

Application Notes

How to configure FUJI PXR Temperature Controller and IDEC MicroSmart Pentra PLC with Modbus RTU RS485 protocol



Purpose

This application notes will guide you through step-by-step instruction on how to configure the FUJI PXR type temperature controller to communicate with IDEC MicroSmart PLC using Modbus RTU RS485 protocol.

Parts

- 1 – FC5A MicroSmart Pentra CPU
- 1 – FC4A-PC3 RS485 adapter (All-in-One CPU) or FC4A-HPC3 module (Slim CPU)
- 1 – FUJI PXR Temperature controller (RS485 version)

Step 1: Configure WindLDR Modbus settings

1. Launch WindLDR software.
2. Click **Configure, Comm. Ports** (for WindLDR 5.xx, click **Configure, Function Area Settings, Communication** tab).
3. Under Communication Mode Port 2, select **Modbus RTU Master**.

Communication Ports

Port	Communication Mode	Comm. Param.	Mode Selection Input	Network No.
1	Maintenance Protocol	Configure 9600-7-Even-1		0
2	Maintenance Protocol	Configure 9600-7-Even-1		0
3	Maintenance Protocol	Configure 9600-7-Even-1		0
4	User Protocol	Configure 9600-7-Even-1		0
5	Modem Protocol	Configure 9600-7-Even-1		0
6	Data Link Master	Configure 9600-7-Even-1		0
7	Data Link Slave	Configure 9600-7-Even-1		0
	Modbus ASCII Slave	Configure 9600-7-Even-1		0
	Modbus RTU Slave	Configure 9600-7-Even-1		0
	Modbus ASCII Master	Configure 9600-7-Even-1		0
	Modbus RTU Master			
	MODBUS/TCP Master (Client)			
	MODBUS/TCP Slave (Server)			

4. Modbus RTU Master Request Table dialog box appear.



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5. Under Function Code, click and select **04 Read Input Registers**

Req. No.	Function Code	Master Device Address	Data Size	Word/Bit	Slave Number (0 to 247)	Slave Address	Req. Execution Device	Error Status
1	04 Read Input Registers							
2								
3								
4								
5								
6								
7								
8								
9								
10								

6. Under Master Device Address, enter **D0** (data register D0 will be used to store the current Process Value of the PXR controller)

Req. No.	Function Code	Master Device Address	Data Size	Word/Bit	Slave Number (0 to 247)	Slave Address	Req. Execution Device	Error Status
1	04 Read Input Registers	D0		Word				
2								
3								

7. Enter 1 for Data Size and 1 for Slave Number

Req. No.	Function Code	Master Device Address	Data Size	Word/Bit	Slave Number (0 to 247)	Slave Address	Req. Execution Device	Error Status
1	04 Read Input Registers	D0000	1	Word	1			
2								
3								

8. Under Slave address, enter **301001** which is the Process Value (PV) register number in Modbus addressing

- a. **Note** that in the FUJI PXR user's manual, the Modbus address is expressed in 5 digits (example 31001). Since IDEC WindLDR uses 6-digit Modbus addressing, an extra zero (0) is needed.

Req. No.	Function Code	Master Device Address	Data Size	Word/Bit	Slave Number (0 to 247)	Slave Address	Req. Execution Device	Error Status
1	04 Read Input Registers	D0000	1	Word	1	301001		
2								
3								

9. Click **OK** button. Note that the Comm. Param. settings automatically changed to 9600-8-Even-1.



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Port	Communication Mode		Comm. Param.	Mode Selection Input	Network No.
1	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0
2	Modbus RTU Master	<input type="button" value="Configure"/>	9600-8-Even-1	(not necessary)	(not necessary)
3	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0
4	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0
5	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0
6	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0
7	Maintenance Protocol	<input type="button" value="Configure"/>	9600-7-Even-1		0

10. Click **OK** button.

11. Click **Online, Download** to download this setting into MicroSmart Pentra PLC.

Step 2: Configure FUJI PXR communication settings

1. Follow the steps below to change the PXR settings to STno = 1 (Slave address) and CoM parameters = 1 (even parity).

The following example shows how to set the communication conditions.

Example: Selecting an even parity and “STno=1” on a station.

Key operation	Indication	Description
	<input type="text" value="200"/> <input type="text" value="200"/>	Running state (PV/SV indication)
SEL (6 seconds)	<input type="text" value="P-n1"/> <input type="text" value="0"/>	Press the SEL key for approximately 6 seconds. P-n1 appears and No. 3 block parameter is selected.
∨	<input type="text" value="STno"/> <input type="text" value="0"/>	Operate the ∨ key repeatedly until STno parameter appears. (If past over, operate the ∧ key to return.)
SEL	<input type="text" value="STno"/> <input type="text" value="0"/>	Press the SEL key. The numeric value on the lower indicator blinks and the setting mode is selected.
∧∨	<input type="text" value="STno"/> <input type="text" value="1"/>	Operate the ∧ or ∨ key to change the numeric value to 18.
SEL	<input type="text" value="STno"/> <input type="text" value="1"/>	Press the SEL key again. The numeric value stops blinking and the setting is registered.
∨	<input type="text" value="CoM"/> <input type="text" value="0"/>	Press the ∨ key to display the CoM parameter.
SEL	<input type="text" value="CoM"/> <input type="text" value="0"/>	Press the SEL key. The numeric value on the lower indicator blinks and the setting mode is selected.
∧∨	<input type="text" value="CoM"/> <input type="text" value="1"/>	Operate the ∧ or ∨ key until the numeric value changes to 1 (even parity).
SEL	<input type="text" value="CoM"/> <input type="text" value="1"/>	Press the SEL key again. The numeric value stops blinking and the setting is registered.
SEL (3 seconds)	<input type="text" value="200"/> <input type="text" value="200"/>	Press the SEL key for 3 seconds to resume the running indication (PV/SV indication).

