

Using RX / WX Commands to manage Ethernet messages between a PLC to a PC

Before beginning, verify that:

- 1) ECOM firmware version is 1.0.147 or later
- 2) Dip switch #7 on the ECOM module is switched ON

When dip switch #7 of the H2/H4-ECOM is on, using address 90 signals the ECOM that this RX/WX command is intended for processing by the ECOM, not intended for a slave module at address 90. Use the WX instruction to send a block of data to a computer on the network, and use the RX instruction to get the error code and response data.

To use the WX instruction:

- 1) Load the address (90 BCD) into the high byte and the slot number of the ECOM module into the low byte.
- 2) Load the number of bytes (2 – 128) to be transferred. This number will be 32 + the number of data bytes to send.
- 3) Load the address of the data block used to generate the packet. This address must be specified in HEX.
- 4) Insert the WX instruction. Note: the address specified in the WX instruction will be ignored.

Example:

```
LD    K0290 : Specifies ECOM module in slot number 02 and address 90
LD    K0040 : Specifies 40 bytes (16 setup + 16 address + 8 data bytes)
LDA   O2000 : Specifies V2000 as the address of our block of memory
WX    V0000 : Perform the write (V0000 is ignored)
```

The table on page 2 details the format of the data block needed to generate a PLC-to-PC packet.

To use the RX instruction:

- 1) Load the address (90 BCD) into the low byte and the slot number of the ECOM module into the high byte..
- 2) Load the number of bytes to read (2 – 128) to read. **Note:** To read just the error code, specify 2 bytes. To read the error code AND response data, specify 32 + the number of response bytes expected.
- 3) Load the address where you want to store the data in the PLC. The address must be specified in HEX.
- 4) Insert the RX instruction and specify V0000 as the address to read from.

Example:

```
LD    K0290 : Specifies ECOM module in slot number 02 and address 90
LD    K0040 : Specifies 40 bytes to read (16 setup + 16 address + 8 response bytes)
LDA   O3000 : Specifies V3000 as the address to store the data.
RX    V0000 : Perform the read. V0000 is used to indicate that we want to read the error and response data.
```

The table on page 3 details the format of the data block returned by an RX command when using it to read the Error and response data

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This table details the format of the V-memory block needed for a WX command -assuming V2000

V Memory Address	Contents	Value
V2000 – V2007	Setup Values	
V2000	Version	0
V2001	Function	1 = COMM_FUN_SEND
V2002	Media	1 = Ethernet 802.2 2 = Ethernet 802.3 3 = Ethernet Ether II Note: Only used for IPX protocol.
V2003	Protocol	1 = UDP/IP 2 = IPX 3 = Host Ethernet (raw)
V2004	Flags	Bit 0: COMM_FLAG_NO_WAIT_ACK 0 = ACK is required for message 1 = ACK is NOT required for message Bit 1-7: Unused
V2005	Reserved	0
V2006	Reserved	0
V2007	Reserved	0
V2010 – V2017	Destination Address	Address of the PC that we are sending the message to. We also may broadcast on the network with IPX by using an Ethernet address of: FF FF FF FF FF FF and with IP by using the broadcast address.
V2010	Ethernet Address	First two bytes of Ethernet address to send to.
V2011	Ethernet Address	Next two bytes of Ethernet address to send to.
V2012	Ethernet Address	Last two bytes of Ethernet address to send to.
		Example: If destination is Ethernet address: 00 11 22 33 44 55: *** V2010 = 0011 (HEX), V2011 = 2233 (HEX), V2012 = 4455 (HEX)
If Protocol = UDP/IP		
V2013	IP Address	First Two bytes of IP address to send to.
V2014	IP Address	Last Two bytes of IP address to send to.
		Example: If we are sending to IP address 192.168.0.100: After converting to HEX we have: C0.A8.00.64: V2013 = C0A8 (HEX), V2014 = 0064 (HEX)
V2015	Socket Number	0x7777 (30,583 decimal) This needs to be the same socket the PC is listening on. NOTE: Bytes are swapped. Example: If set to 0x7776 (30,582 decimal) will actually generate a telegram with Socket Number of 0x7677 (30,327)
V2016	Reserved	0
V2017	Reserved	0
If Protocol = IPX		
V2013	Network Number	High word of network number to send to (probably 0).
V2014	Network Number	Low word of network number to send to (probably 0).
V2015	Socket Number	0x7777 (30583 decimal) to send to. NOTE: Bytes for Socket Number when using IPX protocol are <u>not</u> byte-swapped.
V2016	Reserved	0
V2017	Reserved	0
If Protocol = Ethernet (raw)		
V2013	Reserved	0
V2014	Reserved	0
V2015	Reserved	0
V2016	Reserved	0
V2017	Reserved	0
V2020 – V2177	User Defined	This is the block of data to send. Words are byte swapped – so that a text message entered with the Data View in DirectSOFT will be sent correctly.

***The Ethernet address and IP address of a PC running Windows can be obtained by running ipconfig /all from a command prompt

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This table details the format of the V-memory block returned by an RX command - assuming V3000

V Memory Address	Contents	Value
V3000 – V3007	Setup Values	
V3000	Error Code	Error from last WX instruction execution: 0 = No Error 1 = Invalid Media Value 2 = Invalid IP address in ECOM module 3 = Invalid Protocol Specified 4 = Invalid Function Specified 5 = Invalid Version Specified 6 = Invalid Number of Bytes Specified in WX instruction must be at least 32 7 = RX/WX Overrun. Tried to issue an RX/WX while one is already being processed 8 = Internal ECOM Error. 9 = Packet was NAK'd by the receiver (PC) A = Timeout error waiting for the ACK or response.
V3001	Number Data Bytes	Specifies the number of data bytes that were returned by the receiver (PC)
V3002	Media	1 = Ethernet 802.2 2 = Ethernet 802.3 3 = Ethernet Ether II Note: Only used for IPX protocol.
V3003	Protocol	1 = Ether-UDP 2 = IPX 3 = Ethernet (raw)
V3004	Reserved	0
V3005	Reserved	0
V3006	Reserved	0
V3007	Reserved	0
V3010 – V3017	Receiver's Address	
V3010	Ethernet Address	First two bytes of receiver's Ethernet address
V3011	Ethernet Address	Next two bytes of receiver's Ethernet address
V3012	Ethernet Address	Last two bytes of receiver's Ethernet address
If Protocol = UDP/IP		
V3013	IP Address	First Two bytes of receiver's IP address
V3014	IP Address	Last Two bytes of receiver's IP address
V3015	Socket Number	Socket number the receiver is using
V3016	Reserved	0
V3017	Reserved	0
If Protocol = IPX:		
V3013	Network Address	Network address receiver is using.
V3014	Network Address	Network address receiver is using.
V3015	Socket Number	Socket number the receiver is using
V3016	Reserved	0
V3017	Reserved	0
If Protocol = Ethernet (raw)		
V3013	Reserved	0
V3014	Reserved	0
V3015	Reserved	0
V3016	Reserved	0
V3017	Reserved	0
V3020 – V3177	Response data.	Application specific.

Using RX / WX Commands to manage Ethernet messages between a PLC to a PC

The following special relay bits can be used in a 405 PLC program to monitor the Busy and error status of an ECOM module in a particular slot of a 405 Series PLC.

Local Base	Expansion Base #1	Expansion Base #2	Expansion Base #3
SP120 Module Busy Slot 0	SP140 Module Busy Slot 0	SP160 Module Busy Slot 0	SP200 Module Busy Slot 0
SP121 Comm Error Slot 0	SP141 Comm Error Slot 0	SP161 Comm Error Slot 0	SP201 Comm Error Slot 0
SP122 Module Busy Slot 1	SP142 Module Busy Slot 1	SP162 Module Busy Slot 1	SP202 Module Busy Slot 1
SP123 Comm Error Slot 1	SP143 Comm Error Slot 1	SP163 Comm Error Slot 1	SP203 Comm Error Slot 1
SP124 Module Busy Slot 2	SP144 Module Busy Slot 2	SP164 Module Busy Slot 2	SP204 Module Busy Slot 2
SP125 Comm Error Slot 2	SP145 Comm Error Slot 3	SP165 Comm Error Slot 3	SP205 Comm Error Slot 3
SP126 Module Busy Slot 3	SP146 Module Busy Slot 3	SP166 Module Busy Slot 3	SP206 Module Busy Slot 3
SP127 Comm Error Slot 3	SP147 Comm Error Slot 3	SP167 Comm Error Slot 3	SP207 Comm Error Slot 3
SP130 Module Busy Slot 4	SP150 Module Busy Slot 4	SP170 Module Busy Slot 4	SP210 Module Busy Slot 4
SP131 Comm Error Slot 4	SP151 Comm Error Slot 4	SP171 Comm Error Slot 4	SP211 Comm Error Slot 4
SP132 Module Busy Slot 5	SP152 Module Busy Slot 5	SP172 Module Busy Slot 5	SP212 Module Busy Slot 5
SP133 Comm Error Slot 5	SP153 Comm Error Slot 5	SP173 Comm Error Slot 5	SP213 Comm Error Slot 5
SP134 Module Busy Slot 6	SP154 Module Busy Slot 6	SP174 Module Busy Slot 6	SP214 Module Busy Slot 6
SP135 Comm Error Slot 6	SP155 Comm Error Slot 6	SP175 Comm Error Slot 6	SP215 Comm Error Slot 6
SP136 Module Busy Slot 7	SP156 Module Busy Slot 7	SP176 Module Busy Slot 7	SP216 Module Busy Slot 7
SP137 Comm Error Slot 7	SP157 Comm Error Slot 7	SP177 Comm Error Slot 7	SP217 Comm Error Slot 7

The following special relay bits can be used in a 205 PLC program to monitor the Busy and error status of an ECOM module in a particular slot of a 205 Series PLC.

SP120 Module Busy Slot 0
SP121 Comm Error Slot 0
SP122 Module Busy Slot 1
SP123 Comm Error Slot 1
SP124 Module Busy Slot 2
SP125 Comm Error Slot 2
SP126 Module Busy Slot 3
SP127 Comm Error Slot 3
SP130 Module Busy Slot 4
SP131 Comm Error Slot 4
SP132 Module Busy Slot 5
SP133 Comm Error Slot 5
SP134 Module Busy Slot 6
SP135 Comm Error Slot 6
SP136 Module Busy Slot 7
SP137 Comm Error Slot 7