

FLEX-PRO[®]
Peristaltic Metering Pump

Advanced Communication Manual

ETHERNET - IP



ProSeries[®]
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PLEASE READ ENTIRE INSTRUCTION MANUAL PRIOR TO INSTALLATION AND USE.

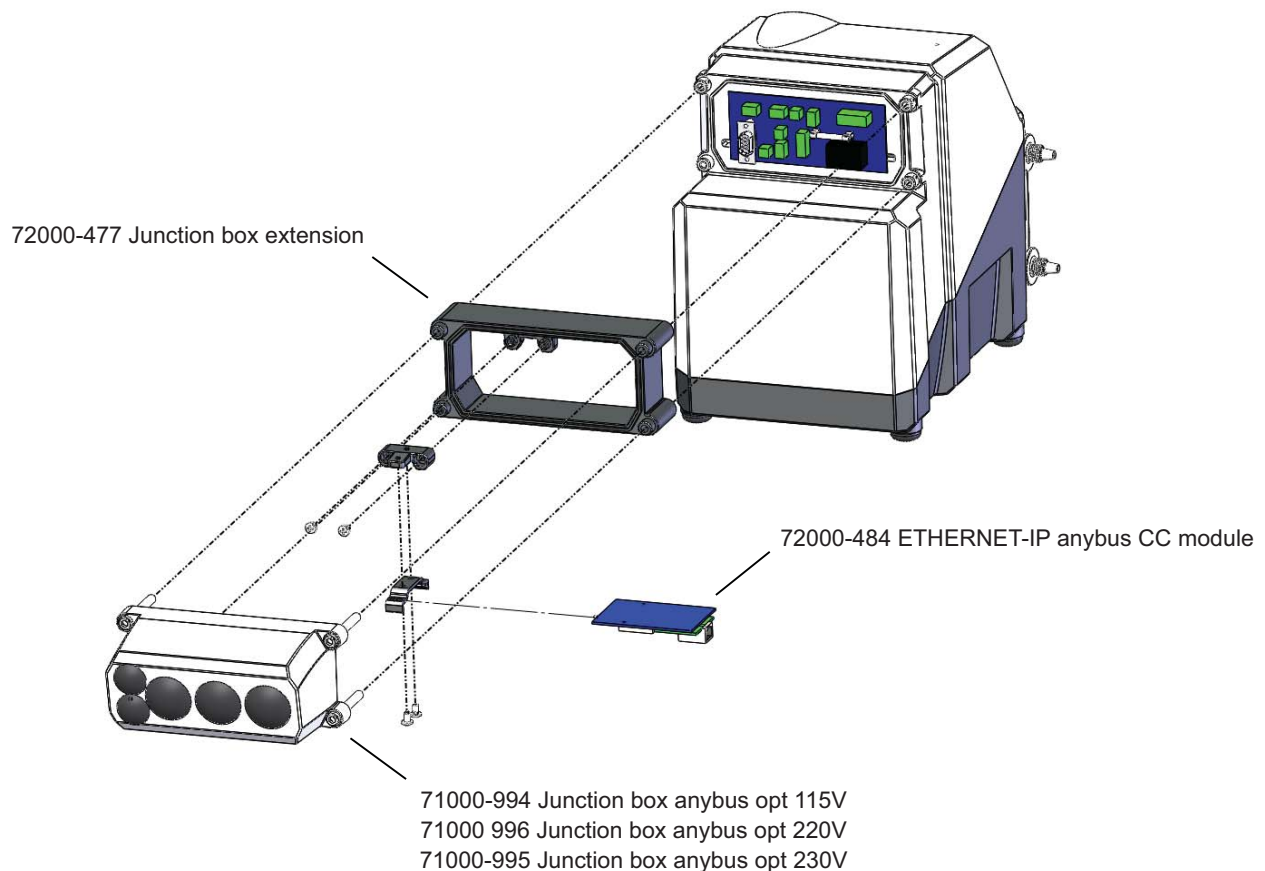
1.0 Introduction

Prior to installing your communication kit, please read instruction and operating instructions manual that shipped with your pump.

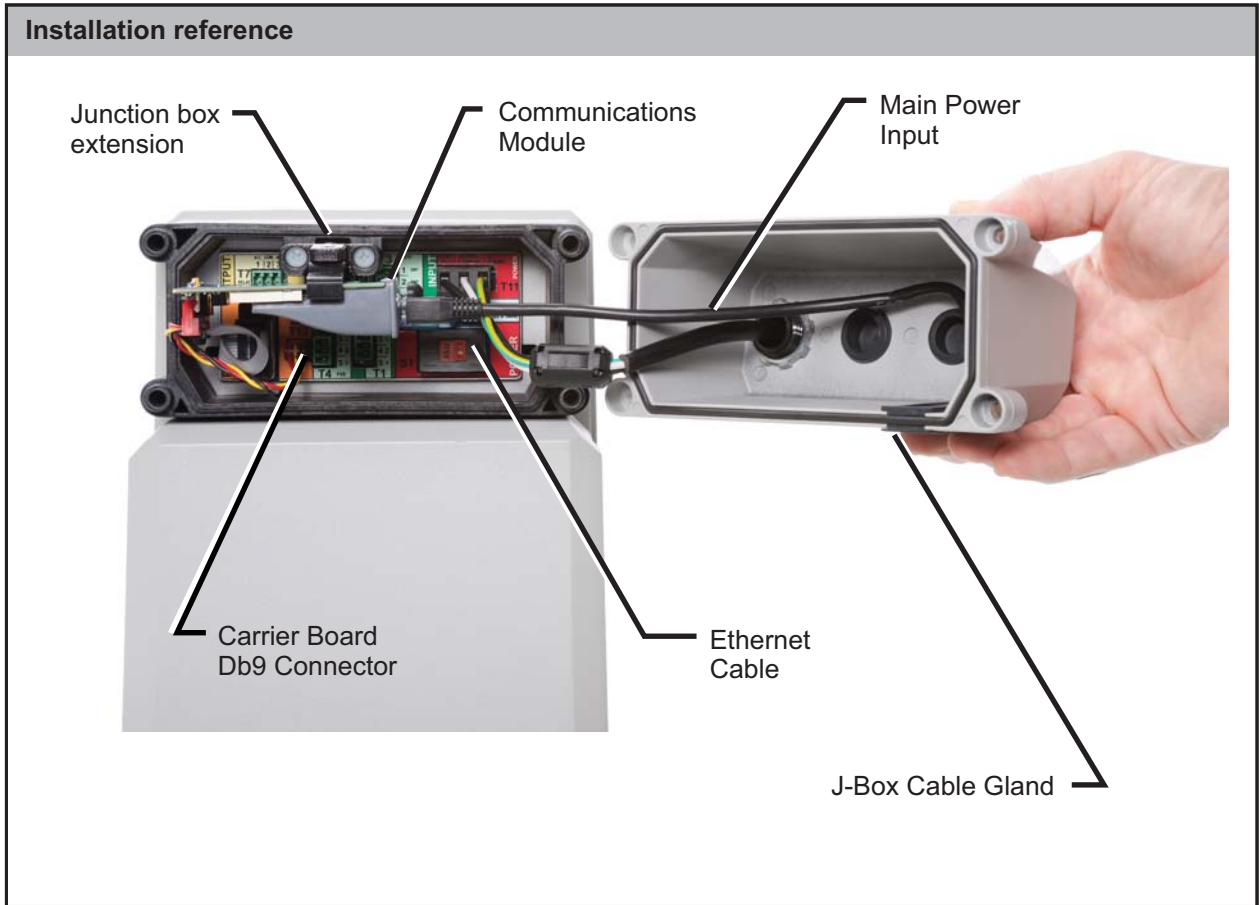
This manual describes how to install an ETHERNET-IP kit to your Flex-Pro® variable speed Peristaltic Metering Pump.

What You'll Need - One of the following based on your electrical requirements:

- ETHERNET - IP Communication Kit #72000-513 For 115V 60Hz Power Cord (USA)
- ETHERNET - IP Communication Kit #72000-514 For 220V 50Hz Power Cord (EU)
- ETHERNET - IP Communication Kit #72000-515 For 230V 60Hz Power Cord (USA)



2.0 Junction box wiring and components



3.0 Installation instructions

Step 1

Loosen liquid-tight connector to allow slack for removal of junction box



Step 2

Unscrew and remove all junction box screws



Step 3

Remove old junction box



Step 4

Disconnect existing wiring by pulling out terminal connectors.



Step 5

Locate new junction box with cable gland slot.



Step 6

Prepare components for installation.



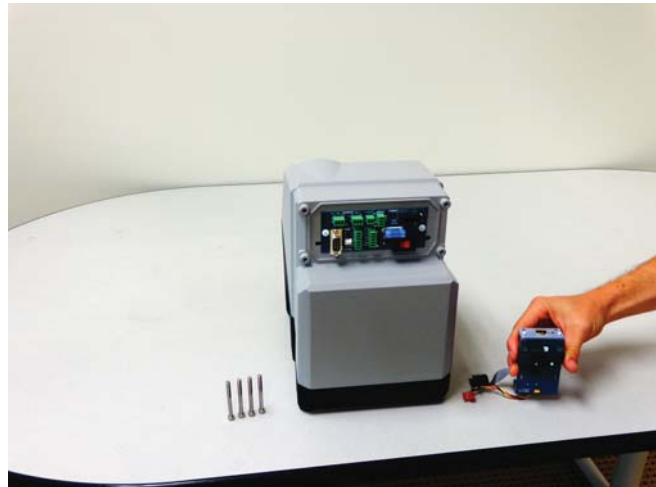
Step 7

Install clip onto communication module.



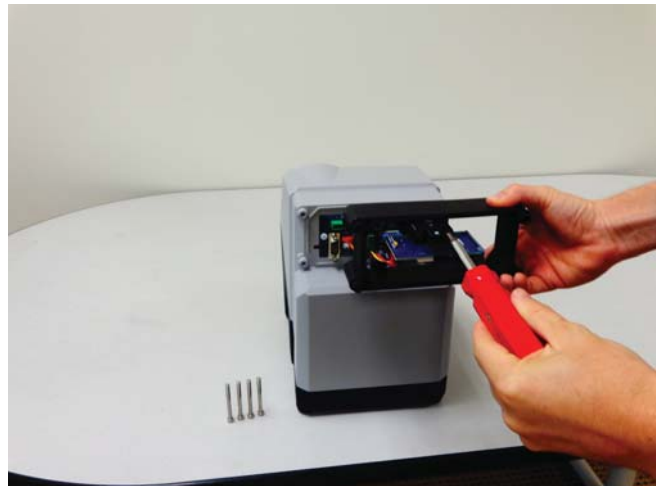
Step 8

Clip should be mounted onto module as shown.



Step 9

Install Anybus module using clip mounting system.



Step 10

Connect power cable from communication carrier board to terminal board on pump.



Step 11

Install Anybus module using clip mounting system.



Step 12

Connect power cable from communication carrier board to terminal board on pump.



Step 13

Connect external communications cable from communication carrier board to pump terminal board.

**Step 14**

External communications cable should be connected as shown.

**Step 15**

Remove installed cable gland and re-route wiring through it.



Step 16

Replace cable gland with re-routed wiring.



Step 17

Place junction box onto pump.



Step 18

Tighten liquid-tight connectors.



4.0 Setting up ETHERNET-IP

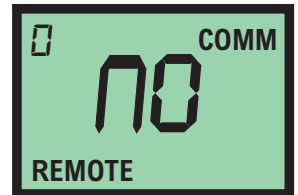
Step 1

Press and release MODE button until you arrive at this screen, then press and hold MODE button



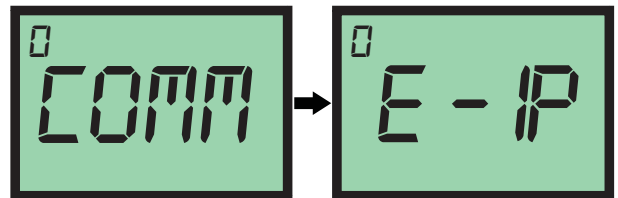
Step 2

You should arrive at this screen. Notice Remote icon begins flashing. This indicates that you've entered Setup menu.



Step 3

Press and release RIGHT ARROW button to scroll through menu until you see COMM briefly flash on screen. From here you can press UP or DOWN arrows to cycle through different communication protocols. Pressing RIGHT ARROW button will select displayed protocol.



Step 4

Upon selection you'll be asked to input an IP ADDRESS for your pump. Four groups of three digits.

Sample IP address:

192.168.1.156

IPA1

IPA2

IPA3

IPA4



IPA1 will briefly flash on screen, prompting you to input first set of numbers. Use UP or DOWN arrows to scroll through numbers (1 - 255) for each individual digit and press RIGHT ARROW to make your selection.

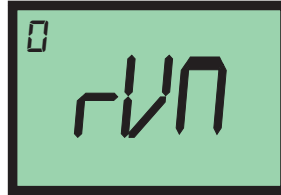
IPA2 will then flash on screen, prompting you to input the second set of numbers out of a total of four sets of digits, then IPA3 for third set of numbers, and finally IPA4 for last set of numbers.

TIP: Pump will time out after 20 seconds of inactivity

4.0 Setting up ETHERNET-IP (continued)

Step 5

After you've input the entire IP ADDRESS press UP or DOWN arrows to select RUN or RESET. Whenever you select a new IP ADDRESS always select RESET to lock in your selection. Select reset then press RIGHT ARROW to confirm selection.



Step 6

After you've pressed MODE button you should return to this screen.

Please note COMM will flash if there is no connection, COMM will remain solid once connection is made.



5.0 Anybus - Control and status mapping

Control Word: Master to Pump

CONTROL (Master to Pump)	RUN size (bits)	Bit	Description			
Start/Stop pump	16	0	Transition 0 -> 1 (Edge trigger) = START pump Transition 1-> 0 (Edge trigger) = STOP pump Note: A toggle of 0 -> 1 of this bit is required to start pump; and a toggle of 1 -> 0 of this bit is required to stop pump.			
60-sec Priming @ Max pump speed		1	Transition from 0 -> 1 (Edge trigger) = 60-second prime cycle @ max speed Note: A toggle of 0 -> 1 of this bit is required to initiate a prime.			
Lock/Unlock Start & Stop button Key(s) (Stop pump in case of emergency; re-start pump after pump tube replacement; reset a fault, etc.)		2	1 = lock, 0 = Unlock. A "0" will allow both Start & Stop button keys on the pump control to be active.			
Lock/Unlock the MODE button key		3	1 = lock, 0 = Unlock. A "0" will allow the MODE button key on the pump control to be active.			
Lock/Unlock Arrow UP & Arrow DOWN button keys		4	1 = lock, 0 = Unlock. A "0" will allow both Arrow Up & Down keys to be active. Pump speed can now be set locally via the button keys which is independent of the network control via "Pump Speed Set point" command.			
Reserved		5	Reserved			
Lock/Unlock the REVERSE button key		6	1 = lock, 0 = Unlock. A "0" will allow the Reverse button key on the pump control to be active. Pump Running direction can now be set CW or CCW via local "Reverse" button key.			
Clear General Alarm (Reset all alarms)		7	Transition from 0 -> 1 (Edge trigger) = Reset alarms. Note: A toggle of 0 -> 1 of this bit is required to clear alarm. If the source of the alarm has been cleared (e.g. DFD alarm) then this action will cause the pump to exit the alarm state. If the source of the alarm is still present, pump will immediately enter alarm state.			
Reset Pump Tube Timer		8	Transition from 0 -> 1 (Edge trigger) = Reset pump tube timer Note: A toggle of 0 -> 1 of this bit is required to reset pumptube timer to zero.			
Reserved		9	Reserved			
Reverse pump direction		10	Reverse Pump Run Direction Transition 0 -> 1 (Edge trigger) = Start pump Reverse Direction request Note: A toggle of 0 -> 1 of this bit is required to reverse pump run direction.			
Reserved	11	Reserved				
Set pump Operating (RUN) Mode:	12-15	Pump Operating (RUN) Mode: Note: Set pump to "OFF" before change pump operating mode.				
		Bit 7	Bit 6	Bit 5	Bit 4	Equiv. Hex value
1.) MANUAL SPEED		0	0	0	0	0x0
2.) 4-20 mA INPUT		0	0	0	1	0x1
3.) 0-1000 Hz FREQ INPUT		0	1	0	0	0x4
4.) PULSE/BATCH		0	1	0	1	0x5
Pump Speed Set point (1.0% to 100%speed) (Network control in Manual Speed mode)	16	0-15	Numeric Value (unsigned interger, Pump Speed in Percent, Multiplied by 10) Valid Range = 10 to 1000 (1.0% to 100.0%). Min Speed 1.0% =====> 0010 (decimal value) = 0x000A (Hexadecimal value) Max Speed 100.0% =====> 1000 (decimal value) = 0x03E8 (Hexadecimal value) Eg: To set 67.3 %Speed, take 67.3 X 10 = 673 =====> Enter 0x02A1 (Equivalent Hexadecimal value) Pump will run at the set speed until the motor speed is changed locally via the UP or DOWN button keys when they are unlocked.			
Reserved	32	0-31	Reserved			

Status Word: Pump to Master

STATUS (Pump to Master)	J ON Size (bits)	Bit	Description
Motor ON/OFF Status	16	0	0 indicates pump if OFF 1 indicates pump is ON (Running)
Priming status		1	0 = Not Priming, 1 = Priming
Pump head cover status		2	0 = Removed, 1 = Ok. detected
Local Start & Stop button key(s) status		3	0 = Unlocked, 1 = Locked
Local MODE button key status		4	0 = Unlocked, 1 = Locked
Local Arrow Up & Down keys status		5	0 = Unlocked, 1 = Locked
Reserved		6	Reserved
Motor running direction status		7	0 = CCW, 1 = CW
Motor reverse direction button lock status		8	0 = Unlocked, 1 = Locked
Reserved		9	Reserved
Reserved		10	Reserved
Reserved		11	Reserved
Set operating (RUN) mode		12-15	Bit 15 Bit 14 Bit 13 Bit 12 Equiv. Hex value
1.) MANUAL SPEED			0 0 0 0 0x0
2.) 4-20 mA INPUT		0 0 0 1 0x1	
3.) 0-1000 Hz FREQ INPUT		0 1 0 0 0x4	
4.) PULSE/BATCH		0 1 0 1 0x5	
5.) Reserved for future use		X X X X	
6.) Reserved for future use		X X X X	
TFD status	16	0	0 = Ok, 1 = Alarmed
FVS status		1	0 = Ok, 1 = Alarmed
General Alarm status		2	0 = Ok, 1 = Alarmed
Output Relay status		3	0 = De-energized, 1 = energized
Reserved		4	Reserved
Reserved		5	Reserved
Reserved		6	Reserved
Reserved		7	Reserved
Reserved		8	Reserved
Requested speed is Out-of-Range		9	0 = Ok. Requested speed was within range (from 0.5% to 100% speed), 1 = Error. Requested Speed was out-of-range
Operating Mode Change requested while motor is running		10	0 = Ok. Mode change requested while motor is OFF; 1 = Error. Mode change requested while motor is ON
Reserved	11-15	Reserved	
Read Pump Speed (in %speed)	16	0-15	Numeric Value (unsigned interger. Pump Speed in Percent, Multiplied by 10) Range = 05 to 1000 (for 0.5% to 100.0%) Min Speed 0.5% <=====> 0005 (decimal value) = 0x0005 (Hexadecimal value) Max Speed 100.0% <=====> 1000 (decimal value) = 0x03E8 (Hexadecimal value)
Reserved	16	0-15	Reserved
Reserved	32	0-31	Reserved

Status Word: Pump to Master (continued)

STATUS (Pump to Master)	Word Size (bits)	Bit	Description
<i>Reserved</i>	16	0-15	<i>Reserved</i>
<i>Reserved</i>	32	0-31	<i>Reserved</i>
Read Analog Input Signal (in mA)	16	0-15	Numeric Value (unsigned integer. Analog input signal in mA, Multiplied by 100) Range = 400 to 2000 (for 4.00 mA to 20.00 mA) Min Input signal 4.00 mA <====> 400 (Decimal value) = 0x0005 (Hexadecimal value) Max Input signal 20.00 mA <====> 2000 (Decimal value) = 0x0D70 (Hexadecimal value)
Read Frequency Input signal (in Hz)	16	0-15	Numeric Value (unsigned integer. Frequency input signal in Hz) Range = 0 to 1000 (for 0 to 1000 Hz) Min Input Frequency 0 Hz <====> 0000 (Decimal value) = 0x0000 (Hexadecimal value) Max Input Frequency 1000 Hz <====> 1000 (Decimal value) = 0x03E8 (Hexadecimal value)
Read Analog Output Signal (in mA)	16	0-15	Numeric Value (unsigned integer. Analog Output signal in mA, Multiplied by 100) Range = 400 to 2000 (for 4.00 mA to 20.00 mA) Min Output signal 4.00 mA <====> 400 (Decimal value) = 0x0005 (Hexadecimal value) Max Output signal 20.00 mA <====> 2000 (Decimal value) = 0x0D70 (Hexadecimal value)
<i>Reserved</i>	16	0-15	<i>Reserved</i>
Pump Model & Software version	32	0-31	Eg: C2V 2.0, C3V 2.0
<i>Reserved</i>	32	0-31	<i>Reserved</i>

6.0 EDS File

[File]

```

DescText = "HMS Anybus-CC EtherNet/IP";
CreateDate = 09-12-2005;
CreateTime = 07:02:13;
ModDate = 10-31-2006;
ModTime = 14:21:00;
Revision = 2.1;

```

[Device]

```

VendCode = 90;
VendName = "HMS Networks";
ProdType = 0;
ProdTypeStr = "Generic Device";
ProdCode = 99;
MajRev = 2;
MinRev = 1;
ProdName = "Anybus-CC EtherNet/IP";
Catalog = "Anybus-CC EtherNet/IP";

```

[Device Classification]

```

Class1 = EtherNetIP;

```

[Params]

```

Param1 =
  0,          $ first field shall equal 0
  ,,         $ path size,path
  0x0000,    $ descriptor
  0xC7,      $ data type : 16-bit Unsigned Integer
  2,         $ data size in bytes
  "Output Size", $ name
  "",        $ units
  "",        $ help string
  0,256,16,  $ min, max, default data values
  ,,,,      $ mult, dev, base, offset scaling not used
  ,,,,      $ mult, dev, base, offset link not used
  ;         $ decimal places

```

```

Param2 =
  0,          $ first field shall equal 0
  ,,         $ path size,path
  0x0000,    $ descriptor
  0xC7,      $ data type : 16-bit Unsigned Integer
  2,         $ data size in bytes
  "Input Size", $ name
  "",        $ units
  "",        $ help string
  0,256,16,  $ min, max, default data values
  ,,,,      $ mult, dev, base, offset scaling not used
  ,,,,      $ mult, dev, base, offset link not used
  ;         $ decimal places

```



```

Param3 =
    0,          $ reserved, shall equal 0
    ,,         $ Link Path Size, Link Path
    0x0000,    $ Descriptor
    0xC8,      $ Data Type
    4,         $ Data Size in bytes
    "RPI Range", $ name
    "",        $ units
    "",        $ help string
    2000,3200000,10000, $ min, max, default data values
    ,,,,      $ mult, div, base, offset scaling
    ,,,,      $ mult, div, base, offset links
    ;         $ decimal places

```

[Assembly]

```
Revision = 2;
```

```

Assem100 =
    "Input Data",
    ,
    256,
    0x0000,
    ,,
    2048,;

```

```

Assem150 =
    "Output Data",
    ,
    256,
    0x0000,
    ,,
    2048,;

```

[Connection Manager]

```

Connection1 =
    0x04010002,    $ trigger & transport
                  $ 0-15 = supported transport classes (class 1)
                  $ 16 = cyclic (1 = supported)
                  $ 17 = change of state (0 = not supported)
                  $ 18 = on demand (0 = not supported)
                  $ 19-23 = reserved (must be zero)
                  $ 24-27 = exclusive owner
                  $ 28-30 = reserved (must be zero)
                  $ 31 = client 0 / server = 1
    0x44640405,    $ point/multicast & priority & realtime format
                  $ 0 = O=>T fixed (1 = supported)
                  $ 1 = O=>T variable (0 = not supported)
                  $ 2 = T=>O fixed (1 = supported)
                  $ 3 = T=>O variable (0 = not supported)
                  $ 4-7 = reserved (must be zero)
                  $ 8-10 = O=>T header (4 byte run/idle)

```

```

$ 11 = reserved (must be zero)
$ 12-14 = T=>O header
$ 15 = reserved (must be zero)
$ 16-19 = O=>T point-to-point
$ 20-23 = T=>O connection type (multicast or point-to-point)
$ 24-27 = O=>T scheduled
$ 28-31 = T=>O scheduled
Param3,Param1,Assem150, $ O=>T RPI,Size,Format
Param3,Param2,Assem100, $ T=>O RPI,Size,Format
,, $ config part 1 (dynamic assemblies)
,, $ config part 2 (module configuration)
"Exclusive Owner", $ connection name
"", $ Help string
"20 04 24 05 2C 96 2C 64"; $ exclusive output path

```

Connection2 =

```

0x02010002, $ trigger & transport
$ 0-15 = supported transport classes (class 1)
$ 16 = cyclic (1 = supported)
$ 17 = change of state (0 = not supported)
$ 18 = on demand (0 = not supported)
$ 19-23 = reserved (must be zero)
$ 24-27 = exclusive owner
$ 28-30 = reserved (must be zero)
$ 31 = client 0 / server = 1
0x44640305, $ point/multicast & priority & realtime format
$ 0 = O=>T fixed (1 = supported)
$ 1 = O=>T variable (0 = not supported)
$ 2 = T=>O fixed (1 = supported)
$ 3 = T=>O variable (0 = not supported)
$ 4-7 = reserved (must be zero)
$ 8-10 = O=>T header (4 byte run/idle)
$ 11 = reserved (must be zero)
$ 12-14 = T=>O header
$ 15 = reserved (must be zero)
$ 16-19 = O=>T point-to-point
$ 20-23 = T=>O connection type (multicast or point-to-point)
$ 24-27 = O=>T scheduled
$ 28-31 = T=>O scheduled
Param3,0,, $ O=>T RPI,Size,Format
Param3,Param2,Assem100, $ T=>O RPI,Size,Format
,, $ config part 1 (dynamic assemblies)
,, $ config part 2 (module configuration)
"Input Only", $ connection name
"", $ Help string
"20 04 24 05 2C 03 2C 64"; $ input only path

```

```

Connection3 =
  0x01010002,      $ trigger & transport
                   $ 0-15 = supported transport classes (class 1)
                   $ 16 = cyclic (1 = supported)
                   $ 17 = change of state (0 = not supported)
                   $ 18 = on demand (0 = not supported)
                   $ 19-23 = reserved (must be zero)
                   $ 24-27 = exclusive owner
                   $ 28-30 = reserved (must be zero)
                   $ 31 = client 0 / server = 1
  0x44240305,      $ point/multicast & priority & realtime format
                   $ 0 = O=>T fixed (1 = supported)
                   $ 1 = O=>T variable (0 = not supported)
                   $ 2 = T=>O fixed (1 = supported)
                   $ 3 = T=>O variable (0 = not supported)
                   $ 4-7 = reserved (must be zero)
                   $ 8-10 = O=>T header (4 byte run/idle)
                   $ 11 = reserved (must be zero)
                   $ 12-14 = T=>O header
                   $ 15 = reserved (must be zero)
                   $ 16-19 = O=>T point-to-point
                   $ 20-23 = T=>O connection type (multicast)
                   $ 24-27 = O=>T scheduled
                   $ 28-31 = T=>O scheduled
  Param3,0,,        $ O=>T RPI,Size,Format
  Param3,Param2,Assem100, $ T=>O RPI,Size,Format
  ,,                $ config part 1 (dynamic assemblies)
  ,,                $ config part 2 (module configuration)
  "Listen Only",    $ connection name
  "",               $ Help string
  "20 04 24 05 2C 04 2C 64"; $ listen only path

```

[Port]

```

Port1 =
  TCP,              $ port type name
  "TCP/IP",         $ name of port
  "20 F5 24 01",    $ instance one of the TCP/IP interface object
  2;                $ port number

```

[Capacity]

```

MaxCIPConnections = 20;    $ Max CIP cnx - all classes
TSpec1 = TxRx, 1, 1000;    $ Packets per sec @ 1 bytes
TSpec2 = TxRx, 256, 1000;  $ Packets per sec @ 256 bytes

```

LIMITED WARRANTY

Your new Clem-Pro pump is a quality product and is warranted for 24 months from date of purchase (proof of purchase is required). The pump will be repaired or replaced at our discretion.

WHAT IS NOT COVERED

- **Pump diaphragm and rubber components – They are perishable and require periodic replacement.**
- **Pump removal, or re-installation, and any related labor charge.**
- **Freight to the factory, or ProSeries service center.**
- **Pumps that have been tampered with, or in pieces.**
- **Damage to the pump that results from misuse, carelessness such as chemical spills on the enclosure, abuse, lack of maintenance, or alteration which is out of our control.**
- **Pumps damaged by faulty wiring, power surges or acts of nature.**

Blue-White Industries does not assume responsibility for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the pump manual.

Warranty status is determined by the pump's serial label and the sales invoice or receipt. The serial label must be on the pump and legible. The warranty status of the pump will be verified by Blue-White Industries or a factory authorized service center.

OTHER IMPORTANT WARRANTY INFORMATION

Please be advised; injection and metering devices are not intended as a means of treating water to render it suitable for human consumption. When used as hypochlorinators, they are meant to destroy bacteria and algae contamination, before its removal by filtration. Acid and soda injectors are used for PH control (balance). Blue-White Industries injectors are factory tested with water only for pressure and performance. Installers and operators of these devices must be well informed and aware of the precautions to be taken when injecting various chemicals -especially those considered hazardous or dangerous, eye protection must be worn when working around this product or any other metering type of pump.

Should it become necessary to return the pump for repair or service, you must attach information regarding the chemical used as some residue may be present within the unit which could be a hazard to service personnel.

Blue-White Industries will not be liable for any damage that may result by the use of chemicals with their injectors and its components. Thank you.

PROCEDURE FOR IN WARRANTY REPAIR

Contact the factory to obtain a RMA (Return Material Authorization) number. Carefully pack the pump to be repaired. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Please enclose a brief description of the problem as well as the original invoice or sales receipt, or copy showing the date of purchase. Prepay all shipping costs. COD shipments will not be accepted. Warranty service must be performed by the factory or an authorized ProSeries service center. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair or replacement is completed, the factory pays for return shipping to the dealer or customer.



Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC. Contact your local waste recovery agency for a *Designated Collection Facility* in your area.

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