RS-422A/485 2ch Serial I/O Board
with Isolation for PCI Express Low Profile
COM-2PD-LPE

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

This product is a low profile sized PCI Express bus-supported board designed for extending RS-422A/485 compatible serial communication functionality on your PC.

The product has two RS-422A/485 communication ports.

Higher noise-resistant models with isolation between a PC and bus line as well as a surge protection circuit for communication ports.   With a 128byte built-in FIFO buffer for transmission and reception of each channel, the product supports a baud rate of up to 921,600bps.

It also comes with a Windows driver, which allows boards 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 June, 2018.

Features

Max. 921,600bps RS-422A/485 Serial Communication
The product has two RS-422A/485-standard serial ports.
Baud rates from 2 to 921,600bps can be set.   When using the bundled "Standard COM Driver Software", baud rates from 15 to 921,600bps can be set.

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.   In addition, supplies a diagnostic program to confirm hardware operation and to perform a communication test with equipment.

Isolation between PCs, surge protection for all signal lines
Between PCs are electrically isolated.
As isolation of the bus is provided, this prevents electrical noise between the PC and external circuits.   As surge protection is provided on all signal lines, you can safely use the boards in environments where you are concerned about surges causing incorrect operation or damage to the PC.

Max. 16 boards can be installed as configured in the range COM1 - COM256.
Up to 16 boards can be mounted on a single PC.
COM1 - COM256 can be set using the device manager.

Each channel is equipped with separate 128-byte FIFO buffers for transmit and receive.
Employed a buffer memory 128-byte dedicated to transmission and 128-byte for each channel.
These are FIFO format, useful for high speed communications and to reduce the load to the CPU when transmitting/receiving.   As the device manager can be used to enable/disable the use of FIFO and set the FIFO trigger size, you can build an optimum system according to your use.

Support for Low Profile size slot / standard size slot
Bundled with each bracket for Low Profile size slot / standard size slot.
Exchanges it for the standard size bracket when mounting on the standard size slot.

To suit your application, cables and connectors are available as optional
Distribution cable for 2channels and 44-pin D-SUB connectors (male type) for your own cables are available as optional.

The control line for RS-422A/485 can be controlled and monitored by software.
The control lines for RTS+, RTS-, CTS+ and CTS- can be controlled and monitored using software.

Specification

Item	Specification
Number of channels	2ch
Interface type	RS-422A/RS-485
Isolation specification	Isolation between channel, Bus isolation
Isolation pressure proof	Between channel : 300VAC, Between bus : 500VAC
Transfer method	Asynchronous serial transfer (Full-duplex / half-duplex)
Baud rate	30 - 921,600bps *1 *2
Data length	5, 6, 7, 8 bits 1, 1.5, 2 stop bits *1
Parity check	Even, Odd, Non-parity *1
Loarding LSI	162850 or equivalent (Each channel has 128-byte receive and 128-byte transmit FIFO buffers.)
Connecting distance	Within 1200m *3
Interrupt requests	1 level use *4
I/O address	Any 32-byte boundary
Power consumption	3.3VDC 600mA (Max.)
Operating temperature	0 - 50°C, 10 - 90%RH (No condensation)
Bus specification	PCI Express Base Specification Rev. 1.0a x 1
Dimension (mm)	121.69(L) x 67.90(H)
Connector used	44-pin D-SUB, female connector, 103A-44FGTBBB3 (mfd. by COXOC)equivalent
Weight	80g
Standard	VCCI Class A, FCC Class A, CE Marking (EMC Directive Class A, RoHS Directive)

*1   These items can be set by software.

*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   A single interrupt signal "INTA" is output as a collection of interrupt input signals from two channels

Board Dimensions
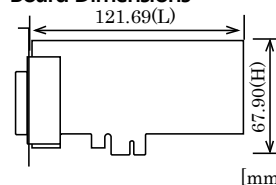
[mm]
The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

Packing List

Board [COM-2PD-LPE] ...1
First step guide ... 1
Disk [COM Setup Disk] ...1
Transmission line connection terminal ...1
Standard size bracket ...1
Warranty Certificate ...1
Serial Number Label ...1

Support Software & Service

Standard COM Driver Software COM Setup Disk (Bundled)
The purpose of this software is to allow the CONTEC serial communication boards to be used under Windows in the same way as the standard COM ports on the PC.   By installing additional boards, you can use COM ports in the range COM1 - COM256.
The boards can be used for all types of serial communications such as for remote access service (RAS) and uninterruptible power supply (UPS) applications.
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 2.0 (SerialPort class).

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

Cable & Connector (Option)

Connection Conversion Cable for Serial I/O (44M→9M x 2, 250mm)   : PCE44/9P2S

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

Parts of the Board and Factory Defaults

Note that the switch setting shown below is the factory default.
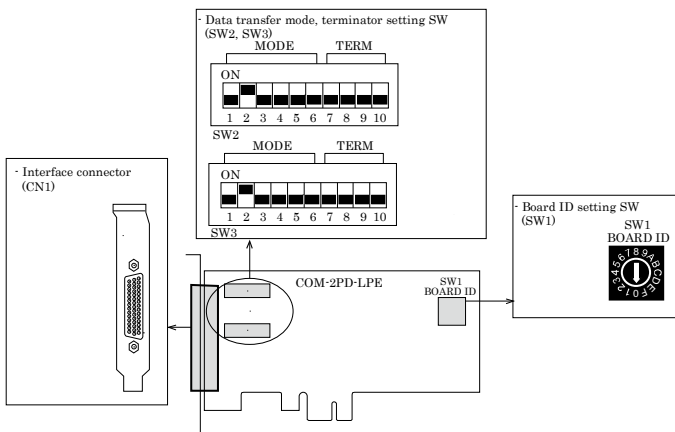
Setting the Board ID

If you install two or more boards on one personal computer, assign a different ID value to each of the boards to distinguish them.

The board IDs can be set from 0 - Fh to identify up to sixteen boards. If only one board is used, the original factory setting (Board ID = 0) should be used.
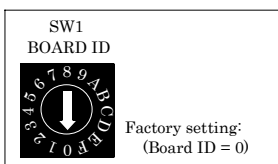
Setting Transmission Mode

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.   SW2 sets the mode for channel 1, SW3 for channel 2. Bits 1 - 5 are used to set the data transfer mode.   Always set bit 6 is to OFF.

Transmission mode	Half duplex	Full duplex	
		When there are no RTS and CTS	When there are RTS and CTS
Setting method	MODE TERM — SW2, SW3 — TXD is only used for data transmission; the sending and receiving modes should be switched over using the modem control register.	MODE TERM — SW2, SW3 — With above setting, RTS and CTS are connected in the board. Communication is available without wiring of RTS and CTS.	MODE TERM — SW2, SW3 Factory setting — To connect RTS and CTS to the other unit, communication is available.

⚠ CAUTION

- Do not use with bits 1 and 2 both set ON as this may result in damage to the board.
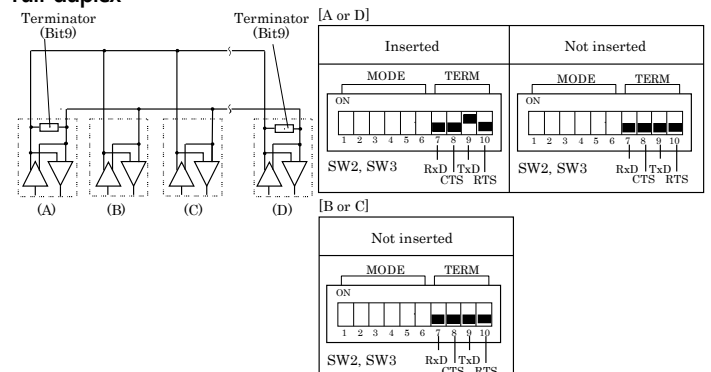
Setting Transmission Mode

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 board are 100Ωresistors. SW2 sets the terminator for channel 1, SW3 for channel 2,
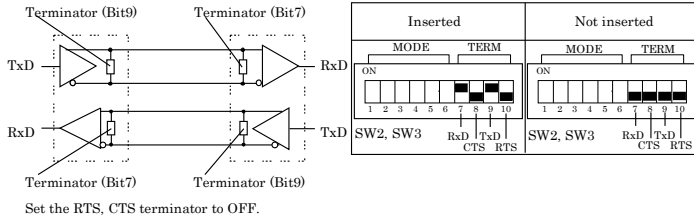
Setting Procedure
If you wish to use a terminator of other than 100☐ , set the terminator switch OFF and insert an external terminator.   The diagrams below show examples of terminator installation for half and full duplex setting.

Setting method	Inserted [Term ON]	Not inserted [Term OFF]
	MODE TERM — SW2, SW3 — RxD TxD CTS RTS — Next figure A or D (Both terminators of the line)	MODE TERM — SW2, SW3 — RxD TxD CTS RTS — Factory setting — Next figure 2.4. B or C (Other than both terminators of the line)

Falf-duplex

Falf-duplex (Setting Switch Circuits)

Set the RTS, CTS terminator to OFF.

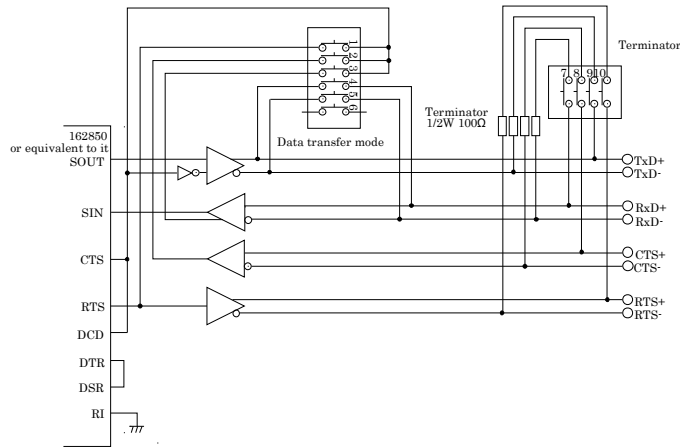## Falf-duplex (Connecting the RTS, CTS to the remote device)
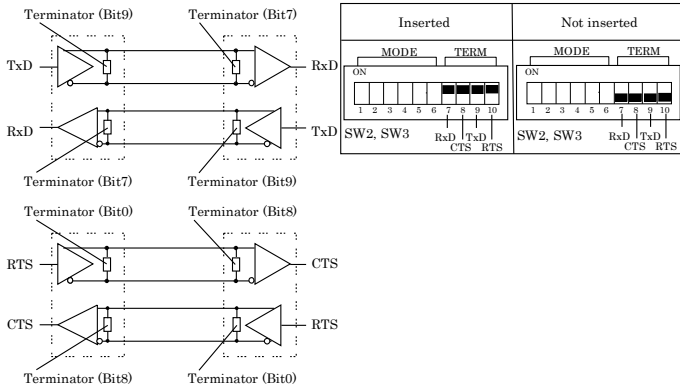
The figure below shows the circuit associated with the data transfer mode setting switch and terminator setting switch.
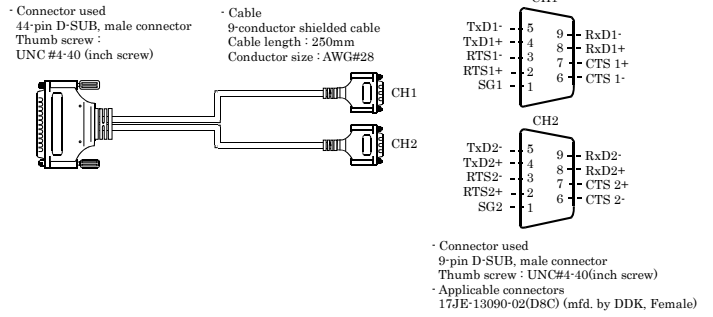

External Connection

Check the information available here when connecting an external device. In addition to connecting directly to the connector on the board, you can also connect external devices via a distribution cable or distribution unit.

- Connecting directly to the port connector.

- Using a distribution cable

When using a COM-2PD-LPE, an alternative to connecting an external device directly to the connector on the board is to use a connection conversion cable.

Using the 9-pin D-SUB Connector Conversion Cables

Use a PCE44/9P2S connection conversion cable (purchased separately) to connect to external devices after dividing into two 9-pin D-SUB male connector channels.

- Connector used
  44-pin D-SUB, male connector
  Thumb screw :
  UNC #4-40 (inch screw)

- Cable
  9-conductor shielded cable
  Cable length : 250mm
  Conductor size : AWG#28

CH1
TxD1- 5 / 9 RxD1-
TxD1+ 4 / 8 RxD1+
RTS1- 3 / 7 CTS 1+
RTS1+ 2 / 6 CTS 1-
SG1 1

CH2
TxD2- 5 / 9 RxD2-
TxD2+ 4 / 8 RxD2+
RTS2- 3 / 7 CTS 2+
RTS2+ 2 / 6 CTS 2-
SG2 1

- Connector used
  9-pin D-SUB, male connector
  Thumb screw : UNC#4-40(inch screw)
- Applicable connectors
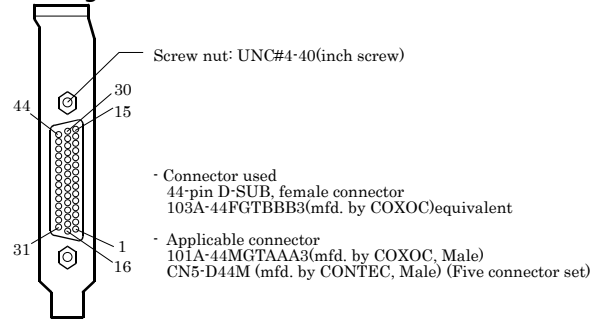 17JE-13090-02(D8C) (mfd. by DDK, Female)

⚠ CAUTION

The SG lines for CH1 – CH2 of the option cable are not connected to the cable shielding.   However, the frame of each connector is connected to the shielding.   This means that the cable shielding is connected to the body of the PC via the frame of the interface connector.
Note that the option cable is not a twisted-pair cable.

Connecting it directly from the on-board connector

If connecting an external device directly from the connector on the board, use an connector for creating your own cables.

Pin Assignment

Screw nut: UNC#4-40(inch screw)

- Connector used
  44-pin D-SUB, female connector
  103A-44FGTBBB3(mfd. by COXOC)equivalent
- Applicable connector
  101A-44MGTAAA3(mfd. by COXOC, Male)
  CN5-D44M (mfd. by CONTEC, Male) (Five connector set)

Pin Assignments of Interface Connector

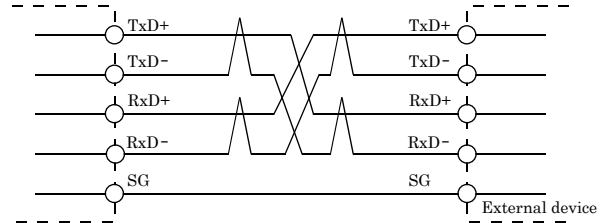| Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name
44	SG1	30	CTS1-	15	RxD1+
43	RTS1-	29	RTS1+	14	RxD1-
42	TxD1-	28	CTS1+	13	TxD1+
41	N.C.	27	N.C.	12	N.C.
40	SG2	26	CTS2-	11	RxD2+
39	RTS2-	25	RTS2+	10	RxD2-
38	TxD2-	24	CTS2+	9	TxD2+
37	N.C.	23	N.C.	8	N.C.
36	N.C.	22	N.C.	7	N.C.
35	N.C.	21	N.C.	6	N.C.
34	N.C.	20	N.C.	5	N.C.
33	N.C.	19	N.C.	4	N.C.
32	N.C.	18	N.C.	3	N.C.
31	N.C.	17	N.C.	2	N.C.
---------		16	N.C.	1	N.C.

CN1

Types of Cable and Example Connections

The figures below show examples of how to connect the cable for the board.
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.
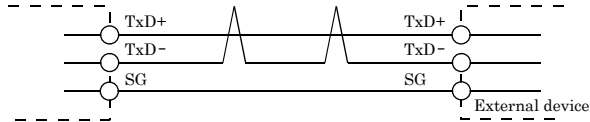
Example Connection RTS and CTS to a External Device in Full Duplex

TxD+ — TxD+
TxD- — TxD-
RxD+ — RxD+
RxD- — RxD-
RTS+ — RTS+
RTS- — RTS-
CTS+ — CTS+
CTS- — CTS-
SG — SG
External device
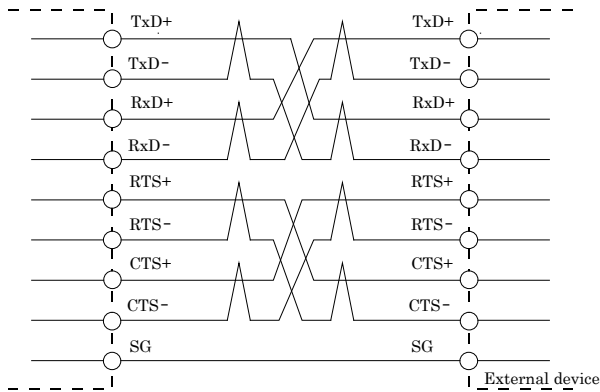
Example Connection Oneself loop to RTS and CTS in Full Duplex

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

⚠ CAUTION

If connecting between external devices and this board with faulty wiring, it will become the cause of failure.