▶Trio Motion Technology◀

Application Note

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The communication link between Motion Coordinator and the Trio P502 & P503 membrane keypads uses a 1 mm dia polymer fibre optic cable. Normally Trio can also supply made up duplex cables in lengths 5m, 10m and 30m. Sometimes an OEM requires a custom length and Trio have been asked on occasion for a duplex cable and connector kit.

Duplex fibre optic cable kits are not a stock item but it is possible to buy the components from any company that stocks Hewlett Packard* "Versatile Link" fibre optic parts. In the UK these can be obtained from Farnell.

Hewlett Packard* part numbers.

Duplex Connector: HFBR 4506
Simplex Connector (grey): HFBR 4503
Simplex Connector (blue): HFBR 4513

FO Port location on the MC216.

"Versatile Link"
FO connector

Duplex connector fitted to fibre optic cable.

Assembly tools for above cable mounted connectors.

A polishing kit is available to enable the cable ends to be finished off after assembly.
Part number HFBR 4593

Crimp tool for crimping metal ring; use either
Hewlett Packard* part number HFBR 4597
or Weidmuller Klippon part number HTX-LWL

* Hewlett-Packard communications products now trade under the name "Agilent Technologies".

Step-by-Step Instructions for fitting Plastic Cable Connectors

The following step-by-step guide from Hewlett-Packard's data book describes how to terminate the cable. It is ideal for both field and factory installation.

Fitting connectors to the cable is accomplished with the Hewlett-Packard HFBR-4593 Polishing Kit consisting of a Polishing Fixture, 600 grit abrasive paper and 3 μm pink lapping film (3M Company, 0C3-14). No adhesive material is needed to secure the cable in the connector, and the connector can be used immediately after polishing. Improved connector to cable attachment can be achieved with the use of an RTV (GE Company, RTV-128 or Dow Corning 3154-RTV) adhesive for frequent, extreme temperature cycling environments or for elevated temperature operation.

Connectors may be easily installed on the cable ends with readily available tools. Materials needed for the terminating procedure are:

1. Hewlett-Packard Plastic Fibre Optic Cable
2. HFBR-4593 Polishing kit
3. HFBR-4501/4503 Grey Simplex/Simplex Latching Connector and Silver Colour Crimp Ring
4. HFBR-4511/4513 Blue Simplex/Simplex Latching Connector and Silver Colour Crimp Ring
5. HFBR-4506 Parchment Duplex Connector and Duplex Crimp Ring
6. HFBR-4516 Grey Latching Duplex Connector and Duplex Crimp Ring
7. Industrial Razor Blade or Wire Cutters
8. 16 Gauge Latching Wire Strippers
9. Crimp Tool, HFBR-4597

Step 1

The zip cord structure of the duplex cable permits easy separation of the channels. The channels should be separated approximately 50 mm (2.0 in.) back from the ends to permit fitting the connector and polishing.

After cutting the cable to the desired length, strip off approximately 7 mm (0.3 in.) of the outer jacket with the 16 gauge wire strippers. Excess webbing on duplex cable may have to be trimmed to allow the simplex or simplex latching connector to slide over the cable.

When using the duplex connector and duplex cable, the separated duplex cable must be stripped to equal lengths on each cable. This allows easy and proper seating of the cable into the duplex connector.

Step 2

Place the crimp ring and connector over the end of the cable; the fibre should protrude about 3 mm (0.12 in.) through the end of the connector. Carefully position the ring so that it is entirely on the connector with the rim of the crimp ring flush with the connector, leaving a small space between the crimp ring and the flange. Then crimp the ring in place with the crimping tool. One crimp tool is used for all connector crimping requirements.

Note: Place the grey connector on the cable end to he connected to the transmitter and the blue connector on the cable end to be connected to the receiver to maintain the colour coding (both connectors are the same mechanically). For duplex connector and duplex cable application, align the colour coded side of the cable with the appropriate ferrule of the duplex connector in order to match connections to the respective optical ports. The simplex connector crimp ring cannot be used with the duplex connector. The duplex connector crimp ring cannot be used with the simplex or simplex latching connectors. The simplex crimp has a dull lustre; the duplex ring is shiny and has a thinner wall.

Step 3

Any excess fibre protruding from the connector end may be cut off; however, the trimmed fibre should extend at least 5 mm (0.06 in.) from the connector end.

Insert the connector fully into the polishing fixture with the trimmed fibre protruding from the bottom of the fixture. This plastic polishing fixture can he used to polish two simplex connectors or two simplex latching connectors simultaneously, or one duplex connector.

Note: The four dots on the bottom of the polishing fixture are wear indicators, Replace the polishing fixture when any dot is no longer visible. Typically, the polishing fixture can he used 10 times: 10 duplex connectors or 20 simplex connectors, two at a time.

Place the 600 grit abrasive paper on a flat smooth surface. Pressing down on the connector, polish the fibre and the connector using a figure eight pattern of strokes until the connector is flush with the bottom of the polishing fixture. Wipe the connector and fixture with a clean cloth or tissue.

Step 4

Place the flush connector and polishing fixture on the dull side of the 3 micron pink lapping film and continue to polish the fibre and connector for approximately 25 strokes. The fibre end should be flat, smooth and clean.

The cable is now ready for use.

Note: Use of the pink lapping film fine polishing step results in approximately 2 dB improvement in coupling performance of either a transmitter-receiver link or a bulk-head/splice over 600 grit polish alone. This fine polish is comparable to Hewlett-Packard factory polish. The fine polishing step may he omitted where an extra 23 dB of optical power is not essential, as with short link lengths. Proper polishing of the tip of the fibre/connector face results in a tip diameter between 2.8 mm (0.110in) minimum and 3.2 mm (0.125 in) maximum.