



XL Series Profibus Communication Module HE-XPBS

1 Introduction

The HE-XPBS is used to provide Profibus communications support between a Profibus master and an XL series controller acting as slave.

2 Specifications

Table 1 – Specifications						
Software Protocol		DPV0				
Hardware Interface		RS-485				
Power		100mA at 5V				
Transmission Rate		9.6K – 12M bits/second				
Data Access		Cyclic Polling				
Device Identity		Specific ID number for each device				
Data Transfer Size		Upto 232 bytes of Input and 232 bytes of Output				
OCSEs Supporting Profibus DP		All variants of XLE, XLT, XL6 and XL6e series				
Cable Length	Baud Rate (Kbits/sec)	93.75	187.5	500	1500	12000
	Length (meters)	1200	1000	400	200	100

3 Installation Procedure

3.1 Installation Procedure

- a) Disconnect all power from the XLE unit including I/O power.
- b) Remove the four screws on the back of the XLE unit and remove the back cover. The back cover can be discarded or saved, but it will be replaced with the extended back cover that ships with the communication add-on. Screws are re-used (Figure 1).

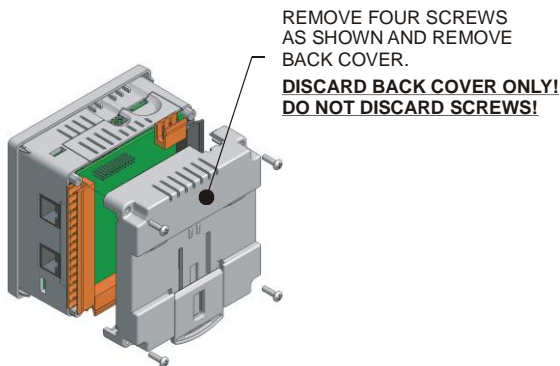


Figure 1 - Removing Back Cover of the XLE

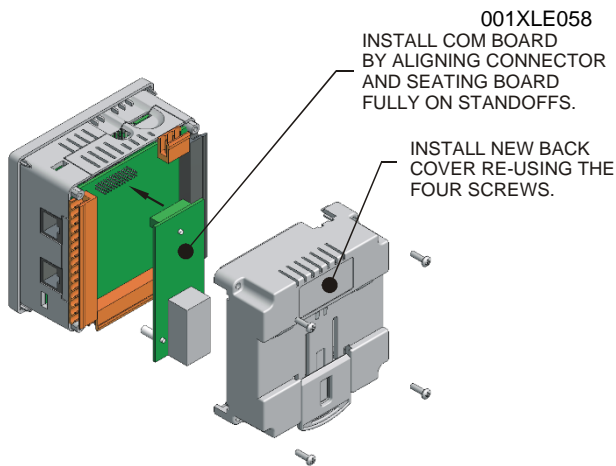


Figure 2 - Installing the Profibus Com Module in the XLE


- c) Make sure all the jumper settings on the I/O board are set correctly for the application.
- d) Plug the communication board onto the 24-pin connector. Make sure all the pins are properly aligned (Figure 2).
- e) Place the extended back cover onto the unit. It can be helpful to tip it at an angle so the connector on the COM board passes through the opening on the back cover.
- f) Place the screw back into the hole and turn the screw slowly counter clockwise until it clicks into the threads. This prevents the screw from being cross-threaded. Now, turn the screw clock-wise until the cover is firmly secured. Repeat this process for all four (4) screws.

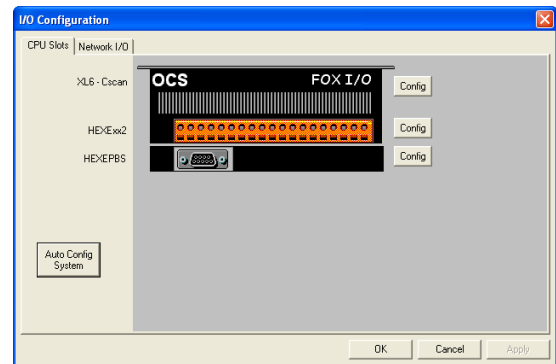
NOTE: If a solid connection cannot be made, then a direct connection to the earth ground screw can be used. Strip and clamp the Profibus cable and then attach an earth ground wire from the clamp to the earth ground screw.


4 Cscape Configuration (Profibus Configuration)

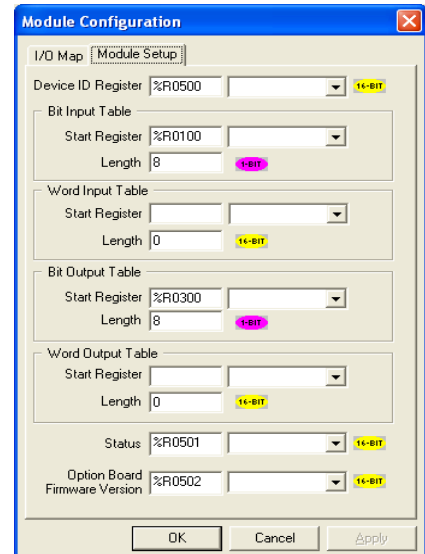
NOTE: Corresponding GSD file (HAPG0C74.GSD) must be loaded in the master device that will communicate with this slave (Refer MAN0919 for configuration details).

Go to <http://www.heapq.com/Pages/TechSupport/Downloads.html> to download the file.

1. Open Cscape and click on the I/O Configuration button . Following window will appear (Profibus option module must be installed as described in the Installation Procedure).



2. Click on  button next to HEXEPBS as shown above. Following window will appear, select Module Setup. In Module Setup user can configure number of registers to be exchanged, status information and slave id. The number of registers to be exchanged should match with the Master configuration.



- a) Device ID Register: This field is for configuring Node ID of the Profibus slave, any word accessible register type can be configured.

Node ID ranges from 1 to 125. If Slave ID is out off range (i.e. less than 1 or greater than 125) Profibus status will be 0xFEFE.

There are 2 methods for setting slave ID:

Method 1: Slave ID can be set through a logic register. If the ID is changed in the register via ladder, unit needs to be put through RUN-IDLE-RUN mode for this new ID to take effect.

Method 2: Slave ID can be directly set (value set between range 1 through 125). If the ID is changed then a new configuration needs to be downloaded and unit power cycled for config to take effect.

- b) Bit Input Table:

Start Register: This field is for configuring Input byte data type of Profibus communication, any bit accessible register type can be configured.

Length: In this field user has to define a value in terms of number of bits. Example: For 232-byte data exchange, configure length as 1856 bits = 8 * 232.

- c) Word Input Table:

Start Register: This field is for configuring Input word data type of Profibus communication, any word accessible register type can be configured.

Length: In this field user has to define a value in terms of number of words

- d) Bit Output Table:

Start Register: This field is for configuring Output byte data type of Profibus communication, any bit accessible register type can be configured.

Length: In this field user has to define a value in terms of number of bits. Example: For 1-byte data exchange, configure length as 8 bits.

- e) Word Output Table:

Start Register: This field is for configuring Output word data type of Profibus communication, any word accessible register type can be configured.

Length: In this field user has to define a value in terms of number of words.

3. Status (Read only):

This field is for configuring status word, any word accessible register type of OCS can be configured. Table below describes the status word:

Status Register, Low-Byte	
bit 7,6	WD_State 1..0: State of the Watchdog State Machine 00 = BAUD_SEARCH state 01 = BAUD_CONTROL state 10 = DP_CONTROL state 11 = Not possible
bit 5,4	DP_State 1..0: State of the DP State Machine 00 = WAIT-PRM state 01 = WAIT-CFG state 10 = DATA-EXCH state 11 = Not possible
bit 3	Reserved
bit 2	Diag_Flag: Status of the Diagnosis-Buffer 0 = The Diagnosis-Buffer had been fetched by the DP-Master. 1 = The Diagnosis-Buffer had not been fetched by the DP-Master yet.
bit 1	Reserved
bit 0	Offline / Passive_Idle: Offline/Passive_Idle state 0 = VPC3+ is in Offline. 1 = VPC3+ is in Passive_Idle.

Status Register, High-Byte	
bit 15-12	VPC3+Release 3..0 : Release number for VPC3+ 0000 = Step A 1011 = Step B 1100 = Step C 1101 = Step D (this chip release) Rest = Not possible
bit 11-8	Baud Rate 3..0 : The baud rate found by VPC3+ 0000 = 12,00 Mbit/s 0001 = 6,00 Mbit/s 0010 = 3,00 Mbit/s 0011 = 1,50 Mbit/s 0100 = 500,00 Kbit/s 0101 = 187,50 Kbit/s 0110 = 93,75 Kbit/s 0111 = 45,45 Kbit/s 1000 = 19,20 Kbit/s 1001 = 9,60 Kbit/s 1111 = after reset and during baud rate search Rest = not possible

Examples:

- a) If Profibus master is configured for 1.50Mbits/s and communicating with profibus slave, the status register will be 0xD3A1.
D = chip release information (refer status information table)
3 = baud rate information
A = slave is in data exchange mode
1 = slave is in passive idle mode
- b) If Profibus master is not communicating with slave, status register will be 0xD341

4. Firmware version:

This field is for configuring Profibus option module firmware version number, any word accessible register type of OCS can be configured for this.

Example: If the selected register is %R1 and the firmware version is 0.02, then 0.02*100 = 2 will be displayed.

NOTE: Power cycle of the device is needed for every new configuration download to slave device for this configuration to be active.

5 Installation / safety

When found on the product, the following symbols specify



WARNING: To avoid the risk of electric shock or burns, always connect the safety (or earth) ground before making any other connections.

WARNING: To reduce the risk of fire, electrical shock, or physical injury it is strongly recommended to fuse the voltage measurement inputs. Be sure to locate fuses as close to the source as possible.

WARNING: Replace fuse with the same type and rating to provide protection against risk of fire and shock hazards.

WARNING: In the event of repeated failure, do not replace the fuse again as a repeated failure indicates a defective condition that will not clear by replacing the fuse.

WARNING: Only qualified electrical personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment. Read and understand this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

- All applicable codes and standards need to be followed in the installation of this product.
- For I/O wiring (discrete), use the following wire type or equivalent: Belden 9918, 18 AWG or larger.

Adhere to the following safety precautions whenever any type of connection is made to the module.

- Connect the green safety (earth) ground first before making any other connections.
- When connecting to electric circuits or pulse-initiating equipment, open their related breakers. Do not make connections to live power lines.
- Make connections to the module first; then connect to the circuit to be monitored.
- Route power wires in a safe manner in accordance with good practice and local codes.
- Wear proper personal protective equipment including safety glasses and insulated gloves when making connections to power circuits.
- Ensure hands, shoes, and floor are dry before making any connection to a power line.
- Make sure the unit is turned OFF before making connection to terminals. Make sure all circuits are de-energized before making connections.
- Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.

6 Technical Support

Technical Support at the following locations:

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