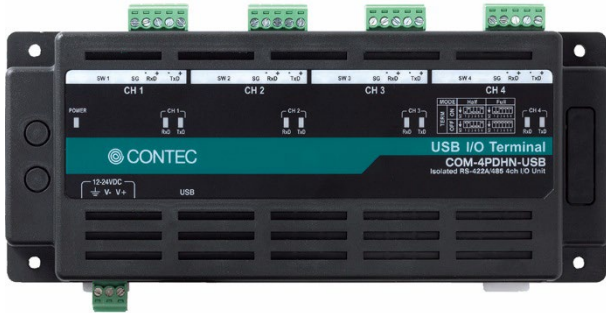# N Series for USB
RS-422A/485 4ch Isolated Serial I/O Unit
COM-4PDHN-USB

* Specifications, color and design of the products are subject to change without notice.

This product is an USB2.0-compliant product designed for extending RS-422A/485 compatible serial communication functionality on your PC.
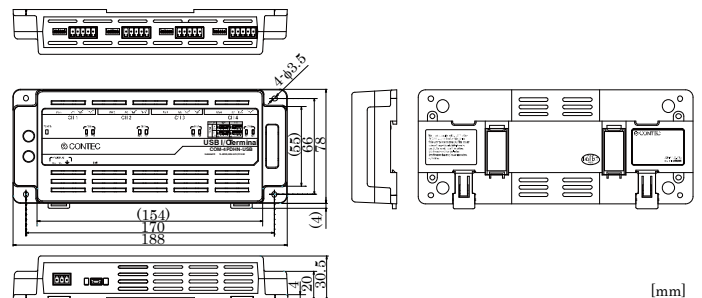
This product supports a baud rate of up to 921,600bps and has separate 128-byte / 384-byte buffer memory for transmit and receive.

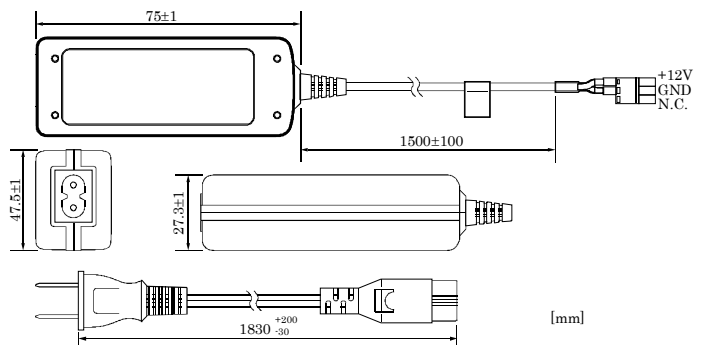It also comes with a Windows driver, which allows products to be used as OS-standard COM ports.

* The contents in this document are subject to change without notice.

* Visit the CONTEC website to check the latest details in the document.

* The information in the data sheets is as of July, 2022.

Features

Max. 921,600bps RS-422A/485 Serial Communication
This product has 4 channel RS-422A/485-standard serial ports. Baud rates from 300 to 921,600bps can be set for each port. When using the bundled "Standard COM Driver Software", baud rates from 300 to 921,600bps can be set. When data is transferred at the high speed, it may not be transferred normally, depending on the use environment such as the external device and cable length used.

Possibly used as Windows-standard COM ports, using the bundled driver library
Comes with a driver software that allows the products to be used under Windows in the same way as COM ports on the PC.
Under Windows, the product supports the OS-standard Win32 API communication function as well as Visual Basic MSComm.

Each channel is equipped with separate 128-byte / 384-byte FIFO buffers for transmit and receive.
These are FIFO format, useful for high speed communications and to reduce the load to the CPU when transmitting/receiving.

Compatible to USB1.1/USB2.0
Compatible to USB1.1/USB2.0 and capable to achieve high speed transfer at Full Speed (12 Mbps).

Compact Design
Compact design, 188.0(W) × 78.0(D) × 30.5(H), features flexibility in installation.

Adapting terminal connecters make it easy to connect and install the product
The terminal connectors (screw type) make it easy to connect and install the product.

Capable of adapting a wide-range power (12- 24VDC)
The product is capable of dealing with a wide range of power in the differing environments.
Power connector also has a FG terminal.

Diverse installations such as screw fastening, magnet (option), DIN rail are possible
Installation on the floor / wall /ceiling is possible by screw fastening, magnet (option), rubber feet, etc.
In addition, DIN rail mounting mechanism is equipped as standard with the product, making it easy to install the product within the panel or the device.

Physical Dimensions

Product

AC adapter (POA201-10-2)

[mm]

Packing List

Product [COM-4PDHN-USB] ...1
Rubber feet...4
3-pin power connector...1
5-pin connector for RS-422A/485 communication ...4
AC cable (1.8m)...1
USB cable (1.8m) ...1
USB cable attachment on the main product's side
    (For Mini B connector side) ...1
AC adapter ...1
Disk *1 [COM Setup Disk] ...1
First step guide ... 1
Warranty Certificate ...1
Serial Number Label ...1

*1 The bundled disk contains the driver software and User's Guide.

Specification

Item		Specifications
I/O		
	Number of channels	4ch
	Interface type	RS-422A/RS-485
	Transfer method	Asynchronous serial transfer
	Baud rate	300 - 921,600bps *1 *2
	Data length	7, 8 bits 1, 2 stop bits *1
	Parity check	Even, Odd, Non-parity *1
	Controller chip	XR21V1414 or equivalent (Mounting the FIFO memory as the common buffer of RS-422A/RS-485 communication and USB. Each channel has 384-byte receive and 128-byte transmit FIFO buffers.)
USB section		
	Bus specification	USB Specification 2.0/1.1 standard
	USB transfer rate	12Mbps (Full-speed) *5
	Power supply	Self-powered
Common section		
	Isolation specification	Isolation between channel, Bus isolation
	Isolation pressure proof	Between channel : 500VAC, Between bus : 1000VAC
	Current consumption (Max.)	12VDC 375mA, 24VDC 190mA
	Operating temperature *6	-20 - 60°C *7, 10 - 90%RH (No condensation)
	Connecting distance	1200m (Typ.) *3*4
	Dimension (mm)	188.0(W) x 78.0(D) x 30.5(H) (No protrusions)
	Weight	220g (Not including the USB cable, attachment)
	Connector	Power connector: MC 1,5/ 3-G-3,5 [PHOENIX CONTACT] equivalent RS-422A/485 communication connector: MC 1,5/ 5-G-3,5 [PHOENIX CONTACT] or equivalent
	Attached cable	USB cable 1.8m
	Standard	VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive)

*1 These items can be set by software.
    For the "Standard COM Driver Software COM Setup Disk" on the bundled disk, the range is
    300 - 921,600 bps.
*2 Data transmission at high speed may not be performed normally depending on the
    environment including the type of status of connected material of cable and environment.
*3 The table below lists an example of the relationship between baud rate and communication
    distance.

Communication distance	Baud rate
300m	115,200bps
600m	57,600bps
900m	19,200bps
1200m	9,600bps

Communication cable: 28AWG, double shielded cable, twisted pairs used for each +/- signal
line.

*4 The table below lists the maximum communication distances of the terminator resistor value
    and individual cable diameters.
    The terminators on the product (100Ω) and the terminators generally used with RS-422A/485(120Ω) are listed.

Maximum communication distances of the terminator resistor
value (100Ω) and cable diameter

Terminator Resistor(Ω)	Cable Diameter	Maximum Communication Distance(m)
100	AWG28	400
	AWG26	700
	AWG24	1100
	AWG22	1200

Maximum communication distances of the terminator resistor
value (120Ω) and cable diameter

Terminator Resistor(Ω)	Cable Diameter	Maximum Communication Distance (m)
120	AWG28	500
	AWG26	800
	AWG24	1200
	AWG22	1200

*5 This depends on the PC environment used (OS and USB host controller).
*6 To suppress the heating, ensure that there are spaces for ventilation (about 5cm) around this
    product.
*7 When using the provided AC adapter POA201-10-2, the operating temperature is 0 - 40
    deg.C.

AC adapter Environment Requirements (Installation Environment Requirements)

Item	Specifications
Input voltage range	90 - 264VAC
Rated input current	300mA
Number of frequency	50 - 60Hz
Rated output voltage	12.0VDC
Rated output current	1.0A (Max.)
Dimension (mm)	47.5(W) x 75(D) x 27.3(H) (No protrusions)
Weight	175g
Operating temperature	0 - 40°C
Operating humidity	20 - 80%RH(No condensation)
Life expectancy	1.5 years at the ambient temperature 40°C (When 100VAC is input and 1.0A is output) 4 years at the ambient temperature 40°C (When 100VAC is input and 0.5A is output) *1
Allowable time of short interruption	20ms (Max.) (When 100VAC is input and 0.55A is output) *2
Floating dust particles	Not to be excessive
Corrosive gases	None
Voltage corresponding to the attached AC cable	125VAC 7A

*1 The current consumption (Max.) of the F&eIT N series supported by this product is 6.5W.
*2 When the short interruption occurs and the defective operation of the equipment is generated,
    please insert the power supply of the equipment after pulling out it.

Support Software

Standard COM Driver Software   COM Setup Disk
Under Windows, this software allows you to use the serial ports on the
converter as if they were standard COM ports on the PC. By connecting
additional products, you can use COM ports in the range COM1 -
COM256. Under Windows, the serial ports can be accessed using the
standard Win32 API communication routines (CreateFile( ), WriteFile( ),
ReadFile( ), and SetCommState( ), etc.) The serial ports are also
compatible with the Visual Basic communication control (MSComm).
Supports the communication class of .NET Framework (SerialPort
class).

For more details on the supported OS, applicable language and new
information, please visit the CONTEC's Web site.

List of Options

AC adaptor (Input : 90 - 264VAC, output : 12VDC 1.0A) :POA201-10-2

DIN rail mounting power supply 15[w] :   CPS-PWD-15AW12-01 *1
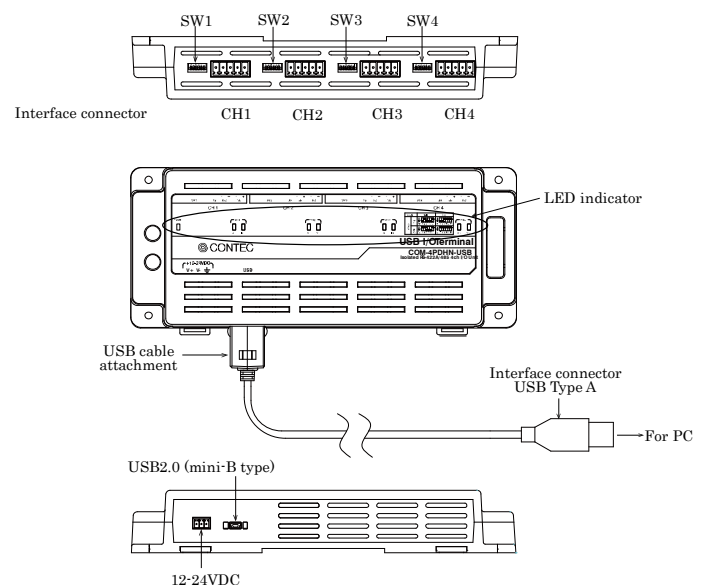
(Input: 100 - 240VAC, output: 12VDC 1.3 A)

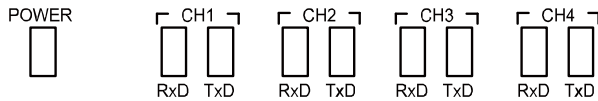Magnets for installation (For piece Set)   : CPS-MAG01-4

*1 This needs to be accompanied by AC cable. A user is encouraged to purchase our
    recommended AC cable (sold separately).

* Check the CONTEC's Web site for more information on these options.

Name of each parts

LED indecator

POWER   CH1   CH2   CH3   CH4

RxD TxD   RxD TxD   RxD TxD   RxD TxD

LED	Meaning	Status
POWER (Green)	Power status	OFF: Power has not been supplied. ON: Power has been supplied.
RxD (Yellow)	Reception status	Output status indication OFF : Data has not been received by the RS-422A/485 ON : When receiving data by the RS-422A/485
TxD (Green)	Transmission status	Input status indication OFF : Data has not been sent by the RS-422A/485 ON : When sending data by the RS-422A/485

Setting Transmission Mode

The data transfer mode setting switch is used to switch between full duplex and half duplex and to specify whether to use RTS/CTS in full duplex mode. Set the appropriate data transfer mode for the device with which you are communicating.

Bits 3 - 5 corresponded to each channel are used to set the data transfer mode. Since the bit 6 does not have a function, the bit 6 can set either ON or OFF.

Transmission mode	Half duplex	Full duplex
Setting mode (SW1 - 4)	TERM MODE NO 1 2 3 4 5 6	TERM MODE NO 1 2 3 4 5 6

The CTS signal of each channel is controlled by self-looping the RTS signal of the corresponding channel in the product.
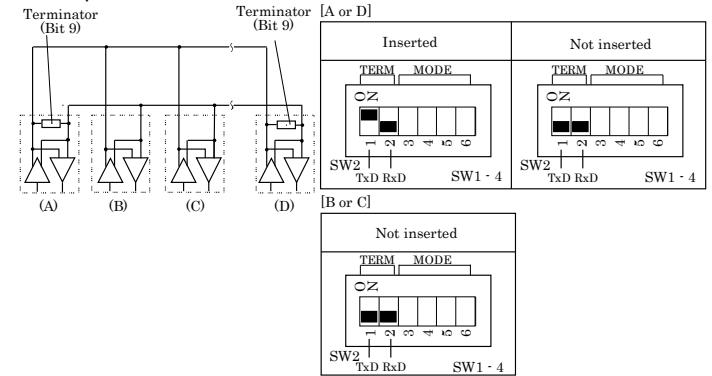
Setting of Terminator

The terminator setting switch controls whether or not a terminator is inserted into each signal line. Set the terminators on or off in accordance with the devices with which you are communicating. The terminators on the product are 100Ω resistors.
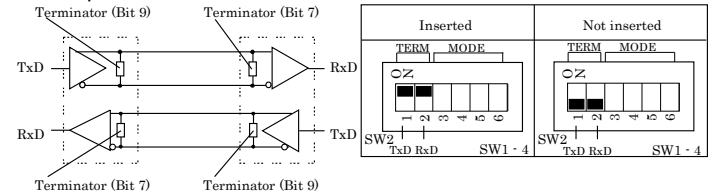
Setting Procedure
If you wish to use a terminator of other than 100Ω, set the bit 1 and 2 of corresponded channels OFF, and insert an external terminator. The diagrams below show examples of terminator installation for half and full duplex setting.

	Not inserted [Term OFF]
SW1 - 4 Setting method	TERM MODE NO 1 2 3 4 5 6 TxD RxD Figure 2.2 B to C (Other than both terminators of the line)

Half-duplex

Terminator (Bit 9)   Terminator (Bit 9)   [A or D]

Inserted	Not inserted
TERM MODE ON 1 2 3 4 5 6 SW2 TxD RxD SW1 - 4	TERM MODE ON 1 2 3 4 5 6 SW2 TxD RxD SW1 - 4

(A)   (B)   (C)   (D)

[B or C]

Not inserted
TERM MODE ON 1 2 3 4 5 6 SW2   TxD RxD   SW1 - 4

Full -duplex

Terminator (Bit 9)   Terminator (Bit 7)

TxD   RxD

RxD   TxD

Terminator (Bit 7)   Terminator (Bit 9)

| Inserted	Not inserted
TERM MODE ON 1 2 3 4 5 6 SW2 TxD RxD SW1 - 4	TERM MODE ON 1 2 3 4 5 6 SW2 TxD RxD SW1 - 4

The figure below shows the circuit associated with the data transfer mode setting switch and terminator setting switch. Each channel shares the same switch and the bits to be set are vary.

SOUT   TxD+ / TxD-
SIN   RxD+ / RxD-
CTS   Terminator 1/2W 100Ω   Terminator
RTS   Data transfer mode
DCD
DTR
DSR
RI
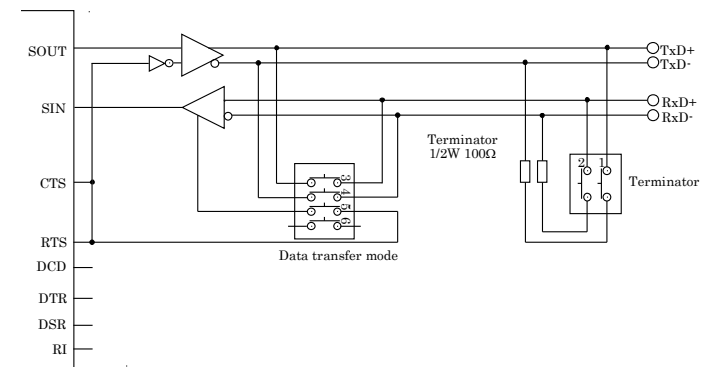
How to supply power to the product

Connect to the external power using the power input connector of this product (suitable cable is AWG28 - 16). Even when using the commercial DC output power supply, follow the instruction described here.
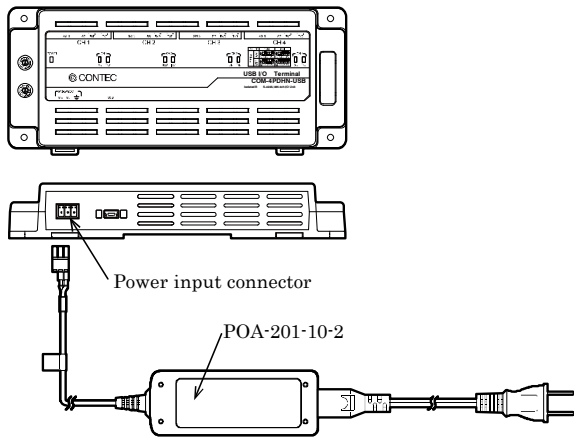
12-24VDC

FG Vi- Vi+
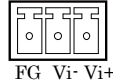
- Connector used
  MC1,5/3-G3,5 [PHOENIX CONTACT]
- Applicable connectors
  MC1,5/3-ST3,5 [PHOENIX CONTACT]

Signal name	Meaning
FG	Frame ground
Vi-	Power supply (GND)
Vi+	Power supply (12 – 24VDC□10%)

When using the provided AC adapter [POA201-10-2], please connect directly to the input terminals.

When using the provided 3-pin connector (MC1,5/3-ST-3,5, suitable cable: AWG28 - 16) to supply power to this product, strip the end of the suitable cable and connect it with the connector firmly using a screw, then insert it to the terminals.

Power input connector

POA-201-10-2

⚠ CAUTION

- First, connect 12 - 24VDC power supply to the product. Next, connect the USB cable to the PC.
  Do not power on or off when using the product. When removing, first remove the USB cable, and then disconnect 12 - 24VDC power supply.
- When the USB module is not used, leave the AC adapter unplugged.
- Continuously using the AC adapter heated affects its life.
- Use the AC adapter not in a closed place but in a well-ventilated place not to be heated.
- Do not remove the 3-pin power connector attached to the AC adapter.

Connection Method

Interface Connector
Use the interface connectors of the product to connect with external devices.

CH4   CH3   CH2   CH1
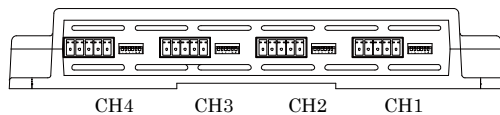
- Connector used
  MC 1,5/5-G-3,5 equivalent [PHOENIX CONTACT]
- Applicable connectors
  MC 1,5/5-ST-3,5 equivalent [PHOENIX CONTACT]
- Applicable wire   AWG28-16

Connector Pin Assignment
To connect the product directly to the external devices, make your own cable and connect it to the external device using the provided 5-pin RS422A/485 connector.
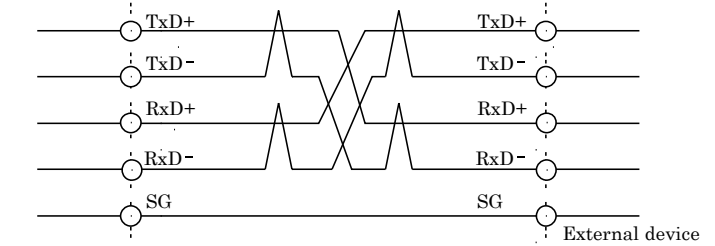
Pin Assignment

TxD+   RxD+   SG
  TxD-   RxD-
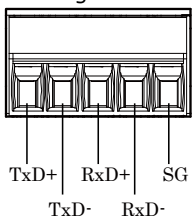
Signal name	Meaning
TxD+	Transmission data (+)
TxD-	Transmission data (-)
RxD+	Reception data (+)
RxD-	Reception data (-)
SG	Signal ground

Types of Cable and Example Connections

The figures below show examples of how to connect the cable for the product.
The RS-422A/485 interface works based on a differential signal whereby the signal is carried by the potential difference between two lines (+ and -).   Using twisted pair cable is recommended to improve resistance to noise.

Example Connection Oneself loop to RTS and CTS in Full Duplex

TxD+   TxD+
TxD-   TxD-
RxD+   RxD+
RxD-   RxD-
SG   SG
                        External device

Example Connection in Half Duplex

TxD+   TxD+
TxD-   TxD-
SG   SG
                        External device