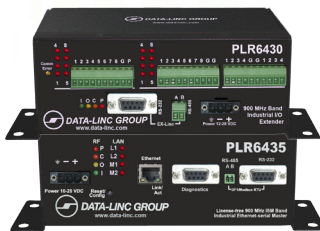


User Guide

PlantLinc Family **Medium-range Industrial Wireless I/O**

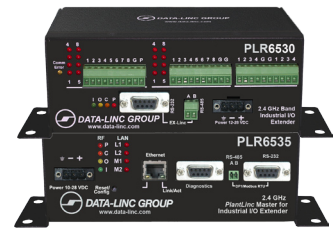
**Ethernet-serial Protocol to I/O
&
I/O to I/O**



PLR6430/PLR6435
900MHz Band



CIX/EXR
Wired Expander



PLR6530/PLR6535
900MHz Band

It is essential that all instructions contained in the User Guide are followed precisely to ensure proper operation of equipment

For coverage from process to perimeter



Think DATA-LINC for the world's broadest line of industrial grade modems

DATA-LINC modems interface seamlessly with the major manufacturers' PLCs.



Notes:



DATA-LINC GROUP is a Global Encompass Partner with Rockwell Automation and a Schneider Electric Collaborative Alliance Partnership Program Gold Level member. Its modems interface seamlessly with the other major PLC manufacturers as well.

It is essential that all instructions contained in the User Guide are followed precisely to ensure proper operation of equipment.

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Warnings / FCC

FCC Part 15 Notification

This device complies with part 15 of the FCC rules. Operation is subject to the following conditions:

- 1) This device may not cause harmful interference
- 2) This device must accept any interference received, including interference that may cause undesired operation.

The device must be operated as supplied by Data-Linc Group. Any changes or modifications made to the device without the express written approval of Data-Linc Group may void the user's authority to operate the device.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note: Whenever any PLR is placed inside an enclosure a label must be placed on the outside of that enclosure which includes the modem's FCC ID.

Note: Per FCC Rules, the maximum power allowed at the antenna is 4 Watts E.I.R.P.

RF Exposure



The PLR643x has a maximum transmitted output power of 1W. It is required that the transmit antenna be kept at least 23 cm away from nearby persons to satisfy FCC RF exposure requirements.

The PLR653x has a maximum transmitted output power of 500 mW. It is required that the transmit antenna be kept at least 23 cm away from nearby persons to satisfy FCC RF exposure requirements.

Introduction

Data-Linc Group (DLG) has prepared this user guide for use by customers as a guide to the proper installation, operation, and maintenance of a Communication Interface Extender (PLR) system.

This includes the following DLG products:

PLR6435 – Master Ethernet and Serial interface for Wireless I/O Remotes (PLR6430) (500 mW, 900 MHz FHSS)

PLR6430 – Wireless I/O Remote with 8 discrete inputs, 8 discrete outputs, 4 analog inputs, and 4 analog outputs (500 mW, 900 MHz FHSS)

PLR6535 – Master Ethernet and Serial interface for Wireless I/O Remotes (PLR6530) (250mW, 2.4 GHz FHSS)

PLR6530 – Wireless I/O Remote with 8 discrete inputs, 8 discrete outputs, 4 analog inputs, and 4 analog outputs (250mW, 2.4 GHz FHSS)

CIX/EXR – Wired I/O Remote with 8 discrete inputs, 8 discrete outputs, 4 analog inputs, and 4 analog outputs. This device connects to either the PLR6430 or PLR6530 via the “EX-Linc port” (No Radio). The CIX/EXR is treated by a system master the same as a separate remote with the only difference being that it is accessed via a hard wire connection to another PLR6x30.

The PLR6x35 is a cost effective and easy-to-implement Ethernet and/or serial to wireless I/O (protocol to I/O) system. This system is designed to provide wireless communication where wire lengths are too long, too costly or not possible and facilitates the conversion from analog and discrete to register values that can be accessed using Ethernet/IP and DF1 Serial or ModBus/TCP and ModBus RTU, reducing the need for additional equipment at each remote location.

The PLR6x30 master to PLR6x30 remote(s) is a cost effective and easy-to-implement I/O to I/O system. This system is designed to provide wireless I/O where wire lengths are too long, too costly or not possible.

Each system must have one master and at least one remote, but can have up to 16 remotes when using a PLR6x35 master or 8 remotes when using a PLR6x30 master. Each PLR6x30 provides 8 discrete inputs, 8 discrete outputs, 4 analog inputs and 4 analog outputs. Discrete inputs are self-sensing dry contact. Discrete outputs are open collector common emitter (sinking) to drive a relay, and the 12 bit resolution analogs can be configured for 0-20 mA, 4-20 mA or 0-10 VDC. The PLR6x35's or PLR6x30 masters come standard with a diagnostics port capable of utilizing LincView™ OPC RF network diagnostics tool.

The PLR6x35's are configured using the supplied “CIX-Linc” software program and are accessed via the Ethernet connection. The PLR6x30's are configured using the supplied “CIX I-O Configurator” software program and are accessed via the “EX-Linc” port for IO configuration and the side panel DB9 port for radio configuration. The CIX/EXR also uses the “CIX I-O Configurator” software program using the “EX-Linc” port (IO configuration only).

Note: These transceivers are “line of sight” transceivers, so line of sight is required for communications. In some instances, depending on distance and obstruction, line of sight may not be necessary, but high latency or poor communications could result. If line of sight does not exist or the units are to be mounted into grounded metal enclosures, an external antenna may be needed. If external antennas were not purchased with this equipment, contact Data-Linc Group for information.

PLR I/O specifications

Power

10-28 VDC

RF Antenna Connection

SMA connection.

PLR6435/6535:

Ethernet

1 RJ45 - 10/100 Base-T Auto-MDIX

Diagnostics Port

DB9 female RS232 port for running radio diagnostics

EX-Linc Port

Shared DB9 female RS232 and 2-pin terminal RS485 port for full duplex DF1 Serial or Slave ModBus RTU connection.

Discrete Outputs

The discrete outputs are bipolar current-sink Darlington output drivers. The outputs are designed to operate the coil of a relay (typically a 12V or 24V relay coil). The outputs of the units cannot directly drive a relay. An external power supply must be used to provide DC power to any relays. The outputs are rated to 100mA each. If driving inductive loads, place a voltage suppression diode across the relay coil.

Discrete Inputs

Contact closure to input ground connection.

NOTE: The discrete inputs must not be supplied with a voltage. Doing so will result in damage to the inputs and will void the warranty.

Analog Outputs

0-20mA, 4-20mA or 0-10V DC output transmitters.

For producing a 0-10VDC analog signal a dipswitch and a 500 ohm resistor is provided for each analog output. For 0-10VDC the connected unit expects the unit to have high input impedance to avoid loading the outputs.

Note: To use the 0-10VDC, the channel must be configured for to 0-20mA operation.

Analog Inputs

Accepts a 4-20mA current or 0-10 VDC voltage.

Note: All connections share a common ground connection labeled "G".

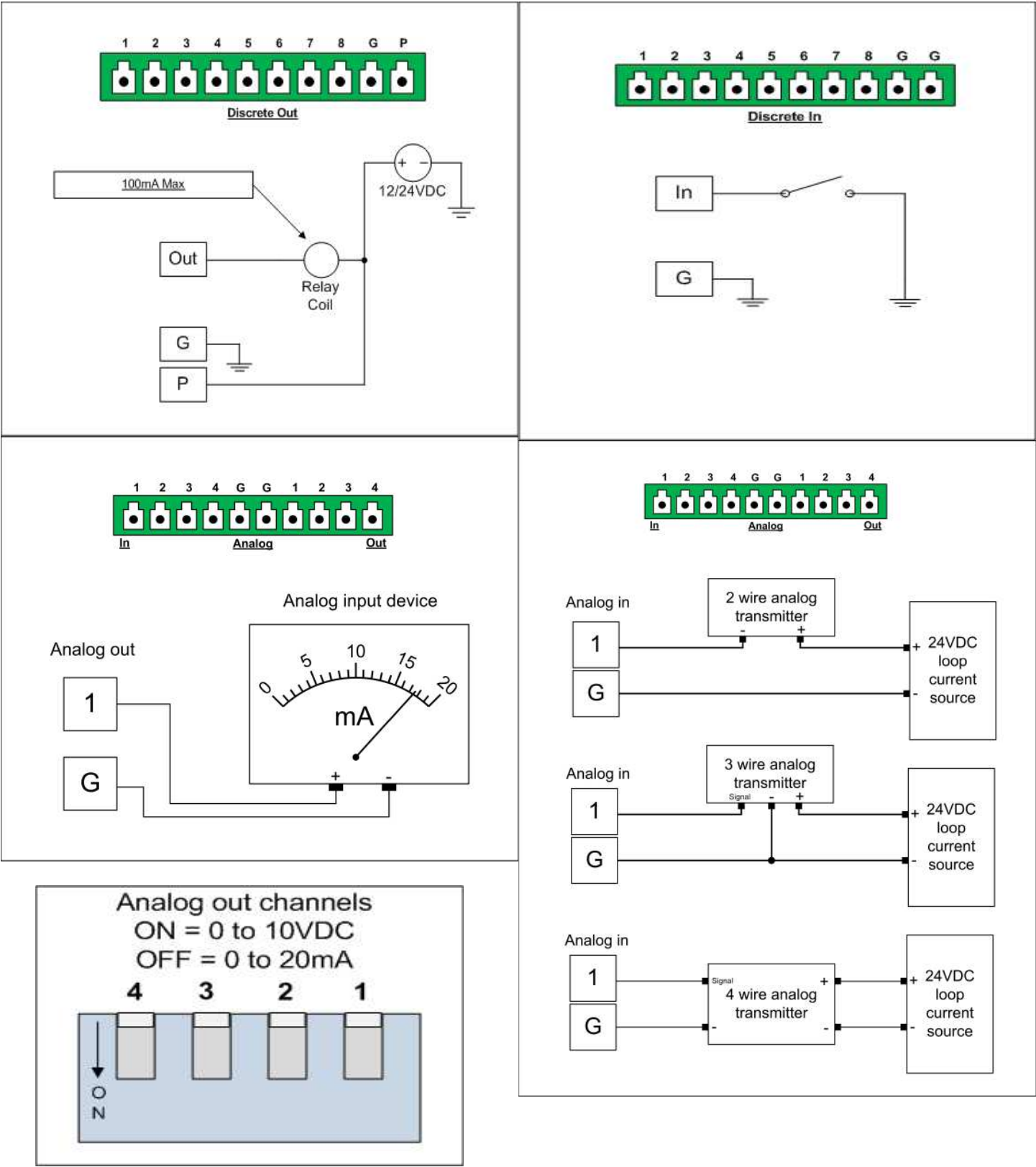
EX-Linc Port

Shared DB9 female RS232 and 2-pin terminal RS485 port for configuration of the I/O and expansion of I/O with a PLR/EXR unit

Diagnostics Port

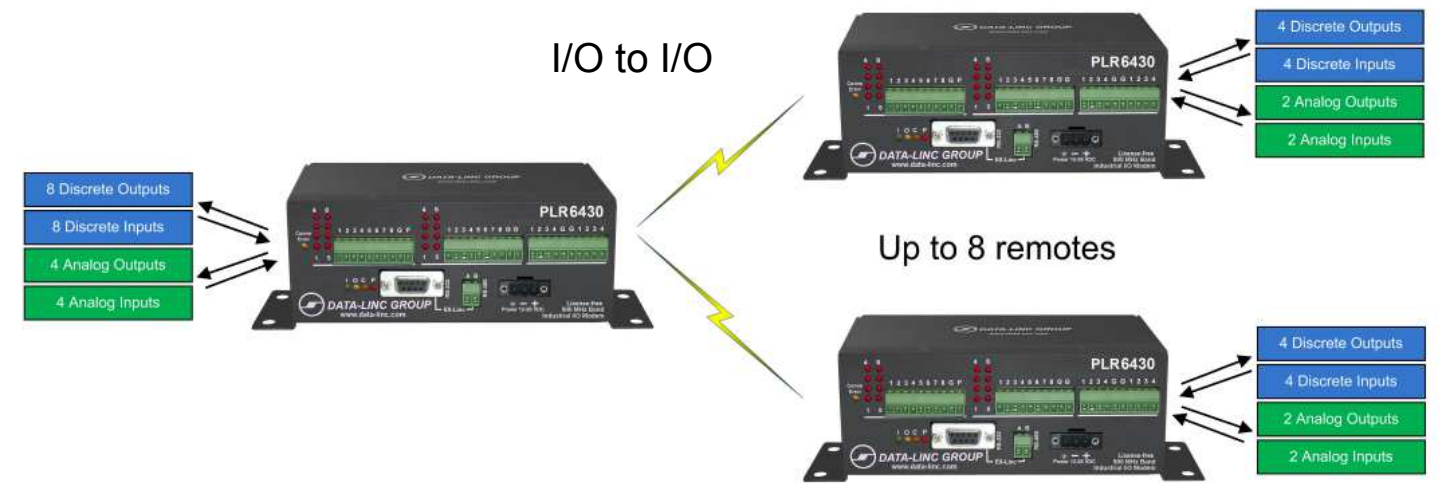
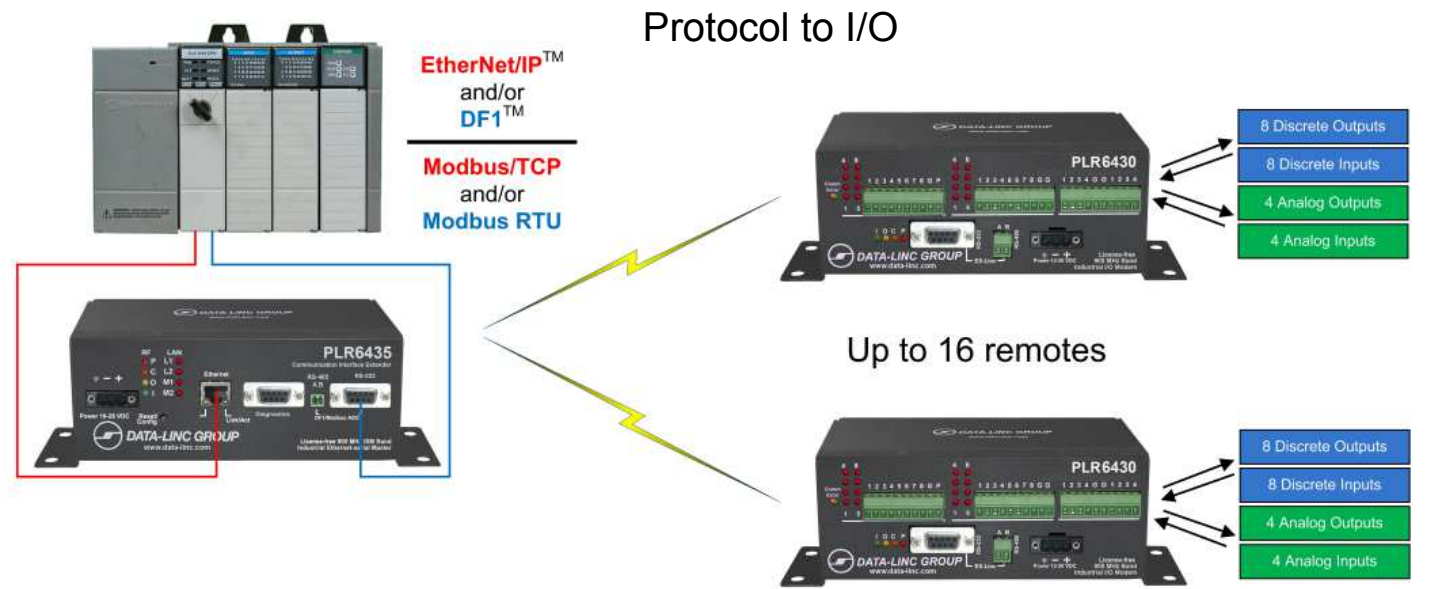
DB9 female RS232 port for configuration of the radio

I/O Wiring



Applications

The PLR's are designed for point-to-point or point-to-multipoint wireless extension of wired sensors and/or input and output controls. The system consists of one master and at least one remote unit, but can have up to 16 remotes when using a PLR6435 master or 8 remotes when using a PLR6430 master.



Installation

Unpacking the Box

- PLR IO device
- Cat5 Ethernet Cable (PLR6x35 only)
- Test Antenna
- 120 VAC Wall Transformer (US Power Connector)
- Blue Config Cable (PLR6x30 only)
- Quick Start and Software/User Guide CD

Hardware Overview

PLR6x35

Front Panel

- 3 pin terminal power connector (F-Ground, Negative, Positive)(10-28VDC)
- RF indication LEDs
 - P – Unit Power, always on with power present
 - C – RF Carrier, flashes with received responses from the remotes
 - O – RF Data Out, flashes on polls
 - I – RF Data In, flashes on polled responses
- LAN indication LEDs
 - L – LAN link, should be on solid with link Link
 - A – LAN activity,
 - M1 – No Response for remote error
 - M2 – Status
- 10BaseT port (Straight Through or Crossed Connection)
- Diagnostics port (RS-232 DB9 for RF diagnostics)
- DF1/Modbus RTU (EX-Linc) (Shared RS-485 and RS-232 port for Serial Communications)
- Reset Button (Button to reset the unit to default on power-up)

Side Panel

- Antenna Connector with standard thread SMA connector

PLR6x30

Front Panel

- Comms Error LED (normally OFF)
- 8 Discrete open collector outputs (sinking) with pluggable connector with LED indicators (1-8)
- 8 Discrete inputs, self-sensing with pluggable connector with LED indicators (1-8)
- 4 Analog passive inputs with shared pluggable connector
- 4 Analog powered outputs with shared pluggable connector
- Indicator LEDs
 - I – Data out of the radio(into the I/O), normally flashing from polled messages from the Master
 - O – Data in the radio(out of the I/O), normally flashing with polled response
 - C – RF Carrier, should always be on for the remotes
 - P – Power, should be on if power is present
- EX-Linc port, Shared RS-485 and RS-232 port for configuring the PLR I/O module.
- 3 pin terminal power connector (F-Ground, Negative, Positive) (12-28VDC)

Side Panel (Right)

- Antenna SMA connector with standard thread SMA connector

Side Panel (left)

- Pin hole to Access Push button.
- RS232 Radio Configuration/Diagnostics Port

Getting Started

Setup

A system is setup with one PLR master unit connected to up to 8 or 16 PLR remotes depending on the network master type. Each PLR remote unit is uniquely addressed and polled by the PLR master.

PLR6x35 Configuration

The PLR6x35 is configured using the CIX-Linc Utility. The "CIX-Linc" Utility runs on a Windows® PC and uses UDP Ethernet packets to configure the units.

- Launch the CIX-Linc Utility
- Connect the PLR master to the network port of the computer running the configuration software.
- Click the "Ethernet Locate" button to find the PLR master unit(s).

Note: If multiple devices are found use the MAC address or call number to identify the unit.

- When the search for units is complete or your unit has been found click the "Configure" (or "Radio Statistics" to view the current radio statistics).

- If more than one unit was located, select the unit to configure and enter the password for the unit.

The default password is: default

- Click the "OK" button to continue to the configure parameter page.

Configure Parameters

File Help

DATA-LINC GROUP
Industrial Data Communication Solutions

CIX6400 Version 1.01 08/13/2010
Mac Addr: 00:90:c2:df:99:16
Call# 877-5525 FW: 2.66

Access Mode
☐ Ethernet/IP - DF1
☒ ModBus

Serial Params
 19200 Baud
☒ N ☐ O ☐ E
☒ 8 bit ☐ 7 bit
 Modbus Address: 1
 DF1 Checksum
☒ CRC ☐ BCC

TCP/IP
 Port# 502

Change Configuration
 Cancel Changes
 Reset to Factory Configuration
 Close Advanced Options

IP Settings
 IP Address: 192 168 3 1
 Net Mask: 255 255 255 0

Number of CIX/R Units to Poll: 1

Radio Settings
 Operation Mode
 2 - Point to MultiPoint Master
 Freq Key 12

Network System Type

Repeater(s)
☐ Repeater(s) in System
☐ Remote / Repeater Mode

Network ID
 Network ID Number 100 Subnet Xmit 15 Subnet Recv 15

Hop Table Version
 0 - North America

Frequency Zones
☒ 1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☒ 8 ☒ 9 ☒ 10 ☒ 11 ☒ 12 ☒ 13 ☒ 14 ☒ 15 ☒ 16

Advanced
 Max Packt 9 RF Power 10
 Min Packt 0 RF Data Rate 2
 Retry TO 255 High Noise 0
 Number Repeaters 0
 Master Packt Repeat 1
 Remote Retry 9
 Repeater Freq 0
 Remote/Repeater 0
 Diagnostics 0

On this page are the parameters that are changeable for the network settings and radio settings.

Below is a description of each changeable option:

- IP Settings:

IP Address: The IP address the unit is to use on the network.

Net Mask: The Subnet Mask to use for the network.

- Number of PLR remote Units to Poll: Sets the number of PLR remote unit(s) the PLR6x35 will acquire data from.

Available Options: (Default is 1) A setting of "1" thru "16" is the number of PLR6x30 units in the system.

- Radio Settings

Operation Mode: The radio supports a few different operation modes, for the PLR6x35 units this option should always be set to either (0 – Point to Point Master) or (2 – Point to Multipoint Master). To set the operation mode, open the pull down box and select the operation mode for the unit to configure.

Note: Even if there are only two modems in a network, the modems can be setup in a Multipoint configuration, so if more remotes need to be added in the future the configuration of the existing remote modem(s) will not change and the Master modem will just add to the number of remotes.

Freq Key: The radio have 15 different "Frequency Keys". These "Keys" use different frequency hopping patterns, so multiple networks operating in close proximity, will minimize the frequency interference between networks. All the modems in a given network need to have the same "Freq Key" number. To set the frequency key, open the pull down box and select the number (0-14) to use for the unit to configure.

Network System Type: There are two different ways to set the multipoint radio network configuration. The two types of addressing are "Network ID" and "Callbook". Network ID is the preferred method for a multipoint network because it is more flexible when adding and/or replacing modems in the network. Select the type of network by pressing the button labeled "Network ID" or "Callbook".

Selecting "Network ID":

Network ID: Network ID is an arbitrary number assigned to the network for addressing. All the units in the network must have the same Network ID to communicate. If there are Repeaters in the system, the communication paths can be directed using Subnet ID.

Subnet ID: is the sub ID for the transmission to give an address to retransmission packets. Subnet ID is 2 parts, a Transmit(Xmit) ID and a Receive(Recv) ID. The Xmit ID is only used in the Master and Repeater units, and the Recv ID is used at the Repeater and Remote unit(s). If using Subnet ID, the Master is usually set to Subnet ID Xmit = 0 and Recv = 0. Any units that are directed to connect directly with the Master will have a Subnet ID Recv of 0. If the unit is a Repeater then the Xmit will be the rebroadcast of the packet and the subsequent Remotes or Repeaters would Recv the selected Xmit ID from that Repeater. A setting of Xmit = 15 and Recv = 15 disables using Subnet IDs.

Repeater(s) in System: If Repeaters are used in the system check the "Repeater(s) in System" checkbox.

Selecting "Callbook": Callbook uses the radio unique seven-digit number (that cannot be duplicated) for directing the communications.

In a Point-to-Point network, the callbook number of the Master radio is in the Remote's callbook table, and the Remote callbook number is in the Master's callbook table. If Repeaters are used, the callbook number of the Repeater would go in the "Repeater Number" location.

In a Multi-Point network, the callbook number of the Master or Repeater radio is in the Remote's (or Repeater's) callbook table (depending on which unit it is directly connected with), and it is important to remember that you are addressing towards the Master radio. The Master radio callbook table has no entries in Multipoint, it broadcasts to all the units and then is filtered by the Remote or Repeater's callbook entries.

In a network without Repeaters, the Remotes have the Master's callbook in their callbook table.

In a network with Repeaters, any modem (Repeaters or Remotes) that are connecting to the Master will have the Master's callbook number in the callbook table and any modems that are connecting through Repeaters (Repeaters or Remotes) will have the callbook number of that Repeater in the callbook table.

- Access Mode: Selects the access mode for acquiring the data from the PLR6x35.

Available Options: (Default is Modbus)

- Select Ethernet/IP – DF1 for read and write access using Allen Bradley© PLC message instructions. Refer to “Using Ethernet/IP – DF1” Section for more setup detailed information.
- Select Modbus for Modbus read and write access from a Modbus master. Refer to “Using Modbus” section for more detailed setup information.

- TCP/IP: Port # Sets the port to use for a Modbus/TCP connection.

Available Options: (Default is 502)

A setting of “1” thru “65536” will set the port number that the Modbus/TCP master device will connect with to access the data tables.

- Serial Parameters

Baud Rate: Sets the EX-Linc port baud rate. (RS-232 and RS-485)

Available Options: (Default is 19200)

1200 Baud, 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud and 115200 Baud.

Parity and Bits: Sets the parity and the bits for the EX-Linc port.

Available Options: (Default is N, 8 bit) N = No Parity, O = Odd Parity, E = Even Parity

8 bit = 8 bit word , 7 bit = 7 bit word

Modbus Address: Sets the slave modbus node address for the port, this is also used for the TCP ID.

Available Options: (Default is 1) A setting of “1” thru “247” for the Modbus Address.

DF1 Checksum: Sets the type of checksum used for the DF1 Full Duplex serial communications.

Available Options: (Default is CRC) CRC type checksum, BCC type checksum

Advanced

To show the Advanced Settings, click on the “Edit Advanced Options” button on the right hand side of the screen.

To hide the Advanced Settings, click on the “Close Advanced Options” button. A “keep changes” prompt will keep the changes if yes is clicked or revert the settings to before the Advanced settings were in the edit mode.

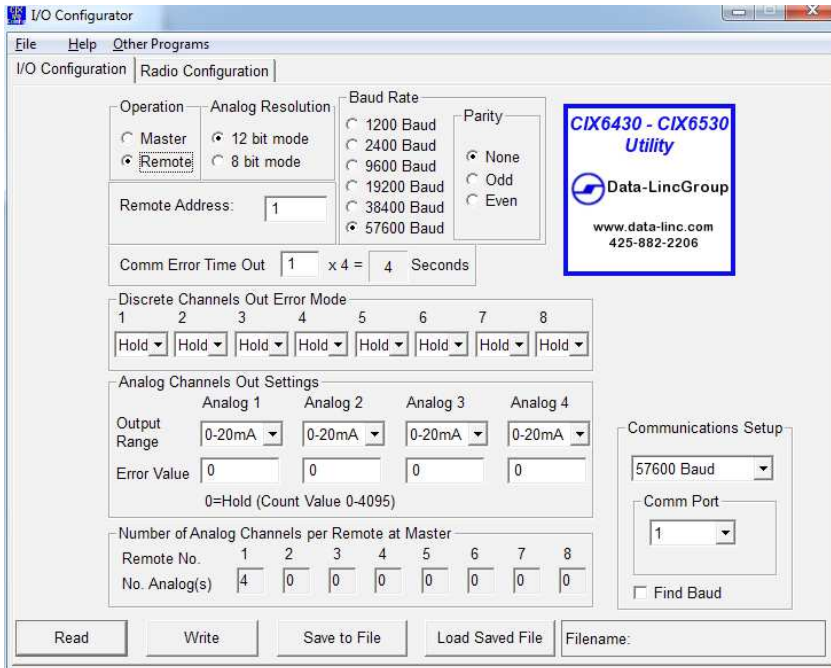
Note: With the exception of “RF Power” changing the “Advanced Settings” can have an adverse affect on a PLR6x35's ability to communicate with PLR6x30 remotes and should only be changed by users with advanced knowledge of Data-Linc Group's radio modems. These settings are pre-configured at the factory for optimum use and in most applications should not be changed.

PLR6x30, CIX/EXR remote I/O Configuration

The PLR6x30 and CIX/EXR are configured using the “CIX I-O Configuration” Utility.

- Connect a straight through serial cable to the EX-Linc port (The RS-485 port may also be used)

Note: There is a switch (SW6) behind the left side access panel (next to the DB9 configuration port) that has two positions “PIC” and “Radio (EXR)”. By default this switch is set to “PIC” which is required to configure the I/O. However if the PLR6x30 is to have a CIX/EXR connected to it, this switch must be set to “Radio (EXR)” for system operation.



- Press the Configuration button
The Comm Error LED should begin to flash (1)
- On the software select the port and the baud rate (or find baud if unknown)
- Select “Read” to see the current settings
- Select “Write” to set the changes.

Note: The changes will not take affect until the power has been removed and re-applied

The PLR6x30 will only work with the following options set:

Analog resolution: 12 bit mode

Operation: Remote – Responds to master polls to update I/O points

Description of all Settings

Analog resolution:

12 bit mode (normal operation)

8 bit mode (DDAA packet format, not recommended for PLR system)

Operation (Mode):

Master – The PLR6x30 master unit will poll PLR6x30 remotes (CIX/EXR's cannot operate as a network master).

Remote – The PLR6x30 and CIX/EXR units will respond to polls a PLR6x35 or PLR6x30 master.

Baud Rate: 1200 Baud, 2400 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 56700 Baud (default)

Parity: None (default), Odd, Even

Note: Baud Rate and Parity MUST match the Radio Baud Rate and Parity

Number of Remotes: This is set in a Master to know how many Remotes to poll.

Remote Address: The address of the unit. Use 1-16 when using a PLR6x35 as a master 1-8 when using a PLR6x30 as a master. The PLR6x30 remote addresses must be sequentially assigned starting at 1.

Comm Error Time Out: Time out in increments of 4 seconds times the multiplier

Discrete Channels Out Error Mode: Discrete outputs value if a Comm Error time out occurs.

Hold (default) – Hold last known good value

On – Turn on output

Off – Turn off output

Analog Channels Out Settings: The options for the operation of the Analog outputs

Output Range:

0-20mA (default) – Full 0mA to 20mA readings

4-20mA – 4mA to 20mA, 0 to 4mA values is output as 4mA

Error Value:

0 (default) – Hold last known good value

1-4095 – The value to output on Comm Error time out

PLR6x30 remote Radio Configuration

- Connect the serial cable to the Radio Diagnostics and Configuration Port (DB9 port on side of device)

- Start the CIX-IO Configuration software (if not already running)

- Select the "Read from Radio" button and follow the prompts (if any) to view the current configuration of the radio. The options here should match the configuration for the PLR6x35 master or PLR6x30 master for a PLR6x30 remote (except for operation mode which should be either (3) Multipoint remote or (7) multipoint repeater.

- Select the "Program Radio" button to make the changes in the radio (follow prompts if needed).

With the Master Radio unit powered up the Remote units will have the "C" LED on solid, meaning a RF link exists. The "I" LED and "O" LED should be blinking rapidly from the polls from the Master unit. If not all the units are powered up then there will be pauses waiting for the response for those units.

Accessing the I/O

Using Ethernet/IP – DF1

Using the Ethernet/IP – DF1 mode will put the PLR6x35 master into a SLC/MicroLogix PLC style file access mode. The unit will connect using Ethernet/IP through the LAN port and DF1 full Duplex through the EX-Linc port.

Using the serial DF1, the baud rate, parity, and checksum type must match between the PLC and the PLR6x35 master. The PLR6x35 master will read and write to the wireless PLR6x30 remote(s) to update the changes made to the register values by the PLC message instructions. When configuring your PLC's message instruction, treat the PLR6x35 as if it were a SLC/MicroLogix PLC.

Addressing the PLR6x35 master – Ethernet/IP – DF1

Remote 1: File register N10

Remote 2: File register N11

...

Remote 16: File register N25

The words in each file register are as follows:

NXX:0 discrete inputs (NXX:0.0 = Discrete input 1, NXX:0.7 = Discrete input 8)

NXX:1 analog input 1

NXX:2 analog input 2

NXX:3 analog input 3

NXX:4 analog input 4

NXX:5 discrete outputs (NXX:5.0 = Discrete input 1, NXX:5.7 = Discrete input 8)

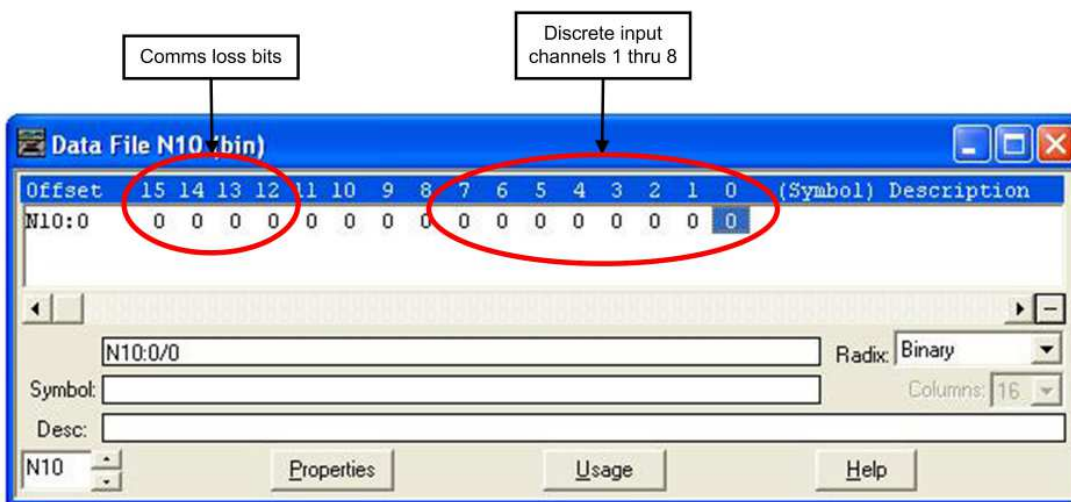
NXX:6 analog output 1

NXX:7 analog output 2

NXX:8 analog output 3

NXX:9 analog output 4

Note: Discretet input bits 12, 13, 14 & 15 are used as “comms loss” bits which will go high (1) when the PLR6x35 has loss communications with the corresponding PLR6x30 remote.



Using Modbus/TCP – Modbus RTU

Using the Modbus mode will put the PLR6x35 into a Modbus style access mode. The unit will connect Modbus/TCP through the LAN port and Modbus RTU through the EX-Linc port.

Using Modbus/TCP the ID number is the same as the Modbus address for the serial parameters.

Using the Modbus RTU, the baud rate, parity, and address must match between the connected Modbus master for a connection to be established. The PLR6x35 will read and write to the wireless PLR6x30(s) to update the changes made to the Modbus addresses by the connected Modbus master device.

Addressing the PLR6x35 – Modbus

| | Discrete Outputs | Discrete Inputs | Analog Inputs | Analog Outputs |
|------------------|------------------|-----------------|---------------|----------------|
| Remote 1 | 00001 – 00008 | 10001 – 10008 | 30001 – 30004 | 40001 – 40004 |
| Remote 2 | 00009 – 00016 | 10009 – 10016 | 30005 – 30008 | 40005 – 40008 |
| ... | ... | ... | ... | ... |
| Remote 16 | 00121 – 00128 | 10121 – 10128 | 30061 – 30064 | 40061 – 40064 |

NOTE: For detailed addressing information see Appendix A

Supported Modbus commands:

| Code | Description | I/O range |
|------|--|---------------|
| 01 | Read coils (Discrete output) | 00001 - 10000 |
| 02 | Read contacts (Discrete inputs) | 10001 - 20000 |
| 05 | Write a single coil (Discrete outputs) | 00001 - 10000 |
| 15 | Write multiple coils (Discrete outputs) | 00001 - 10000 |
| 03 | Read holding registers (analog outputs) | 40001 - 50000 |
| 04 | Read input registers (Analog inputs) | 30001 - 40000 |
| 06 | Write single register (Analog outputs) | 40001 - 50000 |
| 16 | Write multiple registers (Analog outputs) | 40001 - 50000 |
| 22 | Mask write register (Analog outputs) | 40001 - 50000 |
| 23 | Read/Write multiple registers (analog outputs) | 40001 - 50000 |

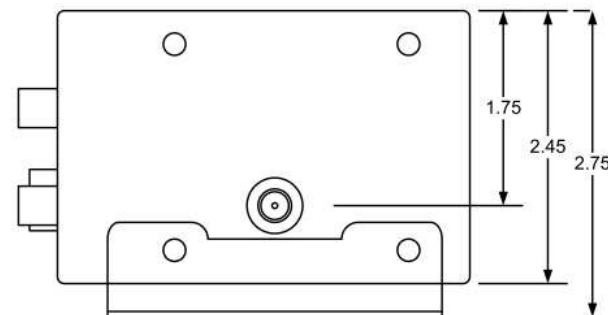
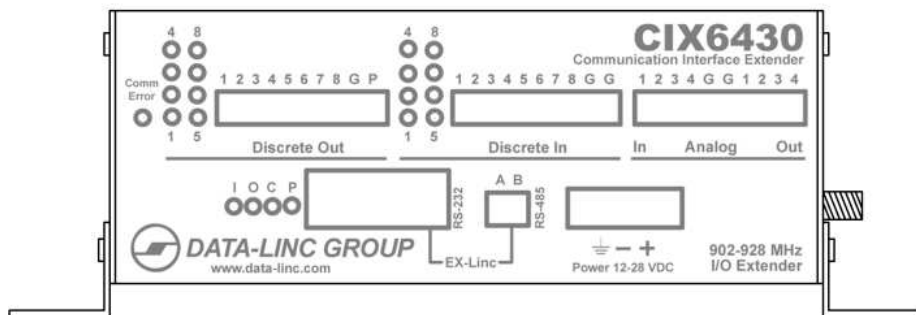
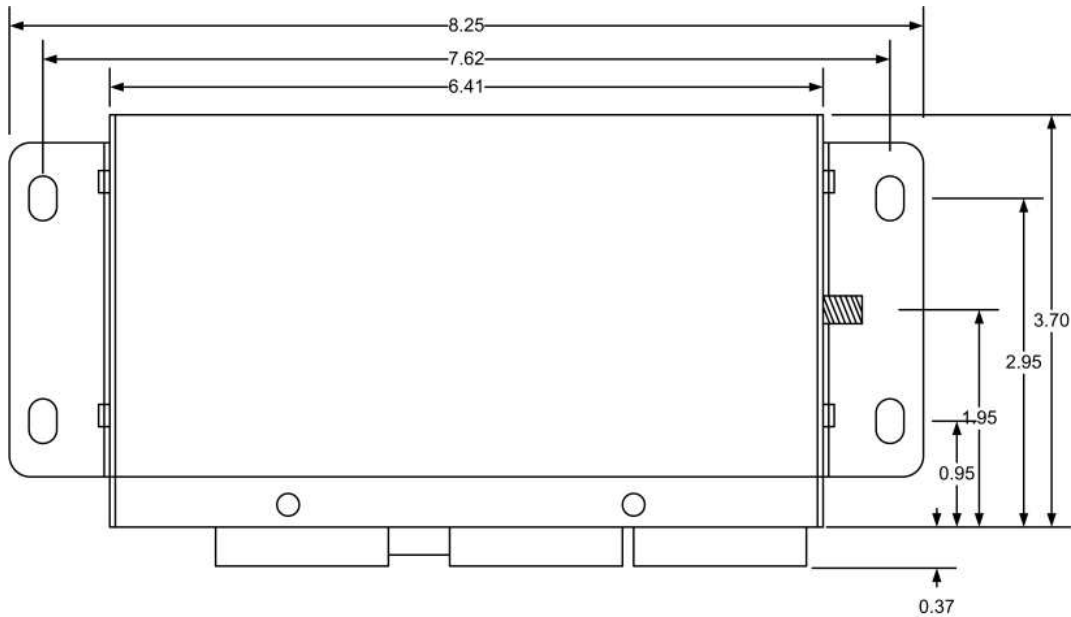
Technical Specifications

| PLR643x | PLR653x |
|--|--|
| Operating ranges System gain. 138 dB Distance. 5 miles (8 km) LOS Transmitter RF Output Power. 500 mW (27 dBm) maximum, (10 programmable steps) Modulation. Frequency Hopping Spread Spectrum, GFSK Hop Patterns. 15 (user selectable) Occupied Bandwidth. 230KHz Error Correction. 32 bit CRC RF Encryption. Substitution Dynamic Key Receiver Sensitivity. -105 dBm @ 10^{-6} raw BER (best) Selectivity. 40 dB @ fc \pm 230 KHz and 60dB @ fc \pm 460 KHz | Operating ranges System gain. 134 dB Distance. 2 miles (3.2 km) LOS Transmitter RF Output Power. 250 mW (24dBm) maximum, (27 programmable steps) Modulation. FHSS, GFSK Hop Patterns. 15 (user selectable) Occupied Bandwidth. 230KHz Error Correction. 32 bit CRC RF Encryption. Substitution Dynamic Key Receiver Sensitivity. -102 dBm @ 10^{-4} raw BER Selectivity. 40 dB @ fc \pm 230 KHz and 60dB @ fc \pm 460 KHz |
| PLR6x35 Connections Antenna. Standard thread female SMA for optional external omni directional or yagi antennas Ethernet. 2 RJ45s, 10Base-T (1 straight, 1 crossed) Serial. DB9 or RS485 2-wire Power. Detachable 3-position screw terminal block Indicators LAN. LAN connection (L), LAN activity (A) RF. Power (P), RF Link (L), RF output (O), RF input (I) Mode. M1, M2 Power Voltage. 10-28VDC nominal Current. 160mA idle, 660mA peak on transmit | |
| PLR6x30 Channel Functions Analog. 0-20ma, 4-20mA or 0-10 VDC, 24VDC max. loop voltage, 12 bit resolution. Self-powered outputs. Discrete Input. Dry contact closure Discrete Output. Open collector (sink to ground), 100mA per channel, 12-24VDC Connections Antenna. Standard thread female SMA for optional external omni directional or yagi antennas I/O Discrete and Analog Detachable screw-type terminal blocks, Wire size 12-26 AWG Power. Detachable three position screw terminal block Configuration port. Standard DB9 RS232 port EX-Linc. DB9 RS232 or RS485 2-wire Indicators General. Power (P), Carrier Detect (C), RF output (O), RF input (I), Comm Error Discrete. Activity LED for each discrete I/O Power Voltage. 12-28VDC nominal Current. 160mA idle, 660mA peak on transmit | |
| Operating Environment Temperature. -40°F to 167°F (-40°C to 75°C) Humidity. 0 to 95% non-condensing humidity Enclosure Standard. 18-gauge steel with mounting flanges 3.0 in x 2.75 x 8.1 in (7.6 x 7 x 20.6 cm) Optional. DIN rail mounting Shipping Weight. 1.8 lb (0.82 kg) | |

Appendix A: Dimensions

Enclosure Dimensions

Note: The CIX6x35, CIX6x30, PLR6x35 & PLR6x30 I/O units all share the same physical dimensions.



Technical Support

Data-Linc Group maintains a fully trained staff of service personnel who are capable of providing complete product assistance. They can provide you with technical, application and troubleshooting, spare parts and warranty assistance.

Our technical staff are based in Bellevue, Washington USA and may be reached at (425) 882-2206 or e-mail support@data-linc.com

Product Warranty

Data-Linc Group warrants equipment of its own manufacture to be free from defects in material and workmanship for one year from date of shipment to original user. Data-Linc Group will replace or repair, at our option, any part found to be defective. Buyer must return any part claimed defective to Data-Linc Group, transportation prepaid.

Return Material Authorization

If a part needs to be sent to the factory for repair, contact Data-Linc Group's corporate office and request a Return Material Authorization (RMA) number. The RMA number identifies the part and the owner and must be included with the part when shipped to the factory.

Contact Information

Corporate Office

Data-Linc Group
1125 12th Ave. NW
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Issaquah, WA 98027
Phone: (425) 882-2206
Fax: (425) 867-0865

E-mail: info@data-linc.com
Web site: www.data-linc.com

Appendix A

Modbus Addressing Matrix

| Discrete Outputs Remote # | | DO CH1 | DO CH2 | DO CH3 | DO CH4 | DO CH5 | DO CH6 | DO CH7 | DO CH8 |
|-------------------------------|--------|--------|--------|--------|------------------------------|--------|--------|--------|--------|
| 1 | | 00001 | 00002 | 00003 | 00004 | 00005 | 00006 | 00007 | 00008 |
| 2 | | 00009 | 00010 | 00011 | 00012 | 00013 | 00014 | 00015 | 00016 |
| 3 | | 00017 | 00018 | 00019 | 00020 | 00021 | 00022 | 00023 | 00024 |
| 4 | | 00025 | 00026 | 00027 | 00028 | 00029 | 00030 | 00031 | 00032 |
| 5 | | 00033 | 00034 | 00035 | 00036 | 00037 | 00038 | 00039 | 00040 |
| 6 | | 00041 | 00042 | 00043 | 00044 | 00045 | 00046 | 00047 | 00048 |
| 7 | | 00049 | 00050 | 00051 | 00052 | 00053 | 00054 | 00055 | 00056 |
| 8 | | 00057 | 00058 | 00059 | 00060 | 00061 | 00062 | 00063 | 00064 |
| 9 | | 00065 | 00066 | 00067 | 00068 | 00069 | 00070 | 00071 | 00072 |
| 10 | | 00073 | 00074 | 00075 | 00076 | 00077 | 00078 | 00079 | 00080 |
| 11 | | 00081 | 00082 | 00083 | 00084 | 00085 | 00086 | 00087 | 00088 |
| 12 | | 00089 | 00090 | 00091 | 00092 | 00093 | 00094 | 00095 | 00096 |
| 13 | | 00097 | 00098 | 00099 | 00100 | 00101 | 00102 | 00103 | 00104 |
| 14 | | 00105 | 00106 | 00107 | 00108 | 00109 | 00110 | 00111 | 00112 |
| 15 | | 00113 | 00114 | 00115 | 00116 | 00117 | 00118 | 00119 | 00120 |
| 16 | | 00121 | 00122 | 00123 | 00124 | 00125 | 00126 | 00127 | 00128 |
| Discrete inputs Remote # | | DI CH1 | DI CH2 | DI CH3 | DI CH4 | DI CH5 | DI CH6 | DI CH7 | DI CH8 |
| 1 | | 10001 | 10002 | 10003 | 10004 | 10005 | 10006 | 10007 | 10008 |
| 2 | | 10009 | 10010 | 10011 | 10012 | 10013 | 10014 | 10015 | 10016 |
| 3 | | 10017 | 10018 | 10019 | 10020 | 10021 | 10022 | 10023 | 10024 |
| 4 | | 10025 | 10026 | 10027 | 10028 | 10029 | 10030 | 10031 | 10032 |
| 5 | | 10033 | 10034 | 10035 | 10036 | 10037 | 10038 | 10039 | 10040 |
| 6 | | 10041 | 10042 | 10043 | 10044 | 10045 | 10046 | 10047 | 10048 |
| 7 | | 10049 | 10050 | 10051 | 10052 | 10053 | 10054 | 10055 | 10056 |
| 8 | | 10057 | 10058 | 10059 | 10060 | 10061 | 10062 | 10063 | 10064 |
| 9 | | 10065 | 10066 | 10067 | 10068 | 10069 | 10070 | 10071 | 10072 |
| 10 | | 10073 | 10074 | 10075 | 10076 | 10077 | 10078 | 10079 | 10080 |
| 11 | | 10081 | 10082 | 10083 | 10084 | 10085 | 10086 | 10087 | 10088 |
| 12 | | 10089 | 10090 | 10091 | 10092 | 10093 | 10094 | 10095 | 10096 |
| 13 | | 10097 | 10098 | 10099 | 10100 | 10101 | 10102 | 10103 | 10104 |
| 14 | | 10105 | 10106 | 10107 | 10108 | 10109 | 10110 | 10111 | 10112 |
| 15 | | 10113 | 10114 | 10115 | 10116 | 10117 | 10118 | 10119 | 10120 |
| 16 | | 10121 | 10122 | 10123 | 10124 | 10125 | 10126 | 10127 | 10128 |
| Analog Outputs Remote # | AO CH1 | AO CH2 | AO CH3 | AO CH4 | Analog Inputs Remote # | AI CH1 | AI CH2 | AI CH3 | AI CH4 |
| 1 | 40001 | 40002 | 40003 | 40004 | 1 | 30001 | 30002 | 30003 | 30004 |
| 2 | 40005 | 40006 | 40007 | 40008 | 2 | 30005 | 30006 | 30007 | 30008 |
| 3 | 40009 | 40010 | 40011 | 40012 | 3 | 30009 | 30010 | 30011 | 30012 |
| 4 | 40013 | 40014 | 40015 | 40016 | 4 | 30013 | 30014 | 30015 | 30016 |
| 5 | 40017 | 40018 | 40019 | 40020 | 5 | 30017 | 30018 | 30019 | 30020 |
| 6 | 40021 | 40022 | 40023 | 40024 | 6 | 30021 | 30022 | 30023 | 30024 |
| 7 | 40025 | 40026 | 40027 | 40028 | 7 | 30025 | 30026 | 30027 | 30028 |
| 8 | 40029 | 40030 | 40031 | 40032 | 8 | 30029 | 30030 | 30031 | 30032 |
| 9 | 40033 | 40034 | 40035 | 40036 | 9 | 30033 | 30034 | 30035 | 30036 |
| 10 | 40037 | 40038 | 40039 | 40040 | 10 | 30037 | 30038 | 30039 | 30040 |
| 11 | 40041 | 40042 | 40043 | 40044 | 11 | 30041 | 30042 | 30043 | 30044 |
| 12 | 40045 | 40046 | 40047 | 40048 | 12 | 30045 | 30046 | 30047 | 30048 |
| 13 | 40049 | 40050 | 40051 | 40052 | 13 | 30049 | 30050 | 30051 | 30052 |
| 14 | 40053 | 40054 | 40055 | 40056 | 14 | 30053 | 30054 | 30055 | 30056 |
| 15 | 40057 | 40058 | 40059 | 40060 | 15 | 30057 | 30058 | 30059 | 30060 |
| 16 | 40061 | 40062 | 40063 | 40064 | 16 | 30061 | 30062 | 30063 | 30064 |

NOTES: