Thyro-PX™ Anybus® Ethernet IP Guide

57010163-00A February 2017

Related Documentation

For complete information on the Thyro-PX unit, see the user manual that accompanied the system. In particular, reference the safety information in Chapter 1 of the user manual for the Thyro-PX unit.

ANYBUS ETHERNET IP MODULE

The Anybus Ethernet IP module is an optional accessory for the Thyro-PX power controller.

Related Links

Advanced Energy

HARDWARE DESCRIPTION

This module is compliant with the Ethernet® IP standard, and supports 10/100Mbit, full or half duplex operation.

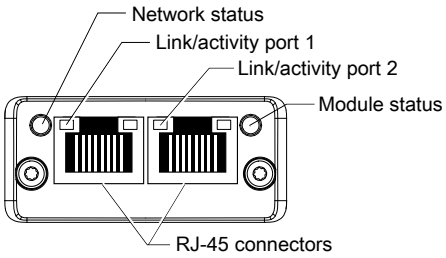


Figure 1. Hardware

Table 1. Network status LED

LED State	Description
Off	No IP address or no power
Green	Online, one or more connections established (CIP Class 1 or 3)
Green, blinking	Online, no connections established
Red	IP address conflict detected, fatal error
Red, blinking	One or more connections timed out (CIP Class 1 or 3)

Table 2. Module status LED

LED State	Description
Off	No power
Green	Controlled by a scanner in Run state
Green, blinking	Not configured, or scanner in Idle state
Red	Major fault (for example, exception state or fatal error)
Red, blinking	Recoverable fault(s). Module is configured, but stored parameters differ from currently used parameters.

If both the network status LED and the module status LED are red, a fatal error has occurred.

Table 3. Link/activity LED

LED State	Description
Off	No link, no activity

Table 3. Link/activity LED (Continued)

LED State	Description
Green	100 Mbit/s link established
Green, flickering	100 Mbit/s activity
Yellow	10 Mbit/s link established
Yellow, flickering	10 Mbit/s activity

Table 4. RJ-45 Ethernet pinout

Pin	Description
1	TD+
2	TX-
3	RX+
6	RX-
4, 5, 7, 8	Normally left unused; to ensure signal integrity, these pins are tied together and terminated to PE via a filter circuit in the module.
Housing	Cable shield

CONFIGURING PROCESS CONTROL SOFTWARE

The Electronic Description Sheet (EDS) file contains information about the capabilities of the unit, which can be used to configure the process control software. Download the current EDS file from the AE website http://www.advanced-energy.com/en/Anybus_modules_ThyroPX.html.

Install the EDS file in the process control software.

CONFIGURING WITH THYRO-TOOL PRO PC SOFTWARE

You can configure the Thyro-PX power controller using either the Thyro-Tool Pro PC software or the Thyro-Touch display.

To configure the unit, you will:

- Adapt the Thyro-PX hardware configuration

If required, you can also:

- Select the configuration
- Configure the diagnostics

- Configure the flexible link parameters

Adapting Thyro-PX Hardware Configuration

Open parameter file with the unit online in the **Port Explorer** tab of the Thyro-Tool Pro PC software, or use the Thyro-Touch display.

Set the Anybus module slot to **Ethernet IP** in the Thyro-PX device hardware configuration:

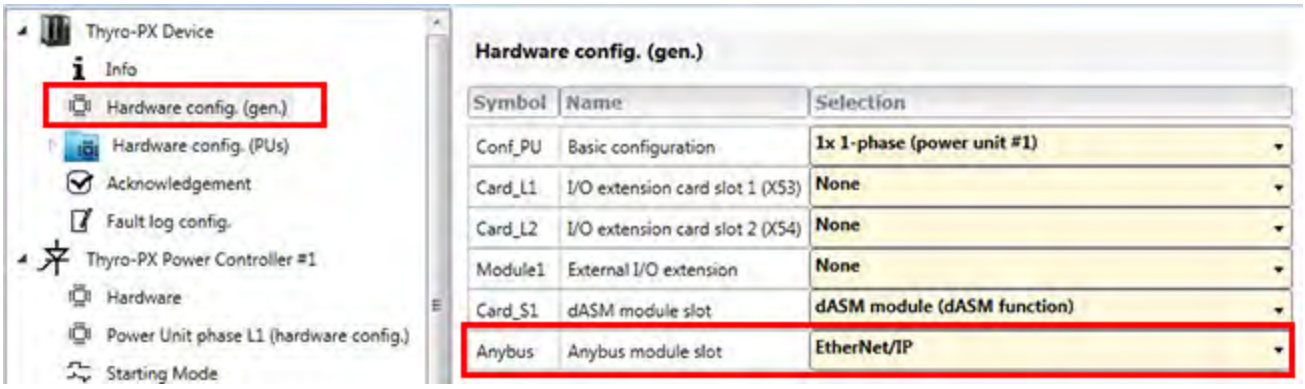


Figure 2. Menu tree

Anybus Parameter Group

When the computer is connected to the Thyro-PX power controller, the Anybus parameter group will be added to the parameter list after updating the hardware configuration, as shown in the previous figure.

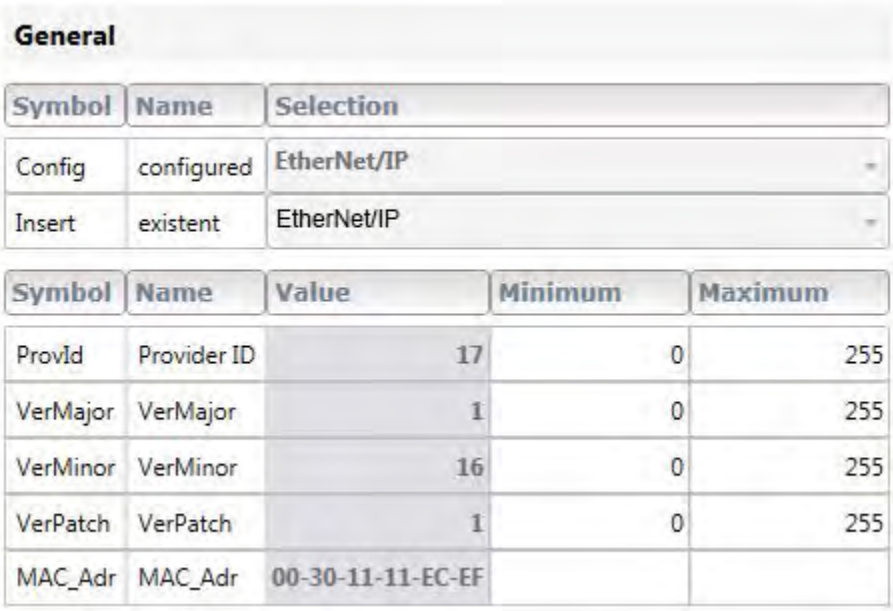
If the unit is not available for online configuration, the software can also be configured offline. Contact AE Global Services to obtain a parameter file appropriate to your hardware configuration.

Figure 3. Anybus parameter group

Connecting to the Ethernet IP controller

Some process control software can scan the network to automatically detect and connect to Ethernet IP devices.

To manually configure the process control software, find the MAC address for the Ethernet IP module in the **General** menu. Use the MAC address to configure the process control software.



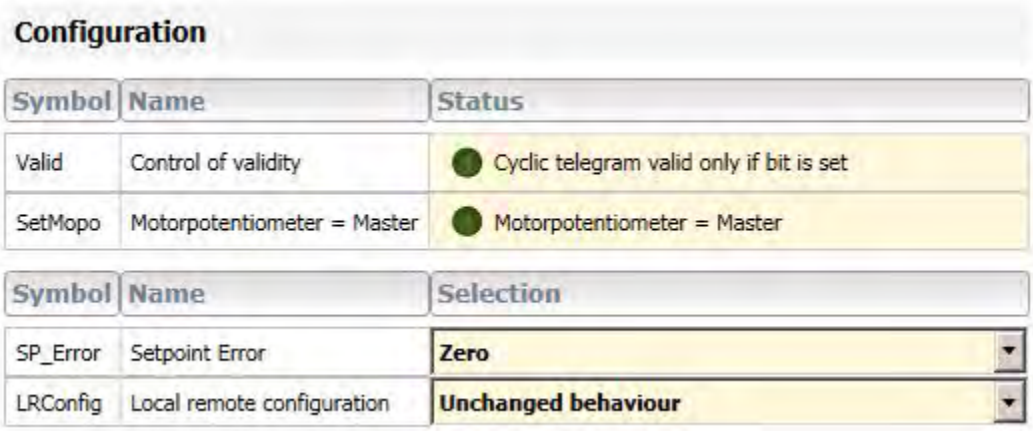
General

Symbol	Name	Selection
Config	configured	EtherNet/IP
Insert	existent	EtherNet/IP

Symbol	Name	Value	Minimum	Maximum
ProvId	Provider ID	17	0	255
VerMajor	VerMajor	1	0	255
VerMinor	VerMinor	16	0	255
VerPatch	VerPatch	1	0	255
MAC_Adr	MAC_Adr	00-30-11-11-EC-EF		

Figure 4. Ethernet IP module MAC address

Selecting Configuration



Configuration

Symbol	Name	Status
Valid	Control of validity	Cyclic telegram valid only if bit is set
SetMopo	Motorpotentiometer = Master	Motorpotentiometer = Master

Symbol	Name	Selection
SP_Error	Setpoint Error	Zero
LRConfig	Local remote configuration	Unchanged behaviour

Figure 5. Select configuration

Each configuration name, status, and selection is described in the following table:

Table 5. Configuration

Name	Status/Selection	Description
Control of validity	**Cyclic telegram valid only if bit is set**	When enabled, the cyclic telegrams received from the master will only be considered as valid and processed if bit 15 of the Device Command (API # 41) is set. This function allows several settings to be changed one after another before enabling the complete change,

Table 5. Configuration (Continued)

Name	Status/Selection	Description
		thereby avoiding unwanted effects due to an incomplete change.
Motorpotentiometer = Master	**Motorpotentiometer = Master**	When enabled, the value of the motorpotentiometer continuously follows the master setpoint while in remote operation, so that no setpoint leap occurs during the switch-over to the local setpoint.
Setpoint Error	**Zero**	Zero is used as the setpoint when the master setpoint is missing.
	Last valid master setpoint	The last valid master setpoint is used as the setpoint when the master setpoint is missing.
	Last valid error setpoint	The last valid error setpoint is used as the setpoint when the master setpoint is missing.
Local remote configuration	**Unchanged behavior**	Configuration of the master's influence to the local remote behavior.
	Automatic switch to local	The unit will automatically switch to local mode when the communication with master is interrupted.
	Ignore master in local	When the unit is in local mode, data and commands from the master will be ignored.

Configuring Flexible Link Parameters

The flexible link parameters have been designed to allow access to Thyro-PX internal data, such as parameters and actual values.

There are up to 20 flexible link parameters for writing data and up to 20 flexible link parameters for reading data.

Most flexible link parameters have a preconfigured, default definition, which can be modified using the Thyro-Tool Pro PC software. All device parameters and actual values are selectable from the drop-down list.

For special applications, the flexible link parameters can be manually configured via Ethernet IP using the configuration assembly (see "Write and Read Assemblies" on page 8).

Default Flexible Links

Table 6. Default flexible links

Flexible Link	Type	Default Link Setting
Flexible read-link 01 r	FLOAT	Power Controller #1: Total power - read
Flexible read-link 02 r	FLOAT	Power Controller #1: L1 Urms - read
Flexible read-link 03 r	FLOAT	Power Controller #1: L1 Irms - read

Table 6. Default flexible links (Continued)

Flexible Link	Type	Default Link Setting
Flexible read-link 04 r	FLOAT	Power Controller #1: L1 Power - read
Flexible read-link 05 r	FLOAT	Power Controller #1: L1 Resistance - read
Flexible read-link 06 r	FLOAT	Power Controller #1: L1 Umains - read
Flexible read-link 07 r	FLOAT	Power Controller #1: L1 Temperature - read
Flexible read-link 08 r	FLOAT	Power Controller #1: L2 Urms - read
Flexible read-link 09 r	FLOAT	Power Controller #1: L2 Irms - read
Flexible read-link 10 r	FLOAT	Power Controller #1: L2 Power - read
Flexible read-link 11 r	FLOAT	Power Controller #1: L2 Resistance - read
Flexible read-link 12 r	FLOAT	Power Controller #1: L2 Umains - read
Flexible read-link 13 r	FLOAT	Power Controller #1: L2 Temperature - read
Flexible read-link 14 r	FLOAT	Power Controller #1: L3 Urms - read
Flexible read-link 15 r	FLOAT	Power Controller #1: L3 Irms - read
Flexible read-link 16 r	FLOAT	Power Controller #1: L3 Power - read
Flexible read-link 17 r	FLOAT	Power Controller #1: L3 Resistance - read
Flexible read-link 18 r	FLOAT	Power Controller #1: L3 Umains - read
Flexible read-link 19 r	FLOAT	Power Controller #1: L3 Temperature - read
Flexible read-link 20 r	UINT32 FLOAT	Not applicable

INSTALLING OPTIONAL MODULES

DANGER:

RISK OF DEATH OR BODILY INJURY. Disconnect and lockout/tagout all sources of input power before working on this unit or anything connected to it.

DANGER:

RISQUE DE MORT OU DE BLESSURES CORPORELLES. Débrancher et verrouiller/étiqueter toutes les sources de puissance d'entrée avant de travailler sur cette unité ou sur tout élément qui y est raccordé.

The optional modules may be shipped separately.

1. Verify that the unit is disconnected from all power sources.
2. Unpack each optional module at an ESD safe work space.
3. Plug each optional module into the unit.

When an Anybus module is inserted into the unit, guide the module towards the left during insertion.

4. Secure each module with the two TORX® T8 screws provided with the module.

If an Anybus module must be removed from the unit, loosen the TORX T8 mounting screws 3 turns, and pry out the module with a small flat-bladed screwdriver, as shown in the following figure.

Figure 6. Anybus module removal

WRITE AND READ ASSEMBLIES

Assemblies enable the sending or receiving of data via a single connection. This can be input and output data, status and control information, or diagnosis information. The terms input and output assemblies are defined from the perspective of the network. The input assemblies produce (write) data on the bus; the output assemblies consume (read) data from the bus. With the aid of write and read assemblies, cyclical IO data are transmitted.

The Thyro-PX Ethernet IP module contains several sets of assemblies. The user can select the corresponding assemblies depending on how many flexible links are needed.

The following write and read assembly combinations are possible:

- Write assembly 101, with read assemblies:
  - 111
  - 112
  - 113
- Write assembly 102, with read assemblies:
  - 112
  - 113

- Write assembly 103, with read assemblies:
  - 112
  - 113

Write Assemblies

Table 7. Write Assemblies

Address		Write Parameter by Thyro-PX Configuration			
Dec	Hex	Assembly 101	Assembly 102	Assembly 103	Configuration
41	29	Device Commands w	Device Commands w	Device Commands w	
50	32	#1 Fieldbus setpoint w	#1 Fieldbus setpoint w	#1 Fieldbus setpoint w	
52	34	#1 Error setpoint w	#1 Error setpoint w	#1 Error setpoint w	
21	15	Flexible link 01 w	Flexible link 01 w	Flexible link 01 w	
22	16		Flexible link 02 w	Flexible link 02 w	
23	17		Flexible link 03 w	Flexible link 03 w	
24	18		Flexible link 04 w	Flexible link 04 w	
25	19			Flexible link 05 w	
26	1A			Flexible link 06 w	
27	1B			Flexible link 07 w	
261	0105				Config write-link 01 w
262	0106				Config write-link 03 w
263	0107				Config write-link 04 w
264	0108				Config write-link 02 w
265	0109				Config write-link 05 w
266	010A				Config write-link 06 w
267	010B				Config write-link 07 w
Length		16	28	40	

Read Assemblies

Table 8. Read Assemblies

Address		Read Parameter by Thyro-PX Configuration			
Dec	Hex	Assembly 111	Assembly 112	Assembly 113	Configuration
45	2D	Device Error device r	Device Error device r	Device Error device r	
46	2E	Device Error extension r	Device Error extension r	Device Error extension r	
51	33	#1 Actual setpoint r	#1 Actual setpoint r	#1 Actual setpoint r	
56	38	#1 Output r	#1 Output r	#1 Output r	
59	3B	#1 Error PC r	#1 Error PC r	#1 Error PC r	
60	3C	#1 Status PC r	#1 Status PC r	#1 Status PC r	
61	3D	#1 Monitoring PC r	#1 Monitoring PC r	#1 Monitoring PC r	
168	A8	I/O Int Digital In 1-6 r	I/O Int Digital In 1-6 r	I/O Int Digital In 1-6 r	
1	01	Flexible link 01 r	Flexible link 01 r	Flexible link 01 r	
2	02	Flexible link 02 r	Flexible link 02 r	Flexible link 02 r	
3	03	Flexible link 03 r	Flexible link 03 r	Flexible link 03 r	
4	04	Flexible link 04 r	Flexible link 04 r	Flexible link 04 r	
5	05	Flexible link 05 r	Flexible link 05 r	Flexible link 05 r	
6	06	Flexible link 06 r	Flexible link 06 r	Flexible link 06 r	
7	07	Flexible link 07 r	Flexible link 07 r	Flexible link 07 r	
8	08	Flexible link 08 r	Flexible link 08 r	Flexible link 08 r	
9	09	Flexible link 09 r	Flexible link 09 r	Flexible link 09 r	
10	0A		Flexible link 10 r	Flexible link 10 r	
11	0B			Flexible link 11 r	
12	0C			Flexible link 12 r	
13	0D			Flexible link 13 r	
14	0E			Flexible link 14 r	
15	0F			Flexible link 15 r	
16	10			Flexible link 16 r	
17	11			Flexible link 17 r	
18	12			Flexible link 18 r	
19	13			Flexible link 19 r	
20	14			Flexible link 20 r	
241	00F1				Config read-link 01 r

Table 8. Read Assemblies (Continued)

Address		Read Parameter by Thyro-PX Configuration			
Dec	Hex	Assembly 111	Assembly 112	Assembly 113	Configuration
242	00F2				Config read-link 02 r
243	00F3				Config read-link 03 r
244	00F4				Config read-link 04 r
245	00F5				Config read-link 05 r
256	00F6				Config read-link 06 r
247	00F7				Config read-link 07 r
248	00F8				Config read-link 08 r
249	00F9				Config read-link 09 r
250	00FA				Config read-link 10 r
251	00FB				Config read-link 11 r
252	00FC				Config read-link 12 r
253	00FD				Config read-link 13 r
254	00FE				Config read-link 14 r
255	00FF				Config read-link 15 r
256	0100				Config read-link 16 r
257	0101				Config read-link 17 r
258	0102				Config read-link 18 r
259	0103				Config read-link 19 r
260	0104				Config read-link 20 r

AE GLOBAL SERVICES

Please contact AE Global Services if you have questions or problems that cannot be resolved by working through the provided troubleshooting. When you call Global Services, make sure to have the unit serial number and part number. These numbers are available on unit labels.

☞ **Important**
For returns and repairs, please call AE Global Services to get the correct shipping address.

Table 9. AE Global Services 24 X 7 contact information

Office	Contact
AE World Headquarters	Address: 1625 Sharp Point Drive Fort Collins, CO 80525 USA Phone (24 hrs/day, 7 days/week): 800.446.9167 or +1.970.221.0108 Email: (We will respond to email by the next business day.) mailto:technical.support@aei.com
Thermal product support	Contact by phone or email: +1.360.694.7871 mailto:thermalapplications@aei.com
Power Control Module product support	Contact by phone or email: +49 (0) 2902 910370 10 (technical support during German business hours) mailto:powercontroller@aei.com
High Voltage product support: HiTek Power, Ltd.	Contact by phone or email: +44 (0) 1903 712400 mailto:support.centre@aei.com
High Voltage product support: UltraVolt, Inc.	Contact by phone or email: +1.631.471.4444 mailto:sales.support-uv@aei.com

Table 9. AE Global Services 24 X 7 contact information (Continued)

Office	Contact
Local or regional sales or service office	Visit the Advanced Energy website for current contact information: http://www.advanced-energy.com

TRADEMARKS