

PLC COMMUNICATIONS



CHAPTER

6

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Introduction

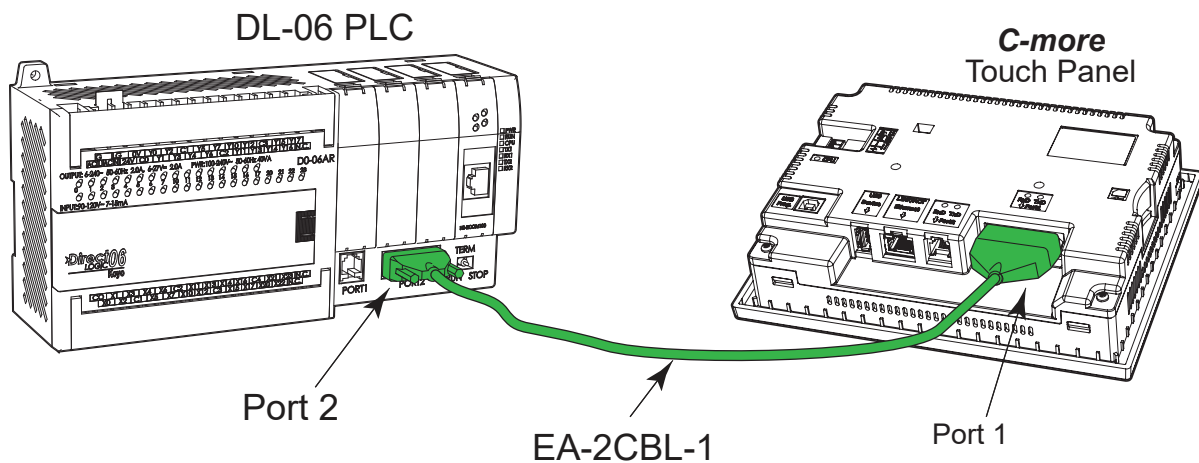
The **C-more** family of touch panels is capable of communicating with a wide variety of Programmable Logic Controllers. **C-more** is capable of communicating over RS232, RS422 and RS485 serial networks as well as Ethernet networks. It communicates with all AutomationDirect PLC's utilizing various protocols. **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 showing 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.

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

DIRECTLOGIC PLCs Password Protection



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



PLC Protocols

| PLC Protocol Table | | | |
|--------------------|--|--|----------------------------------|
| Model | | Protocols | |
| AutomationDirect | Productivity Series | | Productivity Serial |
| | | | Productivity Ethernet |
| | Do-more (BRX) | All | Do-more Serial |
| | | | Do-more Ethernet |
| | CLICK | All | CLICK Serial |
| | | C0-1x series | CLICK Ethernet |
| | CLICK PLUS | C2-01CPU-x, C2-03CPU-x, All with C2-DCM | CLICK Serial |
| | | All | CLICK Ethernet |
| | DL05/DL06 | All | K-Sequence |
| | | | DirectNET |
| | | | Modbus (Koyo addressing) |
| | | H0-ECOM/H0-ECOM100 | DirectLOGIC Ethernet |
| | DL105 | All | K-Sequence |
| | DL205 | D2-230 | K-Sequence |
| | | D2-240 | K-Sequence |
| | | | DirectNET |
| | | D2-250/D2-250-1/D2-260/D2-262 | K-Sequence |
| | | | DirectNET |
| | | | Modbus (Koyo addressing) |
| | | | D2-240/D2-250-1/D2-260 Using DCM |
| | | H2-ECOM/H2-ECOM100 | Modbus (Koyo addressing) |
| | | | DirectLOGIC Ethernet |
| | DL305 | D3-330/330P (Requires the use of a Data Communications Unit) | DirectNET |
| | | D3-340 | DirectNET |
| | | D3-350 | K-Sequence |
| | | | DirectNET |
| | | D3-350 DCM | Modbus (Koyo addressing) |
| | DL405 | D4-430 | DirectNET |
| | | | K-Sequence |
| | | D4-440 | DirectNET |
| | | D4-450/D4-454 | K-Sequence |
| | | | DirectNET |
| | | | Modbus (Koyo addressing) |
| | | All with DCM | DirectNET |
| | H4-ECOM/H4-ECOM100 | Modbus (Koyo addressing) | |
| | | DirectLOGIC 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) | |
| | GS Drives | GS Drives Serial | |
| | | GS Drives TCP/IP (GS-EDRV) | |
| | SOLO Temperature Controllers (models with serial communications) | SOLO Temperature Controller | |

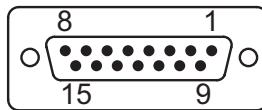
| PLC Protocol Table (cont'd) | | |
|------------------------------|--|----------------------------------|
| Model | | Protocols |
| Allen-Bradley | MicroLogix 1000, 1100, 1200, 1400 and 1500 | DF1 Half Duplex; DF1 Full Duplex |
| | SLC 5-03/04/05 | |
| | ControlLogix™, CompactLogix™, FlexLogix™ | |
| | 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 and SLC 5/05, via native Ethernet port | |
| | MicroLogix 1000, 1100, 1200, 1400, 1500, SLC 5-03/04/05, all via ENI adapter | |
| | Micro 800 Series | Modbus RTU |
| | Modbus TCP | |
| Micro 800 Series - Tag Based | DF1 Full Duplex | |
| | EtherNet/IP Client | |
| Modbus RTU | Modbus RTU devices | Modbus RTU |
| Modbus TCP/IP | Modbus TCP/IP devices | Modbus TCP/IP |
| GE | 90/30, 90/70, Micro 90, VersaMax Micro | SNPX |
| | 90/30, Rx3i | SRTP Ethernet |
| Mitsubishi | FX Series | FX Direct |
| | Q02, Q02H, Q06H, Q12H, Q25H | Q CPU |
| | Q, QnA Serial | QnA Serial |
| | Q, QnA Ethernet | QnA Ethernet |
| Modicon | 984 CPU, Quantum 113 CPU, AEG Modicon Micro Series 110 CPU: 311-xx, 411-xx, 512-xx, 612-xx | Modbus RTU |
| | Other devices using Modicon Modbus addressing | Modbus RTU Modbus TCP/IP |
| Omron | C200 Adapter, C500 | Host Link |
| | CJ1/CS1 Serial | FINS |
| | CJ1/CS1 Ethernet | |
| Siemens | S7-200 CPU, RS-485 Serial | PPI |
| | S7-200 CPU, S7-300 CPU, S7-400, S7-1200, S7-1500 CPU Ethernet | Ethernet ISO over TCP |

PLC Communication Cables & Wiring Diagrams

| Cable Description | Cable Part No. |
|--|------------------------|
| Cables used with 15-pin RS-232/422/485 serial Port1 | |
| AutomationDirect Productivity Series, Do-more, CLICK, Direct LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C) 3m (9.8 ft) cable length | EA-2CBL |
| Direct LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C) 3m (9.8 ft) cable length | EA-2CBL-1 |
| Direct LOGIC PLC RJ-11 port, D3-340 (RS-232C) 3m (9.8 ft) cable length | EA-3CBL |
| Direct LOGIC DL405 PLC 15-pin D-sub port, DL405 (RS-232C) 3m (9.8 ft) cable length | EA-4CBL-1 |
| Direct LOGIC PLC 25-pin D-sub port, DL405, D3-350, DL305 DCU and all DCM's (RS-232C) 3m (9.8 ft) cable length | EA-4CBL-2 |
| 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, ControlLogix, CompactLogix, FlexLogix DF1 port (RS-232C) | EA-SLC-232-CBL |
| Allen-Bradley PLC-5 DF1 port (RS-232C) 3m (9.8 ft) cable length | EA-PLC5-232-CBL |
| 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 | EA-MITSU-CBL |
| 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 | EA-OMRON-CBL |

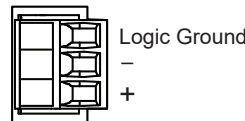
| Cable Description | Cable Part No. |
|---|------------------|
| Cables used with RJ12 RS-232 serial Port2 | |
| AutomationDirect Productivity Series, Do-more, CLICK, Direct LOGIC PLC RJ-12 port, DL05, DL06, DL105, DL205, D3-350, D4-450 & H2-WinPLC (RS-232C) 3.66m (12ft) cable length | D0-CBL |
| Direct LOGIC (VGA Style) 15-pin port, DL06, D2-250 (250-1), D2-260 (RS-232C). Use with D0-CBL cable. | FA-15HD |
| Direct LOGIC PLC 15-pin D-sub port, DL405 (RS-232C). Use with D0-CBL cable. | FA-CABKIT |
| Direct LOGIC PLC RJ-11 port, D3-340 (RS-232C) 2m (6.56 ft) cable length | OP-3CBL-1 |

PORT1



D-Sub 15-pin female
on rear of touch panel
RS-232C, RS-422, RS-485

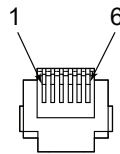
***PORT3**



RS-485 Serial
Communications

PORT2

| Pin | Signal |
|-----|--------|
| 1 | 0V |
| 2 | N.C. |
| 3 | RXD |
| 4 | TXD |
| 5 | N.C. |
| 6 | 0V |



RJ12 RS-232 Serial
Communications



NOTE: All cables for connections at Port 3 are user constructed. Refer to the specifications of the connected device port to construct the cable properly. The connector for Port3, HMI-3TB, is included with your C-more panel.

CABLES FROM AUTOMATIONDIRECT



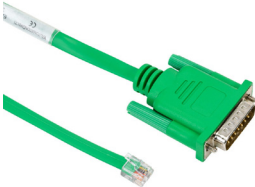
Part No. D0-CBL



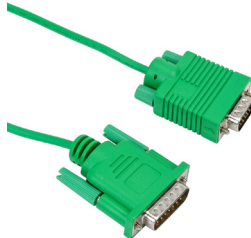
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Part No. FA-15HD



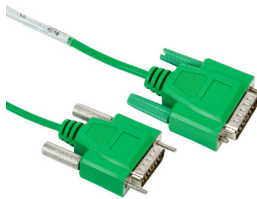
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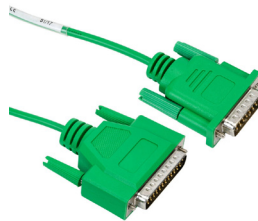
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Part No. FA-CABKIT



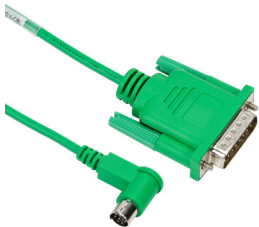
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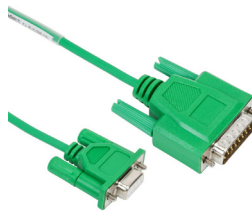
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Part No. EA-3CBL



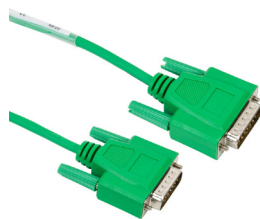
Part No. EA-MLOGIX-CBL



Part No. EA-SLC-232-CBL



Part No. EA-PLC5-232-CBL



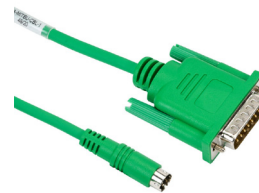
Part No. EA-90-30-CBL



Part No. EA-OMRON-CBL



Part No. EA-MITSU-CBL

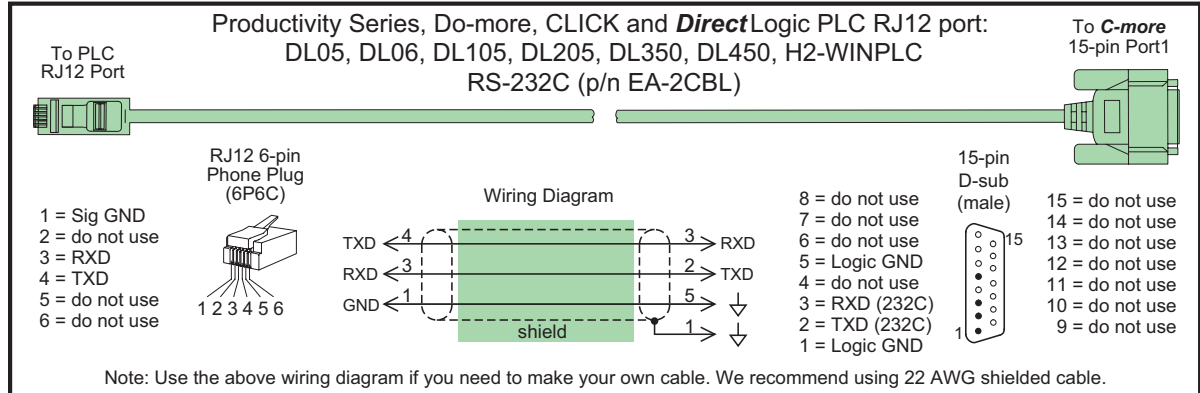


Part No. EA-MITSU-CBL-1

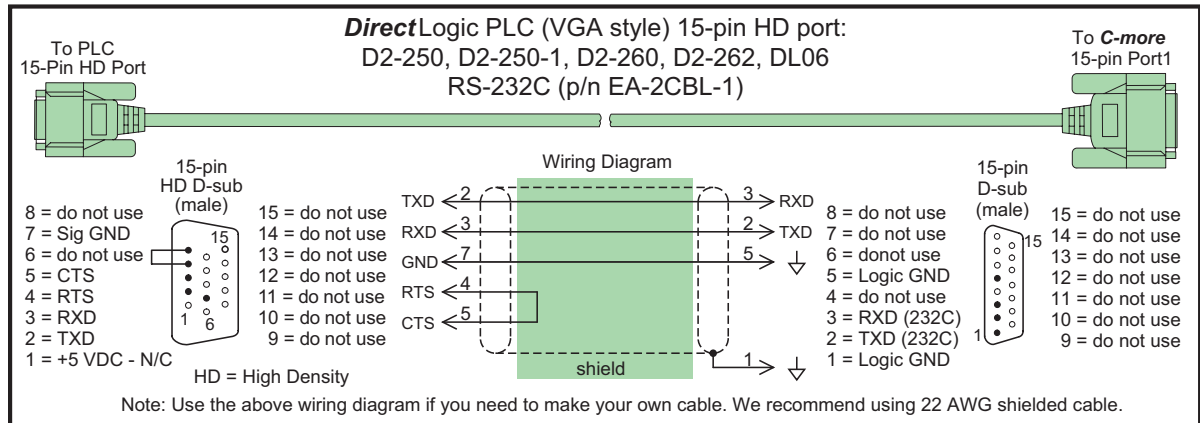
AUTOMATIONDIRECT PLCs RS-232C SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** 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.

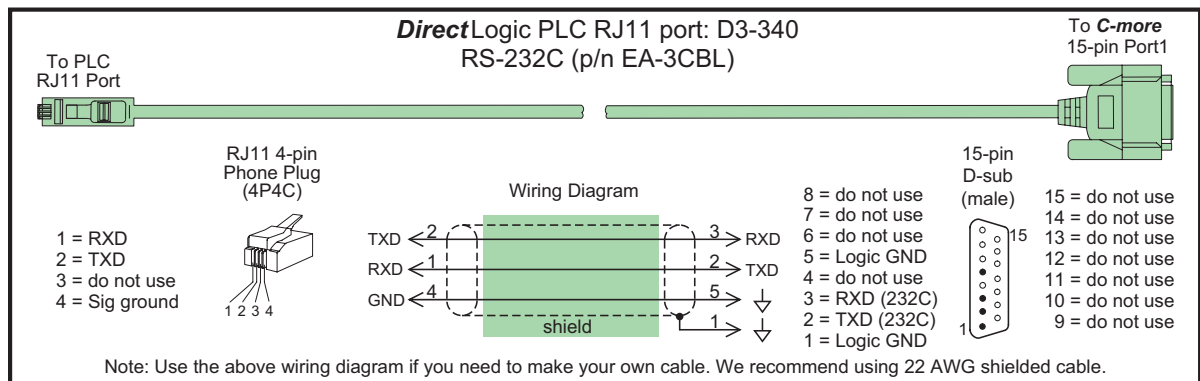
EA-2CBL



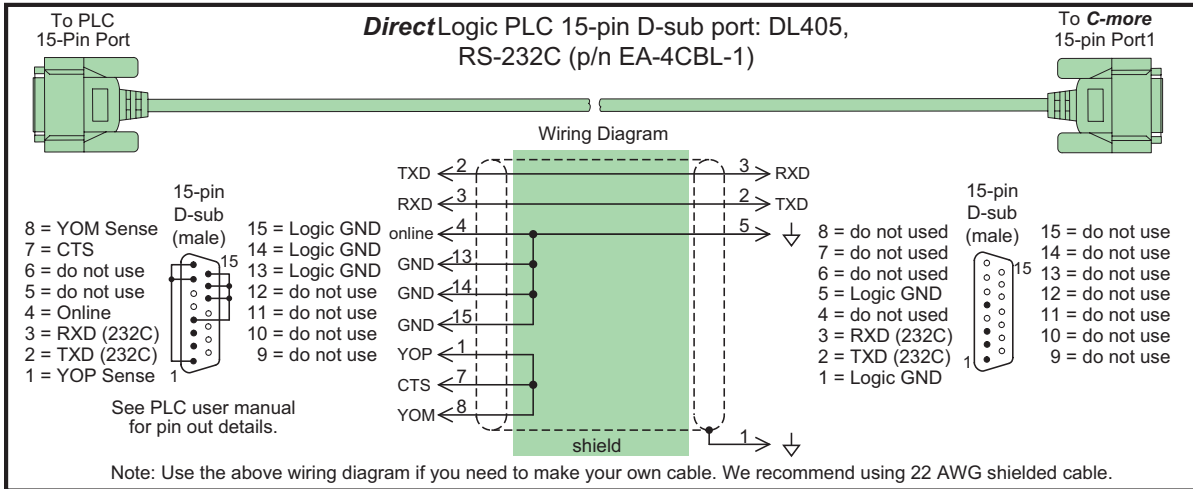
EA-2CBL-1



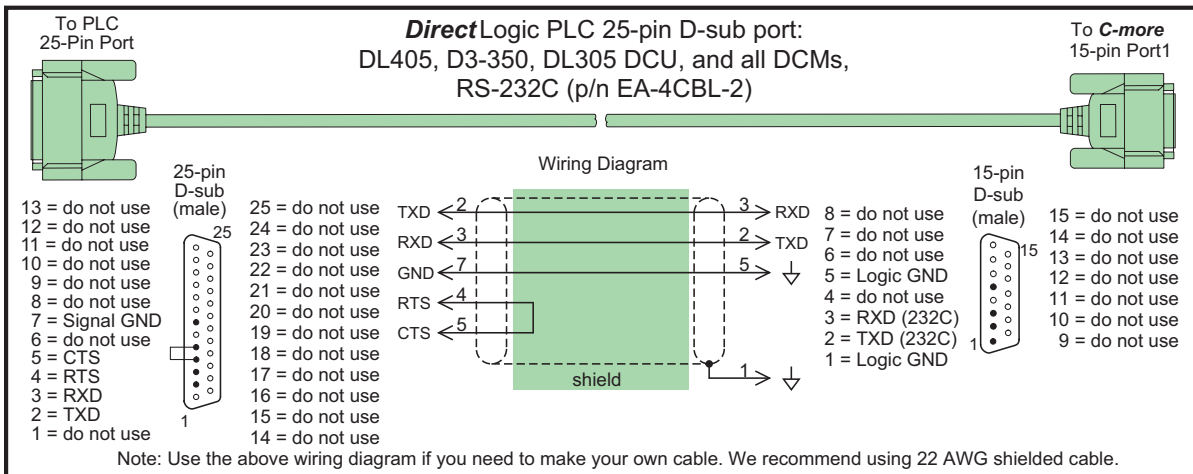
EA-3CBL



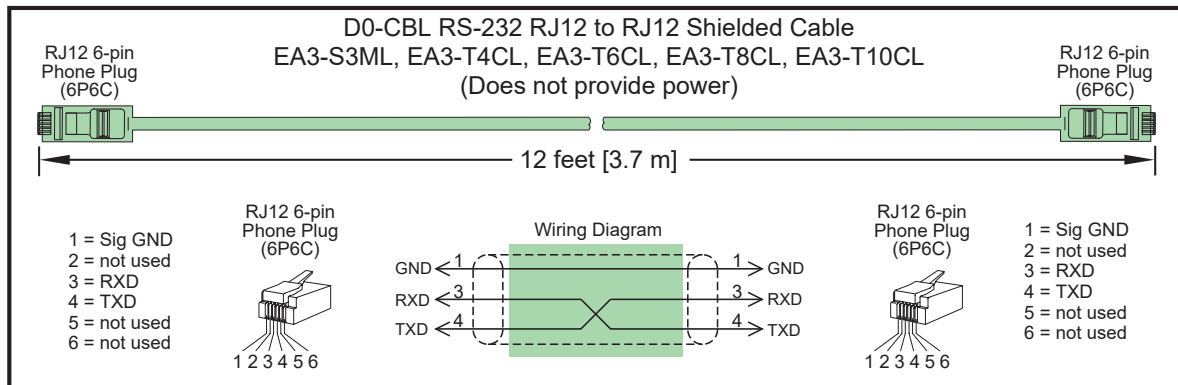
EA-4CBL-1



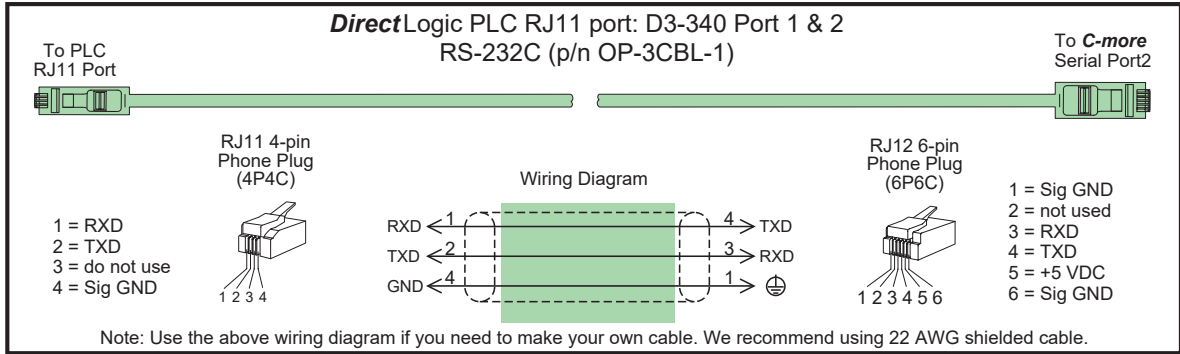
EA-4CBL-2



D0-CBL



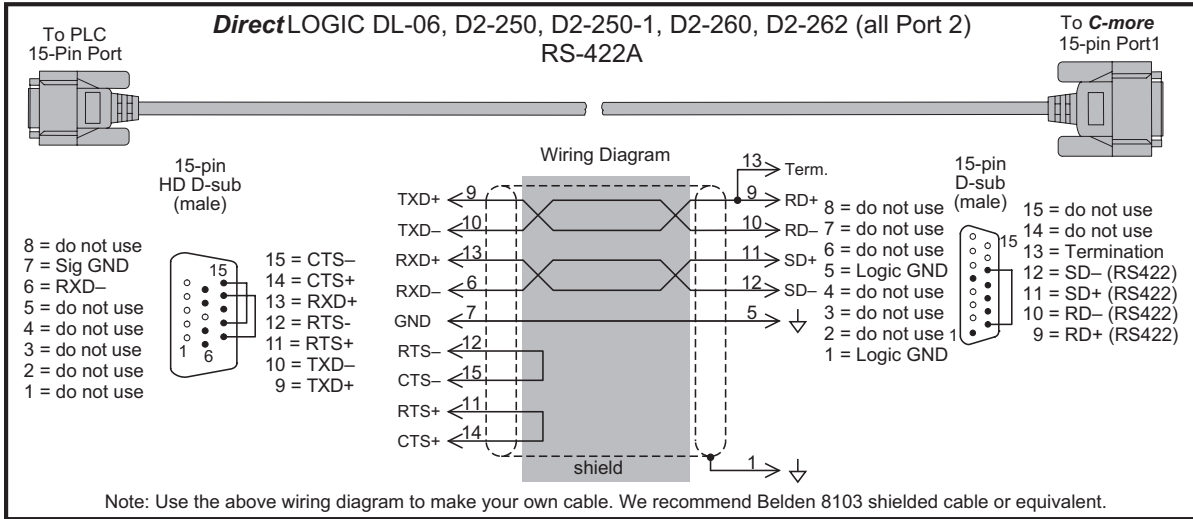
OP-3CBL-1



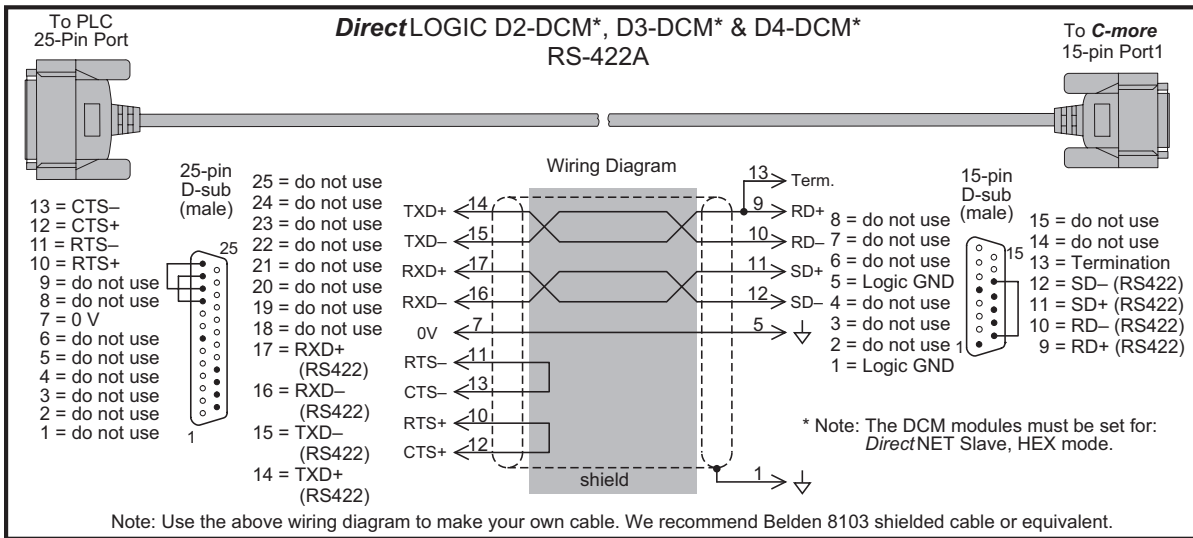
AUTOMATIONDIRECT PLCs PLCs RS-422A/RS-485A CABLES WIRING DIAGRAMS

When using the RS-422A/RS-485A capabilities of the **C-more** 15-pin PLC communications Port1, 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 Port1.

USER CONSTRUCTED

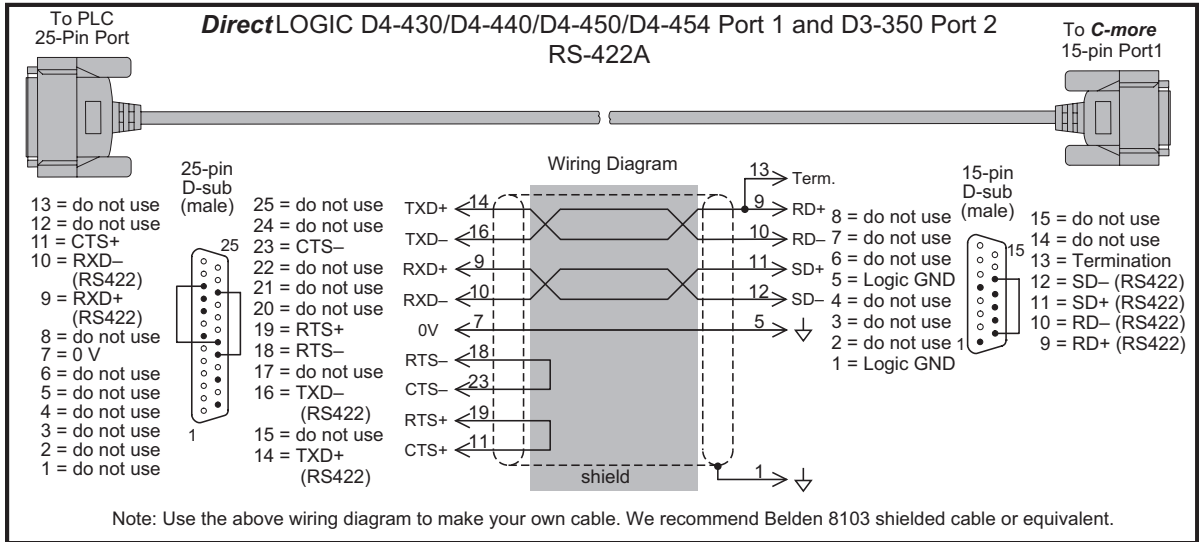


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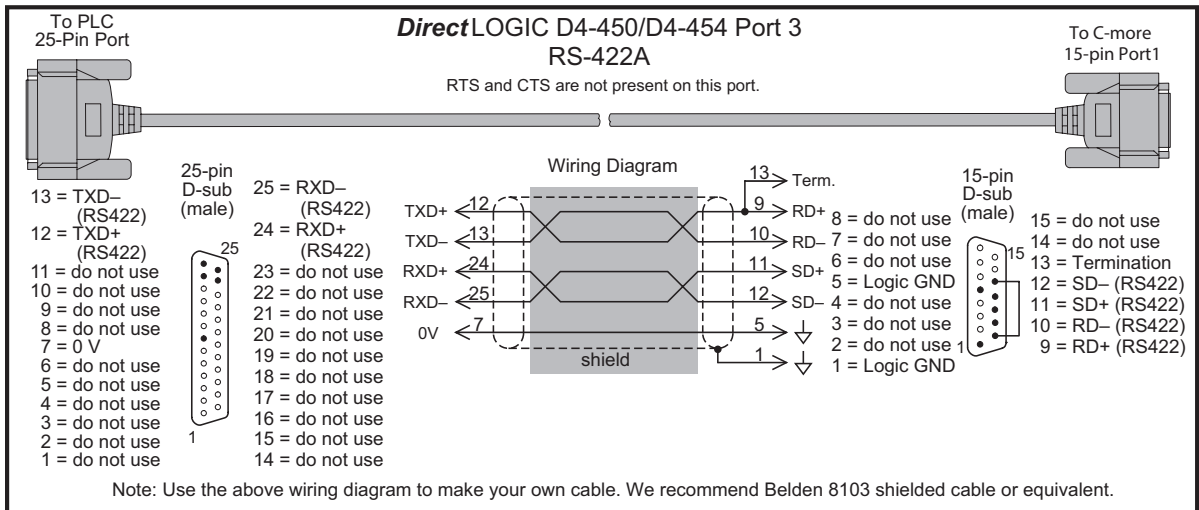


NOTE: The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to a panel.

USER CONSTRUCTED

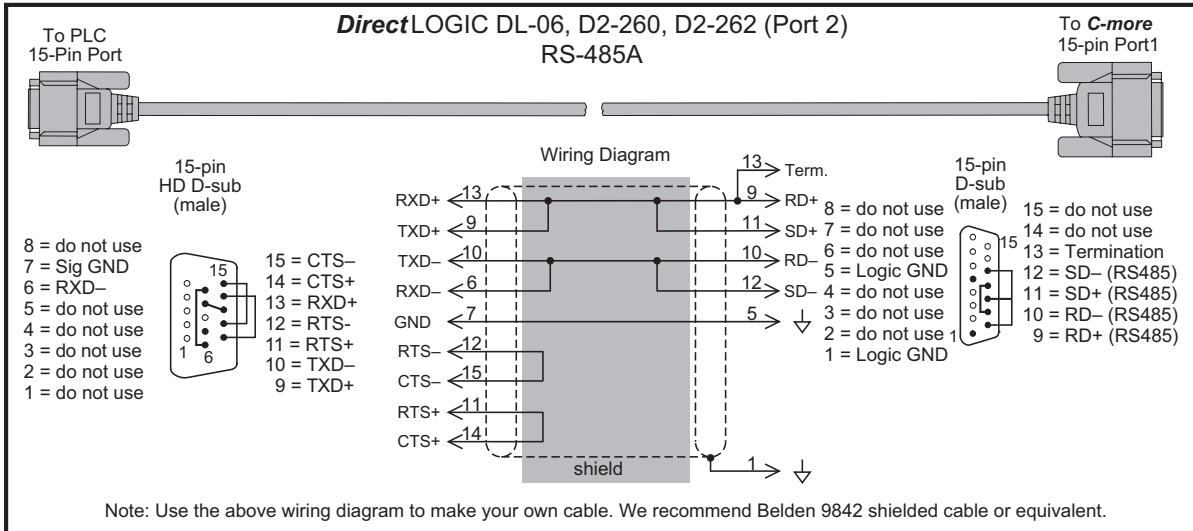


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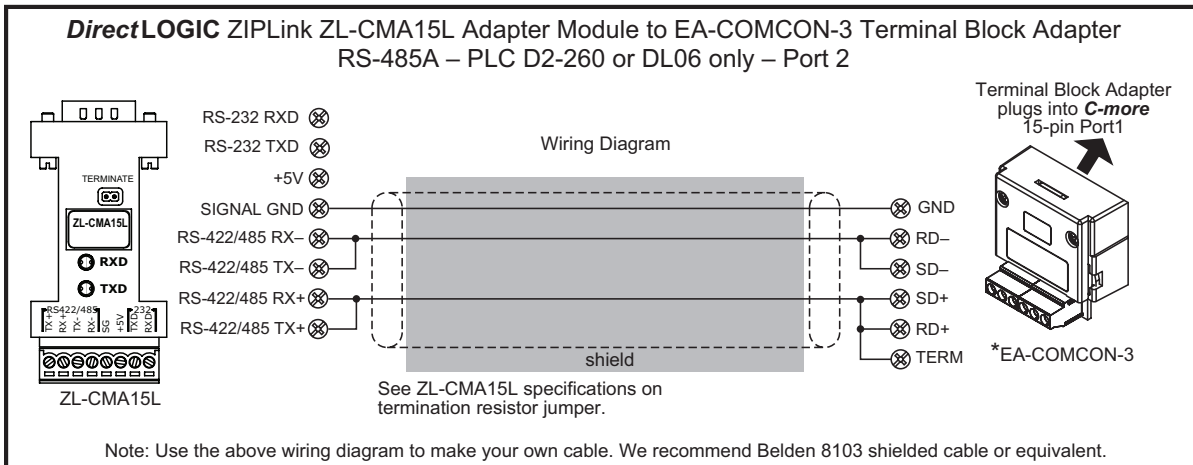


NOTE: The RS-422 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to a panel.

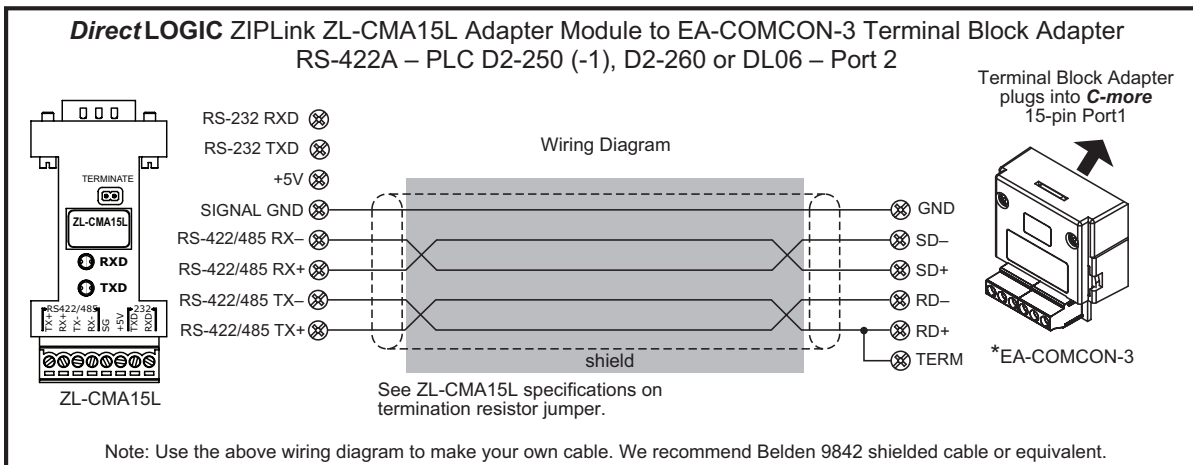
USER CONSTRUCTED



USER CONSTRUCTED



USER CONSTRUCTED

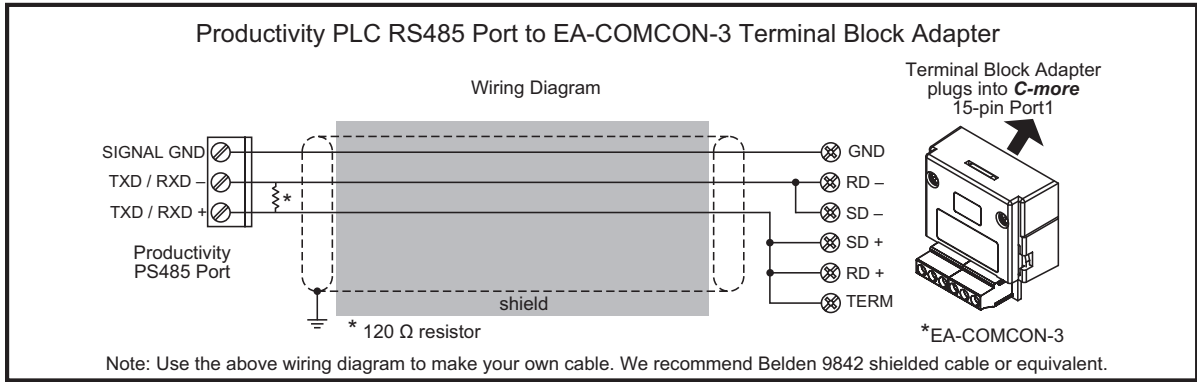


***NOTE:** EA-COMCON-3 will install only on CM5-T4W. For all other models use EA-COMCON-3A



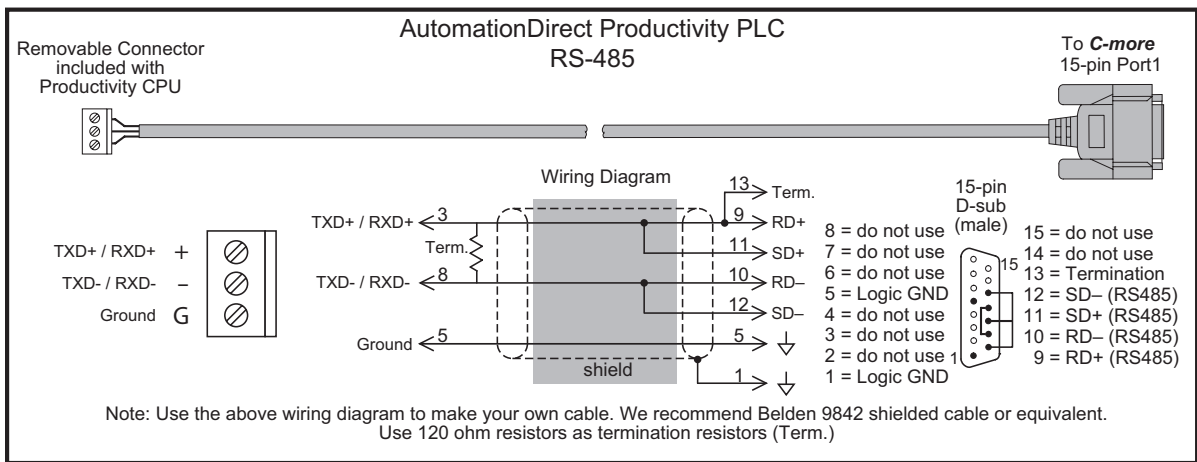
NOTE: The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to a panel.

USER CONSTRUCTED

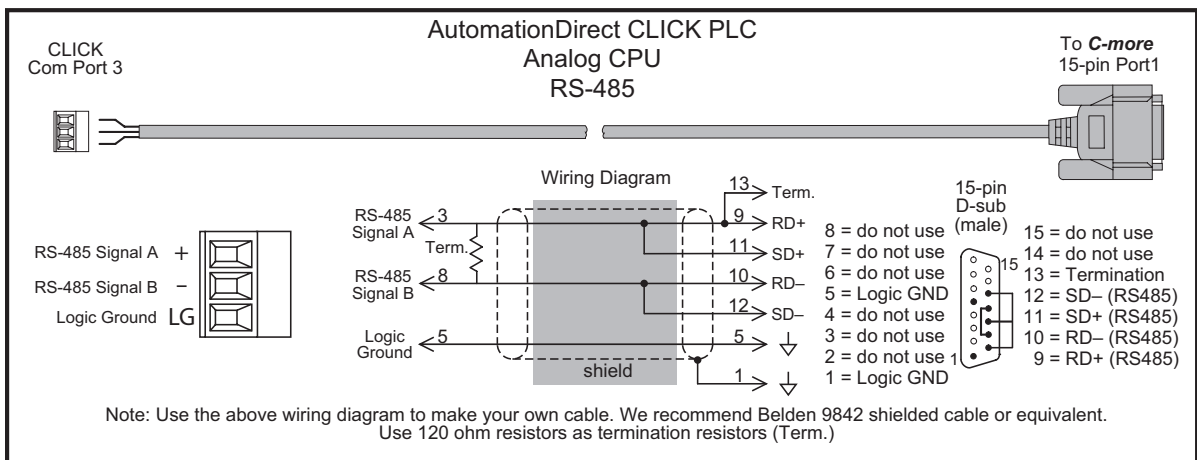


***NOTE:** EA-COMCON-3 will install only on CM5-T4W. For all other models use EA-COMCON-3A

USER CONSTRUCTED

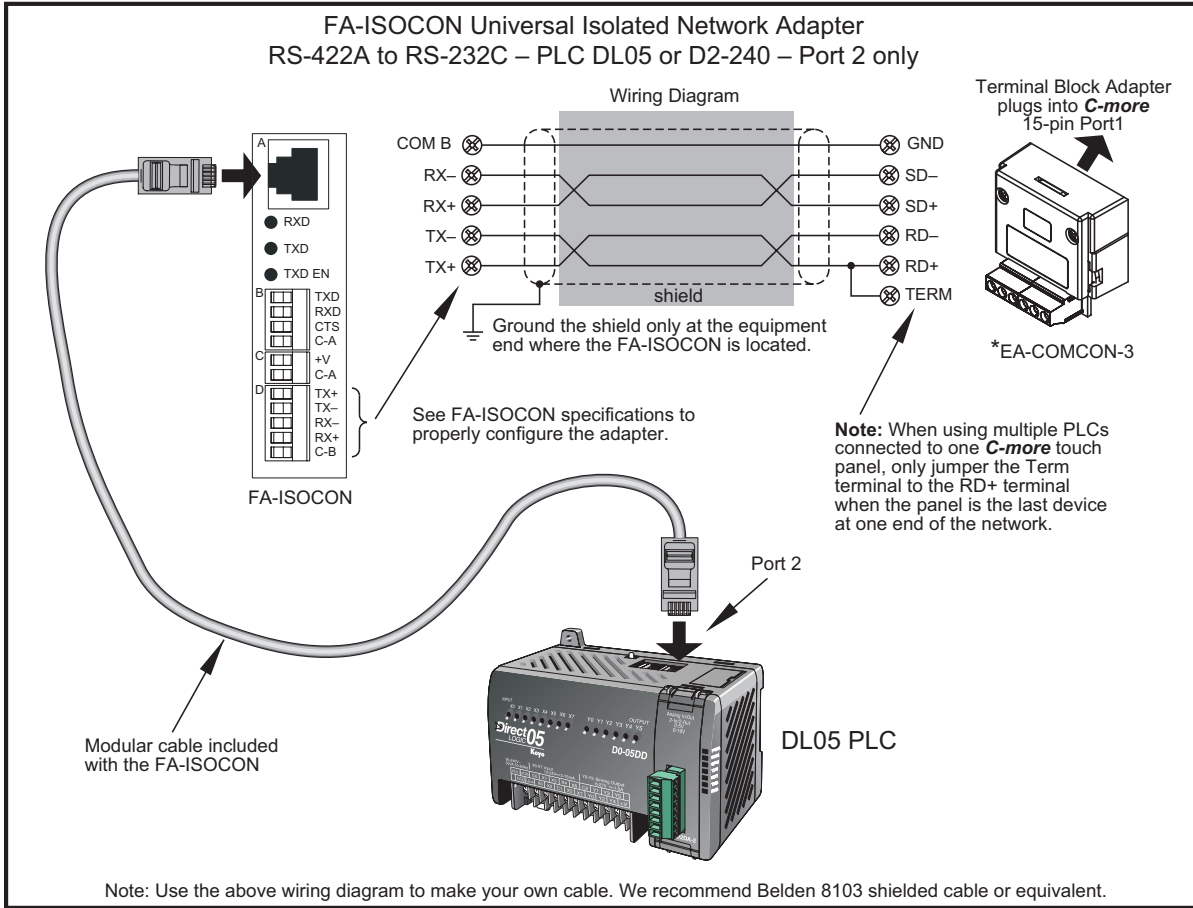


USER CONSTRUCTED



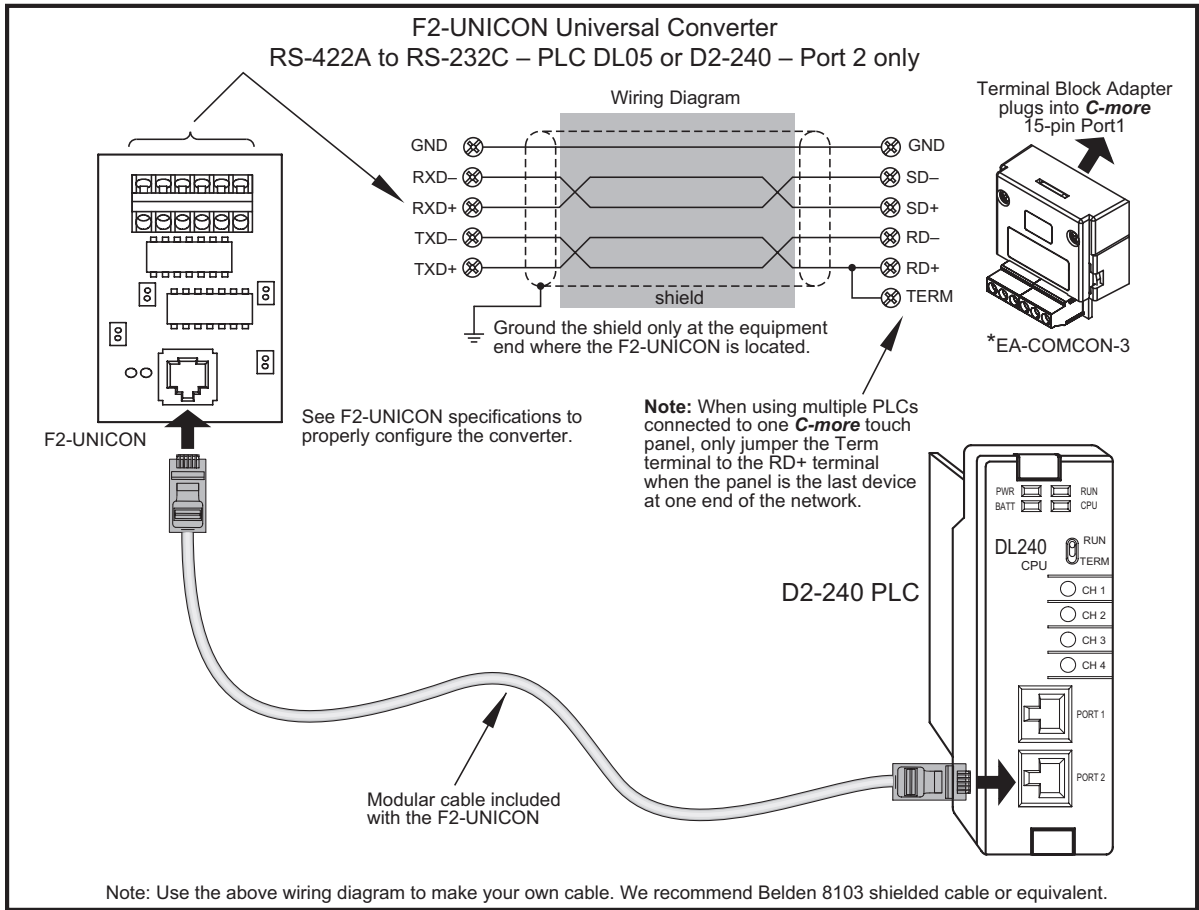
NOTE: The RS-422 and RS-485 wiring diagrams shown above are not for multi-drop networks involving connecting more than one PLC to a panel. Refer to the multi-drop wiring diagram examples later in this chapter if more than one PLC will be connected to a panel.

DIRECTLOGIC UNIVERSAL ISOLATED NETWORK ADAPTER, P/N FA-ISOCAN:



***NOTE:** EA-COMCON-3 will install only on CM5-T4W. For all other models use EA-COMCON-3A

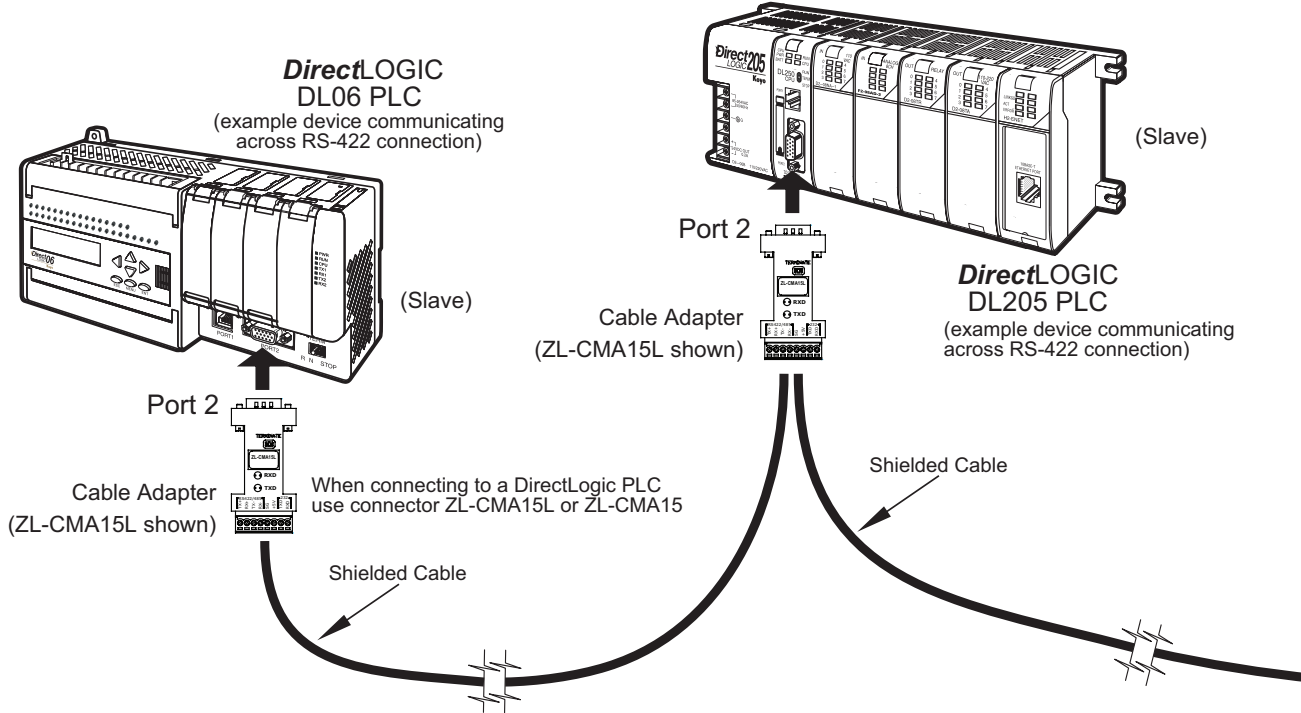
DIRECTLOGIC UNIVERSAL CONVERTER, P/N F2-UNICON:



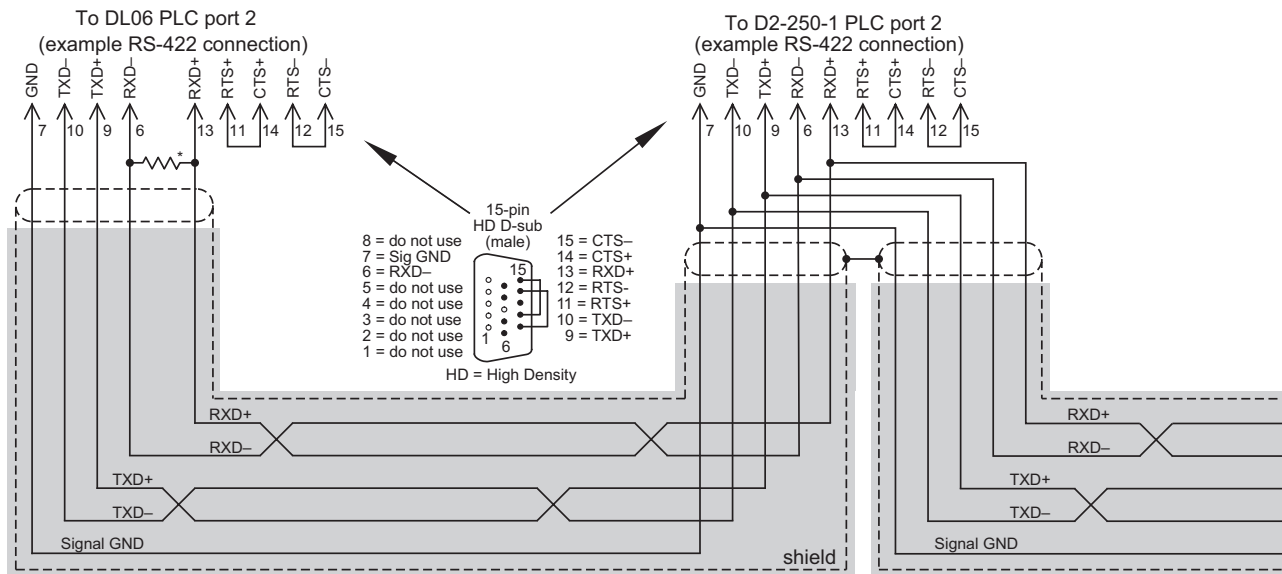
***NOTE:** EA-COMCON-3 will install only on CM5-T4W. For all other models use EA-COMCON-3A

RS-422A/RS-485A MULTI-DROP WIRING DIAGRAM EXAMPLES

DL06 and DL205 used for illustration purposes



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

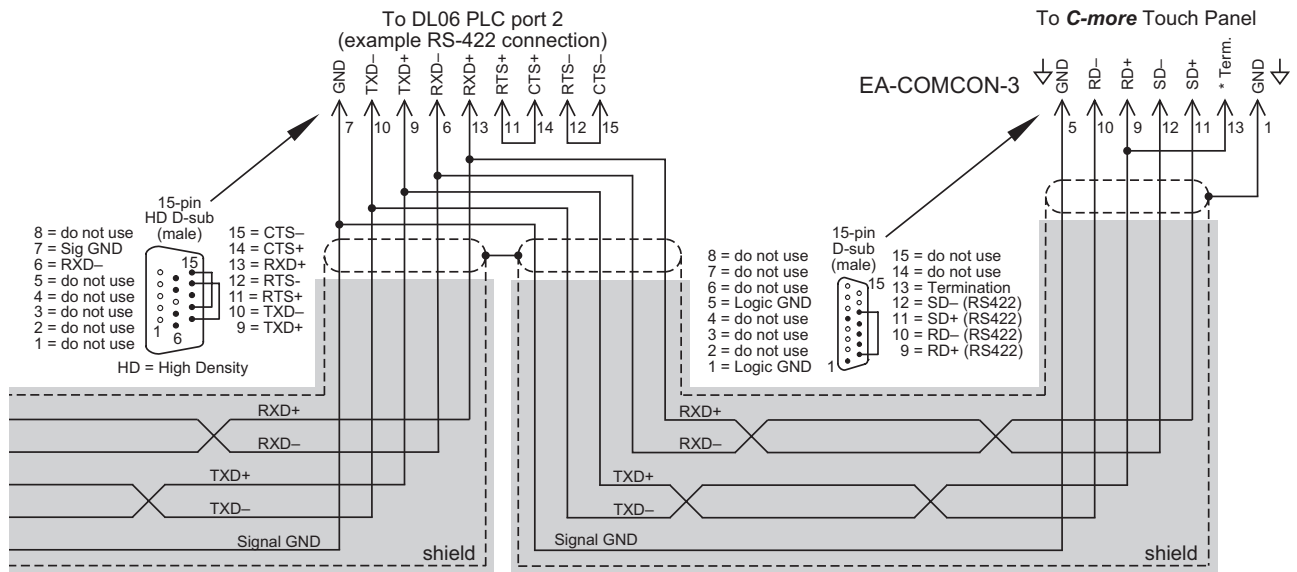
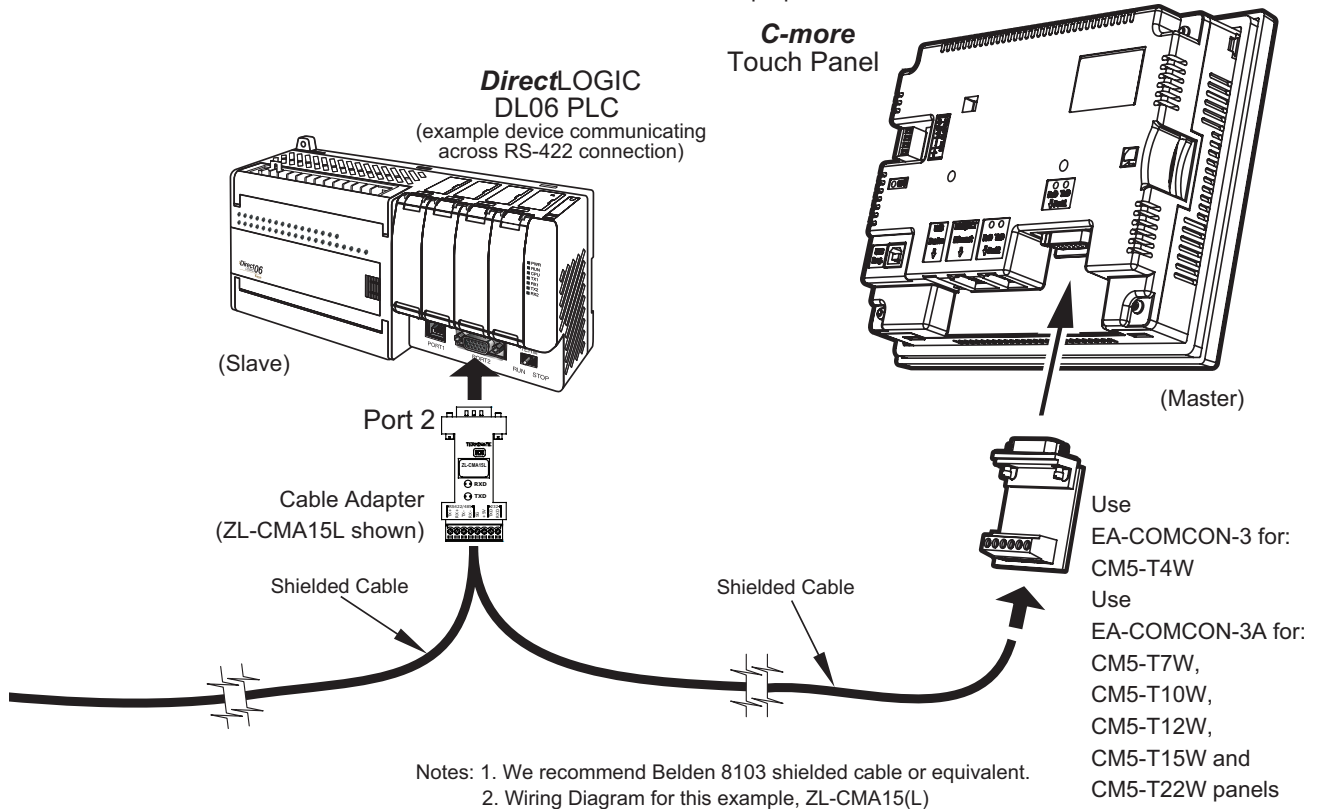


* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms).

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

RS-422A/RS-485A MULTI-DROP WIRING DIAGRAM EXAMPLES (CONT'D)

DL06 and DL205 used for illustration purposes

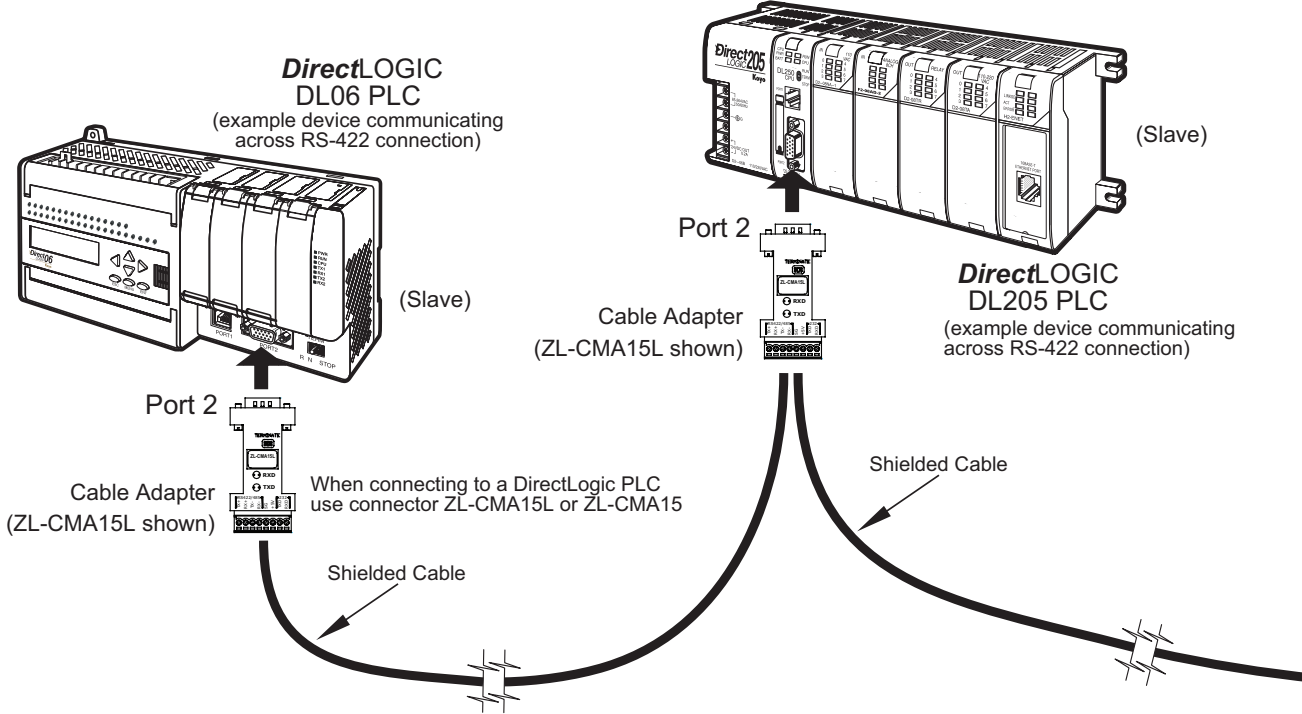


Typical RS-422 Multi-Drop Wiring Diagram (cont-d)
using DirectLogic pin numbers to illustrate

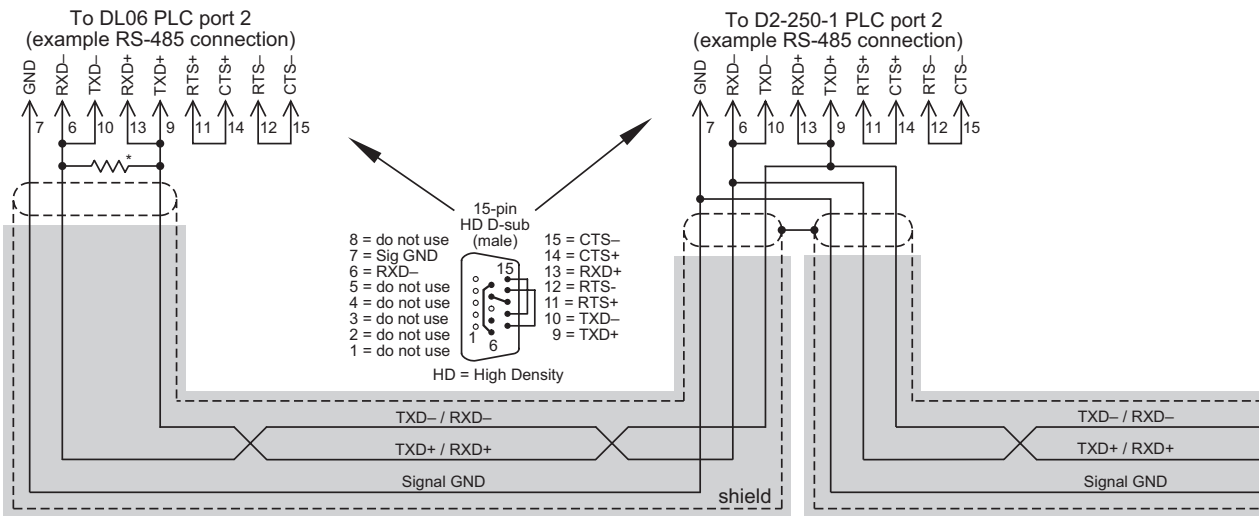
* Termination resistors required at both ends of the network receive data signals to match the impedance of the cable (between 100 and 500 ohms). Jumper pin 13 to 9 on the C-more Touch Panel 15-pin connector to place the 120Ω internal resistor into the network. If the cable impedance is different, then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

RS-422A/RS-485A MULTI-DROP WIRING DIAGRAM EXAMPLES (CONT'D)

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)

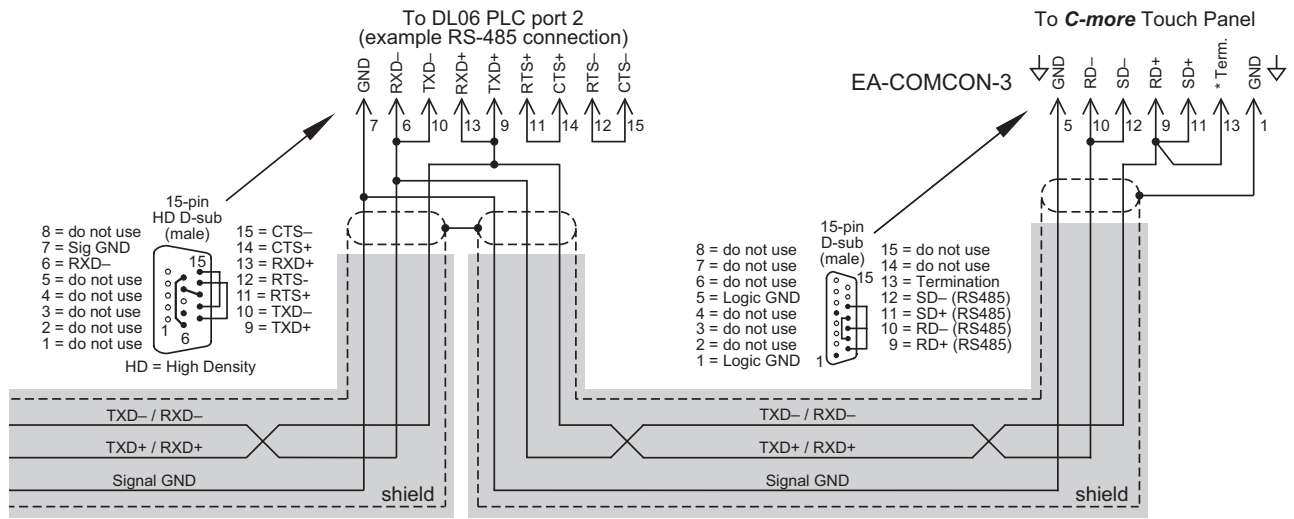
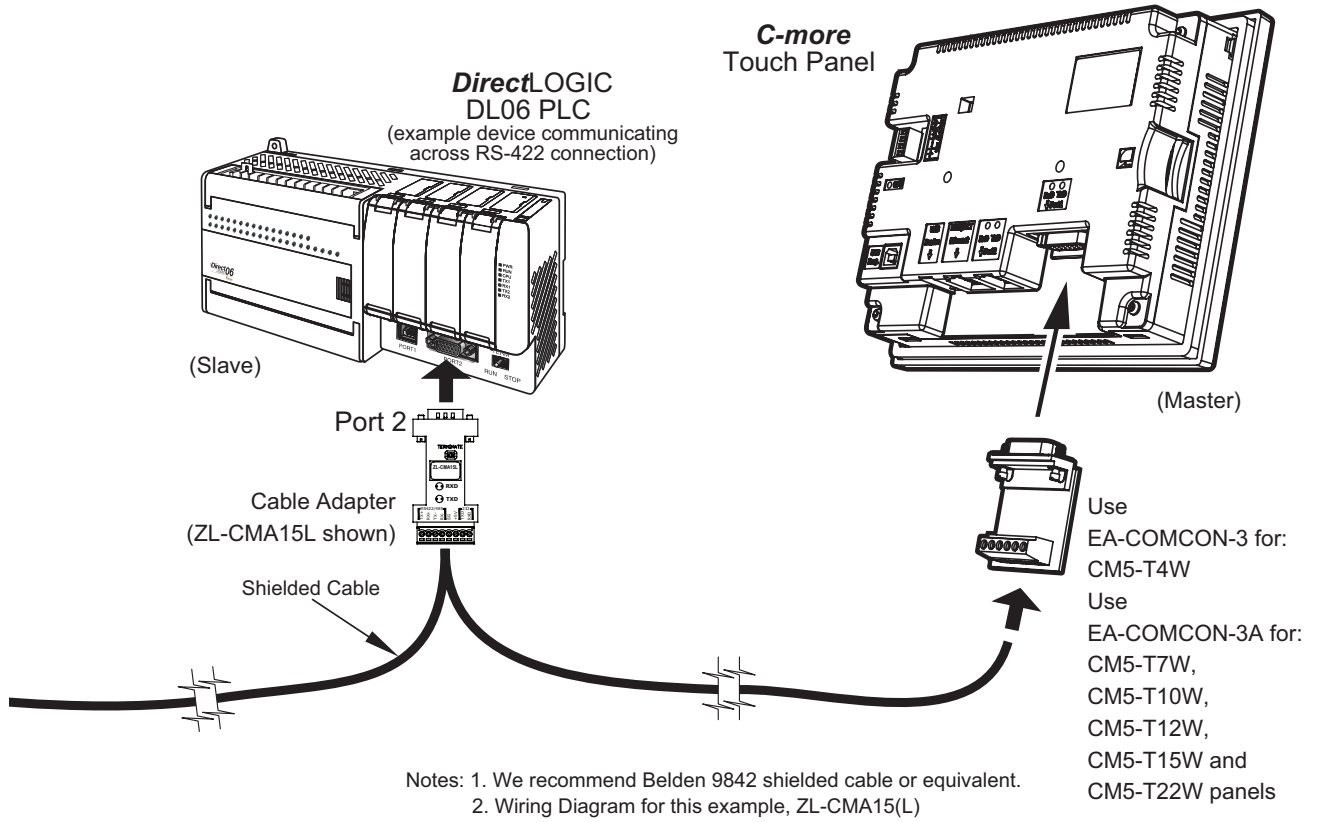


* Termination resistors required at both ends of the network to match the impedance of the cable (between 100 and 500 ohms).

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

RS-422A/RS-485 MULTI-DROP WIRING DIAGRAM EXAMPLES (CONT'D)

DL06 and DL205 used for illustration purposes



* 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.

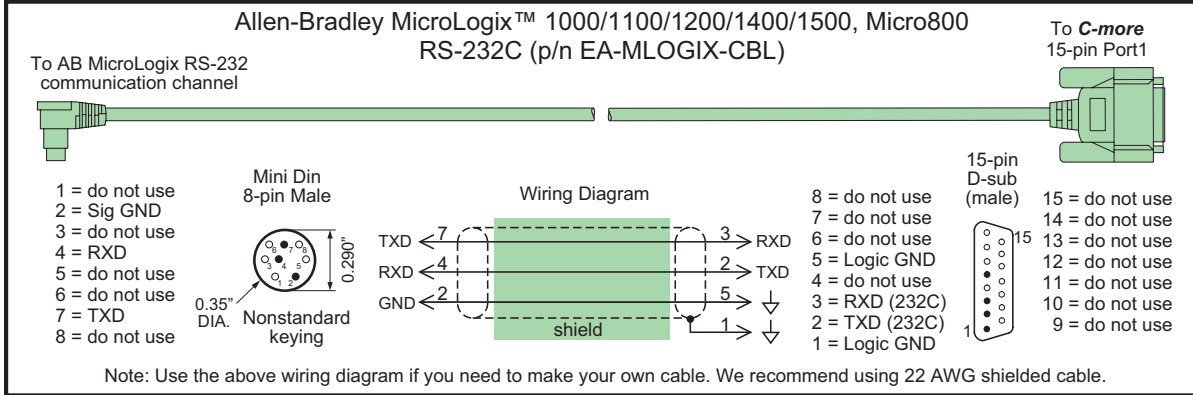
Typical RS-485 Multi-Drop Wiring Diagram (cont-d)

using DirectLogic pin numbers to illustrate

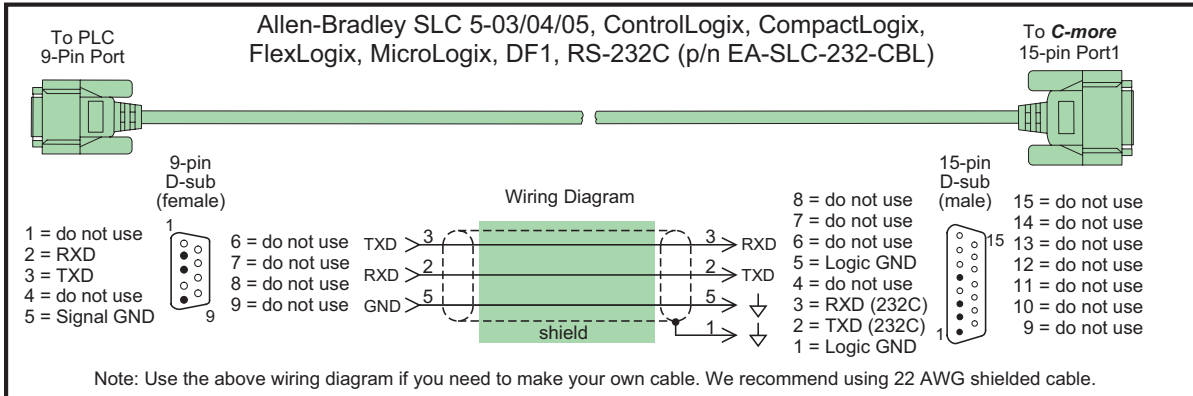
ALLEN-BRADLEY PLCs RS-232C/RS-485A SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** touch panels and Allen-Bradley 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.

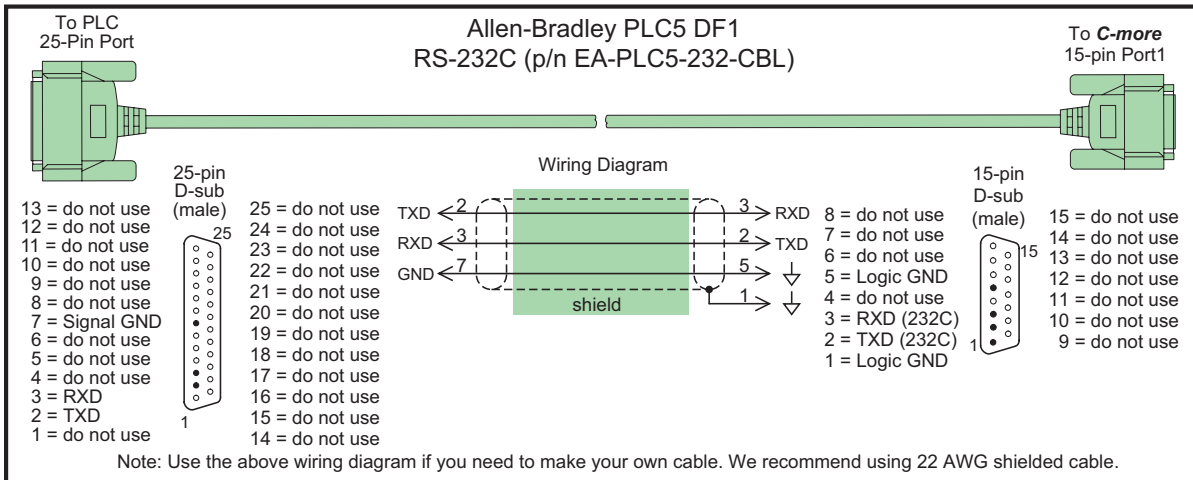
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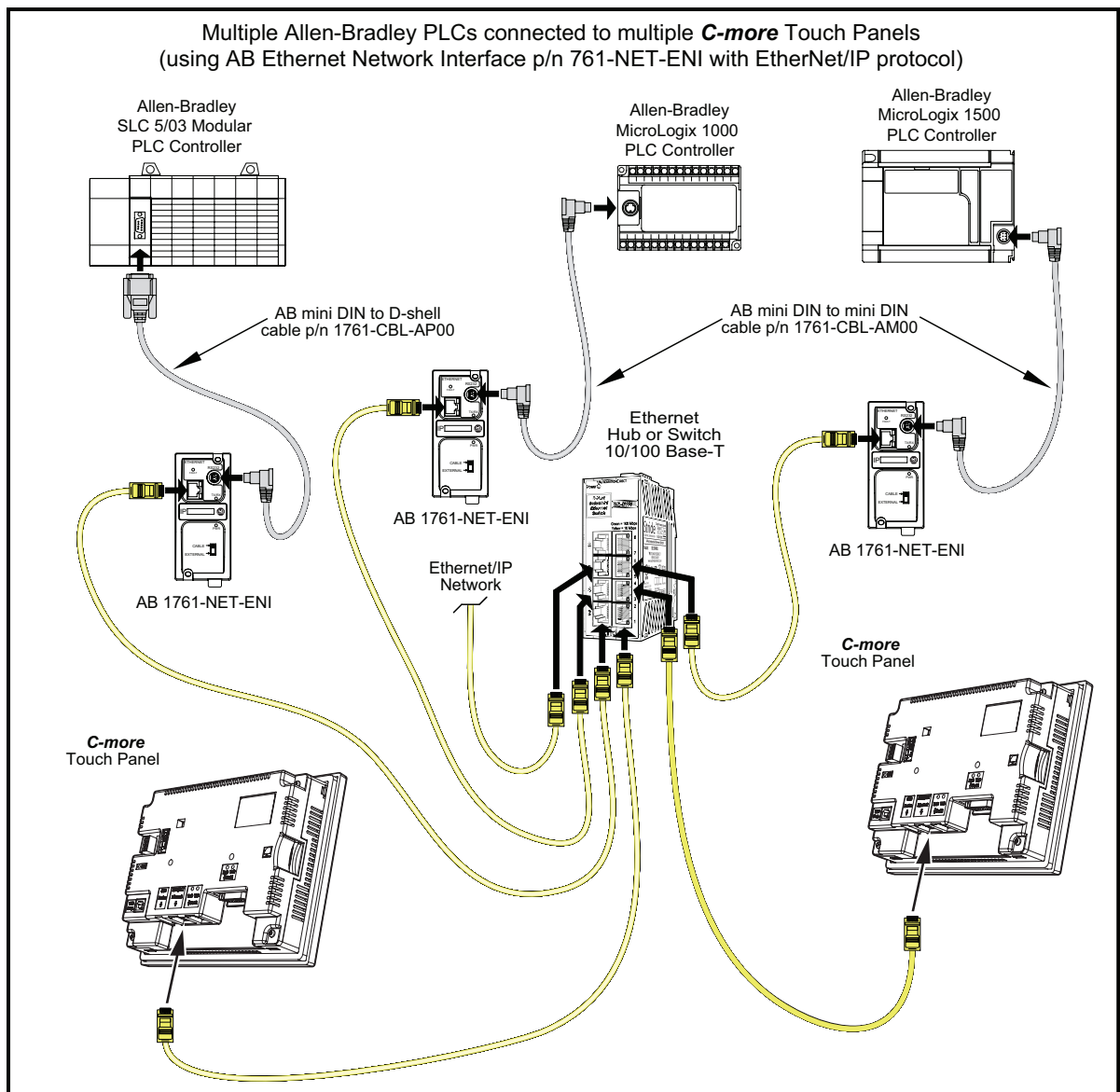


EA-SLC-232-CBL

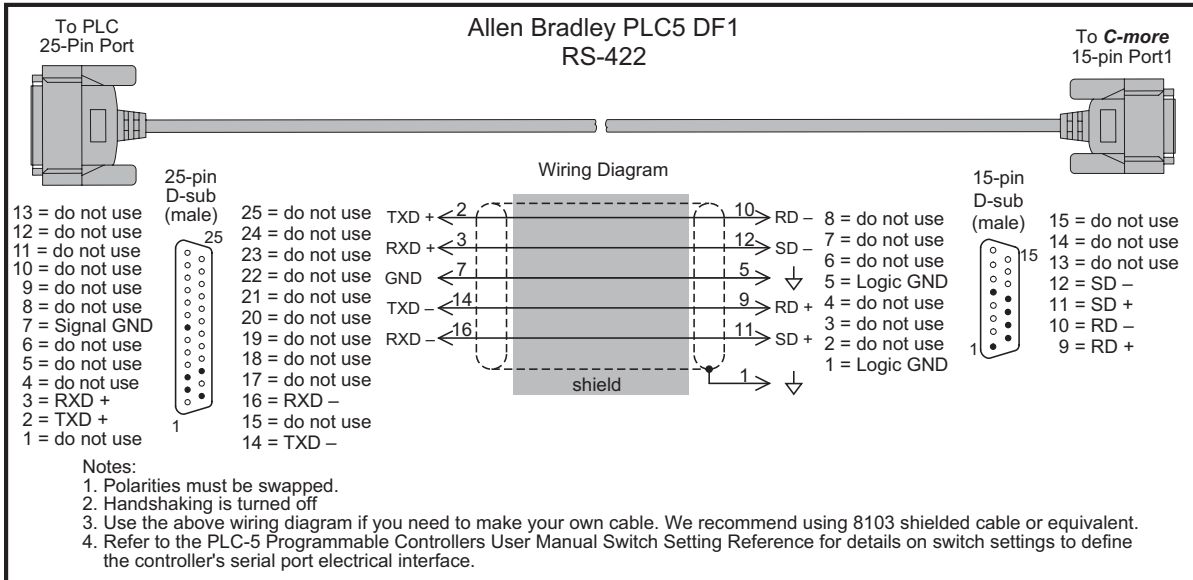


EA-PLC5-232-CBL





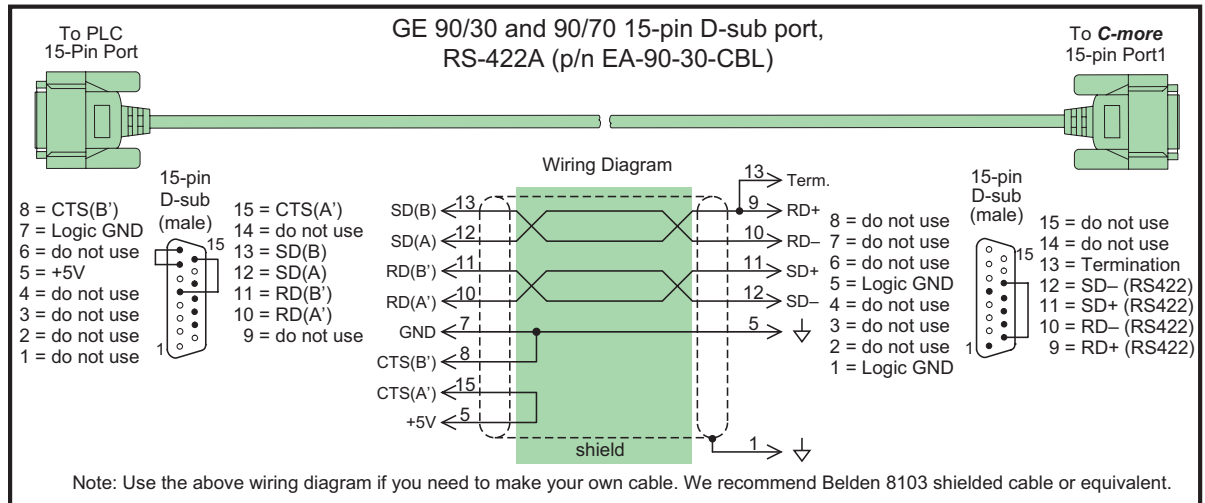
USER CONSTRUCTED



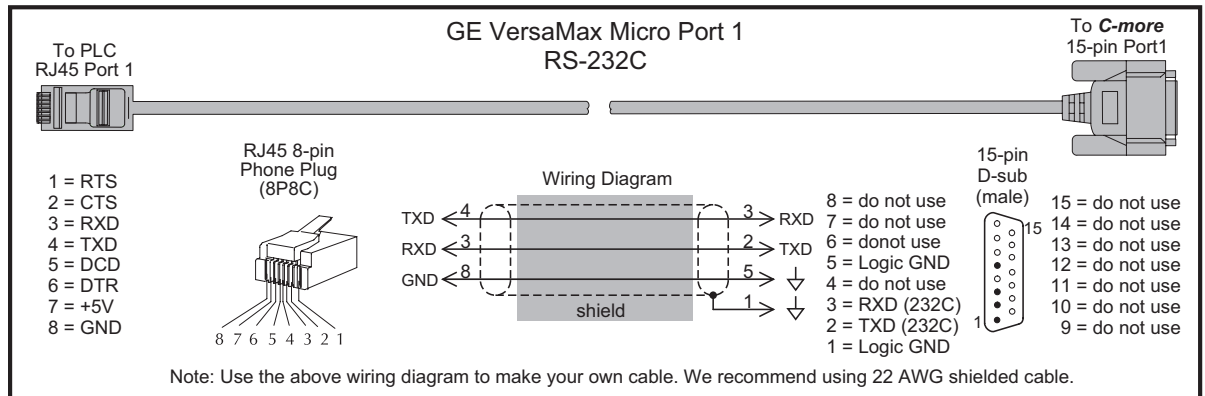
GE PLCs RS-422/RS-232C SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** touch panels and GE 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.

EA-90-30-CBL



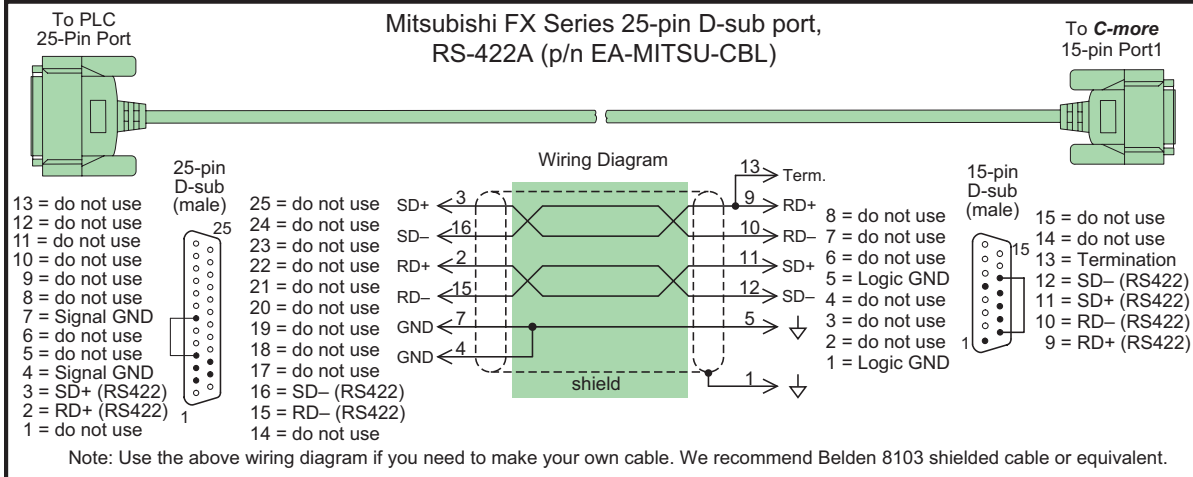
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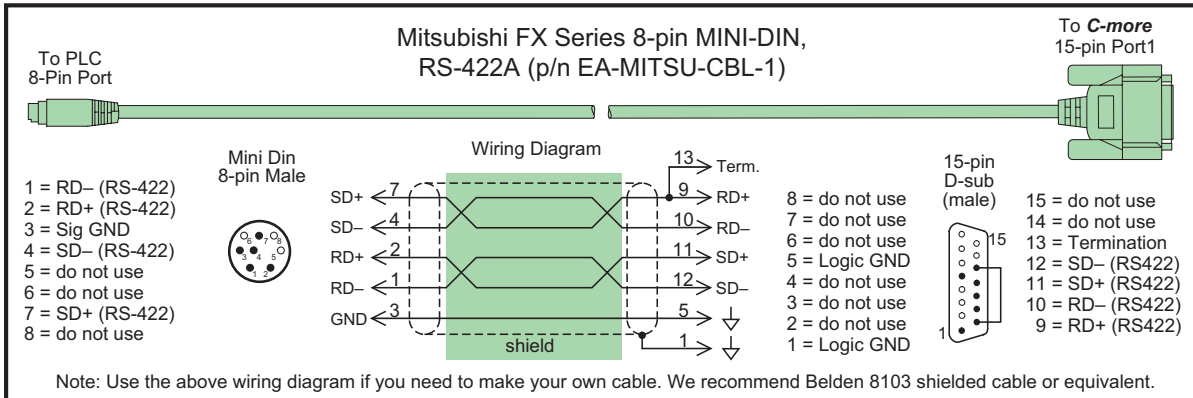
MITSUBISHI PLCs RS-422/RS-232C SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** touch panels and Mitsubishi 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.

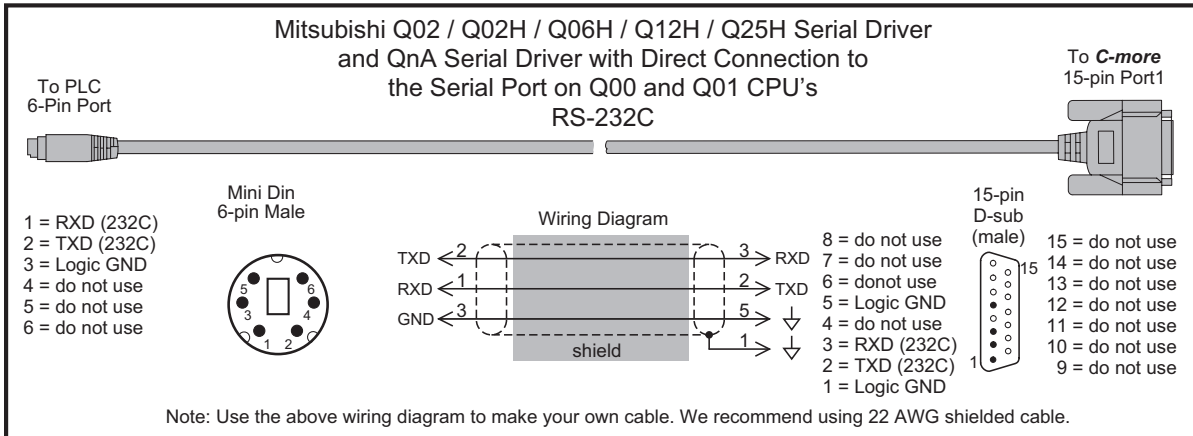
EA-MITSU-CBL



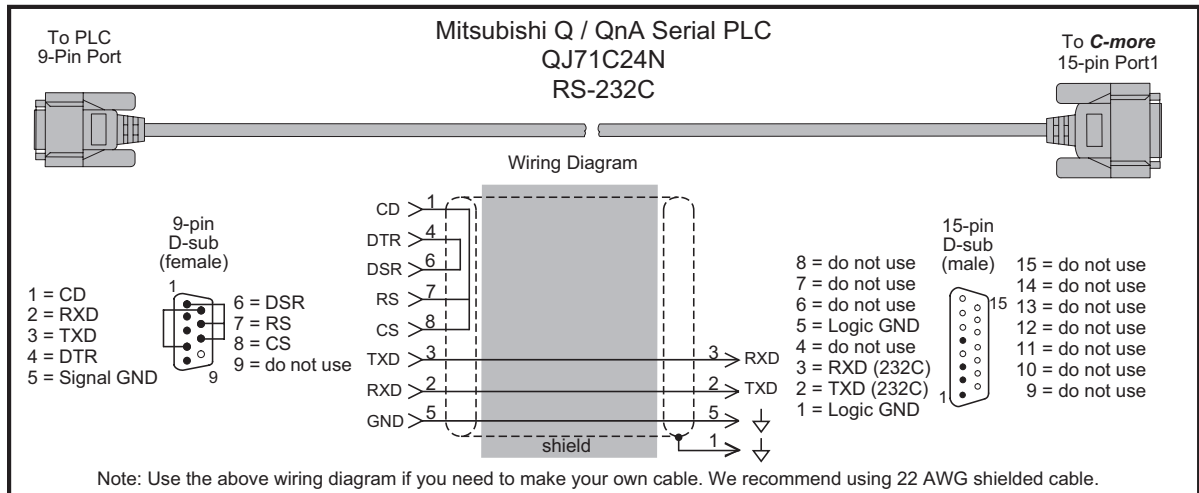
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USER CONSTRUCTED



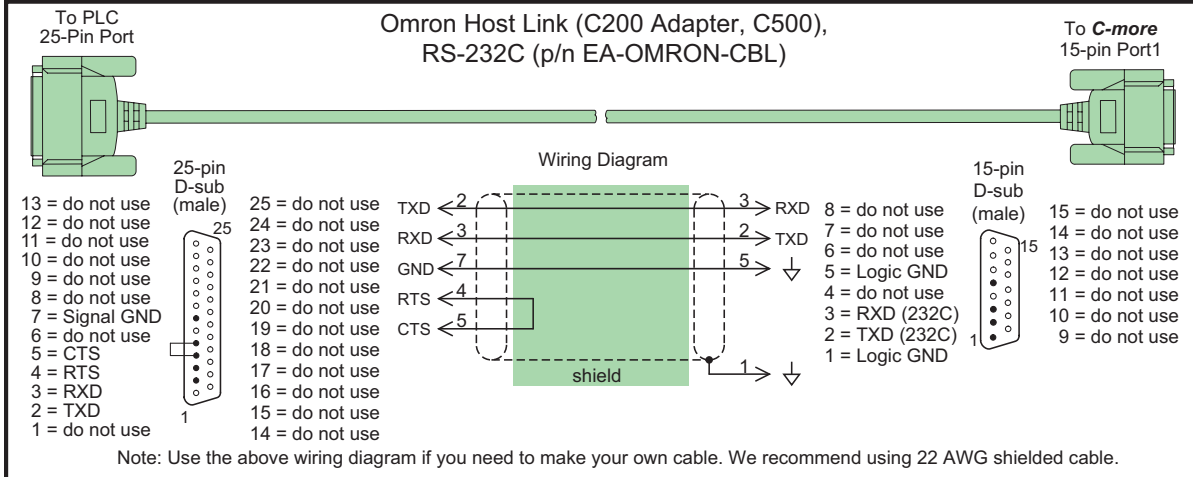
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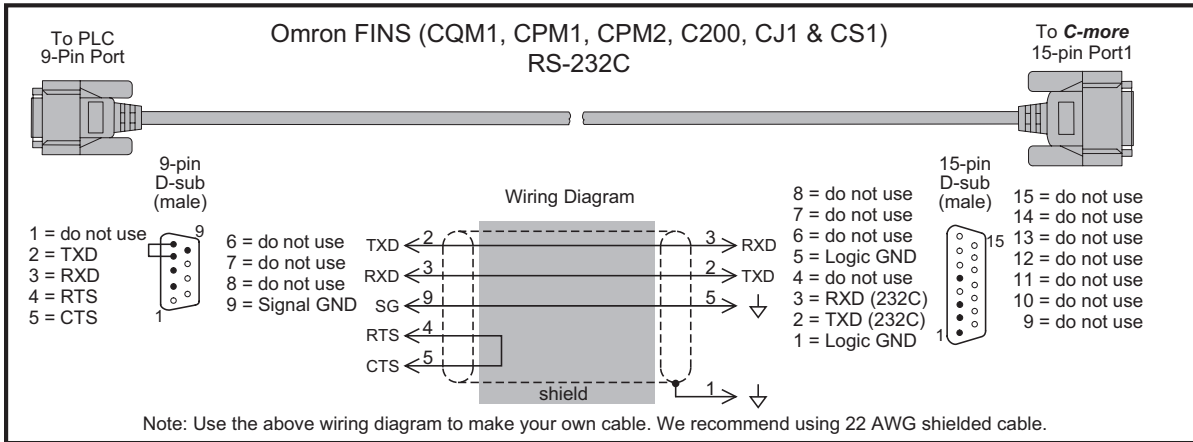
OMRON PLCs RS-232C SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** touch panels and Omron 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.

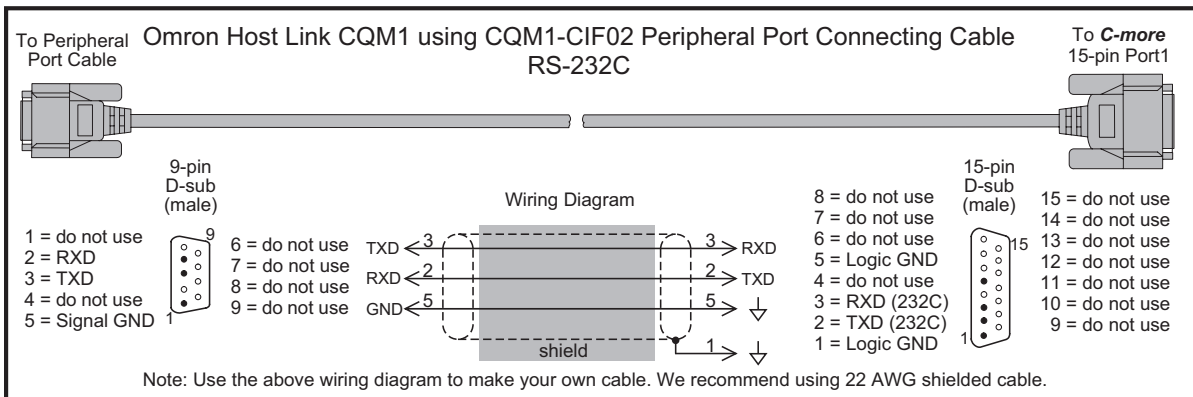
EA-OMRON-CBL



USER CONSTRUCTED



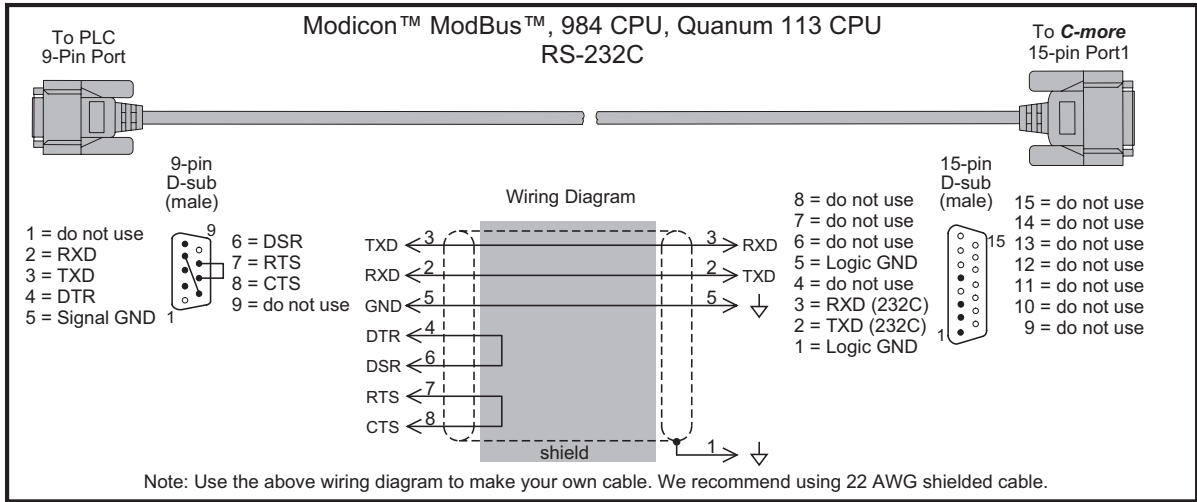
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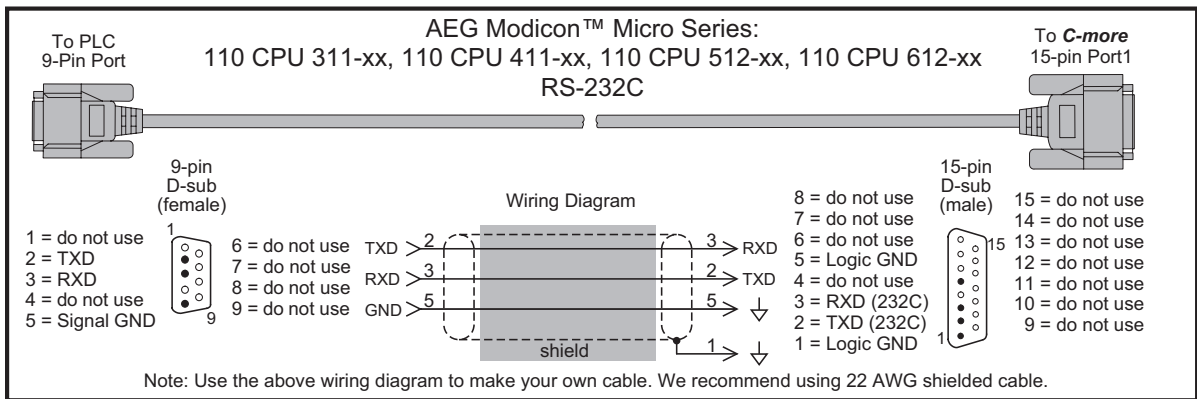
MODICON PLCs RS-232C SERIAL CABLES WIRING DIAGRAMS

The following series of wiring diagrams show the connectors and wiring details for the communication cables that are used between the **C-more** touch panels and Modicon PLC controllers. The information presented will allow the user to construct their own cables.

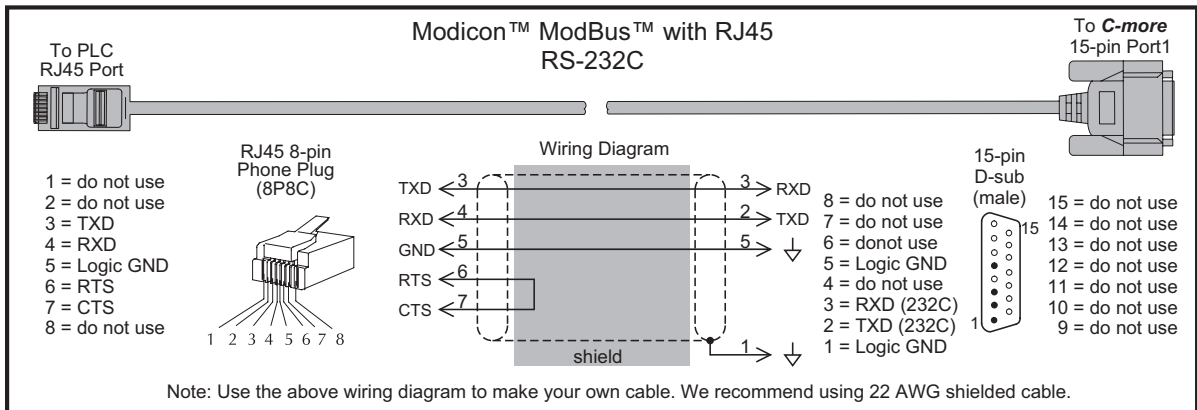
USER CONSTRUCTED



USER CONSTRUCTED



USER CONSTRUCTED



SIEMENS PLCs RS-485A SERIAL CABLES WIRING DIAGRAMS

The wiring diagram below shows the connectors and wiring details for the communication cable that may be used between the **C-more** touch panel and Siemens PLC controller. The information presented will allow the user to construct their own cable.

USER CONSTRUCTED

