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Instruction Sheet

IS-42

Assembly Procedure for
Datamate Metal Backshells



INTRODUCTION

This instruction sheet is designed to demonstrate how to assemble a cable metal backshell to a female Datamate cable connector, with details on adding the jackscrews and braid for a complete cable assembly solution.

Applicable Backshell products

- **M80-945xx02** – Datamate Metal Backshell for female connectors, slotted jackscrews
- **M80-946xx02** – Datamate Metal Backshell for female connectors, hex socket jackscrews



Applicable Connector products

The metal backshells can be fitted to the following Datamate female connector types:

- Datamate J-Tek (signal only, double row): 22 to 32AWG cable
- Datamate Power (power only, single row): 12 to 20AWG cable
- Datamate Coax (coax only, single row): all applicable cable sizes
- Datamate Mix-Tek (mixture of signal, power and coax contacts)

PREPARATION

Choose the Jackscrew style

Please consult the “Applicable part numbers” in the Introduction to determine which connector series is required – **M80-945xx02** or **M80-946xx02**. This will be referred to as **M80-94#xx02** during the rest of the instruction sheet.

Calculate the correct Datamate Metal Backshell size to find the right Part Number

To determine the remainder of the part number, the “equivalent number of signal contacts” must be calculated. This will be the **xx** in the **M80-94#xx02** part number:

Each power or coax contact is the equivalent of 4 signal contacts.

If the cable connector is all signal contacts, then the **xx** is the same number, e.g.:

- For connector M80-4701042, the backshell is **M80-94#1002**.

If the connector is all power, all coax, or a mixture, a calculation is required, e.g.:

- All Power = M80-4000000F2-04-325-00-000 = 4 x 4 = backshell **M80-94#1602**
- All Coax = M80-FC305F1-06 = 6 x 4 = backshell **M80-94#2402**
- Mix-Tek = M80-4C10605F1-02-325-00-000 = (2 x 4) + 6 = backshell **M80-94#1402**

Additional Tooling and Products

Depending on what type of connector is specified, you will need the applicable crimp and assembly tooling for the contacts (see [IS-01](#) and [IS-25](#) for signal contacts, [IS-29](#) for 18-20AWG Power crimp contacts, and [IS-34](#) for coax contacts). In addition to these tools, you will also need the following:

- E-clip tool **Z80-300** (to assemble the jackscrews)
- If you are adding Braid, you will need enough length for your cable assembly – braid is not sold separately by Harwin.
- To attached the braid to the backshell, you will need a Micro-Band (also known under the brand name BAND-IT) – Harwin supplies two sizes:
 - **M80-9470000** for diameters up to approximately 22.4mm
 - **M80-9480000** for diameters up to approximately 47.8mm
- BAND-IT Tie-Dex II A30199 Micro Band tool, to fix the band – this tool is not sold by Harwin.

Connector Preparation

If the female connector has jackscrews installed with E-clips, these will need these removed prior to the assembly. The E-clips can be re-used – they are the same size as those supplied with the Backshell kits. The E-clip tool Z80-300 can be used to assist with the removal.

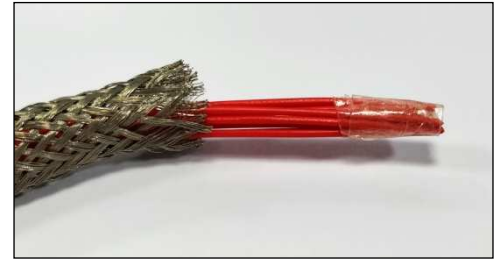
ASSEMBLY METHOD

Here is a typical kit for a signal connector assembly with backshells, ready for processing:



The instructions also cover the tin-coated copper braid being assembled, which provides EMC shielding, wear prevention and cable management.

1. Tape the cable bundle end, and feed it through an applicable length of braiding. The tape will help prevent the cables becoming entangled in the braid. Leave the tape on until step 3.



2. Feed the cable bundle through the elliptical rear collar of the metal backshell.



3. Remove the tape on the cable bundle end.

4. Terminate the individual wires to the contacts.

Either refer to [IS-01](#) for signal contacts, [IS-29](#) for 18-20AWG Power crimp contacts, and [IS-34](#) for coax contacts, or solder other power contacts as applicable.

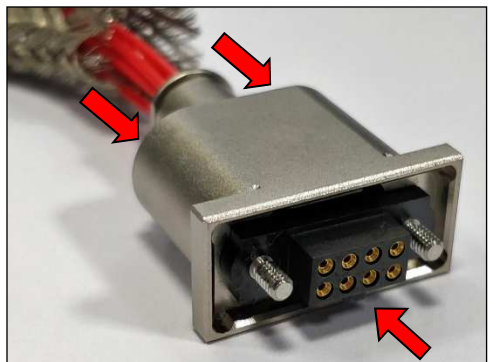


5. Insert the individual contacts into the connector housing.

For signal contacts, refer to [IS-25](#) – all power and coax contacts are inserted by hand into the rear of the housing.



6. Push the completed connector fully into the backshell. Assemble the jackscrews through the rear of the backshell.

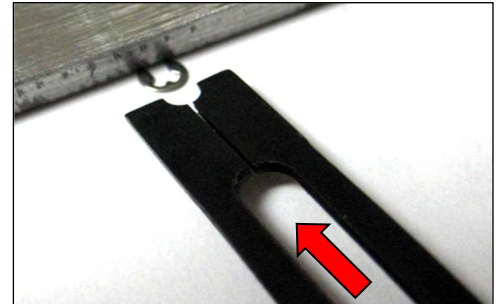
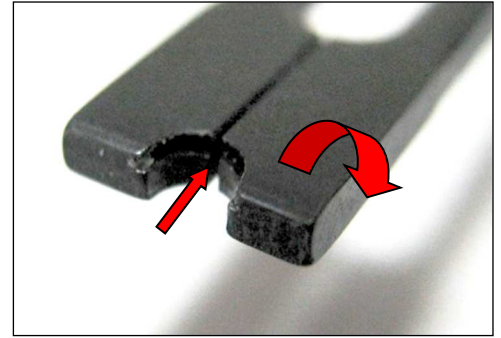


7. Using the E-clip tool Z80-300, pick up an E-Clip.

The straight arrow shows the location of the groove, that the E-Clip sits in. To use the tool correctly, turn it over, so that the wider area of the cutout is down.

Position the E-Clip on a flat surface, with the open side against a solid edge. Slide the tool along the flat surface, so that it clicks around the E-Clip.

If the E-clip stays within the jaws of the tool when it is picked up, then continue. If there is any trouble picking up the E-clip, try turning the tool over to check if the orientation was correct.

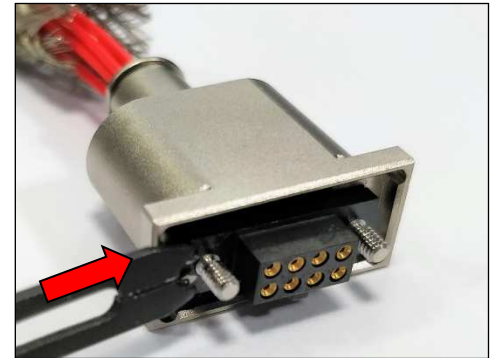


8. Assemble the E-Clip onto one of the jackscrews.

There is a groove on the jackscrew, just above where the jackscrew exits the housing. Push the E-Clip onto the jackscrew – there is an audible click when it engages. Pressure on the rear of the jackscrew whilst doing this will help, to make sure the groove stays visible. Once the E-clip is fully engaged, remove the tool.

Inspect the jackscrew to ensure the E-Clip is fully inserted around the shaft.

Repeat points 7 & 8 for the second jackscrew.



9. Work the braid over the rear collar / wire exit, as shown in the image.



10. Apply the M80-9470000 or M80-9480000 BAND-IT tie around the rear collar, on top of the braid.

The tie is supplied straight – it needs to be double-wrapped around the rear collar and braid – it is shown here separately for reference. The tie goes through its buckle twice.



Pull it hand-tight, making sure that the buckle is sitting on the long side of the elliptical rear exit.



11. Use the BAND-IT tool on the tie to secure it on the braid and backshell.

Keep ensuring that the buckle remains on the long side of the elliptical rear exit. This gives the best uniformity for band and braid compression, and keeps it clear of fouling with the jackscrews.

Your cable assembly end is now complete – repeat as necessary for the other end of the cable.

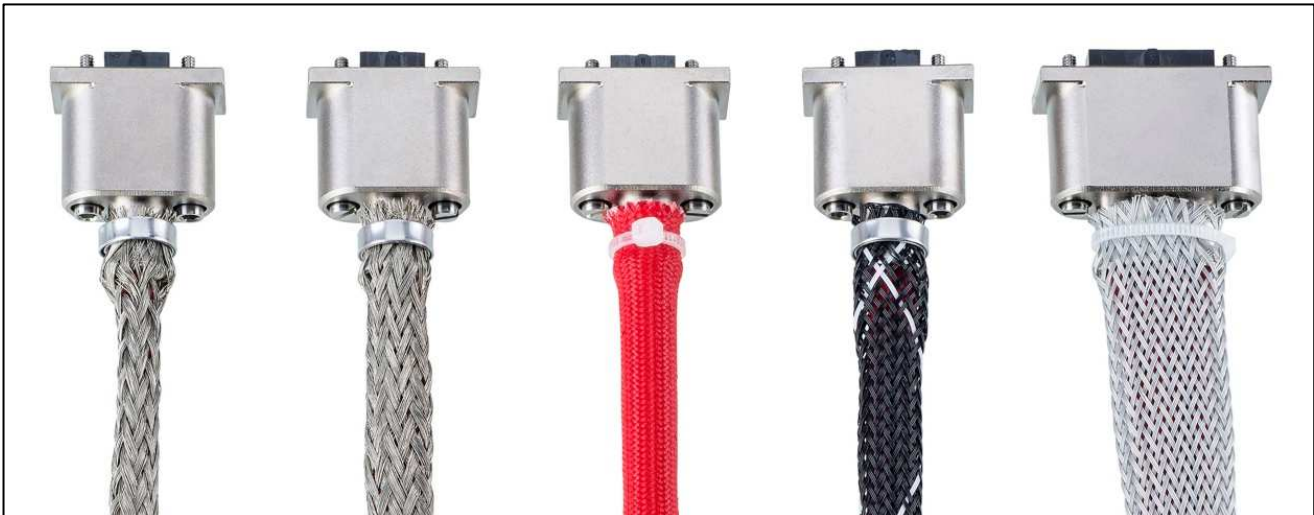


OTHER ASSEMBLY METHODS

This Metal Backshell range is expected to be used with metal braid, for EMC/RFI purposes. However, it is also possible to use Polymer and Glass-fibre braid types, depending on the desired result and application.

- For full EMC/RFI shielding, Harwin recommend Nickel-coated Copper braid, with a Micro-band to secure in place on the backshell.
- For mechanical protection such as strain relief and abrasion protection, lightweight polymer braid can be used. Either the Micro-band or a miniature plastic cable tie can be used to secure it to the backshell. The plastic tie should have a width of 1.6 to 2.5mm, with a head that does not exceed 5.2mm.
- For heat protection, polyurethane-impregnated braided fibreglass can be used. As with the option above, either the Micro-band or a miniature plastic cable tie (same dimensions as above) can be used to secure the braid to the backshell.

Some examples of possible braiding options are shown here:



If you would like Harwin to offer a full cable assembly service, please contact us on technical@harwin.com with your full requirements and volumes.