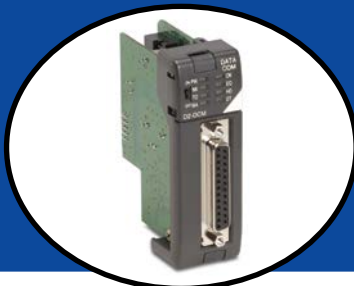# Serial Data Communications Module

DATA COMMUNICATIONS MODULE

D2-DCM $501.00

The D2-DCM Data Communications Module is used primarily for three reasons:

- Extra communications port to connect a PC, operator interface, etc.
- Network interface to **Direct**NET
- Network interface to a Modbus® network using the RTU protocol

Extra communications port

If additional communication ports are needed, they can easily be added by installing DCM modules. This allows additional connections of devices, such as operator interfaces, PCs, etc. Since the DCM does not require any programming, you can set the DCM communication parameters, connect the cables, and start transferring data. Make sure the device has a DL205 compatible driver.

*Direct*NET network interface

The DCM can be used as a network interface for applications requiring data to be shared between PLCs, or between PLCs and an intelligent device such as a host PC. The DCM connects easily to **Direct**NET. This network allows you to upload or download virtually any type of system data including Timer/Counter data, I/O information, and V-memory information from any **Direct**LOGIC or compatible PLC. The DCM allows the DL205 to function as a network Client or network Server.
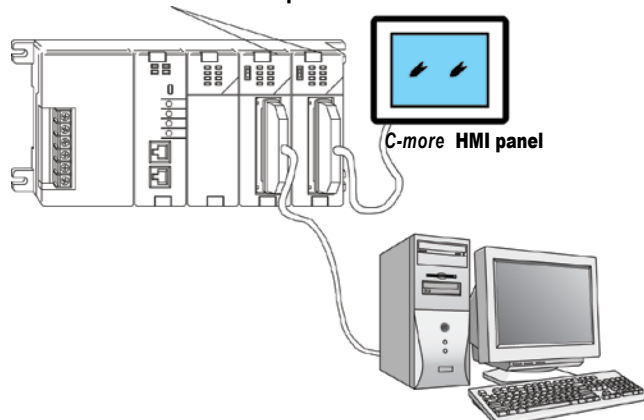
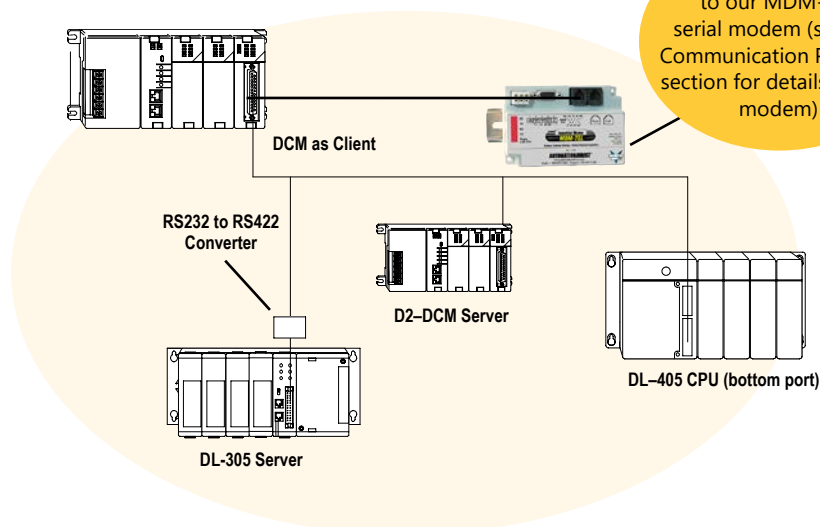| Specifications	
Module Type	Intelligent
Modules per CPU	7 maximum, any slot except slot 0, CPU base only
	D2-262
Communications	RS-232/422 signal levels, **Direct**NET Client/Server, K-sequence or Modbus RTU Server protocol, Baud rate selectable from 300 baud to 38.4 Kbaud, Odd or No parity, **Direct**NET HEX or ASCII mode
Recommended Cable	Belden 9729 or equivalent (for RS-422)
Field Wiring Connector	25-pin D-shell connector
Internal Power Consumption	300mA maximum at 5VDC, (supplied by base power supply)
Operating Environment	0ºC to 60ºC (32ºF to 140ºF), 5% to 95% humidity (non-condensing)
Manufacturer	Koyo Electronics

Modbus RTU interface

The DCM can be used as a Server station interface to connect your DL205 system to a Modbus® network using the Modbus RTU protocol. The host system must be capable of issuing the Modbus commands to read or write the appropriate data. Remember that the bottom port on the D2-262 CPU can act as a Modbus Client.

DCM as additional serial port

C-more HMI panel

Client/Server Network

DCM as Client

RS232 to RS422 Converter

D2–DCM Server

DL–405 CPU (bottom port)

DL-305 Server

Connect the DCM to our MDM-TEL serial modem (see the Communication Products section for details on the modem)

Serial Module for EBC Systems

SERIAL COMMUNICATIONS MODULE FOR EBCs

H2-SERIO $252.00

H2-SERIO-4 $252.00

H2-SERIO / H2-SERIO-4 Specifications		
	H2-SERIO	*H2-SERIO-4*
Module Type	Intelligent module for use with H2-DM1, H2-DM1E or H2-EBC100 with PC application	
Approvals	cUL Listed, file number E185989	
Number of Serial Ports per Module	3 ports: all RS-232 (RJ12 jack)	3 ports: 2 RS-232 ports (RJ12 jack) and 1 RS-422/485 (5 position terminal strip)
Signals	RS-232: CTS, RXD, TXD RTS, GND RTS transmision delay times: 5, 50, 250 and 500 ms	RS-232: CTS, RXD, TXD RTS, GND RTS transmission delay times: 5, 50, 250 and 500 ms
		RS-422 (4 wire) : TX+, TX-, RX-, RX+, GND RS-485 (2 wire): Data+, Data-, GND
Number of Modules Supported	8 per H2-DM1, H2-DM1E or H2-EBC100	
Recommended Cables	Belden 9729 or equivalent	RS-232 ports: Belden 9729 or equivalent RS-422/RS-485 terminal: 16-28 AWG solid or stranded conductor (1.5 mm^2) Wire strip length: 0.24-0.27 inches (6-7 mm); Screw torque: 1.7 in·lbs (0.2 N·m)
Protocols Supported	Serial ASCII (full-duplex) and Modbus RTU Server	
Power Consumption	80mA @ 5VDC	
Baud Rates	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200	
Parity	None, odd, even	
Start and Stop Bits	1, 2	
Operating Environment	0 to 60°C (32°F to 140°F), 5% to 95% RH (non-condensing); No corrosive gases, Pollution level 2; Vibration: MIL STD 810C 514.2; Shock: MIL STD 810C 516.2	
Storage Temperature	-20 to 70°C (-4°F to 158°F)	
Firmware Note	The H2-EBC100 requires firmware version v2.1383 or later to support the H2-SERIO or H2-SERIO-4.	

H2-SERIO

H2-SERIO-4

Serial I/O modules for PC-based control

Add serial ports to your EBC-based rack system by simply plugging the H2-SERIO or H2-SERIO-4 modules into the DL205 I/O base.

The H2-SERIO module has three RS-232C ports, while the H2-SERIO-4 module has two RS-232C ports and one RS-422/485port.

Processing large amounts of serial data

While the H2-SERIO(-4) module will support virtually any serial device, processing large amounts of serial data will increase the system response time. This is important to consider when using multiple H2-SERIO(-4) modules.

Serial Modules for EBC Systems

Separate communications parameters for each port

Use the Do-More software package to set baud rate, parity, data bits, and stop bits for each serial port. Choose from 300 baud to 57.6K baud communication speeds. Do-More allows each port to be designated as a Modbus Server or a generic serial device. Each port on the H2–SERIO(-4) module is capable of full hardware handshaking.
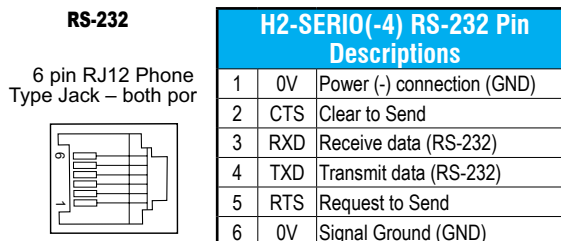
Easy serial communications

Do-More software includes advanced string and array functions that make transmitting, receiving and manipulating serial data a snap.

Using H2-SERIO(-4) in an EBC system

Do-More versions 2.3 and later support the use of up to eight H2-SERIO(-4) modules per EBC node in a PC-based control system. The Client must be a CPU running Do-More v2.3 or later.

H2-SERIO(-4) Wiring: RS-232

RS-232

6 pin RJ12 Phone Type Jack – both por

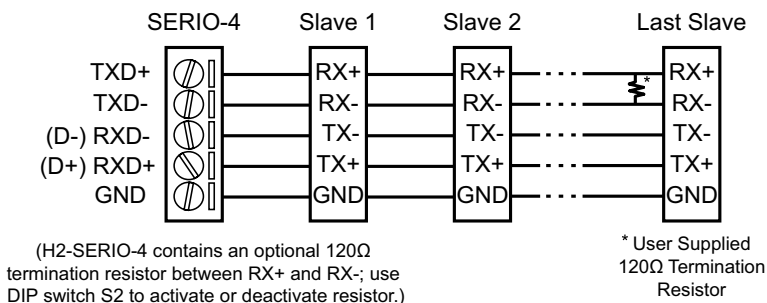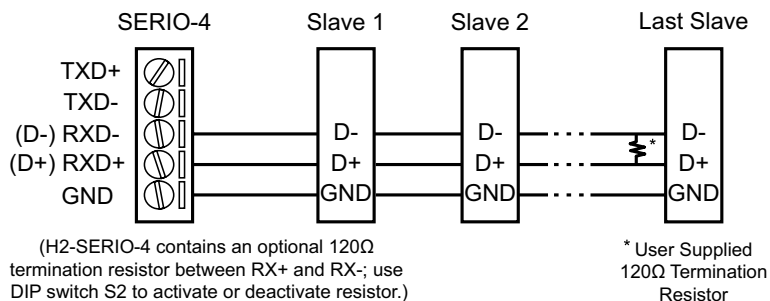| H2-SERIO(-4) RS-232 Pin Descriptions		
1	0V	Power (-) connection (GND)
2	CTS	Clear to Send
3	RXD	Receive data (RS-232)
4	TXD	Transmit data (RS-232)
5	RTS	Request to Send
6	0V	Signal Ground (GND)

H2-SERIO-4 Wiring: RS-422/485

Set DIP switch S2 on the H2-SERIO-4 to:
1. Activate or deactivate the internal 120Ω termination resistor.
2. Select RS-422 or RS-485 operation.

RS-422

(H2-SERIO-4 contains an optional 120Ω termination resistor between RX+ and RX-; use DIP switch S2 to activate or deactivate resistor.)

* User Supplied 120Ω Termination Resistor

RS-485

(H2-SERIO-4 contains an optional 120Ω termination resistor between RX+ and RX-; use DIP switch S2 to activate or deactivate resistor.)

* User Supplied 120Ω Termination Resistor

Ethernet Communications Modules

ETHERNET COMMUNICATIONS MODULE

H2-ECOM100 $423.00

Overview

Ethernet Communications Modules offer features such as:

- High-speed peer-to-peer networking of PLCs
- Fast updates with **Direct**SOFT Programming Software
- High-performance access for Human Machine Interface (HMI), ERP, MES or other Windows-based software
- Industry standard Modbus TCP Client/ Server Protocol (H2-ECOM100)
- Embedded Web Server: HTTP(Unsecure)
- Ethernet Protocols: HTML (Unsecure) configuration
- Free SDK for custom drivers
- Easy setup

The Ethernet Communication (ECOM) Modules represent a price breakthrough for 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 protocol connected through standard cables, hubs, and repeaters. Or, use KEPServerEX* I/O Server to link to your favorite HMI/SCADA, data historian, MES or ERP software to **Direct**LOGIC PLCs. DirectSOFT Programming Software can be used to monitor or update the program in any DirectLOGIC PLC on the network.

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

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. Distances can be greatly extended with Ethernet/ Fiber media converters like the SE-MC2U-ST. Fiber optic cables virtually eliminate electrical noise problems. Use repeaters to extend distances and expand the number of nodes.

Stride Ethernet switches are compatible with the ECOM modules. See the Communications Products section for information on these items.

Message in from a device

Message is sent out of port only connected to device

See the Communications section for details on Ethernet Switches

H2-ECOM100 *IBox* communications instructions

Over 40 Communications IBox instructions are available when using the H2-ECOM100 with a D2-250-1 or D2-262 PLC 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
- Read/Write PLC memory to networked Hx-ECOM modules

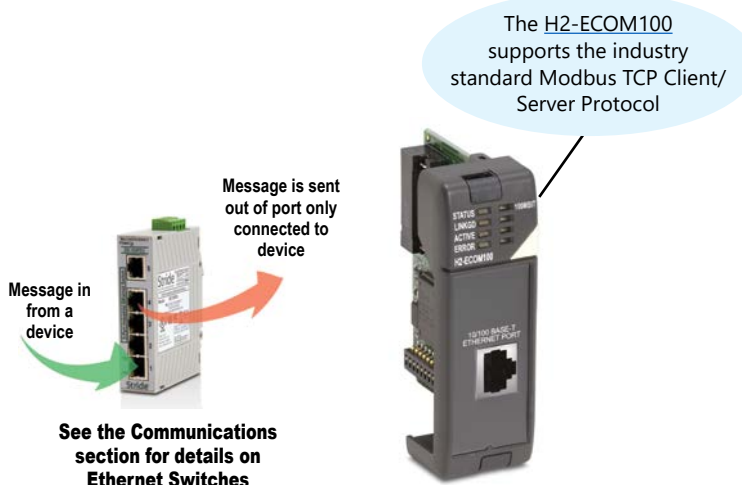See the following page for example Communications IBox instructions.

The H2-ECOM100 supports the industry standard Modbus TCP Client/ Server Protocol

Specifications	H2-ECOM100
Communications	10/100Base-T Ethernet
Data Transfer Rate	100 Mbps max.
Link Distance	100 meters (328ft)
Ethernet Port	RJ45
Ethernet Protocols	TCP/IP, IPX, Modbus TCP, DHCP, HTML (unsecure)configuration, Embedded Web Server: HTTP(unsecured) configuration
Power Consumption	300mA @ 5VDC
Manufacturer	Host Automation Products, L.L.C.

Ethernet Communications Modules

Modbus TCP support

The H2-ECOM100 supports the industry standard Modbus TCP Client/Server protocol in addition to the standard IP and IPX protocols. This allows the DL205 PLC with an H2-ECOM100 module to serve as a client (Client) or as a server (Server) on a Modbus TCP Ethernet network. The H2-ECOM100 can actively issue Modbus commands to other nodes or devices on the Modbus TCP network or simply respond to connected Modbus TCP clients.

Modbus TCP communications architecture
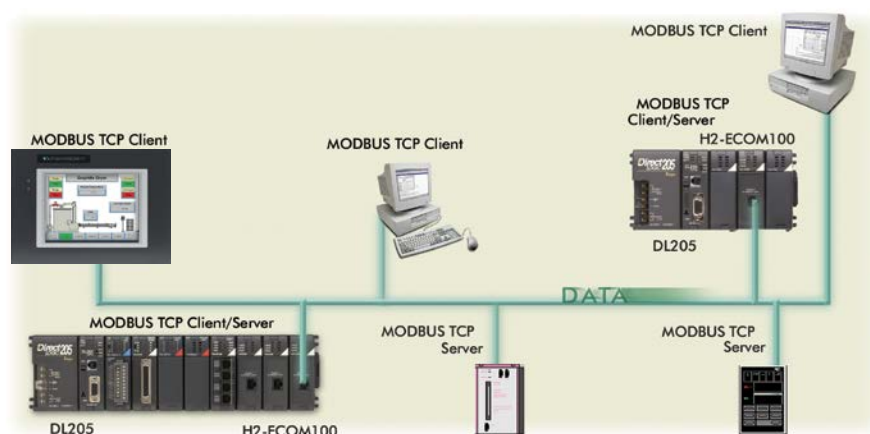
PLC-to-PLC communications

PLC-to-PLC or PLC to a Modbus TCP device communications can be accomplished using standard Read from Network (RX) and Write to Network (WX) instructions (H2-ECOM100, all H2 series ECOMs and all DirectSOFT versions). If you're using DirectSOFT programming software, a D2-262 PLC and an H2-ECOM100, you can use fill-in-the-blank IBox instructions to simplify your communications programming. The H2-ECOM100 supports the ECOM100 Configuration IBox for use with the ECRX and ECWX IBox instructions to read/write to other ECOM(100)s. All H2 series ECOM modules support the NETCFG Configuration IBox for use with the NETRX and NETWX IBox instructions to read/write to other ECOM modules (remember D2-262 and a supporting version of DirectSOFT is required). 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	

H2-ECOM100 has e-mail capability!

The H2-ECOM100 Send EMail (ECEMAIL) IBox instruction allows 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 in IBox's To: field. The Body: field allows you to embed real-time data in your e-mail message. The D2-262 CPU and a supporting version of DirectSOFT is 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:B "went offline at" _time:24 "on" _date:us

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. 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 (excluding slot 0) of any local DL205 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.
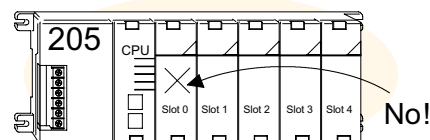
Note: Use D2-262 CPU with the ECOM modules. The D2-CM bases do not support the ECOM modules.