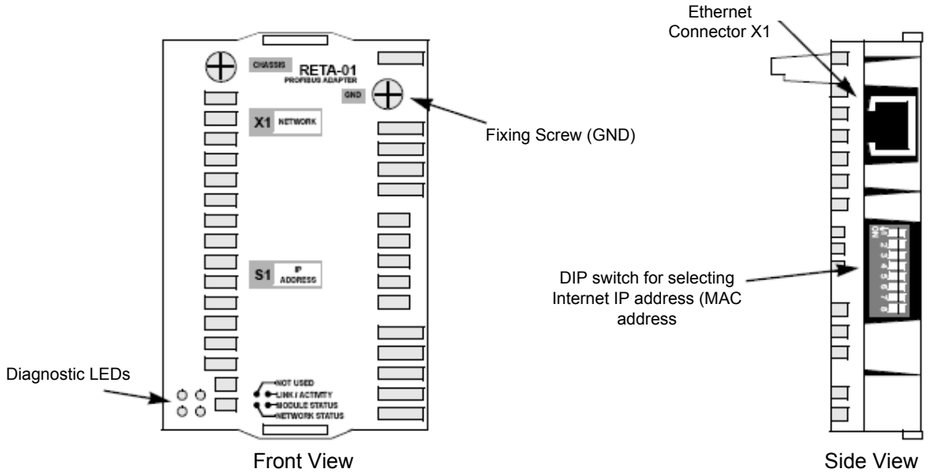
EthernetIP For RS ControlLogix 5000 Quick Start Guide

The RETA-01 Adapter module is required to support communications when using EthernetIP to communicate between an RS Logix 5000 PLC and the PS200.



1. Install the RETA-01 fieldbus module in option slot 1 of the PS200. Be sure to use the fixing screws for proper ground bonding. Module power and signal connections are automatically made.



2. Connect the Ethernet cable (RJ-45 connector) to the RETA-01 module, connector X1. Standard CAT 5 UTP or STP cables can be used. Avoid parallel runs with power (e.g. motor) cables.

3. Power up the drive. The "MODULE STATUS" LED should be green. If the network cable is connected to an active network, the "LINK/ACTIVITY" LED should also be solid or blinking green. The "NETWORK STATUS" LED will be a steady green if the DCS/PLC has an Ethernet connection open against the drive.

4. Enter the proper pass code into the PS200 and go to parameter group 30. Be sure parameter 30.01 shows "**FIELDBUS**". Change parameter 30.03 to "**CSA2.8 / 3.0**" Set up parameter group 31 according to Table 1. NOTE: Once group 31 parameters are entered you must use parameter 31.27 to refresh the module or the new parameters will not take affect. Another way to refresh the module is to cycle power.

5. Set up PumpSmart for the type of process control required. Be sure to define all parameters being written to via EthernetIP to "FIELDBUS". Examples include:
   - 12.01 START / STOP
   - 12.11 SPEED OVERRIDE
   - 12.13 SPEED OVERRIDE REF
   - 16.01 SET 1 / SET 2 SELECT
   - 16.02 SETPOINT 1 SELECT
   - 16.03 SETPOINT 2 SELECT
   - ETC.

See Page 2 for the PLC side set up.

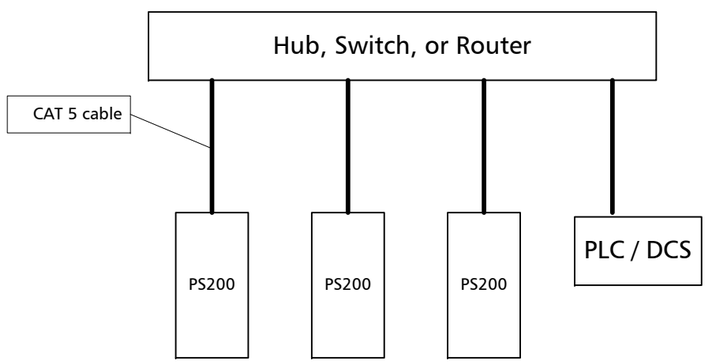


Table 1 Group 30 & 31 Definitions

Parameter Number	Parameter Name	Default Value	Required Value	Available Options	Comments
30.01	FIELDBUS	NO	FIELDBUS	NO FIELDBUS ADVANT STD MODBUS CUSTOMIZED	
30.03	COMM PROFILE	CSA2.8/3.0	CSA2.8/3.0	CSA2.8/3.0 ABB DRIVES GENERIC	
31.01	MODULE TYPE		RETA-01		No action is required. This parameter is automatically configured by the SP200
31.02	COMM RATE	(0) Auto Negotiate	USER DEFINED	0 = Auto Negotiate 1 = 100 Mbit/s, full duplex 2 = 100 Mbit/s, half duplex 3 = 10 Mbit/s, full duplex 4 = 10 Mbit/s, half duplex	Set the COMM RATE to Auto Negotiate will permit the drive to automatically detect the baud rate.
31.03	DHCP	(1) DHCP Enabled	USER DEFINED	0 = DHCP Disabled 1 = DHCP Enabled	DHCP (Dynamic Host Configuration Protocol) can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information.
31.04	IP ADDRESS 1	0	USER DEFINED	0 - 255	Defined by the user's network. This is the MAC ID address for this drive. Each drive has its own unique address. NOTE: Be sure all DIP switch settings are set at "0", or this address will be ignored.
31.05	IP ADDRESS 2	0	USER DEFINED	0 - 255	
31.06	IP ADDRESS 3	0	USER DEFINED	0 - 255	
31.07	IP ADDRESS 4	0	USER DEFINED	0 - 255	
31.08	SUBNET MASK 1	0	USER DEFINED	0 - 255	Defined by the user's network. Subnet masks are used for splitting networks into subgroups, or subnets.
31.09	SUBNET MASK 2	0	USER DEFINED	0 - 255	
31.10	SUBNET MASK 3	0	USER DEFINED	0 - 255	
31.11	SUBNET MASK 4	0	USER DEFINED	0 - 255	
31.12	GW ADDRESS 1	0	USER DEFINED	0 - 255	This is the Gatway address. Defined by the user's network.
31.13	GW ADDRESS 2	0	USER DEFINED	0 - 255	
31.14	GW ADDRESS 3	0	USER DEFINED	0 - 255	
31.15	GW ADDRESS 4	0	USER DEFINED	0 - 255	
31.16	PROTOCOL	MODBUS TCP	2	0 = MODBUS TCP 1 = ETHERNET AC/DC 2 = ETHERNET IP / TRANSPERENT	The RETA-01 module can be used for any one of these three protocols. This Quick Start Guide deals with ETHERNET IP/TRANSPARENT.
31.19	OUTPUT 1*	0	1	0-65535	Placing a 1 here permits accessing the Control Word. (see Table 2 for the Control Word definition)
31.20	OUTPUT 2	0	2	0-65535	Placing a 2 here permits writing to the first reference (set-point).
31.21	OUTPUT 3	0	0	0-65535	
31.22	OUTPUT 4	0	0	0-65535	
31.23	INPUT 1*	0	4	0-65535	Placing a 4 here permits reading the Status Word. (see Table 3 for the Status Word definition)
31.24	INPUT 2	0	102	0-65535	Enter 102 here if you want to read the motor speed, else leave this entry 0.
31.25	INPUT 3	0	106	0-65535	Enter 106 here if you want to read the Motor Power, else leave this entry 0.
31.26	INPUT 4	0	219	0-65535	Enter 219 here if you want to read SmartFlow, else leave this entry 0.

*Inputs and Outputs are as viewed from PLC

Table 2 Control Word

Bit	Name	Description
0	Reserved	
1	Reserved	
2	Reserved	
3	Start/Stop	0 = Stop 1 = Start
4	Reserved	
5	Ref Select	0 = Reference 1 1 = reference 2
6	Reserved	
7	Reserved	
8	Reset Fault	0 →1
9-12	Reserved	
13	Speed Override	0 = Speed Override Disabled 1 = Speed Override Enabled

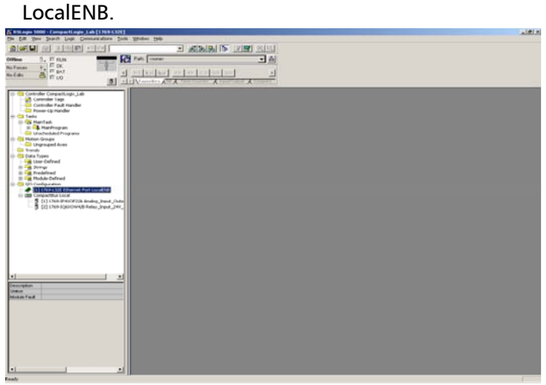
Table 3 Status Word

Bit	Name	Description
0	Ready	0 = Initializing, or initialization error 1 = Ready to start
1	Enabled	0 = Coast to stop 1 = Stop per profile (defined in parameter 13.02)
2	Reserved	
3	Running	0 = Stopped 1 = Running with selected setpoint
4	Reserved	
5	Remote	0 = Drive in Local Mode 1 = Drive in Remote Mode
6	Reserved	
7	At Setpoint	0 = Actual not at setpoint 1 = Actual at setpoint
8	Faulted	0 = No active faults 1 = A fault is active
9	Warning	0 = No active warning 1 = A warning is active
10	Limit	0 = Drive is not at limit 1 = Drive is at a limit

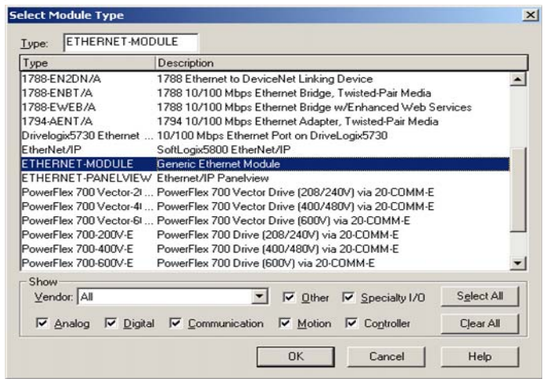
ControlLogix 5000 Set Up

EDS File – An EthernetIP EDS file specific to PumpSmart PS200 is available on the PS200 v5 Fieldbus Communications web page at http://www.ittmc.com/PS200v5fldbcomm.html. Note that EDS files are only required when using RSNetWorx for Ethernet in your application. This example is not using RSNetWorx for Ethernet but is opening a generic Ethernet Module in the ControlLogix 5000 PLC.

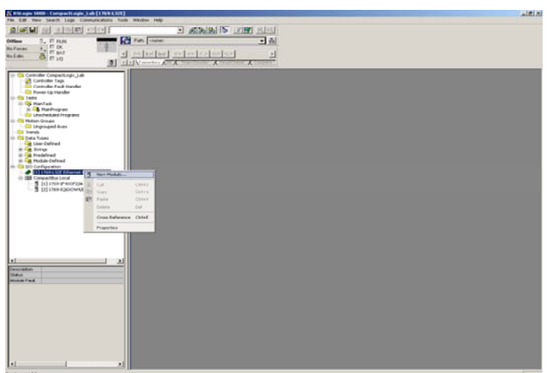
1 Open RS Logix 5000 and open a RS Logix 5000 program. Right Click on the 1769-L32E Ethernet Port LocalENB.



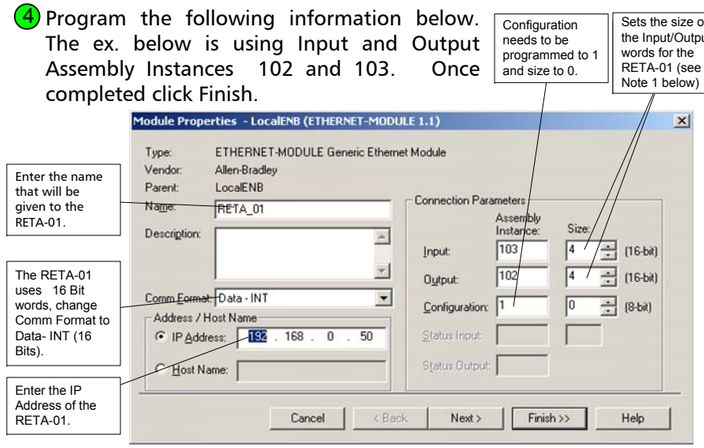
2 Click on New Module.



3 Select Module ETHERNET-MODULE.

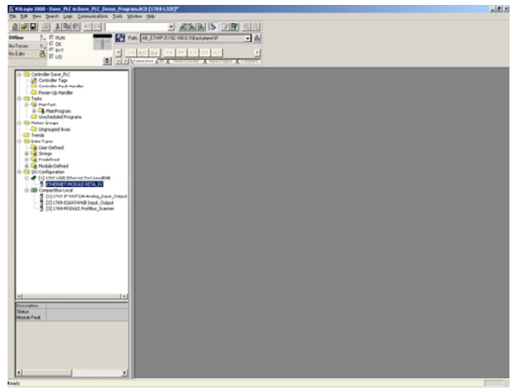


4 Program the following information below. The ex. below is using Input and Output Assembly Instances 102 and 103. Once completed click Finish.



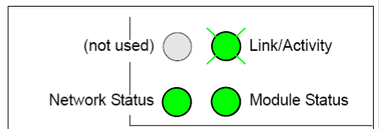
Note 1
Input and Output sizes must match that used in the PS200. Ex. If writing to the Control Word and 1st Reference, and reading the Status Word, Motor Speed, Power, and SmartFlow, the Output size must be 2 and the Input size must be 4.

5 The RETA-01 is now added to the PLC I/O.



Troubleshooting Guidelines

The LED Indicators on the RETA-01 module can assist with troubleshooting communications between the drive and DCS.



Name	Colour	Function
Link/Activity	Green	**Flashing green** - Module is receiving/transmitting on Ethernet **Steady green** - Module has detected link **Off** - Module cannot detect link
Network Status	Red/ Green	**Flashing red** - *EtherNet/IP:* One or more connections timed out; *Modbus/TCP:* No message has been received within configured time **Steady red** - Duplicate IP address **Flashing green** - Waiting for connections **Steady green** - *EtherNet/IP:* At least one EtherNet/IP connection is open against the module (even to the Message router); *Modbus/TCP:* At least one Modbus/TCP connection is open against the module
Module Status	Red/ Green	**Flashing red** - Minor fault (e.g. communication with application lost but recoverable) **Steady red** - Major fault (e.g. bad flash, failed memory test, non-recoverable communication problem with host) **Steady green** - Normal operation

Unable to establish communications between the drive and the DCS (PLC).

Be sure the Module is located in Slot 1 of the PS200.

Check the MAC addressing between the DCS and the drive, specifically the IP and Subnet Mask. If Gateway addressing is used be sure it is correct for the network.

Be sure the Comm Rate and DHCP values are correct for the network. Setting these to "0" and "1" respectively causes the module to automatically determine these two attributes.

Be sure that parameter 31.01 states RETA-01, as this indicates the module is recognized by the drive. If not, check that parameters 30.01 and 30.03 are set for FIELDBUS and CSA2.8/3.0 respectively.

Be sure that you have Refreshed the Fieldbus module anytime after you change parameters in Groups 30 & 31. This is done by initiating a Refresh at parameter 31.27.

Verify the Ethernet cable is OK.

Be sure the DIP switches are in the off position if not using them to set the MAC addressing. Only one switch being in the "on" position will cause the module to look to the DIP switches for the complete MAC address.

"COMM FLT FUNC" Error
Disable the COMM FAULT FUNC (24.19) if you do not want to see a communications loss fault when switching from remote to local. Set up 16.10 for type of local control desired. However, doing so disables any communication loss indication via the keypad display.

Common Errors.

♦ Connection Request Error – Invalid Connection Size
Indicates that the Input and Output sizes defined in the Module Properties box of the RSLogix do not agree with the number of inputs and outputs assigned in group 31 of the PS200.