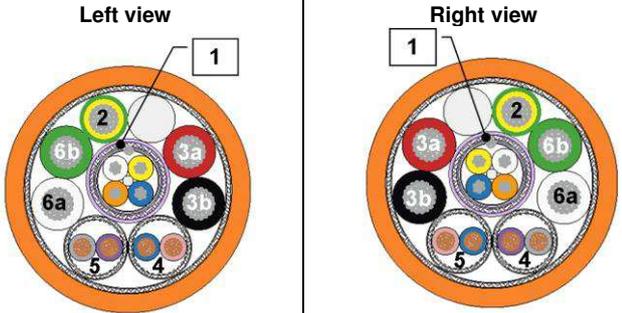
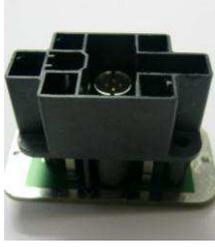
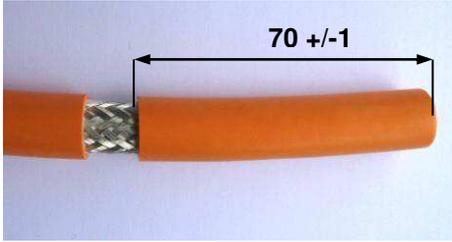
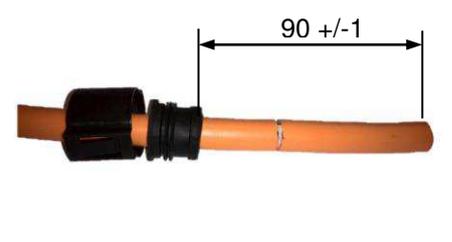


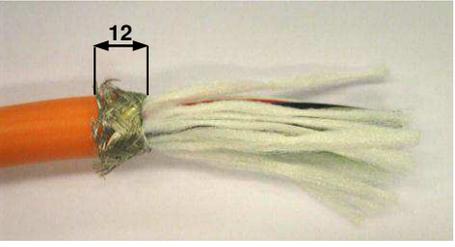
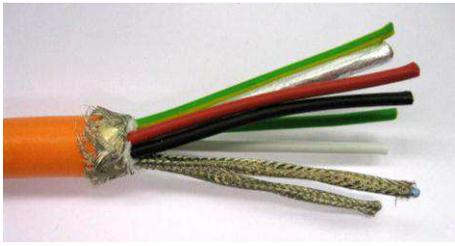
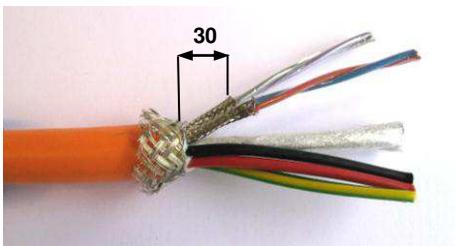
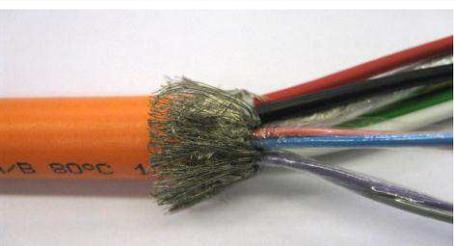
Title: Motorman Hybrid Connector

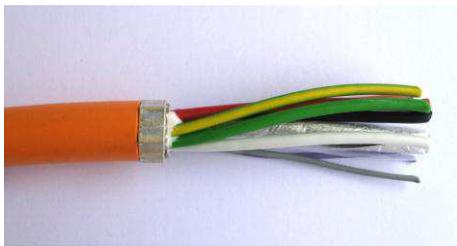
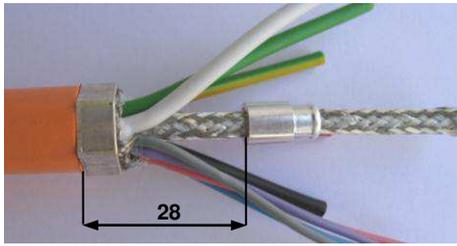
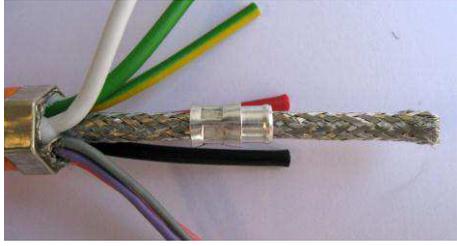
| | | | | | | | | | | | | | | | | | | | |
|--|---|---|--|---------------------|----------------|-----------------|----------------|------|----------------|------|----------------|---------|--------|--------|--------|--------|--------|-------|--------|
| 1 Introduction | | This specification covers the regulations to assemble and handle Motorman Hybrid Connector. | | | | | | | | | | | | | | | | | |
| 2 Caution | | | | | | | | | | | | | | | | | | | |
| 2.1 |  | “WARNING” – Risk of Electric Shock. Do Not Disconnect Under Load. | | | | | | | | | | | | | | | | | |
| 2.2 | | To protect against electrical shock during installation, ensure that the conductors and their associated connectors are separated from opposite polarity components. | | | | | | | | | | | | | | | | | |
| 3 Description | | | | | | | | | | | | | | | | | | | |
| 3.1 Metal Kit | | 3.2 Hybrid Cable (For more info call TE-Connectivity) | | | | | | | | | | | | | | | | | |
|  | |  | | | | | | | | | | | | | | | | | |
| | | <table border="0"> <tr> <td>1 Ethernet Core 2x2</td> <td>4 Signal wires</td> <td>1 Ethernet Core</td> <td>4 Signal wires</td> </tr> <tr> <td>2 PE</td> <td>5 Signal wires</td> <td>2 PE</td> <td>5 Signal wires</td> </tr> <tr> <td>3a 24 V</td> <td>6a DC-</td> <td>3a 24V</td> <td>6a DC-</td> </tr> <tr> <td>3b 0 V</td> <td>6b DC+</td> <td>3b 0V</td> <td>6b DC+</td> </tr> </table> | | 1 Ethernet Core 2x2 | 4 Signal wires | 1 Ethernet Core | 4 Signal wires | 2 PE | 5 Signal wires | 2 PE | 5 Signal wires | 3a 24 V | 6a DC- | 3a 24V | 6a DC- | 3b 0 V | 6b DC+ | 3b 0V | 6b DC+ |
| 1 Ethernet Core 2x2 | 4 Signal wires | 1 Ethernet Core | 4 Signal wires | | | | | | | | | | | | | | | | |
| 2 PE | 5 Signal wires | 2 PE | 5 Signal wires | | | | | | | | | | | | | | | | |
| 3a 24 V | 6a DC- | 3a 24V | 6a DC- | | | | | | | | | | | | | | | | |
| 3b 0 V | 6b DC+ | 3b 0V | 6b DC+ | | | | | | | | | | | | | | | | |
| 4 Additional Documents | | | | | | | | | | | | | | | | | | | |
| 4.1 | Customer drawings | Male Insert Female Insert Signal Housing 5Pos Hood Kit - Metal Assy Female Insert Series HC26, 4Pos Protection Cover Cable Seal Side Clip Crimp Sleeve Kit | 2120325-3 2120319-3 2120321-1 2120330-1 1103427-2 2120336-1/-2 2120337-1 2120207-1 2120432-3 | | | | | | | | | | | | | | | | |
| 4.2 | Contacts | MCON 2.8 LL Receptacle MCON 1.2 LL Receptacle Contact series 22 DF | 1719840-3 1452656-2 1658686-1 1658686-2 (L.P) | | | | | | | | | | | | | | | | |
| 4.3 | Product Specification | Motorman Hybrid Connector MCON 2.8 LL Receptacle MCON 1.2 LL Receptacle Contact series 22 DF | 108-94252 108-94002 108-18782 108-1268 | | | | | | | | | | | | | | | | |
| 4.4 | Application Specification | MCON 2.8 LL Receptacle MCON 1.2 LL Receptacle Contact series 22 DF | 114-18718 114-18464 114-10001 | | | | | | | | | | | | | | | | |
| 4.5 | Catalog | HDP-22 Crimp Snap-in Contact, Size 22 DF | PN 82068 | | | | | | | | | | | | | | | | |
| 4.6 | Internet | Tooling information: Download Documents: Product Information (E-Catalog): | www.tooling.te.com/europe/ www.te.com/documentation/ www.te.com/products/motorman | | | | | | | | | | | | | | | | |
| 4.7 | Standard | Connectors And Connecting Devices Insulation Coordination For Electrical Equipment (up to 1000V) Electrical Copper Conductors- Safety Requirements For The Clamping Units For Conductors From 0,2 mm ² To 35 mm ² Multi-Point Interconnection Power Cable Assemblies For Industrial Machinery | DIN EN 61984 DIN IEC 60664 DIN EN 60999-1 UL Category PVVA/Subject 2237 | | | | | | | | | | | | | | | | |

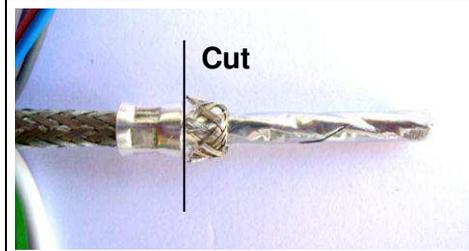
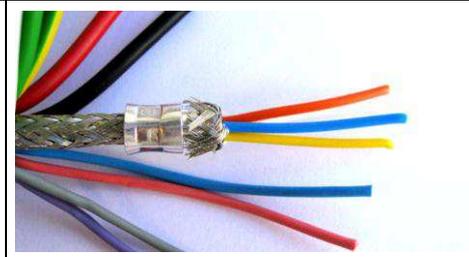
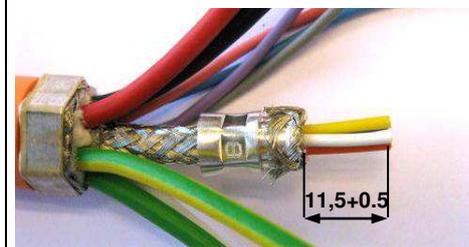
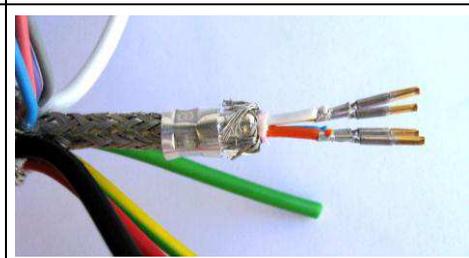
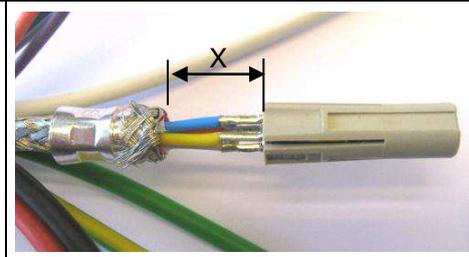
| | | | |
|---|--|---|--|
| 5 Tools | | | |
| 5.1 | Wire stripper and cutter | Economy Automatic Automatic stripping machine | Please contact GATD-Department for more info and professional assistance. Phone: +49 6251 133 - 0 |
| 5.2 | MCON 2.8 Receptacle 2,5mm² | Hand Tool Applicator | PN 9-1579004-8 PN 1528633-1 |
| 5.3 | MCON 1.2 LL Rec. 0.35 mm² | Hand Tool Applicator | PN 4-1579001-3+ Basis Tool 539635-1 PN 1528428 |
| | MCON 1.2 LL Rec. 0.75 mm² | Hand Tool Applicator | PN 4-1579001-2 + Basis Tool 539635-1 PN 7-1528157-2 |
| 5.4 | Crimping Tool Series 22 DF | Hand Tool Applicator | PN 90800-1 PN 466423 |
| 5.5 | Ethernet Core Housing | Hand Tool | PN 6-1579014-0 |
| 5.5 | Ethernet Core Ferrule | Die Set Hand Tool | PN 4-1105653-8 PN 1-1105653-8 |
| 5.5 | Extraction Tool | MCon 1.2 MCon 2.8 | PN 5-1579007-3 PN 5-1579008-2 |
| 6 Packaging | | | |
| Quantities and details see appropriate customer drawings. | | | |

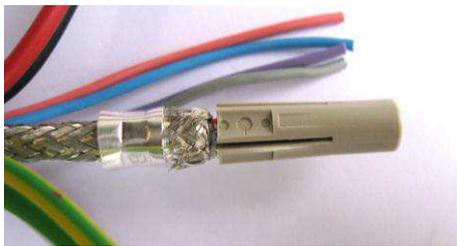
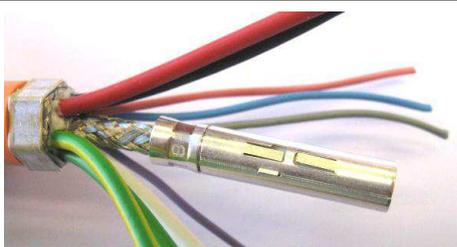
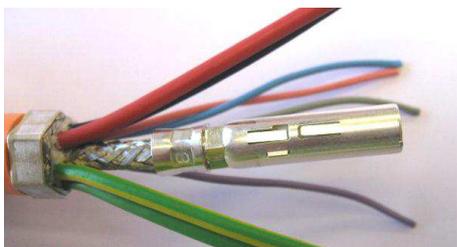
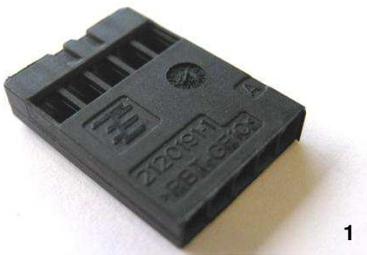
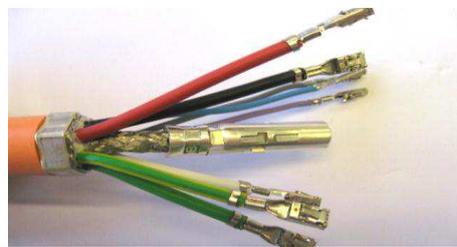
| 7 Mounting of Tab Header | | | | | | |
|--------------------------|--|--|--|---|---|--|
| 7.1 | Male Insert |  <p>1</p> |  <p>2</p> | Pos. | Description | P/N |
| | | | | 1 | Tab Connector | 2120325-3 |
| | | | | 2 | Torx Screws M3x12 <i>Use screw driver: Torx 10</i> | 1110916-8 |
| 7.1.1 |  |  | Mount the Tab Connector on the PCB and ensure correct positioning. | | | |
| 7.1.2 |  |  | After soldering mount frame (=customer specific PCB) and fix it with 2 Torx Screws with torque 1.0 Nm. | | | |
| 7.2 | Side Clip |  <p>1</p> | Pos. | Description | P/N | |
| | | | 1 | Side Clip | 2120339-1 | |
| | | | 7.2.1 |  |  | Assemble the Side Clip with the Frame by mounting the Side Clip first on the one side and then on the opposite side of the Frame shaft. <i>Shown Frame Interface beside has to be considered as a dummy due to different types of customer specific applications.</i> |

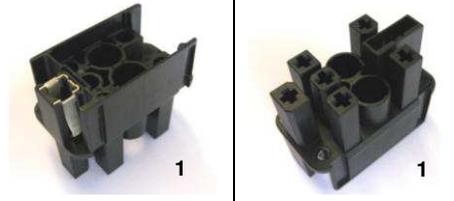
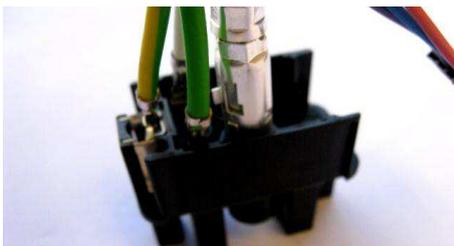
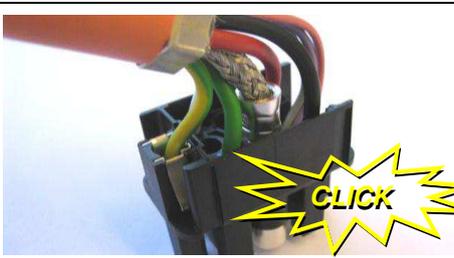
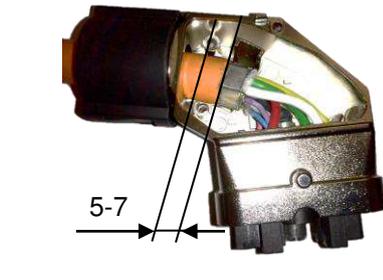
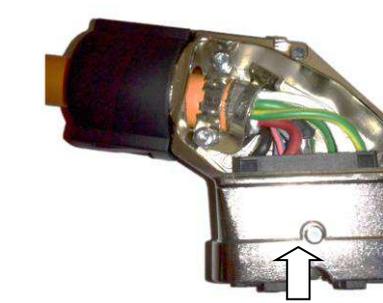
| | 7.3 | Cable Step 1 |  | <table border="1"> <thead> <tr> <th>Pos.</th> <th>Description</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Protection Cover</td> <td>2120336-1</td> </tr> <tr> <td>2</td> <td>Cable Seal</td> <td>2120337-1</td> </tr> <tr> <td>3</td> <td>Hood (Metal / Kit)</td> <td>2120330-1</td> </tr> <tr> <td>4</td> <td>Cable (shielded)</td> <td>see: page 11</td> </tr> </tbody> </table> | Pos. | Description | P/N | 1 | Protection Cover | 2120336-1 | 2 | Cable Seal | 2120337-1 | 3 | Hood (Metal / Kit) | 2120330-1 | 4 | Cable (shielded) | see: page 11 |
|---|------------------|---|---|---|--------------------|-------------|-----|---|------------------|-----------|---|---------------|-----------|---|--------------------|-----------|---|------------------|--------------|
| | | | | Pos. | Description | P/N | | | | | | | | | | | | | |
| | | | | 1 | Protection Cover | 2120336-1 | | | | | | | | | | | | | |
| | | | | 2 | Cable Seal | 2120337-1 | | | | | | | | | | | | | |
| | | | | 3 | Hood (Metal / Kit) | 2120330-1 | | | | | | | | | | | | | |
| 4 | Cable (shielded) | see: page 11 | | | | | | | | | | | | | | | | | |
| 7 | 7.3 | 7.3.1 |  | Cut the cable on the correct length according to drawing. Only cut the isolation at the length of 70 mm without to remove the separated insulation part. | | | | | | | | | | | | | | | |
| | | 7.3.2 |  | Lead the protection cover and cable seal over the cable 90mm from the end of the cable like in the picture 7.3.2. | | | | | | | | | | | | | | | |
| | | 7.3.3 |  | Remove the cable isolation. | | | | | | | | | | | | | | | |
| | 7.4 | Cable Step 2 |  | <table border="1"> <thead> <tr> <th>Pos.</th> <th>Description</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Ferrule small</td> <td rowspan="2">2120432-3</td> </tr> <tr> <td>2</td> <td>Ferrule large</td> </tr> </tbody> </table> | Pos. | Description | P/N | 1 | Ferrule small | 2120432-3 | 2 | Ferrule large | | | | | | | |
| | | | | Pos. | Description | P/N | | | | | | | | | | | | | |
| 1 | Ferrule small | 2120432-3 | | | | | | | | | | | | | | | | | |
| 2 | Ferrule large | | | | | | | | | | | | | | | | | | |
| | 7.4.1 |  | Move the small Ferrule over the shield. | | | | | | | | | | | | | | | | |

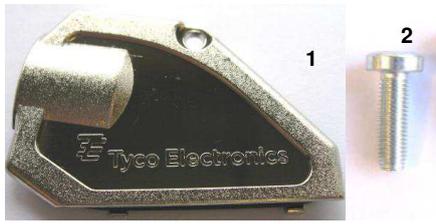
| | | | | |
|---|-----|-------|---|---|
| | | 7.4.2 |  | Fold back the shield over the orange isolation and the Ferrule. |
| 7 | 7.4 | 7.4.3 |  | Cut the shield approximately to length 12 mm. |
| | | 7.4.4 |  | Cut off the white twine, plastic strings and the paper. |
| | | 7.4.5 |  | Cut the shields of the paired conductors approximately to length 30 mm. |
| | | 7.4.6 |  | Expand the shields by a pincer and fold them over the orange isolation. Remove the plastic foil from the 2 paired conductors. |
| | | 7.4.7 |  | Move the large Ferrule over the shield. Cut off overlapping braid shields. |

| | | 7.4.8 |  | <p>Crimp the Ferrule according to Application Specification for Hex-Crimp.</p> <p>Tool see:</p> | | | | | | | | | | | | | | | |
|----------------|--------------------|-----------------------------|---|--|-------|-------------|-----------|---------------|---------|-----------|-----|--------------------|-----|----------------|------|-----|---------------|-------|-----|
| 7 | 7.4 | 7.4.9 |  | <p>Cut the conductors as listed below.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Cable Right Side Cable Left Side </div> <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Wires</th> <th style="text-align: center;">Right side</th> <th style="text-align: center;">Left side</th> </tr> </thead> <tbody> <tr> <td>Black & Red *</td> <td style="text-align: center;">45mm</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>PE*</td> <td style="text-align: center;">65 mm</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>White & Green*</td> <td style="text-align: center;">60mm</td> <td style="text-align: center;">TBD</td> </tr> <tr> <td>Signal Wires*</td> <td style="text-align: center;">50 mm</td> <td style="text-align: center;">TBD</td> </tr> </tbody> </table> <p>Remove the plastic and the tin foil from the Ethernet Cable.</p> <p>* Length tolerance +/- 0.1mm</p> | Wires | Right side | Left side | Black & Red * | 45mm | TBD | PE* | 65 mm | TBD | White & Green* | 60mm | TBD | Signal Wires* | 50 mm | TBD |
| Wires | Right side | Left side | | | | | | | | | | | | | | | | | |
| Black & Red * | 45mm | TBD | | | | | | | | | | | | | | | | | |
| PE* | 65 mm | TBD | | | | | | | | | | | | | | | | | |
| White & Green* | 60mm | TBD | | | | | | | | | | | | | | | | | |
| Signal Wires* | 50 mm | TBD | | | | | | | | | | | | | | | | | |
| 7 | 7.5 | Female Ethernet Core |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Pos.</th> <th style="text-align: center;">Description</th> <th style="text-align: center;">P/N</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">Ferrule</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">1103427-2</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Receptacle Housing</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Female Insert</td> </tr> </tbody> </table> | Pos. | Description | P/N | 1 | Ferrule | 1103427-2 | 2 | Receptacle Housing | 3 | Female Insert | | | | | |
| Pos. | Description | P/N | | | | | | | | | | | | | | | | | |
| 1 | Ferrule | 1103427-2 | | | | | | | | | | | | | | | | | |
| 2 | Receptacle Housing | | | | | | | | | | | | | | | | | | |
| 3 | Female Insert | | | | | | | | | | | | | | | | | | |
| | | 7.5.1 |  | <p>Move the Ferrule over the Ethernet Cable and keep 28 mm (+2 mm/-1mm) distance to the hex crimp.</p> | | | | | | | | | | | | | | | |
| | | 7.5.2 |  | <p>Crimp the ferrule by using the devices listed below.</p> <p>Die Set: P/N 4-1105653-8 Hand Tool: P/N 1-1105653-8</p> | | | | | | | | | | | | | | | |

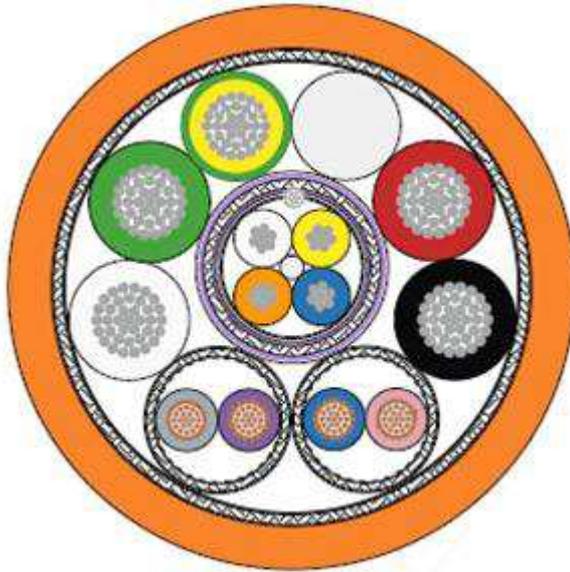
| | | 7.5.3 |  | <p>Move the Metal Hood over the cable and assembly the cable seal and move the protection cover completely over the locking positions.</p> <p>Please do not damage or scratch the wire insulation, system sealing and the cable jacket</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|---------------------------|--------------------------|---|--|-------------|--|--|--|--|-----|---------------------------|--------------------------|-----|--|---|------------|------|---|--|---|-------------|--------|---|--|---|------------|-------|---|--|---|--------------|--------|---|--|
| | | 7.5.4 |  | <p>Fold back the shield over the Ethernet Cable and cut the shield at the figured cutting line.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 7.5 | 7.5.5 |  | <p>Remove the tin-foil, paper and plastic from the 2x2 twisted pairs.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 7.5.6 |  | <p>Cut the 2x2 twisted pairs to length between 11,5mm and 12.0 mm.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 7.5.7 |  | <p>Dismantle wire isolation (4x) and crimp contacts P/N 1658686-2 according to Application Specification 114-10001 for Contact 22 DF crimp.</p> <p>Hand Tool & Applicator see: Pos. 5.4</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 7.5.8 |  | <p>Move the insert over the crimped contacts. For the cable configuration use the following cable guide.</p> <table border="1" data-bbox="869 1713 1428 1915"> <thead> <tr> <th colspan="5">Cable guide</th> </tr> <tr> <th>Pin</th> <th>Assignment Color (left)</th> <th>Assignment Color (right)</th> <th>Pin</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RXD - blue</td> <td>blue</td> <td>1</td> <td></td> </tr> <tr> <td>2</td> <td>TXD+ yellow</td> <td>orange</td> <td>2</td> <td></td> </tr> <tr> <td>3</td> <td>RXD+ white</td> <td>white</td> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td>TXD - orange</td> <td>yellow</td> <td>4</td> <td></td> </tr> </tbody> </table> <p>Crossing wires in marked area (X) not permitted!</p> <p>Check wire arrangement for your individual application!</p> | Cable guide | | | | | Pin | Assignment Color (left) | Assignment Color (right) | Pin | | 1 | RXD - blue | blue | 1 | | 2 | TXD+ yellow | orange | 2 | | 3 | RXD+ white | white | 3 | | 4 | TXD - orange | yellow | 4 | |
| Cable guide | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pin | Assignment Color (left) | Assignment Color (right) | Pin | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | RXD - blue | blue | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | TXD+ yellow | orange | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | RXD+ white | white | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | TXD - orange | yellow | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | |
|---|-----|--------------------------|---|---|------------------------|---------------------|
| | | 7.5.9 |  | Move the insert over the 2x2 twisted pairs. | | |
| | | 7.5.10 |  | Move the screen housing over the Insert towards stopping position. | | |
| 7 | 7.5 | 7.5.11 |  | Crimp the housing with crimp tool listed below Hand Tool P/N: 6-1579014-0 | | |
| | 7.6 | Signal Housing 5 Pos. |  | Pos. | Description | P/N |
| | | | | 1 | Signal Housing | 2120321-1 |
| | | 7.6.1 |  | Crimp the contacts according to Appl.Spec. 114-18718 for MCON 2.8 LL and Appl.Spec. 114-18464 for MCON 1.2 LL. Use the devices listed below. | | |
| | | | | Device | P/N MCON 1.2 LL | P/N MCON 2.8 |
| | | | | Die Set | 4-1579001-2 | 9-1579021-2 |
| | | | | Hand Tool | 539635-1 | 9-1579004-8 |
| | | | | Applicator | 1528157-1 | 1528633-1 |
| | | 7.6.2 |  | Move the signal housing over the signal conductors. Cable configuration according to application specification from customer. | | |

| 7.7 | Female Insert |  | <table border="1"> <thead> <tr> <th>Pos.</th> <th>Description</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Female Insert with PE contact</td> <td>2120320-3</td> </tr> </tbody> </table> | Pos. | Description | P/N | 1 | Female Insert with PE contact | 2120320-3 | | | |
|-------|---|--|---|-------------|-------------|-----|----------------|-------------------------------|-----------|---|-------------|-----------|
| | | Pos. | Description | P/N | | | | | | | | |
| | | 1 | Female Insert with PE contact | 2120320-3 | | | | | | | | |
| 7.7.1 |  | <p>Insert all crimped contacts into the Female Insert following sequence listed below.</p> <ol style="list-style-type: none"> 1. Ethernet Core, PE, Green, White 2. Signal wires 3. Power wires (Black & Red) | | | | | | | | | | |
| 7.7.2 |  | <p>Click the Signal Housing into the Female Insert.</p> | | | | | | | | | | |
| 7 | 7.8 Screen Clamp |  | <table border="1"> <thead> <tr> <th>Pos.</th> <th>Description</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Torx Screws M3</td> <td>2120204-1</td> </tr> <tr> <td>2</td> <td>Gland Plate</td> <td>2120338-1</td> </tr> </tbody> </table> | Pos. | Description | P/N | 1 | Torx Screws M3 | 2120204-1 | 2 | Gland Plate | 2120338-1 |
| | | Pos. | Description | P/N | | | | | | | | |
| | | 1 | Torx Screws M3 | 2120204-1 | | | | | | | | |
| 2 | Gland Plate | 2120338-1 | | | | | | | | | | |
| 7.8.1 |  | <p>Draw the cable with contacts back into the Metal Hood. The orange isolation should be positioned against the screw holes as shown.</p> | | | | | | | | | | |
| 7.8.2 |  | <table border="1"> <thead> <tr> <th>Pos.</th> <th>Description</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Torx Screws M3</td> <td>2120204-1</td> </tr> </tbody> </table> <p>Fix the cable with the Gland Plate and the screws (2x). Bolting torque: 1.0 Nm - 1.2 Nm</p> <p>Press the Connector Housing into the Metal Hood (arrow) towards internal stopping positions and fix it with screws (2x) from the mating side.</p> <p>Bolting torque:</p> <ul style="list-style-type: none"> • First time : 0.6 Nm - 0.7 Nm • Afterwards: 0.3 Nm - 0.4 Nm | Pos. | Description | P/N | 1 | Torx Screws M3 | 2120204-1 | | | | |
| Pos. | Description | P/N | | | | | | | | | | |
| 1 | Torx Screws M3 | 2120204-1 | | | | | | | | | | |

| | | | | | | |
|---|-------|---|--|------|-----------------|-----------|
| 7 | 7.9 | Metal Cover |  | Pos. | Description | P/N |
| | | | | 1 | Cover with Seal | 2120202-1 |
| | | | | 2 | Torx Screw M3 | 2120204-1 |
| | 7.9.1 |  | <p>Set both hooks of Cover located below TE-Logo onto lower Hood edge of side opening. Hinge the Cover closing the opening and fix it with the Screw.</p> | | | |
| | | | <p>If specified, assemble the appropriate Motorman HC on the opposite side of the harness applying the appropriate Application Spec. of Motorman HC.</p> <p>After that a fully-electrical check of the harness is urgently recommended.</p> | | | |
| | | | | | | |
| | | | | | | |

8. Wire Configuration (Principal Scheme)



Shown cable design should be considered as a principle configuration. In case of any deviation depending on different customer specific application this specification should be used as a principle guide line for harness production.

In case any additional support or info is needed, please contact TE Connectivity.