Bitronics

PowerPlex II and 60 Series

EtherNet/IP Protocol Manual

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NovaTech®
Bitronics ◆ D/3 ◆ Orion

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VERSION HISTORY (ABRIDGED)

V1.00.0	2014-07-29	Initial release
V1.30.0	2014-10-22	Minor feature upgrades and bug fixes
V2.06.0	2015-05-21	Minor feature upgrades
V2.12.0	2016-02-22	Support for IEC 61850, universal power supply, IRIG-B and display ports
V2.20.0	2016-10-04	Support for serial port and digital I/O
V2.21.0	2016-10-26	Minor feature upgrades and bug fixes
V2.22.0	2017-03-15	Added support for KYZ Energy Counter and Energy LED.
V2.23.0	2017-06-21	Energy resets did not work without an IO card; 2-Element mode enabled for 3-phase averages
V2.24.0	2017-08-15	Added Average L-L Volts, Average L-N Volts and Average Amps to protocols
V2.25.0	2017-12-11	Support for trend recording
V2.28.0	2018-04-04	Support for pole-top feature
V2.30.0	2018-05-16	Support for EtherNet/IP protocol
V2.31.0	2018-06-29	Support for EtherNet/IP protocol in 60 Series
V2.42.0	2019-05-31	Web server enhancements
V2.51.0	2019-10-11	Fix protocol session selector responsiveness
V2.52.0	2019-11-20	Add normalized voltages for M661P3

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TRADEMARKS

SAFETY SECTION

Please refer to the PPX II User Manual (ML0044B) or the M66x Family User Manual (ML0042) for information regarding safety, installation, commissioning, and decommissioning.

1.0 DESCRIPTION

1.1 Introduction

EtherNet/IP is an industrial network protocol that adapts the Common Industrial Protocol (CIP) to standard Ethernet. It is one of the leading industrial protocols in the United States and is widely used in the factory automation and process control industries, among others. EtherNet/IP is available as an optional protocol on both the Bitronics PowerPlex II Transducer as well as the Bitronics M66x Meter/Transducer.

The PowerPlex II, henceforth known as “PPXII”, is a synchronizing Ethernet transducer with two sets of three-phase voltage inputs with 1-cycle measurement update speeds. It offers superior communications flexibility and easy setup. The M660/M661/M663, henceforth known as “M66x”, is a family of SCADA meters & transducers that provides a range of advanced measurement and communications capabilities for 3-phase metering applications.

When ordered with the EtherNet/IP option, both the PPXII and the M66x devices operate as an EtherNet/IP Client Adapter I/O module that provides power and energy metering data to an EtherNet/IP network. The data is accessed as instances of the device’s Assembly Object. The PPXII provides twenty-two and the M66x provides eighteen static Assembly Instances that contain real-time, fundamental, demand, minimum, maximum, energy measurement data as well as device control and status data that can be read by a client using Class 1 implicit messaging, as well as Class 3 and UCMM explicit messaging. Appendix A provides details on the Assembly Instances.

1.2 Features & Capabilities

Operation Mode:	Class 1 I/O Adapter
Message Support:	Implicit Class 1 Cyclic, Explicit Class 3 & UCMM support
Data Types:	INT8, 16, 32; UINT8, 16, 32; Float
Maximum EtherNet/IP Scanner Devices:	Up to 20 can listen
Assembly Instances (Static only):	PPXII: 21 Output only M66x: 17 Output only 1 Input/Output (for demand & energy resets)
Maximum Data Supported:	511 bytes
I/O Connection Types (implicit):	PPXII: Input Only (24), Listen Only (24) M66x: Input Only (18), Listen Only (18)
I/O Connection Trigger Types:	Cyclic
I/O Connection Scan Rate (msec):	16 – 32,000
Reset services:	Identity Object Reset service (Types 0 & 1)
Encapsulation Inactivity Timeout (msec):	0 – 3600 (0=disable, 120=default)

1.3 EtherNet/IP Performance Level

While the PowerPlex II Transducer has passed conformance testing at the Commercial Performance Level, when ordered with the 24Vdc Power Supply option (i.e. order option ‘D’ in order number position 8), the PowerPlex II meets most of the same criteria that is specified for the Industrial Performance Level. Please see the PowerPlex II User Manual for details.

1.4 Electronic Data Sheet (EDS)

The EDS file is used to convey device configuration data and functionality supported by an EtherNet/IP device. The EDS file for the PPXII and the M66x devices can be found on the accompanying CD-ROM disk and can also be obtained via the corporate ftp server. Please contact a member of the Bitronics technical support team for details.

1.5 PowerPlex II User Manual (ML0044B)

Please refer to the PowerPlex II User Manual for information on the overall operation of the PowerPlex II.

1.6 M66x Family User Manual (ML0042)

Please refer to the M66x Family User Manual for information on the overall operation of the M660/M661 devices.

2.0 ETHERNET INTERFACE

2.1 Description

The PPXII provides DUAL standard Ethernet 10/100 Megabit (Mb) RJ45 (copper) interfaces (10BASE-T and 100BASE-TX) each of which automatically selects the most appropriate operating conditions via auto-negotiation. Each interface is capable of operating either as half-duplex (compatible with all Ethernet infrastructure) or full-duplex interfaces which allow a potential doubling of network traffic.

The M66x includes a single RJ45 Ethernet port with the same characteristics. An LC 100BASE-FX fiber port operating at 1300nm (far infrared, full-duplex) is available as an option.

2.2 Built-in Switch (PPXII only)

The PPXII includes a built-in three port 10/100 copper-based Ethernet switch. One of the ports connects internally to the central processing unit (CPU) of the PPX II allowing it to communicate to other devices on the network. The CPU will always auto negotiate the internal connection to the built-in switch at 100Mbps and full duplex.

The remaining two ports are on the front panel and labeled Ethernet 1 and Ethernet 2. Either port may be connected to the network to allow communications with the PPX II. The remaining port can be used to extend the network to another device without the need for a separate external ethernet switch.

2.3 Device Level Ring (DLR) statement (PPXII only)

The PPXII is now available with an option to support DLR functionality out of the box. PPXII devices ordered with this option will operate as a fully compliant **beacon-based ring node**. No configuration is necessary.

Furthermore, PPXII devices without the DLR option should be considered a "**non-compliant DLR device**" and therefore should not be located as a main node on a DLR network.

2.4 Activity (ACT) LEDs

All available ethernet ports contain a single-color activity LED. The LED will illuminate to indicate that a link has been established on the port. Furthermore, it will flash to indicate there is communications activity on the port. The is no activity LED for the internal interface between the CPU and the built-in switch (PPXII only).

2.5 Shield Grounding

All RJ45 ethernet jacks used on the PPXII and M66x are unshielded. As such, it is not necessary to provide shield grounding at the device end of the link.

3.0 CIP OBJECT MODEL

The PPXII and M66x devices are represented by the following Object Model.

Class Code	Object Class	Instance Numbers	Number of Connections
0x0001	Identity	0 (class), 1	0
0x0002	Message Router	0 (class), 1	0
0x0004	Assembly	0 (class), 100 – 120 (PPXII) 0 (class), 100 – 121 (PPXII)[2] 0 (class), 100 – 117 (M66x)	42 (PPXII) 44 (PPXII)[2] 36 (M66x)
0x0006	Connection Manager	0 (class), 1	0
0x0047[1]	DLR Object	0 (class), 1	0
0x0048[2]	Quality of Service (QoS)	0 (class), 1	0
0x00F5	TCP/IP Interface Object	0 (class), 1	0
0x00F6	Ethernet Link Object	0 (class), 1, 2[2], 3[2]	0

(1) Available on the PowerPlex II with DLR option
(2) Available on the PowerPlex II firmware v2.53 or later
(3) Available on the 60 Series with firmware v2.44 or later

3.1 Identity Object (Class Code = 0x01)

The Identity Object is used to provide identification information about the device. Each device supports one instance of the identity object. The system uses the Identity Object to determine which devices are on the network. The Identity Object supports Class Attributes as Instance 0, and Instance Attributes as Instance 1.

3.1.1 Identity Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Default Value
1	Get	Revision	UINT	1
2	Get	Max Instance	UINT	1
3	Get	Number of Instances[1]	UINT	1
4	Get	Optional attribute list	STRUCT of	0x0003 (0x000F, 0x0010, 0x0011)
		number of attributes	UINT	
		optional attributes	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	17 (0x0011)

(1) Attribute ID 0x03 & 0x04 not returned for service type Get Attribute All

3.1.2 Identity Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Default Value
1	Get	Vendor ID	UINT	1476 (Bitronics, LLC.)
2	Get	Device Type	UINT	125 (0x7D)
3	Get	Product Code	UINT	PPXII: 160 (0xA0) PPXII w/DLR: 161 (0xA1) M66x: 60 (0x3C)
4	Get	Revision	STRUCT of:	
		Major Revision	USINT	
		Minor Revision	USINT	
5	Get	Status	WORD	
6	Get	Serial Number	UDINT	
7	Get	Product Name	SHORT_STRING	PPXII: PowerPlex II Transducer PPXII w/DLR: PowerPlex II Transducer w/DLR M66x: M66x Advanced SCADA Meter
15	Get	Assigned_Name	STRINGI	
16	Get	Assigned_Description	STRINGI	
17	Get	Geographic_Location	STRINGI	

3.1.3 Identity Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attributes All	Class/Instance
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance

3.2 Message Router Object (Class Code = 0x02)

3.2.1 Messenger Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Default Value
1	Get	Revision	UINT	1
2	Get	Max Instance[2]	UINT	1
3	Get	Number of Instances[2]	UINT	1
4	Get	Optional attribute list	STRUCT	0x0003 (0x0001, 0x0002, 0x0003)
		number of attributes	UINT	
		optional attributes	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	3

(2) Attribute ID's 0x02 and 0x03 not returned for service type Get Attribute All

3.2.2 Message Router Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get	Object_list	STRUCT of:	0x0007 (0x0001, 0x0002, 0x0004, 0x0006, 0x00F5, 0x00F6, 0x0000)
		Number	UINT	
		Classes	ARRAY of UINT	
2	Get	Number Available	UINT	
3	Get	Number Active	UINT	

3.2.3 Message Router Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attributes All	Class/Instance
0x0E	Get Attribute Single	Class/Instance

3.3 Assembly Object (Class Code = 0x04)

3.3.1 Assembly Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Default Value
1	Get	Revision	UINT	2
2	Get	Max Instance	UINT	PPXII: 120 (0x0078) PPXII^2: 121 (0x0079) M66x: 117 (0x0075)
3	Get	Number of Instances	UINT	PPXII: 21 (0x0015) PPXII^2: 22 (0x0016) M66x: 18 (x00012)
4	Get	Optional attribute list	STRUCT	0x0001 (0x0004)
		number services	UINT	
		optional services	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	4

3.3.2 Assembly Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get	Number of Members in List	UINT	
2	Get	Member List	ARRAY of STRUCT:	
		Member Data Description	UINT	Size of member data in bits.
		Member Path Size	UINT	Size of member path in bytes.
		Member Path	Packet EPATH	
3	Get	Data	ARRAY of BYTE	
4	Get	Size	UINT	Number of bytes in Attribute 3.

3.3.3 Assembly Object Services

Service Code	Service Name	Class/Instance Usage
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance
0x18	Get Member	Instance

3.3.4 Assembly Object Instances

The PPXII supports twenty-two (22) and the M66x support eighteen assembly instances numbered 100 through 121 and 117, respectively. The data attributes of these instances can be accessed using Class 1 scheduled connections as well as Class 3 or UCMM unscheduled connections.

Assembly Instance	Size				Data Type	Description
	No. of Members		(bytes)			
	PPXII	M66x	PPXII	M66x		
100	8	8	32	32	UDINT	Device Information
101	11	10	44	40	REAL	Device Configuration
102	12	12	48	48	UDINT	Device Control (resets of Demands and Energies)
103	4	4	16	16	UDINT	Device Status (Health and Heartbeat registers)
104	18	11	72	44	REAL	Instantaneous Voltage and Current Measurements
105	18	17	72	68	REAL	Instantaneous Power, Power Factor and Frequency Measurements
106	16	10	64	40	REAL	Fundamental Voltage and Current Measurements
107	12	12	48	48	REAL	Fundamental Power and Displacement Power Factor
108	16	10	64	40	REAL	Demand Voltage and Current Measurements
109	12	12	48	48	REAL	Demand Power Measurements
110	16	10	64	40	REAL	Maximum Demand Voltage and Current Measurements
111	12	12	48	48	REAL	Maximum Demand Power Measurements
112	12	6	48	24	REAL	Minimum Demand Voltage Measurements
113	12	12	48	48	REAL	Minimum Demand Power Measurements
114	8	8	32	32	REAL	Demand and Maximum Demand Fundamental Current Measurements
115	20	14	80	56	REAL	THD Voltage, TDD Current and K-factor Current Measurements
116	21	17	84	68	REAL	Phase, Frequency and Average Voltage Measurements
117	6	6	24	24	DINT	Total and Partial Energy Meters
118	9	n/a	36	n/a	REAL	Bus Voltage Differential Measurements (magnitude, frequency and phase)
119	24	n/a	96	n/a	REAL	Sequence Components and Imbalance Measurements
120	15	n/a	60	n/a	REAL	Synchronizing Measurements
121	31	n/a	124	n/a	REAL	Synchronizing Measurements (custom)

3.3.5 Assembly Object Commands

The PPXII and M66x supports the following commands related to assembly instances:

- CIP Generic Assembly Object (Class 4), Service Code 0x0E – Get_Attribute_Single for Attribute 1 (Number of Members)
- CIP Generic Assembly Object (Class 4), Service Code 0x0E – Get_Attribute_Single for Attribute 2 (Member List)
- CIP Generic Assembly Object (Class 4), Service Code 0x0E – Get_Attribute_Single for Attribute 3 (Data)
- CIP Generic Assembly Object (Class 4), Service Code 0x0E – Get_Attribute_Single for Attribute 4 (Size in bytes)
- CIP Generic Assembly Object (Class 4), Service Code 0x10 – Set_Attribute_Single for Attribute 3 (Data)
- CIP Generic Assembly Object (Class 4), Service Code 0x18 – Get_Member

3.3.6 Heartbeat Instances

With the Assembly Instances shown in Appendix A, the PPXII and M66x also support two heartbeat instances. A heartbeat instance is a virtual output instance that is specified by devices wishing to establish Input Only and Listen Only Class 1 I/O connections to the PPXII or M66x device. The heartbeat instance is purely a programming construct that serves to keep an active connection. As such, data cannot be read from or written to a heartbeat instance.

Instance Number	Connection Type
98	Input Only
99	Listen Only

3.4 Connection Manager Object (Class Code = 0x06)

3.4.1 Connection Manager Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	1
2	Get	Max Instance	UINT	1
3	Get	Number of Instances[3]	UINT	1
4	Get	Optional attribute list[3]	STRUCT	0x0008 (0x0001, 0x0002, 0x0003, 0x0004, 0x0005, 0x0006, 0x0007, 0x0008, 0x000B)
		number of attributes	UINT	
		optional attributes	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	11

(3) Attribute ID's 0x03 and 0x04 not returned for service type Get Attribute All

3.4.2 Connection Manager Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get/Set	Open Requests	UINT	
2	Get/Set	Open Format Rejects	UINT	
3	Get/Set	Open Resource Rejects	UINT	
4	Get/Set	Open Other Rejects	UINT	
5	Get/Set	Close Requests	UINT	
6	Get/Set	Close Format Rejects	UINT	
7	Get/Set	Close Other Rejects	UINT	
8	Get/Set	Connection Timeouts	UINT	
11	Get	CPU Utilization	UINT	

3.4.3 Connection Manager Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attribute All	Class/Instance
0x02	Set Attribute All	Instance
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance
0x54	Forward Open Request	Instance
0x5B	Large Forward Open Request	Instance
0x4E	Forward Close Request	Instance
0x5A	Get Connection Owner	Instance

3.5 TCP/IP Interface Object (Class Code = 0xF5)

3.5.1 TCP/IP Interface Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	4
2	Get	Max Instance	UINT	1
3	Get	Number of Instances	UINT	1
4	Get	Optional attribute list	STRUCT	0x0004 (0x0008, 0x0009, 0x0010, 0x0011)
		number of attributes	UINT	
		optional attributes	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	17 (0x0011)

3.5.2 TCP/IP Interface Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get	Status	DWORD	
2	Get	Configuration Capability	DWORD	
3	Get	Configuration Control	DWORD	
4	Get	Physical Link Object	STRUCT of:	
		Path size	UINT	
		Path	Padded EPATH	
5	Get	Interface Configuration	STRUCT of:	
		IP Address	UDINT	
		Network Mask	UDINT	
		Gateway Address	UDINT	
		Name Server	UDINT	
		Name Server 2	UDINT	
		Domain Name	STRING	
6	Get	Host Name	UINT	
8	Get/Set	TTL Value	UINT	
9	Get/Set	Mcast Config	UINT	
		Alloc Control	USINT	
		Reserved	USINT	
		Num Mcast	UINT	
		Mcast Start Addr	UDINT	
13	Get	Encapsulation Inactivity Timeout	UINT	
16	Get	Active TCP Connections	UINT	
17	Get	Non-CIP Encapsulation Messages Per Second	UDINT	

3.5.3 TCP/IP Interface Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attribute All	Class/Instance
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance

3.6 Ethernet Link Object (Class Code = 0xF6)

3.6.1 Ethernet Link Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	4
2	Get	Max Instance	UINT	3
3	Get	Number of Instances	UINT	3
4	Get	Optional attribute list	STRUCT	0x0008 (0x0004, 0x0005, 0x0007, 0x0008, 0x0009, 0x000A, 0x000E, 0x000F)
		number of attributes	UINT	
		optional attributes	ARRAY of UINT	
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	15 (0x000F)

3.6.2 Ethernet Link Object Instance Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get	Interface Speed	UDINT	
2	Get	Interface Flags	DWORD	
3	Get	Physical Address	ARRAY of 6 USINTs	
4	Get	Interface Counters	STRUCT of:	
		In Octets	UDINT	
		In Ucast Packets	UDINT	
		In NUcast Packets	UDINT	
		In Discards	UDINT	
		In Errors	UDINT	
		In Unknown Protos	UDINT	
		Out Octets	UDINT	
		Out Ucast Packets	UDINT	
		Out NUcast Packets	UDINT	
		Out Discards	UDINT	
		Out Errors	UDINT	
5	Get	Media Counters	STRUCT of:	
		Alignment Errors	UDINT	
		FCS Errors	UDINT	
		Single Collisions	UDINT	
		Multiple Collisions	UDINT	
		SQE Test Errors	UDINT	
		Deferred Transmissions	UDINT	
		Late Collisions	UDINT	
		Excessive Collisions	UDINT	
		MAC Transmit Errors	UDINT	
		Carrier Sense Errors	UDINT	
		Frame Too Long	UDINT	
		MAC Receive Errors	UDINT	
7	Get	Interface Type	USINT	
8	Get	Interface State	USINT	
9	Get	Admin State	USINT	
10	Get	Interface Label	SHORT_STRING	
11	Get	Interface Capability	STRUCT of:	
		Capability Bits	DWORD	
		Speed/Duplex Options	STRUCT of:	
		Speed/Duplex Array Count	USINT	
		Speed/Duplex Array	STRUCT of:	
		Interface Speed	UINT	
		Interface Duplex Mode	USINT	
14	Get	Ethernet Errors	UDINT	
15	Get	Link Down Counters	UDINT	

3.6.3 Ethernet Link Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attribute All	Class/Instance
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance

3.7 DLR Object (Class Code = 0x47)

3.7.1 DLR Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	4
2	Get	Max Instance	UINT	1
3	Get	Number of Instances	UINT	1
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	19 (0x0013)

3.7.2 DLR Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Notes
1	Get	Network Topology	USINT	
2	Get	Network Status	USINT	
10	Get	Active Supervisor Address	STRUCT of:	
		Supervisor IP Address	UDINT	
		Supervisor MAC Address	ARRAY of:	
			6 USINTs	
12	Get	Capability Flags	DWORD	
17	Get	Ring Port 1 Ethernet Link Obj. Inst.	UINT	
18	Get	Ring Port 2 Ethernet Link Obj. Inst.	UINT	
19	Get/Set	DLR Enable	BOOL	

3.7.3 DLR Object Services

Service Code	Service Name	Class/Instance Usage
0x01	Get Attribute All	Class/Instance
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance

3.8 QoS Object (Class Code = 0x48)

3.8.1 Qos Object Class Attributes (Instance = 0)

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	1
2	Get	Max Instance	UINT	1
3	Get	Number of Instances	UINT	1
6	Get	Maximum ID Number Class Attributes	UINT	7
7	Get	Maximum ID Number Instance Attributes	UINT	8

3.8.2 QoS Object Instance 1 Attributes

Attribute ID	Access Rule	Name	Data Type	Default Values
1	Get	802.1Q Tag Enable	USINT	0
2	Get	DSCP PTP Event	USINT	59
3	Get	DSCP PTP General	USINT	47
4	Get/Set	DSCP Urgent	USINT	55
5	Get/Set	DSCP Scheduled	USINT	47
6	Get/Set	DSCP High	USINT	43
7	Get/Set	DSCP Low	USINT	31
8	Get/Set	DSCP Explicit	USINT	27

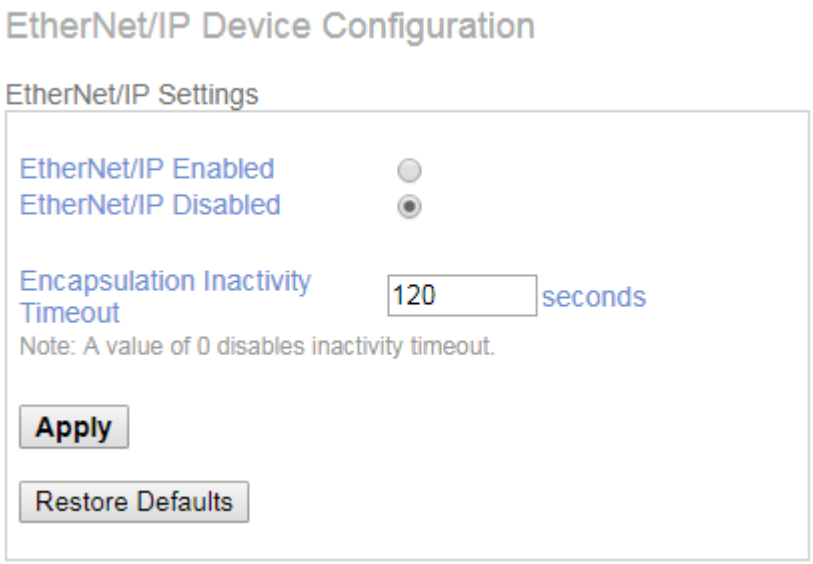
3.8.3 QoS Object Services

Service Code	Service Name	Class/Instance Usage
0x0E	Get Attribute Single	Class/Instance
0x10	Set Attribute Single	Instance

4.0 CONFIGURATION AND OPERATIONAL STATUS

4.1 Enabling/Disabling the Protocol

If necessary, the EtherNet/IP Communication stack can be disabled using the device's built-in web server. Using a standard web browser, navigate to the EtherNet/IP Settings page under the Settings tab. Click on the appropriate radio button and then click Apply. After doing so, it will be necessary to reset the device by clicking on Reset button for the change to take effect.

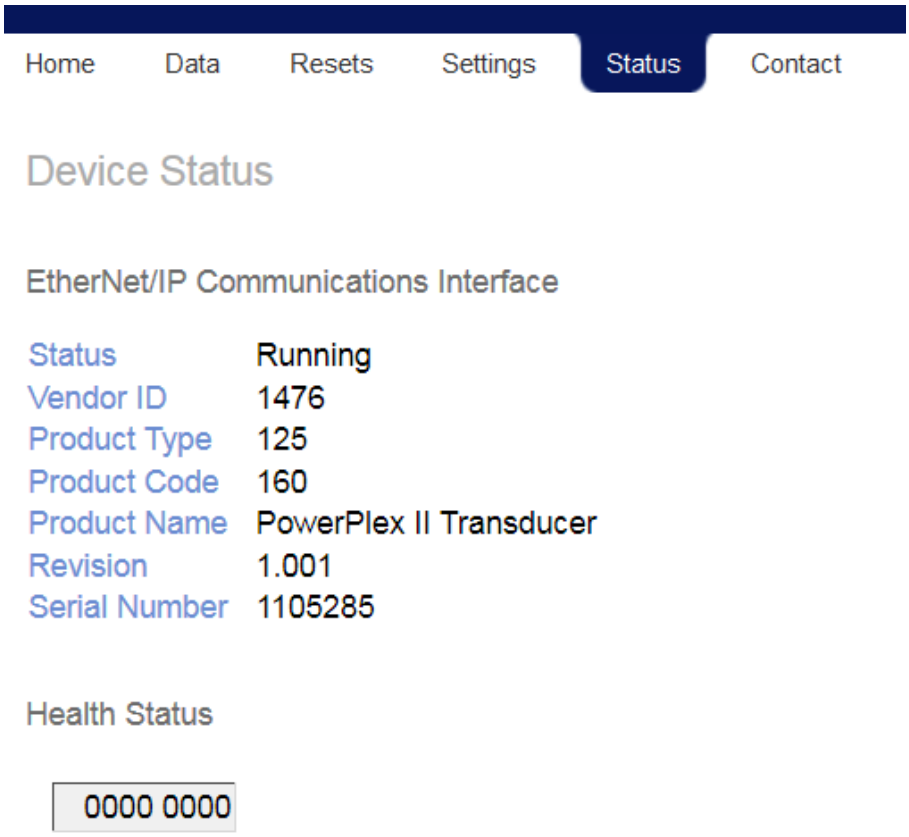


4.2 Encapsulation Inactivity Timeout

In addition to being able to be set over the EtherNet/IP network, the Encapsulation Inactivity Timeout can also be changed via the IED's built-in web interface. Navigate to the same web page used for enabling/disabling the protocol above. Enter the desired timeout in seconds and click Apply. Enter a value of zero (0) to disable the inactivity timeout. Once prompted, click the Reset button to reset the device and have the change take effect.

4.3 Operational Status

The status of the EtherNet/IP communication interface can be viewed by navigating to the Status tab of the web server. In addition to the device status, this web page also displays the devices Vendor ID, Product Type, Product Code, Product Name and Revision number. An example of the Status web page (from the PPXII) is shown below,



APPENDIX A - ASSEMBLY INSTANCES DETAILS

Note: All Assemblies are Read Only except for Assembly 102 which is Read/Write

CIP Assembly Instance 100 - Device Information

Member	Length (Words)	Description	Data Format	Notes
0	2	Firmware Version	UDINT	PPX2 firmware version number XX.YY.Z encoded as: BYTE1 (LSB) = Z BYTE2 = YY BYTE3 = XX BYTE4 (MSB) = 0 (not used)
1	2	Reserved for Future	UDINT	
2	2	Reserved for Future	UDINT	
3	2	Reserved for Future	UDINT	
4	2	Model number - 1st 4 chars	UDINT	BYTE1 (LSB) = ASCII code char 1 BYTE2 = ASCII code char 2 BYTE3 = ASCII code char 3 BYTE4 (MSB) = ASCII code char 4
5	2	Model number - 2nd 4 chars	UDINT	BYTE1 (LSB) = ASCII code char 5 BYTE2 = ASCII code char 6 BYTE3 = ASCII code char 7 BYTE4 (MSB) = ASCII code char 8
6	2	Model number – 3rd 4 chars	UDINT	BYTE1 (LSB) = ASCII code char 9 BYTE2 = ASCII code char 10 BYTE3 = ASCII code char 11 BYTE4 (MSB) = ASCII code char 12
7	2	Model number – 4th 4 chars	UDINT	BYTE1 (LSB) = ASCII code char 13 BYTE2 = ASCII code char 14 BYTE3 = 0 (not used) BYTE4 (MSB) = 0 (not used)

CIP Assembly Instance 101 –Device Configuration

Member	Length (Words)	Description	Data Format	Notes
0	2	Input Configuration	REAL	1.0: 2 Element 2.0: 2.5 Element A 3.0: 2.5 Element B 4.0: 2.5 Element C 5.0: 3 Element
1	2	Amp Demand Interval	REAL	Units: Seconds (Range: 10 to 9999)
2	2	Voltage Demand Interval	REAL	Units: Seconds (Range: 10 to 9999)
3	2	Power Demand Interval	REAL	Units: Seconds (Range: 10 to 9999)
4	2	TDD Denominator – Phase A	REAL	Range: 0.0 to 20.0
5	2	TDD Denominator – Phase B	REAL	Range: 0.0 to 20.0
6	2	TDD Denominator – Phase C	REAL	Range: 0.0 to 20.0
7	2	TDD Denominator – Phase R	REAL	Range: 0.0 to 20.0
8	2	VT Ratio	REAL	Range: 1.0000 to 9999.9
9	2	CT Ratio	REAL	Range: 1.0000 to 9999.9
10	2	VT Ratio Bus 2	REAL	Range: 1.0000 to 9999.9 (PPXII only)

CIP Assembly Instance 102 – Device Control

Member	Length (Words)	Description	Data Format	Notes
0	2	Reserved for Future	UDINT	
1	2	Control Word	UDINT	When resetting either Demands or Energy Registers, the user must issue a Set Attribute Single (0x10) with all reserved locations = 0, and the Control Word set to the desired value according to the following bit definitions: Bit 0: Reserved (unused) Bit 1: Reset Amp Demands Bit 2: Reset Volt Demands Bit 3: Reset Power Demands Bit 4: Reset Energy Registers Bits 5 - 31: Reserved (unused)
2	2	Reserved for Future	UDINT	
3	2	Reserved for Future	UDINT	
4	2	Reserved for Future	UDINT	
5	2	Reserved for Future	UDINT	
6	2	Reserved for Future	UDINT	
7	2	Reserved for Future	UDINT	
8	2	Reserved for Future	UDINT	
9	2	Reserved for Future	UDINT	
10	2	Reserved for Future	UDINT	
11	2	Reserved for Future	UDINT	

CIP Assembly Instance 103 – Device Status

Member	Length (Words)	Description	Data Format	Notes
0	2	Heartbeat	UDINT	See the PPXII or M66x User Manual for details
1	2	Health	UDINT	See the PPXII or M66x User Manual for details
2	2	Reserved for Future	UDINT	
3	2	Reserved for Future	UDINT	

CIP Assembly Instance 104 – Instantaneous Measurements (Voltage and Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	RMS Volts A	REAL	
1	2	RMS Volts B	REAL	
2	2	RMS Volts C	REAL	
3	2	RMS Volts N	REAL	
4	2	RMS Volts A-B	REAL	
5	2	RMS Volts B-C	REAL	
6	2	RMS Volts C-A	REAL	
7	2	RMS Amps A	REAL	
8	2	RMS Amps B	REAL	
9	2	RMS Amps C	REAL	
10	2	RMS Amps Residual	REAL	
11	2	RMS Volts A, Bus 2	REAL	PPXII only
12	2	RMS Volts B, Bus 2	REAL	PPXII only
13	2	RMS Volts C, Bus 2	REAL	PPXII only
14	2	RMS Volts N, Bus 2	REAL	PPXII only
15	2	RMS Volts A-B, Bus 2	REAL	PPXII only
16	2	RMS Volts B-C, Bus 2	REAL	PPXII only
17	2	RMS Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 105 – Instantaneous Measurements (Power, Power Factor, Frequency)

Member	Length (Words)	Description	Data Format	Notes
0	2	Watts Phase A	REAL	
1	2	Watts Phase B	REAL	
2	2	Watts Phase C	REAL	
3	2	Watts Total	REAL	
4	2	VARs Phase A	REAL	
5	2	VARs Phase B	REAL	
6	2	VARs Phase C	REAL	
7	2	VARs Total	REAL	
8	2	VA Phase A	REAL	
9	2	VA Phase B	REAL	
10	2	VA Phase C	REAL	
11	2	VA Total	REAL	
12	2	PF Phase A	REAL	
13	2	PF Phase B	REAL	
14	2	PF Phase C	REAL	
15	2	PF Total	REAL	
16	2	System Frequency	REAL	
17	2	System Frequency, Bus 2	REAL	PPXII only

CIP Assembly Instance 106 – Fundamental Measurements (Voltage and Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	Fundamental Volts A	REAL	
1	2	Fundamental Volts B	REAL	
2	2	Fundamental Volts C	REAL	
3	2	Fundamental Volts A-B	REAL	
4	2	Fundamental Volts B-C	REAL	
5	2	Fundamental Volts C-A	REAL	
6	2	Fundamental Amps A	REAL	
7	2	Fundamental Amps B	REAL	
8	2	Fundamental Amps C	REAL	
9	2	Fundamental Amps Residual	REAL	
10	2	Fundamental Volts A, Bus 2	REAL	PPXII only
11	2	Fundamental Volts B, Bus 2	REAL	PPXII only
12	2	Fundamental Volts C, Bus 2	REAL	PPXII only
13	2	Fundamental Volts A-B, Bus 2	REAL	PPXII only
14	2	Fundamental Volts B-C, Bus 2	REAL	PPXII only
15	2	Fundamental Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 107 – Fundamental Measurements (Power and Power Factor)

Member	Length (Words)	Description	Data Format	Notes
0	2	Fundamental Watts Phase A	REAL	
1	2	Fundamental Watts Phase B	REAL	
2	2	Fundamental Watts Phase C	REAL	
3	2	Fundamental Watts Total	REAL	
4	2	Fundamental VA Phase A	REAL	
5	2	Fundamental VA Phase B	REAL	
6	2	Fundamental VA Phase C	REAL	
7	2	Fundamental VA Total	REAL	
8	2	Displacement PF Phase A	REAL	
9	2	Displacement PF Phase B	REAL	
10	2	Displacement PF Phase C	REAL	
11	2	Displacement PF Total	REAL	

CIP Assembly Instance 108 – Demand Measurements (Voltage and Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	Demand Volts A	REAL	
1	2	Demand Volts B	REAL	
2	2	Demand Volts C	REAL	
3	2	Demand Volts A-B	REAL	
4	2	Demand Volts B-C	REAL	

5	2	Demand Volts C-A	REAL	
6	2	Demand Amps A	REAL	
7	2	Demand Amps B	REAL	
8	2	Demand Amps C	REAL	
9	2	Demand Amps Residual	REAL	
10	2	Demand Volts A, Bus 2	REAL	PPXII only
11	2	Demand Volts B, Bus 2	REAL	PPXII only
12	2	Demand Volts C, Bus 2	REAL	PPXII only
13	2	Demand Volts A-B, Bus 2	REAL	PPXII only
14	2	Demand Volts B-C, Bus 2	REAL	PPXII only
15	2	Demand Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 109 – Demand Measurements (Power)

Member	Length (Words)	Description	Data Format	Notes
0	2	Demand Watts Phase A	REAL	
1	2	Demand Watts Phase B	REAL	
2	2	Demand Watts Phase C	REAL	
3	2	Demand Watts Total	REAL	
4	2	Demand VARs Phase A	REAL	
5	2	Demand VARs Phase B	REAL	
6	2	Demand VARs Phase C	REAL	
7	2	Demand VARs Total	REAL	
8	2	Demand VA Phase A	REAL	
9	2	Demand VA Phase B	REAL	
10	2	Demand VA Phase C	REAL	
11	2	Demand VA Total	REAL	

CIP Assembly Instance 110 – Maximum Demand Measurements (Voltage and Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	Max Demand Volts A	REAL	
1	2	Max Demand Volts B	REAL	
2	2	Max Demand Volts C	REAL	
3	2	Max Demand Volts A-B	REAL	
4	2	Max Demand Volts B-C	REAL	
5	2	Max Demand Volts C-A	REAL	
6	2	Max Demand Amps A	REAL	
7	2	Max Demand Amps B	REAL	
8	2	Max Demand Amps C	REAL	
9	2	Max Demand Amps Residual	REAL	
10	2	Max Demand Volts A, Bus 2	REAL	PPXII only
11	2	Max Demand Volts B, Bus 2	REAL	PPXII only
12	2	Max Demand Volts C, Bus 2	REAL	PPXII only
13	2	Max Demand Volts A-B, Bus 2	REAL	PPXII only
14	2	Max Demand Volts B-C, Bus 2	REAL	PPXII only
15	2	Max Demand Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 111 – Maximum Demand Measurements (Power)

Member	Length (Words)	Description	Data Format	Notes
0	2	Max Demand Watts Phase A	REAL	
1	2	Max Demand Watts Phase B	REAL	
2	2	Max Demand Watts Phase C	REAL	
3	2	Max Demand Watts Total	REAL	
4	2	Max Demand VARs Phase A	REAL	
5	2	Max Demand VARs Phase B	REAL	
6	2	Max Demand VARs Phase C	REAL	
7	2	Max Demand VARs Total	REAL	
8	2	Max Demand VA Phase A	REAL	
9	2	Max Demand VA Phase B	REAL	
10	2	Max Demand VA Phase C	REAL	
11	2	Max Demand VA Total	REAL	

CIP Assembly Instance 112 – Minimum Demand Measurements (Voltage)

Member	Length (Words)	Description	Data Format	Notes
0	2	Min Demand Volts A	REAL	
1	2	Min Demand Volts B	REAL	
2	2	Min Demand Volts C	REAL	
3	2	Min Demand Volts A-B	REAL	
4	2	Min Demand Volts B-C	REAL	
5	2	Min Demand Volts C-A	REAL	
6	2	Min Demand Volts A, Bus 2	REAL	PPXII only
7	2	Min Demand Volts B, Bus 2	REAL	PPXII only
8	2	Min Demand Volts C, Bus 2	REAL	PPXII only
9	2	Min Demand Volts A-B, Bus 2	REAL	PPXII only
10	2	Min Demand Volts B-C, Bus 2	REAL	PPXII only
11	2	Min Demand Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 113 – Minimum Demand Measurements (Power)

Member	Length (Words)	Description	Data Format	Notes
0	2	Min Demand Watts Phase A	REAL	
1	2	Min Demand Watts Phase B	REAL	
2	2	Min Demand Watts Phase C	REAL	
3	2	Min Demand Watts Total	REAL	
4	2	Min Demand VARs Phase A	REAL	
5	2	Min Demand VARs Phase B	REAL	
6	2	Min Demand VARs Phase C	REAL	
7	2	Min Demand VARs Total	REAL	
8	2	Min Demand VA Phase A	REAL	
9	2	Min Demand VA Phase B	REAL	
10	2	Min Demand VA Phase C	REAL	
11	2	Min Demand VA Total	REAL	

CIP Assembly Instance 114 – Demand and Maximum Demand Fundamental Measurements (Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	Fundamental Amp Demand A	REAL	
1	2	Fundamental Amp Demand B	REAL	
2	2	Fundamental Amp Demand C	REAL	
3	2	Fundamental Amp Demand Residual	REAL	
4	2	Fundamental Amp Demand Max A	REAL	
5	2	Fundamental Amp Demand Max B	REAL	
6	2	Fundamental Amp Demand Max C	REAL	
7	2	Fundamental Amp Demand Max Residual	REAL	

CIP Assembly Instance 115 – THD Voltage, TDD Current and K-factor Current Measurements

Member	Length (Words)	Description	Data Format	Notes
0	2	THD Volts A	REAL	
1	2	THD Volts B	REAL	
2	2	THD Volts C	REAL	
3	2	THD Volts A-B	REAL	
4	2	THD Volts B-C	REAL	
5	2	THD Volts C-A	REAL	
6	2	TDD Amps A	REAL	
7	2	TDD Amps B	REAL	
8	2	TDD Amps C	REAL	
9	2	TDD Amps Residual	REAL	
10	2	K-Factor Amps A	REAL	
11	2	K-Factor Amps B	REAL	
12	2	K-Factor Amps C	REAL	
13	2	K-Factor Amps Residual	REAL	
14	2	THD Volts A, Bus 2	REAL	PPXII only
15	2	THD Volts B, Bus 2	REAL	PPXII only
16	2	THD Volts C, Bus 2	REAL	PPXII only
17	2	THD Volts A-B, Bus 2	REAL	PPXII only
18	2	THD Volts B-C, Bus 2	REAL	PPXII only
19	2	THD Volts C-A, Bus 2	REAL	PPXII only

CIP Assembly Instance 116 – Phase Angle, Frequency, and Average Measurements (Voltage and Current)

Member	Length (Words)	Description	Data Format	Notes
0	2	Phase Angle Volts A	REAL	
1	2	Phase Angle Volts B	REAL	
2	2	Phase Angle Volts C	REAL	
3	2	Phase Angle Volts A-B	REAL	
4	2	Phase Angle Volts B-C	REAL	
5	2	Phase Angle Volts C-A	REAL	
6	2	Phase Angle Amps A	REAL	
7	2	Phase Angle Amps B	REAL	
8	2	Phase Angle Amps C	REAL	
9	2	Frequency Volts A	REAL	PPXII only (always reads “0” on M66x)
10	2	Frequency Volts B	REAL	PPXII only (always reads “0” on M66x)
11	2	Frequency Volts C	REAL	PPXII only (always reads “0” on M66x)
12	2	Frequency Amps A	REAL	PPXII only (always reads “0” on M66x)
13	2	Frequency Amps B	REAL	PPXII only (always reads “0” on M66x)
14	2	Frequency Amps C	REAL	PPXII only (always reads “0” on M66x)
15	2	Average Volts A, B, C	REAL	
16	2	Average Amps A, B, C	REAL	
17	2	Average Volts A, B, C, Bus 2	REAL	PPXII only
18	2	Frequency Volts A, Bus 2	REAL	PPXII only
19	2	Frequency Volts B, Bus 2	REAL	PPXII only
20	2	Frequency Volts C, Bus 2	REAL	PPXII only

CIP Assembly Instance 117 – Energy Measurements

Member	Length (Words)	Description	Data Format	Notes
0	2	kWatt-Hours Net	DINT	
1	2	kWatt-Hours Positive (Normal)	DINT	
2	2	kWatt-Hours Negative (Reverse)	DINT	
3	2	kVAR-Hours Positive (Lag)	DINT	
4	2	kVAR-Hours Negative (Lead)	DINT	
5	2	kVA-Hours	DINT	

CIP Assembly Instance 118 – Bus Voltage Differential Measurements (Magnitude, Frequency, and Phase) (PPXII only)

Member	Length (Words)	Description	Data Format	Notes
0	2	RMS Differential Volts A 1-2	REAL	
1	2	RMS Differential Volts B 1-2	REAL	
2	2	RMS Differential Volts C 1-2	REAL	
3	2	Phase Angle Volts A 1-2	REAL	
4	2	Phase Angle Volts B 1-2	REAL	
5	2	Phase Angle Volts C 1-2	REAL	
6	2	Slip Frequency Volts A 1-2	REAL	
7	2	Slip Frequency Volts B 1-2	REAL	
8	2	Slip Frequency Volts C 1-2	REAL	

CIP Assembly Instance 119 – Sequence Components and Unbalance Measurements (PPXII only)

Member	Length (Words)	Description	Data Format	Notes
0	2	Zero Sequence Magnitude Volts	REAL	
1	2	Positive Sequence Magnitude Volts	REAL	
2	2	Negative Sequence Magnitude Volts	REAL	
3	2	Zero Sequence Magnitude Volts 2	REAL	
4	2	Positive Sequence Magnitude Volts 2	REAL	
5	2	Negative Sequence Magnitude Volts 2	REAL	
6	2	Zero Sequence Magnitude Amps	REAL	
7	2	Positive Sequence Magnitude Amps	REAL	
8	2	Negative Sequence Magnitude Amps	REAL	
9	2	Zero Sequence Angle Volts	REAL	
10	2	Positive Sequence Angle Volts	REAL	
11	2	Negative Sequence Angle Volts	REAL	
12	2	Zero Sequence Angle Volts 2	REAL	
13	2	Positive Sequence Angle Volts 2	REAL	
14	2	Negative Sequence Angle Volts 2	REAL	
15	2	Zero Sequence Angle Amps	REAL	
16	2	Positive Sequence Angle Amps	REAL	
17	2	Negative Sequence Angle Amps	REAL	
18	2	Zero Sequence Unbalance Volts (U0)	REAL	
19	2	Neg. Sequence Unbalance Volts (Uu)	REAL	
20	2	Zero Sequence Unbalance Volts (U0) 2	REAL	
21	2	Neg. Sequence Unbalance Volts (Uu) 2	REAL	
22	2	Zero Sequence Unbalance Amps (U0)	REAL	
23	2	Neg. Sequence Unbalance Amps (Uu)	REAL	

CIP Assembly Instance 120 – Synchronizing Measurements (PPXII only)

Member	Length (Words)	Description	Data Format	Notes
0	2	RMS Volts A	REAL	
1	2	RMS Volts B	REAL	
2	2	RMS Volts C	REAL	
3	2	RMS Volts A, Bus 2	REAL	
4	2	RMS Volts B, Bus 2	REAL	
5	2	RMS Volts C, Bus 2	REAL	
6	2	RMS Differential Volts A 1-2	REAL	
7	2	RMS Differential Volts B 1-2	REAL	
8	2	RMS Differential Volts C 1-2	REAL	
9	2	Phase Angle Volts A 1-2	REAL	
10	2	Phase Angle Volts B 1-2	REAL	
11	2	Phase Angle Volts C 1-2	REAL	
12	2	Slip Frequency Volts A 1-2	REAL	
13	2	Slip Frequency Volts B 1-2	REAL	
14	2	Slip Frequency Volts C 1-2	REAL	

CIP Assembly Instance 121 – Synchronizing Measurements (Custom) (PPXII only)

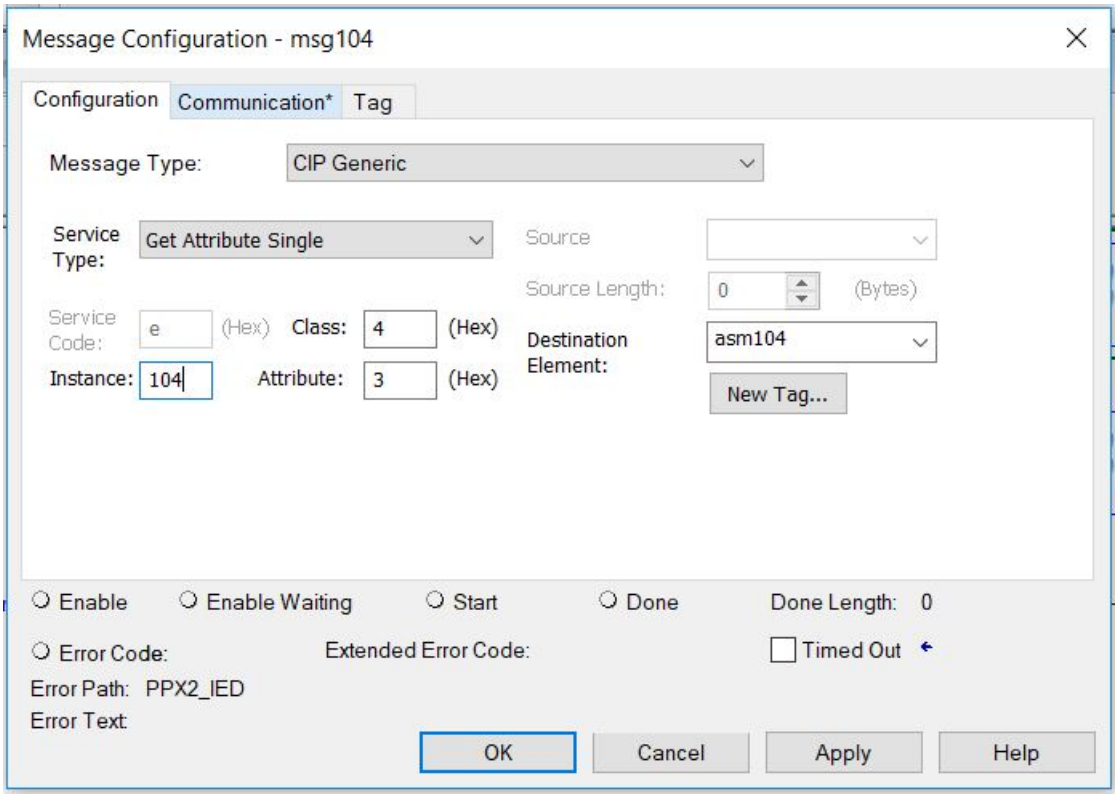
Member	Length (Words)	Description	Data Format	Notes
0	2	RMS Volts A	REAL	
1	2	RMS Volts B	REAL	
2	2	RMS Volts C	REAL	
3	2	RMS Volts A-B	REAL	
4	2	RMS Volts B-C	REAL	
5	2	RMS Volts C-A	REAL	
6	2	RMS Amps A	REAL	
7	2	RMS Amps B	REAL	
8	2	RMS Amps C	REAL	
9	2	Watts Total	REAL	
10	2	VARs Total	REAL	
11	2	VA Total	REAL	
12	2	PF Total	REAL	
13	2	Frequency Volts A	REAL	
14	2	Frequency Volts B	REAL	
15	2	Frequency Volts C	REAL	
16	2	RMS Volts A, Bus 2	REAL	
17	2	RMS Volts B, Bus 2	REAL	
18	2	RMS Volts C, Bus 2	REAL	
19	2	RMS Volts A-B, Bus 2	REAL	
20	2	RMS Volts B-C, Bus 2	REAL	
21	2	RMS Volts C-A, Bus 2	REAL	
22	2	Frequency Volts A, Bus 2	REAL	
23	2	Frequency Volts B, Bus 2	REAL	
24	2	Frequency Volts C, Bus 2	REAL	
25	2	Phase Angle Volts A 1-2	REAL	
26	2	Phase Angle Volts B 1-2	REAL	
27	2	Phase Angle Volts C 1-2	REAL	
28	2	Slip Frequency Volts A 1-2	REAL	
29	2	Slip Frequency Volts B 1-2	REAL	
30	2	Slip Frequency Volts C 1-2	REAL	

APPENDIX B – EXPLICIT MESSAGING EXAMPLE

The following example provides details on how to configure a messaging instruction to read from one of the Assembly Instances by using a CIP Generic message from a Studio 5000 Logix Designer application.

It is assumed that the user has familiarity with basic message programming in a Logix controller. The user should first configure the logic, message tag, destination tag and message instruction. Once that is completed, follow these steps to finish setting up the message.

1. Select the appropriate parameters in the Message Configuration window. Note that the tag named "**asm104**" was previously created to be the destination for the Assembly Instance 104 measurements.

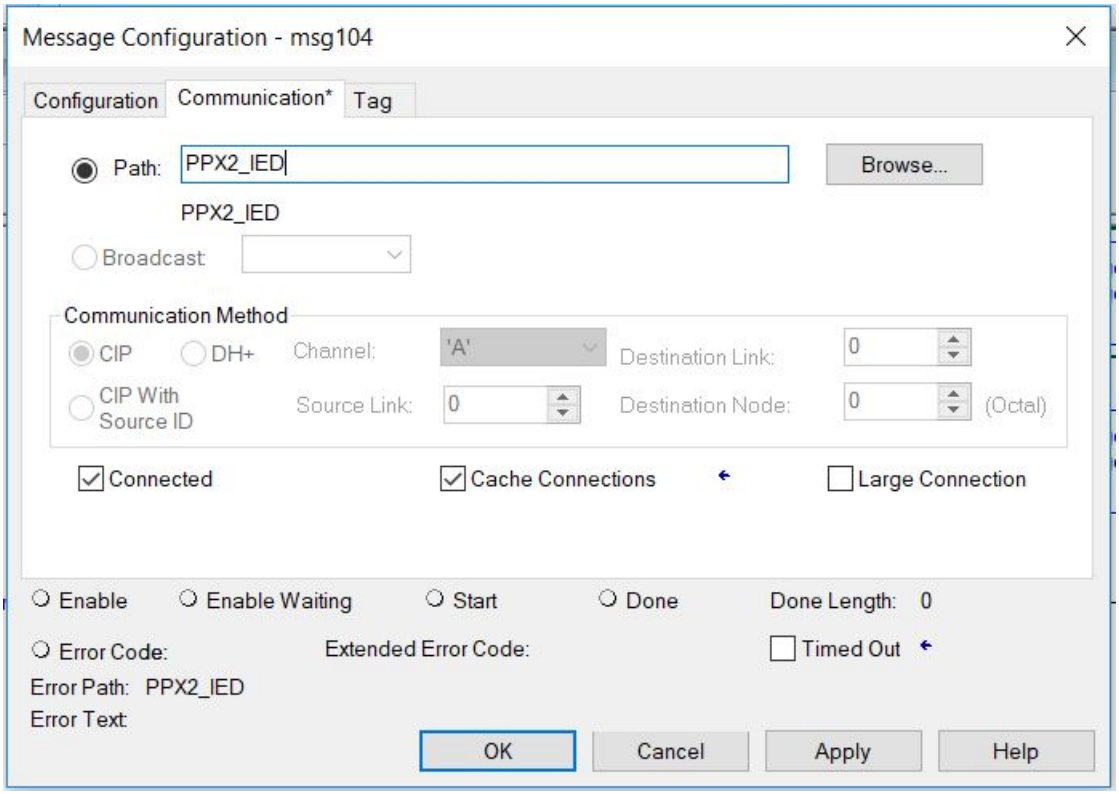


Selection details

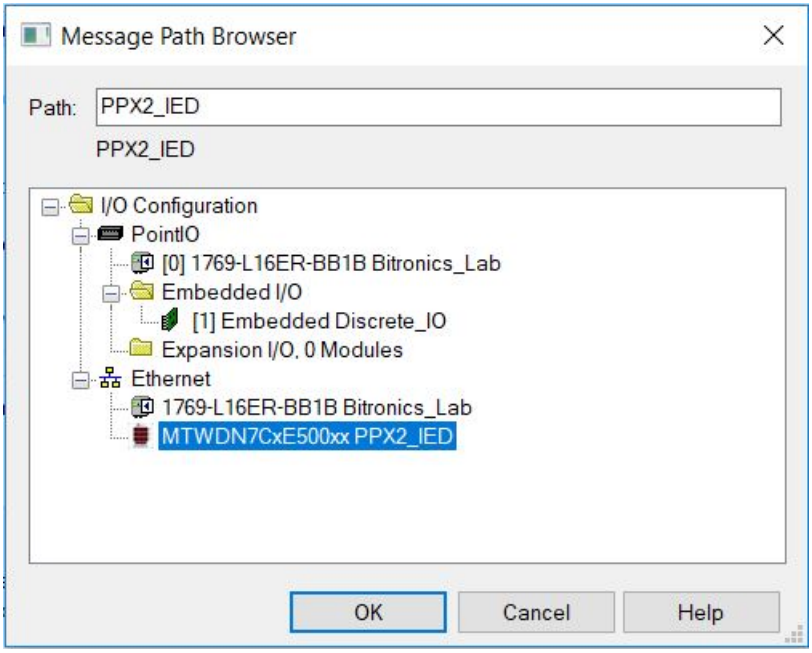
- **Message Type**: CIP Generic
- **Service Type**: Get Attribute Single
- **Service Code**: e (in hex, automatically selected for Service Type selection)
- **Class**: 4 (in hex, class code for Assembly Object)
- **Instance**: 104 (number of desired Assembly Instance)
- **Attribute**: 3 (in hex, denotes "data")

.

2. Click the **Communication** tab and fill in the Path name. If the Path name is not known, click on ***Browse*** to bring up the Message Path Browser window shown below.



The Message Path Browser windows will appear,



Navigate to and select the PowerPlex II device under **Ethernet** branch located under the ***"I/O Configuration"*** folder, and then click on **OK**. The Path field on the Communication tab should now be populated with the PowerPlex II device name. In this example, the name is "**PPX2_IED**".

3. Click on **OK** to complete the configuration.

Revision	Date	Changes	By
A	04/04/18	Original Release	E. DeMicco, G. Nelson
B	5/22/18	Modified details of Section 1.3 EtherNet/IP Performance Level. Modified details of Section 2.0 Ethernet Interface. Changed ordering of measurements in Assembly Instance 116. Corrected attributes Max Instances and Number of Instances for Assembly Object Class.	E. DeMicco, G. Nelson
C	6/29/18	Add support for 60 Series products (as M66x).	E. DeMicco, G. Nelson
D	8/1/18	Noted that Per Phase Frequency measurements (members 9 – 14) in Assembly Instance 116 are only available on the PPXII and will always return “0” on M66x.	E. DeMicco, G. Nelson
E	11/26/19	Updated the CIP Object Model to include the QoS Object and DLR Object (for PPXII w/DLR). Added custom synchronizing Assembly Instance 121. Added attribute 0x0B CPU Utilization to the Connection Manager object. Added attributes 4 Interface Counters, 0x05 Media Counters, 0x0E Ethernet Errors and 0x0F Link Down Counters to the Ethernet Link object. Changed the values for Attributes 0x02 Max Instance and 0x03 Number of Max Instances of the Ethernet Link object to 3 for both.	E. DeMicco, G. Nelson

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