8 Indoor Cabling for an AMM 6p Configuration

This chapter describes how to connect the pre-assembled cables to the plug-in units.

Installation Procedure

Step 1 Make sure all required tools, units and accessories are available, see Section 4 on page 21.

Step 2 Connect the cables to the indoor units, see Section 8.1 on page 86.

Step 3 Mark the cables, see Section 8.8 on page 99.

Step 4 Route the cables, see Section 8.9 on page 100.

Step 5 Fill out the label in the AMM, see Section 8.10 on page 102.

8.1 Connecting the Cables

Figure 81 on page 86 gives an overview of all cables for the indoor units and how they should be connected.

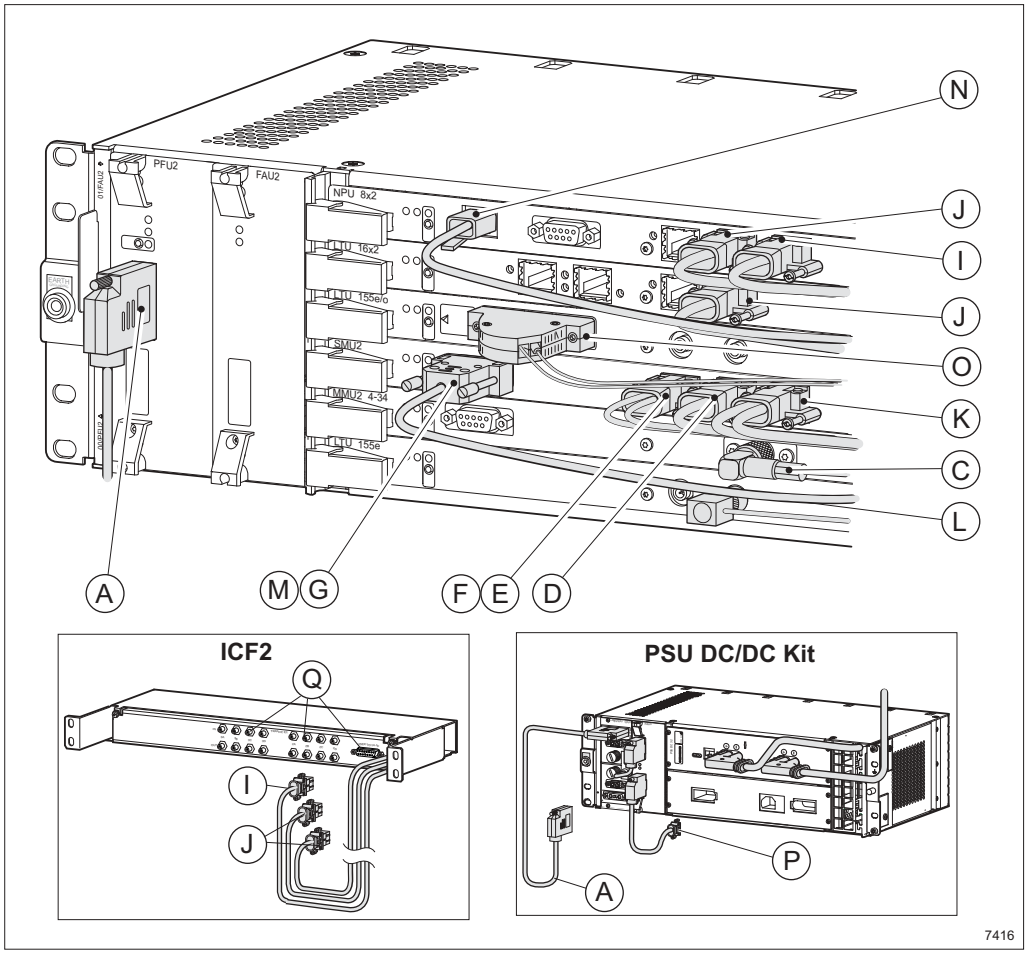

Figure 81 Overview of cables connected to the indoor units

Note: Some of the cables in the figure and table are optional.

Caution!

The cables must not be bent more than specified. See Section 8.9 on page 100 for more information on minimum bending radius.

Table 10 on page 87 contains references to connection instructions for all cables. Section 19 on page 237 contains a pin connection overview for all cables.

Table 10 Overview of cables connected to the indoor units

Item	Connector	Cable	Pre-assembled	Assembly and Connection Instructions
A	0V –48V DC	DC cable	–	See Section 8.7 on page 98
		PSU-PFU DC cable	–	See separate instruction included with the PSU DC/DC Kit
C	60 V RAU	Station radio cable	RPM 517 6906/1	See Section 8.6 on page 97
D	E1:2A-2B	2xE1 120 Ohm cable	RPMR 102 15/2	See Section 8.3 on page 90
E	E2:3B-3C	2xE2 75 Ohm cable	RPMR 102 19/1	See Section 8.3 on page 90
F	E3:3A	E3 75 Ohm cable	RPMR 102 14/1	
G	O&M	PC cable	RPM 517 54/2	See Section 8.3 on page 90
I	User I/O: 1A-1F	4xE1 120 Ohm, User I/O cable	RPMR 102 06/2	One end pre-assembled. See Section 8.2 on page 89 and Section 8.4 on page 93
		User I/O cable from ICF2	–	See Section 11.3.4 on page 127
J	E1:1A-1D E1:2A-2D (E1:3A-3D) (E1:4A-4D)	4xE1 120 Ohm User I/O cable	RPMR 102 06/2	One end pre-assembled. See Section 8.2 on page 89 and Section 8.4 on page 93
		4xE1 cables from ICF	–	See Section 11.3.4 on page 127
K	Dig SC: 1A-1B	DIG SC cable	RPMR 102 15/3	One end pre-assembled. See Section 8.3 on page 90
L	EL.(1)	STM-1 electrical cable	RPMR 102 07/1	See Section 8.5 on page 94
M	O&M	Access server cable	RPMR 102 13/1	See Section 8.3 on page 90

Table 10 Overview of cables connected to the indoor units

Item	Connector	Cable	Pre-assembled	Assembly and Connection Instructions
N	10/100Base-T	Ethernet cable	RPMR 102 11/1 (crossed) or RPMR 102 10/1 (straight)	See Section 8.2 on page 89
O	OPT.(2)	Optical fibre cables + connector casing	2 pcs TSR 311 9173/xxx + SXK 109 53	See Section 8.5 on page 94
P	Alarm	FAU3 alarm cable	–	See separate instruction included with the PSU DC/DC Kit
Q	–	E1 cable 75/120 Ohm and User I/O cable	–	See section Section 11.3.5 on page 128

(1) The optical and electrical cables cannot be used at the same time.

(2) The optical cable comes in various lengths and with different connectors at the users end. See MINI-LINK TN, MINI-LINK HC, MINI-LINK E Product Catalog for more information.

Note: The cables should be connected from bottom to top to make future connections easier.

8.2 Connecting to the NPU 8x2

This section describes all cable connections for NPU 8x2. Follow the instructions that apply to your configuration.

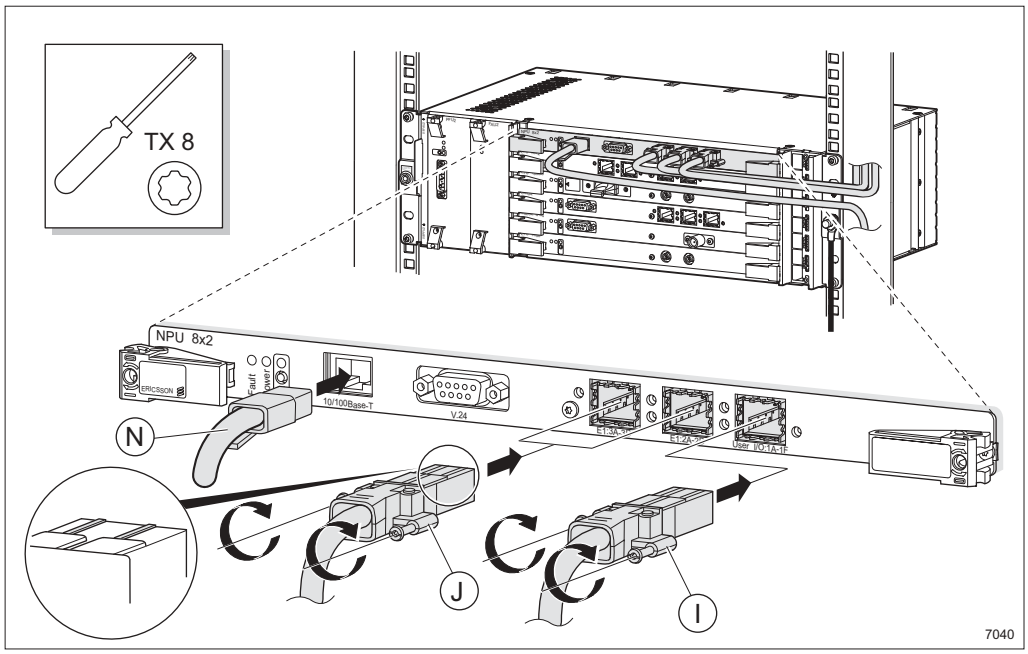

Figure 82 Connecting the 4xE1, User I/O and Ethernet cables

- Connect the User I/O cable **I** (4xE1 120 Ohm, User I/O cable). See Section 19.3 on page 240 for pin connection information.
- Connect the 4xE1 120 Ohm cables **J** (4xE1 120 Ohm, User I/O cable). See Section 19.3 on page 240 for pin connection information.

Note: Make sure the connectors are entered correctly.

- Connect a straight or crossed Ethernet cable **N**. The straight version is used for connection to a site LAN and the crossed version is used for connection to a PC with LCT.
- Mark the cables, see Section 8.8 on page 99.

Note: The V.24 connector is for future use.

8.3 Connecting to the SMU2

This section describes all cable connections for SMU2. Follow the instructions that apply to your configuration.

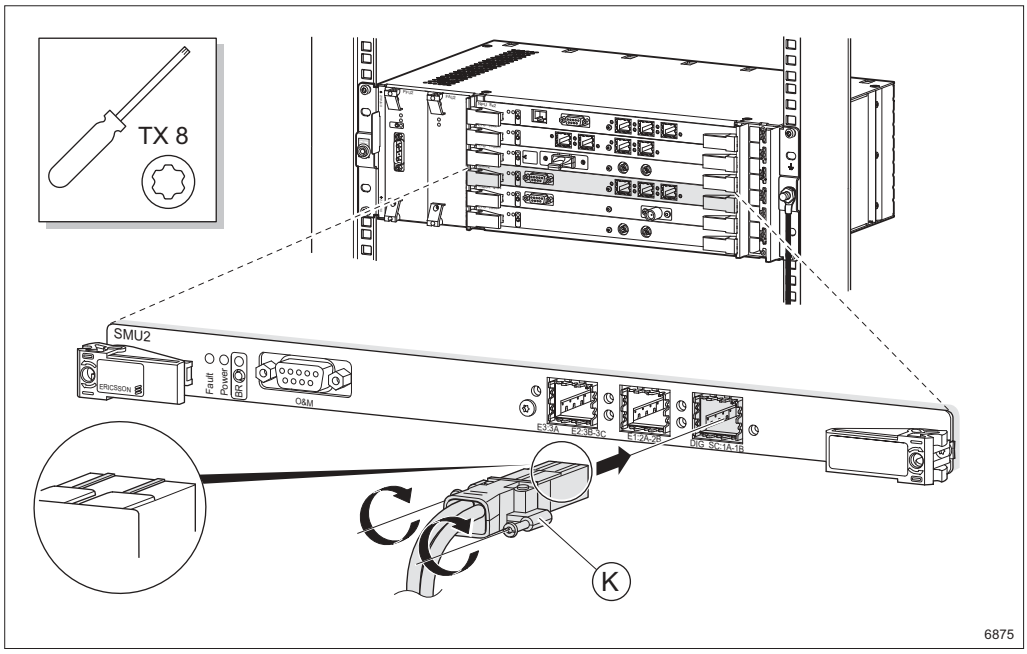

Figure 83 Connecting the DIG SC cable

- Connect the DIG SC cable **K**

  Note: The other end of the cable is connected to MINI-LINK E (SAU). For information on how to assemble the 25-pin D-sub connectors, see Section 18.1 on page 181.

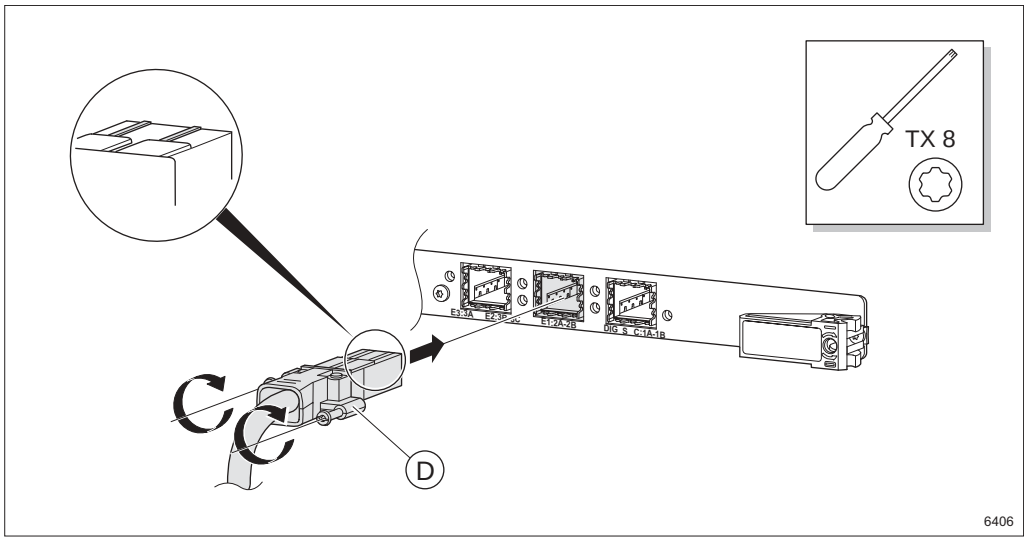

Figure 84 Connecting the 2xE1 120 Ohm cable

- Connect the pre-assembled 2xE1 120 Ohm cable **D**.

  Note: The other end of the cable is connected to MINI-LINK E (MMU or SMU). For information on how to connect the cables, see *MINI-LINK E ETSI Indoor Installation Manual*.

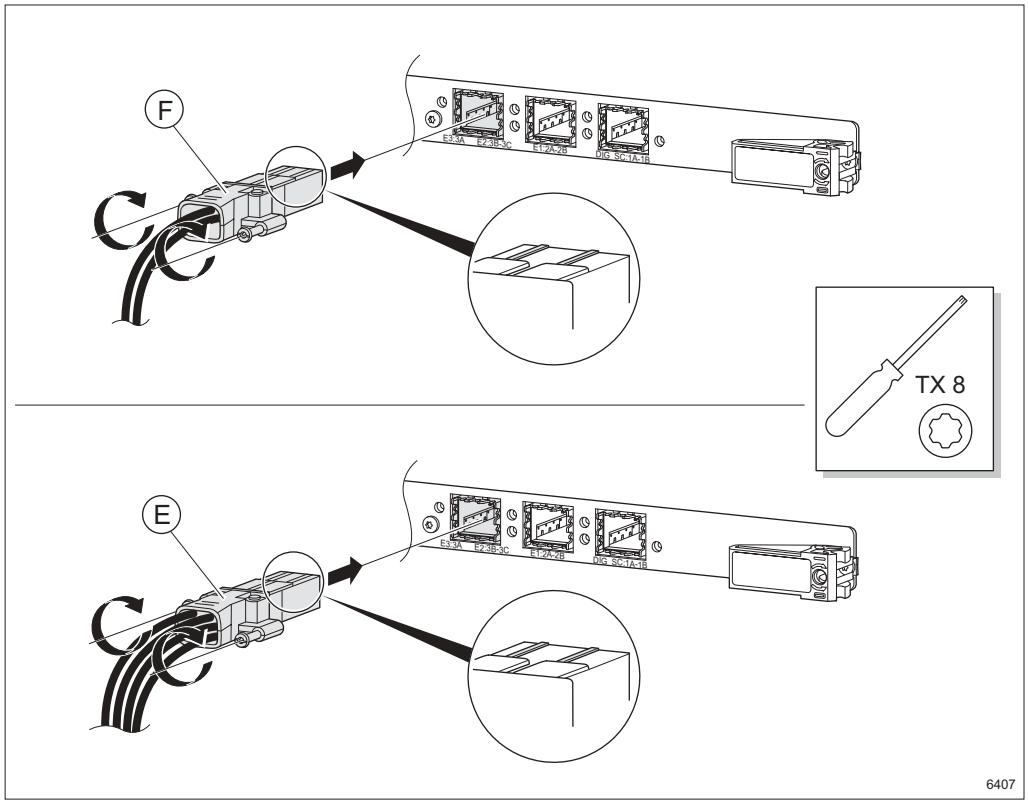

Figure 85 Connecting the E3 or 2xE2 75 Ohm cables

- Connect the pre-assembled E3 75 Ohm cable **F** or 2xE2 75 Ohm cable **E**.

  Note: The other end of the cable is connected to MINI-LINK E (MMU or SMU). For information on how to connect the cables, see *MINI-LINK E ETSI Indoor Installation Manual*.

Note: Make sure the connectors are entered correctly.

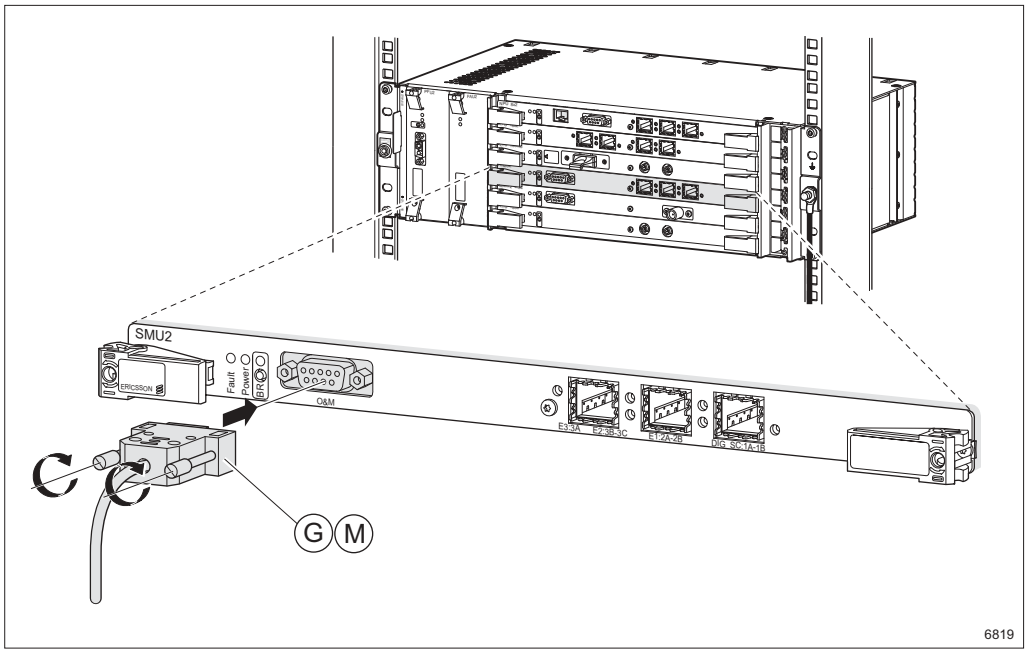

Figure 86 Connecting the access server and PC cables

- Connect the access server cable **M** or the PC cable **G**. The access server cable can be connected to any available O&M connector on MINI-LINK E equipment and the PC cable can be connected to a PC to perform a Local Upgrade (LU).

  Note: The access server functionality is only available when the SMU2 is used for cositing and the LU functionality is only available when the SMU2 is in protection (1+1) mode.

- Mark the cables, see Section 8.8 on page 99.

8.4 Connecting to the LTU 16x2

This section describes all cable connections for LTU 16x2. Follow the instructions that apply to your configuration.

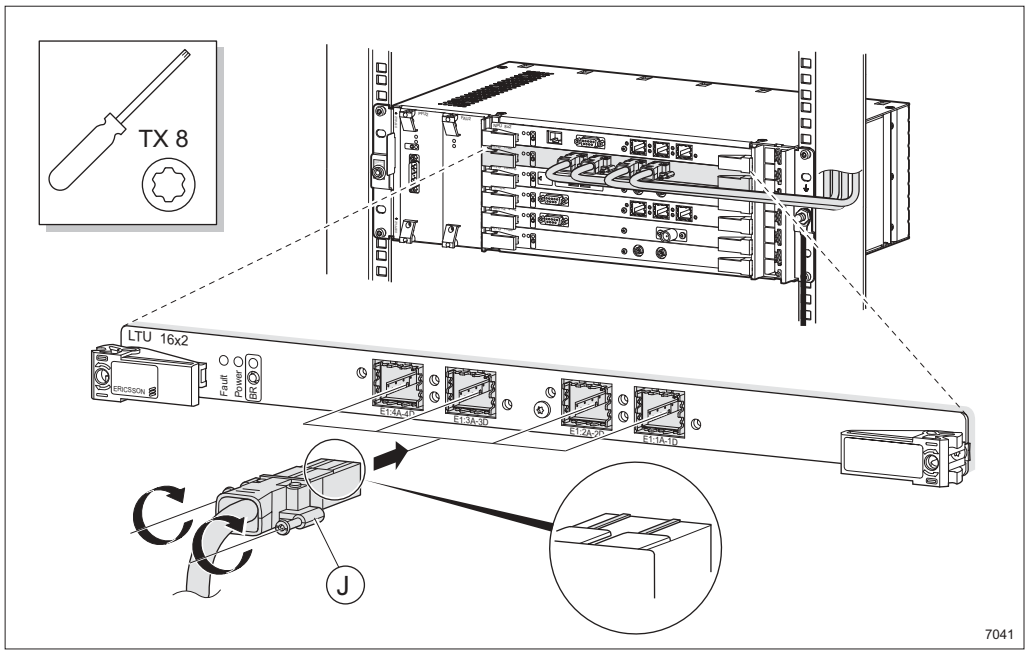

Figure 87 Connecting the 4xE1 cables

- Connect the 4xE1 120 Ohm cables **J** (4xE1 120 Ohm, User I/O cable). See Section 19.3 on page 240 for pin connection information.

Note: Make sure the connectors are entered correctly.

- Mark the cables, see Section 8.8 on page 99.

8.5 Connecting to the LTU 155e and LTU 155e/o

This section describes all cable connections for LTU 155e and LTU 155e/o. Follow the instructions that apply to your configuration.

8.5.1 Electrical Interface

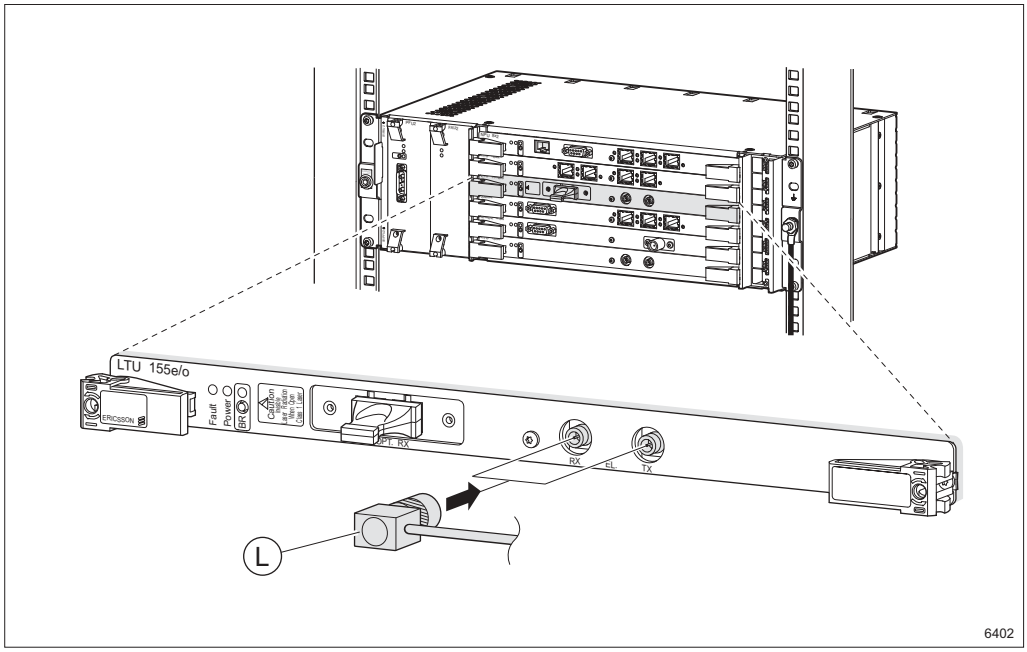

Figure 88 Connecting the STM-1 electrical cables

- Connect the STM-1 electrical cables **L**.
- Mark the cables, see Section 8.8 on page 99.

8.5.2 Optical Interface

The LTU 155e/o plug-in unit is a Class 1 laser product (IEC 60825-1). Insert optical plugs in unused connectors.

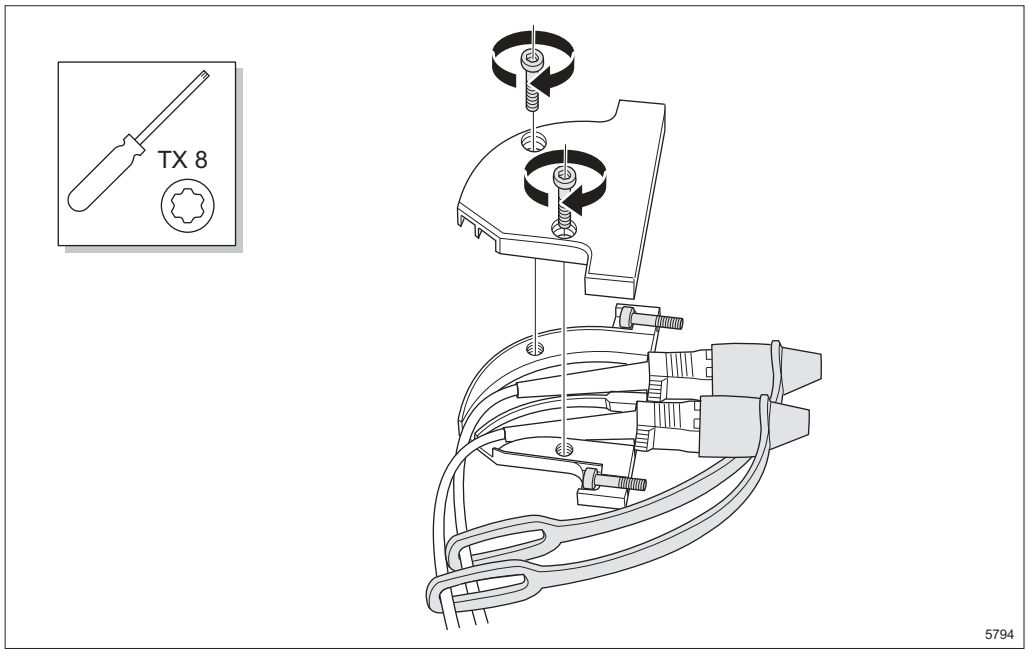

Figure 89 Inserting the optical fibre cables and assembling the connector casing

1. Open the connector casing by undoing the two screws.
2. Insert the optical fibre cables and place the two screws, used for tightening the casing to the plug-in unit, in their positions.
3. Fasten the top of the connector casing with the two screws.

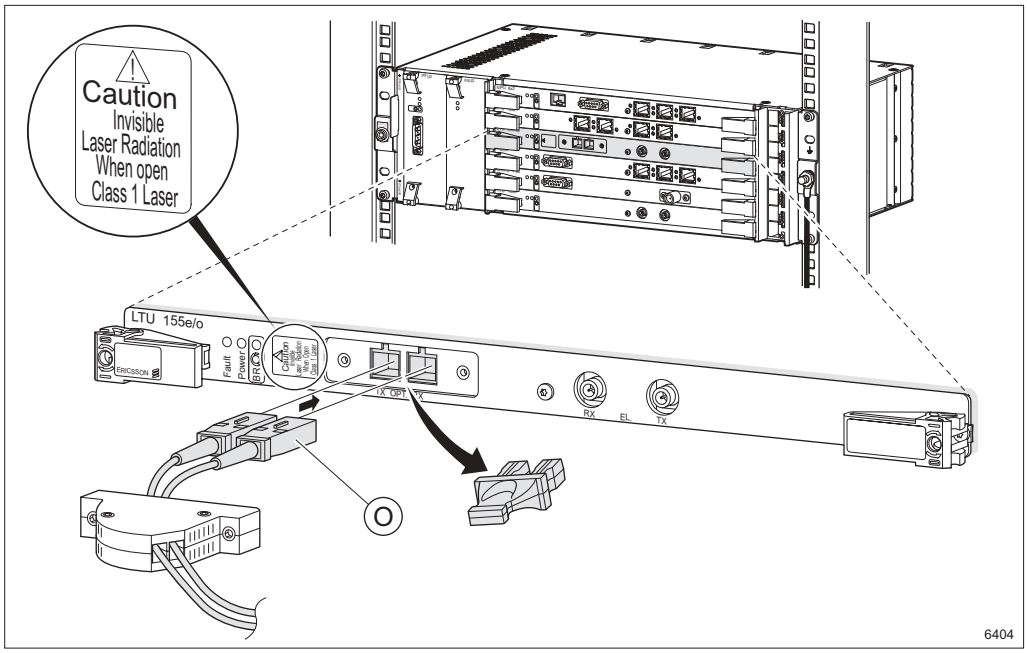

Figure 90 Connecting the optical fibre cables

4. Remove the protective end caps from the optical fibre cables and the optical plugs to the OPT. connectors.

5. Connect the cables **O**.

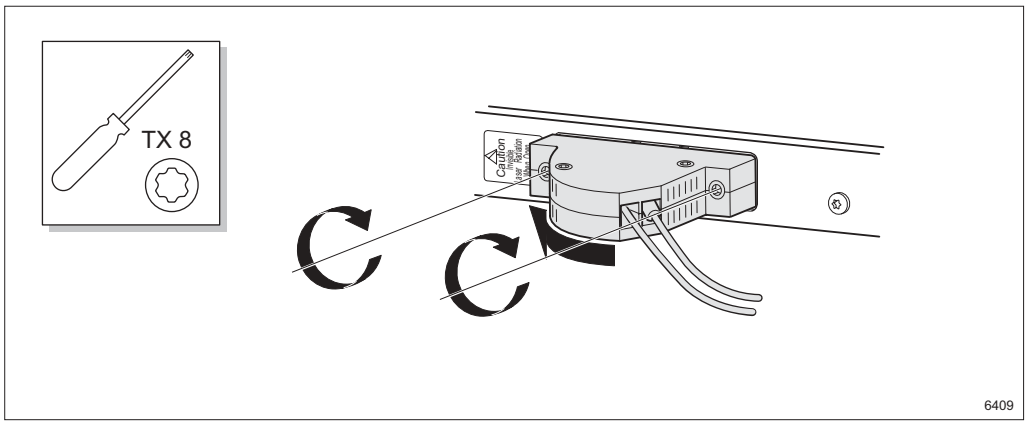

Figure 91 Fastening the connector casing

6. Fasten the connector casing to the plug-in unit.

7. Mark the cables, see Section 8.8 on page 99.

8.6 Connecting to the MMU2

This section describes all cable connections for MMU2 4, MMU2 4-8, MMU2 4-16 and MMU2 4-34. Follow the instructions that apply to your configuration.

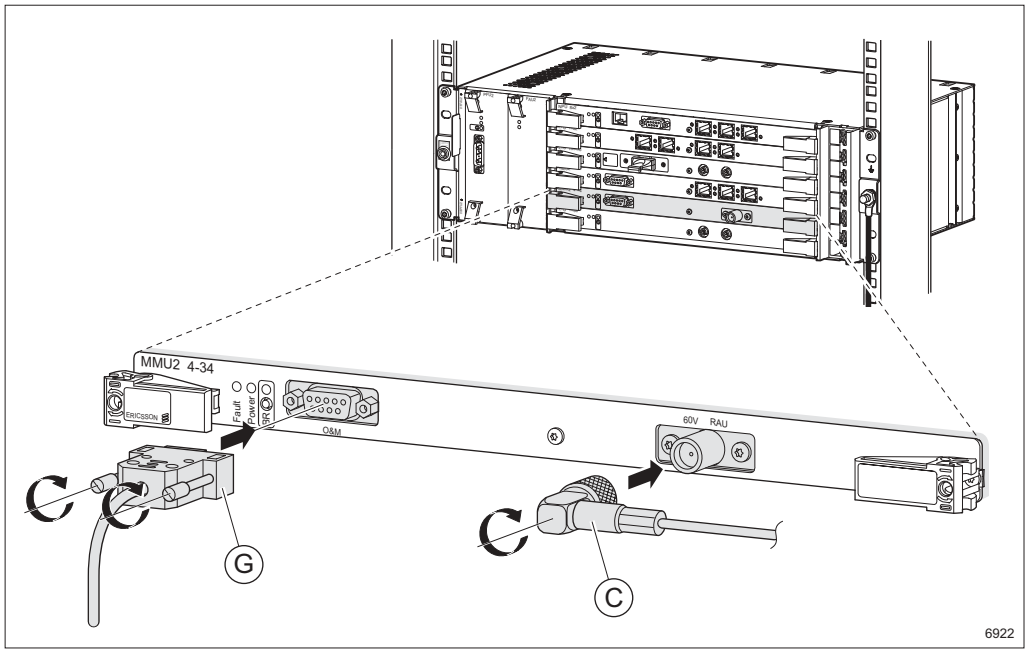

Figure 92 Connecting the station radio cable and PC cable

- Connect the station radio cable **C**.
- Connect the PC cable **G**.

  Note: The PC cable can be connected to a PC to perform a Local Upgrade (LU).

- Mark the cable, see Section 8.8 on page 99.

8.7 Connecting to the PFU2

This section describes all cable connections for PFU2.

Caution!

Make sure the power is switched off before working with the DC cable.

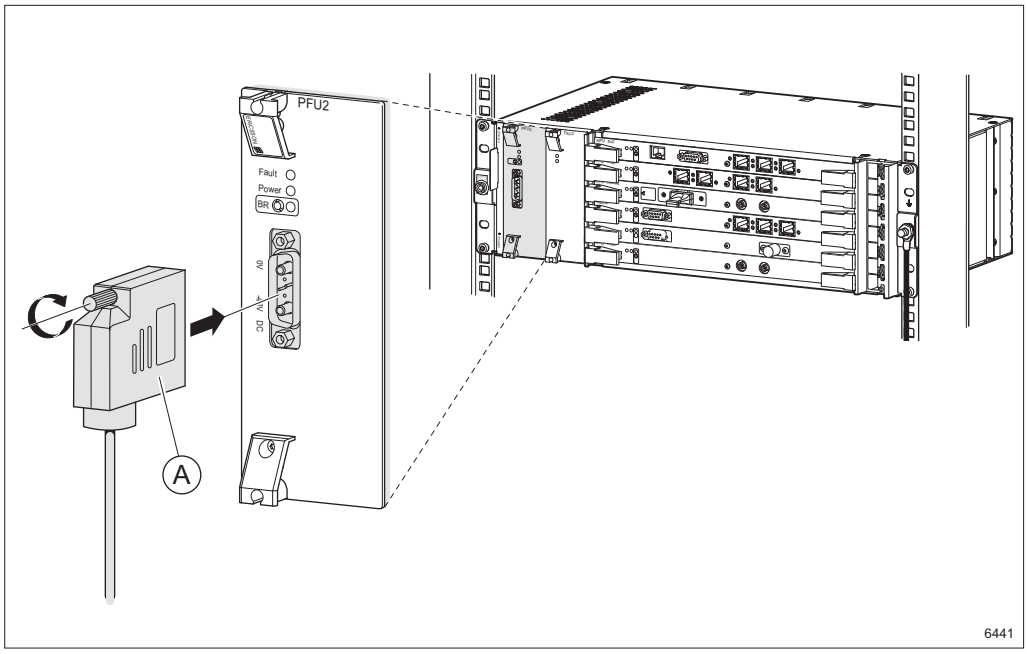

Figure 93 Connecting the DC cable

1. Assemble the DC cable **A**. See Section 18.5 on page 213 for assembly instructions.
2. Connect the DC cable.
3. Mark the cables, see Section 8.8 on page 99.
4. Connect the DC cable to the power supply source. Make sure the power supply requirements are met, see Section 4.1 on page 21 for information.

8.8 Marking the Cables

All cables should be marked using the marking kits included with the cable deliveries.

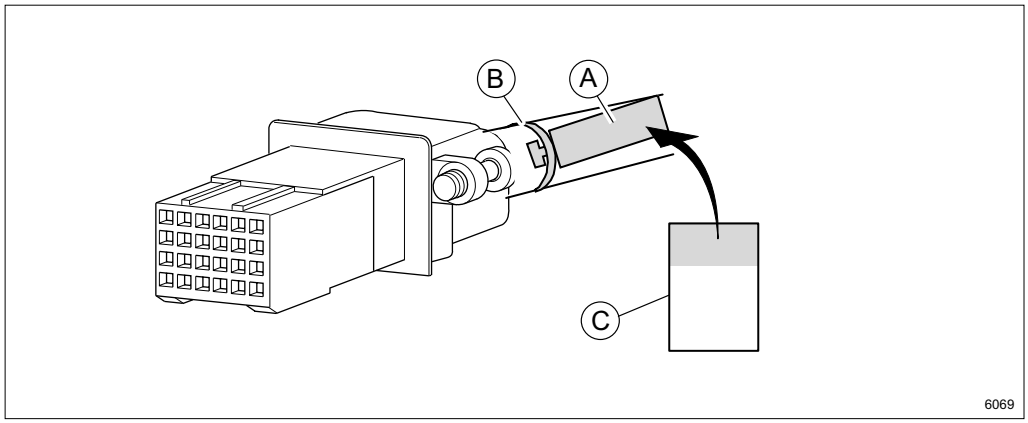

Figure 94 Example of cable marking

1. Fasten a tag **A** to the cable using a strap **B**.
2. Mark the cable by writing on the yellow part of the tape **C** and attaching it to the tag (wrapping the transparent part around the tag).

   Note: There are two tags, one for each end of the cable.

8.9 Routing the Cables

When all cables are connected they have to be routed.

Caution!

Sharp bends may damage the cables. Do not bend the cables more than the stated minimum bending radius.

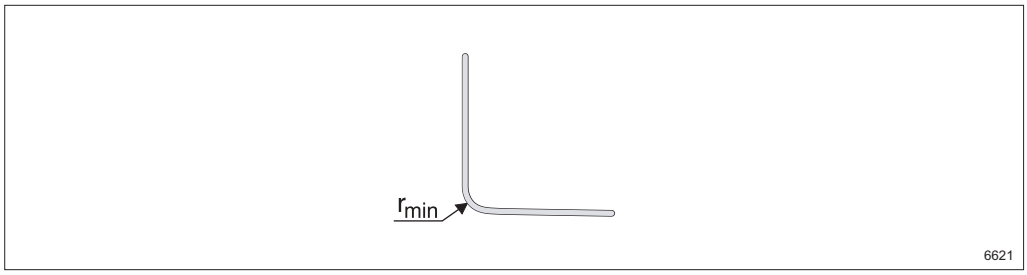

Figure 95 Minimum bending radius

Table 11 Minimum bending radius

Description	**r_{min}(mm)**
E1 120 Ohm cable	70
2xE1 120 Ohm cable	38
DIG SC cable	27
4xE1 120 Ohm, User I/O cable	50
Ethernet cable	22
2xE2 75 Ohm cable	25
E3 75 Ohm cable	20
Optical fibre cable	20
STM-1 electrical cable	20
Station radio cable	33
DC cable	100

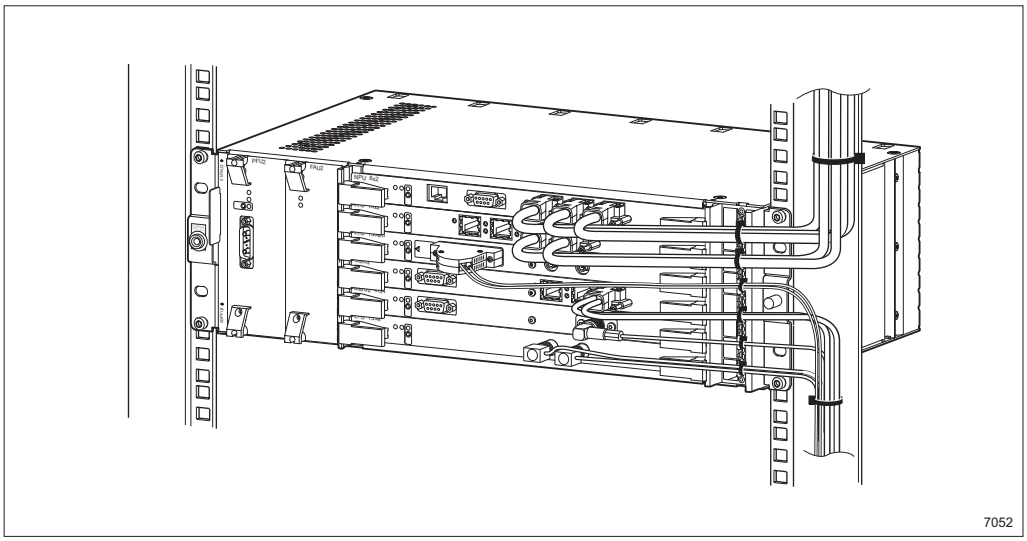

Figure 96 Routing the cables for AMM 6p

1. Strap the cables to the cable grid on the right hand side.

   Note: Make sure the cables are routed straight to the right to make future replacement of the neighboring plug-in units easy.

8.10 Labeling

Fill out the labels on both sides of the information plate.

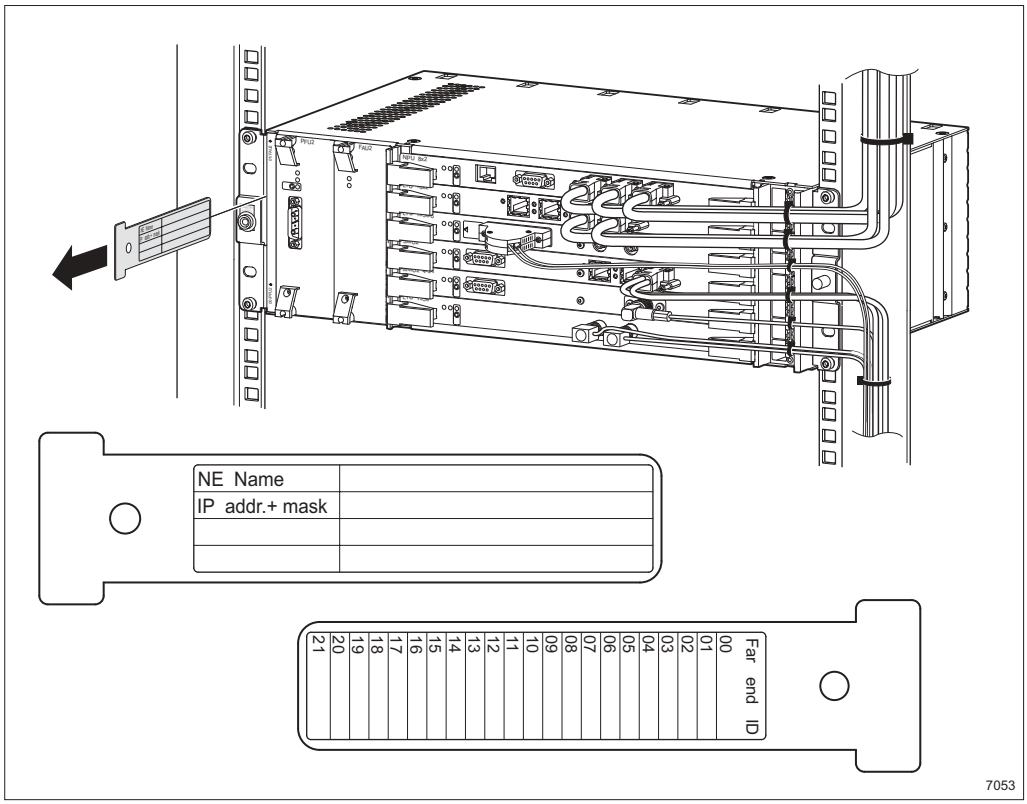

Figure 97 The information plate

NE Name	IP Address / Name
IP Address + Mask	The IP address and subnet mask of the Network Element (NE)
Far-end ID	The identity of the terminal with which the near-end terminal communicates

9 Installing an AMM 2p Configuration

This section describes a recommended installation procedure for an AMM 2p configuration in a 19” rack or cabinet. Wall installation is described in Section 11.4 on page 132.

Installation Procedure

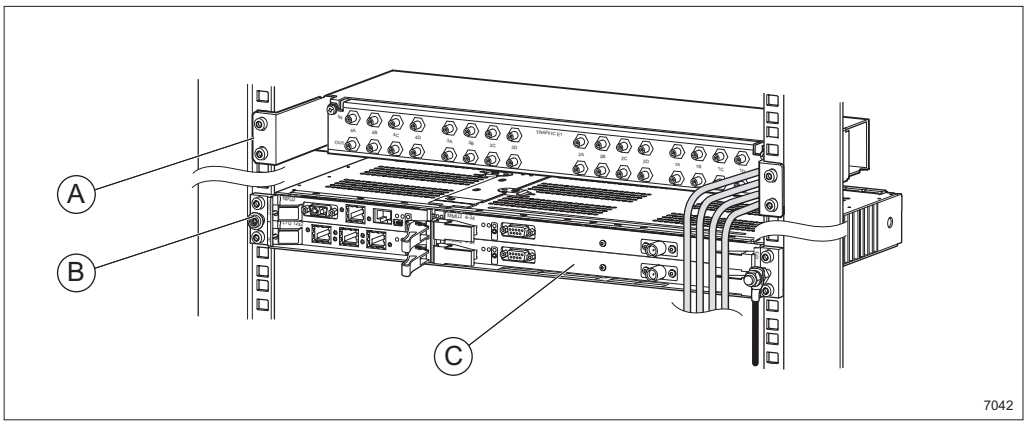

Figure 98 Overview of the indoor installation procedure for a rack or cabinet

Step 1 Make sure all required tools, units and accessories are available, see Section 4 on page 21.

Step 2 Optional: Install the ICF 16x2 **A**, see Section 11.3 on page 124.

Step 3 Install the AMM **B**, see Section 9.1 on page 104.

Step 4 Insert the plug-in units **C**, see Section 9.2 on page 108.

9.1 Installing the AMM 2p

This instruction describes how to install the AMM 2p. It fits into 19” and metric racks.

9.1.1 Cooling Arrangement

Caution!

Insufficient cooling may shorten the useful life of the equipment. Be sure to always follow the instructions.

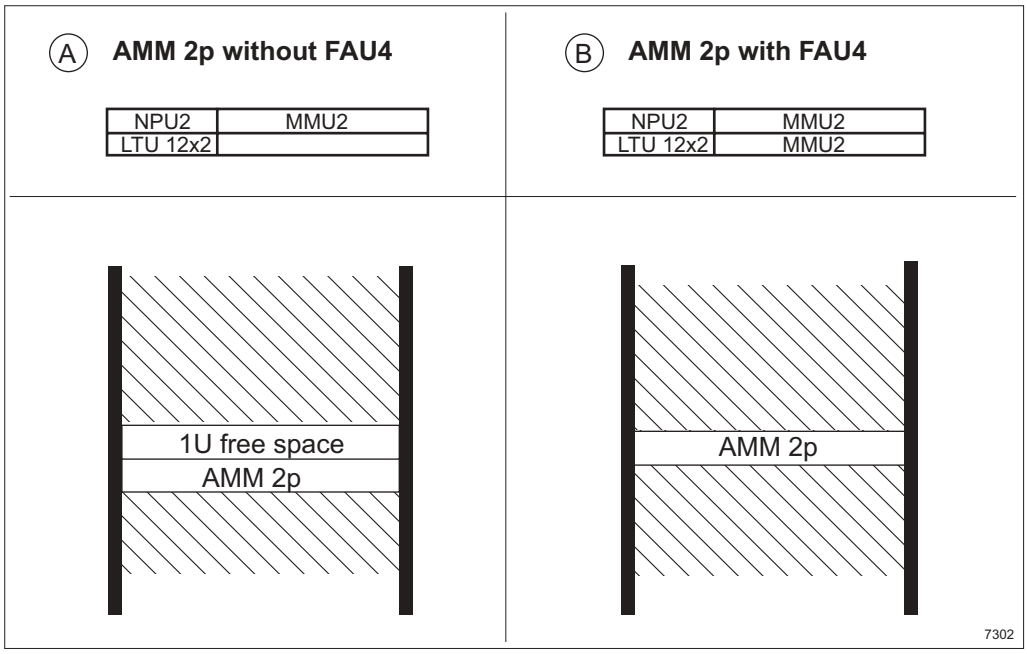

Figure 99 Cooling requirements for AMM 2p

A An AMM 2p equipped with only one MMU2 does not require any forced cooling, but a 1U free space directly above the AMM is needed.

B An AMM 2p fully equipped with two MMU2s requires a fan unit (FAU4). If the indoor location has other fan units, providing forced air-cooling through the AMM with an airflow of at least 130 m^3/h and with a temperature of the incoming air less than 45°C, the fan unit can be omitted even when the AMM is fully equipped.

9.1.2 Inserting the Fan Unit (FAU4)

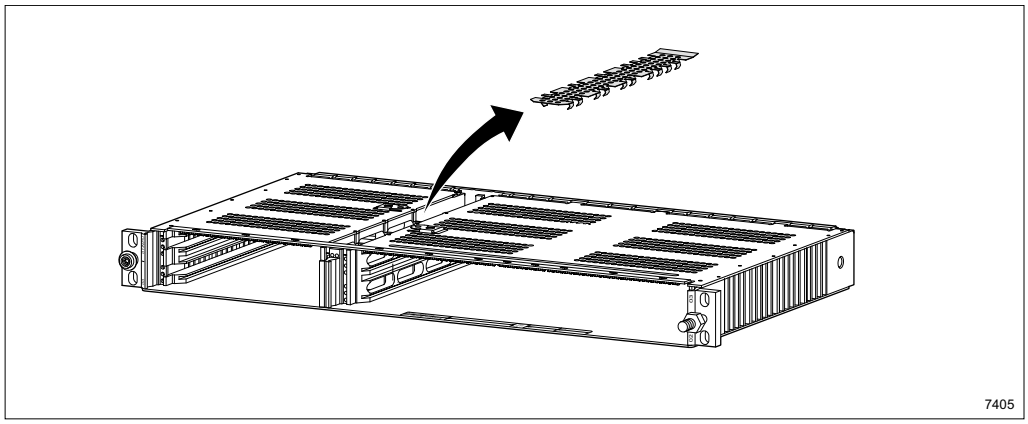

Figure 100 Removing the cover plate

1. Remove the cover plate by pulling it upwards.

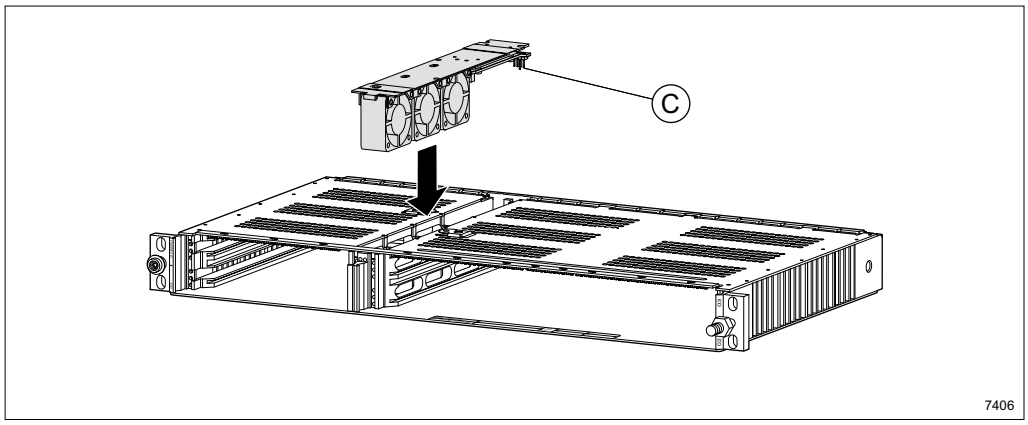

Figure 101 Fitting the FAU4

2. Insert the FAU4 into the AMM.

Note: Make sure the connector at the back **C** is fully connected by pressing at the back of the FAU4.

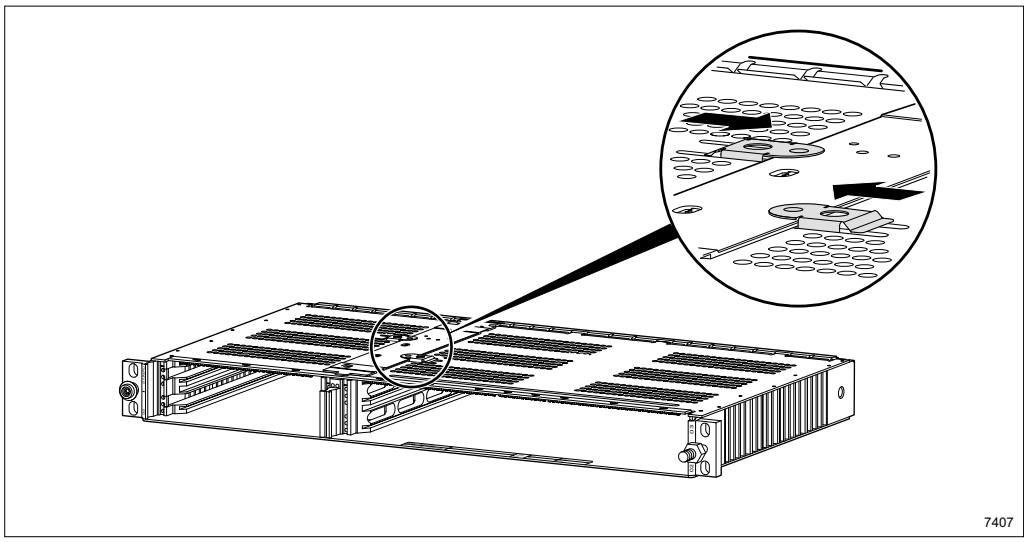

Figure 102 Locking the FAU4

3. Lock the FAU4 by pressing the two locking plates over the top of the fan unit.

9.1.3 Fitting the AMM 2p

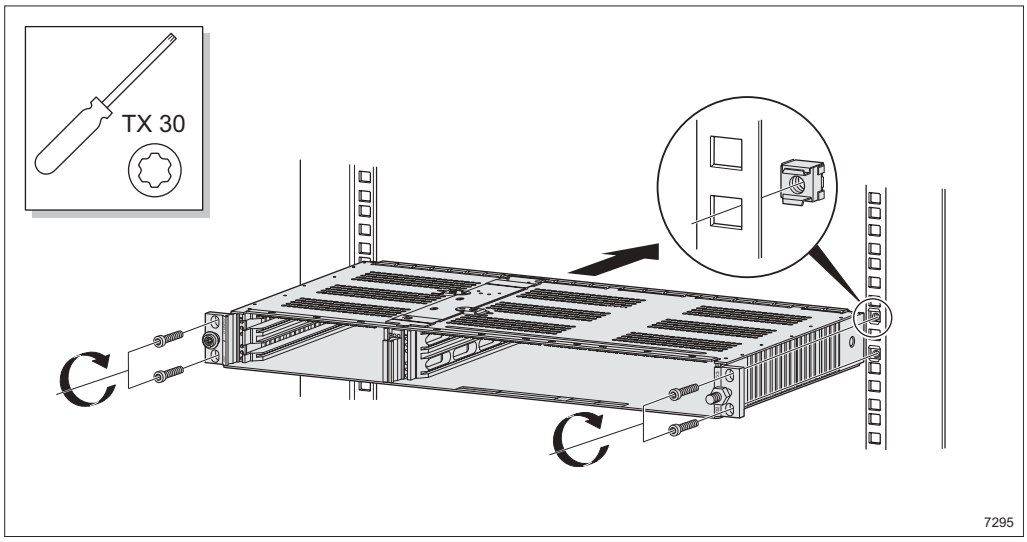

Figure 103 Fitting the AMM 2p

4. Fit the four captive nuts to the rack.

5. Fit the AMM in the rack and tighten the screws.

9.1.4 Grounding the AMM 2p

Caution!

The AMM must be grounded.

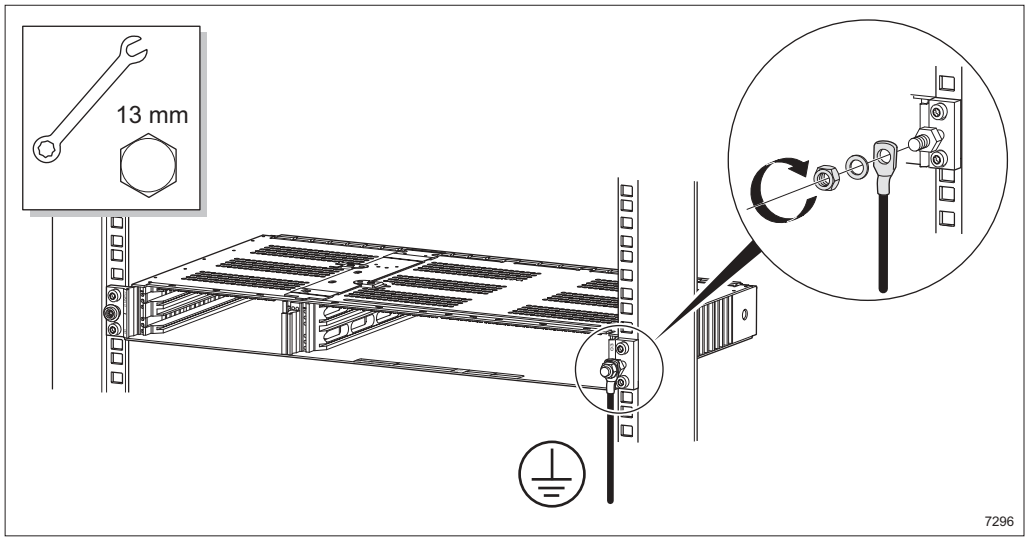

Figure 104 Grounding the AMM 2p

6. Connect and tighten the earthing cable to the AMM.
7. Connect the other end of the earthing cable to protective earthing via station ground.

9.2 Inserting and Removing the Plug-in Units

Read this section carefully before inserting or removing the plug-in units.

9.2.1 Positioning the Plug-in Units

The AMM 2p can house up to 2 full-height and 2 half-height (NPU2 and LTU 12x2) plug-in units.

9.2.1.1 Common Rules and Recommendations

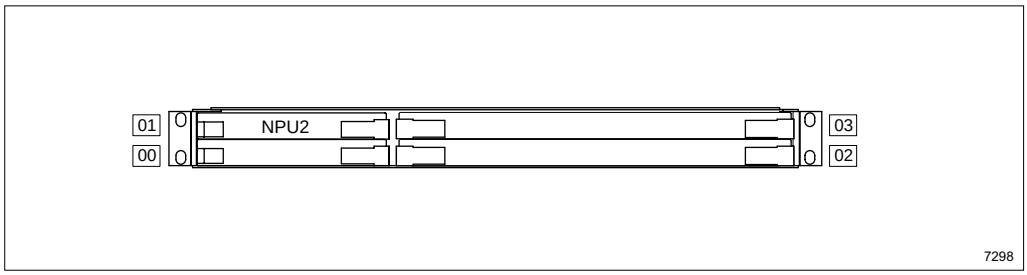

Figure 105 Basic configuration for AMM 2p

- The NPU2 must be fitted in position 01 and the optional LTU 12x2 in position 00.
- The full-height slots, position 02 and 03, can be equipped with MMU2 plug-in units.

9.2.2 Inserting the Plug-in Units

Electrostatic Discharge (ESD) may damage the equipment. Always use an approved antistatic bracelet to avoid damage to components fitted on printed circuit boards.

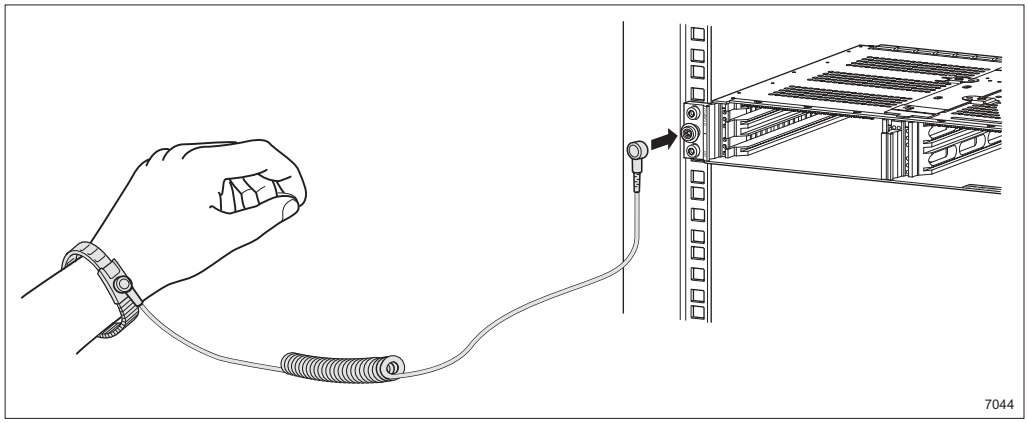

Figure 106 Attaching and connecting the antistatic bracelet

1. Attach the antistatic bracelet to the wrist and plug it into the ESD connector at the front of the magazine.

   Note: The AMM must be grounded.

2. Remove the plug-in unit from the ESD protective packaging.

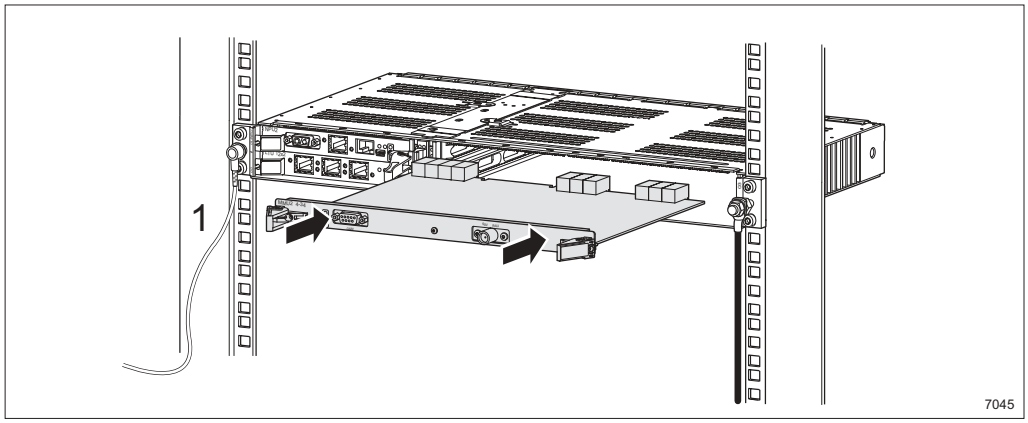

Figure 107 Inserting the plug-in unit

3. Insert the plug-in unit **1**.

   Note: Press in the plug-in unit until it connects to the back of the AMM.

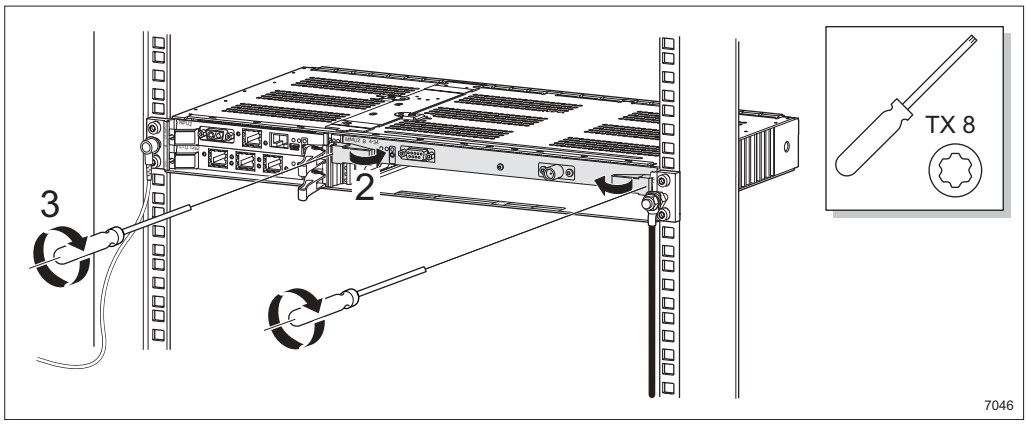

Figure 108 Locking and tightening the plug-in unit

4. Lock the plug-in unit using the two latches **2**.

5. Tighten the two screws to secure the plug-in unit **3**.

9.2.2.1 Inserting the Dummy Units

Caution!

All empty slots must be covered with dummy units to comply with EMC and cooling specifications.

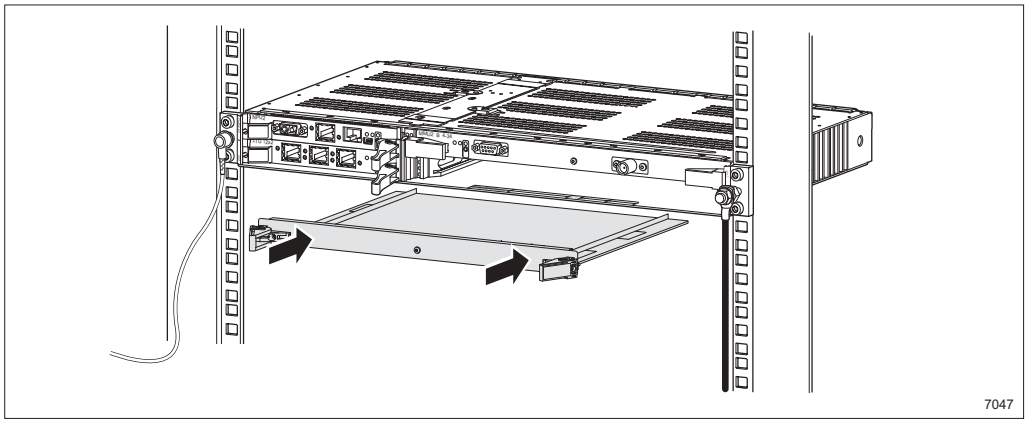

Figure 109 Fitting the dummy units

6. Insert and secure the dummy units in the same way as the plug-in units.

9.2.3 Removing the Plug-in Units

The plug-in units are removed in the reverse order.

10 Indoor Cabling for an AMM 2p Configuration

This chapter describes how to connect the pre-assembled cables to the plug-in units.

Installation Procedure

Step 1 Make sure all required tools, units and accessories are available, see Section 4 on page 21.

Step 2 Connect the cables to the indoor units, see Section 10.1 on page 112.

Step 3 Mark the cables, see Section 10.5 on page 117.

Step 4 Route the cables, see Section 10.6 on page 118.

Step 5 Fill out the label in the AMM, see Section 10.7 on page 119.

10.1 Connecting the Cables

Figure 110 on page 112 gives an overview of all cables for the indoor units and how they should be connected.

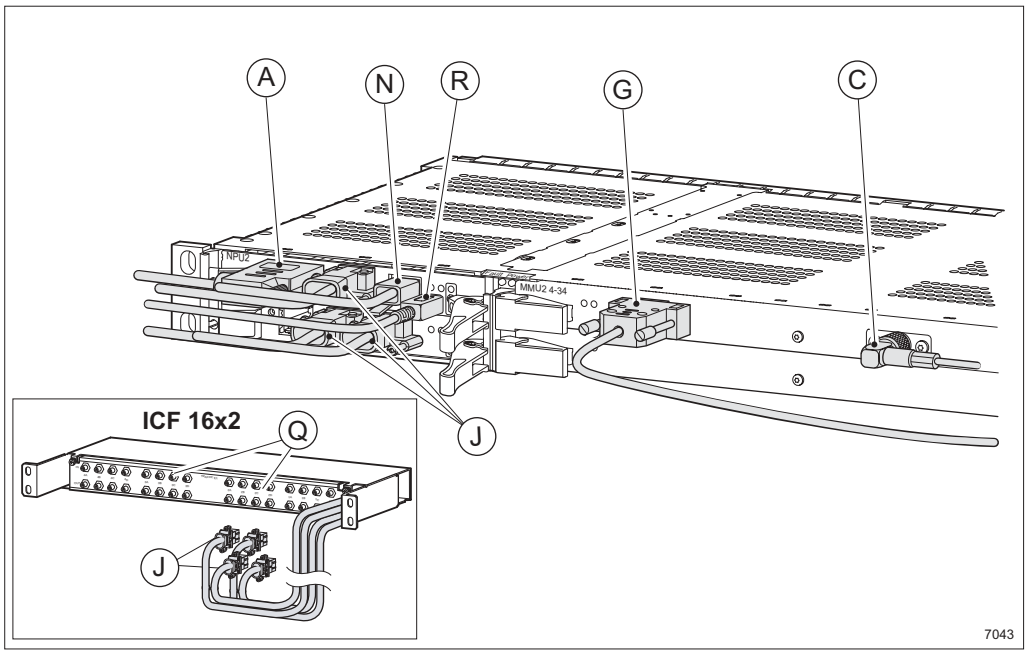

Figure 110 Overview of cables connected to the indoor units

Note: Some of the cables in the figure and table are optional.

Caution!

The cables must not be bent more than specified. See Section 10.6 on page 118 for more information on minimum bending radius.

Table 12 on page 113 contains references to connection instructions for all cables. Section 19 on page 237 contains a pin connection overview for all cables.

Table 12 Overview of cables connected to the indoor units

Item	Connector	Cable	Pre-assembled	Assembly and Connection Instructions
A	0V –48V DC	DC cable	–	See Section 10.2 on page 114
C	60 V RAU	Station radio cable	RPM 517 6906/1	See Section 10.4 on page 116
G	O&M	PC cable	RPM 517 54/2	See Section 10.4 on page 116
J	E1:1A-1D E1:2A-2D E1:3A-3D	4xE1 120 Ohm User I/O cable	RPMR 102 06/2	One end pre-assembled. See Section 10.2 on page 114 and Section 10.3 on page 115
		4xE1 cables from ICF 16x2	–	See Section 11.3.4 on page 127
N	10/100Base-T	Ethernet cable	RPMR 102 11/1 (crossed) or RPMR 102 10/1 (straight)	See Section 10.2 on page 114
Q	–	E1 cable 75/120 Ohm	–	See section Section 11.3.5 on page 128
R	USB	USB Type A to mini-B cable	RPM 517 510/01	See Section 10.2 on page 114.

10.1.1 Cabling Prerequisites

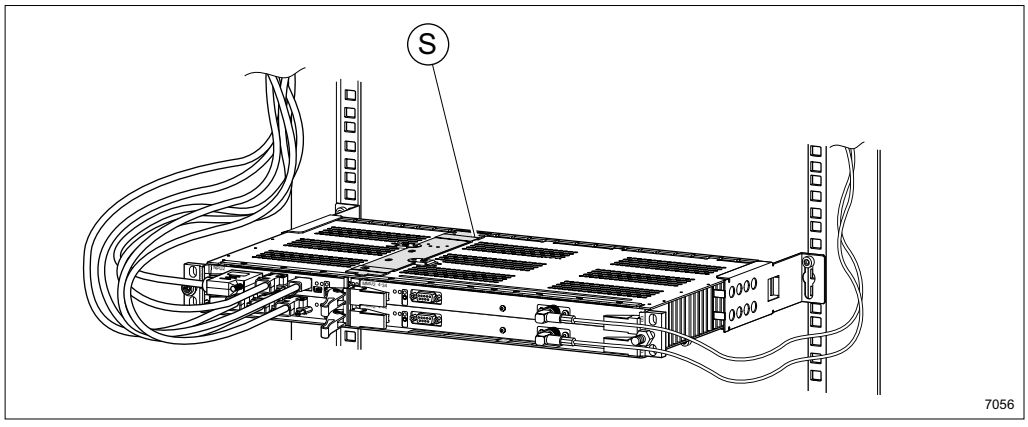

Figure 111 Pulling out the AMM 2p

When other equipment is fitted directly above the AMM, it must be pulled out from the rack to be able to replace the fan unit (FAU4) **S**. Make sure the cables are long enough to support this. See Section 15.2.5 on page 157 for instructions on how to replace FAU4.

10.2 Connecting to the NPU2

This section describes all cable connections for NPU2. Follow the instructions that apply to your configuration.

Caution!

Make sure the power is switched off before working with the DC cable.

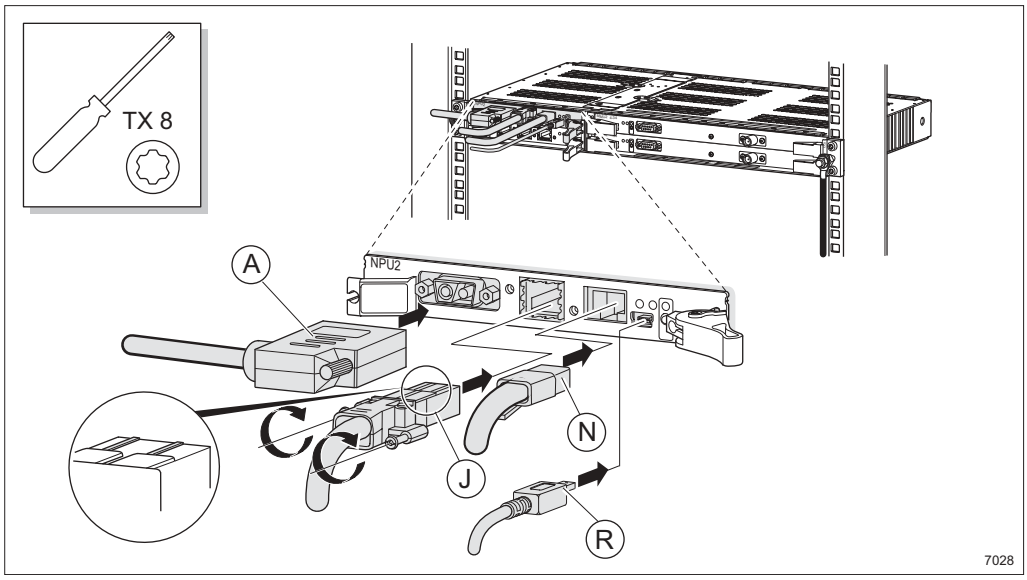

Figure 112 Connecting the 4xE1, User I/O, Ethernet and USB cables

- Connect the 4xE1 120 Ohm cables **J** (4xE1 120 Ohm, User I/O cable). Make sure the connector is entered correctly. See Section 19.3 on page 240 for pin connection information.
- Connect a straight or crossed Ethernet cable **N**. The interface can be configured, using the LCT, to detect the type of cable used, and be used for the optional features Ethernet Site LAN or Ethernet Traffic.
- Connect the USB cable **R**. See Section 12.1.2 on page 140 for more information.
- Assemble and connect the DC Cable **A**. See Section 18.7 on page 229 for assembly instructions.

  Note: Make sure the power supply requirements are met before connecting the DC cable. See Section 4.1 on page 21 for information.
- Mark the cables, see Section 10.5 on page 117.

10.3 Connecting to the LTU 12x2

This section describes all cable connections for LTU 12x2. Follow the instructions that apply to your configuration.

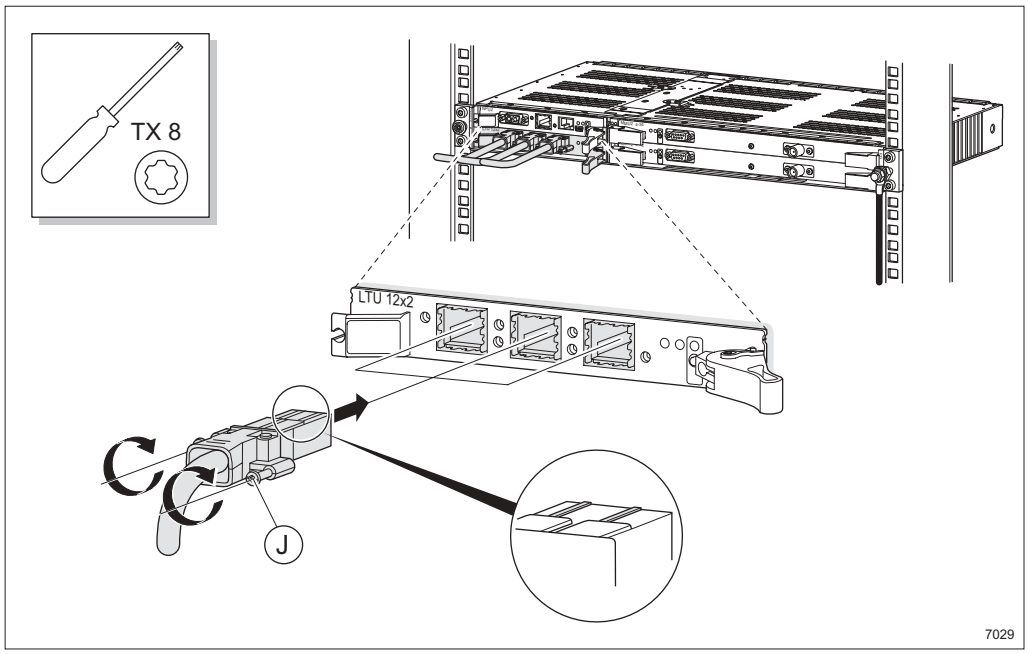

Figure 113 Connecting the 4xE1 cables

- Connect the 4xE1 120 Ohm cables **J** (4xE1 120 Ohm, User I/O cable). See Section 19.7 on page 246 for pin connection information.

Note: Make sure the connectors are entered correctly.

- Mark the cables, see Section 10.5 on page 117.

10.4 Connecting to the MMU2

This section describes all cable connections for MMU2 4, MMU2 4-8, MMU2 4-16 and MMU2 4-34. Follow the instructions that apply to your configuration.

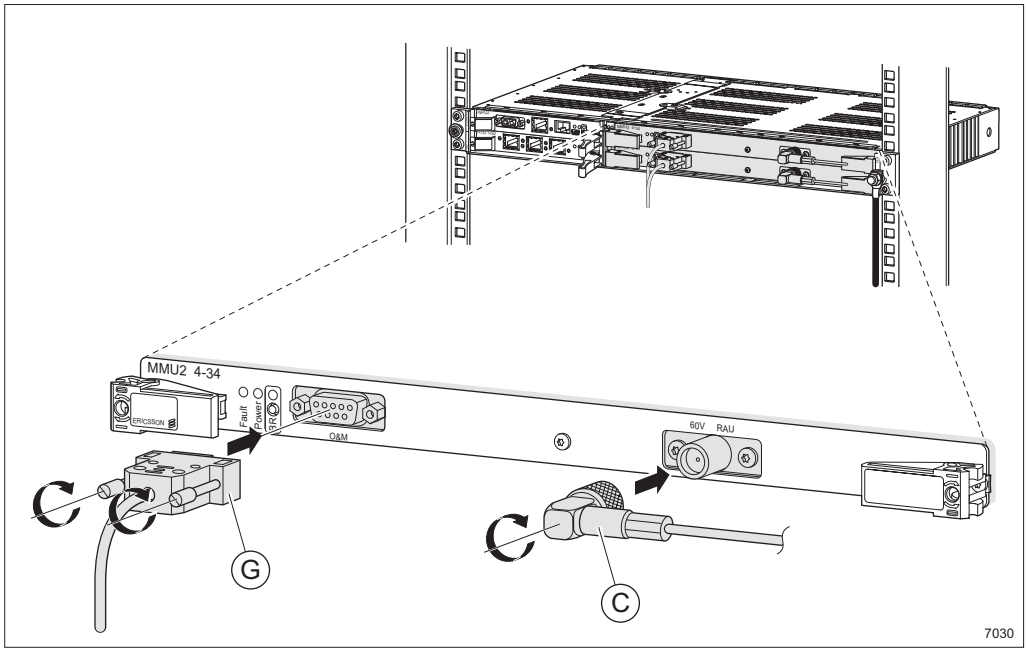

Figure 114 Connecting the station radio cable and PC cable

- Connect the station radio cable **C**.
- Connect the PC cable **G**.

  Note: The PC cable can be connected to a PC to perform a Local Upgrade (LU).

- Mark the cable, see Section 10.5 on page 117.

10.5 Marking the Cables

All cables should be marked using the marking kits included with the cable deliveries.

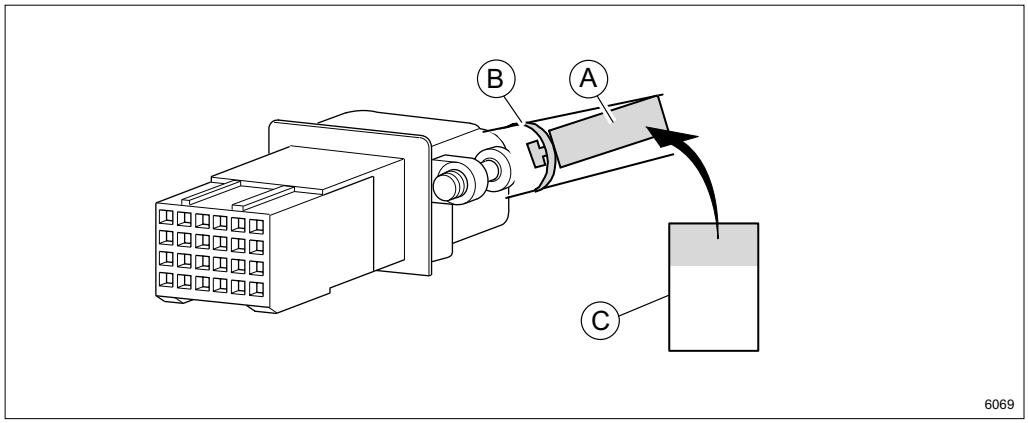

Figure 115 Example of cable marking

1. Fasten a tag **A** to the cable using a strap **B**.
2. Mark the cable by writing on the yellow part of the tape **C** and attaching it to the tag (wrapping the transparent part around the tag).

   Note: There are two tags, one for each end of the cable.

10.6 Routing the Cables

When all cables are connected they have to be routed.

Caution!

Sharp bends may damage the cables. Do not bend the cables more than the stated minimum bending radius.

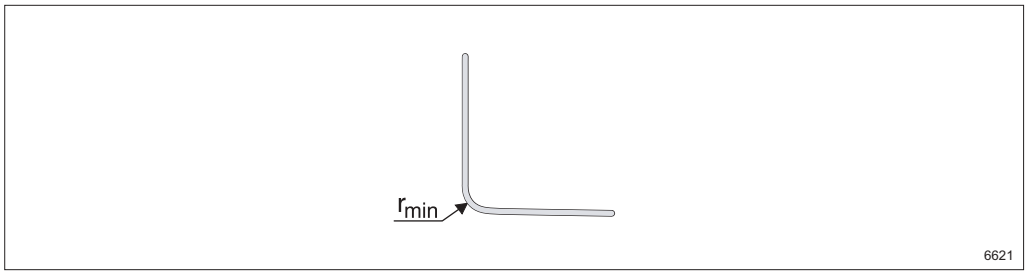

Figure 116 Minimum bending radius

Table 13 Minimum bending radius

Description	**r_{min}(mm)**
E1 120 Ohm cable	70
4xE1 120 Ohm, User I/O cable	50
Ethernet cable	22
Station radio cable	33
DC cable	100

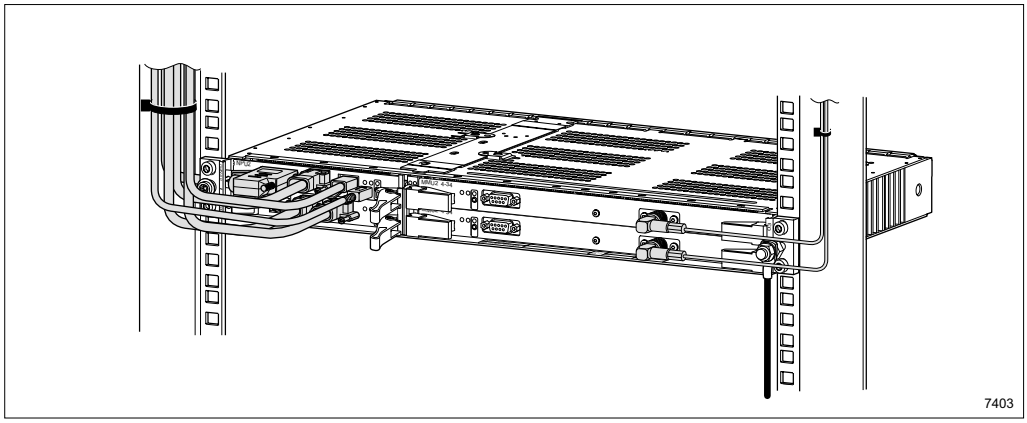

Figure 117 Routing the cables for AMM 2p

1. Route the cables to the sides and strap them.

10.7 Labeling

Fill out the label found at the front of the AMM.

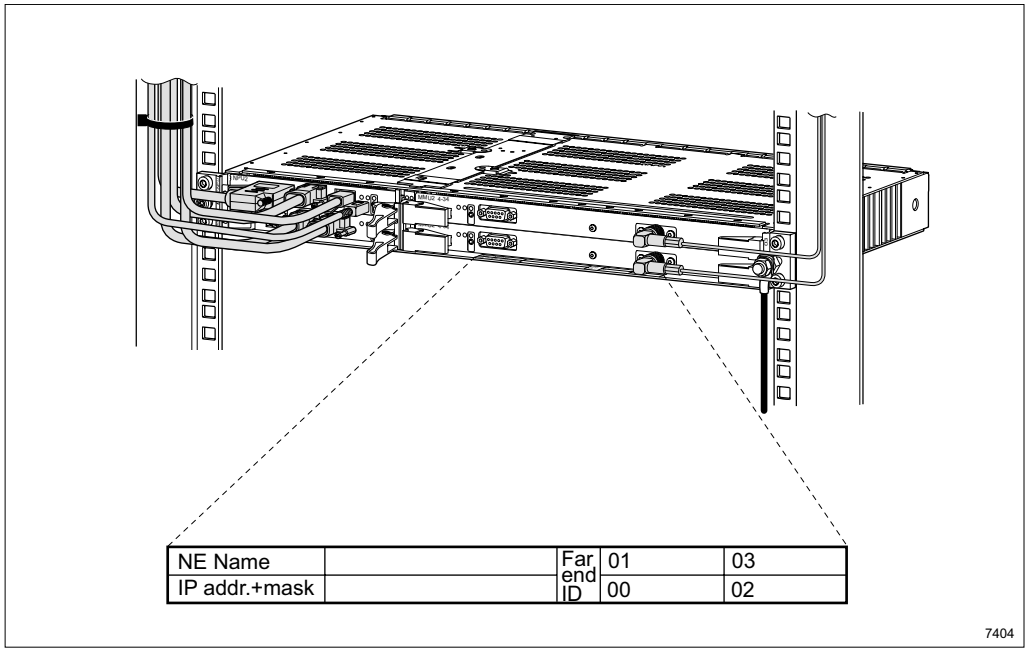

Figure 118 The information label

NE Name	IP Address / Name
IP Address + Mask	The IP address and subnet mask of the Network Element (NE)
Far-end ID	The identity of the terminal with which the near-end terminal communicates

11 Installing Optional Equipment

11.1 Fitting the Radio Cable Panel

This instruction describes how to fit the radio cable panel. The radio cable panel is used when connecting several radio cables and it fits into 19” racks. As an alternative, a mounting bracket can be used. See Section 13.2.1 on page 146 for more information.

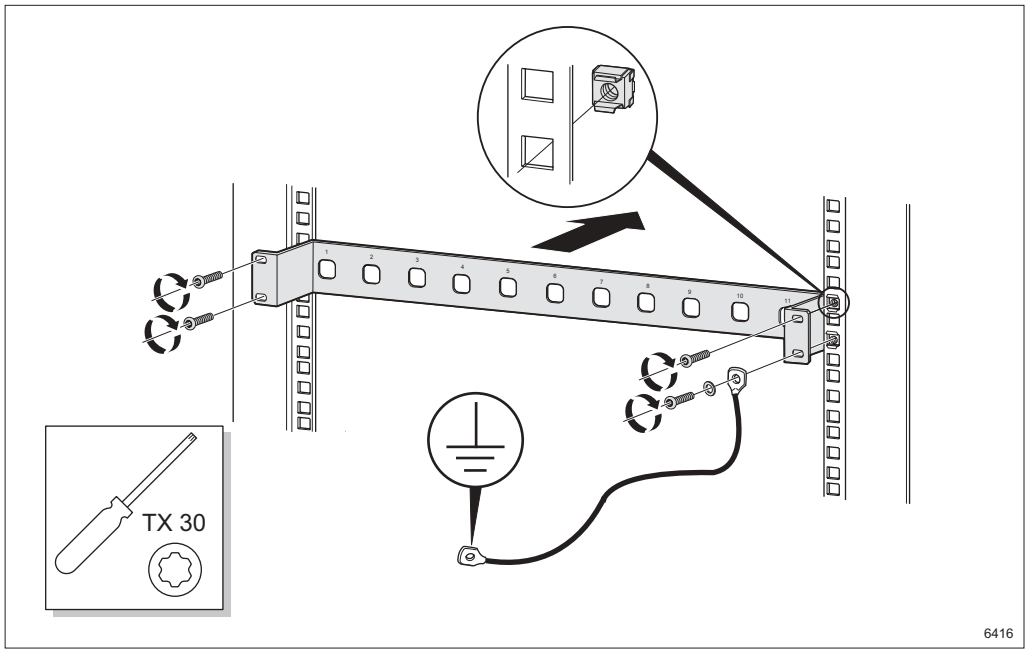

Figure 119 Fitting the radio cable panel

Caution!

The radio cable panel must be grounded.

1. Fit the four captive nuts to the rack
2. Fit the radio cable panel and the earthing cable to the rack and tighten the screws.
3. Connect the other end of the earthing cable to protective earthing via station ground.

11.2 Fitting the Radio Cable Mounting Bracket

This section describes how to fit the radio cable mounting bracket in a rack or a cabinet.

11.2.1 Connecting the Radio Cable in a Rack

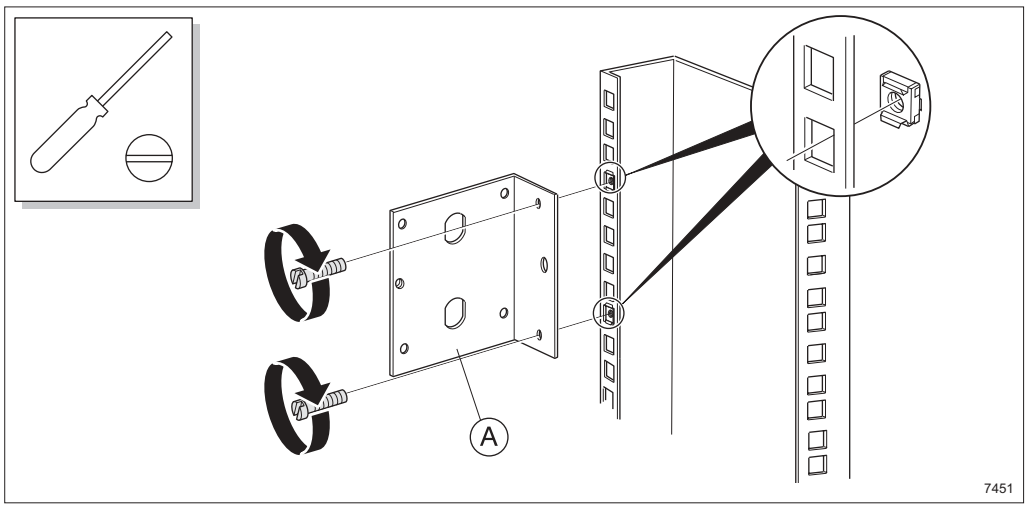

Figure 120 Fitting the bracket to the rack

1. Fit the bracket **A** with the two larger screws and captive nuts.

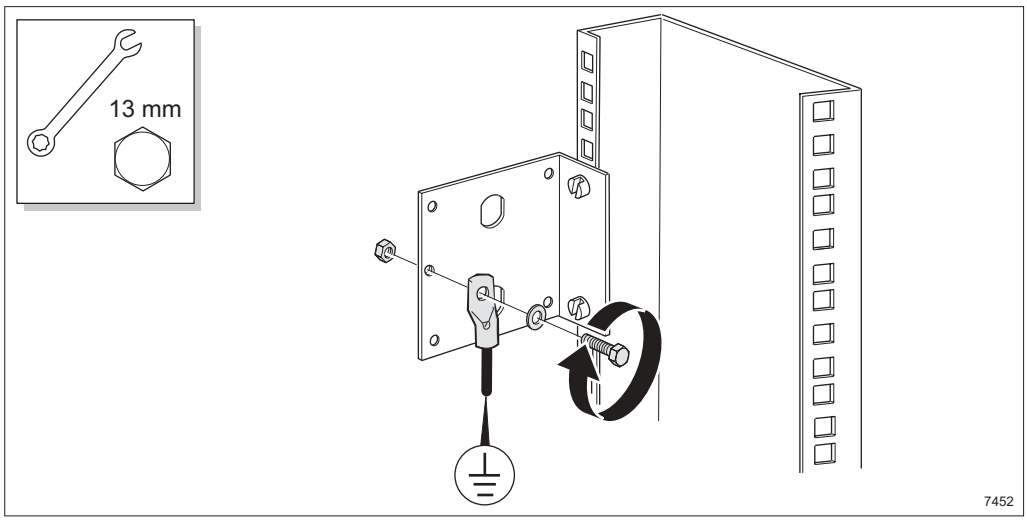

Figure 121 Grounding the bracket on the rack

2. Optional: Connect and tighten the earthing cable to the bracket. Connect the other end to protective earthing via station ground.

   Note: It is recommended that the mounting bracket be grounded, if placed on a wall or on a painted metallic surface.

11.2.2 Fitting the Radio Cable Bracket to a Cabinet

This instruction applies to a mounting bracket that is fastened to a cabinet.

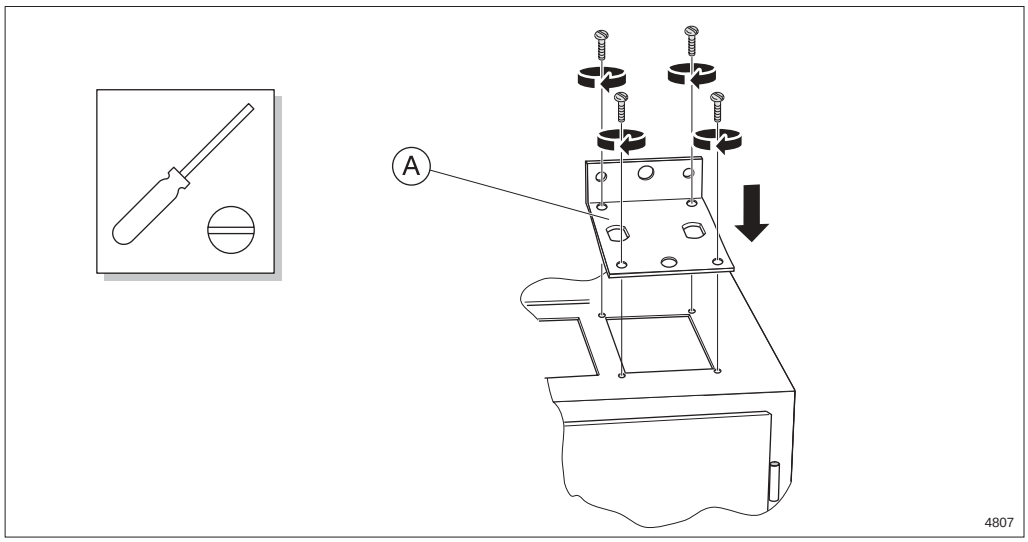

Figure 122 Fitting the bracket to the cabinet top

1. Fit the bracket **A** to the cabinet top with the four smaller screws.

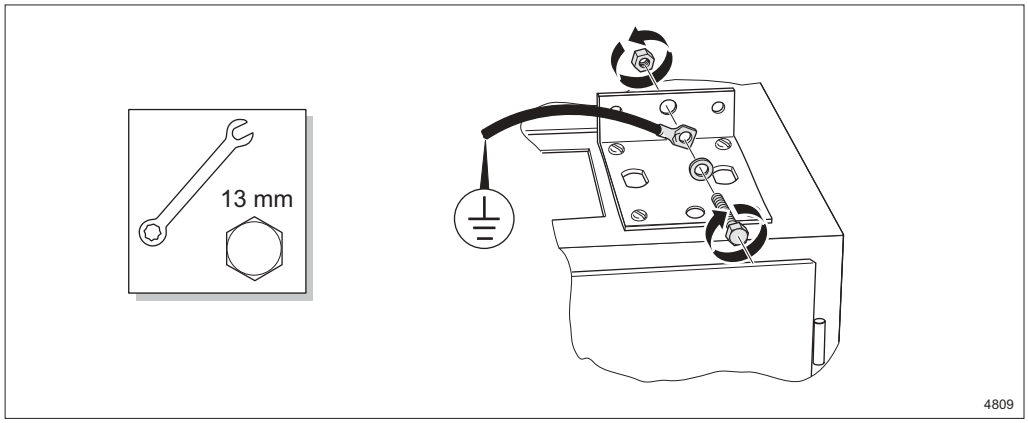

Figure 123 Grounding the bracket on the cabinet

2. Optional: Connect and tighten the earthing cable to the bracket. Connect the other end to protective earthing via station ground.

   Note: It is recommended that the mounting bracket be grounded, if placed on a wall or on a painted metallic surface.

11.3 Installing an ICF

This instruction describes how to install an ICF. It shows an ICF1 120 Ohm but the installation procedure for other ICFs is similar. The ICFs fit into 19” and metric racks.

11.3.1 Preparing the ICF before Installation

The cables can be routed to the front of the ICF1 or to the sides. It is delivered with front routed cables. Follow the instruction below to route the cables to the sides of the ICF1.

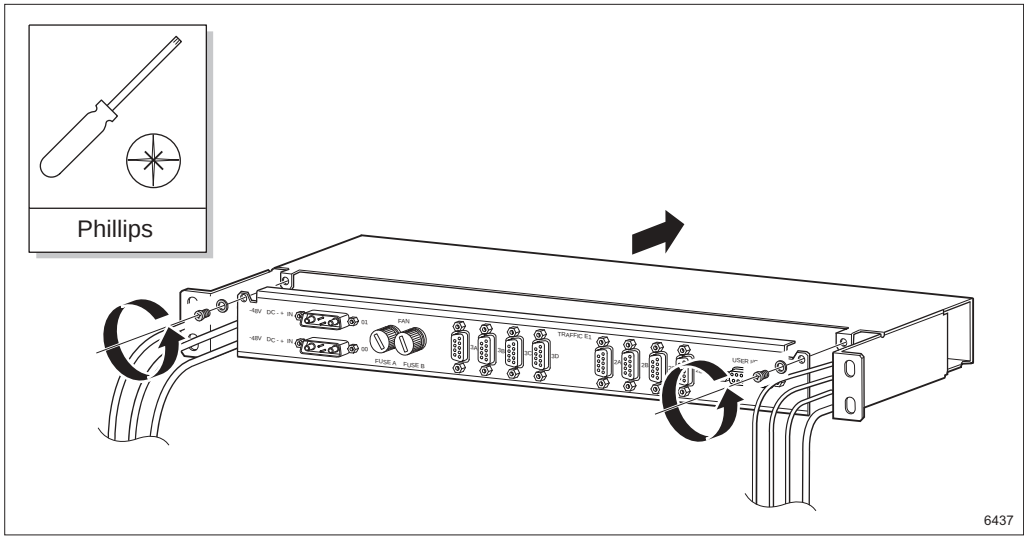

Figure 124 Opening the ICF1

1. Remove the two screws at the front and pull the casing and the front apart.

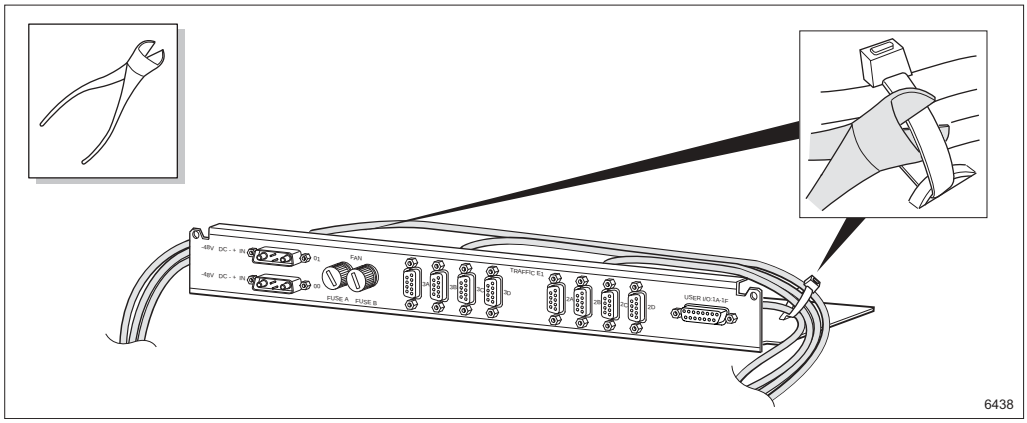

Figure 125 Cutting the cable straps

2. Cut the two straps holding the cables.

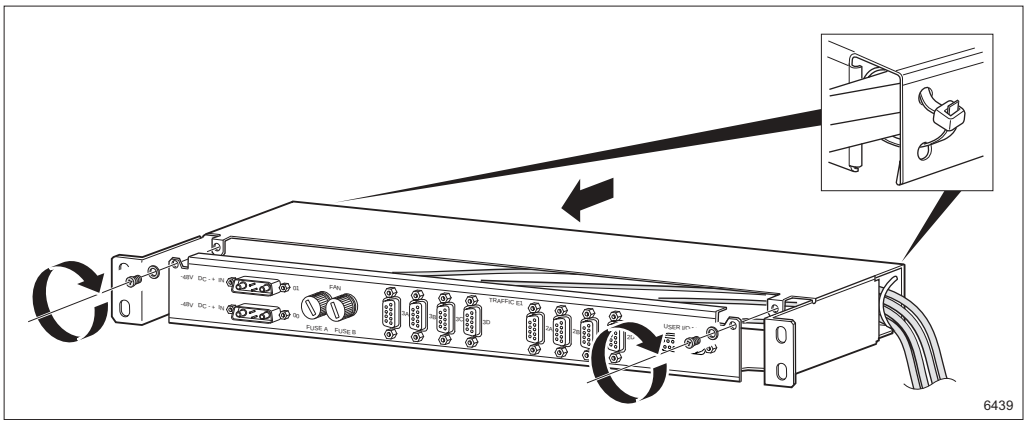

Figure 126 Rerouting the cables and assembling the ICF1

3. Route the cables to the sides and fasten them at the back of the casing using straps.

4. Assemble the ICF1 and tighten the two screws.

11.3.2 Grounding the ICF (ICF1 only)

Caution!

The ICF1 must be grounded.

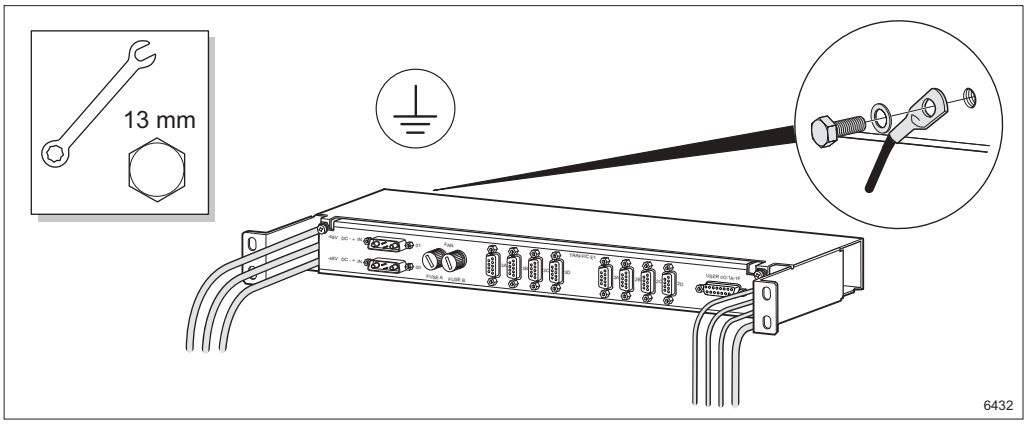

Figure 127 Fitting the earthing cable to the ICF

5. Connect and tighten the earthing cable to the ICF1.

11.3.3 Fitting the ICF

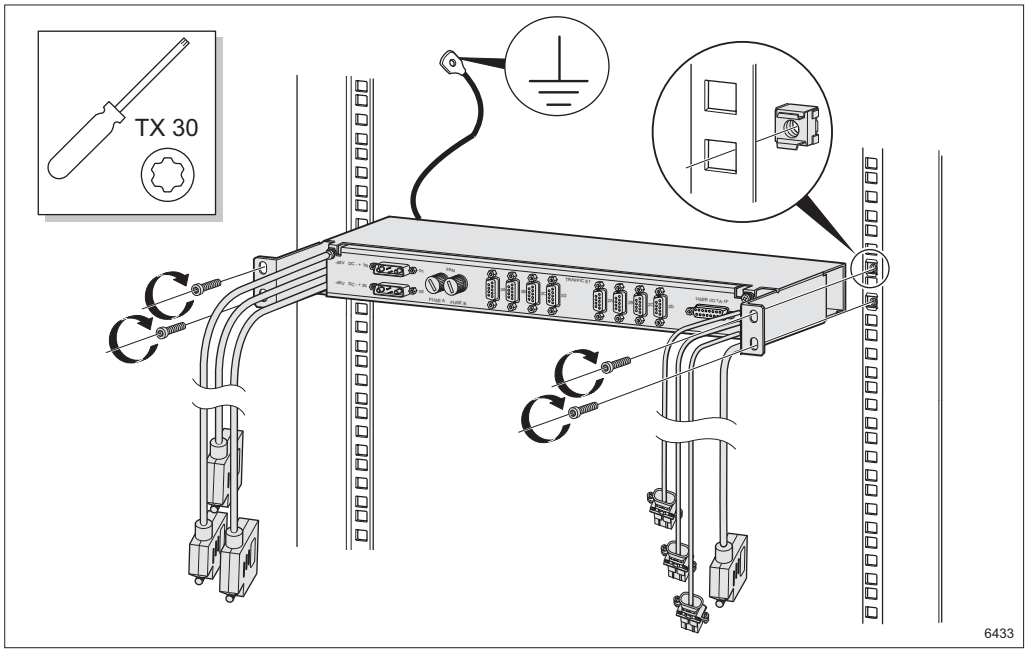

Figure 128 Fitting the ICF1

6. Fit the four captive nuts to the rack.
7. Fit the ICF1 to the rack and tighten the screws.

   Note: If there are many cables that will be connected to the ICF, a cable shelf can be fitted between the ICF and the AMM.

8. Connect the other end of the earthing cable to protective earthing via station ground (ICF1 only).

11.3.4 Connecting the ICF to the AMM

This section shows how to connect the ICFs to the AMMs. See section “Connecting the Cables” for each type of AMM for connection information.

11.3.4.1 AMM 20p

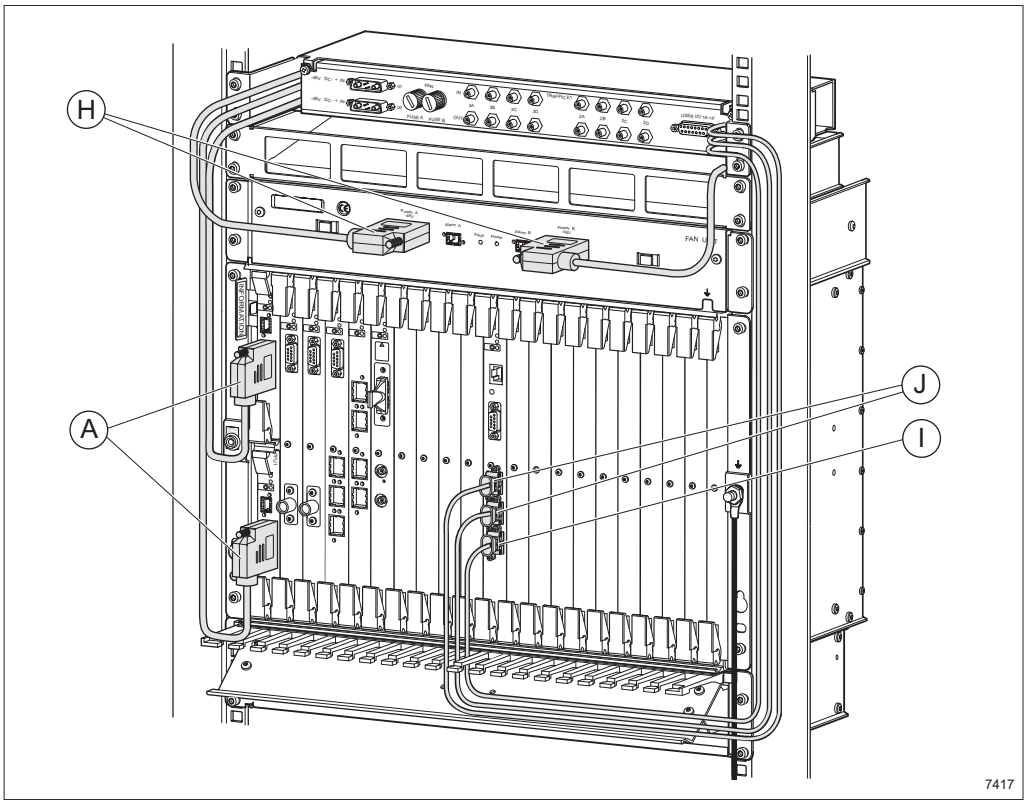

Figure 129 Connecting the cables to AMM 20p

11.3.4.2 AMM 6p

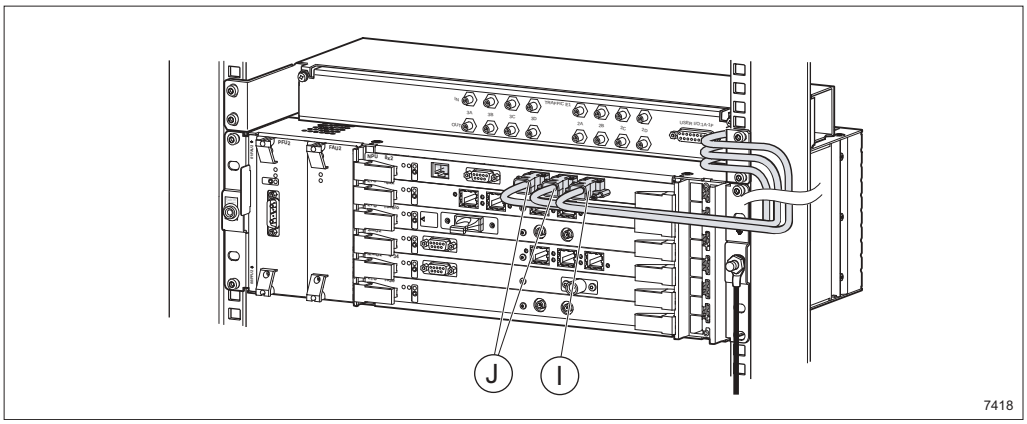

Figure 130 Connecting the cables to AMM 6p

11.3.4.3 AMM 2p

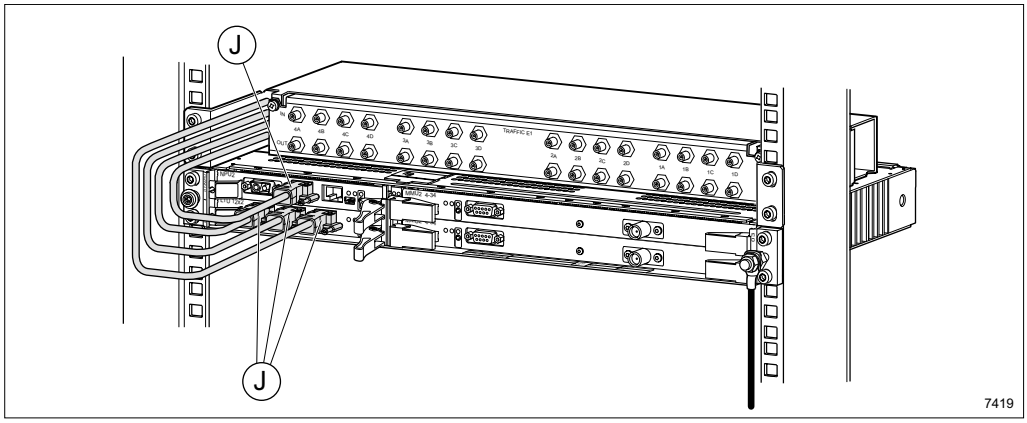

Figure 131 Connecting the cables to AMM 2p

11.3.5 Connecting User's End to the ICF

This instruction shows how to connect to an ICF1. The connection procedure for other ICFs is similar. Follow the instructions that apply to your configuration.

11.3.5.1 Connecting the E1 120 Ohm Cable

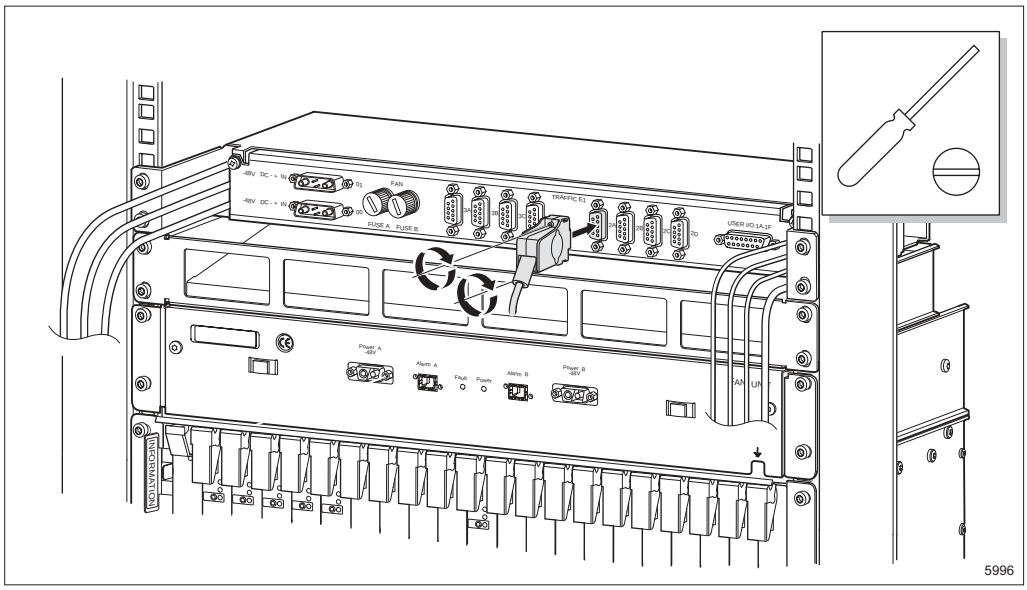

Figure 132 Connecting the E1 120 Ohm cable

1. Assemble the E1 120 Ohm cable. See Section 18.2 on page 191 for assembly instructions.
2. Connect the cable to the ICF1.
3. Mark the cable, see Section 6.10 on page 71.

11.3.5.2 Connecting the E1 75 Ohm Cables (SMZ)

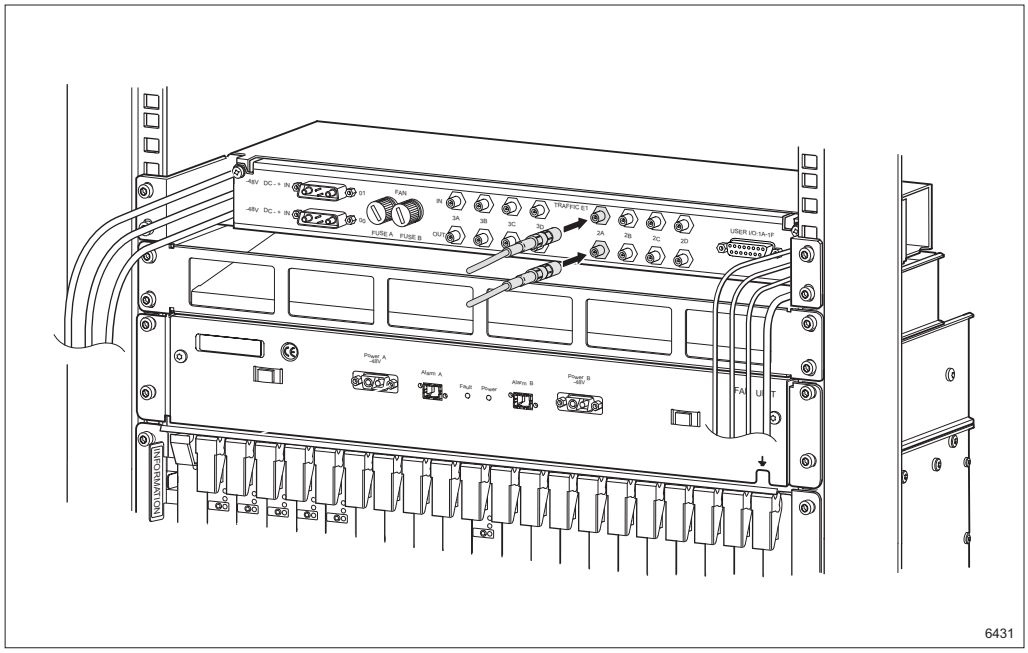

Figure 133 Connecting the E1 75 Ohm cables

1. Assemble the E1 75 Ohm cables. See Section 18.3 on page 199 for assembly instructions.
2. Connect the cables to the ICF1.
3. Mark the cables, see Section 6.10 on page 71.

11.3.5.3 Connecting the User I/O Cable

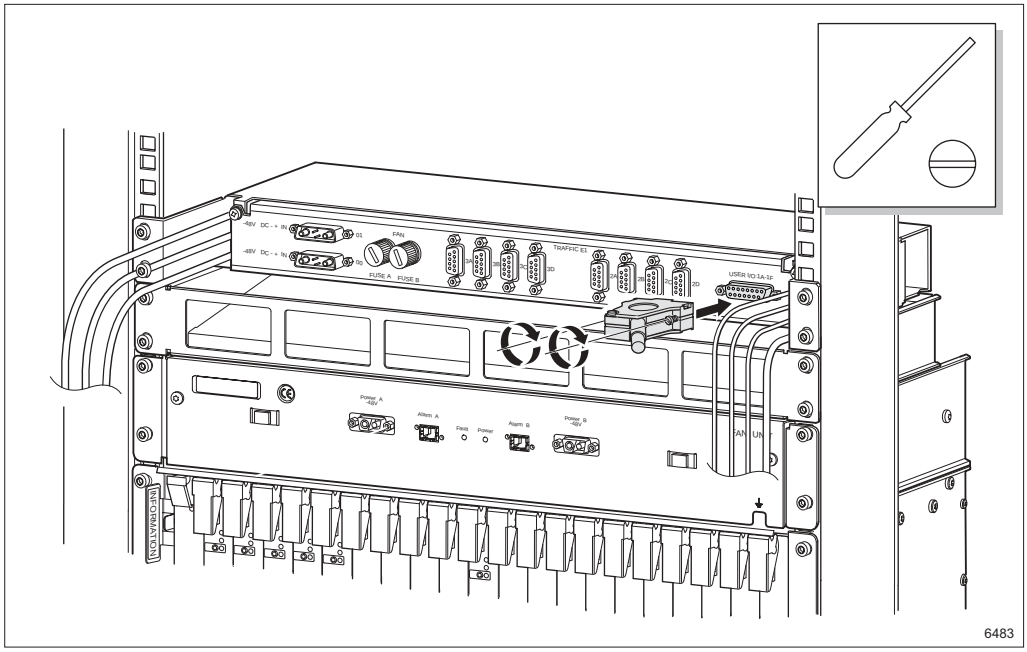

Figure 134 Connecting the User I/O cable

1. Assemble the User I/O cable. See Section 18.4 on page 205 for assembly instructions.
2. Connect the cable to the ICF1.
3. Mark the cables, see Section 6.10 on page 71.

11.3.5.4 Connecting the DC Cable (ICF1 Only)

Caution!

Make sure the power is switched off before working with the DC cable.

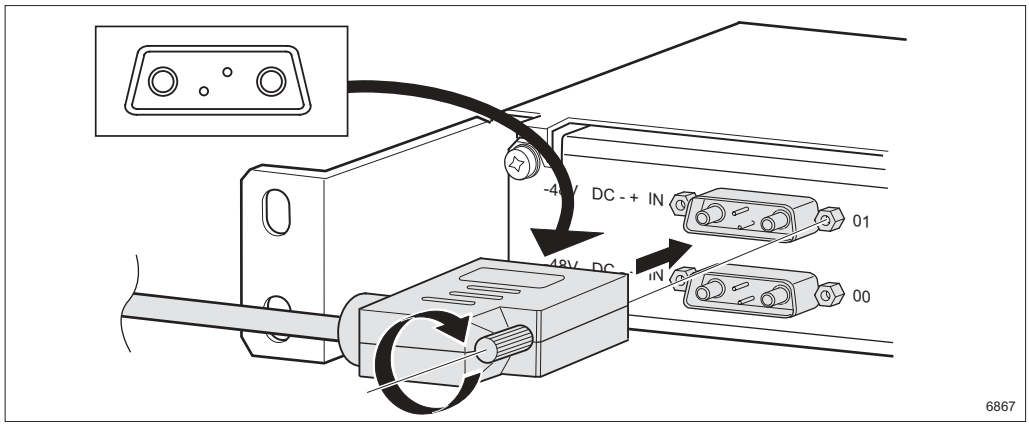

Figure 135 Connecting the DC cable

1. Connect the DC cable to the ICF1. The cable must be assembled, see Section 18.5 on page 213 for assembly instructions.

   Note: The ICF1 DC connectors have no built-in spark suppressors and must not be connected/disconnected when the power is on.

2. Mark the cables, see Section 6.10 on page 71.

3. Connect the DC cable to the power supply source. Make sure the power supply requirements are met, see Section 4.1 on page 21 for information.

11.4 Wall Installation of AMM 2p

This section describes how to fit AMM 2p to a wall. One installation alternative **A** is described but a second alternative **B** is also possible.

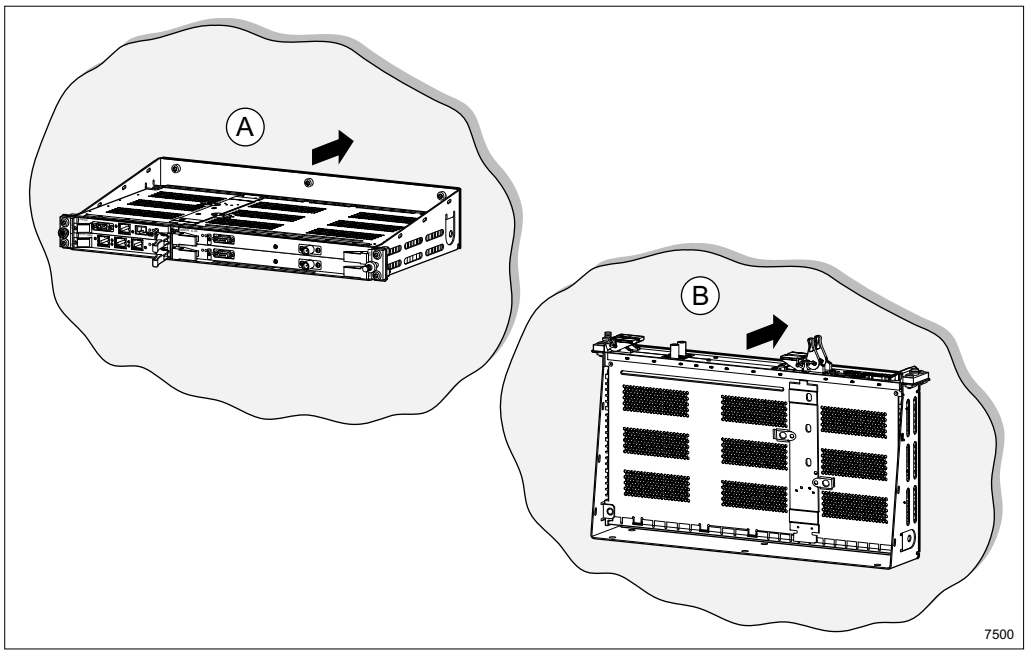

Figure 136 Wall installation alternatives for AMM 2p

11.4.1 Cooling Arrangement

Caution!

Insufficient cooling may shorten the useful life of the equipment. Be sure to always follow the instructions.

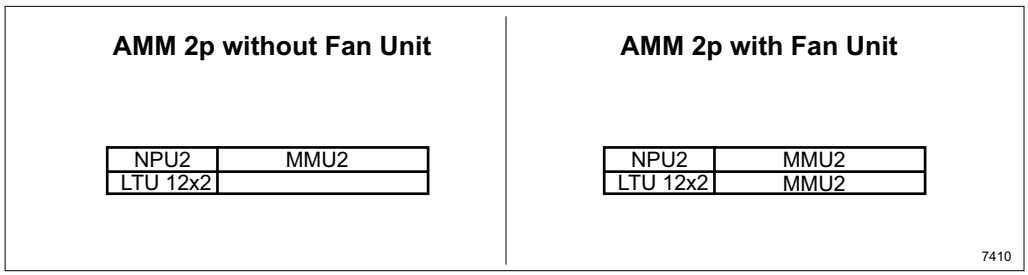

Figure 137 Cooling requirements for AMM 2p

AMM 2p without FAU4 An AMM 2p equipped with only one MMU2 does not require any forced cooling, but a 1U free space directly above the AMM is needed.

AMM 2p with FAU4 An AMM 2p fully equipped with two MMU2s requires a fan unit (FAU4).

Note: If the indoor location has other fan units, providing forced air-cooling through the AMM with an airflow of at least 130 m^3/h and with a temperature of the incoming air less than 45°C, the fan unit can be omitted even when the AMM is fully equipped.

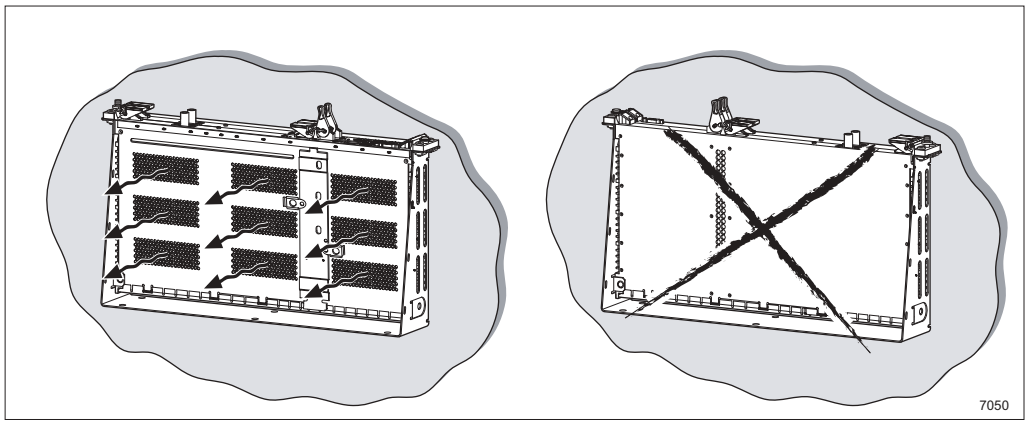

Figure 138 Cooling arrangement for the AMM

When fitting the AMM 2p flat **B** to the wall, the side with the air holes must always point away from the wall.

11.4.2 Fitting the AMM 2p

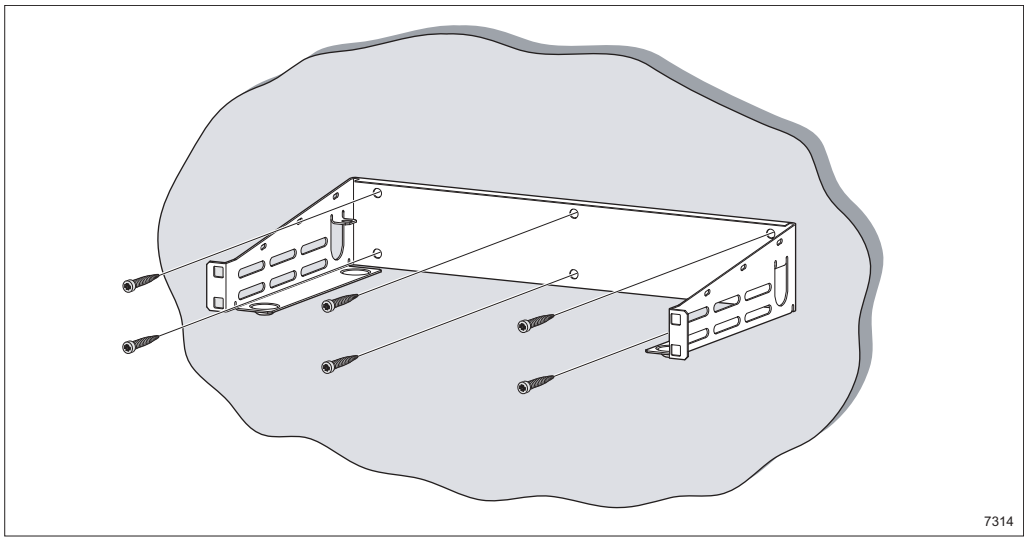

Figure 139 Fitting the wall mount

1. Fit and tighten the wall mount to the wall.

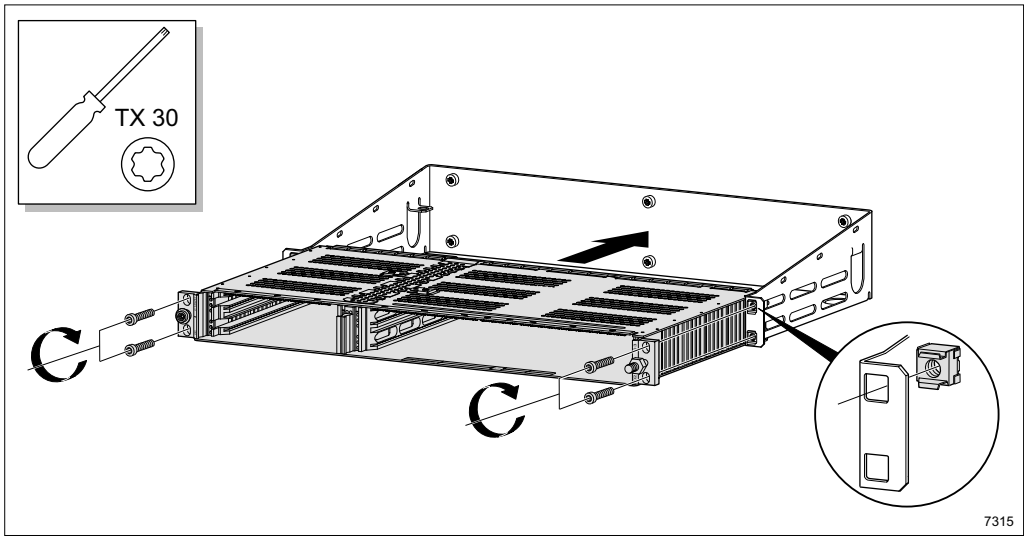

Figure 140 Inserting and tightening the AMM

2. Fit the four captive nuts to the wall mount.
3. Fit the AMM in the wall mount and tighten the four screws.

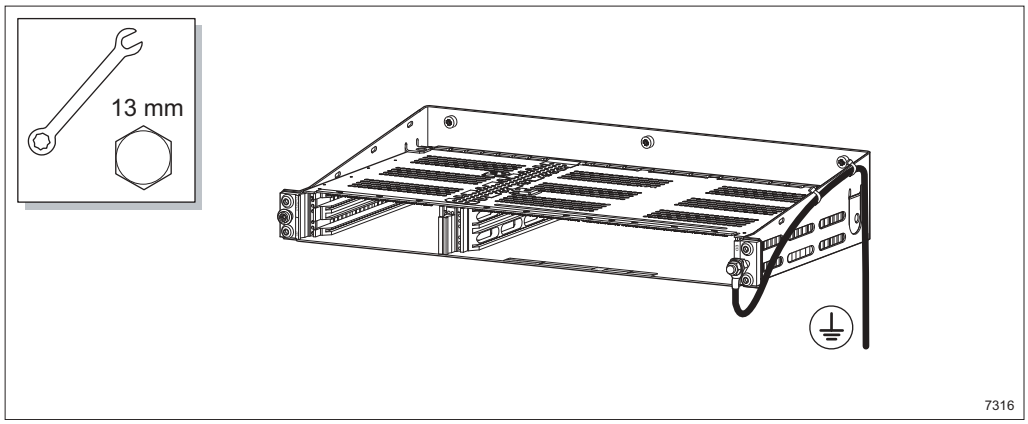

Figure 141 Grounding the AMM

4. Connect and tighten the earthing cable to the AMM.

5. Connect the other end of the earthing cable to protective earthing via station ground.

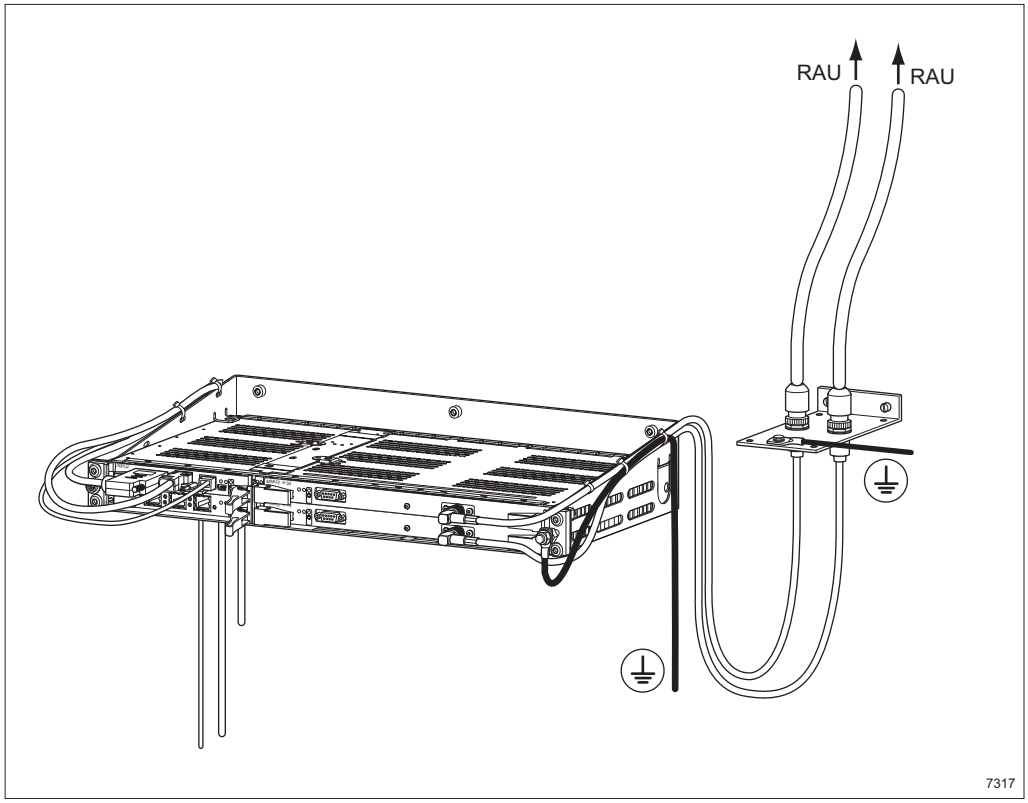

Figure 142 Connecting the cables

6. Connect the cables as described in Section 10.1 on page 112. See Section 13.2.1 on page 146 for instructions on how to fit the radio cable mounting bracket.

12 Initial Setup

The initial setup is done using the installation wizard and it consists of two parts:

- radio terminal configuration
- configuration of NE parameters. This can be done manually or automatically.

This section describes the radio terminal configuration which comprises some basic settings using the LCT as well as AM and Hop Setup using MSM.

The purpose of the radio terminal configuration is to prepare the radio terminals for antenna alignment and should be made indoors before the radio unit installation. The configuration of the NE parameters is done after antenna alignment, see Section 14 on page 149 for more information.

For RAU1 it is sometimes necessary to fit a fixed RF attenuator and change frequency sub-band. For more information, see the *MINI-LINK TN, MINI-LINK HC, MINI-LINK E Outdoor Installation Manual*.

Setup Procedure

Step 1 Make sure the LCT is set up correctly and that MSM is installed on the computer. See *MINI-LINK TN ETSI LCT Installation Instruction* and *MSM Installation Guide* for information on requirements and installation instructions.

Step 2 Make sure all required tools, units and accessories are available, see Section 4 on page 21.

Step 3 Make a radio terminal configuration, see Section 12.1 on page 138.

Step 4 Set an RF loop, see Section 12.2 on page 142.

12.1 Radio Terminal Configuration

12.1.1 Radio Terminal Configuration with NPU 8x2

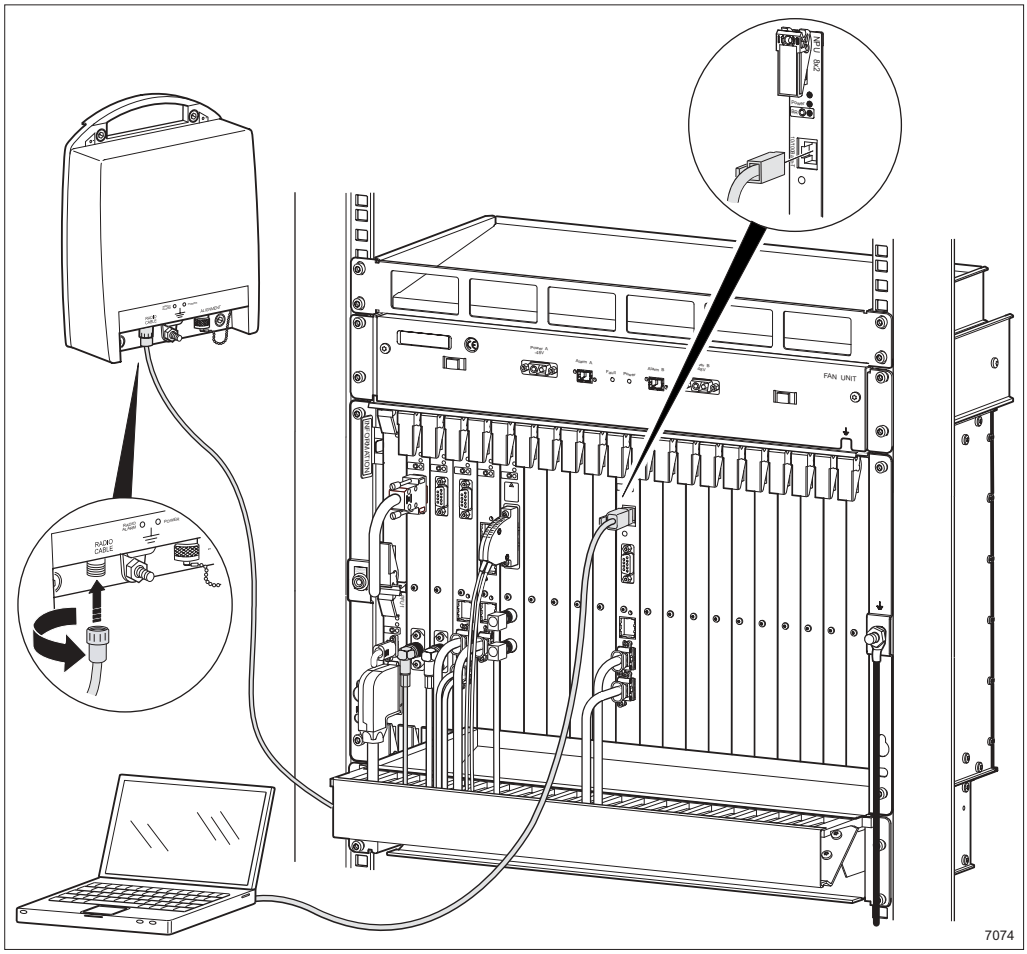

Figure 143 Connecting the RAU and PC

1. Connect the station radio cable between the RAU and the MMU2.
2. Connect the crossed Ethernet cable between the NPU and the PC.

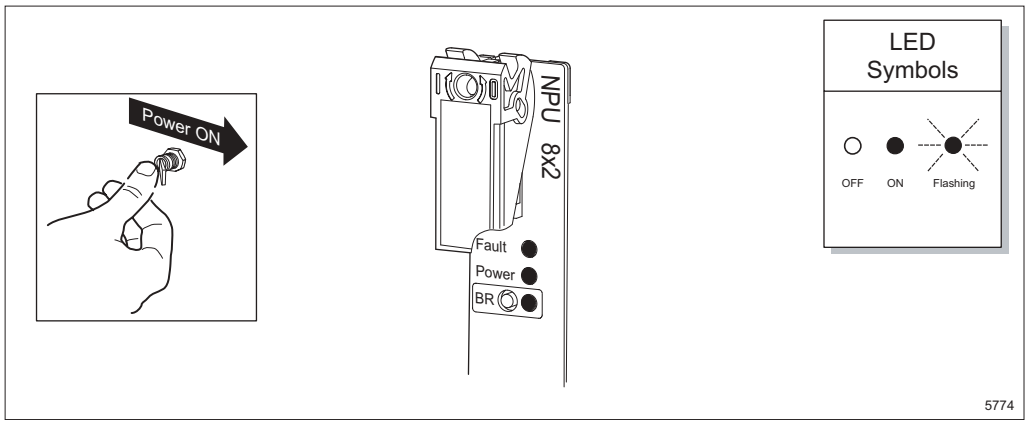

Figure 144 Switching on the power

3. Switch on the external power supply. The LEDs on the NPU should have the following states during startup:

Fault (red)	**ON**
Power (green)	**ON**
BR (yellow)	**ON**

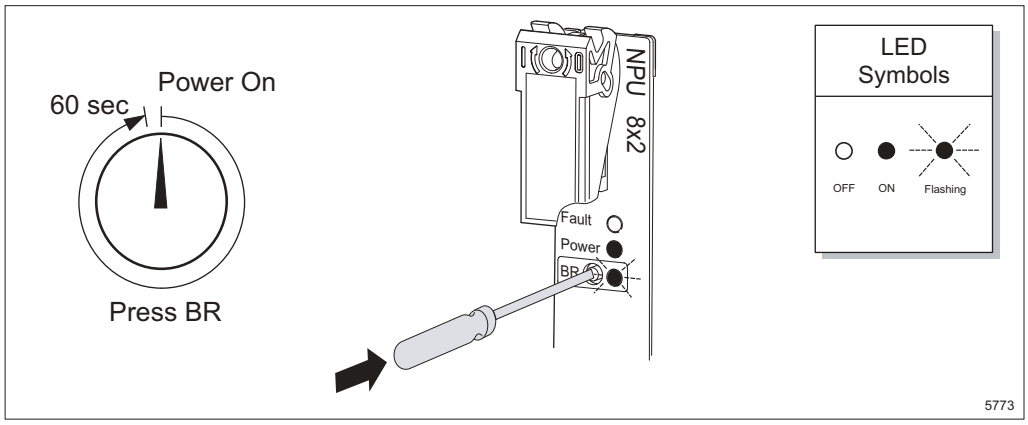

Figure 145 Entering Node Installation Mode

4. Within 60 seconds of power on, press the BR button gently and release it. The NE will now enter Installation Mode, which is indicated by the following LED states on the NPU after the NE startup is done.

Fault (red)	**OFF**
Power (green)	**ON**
BR (yellow)	**FLASHING**

Note: If the BR LED on the NPU does not start flashing, check that no unit has a fault LED ON, and then switch the power OFF and ON.

5. Start the LCT.

6. Make a radio terminal configuration for each MMU2 and SMU2 (if applicable), using the installation wizard.

   See *MINI-LINK TN ETSI Online Help* for more information.

12.1.2 Radio Terminal Configuration with NPU2

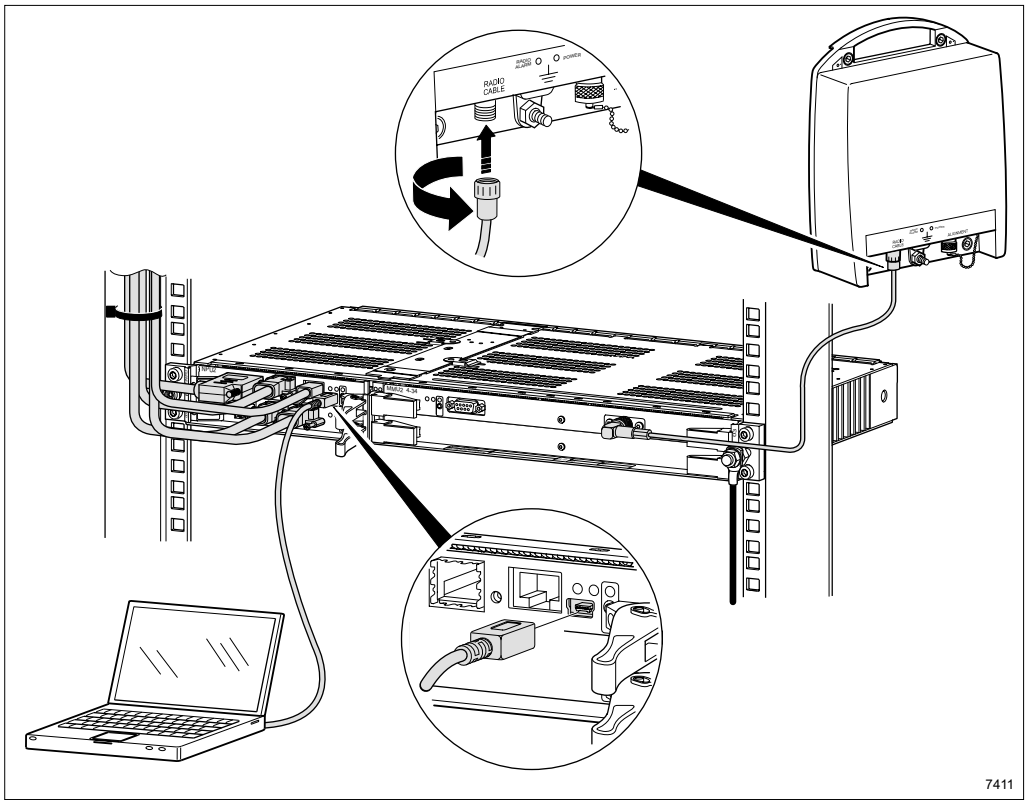

Figure 146 Connecting the RAU and PC

1. Connect the station radio cable between the RAU and the MMU2.
2. Connect the USB cable between the NPU and the PC.

   Note: Make sure the USB LAN driver is installed on the PC. See *MINI-LINK TN ETSI LCT Installation Instruction* for information.

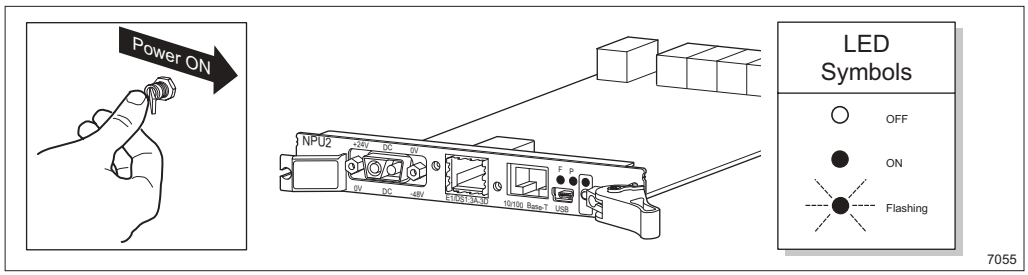

Figure 147 Switching on the power

3. Switch on the external power supply. The LEDs on the NPU should have the following states during startup:

Fault (red)	**ON**
Power (green)	**ON**
BR (yellow)	**ON**

   After the startup is completed the LEDs on the NPU should have the following states:

Fault (red)	**OFF**
Power (green)	**ON**
BR (yellow)	**OFF**

4. Start the LCT.

5. Make a radio terminal configuration for each MMU2 using the installation wizard.

   See *MINI-LINK TN ETSI Online Help* for more information.

12.2 Setting an RF Loop

Perform an RF loop test on each radio.

Note: RAU1 26 does not have this functionality.

1. Switch the transmitter ON.

Caution!

Do not stand or work in front of an operational antenna, unless it has been verified or documented that RF exposure levels are within specified safety limits.

2. Set an RF loop and check that there are no near-end alarms.
3. Remove the RF loop
4. Switch the transmitter OFF.
5. Repeat the procedure for all radios.
6. The radio cables must not carry any voltage during the next phase — radio cable installation. Disconnect the station radio cables, alternatively disconnect the MMU2 plug-in units from the backplane of the AMM by loosening the two screws and pulling them out.

13 Indoor Radio Cabling

This section describes the indoor installation procedure for the radio cable. The outdoor radio cabling should have been made before the indoor radio cabling.

Installation Procedure

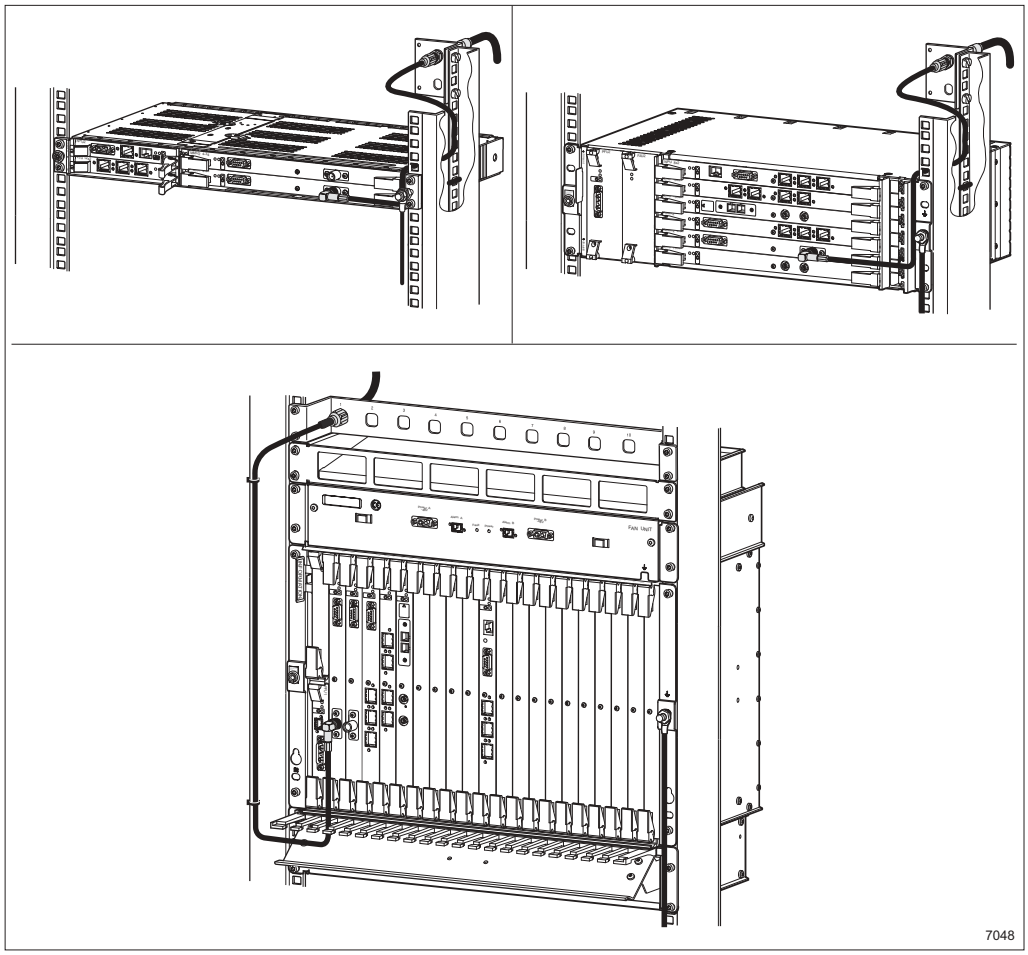

Figure 148 Radio cable indoor installation

Step 1 Make sure all required tools, units and accessories are available, see Section 4 on page 21.

Step 2 Prepare the indoor end of the radio cable, see Section 13.1 on page 144.

Step 3 Connect the radio cable to the indoor unit, see Section 13.2 on page 145.

13.1 Preparing the Radio Cable

This section describes how to prepare the radio cable, which connects the radio unit and the station radio cable. The instruction applies to Ø10 mm (3/8"), Ø16 mm (1/2") and Ø28 mm (7/8") radio cable.

Trimming and Assembling

1. Fit the cable connector to the radio cable. See separate instruction included with the connector kit.

Caution!

Make sure the radio cable is handled with care on preparation in order not to deform or tear it.

Marking

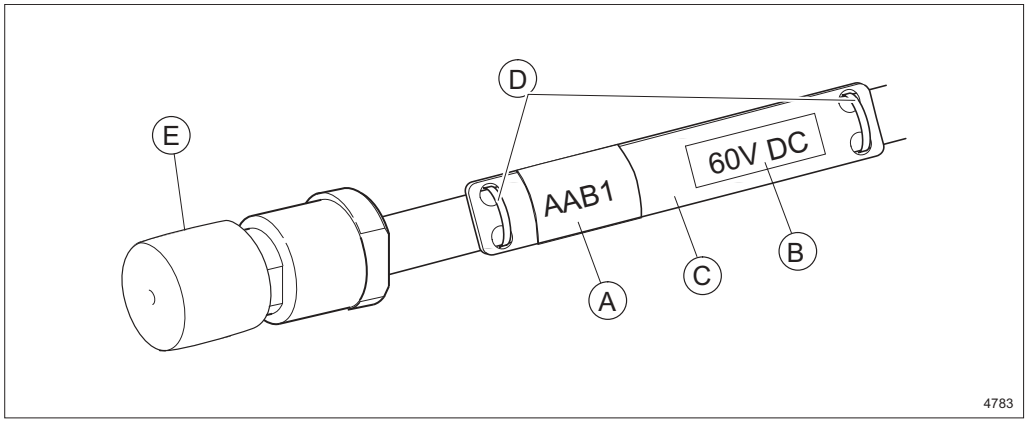

Figure 149 Assembling the radio cable cover and attaching the label

2. Write the identity on the marking tape **A**.

3. Attach the DC-label **B** and the marking tape **A** to the marking tag **C** and fix the tag to the cable, using the straps **D**.

4. Protect the cable end using the protective cover **E** unless the radio cable is immediately connected to the radio unit.

Testing the Radio Cable

5. Use an Ohmmeter to make sure there is no short circuit in the radio cable before connecting it into operation. A Voltage Standing Wave Ratio (VSWR) meter can be used for a more complete test of the radio cable.