Configuring the XL Series OCS equipped with HE-XPBS with the Profibus DP Master unit (Siemens S7 Series PLC as an example)
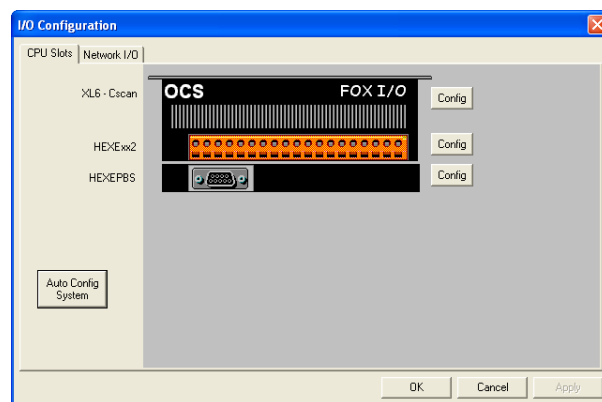
1.0. Protocol Name

Profibus DP

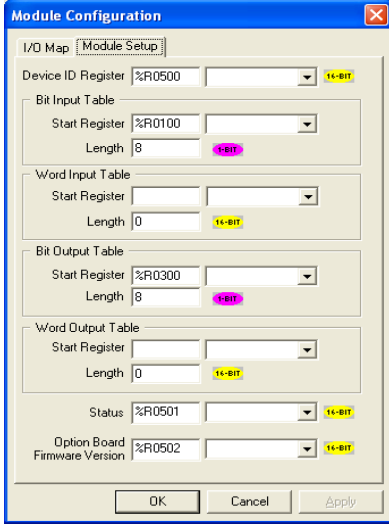## 2.0. Configuring the S7 300 Profibus Master Device

1. Open Simatic Manager
2. Select the Station and double click on Hardware option
3. In the new window select the existing DP Master System and set the address (it should be different from the Node ID specified in Cscape for the Slave unit)
4. From the menu Options select Install GSD file and follow the instructions (GSD file for XPBS is available on Horner websites).
5. After successful installation the HE-XPBS should be present on the far right panel (Profibus DP/Additional Field Devices/I/O/).
6. Simply drag the HE-XPBS and drop it on the Master link
7. Double clicking on the new object allows configuring Slave's Address (it should be same as the Node ID specified in Cscape)
8. To configure the incoming/outgoing traffic simply drag and drop the Items from HE-XPBS folder in the right panel to the bottom list.

3.0. Cscape Configuration of the HE-XPBS slave module

1. Open Cscape and click on the I/O Configuration button Following window will appear (Profibus module must be installed as described in the Installation Procedure in MAN0908).

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 ways for setting slave ID, user can use either depending on the application.

Procedure 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.

1.   User can set a logic register say %R500 in Device ID Register setting of the module configuration and also select the remaining configuration.
2.   Down load the configuration to OCS
3.   Set the %R500 to the desired node ID.
4.   Put OCS in RUN mode, if OCS is already in run mode change RUN-IDLE-RUN mode for the new ID to take effect.
5.   Repeat procedure 3 and 4 to effect any further change in slave ID.

Procedure 2: Slave ID can be directly set. If the ID is changed then a new configuration needs to be downloaded and unit power cycled for configuration to take effect.

1.   User can directly set slave ID (value set between range 1 through 125) in Device ID Register setting of the module configuration and also select the remaining configuration.
2.   Down load the configuration to OCS.
3.   Power cycle the unit.
4.   Repeat procedure 1 through 3 to make further changes in the slave ID.

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, 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
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.

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.

4.0. Data Types Supported

The Profibus Slave setup in Cscape allows configuring exchange of Bits and/or Words (16 bits), however the Profibus Master (S7) expects the traffic of Bytes and/or Words.

To match the settings the configured number of Bits (Cscape) should be equal to number of Bytes (S7) multiplied by 8. For example: to successfully send 16 bits from OCS to S7 (Length of 16 in the Bit Output Table field) the correct setting on the Master side is 2 incoming Bytes.

Number of incoming/outgoing Words should also be matched at both ends of configuration.

5.0. Comments

The HE-XPBS currently supports:

- 9.6k – 12M bits/second Transmission Rate
- Data transfer size of upto 232 Bytes In & Out

Profibus data exchange expands the overall scan time of the XL Series unit. The extra time may vary, from few ms (when exchanging only few registers) to around 30 ms (with full 232 Bytes In & Out traffic on XLt unit).

While exchanging the data registers specified in Word Input/Output, table fields can be modified and worked on, however it is not so for Bits specified in Bit Input/Output table fields. Bits that are being sent/updated cannot be modified at the same time (only in the next scan).

6.0. Connection details

Standard Profibus DP connection.

7.0. Technical Support

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