Ethernet Communication Modules

Ethernet Communications Module

H4-ECOM100 $979.00

Simple connections

Use Category 5 UTP cables or 62.5/125 ST-style fiber optic cables depending on the requirements of your application. Inexpensive UTP cables can be run up to 100 meters between nodes, and fiber optic cables can be run up to 2,000 meters. Fiber optic cables virtually eliminate electrical noise problems. Use repeaters to extend distances and expand the number of nodes.

Specifications	H4-ECOM100
Communications	10/100 Base-T Ethernet
Data Transfer Rate	100 Mbps max.
Link Distance	100m (328ft)
Ethernet Port	RJ45
Ethernet Protocols	TCP/IP, IPX, MODBUS TCP/IP, DHCP, HTML (unsecure) configuration
Embedded Web Server	HTTP (unsecure)
Power Consumption	300 mA @ 5 VDC

Overview

Ethernet Communications Modules offer features such as:

- High-speed peer-to-peer networking of PLCs
- Fast updates with DirectSOFT Programming Software
- High-performance access for Human Machine Interface (HMI), ERP, MES or other Windows-based software
- Industry standard ModbusTCP/IP Client/Server Protocol
- HTML (unsecure) configuration
- Embedded Web Server: HTTP (unsecure)
- Free SDK for custom drivers
- Easy setup

The Ethernet Communication Module (ECOM) supports high-speed peer-to-peer networking of PLCs. No longer are you forced to designate a single PLC to be the network Client. Any PLC can initiate communications with any other PLC. Link your PLCs with PCs using industry standard Modbus TCP/IP protocol connected through standard cables, hubs, and repeaters. Or, use KEPSeverEX* I/O Server to link to your favorite HMI/SCADA, data historian, MES or ERP software to DirectLOGIC PLCs. Our DataWorx data collection software includes ECOM drivers as well. DirectSOFT Programming Software can be used to monitor or update the program in any DirectLOGIC

PLC on the network.

** KEPSeverEX may be purchased from Kepware and will support any existing applications. (https://www.kepware.com/en-us/products/kepserverex)*

H4-ECOM100

The H4-ECOM100 supports the Industry Standard Modbus TCP/IP Client/Server Protocol

H4-ECOM100 IBox communications instructions

Over 40 communications IBox instructions are available when using the H4-ECOM100 with D4-454 CPUs and DirectSOFT6 programming software. These easy-to-use instructions allow you to:

- Enable/disable module DHCP
- Read/write module IP, Gateway and Subnet Mask addresses
- Read/write module ID, Name and Description
- Send E-mail messages
- Read/Write PLC memory to networked Hx-ECOM100 modules

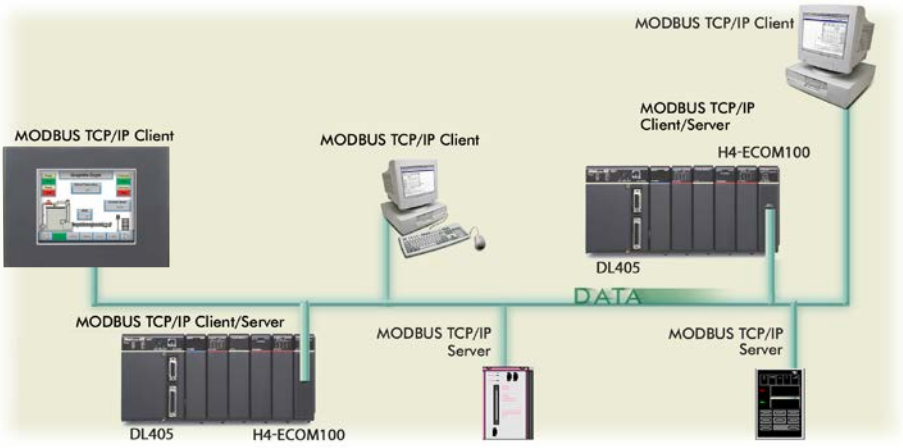
See the following page for example communications IBox instructions.

Ethernet Communication Modules

Modbus TCP/IP support

The H4-ECOM100 supports the industry standard Modbus TCP/IP Client/Server protocol in addition to the standard IP and IPX protocols. This allows the DL405 PLC with an H4-ECOM100 module to serve as a client (Client) or as a server (Server) on a Modbus TCP/IP Ethernet network. The H4-ECOM100 can actively issue Modbus commands to other nodes or devices on the Modbus TCP/IP network or simply respond to connected Modbus TCP/IP clients.

Modbus TCP/IP communications architecture



PLC-to-PLC communications

PLC-to-PLC or PLC to a Modbus TCP/IP device communications can be accomplished using standard Read from Network (RX) and Write to Network (WX) instructions (D4-454, all H4 series ECOMs and all DirectSOFT versions). If you're using our DirectSOFT6 programming software with a D4-454 PLC and an H4-ECOM100, you can use fill-in-the-blank IBox instructions to simplify your communications programming. The H4-ECOM100 supports the ECOM Configuration IBox for use with the ECRX and ECWX IBox instructions to read/write to other ECOMs. H4 series ECOM modules support the NETCFG Configuration IBox for use with the NETRX and NETWX IBox instructions to read/write to other ECOM modules. The communications IBox instructions execute with built-in interlocking to greatly simplify communications programming.

ECOM100 Configuration IBox

ECOM100 Config

ECOM100	IB-710
ECOM100 #	K0
Slot	K1
Status	V400
Workspace	V400
Msg Buffer (65 WORDs)	V400

ECOM100 Read Network IBox

ECOM100 RX Network Read

ECRX	IB-740
ECOM100 #	K0
Workspace	V400
Slave ID	K0
From Slave Element (Src)	C0
Number Of Bytes	K1
To Master Element (Dest)	TA0
Success	C0
Error	C0

NetEdit3 software

NetEdit3 Software is installed with DirectSOFT and it can be downloaded on the AutomationDirect.com website. Use NetEdit3 to configure the ECOM modules for your network. Flexible addressing allows you to use your choice of protocols and identifying methods. Assign each module a number or a name or both. You don't have to use an IP address, but you can if it's necessary for your network. NetEdit3 uses two protocols for PC-to-PLC communications: IPX and TCP/IP. The NetEdit3 screen displays all identifiers and troubleshooting information for each module on the network. You can use NetEdit3 to adjust parameters for PLC-to-PLC communications by clicking on Advanced Settings. The network identifiers can also be changed from DirectSOFT Programming Software.

Choose your slot

The ECOM modules plug into any I/O slot of any local DL405 I/O base. The module maintains identification data, descriptive information, and communication parameters for PLC-to-PLC communications in flash memory. Disconnect power before installing or removing any PLC module.

H4-ECOM100 has e-mail capability!

The H4-ECOM100 Send EMail (ECEMAIL) IBox instruction will allow the module to behave as an e-mail client and send an SMTP request to your SMTP Server to send a specified e-mail message to the e-mail addresses in the IBox's To: field. The Body: field allows you to embed real-time data in your e-mail message. The D4-454 CPUs and DirectSOFT6.1 or later are required to use the IBox instructions.

ECOM100 Send EMail IBox

ECOM100 Send EMail

ECEMAIL	IB-711
ECOM100 #	K0
Workspace	V400
Success	C0
Error	C1
Error Code	V400
To	steve@work.com
Subject	Machine Offline
Body	

"Machine #" V5010:8 "went offline at" _time:24 "on" _date:us

Check the Power Budget

Verify your power budget requirements

Your I/O configuration choice can be affected by the power requirements of the I/O modules you choose. When determining the types and quantity of I/O modules you will be using, it is important to remember there is a limited amount of power available from the power supply.

The chart on the opposite page indicates the power supplied and used by each DL405 device. The adjacent chart shows an example of how to calculate the power used by your particular system. These two charts should make it easy for you to determine if the devices you have chosen fit within the power budget of your system configuration.

If the I/O you have chosen exceeds the maximum power available from the power supply, you can resolve the problem by shifting some of the modules to an expansion base or remote I/O base (if you are using remote I/O).

Warning: It is extremely important to calculate the power budget correctly. If you exceed the power budget, the system may operate in an unpredictable manner which may result in a risk of personal injury or equipment damage.

Use *ZIP*Links to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZipLink AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to Wiring System for DL405 PLCs later in this section for more information.

This logo is placed next to I/O modules that are supported by the ZipLink connection systems.

See the I/O module specifications at the end of this section.

Calculating your power usage

The following example shows how to calculate the power budget for the DL405 system. The example is constructed around a single 8-slot base using the devices shown. It is recommended you construct a similar table for each base in your system.

A				
	Base Number 0	***Device Type***	***5 VDC (mA)***	***External 24 VDC Power (mA)***
B	***CURRENT SUPPLIED***			
	CPU/Expansion Unit /Remote Server	D4-454 CPU	3700	400
C	***CURRENT REQUIRED***			
	SLOT 0	D4-16ND2	+150	+0
	SLOT 1	D4-16ND2	+150	+0
	SLOT 2	F4-04DA-2	+90	+90
	SLOT 3	D4-08NA	+100	+0
	SLOT 4	D4-08NA	+100	+0
	SLOT 5	D4-16TD2	+100	+0
	SLOT 6	D4-16TD2	+100	+0
	SLOT 7	D4-16TR	+1000	+0
D	***OTHER***			
	BASE	D4-08B-1	+80	+0
	Handheld Programmer	D4-HPP-1	+320	+0
E	***Maximum Current Required***		***2190***	***90***
F	***Remaining Current Available***		***3700-2190=1510***	***400-90=310***

1. Using a chart similar to the one above, fill in column 2.
2. Using the tables on the opposite page, enter the current supplied and used by each device (columns 3 and 4). Pay special attention to the current supplied by the CPU, Expansion Unit, and Remote Server since they differ. Devices which fall into the "Other" category (Row D) are devices such as the Base and the Handheld programmer, which also have power requirements, but do not plug directly into the base.
3. Add the current used by the system devices (columns 3 and 4) starting with Slot 0 and put the total in the row labeled "maximum current required" (Row E).
4. Subtract the row labeled "Maximum current required" (Row E), from the row labeled "Current Supplied" (Row B). Place the difference in the row labeled "Remaining Current Available" (Row F).
5. If "Maximum Current Required" is greater than "Current Supplied" in either column 3 or 4, the power budget will be exceeded. It will be unsafe to use this configuration and you will need to restructure your I/O configuration. Note the auxiliary 24 VDC power supply does not need to supply all the external power. If you need more than the 400mA supplied, you can add an external 24 VDC power supply. This will help keep you within your power budget for external power.

DL405 CPU power supply specifications and power requirements

Specification	AC Powered Units	24 VDC Powered Units
Part Numbers	D4-454, D4-EX (expansion base unit), D4-RS (remote Server unit)	D4-454DC-1, D4-EXDC (expansion base unit)
Voltage Withstand (dielectric)	1 minute @ 1,500 VAC between primary, secondary, field ground, and run relay	
Insulation Resistance	> 10 MΩ at 500 VDC	
Input Voltage Range	85–132 VAC (110V range) 170–264 VAC (220V range)	20–28 VDC (24 VDC) with less than 10% ripple
Maximum Inrush Current	20A	20A
Maximum Power	50 VA	38W

Power Requirements

Power Supplied					
CPUs/RemoteUnits/ Expansion Units	***5 VDC Current Supplied in mA***	***24V Aux Power Supplied in mA***	***CPUs/Remote Units/ Expansion Units***	***5V Current Supplied in mA***	***24V Aux Power Supplied in mA***
D4-454 CPU	3100	400	D4-EX	4000	400
D4-454DC-1	3100	NONE	D4-EXDC	4000	NONE
			D4-RS	3700	400
			H4-EBC	3470	400
Power Consumed					
Power-consuming Device	***5V Current Consumed***	***External 24 VDC Current Required***	***Power-consuming Device***	***5V Current Consumed***	***External 24 VDC Current Required***
I/O Bases			***Analog Modules (continued)***		
D4-04B-1	80	NONE	F4-16AD-1	75	100
D4-06B-1	80	NONE	F4-16AD-2	75	100
D4-08B-1	80	NONE	F4-08DA-1	70	75+20 per circuit
DC Input Modules			F4-08DA-2	90	90
			F4-04DAS-1	60	60 per circuit
D4-16ND2	150	NONE	F4-08DA-1	90	100+20 per circuit
D4-16ND2F	150	NONE	F4-08DA-2	80	150
D4-32ND3-1	150	NONE	F4-16DA-1	90	100+20 per circuit
D4-64ND2	300 max.	NONE	F4-16DA-2	80	25 max.
			F4-08RTD	80	NONE
			F4-08THM-J(-n)	120	50
			F4-08THM	110	60
AC Input Modules			***Remote I/O***		
D4-08NA	100	NONE	H4-ERM100	320(300)	NONE
D4-16NA	150	NONE	H4-ERM-F	450	NONE
AC/DC Input Modules			D4-RM	300	NONE
D4-16NE3	150	NONE	***Communications and Networking***		
DC Output Modules			H4-ECOM100	300	NONE
D4-16TD1	200	125	D4-DCM	500	NONE
D4-16TD2	400	NONE	F4-MAS-MB	235	NONE
D4-32TD1	250	140	***CoProcessors***		
D4-32TD2	350	120 (4A max including loads)	F4-CP128-1	305	NONE
D4-64TD1	800	NONE	***Specialty Modules***		
AC Output Modules			H4-CTRIO	400	NONE
D4-08TA	250	NONE	D4-16SIM	150	NONE
D4-16TA	450	NONE	F4-4LTC	280	75
Relay Output Modules			***Programming***		
D4-08TR	550	NONE	D4-HPP-1 (Handheld Prog.)	320	NONE
F4-08TRS-1	575	NONE	***Operator Interface***		
F4-08TRS-2	575	NONE	***C-more*** Micro-Graphic	210	NONE
D4-16TR	1000	NONE			
Analog Modules					
F4-04AD	150	100			
F4-04ADS	370	120			
F4-08AD	75	90			