CONTEC

CONPROSYS®

VTC Script sample programs

(No. 020)

M2M/IoT Solution CONPROSYS
FIT Protocol Communication Sample

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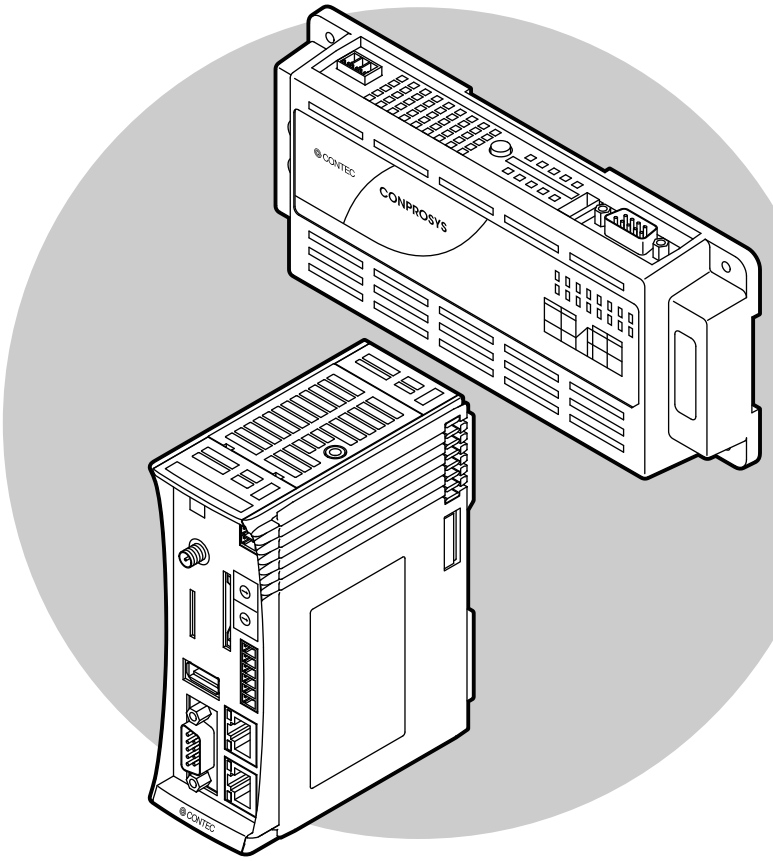

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1. Required Equipment

The minimally-required equipment for when using this sample is shown below. Please prepare switches and sensors for confirming operation and changing signal status depending on the situation.

Item Name	Model	pcs	Manufacturer
M2M Controller	CPS-MC341-ADSC1-111	2	CONTEC
Laptop PC	- *1	1	
LAN Cable	- *2	2	

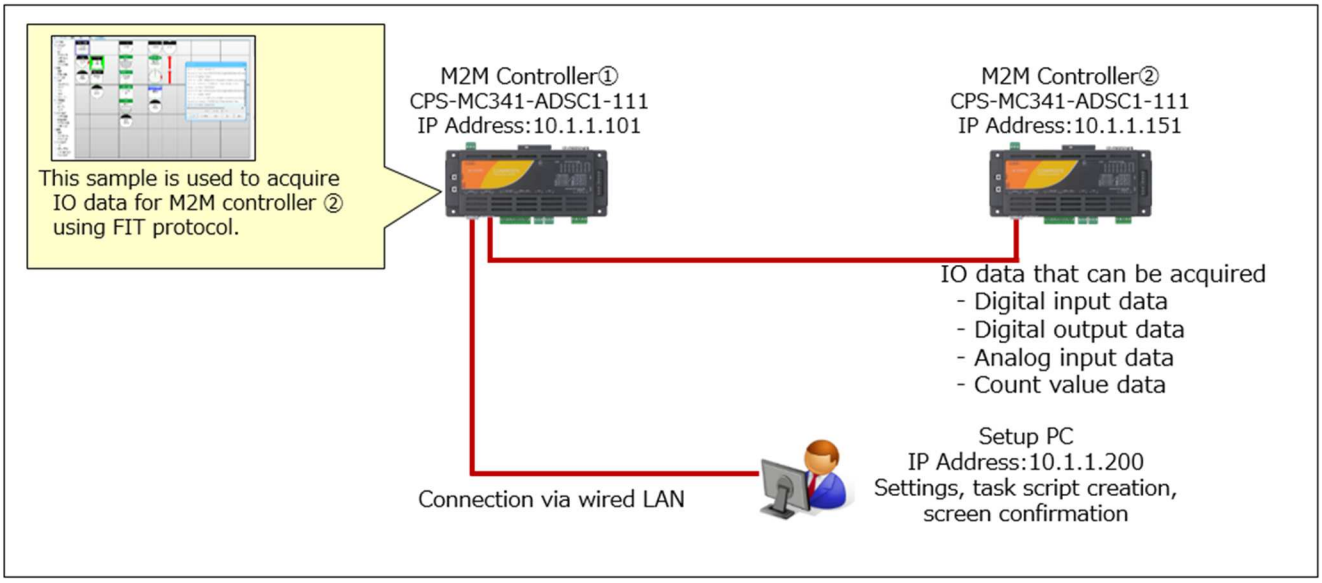
*1 : Please use a computer on which Google Chrome, Firefox, or IE 11, etc., is available.

*2 : Because the M2M controller is equipped with two LAN ports, please use it as a hub.
If connecting with other network devices, please prepare the appropriate hubs and cables.

2. Sample Overview

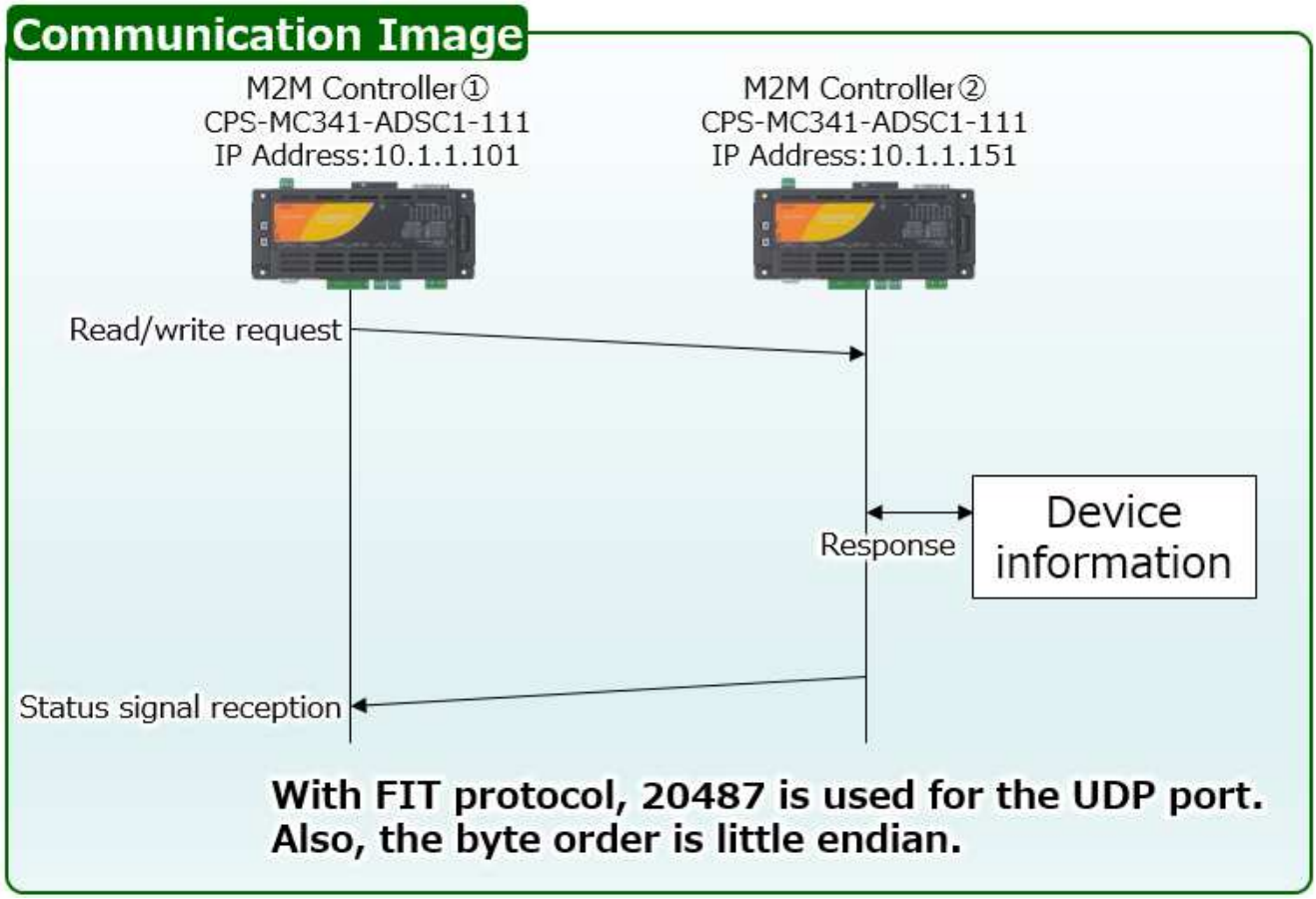
This sample shows a sample program for acquiring IO data using FIT protocol in which two CONPROSYS® units are connected via LAN cable. In this sample, a sample task for acquiring data using FIT protocol and a sample monitoring screen for viewing acquired data have been prepared.

The network configuration necessary for when using this sample is shown below.



3. FIT Protocol Overview

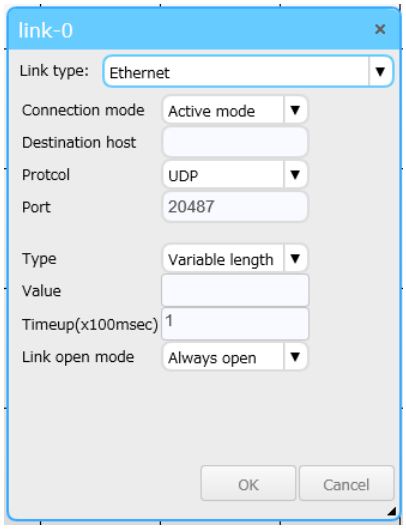
F&eIT protocol (hereinafter “FIT protocol”) is CONTEC’s original communication protocol that uses UDP/IP and which mainly serves the purpose of acquiring remote IO data. Both CONPROSYS® series models and F&eIT® Minimal Wiring Remote I/O Systems are equipped with this protocol.



4. How to Use Sample Tasks

1. Select “File - Open from local disk...” on Task Edit’s menu to show the File select dialog.
2. Select “FIT_Sample.dat” file which is extracted from download file on the File select dialog and Open it.
3. Select “File – Save task...” on Task Edit’s menu to show “Save task” dialog after you load “FIT_Sample.dat” to current Task. Select the file name from Task0 to Task9 and Click the “OK” button.
4. Select “Options – Link settings...” to show “Link setting” dialog on Task Edit’s menu.
5. Click “Detail..” button of “Link-0” on “Link setting” dialog.
6. Please configure the setting as below.

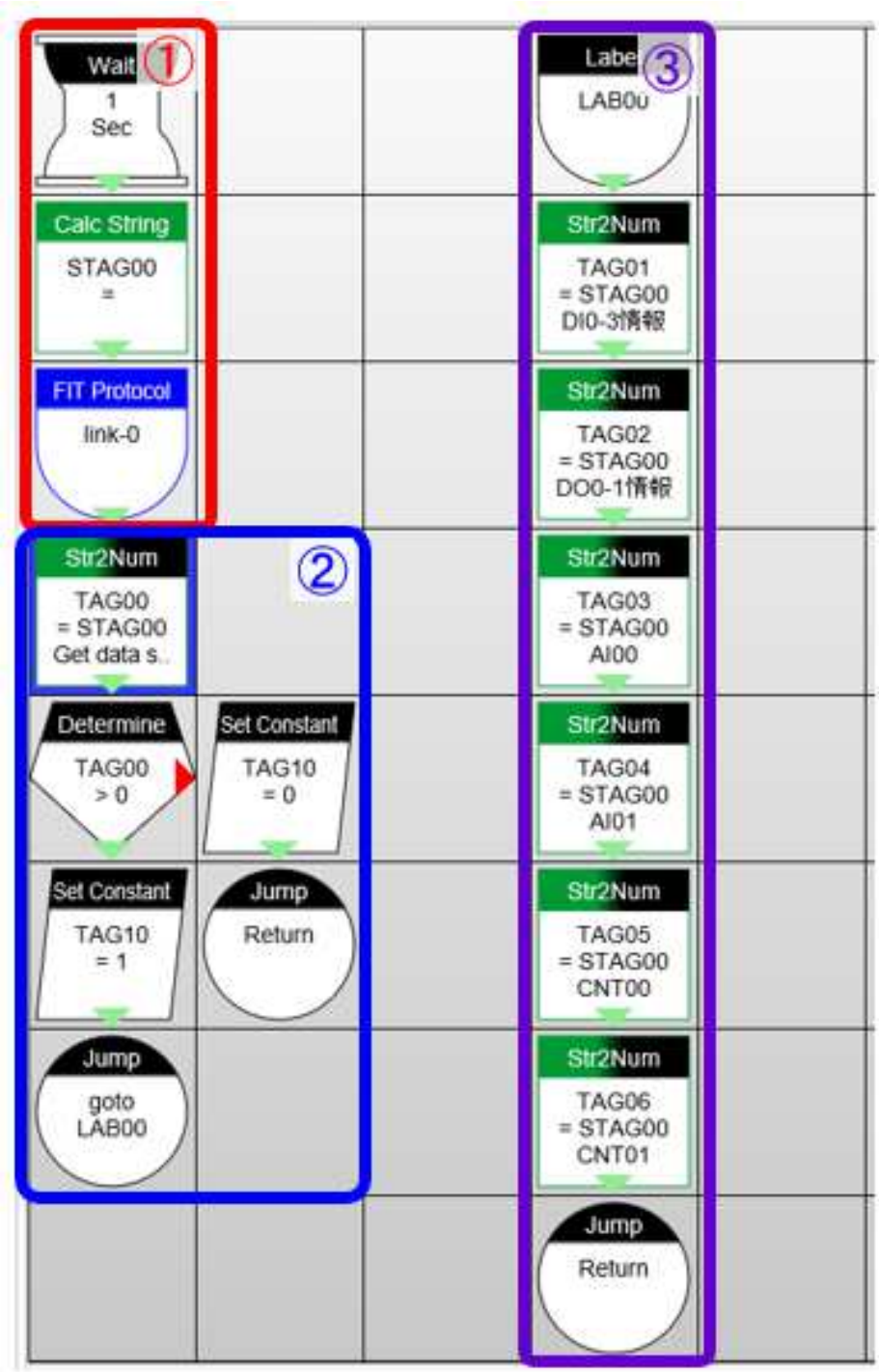
   ・Connection mode : Active mode
   ・Destination : 10.1.1.151
   ・Protocol : UDP
   ・Port : 20487
   ・Type : Variable length
   ・Timeup *1 : 1
   ・Link open mode : Always open



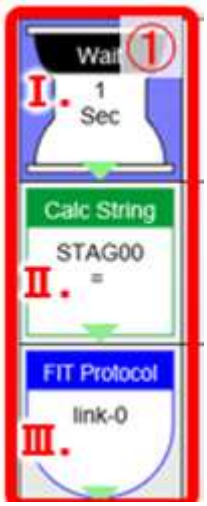
*1 : The value set for communication timeout (×100 msec) is the amount of wait time for the next packet to be received after the final telegram has been received before a communication timeout occurs. Please use when packets are segmented, etc.

5. Sample Task Operation

The sample tasks ”FTI_Sample.dat” is shown below.



This page provides an explanation regarding part ①.

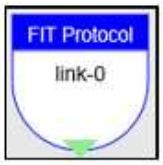


①From Preprocessing to FIT Protocol Communication

Ⅰ. Standby for 1 min.

Ⅱ. Clear the receive buffer (STAG00).

Ⅲ. Start FIT communication. Settings for FIT protocol communication are made using the following conditions.



◇Property Information of Sample Task "FIT Protocol"

Property	Value
Link No	link-0
Address	Fixed Value
Fixed value (address)	3a2900
FeIT Read/Write	read
Size	Fixed Value
Fixed value (size)	48
Buffer	STAG00
Next step	Down
→ X	0
↓ Y	2

Specify the Link No.

Specify the address for accessing using FIT protocol. Refer to the Reference Manual for the access address.

Specify the size for reading from the specified address. Refer to the Reference Manual for the address map.

Assign received telegrams to STAG00.

◇The FIT Protocol address on CPS-MC341-ADSC1-111

◆ I/O space

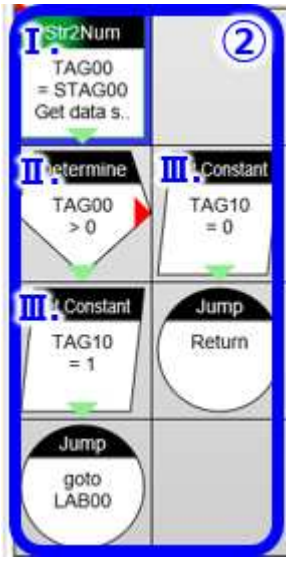
I/O information (Example)

• CPS-MC341Q-ADSC1-111 • CPS-MC341G-ADSC1-110

• CPS-MC341-ADS 2-111 • CPS-MC341G-ADSC1-111

Address	Size		Description	Remarks
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	

This page provides an explanation regarding part ②.



② From Confirming Received Content to Judging Whether a Communication Abnormality Has Occurred

I. Confirm the data size for the receive buffer (STAG00). Use the "Convert to Numerical Value" icon to confirm the data size. If data cannot be acquired, STAG00 will become null, and if the data size is acquired, it will be "0".

◇ **Property Information of "Convert to Numerical Value"**

Property	Value
TargetValue=	TAG00
Action	Get data size
Str	STAG00
Next step	Down
→ X	0
↓ Y	3

Select where to assign the conversion results.

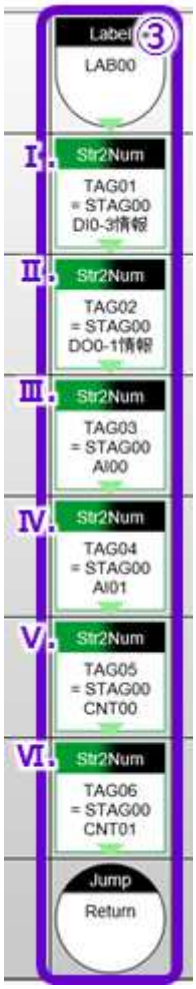
Select the data size to be acquired.

Select the character string variable for acquiring the data size.

I. Using the process described in "I.", judge whether operation is normal or abnormal using the judgment made after the data size was acquired.
If the value for the received data size (TAG0) is larger than "0", operation is normal. Anything other than that indicates an abnormality.

II. If normal, assign "1" for communication status (TAG10) and skip to process ③.
If abnormal, assign "0" for communication status (TAG10) and return to the beginning.

This page provides an explanation regarding part ③.



③ Data Extraction Process

Here, required data from telegrams inside the receive buffer will be extracted. Use the “Convert to Numerical Value” icon to extract data. Properties will change depending on the acquired size.

◇Acquiring DI/DO （Ⅰ・Ⅱ）

Property	Value
TargetValue=	TAG01
Action	1byte binary >> short
Str	STAG00
Offset	Fixed Value
Fixed value (offset)	0
Next step	Down
→ X	3
↓ Y	1

◇Acquiring CNT (Ⅲ･Ⅳ)

Property	Value
TargetValue=	TAG02
Action	1byte binary >> short
Str	STAG00
Offset	Fixed Value
Fixed value (offset)	1
Next step	Down
→ X	3
↓ Y	2

◇Acquiring AI (Ⅲ･Ⅳ)

Property	Value
TargetValue=	TAG03
Action	2bytes binary >> short
Str	STAG00
Offset	Fixed Value
Fixed value (offset)	16
Endian	little endian
Next step	Down
→ X	3
↓ Y	3

Refer to the address map for position from beginning and acquired size.

◇ The FIT Protocol address on CPS-MC341-ADSC1-111

Address	Size		Description	Remarks
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	

5 TAG Assignment

The tag assignment data used in this sample is shown below.
Use as reference for when expanding or linking.

TAG No.	Item name
TAG00	Recived size
TAG01	DI data
TAG02	DO data
TAG03	AI00 data
TAG04	AI01 data
TAG05	CNT00 data
TAG06	CNT01 data
TAG07	Reserved
TAG08	Reserved
TAG09	Reserved
TAG10	Comm. status

STAG No.	Item name
STAG00	Recived buffer
STAG01	Reserved
STAG02	Reserved
STAG03	Reserved
STAG04	Reserved
STAG05	Reserved
STAG06	Reserved
STAG07	Reserved
STAG08	Reserved
STAG09	Reserved
STAG10	Reserved

6 How to Use the Monitoring Screen

① Select “File - Open from local disk...” on Monitoring Edit’s menu to show the File select dialog.

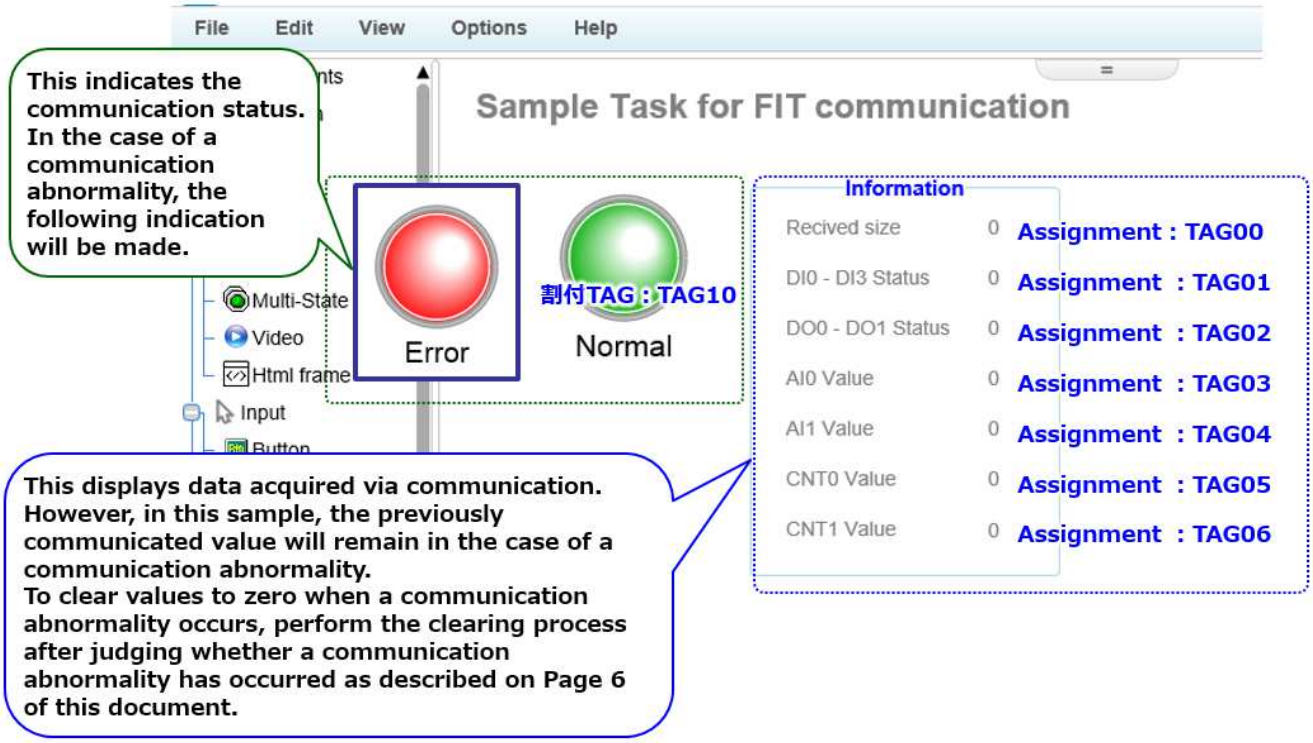
② Select “FIT_Sample.page” file which is extracted from download file on the File select dialog and Open it.

③ Select “File – Save Page as...” on Page Edit’s menu to show “Save Page” dialog after you load “FIT_Sample.page” to current Page. Save it by unique name.

7 Image of HMI Screen

Sample of Monitoring Screen Data Confirmation

This is a sample monitoring screen for confirming FIT protocol communication data.



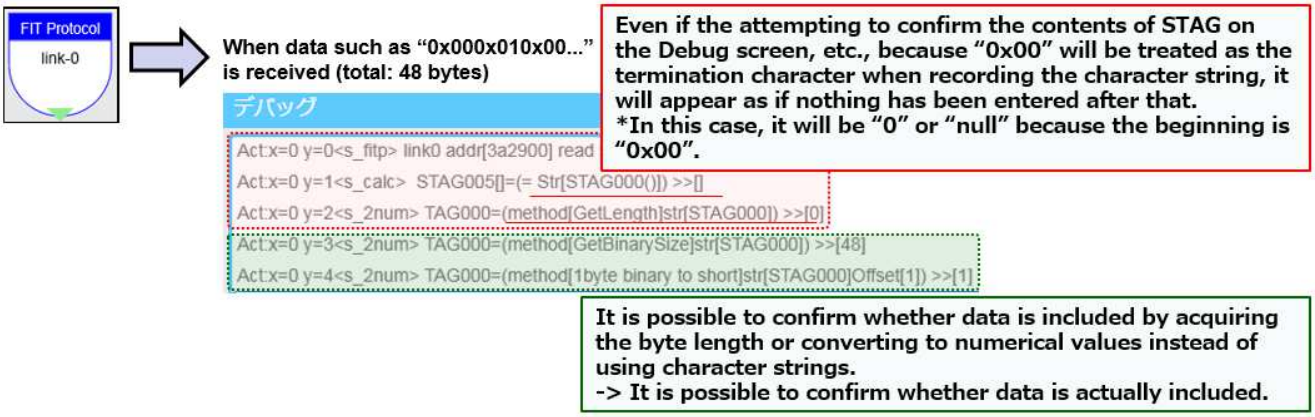
8 Precautions for FIT Communication

▼The display of telegrams received via FIT protocol

When displaying telegrams acquired using FIT protocol on the Debug screen or monitoring screen, it may appear that no data exists.

This is due to the fact that “0x00” may been inserted for FIT protocol to handle binary values. When attempting to view character strings that include “0x00” on the Debug screen or monitoring screen, the “0x00” portion of the character code will be interpreted as the termination character at which the character string ends.

As the following example shows, although subsequent viewing on the Debug screen will not be possible if “0x00” is included when receiving data, because it is included as actual data, please use data length properties for “Convert to Numerical Value” to confirm reception.



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March 2018 Edition

December 2018 Translation