

# X-PAQ Ethernet IP

## *Addendum*

7-20-12

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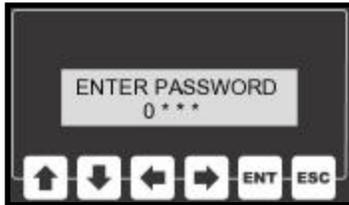
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## Quick Start Guide:

**Step 1:** Power up the Ethernet IP equipped X-PAQ.

**Step 2:** Be sure that the unit is physically connected to the network through the Ethernet connection (RJ45 Connector).

**Step 3:**



Use the network user interface and enter the program mode by pressing the ENT key. The unit will prompt the user for a password at this point, the default is "0 1 0 4". Using the keypad, enter the password

**Step 4 Network Settings:**



The menu system is broken down into a few different sub-menus. Select "Network Settings" from the main menu and press the ENT key.

**Step 5 Connection Type:**



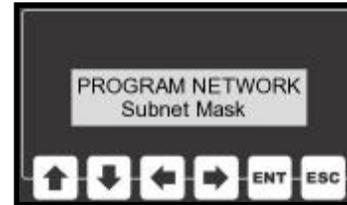
The the "Network Settings" sub-menu select "Connection" and press the ENT key. The connection type can be set to either static or dynamic. If dynamic is chose, the network should automatically select an IP address. If static is chose, an IP address will need to be programmed into the unit.

**Step 6 Set IP Address:**



This step can be skipped if IP addresses are assigned dynamically by the network. If the connection type is static, select "IP Address" from the sub-menu and press the ENT key. Using the arrow keys, edit the IP address for the unit. Please consult the IT director for this value.

**Step 7 Subnet Mask:**



Next, from the networking sub-menu, select "Subnet Mask". The Subnet Mask helps the unit determine which IP addresses are local and which lie beyond a Gateway.

Press the ENT key to view the unit's Subnet Mask. Using the arrow keys alter this setting to the desired value (please consult your IT group for this value). Press the ENT key to store the value.

**Step 8 Gateway:**



The Gateway setting holds the address of the device that will allow this unit to send and receive messages with devices that are not on the local network.

Press the ENT key to view the unit's Gateway address. Using the arrow keys alter this setting to the desired value (please consult your IT group for this value). Press the ENT key to store the value.

**Step 9 Cycle Unit Power:**

After all of the network settings are programmed. Turn the unit off and then back on again. The network module's settings will only be altered at power up.

### Overview:

The X-PAQ can be equipped with a network interface module that provides connectivity to a Plant Floor Control System using Ethernet IP. This interface includes a network card, a human-machine interface (LCD display & keypad), an additional serial port, and an RJ45 network connector.

### Human-Machine Interface:



The human-machine interface or HMI consists of an 2-line by 16 character backlit LCD display and a six-button keypad. During power-up, the display on the HMI will display the firmware version contained inside the microprocessor's memory.

During operation, the HMI will show the unit's IP address.

The HMI is also used during the programming phase allowing the user to enter program menus. These program menus allow access to settings that govern how the Ethernet IP interface functions.

### Network Connector (RJ45):



The Ethernet port is used to transmit and receive TCP/IP messages that are formatted to comply with Ethernet IP.

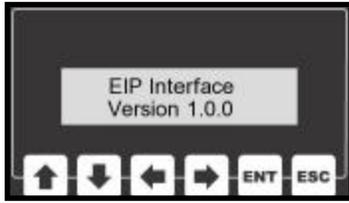
### Serial Port (MIF):



The serial port on this unit is a debugging port. This port will give the user direct access to the network module. A terminal program is all that is necessary to use this port. The settings for the terminal program should be 38400 baud, 8-bit, no-parity, and 1 stop bit.

DSUB 9 PINOUT	
2	- RX
3	- TX
5	- GND

## Operating Mode:



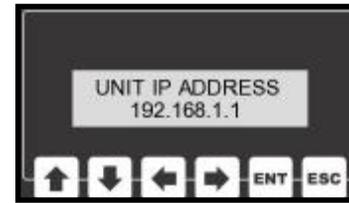
When the Ethernet IP network interface powers up, the display briefly shows the firmware version information and then the unit enters its operating mode.



In the main operating mode, the display will show the unit's IP address.

From this main screen the user can press the ENT key to enter the programming mode.

## Program Mode:



There are several items that are user configurable through the programming menu. In order to reach this menu from the main display, press the enter (ENT) key.



The display will prompt the user to enter a password before reaching the programming menu. The default password is "0 1 0 4".



While entering the password, the left and right arrow keys will move the cursor back and forth. The up and down arrows will raise and lower the value of the digit that the cursor is highlighting.

The escape key (ESC) will send the program back to the main screen without attempting to read the password. If the enter key (ENT) is pressed, the unit will compare the entered password to the password that is stored in the unit's non-volatile memory. If these values match, the unit will continue onto the programming menu.

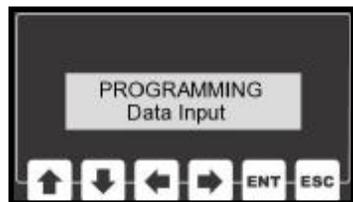
## Programming Menu:



The Ethernet IP network card has quite a bit of flexibility and therefore also has a large number of variables that can be programmed by an end user.



The menu system has been broken down into several logical sub-menus.



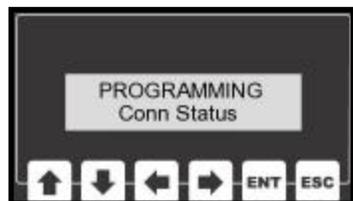
The network sub-menu contains IP addresses, gateway and sub-net mask configurations.



The data input and data output menus allow user to select which data bytes to send/receive and also where those bytes will be located in the input and output strings.



The data mask sub-menu allows users to choose different popular data masks that include different input and output data.



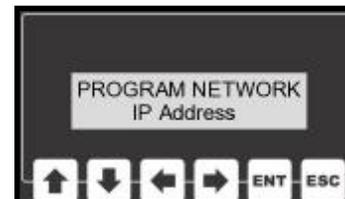
The password can be edited from this menu and the connection status can also be monitored.

tored.

## Programming the Unit's IP Address:



It's important that each device on the network has its own unique IP address. In order to edit this interface's IP address, select Programming IP Address from the main menu and press enter.



The current IP address will be displayed at this point. In order to change the address use the LEFT and RIGHT arrow keys to select any given digit in the address and then use the UP and DOWN

keys to alter that digit's value.

Once the desired IP address is displayed, the enter key can be pressed to save that value. All programmable values are stored in non-volatile memory. This allows the unit to "remember" these values even when the unit is turned off and unplugged.

The escape key can be pressed any time during the editing process allowing the user to return to the main menu without saving a new value.

For a new IP address to take effect, the unit's power must be cycled off and then back on.

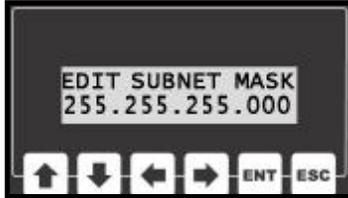
## Programming the Unit's Subnet Mask:



The Subnet Mask is used to identify which part of the IP address is the network ID and which part is the host ID. This is accomplished by a logical bit-wise ANDing of the IP address and the netmask.



In order to edit the netmask, select Subnet Mask from the main menu and press enter.



The current mask value will be displayed at this point.

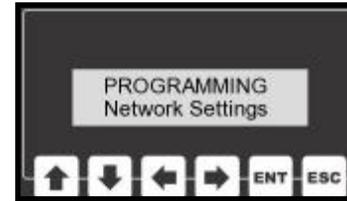
In order to change the mask's value use the LEFT and RIGHT arrow keys to select any given digit in the address and then use the UP and DOWN keys to alter that digit's value.

Pressing the enter key will allow the user to save the new subnet mask that is displayed on the LCD.

The escape key can be pressed any time during the editing process allowing the user to return to the main menu without saving a new value.

For a new Subnet Mask to take effect, the unit's power must be cycled off and then back on.

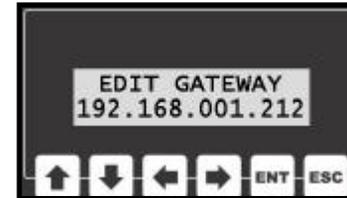
## Programming the Gateway:



Gateways perform routing functions. This gateway value identifies the router that connects a LAN to other networks. Some gateways also perform protocol conversions.



In order to edit this gateway's IP address, select Gateway from the main menu and press enter.



The current gateway address will be displayed at this point. In order to change the address use the LEFT and

RIGHT arrow keys to select any given digit in the address and then use the UP and DOWN keys to alter that digit's value.

Pressing the enter key will allow the user to save the gateway's IP address that is displayed on the LCD.

The escape key can be pressed any time during the editing process allowing the user to return to the main menu without saving a new value.

For a new Gateway to take effect, the unit's power must be cycled off and then back on.

## Programming the Connection Type:



The IP Address assigned to this unit



The current timeout value (in seconds) will be displayed at this point. In order to change the value the arrow keys may be pressed. The UP key will add one second, DOWN will subtract a second, RIGHT will add 10 seconds, and LEFT will subtract 10 seconds from the value.

Pressing the enter key will allow the user to save the value that is displayed on the LCD.

The escape key can be pressed any time during the editing process allowing the user to return to the main menu without saving.

## Data Output:

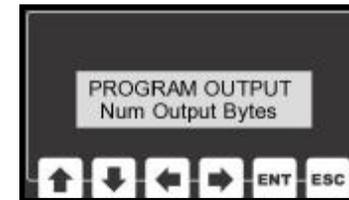
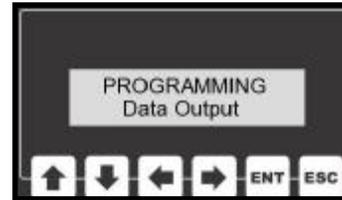


This unit is capable of transmitting 103 output bytes. The user can select which groups of information are actually transmitted. The programmed defaults have 79 output bytes. The “Tool Type” outputs are not activated for use with the X-PAQ. The unit has no need for them at this time.

Output Data	Number of Bytes	Default Location
Parameter	1	0
Tool Type	3	1
Tool Name	8	4
OK/NOK	1	12
Result	1	13
Count	1	14
Batch	1	15
Rolling Count	2	16
Total	2	18
Time	6	20
Date	6	26
EE Write Time	6	32
EE Write Date	6	38
Torque	6	44
Min Torque	6	50
Max Torque	6	56
Units	1	62
Angle	5	63
Min Angle	5	68
Max Angle	5	73
Tool Type A	3	Not Active by default
Tool Type B	3	Not Active by default
Tool Type C	3	Not Active by default
Tool Type D	3	Not Active by default
Tool Type E	3	Not Active by default
Tool Type F	3	Not Active by default
Tool Type G	3	Not Active by default
Tool Type H	3	Not Active by default
XPAQ Outputs	1	78

Output Data	Description
Parameter	ASCII character representing current parameter. Possible values 'A' (0x41) through 'H' (0x48).
Tool Type	Three ASCII characters describing the tool type. Possible values include 'DIG', 'CLK', 'AIR', and/or 'BAT'
Tool Name	Up to 8 alpha-numeric ASCII characters that represent a user defined tool name.
OK/NOK	Single character giving status of last fastening. 'O' (0x4F) for okay or 'N' (0x4E) for not okay.
Result	Single character giving status of last fastening. 'C' (0x43) for cycle, 'B' (0x42) for batch and 'R' (0x52) for reject.
Count	Number of fasteners completed towards the batch. Possible values 0x00 through 0xFF.
Batch	Value representing the number of fasteners in a batch. Possible values 0x00 through 0xFF.
Rolling Count	Integer (2 bytes) holding a rolling count. The count will increase with each new result. Possible value 0x0000 through 0xFFFF.
Total	Integer (2 bytes) representing number of batches completed in a given parameter. Possible value 0x0000 through 0xFFFF.
Time	6 ASCII bytes describing the time an event occurred in HHMMSS format.
Date	6 ASCII bytes describing the date an event occurred in MMDDYY format.
EE Write Time	6 ASCII bytes describing the last time the eeprom was written to in HHMMSS format.
EE Write Date	6 ASCII bytes describing the last date the eeprom was written to in MMDDYY format.
Torque	6 ASCII numbers and/or decimal point representing the torque value from the last fastening (if available).
Min Torque	6 ASCII numbers and/or decimal point representing the min torque setting from the last fastening (if available).
Max Torque	6 ASCII numbers and/or decimal point representing the max torque setting from the last fastening (if available).
Units	Single character describing torque units used during last fastening. Possible values 'I'/InLb, 'N'/Nm, 'F'/FtLb, 'K'/KgCm, and 'm'/mKg.
Angle	5 ASCII numerals representing angle.
Min Angle	5 ASCII numerals representing min angle setting.
Max Angle	5 ASCII numerals representing max angle setting.
Tool Type A	Three ASCII characters describing the tool type in parameter A.
Tool Type B	Three ASCII characters describing the tool type in parameter B.
Tool Type C	Three ASCII characters describing the tool type in parameter C.
Tool Type D	Three ASCII characters describing the tool type in parameter D.
Tool Type E	Three ASCII characters describing the tool type in parameter E.
Tool Type F	Three ASCII characters describing the tool type in parameter F.
Tool Type G	Three ASCII characters describing the tool type in parameter G.
Tool Type H	Three ASCII characters describing the tool type in parameter H.
X-PAQ Outputs	The outputs from the X-PAQ in a bitfield.

## Programming Data Output:



The user has the ability to decide the total number of bytes this unit will transmit as output bytes. The user can also decide which elements of output data will be transmitted and at what address.

To set the number of output bytes, the user will want to select Num Output Bytes from the Data Output sub-menu. After pressing the ENT key, the user can use the arrow keys to set the number of output bytes. Pressing ENT will save this value ESC will allow the user to exit without saving a new value.

Similarly, each piece of output data can be located wherever the user desires in the output message.

To program any of the output data, select it from the data output sub-menu. When the ENT key is pressed, the address of where the first byte will be placed will be shown. The user can use the arrow keys to manipulate this value and set it to any desired address or to DO NOT SEND.

Once the desired value is displayed, pressing ENT will store that value. The ESC key can be pressed to exit without saving.

## Data Input:



This unit is capable of receiving 40 input bytes. The user can select which groups of information are actually received. The programmed defaults have only one active input byte. The X-PAQ does not respond to any of the non-active inputs at this time.

Input Data	Number of Bytes	Default Location
Parameter	1	Not Active by default
Batch Reset	1	Not Active by default
Suspend	1	Not Active by default
Batch Value	1	Not Active by default
Time	6	Not Active by default
Date	6	Not Active by default
Torque Min	6	Not Active by default
Torque Max	6	Not Active by default
Angle Min	5	Not Active by default
Angle Max	5	Not Active by default
Units	1	Not Active by default
X-PAQ Inputs	1	0

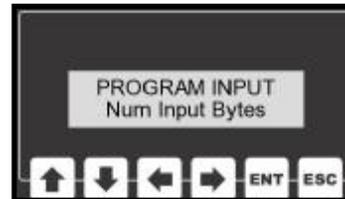
## Data Input (continued) :

Input Data	Number of Bytes
Parameter	Changing this byte will alter the parameter setting in the unit. Possible value '0' through '7', '0' through '7', and 'A' through 'H'.
Batch Reset	Setting this byte to a non-zero value will reset the batch count.
Suspend	Setting this byte to a non-zero value will suspend the unit. Set byte back to zero to un-suspend.
Batch Value	Altering this byte will reprogram the batch value in the current parameter. If this value is zero, no action will be taken.
Time	Altering this value will reprogram the current unit time with these 6 bytes. HHMMSS format. Both time and date must be legal values for write to occur.
Date	Altering this value will reprogram the current unit date with these 6 bytes. MMD-DYY format. Both time and date must be legal values for write to occur.
Torque Min	Altering these 6 bytes will change the min torque setting for the current parameter. Min/Max Torque, Min/Max Angle, and Units must all be legal value before write will occur.
Torque Max	Altering these 6 bytes will change the max torque setting for the current parameter. Min/Max Torque, Min/Max Angle, and Units must all be legal value before write will occur.
Angle Min	Altering these 5 bytes will change the min angle setting for the current parameter. Min/Max Torque, Min/Max Angle, and Units must all be legal value before write will occur.
Angle Max	Altering these 5 bytes will change the max angle setting for the current parameter. Min/Max Torque, Min/Max Angle, and Units must all be legal value before write will occur.
Units	Altering this bytes will change the units setting for the current parameter. Possible values 'l'/InLb, 'N'/Nm, 'F'/FtLb, 'K'/KgCm, and 'm'/mKg. Min/Max Torque, Min/Max Angle, and Units must all be legal value before write will occur.
X-PAQ Inputs	This byte will be passed to the X-PAQ to change its inputs. These inputs will be handled the same as those wired to the physical input connector. See the X-PAQ manual for how to use these inputs to control the X-PAQ.

## Programming Data Input:



The user has the ability to decide the total number of bytes this unit will receive as input bytes. The user can also decide which elements of input data will be received and at what address.



To set the number of input bytes, the user will want to select Num Input Bytes from the Data Input sub-menu. After pressing the ENT key, the user can use the arrow keys to set the number of input bytes.

### Programming Data Input continued:

Similarly, each piece of input data can be located wherever the user desires in the input message.

To program any of the input data, select it from the data input sub-menu. When the ENT key is pressed, the address of where the first byte will be read will be shown. The user can use the arrow keys to manipulate this value and set it to any desired address or to DO NOT SEND.

Once the desired value is displayed, pressing ENT will store that value. The ESC key can be pressed to exit without saving.

### Programming Data Masks:

A few different automatically selectable data masks are resident in memory. By selecting one of these default masks, the user can set the input and output data to one of several different defaults.



**Default Mask:** The default mask includes all of the input and output data currently usable by the X-PAQ. The default mask contains 79 output bytes and 1 input byte. The addresses are defined in the data input and data output sections of this manual. Selecting this value will return the unit to its default data settings.

### Programming Data Masks continued:

#### Mask 1:

Output Byte	Location
Parameter	0
OK/NOK	1
Result	2
Count	3
Batch	4
Rolling Count	5
Total	7

Input Byte	Location
Parameter	0
Batch Reset	1
Suspend	2
Batch	3

#### Mask 2:

Output Byte	Location
OK/NOK	0
Rolling Count	1

Mask 2 has no input bytes.

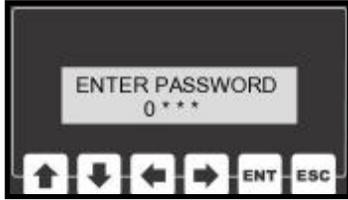
**All Off:** The All Off setting turns all of the incoming and outgoing data off. This is a great place to start if the user only wants to send and receive a few bytes.

**All On:** The All On setting turns all of the incoming and outgoing data on. This is similar to the Default Mask setting, but it includes the input and output data not currently used by the X-PAQ.

## Changing the Password:



In order to gain access to the programming menu, the user must enter a password. The password is a four digit (numeric) code.



All units ship with a default code of "0 1 0 4". This default code may be changed to a value that is more easily remembered by

the user.

In order to edit the password, select Edit Password from the programming menu and press enter.

To change the password use the LEFT and RIGHT arrow keys to select any given digit in the address and then use the UP and DOWN keys to alter that digit's value.

Pressing the enter key will allow the user to save the new password.

The escape key can be pressed any time during the editing process allowing the user to return to the main menu without saving a new value.

## Connection Status:



The module status and network status can be displayed by this unit as a means of trouble shooting this device.

In order to view these statuses, select Conn Status from the main menu by pressing the ENT key.

If the module status is red, something is wrong with the Ethernet IP module. If the module status is green, the Ethernet IP interface is functioning properly.

If the network status is red, no network is connected. If the network status is flashing green, the network is physically connected but is not communicating with the module yet. If the network status is solid green the device is on the network and communicating.