PLC COMMUNICATIONS

In This Chapter...

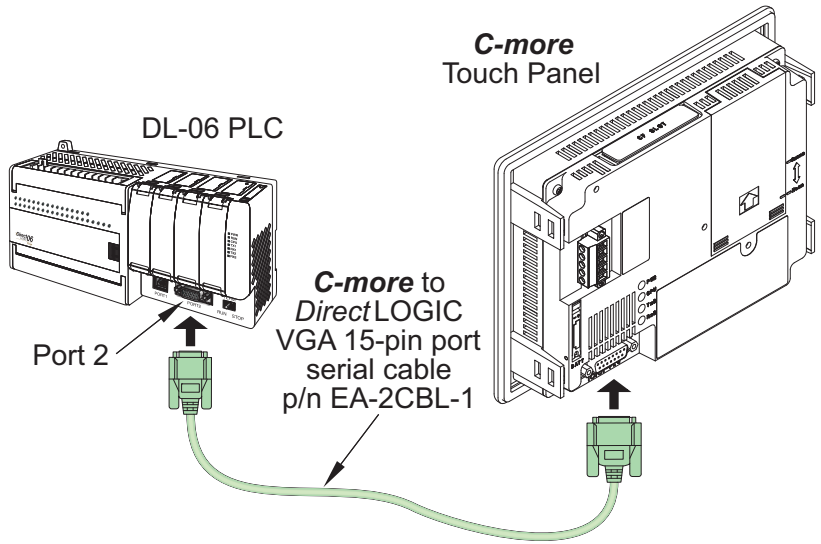
Introduction

The ***C-more*** family of touch panels is capable of communicating with a wide variety of Programmable Logic Controllers. ***C-more*** is capable of communicating over RS232, RS422 and RS485 serial networks as well as Ethernet networks. It communicates with all AutomationDirect PLC's utilizing various protocols. ***C-more*** also communicates with other brands of PLCs by their different protocols. The table on the next page lists all of the various PLCs and protocols that can be configured. The page after the protocol table lists the various serial communication cables that are available to purchase. The rest of this chapter is devoted to show the pin to pin connections of all the available cables plus wiring diagrams that the user can refer to in order to construct their own cables, along with wiring diagrams of cables that are not available for purchase. To simplify RS422/RS485 wiring schemes, we have included wiring diagrams showing connections for available terminal connectors such as our ZIPLink Communication Adapter Module, p/n ZL-CMA15, used for example with our DL-06 and D2-260 PLCs and ***C-more*** D-Sub 15-pin to Terminal Block Adapter p/n EA-COMCON-3.

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

*Direct*LOGIC PLCs Password Protection

NOTE: *Many* ***Direct****Logic 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 seven numeric characters (e.g. A1234567). Please refer to the specific PLC user manual for further details.*



PLC Protocol & Cables

PLC Compatibility Table			
PLC Family	**Model**		**Protocols**
CLICK	all		AutomationDirect Modbus (CLICK)
AutomationDirect *Direct*LOGIC	DL05/DL06	all	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		H0-ECOM/H0-ECOM100	***Direct***LOGIC Ethernet
	DL105	all	K-Sequence
	DL205	D2-230	K-Sequence
		D2-240	K-Sequence
			DirectNET
		D2-250/D2-250-1/D2-260	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D2-240/D2-250-1/D2-260 Using DCM	***Direct***NET
			Modbus (Koyo addressing)
		H2-ECOM/H2-ECOM100	***Direct***LOGIC Ethernet
	DL305	D3-330/330P (Requires the use of a Data Communications Unit)	***Direct***NET
		D3-340	***Direct***NET
		D3-350	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		D3-350 DCM	***Direct***NET
			Modbus (Koyo addressing)
	DL405	D4-430	K-Sequence
			DirectNET
		D4-440	K-Sequence
			DirectNET
		D4-450	K-Sequence
			DirectNET
			Modbus (Koyo addressing)
		All with DCM	***Direct***NET
			Modbus (Koyo addressing)
		H4-ECOM/H4-ECOM100	***Direct***LOGIC Ethernet
	H2-WinPLC (Think & Do) Live V5.2 or later and Studio any version		Think & Do Modbus RTU (serial port)
	H2-WinPLC (Think & Do) Live V5.5.1 or later and Studio V7.2.1 or later		Think & Do Modbus TCP/IP (Ethernet port)

PLC Compatibility Table continued on the next page.

PLC Protocol & Cables (cont'd)

PLC Compatibility Table (cont'd)		
PLC Family	**Model**	**Protocols**
Allen-Bradley	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-01/02/03, PLC5	DH485/AIC/AIC+
	MicroLogix 1000, 1100, 1200, 1400, 1500	DF1 Half Duplex; DF1 Full Duplex
	SLC 5-03/04/05	
	ControlLogix™, CompactLogix™, FlexLogix™	
	PLC-5	DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Tag Based	DF1 Half Duplex; DF1 Full Duplex
	ControlLogix, CompactLogix, FlexLogix - Generic I/O Messaging	EtherNet/IP Server
	ControlLogix, CompactLogix, FlexLogix - Tag Based	EtherNet/IP Client
	MicroLogix 1100, 1400, SLC 5/05, both via native Ethernet port	
	MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-03/04/05, all via ENI adapter	
Modbus TCP/IP	Modbus TCP/IP devices	Modbus TCP/IP
GE	90/30, 90/70. Micro 90, VersaMax Micro	SNPX
Mitsubishi	FX Series	FX Direct
	Q02, Q02H, Q06H, Q12H, Q25H	Q CPU
	Q, QnA Serial	QnA Serial
	Q, QnA Ethernet	QnA Ethernet
Omron	C200 Adapter, C500	Host Link
	CJ1/CS1 Serial	FINS
	CJ1/CS1 Ethernet	
Modicon	984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx	Modbus RTU
Siemens	S7-200 CPU, RS-485 Serial	PPI
	S7-200 CPU, S7-300 CPU; Ethernet	Ethernet ISO over TCP

PLC Communication Cables & Wiring Diagrams

Purchased Cable Description	Cable Part Number
AutomationDirect CLICK, *Direct*LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WINPLC (RS-232C)	**EA-2CBL**
*Direct*LOGIC (VGA Style) 15-pin port DL06, D2-250 (250-1), D2-260 (RS-232C)	**EA-2CBL-1**
*Direct*LOGIC PLC RJ-11 port, D3-340 (RS-232C)	**EA-3CBL**
*Direct*LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C)	**EA-4CBL-1**
*Direct*LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C)	**EA-4CBL-2**
Allen-Bradley MicroLogix 1000, 1100, 1200, 1400, 1500 (RS-232C)	**EA-MLOGIX-CBL**
Allen-Bradley SLC 5-03/04/05, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C)	**EA-SLC-232-CBL**
Allen-Bradley PLC-5 DF1 port (RS-232C)	**EA-PLC5-232-CBL**
Allen-Bradley MicroLogix, SLC 5-01/02/03, PLC5 DH485 port (RS-232C)	**EA-DH485-CBL**
GE 90/30, 90/70, Micro 90, VersaMax Micro 15-pin D-sub port (RS-422A)	**EA-90-30-CBL**
MITSUBISHI FX Series 25-pin port (RS-422A)	**EA-MITSU-CBL**
MITSUBISHI FX Series 8-pin mini-DIN (RS-422A)	**EA-MITSU-CBL-1**
OMRON Host Link C200 Adapter, C500 (RS-232C)	**EA-OMRON-CBL**

Part No. EA-2CBL

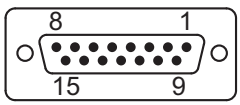
Part No. EA-2CBL-1

Part No. EA-3CBL

NOTE 1: *The above list of pre-made communications cables may be purchased. See further in this chapter for wiring diagrams of additonal* ***user constructed cables****. This chapter also includes wiring diagrams for the pre-made cables.*

NOTE 2: *EZTouch serial PLC communication cables are compatible with* ***C-more*** *touch panels.*

C-more PLC Serial Communications Port



D-Sub 15-pin female on rear of touch panel

PLC Communication Cables & Wiring Diagrams

Part No. EA-4CBL-1

Part No. EA-4CBL-1

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

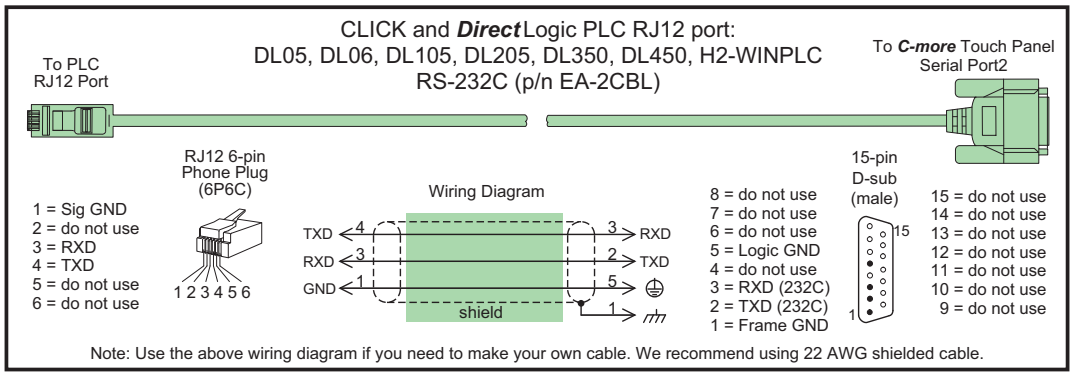
Part No. EA-MITSU-CBL-1

Part No. EA-OMRON-CBL

PLC Communication Cables & Wiring Diagrams (cont'd)

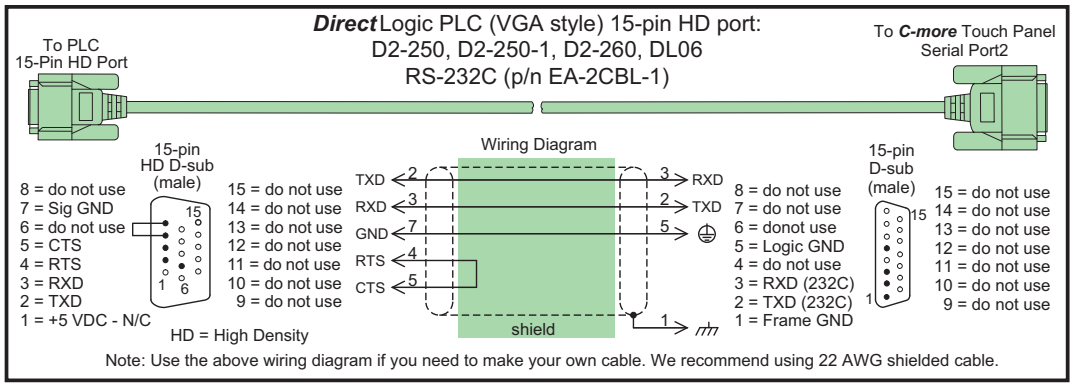
The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the *C-more* touch panels and various PLC controllers. Part numbers are included with the **pre-made cables** that can be purchased from *AutomationDirect*. The information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

AutomationDirect PLCs RS-232C Serial: *EA-2CBL*



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

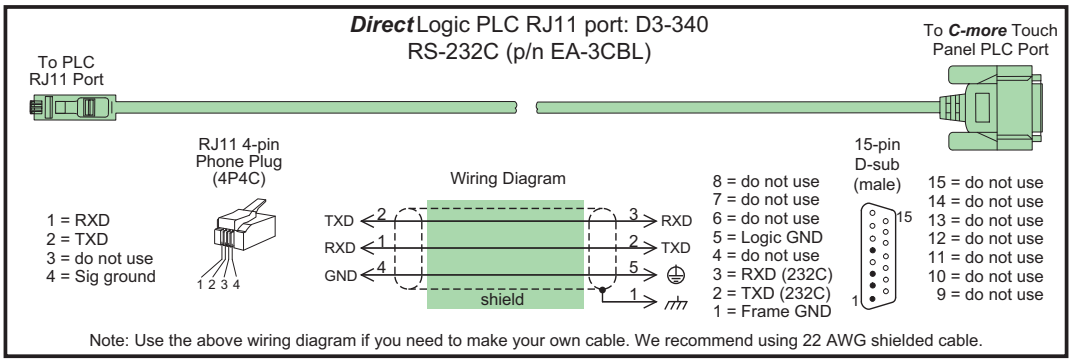
EA-2CBL-1



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

AutomationDirect PLCs RS-232C Serial (cont'd):

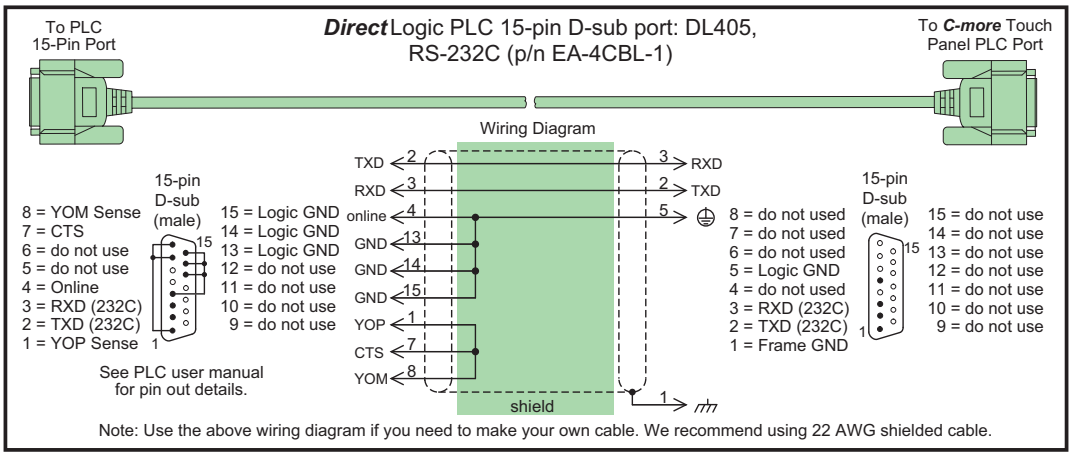
EA-3CBL



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

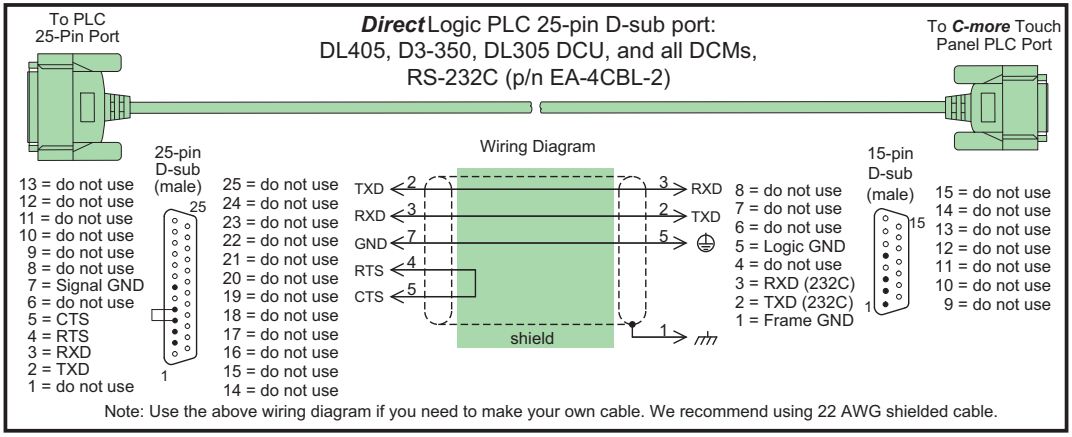
AutomationDirect PLCs RS-232C Serial (cont'd):

EA-4CBL-1



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

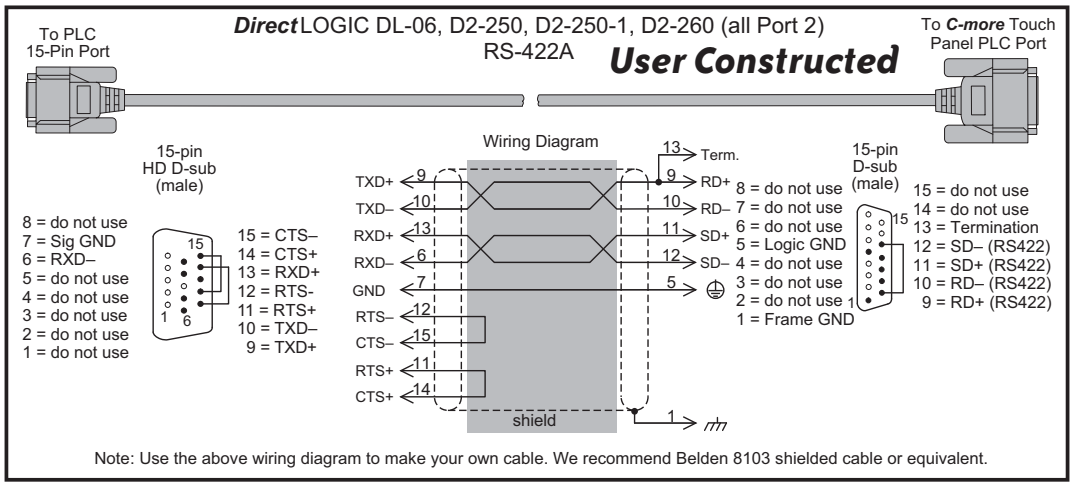
EA-4CBL-2



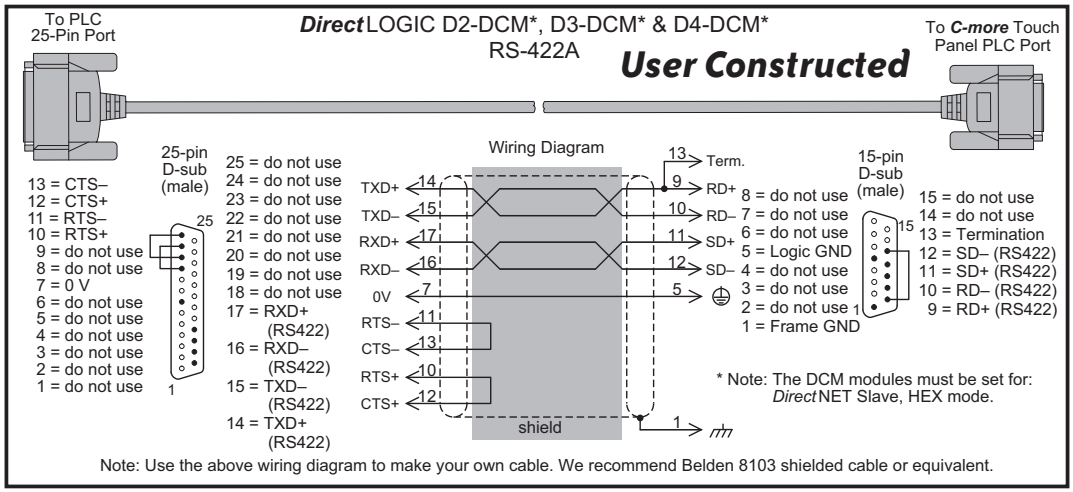
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

*Direct*LOGIC PLCs RS-422A/RS-485A:

When using the RS-422A/RS-485A capabilities of the *C-more* PLC communications port, the termination resistor is placed between the **RXD–** and **RXD+** terminals on the PLC side of the connection between the touch panel and PLC. The Termination Resistor value is based on the characteristic impedance of the cable being used. To enable the built-in 120 Ohm Termination Resistor, jumper pin **13** to pin **9** (**RXD+**) on the *C-more* 15-pin PLC communications port.



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

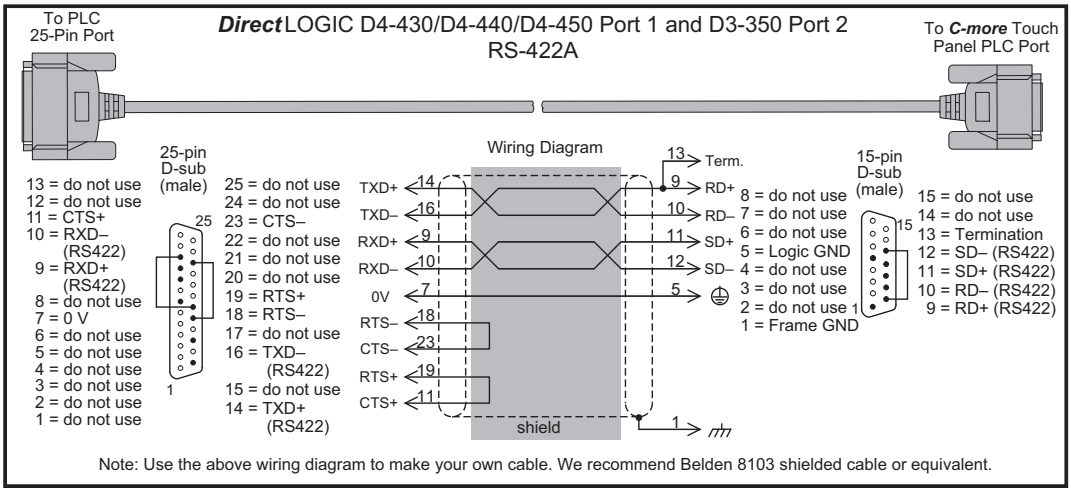


Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

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 example on page 6-16 if more than one PLC will be connected to a panel.*

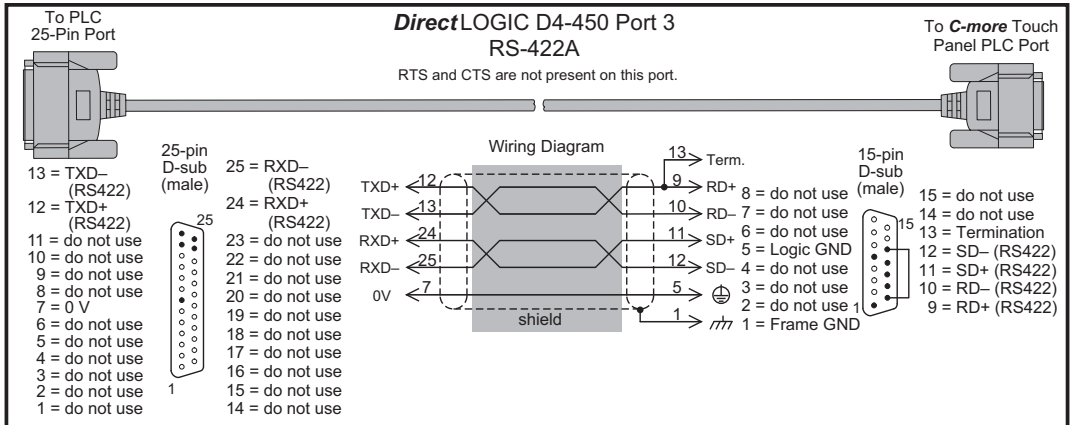
*Direct*LOGIC PLCs RS-422A/RS-485A (cont'd):

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

User Constructed

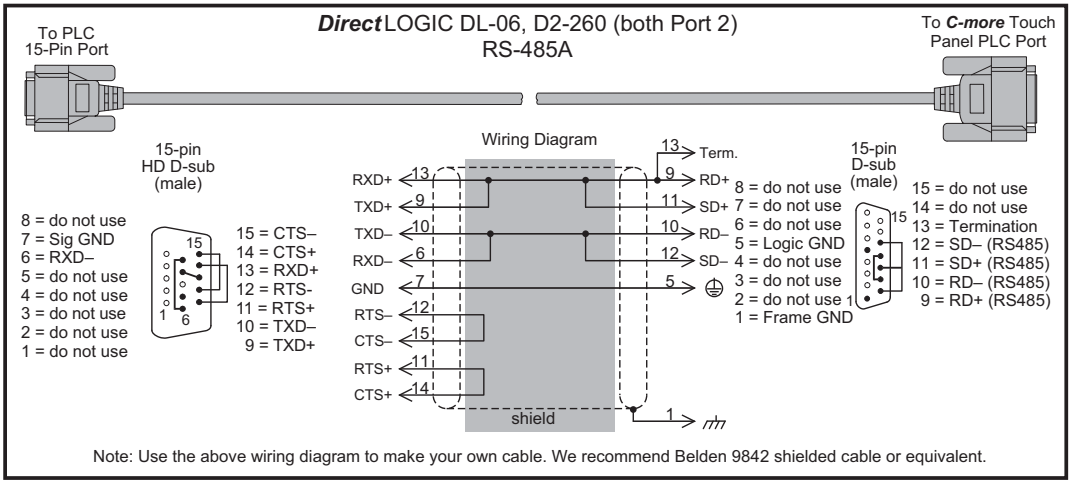


Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

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 example on page 6-16 if more than one PLC will be connected to a panel.*

*Direct*LOGIC PLCs RS-422A/RS-485A (cont'd):

User Constructed

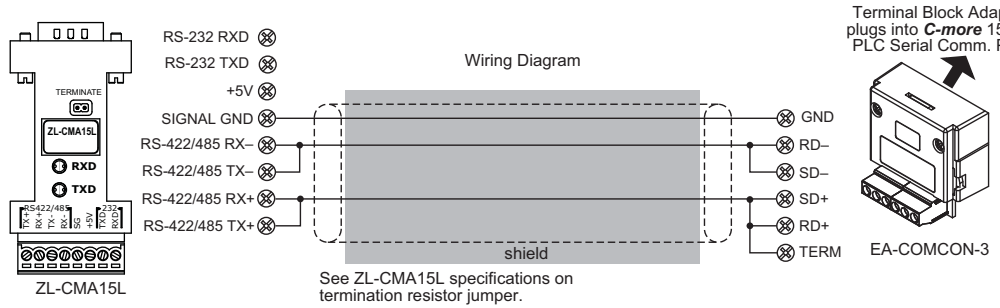


Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.

NOTE: *The RS-485 wiring diagram shown above is not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the wiring diagram example on page 6-16 if more than one PLC will be connected to a panel.*

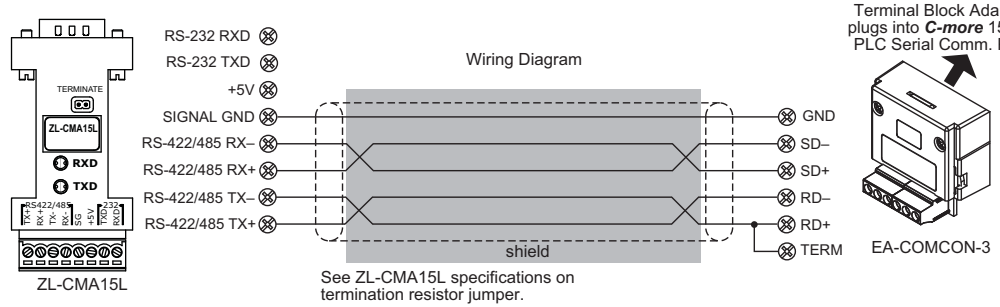
*Direct*LOGIC PLCs RS-422A/RS-485A (cont'd):

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



Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

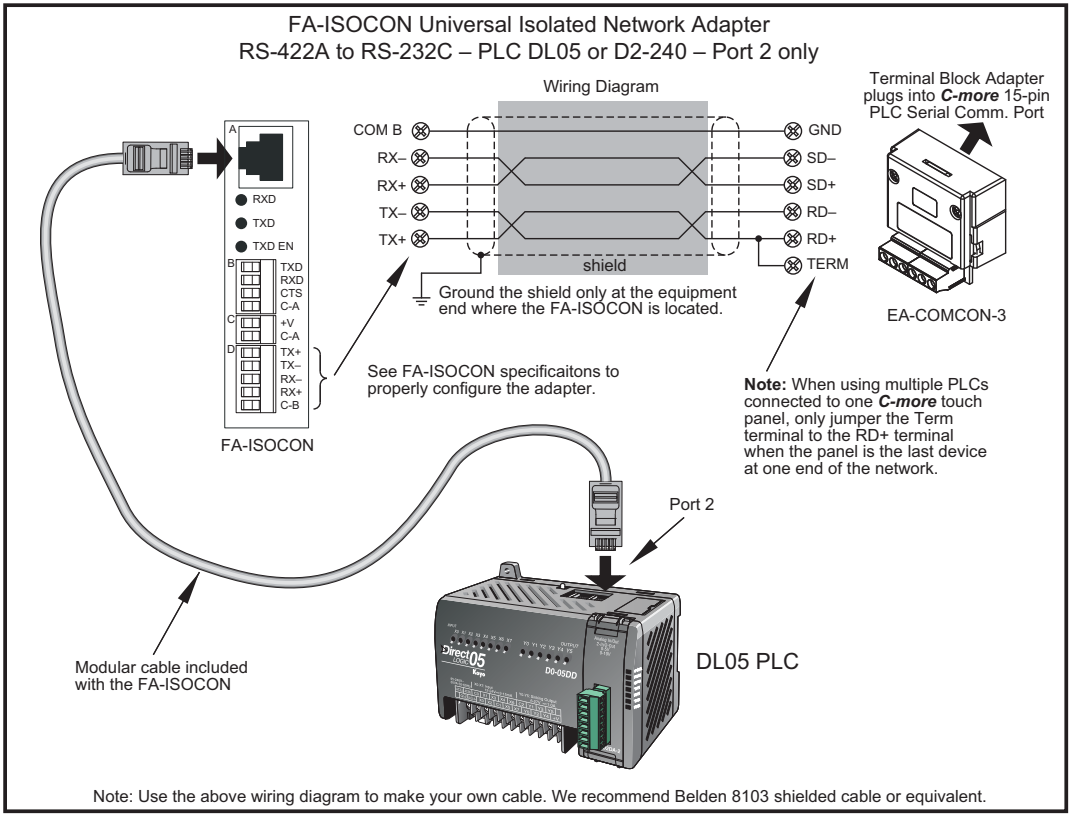
***Direct*LOGIC** ZIPLink ZL-CMA15L Adapter Module to EA-COMCON-3 Terminal Block Adapter
RS-422A – PLC D2-250 (-1), D2-260 or DL06 – Port 2



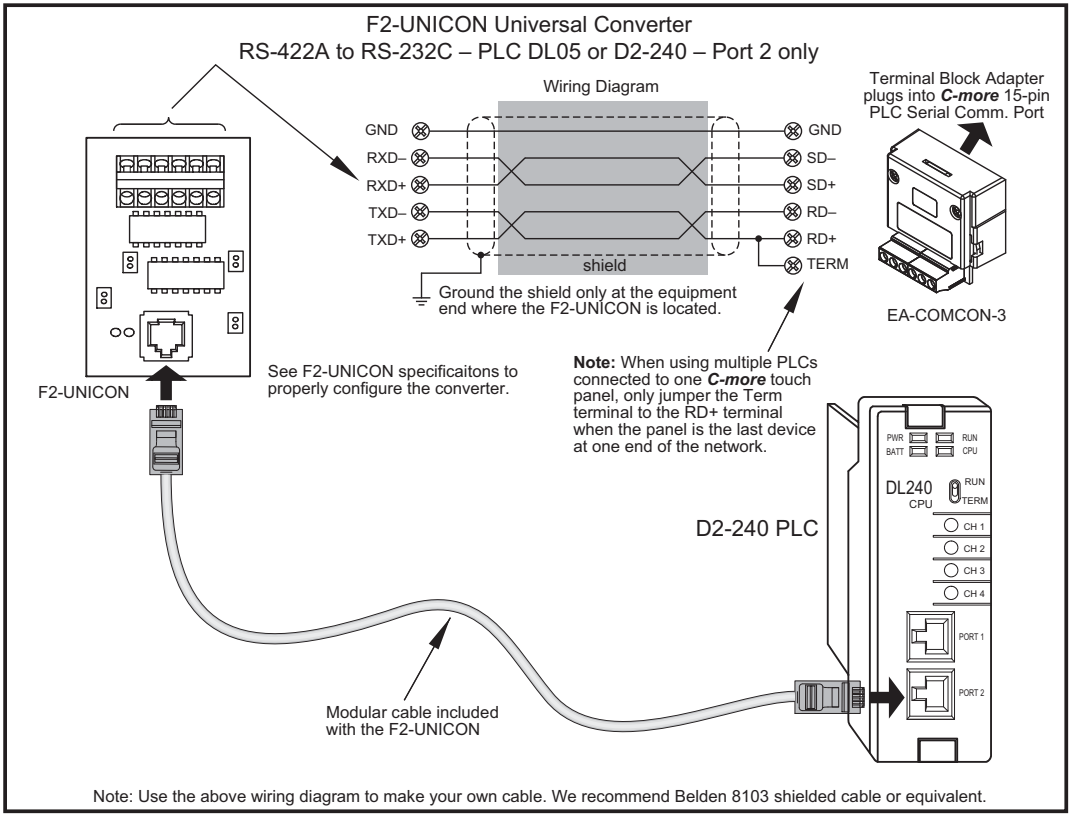
Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.

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 6-14 if more than one PLC will be connected to a panel.*

*Direct*LOGIC Universal Isolated Network Adapter, p/n FA-ISOCON:

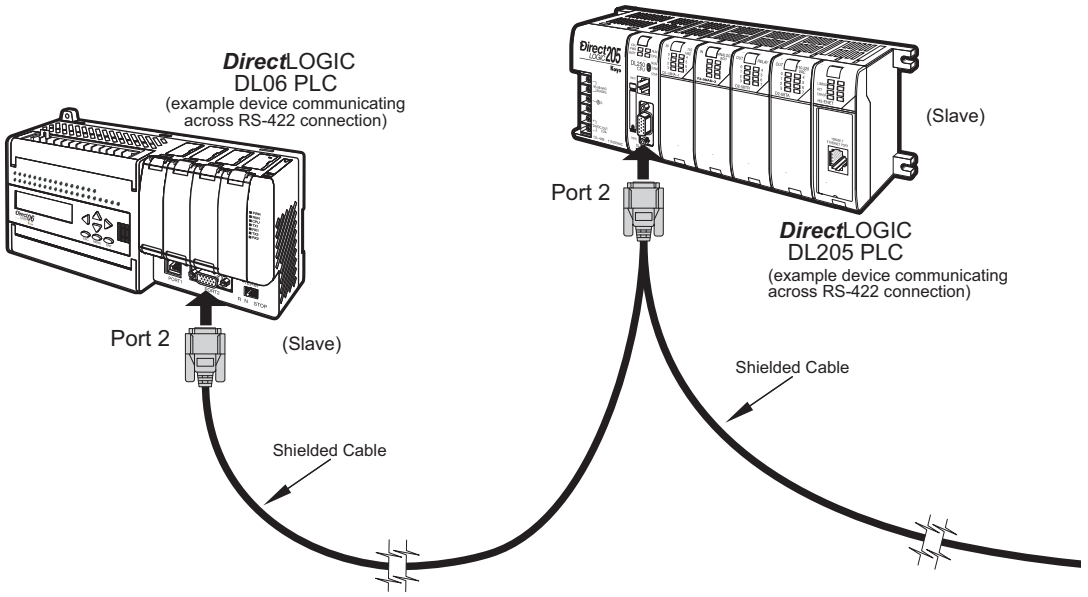


Direct LOGIC Universal Converter, p/n F2-UNICON:

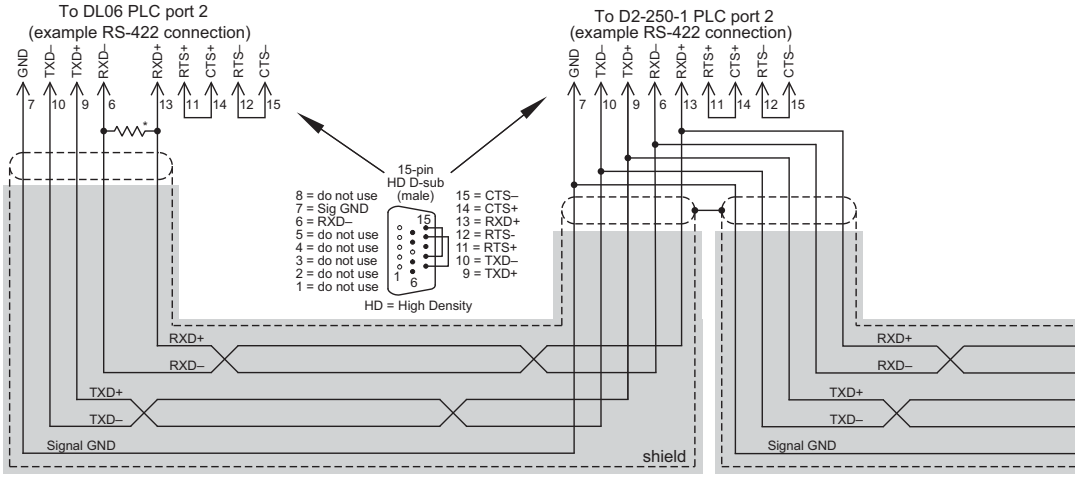


Note: Use the above wiring diagram to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples



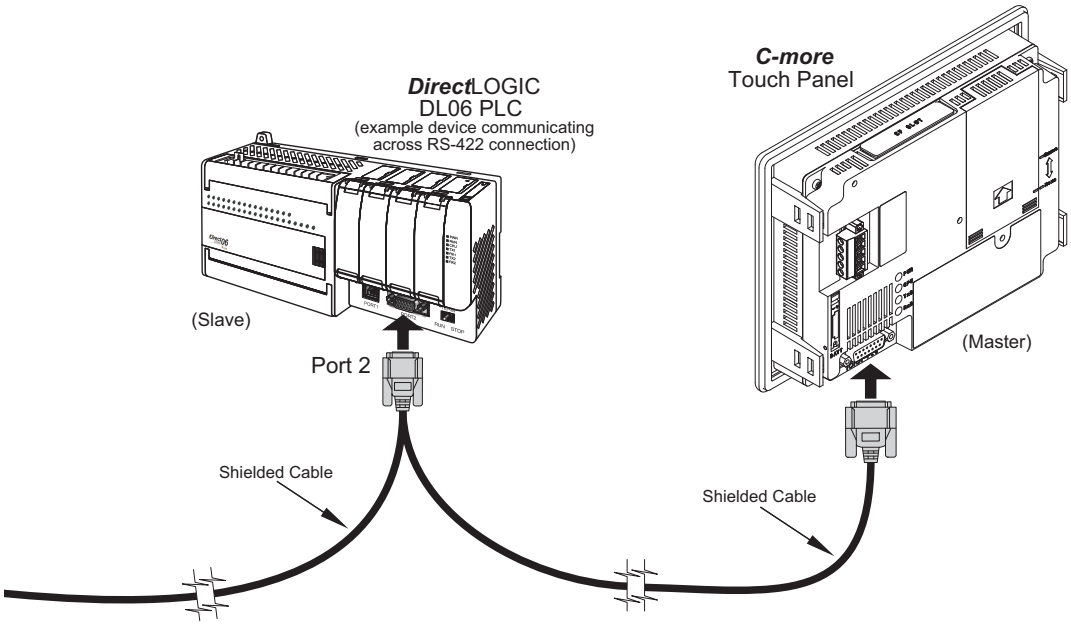
Note: We recommend Belden 8103 shielded cable or equivalent.



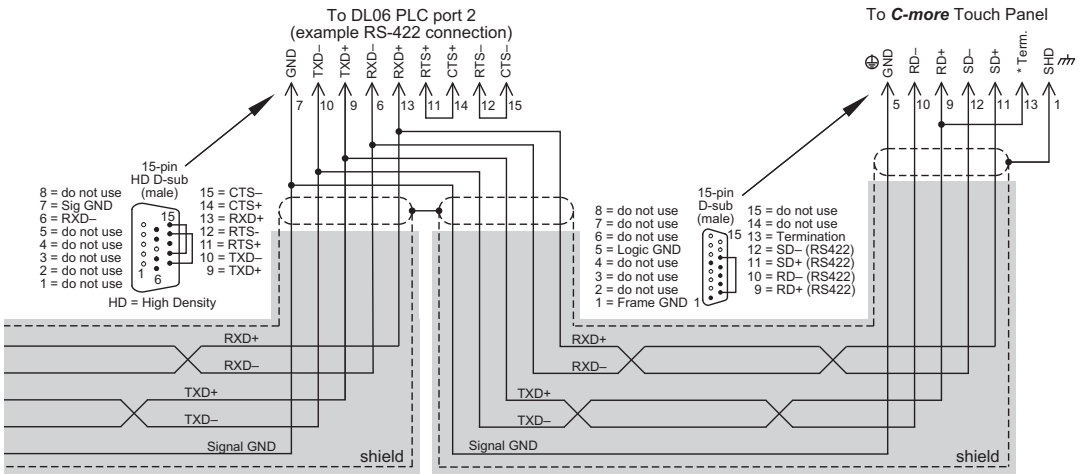
* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-422 Multi-Drop Wiring Diagram

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)



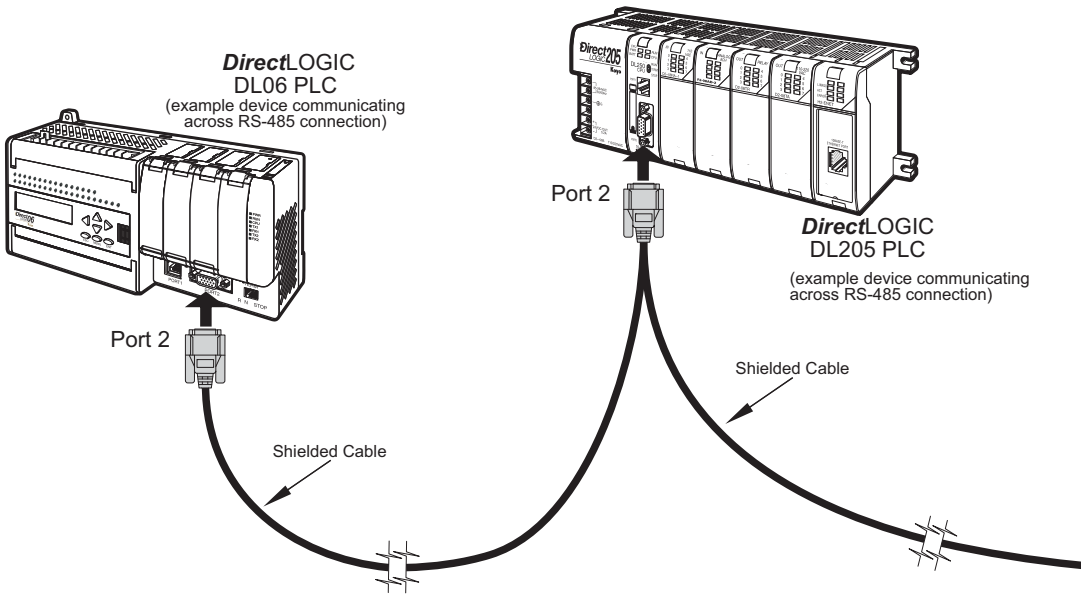
Note: We recommend Belden 8103 shielded cable or equivalent.



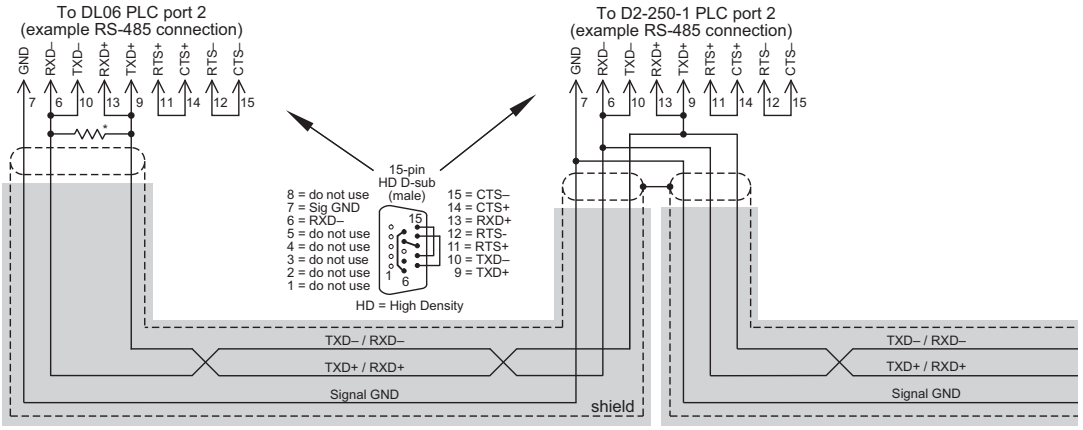
Typical RS-422 Multi-Drop Wiring Diagram (cont'd)

* 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*** Touch Panel 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-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)



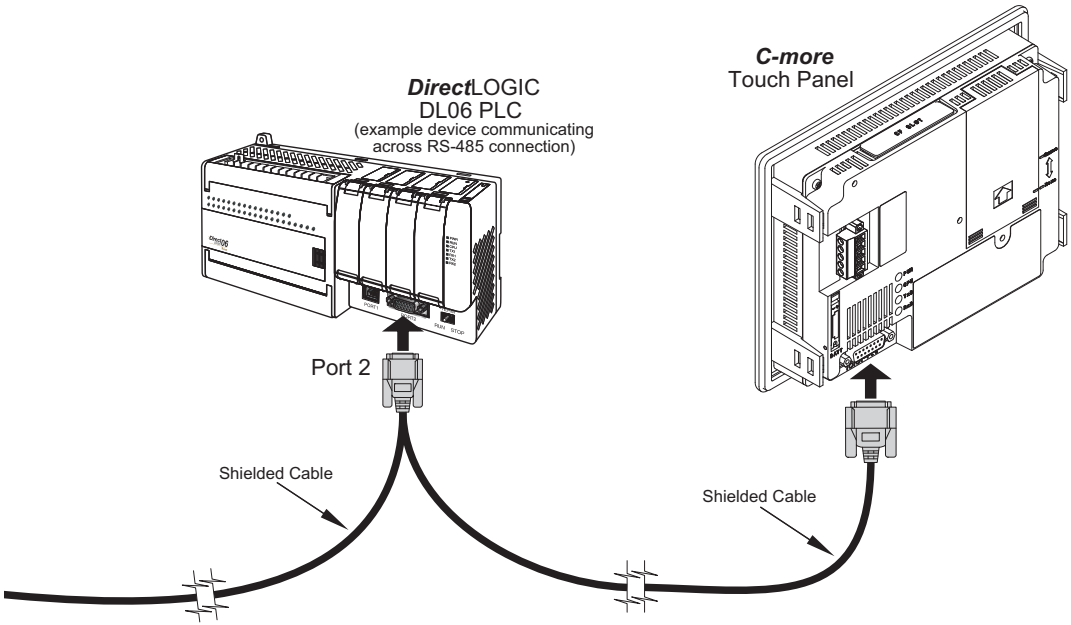
Note: We recommend Belden 88102 shielded cable or equivalent.



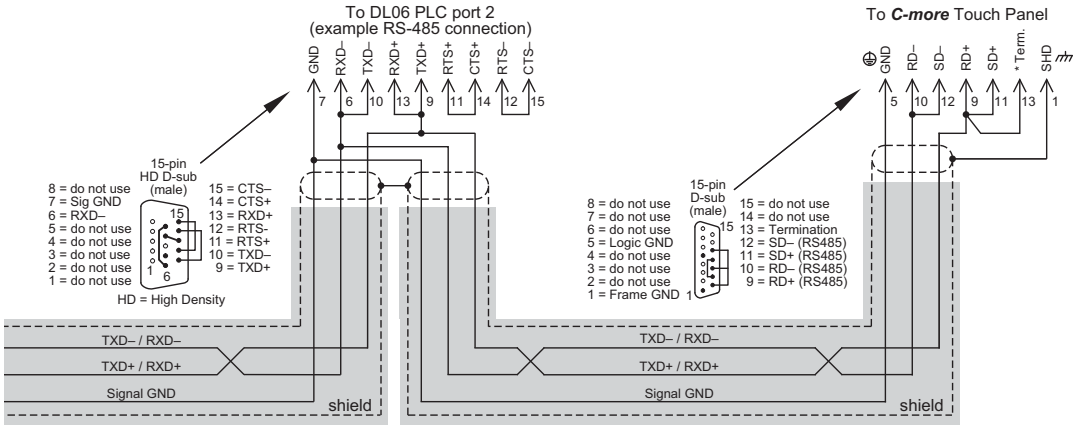
* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

Typical RS-485 Multi-Drop Wiring Diagram

RS-422A/RS-485A Multi-Drop Wiring Diagram Examples (cont'd)



Note: We recommend Belden 88102 shielded cable or equivalent.

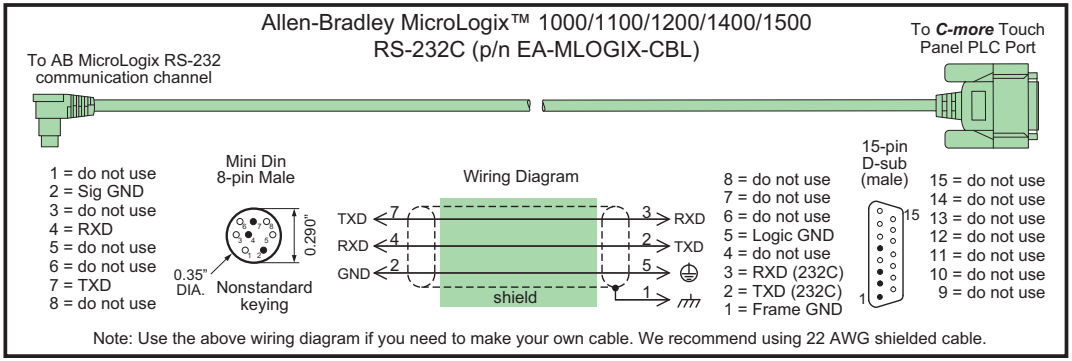


Typical RS-485 Multi-Drop Wiring Diagram (cont'd)

* 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*** touch panel 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.

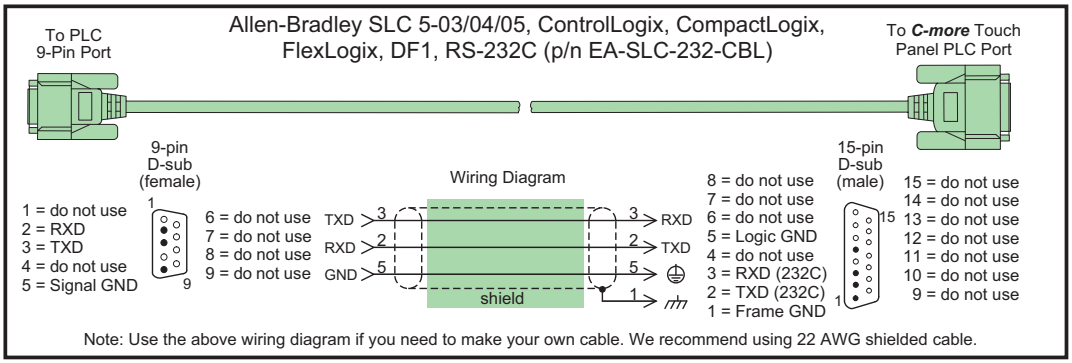
Allen-Bradley:

EA-MLOGIX-CBL



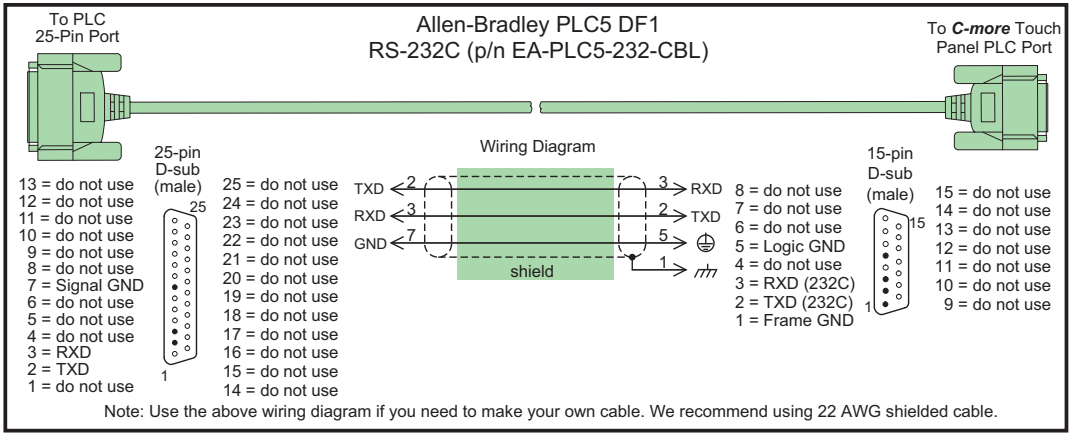
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

EA-SLC-232-CBL



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

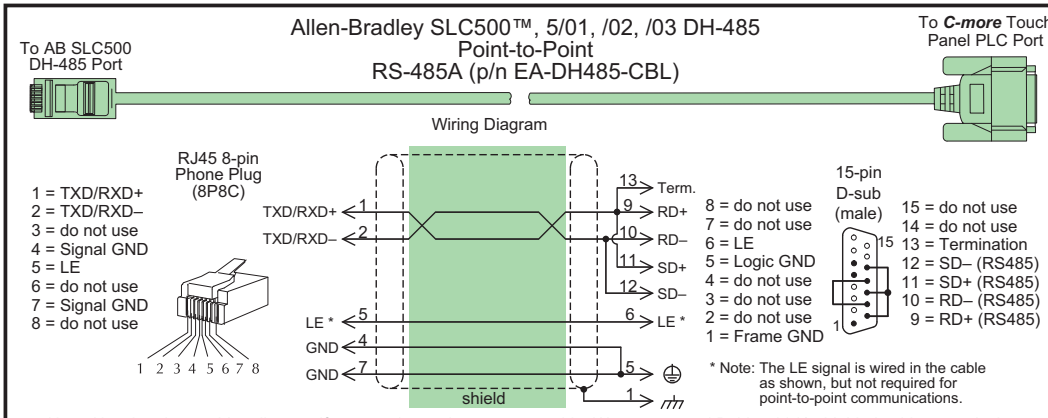
EA-PLC5-232-CBL



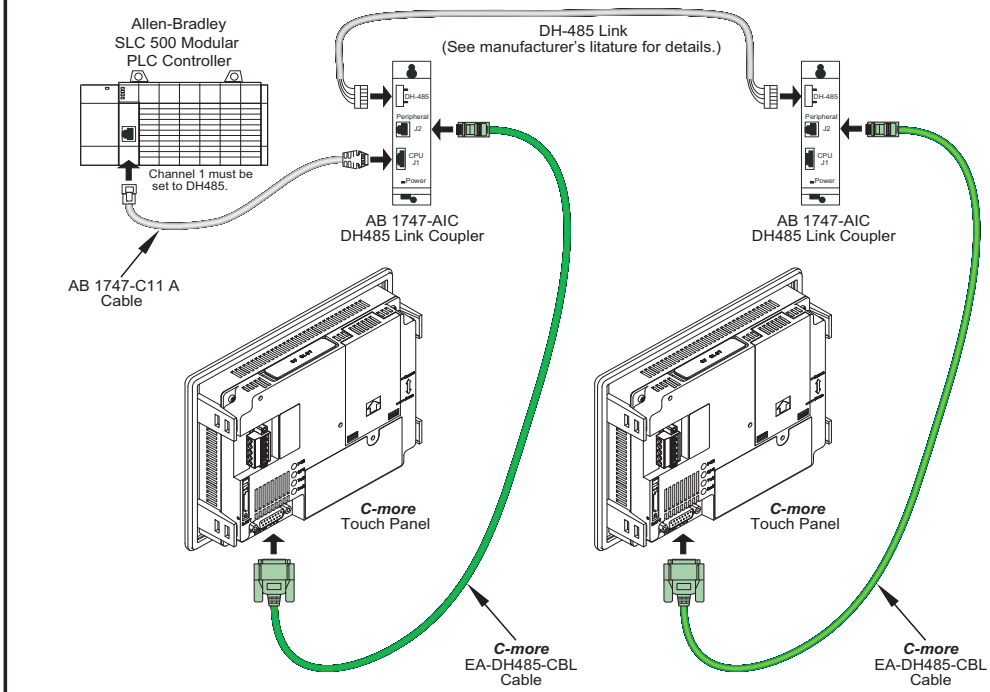
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

Allen-Bradley (cont'd):

EA-DH485-CBL



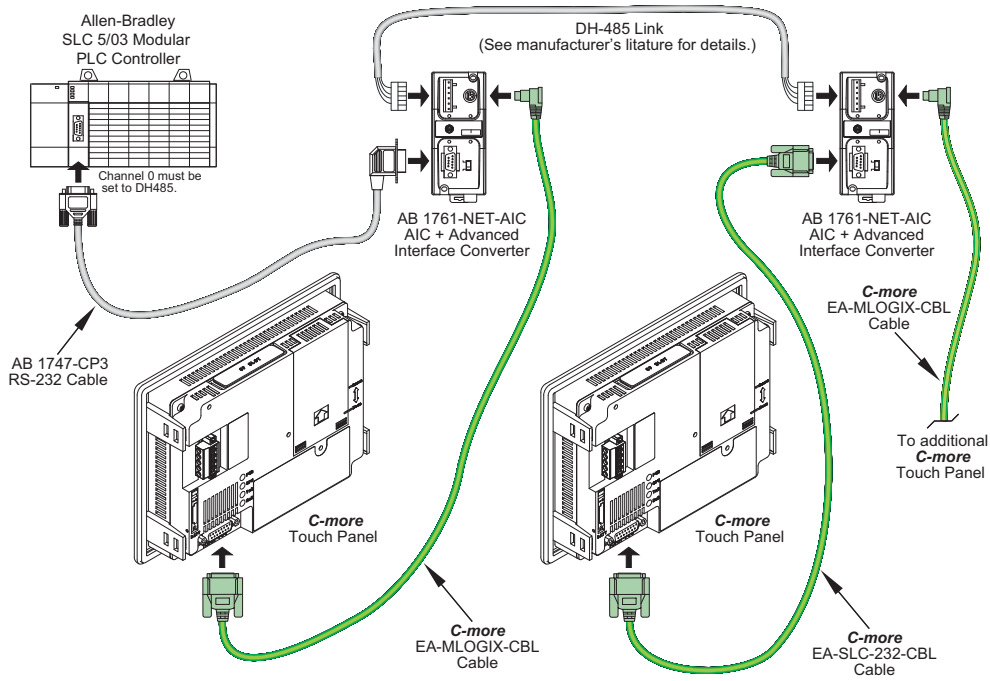
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 9842 shielded cable or equivalent.



Note: The above diagram shows connecting multiple ***C-more*** touch panels to an Allen-Bradley DH485/AIC network using the AB DH485 Link Coupler, p/n 1747-AIC. Select the "Allen-Bradly DH485/AIC SLC500 MircroLogix" driver in the ***C-more*** Programming Software when starting the project. Also, set the AB channel configuration for DH485.

Allen-Bradley (cont'd):

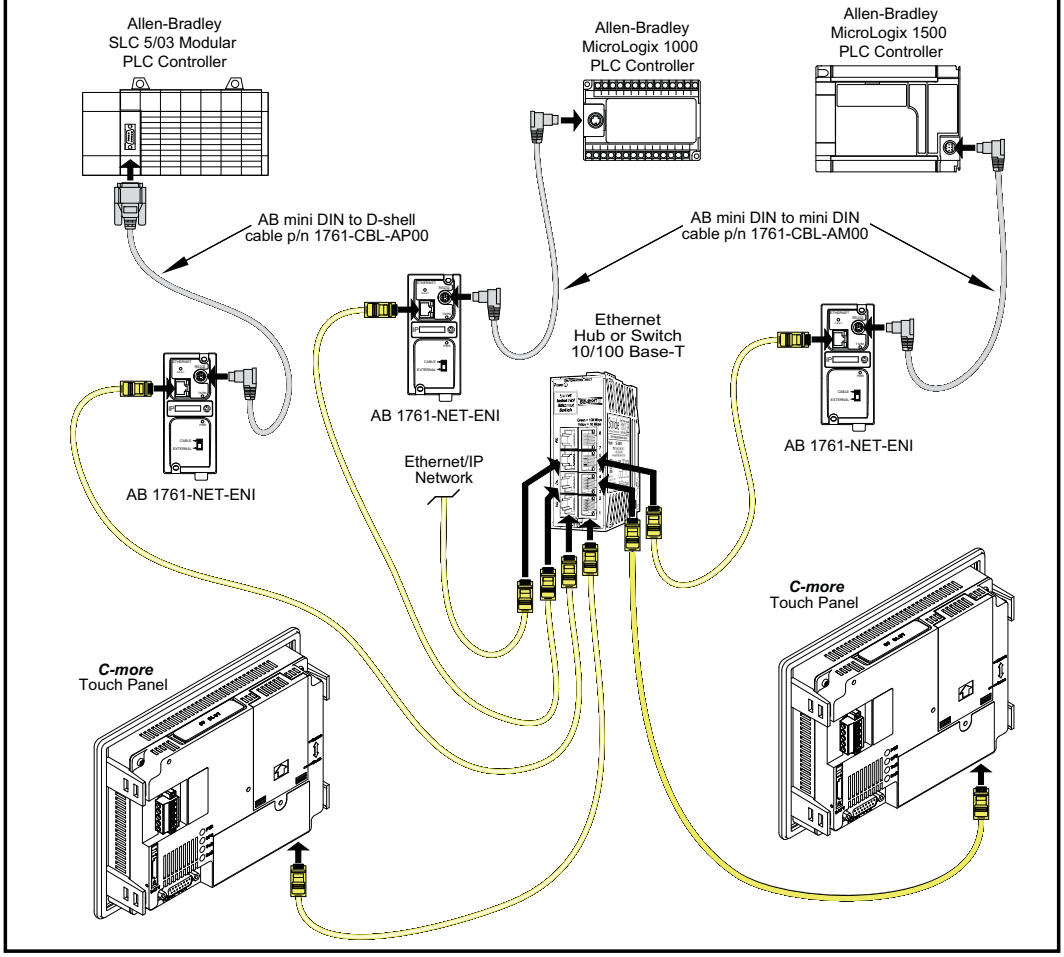
Allen-Bradley SLC500™ 5/03 DH-485/AIC to Multiple ***C-more*** Touch Panels
(using ***C-more*** cables p/n EA-MLOGIX-CBL, EA-SLC-232-CBL)



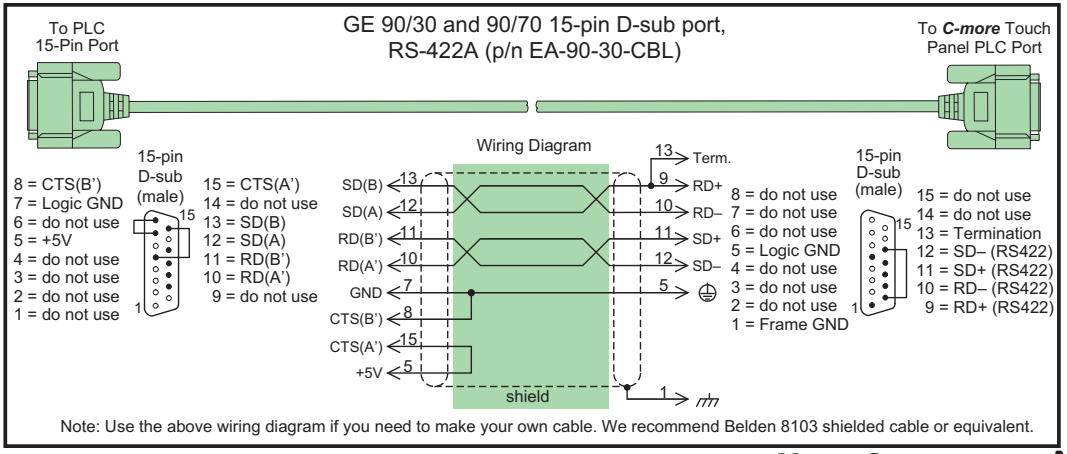
Note: The above diagram shows connecting multiple ***C-more*** touch panels to an Allen-Bradley DH485/AIC network using the AB AIC+ Advanced Interface Converter, p/n 1761-NET-AIC. Select the "Allen-Bradly DH485/AIC SLC500 MircroLogix" driver in the ***C-more*** Programming Software when starting the project. Also, set the AB channel configuration for DH485.

Allen-Bradley (cont'd):

Multiple Allen-Bradley PLCs connected to multiple ***C-more*** Touch Panels
(using AB Ethernet Network Interface p/n 761-NET-ENI with EtherNet/IP protocol)

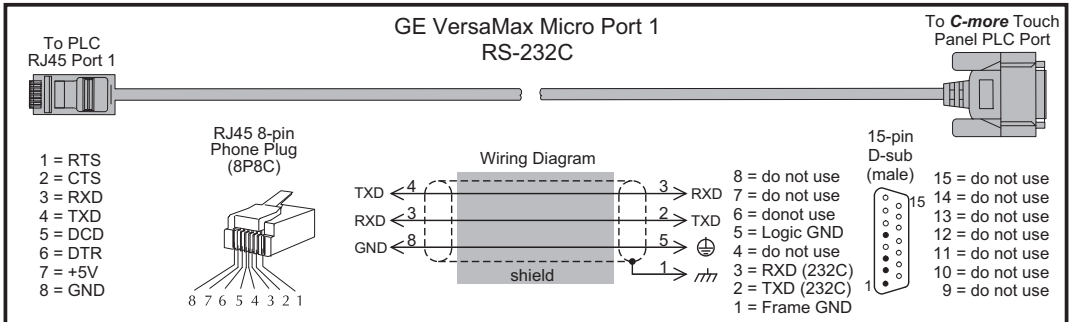


GE: EA-90-30-CBL



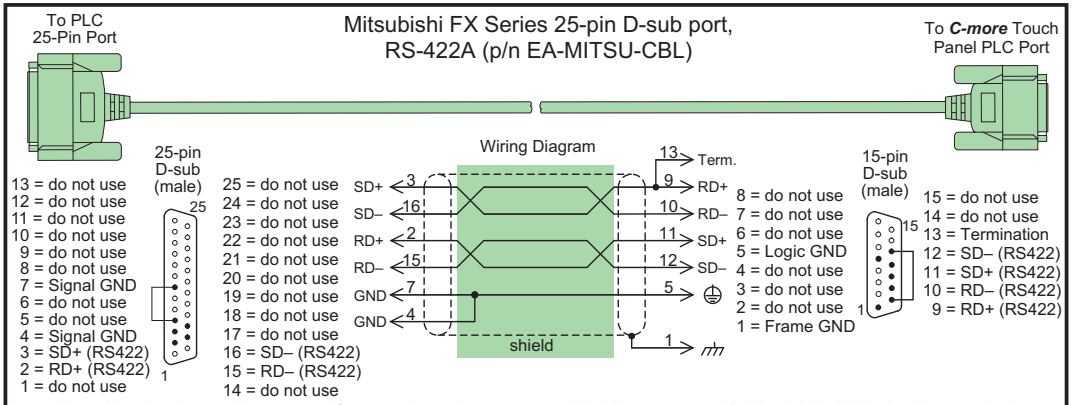
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

GE VersaMax Micro: User Constructed



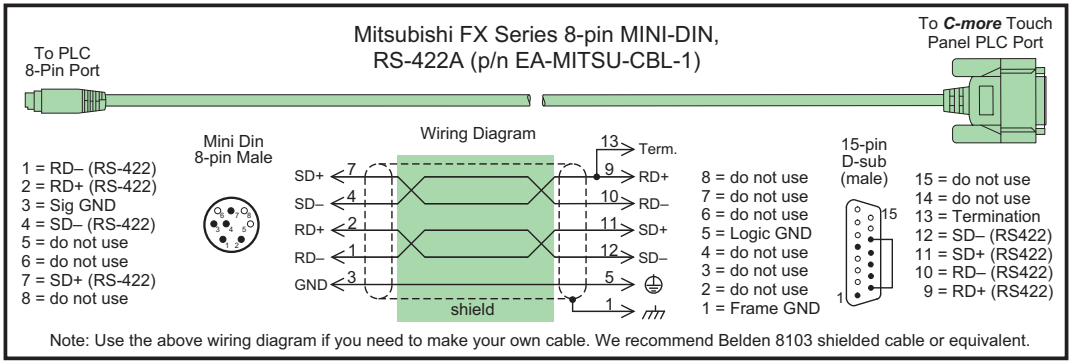
Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Mitsubishi: EA-MITSU-CBL



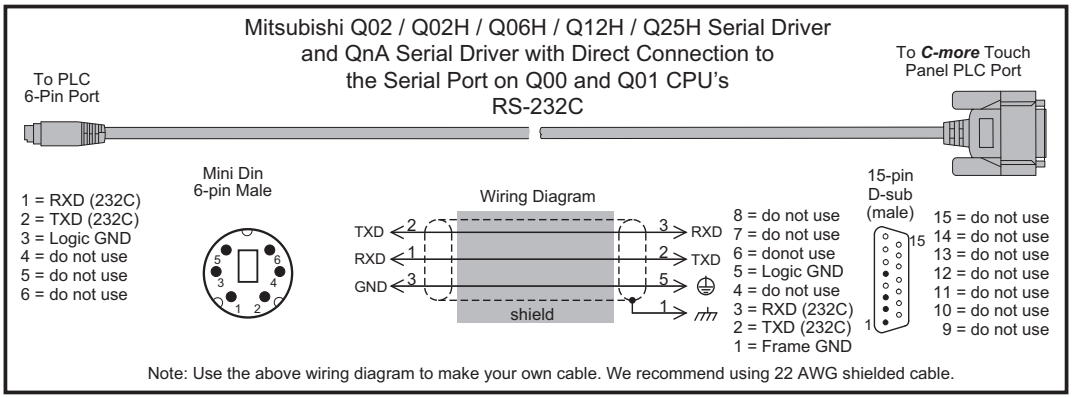
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

Mitsubishi(cont'd): EA-MITSU-CBL-1



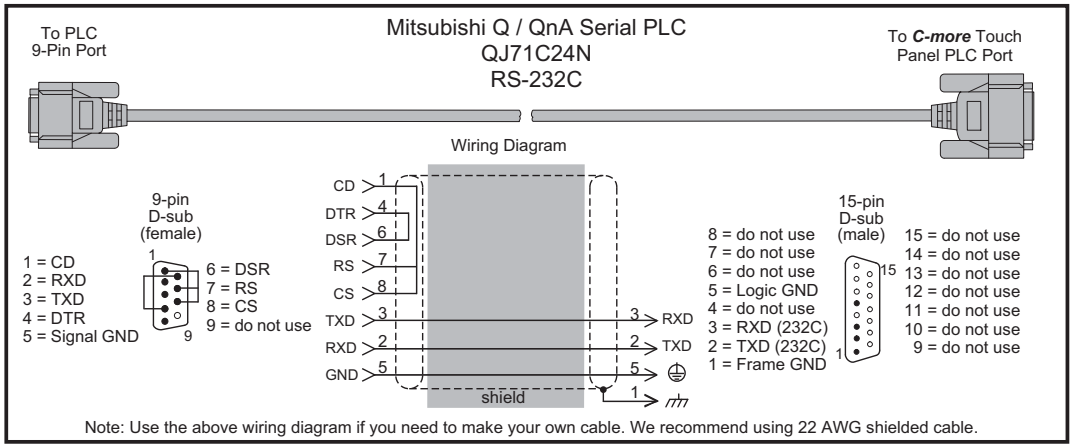
Note: Use the above wiring diagram if you need to make your own cable. We recommend Belden 8103 shielded cable or equivalent.

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

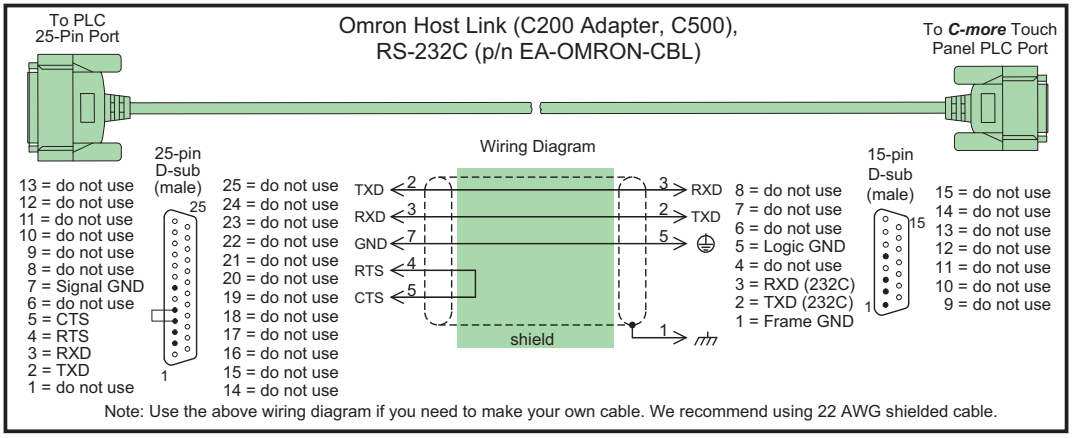
User Constructed



Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

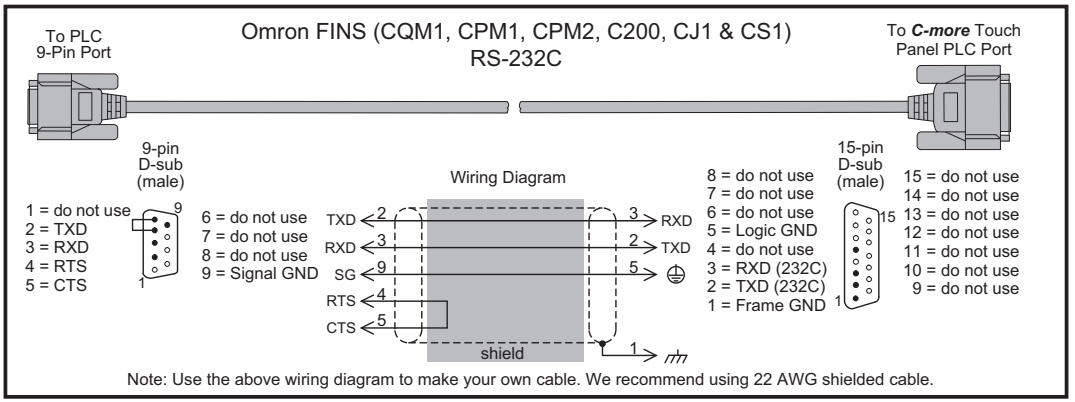
Omron:

EA-OMRON-CBL



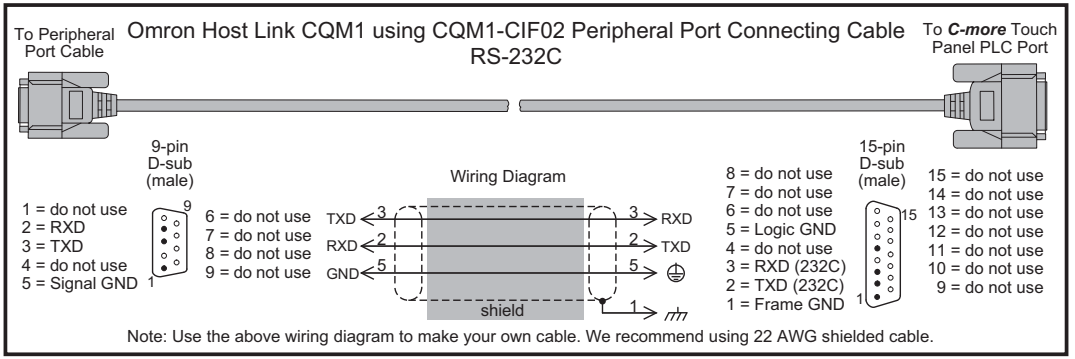
Note: Use the above wiring diagram if you need to make your own cable. We recommend using 22 AWG shielded cable.

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

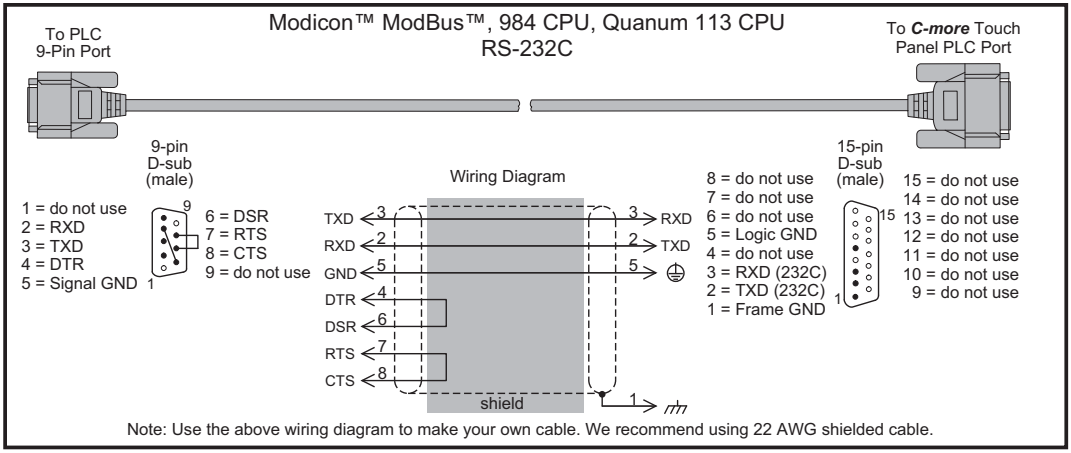
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon ModBus RS-232:

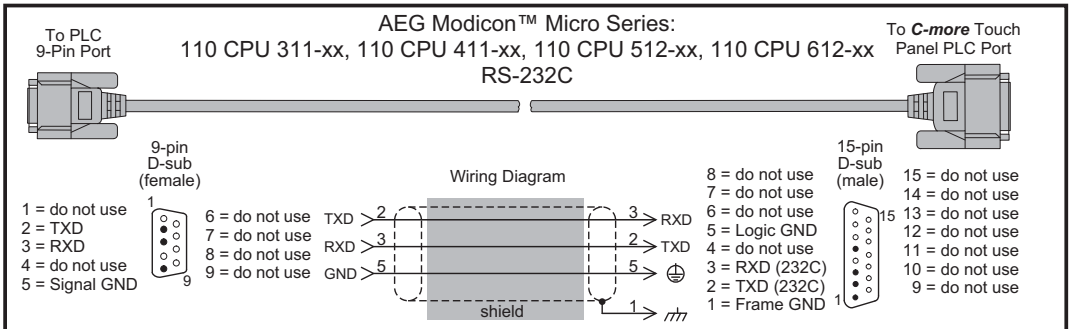
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon Micro Series:

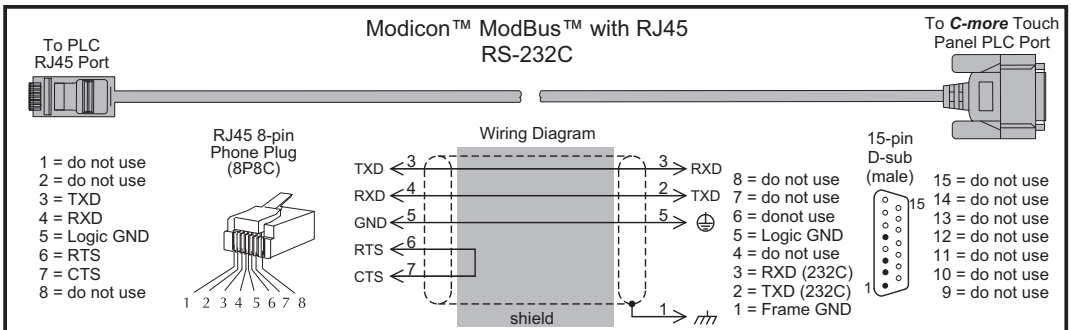
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Modicon ModBus with RJ45:

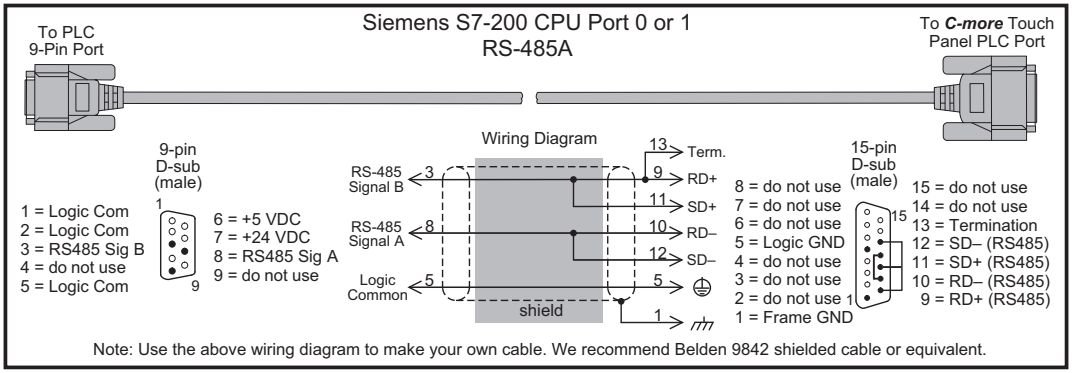
User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend using 22 AWG shielded cable.

Siemens:

User Constructed



Note: Use the above wiring diagram to make your own cable. We recommend Belden 9842 shielded cable or equivalent.