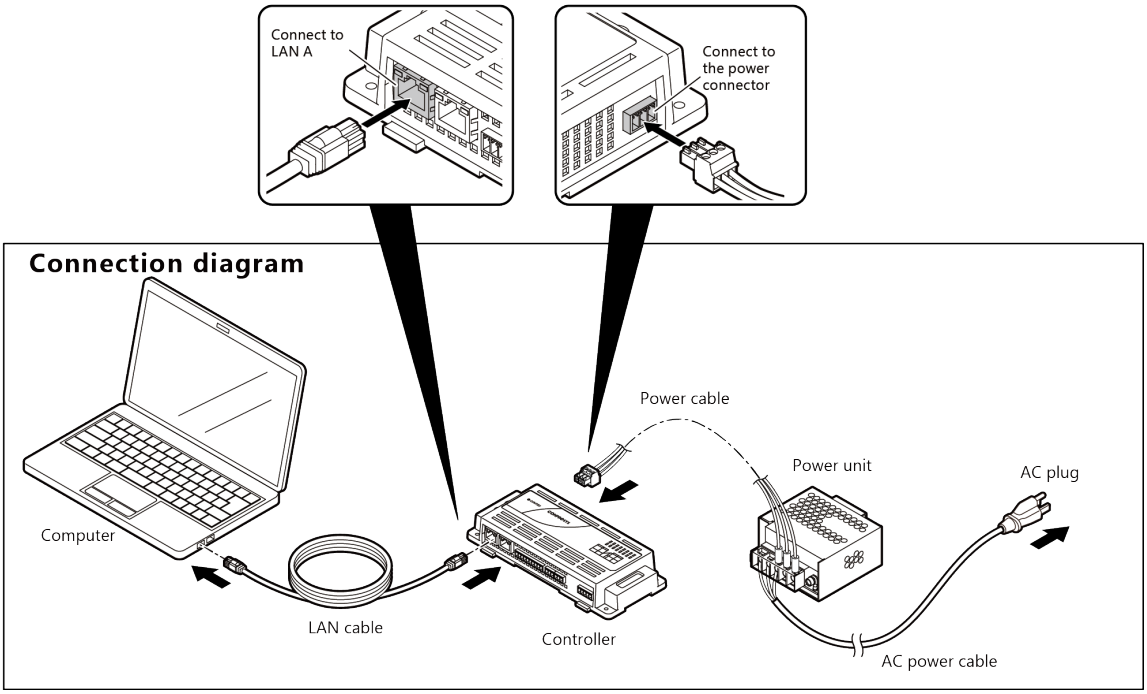
  The followings are considered as the cause of failure
  - TAG or TASK number exceeds the limitation
  - String is used instead of TAG value for TAG/LTAG
  - Elements such as “TAG name, Display format, TAG value, or Comment” are missing
  - Elements other than “TAG name, Display format, TAG value, or Comment” are set
  - Other than “0” and “1” are set in display format for STAG / LSTAG
  - No data in CSV that can be imported (including CSV with an explanation line only)

Collecting Information From PLC

This section describes the settings to collect data from PLC.

1.Display System Setting Page

1 Connect the LAN port of host computer and LAN A port of the product with LAN cable.
*Use the LAN A port to connect the controller.



2 Power on the product.

3 Change the network settings of a host computer.
If you have not changed the IP address and subnet mask of LAN A port in this product from the factory default settings, set the host computer IP address to, for example, "10.1.1.200".
Set subnet mask to "255.0.0.0".

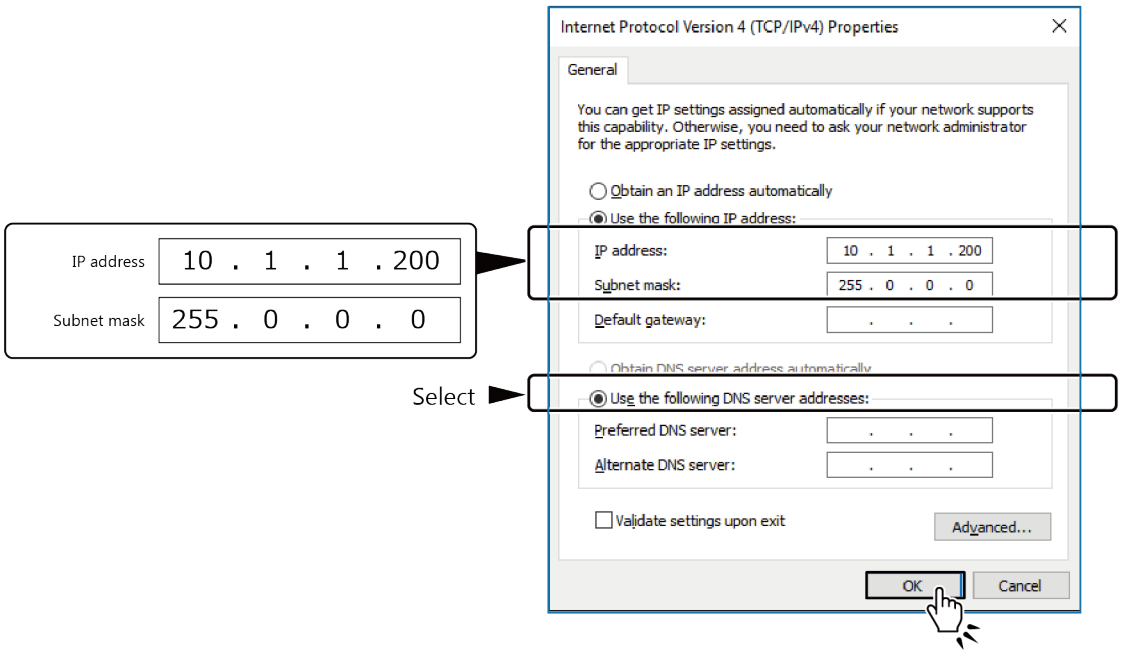
* IP address of LAN A port in this product is set to "10.1.1.101", and the subnet mask is set to "255.0.0.0" as the factory default.

IP address of LAN B port in this product is set to "192.168.1.101", and the subnet mask is set to "255.255.255.0" as the factory default.

If you already changed them from the factory default, set the network settings of the computer in accordance with the changed IP address and subnet mask.

* IP address of the PLC controller must be unique that is not used by any other devices on your network. The IP address can be set through web browser.

* Refer to "**Set the Computer Network (page 22)**" for details.



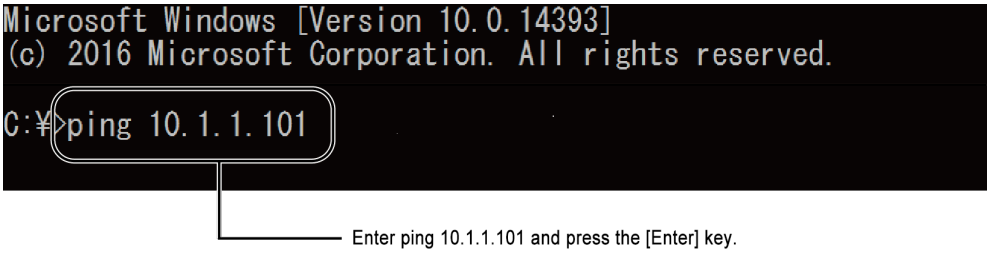
4 Use the ping command from the host computer and confirm that connection between the controller and computer is active.

Open Command Prompt and ping the IP address “10.1.1.101”.

Format

ping IP address of the product

The server unit should respond if it is operating.

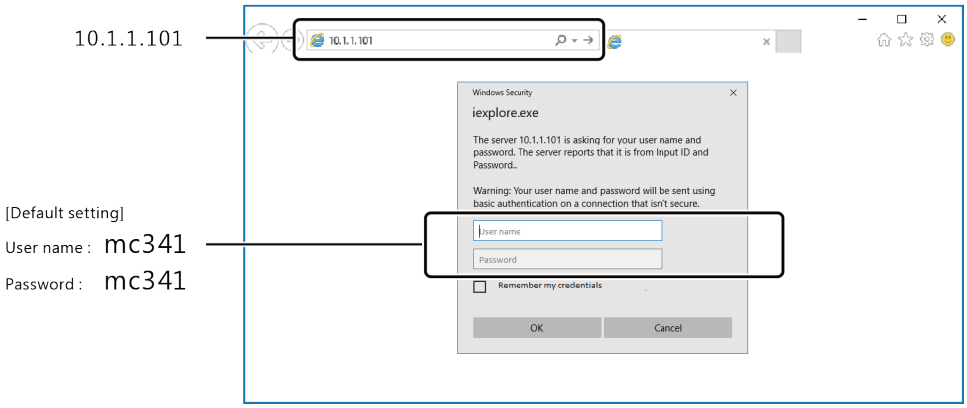


5 Start the Web browser on your computer that is connected with the controller. Enter IP address (http://10.1.1.101/) of the controller in in the address bar.

* Access can also be done with “https://10.1.1.101/”.

If the security certificate appears on the screen, choose the “Continue to this website”.

6 Enter user name: “mc341” and password: “mc341” in the dialog box to log in.



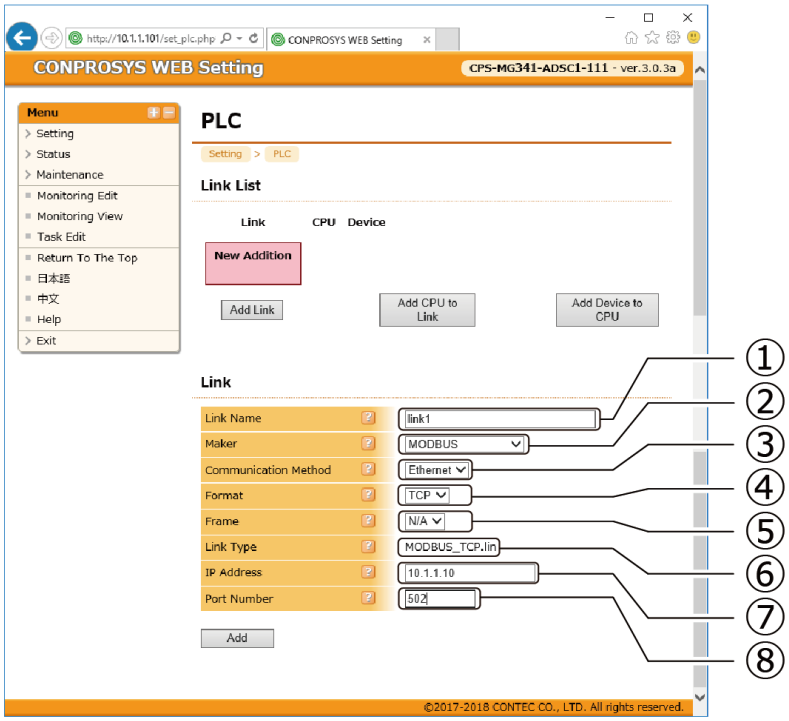
* After entering IP address and pressing [Enter] key, the “Security certificate” might appear on the screen. Choose the “Continue to this website”.

2.PLC Link Configuration

Set connection method to link PLC and the product.

1 From the [PLC] in CONPROSYS WEB setting displayed in [**PLC (Link config) (P92)**], click the [Add Link] to open the [Link] setting page in the bottom.

2 Enter setting items 1-8 listed below.



Settings

No.	Setting	Description
1	Link Name	An arbitrary name for PLC and the product connection. 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen. The name cannot be set with only numbers. (e.g.: Link1)
2	Maker	Select a maker name of PLC from the list
3	Communication Method	Select Ethernet or Serial in accordance with the used PLC.
4	Format	Select a format from the list in accordance with the used PLC.
5	Frame	Select a frame from the list in accordance with the used PLC.
6	Link Type	The link types correspond to selected maker name, communication method, format and frame are allocated automatically and the file name is displayed.
7	IP Address	[Ethernet connection] Enter IP address of PLC. (e.g.: 10.1.1.102)
8	Port Number	[Ethernet connection] Enter the port number of PLC. (e.g.: 8080)

3 Displayed contents differ depending on the communication method. Enter items such as communication method and click the “Add” button.

Settings (Configurable contents differ depending on the communication method)

No.	Setting	Description
Ethernet connection	IP address	Enter IP address of PLC. e.g.: 10.1.1.102
	Port Number	Enter the port number of PLC. e.g.: 8080
Serial communication (RS232C/RS-485)	Serial Port	Select a communication method of Serial port in CONPROSYS from a pull-down menu. RS-485 communication (1 port) :/dev/com00 RS-485 communication (2 port) :/dev/com02 RS-232C communication :/dev/com01
	Baud Rate	Set baud rate in your actual environment.
	Data Bits	Set data bits in your actual environment.
	Stop Bits	Set stop bits in your actual environment.
	Parity	Set parity in your actual environment.
	Sum Check	Set Enabled or Disabled of sum check.

3.PLC CPU Configuration

Register with CPU name (name for the CPU of PLC connected) for connecting the link configured PLC and this product

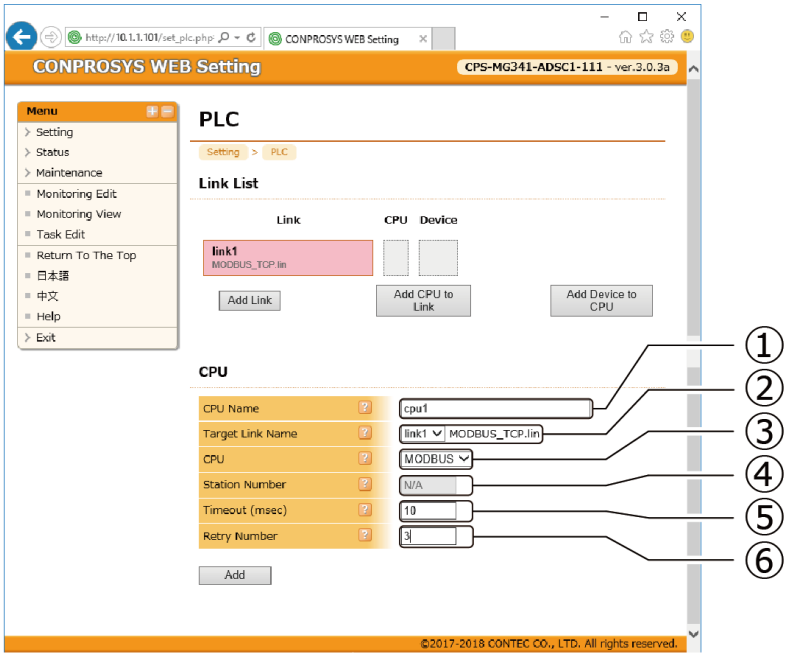
Enter a unit name and select a link name.

* Set the CPU after completing "**PLC Link Configuration (page 231)**".

1 From the [PLC] in CONPROSYS WEB setting, click the [Add CPU to Link] button to open the setting page.

2 Enter items 1- 6 below. Enter the [CPU Name] and select the [Target Link Name] that has been registered by [Add Link], and enter or select the other items.

* When connecting with serial communication, several PLCs can be set per link name (serial communication). Select a link name, and register CPU name respectively to the connected CPU (station).



Settings

No.	Setting	Description
1	CPU Name	Decide a name for the CPU of PLC connected by link. 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen. The name cannot be set with only numbers. (e.g.: Unit1)
2	Target Link Name	The set link name is displayed. Select the link (link name) for CPU setting.
3	CPU	CPU corresponds to the set link (link name) is displayed in the list
4	Station Number	Enter the station number for serial communication. (Entering the number is not necessary when "N/A" is shown in the field)
5	Timeout	[With only serial communication] Enter the timeout (msec) period on serial communication.
6	Retry	[With only serial communication] Enter the retry times.

3 Enter items for communication and click the "Add" button.

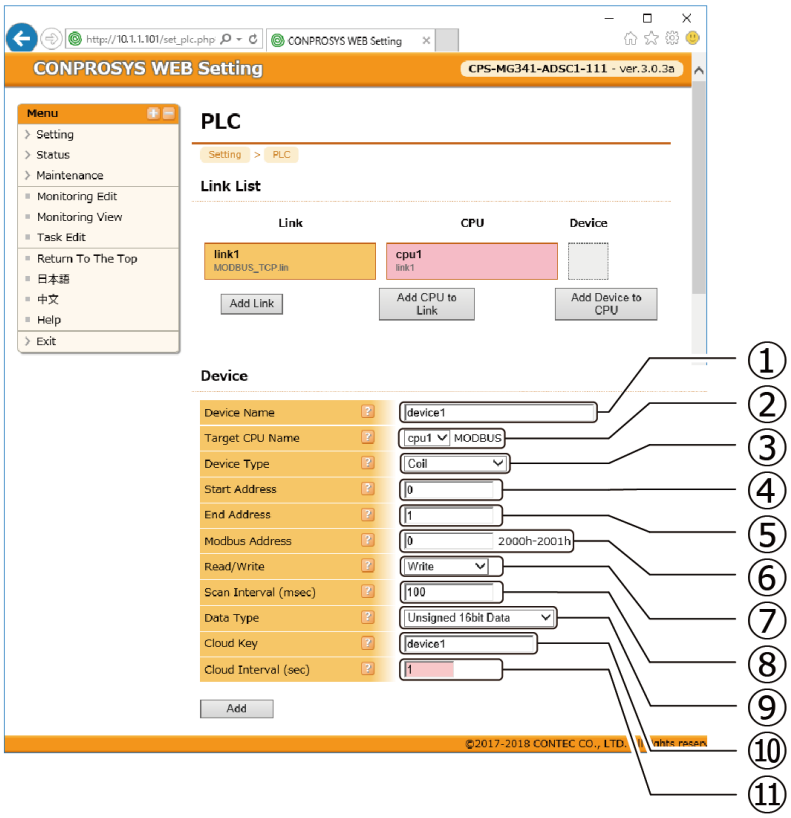
4.PLC Device Configuration

Register with Device name (name for the CPU of PLC connected) for CPU name that has been set by [Add CPU to Link].

* Set the device configuration after completing "**PLC Link Configuration (page 231)**" and "**PLC CPU Configuration (page 233)**".

1 From the [PLC] in CONPROSYS WEB setting, click the [Add Device to CPU] button to open the setting page.

2 Enter items 1- 11 below.
Enter the [Device Name] and select the [Target CPU Name] that has been registered by [Add CPU to Link], and enter or select the other items.



Settings

No.	Setting	Description
1	Device Name	Decide a name for the CPU name (CPU of PLC). 0 to 32 of one-byte alphanumeric letters, [_] underline, and [-] hyphen. The name cannot be set with only numbers. (e.g.: Device1)
2	Target CPU Name	The set CPU name is displayed. Select CPU (CPU name) for device setting.
3	Device Type	Device type corresponds to the set CPU (CPU name) is displayed in the drop-down list.
4	Start Address	Specify Start address of PLC for communication in decimal.
5	End Address	Specify End address of PLC for communication in decimal.
6	Modbus Address	Specify Modbus address that maps PLC value to CONPROSYS in decimal.
7	Read/Write	Read: This reads data of Modbus address. Write: This writes data of Modbus address. TriggerRead: This reads data of Modbus address when the flag is on by PLC trigger of task. TriggerWrite: This writes data of Modbus address when the flag is on by PLC trigger of task. EventWrite: Writing data in Modbus address makes the flag on. This writes data of Modbus address when the flag is on.
8	Scan Interval	Specify an interval (msec) of communication with PLC.
9	Data Type	Select the data type from the drop-down list.
10	Cloud Key *1	This cloud key is necessary to send data to cloud with PLC communication. Specify the key added at the beginning of the column in data (csv file) to be sent to server. When there is no input, data are not sent to cloud.
11	Cloud Interval	Specify an interval (sec) of data transfer.

*1 This setting is necessary when using CDS2.

* By entering the cloud key and interval, communication data are sent to server. The destination is "Data Transfer URL" set in [DataTransfer].

3 PLC communication and data transfer to server start after the configuration is saved, then rebooted.

Transferring Measured Data to Server

This section describes how to transfer measured data to Web server.

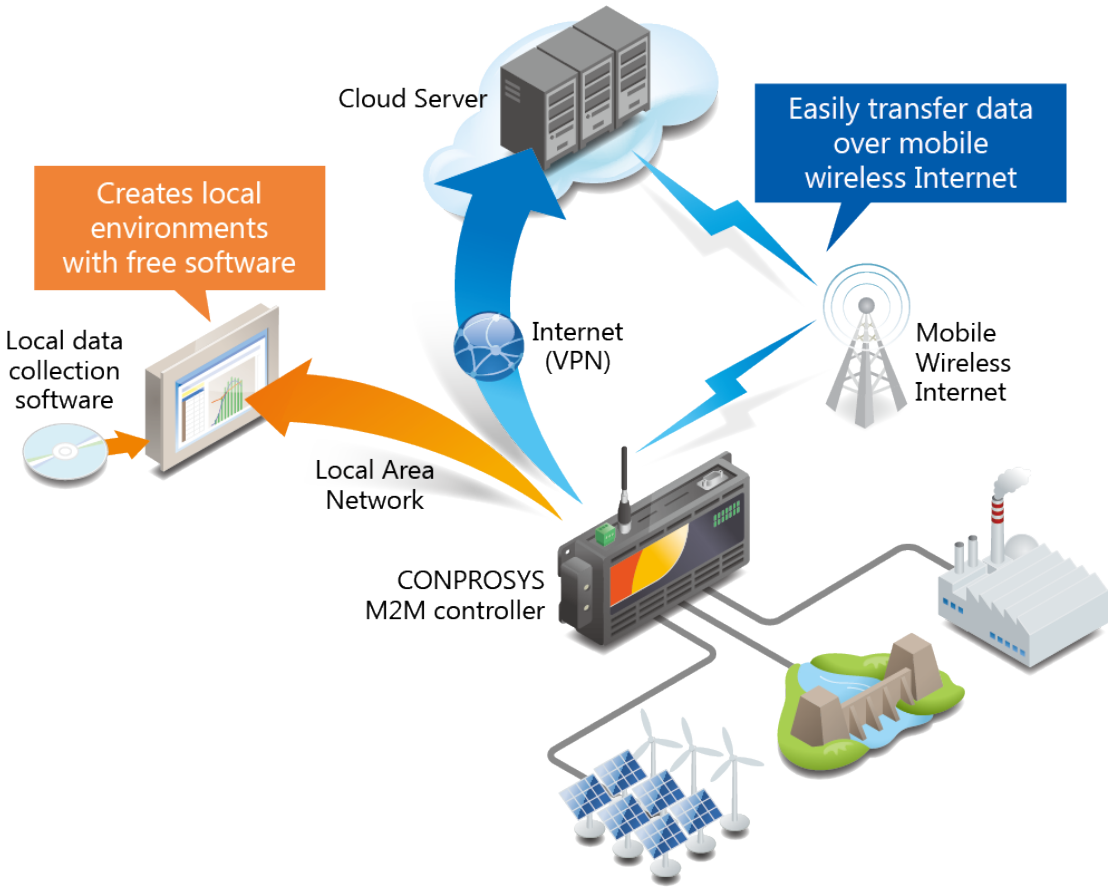
1.Data Transfer Outline

Measured data can be transferred to Web server from the product.

Even if wired networks are unavailable in the facilities, our product with 3G communication provides the function to transfer data via mobile line.

Data can be collected easily with on-premises data collecting software.

Data transfer setting can be done by simply entering a server address.



2.Settings for Transferring Measured Data.

To transfer measured data to Web server from the product, set the followings in CONPROSYS WEB Setting.

- Data Transfer Setting
- Service setting
- Network setting
- Wireless LAN setting
- SIM card *1
- LTE *2

*1: This function only available with CPS-MG341G-ADSC1-111, CPS-MG341G-ADSC1-930.

*2: This function only available with CPS-MG341G5-ADSC1-931.

*After setting the above, save them to ROM and reboot the product.

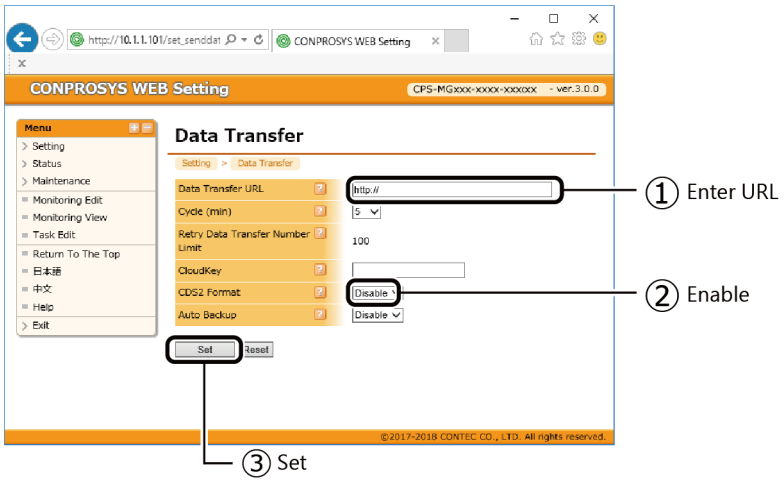
3.Data Transfer Setting

1. Data Transfer

Set up the transfer destination of the measured data in [Data transfer] setting of CONPROSYS WEB Setting.

If you are sending data to CONTEC cloud service CDS2. (1) Enter URL* in the “Data transfer URL”. (2) Select CDS2 format [Enable]. (3) Click the [set].

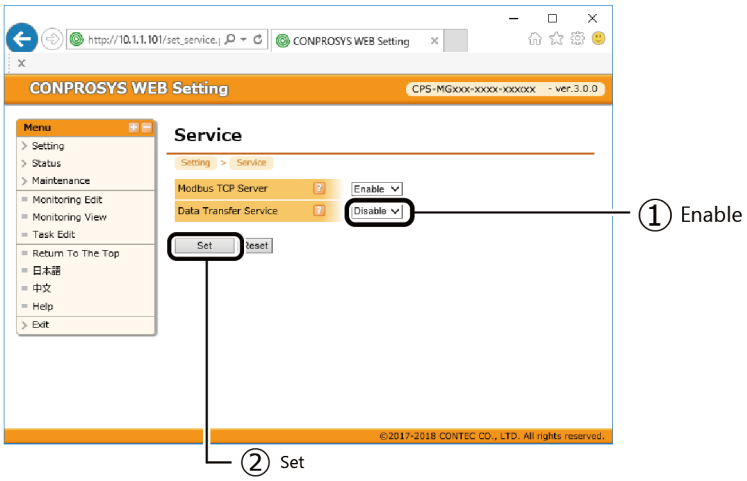
* As for Data transfer URL, enter the “Measured data upload URL” that is listed on the mail sent after completing CDS2 contract. The CDS2 is the service for Japan domestic only.



2. Service

Set up the service setting in CONPROSYS WEB Setting.

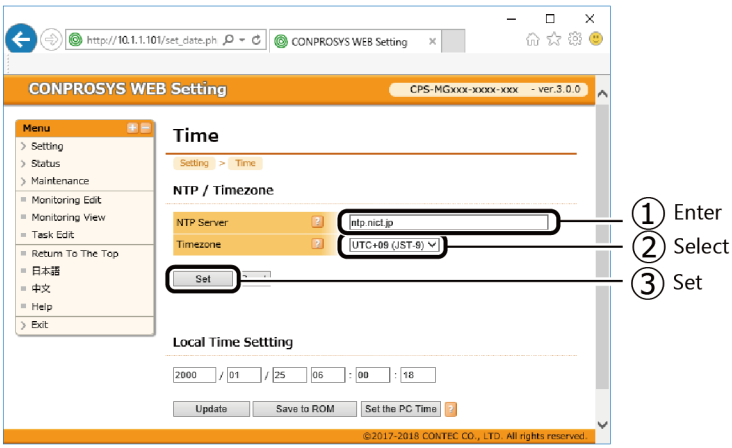
(1) Click the [Enable] in the “Data transfer service”. (2) Then click the “set”.



3. Time

Set NTP Server and Time Zone in [Time] in CONPROSYS WEB Setting.

(1) Enter the address of “NTP Sever”. (2) In [Time Zone], set a time difference between UTC (Universal Time, Coordinated) and the time of the local region where the product is used. (3) Click the [set].



4. Network Setting

* This setting is unnecessary when using the CPS-MG341G-ADSC1-111 and CPS-MG341G-ADSC1-930 with 3G communication.
* This setting is unnecessary when using the wireless LAN adapter.
* This setting is unnecessary when using the CPS-MG341G5-ADSC1-931 with LTE function.

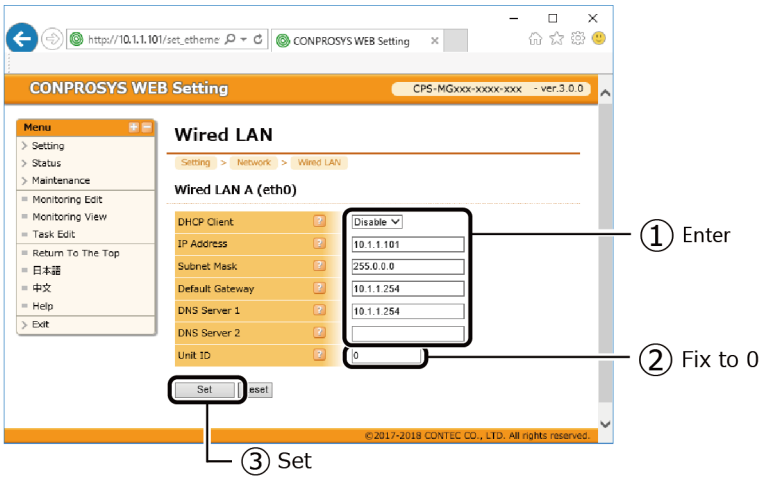
◆ Wired LAN

First, set up the network setting in [Wired LAN] in CONPROSYS WEB Setting.

Follow your network environment, (1) Enter the appropriate settings for DHCP Client, IP Address, Subnet Mask, Default Gateway, DNS Sever1, and DNS Sever2.

(2) Enter 0 in “Unit id” and do not change it in operation.

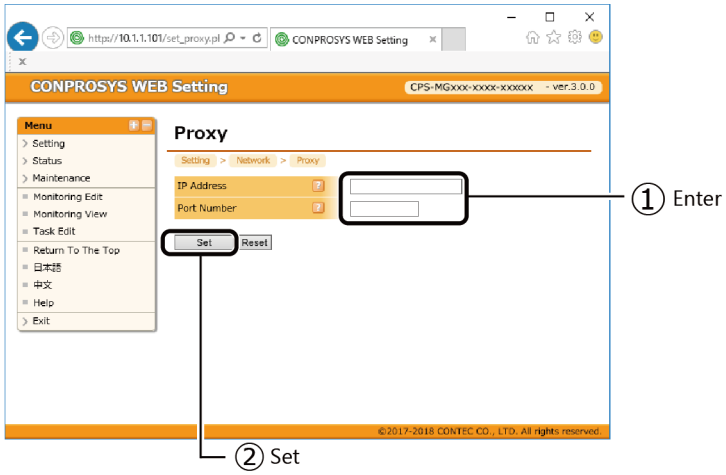
(3) Click the [set].



◆ Proxy

Next, set up the network setting in in [Proxy] CONPROSYS WEB Setting.

(1) Enter Proxy Sever IP Address and Proxy Sever Port Number. (2) Click the [set].



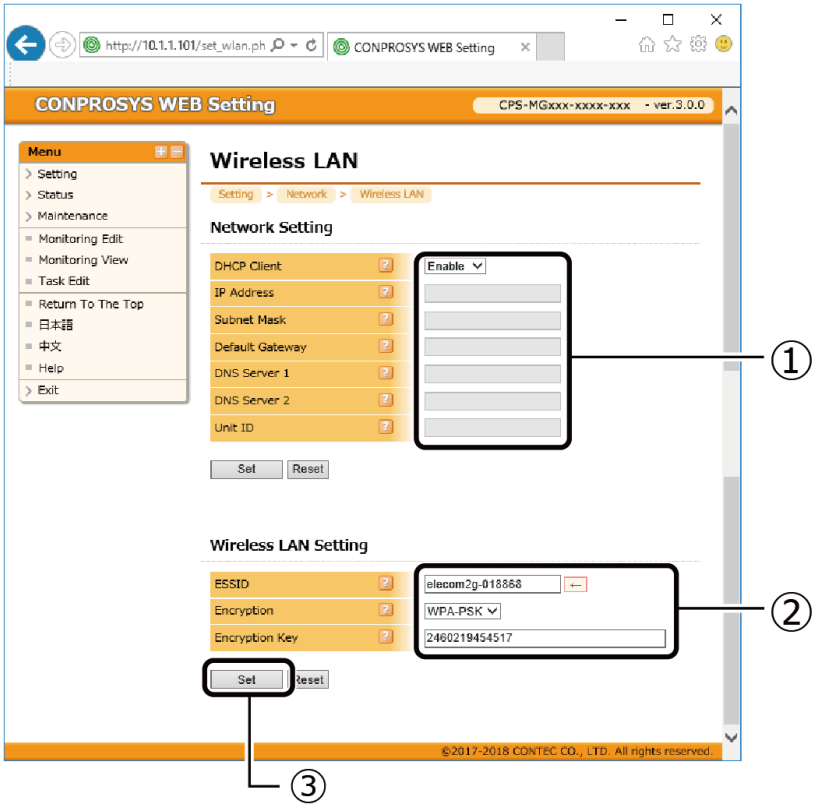
5. Wireless LAN

Set up the wireless LAN setting in CONPROSYS WEB Setting.

The display of the opened page differs depending on CONPROSYS condition.

- When a USB wireless LAN adapter is not connected to CONPROSYS or an unsuitable USB wireless LAN adapter is connected to CONPROSYS.

- When a suitable USB wireless LAN adapter is connected to CONPROSYS.
  Enter or choose appropriate setting for (1) – (2) to connect. (3) Click the [set].



Scan access points in the area and when AP exists, [←] button is displayed. Click the button to open the list of ESSIDs. Choose one from the list and it is entered automatically in the form.

- Compatible USB wireless LAN adapter

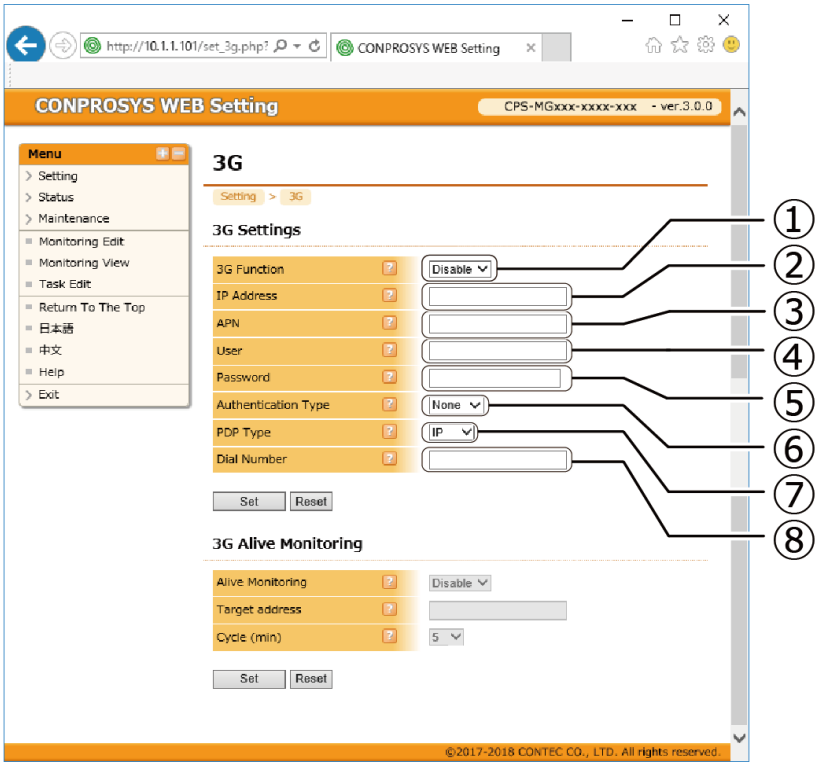
Vender	Product
D-Link	DWA-125 REV D1
D-Link	DWA-123 REV D1
D-Link	GO-USB-N150 REV B1
Elecom	WDC-150SU2M
TP-LINK	TL-WN725N v2
TP-LINK	TL-WN723N v3
TP-LINK	TL-WN727N v4
Sitecom	N150 v2

6. 3G

* Set up this setting when transferring data via 3G network with CPS-MG341G-ADSC1-111 or CPS-MG341G-ADSC1-930.

Set up the SIM card setting in [3G] in CONPROSYS WEB Setting.

Enter the necessary information in No.1 - 8 and click the “set”.



- An example with a SORACOM SIM card.

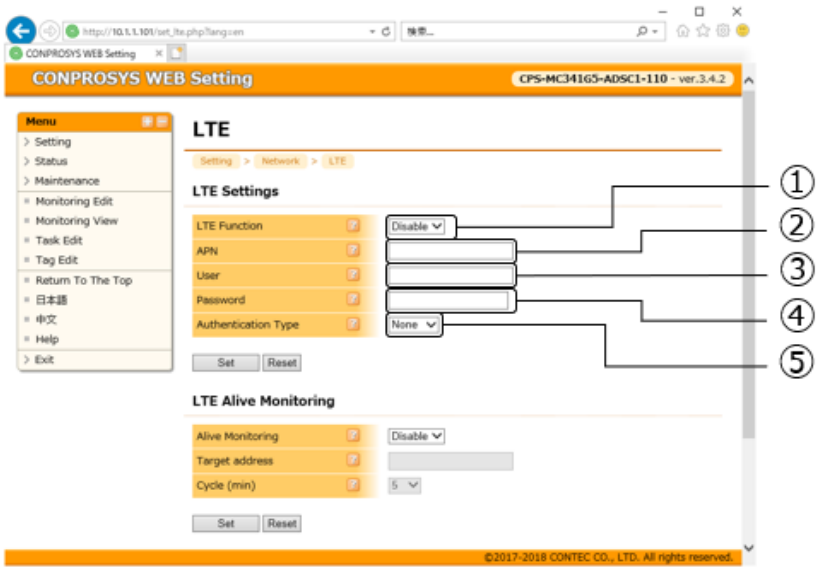
No.	Setting	Setting
1	3G	Enable
2	IP Address	0.0.0.0 (Default)
3	APN	soracom.io
4	User	sora
5	Password	sora
6	Authentication Type	CHAP
7	PDP Type	IP
8	Dial Number	Blank (Default)

7. LTE

* Set up this when using the CPS-MG341G5-ADSC1-931 with LTE function.
* If your SIM card is for an LTE device or a SIM card that allows you to select the access point name (APN), be sure to enter the details of your LTE device in the "APN" section below.

Set up the SIM card setting in [LTE] on CONPROSYS WEB Setting.

Enter the necessary information in No.1 - 5 and click the “set”.



- An example with a SORACOM SIM card.

No.	Setting	Setting
1	LTE Function	Enable
2	APN	soracom.io
4	User	sora
5	Password	sora
6	Authentication Type	CHAP

OPC UA

This section describes the OPC UA function.

The list of products with OPC UA server and client

- CPS-MG341G-ADSC1-930
- CPS-MG341-ADSC1-931
- CPS-MG341G5-ADSC1-931

1.OPC UA function

This chapter describes the server and client functions of OPU UA that are supported by this product. Please refer to each section for details of the features. The following is an explanation of common matters.

1. Application Instance Certificate

It is a digital certificate that proves that an OPC UA application (server or client) is a specific instance. It will be displayed as "Own Certificate" from the web setting screen and can be reissued.

Server: [Menu] → [Setting] → [OPUCA Server] → [Certificate] on the WEB settings screen

Client: [Menu] → [Setting] → [OPUCA Client] → [Certificate] on the WEB settings screen

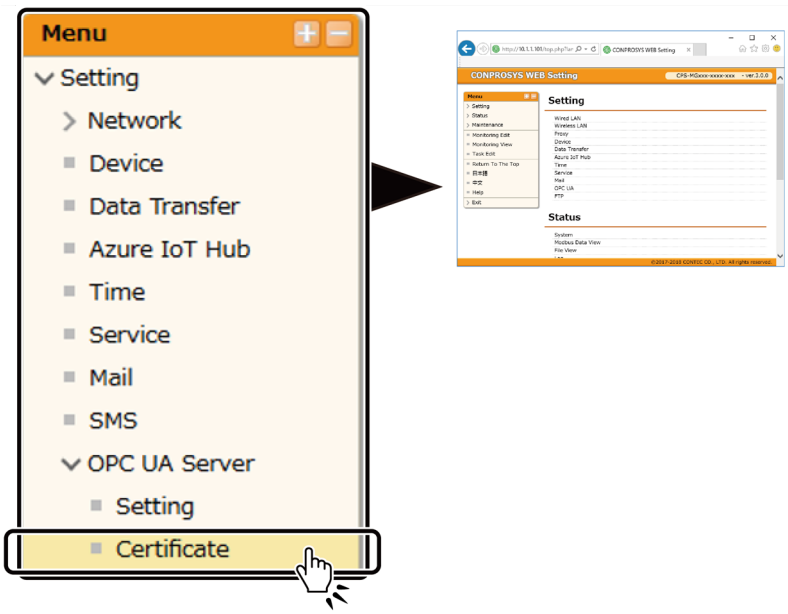
This certificate is required to establish an OPC UA session, and it is necessary to register the certificate of the OPC UA application to be communicated with in the Trusted List in advance. As an example, the certificate registration procedure when using the server function of this product is shown below.

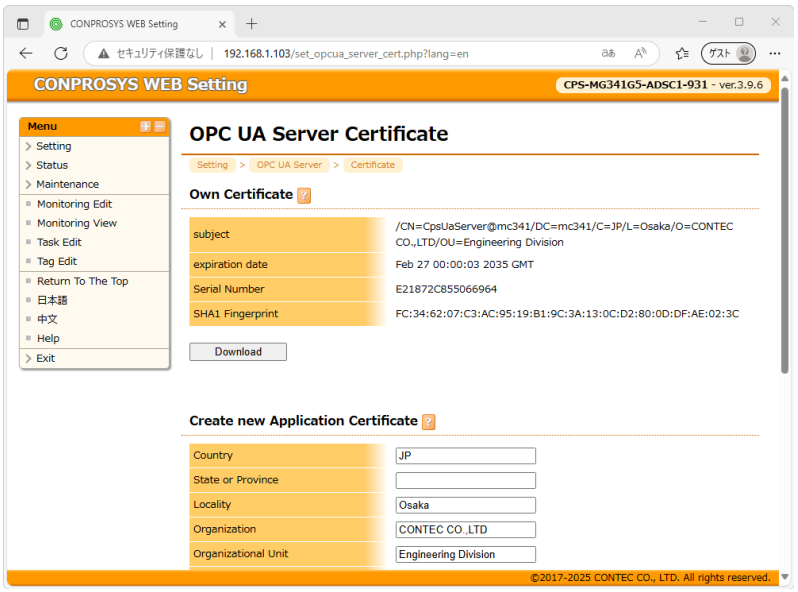
◆ Server Functions: Certificate Registration Procedure

Download OPC UA Server Certificate

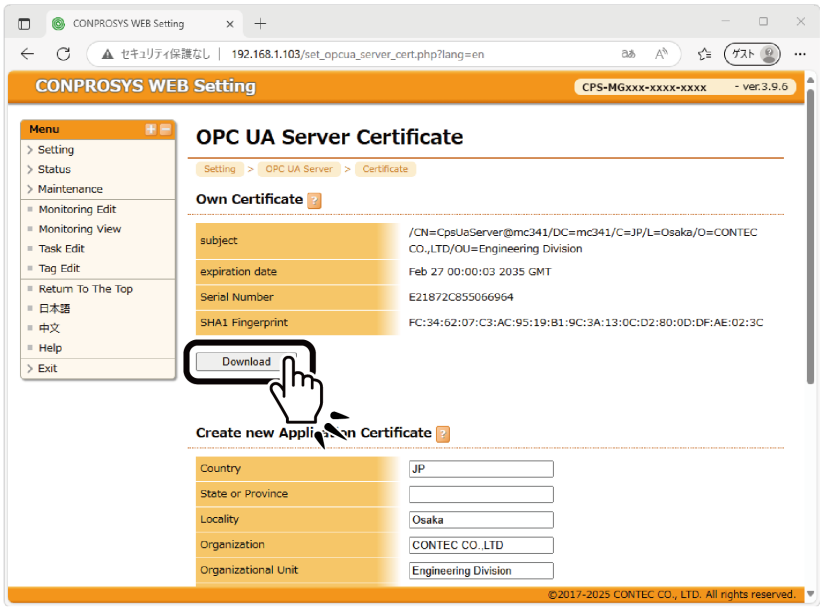
To establish a session, some OPC UA clients might require the OPC UA server certificate (application certificate) of the server. If the installation of the certificate to the specified folder of the client software is requested, download the OPC UA server certificate from the “menu”.

1 From the PC browser, open CONPROSYS WEB Setting in the product that is connected through Ethernet cable. Go to [Setting] – [OPC UA Server], then click the [Certificate].





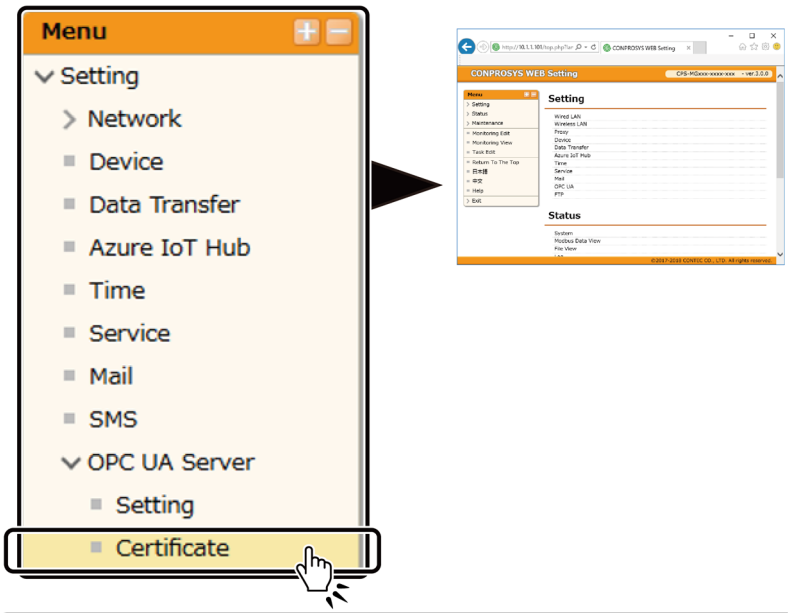
2 Click the [download] in the Own Certificate to download the certificate.

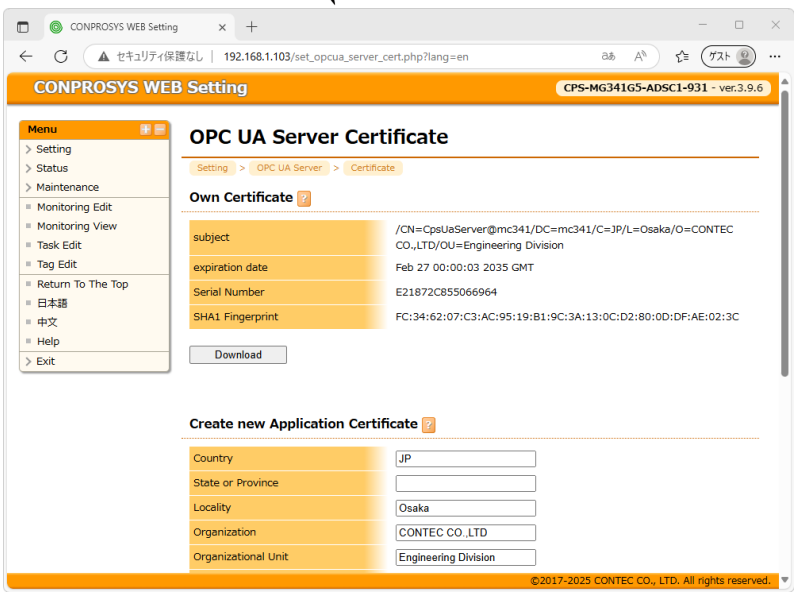


Upload OPC UA Client Certificate

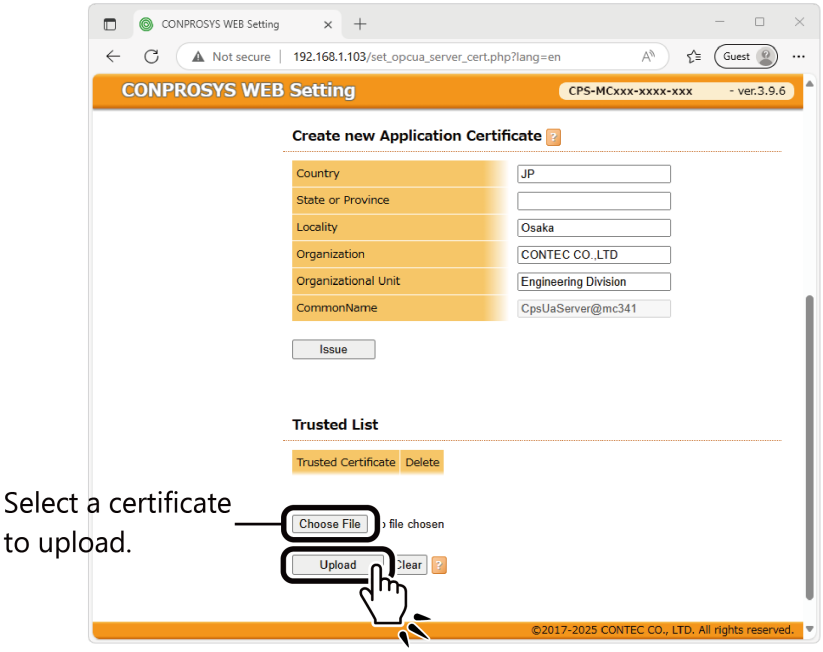
When establishing the session of the OPC UA client, and authentication of the user ID or certificates is carried out, uploading the application certificate of the client is required beforehand. Upload the OPC UA Client certificate from the menu.

1 From the PC browser, open CONPROSYS WEB Setting in the product that is connected through Ethernet cable. Go to [Setting] - [OPC UA Server], then click the [Certificate].]

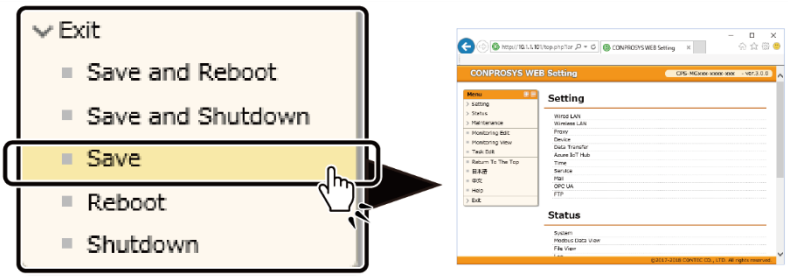




2 From the [Choose file] in the “Trusted List”, select a certificate, then click the [upload].



3 The certificate is only temporarily saved and it will be discarded upon shutting the power. If you intend to save it, go to [Exit] - [Save], then click the [OK].



4 To delete the uploaded certificate, choose it from the “Trusted List”, then click the [del].

2.OPC UA Server Specification

1. Overall Specification

Item	Specification
Endpoint URL Server URL	opc.tcp://[IP Address]
Access type	Data Access (Synchronization I/O)
Profile	Embedded UA Server Profile
Communication protocol	UA TCP Binary
Security policy	None Basic128Rsa15 Basic256 Basic256Sha256
Security mode	Anonymous Username/Password *1 Certificate/Private Key
Node tree structure	CONTEC ——— CPS-MG341-ADSC1 ——— SubFolder ——┬— Node1 └— Node2
Node editing	Not Available (Fixed)

*1 For this, use the same name and password which you need to access to CONPROSYS WEB Setting. The factory default setting of username and password are [mc341].

2. Address Space Specification

OPC UA Node	Sub folder	Node Name	Data Type	Access	Data Range
Digital input Bit0 Bit1 Bit2 Bit3	Digital_Input	 DI00 DI01 DI02 DI03	Boolean	Read	0, 1
Digital output Bit0 Bit1	Digital_Output	 DO00 DO01	Boolean	Read/Write	0, 1
Analog input Channel0 Channel1	Analog_Input	 AI00 AI01	UInt32	Read	0 - 4095 0 -326767 will be used when Industrial Value Conversion is enabled in the Device setting. *1
Counter input Channel0 Channel1	Counter	 CNT00 CNT01	UInt32	Read	0 - 16777215
Counter input clear Channel0 Channel1	Counter_Clear	 CNT00_CLR CNT01_CLR	Boolean	Read/Write	0, 1
Serial communication Letter output Product name The total number of processed parts Value data in any type 1 - 10 String data in any type 1-10 *2	COM	 PrintOutput ProductName ProductResultNumber value01 - value10 string01 - string10	 String String Int32 Double String	Read	Rely on a DPRNT content prescribed in the CNC program.
Other battery level	System	 Battery	Boolean	Read	0 (None) 1 (Remain)
PLC communication data Channel 0 - 0999	Modbus	 EX0000 - EX0999	UInt16	Read/Write	0 - 65535
TAG	TAG	TAG00 – TAG499	Int32	Read/Write	0 - 2147483647
String tag	STAG	STAG00 – STAG499	-	Read/Write	-
Decimal place tag	DTAG	DTAG00 - DTAG499	Double	Read/Write	Up to 3 decimal places

*1 The converted value will be set in the UInt32 when the value used in Industrial Value Conversion is equal to or less than 0.

*2 For details, please refer to [3.Communication with CNC by FANUC(Page254)] below.

*Regarding TAG, DTAG

TAG: The TAG area on the VTC is expressed in Int32.

DAG: The TAG area on the VTC is expressed in Double (3 decimal places).

3. Communication With CNC by FANUC

Contain the function to get the output information from FANUC CNC by serial communication and send it to the upper client with the OPC UA protocol.

It receives a DPRNT content prescribed in the CNC program as serial communication data, then convert an identifier and data that are included in the DPRNT into the OPC UA node to send.

*Initial settings of the controller need to be set to communicate with the CNC. From a WEB browser, go to [Setting] - [Network], and set the COM B for "FANUC CNC" in the [Device], then set the serial communication parameter such as baud rate in accordance with CNC side.

The List of CNC Supportive Models

- FANUC Series 15
- FANUC Series 16/18/20/21
- FANUC Power Mate -D/F/H
- FANUC Series 16i/18i/21i
- FANUC Power Mate i
- FANUC Series 15i
- FANUC Series 0i
- FANUC Series 30i/31i/32i

DPRNT Identifier List

Item	DPRNT identifier	UA Node Name	Data Type	Description
Letter Output	None	PrintOutput	String	Store several string data of the DPRNT contents with commas (,).
Product Name	PN	ProductName	String	Store the information regarding the name of the parts processed by machine.
The total number of processed parts	PC	ProductResultNumber	Int32	Store the total number of parts processed by machine.
Value data in any type 1-10	VA01 - VA10	value01 - value10	Double	These nodes can store value data in any type. (10)
String data in any type 1-10	SR01 - SR10	string01 - string10	String	These nodes can store string data in any type. (10)

4. OPC UA Client Preparation and Communication

In this section, we use the "OPC UA Client Package" supplied by Softing as the OPC UA client software.

◆ OPC UA Client Preparation

1 Access to the following URL and download the free package of OPC UA Client Package.

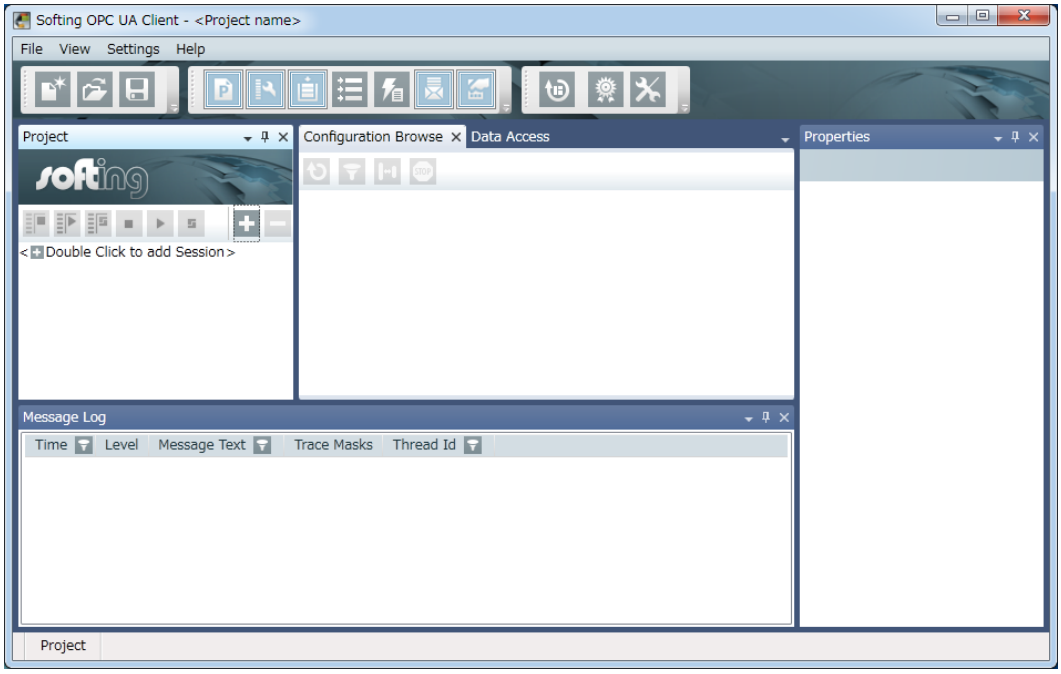
Download https://industrial.softing.com/en/products/protocol-software-and-sdks/opc-ua-embedded-toolkit.html

* The latest version is "OPC UA Demo Client Package V1.46.0 (Free of Charge, Unlimited Runtime)" as of April, 2019.

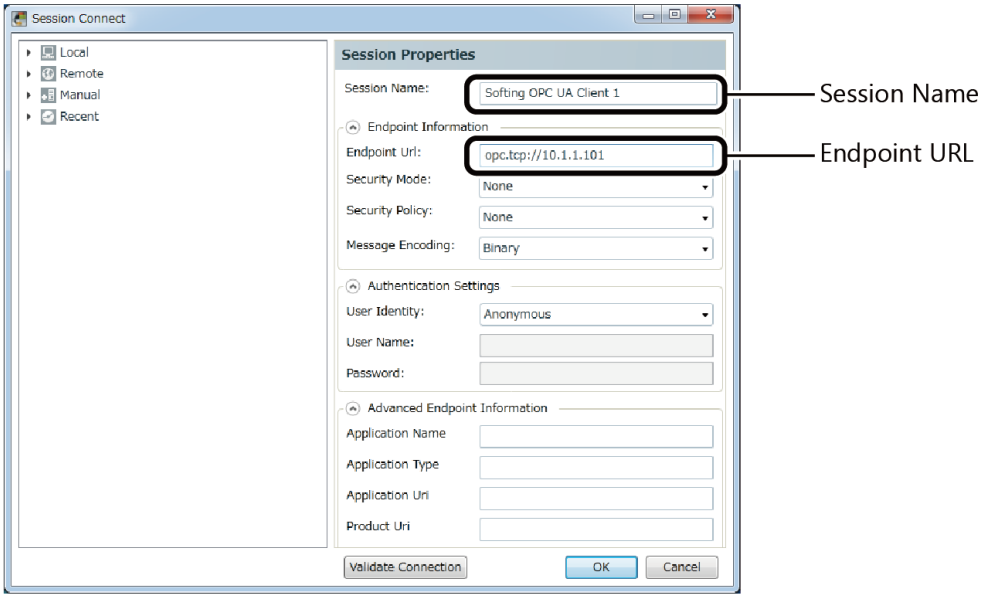
2 Install the downloaded OPC UA Client Package.

◆ Communication With OPC UA Client

1 Start up OPC UA Client Package and double-click the "Double Click to add Session" in the Project window.



2 Enter a session name in the “Session Name” and enter “opc.tcp://10.1.1.101” in “Endpoint Url”. (As for the 10.1.1.101 part, enter the same IP address that is set in the product).



3 Click the [Validate Connection].
* When the Certifiate Validation dialog box is displayed, check whether the connection destination URL is correct and whether the application instance certificate of the server function is registered correctly. If you want to accept the certificate temporarily, select Temporarily Accept the Certificate and click OK to make the connection.

4 Confirm that the green icon of check mark is shown next to [Validate Connection] button and click the [OK].

5 On the Configuration Browse window, the list of OPC UA server nodes of the product is displayed. The I/O nodes of the product are listed under the “Objects/CONTEC/CPS-MG341-ADSC1/”.

6 When an I/O node is selected, data value (Value), status (StatusCode), and timestamp (SourceTimestamp/ServerTimestamp) are displayed on the property window. To change the value of output, change the value in the Value and click the [Write].

3.OPC UA Client Specification

1. Overall Specification

Item	Specification
Application Name	CpsUaClient@mc341
Profile	Embedded UA Client Profile
Communication protocol	UA TCP Binary
Security policy	None Basic128Rsa15 Basic256 Basic256Sha256
Security mode	None Sign SignAndEncrypt
Authentication method	Anonymous Username/Password
Data Type	Boolean UInt32 Int32 UInt64 Int16 UInt16 Double Float String
Write conditions	Write Interval [ms], Data Change
Read conditions	Read Interval [ms]

2. OPC UA Server Preparation and Communication

Configure the following settings in CONPROSYS WEB Setting to function as an OPC UA client.

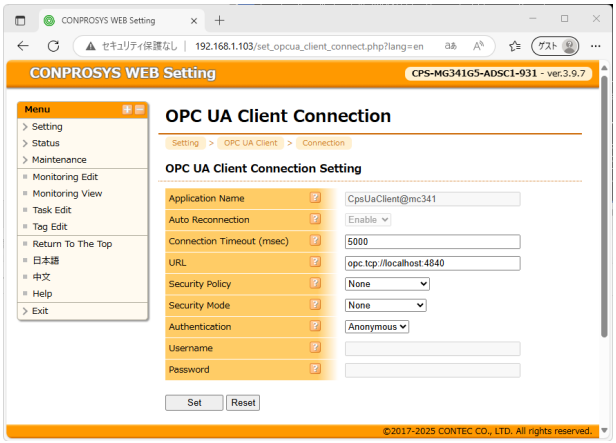
- OPC UA Client Connection
- OPC UA Client Certificate
- OPC UA Client Write
- OPC UA Client Read

Refer to "**Function Details (page34)**" for further details on each setting item.

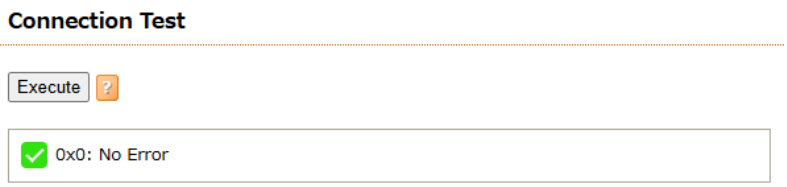
After you have completed the settings, save them to ROM in the controller and reboot the product.

◆ Connection Setting

1 On the CONPROSYS WEB Setting, go to [OPC UA Client] -[Connection] from the setting menu. Enter the URL in the format of [opc.tcp://'IP address':'port number'] according to the OPC UA server you are using.
Enter the necessary information for other items. After you enter them, click the "Set".



2 Click the [Execute] button under "Connection Test" to test the connection with the OPC UA server using the connection settings.
The "0x0: No Error" can be viewed when connecting has succeeded.
An error code can be viewed when connecting has failed. Check the settings or connection status again.



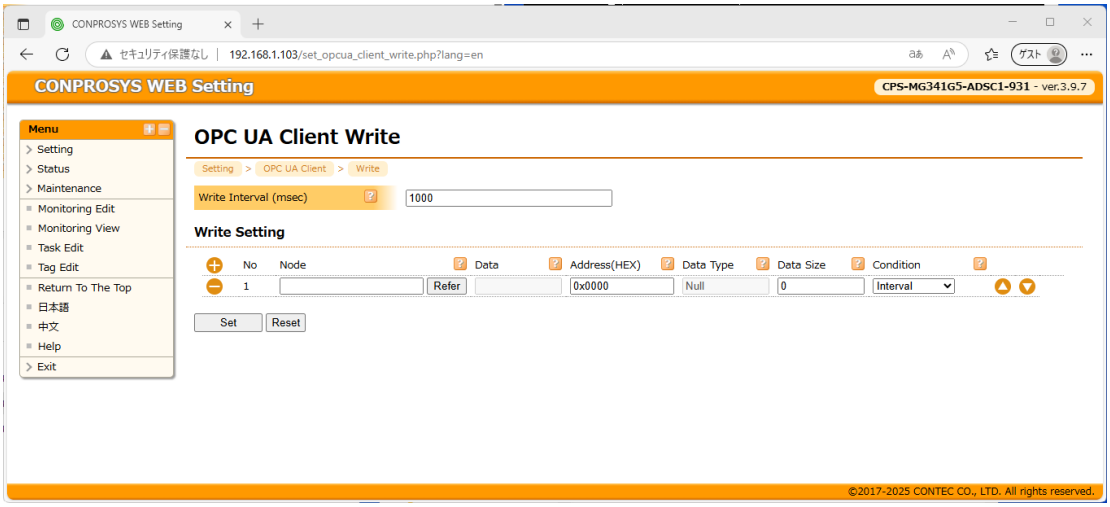
3 When the connection test has been completed, save the settings to ROM of the controller and reboot the product.

4 When the product is rebooted, if [Error Information] in [OPC UA Client Connection] in [OPC UA Client] in [Status] of CONPROSYS WEB Setting is displayed as "0x00000000", the connection was successful.
If the connection fails, an error code is displayed. Check the settings or connection status again.

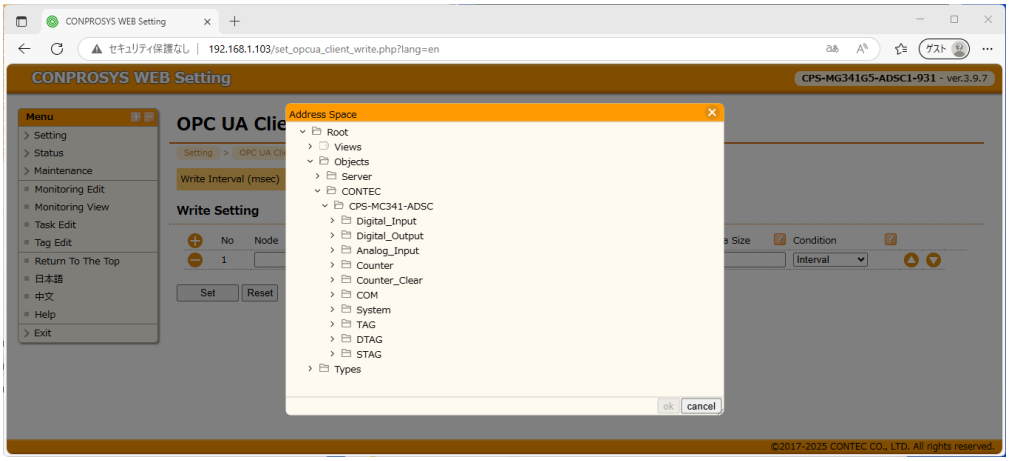
◆ Write Setting

In CONPROSYS WEB Setting, select [Write] under [OPC UA Client] to configure the write settings.
The write function operates at a set interval or when the data changes and writes the data.

1 Click “Write” under “OPC UA Client” in CONPROSYS WEB Setting to display the setting screen.
Up to 100 items are configurable.



2 Clicking the [Refer] button on a node displays the tree structure retrieved from the OPC UA server and allows you to select a node. As an example, CONPROSYS of another device is connected as an OPC UA server.
If the data type is “String”, please set the data length.
* Cannot be pressed until node information acquisition is complete.



3 As an example, register with the following settings.
Node: ns=2; s=CPS-MC341-ADSC. TAG. TAG01 Address: 0x0000
After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

Write Setting

No	Node	Data	Address(HEX)	Data Type	Data Size	Condition
1	ns=2;s=CPS-MC341-ADSC. Refer	TAG01	0x0000	Int32	4	Interval

4 After rebooting, click [Modbus Data View] in [Status] of CONPROSYS WEB Setting. Select "Holding Register: AO", enter "2000" in the address (hexadecimal) and click the "Get" button. Enter the value you want to write to the address (0x2000) set in step 3.

Modbus Data View

Status > Modbus Data View

Register	Holding Register: AO
Address(HEX)	2000
Display Format	Hexadecimal notation
Data Length	16bit

Get | Monitor Value | Change Value

Address(HEX)	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+a	+b	+c	+d	+e	+f
2000	0005	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
2010	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000

5 The value written to TAG01 of CONPROSYS connected as an OPC UA server is set.

【Tag Edit screen of CONPROSYS of OPC UA server】

TAG	Value(Decimal notation)	Value(Hexadecimal notation)	Comment
TAG00	0	00000000	
TAG01	5	00000005	
TAG02	0	00000000	

6 In [OPC UA Client]: [Write Data] in [Status] of CONPROSYS WEB Setting, the value (Value), status (Statuscode), and timestamp (Request Ack Time) of the data are displayed.

Write Data

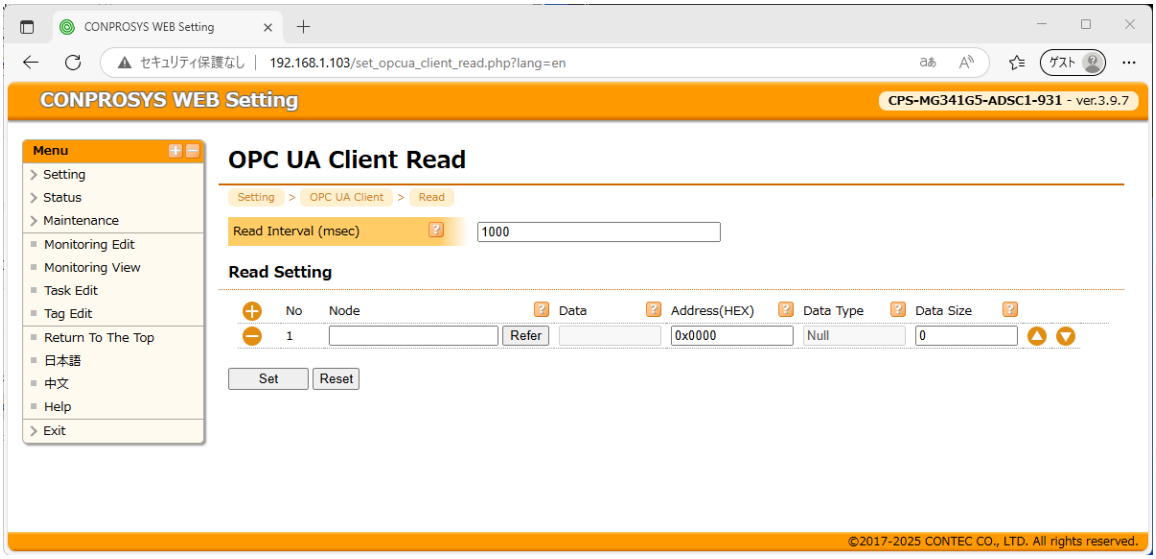
No	Statuscode	Request Ack Time	Value
1	0x00000000	2025-06-13 00:21:33	5

◆ Read Setting

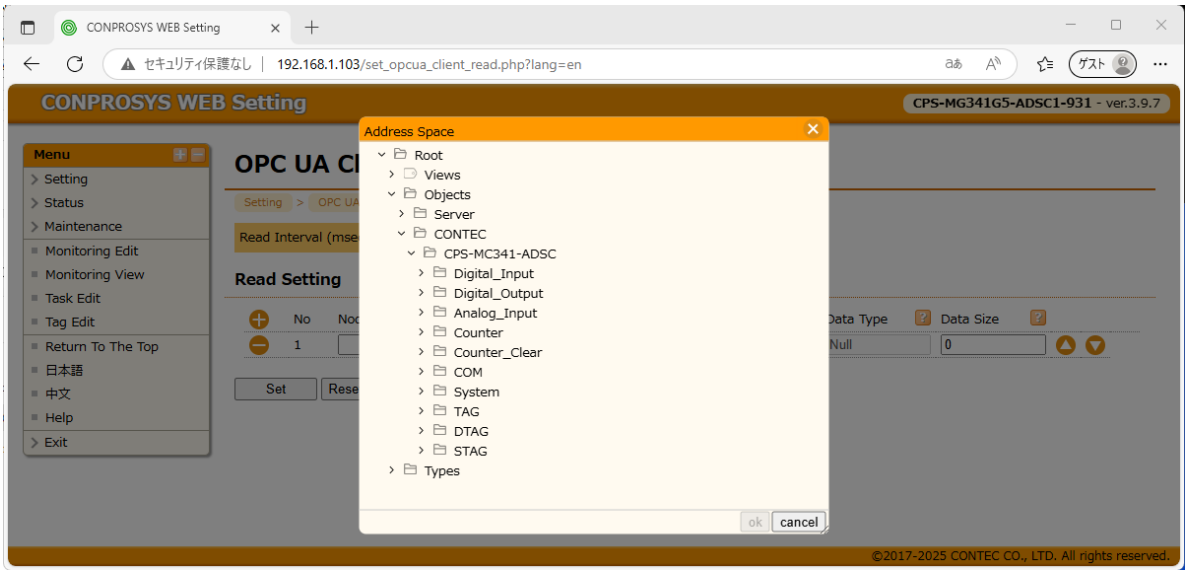
In CONPROSYS WEB Setting, select [Read] under [OPC UA Client] to configure the read settings.

The read function operates at the set interval to read data.

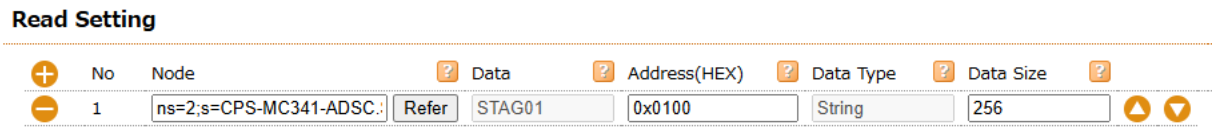
1 Click “Read” under “OPC UA Client” in CONPROSYS WEB Setting to display the setting screen. Up to 100 items are configurable.



2 Clicking the [Refer] button on a node displays the tree structure retrieved from the OPC UA server and allows you to select a node. As an example, CONPROSYS of another device is connected as an OPC UA server.
If the data type is “String”, please set the data length.
* Cannot be pressed until node information acquisition is complete.



3 As an example, register with the following settings.
Node: ns=2;s=CPS-MC341-ADSC.STAG.STAG01 Address: 0x0100
After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

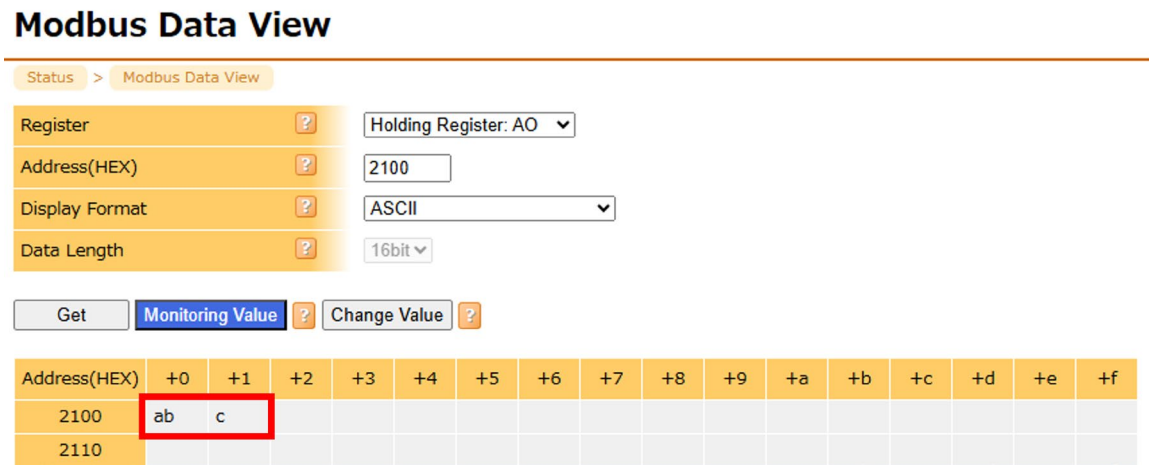


4 Set [abc] to STAG01 of CONPROSYS, which is connected as an OPC UA server.

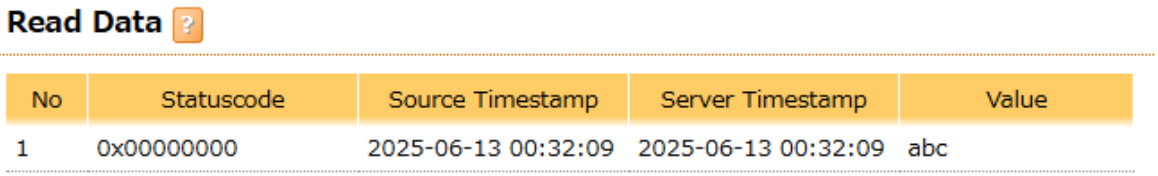
【Tag Edit screen of CONPROSYS of OPC UA server】

TAG	Display format	Value	Comment
STAG00	UTF-8		
STAG01	UTF-8	abc	
STAG02	UTF-8		

5 After rebooting, click [Modbus Data View] in [Status] of CONPROSYS WEB Setting. Select "Holding Register: AO", enter "2100" in the address (hexadecimal) and click the "Get" button. Enter the value you want to read to the address (0x2000) set in step 3.



6 In [OPC UA Client]: [Read Data] in [Status] of CONPROSYS WEB Setting, the value (Value), status (Statuscode), and timestamp (Source Timestamp/Server Timestamp) of the data are displayed.



Set the Auto Send Mail

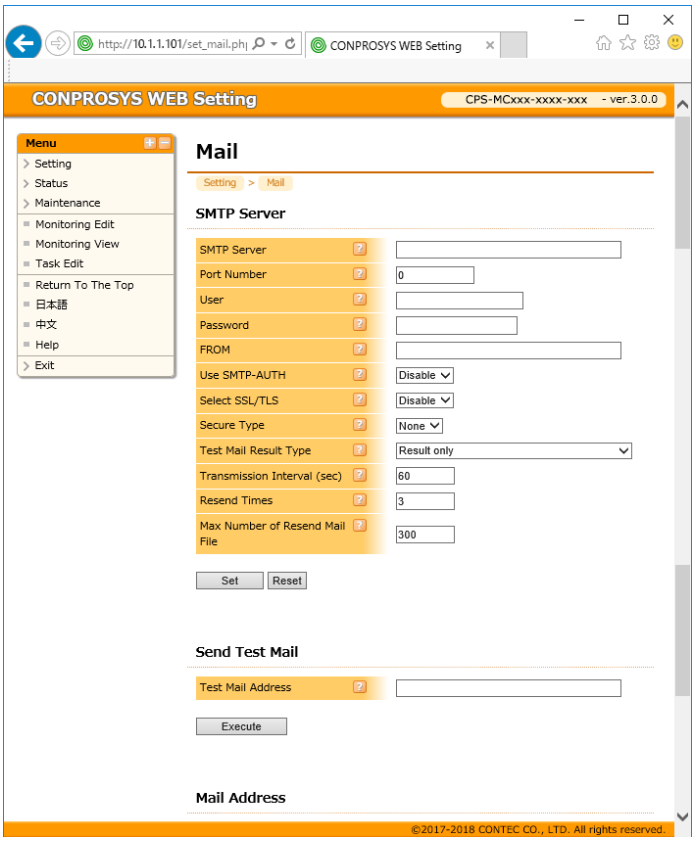
With Send Mail task, mails can be sent automatically from the product.
This section describes how to set and send mails by task.

1.SMTP Sever Setting

Set up SMTP Sever.

1 Open CONPROSYS WEB Setting through a WEB browser and go to [Setting] – [Network]. Click the [Mail] to open SMTP Server setting page.

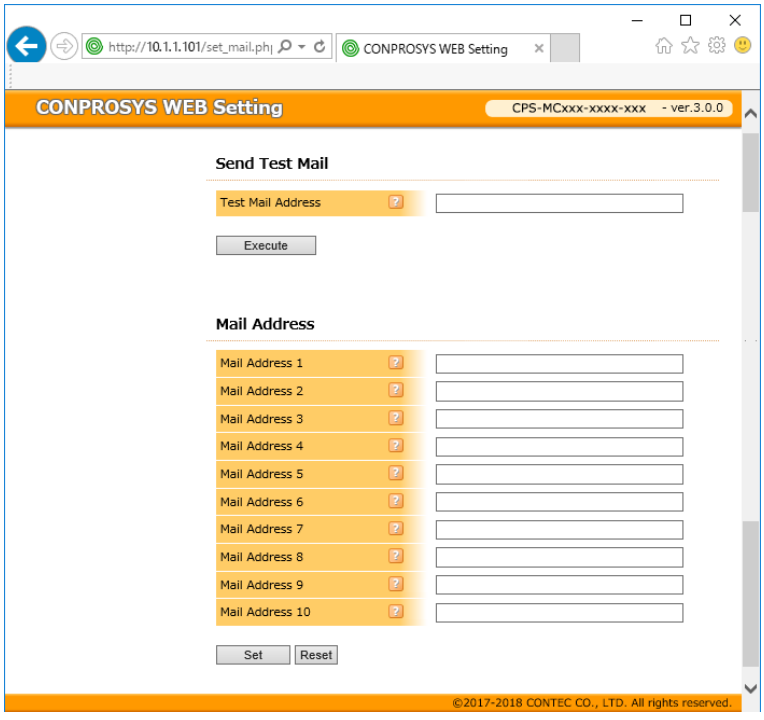
2 Check the specification of the connecting SMTP server and enter the information listed below, then click the [set].



Settings

Settings	Description
SMTP Server	Check the specification of the connecting SMTP server.
Port Number	
User	
Password	
From	
Use SMTP-AUTH	
Select SSL/TLS	
Secure type	
Test Mail Result Type	Display the communication details between SMTP server and CONPROSYS upon sending a test mail.
Transmission Interval(sec)	Specify the cycle to resend a mail when sending fails.
Resend Times	Specify the number of times to resend mails. If sending fails at the specified number of times, mails are discarded.
Max Number of Resend Mail Files	Specify the maximum number of resending mails. When resending mails exceed the maximum, resending is canceled and the mails are discarded.

3 When the setting is completed, send a test mail to confirm.
Enter an address in "email address:", and click the [send test email]. Confirm "Send OK" is viewed on the page.



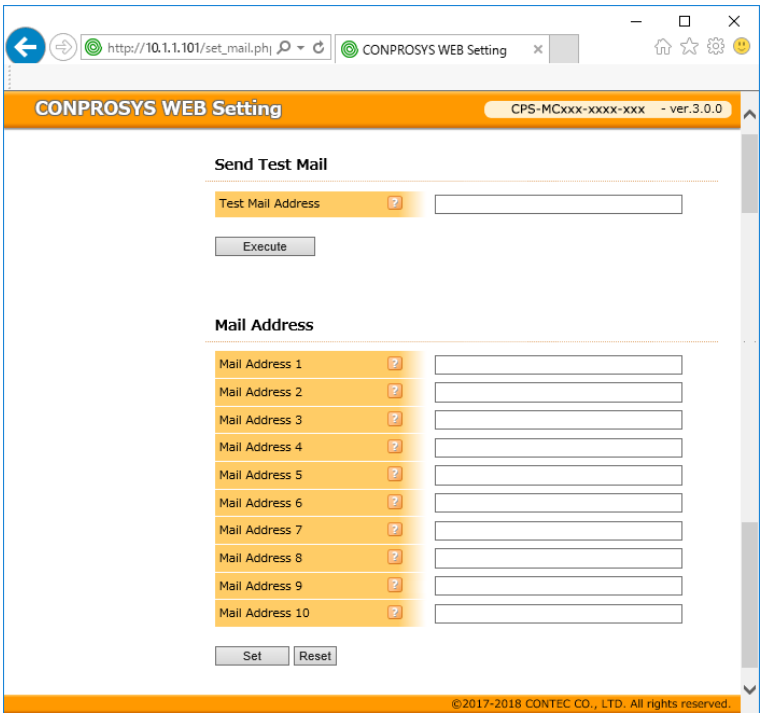
2.Mail Address Setting

1 Open CONPROSYS WEB Setting through a WEB browser and go to [Setting] – [Network]. Click the [Mail] to open the setting page.

2 Enter an address and click the [set].

* Several destinations (Up to 10) can be set with "," (comma).

* Up to 10 destinations can be set per address. The created contents can be set in To, Cc, and Bcc in Send Mail task.



3 Click the [set]. Send a test mail to confirm whether the setting is completed.
Select the address to send a test mail and click the [Execute].
Confirm the "Send OK" is viewed on the page.

3.Send Mail Program

1 Open CONPROSYS WEB Setting through a WEB browser and go to [Setting], then click the [Task Edit] to open the setting page.

* Refer to "**Easy Data Process and Control (page 156)**" for the task program sample of Email sending.

Send Mail task

◆ Send Mail Task Property

	Property	Value
①	To	ADDR00
②	CC	ADDR01
③	BCC	ADDR02
④	Subject	Fixed Value
	Fix value (Subject)	test mail
⑤	Body	Fixed Value
	Fix value (Body)	test send
⑥	Attached	NONE
	Next step	Down
	X	0
	Y	0

No.	Property	Description
1	To	Set the address that is set in the Mail address setting into To
2	CC	Set the address that is set in the Mail address setting into CC.
3	BCC	Set the address that is set in the Mail address setting into BCC.
4	Subject	Choose to specify Fix value (Subject) from Fixed Str, STAG, or LSTAG
5	Body	Choose to specify Fix value (Body) from Fixed Str, STAG, LSTAG, or File. When specified from the file, the strings in the file are treated as Body.
6	Attached	Files can be attached.

* Mails are sent upon executing Send Mail task. Be aware that SMTP server might misjudge the sending mails as spam mails if the task of Send Mail are executed consecutively.

Connecting to Azure IoT Hub

This section describes how to connect to Azure IoT Hub cloud service offered by Microsoft.

1.Azure IoT Hub Communication Functions

This product features functions to transfer and receive data with Azure IoT Hub cloud service offered by Microsoft.

1. Azure IoT Hub Communication Specification

Item	Specification
The number of Azure IoT Hubs to be connected	1(cannot be connected with several multiple Azure IoT Hubs from one product)
Communication protocol	HTTPS (AMQP and MQTT are unsupported).
Azure IoT Hub security	Approval by security token.
Sending method	Upon executing the task “Send Azure IoT”.
Sending cycle	Any (Upon executing the task “Send Azure IoT”).
Sending data format	JSON format (Convert the specified files into JSON format to send).
Sending timeout	30 seconds.
Receiving method	Automatically execute reception data processing upon sending.
Receiving interval	Synchronize with the sending cycle.
Receiving data process	Set in the specified TAG or STAG of processing task.
Receiving data format	JSON format (Specifying TAG and STAG and assigning values).
Receiving data specification available TAG	[TAG00] – [TAG499] and [STAG00] – [STAG499].

2.Azure IoT Hub Preparation

The followings are required in advance for communicating with Azure IoT Hub.

- Create a Microsoft Azure account
- Create an Azure IoT Hub
- Obtain a device connection string

1. Create a Microsoft Azure Account

First, create a Microsoft Azure account to use the Azure IoT Hub.

Account https://azure.microsoft.com/en-us/free/

* Microsoft Azure portal link may change due to version upgrading.

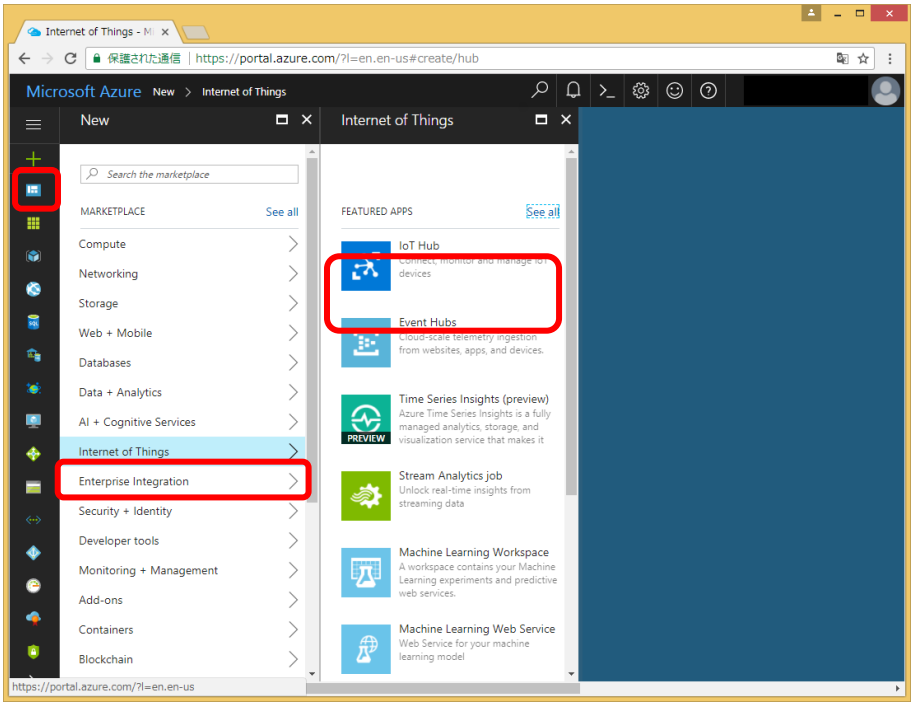
2. Create an Azure IoT Hub

After creating a Microsoft Azure account, a user can sign in to Microsoft Azure portal through the links below.

Azure Portal https://azure.microsoft.com/en-us/features/azure-portal/

* Microsoft Azure portal link may change due to version upgrading.

1 Click the [+] on the left - [Internet of Things] - [IoT Hub] in order and select Azure IoT Hub.

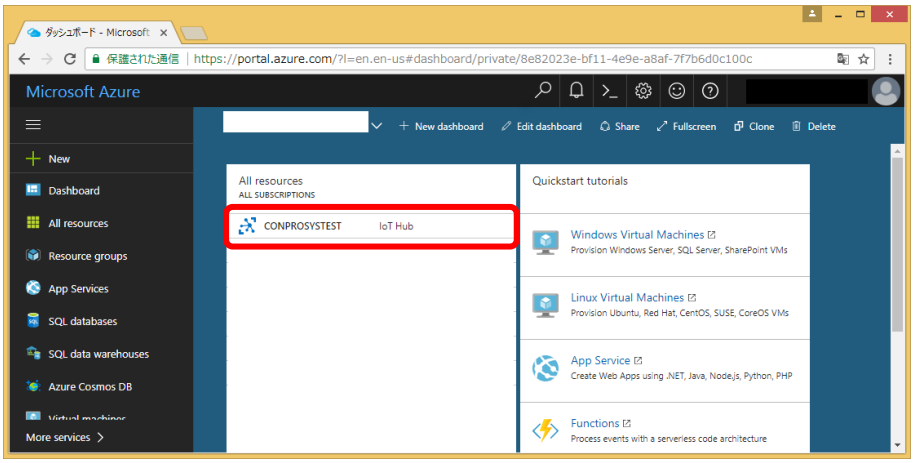


2 Enter an arbitrary name in the Name, and choose Pricing and scale tier as desired, use Location to specify a geographic location, then select either Creating new or Use existing for Resource group.

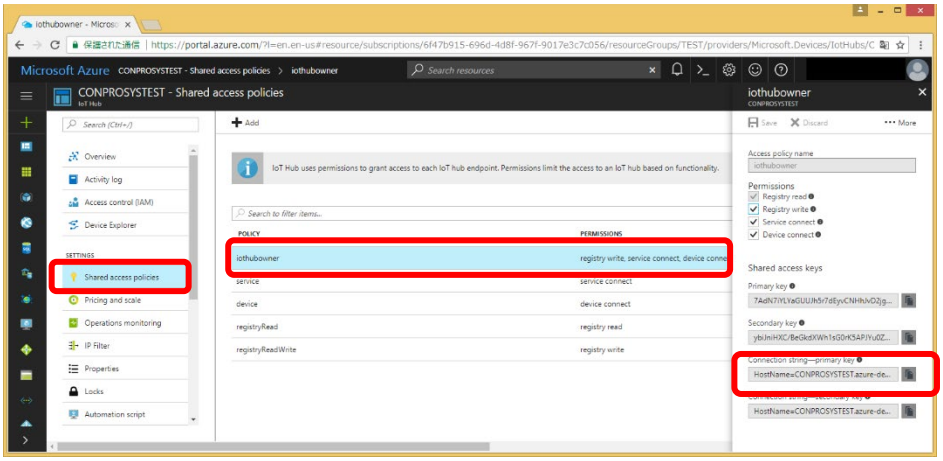
3 Click the [Create] to create an Azure IoT Hub.

* It might take a few minutes to be completed.

4 The created Azure IoT Hub appears on Dashboard. Click it on the Dashboard.



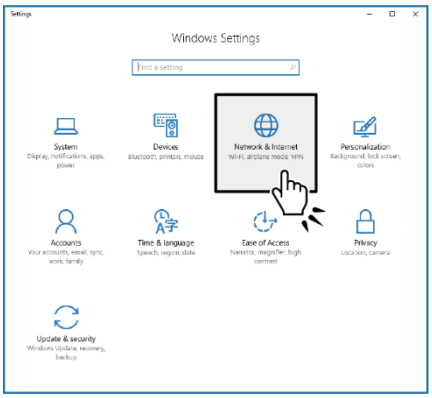
5 Click the [Shared access policies] - [iothubowner] in order, then copy the string displayed in “Connection string - primary key” (It can be copied to the clipboard by clicking the icon on the right).
The “Connection string - primary key” is used in the following section of Obtain a device connection string.



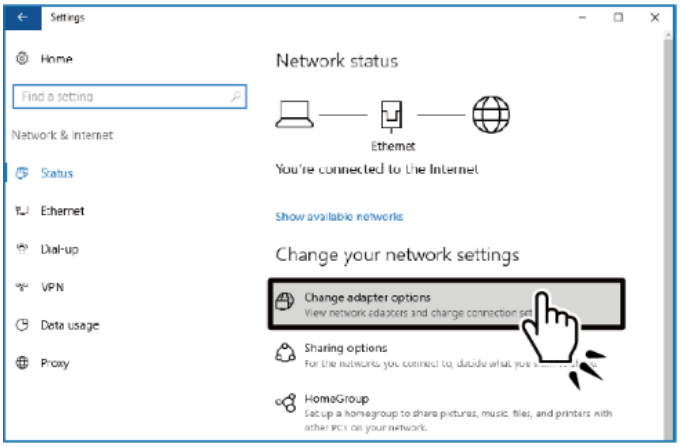
3. Obtain a Device Connection String

This describes how to use the “Device Explorer” tool for creating device string.

1 On the “Windows Settings “screen, click the [Network & Internet].



2 Click the [Network and Sharing Center], and select [Internet Options].

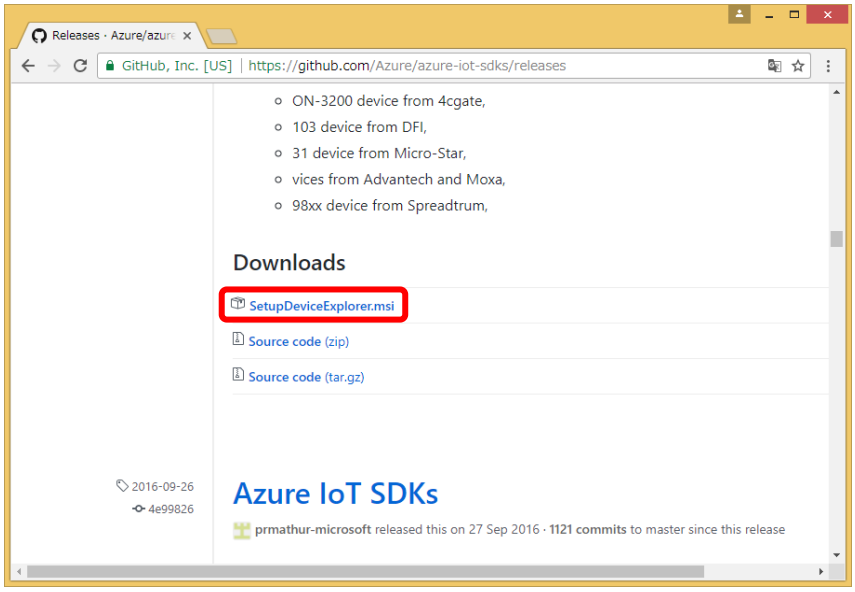


3 The proxy server setting can be checked in [LAN setting] of [Connection] tab from the “Internet Options”. Be certain the proxy server is off or unchecked.

* To use the “Device Explorer” tool, it is necessary for the device to not use the proxy server in a network environment that avoids the proxy server. Windows proxy server setting is applied for “Device Explorer” tool.

4 From the link below, download "SetupDeviceExplorer.msi" into Windows PC.
*The link may change due to Azure IoT SDKs version upgrading.

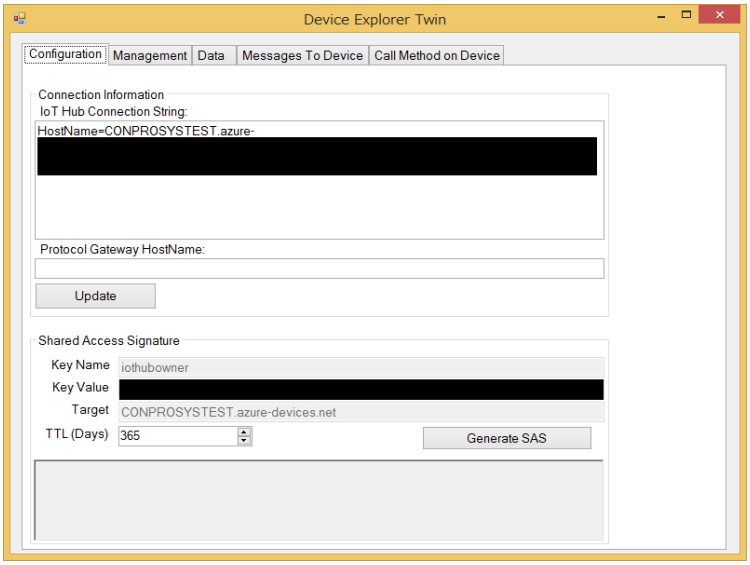
Download https://github.com/Azure/azure-iot-sdks/releases



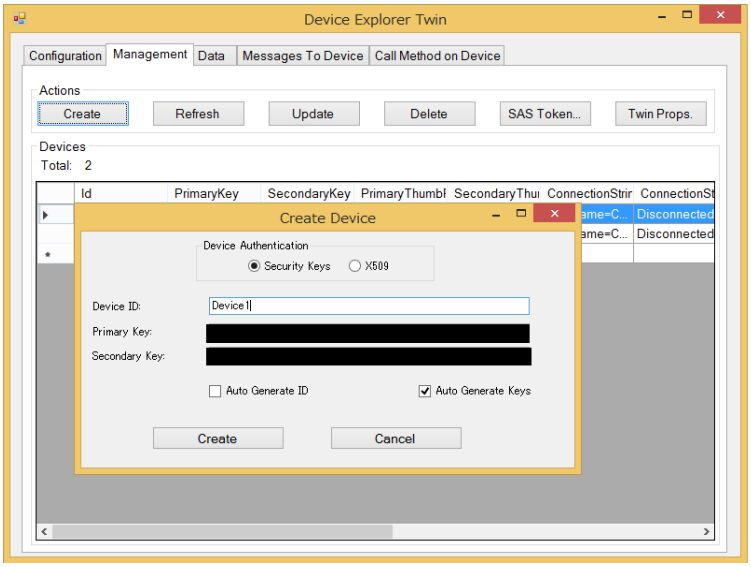
5 Execute the downloaded "SetupDeviceExplorer.msi". "Device Explorer" is installed into Windows PC.

6 Start up the installed "Device Explorer".

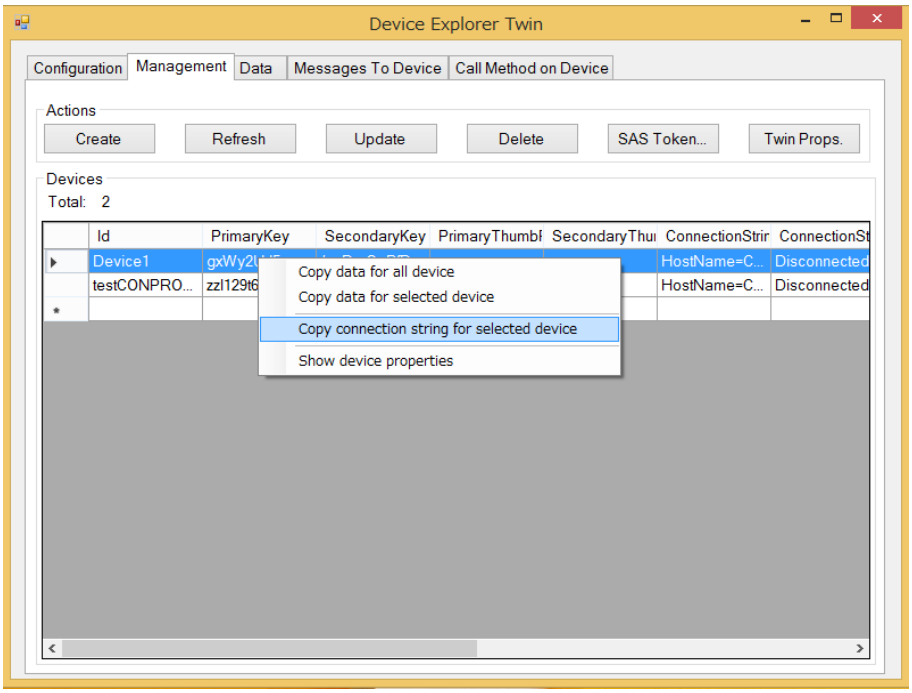
7 Register the connection information of Azure IoT Hub.
In "IoT Hub Connection String" of the [Configuration] tab, paste the "Connection string - primary key" that was obtained when creating Azure IoT Hub. Then click the [Update].



8 Register the device.
Click the [Create] in the [Management] tab. In the “Create Device” dialog box, enter an arbitrary device ID in “Device ID: ”. Select [Security Keys] from “Device Authentication”, then click the [Create].



9 Obtain a connection string to set in the device.
The registered devices are listed in the [Management] tab. Right-click on the device you plan to set a connection string and select [Copy connection string for selected device].
The device connection string is then copied to the clipboard.



10 Device connection string is obtained per device.
To connect a new device, start from (8) Register the device.

3.Azure IoT Hub Setting

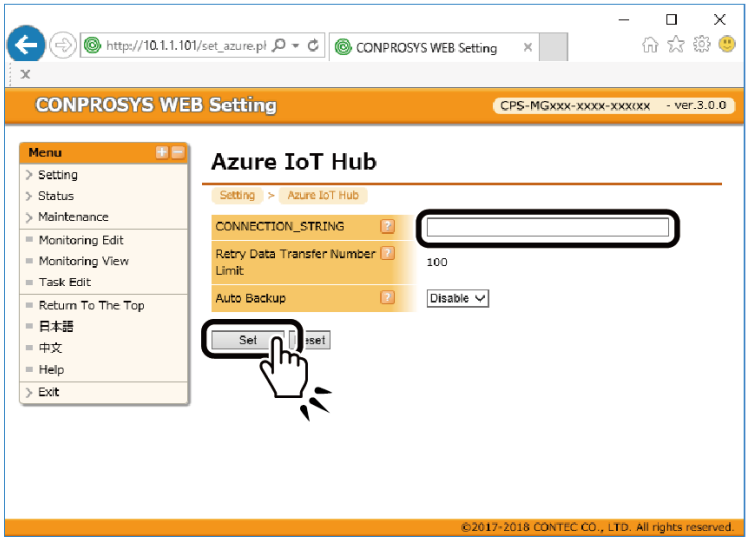
When the cloud service is ready, set the followings to the product.

- Network setting
- SIM card setting (Available with CPS-MG341G-ADSC1-111 and CPS-MG341G-ADSC1-930)
- Azure IoT_Hub setting

* Refer to "**Transferring Measured Data to Server (page 237)**" for the details of Network setting and SIM card setting.

1 Open CONPROSYS WEB Setting through a WEB browser and click the [Azure IoT Hub setting] to open the Azure IoT Hub setting page.

2 Enter the device connection string copied in "Obtain the device connection string" to the "CONNECTION_STRING: String". Then click the [set].

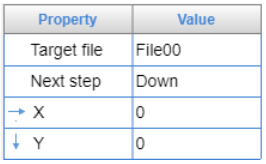


* After completing the settings, go to [Exit] and perform one of the followings [Save and Reboot], [Save and Shut Down], or [Save] to save the settings.

4.Send Azure IoT Task

Open CONPROSYS WEB Setting through a WEB browser and click the [Task Edit] to open Task Edit page.

Place the Send Azure IoT processing task icon. Upon executing the task, this converts the csv file specified in the target file of the property into JSON format and send it to Azure IoT Hub.

Name	Tool Icon	Description	
Send Azure IoT task		Upon executing the task, this converts the csv file specified in the target file of the property into JSON format and send it to Azure IoT Hub.	

1. Sending Format

For the target file (csv file), describe Key in the first line and Values in the following lines.

The target files are converted into JSON format data when they are sent. If several values are described, the data are divided into smaller portions and sent over several times.

◆ Target File (CSV file)

Format

```
Key_Line
Value_Line1
Value_Line2
Value_Line3
```

Data example

```
DateTime,TAG00,TAG01,
201611281551,0,0,
201611281552,0,0,
201611281553,0,0,
  :
  :
```

◆ Send Data (JSON format)

Format

```
{Record_Data1}
{Record_Data2}
{Record_Data2}
```

Data example

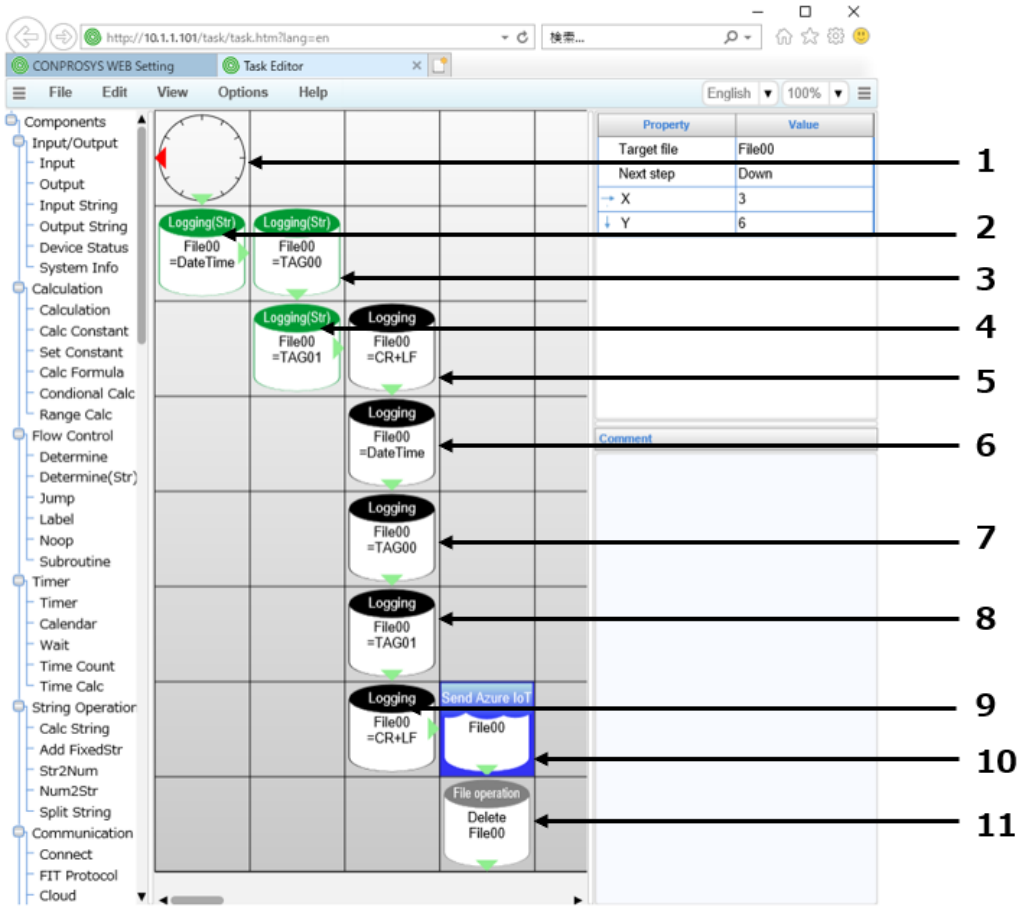
```
{"DateTime":"201611281551","TAG00":"0","TAG01":"0"}
```

```
{"DateTime":"201611281552","TAG00":"0","TAG01":"0"}
```

```
{"DateTime":"201611281553","TAG00":"0","TAG01":"0"}
```

2. Set a Task

Sending target files are created with “Logging” and “Logging (Str)” controls.



1 One action per minute.*
In the example, the following actions are conducted at 00 second per minute.

Property	Value
Hour	*
Min	*
Sec	00
Action	one time
True	Down
False	Left
→ X	0
↓ Y	0

2 Write a key string “DateTime” into File00 (csv file).

Property	Value
Target file	File00
Str	Fixed Value
Fixed value (str)	DateTime
Append char	Comma(,)
Next step	Right
→ X	0
↓ Y	1

3 Write a key string “TAG00” into File00 (csv file).

Property	Value
Target file	File00
Str	Fixed Value
Fixed value (str)	TAG00
Append char	Comma(,)
Next step	Down
→ X	1
↓ Y	1

4 Write a key string “TAG01” into File00 (csv file).

Property	Value
Target file	File00
Str	Fixed Value
Fixed value (str)	TAG01
Append char	Comma(,)
Next step	Right
→ X	1
↓ Y	2

5 Add CR+LF (carriage return) into File00.

Property	Value
Target file	File00
Value	CR+LF
Next step	Down
→ X	2
↓ Y	2

6 Date and Time data are added into File00.

Property	Value
Target file	File00
Value	DateTime
Append char	Comma(,)
Next step	Down
→ X	2
↓ Y	3

7 Write a value "TAG00" into File00 (csv file).

Property	Value
Target file	File00
Value	TAG00
Append char	Comma(,)
Next step	Down
→ X	2
↓ Y	4

8 Write a value "TAG01" into File00 (csv file).

Property	Value
Target file	File00
Value	TAG01
Append char	Comma(,)
Next step	Down
→ X	2
↓ Y	5

9 Add CR+LF (carriage return) into File00.

Property	Value
Target file	File00
Value	CR+LF
Next step	Right
→ X	2
↓ Y	6

10 The contents of File00 are converted in JSON format to send to Azure IoT Hub.

Property	Value
Target file	File00
Next step	Down
X	3
Y	6

11 Delete the File00 (csv file).

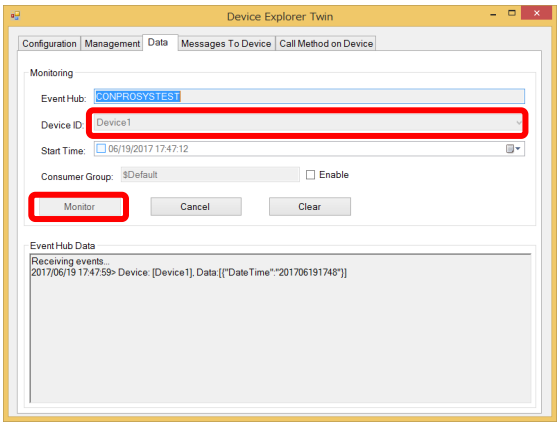
Property	Value
Operation	Delete
From	File00
Next step	Down
X	3
Y	7

* It is recommended to use Timer or Wait for executions. (If conducted without it, data will be sent continuously)

3. Check Sending

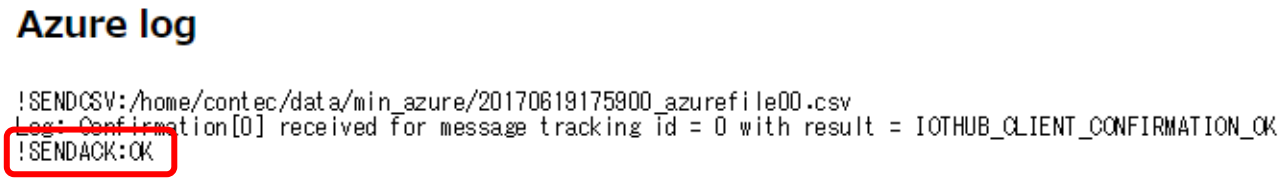
Data sent from the device can be checked in "Device Explorer" tool.

Open the [Data] tab in "Device Explorer" tool. Select the device from "Device ID:" and click the [Monitor]. This enables users to check that the data are being sent to Azure IoT Hub from the device.



4. Check Log

From CONPROSYS WEB Setting, go to [Menu] – [Status], and click the [Log]. In “Azure log”, the sending data log to Azure IoT Hub at the latest time can be checked. “!SENDACK:OK” can be viewed when data has been sent successfully.



5. Check Resending File

When sending data is failed, click the [File view] and select [Resend folder (Azure)]. This enables a user to check the resend files.

Data are converted in JSON format and stored in the resend file.

6. Receiving Format

◆ Receive Data (JSON format)

Format

{
TAG_Data1,
TAG_Data2
:
:
}

Data example

{“TAG00”:”1”,”STAG99”:”TEST”}

*Reception operation with the data example

- Set value 1 into TAG00.
- Set a sting TEST into STAG99.

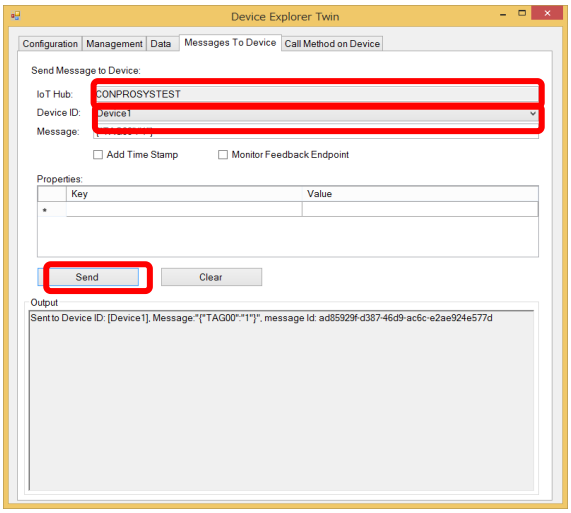
7. Check Receiving

Data can be sent to the device by “Device Explorer” tool.

Open the [Message To Device] tab in “Device Explorer” tool. Select the device from “Device ID:” and describe data in “Message: ”. Click the [Send] to send data to the device.

When the data below is described in “Message:”, 1 is set into TAG00 value.

{“TAG00”:”1”}



MTConnect

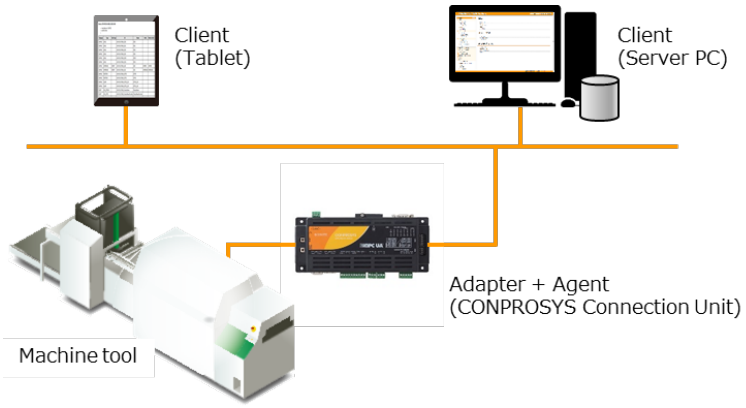
This section describes a communication protocol for machine tools, “MTConnect”.

The list of products with MTConnect

- CPS-MG341G-ADSC1-930
- CPS-MC341-ADSC1-931
- CPS-MG341G5-ADSC1-931

1.MTConnect Outline

- MTConnect is a communication protocol for machine tools, which is standardized by MTConnect Institution.
- For MTConnect, open communication interface with HTTP and XML is used.
- CONPROSYS that contains MTConnect Adapter and Agent can be used by MTConnect supportive client software.



1. MTConnect Overall Specification

Item		Specification
MTConnect version		V1.3
Adapter Specification	TCP Port	7878 (can be changed in WEB menu)
	Communication Protocol	SHDR Ver1.2.0
	Device Identification ID	<Device id="Device serial number">
	Cycle Time	100 msec
Agent Specification	TCP Port	5000 (can be changed in WEB menu)
	AllowPut	True
	ReconnectInterval	10000 msec
	BufferSize	131072
	SchemaVersion	1.3

2. MTConnect DataItem Specification

Category	Name Attribute	Id Attribute *1	Data Type	Data Range
Digital input Bit0 Bit1 Bit2 Bit3	 DI00 DI01 DI02 DI03	 XXX_DI00 XXX_DI01 XXX_DI02 XXX_DI03	Boolean	0, 1
Digital output Bit0 Bit1	 DO00 DO01	 XXX_DO00 XXX_DO01	Boolean	0, 1
Analog input Channel0 Channel1	 AI00 AI01	 XXX_AI00 XXX_AI01	UInt32	0 - 4095 -32768 to +326767 will be used when Industrial Value Conversion is enabled in the Device setting. *2
Counter input Channel0 Channel1	 CNT00 CNT01	 XXX_CNT00 XXX_CNT01	UInt32	0 - 16777215
Counter input clear Channel0 Channel1	 CNT00_CLR CNT01_CLR	 XXX_CNT00_CLR XXX_CNT01_CLR	Boolean	0, 1
Other - battery level Indication	 Battery	 XXX_Battery	Boolean	0, 1
Decimal place tag	DTAG00 - DTAG499	XXX_DTAG00 - XXX_DTAG499	Double	Up to 3 decimal places
Fanuc CNC - Output log - Product name - The number of products - General numerical value 01-10 - General string 01-10	 PrintOutput ProductName ProductResultNumber value01-value10 string01-string10	 XXX_PrintOutput XXX_ProductName XXX_ProductResult Number XXX_value01-value10 XXX_string01-string10	 String String Int32 Double String	Rely on CNC DPRNT description.

*1 XXX in ID attribute indicates the serial number.
The serial number is the 13-digit serial number of this product.
(e.g.) XXX_CNT00 indicates LRKV311708041_CNT00

*2 The converted value will be set in the UInt32 when value used in Industrial Value Conversion is equal to or less than 0.

*Regarding DTAG

DTAG: The TAG area on the VTC is expressed in Double (3 decimal places).

3. An Example Of MTConnect Client Display

This is an example of Agent used through Chrome browser with the definition file of default (samplel.xml).

- Probe command (http://IPaddress:5000/probe)

Device: CPS-MC341-ADSC; UUID: 000

- manufacturer: CONTEC
- serialNumber:
-

Category	Type	Sub Type	Id	Name	Units	Native Units
SAMPLE	LEVEL		LRKV331170804_DI00	DI00		
SAMPLE	LEVEL		LRKV331170804_DI01	DI01		
SAMPLE	LEVEL		LRKV331170804_DI02	DI02		
SAMPLE	LEVEL		LRKV331170804_DI03	DI03		
SAMPLE	LEVEL		LRKV331170804_DO00	DO00		
SAMPLE	LEVEL		LRKV331170804_DO01	DO01		
SAMPLE	AMPERAGE	DIRECT	LRKV331170804_AI00	AI00	AMPERE	AMPERE
SAMPLE	AMPERAGE	DIRECT	LRKV331170804_AI01	AI01	AMPERAGE	AMPERAGE
SAMPLE	POSITION		LRKV331170804_CNT00	CNT00		
SAMPLE	POSITION		LRKV331170804_CNT01	CNT01		
SAMPLE	CLEAR		LRKV331170804_CNT00_CLR	CNT00_CLR		
SAMPLE	CLEAR		LRKV331170804_CNT01_CLR	CNT01_CLR		
EVENT	CNC_STRING		LRKV331170804_ProductName	ProductName		
EVENT	CNC_INT32		LRKV331170804_ProductResultNumber	ProductResultNumber		

- Sample command (http://IPaddress:5000/sample?from=24000&count=10)

Device: CPS-MC341-ADSC; UUID: 000

Device : CPS-MC341-ADSC

Samples

Timestamp	Type	Sub Type	Name	Id	Sequence	Value
2017-08-30T04:59:38.094564Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	24001	385
2017-08-30T04:59:39.044707Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	24002	386
2017-08-30T04:59:39.495983Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	24004	385
2017-08-30T04:59:40.533438Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	24007	386
2017-08-30T04:59:41.553099Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	24009	385
2017-08-30T04:59:37.059484Z	Amperage	DIRECT	AI01	LRKV331170804_AI01	24000	387
2017-08-30T04:59:39.044707Z	Amperage	DIRECT	AI01	LRKV331170804_AI01	24003	388
2017-08-30T04:59:39.495983Z	Amperage	DIRECT	AI01	LRKV331170804_AI01	24005	387
2017-08-30T04:59:40.013811Z	Amperage	DIRECT	AI01	LRKV331170804_AI01	24006	388

- Current command (http://IPaddress:5000/current)

Device: CPS-MC341-ADSC; UUID: 000

Device : CPS-MC341-ADSC

Samples

Timestamp	Type	Sub Type	Name	Id	Sequence	Value
2017-08-30T04:48:02.473328Z	Amperage	DIRECT	AI00	LRKV331170804_AI00	22590	386
2017-08-30T04:48:02.987969Z	Amperage	DIRECT	AI01	LRKV331170804_AI01	22591	388
2017-08-30T04:47:33.424413Z	Position		CNT00	LRKV331170804_CNT00	22532	7
2017-08-30T01:41:23.666616Z	Clear		CNT00_CLR	LRKV331170804_CNT00_CLR	718	0
2017-08-30T04:47:34.023618Z	Position		CNT01	LRKV331170804_CNT01	22538	7
2017-08-30T01:41:23.666616Z	Clear		CNT01_CLR	LRKV331170804_CNT01_CLR	719	0
2017-08-30T04:47:33.424413Z	Level		DI00	LRKV331170804_DI00	22528	1
2017-08-30T04:47:34.023618Z	Level		DI01	LRKV331170804_DI01	22533	1

*Before activating MTConnect, open the CONPROSYS WEB Setting, go to [Menu] – [Service] – [MTConnect], choose the [Enable], and save the settings, then, reboot the controller.

FTP Communication

This section describes FTP communication.

1.FTP Communication Function

The setting below is required for FTP communication.

- FTP Server setting

* From the [Exit] menu, perform [Save and Reboot], [Save and Shut down], or [Save] to save the settings.

The followings describe each setting.

2.FTP Server Settings

Set FTP server.

Open CONPROSYS WEB Setting through a WEB browser and click the [FTP] to open FTP Server page.

Enter FTP server information, and click the “set”.

* See the “**FTP (page 89)**” for FTP server settings.
* By setting the server, the CONPROSYS can communicate with FTP as a client.

After the setting completion, click FTP connection test button to check the communication.

IF the connection is successful, the host folder file and directory information can be viewed.

FTP connection test

```
* Trying 10.1.1.101...
,* Connected to 10.1.1.101 (10.1.1.101) port 21 (#0)
,< 220 Operation successful
,> USER
,< 230 Operation successful
,> PWD
,< 257 "/"
,* Entry path is '/'
,> EPSV
,* Connect data stream passively
,* ftp_perform ends with SECONDARY: 0
,< 229 EPSV ok (|||60805|)
,* Trying 10.1.1.101...
,* Connecting to 10.1.1.101 (10.1.1.101) port 60805
,* Connected to 10.1.1.101 (10.1.1.101) port 21 (#0)
,> TYPE A
,< 200 Operation successful
,> LIST
,< 150 Directory listing
,* Maxdownload = -1
,{ [11 bytes data]
,* Remembering we are in dir ""
,< 226 Operation successful
,* Connection #0 to host 10.1.1.101 left intact
,total 13920
,-rwxrwxrwx 1 0 0 35760 Feb 6 2018 ??.png
,-rwxrwxrwx 1 0 0 14026823 Feb 5 2018 ???????????(???????)MC341??????_2013_20180205.docx
,drwxrwxrwx 4 0 0 32768 Jan 1 1980 SD
,drwxrwxrwx 2 0 0 32768 Jan 31 2018 System Volume Information
,drwxrwxrwx 4 0 0 32768 Feb 1 2018 tmp
,drwxrwxrwx 2 0 0 32768 Dec 8 2017 tools
```

3.File Sending/Receiving Program

Click [Task edit] in the [Maintenance menu] to open the setting page.

* See the "**the sample (10) Receive a file from and send it back to FTP server. (page 199)**" for sending and receiving files by task program.
* Task program is required to send/receive files in FTP communication.

FTP Get task

FTP Get task property

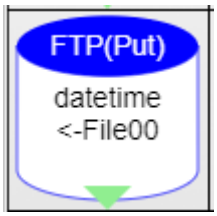
Property		Value
Destination file	(1)	File00
Target file name	(2)	Fixed Value
Fixed Value	(3)	test_recv.csv
Next step		Down
X		0
Y		0

(1) Choose File.

(2) Target file name can be selected from Fixed Value, or STAG/LSTAG.

(3) Specify the target file name if you select the fixed value.

FTP Put task



FTP Put task property

Property		Value
Destination file name	(1)	Fixed Value
Fixed Value	(2)	datetime
Target file	(3)	File00
Next step		Down
X		0
Y		2

(1) Destination file name can be selected from Fixed Value, or STAG/LSTAG.

(2) Specify the destination file name if you select the fixed value.

(3) Choose File

* When using file (File00 - File19) by task, get Ram or SD area before you set up Task edit - Setting - File setting.

MQTT Publish And Subscribe

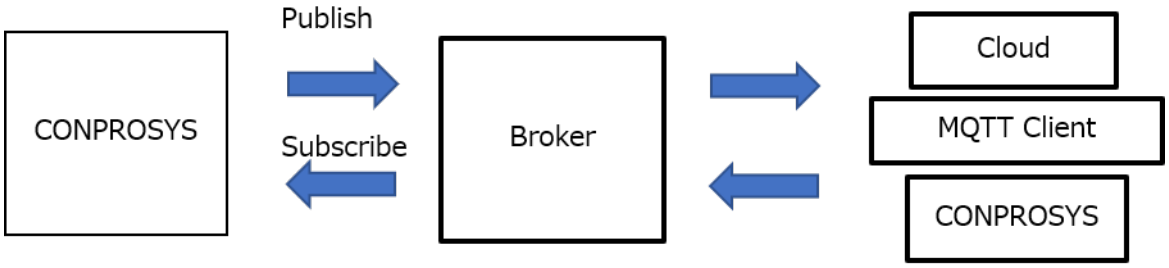
This section describes the settings for sending and receiving data with MQTT protocol.

1.MQTT Outline

This product can be connected to the MQTT-Broker (the server which delievers messages by MQTT) to send/publish or receive/subscribe the measured data with MQTT protocol.

To publish, the measured data can be sent to Cloud or other MQTT clients.

To subscribe, the measured data can be written into the area such as tag (internal variables).



- The tag values edited in the CONPROSYS HMI or the CONPROSYS VTC can be sent.
- The values of the device status can be sent.
- By receiving the tag values, the changed values can be viewed on the CONPROSYS HMI.
- By receiving the values of the device status, device can be controlled.
- The measured data can be sent to Cloud services such as Azure IoT Hub or AWS IoT.
- Data can be sent and received between the CONPROSYS controllers.

2.Required Settings For MQTT Publish And Subscribe

Configure the following items on the CONPROSYS WEB Setting for MQTT Publish/Subscribe with the product.

- MQTT Connection
- MQTT Publish
- MQTT Subscribe
- Service - “MQTT Client” -[Enable]
- Time *1
- Network settings *1

*1 : Refer to “**Transferring Measured Data to Server (page 237)**” for Time and Network setting.

Refer to “**Function Details (page 34)**” for further details on each setting item.

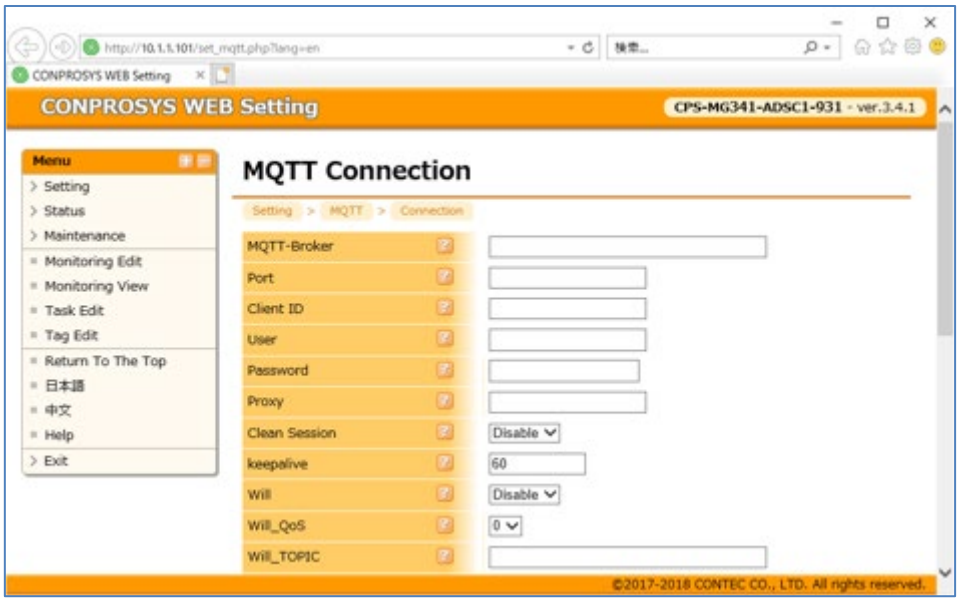
Refer to “**MQTT Publish And Subscribe Data Format (page 399)**” for further details on Publish and Subscribe data format.

After you have completed the settings, save them to ROM in the controller and reboot the product.

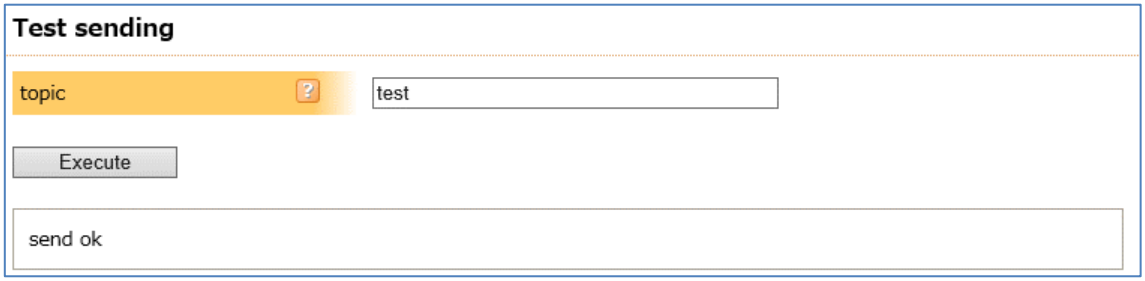
3.MQTT Connection

Set up and check MQTT Connection.

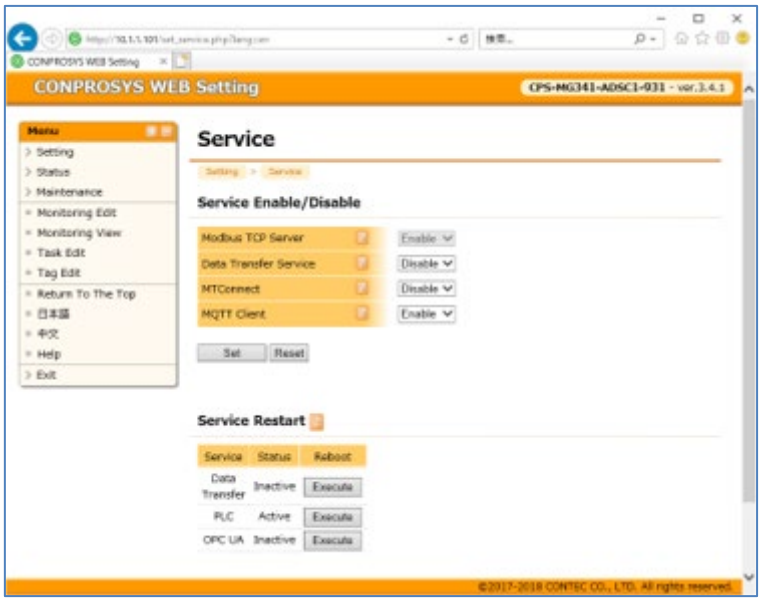
1 On the CONPROSYS WEB Setting, go to [MQTT] -[Connection] from the Setting menu. Enter the host name or IP address of the connecting Broker prepared separately in “MQTT-Broker”.
Enter the port number of the connecting Broker in the “Port”.
Enter the necessary information for other items.　After you enter them, click the “Set”.



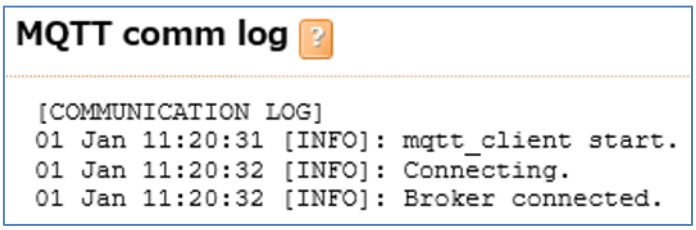
2 On the Test sending, enter a sting in the “topic” and click the [Execute] button. The string “CONPROSYS_MQTT_TEST_MESSAGE” can be sent to the connecting Broker.
Enter a sting such as 'test' in the “topic” as sending destination.
The “send ok” can be viewed when sending has succeeded.
An error message starting with “Error: ” can be viewed when sending has failed.
Check the settings or connection status again.



3 When the Test sending has been completed, go to [Service] from the Setting on the CONPROSYS WEB Setting. Select the [Enable] in the “MQTT Client” and click the “Set”. Save the settings to ROM of the controller and reboot the product.



4 When the product is rebooted, go to [Status] - [log] on the CONPROSYS WEB Setting.
See the [COMMUNICATION LOG] in [MQTT comm log].
If “[INFO]: Broker connected.” is displayed, it indicates that the connection has succeeded.
If the connection has failed, an error message starting with “Error: “ is displayed.
Check the settings or connection status again.



5 After the connection success, the contents configured in MQTT Publish are published and the details set in MQTT Subscribe are subscribed. If there are errors in MQTT Publish or Subscribe, an error message will be displayed on [COMMUNICATION LOG] in [MQTT comm log] from [Status] - [log]on the CONPROSYS WEB Setting.
The communication log can be viewed on [COMMUNICATION LOG].
The conversion logs for PUBLISH and SUBSCRIBE can be viewed on [PUBLISH LOG] and on [SUBSCRIBE LOG]. Publishing and subscribing will be logged per Cloud Key in the event of an error.
Refer to “**MQTT Communication Log (page 404)**” for further details on log.

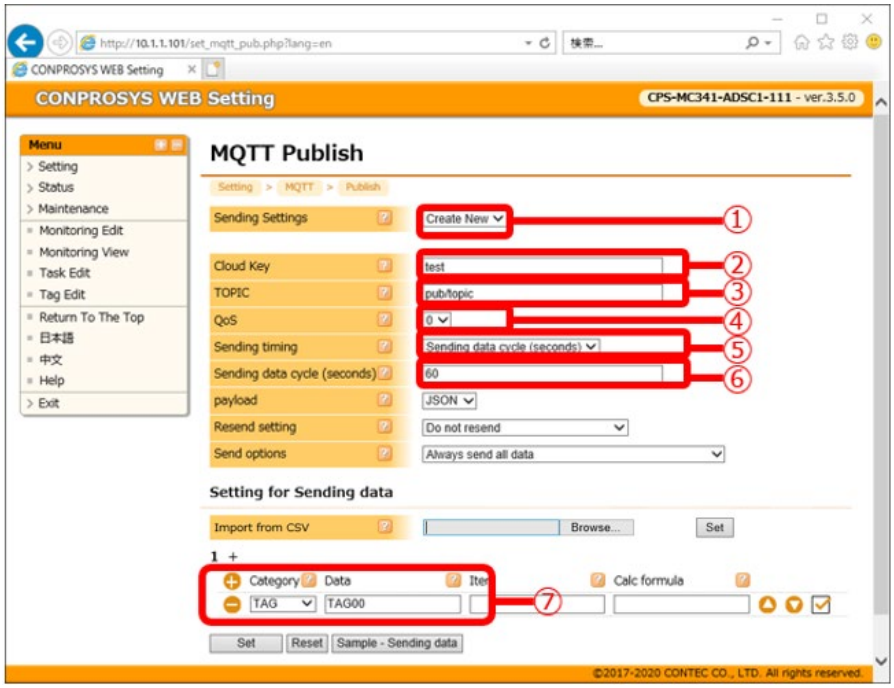
4. Examples for MQTT Publish and Subscribe

The following table lists samples of MQTT Publish and Subscribe.

1. Publish (1)

◆ Sending TAG00 values per 60 seconds to TOPIC “pub/topic”

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.



No.	Item	Example	Description
1	Sending Settings	Create New	Select the “Create New” for a new sending setting. Select the Cloud Key to edit the setting previously created.
2	Cloud Key	test	Set the string that is included in the sending data “CK”.
3	TOPIC	pub/topic	Set up sending TOPIC.
4	QoS	0	Set QoS value of MQTT by selecting 0,1, or 2.
5	Sending timing	Sending data cycle(seconds)	Select timing to send data.
6	Sending data cycle (seconds)	60	Decide the sending cycle in seconds.
7	Setting for Sending data	Category “TAG” Data “TAG00”	Set sending tags or devices.

After setting the items, click the “Set”. Save the settings to ROM of the controller and reboot the product.

After the items listed above are entered, the following contents are sent at every specified timing (60 seconds).

Publish sample

```
{
	“UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
	“T”: “2010-01-01T00:00:00.000Z”,
	“SN”: “product serial number”,
	“CK”: “test”,
	“DATA”: [
		{
			“ID”: “TAG00”,
			“V”: “VALUE”
		}
	]
}
```

2. Publish (2)

◆ Deciding the timing to send data by TASK (CONPROSYS VTC)

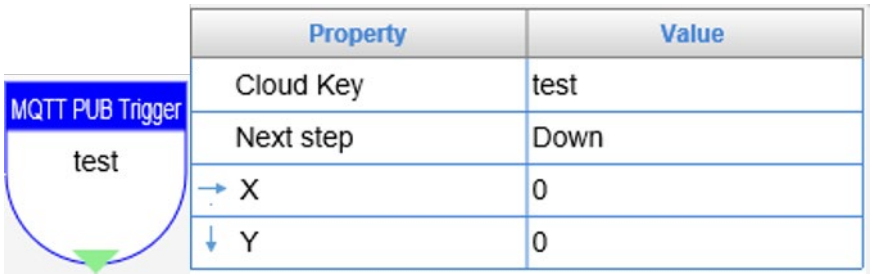
Configure the settings in the [Publish] and [Task Edit] of MQTT menu on the CONPROSYS WEB Setting.

1 [Go to [MQTT] - [Publish], and select the "Task Trigger" in "Sending timing".
As for the other items, set the same contents listed in "**Publish (1) (Page 301)**".

Item	Example	Description
Sending timing	Sending data cycle (seconds)	Send data at every specified number of seconds.
	Task Trigger	Send data when the task "MQTT PUB Trigger" is executed.

2 Go to Task Edit, and place the "MQTT PUB Trigger" task at the timing you wish to send.

3 In the "MQTT PUB Trigger" task, enter the name for the Cloud Key in Property.
"test" is set for this example.



Publish will be available by saving the settings to ROM and rebooting the product.

After the items listed above are entered, the following contents are sent at every passing through the "MQTT PUB Trigger" timing.

Publish sample

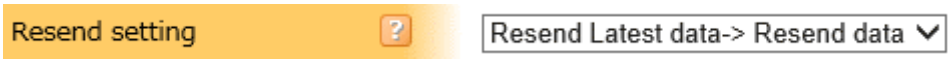
```
{
    “UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
    “T”: “2010-01-01T00:00:00.000Z”,
    “SN”: “product serial number”,
    “CK”: “test”,
    “DATA”: [
        {
            “ID”: “TAG00”,
            “V”: “VALUE”
        }
    ]
}
```

3. Publish (3)

◆ Storing sending data on the product when disconnecting from the Broker

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.

1 Configure the "Resend" setting as either " Latest data -> Resend data" or "Resend data -> Latest data".
As for the other items, set the same contents listed in "**Publish (1) (Page 301)**".
Save the settings to ROM of the controller and reboot the product.



Item	Example	Description
Resend setting	Do not resend	Data are not stored.
	Resend Latest Data->Resend data	Each time the latest data are sent at the specified cycle first, then the resend data will be sent. If the specified sending cycle comes while resending data, the latest data will be sent first, then resending data restarts.
	Resend Resend data->Latest Data	The resend data are sent first, then the latest data will be sent. If the specified sending cycle comes while resending data, the latest data will be added to the end of the resending data. Sending timing is maintained in chronological order.

2 When the product is disconnected from the Broker, resending data are stored and the controller attempts to reconnect to the Broker. After reconnecting with the Broker, the stored data are sent from the oldest one in order.

After the items listed above are entered and when connected to the Broker, the following contents are sent at every specified timing (60 seconds).

After the items listed above are entered and the controller is connected to the Broker, the following contents are sent at every specified timing (60 seconds).

Resending data can be stored for three days up to 16MB. If the stored data exceeds 16MB, the oldest data in each Cloud Key will be deleted.

Publish sample

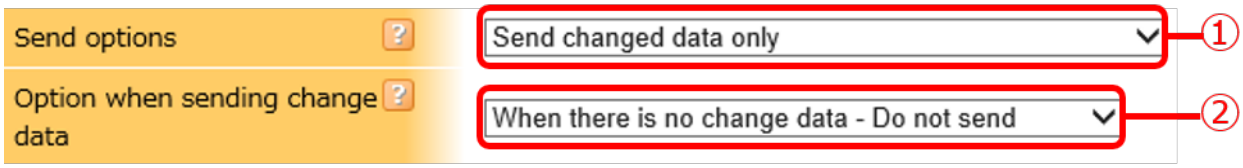
```
{
	“UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
	“T”: “2010-01-01T00:00:00.000Z”,
	“SN”: “product serial number”,
	“CK”: “test”,
	“DATA”: [
		{
			“ID”: “TAG00”,
			“V”: “VALUE”
		}
	]
}
```

Refer to “**MQTT Publish And Subscribe Data Format (page 399)**” for details of Resend data format.

4. Publish (4)

◆ Sending data when only there is a change in the contents

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.



No.	Item	Example	Description
1	Send options	Always send all data	All data are always sent even when there are no changes in data.
		Send changed data only	When there are no changes in data after the previous sending time, those data will not be included in the sending strings.
		Send changed data only Send all data in (1,5,10,30,60)	After the set time has elapsed, all data will be sent even if there are no changes in data.
2	Option when sending change data	When there is no change data Do not send	Data are not sent when there are no changes in data.
		When there is no change data Send header only	Only header is sent when there are no changes in data.

Here, set the “TAG00” and “TAG01” to be sent in [Setting for Sending data].

As for the other items, set the same contents listed in “**Publish (1) (Page 301)**”.

Save the settings to ROM of the controller and reboot the product.

The following contents are sent at every specified timing (60 seconds) when the “Always send all data” is selected in No. 1 “Send options”.

Always send all data sample

```
{
	“UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
	“T”: “2010-01-01T00:00:00.000Z”,
	“SN”: “product serial number”,
	“CK”: “test”,
	“DATA”: [
		{
			“ID”: “TAG00”,
			“V”: “VALUE”
		},
		{
			“ID”: “TAG01”,
			“V”: “VALUE”
		}
	]
}
```

When the “Send changed data” is selected in No. 1 “Send options”, the following contents are sent if only TAG01 is changed after the previous sending time.

When there are no changes in data, they are not sent.

Send changed data (TAG01) only sample

```
{
	“UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
	“T”: “2010-01-01T00:00:00.000Z”,
	“SN”: “product serial number”,
	“CK”: “test”,
	“DATA”: [
		{
			“ID”: “TAG01”,
			“V”: “VALUE”
		}
	]
}
```

When the “Send header only” is selected in No. 2 “Option when sending change data”, the following contents are sent if there are no changes in all data after the previous sending time.

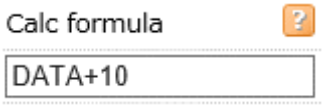
Send header only data sample

```
{
	“UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
	“T”: “2010-01-01T00:00:00.000Z”,
	“SN”: “product serial number”,
	“CK”: “test”,
	“DATA”: [
	]
}
```

5. Publish (5)

◆ Calculating data values and sending the results

Configure the “Cal formula” setting in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.



Enter “Cal formula” per data.

When “DATA+10” is set, the data values will be increased by +10 upon publishing.

- Available symbols or marks

+,-,*,/,%,|,&,^,<,<=,==,!=,>=,>,(,),:,?,<<,>>,!,&&,||

- Available data

TAG,MODBUS,DEVICE,DATA (Selected data)

(The selectable items from “Data” in the [Setting for Sending data] can be used.)

Sample

- DATA*TAG00
- DATA+10
- MODBUS0001<<1

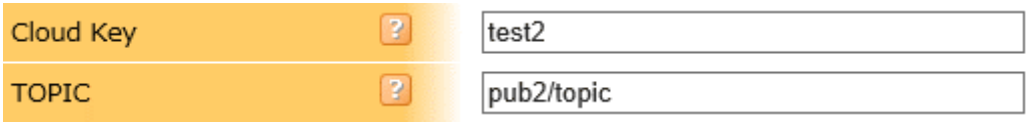
6. Publish (6)

◆ Adding the Sending Settings to send data to more than one TOPIC

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.

1 Select the “Create New” for “Sending Settings” (Up to 10 settings can be created).

2 Set strings for “Cloud Key” and the “TOPIC” that are different from the previously set ones.
For this example, enter [test2] for the “Cloud Key”, and [pub2/topic] for the “TOPIC”.
As for the other items, set the same contents listed in “**Publish (1) (Page 301)**”.
Save the settings to ROM of the controller and reboot the product.



After the items listed above are entered, the following contents as well as the previously set ones are sent at every specified timing (60 seconds) to TOPIC [pub2/topic].

Publish sample

```
{
    “UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
    “T”: ”2010-01-01T00:00:00.000Z”,
    “SN”: ””product serial number “,
    “CK”: “test2”,
    “DATA”: [
        {
            “ID”: “TAG00”,
            “V”: “VALUE”
        }
    ]
}
```

7. Publish (7)

◆ Exporting the Setting for Sending data to a file and importing it into other sending settings.

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.

1 In the [Sending Settings], select cloud key to export the Setting for Sending data. In this example, select the [test] as performed in the "**Publish (1)(page301)**".

2 Click the [Execute] button of the [Export to CSV] to export the Setting for Sending data to the following CSV file (letters/CR code: crlf with utf-8-bom) and to be download.
The file name to be exported is output in the form of [(Cloud key_)pubdata.csv].
It is [test_pubdata.csv] in this example.

An example of CSV file

```
DATA,NAME,TYPE,CALC,USE
TAG00,,0,,1
```

Name	Description
DATA	Data ID (TAG,MODBUS,DEVICE).
NAME	Item name
TYPE(For M2M Gateway only)	This is the settings configured in PLC data type. When the category is not selecting PLC : 0 When the category is selecting PLC : 0 : Unsigned 16bit data 1 : Signed 16bit data 2 : Unsigned 32bit data (BE) 3 : Signed 32bit data (BE) 4 : Unsigned 32bit data (LE) 5 : Signed 32bit data (LE) 6 : Floating-point 32bit data (BE) 7 : Floating-point 32bit data (LE)
CALC	Cal formula
USE	This is the enabled or disabled data settings configured by checking off the box. 1 will be written when data are enabled and 0 will be written when data are disabled. The disabled data are not included in the sending payload.

3 Select Sending Settings to import the Setting for Sending data. It is selectable from the present settings or a new setting. In this example, [test2] is selected.

4 4 Select CSV file from the [Import from CSV] and click the [Set] button. The Setting for Sending data of CSV file will be saved.

8. Publish (8)

◆ Setting data in any format in STAG to send

Configure the settings in the [Publish] of MQTT menu on the CONPROSYS WEB Setting.

1 Select "STAG" for "payload". Select STAG number for "STAG" to send data.
As for the other items, set the same contents listed in "**Publish (1) (Page 301)".**

Item	Example	Description
payload	JSON	Data specified in CONPROSYS WEB Setting are dynamically changed into JSON format to be sent.
	STAG	Value of STAG specified is sent.
STAG	STAG00	Specify the STAG number to send data.

After the items listed above are entered, the following contents are sent at every specified timing (60 seconds).

Publish sample

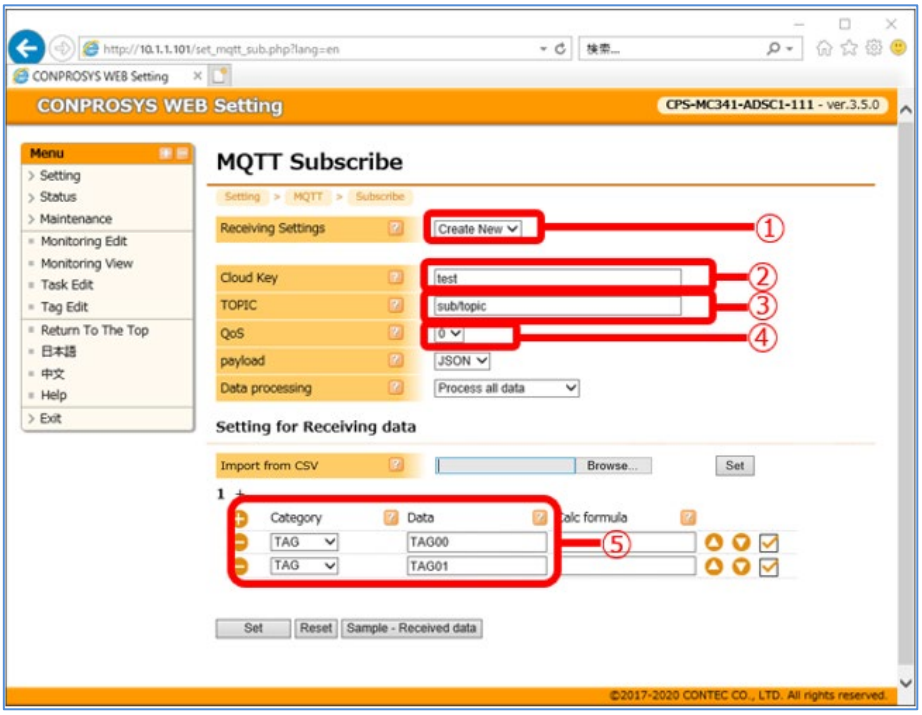
```
2000/01/01 00:00:00,CONPROSYS
```

* In this sample, the string "2000/01/01 00: 00: 00, CONPROSYS" is set into STAG00 in Task Edit.

9. Subscribe (1)

◆ Writing the data from TOPIC “sub/topic” into TAG00 and TAG01

Configure the settings in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.



No.	Item	Example	Description
1	Receiving Settings	Create New	Select the “Create New” for a new receiving setting. Select the Cloud Key to edit the setting previously created.
2	Cloud Key	test	Set the string that is included in the receiving data “CK”.
3	TOPIC	sub/topic	Set up receiving TOPIC.
4	QoS	0	Set QoS value of MQTT by selecting 0,1, or 2.
5	Setting for Receiving data	Category “TAG” Data “TAG00”,”TAG01”	Set receiving tags or devices.

After setting the items, click the “Set”. Save the settings to ROM of the controller and reboot the product.

After the items listed above are entered, each “VALUE” will be written into TAG00 and TAG01 when the following contents are received.

Subscribe sample

```
{
    “CK”: “test”,
    “DATA”: [
        {
            “ID”: “TAG00”,
            “V”: “VALUE”
        },
        {
            “ID”: “TAG01”,
            “V”: “VALUE”
        }
    ]
}
```

10. Subscribe (2)

◆ Checking time stamp and processing only the data that are new since the previous processing

Configure the settings in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.

1 Select the “Process only new data” for “Data Processing”.As for the other items, set the same contents listed in “**Subscribe (1) (Page 315)**”.
Save the settings to ROM of the controller and reboot the product.

Item	Example	Description
Data processing	Process all data	Process all of the received data.
	Process only new data	Process only new data since the previous processing. *

* Receiving data should contain time stamp (ISO8601 extended form). Perform processing if there is no time stamp. If no time zone is specified, processing will be performed with the time zone set in the product.

[Time stamp format (ISO8601 extended form)] :

- “T”:”YYYY-MM-DDThh:mm:ss.sss”
- “T”:”YYYY-MM-DDThh:mm:ss.sss+timezone”

After the items listed above are entered, the following contents will be received and each “VALUE” will be written into TAG00 and TAG01 when the time stamp is newer than the data processed last time.

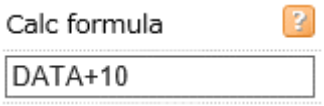
Subscribe sample

```
{
    “CK”: “test”,
    “T”: “2010-01-01T00:00:00.000Z”,
    “DATA”: [
        {
            “ID”: “TAG00”,
            “V”: “VALUE”
        },
        {
            “ID”: “TAG01”,
            “V”: “VALUE”
        }
    ]
}
```

11. Subscribe (3)

◆ Receiving data and setting the calculated results in tag

Configure the “Cal formula” setting in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.



Enter “Cal formula” per data.

When “DATA+10” is set, the data values will be increased by +10 upon subscribing.

- Available symbols or marks

+,-,*,/,%,|,&,^,<,<=,==,!=,>=,>,(,),:,?,<<,>>,!,&&,||

- Available data

TAG,MODBUS,DEVICE,DATA(Selected data)

(The selectable items from “Data” in the [Setting for Subscribing data] can be used.)

Sample

- DATA*TAG00
- DATA+10
- MODBUS0001<<1

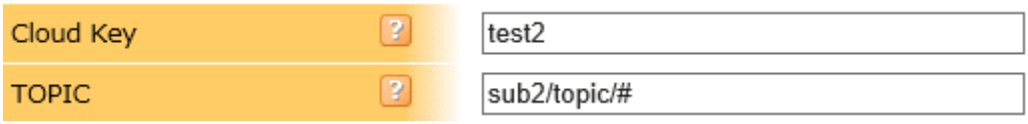
12. Subscribe (4)

◆ Adding the Receiving Settings to receive data from more than one TOPIC

Configure the settings in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.

1 1 Select the “Create New” for “Receiving Settings” (Up to 10 settings can be created).

2 Set strings for “Cloud Key” and the “TOPIC” that are different from the previously set ones.
For this example, enter [test2] for the “Cloud Key”, and [sub2/topic/#] for the “TOPIC”.
MQTT Wildcard [+] and [#] are usable for “TOPIC” in the Receiving Setting.
As for the other items, set the same contents listed in “**Subscribe (1) (page 315)**”
Save the settings to ROM of the controller and reboot the product.



After the items listed above are entered, each “VALUE” will be written into TAG00 and TAG01 when the following contents as well as the previously set ones are received in TOPIC [sub2/topic/#].

Subscribe sample

```
{
    “CK”: “test2”,
    “DATA”: [
        {
            “ID”: “TAG00”,
            “V”: “VALUE”
        },
        {
            “ID”: “TAG01”,
            “V”: “VALUE”
        }
    ]
}
```

13. Subscribe (5)

◆ Exporting the Setting for Receiving data to a file and importing it into other receiving settings

Configure the settings in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.

1 In the [Receiving Settings], select cloud key to export the Setting for Receiving data. In this example, select the [test] as performed in the "**Subscribe (1)(page315)**".

2 Click the [Execute] button of the [Export to CSV] to export the Setting for Receiving data to the following CSV file (letters/CR code: crlf with utf-8-bom) and to be download.
The file name to be exported is output in the form of [(Cloud key_)subdata.csv].
It is [test_subdata.csv] in this example.

An example of CSV file

```
DATA,TYPE,CALC,USE
TAG00,0,,1
TAG01,0,,1
```

Name	Description
DATA	Data ID (TAG,MODBUS,DEVICE).
TYPE (For M2M Gateway only)	This is the settings configured in PLC data type. When the category is not selecting PLC : 0 When the category is selecting PLC : 0 : Unsigned 16bit data 1 : Signed 16bit data 2 : Unsigned 32bit data (BE) 3 : Signed 32bit data (BE) 4 : Unsigned 32bit data (LE) 5 : Signed 32bit data (LE) 6 : Floating-point 32bit data (BE) 7 : Floating-point 32bit data (LE)
CALC	Cal formula
USE	This is the enabled or disabled data settings configured by checking off the box. 1 will be written when data are enabled and 0 will be written when data are disabled. This is not performed If disabled data are received.

3 Select Receiving Settings to import the Setting for Receiving data. It is selectable from the present settings or a new setting. In this example, [test2] is selected.

4 Select CSV file from the [Import from CSV] and click the [Set] button. The Setting for Receiving data of CSV file will be saved.

14. Subscribe (6)

◆ Receiving data in any format to set in STAG

Configure the settings in the [Subscribe] of MQTT menu on the CONPROSYS WEB Setting.

1 Set "payload" for "STAG". Select the STAG number to write the payload that is received. Leave the Cloud key blank, and as for the other items, set the same contents listed in "**Subscribe (1) (Page 315)**".

Item	Example	Description
payload	JSON	Write received JSON string into data that are specified in CONPROSYS WEB Setting.
	STAG	Write received data into specified STAG.
STAG	STAG00	Select the STAG to write payload that is received.

After the items listed above are entered, received strings will be written into "STAG00".

Subscribe sample

```
2000/01/01 00:00:00,CONPROSYS
```

*In this sample, the string "2000/01/01 00: 00: 00, CONPROSYS" is written into "STAG00".

5.Examples for MQTT Application

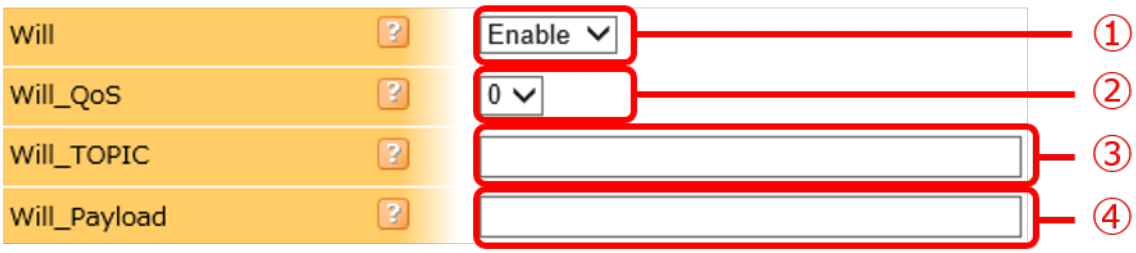
The following table lists samples of MQTT Application

Sample	Description	Page
Connection (1)	Detecting disconnection between the product and the Broker	Page 325
Connection (2)	Encrypting Publish or Subscribe Strings	Page 326
Other (1)	Obtaining “MQTT Result” and “MQTT ErrorTime” by Task (CONPROSYS VTC)	Page 328

1. Connection (1)

◆ Detecting disconnection between the product and the Broker

Configure the “Will” settings in the [Connection] of MQTT menu on the CONPROSYS WEB Setting.
After you have completed the settings, save them to ROM in the controller and reboot the product.



No.	Item	Description
1	Will	Set Will to Enable.
2	Will_QoS	Select MQTT QoS value from 0,1, or 2.
3	Will_TOPIC	Set TOPIC to send.
4	Will_Payload	Set the string to send.

When the Will is enabled, the specified string in the “Will_Payload” will be sent to the “Will_TOPIC”.

Informing other CONPROSYS controller connected with the same Broker of disconnection.

Follow the steps below to inform the disconnection to other CONPROSYS.

1 Set an arbitrary Cloud Key, any TOPIC, and arbitrary receiving data for “MQTT Subscribe” setting in other CONPROSYS controller. “TAG00” is used in this example.

2 Set the TOPIC specified in other CONPROSYS to the “Will_TOPIC” of this contoller.

3 Set the “Will_Payload” with the following contents.

An example of Will_Payload (JSON format)

```
{“CK”:”Cloud Key” ,”DATA”:[{ “ID”:”TAG00” , “V”: 1}]}
```

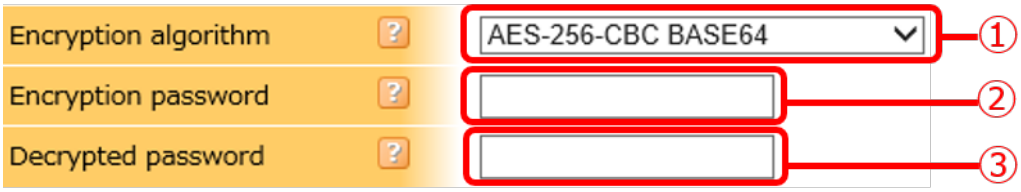
When the product is disconnected from the Broker, 1 will be written into TAG00 of other CONPROSYS.

2. Connection (2)

◆ Encrypting strings to Publish or Subscribe

Configure the settings in the [Connection] of MQTT menu on the CONPROSYS WEB Setting.

After you have completed the settings, save them to ROM in the controller and reboot the product.



No.	Item	Description
1	Encryption algorithm	Select “AES-256-CBC BASE64” or “AES-256-CBC BASE64 NOSALT”.
2	Encryption password	Set an arbitrary password to encrypt a sending string.
3	Decrypted password	Set an arbitrary password to receive an encrypted string.

Refer to “**MQTT Publish And Subscribe Data Format (page 399)**”for the publish/subscribe data format of the encrypted strings

Sending and receiving encrypted strings between the CONPROSYS controllers

1 With the sending side of the CONPROSYS controller, set the “Encryption algorithm” and the “Encryption password” in [MQTT Connection].

2 With the receiving side of the CONPROSYS controller, set the same “Encryption algorithm” of the sending side in [MQTT Connection]. Set the password decided in the “Encryption password” of the sending side to “Decrypted password”.

After the items listed above are entered, the following contents are sent at every specified timing from the sending side of the controller.

On the receiving side of the controller, the inside of the “E_DATA” key is decrypted with the encryption algorithm of the “ALG” key in the sending data.

Publish sample

```
{
        “UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
        “T” : “2010-01-01T00:00:00.000Z”,
        “SN”: “Serial number of the product”,
        “CK”: “Cloud Key”,
        “ALG”: “Encryption algorithm”,
        “E_DATA”: “XXXXXXXXXXXXXX”
}
```

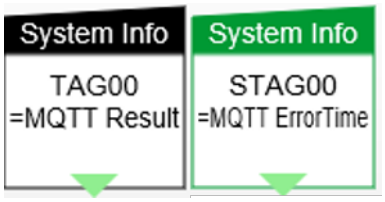
* When there is no “ALG” key in the sending data, the inside of the “E_DATA” key is decrypted with the “encryption algorithm” set in the receiving side of the CONPROSYS.
* The contents of “DATA” key will be processed when there is neither “ALG” key nor “E_DATA” key and there is unencrypted “DATA” key in the sending data.

3. Other (1)

◆ Obtaining “MQTT Result” and “MQTT ErrorTime” by Task (CONPROSYS VTC)

Configure the settings in the [Task Edit] on the CONPROSYS WEB Setting.

After you have completed the settings, save them to ROM in the controller and reboot the product.



In the “System Info” task, set “MQTT Result” and “MQTT ErrorTime” for the “System Info”. Place the set “System Info” task at the timing you wish to obtain.

Property	Value
Tag ID	TAG00
System Info	MQTT Result
Next step	Down
→ X	0
↓ Y	0

Property	Value
Tag ID	STAG00
System Info	MQTT ErrorTime
Next step	Down
→ X	0
↓ Y	0

For the “MQTT Result”, “0” will be written as a failure, and “1” will be written as a success of communication with the Broker into the specified tag.

For the “MQTT ErrorTime”, the time when communication with the connecting Broker failed will be written into the specified tag.

The time format is “YYYYMMDDhhmmss”.

BACnet

This section describes the specifications and settings.

1.BACnet Basic Information

The following is the main information on BACnet for this product.

Item	Description
Vendor Name	Contec Co., Ltd.
Product Name	CONPROSYS
BACnet Protocol Version	1
BACnet Protocol Revision	19, BACnet-2016
BACnet Firmware Revision	Indicate CONPROSYS firmware version
BACnet Application Software Version	Will be changed by update and fix the BACnet application
Server / Client	Server Function, Client Function

◆ BACnet Service

The following is a list of properties of the BACnet Service supported by the product.

Service Name	Initiate	Execute	Description
ReadProperty	-	Yes	Request to read a single property of a single object
ReadPropertyMultiple	-	Yes	Request to read a single or multiple objects and a single or multiple properties
WriteProperty	-	Yes	Request to write a single property of a single object
WritePropertyMultiple	-	Yes	Request to write a single or multiple objects and a single or multiple properties
SubscribeCOV(*1)	-	Yes	Register to receive a notification of changed a specific property of an object
ConfirmedCOVNotification	Yes	-	Send a notification of changed property to a registrant. Request to send ACK at the same time.
UnconfirmedCOVNotification	Yes	-	Send a notification of changed property to a registrant. Not Requesting to send ACK at the same time.
Who-Is	-	Yes	Verify existence of devices on the network
I-Am	Yes	-	Reply to Who-Is service
Who-Has	-	Yes	Verify objects the device has
I-Have	Yes	-	Reply to Who-Has Service

*1 The following are the SubscribeCOV limits supported by this product.

COV subscriptions	maximum 200
COV Number of Clients	maximum 16
Lifetime	maximum infinite

◆ BACnet Configuration File Format

The format of the configuration file to be imported from the web configuration screen is shown below.

JSON Key (Physical Name)	Logical Name	Data Type	Required	Description
net_iface	Network Interface	String	○	LAN A: LAN B: only for 2lan type WLAN: USB wireless LAN LTE: only for LTE model
net_port	IP Port	Number	○	
net_number	Network Number	Number		
device_id	BACnet Device ID	Number	○	
device_name	Device Name	String	○	MAX 32 characters
device_dsc	Deggggvice Description	String	○	MAX 64 characters
db_rev	Database Revision	Number		
Objects	Objects	Object	○	
<object_type>	Object Type	Object Array	○	<object_type> set from the below analog-input analog-output binary-input binary-output
index	Index Number	Number	○	
object_name	Object Name	String	○	MAX 32 characters
object_dsc	Object Description	String	○	MAX 64 characters
plc_dev_name	PLC Device Name	String		[PLC Setting “Device Name”]
var_name	Variable Name	String	○	TAGXX, MODBUSXX (ex：TAG0, MODBUS0) *Object’s “Present Value” refer to this value
var_fmt	Variable Format	Number	Optional 1)	0 : Unsigned 16bit Data 1 : Signed 16bit Data 2 : Unsigned 32bit Data(BE) 3 : Signed 32bit Data(BE) 4 : Unsigned 32bit Data(LE) 5 : Signed 32bit Data(LE) 6 : FLOAT (BE) 7 : FLOAT (LE)
var_unit	Unit	Number	Optional	Instance unit Only for “analog-input” and “analog-output”
cov	COV_increment	Number	Optional	Only for “analog-input” and “analog-output”
rinq	Relinquish Default	Number	Optional	Only for “analog-output” and “binary-output”

1) Set if “MODBUSXX” selected for “var_name”.

【Sample】


```
{
    "net_iface": "LAN_A",
    "net_port": 47808,
    "net_number": 0,
    "device_id": 694,
    "device_name": "test",
    "device_dsc": "test",
    "db_rev": 0,
    "Objects": {
        "analog-input": [
            {
                "index": 1,
                "object_name": "AI_Name",
                "object_dsc": "AI_Description",
                "var_name": "TAG00",
                "var_unit": 95,
                "cov": 1
            }
        ],
        "analog-output": [
            {
                "index": 2,
                "object_name": "AO_Name",
                "object_dsc": "AO_Description",
                "var_name": "MODBUS0010",
                "var_fmt": 0,
                "var_unit": 95,
                "cov": 1,
                "rinq": 0
            }
        ],
        "binary-input": [
            {
```

```
                "index": 3,
                "object_name": "BI_Name",
                "object_dsc": "BI_Description",
                "plc_dev_name": "device",
                "var_name": "MODBUS0000",
                "var_fmt": 1
            }
        ],
        "binary-output": [
            {
                "index": 4,
                "object_name": "BO_Name",
                "object_dsc": "BO_Description",
                "plc_dev_name": "device",
                "var_name": "MODBUS0001",
                "var_fmt": 2,
                "rinq": 0
            }
        ]
    }
}
```


※The description changes depending on the category selection. The sample above is for the following category selection.

analog-input categories：TAG

analog-output categories：MODBUS

binary-input, binary-output categories：PLC_<Device Name>

2.BACnet Server Function

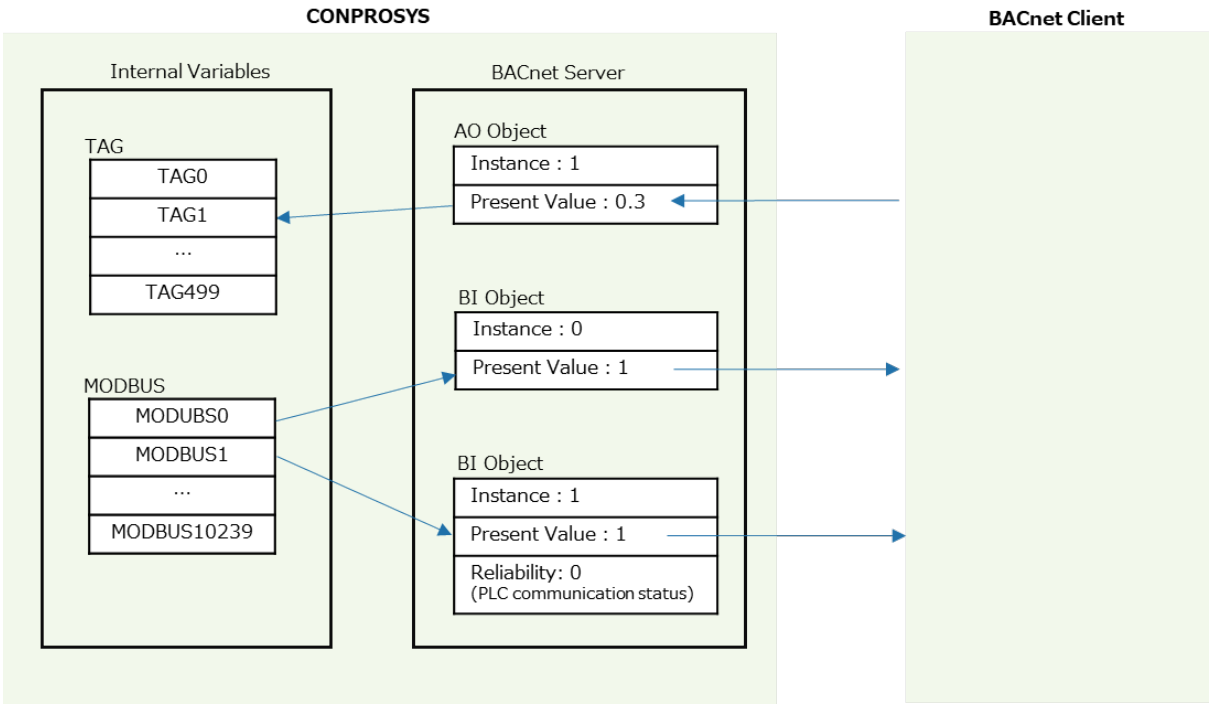
1. BACnet Object

This product supports BACnet object type below. BACnet device can be optionally set including the input and output object such as Analog Input, Analog output, Binary Input, Binary Output.

- Analog Input
- Analog Output
- Binary Input
- Binary Output
- Device
- Network Port

Analog Input and Binary Input are the input type object, and this product reads value from its variable and writes to their "Present Value" property. Analog Output and Binary Input are the output type object, and this product reads their "Present Value" property and writes to its variable.

In case of cooperating with PLC communication, this product set status of the communication to "Reliability" property of each object. (Refer to "**Link with PLC communication**")



◆ Analog Input Object

The following is a list of properties of the Analog Input Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Configurable	0...4194302, default: 694	R
Object Name	Configurable	Up to 32 characters	R
Object Type	Fixed	ANALOG_INPUT	R
Present Value	Dynamic	-3. 4E+38...3.4E+38, resolution: 0.001	R/W (*1)
Description	Configurable	Up to 64 characters	R
Status Flags	Dynamic	IN_ALARM: FALSE FAULT: FALSE / TRUE (*2) OVERRIDDEN: FALSE OUT_OF_SERVICE: FALSE / TRUE	R
Event State	Fixed	NORMAL	R
Reliability	Dynamic	RELIABILITY_NO_FAULT_DETECTED / RELIABILITY_COMMUNICATION_FAILURE (*3)	R
Out Of Service	Dynamic	FALSE/TRUE, default: FALSE	R/W
Units	Configurable	default: No-unit	R
COV Increment	Configurable	0...3.4E+38, default: 1	R
R: Read Property W: Write Property			

*1 If "Out Of Service" is TRUE, then this property become writeable.

*2 Always FALSE without a cooperation with PLC communication.

*3 Always RELIABILITY_NO_FAULT_DETECTED without a cooperation with PLC communication.

◆ Analog Output Object

The following is a list of properties of the Analog Output Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Configurable	0...4194302	R
Object Name	Configurable	Up to 32 characters	R
Object Type	Fixed	ANALOG_OUTPUT	R
Present Value	Dynamic	-3. 4E+38...3.4E+38	R/W
Description	Configurable	Up to 64 characters	R
Status Flags	Dynamic	IN_ALARM: FALSE FAULT: FALSE / TRUE (*1) OVERRIDDEN: FALSE OUT_OF_SERVICE: FALSE / TRUE	R
Event State	Fixed	NORMAL	R
Reliability	Dynamic	RELIABILITY_NO_FAULT_DETECTED / RELIABILITY_COMMUNICATION_FAILURE (*2)	R
Out Of Service	Dynamic	FALSE/TRUE, default: FALSE	R/W
Units	Configurable	default: No-unit	R
Priority Array	Dynamic	default: NULL	R
Relinquish Default	Configurable	-3. 4E+38...3.4E+38, default: 0	R
COV Increment	Configurable	0...3.4E+38, default: 1	R
R: Read Property W: Write Property			

*1 Always FALSE without a cooperation with PLC communication.

*2 Always RELIABILITY_NO_FAULT_DETECTED without a cooperation with PLC communication.

◆ Binary Input Object

The following is a list of properties of the Binary Input Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Configurable	0...4194302	R
Object Name	Configurable	Up to 32 characters	R
Object Type	Fixed	BINARY_INPUT	R
Present Value	Dynamic	ACTIVE/INACTIVE	R/W (*1)
Description	Configurable	Up to 64 characters	R
Status Flags	Dynamic	IN_ALARM: FALSE FAULT: FALSE / TRUE (*2) OVERRIDDEN: FALSE OUT_OF_SERVICE: FALSE / TRUE	R
Event State	Fixed	NORMAL	R
Reliability	Dynamic	RELIABILITY_NO_FAULT_DETECTED / RELIABILITY_COMMUNICATION_FAILURE (*3)	R
Out Of Service	Dynamic	FALSE/TRUE, default: FALSE	R/W
Polarity	Fixed	NORMAL	R
R: Read Property W: Write Property			

*1 If "Out Of Service" is TRUE, then this property become writeable.

*2 Always FALSE without a cooperation with PLC communication.

*3 Always RELIABILITY_NO_FAULT_DETECTED without a cooperation with PLC communication.

◆ Binary Output Object

The following is a list of properties of the Binary Output Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Configurable	0...4194302	R
Object Name	Configurable	Up to 32 characters	R
Object Type	Fixed	BINARY_OUTPUT	R
Present Value	Dynamic	ACTIVE/INACTIVE	R/W
Description	Configurable	Up to 64 characters	R
Status Flags	Dynamic	IN_ALARM: FALSE FAULT: FALSE / TRUE (*1) OVERRIDDEN: FALSE OUT_OF_SERVICE: FALSE / TRUE	R
Event State	Fixed	NORMAL	R
Reliability	Dynamic	RELIABILITY_NO_FAULT_DETECTED / RELIABILITY_COMMUNICATION_FAILURE (*2)	R
Out Of Service	Dynamic	FALSE/TRUE, default: FALSE	R/W
Polarity	Fixed	NORMAL	R
Priority Array	Dynamic	default: NULL	R
Relinquish Default	Configurable	0...1, default: 0	R
R: Read Property W: Write Property			

*1 Always FALSE without a cooperation with PLC communication.

*2 Always RELIABILITY_NO_FAULT_DETECTED without a cooperation with PLC communication.

◆ Device Object

The following is a list of properties of the Device Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Configurable	0...4194302, default: 694	R
Object Name	Configurable	Up to 32 characters	R
Object Type	Fixed	DEVICE	R
System Status	Fixed	OPERATIONAL	R
Vendor Name	Fixed	Contec Co., Ltd.	R
Vendor Identifier	Fixed	694	R
Model Name	Fixed	CPS-MG341	R
Firmware Revision	Fixed	Firmware Version of this product Ex. 3.7.3	R
Application Software Version	Fixed	BACnet application version Ex. 1.0.0	R
Description	Configurable	Up to 64 characters	R
Protocol Version	Fixed	1	R
Protocol Revision	Fixed	19	R
Protocol Services Supported	Fixed	Services this product support	R
Protocol Object Types Supported	Fixed	Based on the BACnet setting	R
Object List	Fixed	Based on the BACnet setting	R
Max APDU Length Accepted	Fixed	1476	R
Segmentation Supported	Fixed	NO_SEGMENTATION	R
Local Time	Dynamic	Based on the time setting	R
Local Date	Dynamic	Based on the time setting	R
APDU Timeout	Fixed	3000[msec]	R
Number of APDU Retries	Fixed	3	R
Device Address Binding	Dynamic	-	R
Database Revision	Configurable	0...65535, default:0	R
UTC Offset	Fixed	Based on the time setting	R
Active COV Subscriptions	Dynamic	Shows registered COV subscription	R
R: Read Property W: Write Property			

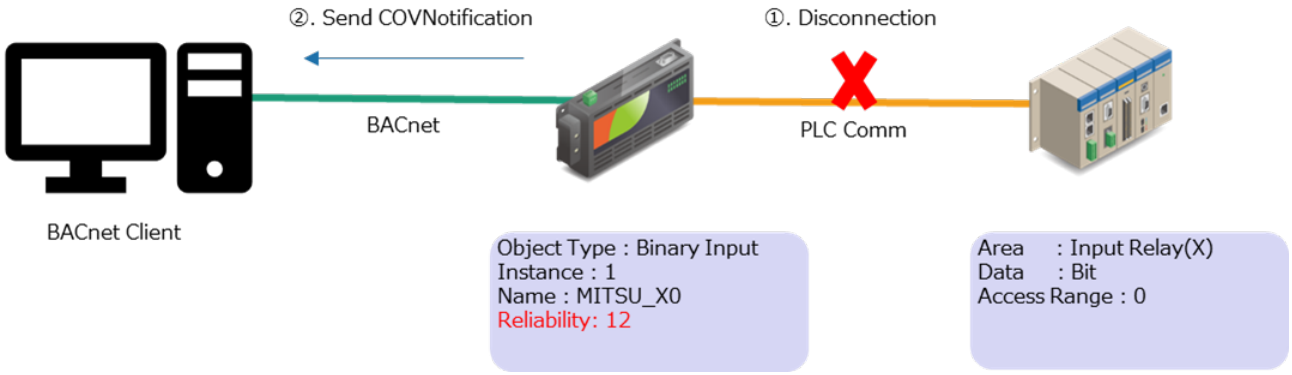
◆ Network Port Object

The following is a list of properties of the Network Port Object supported by the product.

Property	Data	Data Range	R/W
Object Identifier	Fixed	1	R
Object Name	Fixed	BACnet/IP Port	R
Object Type	Fixed	NETWORK_PORT	R
Status Flags	Fixed	IN_ALARM: FALSE FAULT: FALSE OVERRIDDEN: FALSE OUT_OF_SERVICE: FALSE	R
Reliability	Fixed	RELIABILITY_NO_FAULT_DETECTED	R
Out Of Service	Fixed	FALSE	R
Network Type	Fixed	IPv4	R
Protocol Level	Fixed	BACNET APPLICATION	R
Network Number	Configurable	0...65534, default: 0	R
Network Number Quality	Fixed	UNKNOWN/CONFIGURED	R
Changes Pending	Fixed	FALSE	R
MAC Address	Fixed	IP address + MAC address (6 octets)	R
APDU Length	Fixed	1476	R
Link Speed	Fixed	0	R
BACnet IP Mode	Fixed	NORMAL	R
IP Address	Fixed	Based on the network setting	R
BACnet IP UDP Port	Configurable	Based on the BACnet setting	R
IP Subnet Mask	Fixed	Based on the network setting	R
IP Default Gateway	Fixed	Based on the network setting	R
IP DNS Server	Fixed	Based on the network setting	R

2. Link with PLC communication

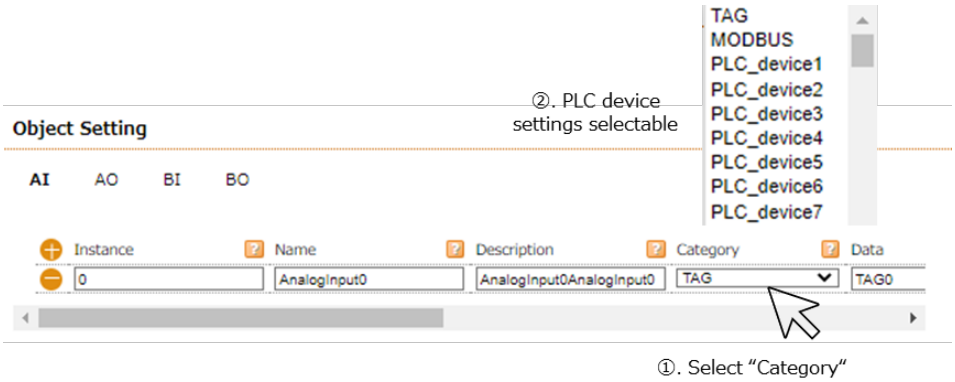
In case of using this product as BACnet Gateway, it can write the communication status to "Reliability" Property of each object by the setting. This function enables this product to notify a BACnet client, whether this product stores the latest value even when the communication is disconnected.



◆ How to set up

After setting PLC from the WEB, move to the BACnet setting page. See the **"Collecting Information From PLC"** for PLC settings.

Select "Category" item from each object setting table. If PLC setting is completed, "PLC_<Device Name>" will be selectable in addition to TAG and MODBUS. Regarding to "Data" item, in the range of designated Modbus area will be selectable based on the PLC setting.



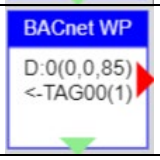
◆ Communication Status

See the DEVICEXXX Communication State in "**Modbus Status Information: PLC Communication Information**" for PLC Communication Status. The following is as a conversion table between the above statuses and the BACnet Reliability property value.

PLC communication DEVICEXXX Communication State	BACnet Reliability Property
Normal (1)	RELIABILITY_NO_FAULT_DETECTED(0)
Communication error or Stopping (0)	RELIABILITY_COMMUNICATION_FAILURE(12)

3.BACnet Client Function

The following BACnet services can be requested from CONPROSYS VTC.

BACnet Service	Controls	Name	Description
ReadProperty		BACnet RP	Requests a BACnet ReadProperty for the target device.
WriteProperty		BACnet WP	Requests a BACnet WriteProperty for the target device.

Refer to "**Online Help**" for the details on how to use each task control.

◆ About the BACnet data types supported by this product

The CONPROYS variable where each data type is stored is shown below. If the data acquired by the ReadProperty service is of an unsupported data type, an error is determined.

BACnet data type	CONPROSYS variable	supplement
NULL	---	
BOOLEAN	TAG, LTAG	FALSE: 0, TRUE: non-zero
UNSIGNED INT	TAG, LTAG	
SIGNED INT	TAG, LTAG	
REAL	TAG, LTAG	
DOUBLE	---	
OCTETSTRING	---	
CHARACTER STRING	STAG, LSTAG	Max. 1469 bytes
BITSTRING	---	
ENUMERATED	TAG, LTAG	
DATE	---	
TIME	---	
OBJECT IDENTIFIER	---	

*Read/write of the entire array of array type properties is not supported.

*Array size read/write support is not provided for array type properties.

*List Value (ASN.1 "SEQUENCE OF") read/write is not supported.

*Read/write of Constructed Data is not supported.

4.Glossary

Term	Description
BACnet Client	System or device that request a service for a specific purpose and utilize other devices
BACnet Device	A device that supports the communication with BACnet protocol
BACnet Gateway	A device that connects devices between different network protocols and BACnet
BACnet Server	A device that replies against a service request for a specific purpose
cov (change of value)	An event that happens when detecting changes which a specific status or more than predefined analog value
Object Type	Sorts of BACnet devices

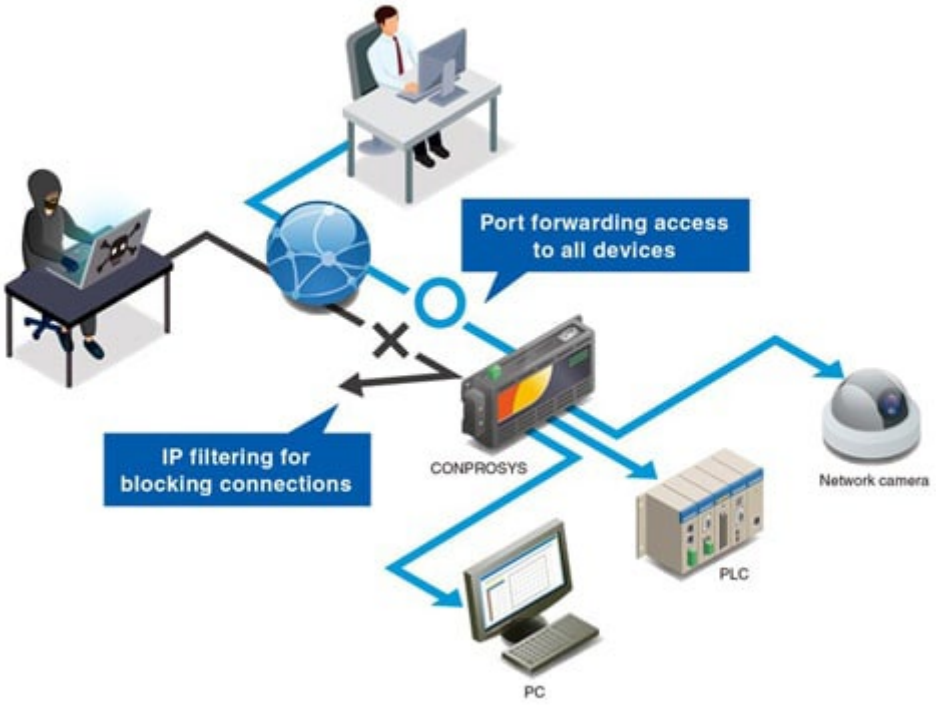
Router Function

This section describes Router function.

1.Router Function Outline

The product is equipped with a simple routing function.

It is possible to use a DHCP server, static routing, port forwarding and IP filtering.

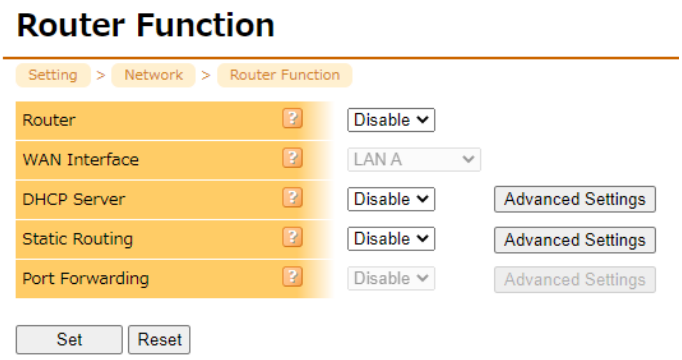


2.Router Function Setting

WAN interface settings allow switching between Wired LAN/Wireless LAN/LTE function/3G function used for Internet connection.

Set the function to be used as “Enabled” and click the [set].

*From the [Exit] menu, perform [Save and Reboot], [Save and Shut down], or [Save] to save the settings.



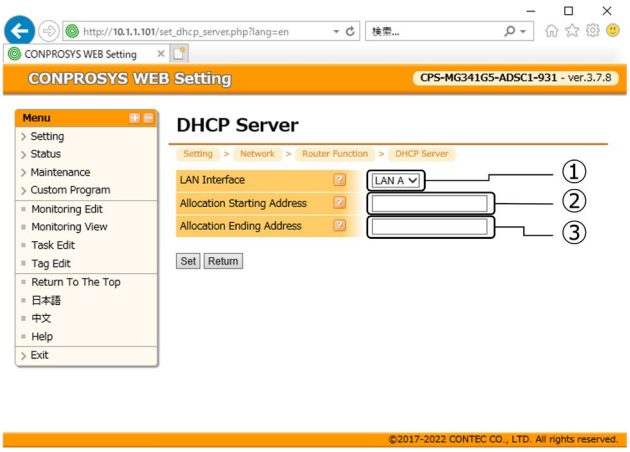
1. DHCP Server

Configure the settings in the [DHCP Server] of Router Function menu on the CONPROSYS WEB Setting.

Assigns IP addresses to DHCP clients connected to the product over a wired LAN.

1 Click the [Advanced Settings] button under [Router Function] and [DHCP Server] in CONPROSYS WEB Setting to display the DHCP server configuration screen.

2 Set the DHCP server. Select and enter items 1-3 below.



No.	Setting	Description
1	LAN Interface	Select LAN interface that allocates DHCP.
2	Allocation Starting Address	Enter the starting address that allocates DHCP.
3	Allocation Ending Address	Enter the Ending address that allocates DHCP.

The starting IP address allocated is set to the same segment as the IP address of the wired LAN.

After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

2. Static Routing

Configure the settings in the [Static Routing] of Router Function menu on the CONPROSYS WEB Setting.

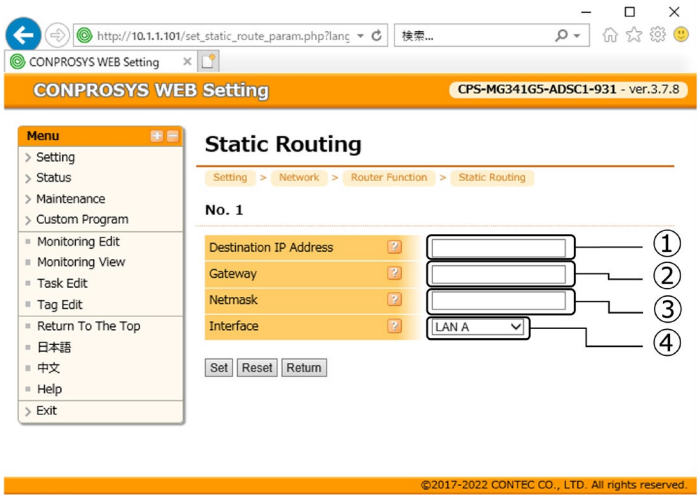
Static routing is a function that allows the product to send to a specified IP address by registering the destination IP address in the product.

1 Click the [Advanced Settings] button under [Router Function] and [Static Routing] in the CONPROSYS WEB Setting to display the setting list screen.

This product allows a maximum of 32 settings. Click "Add" to select and enter the setting values.

*Click Add on the screen to proceed to the screen for adding settings to "Static Routing".

2 Set the static routing route.Enter items 1-4 below.



No.	Setting	Description
1	Destination IP Address	Enter the network address of the destination IP address. Example: To set "192.168.3.0" as the network address 192.168.3.0
2	Gateway	Enter the IP address of the next hop router (gateway) that will be the routing destination by static routing.

No.	Setting	Description
3	Netmask	Enter the subnet mask of the specified network address. Make sure that the subnet mask specified is the correct combination of IP address and subnet mask. If the correct subnet mask is not specified, the system may not operate properly.
4	Interface	Select the interface to be routed to by static routing.

After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

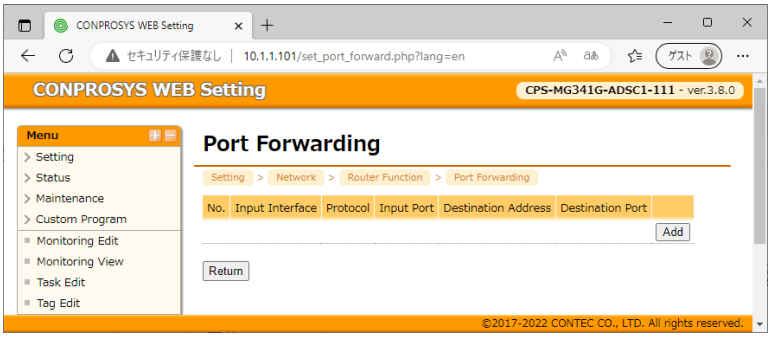
3. Port Forwarding

Configure the settings in the [Port Forwarding] of Router Function menu on the CONPROSYS WEB Setting.

Port forwarding is a function that forwards packets arriving at a specific port number from the Internet to a pre-defined LAN-side device.

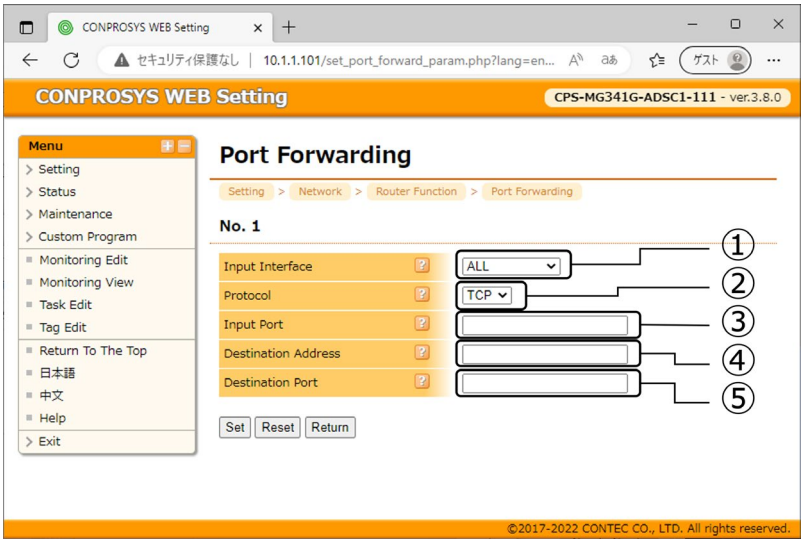
1 Click the [Advanced Settings] button under [Router Function] and [Port Forwarding] in the CONPROSYS WEB Setting to display the setting list screen.

This product allows a maximum of 32 settings. Click "Add" to select and enter the setting values.



*Click Add on the screen to proceed to the screen for adding settings to "Port Forwarding".

2 Set the Port Forwarding. Select and enter items 1-5 below.



No.	Setting	Description
1	Input Interface	Select the input interface to be forwarded.
2	Protocol	Select the target protocol.
3	Input Port	Enter any port number. Accesses from the Internet side using the specified port number will be forwarded to the device specified in "Destination Address".

No.	Setting	Description
4	Destination Address	Enter the IP address of the LAN-side host to which port mapping is applied.
5	Destination Port	Enter any port number. Example: To allow access to the Web server: 80 To allow access to the FTP server: 21

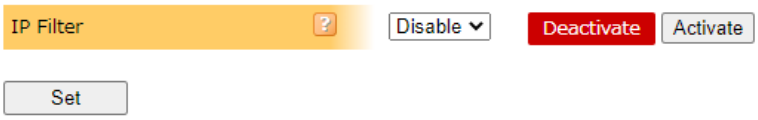
After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

4. IP Filter

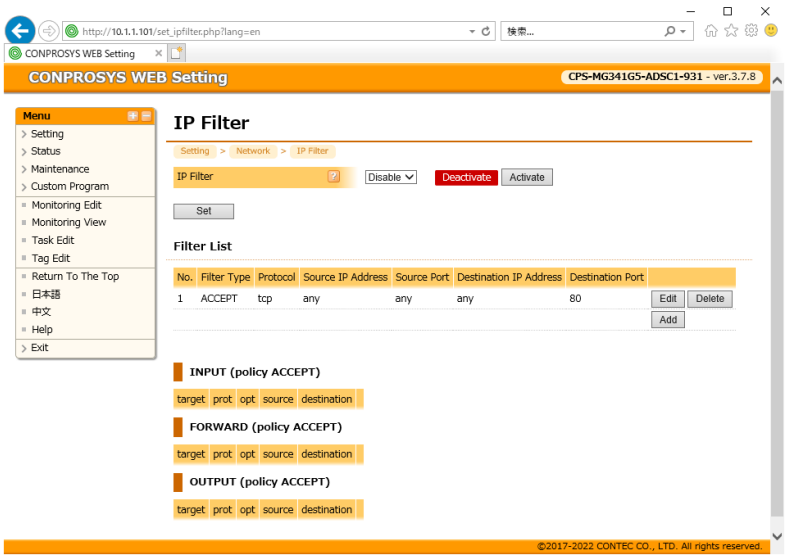
Configure the settings in the [IP Filter] of IP Filter menu on the CONPROSYS WEB Setting.

Rejection of unnecessary IP packets depending on the application and network.

1 Set the following items to be enabled and click the "Set" button.
The IP filter can be activate or deactivate by clicking the [Activate] or the [Deactivate] buttons.

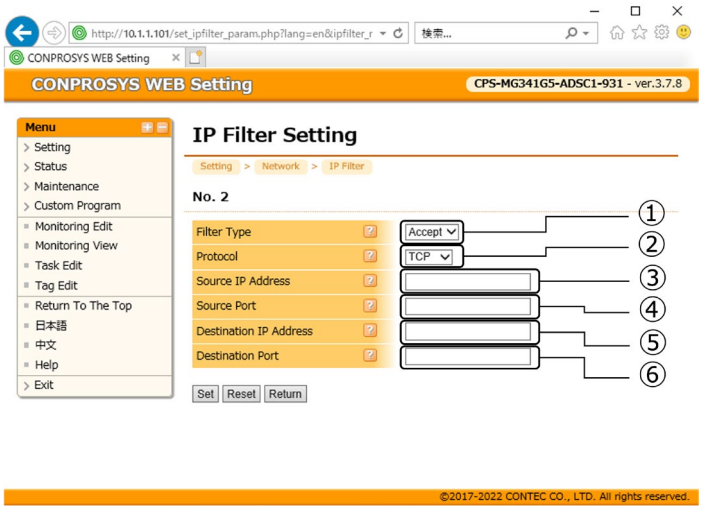


2 The Filter List screen is displayed.
This product allows a maximum of 64 settings. Click "Add" to select and enter the setting values.



*Click Add on the screen to proceed to the screen for adding settings to "IP Filter".

3 Set the IP Filter. Select and enter items 1-6 below.



No.	Setting	Description
1	Filter Type	Select the handling of packets that match the filter criteria.
2	Protocol	Select the IP protocol type to be filtered.
3	Source IP Address	Enter the source IP address of the packets to be filtered. Leave blank (any) if you want to target packets from all IP addresses.
4	Source Port	Enter the source port number of the packets to be filtered. Leave this field blank (any) if you want to target packets from all port numbers.
5	Destination IP Address	Enter the destination IP address of the packets to be filtered. Leave blank (any) if you want to target packets from all IP addresses.
6	Destination Port	Enter the destination port number of the packets to be filtered. Leave this field blank (any) if you want to target packets from all port numbers.

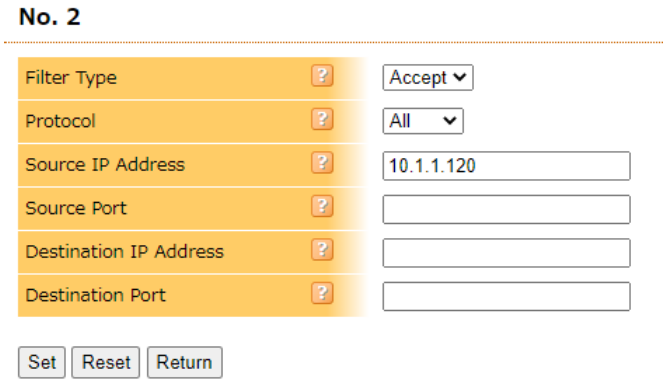
After you enter them, click the “Set”. Save the settings to ROM of the controller and reboot the product.

◆ Access permission by IP address filtering

Register the clients to be allowed access.

Enter the IP address of the client to be allowed access in 3 Source IP Address. 2 Select "All" for Protocol.

Example: When specifying 10.1.1.120



When settings are complete, click "Set".

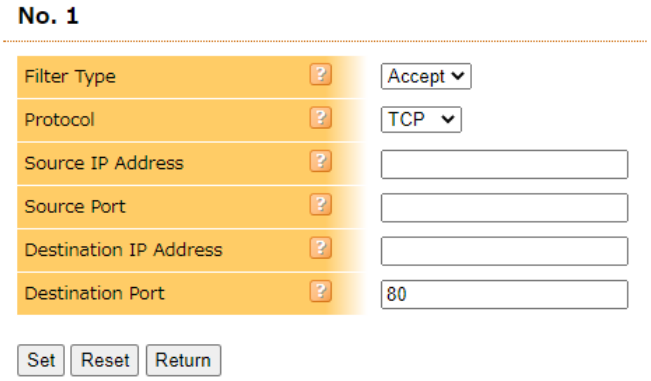
"The settings are saved temporarily." screen ends, the settings are registered in the filter list.

◆ Access Permission by Port Filtering

Select the protocol of the service to be allowed access at 2. (TCP/UDP/ICMP)

Enter the port number of the service to which access is allowed in 4 Destination Port and 6 Source Port according to the service.

Example: To allow Web access (HTTP) (This setting is initially registered.)



When settings are complete, click "Set".

"The settings are saved temporarily." screen ends, the settings are registered in the filter list.

[Example of entering a port number depending on the service to be allowed]

Services to be allowed	Filtering to use	Example of port number entry
To allow Web access (HTTP)	TCP port filtering	80
To allow file downloading (FTP)	TCP port filtering	21
To allow sending e-mail (SMTP)	TCP port filtering	25

Connecting to FacilityView

This section describes how to connect with FacilitView.

The list of the product with FacilitView

- CPS-MG341-ADSC1-931
- CPS-MG341G-ADSC1-930
- CPS-MG341G5-ADSC1-931

1.FacilityView

Connecting with FacilityView allows the following.

- Checking data, firmware version, and uptime measured by FacilityView
- Updating the product's firmware from FacilityView

2.Preparation for FacilityView Connection

To connect with FacilityView, the following preparations are required.

- Basic License Purchase
- Purchase Terminal Connection License
- Account Registration

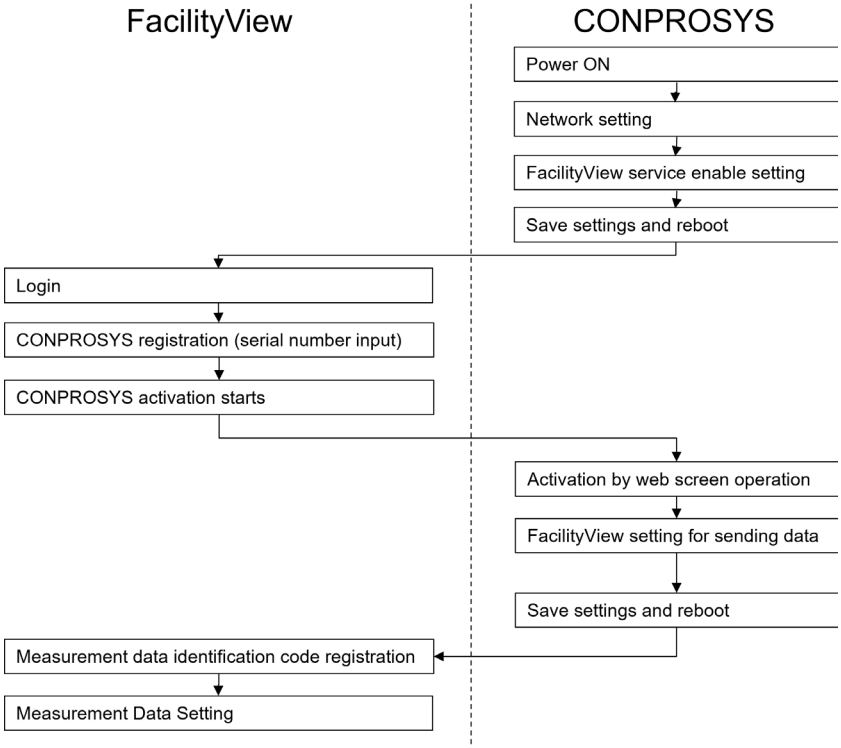
The following should be prepared as necessary.

- Identification Code License Purchase *

* If not, measurement data cannot be displayed. Firmware can be distributed.

3.FacilityView Setting

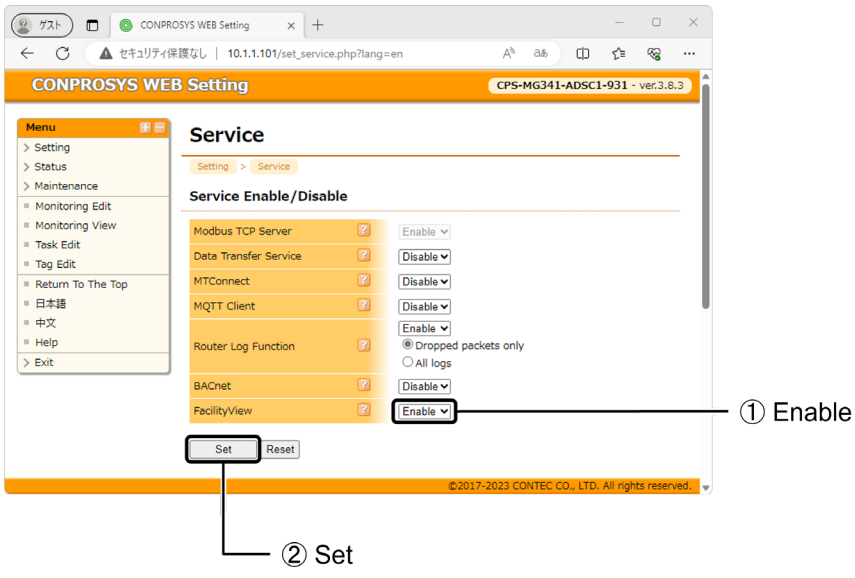
The following steps are used to set up with FacilityView.



1. Service

Set up the service setting in CONPROSYS WEB Setting.

(1) Click the [Enable] in the “FacilityView”. (2) Then click the “set”.

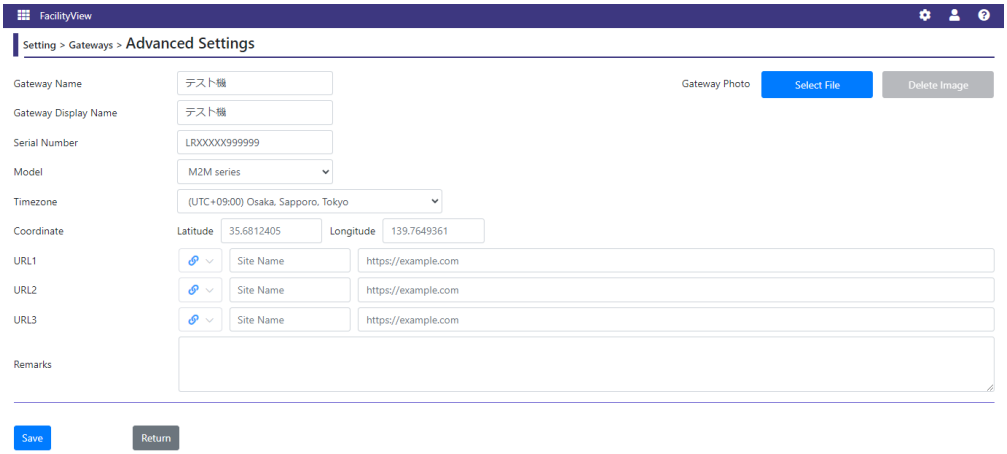


Save the settings to ROM of the controller and reboot the product.

2. CONPROSYS Registration

From the "Gateways" screen of the FacilityView site, click "New".

The "Advanced Settings" screen will be displayed. Enter each item and click "Save".

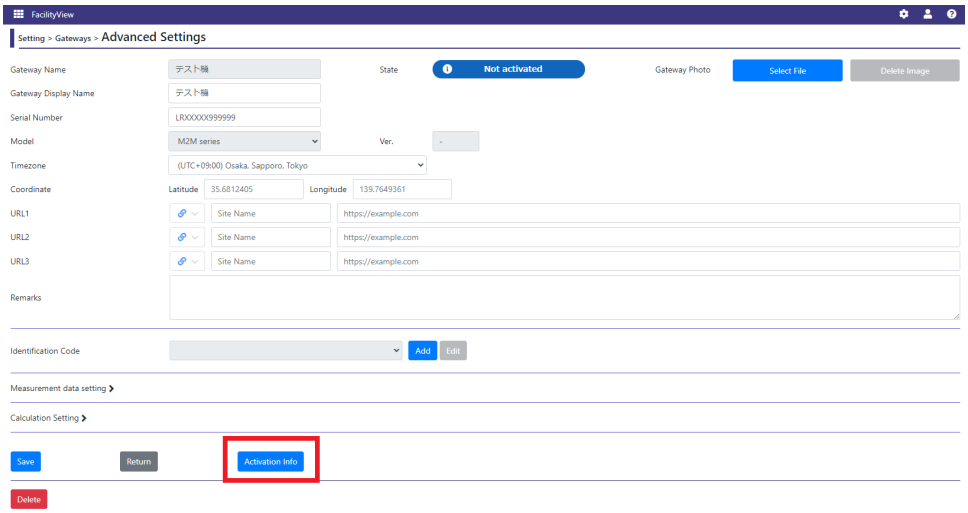


Please refer to the FacilityView Reference Manual for operating instructions.

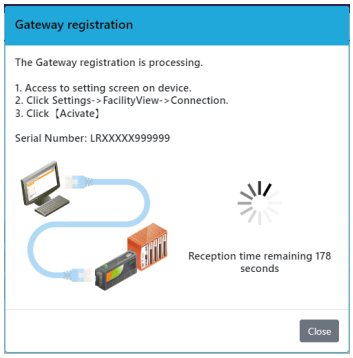
3. Activation

◆ FacilityView

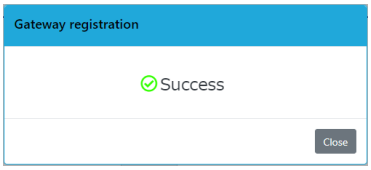
From the "Gateways Advanced Settings" screen on the FacilityView site, click the "Activation Info" button. Please refer to the FacilityView Reference Manual for operating instructions.



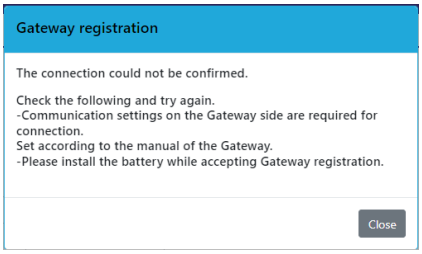
Click the [Activation Info] button to start the activation process.



If successful, the following screen will be displayed.



In case of failure, the following screen is displayed.



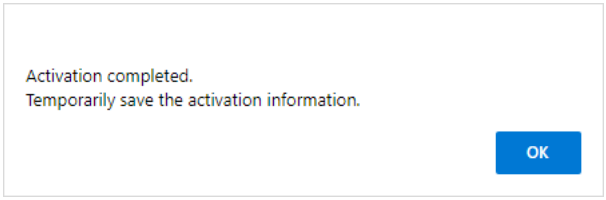
◆ CONPROSYS

Perform the activation in [FacilityView Connection] in CONPROSYS WEB Setting.

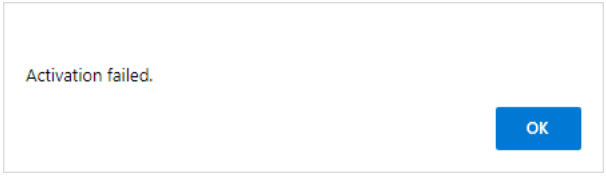
If activation information is already available, the [Connected] button will appear.

Move the mouse cursor over the [Connected] button to change the display to [Reactivate]. Clicking the button above will perform the activation.

If successful, the following dialog box will appear.



In case of failure, the following dialog box appears.



Save the settings to ROM of the controller and reboot the product.

4.Check FacilityView communication logs

From CONPROSYS WEB Setting, go to [Menu] – [Status], and click the [Log]. In “FacilityView comm log”, the last transmission history can be checked for each data identification code in the transmission settings.

FacilityView comm log

```
>CodeDev
 {"RET": 0, "BODY": {"code": "", "message": "", "data": ""}, "HEADERS": [["Content-Type", "application/json"], ["Content-Length", "34"], ["Connection"
>CodePlc
 {"RET": 0, "BODY": {"code": "", "message": "", "data": ""}, "HEADERS": [["Content-Type", "application/json"], ["Content-Length", "34"], ["Connection"
>CodeTag
 {"RET": 0, "BODY": {"code": "", "message": "", "data": ""}, "HEADERS": [["Content-Type", "application/json"], ["Content-Length", "34"], ["Connection"
```

ID	Description	Notes
RET	Result of transmission to FacilityView	0:Normal Non-zero:Error
BODY	Response body from FacilityView	
HEADERS	Response header from FacilityView	
STATUS	Response status code from FacilityView	200:Normal termination Other than 200:Error termination

Set Up Troubleshooting

This section describes how to check and solve the troubles when the product does not function properly.

1.If You Encounter a Problem?

Perform the following checks if you encounter a problem in the use of this product.

1. General

◆ Check the LEDs on the front panel

- Check that PWR LED is on.
- Check that ST1 LED is flashing.

◆ Check the network port LEDs

Check the LEDs on the UTP connector at the front of the unit.

The Link/Act LED lights up if the network cable is correctly connected to a hub.

If not, refer to the "Hardware Setup Guide" and check the connection.

The Link/Act LED will be flashing when communication is in progress via the network port.

◆ Use the ping command from a host computer and confirm that the server unit responds.

Ping the IP address of the server unit.

The server unit should respond if it is operating.

Example: The following response should be received when the server unit is set to IP address 10.1.1.101:

ping 10.1.1.101<Enter>:

Reply from 10.1.1.101: bytes=32 time<10ms TTL=255

Reply from 10.1.1.101: bytes=32 time<10ms TTL=255

Reply from 10.1.1.101: bytes=32 time<10ms TTL=255

If you are unsure of the IP address of the server unit, you can restore the default factory settings (IP address 10.1.1.101) by turning on the power to the unit with SW1-2 switch on (left).

(User/Password and Group settings start up with the ones specified by user.)

⚠ CAUTION

If you turn off (right) SW1-2 switch, the product starts up with the previous settings that are saved to ROM.

You can restore the default factory settings by turning on the power to the unit with SW1-2 and SW1-3switches on (left).

⚠ CAUTION

This also initializes all other settings.

◆ If your user name and password are not recognized when you connect from a browser on a host computer:

Both the user name and password are case sensitive (upper and lower case letters are treated as different). Make sure that the Caps Lock key is off and try again.

You can restore the default factory settings by turning on the power to the unit with SW1-2 and SW1-3 switches on (left).

⚠ CAUTION

This also initializes all other settings.

◆ If the ping command receives a response but a “page not found” message appears when you try to connect from a browser.

Setup your browser as follows:

Proxy server setting

Set “do not use proxy server”.

Dialup setting

Set “do not dial”.

◆ Product does not function properly

Contact CONTEC to have the product examined.

2. Data Transfer To The Server Problems

When the data cannot be transferred, check the following:

◆ NTP sever setting

Data will not be transferred if you fail to set up “Time sync setting” with NTP server at a time of booting.

Check whether the address of the “Synchronization server” is correct.

Check the result of “sync time” in the web server communication log in the system information.

◆ Service setting

If “Disable” is selected in the “Data transfer service”, data cannot be transferred.

Check whether “Enable” is selected in the “Data transfer service” of the service setting.

Check the status of “Data transfer service” in the system information on the screen.

◆ Data transfer URL setting

When you fail in transferring data to URL, LED “ST2” on the front panel illuminates.

Check whether the Data transfer URL is correct.

Check the result of “data transfer” in the web server communication log in the system information.

3. Monitoring Screen Creation And Display Problems

◆ Monitoring screen does not display

Monitoring screens use JavaScript.

Confirm that your browser settings permit JavaScript to run.

Also, disable the Compatibility View in Internet Explorer.

4. Processing Task Creation And Display Problems

◆ Cannot open monitoring or task edit screen.

The monitoring and task edit screens use JavaScript.

Confirm that your browser settings permit JavaScript to run.

Also, disable the Compatibility View in Internet Explorer.

Appendix

This section describes additional information of specification and the product.

1.Data Transfer Format

Data is transferred to the server via “http” or “https”.
Data is posted to the specified URL by the following parameters.

◆ Transfer Parameter List

Transfer Contents	Parameter 1	Parameter 2
Measured data file	file=data	filename=YYYYMMDDhhmmss.csv

◆ Response from a Web Server

Response	Description	Operation
Code: 200 X-AggregateInfo-Result: OK	Normal	Delete the files that are already sent.
Code: 400	Invalid ID, Authentication code error, Format error	Delete the files that failed to be sent.
Others	Other errors	Keep the failed files to resend.

◆ Telegram, e.g.

http Request

POST /XXXXX HTTP/1.1<CR_LF>
User-Agent: XXXXX<CR_LF>
Host: 192.168.1.110<CR_LF>
Accept: */*<CR_LF>
Content-Length: 40602<CR_LF>
Expect: 100-continue<CR_LF>
Content-Type: multipart/form-data; boundary=------------------------43ac9283b67c39f1<CR_LF>
Content-Disposition: form-data; name=“data”; filename=“201401011000.csv”<CR_LF>
Content-Type: text/plain;charset=UTF-8<CR_LF>
<CR_LF>
[Measured data**]**
--------------------------43ac9283b67c39f1<CR_LF>
Content-Disposition: form-data; name=“err”; filename=“201401011000_e.csv ”<CR_LF>
Content-Type: text/plain;charset=UTF-8<CR_LF>
<CR_LF>

http Response (Normal)

HTTP/1.1 200 OK<CR_LF>
Server: Apache-Coyote/1.1<CR_LF>
Content-Type: text/plain;charset=UTF-8<CR_LF>
Content-Length: XXXX<CR_LF>
Date: Wed, 01 Jan 2014 10:00:01 GMT<CR_LF>
X-AggregateInfo-Result: OK<CR_LF>

Connection timeout.....20 seconds
Web Sever response timeout.....60 seconds

◆ Data Transfer Web Sever

Use the URL you specified in "Data transfer setting" -"Data transfer URL" in CONPROSYS WEB Setting.

◆ Cycle

Send data to Web server accordance with the "Cycle (min.)" you specified in Data transfer setting
The sending cycle can be chosen from the followings.

The Choice of Sending Cycles
1 min. 5 min. 10 min. 15 min. 20 min. 30 min. 60min.

* The measuring cycle is 1 minute regardless of your choice of sending cycle. 1 datum is transferred when you choose 1 minute. 60 data are transferred when you choose 60 minutes.
* When transferring data from the processing task that has been created, there is no limitation for sending cycles.

◆ Measuring Cycle

Measure data per minute. (Fixed)

* When transferring data from the processing task that has been created, there is no limitation for measuring cycle.

◆ Measured Data File

Group	Item	Description	Notes
Header	Terminal ID	X(7)9(6)	Serial number is listed
	Reservation		not in use
Data 1- Data n			Measured data per minute Items are listed with "," (comma)
Footer	Reservation		not in use
	Transfer type	9(1)	0: Normal transfer 1: Resent

* Even when transferring data from the processing task that has been created, Header and Footer are attached to sending files.

◆ Measuring Data

Formats differ depending on the products. See the list below to check the format corresponding to your product. When CDS2 format is set as “Enable”, Cloudkey, Data, Time, and Millisecond are added at the beginning of the column.

When transferring data from the processing task that has been created, there is no format limitation.

CDS2 Format Is Set As Enable

Column	Indication	Description
1	Cloudkey	Cloudkey that is set in the Data transfer setting
2	Date	Date of the data measured (YYYYMMDD)
3	Time	Time of the data measured (hhmmss)
4	Millisecond	Millisecond of the data measured (0-999)
5	DI-0	The value of digital input channel 0 (0 or 1)
6	DI-1	The value of digital input channel 1 (0 or 1)
7	DI-2	The value of digital input channel 2 (0 or 1)
8	DI-3	The value of digital input channel 3 (0 or 1)
9	CNT-0	The value of counter channel 0 (0 to 16777215)
10	CNT-1	The value of counter channel 1 (0 to 16777215)
11	DO-0	The value of digital output channel 0 (0 or 1)
12	DO-1	The value of digital output channel 1 (0 or 1)
13	AI-0	The value of analog input channel 0 (LSB) (0 to 4095) *-32768 to +32767 will be used when Industrial Value Conversion is enabled.
14	AI-1	The value of analog input channel 1 (LSB) (0 to 4095) *-32768 to +32767 will be used when Industrial Value Conversion is enabled.

CDS2 Format Is Set As "Disable"

Column	Indication	Description
1	Date and time	Date and time of the data measured (YYYYMMDDhhmm)
2	DI-0	The value of digital input channel 0 (0 or 1)
3	DI-1	The value of digital input channel 1. (0 or 1)
4	DI-2	The value of digital input channel 2 (0 or 1)
5	DI-3	The value of digital input channel 3 (0 or 1)
6	CNT-0	The value of counter channel 0 (0 to 16777215)
7	CNT-1	The value of counter channel 1 (0 to 16777215)
8	DO-0	The value of digital output channel 0 (0 or 1)
9	DO-1	The value of digital output channel 1 (0 or 1)
10	AI-0	The value of analog input channel 0 (LSB) (0 to 4095) *-32768 to +326767 will be used when Industrial Value Conversion is enabled.
11	AI-1	The value of analog input channel 1 (LSB) (0 to 4095) *-32768 to +32767 will be used when Industrial Value Conversion is enabled.

Set the obtained data that was input by request in device configuration as measured data and send by PLC communication service.

Column	Indication	Description
1	Cloud key	Cloud key that was input in PLC device configuration
2	Date	Date of the data measured (YYYYMMDD)
3	Time	Time of the data measured (hhmmss)
4	Millisecond	Millisecond of the data measured (0-999)
5	Obtained data	The head address of obtained data
. . .		
n	Obtained data	The end address of obtained data

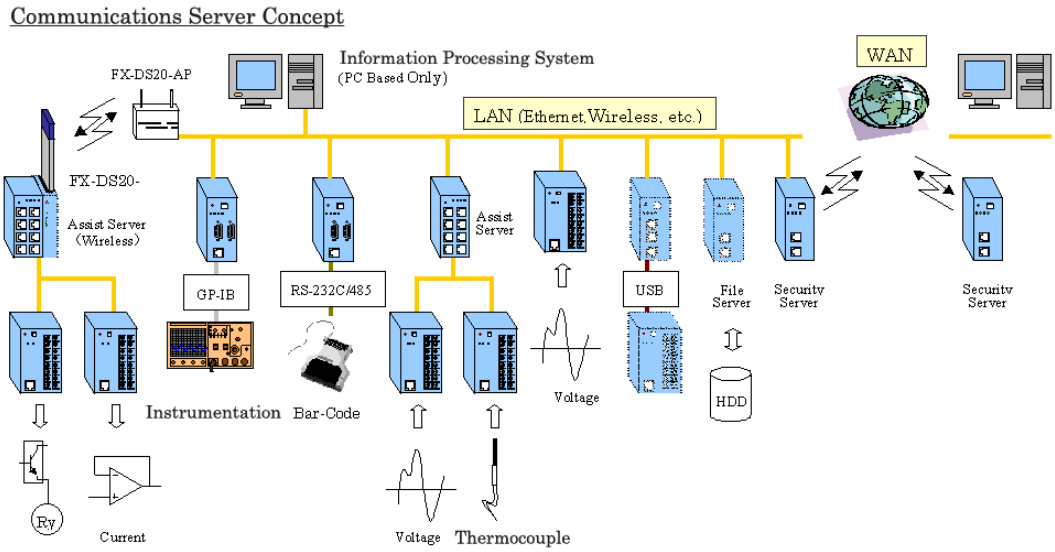
2.F&eIT Protocol Specifications

1. Communications Sever Concept

The proliferation of Internet connections has created numerous Ethernet-based LAN installations, which have enabled a large number of devices to access networks, resulting in the deployment of increasing numbers of FA and SOHO devices using this infrastructure. These devices, however, are mostly used as stand-alone units, which do not fully exploit the greatest advantage of networks: interconnectivity.

In view of the situation, CONTEC, drawing upon its network technology and I/O device expertise and their integration, is pleased to propose a communications server concept that organically links a wide range of devices, from WAN-based machines to remote I/O devices. In the following set of specifications, we define a common protocol that can be used in such a communications server.

◆ Communications Sever Concept-Overall Diagram



The following defines the common protocol layers that will be provided in all products based upon the communications server concept.

Such products, complying with the communications server specifications, will be able to access device information using the same protocol.

◆ The Role of the F&eIT Protocol

Application layer	ACX, DLL, etc
Device-dependent control layer	
F&eIT protocol layer	**F&eIT protocol specifications**
Transport layer	UDP, ICMP
Network layer	IP, ARP
Data link layer	Ethernet(IEEE802.3), etc.
Physical layer	

2. Basic Specifications

◆ Concepts

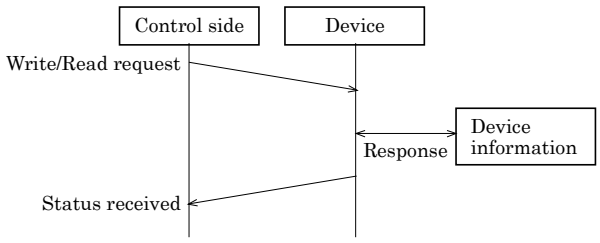
The F&eIT Protocol assigns all device resources (including resource, information) to virtual space so that any access to a device will be performed by specifying a virtual address. The virtual space is divided into information common to devices, device-specific information, I/O space, and memory space. The specific location in the virtual space where information is stored and the method by which information is stored is completely transparent with respect to where or how information is stored in actual physical resources.

00000000h - 000FFFFFh	Information common to devices (1MB)
00300000h - 003FFFFFh	I/O space (1MB)

◆ Data Communications Protocol

The F&eIT Protocol has a command response-type access procedure on the connectionless UDP/IP.

Response-type



◆ Frame Format

Using the UDP/IP port address 5007h, the F&eIT Protocol is installed in the data section.

The frame structure takes the format described below. Due to the header byte order conventions, the Ethernet, IP, and UDP are treated as Big Endians; all other entities are treated as Little Endians, for which components exerted by an x86 CPU hold priority.

Header Name		Size (byte)	Remarks
Ethernet section	Destination Address	6	Remote MAC address
	Source Address	6	Local MAC address
	Type Field	2	Ethernet II
IP section	IP Ver4 Header	20	Fragment disabled
UDP section	UDP Header	8	Port Address 5007h Check Sum disabled
Communication server section	Identifier	2	"SV"
	Version	1	Version of the header structure
	Command	1	Command and the ACK flag
	Sequence number	2	Frame ID
	Response ID	2	Identifies the sender.
	Virtual address	4	Specifies a virtual address space.
	Access size	2	1436 bytes maximum
	Status	2	Result of command execution
	Access ID	8	Identifies the Read/Write privilege
	Remote MAC address	6	Specifies a remote MAC address when using IP multicasting.
	Reserved	6	Reserved for future use
	Data section	1436	Data area

Description of Communications Server Headers

(1) Identifier	Identifies the frame as a F&eIT Protocol frame.
(2) Version	Indicates the frame version.
(3) Command	The virtual address access command.
(4) Sequence no.	A counter that prevents the occurrence of duplicate frames, wherein the sequence number is incremented each time a packet is transmitted.
(5) Response ID	When a response-type command is transmitted, the contents of the response ID are copied to the response ID for the response frame.
(6) Virtual address	Specifies the virtual address being accessed, e.g., device information can be read by specifying the address 0000h.
(7) Access size	Specifies the size of the data to be accessed, from 1 to a maximum of 1436 bytes.
(8) Status	Stores status information after the command is executed.
(9) Access ID	This is an ID for virtual address access control.
(10) Remote MAC address	When data is read/written using IP Multicast, the MAC address of the remote device is set in this header. When data is to be sent to all devices on the network, the value ALL [F] is set in this header. (For Unicast: "ALL [0]")

◆ Commands in Detail

The following command is set in the command section (Offset = 4 in the F&eIT Protocol header section.):

Command Structure

7	6	5	4	3	2	1	0
ACK	Command (1 - 127)						

0 - 6bit represent the command; the MSB indicates a response frame (ACK).

7Bit = 0: command request
1: command response

Commands in Detail

Command	Command description	Type	Remarks
1	Reads from a virtual address	Response	Reads device information by specifying a virtual address.
2	Writes to a virtual address.	Response	Updates device information by specifying a virtual address.
3	Transmits messages.	Response	Exchanges messages between devices.
4	Reserved	Undefined	Undefined
5	Reset	Response	Resets a device after returning a response frame.
7 - 127	Reserved	Undefined	Undefined.

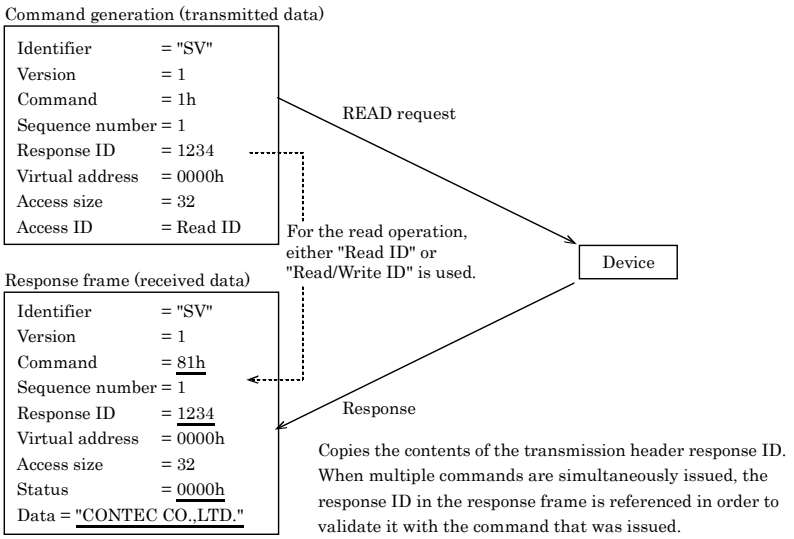
◆ Command-Issuing Procedures

Read a virtual address (command = 1)

A virtual address and its size are specified, and the frame is transmitted to the target device.

The result is received as a response frame with data.

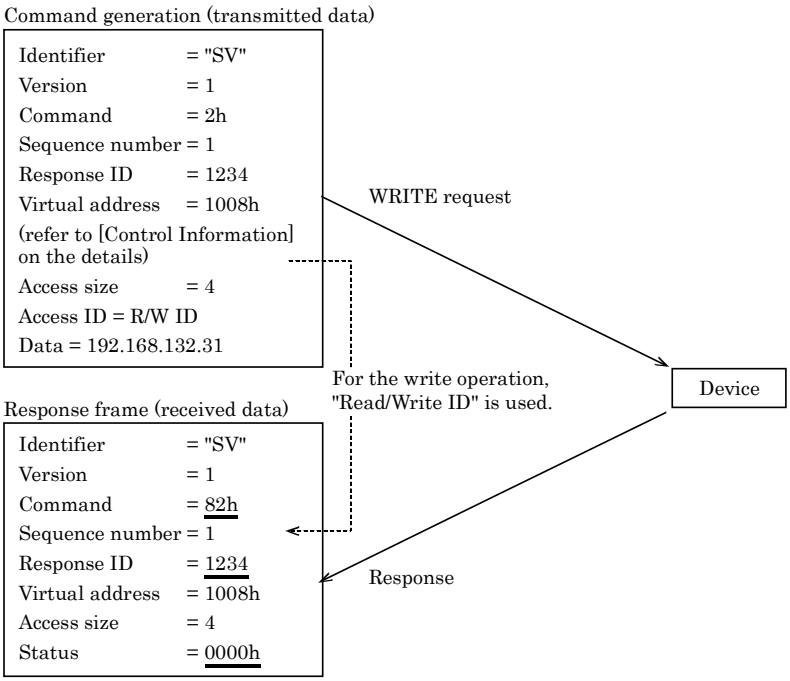
(Example: reading a vendor name)



◆ Writing to a virtual address (command = 2)

A virtual address, its size and data are specified, and the frame is transmitted to the target device. The result is received as a response frame status.

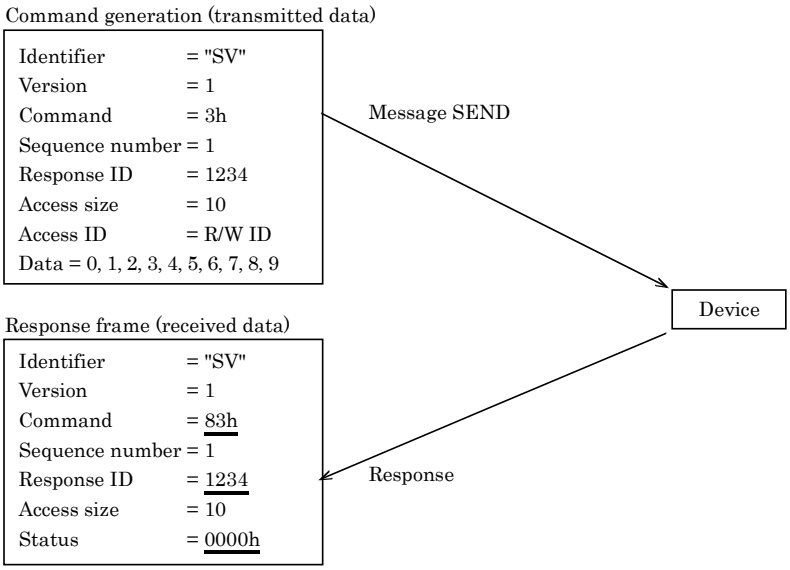
(Example: setting an IP address)



◆ Message transmission (command = 3)

Writes the message to be transmitted into the data section. The result is received as a response frame status. The maximum data size that can be transmitted per command is 1452 bytes.

(Example: data transmission)



Response status

Following is a table of status information that is returned by response-type commands:

Code	Description	Remarks
0000h	Normal termination	
0001h	Access violation	An attempt was made to write to a Read-only area.
0002h	Area error	Access was made to an area not defined on the device.
0003h	Access size error	An access request greater than 1436 bytes was made.
0004h	Parameter error	Invalid parameter contents, such as receipt of a non-supported command.
0005h	Length error	Invalid transmission length, such as an inconsistent data size with the number of data items calculated from the UDP/IP.
0006h	Insufficient resources	Too many tasks are waiting for ACK data, causing a resource shortfall. The resources can be released by a timeout.
0029h	Output error	An error occurred during the write process to the device.
0040h	Message queue over error	Insufficient resources in the queue during the write process to the device.

3. Control Information

The F&eIT Protocol assigns all resources that are disclosed outside the devices to 32-bit virtual space. Following is a table of correspondence between virtual addresses and device information. Bytes order is Little Endian.

◆ Information Common to Devices

The following types of information are provided in all F&eIT Protocol-compliant devices:

Information Common to Devices (Example)

Address	Size		Description	Remarks
From 0000h - 0FFFh	32	R	Vendor name	"CONTEC CO., LTD."
	32	R	Model	
	2	R	Equipment version	1.0
	2	R	Firmware version	1.0
	6	R	MAC address	00804C******
	2	R	Installation function	Bit 0: I/O space Bit 1: Memory space Bit 3: Message send Bit 4: Reset function Bits 5 and higher: reserved
	4	R	IP address	
	2	R	Product type	
	4	R	Reserved	
	2	R	F&eIT protocol version	
			Reserved	
From 2000h	4	R	Elapsed time after the system is started	Seconds
	4	R	Total number of transmitted frames	Counter
	4	R	Total number of transmitted bytes	Counter
	4	R	Total number of received frames	Counter
	4	R	Total number of received bytes	Counter
	4	R	Total number of transmission errors	Counter
	4	R	Total number of reception errors	Counter

◆ I/O space

I/O information (Example)

- CPS-MG341-ADSC1-XXX

Address	Size		Description	Remarks
From 3A2900h	1	R	DI-0ch	bit0, bit1, bit2, bit3
	1	RW	DO-0ch	
	14	R	dummy	
	2	R	AI-0ch	LSB(0-4095)
	2	R	AI-1ch	
	12	R	dummy	
	4	R	CNT-0ch	LSB(0-16777215)
	4	R	CNT-1ch	
	8	R	dummy	

3.SD Card

Inserting SD card in the product enables you to store measured data in the following folders.

Folder	Description	Folder Path
Task SD card folder	Store data collection files set in SD area of task.	SD/
Task SD backup folder	Store backup files created from task.	SD/backup/
Auto backup folder	Store backup files (json file and csv file) created by enabling Auto backup in Data transfer setting. Files of the previous day are compressed at 3:59 am once a day. The file name after compression is “Date.tgz”. If there is no free space on the SD card, the compressed files will be deleted in order of oldest to newest date until a new compressed file can be created.	SD/cloudbackup/

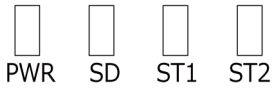
* Refer to the “**Reference Manual (Hardware)**” for inserting the SD card procedure.

4.DIP Switch

DIP switch details are described below.

SW	SW No.	Description
SW1	6	System Reservation: Always OFF
	5	System Reservation: Always OFF
	4	System Reservation: Always OFF
	3	2: OFF, 3: OFF — The settings are the factory defaults. 2: ON, 3: OFF — IP address setting starts up with factory defaults when the power is turned on, while user/password and group settings starts up with a user's settings. The current IP address, user/password and group settings can be checked on the Web monitor. 2: ON, 3: ON — Each setting will be initialized when the power is turned on. LED PWR and ST1 will flash upon the completion. Confirm the flashing and turn off the switch 2, 3, then reboot. 3: OFF, 3: ON — If the backup data is already in the SD card, the backup will be reflected on the data when the power is turned on. LED PWR and ST1 will flash upon the completion. Confirm the flashing and turn off the switch 3, then reboot.
	2	
	1	Refer to the "**Reference Manual (Hardware)**".
SW2	1 - 4	Refer to the "**Reference Manual (Hardware)**". *

5.LED



LED	Color	Operation	Description
PWR	Green	ON	Power has been supplied.
		OFF	Power has not been supplied.
		Flashing	It indicates one of the followings - Setting is being written in ROM. - Completion of initialized setting.
SD	Yellow	Flashing	It flashes at the time of SD access.
		OFF	It indicates there is no SD access.
ST1	Green	ON	Not assigned
		OFF	Not assigned
		Flashing (Slow)	Software has been operated.
		Flashing (Fast)	It indicates one of the followings. - Task is being operated via CONPROSYS WEB Setting. - Completion of initialized setting.
ST2	Red	ON	Data transfer failed.
		OFF	It indicates the system runs normally.
		Flashing (Fast)	It indicates one of the followings. - Task is being operated via CONPROSYS WEB Setting. - Completion of initialized setting.
Others	---	---	Refer to the "**Reference Manual (Hardware)**".

6.Modbus Status Information

With the Modbus Slave function, status information can be obtained from CONPROSYS.
For status information, use address 0x5000 or higher of the input register (function code 0x04).
For CONPROSYS VTC, the same data can be obtained with the “system information” control.

System Information

Modbus Address	Item	Data Type	The number of words	Description
0x5000	NTP Result	unsigned short	1	The latest synchronization result with NTP server 0: synchronization fail 1: synchronization succeed
0x5001	NTP Date	char	8	The latest synchronization date with NTP server YYYYMMDDhhmmss+\0\0
0x5009	Uptime	unsigned long	2	OS up-time[sec]
0x500B	Transfer Result	unsigned short	1	The latest data transfer result 0: Transfer fail 1: Transfer succeed
0x500C	Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x5014	Transfer Info	char	7	The latest data transfer information HTTP status code, curl error code
0x501B	MailErrorTime	char	8	The latest mail transfer error time YYYYMMDDhhmmss+\0\0
0x5023	BuiltInPowerState	unsigned short	1	Digital input power setting 0: External power supply 1: Built-in power supply
0x5024	SD Recognition	unsigned short	1	SD card recognition state 0: without SD card 1: with SD card 2: SD card error 3: write error
0x5025	SD Free	unsigned long	2	SD card free space [kbyte]
0x5027	FTP Transfer Result	unsigned short	1	The latest data transfer result 0: Transfer fail 1: Transfer succeed
0x5028	FTP Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x5030	FTP Transfer Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x5037	Firmware Version		5	Maximum 8byte + \0\0 of XX:YY:ZZ
0x503C	Serial Number		7	Serial NO(13byte) + \0
0x5043	MAC address		9	AA:BB:CC:DD:EE:FF 17byte + \0

Modbus Address	Item	Data Type	The number of words	Description
0x504C	MAC address 2LAN		9	GW 2Lan model only
0x5055	Identification ID		6	CLOUD KEY(10byte) + \0\0
0x505B	MQTT Communication Result	unsigned short	1	The latest MQTT communication result 0: Communication with the Broker fail 1: Communication with the Broker succeed
0x505C	MQTT Communication Error Time	char	8	The latest MQTT communication error time YYYYMMDDhhmmss + \0\0
0x5064	GPS Communication State	unsigned long	1	GPS communication state 0: Error 1: Normal
0x5065	GPS Error Information	unsigned long	1	GPS error information 0: Normal 1: Localization quality error ($GPGGA) 2: Checksum error
0x5066	GPS Error Time	char	8	GPS Error Time YYYYMMDDhhmmss + \0\0
0x506E	GPS Latitude Information	Int32	2	GPS latitude information Multiply ddd.ddd format by ten to the sixth and enter it
0x5070	GPS Longitude Information	Int32	2	GPS longitude information Multiply ddd.ddd format by ten to the sixth and enter it
0x5072 - 0x5074	Reserved	---	3	Reserved
0x5075	SMS Send Result	unsigned long	1	The latest SMS result 0 : Fail 1 : Succeed
0x5076	SMS Error Time	char	8	SMS send error time YYYYMMDDhhmmss+\0\0
0x507E	FTP Server 0 Transfer Result	unsigned long	1	The latest data transfer result 0: Transfer fail, 1: Transfer succeed
0x507F	FTP Server 0 Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x5087	FTP Server 0 Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x508E	FTP Server 1 Transfer Result	unsigned long	1	The latest data transfer result 0: Transfer fail, 1: Transfer succeed
0x508F	FTP Server 1 Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x5097	FTP Server 1 Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x509E	FTP Server 2 Transfer Result	unsigned long	1	The latest data transfer result 0: Transfer fail, 1: Transfer succeed
0x509F	FTP Server 2	char	8	The latest data transfer time

Modbus Address	Item	Data Type	The number of words	Description
	Transfer Time			YYYYMMDDhhmmss+\0\0
0x50A7	FTP Server 2 Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x50AE	FTP Server 3 Transfer Result	unsigned long	1	The latest data transfer result 0: Transfer fail, 1: Transfer succeed
0x50AF	FTP Server 3 Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x50B7	FTP Server 3 Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x50BE	FTP Server 4 Transfer Result	unsigned long	1	The latest data transfer result 0: Transfer fail, 1: Transfer succeed
0x50BF	FTP Server 4 Transfer Time	char	8	The latest data transfer time YYYYMMDDhhmmss+\0\0
0x50C7	FTP Server 4 Error Information	char	7	The latest FTP transfer information HTTP status code, curl error code
0x50CE - 0x50FF	Reserved	---	50	Reserved

Service Information

Modbus Address	Item	Data Type	The number of words	Description
0x5100	DataTransfer	unsigned short	1	Data transfer service state 0: OFF, 1: ON
0x5101	ModbusTCP	unsigned short	1	Modbus TCP Sever state 0: OFF, 1: ON
0x5102	ModbusSessions	unsigned short	1	The number of Modbus TCP Server sessions
0x5103	OPC UA Server	unsigned short	1	OPC UA Sever state 0: OFF, 1: ON
0x5104	Task0State	unsigned short	1	Task0 start state 0: Run, 1: Step Run Start, 2: Step Run Wait, 3: Stop
0x5105	Task0Scantime	unsigned long	2	Cycle [msec] at which task 0 executes the commands of coordinates (0, 0)
0x5107 - 0x513C	Task1-18State	---	54	Task1-18 start state and scan time * The start state is the same format as address 0x5104 *The scan time is the same format as address 0x5105
0x513D	Task19State	unsigned short	1	Task19 start state 0: Run, 1: Step Run Start, 2: Step Run Wait, 3: Stop
0x513E	Task19Scantime	unsigned long	2	Cycle [msec] at which task 19 executes the commands of coordinates (0, 0)
0x5140	BACnet	unsigned short	1	BACnet service state 0: OFF, 1: ON
0x5141 - 0x51FF	Reserved	---	221	Reserved

Controller Information

Modbus Address	Item	Data Type	The number of words	Description
0x5200	Datetime	char	8	Current system date and time YYYYMMDDhhmmss+\0\0
0x5208 - 0x5210	Reserved	---	9	Reserved
0x5211	MemoryFree	unsigned long	2	MemoryFree [kbyte]
0x5213	File0Location	unsigned short	1	File 0 saving location setting 0: Ram, 1: SD card
0x5214	File0MaxSize	unsigned long	2	File 0 size setting [kbyte]
0x5216	File0CurSize	unsigned long	2	File 0 current size [kbyte]
0x5218	File1Location	unsigned short	1	File 1 saving location setting 0: Ram, 1: SD card
0x5219	File1MaxSize	unsigned long	2	File 1 size setting [kbyte]
0x521B	File1CurSize	unsigned long	2	File 1 current size [kbyte]
0x521D - 0x5276	File2- 18 information	---	85	Files 2-18 saving location setting, size setting, and current size *The saving location setting is the same format as address 0x5213. *The size setting is the same format as 0x5214. *The current size is the same format as 0x5216.
0x5272	File19Location	unsigned short	1	File 19 saving location setting
0x5273	File19MaxSize	unsigned long	2	File 19 size setting [kbyte]
0x5275	File19CurSize	unsigned long	2	File 19 current size [kbyte]
0x5277	WaitFiles(st)	unsigned short	1	The number of files in the folder (Send service) waiting to be sent
0x5278	WaitFiles(task)	unsigned short	1	The number of files in the folder (task) waiting to be sent
0x5279	WaitFiles(PLC)	unsigned short	1	The number of files in the folder (PLC) waiting to be sent
0x527A	WaitFiles (Child unit)	unsigned short	1	The number of files in the folder (Child unit) waiting to be sent
0x527B	WaitFiles (Azure)	unsigned short	1	The number of files in the folder (Azure) waiting to be sent
0x527C	WaitMails	unsigned short	1	The number of files in the folder with mails to be sent
0x527D	ResentFiles(st)	unsigned short	1	The number of files in the folder (Send service) waiting to be resent
0x527E	ResentFiles(task)	unsigned short	1	The number of files in the folder (Task) waiting to be resent
0x527F	ResentFiles(PLC)	unsigned short	1	The number of files in the folder (PLC)

Modbus Address	Item	Data Type	The number of words	Description
				waiting to be resent
0x5280	ResentFiles(Child unit)	unsigned short	1	The number of files in the folder (Child unit) waiting to be resent
0x5281	ResentFiles(Azure)	unsigned short	1	The number of files in the folder (Azure) waiting to be resent
0x5282	ResentMails	unsigned short	1	The number of files in the folder with mails to be resent
0x5283	SW1-2	unsigned short	1	The state of 2 in DIP-SW 1 0: OFF, 1: ON
0x5284	SW1-3	unsigned short	1	The state of 3 in DIP-SW 1 0: OFF, 1: ON
0x5285	SW1-4	unsigned short	1	The state of 4 in DIP-SW 1 0: OFF, 1: ON
0x5286	ResentFiles (MQTT)	unsigned short	1	The number of files in the folder (MQTT) waiting to be resent
0x5287	WaitFiles (CHS)	unsigned short	1	The number of files in the folder (Task-CHS) waiting to be sent
0x5288	ResentFiles(CHS)	unsigned short	1	The number of files in the folder (Task-CHS) waiting to be resent
0x5289	WaitFiles (SMS)	unsigned short	1	The number of files in the folder (SMS) waiting to be sent
0x528A	ResentFiles (SMS)	unsigned short	1	The number of files in the folder (SMS) waiting to be resent
0x528B - 0x55FF	Reserved	---	885	Reserved

Special Functions

Modbus Address	Item	Data Type	The number of words	Description
0x5700	Timer (100ms)	unsigned short	1	Repeat 0 and 1 at 100ms interval
0x5701	Timer (1s)	unsigned short	1	Repeat 0 and 1 at 1sec interval
0x5702	Timer (10s)	unsigned short	1	Repeat 0 and 1 at 10sec interval
0x5703 - 0x57FF	Reserved	---	253	Reserved

FANUC CNC

Modbus Address	Item	Data Type	The number of words	Description
0x6000 - 0x607F	Product Name	String	128	Rely on CNC DPRNT description
0x6080 - 0x6081	Product Result Number	Int32	2	
0x6400 - 0x6427	Value01-10	Double	4 x 10	
0x6500 - 0x69FF	String01-10	String	128 x 10	
0x6A00 - 0x6AFFF	Print Output	String	256	
0x6B00 - 0x6BFFF	Blank		1280	

PLC Communication Information

Modbus Address	Item	Data Type	The number of words	Description
0x7000	Communication process state	unsigned short	1	Communication process state with PLC 0 : OFF 1 : ON
0x7001	Communication Process Error Information	unsigned short	1	Communication process error information with PLC 0 : Normal Non-zero : Error Code
0x7002	LINK01 Communication State	unsigned short	1	Communication state with LINK01 0 : Communication error or Stopping 1 : Normal
0x7003	LINK01 Error Information	unsigned short	2	Error information of communication process with LINK01 0 : Normal Non-zero : Error Code - 0x20002 Port Open Error
0x7005 - 0x701C	LINK02 – LINK09 Information		24	Communication state, error information of LINK02 - 09 * The same format of 0x7002 is used for communication state. * The same format of 0x7003 is used for error communication.
0x701D	LINK10 Communication State	unsigned short	1	Communication state with LINK10 0 : Communication error or Stopping 1 : Normal
0x701E	LINK10 Error Information	unsigned short	2	Error information of communication process with LINK10

Modbus Address	Item	Data Type	The number of words	Description
				0 : Normal Non-zero : Error Code - 0x20002 Port Open Error
0x7020 - 0x70FF	Reserved		224	Reserved
0x7100	DEVICE001 Communication State	unsigned short	1	Communication state of DEVICE001 0 : Communication error or Stopping 1 : Normal
0x7101	DEVICE001 Error Information	unsigned short	2	Error information of DEVICE001 0 : Normal Non-zero : Error Code 0x20006: Timeout Error (Retry+1)*When there is no response during the timeout - 0x20025: Read/Write Request Error
0x7103	DEVICE001 Trigger State	unsigned short	1	Trigger state of DEVICE001 0 : Stopping 1 : Instructing Execution * Only TriggerRead/TriggerWrite available
0x7104 - 0x74FB	DEVICE02 – DEVICE255 Information		1016	Communication states, error information, trigger states of DEVICE02 – DEVICE255 * The same format of address 0x7100 is used for communication state. * The same format of address 0x7101 is used for error information. *The same format of address 0x7103 is used for trigger state.
0x74FC	DEVICE256 Communication State	unsigned short	1	Communication state of DEVICE256 0 : Communication error or Stopping 1 : Normal
0x74FD	DEVICE256 Error Information	unsigned short	2	Error information of DEVICE256 0 : Normal Non-zero : Error Code - 0x20006 : Timeout Error (Retry+1)*When there is no response during the timeout - 0x20025 : Read/Write Request Error
0x74FF	DEVICE256 Trigger Information	unsigned short	1	Trigger state of DEVICE256 0 : Stopping 1 : Instructing Execution * Only TriggerRead/TriggerWrite available

OPC UA Client Communication

Modbus Address	Item	Data Type	The number of words	Description
0x7900	Communication status	unsigned short	1	Session State 0 : Unconnected 1 : Connecting 2 : Connected
0x7901	Communication error information	unsigned long	2	Error information communicating with the OPC UA server 0 : Normal Non-zero : Error Code
0x7903 - 0x7912	Reserved	—	16	Reserved
0x7913 - 0x791E	Write Node1 Reserved	—	12	Reserved
0x791F	Write Node1 Request ACK Time	Unsigned long long	4	OPC UA DateTime Value For example, in the case of 0x123456789ABCDEF0, it would be stored as follows: 0x791F : DEF0 0x7920 : 9ABC 0x7921 : 5678 0x7922 : 1234
0x7923	Write Node1 Request ACK Time (string)	char	8	Response Received Time YYYYMMDDhhmmss+\0\0
0x792B	Write Node1 StatusCode	unsigned long	2	Error information of Write Node1 0 : Normal Non-zero : Error Code
0x792D - 0x794C	Write Node1 Reserved	—	32	Reserved
0x794D - 0x8F80	Write Node2 – Write Node99Information	—	5684	Request ACK Time, Request ACK Time(string), StatusCode of Write Node2 – Write Node99 * The same format of address 0x791F is used for Request ACK Time. * The same format of address 0x7923 is used for Request ACK Time(string). * The same format of address 0x792B is used for StatusCode.
0x8F81 - 0x8F8C	Write Node100 Reserved	—	12	Reserved
0x8F8D	Write Node100 Request ACK Time	Unsigned long long	4	OPC UA DateTime Value * Same format as address 0x791F

Modbus Address	Item	Data Type	The number of words	Description
0x8F91	Write Node100 Request ACK Time (string)	char	8	Response Received Time YYYYMMDDhhmmss+\0\0
0x8F99	Write Node100 StatusCode	unsigned long	2	Error information of Write Node100 0 : Normal Non-zero : Error Code
0x8F9B - 0x8FBA	Write Node100 Reserved	—	32	Reserved
0x8FBB	Read Node1 SourceTimestamp	Unsigned long long	4	OPC UA DateTime Value * Same format as address 0x791F
0x8FBF	Read Node1 SourceTimestamp (string)	char	8	SourceTimestamp YYYYMMDDhhmmss+\0\0
0x8FC7	Read Node1 ServerTimestamp	Unsigned long long	4	OPC UA DateTime Value * Same format as address 0x791F
0x8FCB	Read Node1 ServerTimestamp (string)	char	8	ServerTimestamp YYYYMMDDhhmmss+\0\0
0x8FD3	Read Node1 StatusCode	unsigned long	2	Error information of Read Node1 0 : Normal Non-zero : Error Code
0x8FD5 - 0x8FF4	Read Node1 Reserved	—	32	Reserved
0x8FF5 - 0xA628	Read Node2 – Read Node99Information	—	5684	SourceTimestamp, SourceTimestamp(string), ServerTimestamp, ServerTimestamp(string), StatusCode of Read Node2 – Read Node99 * The same format of address 0x8FBB is used for SourceTimestamp. * The same format of address 0x8FBF is used for SourceTimestamp(string). * The same format of address 0x8FC7 is used for ServerTimestamp. * The same format of address 0x8FCB is used for ServerTimestamp(string). * The same format of address 0x8FD3 is used for StatusCode.
0xA629	Read Node100 SourceTimestamp	Unsigned long long	4	OPC UA DateTime Value * Same format as address 0x791F
0xA62D	Read Node100 SourceTimestamp (string)	char	8	SourceTimestamp YYYYMMDDhhmmss+\0\0

Modbus Address	Item	Data Type	The number of words	Description
0xA635	Read Node100 ServerTimestamp	Unsigned long long	4	OPC UA DateTime Value * Same format as address 0x791F
0xA639	Read Node100 ServerTimestamp (string)	char	8	ServerTimestamp YYYYMMDDhhmmss+\0\0
0xA641	Read Node100 StatusCode	unsigned long	2	Error information of Read Node100 0 : Normal Non-zero : Error Code
0xA643 - 0xA662	Read Node100 Reserved	—	32	Reserved

7.COM Setting

The names of COM port displayed on CONPROSYS WEB Setting and the corresponding names of the devices are described below.

CONPROSYS WEB Setting	Device
COM00	COM A
COM01	COM B

8. MQTT Publish And Subscribe Data Format

1. MQTT Publish Data Format

In MQTT Publish, data are sent in the following format.

The format differs depending on the payload setting that has been set in MQTT Publish.

◆ When "JSON" is specified for "payload" setting

The character code is sent in UTF8.

Sending data example 1 (JSON format)

```
{
        “UUID”: “10beac02-aacf-4584-8c8a-913a79307d71”,
        “T” : “2010-01-01T00:00:00.000Z”,
        “SN”: “Serial number of the product”,
        “CK”: “Cloud Key “,
        “DATA” :[{ “ID”:”TAG00” ,”NE”:”tag_name” , “V”: 10} ,
                        {“ID”:”STAG01” , “V”:”test_message”},
                    ....]
}
```

Item	Description
(Header)	
UUID	A unique message ID This is used to determine duplicating messages when QoS 1 is set.
T	A time stamp in ISO8601 extended form
SN	The serial number of the product
CK	Cloud Key　This will not be sent when the cloud key is not set.
DATA	
ID	Sending data ID (TAG,MODBUS,DEVICE)
NE	Item name　This will not be sent when the item name is not set.
V	Sending values

When the algorithm is selected in MQTT Connection settings, data are sent in the following format. The character code is sent in UTF8.

Sending data example 2 (JSON format, Encryption algorithm)

```
{
        "UUID": "10beac02-aacf-4584-8c8a-913a79307d71",
        "T" : "2010-01-01T00:00:00.000Z",
        "SN": "Serial number of the product",
        "CK": "Cloud Key",
        "ALG": "Encryption algorithm",
        "E_DATA": "XXXXXXXXXXXXXX"
}
```

Item	Description
ALG	Encryption algorithm "AES-256-CBC.BASE64" or "AES-256-CBC.BASE64.NOSALT" can be used.
E_DATA	Encrypted data

◆ When "STAG" is specified for "payload" setting

The contents set in STAG are sent.

When the algorithm is selected in MQTT Connection settings, the contents are sent after its encryption.

2. MQTT Resend File Format

When the “Resend setting” is selected in MQTT Publish, and the product is disconnected from the Broker, data will be kept in the following format.

One content of sending data is set as one line, and stored separately per hour. Resending data can be stored for three days up to 16MB. If the data exceeds 16MB, the oldest data in each CloudKey will be deleted.

Data are sent one line by one line when the product is reconnected with the Broker, and they will be deleted upon sending completion.

[File name] : {Cloud Key_}YYYYMMDDHH.csv

[Resend File Format (When "JSON" is specified for "payload" setting)] :

```
Sending data (JSON format)CRLF
Sending data (JSON format)CRLF…
```

[Resend File Format (When "STAG" is specified for "payload" setting)] :

```
MM:SS, Sending data (BASE64 format)CRLF
MM:SS, Sending data (BASE64 format)CRLF…
```

*Only results of decoded sending data (BASE64 format) are sent one line by one line when the product is reconnected with the Broker.

3. MQTT Subscribe Data Format

In MQTT Subscribe, data are received in the following format.

The format differs depending on the payload setting that has been set in MQTT Subscribe.

◆ When "JSON" is specified for "payload" setting

UTF8 should be used to identify the character code accurately.

Receiving data example 1 (JSON format)

```
{
        "UUID": "10beac02-aacf-4584-8c8a-913a79307d71",
        "T": "2010-01-01T00:00:00.000Z",
        "CK": "Cloud Key",
        "DATA" :[{ "ID":"TAG00" , "V": 10} ,
                        {"ID":"STAG01" , "V":"test message"},
                    ....]
}
```

Item	Description
(Header)	
UUID	A unique message ID　When QoS 1 is set and duplicating messages are received, the contents will not be written afterward.
T	A time stamp in ISO8601 extended form. The "Process only new data" setting can be used to process the newer data since the previous processing.
CK	Cloud Key　Set a null character when the cloud key is not set. This will not be written when the unset cloud key is received.
DATA	
ID	Receiving data ID (TAG,MODBUS,DEVICE) This will not be written when the unset data are received.
V	Receiving values

When the algorithm is selected in MQTT Connection settings, data are received in the following format.

UTF8 should be used to identify the character code accurately.

Receiving data example 2(JSON format, Encryption algorithm)

```
{
        "UUID": "10beac02-aacf-4584-8c8a-913a79307d71",
        "T": "2010-01-01T00:00:00.000Z",
        "CK": "Cloud Key ",
        "ALG": "Encryption algorithm",
        "E_DATA": "XXXXXXXXXXXXXX"
}
```

Item	Description
ALG*	The inside of the "E_DATA" key is decrypted with the specified encryption algorithm. "AES-256-CBC.BASE64" or "AES-256-CBC.BASE64.NOSALT" can be used.
E_DATA	Encrypted data

* When there is no "ALG" key, the inside of the "E_DATA" key will be decrypted with the "encryption algorithm" set in the receiving side of the CONPROSYS.
* The contents of "DATA" key will be processed when there is neither "ALG" key nor "E_DATA" key and there is unencrypted "DATA" key.

◆ When "STAG" is specified for "payload" setting

The received contents are written in STAG.

When the algorithm is selected in MQTT Connection settings, the encrypted contents are received, then decrypted. The contents are written into STAG when decryption succeeds.

9.MQTT Communication Log

The following tables list some of the messages displayed in the [MQTT comm log] in [Status] – [log] on the CONPROSYS WEB Setting.

1. COMMUNICATION LOG

Log Contents	Description
host not entered.	The service in MQTT Client is enabled without setting the MQTT connections. Please configure the MQTT Connection settings.
No route to host	The product is unable to connect with the Broker as the connecting destination cannot be found.
Connection timed out	Connection with the Broker has been timed out. (60sec)
Lookup error.	Host names' lookup failed.
Please set the time synchronization.	MQTT Client service is unable to start since time has not been set. Check the Time setting. MQTT Client service starts once the time is set.
Broker disconnected.	The product was disconnected from the Broker. Attempting to reconnect with the Broker.
The connection was lost.	The connection with the Broker was lost. Check the settings of the CONPROSYS or Broker specification.
Connection Refused: not authorised.	User/Password failed to be authorized when configuring the User/Password Authorization settings. Check the User/Password settings.
Not using password since username not set.	The configured password cannot be used since the username has not been set. Set the username in order to use the User/Password Authorization settings.
A TLS error occurred.	The required file for encrypted connection is incorrect in the “Encrypted connection” setting. Check the encrypted connection.
Different receive cloudkey settings.(Cloud Key)	Unable to process since there is no Cloud Key in the receiving data. Check the data format or the receiving settings.

2. PUBLISH LOG

Log Contents	Description
Publishing failed because the time has not been set.	Publishing failed since time has not been set. Check the Time setting.
Delete resend file . Resend directory is full. (Deleted file name)	Since the Resend folder is full reaching the maximum of 16MB, the old resend file in related Cloud Key has been deleted.
Resend file write false. Resend directory is full.	Since the Resend folder is full reaching the maximum of 16MB, writing the resend file failed. The capacity is occupied with the resend file from other Cloud Key.
File remove false. (File name)	1. Deleting the resend file failed. 2. The capacity of the resend folder became full reaching the maximum of 16MB while sending the resend file, and tried to delete that file but failed. This happens when Resend “Resend data -> Latest data” is set for Resend setting.
It contains an invalid value. (Data name)	The specified data cannot be sent since an invalid data name is set. Check the data name in the Sending Settings.
Calc formula error: (Error contents). (Data name)	Since calculating failed, the data cannot be sent. Check the Calculation formula set in the stated data.

3. SUBSCRIBE LOG

Log Contents	Description
There is no json in the received data.	The received string is not in JSON format. Check the data format.
There is no DATA in the received json.	There is no “DATA” key in the received string. Check the data format.
Different receive data settings. (Data name)	The received data cannot be processed since that data are not set in the Receiving Settings. Check the data format and the data name in the Receiving Settings.
It contains an invalid value. (Data name)	An invalid data name is set. Check the data format and the data name in the Receiving Settings.
Different topic settings.	The received data cannot be processed since that data have been received from a different TOPIC. Check the Receiving Settings or TOPIC in the Sending side.
Since there is no time stamp, all received data is processed.	When the setting is “Process only new data” and there is no appropriate time stamp, all data will be processed. Add an appropriate timestamp into the data format.
Since the time zone is invalid, it is processed as local time.	When the setting is “Processing only new data” and the time zone is invalid, the data are processed in local time zone of the product. Add an appropriate time zone to the data format.
Receive payload decrypt false.	The received string is encrypted and failed to decrypt it. Check the encrypted string and encryption algorithm in data format.
There is invalid ALG in the received json. Use config ALG.	Since there is no valid algorithm in the received string, data will be decrypted with the algorithm set in the Connection settings.
Calc formula error: (Error contents).(Data name)	Since calculating failed, the data cannot be processed. Check the Calculation formula set in the related data.

10. SMS Send Log

This section describes a message example that appears in the [SMS Send log] in [Log] on the CONPROSYS WEB Setting.

◆ Log Contents Of SMS Send Results

Log Contents	Description
Successfully sent SMS to 'phone number'	Sending a SMS messages to the phone number succeeded.
Failed to send SMS to 'phone number' (Error contents)	Sending a SMS message to the phone number failed. (The 'phone number' part is not shown when the phone number was unspecified and sending a message failed)

◆ Error Contents When SMS Send Failed

Error Contents	Description
Empty phone number	Phone number to send a message is unspecified.
Empty message	The message contents are empty.
Reached limits of sending SMS per day	The number of sending messages has reached the limit of the day.
Timeout occurred	Timeout occurred for sending a SMS message.
Unexpected AT command response received	SMS send sequence error, received an unexpected response.
Send multiple SMS at the same time	Send multiple SMS message at the same time. (There are other instances executing tool for SMS Send)
Internal error (Error number)	A SMS Send function internal error
Unknown return code (Error number)	An unknown internal error
Module error number and contents	CMS error or CME error contents

◆ For Resending a SMS Message

SMS messages can be resent when SMS Send failed due to the following error cases.

(except when the communication function is in standby mode)

CPS-MG341G5-ADSC1-931, CPS-MG341G-ADSC1-930

Error Contents
+CMS ERROR: 302, Operation not allowed
+CMS ERROR: 331, No network
+CMS ERROR: 512, SIM not ready

11. Industrial Value Conversion

Analog values can be converted into industrial values by specifying in the Device setting.

When the "measurement value" is selected in [Data type], the analog input value will be the one obtained in the range of the resolution (unit: LSB).

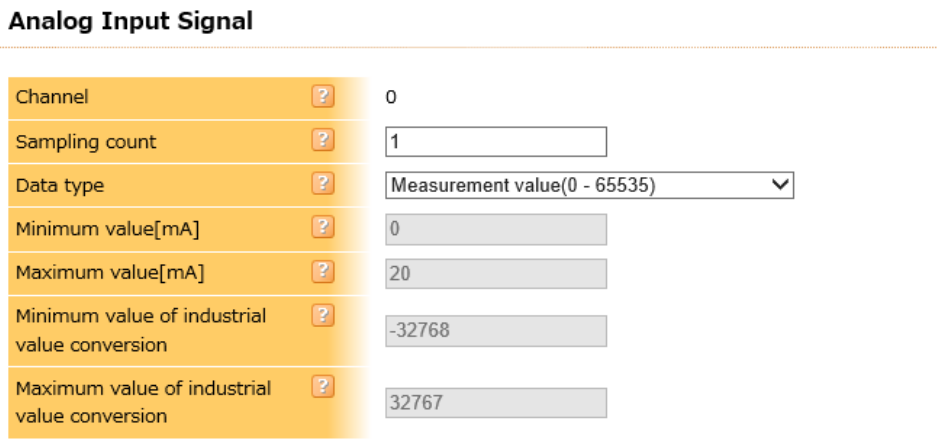
When the industrial value conversion is selected, the value will be the converted one set in the Minimum/Maximum value and the Minimum/Maximum value of industrial value conversion.

Setting Example 1 : Measurement Value

The product model : CPS-MG341-ADSC1-931

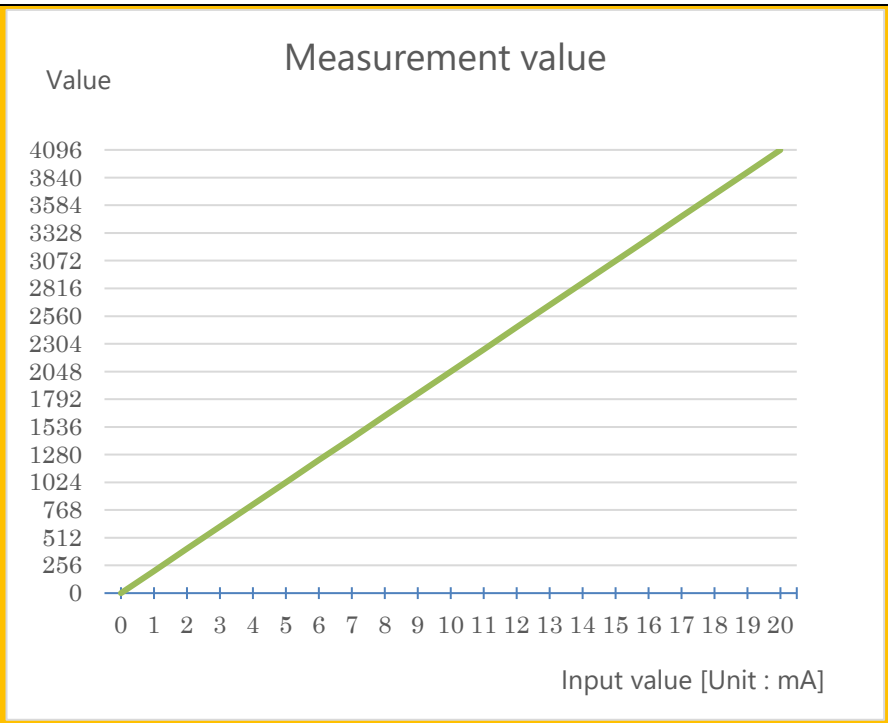
Data type in Default : As for measurement values, sensor values connected to analog input signals are obtained in units of LSB.

[Analog Input Settings]



[Measurement value**]**

Input value [mA]	Measurement value
0	0
1	205
2	410
3	614
4	819
5	1024
6	1229
7	1433
8	1638
9	1843
10	2048
11	2252
12	2457
13	2662
14	2867
15	3071
16	3276
17	3481
18	3686
19	3890
20	4095



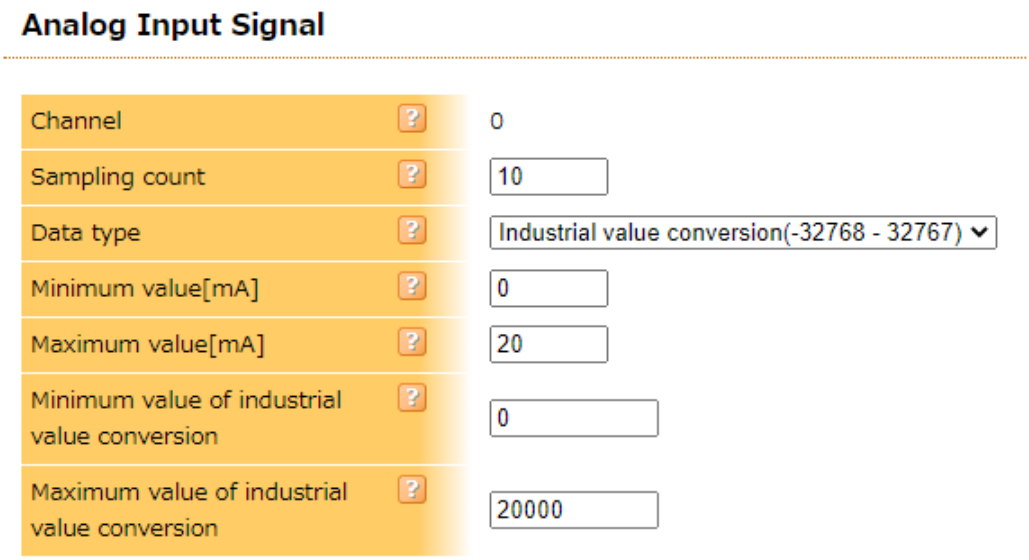
Setting Example 2 : Current Value

The product model : CPS-MG341-ADSC1-931

The following is a setting example when converting the measurement values of sensor connected to analog input channel 0 to current values.

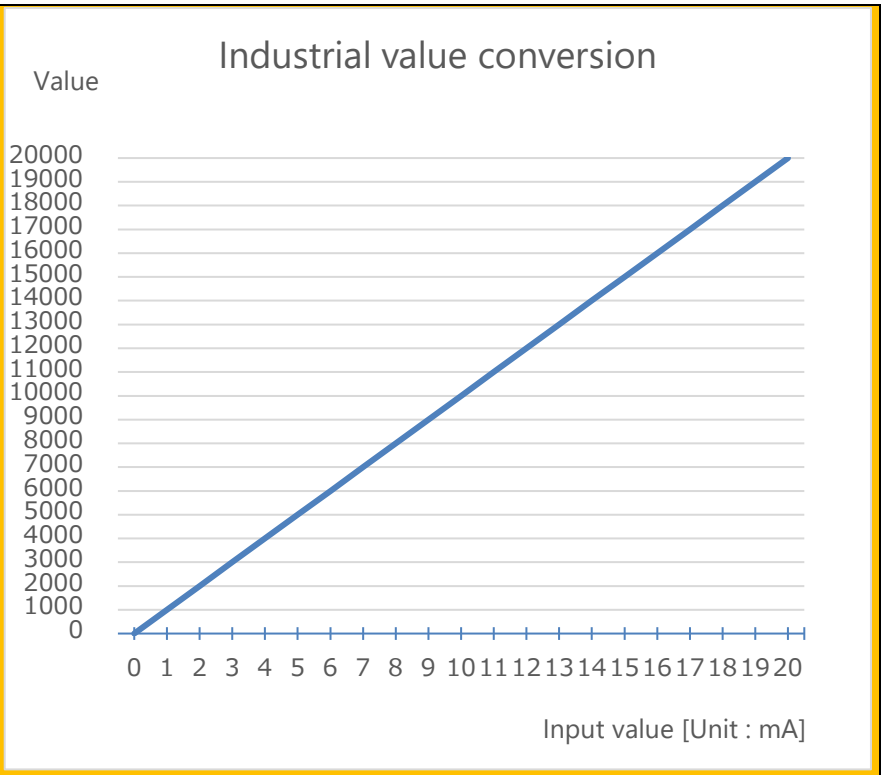
Analog input values will be converted in units of 0.001mA.

[Analog Input Settings]



[Industrial value conversion]

Input value [mA]	Value
0	0
1	1000
2	2000
3	3000
4	4000
5	5000
6	6000
7	7000
8	8000
9	9000
10	10000
11	11000
12	12000
13	13000
14	14000
15	15000
16	16000
17	17000
18	18000
19	19000
20	20000



Setting Example 3 : Connection With a Pyranometer of DC4-20mA Outputs

The product model : CPS-MC341-ADSC1-111

The following is a setting example when connecting the analog input channel 0 with a pyranometer of DC4-20mA outputs and a measurement range of 0 to1.43kW/m^2.

Analog input values will be converted in units of 0.1W/m2.

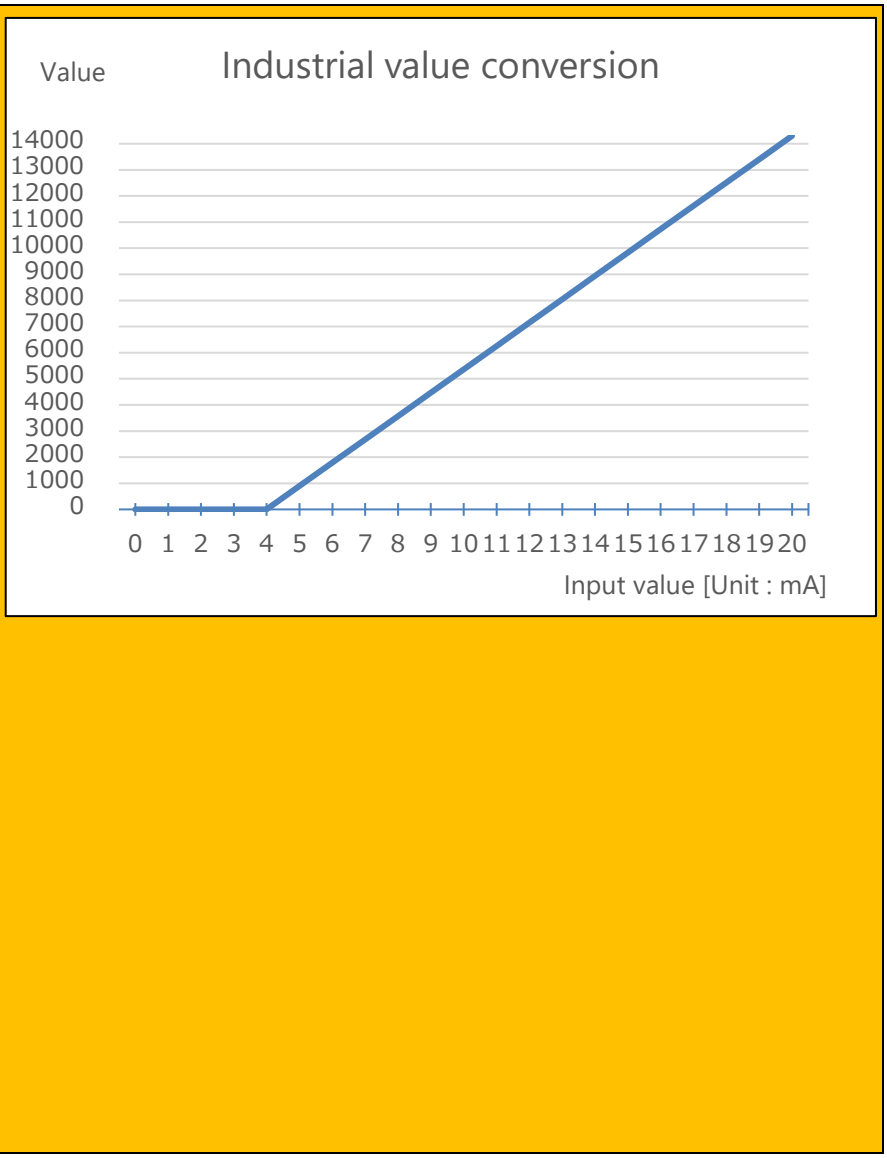
[Analog Input Settings]

Analog Input Signal

Channel	0
Sampling count	10
Data type	Industrial value conversion(-32768 - 32767)
Minimum value[mA]	4
Maximum value[mA]	20
Minimum value of industrial value conversion	0
Maximum value of industrial value conversion	14300

[Industrial value conversion]

Input values [mA]	Values
0	0
1	0
2	0
3	0
4	0
5	895
6	1790
7	2680
8	3575
9	4470
10	5365
11	6255
12	7150
13	8045
14	8940
15	9830
16	10725
17	11620
18	12515
19	13405
20	14300



Customer Support and Inquiry

CONTEC provides the following support services for you
to use CONTEC products more efficiently and comfortably.

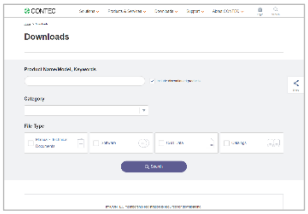
1.Services

CONTEC offers the useful information including product manuals that can be downloaded through the CONTEC website.

Download

https://www.contec.com/download/

You can download updated device driver, firmware, and differential manuals in several languages.　Membership registration (myCONTEC) is required to use the services.



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Revision History

MONTH YEAR	Summary of Changes
June 2018	The First Edition
June 2019	The functions “User's Restrictions” and “Tag Edit” were added in the [CONPROSYS WEB Setting] menu.
March 2020	The function menus of “LTE” and “MQTT Publish and Subscribe” were added.
April 2020	Specifying and function for destination service were added in data transfer settings.
August 2020	The function menus of “SMS” was added.
December 2020	The function menus of “Industrial Value Conversion” was added.
February 2021	Task controls and Modbus status information are added.
March 2022	The functions “Forced Reboot” and “Repair SD and Reboot” are added.
May 2022	The functions “Router Function” and “IP Filter” are added.
October 2022	The function menus of “BACnet” was added.
August 2023	The functions “Alive Monitoring” and “Target address” and “Cycle” are added.
September 2023	The functions “FacilityView Connection” and “FacilityView Transfer” and “Connecting to FacilityView” are added.
September 2024	The function of “Certificate” are added.
January 2025	BACnet Configuration File Format are added.
May 2025	Partially modified "OPC UA Server settings".
June 2025	The function of “OPC UA Client” are added.

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CONTEC CO., LTD. 3-9-31, Himesato, Nishiyodogawa-ku, Osaka 555-0025, Japan

https://www.contec.com/

M2M Gateway Series, Reference Manual (Software)

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