IC693CBL300/301/302/312/313/314
I/O Bus Expansion Cables

(Includes Instructions for Building Custom Length Cables)

Description

I/O bus expansion cables (IC693CBL300, 301, 312, 313, 314), called "Wye cables," have a single male 25-pin D connector on one end and a two-headed (one male, one female) 25-pin D connector on the other end as shown in (A) of the figure. The 50 foot (15m) (IC693CBL302) cable has a single male connector on the CPU baseplate end and a single terminated male connector on the expansion baseplate end. The 3 foot cable (IC693CBL300) can also be used as a WYE adapter cable to simplify building custom length cables (see the section "Cable Application Suggestions" later in this Chapter).

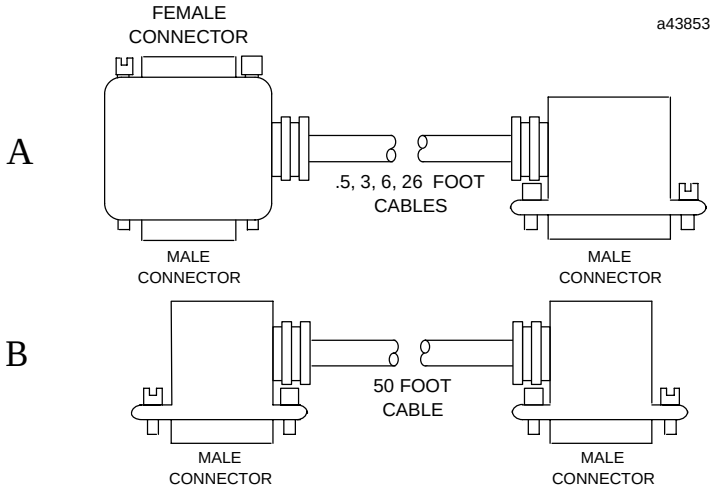

Figure 10-15. Detail of I/O Bus Expansion Cables

Cable Lengths

- IC693CBL300 3 feet (1 meter), *continuous shield*
- IC693CBL301 6 feet (2 meters), *continuous shield*
- IC693CBL302 or IC693CBL314 50 feet (15 meters), *continuous shield*
- IC693CBL312 0.5 feet (0.15 meters), *continuous shield*
- IC693CBL313 25 feet (8 meters), *continuous shield*

Function of Cables

The I/O Bus expansion cables are used to extend the I/O bus to expansion or remote baseplates in a Series 90-30 I/O system when additional I/O slots are needed or baseplates are required some distance from the CPU baseplate. The prewired I/O bus expansion cables can be used for connecting either expansion or remote baseplates. Where required cable length is not available in a standard cable, a custom cable must be built (see the section "Building Custom Length I/O Bus Expansion Cables" for detailed instructions).

Connecting the Cables

- Connect the single male connector to the 25-pin female connector on the right side of the CPU baseplate.
- Connect the male connector on the dual connector end of the cable to the 25-pin female connector on the first expansion baseplate.
- Connect the unused 25-pin female connector on the dual connector end of the cable to either the single male connector of a second I/O bus expansion cable to continue the I/O bus expansion chain, or to an I/O bus Terminator plug if this is the last cable in the expansion chain.

Important Notes About I/O Bus Expansion Cables

1. The maximum number of cables that can be included in an I/O expansion system is seven, and the total maximum cable length between the CPU baseplate and the last expansion baseplate is 50 feet (15 meters). The total maximum cable length between the CPU baseplate and the last remote baseplate is 700 feet (213 meters). Failure to observe these maximum cable lengths could result in erratic operation of the PLC system.
2. CPUs 350 – 364 support a maximum of seven I/O expansion cables. CPUs 331 – 341 support a maximum of four I/O expansion cables.
3. The 50 foot (15 meter) I/O bus expansion cable (IC693CBL302), which has a male connector on each end, has the I/O bus terminating resistors built into the end connector on the cable. If this cable is used, *you would not install a separate terminator block.*

Caution

I/O Bus Expansion cables should NOT be connected or disconnected with power applied to the I/O expansion baseplate(s). Unexpected PLC operation may result.

Cable Application Suggestions

In general, it is advantageous to use standard, factory-built cables, where possible, to save time and avoid wiring errors.

Using Standard Cables

- For connecting between baseplates (either between a CPU and expansion baseplate, between two expansion baseplates or between two remote baseplates) in the same cabinet when a standard length (0.5, 1, 2, 8, or 15 meters) will fit the need.
- As a Wye jumper for custom built point-to-point cables (IC693CBL300 is often used for this). This combination saves time since a point-to-point cable can be built much faster than a Wye cable. An example of this is shown in Figure 10-23.

Using Custom Built cables

- When you need a cable length not available in a standard size.
- When a cable must be routed through a conduit that is not large enough for a standard cable's connector to fit through.

Building Custom Length I/O Bus Expansion Cables

This section provides details needed to create custom length I/O Bus Expansion cables.

Two Types of Custom Built Cables

The two types are:

- **Point-to-Point –** these have a single male connector on one end and a single female connector on the other end. These are usually used with the IC693CBL300 which supplies the Wye connection. This combination saves time since a point-to-point cable can be built much faster than a Wye cable.
- **Wye -** these have a single male connector on one end and two connectors (one male and one female) on the other end.

Components Needed to Build Custom Length I/O Bus Expansion Cables

Note: the special two-headed Wye connector used on the standard Wye cables is not available as a separate component.

Item	Description
Cable:	**Belden 8107 only (no substitutes)**: Computer cable, overall braid over foil shield, twisted-pair 30 volt / 80°C (176°F) 24 AWG (.22 mm^2) tinned copper, 7 x 32 stranding Velocity of propagation = 70% † Nominal impedance = 100Ω
25 Pin Male Connector:	Crimp Plug = Amp 207464-1; Pin = Amp 66506-9 Solder Plug = Amp 747912-2
25 Pin Female Connector:	Crimp Receptacle = Amp 207463-2; Pin = Amp 66504-9 Solder Receptacle = Amp 747913-2
Connector Shell:	Kit - Amp 745833-5: Metal-plated plastic (plastic with nickel over copper) † Crimp ring - Amp 745508-1, split ring ferrule

† = Critical Information

‡ Vendor part numbers listed for user assembled cables are provided for reference only and do not suggest or imply that they are preferred. Any part meeting the same specification can be used.