

# Transmission Installation and Configurations

## RBS 6000 Outdoor

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### INSTALLATION INSTRUCTIONS

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# 1 Introduction

This document describes how to install and configure transmission equipment in the outdoor RBS 6000 family of RBSs.

## 1.1 Target Group

This document is for installation personnel.

**Note:** Technicians working with Ericsson products or systems must have the necessary training and skills to perform their work correctly.

# 2 Prerequisites

This section contains information on the documentation, tools, equipment, and conditions required before starting the installation and configuration procedure.

## 2.1 Documentation

Ensure that the following documents are available:

- *Personal Health and Safety Information, 124 46-2885*
- *System Safety Information, 124 46-2886*

See Reference List on page 26 for needed documents.

## 2.2 Tools

The table below shows the installation tools required:

*Table 1 Tools*

Description	Product Number	Included In
ESD wrist strap <sup>(1)</sup>	LTT 601 136/1	Maintenance tool set LTT 601 137/1
T8, Torx screwdriver	LSA 901 43/6	
T30, Torx screwdriver,	LSA 901 43/5	
Screwdriver for bits	LSS 103 28/1	
8–19 mm socket set with 3/8–inch drive and bits	LTT 601 138/1	
Tool for cable ties	LSD 901 46/1	
0,5–4 Nm torque wrench	LTT 601 145/1	
Cable ties		

(1) *Electrostatic Discharge (ESD)*

The table below shows the transmission equipment torque values.

*Table 2 Torque Values*

Item	Torque
Transmission units and subracks	6.0 Nm
MMU <sup>(1)</sup>	2.5 Nm
Connector housing screws	0.8 Nm
N-type connector	2.8 Nm
TNC connector	1.7 Nm

(1) *Modem Unit (MMU)*.

## 2.3 Conditions

Ensure the following:

- The Operation and Maintenance Center (OMC) is informed that work is to start at the node site and can therefore decide what measures are necessary to minimize service disruptions
- Site access is granted
- Site Installation Documentation is available
- Ordered transmission equipment is available
- Safety information is read and understood

## 2.4 Temperature Requirements

When installing transmission equipment in the transmission space, the temperature requirements must be fulfilled in accordance with the MINI-LINK and OMS installation guidelines.

The table below shows the temperature intervals for which the transmission equipment is able to run with full performance and with reduced performance. More information about the temperature requirements can be found in the CPI (Customer Product Information) documentation in the relevant CPI library.

*Table 3 MINI-LINK Temperature Requirements*

<b>Transmission Equipment</b>	<b>Temperature for Full Performance</b>	<b>Temperature for Reduced Performance</b>
OMS 800	−5°C – +45°C	n/a <sup>(1)</sup>
MINI-LINK TN equipped with fan	−5°C – +55°C	−25°C – +60°C
MINI-LINK TN equipped with MMU2 H and fan	−5°C – +45°C	−25°C – +50°C
MINI-LINK TN 2p B equipped with NPU3 B or SXU3 B and fan	−5°C – +50°C	−25°C – +55°C
MINI-LINK CN 500	−5°C – +45°C	−25°C – +45°C <sup>(2)</sup>
MINI-LINK CN 1010	−5°C – +55°C	n/a <sup>(1)</sup>

(1) The unit does not operate outside the defined operating temperature area.

(2) Temperature requirement is valid for CN 500 R1.0

## 3 Configurations

The following transmission configurations are available:

- OMS 800
- MINI-LINK CN 500 family
- MINI-LINK CN 1000 family
- MINI-LINK TN 1p Compact Node
- MINI-LINK TN 2p B

- MINI-LINK TN 6p C/D

## 4 Installing Transmission Cables

This section describes how to connect the transmission cables.

The table below is an overview of units in different RBS standards.

*Table 4 RBS Standards and Transmission Units*

RBS Standard	Unit	E1 Port	Ethernet Port
GSM	DUG <sup>(1)</sup>	ET A-B	n/a <sup>(2)</sup>
LTE	DUL <sup>(3)</sup>	n/a	TN A
WCDMA (DU-based)	DUW <sup>(4)</sup>	ET A-B	TN A
WCDMA (CBU-based)	CBU <sup>(5)</sup>	ET 1-4	n/a
	ET-MFX <sup>(6)</sup>	n/a	F

*(1) Digital Unit GSM (DUG).*

*(2) DUG can be connected through optional IP equipment.*

*(3) Digital Unit (LTE).*

*(4) Digital Unit WCDMA (DUW).*

*(5) Control Base Unit (CBU).*

*(6) Exchange Terminal Multi Function Switch (ET-MFX).*

### 4.1 Routing Cables in Cabinets

Route the transmission power and signal cables vertically in the middle inside RBS 6102 and on the left side inside RBS 6101. Keep unit front panels clear of cables. The TM inlets for RBS 6102 and RBS 6101 are different, see figure below. A minimum of five jumper cables are supported irrespective of TM inlet or RBS type. It is possible to route three opto cables in each opto cable hole and one jumper cable in each jumper cable hole. For the RBS 6101 additional jumper cable inlets are supported on the left and the right side of the RBS 6101 cabinet.



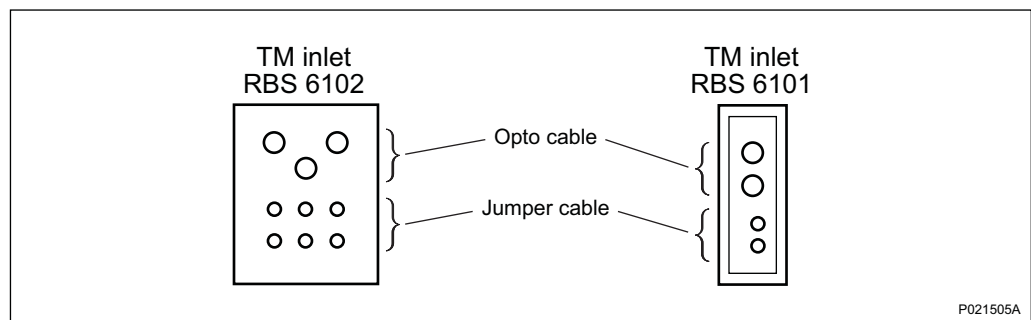


Figure 1 TM Inlets RBS 6102 and RBS 6101

## 4.2

### Routing Optical Fiber Cables

To install an optical fibre cable, see figure below and instructions in document Adding or Replacing Optical Cables, Reference [6].

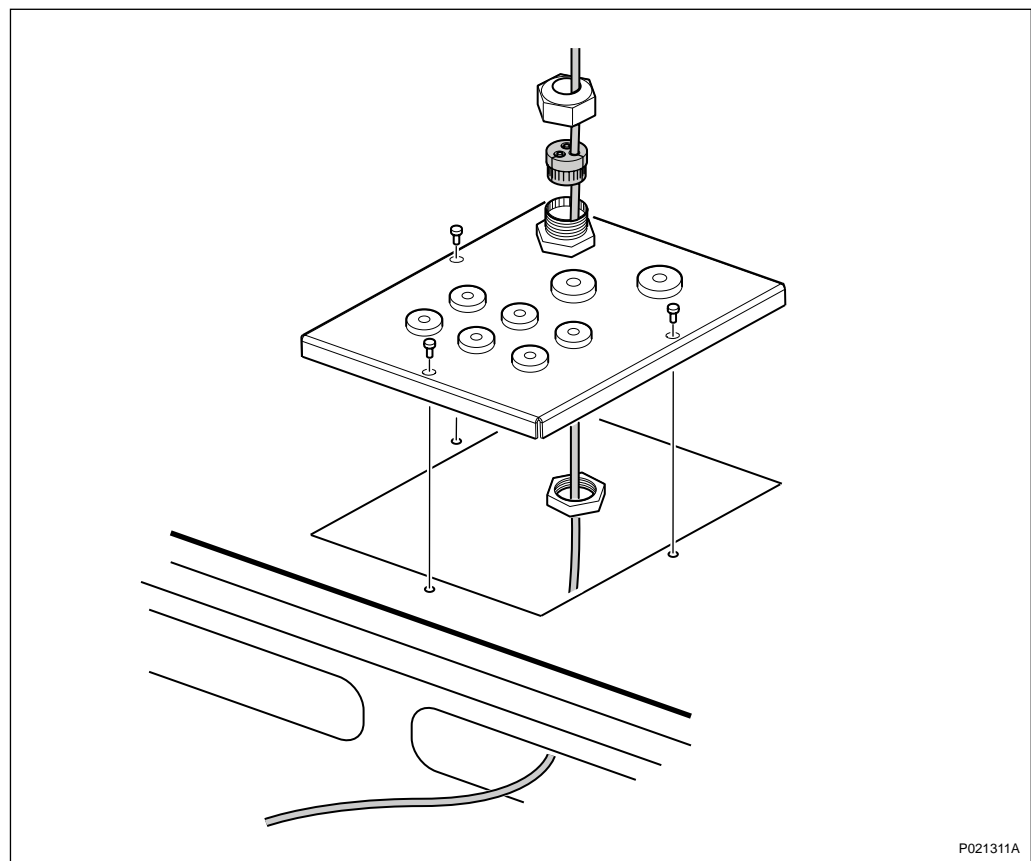


Figure 2 Optical Fiber Cable

## 4.3 Connecting E1 Cables to CBUs

This section describes Control Base Unit (CBU) transmission cable connections. Internal transmission cables must be connected directly to CBUs. See figure below.

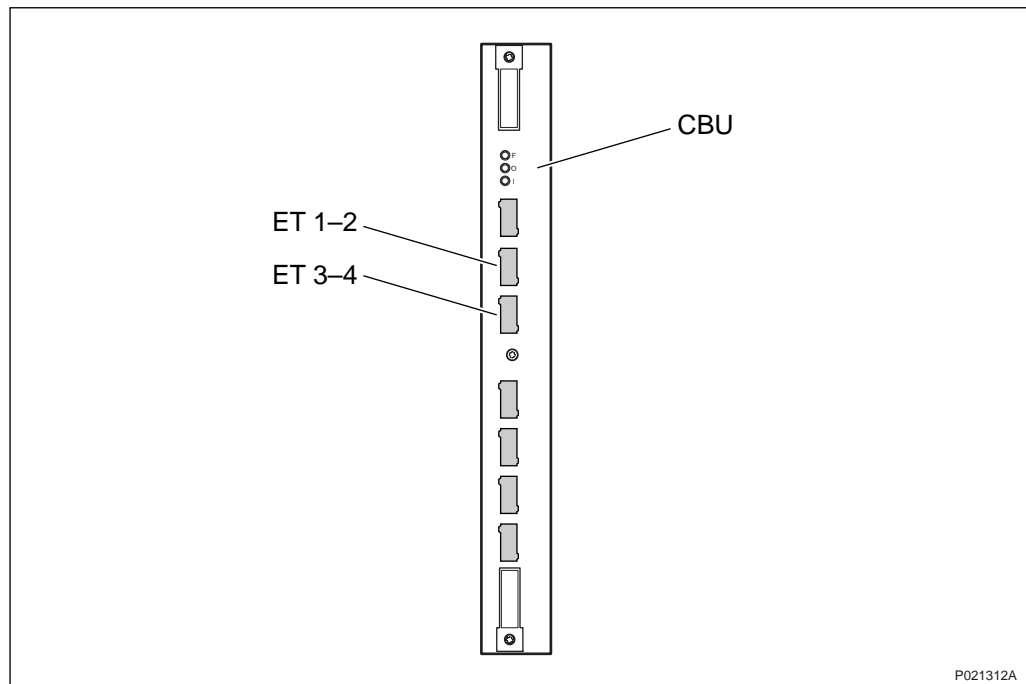


Figure 3 CBU Transmission Cable Connections

## 4.4 Connecting Ethernet Cables to ET-MFXs

This section describes Exchange Terminal Multi Function Switch (ET-MFX) board transmission cable connections points. Internal transmission cables must be connected directly to electrical ET-MFX port F. Up to five ports are available for RBS node Internet Protocol (IP) traffic or site Local Area Network (LAN). See figure below.

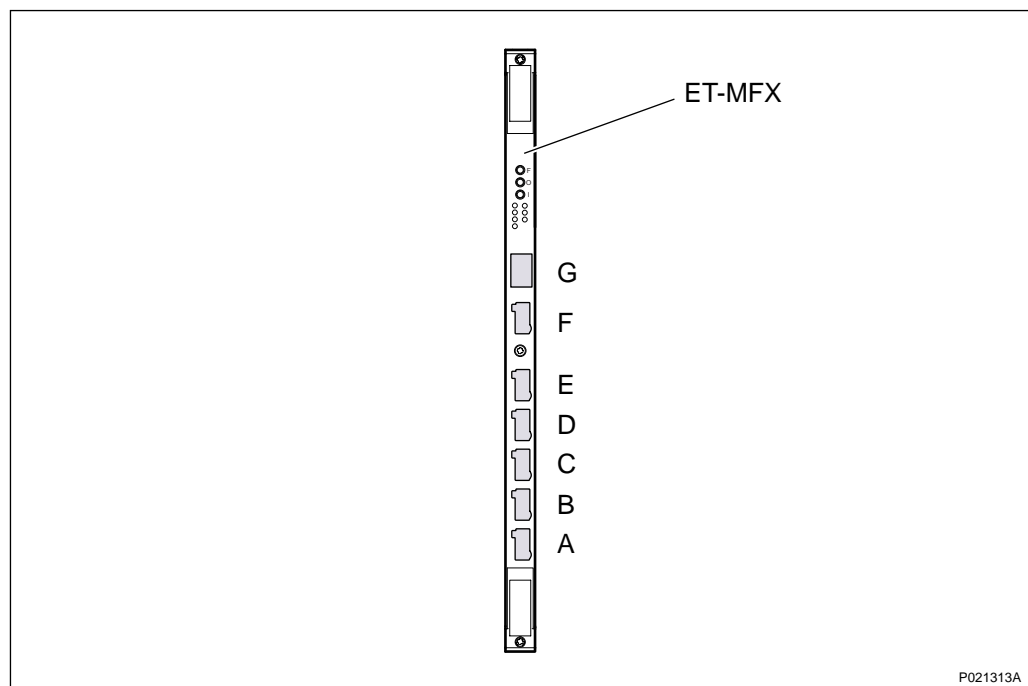


Figure 4 ET-MFX Transmission Cable Connections

## 4.5 Connecting Cables to DUs

This section describes the Digital Unit (DU) transmission cable connection. The DUs are available in three different versions; DUG, DUW, and DUL.

The DUG E1 interface can be connected to E1 interface on the transmission equipment or to the optional IP equipment, such as a Site Integration Unit (SIU), or similar.

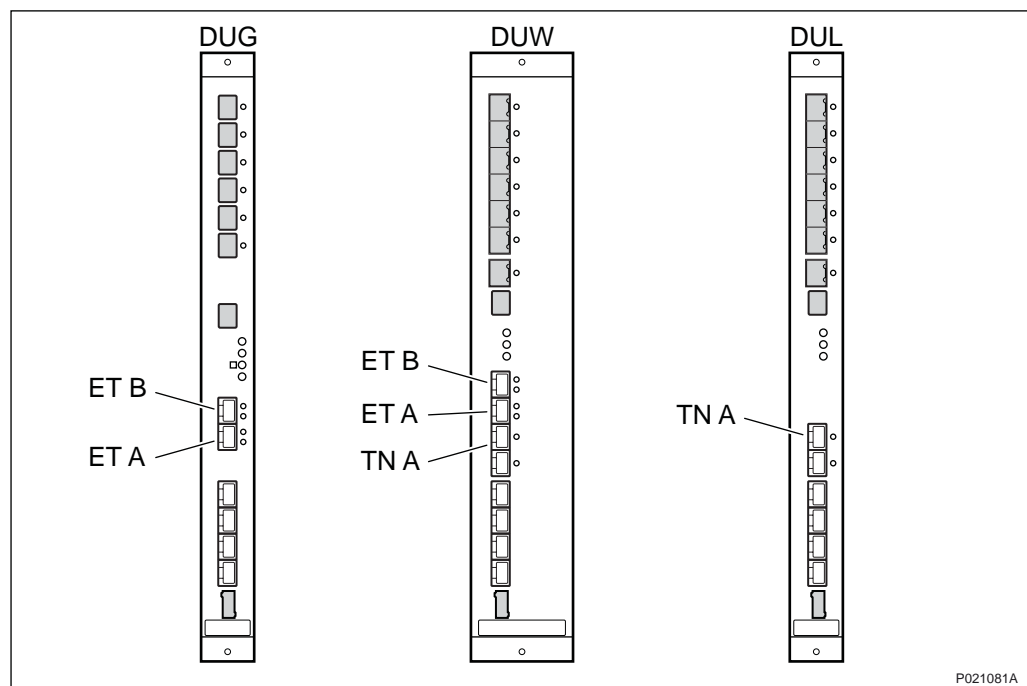


Figure 5 DU Transmission Cable Connections

## 5 Installing Transmission Configurations

This section describes how to install and configure the transmission configurations available for the RBS 6000 family of outdoor RBSs.

The figures below is an overview for the RBS 6102. See figure below.

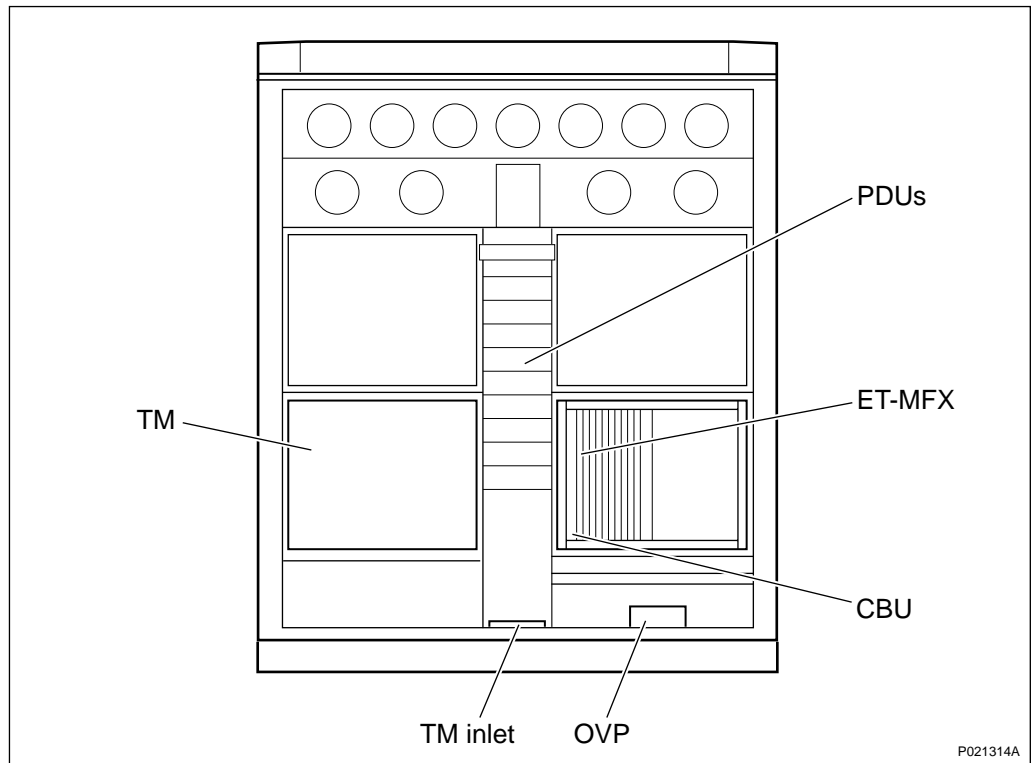


Figure 6 Example of RBS 6102 with CBU Subrack

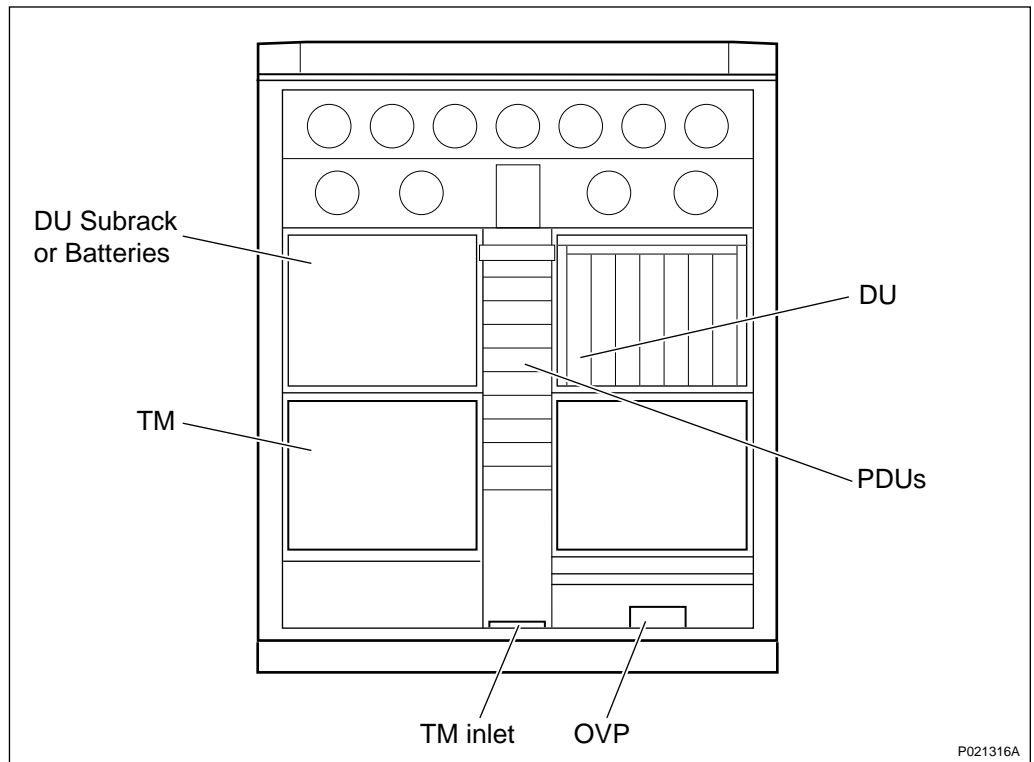


Figure 7 Example of RBS 6102 with DU Subrack

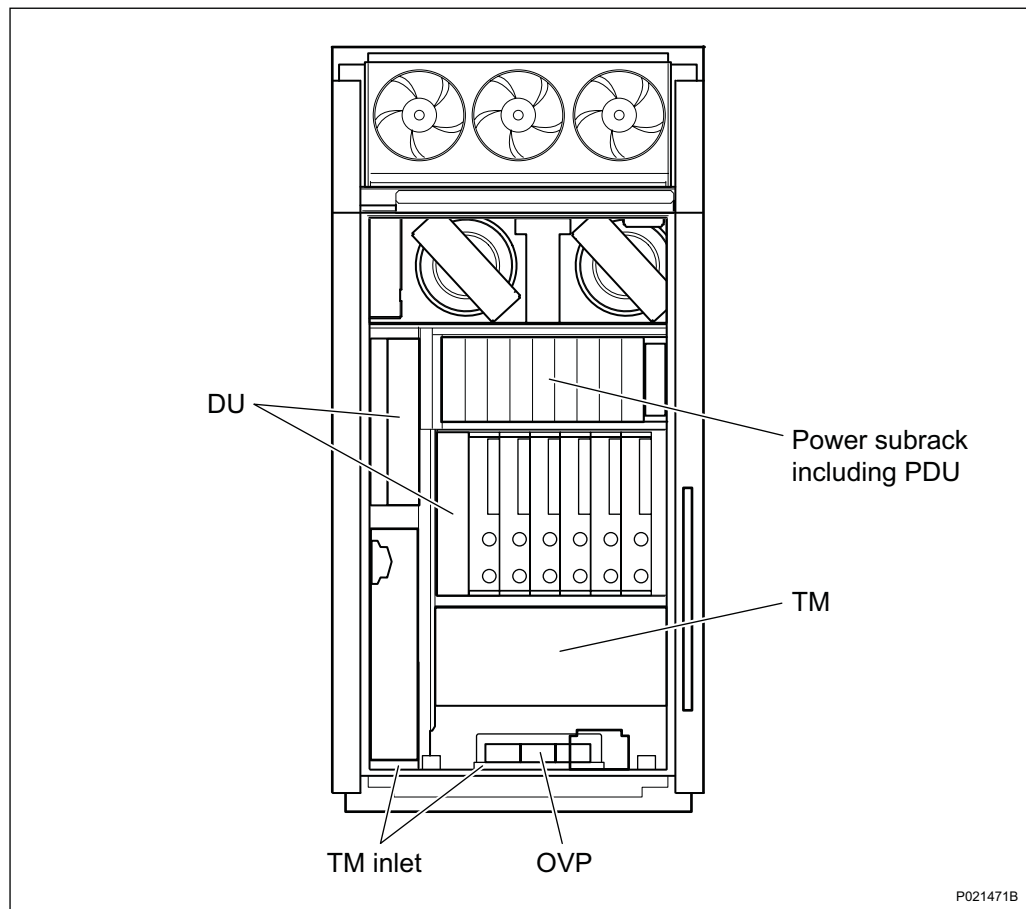


Figure 8 Example of RBS 6101 with DU Subrack

### Key to Figures

- Overvoltage Protection (OVP)
- Power Distribution Unit (PDU)
- Transmission Module (TM)

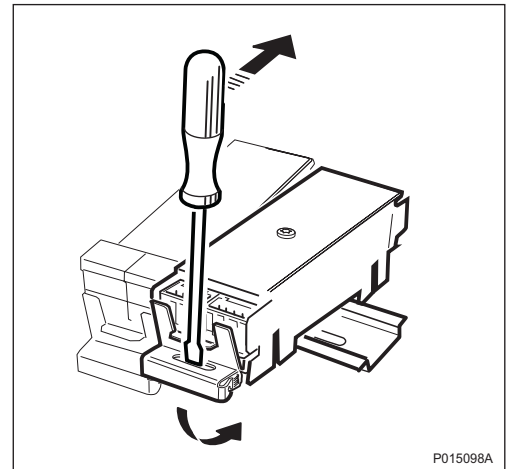
## 5.1 Installing OVP Modules

This section describes how to install an Overvoltage Protection (OVP) module.

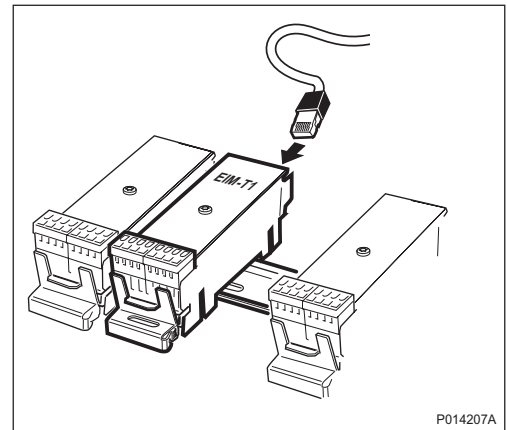
### Inserting OVP Modules

To insert an OVP module, do the following:

1. Insert a flat-bladed screwdriver into the slot at the front of the OVP module and lever it in the direction indicated until the module snaps into place on the mounting rail.



2. Insert the connector according to the cable connection table for the relevant configuration.



## 5.2 Installing Transmission Equipment

This section describes how to install transmission equipment in the RBS 6102.

### 5.2.1 Transmission Equipment

To install transmission equipment, do the following:



#### Do!

Always use an approved ESD wrist strap when working with sensitive equipment. Damage to components mounted on printed board assemblies can occur if an ESD wrist strap is not used.

1. Put on the ESD wrist strap and connect it to an earth grounding point.
2. Unpack the equipment and check that it is all present and undamaged.
3. If necessary, attach the captive nuts to the 19-inch rails in the Transmission Module (TM) space.
4. Install the transmission equipment in the cabinet. See relevant section below.

### 5.2.2 OMS 800

This section describes how to install the two variants of the Optical Multiservice (OMS) 800 solution: OMS 846 and OMS 860.

To install an OMS 800, do the following:

1. Fasten the mounting brackets to the OMS 800.
2. Install the OMS 800 in the TM space, using four screws.
3. Insert a Synchronous Transport Module level 1 or level 4 (STM-1 or STM-4) Small Form-Factor Pluggable (SFP) module in the SFP module slot in the OMS 800.
4. If applicable, insert a Gigabit Ethernet (GE) SFP module.
5. Connect the cables according to Section 5.3 on page 14.

### 5.2.3 MINI-LINK CN 500 family

This section describes how to install one variant of the MINI-LINK CN 500 solutions: MINI-LINK CN 500.

**Note:** When installing transmission equipment in the TM space, leave 0.5 U spaces above and below the equipment to maintain the correct airflow.

To install a MINI-LINK CN 500, do the following:

1. Install the CN in the TM space, using four screws.
2. Connect the cables according to Section 5.4 on page 16.

### 5.2.4 MINI-LINK CN 1000 family

This section describes how to install one variant of the MINI-LINK CN 1000 solutions: MINI-LINK CN 1010.

To install a MINI-LINK CN 1000, do the following:

1. Fasten the mounting brackets to the MINI-LINK CN 1000.
2. Install the MINI-LINK CN 1000 in the TM space, using four screws.



3. Connect the cables according to Section 5.5 on page 18
4. If applicable, insert a Gigabit Ethernet (GE) SFP module.
5. Connect the cables according to Section 5.5 on page 18

### 5.2.5 **MINI-LINK TN 1p Compact Node**

This section describes how to install a MINI-LINK TN 1p Compact node.

**Note:** When installing transmission equipment in the TM space, leave 0.5 U spaces above and below the equipment to maintain the correct airflow.

To install a MINI-LINK TN compact node, do the following:

1. Fasten the mounting brackets to the compact node and snap them into place.
2. Install the compact node in the TM space, using four screws.
3. Connect the cables according to Section 5.6 on page 19.

### 5.2.6 **MINI-LINK TN 2p B**

This section describes how to install a MINI-LINK TN 2p B.

To install a MINI-LINK TN 2p B, do the following:

1. Remove the cover on top of an Access Module Magazine (AMM).
2. Insert a fan unit board FAU4 on top of the AMM and fasten it.
3. Install the AMM in the TM space, using four screws.
4. Insert an Removable Memory Module (RMM) inside the Node Processor Unit (NPU) according to the instructions in document RMM Handling Instructions, Reference [7].
5. Insert an NPU3 or NPU3 B in the upper-left position in the AMM.
6. Insert Line Terminal Unit (LTU) board LTU3 or a dummy board in the lower-left position in the AMM.
7. Insert one or two MMU boards, depending on the configuration, or dummy MMU boards in the upper-right or lower-right position in the AMM.
8. Connect the cables according to Section 5.7 on page 20.

### 5.2.7 **MINI-LINK TN 6p C/D**

This section describes how to install a MINI-LINK TN 6p C/D.

To install a MINI-LINK TN 6p C/D do the following:

1. Install an AMM in the TM space, using four screws.
2. Insert Power Unit (PFU) PFU3 B in the upper-left position in the AMM.
3. Insert a PFU3 B or a dummy PFU3 B in the lower-left position in the AMM.
4. Insert an RMM inside the NPU unit according to the instructions in document RMM Handling Instructions, Reference [7].
5. Insert an NPU3 or NPU3 B in the upper-right position in the AMM.
6. Insert an LTU3 or a dummy board in the upper-left position in the AMM.
7. Insert one to five MMU boards, depending on the configuration, or dummy MMU/LTU boards, in the AMM.

If Cross Polarization Interface Canceller (XPIC) configuration is used, then start from the lower-right position (slot 2).

Place pairs of MMUs with XPIC support in adjacent slots (slot 2 and slot 3 or slot 4 and slot 5) as the slots are related to the same polarization. The front panels XPIC cross-cable connection connects MMUs in alternate slots (slot 2 and slot 4 or slot 3 and slot 5). For more information see document Installing Outdoor Equipment, in Library MINI-LINK TN ETSI, Reference [9].

8. Insert a fan unit board FAU2 between the PFU3 B and the MMU.
9. Connect the cables according to Section 5.8 on page 22.

## 5.3 Connecting OMS 800 Family

Connect the cables according to the figure and table below.

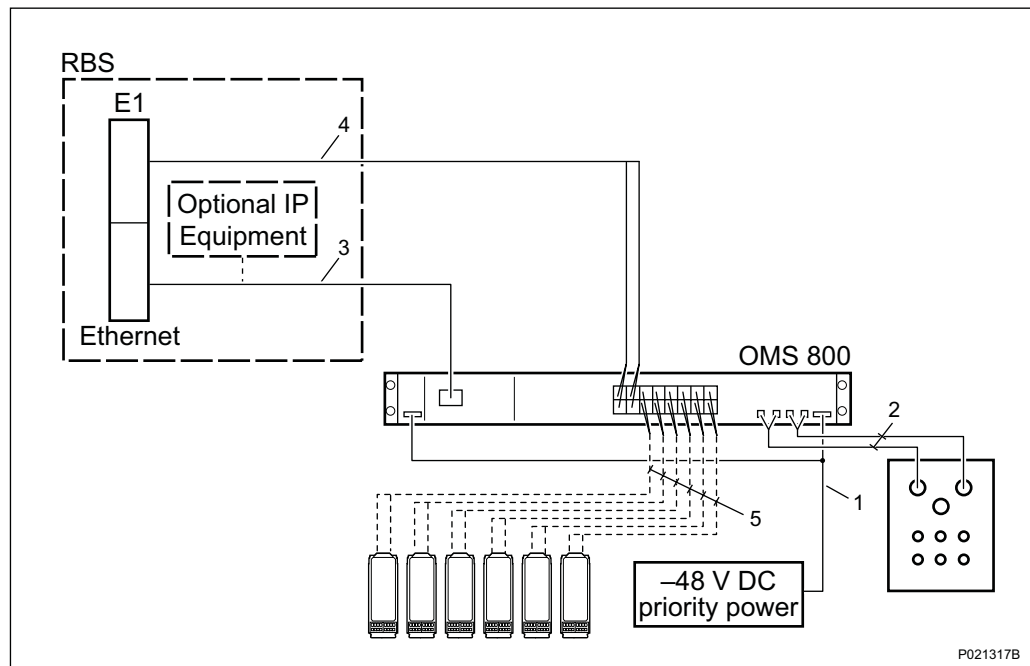


Figure 9 OMS 800 Cable Connections

Table 5 OMS 800 Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
1	RPM 919 721/L <sup>(1)</sup>	OMS 800	–48 V DC	PDU	–48 V DC
2a	RPM 253 2391/L <sup>(2)</sup>	OMS 800	LC connector <sup>(3)</sup>	TM inlet	Optical inlet
			LC connector <sup>(3)</sup>	TM inlet	Optical inlet
2b	RPM 253 2891/L <sup>(2)</sup>	OMS 800	LC connector <sup>(3)</sup>	TM inlet	Optical inlet
			LC connector <sup>(3)</sup>	TM inlet	Optical inlet
3A	RPM 777 15/L	OMS 800	FE <sup>(4)</sup> or GE <sup>(5)</sup>	ET-MFX	F
3B	TRS 432 151/L	OMS 800	FE <sup>(4)</sup> or GE <sup>(5)</sup>	Optional IP equipment	Ethernet port
				DU	TN A
4A	RPM 919 418/L	OMS 800	TRIB 1	CBU	ET 1–2
			TRIB 2		
		OMS 800	TRIB 3	CBU	ET 3–4
			TRIB 4		

Table 5 OMS 800 Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
4B	RPM 919 602/L	OMS 800	TRIB 1	DU	ET A
			TRIB 2		
		OMS 800	TRIB 3	DU	ET B
			TRIB 4		
5	TSR 482 0240/L	OMS 800	TRIB 5 [and so on] TRIB 16	OVP module	OVP 1/1 [and so on] OVP 6/2

(1) L = defined length of cable.

(2) Grommet required.

(3) SFP Module (STM-1 or STM-4).

(4) Fast Ethernet (FE).

(5) SFP Module (GE).

## 5.4 Connecting MINI-LINK CN 500 family

Connect the cables according to the figure and table below.

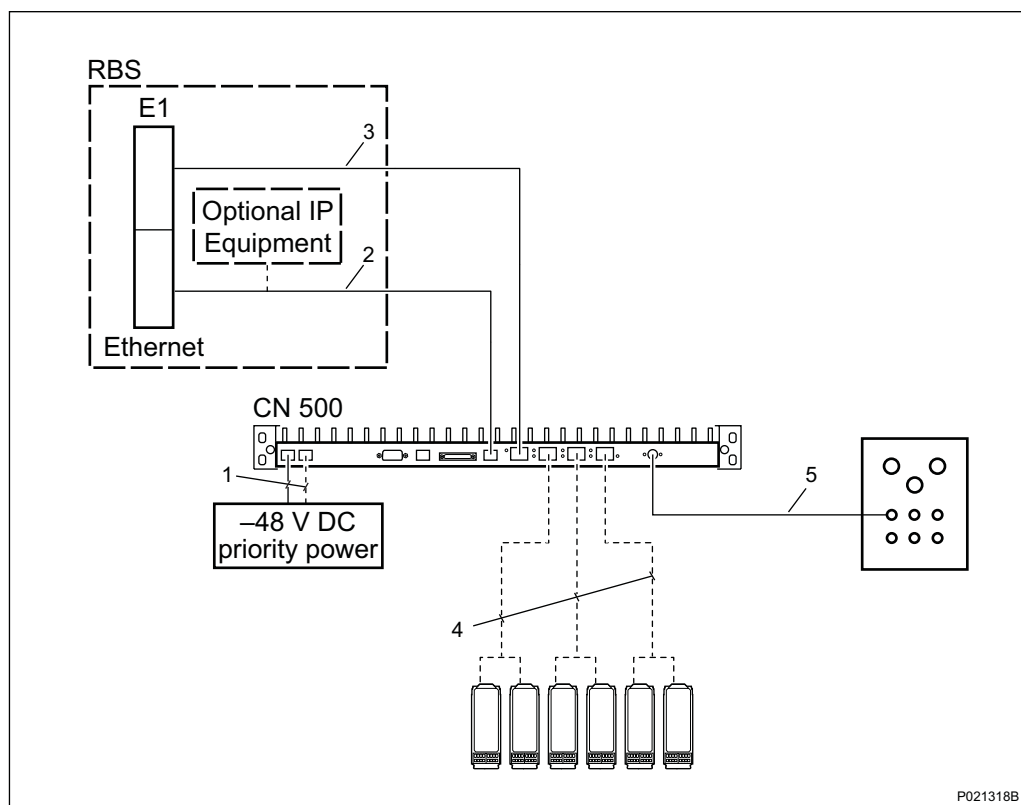


Figure 10 MINI-LINK CN 500 Cable Connections

Table 6 MINI-LINK CN 500 Cable Connections

Pos.	Product No. <sup>(1)</sup>	From		To	
		Unit	Connection	Unit	Connection
1 <sup>(2)</sup>	RPM 919/15/L	Power Supply	-48 V DC	PDU	-48 V DC
2	TSR 432 151/L	CN 500	GE	Optional IP equipment <sup>(3)</sup>	Ethernet port
				DU	TN A
3A	RPM 919 403/L	CN 500	TR 5A-5D	CBU	ET 1-2
					ET 3-4
3B	RPM 919 607/L	CN 500	TR 5A-5D	DU	ET A
					ET B

Table 6 MINI-LINK CN 500 Cable Connections

Pos.	Product No. <sup>(1)</sup>	From		To	
		Unit	Connection	Unit	Connection
4 <sup>(3)</sup>	RPM 919 610/L	CN 500	TR:4A-4D	OVP Module	OVP1/1 OVP 2/1
			TR:3A-3D	OVP Module	OVP 3/1 OVP 4/1
			TR:2A-2D	OVP Module	OVP 5/1 OVP 6/1
5	RPM 919 422/L	CN 500	RAU	TM inlet	Adapter

(1) L = defined length of cable.

(2) 1–2 power cables allowed.

(3) Optional connection.

## 5.5 Connecting MINI-LINK CN 1000 family

Connect the cables according to the figure and table below.

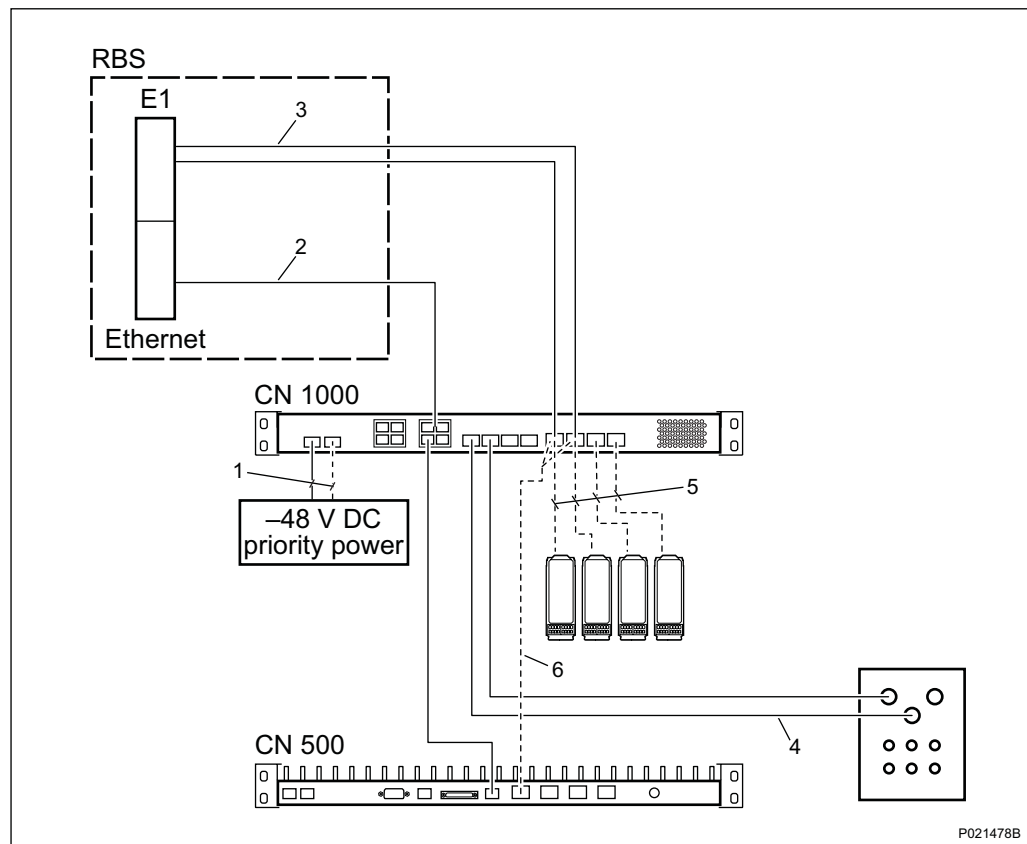


Figure 11 MINI-LINK CN 1000 Cable Connections

Table 7 MINI-LINK CN 1000 Cable Connections

Pos.	Product No. <sup>(1)</sup>	From		To	
		Unit	Connection	Unit	Connection
1 <sup>(2)</sup>	RPM 919 715/L	Power supply	–48 V DC	PDU	–48 V DC
2	TSR 432 151/L	CN 1000	GE	CN 500	GE
3	RPM 919 701/L	CN 1000	TR:1A-1B TR:2A-2B	DU	ET A ET B
4A	RPM 253 2391/L	CN 1000	GE	TM inlet	Optical inlet
4B	RPM 253 2891/L	CN 1000	GE	TM inlet	Optical inlet
5			TR:1A-1B TR:2A-2B TR:3A-3B TR:4A-4B		OVP 1/1 OVP 2/1 OVP 3/1 OVP 4/1
6	RPM 919 607/L	CN 1000	TR:1A-1B TR:2A-2B	CN 500	TR:5A-5B

(1) L = defined length of cable.

(2) 1–2 power cables allowed.

## 5.6 Connecting MINI-LINK TN 1p Compact Node

Connect the cables according to the figure and table below.

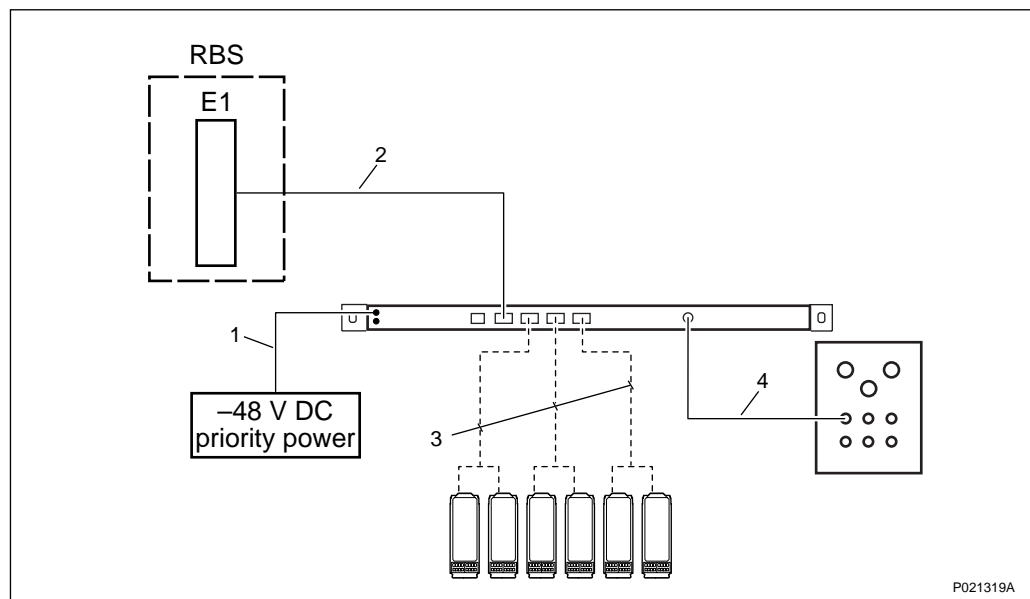


Figure 12 MINI-LINK TN 1p Compact Node

Table 8 MINI-LINK TN 1p Compact Node

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
1	RPM 919 715/L <sup>(1)</sup>	Power supply	–48 V DC	PDU	–48 V DC
2A	RPM 919 403/L	MMU	TR:5A–5D <sup>(2)</sup>	CBU	ET 1–2
					ET 3–4
2B	RPM 919 607/L	MMU	TR:5A–5D <sup>(2)</sup>	DU	ET A
					ET B
3 <sup>(3)</sup>	RPM 919 610/L	MMU	TR:4A–4D	OVP module	OVP 1/1 OVP 2/1
			TR:3A–3D	OVP module	OVP 3/1 OVP 4/1
			TR:2A–2D	OVP module	OVP 5/1 OVP 6/1
4	RPM 919 422/L	MMU	RAU	TM inlet	Adapter

(1) L = defined length of cable.

(2) Letters in parentheses refer to cable-end markings.

(3) Optional connection.

## 5.7 Connecting MINI-LINK TN 2p B

Connect the cables according to the figure and table below.



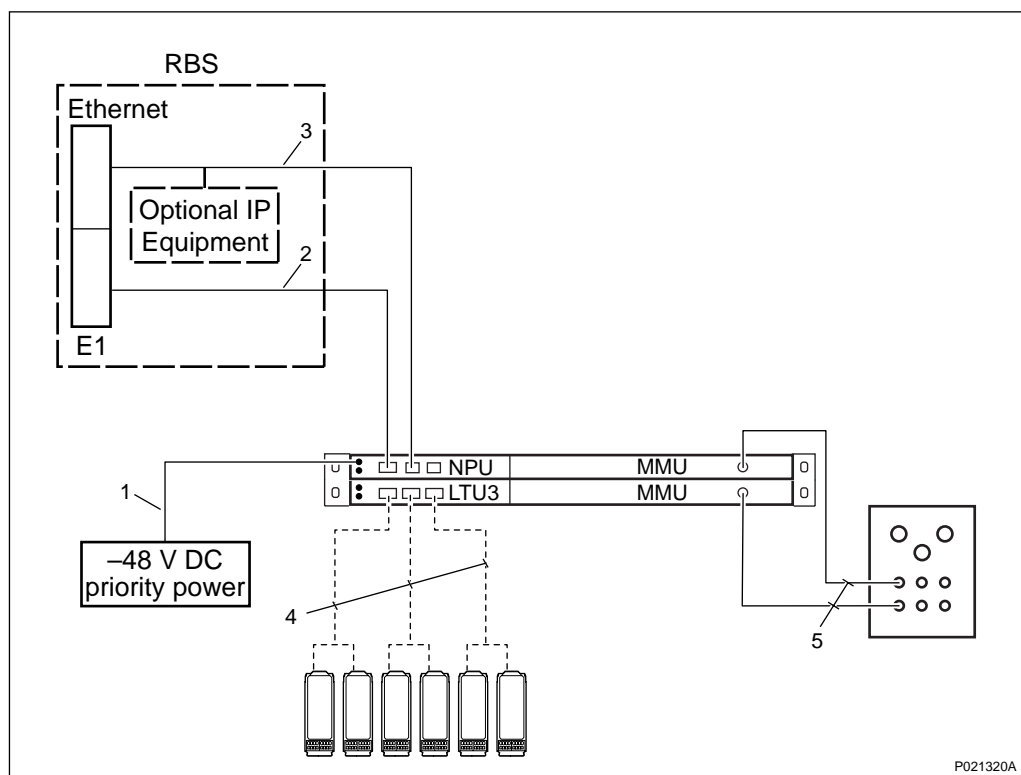


Figure 13 MINI-LINK TN 2p B

Table 9 MINI-LINK TN 2p B Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
1	RPM 919 715/L (1)	Power supply	–48 V DC	PDU	–48 V DC
2A	RPM 919 403/L	NPU3/NPU3 B	E1: 4A–4D <sup>(2)</sup>	CBU	ET 1–2
					ET 3–4
2B	RPM 919 607/L	NPU3/NPU3 B	E1: 4A–4D <sup>(2)</sup>	DU	ET A
					ET B
3A	RPM 777 15/L	NPU3/NPU3 B	FE/GE <sup>(3)</sup>	ET-MFX	F
3B	TSR 432 151/L	NPU3/NPU3 B	FE/GE <sup>(3)</sup>	Optional IP equipment <sup>(4)</sup>	Ethernet port
				DU	TN A

Table 9 MINI-LINK TN 2p B Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
4A <sup>(4)</sup>	RPM 919 610/L E1-drop with LTU3	LTU3	E1:3A–3D	OVP module	OVP 1/1 OVP 2/1
			E1:2A–2D	OVP module	OVP 3/1 OVP 4/1
			E1:1A–1D	OVP module	OVP 5/1 OVP 6/1
4B <sup>(5)</sup> (4)	RPM 919 610/L E1-drop with NPU	NPU3/NPU3 B	E1:4A–4D	OVP module	OVP 7/1 OVP 8/1
5	RPM 919 422/L	MMU	RAU	TM inlet	Adapter

(1) L = defined length of cable.

(2) Letters in parentheses refer to cable-end markings.

(3) NPU3 in FE configurations, NPU3 B in GE configurations.

(4) Optional connection.

(5) Not shown in figure.

## 5.8 Connecting MINI-LINK TN 6p C/D

Connect the cables according to the figure and table below.

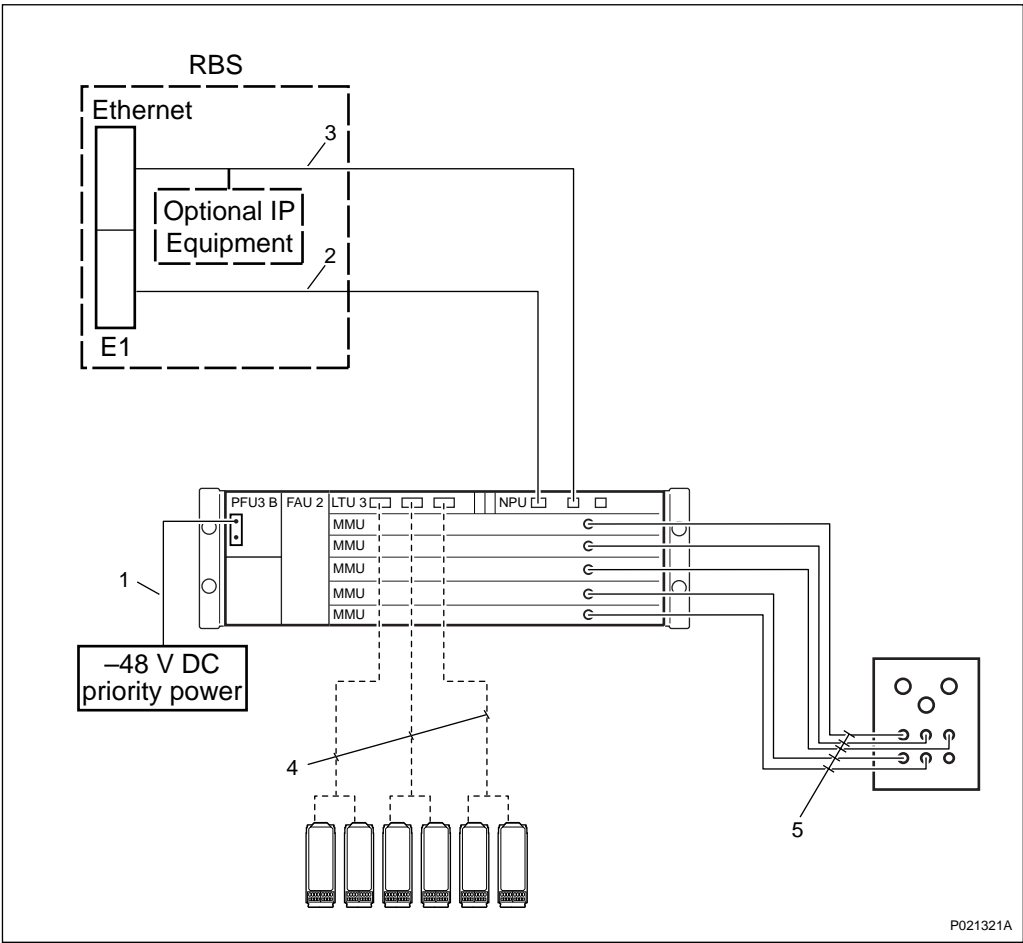


Figure 14 MINI-LINK TN 6p C/D

Table 10 MINI-LINK TN 6p C/D Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
1	RPM 919 714/L <sup>(1)</sup>	PFU3 B	–48 V DC	PDU	–48 V DC
2A	RPM 919 403/L	NPU3/NPU3 B	E1: 4A–4D	CBU	ET 1–2
					ET 3–4
2B	RPM 919 607/L	NPU3/NPU3 B	E1: 4A–4D	DU	ET A
					ET B
3A	RPM 777 15/L	NPU3/NPU3 B	FE/GE <sup>(2)</sup>	ET-MFX	F
3B	TSR 432 151/L	NPU3/NPU3 B	FE/GE <sup>(2)</sup>	Optional IP equipment <sup>(3)</sup>	Ethernet port
				DU	TN A

Table 10 MINI-LINK TN 6p C/D Cable Connections

Pos.	Product No.	From		To	
		Unit	Connection	Unit	Connection
4A (3)	RPM 919 610/L E1-drop with LTU3	LTU3	E1:3A–3D	OVP modules	OVP 1/1 OVP 2/1
			E1:2A–2D	OVP modules	OVP 3/1 OVP 4/1
			E1:1A–1D	OVP modules	OVP 5/1 OVP 6/1
4B (3) (4)	RPM 919 610/L E1-drop with NPU	NPU3/NPU3 B	E1:4A–4D	OVP modules	OVP 7/1 OVP 8/1
5	RPM 919 422/L	MMU	RAU	TM inlet	Adapter

(1) L = length of cable.

(2) NPU3 in FE configurations, NPU3 B in GE configurations.

(3) Optional connection.

(4) Not shown in figure.

## 6 Concluding Routines

Before leaving the site, do the following:

- Clean the site and remove objects such as wrapping paper and pieces of cable
- Dispose of waste in accordance with local regulations
- Report any faults in accordance with local requirements
- Collect all tools
- Close and lock the cabinet
- Inform the OMC that work is finished at the node site
- Complete the work order

# Glossary

**AMM**

Access Module Magazine

**CBU**

Control Base Unit

**CN**

Compact Node

**CPI**

Customer Product Information

**DU**

Digital Unit

**DUG**

Digital Unit GSM

**DUL**

Digital Unit LTE

**DUW**

Digital Unit WCDMA

**ESD**

Electrostatic Discharge

**ET-MFX**

Exchange Terminal Multi Function Switch

**FE**

Fast Ethernet

**GE**

Gigabit Ethernet

**IP**

Internet Protocol

**LAN**

Local Area Network

**LTU**

Line Terminal Unit

**n/a**

Not Applicable

**NPU**

Node Processor Unit

**OMC**

Operation and Maintenance Center

**OMS**

Optical Multiservice

**OVP**

Overvoltage Protection

**PDU**

Power Distribution Unit

**PFU**

Power Unit

**RMM**

Removable Memory Module

**SFP**

Small Form-Factor Pluggable

**SIU**

Site Integration Unit

**STM**

Synchronous Transport Module

**TM**

Transmission Module

**TN**

Traffic Node

## Reference List

### **Safety Document**

- [1] *Personal Health and Safety Information*, 124 46-2885
- [2] *System Safety Information*, 124 46-2886

### **RBS**

- [3] *Hardware Maintenance Instructions*, for the applicable RBS
- [4] *RBS Configurations*, for the applicable RBS
- [5] *Installing RBS*, for the applicable RBS
- [6] *Adding or Replacing Optical Cables*, 120/1543-LZA 701 6003

### **Site**

- [7] *RMM Handling Instructions*, included with the RMM, 1424-EN/LZT 712 0244
- [8] *Site Installation Documentation*, specific for the site

### **Transmission and Transport Libraries**

- [9] *Relevant Transmission and Transport documents available from MINI-LINK TN ETSI CPI library*
- [10] *Relevant Transmission and Transport documents available from OMS 846 CPI library*
- [11] *Relevant Transmission and Transport documents available from OMS 860 CPI library*