DL05/06 Data Communications Module

DATA COMMUNICATIONS MODULE

D0-DCM $262.00

Specifications

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Module Type	Intelligent
Modules per CPU	DL05: one; DL06: up to four
Field Wiring Connectors	Port 1: 6-pin RJ12 RS-232 Port 2: 15-pin HD-sub connector RS-232, RS-422/485
Communications Port 1	RS-232 signal levels, DirectNET Server, K-sequence Server, Modbus RTU Server, protocols, baud rate selectable from 9.6K to 115.2K baud, odd or no parity, selectable address, 8 data bits, one start/stop bit, DirectNET HEX or ASCII mode. (Defaults: Server, 9600 bps, odd parity, address 1, auto-detect protocols)
Port 2	RS-232/422/485 signal levels, DirectNET Client/Server, K-sequence Server, Modbus RTU Client/Server, non-sequence ASCII protocols, baud rate selectable from 300 to 115.2K baud, odd/even/no parity, selectable address, 7 or 8 data bits, one start bit, 1 or 2 stop bits, selectable timeout/response-delay times, DirectNET HEX or ASCII mode. (Defaults: Server, 19200 bps, odd parity, address 1, eight data bits, one stop bit, auto-detect protocols)
Recommended Cable	RS-422: Belden 9729 or equivalent; RS-485: Belden 9841 or equivalent
Internal Power Consumption	250mA maximum at 5VDC (supplied by base)
Operating Environment	0ºC to 60ºC (32ºF to 140ºF), 5% to 95% humidity (non-condensing)
Manufacturer	Koyo Electronics

CPU	Firmware Required	DirectSOFT Required
DL05	**Version 5.00 or later**	**Version 3.0c or later**
DL06	Version 1.90 or later	Version 4.0, Build 16 or later. ASCII functions require version 5.1 or higher.

Overview

The D0-DCM Data Communications Module offers two communication ports for a variety of simultaneous communications possibilities:
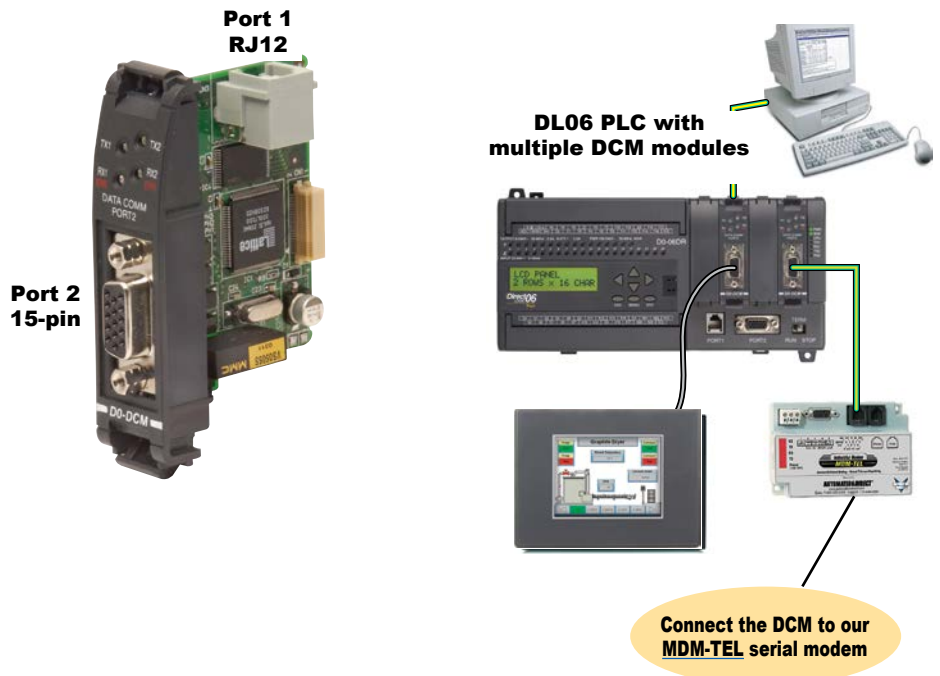
- Extra communications port to connect a PC, operator interface, etc.
- Network interface to DirectNET
- Network interface to a Modbus network using the RTU protocol

The top RJ12 RS-232 port (Port 1) can be used for PLC programming, connection to an OI panel or as a single K-sequence, DirectNet or Modbus RTU Server. The 15-pin front port (Port 2) can be used for RS-232/422/485 communications and supports the following protocols: K-sequence Server, DirectNET Client/Server and Modbus RTU Client/Server.

Module Configuration

Since the D0-DCM does not have DIP switches to set baud rate, station address, parity, etc., ladder logic programming is required to configure its communication parameters, unless the default settings are acceptable for your application. If the D0-DCM is to be used as a network Client, you must use ladder logic code to configure these parameters.

Port 1 RJ12

Port 2 15-pin

DL06 PLC with multiple DCM modules

Connect the DCM to our MDM-TEL serial modem

Extra communications ports for DL05/06

If additional communication ports are needed in the PLC, they can easily be added by installing DCM modules. Connect additional devices such as operator interfaces, PCs, etc. Set the DCM communication parameters using DirectSOFT programming software, connect the cables, and start transferring data. Make sure the connected device has a DL05/06 compatible driver.
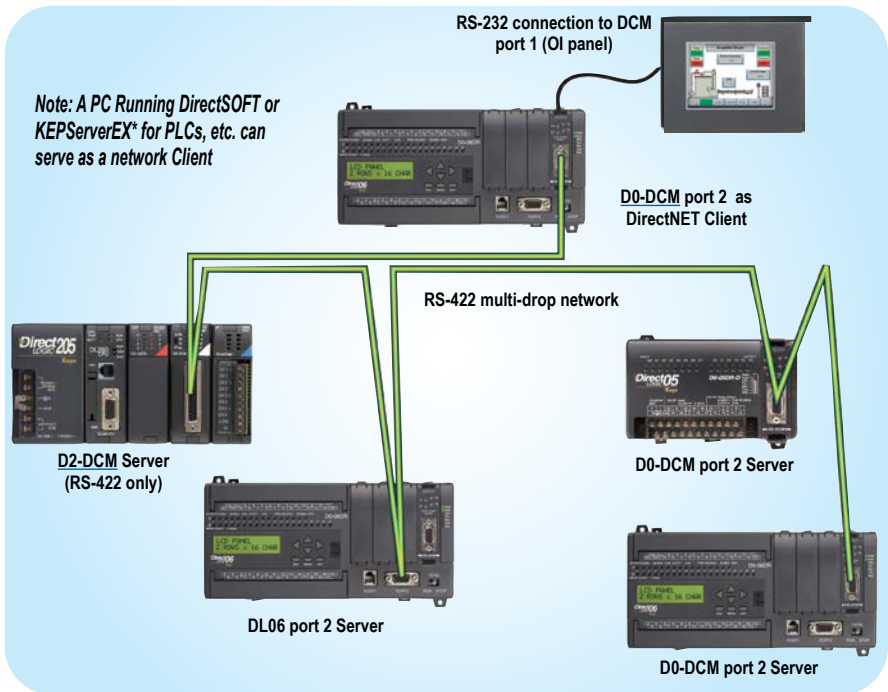
DL05/06 Data Communications Module

DirectNET 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. DirectNET 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 DirectLOGIC or compatible PLC. Port 2 on the DCM allows the DL05/06 to function as a DirectNET network Client or Server using RS-422 communications (RS-232 can be used for single Server networks). Use RX and WX instructions in your RLL program to initiate communications.

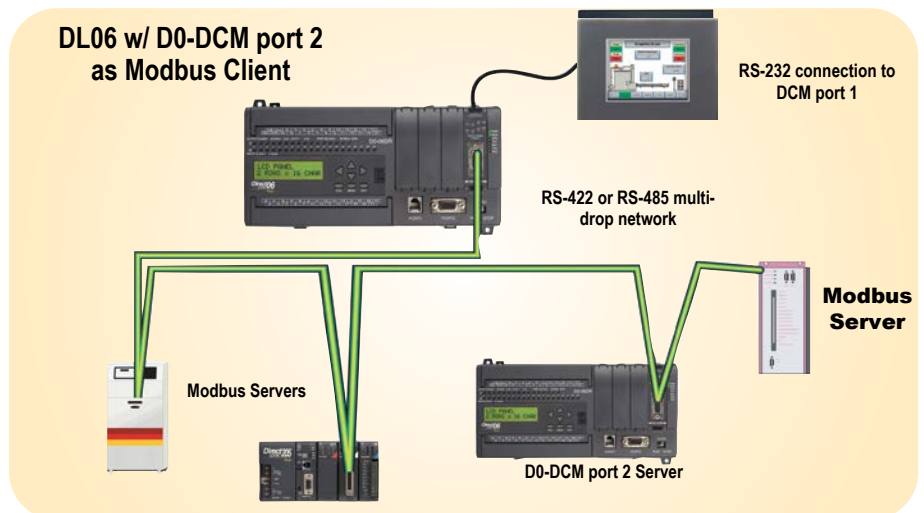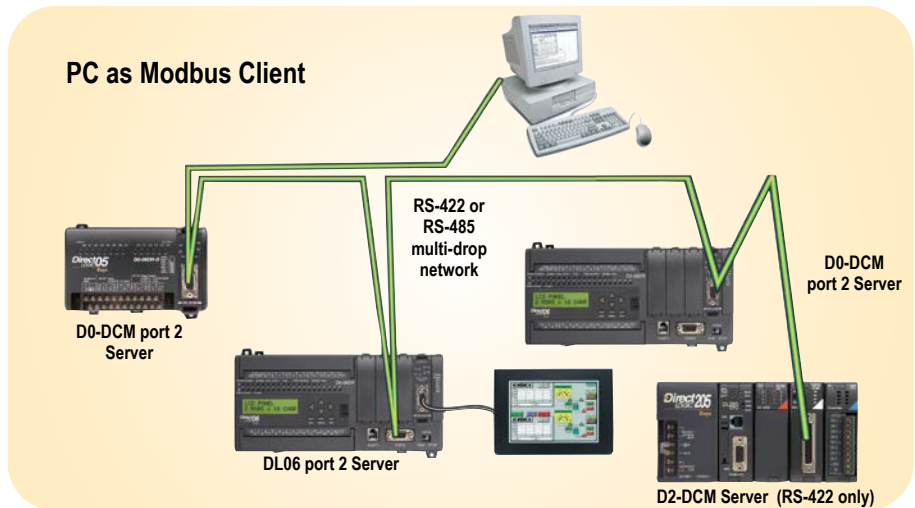** KEPSeverEX may be purchased from Kepware and will support any existing applications. (https://www.kepware.com/en-us/products/kepserverex)*

DirectNET network

Note: A PC Running DirectSOFT or KEPServerEX* for PLCs, etc. can serve as a network Client

RS-232 connection to DCM port 1 (OI panel)

D0-DCM port 2 as DirectNET Client

RS-422 multi-drop network

D2-DCM Server (RS-422 only)

D0-DCM port 2 Server

DL06 port 2 Server

D0-DCM port 2 Server

D0-DCM port 2 Server

Modbus RTU interface

The DCM can be used as a Client or Server station interface to connect your DL05/06 system to a Modbus® network using the Modbus RTU protocol. Port 2 on the DCM allows the DL05/06 to function as a Modbus RTU network Client or Server using RS-422 or RS-485 communications (RS-232 can be used for single Server networks). Use RX and WX instructions in your RLL program to initiate communications.

Modbus RTU networks

PC as Modbus Client

RS-422 or RS-485 multi-drop network

D0-DCM port 2 Server

D0-DCM port 2 Server

DL06 port 2 Server

D2-DCM Server (RS-422 only)

DL06 w/ D0-DCM port 2 as Modbus Client

RS-232 connection to DCM port 1

RS-422 or RS-485 multi-drop network

Modbus Server

Modbus Servers

D0-DCM port 2 Server

Power Budgeting for the DL06

The DL06 has four option module slots. To determine whether the combination of modules you select will have sufficient power, you will need to perform a power budget calculation.

Power supplied

Power is supplied from two sources: the internal base unit power supply and, if required, an external supply (customer furnished). The D0-06xx (AC powered) PLCs supply a limited amount of 24VDC power. The 24VDC output can be used to power external devices.

For power budgeting, start by considering the power supplied by the base unit. All DL06 PLCs supply the same amount of 5VDC power. Only the AC units offer 24VDC auxiliary power.

Be aware of the trade-off between 5VDC power and 24VDC power. The amount of 5 VDC power available depends on the amount of 24VDC power being used, and the amount of 24VDC power available depends on the amount of 5VDC power consumed. Determine the amount of internally supplied power from the table to the right.

Power required by base unit

Because of the different I/O configurations available in the DL06 family, the power consumed by the base unit itself varies from model to model. Subtract the amount of power required by the base unit from the amount of power supplied by the base unit. Be sure to subtract 5VDC and 24VDC amounts.

Power required by option modules

Next, subtract the amount of power required by the option modules you are planning to use. Again, remember to subtract both 5VDC and 24VDC.

If your power budget analysis shows surplus power available, you should have a workable configuration.

DL06 Power Supplied by Base Units

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06xx	1500mA	300mA
	2000mA	200mA
D0-06xx-D	1500mA	none

DL06 Base Unit Power Required

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06AA	800mA	none
D0-06AR	900mA	none
D0-06DA	800mA	none
D0-06DD1	600mA	280mA*
D0-06DD2	600mA	none
D0-06DR	950mA	none
D0-06DD1-D	600mA	none
D0-06DD2-D	600mA	none
D0-06DR-D	950mA	none

* Only if auxiliary 24VDC power is connected to V+ terminal.

DL06 Power Consumed by Other Devices

Part Number	5 VDC (mA)	24 VDC (mA)
D0-06LCD	50mA	none
D2-HPP	200mA	none
DV-1000	150mA	none
C-more Micro-Graphic	210mA	none

Power Budgeting Example

Power Source	5VDC power (mA)		24VDC power (mA)
D0-06DD1 (select row A or B)	A	1500mA	300mA
	B	2000mA	200mA
Current Required		5VDC power (mA)	24VDC power (mA)
D0-06DD1		600mA	280mA*
D0-16ND3		35mA	0
D0-10TD1		150mA	0
D0-08TR		280mA	0
F0-4AD2DA-1		100mA	0
D0-06LCD		50mA	0
Total Used		1215mA	280mA
Remaining	A	285mA	20mA
	B	785mA	note 1

* Auxiliary 24 VDC used to power V+ terminal of D0-06DD1 sinking outputs.

Note 1: If the PLC's auxiliary 24 VDC power source is used to power the sinking outputs, use power choice A, above.

DL05/06 Power Consumed by Option Modules

Part Number	5 VDC (mA)	24 VDC (mA)
D0-07CDR	130mA	none
D0-08CDD1	100mA	none
D0-08TR	280mA	none
D0-10ND3	35mA	none
D0-10ND3F	35mA	none
D0-10TD1	150mA	none
D0-10TD2	150mA	none
D0-16ND3	35mA	none
D0-16TD1	200mA	none
D0-16TD2	200mA	none
F0-04TRS	250mA	none
F0-08NA-1	5mA	none
F0-04AD-1	50mA	none
F0-04AD-2	75mA	none
F0-08ADH-1	25mA	25mA
F0-08ADH-2	25mA	25mA
F0-04DAH-1	25mA	150mA
F0-08DAH-1	25mA	220mA
F0-04DAH-2	25mA	30mA
F0-08DAH-2	25mA	30mA
F0-2AD2DA-2	50mA	30mA
F0-4AD2DA-1	100mA	40mA
F0-4AD2DA-2	100mA	none
F0-04RTD	70mA	none
F0-04THM	30mA	none
D0-DEVNETS	45mA	none
H0-CTRIO2	250mA	none
H0-ECOM100	300mA	none
F0-08SIM	1mA	none
D0-DCM	250 mA	none
F0-CP128	150 mA	none
F0-08SIM	1 mA	none