

PLC COMMUNICATIONS



In this Chapter...

Introduction.....	6-2
Available PLC Protocols.....	6-3
Maximum Connected PLC Nodes.....	6-4
C-more Micro Communication Ports.....	6-5
Cables from <i>AutomationDirect</i> – Wiring Diagrams	6-9
User Constructed Cables – Wiring Diagrams	6-17
RS-422A Multi-Drop Wiring Diagram Example	6-28
RS-485A Multi-Drop Wiring Diagram Example	6-30

Introduction

The **C-more®** Micro panels are capable of communicating with AutomationDirect Productivity Series, Do-more, BRX, CLICK, SOLO, GS Drives and the entire **DirectLOGIC** family of PLCs. The panel is capable of communicating using RS232 on the RJ12 Port1 and RS232, RS422 or RS485 on Port2. The EA3-S3ML and EA3-4TCL have a built-in Ethernet RJ45 port capable of communicating with all AutomationDirect PLC's and Modbus slave devices. Adding the optional EA-ECOM module to the EA3 series 6, 8 and 10-inch models also allows communications via an Ethernet connection with a Cat5e cable.

Cable Description	Cable Part No.	Cable Description	Cable Part No.
Cables used with RJ12 RS-232 serial Port1			
AutomationDirect Productivity Series, Do-more / BRX*, CLICK, DirectLOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450, D4-454 & H2-WinPLC (RS-232C). 3.66m (12ft) cable length	DV-1000CBL	AutomationDirect Productivity Series, Do-more / BRX*, CLICK, DirectLOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450, D4-454 & H2-WinPLC (RS-232C) 3m (9.8 ft) cable length	EA-2CBL
DirectLOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C). Use with D0-CBL cable.	FA-15HD	DirectLOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) 3m (9.8 ft) cable length	EA-2CBL-1
DirectLOGIC PLC 15-pin D-sub port, DL405 (RS-232C). Use with D0-CBL cable.	FA-CABKIT	DirectLOGIC PLC RJ-11 port, D3-340 (RS-232C) 3m (9.8 ft) cable length	EA-3CBL
DirectLOGIC PLC RJ-11 port, D3-340 (RS-232C) 2m (6.56 ft) cable length	OP-3CBL-1	DirectLOGIC PLC 15-pin D-sub port, DL405 (RS-232C) 3m (9.8 ft) cable length	EA-4CBL-1
* BX-P-SER2-RJ12 is required			
Cables used with 15-pin RS-232/422/485 serial Port2			
Allen-Bradley MicroLogix 1000, 1100, 1200, 1400 & 1500 (RS-232C) 3m (9.8 ft) cable length		Allen-Bradley MicroLogix 1000, 1100, 1200, 1400 & 1500 (RS-232C) 3m (9.8 ft) cable length	EA-MLOGIX-CBL
Allen-Bradley SLC 5-03/04/05, ControllLogix, CompactLogix, FlexLogix DF1 port (RS-232C) 3m (9.8 ft) cable length		Allen-Bradley SLC 5-03/04/05, ControllLogix, CompactLogix, FlexLogix DF1 port (RS-232C) 3m (9.8 ft) cable length	EA-SLC-232-CBL
Allen-Bradley PLC-5 DF1 port (RS-232C) 3m (9.8 ft) cable length		Allen-Bradley PLC-5 DF1 port (RS-232C) 3m (9.8 ft) cable length	EA-PLC5-232-CBL
Allen-Bradley SLC 5-01/02/03 DH485 port 3m (9.8 ft) cable length		Allen-Bradley SLC 5-01/02/03 DH485 port 3m (9.8 ft) cable length	EA-DH485-CBL
GE 90/30, 90/70, Micro 90, Versamax Micro (Port2) 15-pin D-sub port (RS-422A) 3m (9.8 ft) cable length		GE 90/30, 90/70, Micro 90, Versamax Micro (Port2) 15-pin D-sub port (RS-422A) 3m (9.8 ft) cable length	EA-90-30-CBL
MITSUBISHI FX Series 25-pin port (RS-422A) 3m (9.8 ft) cable length		MITSUBISHI FX Series 25-pin port (RS-422A) 3m (9.8 ft) cable length	EA-MITSU-CBL
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A) 3m (9.8 ft) cable length		MITSUBISHI FX Series 8-pin mini-DIN (RS-422A) 3m (9.8 ft) cable length	EA-MITSU-CBL-1
OMRON Host Link (C200 Adapter, C500) (RS-232C) 3m (9.8 ft) cable length		OMRON Host Link (C200 Adapter, C500) (RS-232C) 3m (9.8 ft) cable length	EA-OMRON-CBL
* BX-P-SER2-RJ12 is required			

Introduction (cont'd)

Available PLC Protocols

PLC Drivers		
Serial - port1 or port2	Serial - port2 only	Ethernet*
AutomationDirect Productivity Series	Allen-Bradley DF1 Half Duplex	AutomationDirect Productivity Series Ethernet
	Allen-Bradley DF1 Full Duplex	
AutomationDirect Do-more / BRX**	Allen-Bradley PLC5 DF1	AutomationDirect Do-more / BRX Ethernet
AutomationDirect CLICK	Allen-Bradley DH485	AutomationDirect CLICK Ethernet
AutomationDirect K-sequence	GE SNPX (90/30, 90/70, Micro 90, VersaMax Micro)	AutomationDirect ECOM Ethernet
AutomationDirect DirectNET	Mitsubishi FX	Modbus TCP/IP
AutomationDirect Modbus (master only)	Mitsubishi Q & QnA	Allen-Bradley EtherNet / IP Client (MicroLogix 1100/1400)
Modicon Modbus RTU (master only)	Omron Host Link (C200 Adapter, C500)	
Entivity Modbus RTU (master only)	Omron FINS Serial (CJ1, CS1)	Allen-Bradley EtherNet / IP Client (SLC5 / 05 / ENI Adapter)
	Siemens PPI (S7-200 CPU)	
AutomationDirect SOLO Temperature Controller		
AutomationDirect GS Drives		

* Ethernet port is built in on EA3-S3ML and EA3-T4CL. Add an Ethernet port to EA3-T6CL, EA3-T8CL and EA3-T10CL with an optional EA-ECOM module. Ethernet communications require external power supply.

** BX-P-SER2-RJ12 is required

The panel can also be connected to more than one PLC by using RS-422, RS-485 or Ethernet connected in a multi-drop configuration. See the example wiring diagrams at the end of this chapter for details.

If you have difficulty determining whether the particular PLC and/or protocol you are using will work with **C-more** Micro panels, please contact our technical support group at 770-844-4200.

Introduction (cont'd)

Maximum Connected PLC Nodes



NOTE: The maximum number of protocols that can be used on the C-more Micro is four but depends on the connection; serial or Ethernet.

Serial

If connected serially, only one PLC protocol can be used. Up to 32 PLC's can be connected

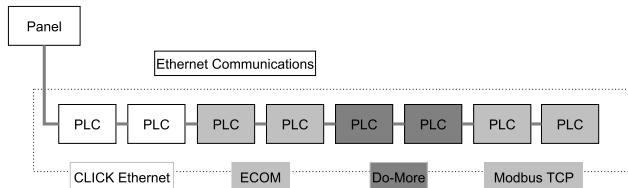
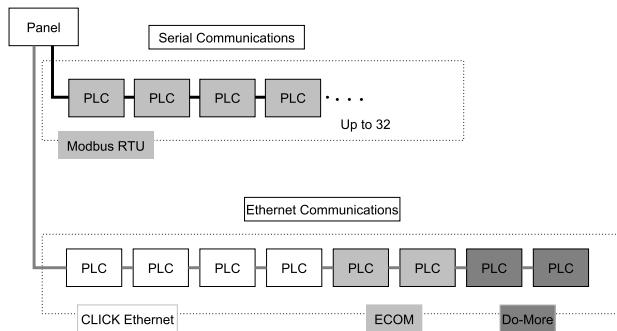
Ethernet

If connected over Ethernet, 4 PLC Protocols can be used. Up to 8 PLC's can be connected to the Ethernet network.

6

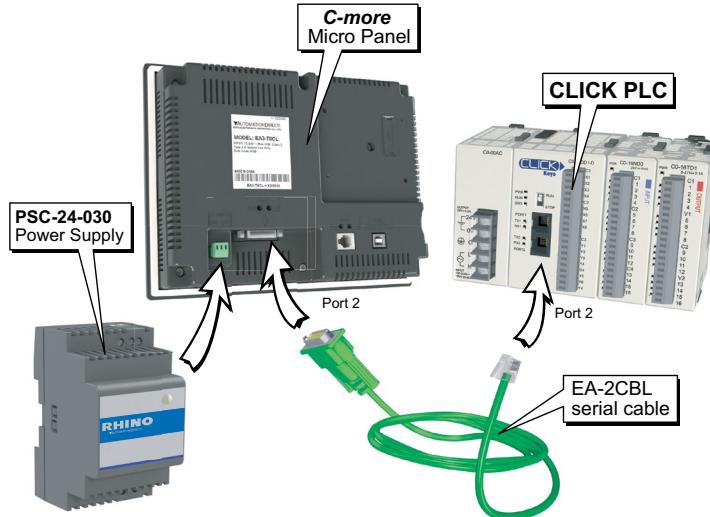
Maximum PLC Connections		
Connection Type	Protocols	PLC Nodes
Serial	1	32
with EA-ECOM	4	32 serial 8 Ethernet

Examples:

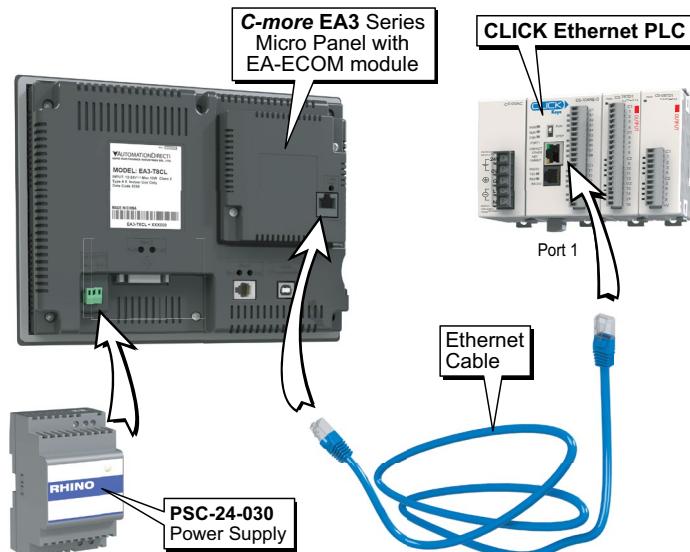


C-more Micro Communication Ports

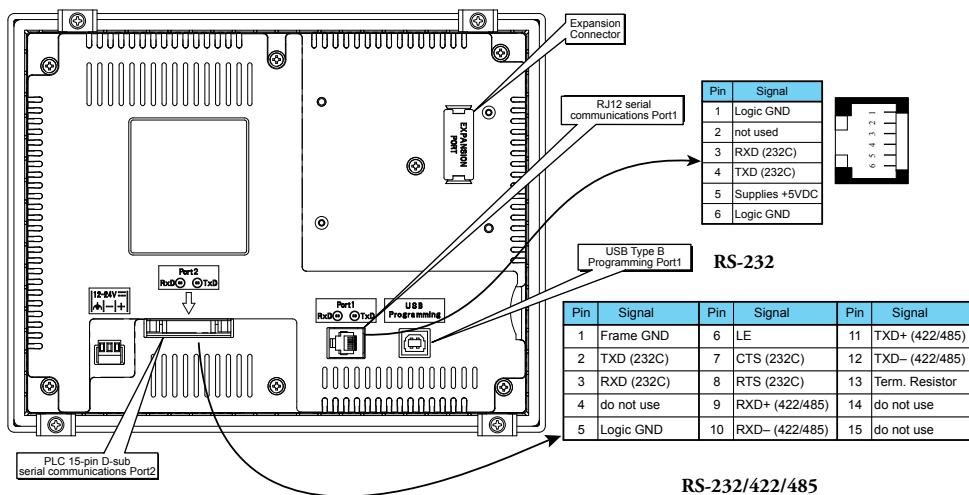
Serial connection to a CLICK PLC example



Ethernet connection to a CLICK PLC example



C-more Micro Communication Ports (cont'd)



DirectLOGIC PLCs Password Protection



NOTE: DirectLOGIC PLCs support multi-level password protection of the ladder program. This allows password protection while not locking the communication port to an operator interface. The multilevel password can be invoked by creating a password with an upper case "A" followed by any variation of seven numeric characters (e.g. A1234567). Please refer to the specific PLC user manual for further details.

Cables from AutomationDirect



Part No. DV-1000CBL



Part No. OP-3CBL-1



Part No. FA-15HD



Part No. EA-2CBL



Part No. EA-2CBL-1



Part No. FA-CABKIT



Part No. EA-4CBL-1



Part No. EA-4CBL-2



Part No. EA-3CBL

Cables from *AutomationDirect* (cont'd)



Part No. EA-MLOGIX-CBL



Part No. EA-SLC-232-CBL



Part No. EA-PLC5-232-CBL



Part No. EA-DH485-CBL



Part No. EA-90-30-CBL



Part No. EA-MITSU-CBL



Part No. EA-MITSU-CBL-1



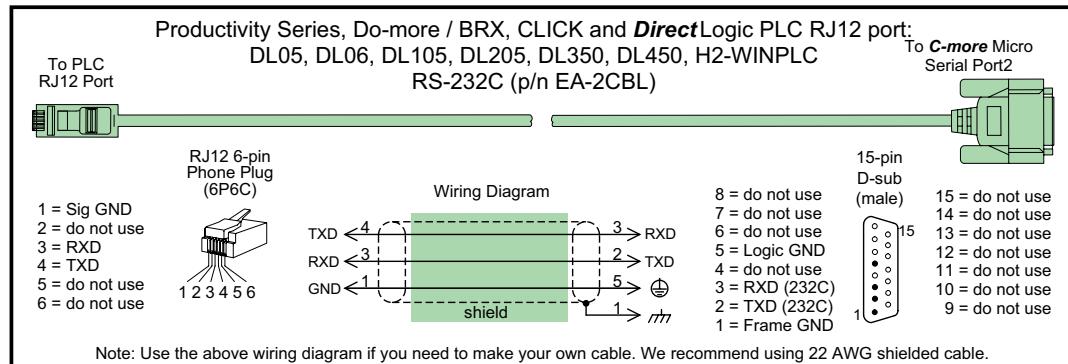
Part No. EA-OMRON-CBL

Cables from AutomationDirect - Wiring Diagrams

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** Micro panels and various PLCs. Part numbers are included with the pre-made cables that can be purchased from **AutomationDirect**. The information presented will allow the user to construct their own cables if so desired.

CLICK and DirectLOGIC:

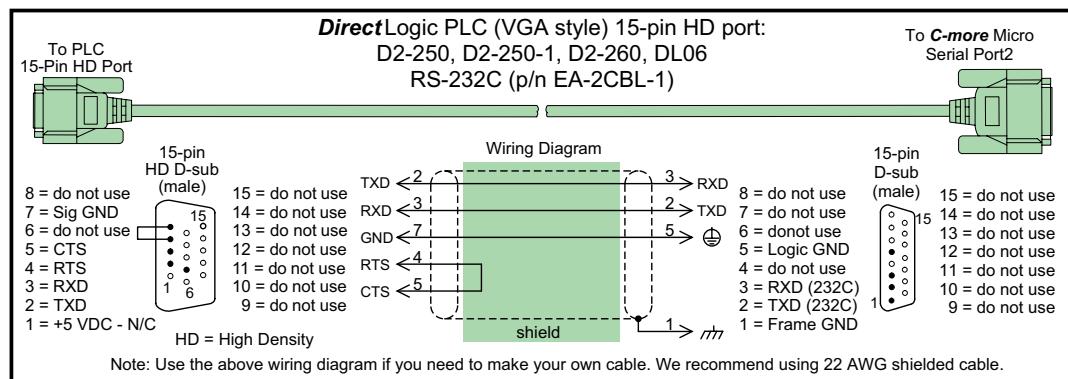
EA-2CBL



6

DirectLOGIC:

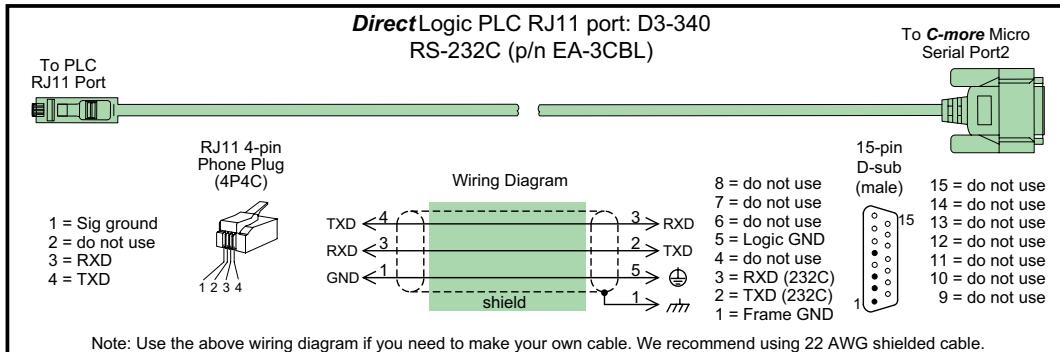
EA-2CBL-1



Cables from AutomationDirect – Wiring Diagrams (cont'd)

DirectLOGIC:

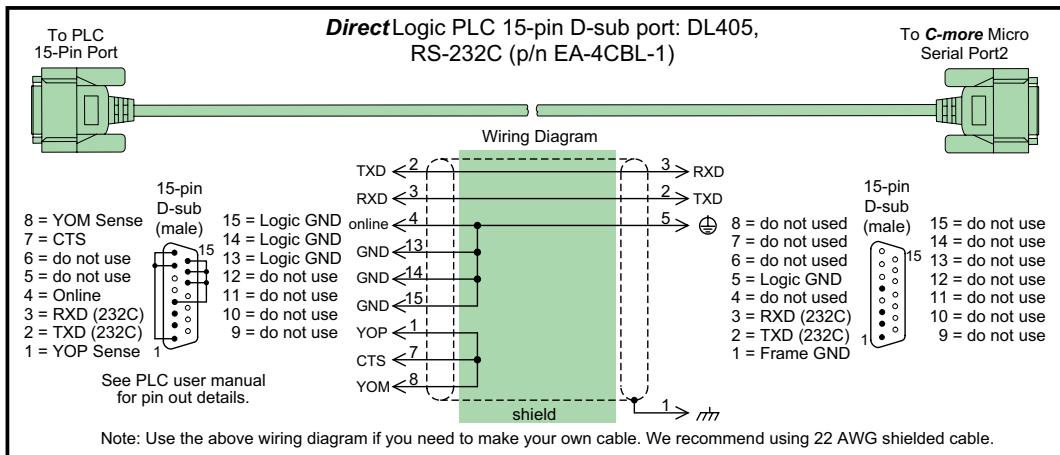
EA-3CBL



6

DirectLOGIC:

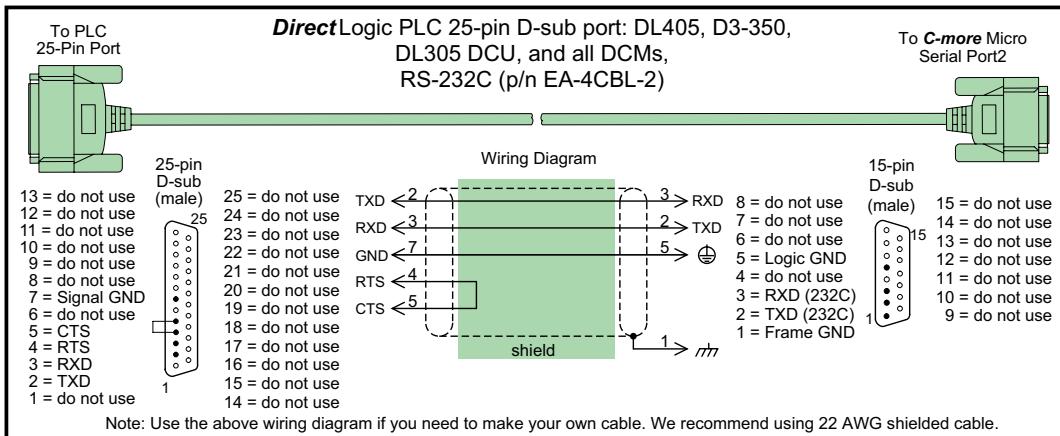
EA-4CBL-1



Cables from AutomationDirect – Wiring Diagrams (cont'd)

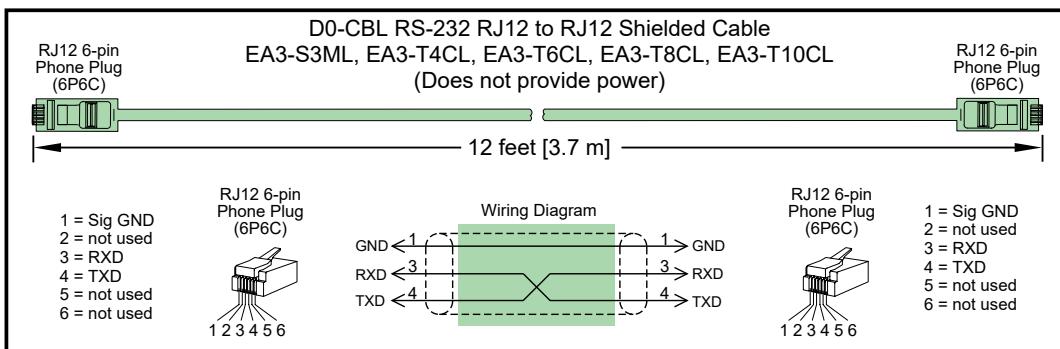
DirectLOGIC:

EA-4CBL-2



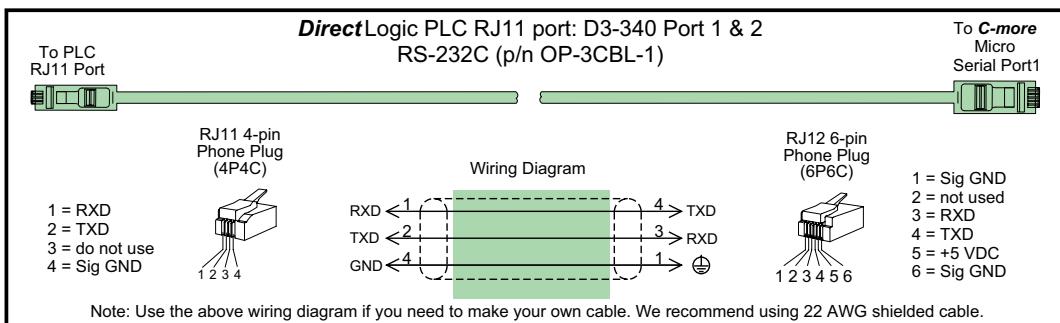
AutomationDirect Controllers

DO-CBL



DirectLOGIC:

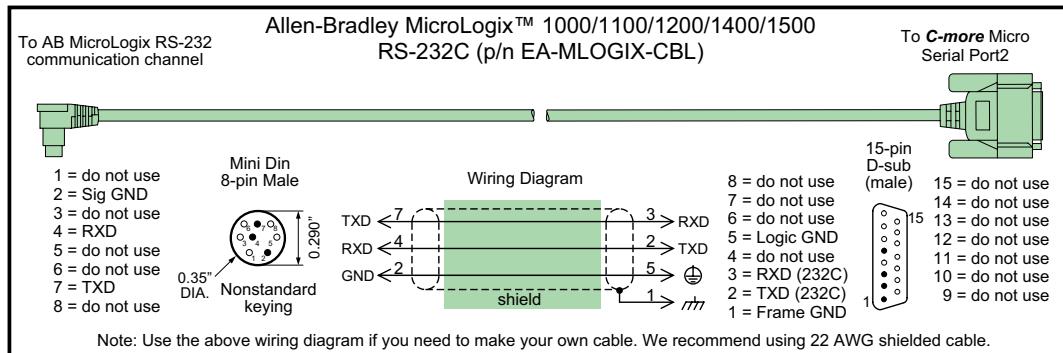
OP-3CBL-1



Cables from AutomationDirect – Wiring Diagrams (cont'd)

AllenBradley:

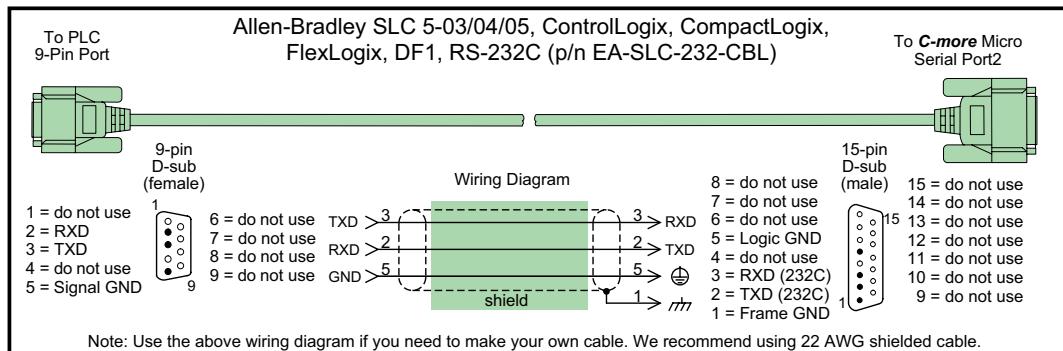
EA-MLOGIX-CBL



6

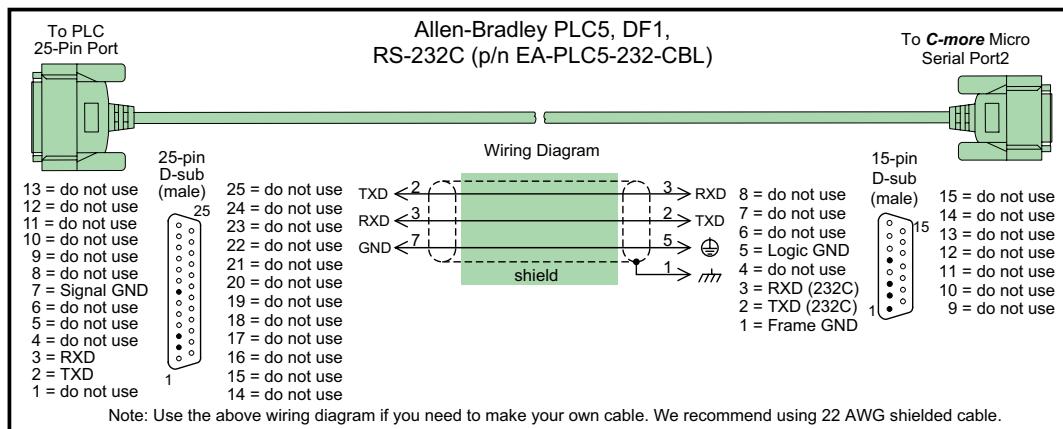
AllenBradley:

EA-SLC-232-CBL



AllenBradley:

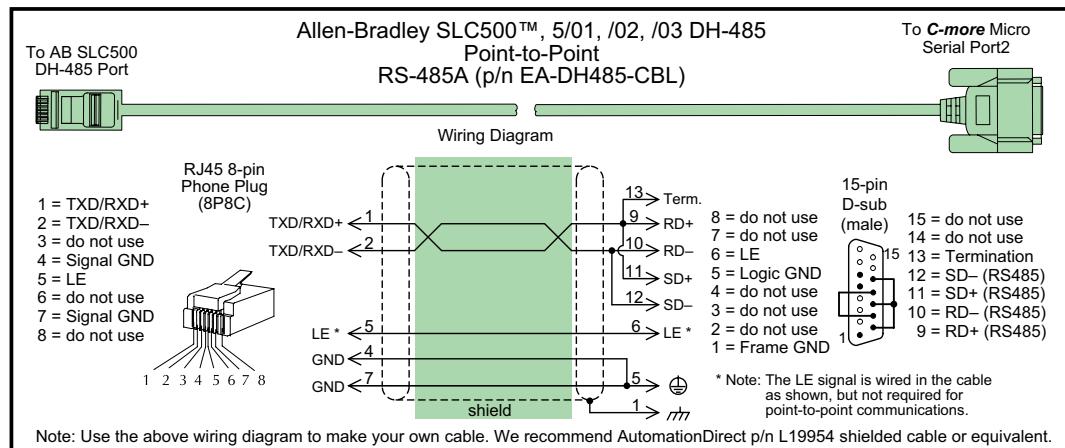
EA-PLC5-232-CBL



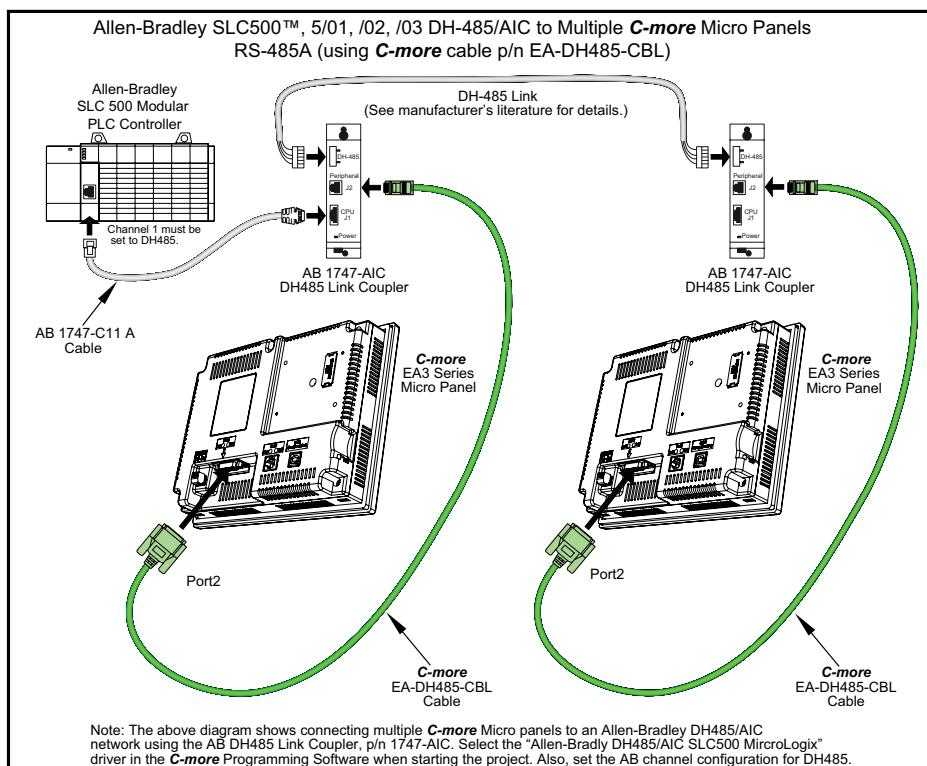
Cables from AutomationDirect – Wiring Diagrams (cont'd)

Allen-Bradley:

EA-DH485-CBL

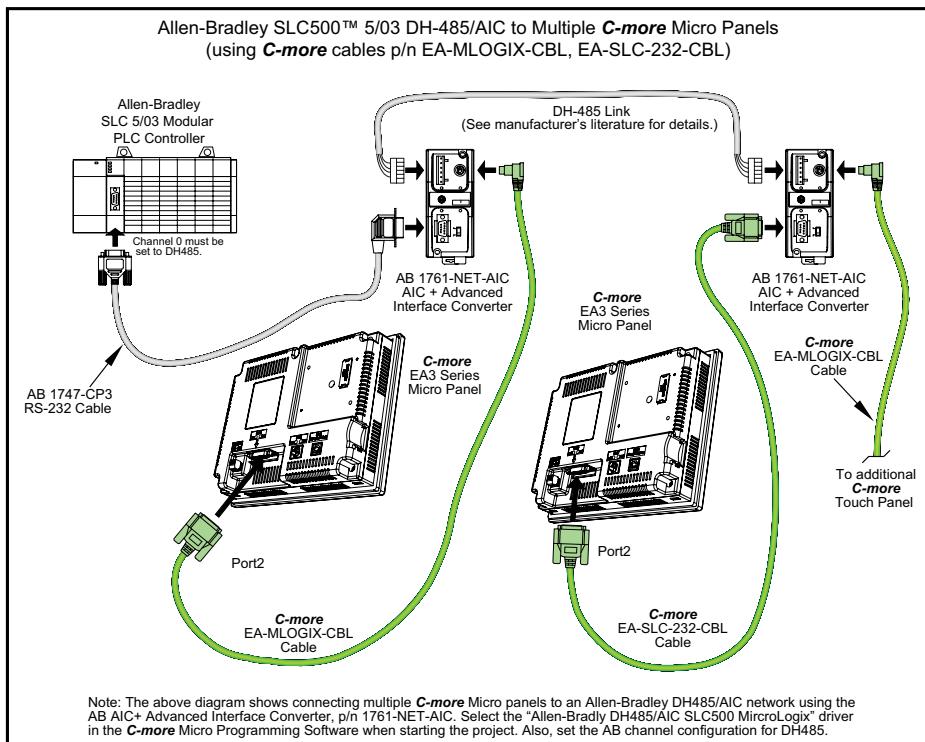


Note: Use the above wiring diagram to make your own cable. We recommend AutomationDirect p/n L19954 shielded cable or equivalent.



Cables from AutomationDirect – Wiring Diagrams (cont'd)

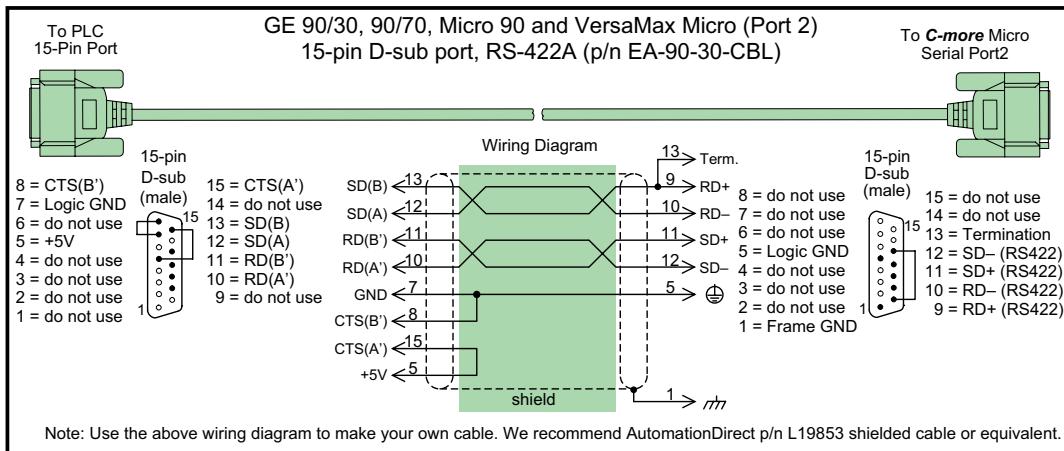
Allen-Bradley:



Cables from AutomationDirect – Wiring Diagrams (cont'd)

GE:

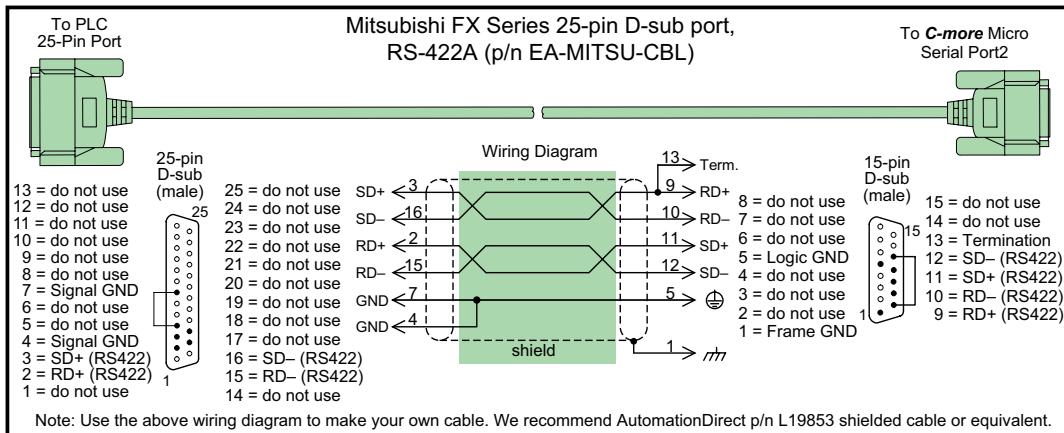
EA-90-30-CBL



6

Mitsubishi

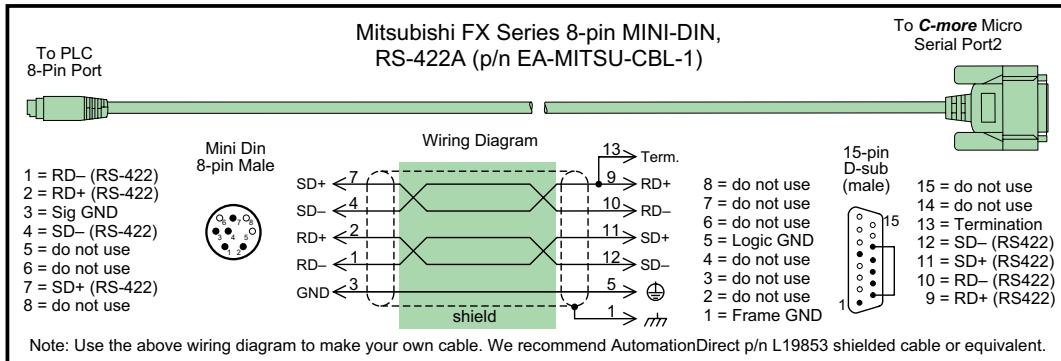
EA-MITSU-CBL



Cables from AutomationDirect – Wiring Diagrams (cont'd)

Mitsubishi

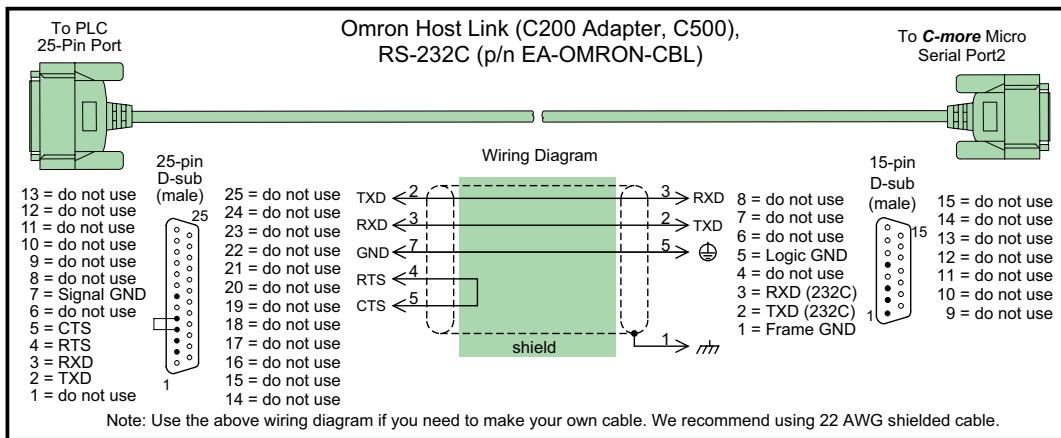
EA-MITSU-CBL-1



6

Omron

EA-OMRON-CBL

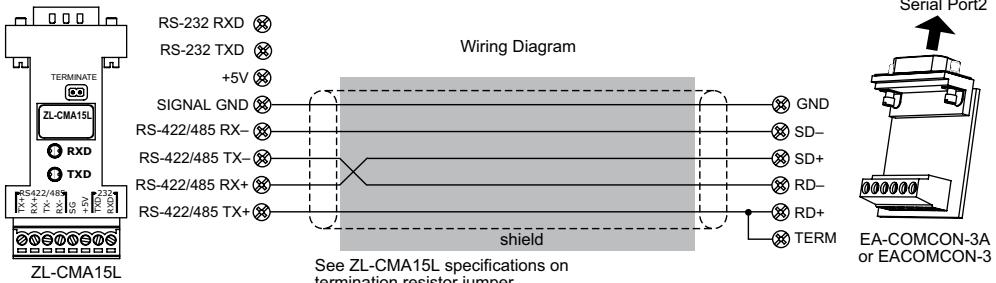


User Constructed Cables – Wiring Diagrams

Diagram 1

User Constructed

DirectLOGIC ZIPLink ZL-CMA15L Adapter Module to EA-COMCON-3A Terminal Block Adapter
RS-422A – PLC D2-250 (-1), D2-260 or DL06 – Port 2

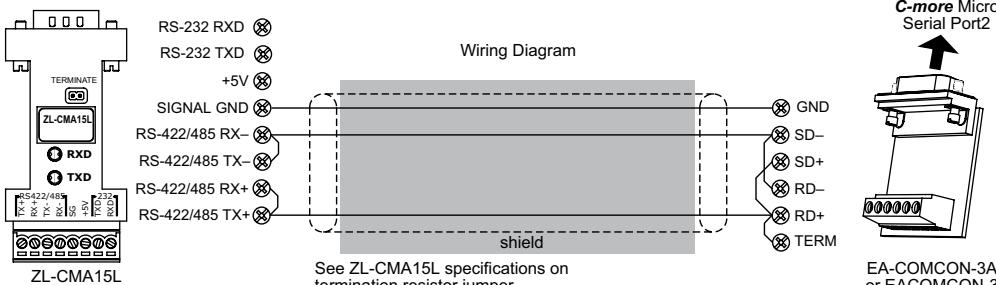


Note: Use the above wiring diagram to make your own cable. We recommend AutomationDirect p/n L19954 shielded cable or equivalent.

Diagram 2

User Constructed

DirectLOGIC ZIPLink ZL-CMA15L Adapter Module to EA-COMCON-3 Terminal Block Adapter
RS-485A – PLC D2-260 or DL06 – Port 2



Note: Use the above wiring diagram to make your own cable. We recommend AutomationDirect p/n L19853 shielded cable or equivalent.



NOTE: The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-40 if more than one PLC will be connected to a panel.

User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 3

User Constructed

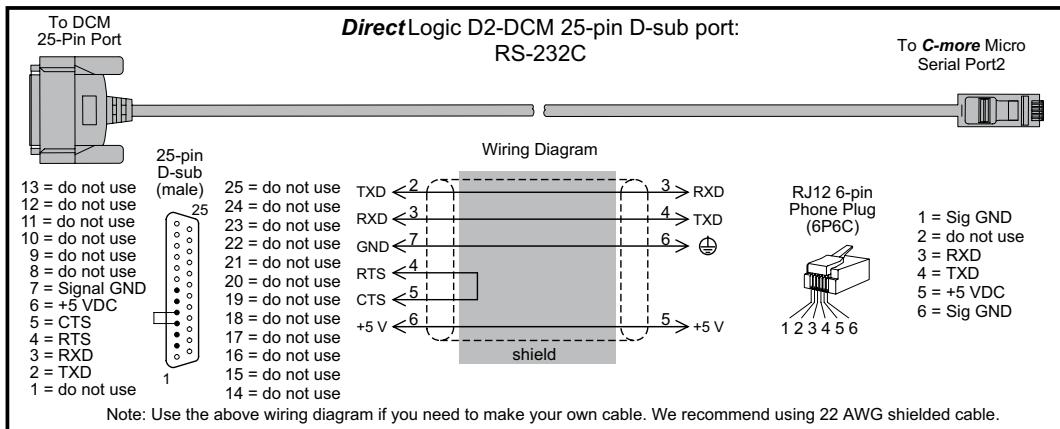
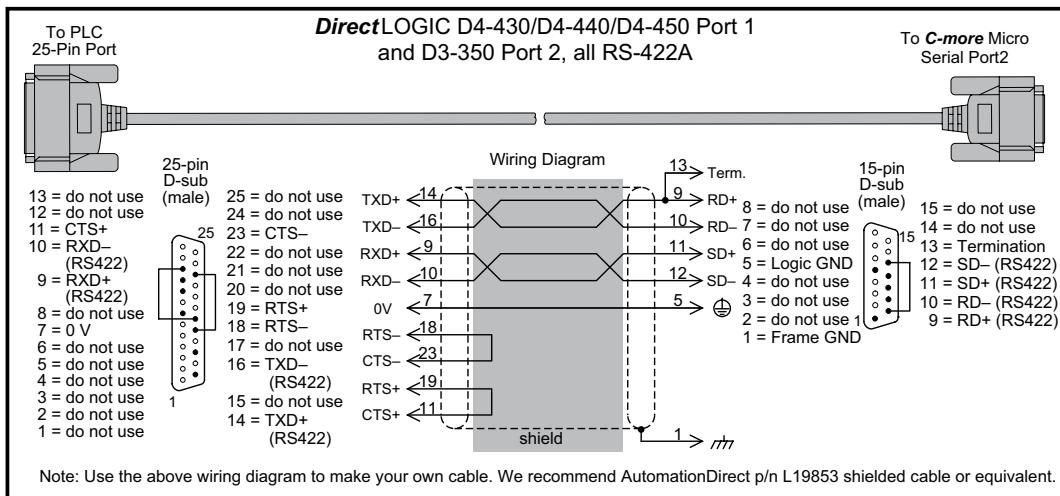


Diagram 4

User Constructed

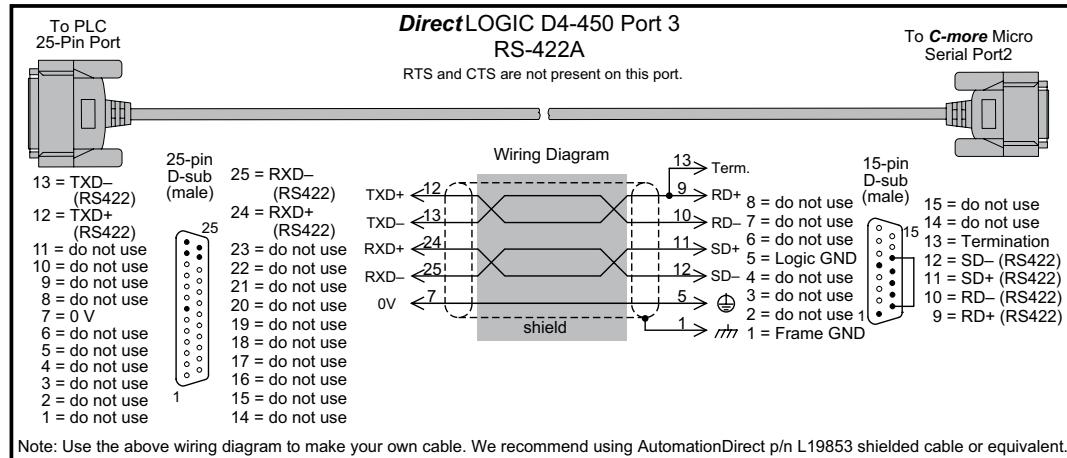


NOTE: The RS-422 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-40 if more than one PLC will be connected to a panel.

User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 5

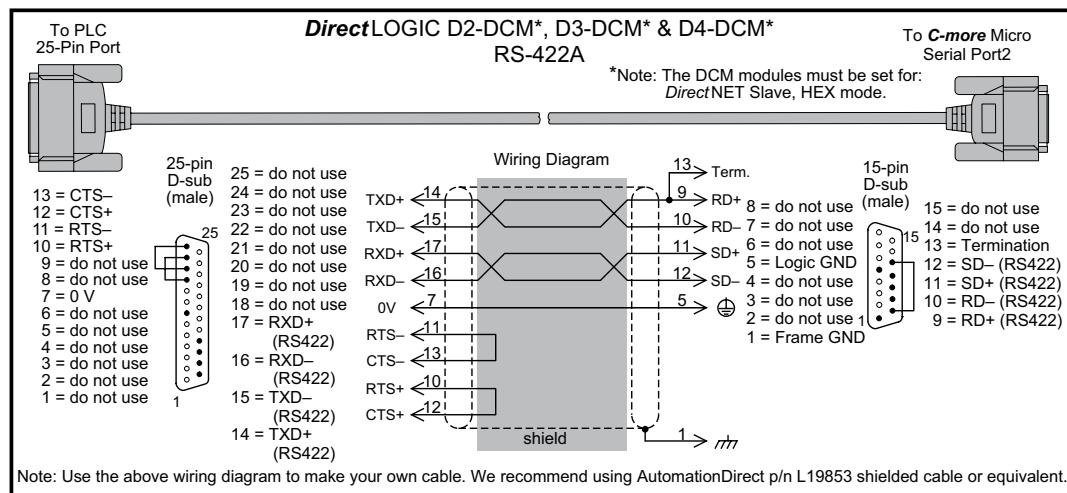
User Constructed



6

Diagram 6

User Constructed



NOTE: The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram examples starting on page 6-40 if more than one PLC will be connected to a panel.

User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 7

User Constructed

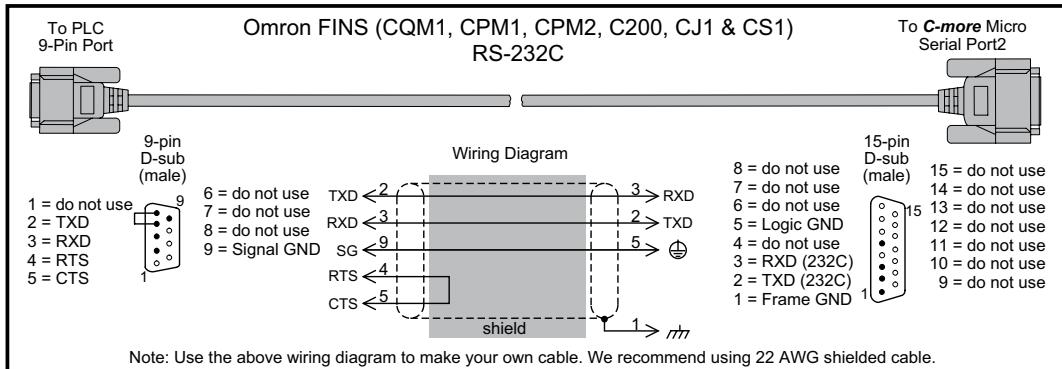
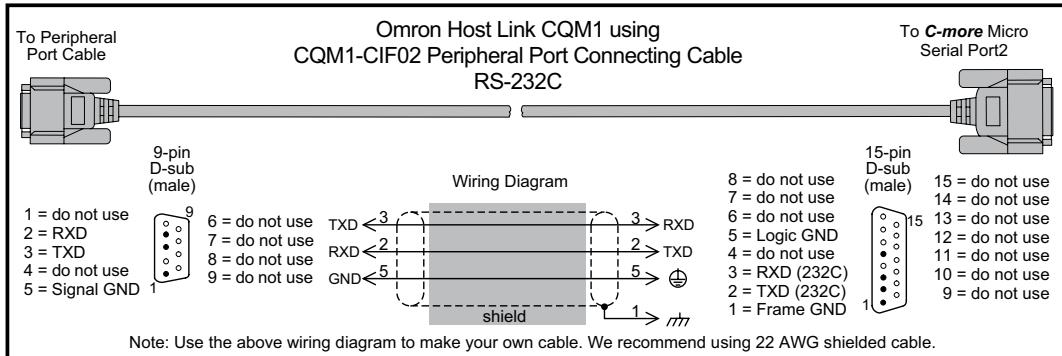


Diagram 8

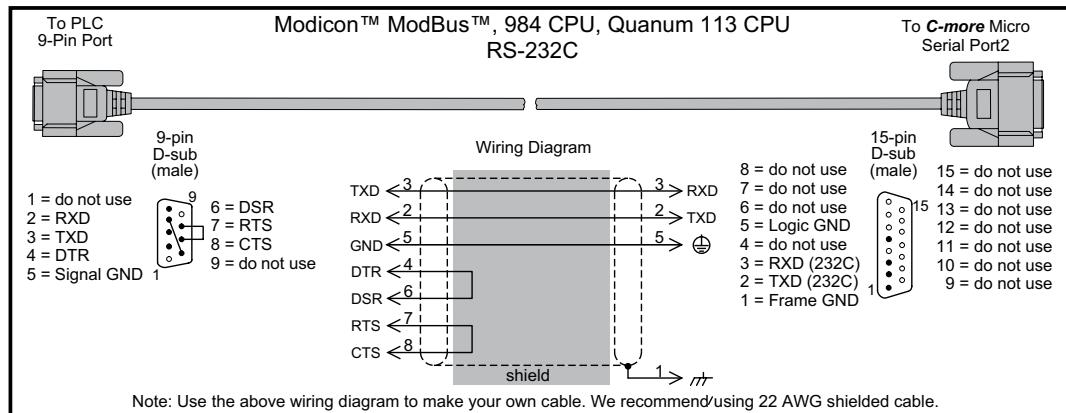
User Constructed



User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 9

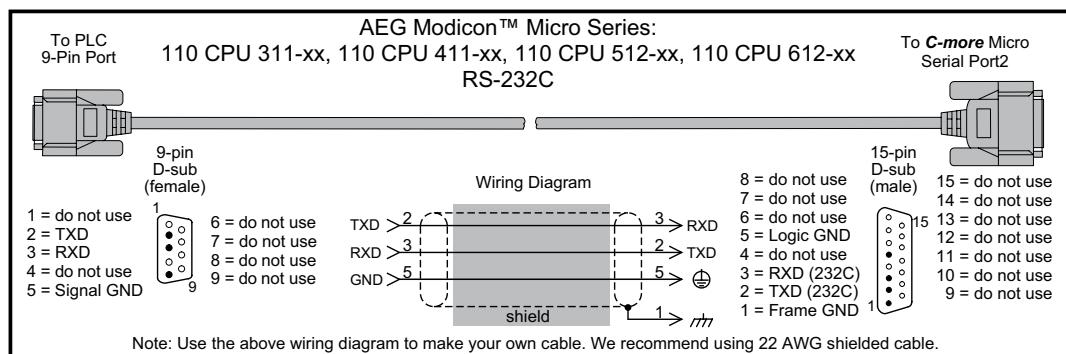
User Constructed



6

Diagram 10

User Constructed



User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 11

User Constructed

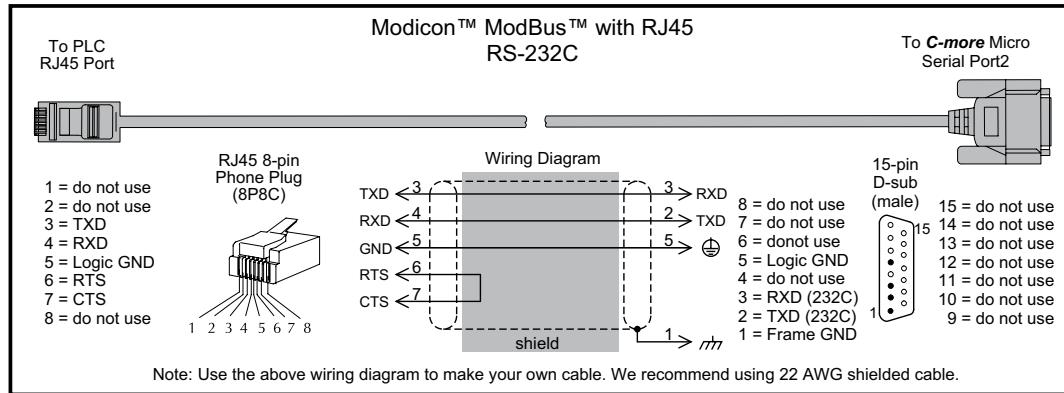
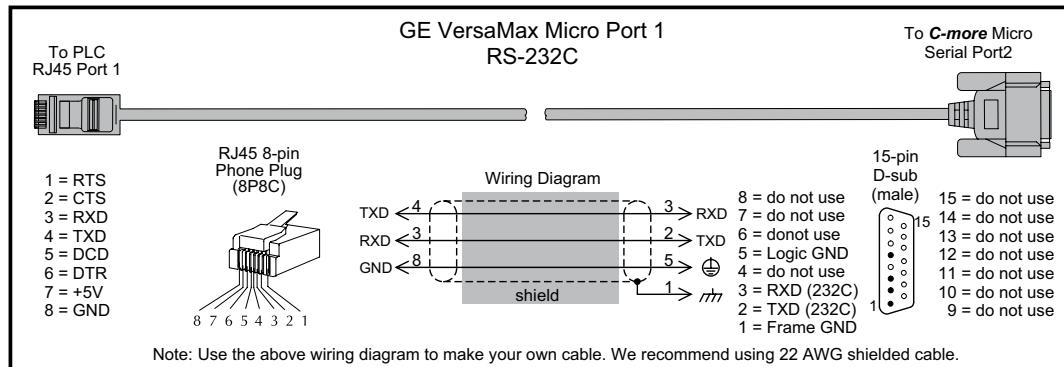


Diagram 12

User Constructed



User Constructed Cables - Wiring Diagrams (cont'd)

Diagram 13

User Constructed

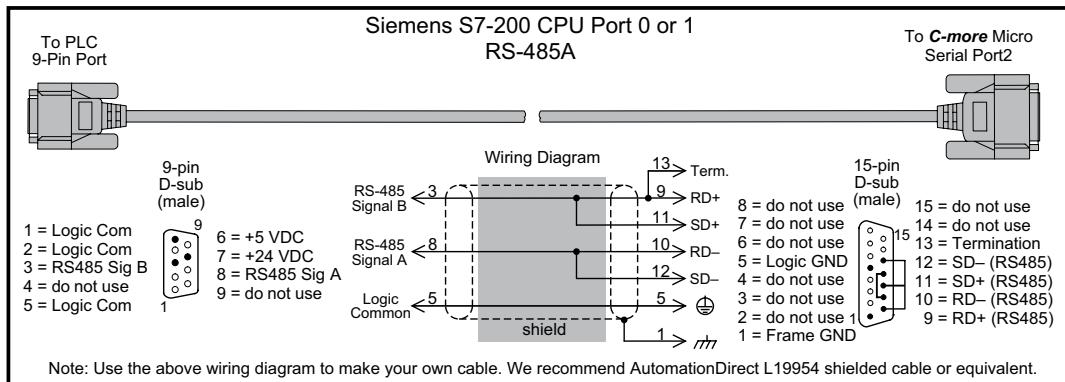
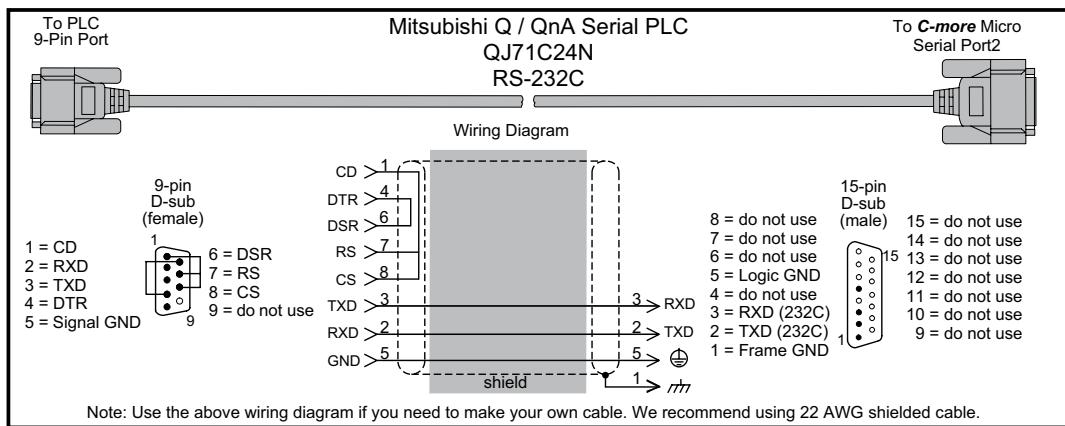


Diagram 14

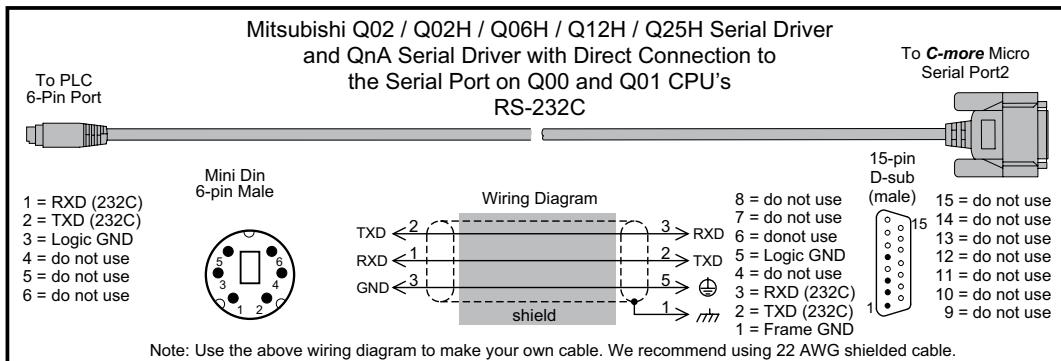
User Constructed



User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 15

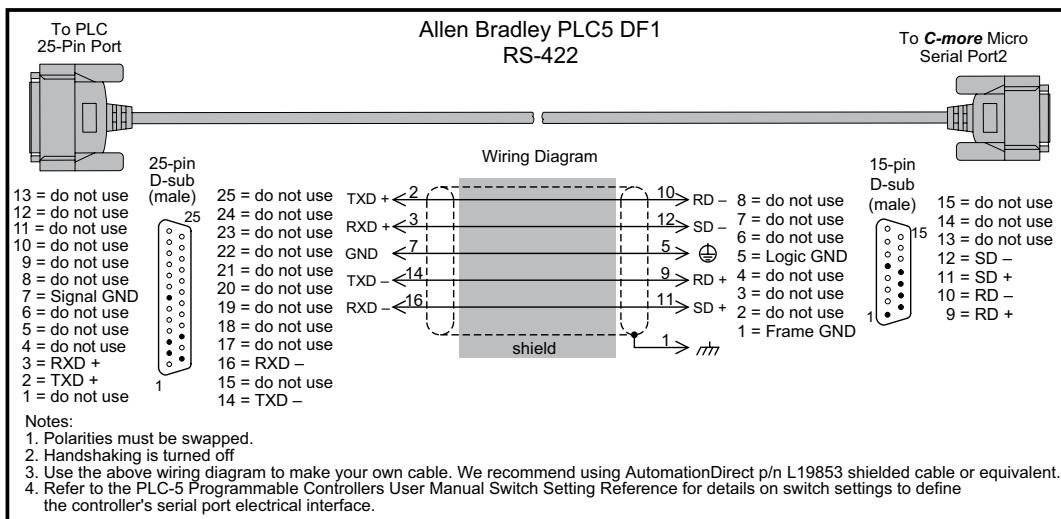
User Constructed



6

Diagram 16

User Constructed



User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 17

User Constructed

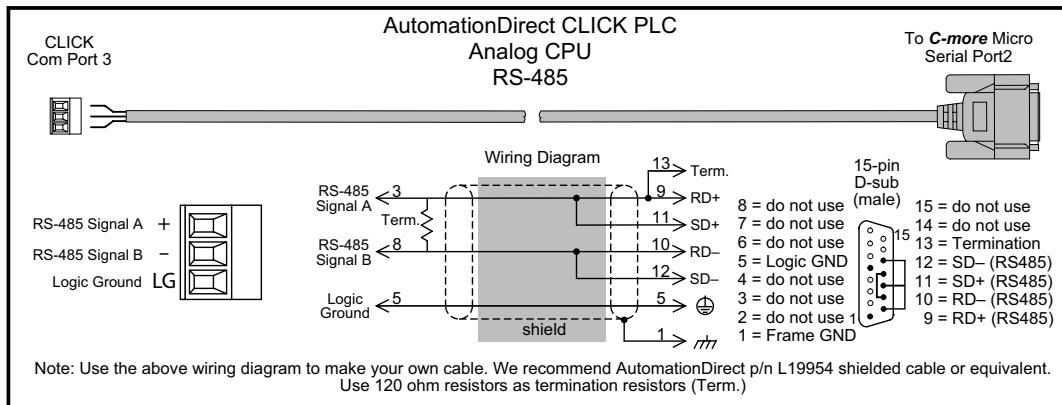
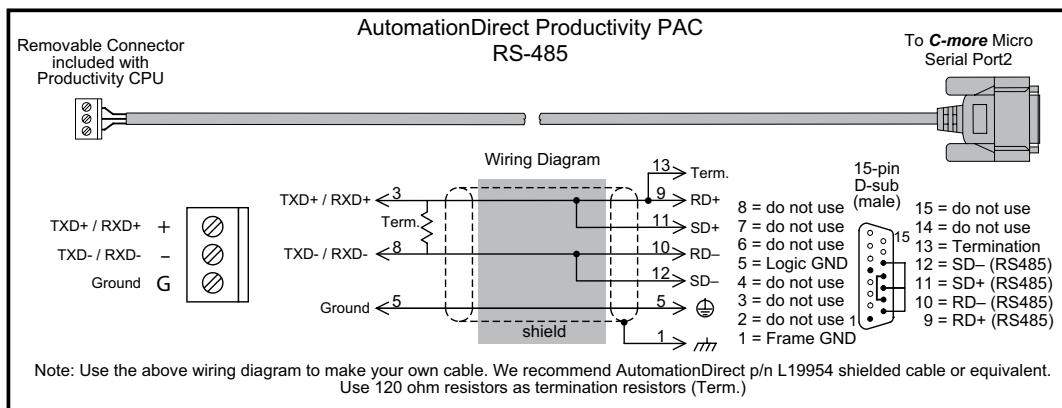


Diagram 18

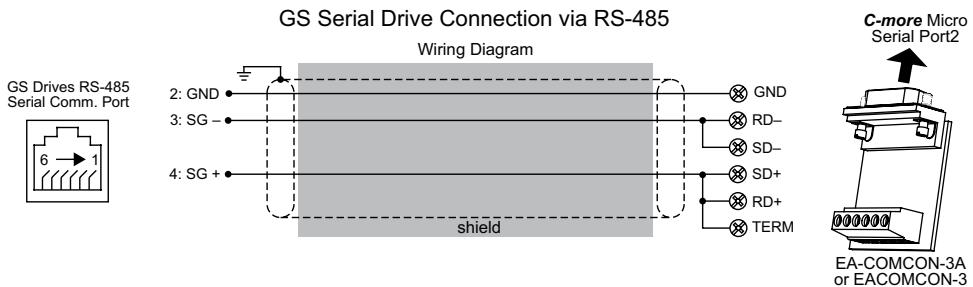
User Constructed



User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 19

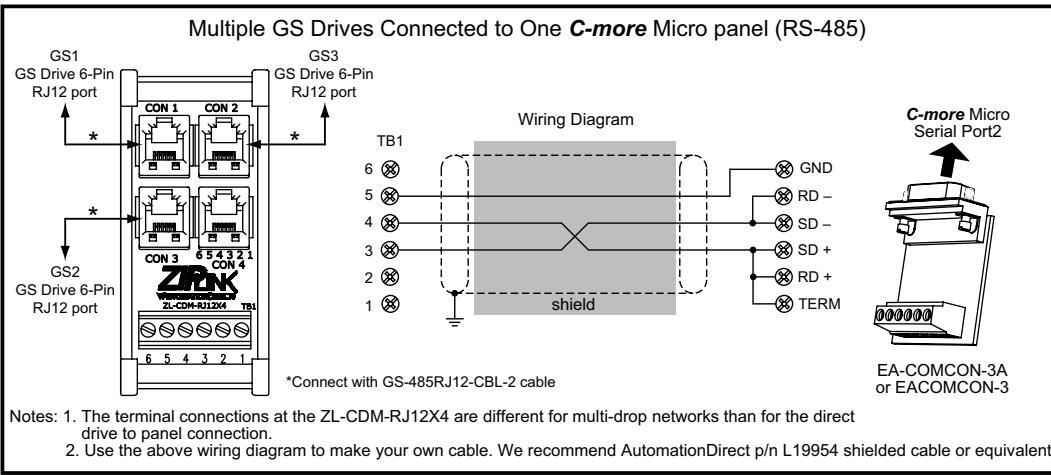
User Constructed



6

Diagram 20

User Constructed



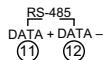
User Constructed Cables – Wiring Diagrams (cont'd)

Diagram 21

User Constructed

SOLO Temperature Controller to **C-more** Micro Panel (RS-485)

SL4824 Series



SL4848 Series

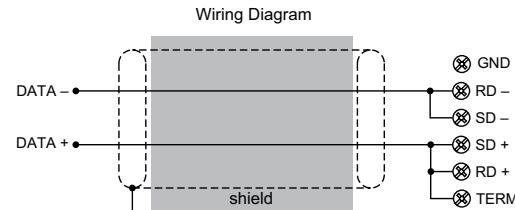


SL4896 Series

SL9696 Series



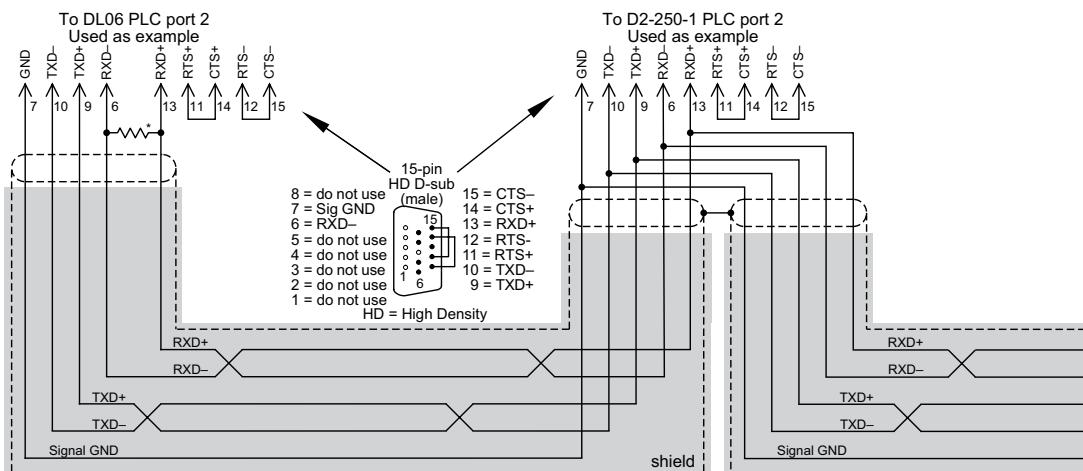
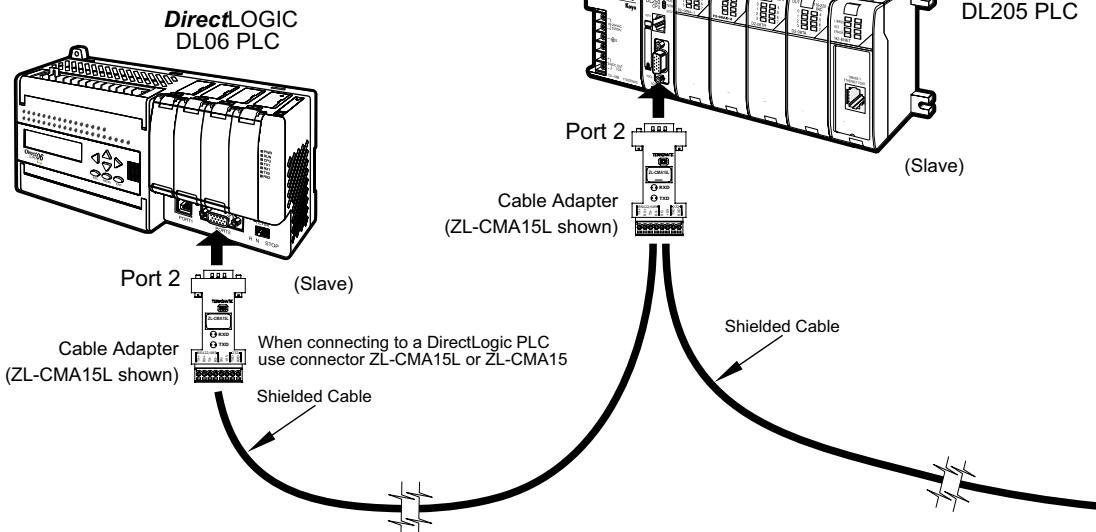
Wiring Diagram

**C-more** Micro Serial Port2EA-COMCON-3A
or EACOMCON-3

Note: Use the above wiring diagram to make your own cable. We recommend AutomationDirect p/n L199772 shielded cable or equivalent.

RS-422A Multi-Drop Wiring Diagram Example

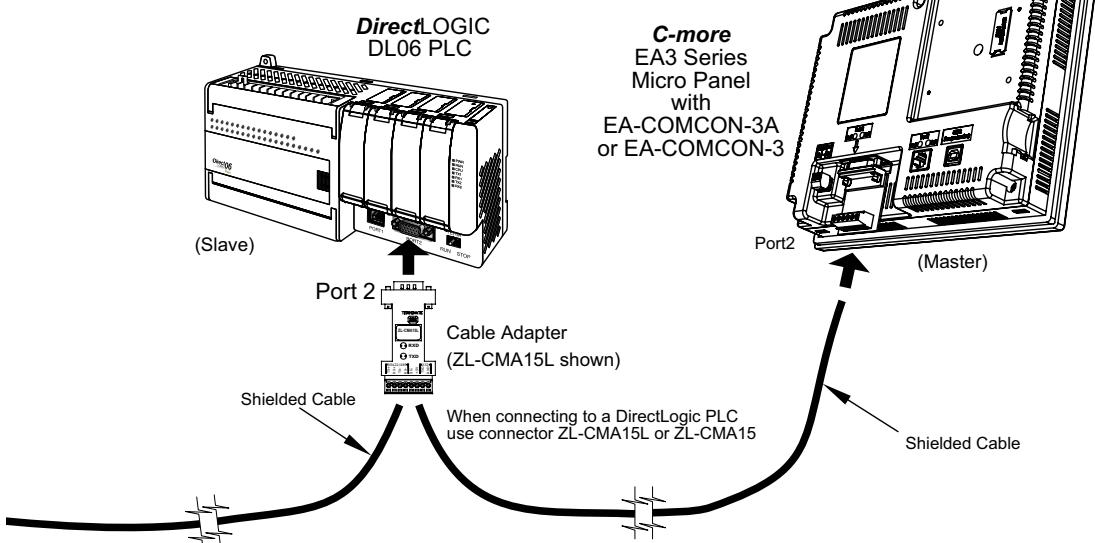
DL06 and DL205 used for illustration purposes



Typical RS-422 Multi-Drop Wiring Diagram
using DirectLogic pin numbers to illustrate

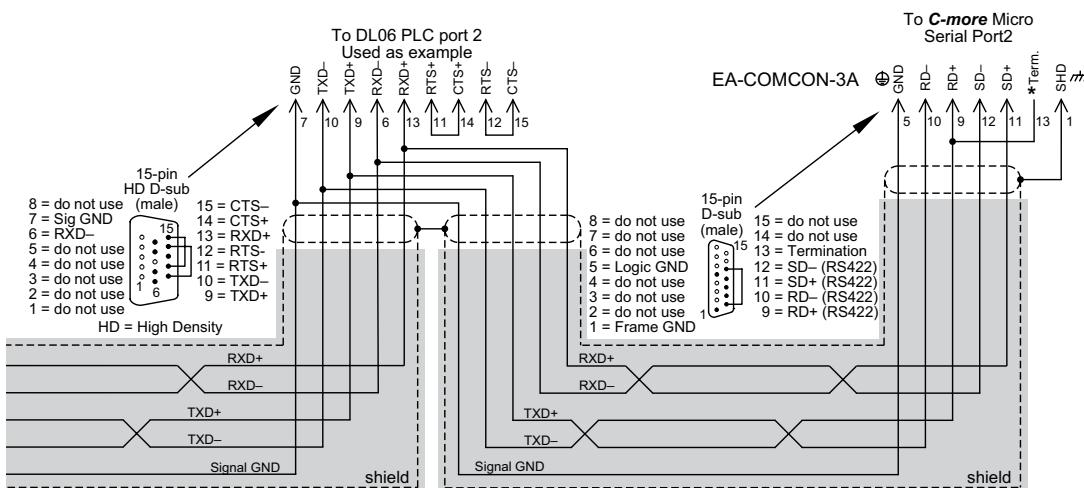
RS-422A Multi-Drop Wiring Diagram Example (cont'd)

DL06 and DL205 used for illustration purposes



6

Notes: 1. We recommend Belden 8103 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



Typical RS-422 Multi-Drop Wiring Diagram (cont'd)

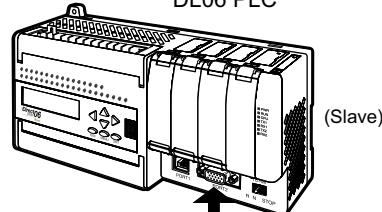
using DirectLogic pin numbers to illustrate

* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more Micro Serial Port2 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

RS-485A Multi-Drop Wiring Diagram Example

DL06 and DL205 used for illustration purposes

DirectLOGIC
DL06 PLC



Port 2

Cable Adapter
(ZL-CMA15L shown)

When connecting to a DirectLogic PLC
use connector ZL-CMA15L or ZL-CMA15

Shielded Cable

DirectLOGIC
DL205 PLC

Port 2

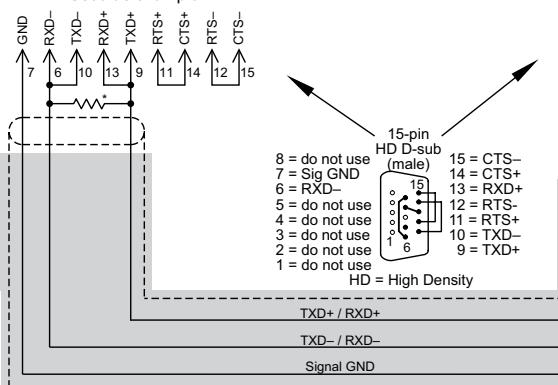
ZL-CMA15 or
ZL-CMA15L

(Slave)

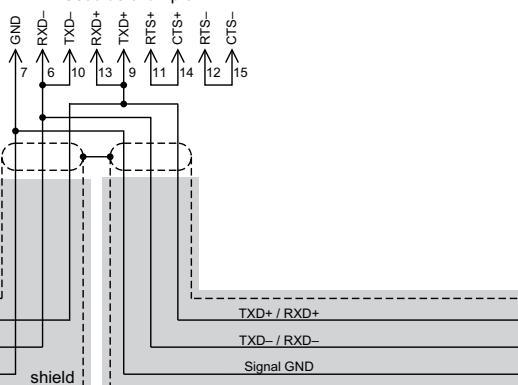
Shielded Cable

- Notes: 1. We recommend Belden 9842 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)

To DL06 PLC port 2
Used as example



To D2-250-1 PLC port 2
Used as example

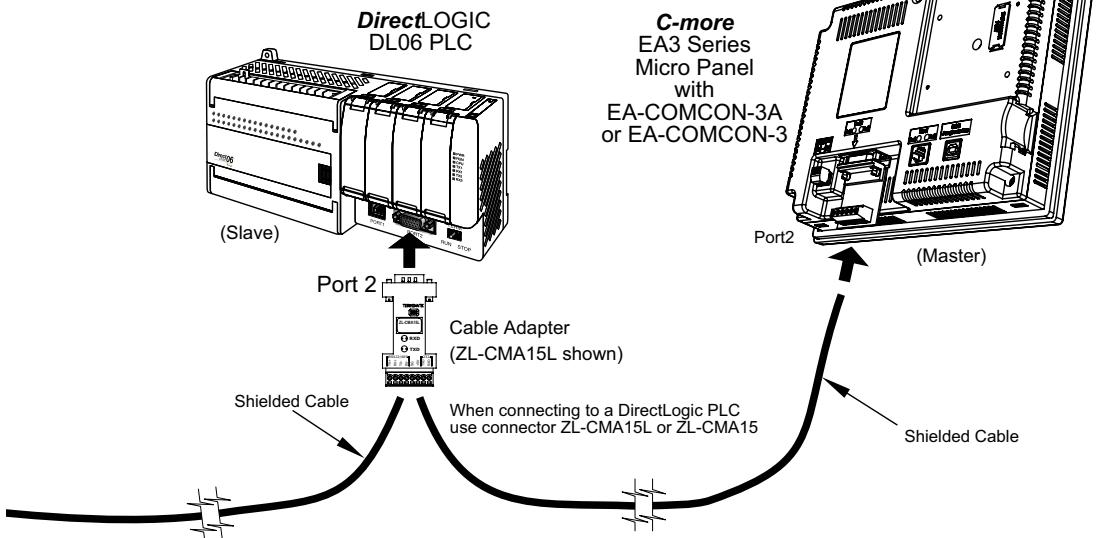


* Termination resistors required at both ends of
the network to match the impedance of the cable
(between 100 and 500 ohms).

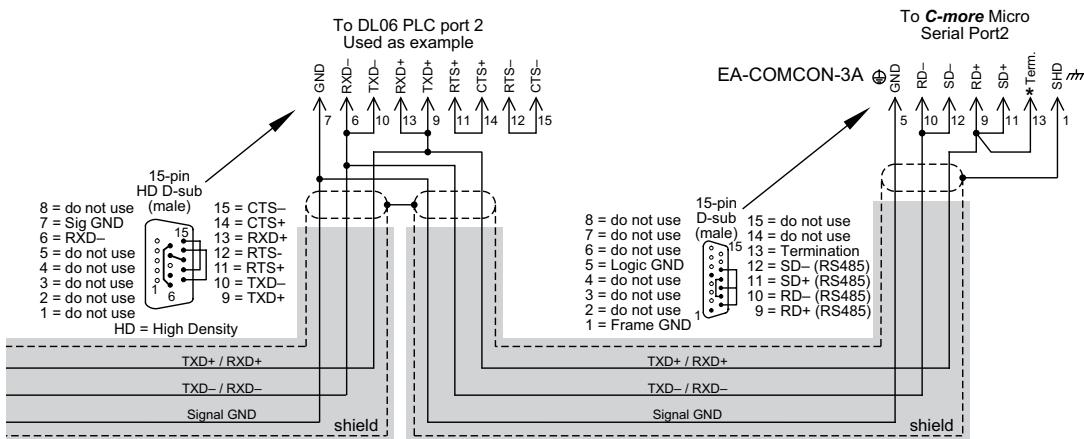
Typical RS-485 Multi-Drop Wiring Diagram
using DirectLogic pin numbers to illustrate

RS-485A Multi-Drop Wiring Diagram Example (cont'd)

DL06 and DL205 used for illustration purposes



Notes: 1. We recommend Belden 9842 shielded cable or equivalent.
2. Wiring Diagram for this example, ZL-CMA15(L)



Typical RS-485 Multi-Drop Wiring Diagram (cont'd)
using DirectLogic pin numbers to illustrate

*Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the **C-more** Micro Serial Port2 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then use an external resistor matched to the cable impedance.

