

# ETHERNET/IP MODULES

---





## CONTENTS OF THIS CHAPTER

<i>Overview . . . . .</i>	<i>. . . . .3-2</i>
<i>EtherNet/IP Modules . . . . .</i>	<i>. . . . .3-2</i>
<i>Specifications . . . . .</i>	<i>. . . . .3-2</i>
<i>System Setup For EtherNet/IP Assemblies . . . . .</i>	<i>. . . . .3-3</i>
<i>Initial Hardware Configuration . . . . .</i>	<i>. . . . .3-3</i>
<i>Configuring the PAL Network Settings. . . . .</i>	<i>. . . . .3-3</i>
<i>NITRA Pneumatic Automation Link (PAL) Configuration Software . . . . .</i>	<i>. . . . .3-6</i>
<i>EtherNet/IP Connections and Data Mapping . . . . .</i>	<i>. . . . .3-7</i>

**OVERVIEW**

Control interface with the PAL system is through either an EtherNet/IP module or conventional electrical module. If I/O modules are to be used, the PAL-EIP bus coupler is required and EtherNet/IP protocol is used. For pneumatic only systems, one of the conventional electrical connection modules can be used.

**ETHERNET/IP MODULES**

PAL System - EtherNet/IP Modules			
Item	Part No.	Description	Electrical Cables
	<b>PAL-EIP</b>	NITRA bus coupler, 12-24 VDC, (2) Ethernet 10/100Base-T (M12) port(s), EtherNet/IP, 10/100 Mbps, (128) solenoid(s) per system, IP65. For use with PAL series. Requires 4-pin M8 power cable.	Power: 4-Pole Pico (M8) cable EtherNet: M12 4-Pole, D-Coded cable
	<b>PAL-EAD</b>	NITRA local expansion coupler, 12-24 VDC, (1) 4-pin M8 quick-disconnect port(s), CAN, up to 100 Mbps, number of solenoid(s) inclusive of main system, IP65. For use with PAL series. Requires 4-pin M8 power cable. Used for local expansion.	

The full capabilities of the NITRA PAL system can be realized when the EtherNet/IP module is used for control and communication interface with a PLC. The PAL-EIP bus coupler is required for systems that utilize I/O modules either with or without solenoid valves. Free downloadable configuration software allows easy setup of the PAL system’s IP address and then configuration of each input and output point and each solenoid valve. I/O and valves can be assembled into sub-units yet treated as a single IP address with the use of the PAL-C3 end plate, PAL-EAD expansion module and the appropriate extension cable.?

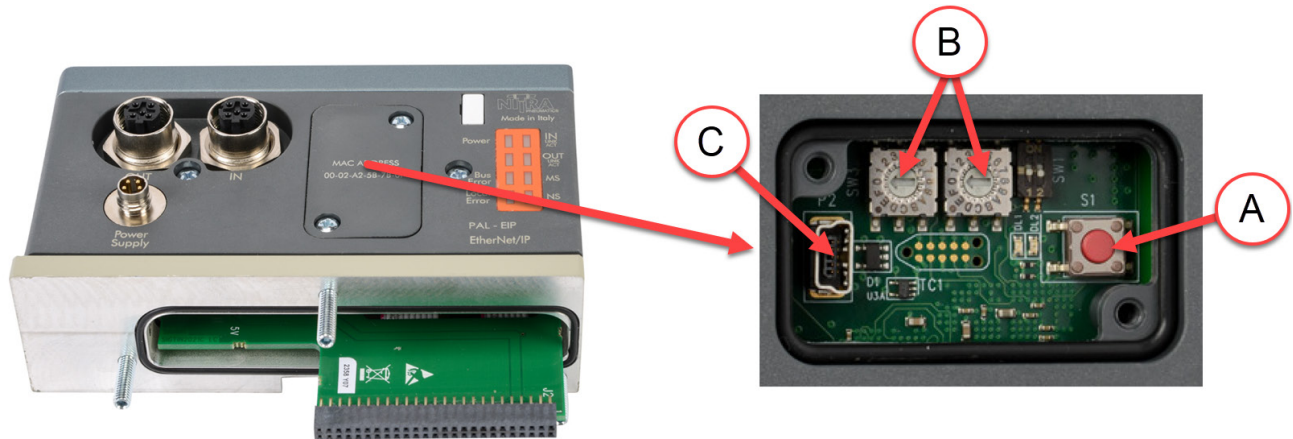
**SPECIFICATIONS**

PAL System - EtherNet/IP Module Specifications	
<b>Maximum Admissible Current (PAL-EIP, PAL-EAD)</b>	4A continuous, 6A instantaneous for valve supply 4A continuous, 6A instantaneous for bus and signal supply
<b>Protection</b>	Overload and short-circuit protected solenoid pilot Output
<b>Diagnostics</b>	LED signal on valve, LED on electrical connection and software message regarding: short-circuited solenoid pilot; solenoid pilot with coil failure; voltage out of range (undervoltage and overvoltage); module communication control; on switching, configuration other than that stored
<b>Maximum Number of Solenoid Pilots</b>	128
<b>Maximum number of simultaneously controllable solenoid pilots to actuate a greater number of solenoid pilots at the same time, add "Intermediate module PAL-M12P" with electrical connection</b>	38
<b>Maximum Number of I/O</b>	128 digital inputs, 128 digital outputs, 16 analog inputs, 16 analog outputs
<b>Maximum Number of Modules</b>	40 Bases for valves + 16 digital inputs + 16 digital outputs + 4 analog inputs + 4 analog outputs
<b>Maximum Number of Class 1 Input Only/ Listen Only Connections</b>	8
<b>Maximum Number of Class 3 Connections</b>	8
<b>Maximum Number of Concurrent TCP Connections (thinking of resources for Unconnected Explicit Messaging)</b>	30

## SYSTEM SETUP FOR ETHERNET/IP ASSEMBLIES

### INITIAL HARDWARE CONFIGURATION

Before the PAL controller can be connected to an EtherNet/IP scanner and update the I/O, the physical configuration must be verified. This is to allow the diagnostics to report if a problem has occurred with the hardware.



- A) To set the hardware configuration, remove the small access panel on the PAL controller. With all the I/O and Solenoid valves installed, power up the unit WHILE pressing the **A** button until all the indicators light up temporarily on the controller, the solenoid valve bases, and the I/O modules. Any time a change is made to the configuration by adding or removing modules or their order, you must repeat this procedure.



**NOTE:** If a 6-point digital output + power supply module is present in the configuration, power must be applied when following the procedure above in order for that module to be recognized properly.

- B) The IP addressing of the module can be configured to a static IP using the EIP Configuration tool discussed in Configuring the PAL Network Settings shown below. But the rotary switches indicated above can be used to either set the network settings to DHCP or to reset the network settings to factory default. To set the network interface to DHCP, set the rotary switches to FF. To change the interface to factory default, set the rotary switches to FF and then back to 00. A power cycle is not required. The default IP address is: 192.168.192.32 with a subnet mask of 255.255.255.0.

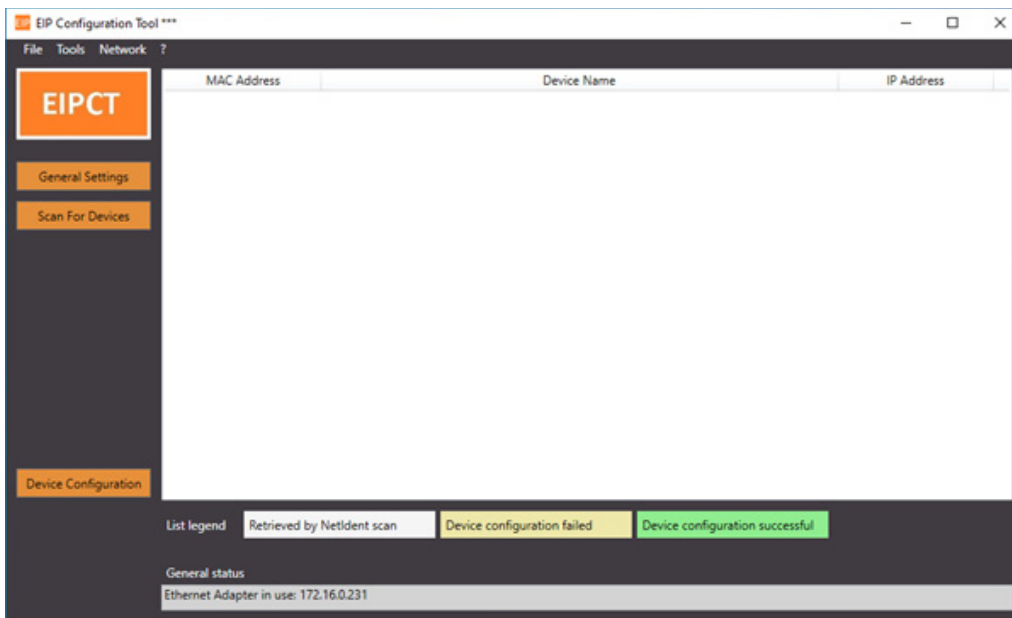
### CONFIGURING THE PAL NETWORK SETTINGS

In order to configure the PAL Network Settings, the software utility EIPConfiguration Tool is required. The download for the EIPConfiguration Tool can be found here:

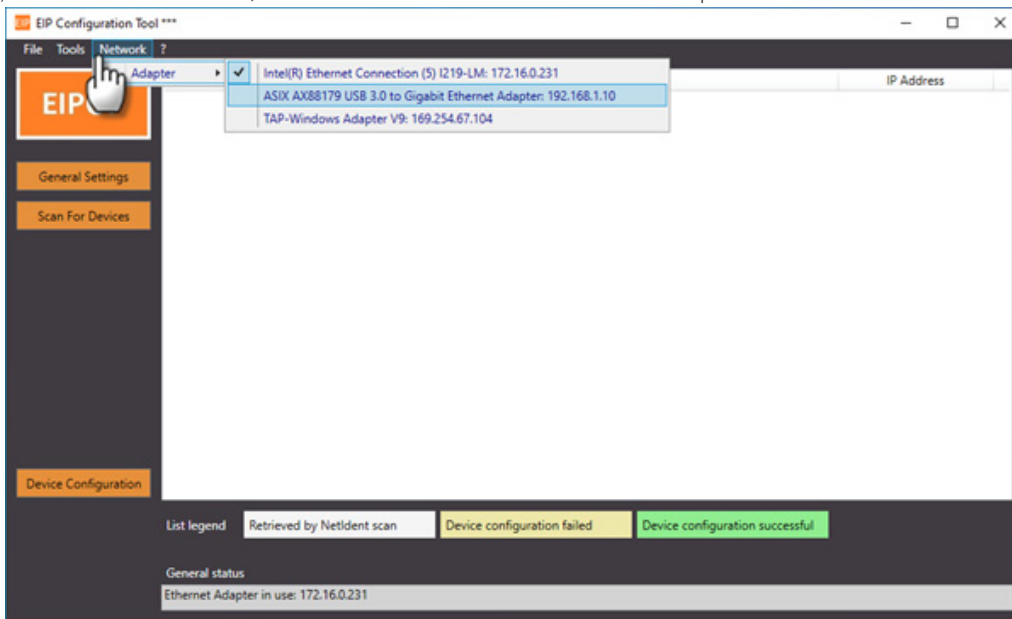
<https://support.automationdirect.com/products/nitra.html>

The EIPConfiguration Tool is a software utility that will scan and discover any NITRA PAL Controllers connected to the network (as well as any EtherNet/IP-capable NITRA CMV modular plates). With the EIPConfiguration Tool, the user can configure the network settings (IP address, subnet mask, default gateway) of their device.

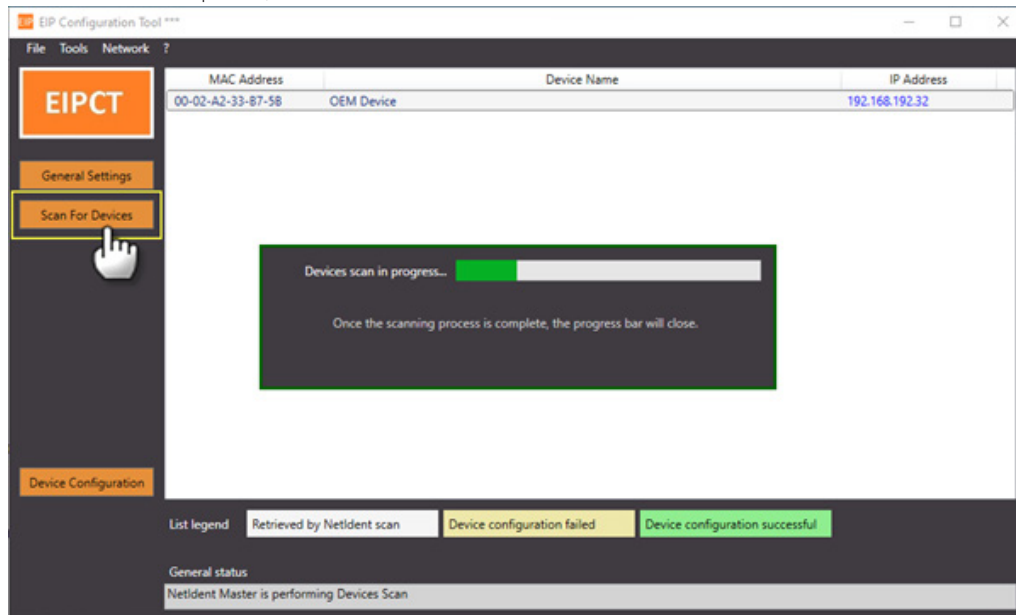
Upon opening the EIPConfiguration Tool, the PC's default network adapter will be displayed in the General Status field. If the PC being used has multiple network adapters and an adapter other than the default is needed, follow the steps listed next.



1) From the menu bar, click the Network menu and select Adapter.



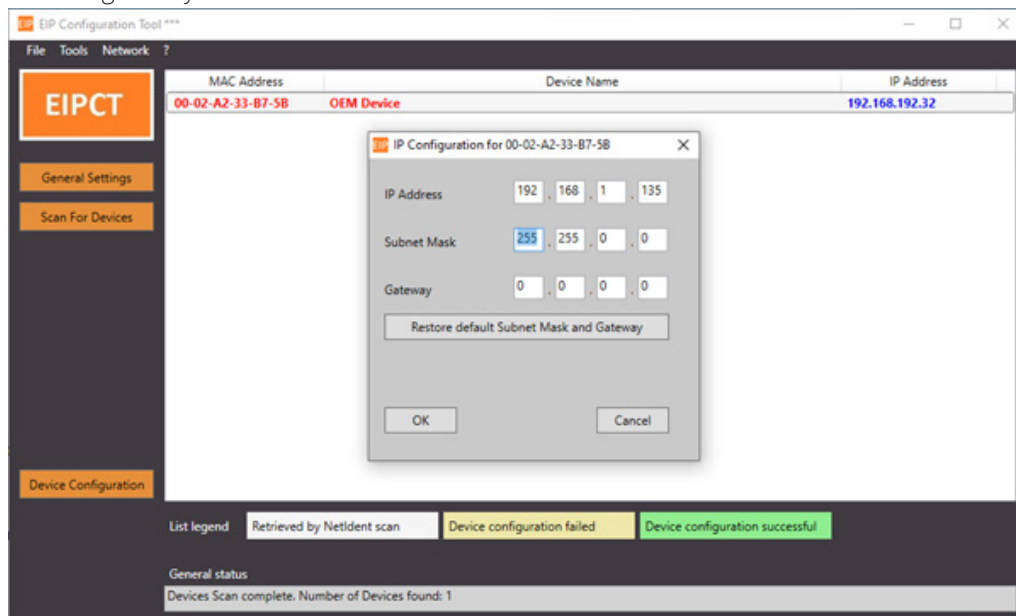
- 2) Select the PC's network adapter that is connected to the same network as the NITRA PAL Controller. The EIPConfiguration Tool will automatically scan the network. When no change of network adapter selection is required, the user can click the Scan for Devices button to also scan the network.



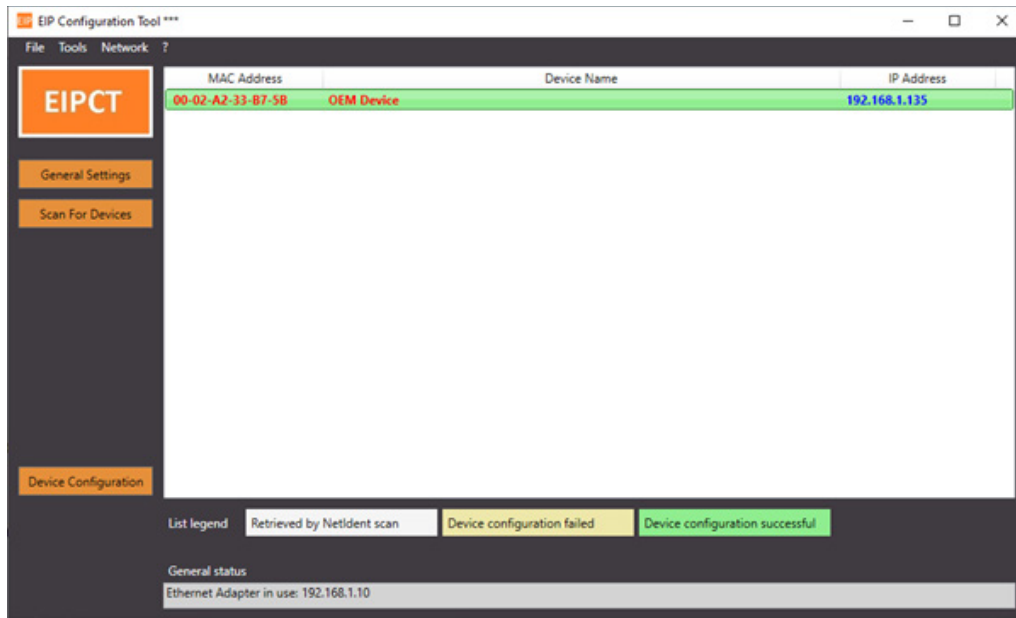
Any discovered NITRA PAL Controller will be listed in the utility window.

**ENTERING THE STATIC IP ADDRESS, SUBNET MASK AND DEFAULT GATEWAY**

With the discovered device selected, click the Device Configuration button or double-click the selected device to open the network settings window. Here the user can enter the static IP address, subnet mask, and default gateway needed for the device.



Once the parameters are set, click OK. The new network parameters are written to the device and the network is rescanned. The device should once again be discovered, only now showing the new IP address.



### NITRA PNEUMATIC AUTOMATION LINK (PAL) CONFIGURATION SOFTWARE

The NITRA Pneumatic Automation Link (PAL) Configuration Software is used to configure the PAL system for proper operation. Refer to the help file included with the configuration software for more in-depth explanation. The software is available for download at

<https://support.automationdirect.com/products/nitra.html>

## ETHERNET/IP CONNECTIONS AND DATA MAPPING

The PAL EtherNet/IP interface supports EtherNet/IP in the following methods:

- Class 1 I/O Messaging (also called "Implicit Messaging")
- Class 3 Explicit Messaging
- Unconnected Explicit Messaging

### EDS FILE

To assist in an EtherNet/IP Scanner side setup for establishing communication and facilitating the exchange of I/O Messaging data with the NITRA PAL EtherNet/IP Adapter, an EDS file for the NITRA PAL is available. See <https://support.automationdirect.com/products/nitrapal.html>

### CLASS 1 I/O MESSAGING

- Input Connection Point = 101 (0x65)
- Input Data Size = 146 bytes
- Output Connection Point = 100 (0x64)
- Output Data Size = 102 bytes
- Configuration Connection Point = 3\*
- Configuration Data Size = 0\*
- Run/Idle header should be enabled for Output (O->T) connection
- Supports Unicast or Multicast for Input (T->O) data.



*\*NOTE: Configuration Data from the EtherNet/IP Scanner is not required by the PAL-EIP. If the Scanner (Client) setup requires a Configuration Connection Point to be specified, use these values.*

### CLASS 3 EXPLICIT OR UNCONNECTED EXPLICIT

- Input Data:
  - Service = Get Single Attribute = 14 (0x0E)
  - Class = 4
  - Instance = 101 (0x65)
  - Attribute = 3
  - Size = 146 bytes
- Output Data:
  - Service = Set Single Attribute = 16 (0x10)
  - Class = 4
  - Instance = 100 (0x64)
  - Attribute = 3
  - Size = 102 bytes
- Enable/Disable Unconnected Explicit Updates:
  - Services: Set Single Attribute = 16 (0x10) and Get Single Attribute = 14 (0x0E)
  - Class = 4
  - Instance = 104 (0x68)
  - Attribute = 3
  - Size = 1 byte
  - Value: Disable = 0; Enable = 1



*\*NOTE: For the PAL-EIP unit to accept Unconnected Explicit writes to the Output Assembly Instance 100:*

- A Class 1 (implicit) or Class 3 (connected explicit) connection to Assembly Instance 100 must NOT exist.
- Attribute 3 of Assembly Instance 104 must be transitioned from 0 to 1. Without this transition, the physical outputs will not engage.

*Additionally, for the PAL-EIP to update the input data image of Input Assembly Instance 101 for Unconnected Explicit Messaging: Attribute 3 of Assembly Instance 104 must be transitioned from 0 to 1. Without this transition, the input data image will not be updated for Unconnected Explicit Messaging.*

**EIP DATA MAPPING**

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>Diagnostic Data</b>	0	1		
<b>8 pt. Digital Input (PAL-S01) Module 1</b>	1	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 2</b>	2	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 3</b>	3	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 4</b>	4	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 5</b>	5	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	

(table continued on next page)



Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Input (PAL-S01) Module 6</b>	6	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 7</b>	7	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 8</b>	8	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 9</b>	9	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 10</b>	10	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Input (PAL-S01) Module 11</b>	11	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 12</b>	12	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 13</b>	13	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 14</b>	14	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Input (PAL-S01) Module 15</b>	15	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	

(table continued on next page)

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Input (PAL-S01) Module 16</b>	16	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>4 ch. Analog Input (PAL-S04) Module 1</b>	17	8		1 High
	18			1 Low
	19			2 High
	20			2 Low
	21			3 High
	22			3 Low
	23			4 High
	24			4 Low
<b>4 ch. Analog Input (PAL-S04) Module 2</b>	25	8		1 High
	26			1 Low
	27			2 High
	28			2 Low
	29			3 High
	30			3 Low
	31			4 High
	32			4 Low
<b>4 ch. Analog Input (PAL-S04) Module 3</b>	33	8		1 High
	34			1 Low
	35			2 High
	36			2 Low
	37			3 High
	38			3 Low
	39			4 High
	40			4 Low
<b>4 ch. Analog Input (PAL-S04) Module 4</b>	41	8		1 High
	42			1 Low
	43			2 High
	44			2 Low
	45			3 High
	46			3 Low
	47			4 High
	48			4 Low
<b>&lt;reserved&gt;</b>	49	48		

(table continued on next page)

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Input (PAL-S06) Module 1</b>	97	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Input (PAL-S06) Module 2</b>	99	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

(table continued on next page)

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Input (PAL-S06) Module 3</b>	101	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Input (PAL-S06) Module 4</b>	103	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

*(table continued on next page)*

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Input (PAL-S06) Module 5</b>	105	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Input (PAL-S06) Module 6</b>	107	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

(table continued on next page)

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Input (PAL-S06) Module 7</b>	109	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Input (PAL-S06) Module 8</b>	111	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>4 ch. Temp Input (PAL-S08) Module 1</b>	113	2		Ch 1
	115	2		Ch 2
	117	2		Ch 3
	119	2		Ch 4
<b>4 ch. Temp Input (PAL-S08) Module 2</b>	121	2		Ch 1
	123	2		Ch 2
	125	2		Ch 3
	127	2		Ch 4
<b>4 ch. Temp Input (PAL-S08) Module 3</b>	129	2		Ch 1
	131	2		Ch 2
	133	2		Ch 3
	135	2		Ch 4

(table continued on next page)

Input Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>4 ch. Temp Input (PAL-S08) Module 4</b>	137	2		Ch 1
	139	2		Ch 2
	141	2		Ch 3
	143	2		Ch 4
<reserved>	145	1		

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>Valves 1 - 8</b>	0	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 9 - 16</b>	1	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 17 - 24</b>	2	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 25 - 32</b>	3	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	

(table continued on next page)



Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>Valves 33 - 40</b>	4	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 41 - 48</b>	5	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 49 - 56</b>	6	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 57 - 64</b>	7	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 65 - 72</b>	8	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>Valves 73 - 80</b>	9	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 81 - 88</b>	10	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 89 - 96</b>	11	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 97 - 104</b>	12	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 105 - 112</b>	13	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>Valves 113 - 120</b>	14	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>Valves 121 - 128</b>	15	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 1</b>	16	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 2</b>	17	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 3</b>	18	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Output (PAL-S02) Module 4</b>	19	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 5</b>	20	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 6</b>	21	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 7</b>	22	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 8</b>	23	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	

(table continued on next page)

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Output (PAL-S02) Module 9</b>	24	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 10</b>	25	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 11</b>	26	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 12</b>	27	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 13</b>	28	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>8 pt. Digital Output (PAL-S02) Module 14</b>	29	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 15</b>	30	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>8 pt. Digital Output (PAL-S02) Module 16</b>	31	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 1</b>	32	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 2</b>	33	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	

(table continued on next page)

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>6 pt. Digital Output (PAL-S03) Module 3</b>	34	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 4</b>	35	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 5</b>	36	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 6</b>	37	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 7</b>	38	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>6 pt. Digital Output (PAL-S03) Module 8</b>	39	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 9</b>	40	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 10</b>	41	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 11</b>	42	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 12</b>	43	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				



Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>6 pt. Digital Output (PAL-S03) Module 13</b>	44	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 14</b>	45	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 15</b>	46	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 16</b>	47	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 17</b>	48	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<i>(table continued on next page)</i>				

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>6 pt. Digital Output (PAL-S03) Module 18</b>	49	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 19</b>	50	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 20</b>	51	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 21</b>	52	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>6 pt. Digital Output (PAL-S03) Module 22</b>	53	1	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
<b>4 ch. Analog Output (PAL-S05) Module 1</b>	54	2		Ch 1
	56	2		Ch 2
	58	2		Ch 3
	60	2		Ch 4

(table continued on next page)

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>4 ch. Analog Output (PAL-S05) Module 2</b>	62	2		Ch 1
	64	2		Ch 2
	66	2		Ch 3
	68	2		Ch 4
<b>4 ch. Analog Output (PAL-S05) Module 3</b>	70	2		Ch 1
	72	2		Ch 2
	74	2		Ch 3
	76	2		Ch 4
<b>4 ch. Analog Output (PAL-S05) Module 4</b>	78	2		Ch 1
	80	2		Ch 2
	82	2		Ch 3
	84	2		Ch 4
<b>16 pt. Digital Output (PAL-S07) Module 1</b>	86	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Output (PAL-S07) Module 2</b>	88	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

(table continued on next page)

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Output (PAL-S07) Module 3</b>	90	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Output (PAL-S07) Module 4</b>	92	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

(table continued on next page)

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Output (PAL-S07) Module 5</b>	94	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Output (PAL-S07) Module 6</b>	96	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

*(table continued on next page)*

Output Data				
Definition	Byte #	Byte Size	Bit #	Ch
<b>16 pt. Digital Output (PAL-S07) Module 7</b>	98	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	
<b>16 pt. Digital Output (PAL-S07) Module 8</b>	100	2	0	
			1	
			2	
			3	
			4	
			5	
			6	
			7	
			8	
			9	
			10	
			11	
			12	
			13	
			14	
			15	

