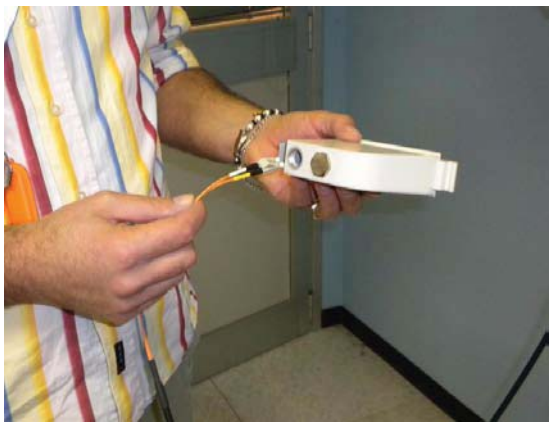
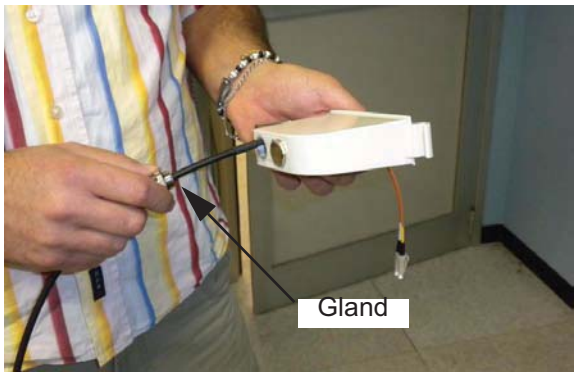
4.1.6.12.2 Optical fiber cable installation

1 Insert the SFP on the MPT-HC.
For the position refer to par. 4.1.6.2.1.1.

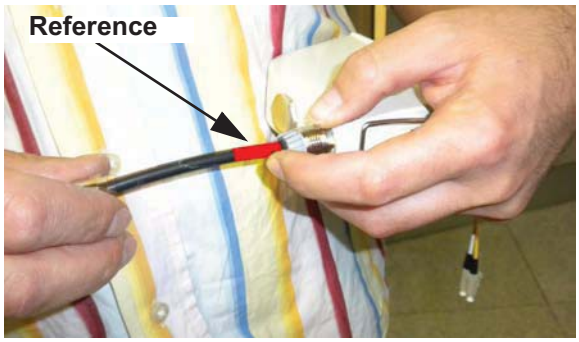
2 Insert the optical fiber on the hole.



3 Take the gland body and move it on the hole.



4 Fix the gland body. The gland body must be fixed on the indication present on the heat shrink tube.



Warning: The end of the heat-shrink tube reference must be outside the gland.

5 Tighten the gland nut with the dynamometric wrench (10 N).

6 Remove the protection caps from the fiber connectors.

7 Take the optical conectors and ...

8 ... connect them on the MPT-HC. Close the co-box. For the position refer to par. 4.1.6.2.1.1.

9 End of optical fiber connection.

Warning: The Power Supply connection must be made waterproof :

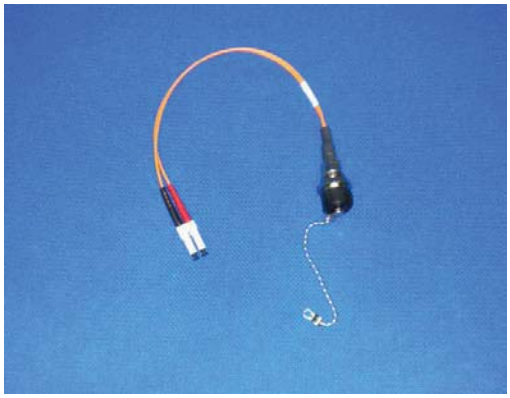
1) Surround the connector with the auto amalgamate tape from **up** to **down**

2) Surround the connector with the adhesive tape from **up** to **down**

3) Put tie raps on the up and the down of the connector

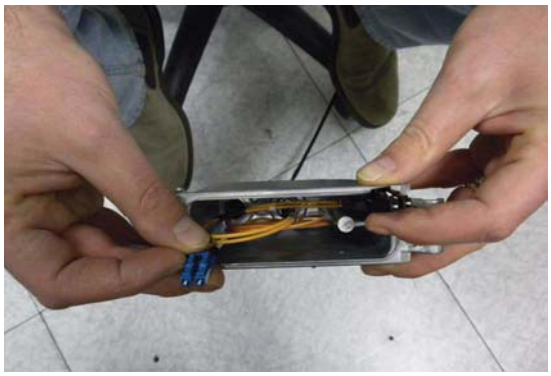
4.1.6.12.3 Connection of the two MPT-HC in 1+1 configuration

1 Take the ODC-LC jumper.

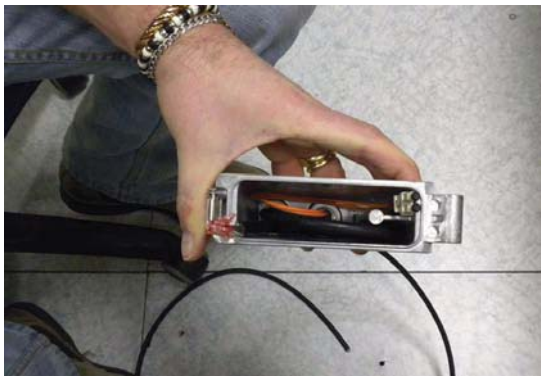


2 Remove the cap on the right side of the co-box. Insert in the hole the ODC-LC jumper and tighten it until the end of stroke.

3a In case of optical cable arrange the cables as shown in the figure below.



3b In case of electrical cable arrange the cables as shown in the figure below.

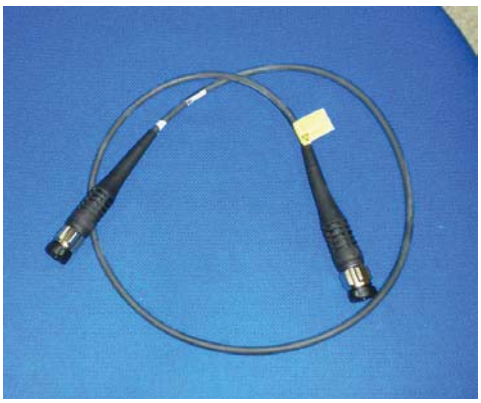


4 Remove the protection caps from the optical connectors.

5 Insert the optical connectors in the SFP in the MPT-HC. For the position refer to par. 4.1.6.2.1.1.

6 Close the co-box and repeat the same operation in the second MPT-HC.

7 Take the ODC-ODC optical cable of the suitable length (0.7 m / 10 m / 20 m).



8 Remove the protection cap on the ODC cord.

9 Remove the protection cap from the ODC connector on the co-box.

10 Assemble the ODC-ODC optical cable and tighten it with the dedicated dynamometric wrench (1N).

11 Repeat the operation in the second MPT-HC.

4.1.6.13 Cable connection to MPT-HC (6-7-8 GHz)

4.1.6.13.1 Electrical cable installation

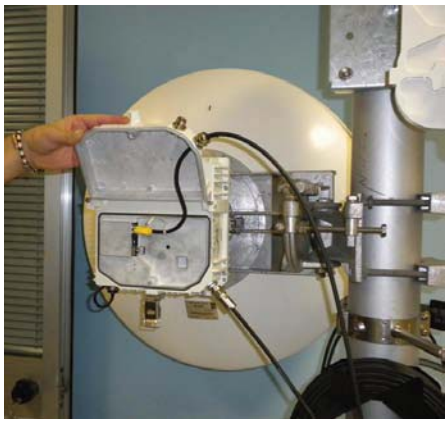
1 Open the co-box.

2 Take a 29 cm reference on the cable and put a tape as reference length.

3 Remove the cap from “User” and insert the cable on the hole. Tighten the gland body with the dynamometric wrench.

4 Move the gland nut and tighten it with the dynamometric wrench (10 N).

5 Insert the yellow boot on the RJ45 connector and insert it in the co-box. Close the co-box. For the position refer to par. 4.1.6.2.1.1.

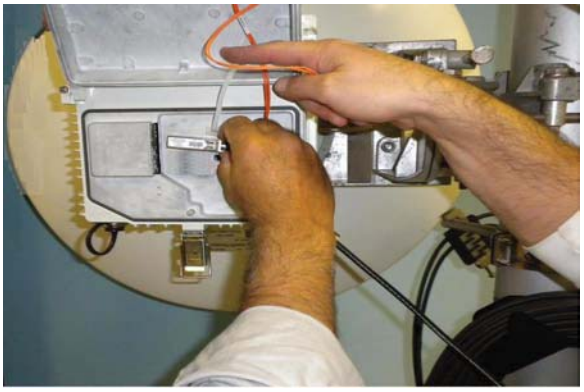


6 End of cable connection.

4.1.6.13.2 Optical fiber cable installation

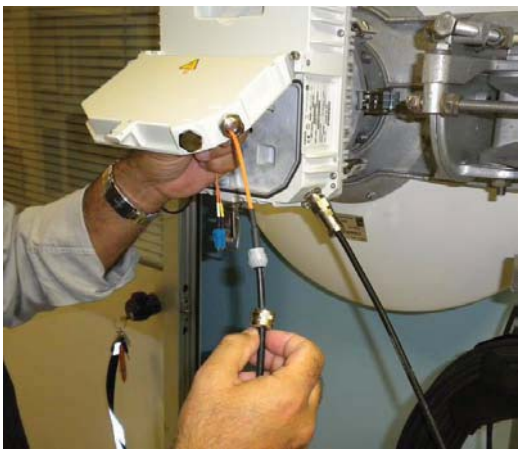
1 Open the co-box.

2 Insert the SFP module. For the position refer to par. 4.1.6.2.1.1.

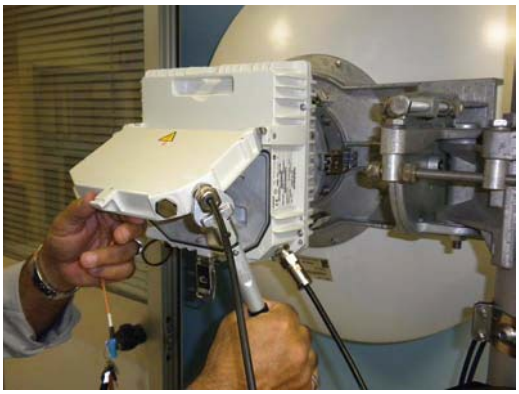


3 Remove the cap from “User” and insert the optical fiber on the hole.

4 Move the gland body and tighten it with the dynamometric wrench.

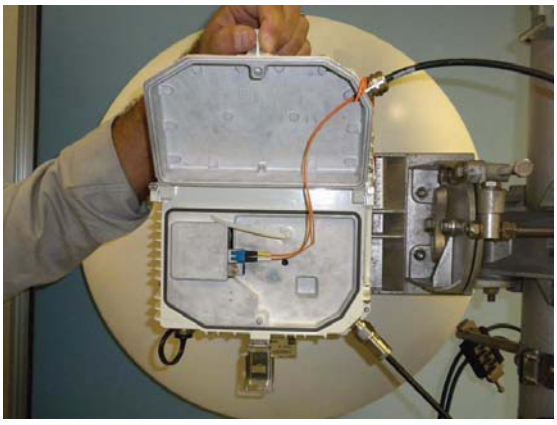


5 Tighten the gland nut with the dynamometric wrench.



Warning: The reference must be outside the co-box and the gland nut.

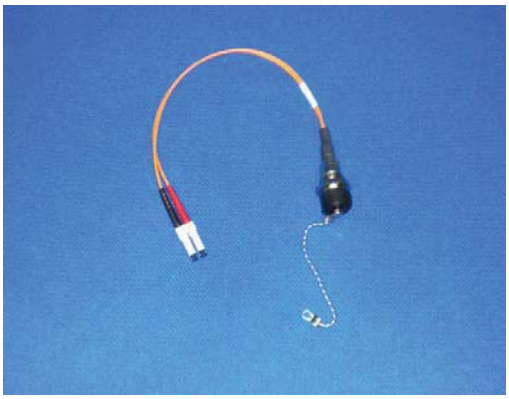
6 Remove the protection caps from the fiber connectors, insert them in the SFP.
Close the co-box.



7 End of optical fiber connection.

4.1.6.13.3 Connection of the two MPT-HC in 1+1 configuration

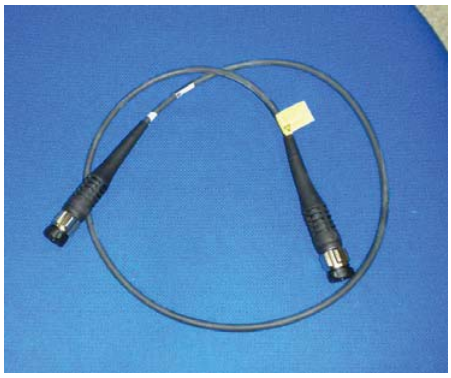
1 Take the ODC-LC jumper.



2 Remove the cap from RPS in the co-box. Insert in the hole the ODC-LC jumper and tighten it until the end of stroke.

3 Close the co-box and repeat the same operation in the second MPT-HC.

4 Take the ODC-ODC optical cable of the suitable length (0.7 m / 10 m / 20 m).



5 Remove the protection cap.

6 Insert the ODC-ODC optical cable and tighten it with the dynamometric wrench (1 N).

7 Repeat the operation in the second MPT-HC and connect the ODC-ODC optical cable.

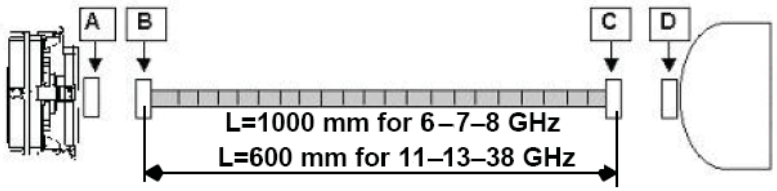
4.1.6.14 Installing the “Flextwist“ waveguide (not integrated antenna cases)

Concerning the interface between the MPT-HC output flange and the suggested antenna flange, the following Table 49. details for each product the standard wave guide to be used and the suggested flange for the external antenna.

Please note that the use of 600 mm flex twist is not suggested for antennas bigger than 3ft (90 cm diameter), due to mechanical reasons. The suggested way to make the RF connection is to use the elliptical wave guide fitted with flanged connectors.

Table 49. MPT-HC Output flanges with external antenna

Range (GHz)	MPT-HC Output Flange	FLEXTWIST				Suggested Antenna Flange
	A	C.E.I.	E.I.A.	B	C	D
6	UBR70	R70	WR137	PDR70	UDR70	PDR70
7-8	UDR84	R84	WR112	PDR84	UBR84	PBR84
	or					
	UBR84	R84	WR112	PBR84	UBR84	PBR84
11	UBR100	R100	WR90	PBR100	UBR100	PBR100
13	UBR120	R120	WR75	PBR120	UBR120	PBR120
15	UBR140	R140	WR62	PBR140	UBR140	PBR140
18	UBR220	R220	WR42	PBR220	UBR220	PBR220
23						
26						
38	UBR320	R320	WR28	PBR320	UBR320	PBR320



The long twistable flexible waveguide is supplied complete with gaskets and fasteners. At one end, it has a smooth square or rectangular flange (to be mounted on the antenna) and at the other end, a grooved square flange designed to accommodate an O–ring seal (mounted at the MPT-HC end).

Table 50. 6-7-8GHz Flextwist waveguide

FLEXIBLE TWISTABLE WAVEGUIDE KIT										
Alcatel-Lucent code	Waveguide	Length mm.	Freq. Band GHz	Flanges		Stainless steel socket cap screws	Stainless steel socket cap screws	"Onduflex" springy crinkle washers	Stainless Z. flat washers	HM. Hex nuts
1AF02951ABAA	WR137	1000	6	PDR70	UDR70	8 (M4x25)	8 (M4x12)	8 (B4)	8 (Z4)	8 (HM4)
3CC08010ABAB	WR112	1000	7,05–10	PBR84	UBR84	8 (M4x25)	8 (M4x12)	8 (B4)	8 (Z4)	8 (HM4)

Table 51. 11-38GHz Flextwist waveguide

FLEXIBLE TWISTABLE WAVEGUIDE KIT										
Alcatel-Lucent code	Waveguide	Length mm.	Freq. Band GHz	Flanges		Stainless steel socket cap screws	Stainless steel socket cap screws	"Onduflex" springy crinkle washers	Stainless Z. flat washers	HM. Hex nuts
1AF02957ABAA	WR90	1000	11	PBR100	UBR100	8 (M4x20)	8 (M4x12)	8 (B4)	12 (Z4)	12 (HM4)
3CC05751ACAA	WR75	600	10 – 15,0	PBR120	UBR120	8 (M4x20)	8 (M4x12)	8 (B4)	12 (Z4)	12 (HM4)
3CC05750ACAA	WR62	600	12,4 – 18	PBR140	UBR140	8 (M4x20)	8 (M4x12)	8 (B4)	8 (Z4)	8 (HM4)
3CC05749ACAA	WR42	600	18 – 26,5	PBR220	UBR220	8 (M3x20)	8 (M3x12)	8 (B3)	8 (Z3)	8 (HM3)
3DB00682AAAA	WR28	600	26,5 – 40	PBR320	UBR320	8 (M3x20)	8 (M3x12)	8 (B3)	8 (Z3)	8 (HM3)

N.B. If the FLEX–TWIST is not provided by Alcatel, the user must carefully choose the type of the connection guide in order to limit as much as possible galvanic couples between ANTENNA/ flex–twist and flex–twist/MPT-HC contact surfaces that can induce rust. For this purpose please note that the surfaces are:

– chromium-plated at MPT-HC output flange side

– tin-plated at flex-twist's flange side

4.1.6.15 MPT-HC system grounding

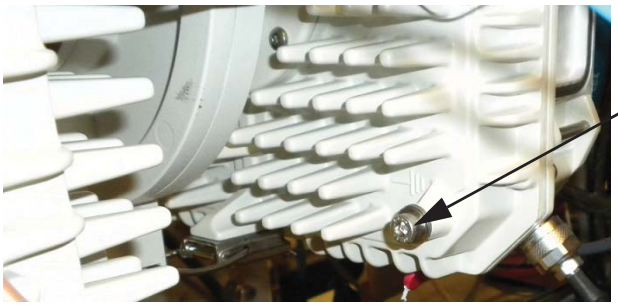
Each MPT-HC transceiver must be individually grounded.

N.B. Neither the RF coupler, nor the antenna(s), integrated or not integrated, must be grounded.

The following items are necessary for the individual grounding of each MPT-HC transceiver:

– one MPT-HC Grounding Kit (P/N 3CC08166AAXX).
  This kit corresponds to a cable (16mm^2 L = 15 m) that must be cut on site and connected to the terminal provided on the MPT-HC transceiver, and, on the other side, to the nearest grounding plate;

This example figure shows the grounding connector position.



MPT-HC grounding connector: to be connected with the grounding cable to the nearest grounding plate

Connect all grounding cables to the nearest grounding plate, as shown in this example:

4.1.6.16 Cable Grounding

The Power Supply cable and the Ethernet electrical cable must be grounded by using the dedicated Grounding kits.

For ground kit installation instructions refer to the guide provided with each kit.

For tower/mast installations the cables must be grounded at:

– The point where it comes on to the tower from the MPT-HC

– The point where it leaves the tower to go to the equipment building

– Not more than 25 m intervals on the tower if the height on the tower exceeds 50 m

– A point just prior to building entry

Figure 497. shows typical tower locations for cable grounding.

Note: All the cables (coax cable, Cat5e cable, fiber cable) must be fixed to the tower with the relevant ties.

At non-standard installations, such as building tops or the sides of buildings, follow the same general guidelines but where proper grounding points are not provided these must first be installed.

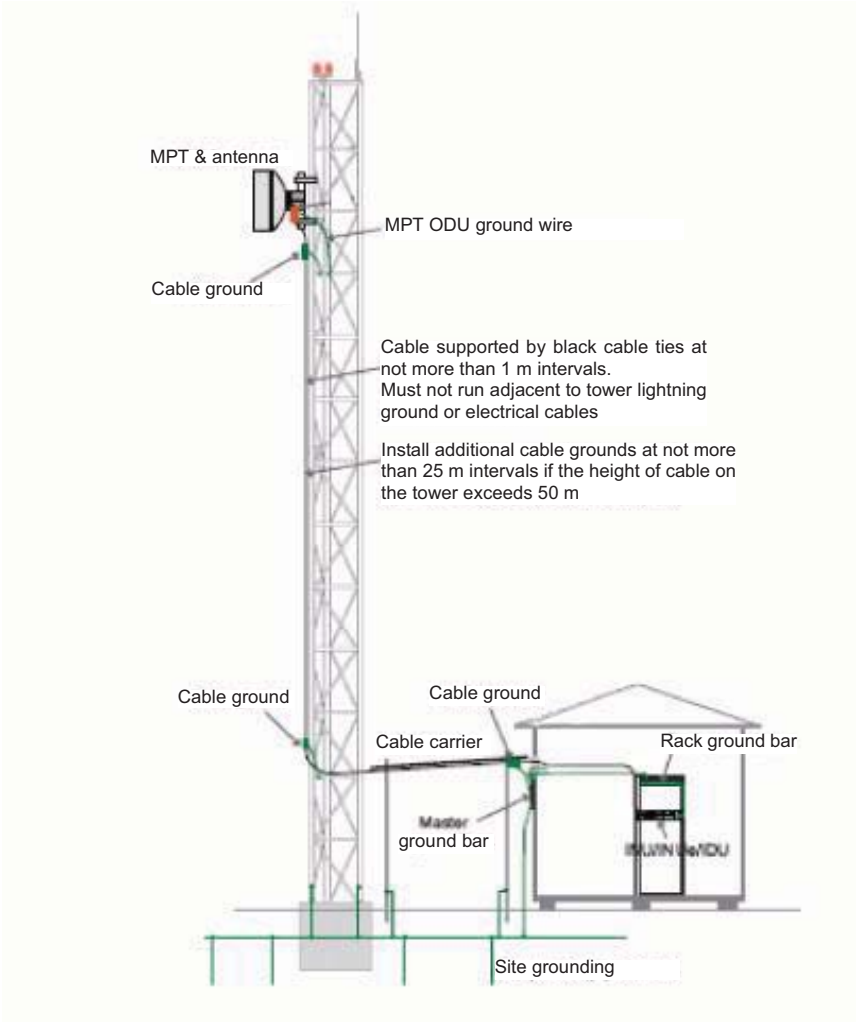


Figure 497. Locations for Cable Grounds

4.1.6.17 Type N connectors and Grounding kits waterproofing on the IDU/ODU cables

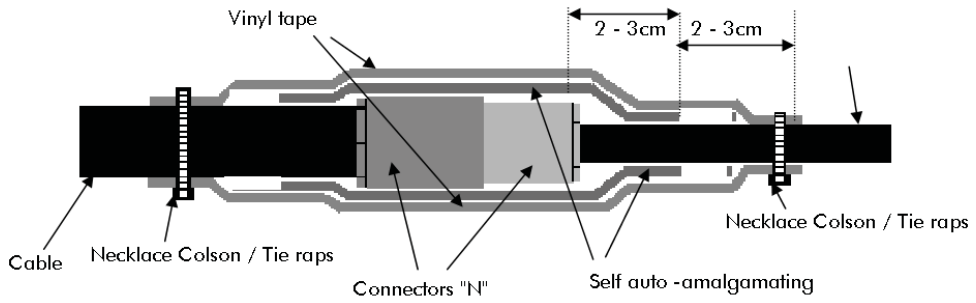
Warning: to make sure of the continuity and avoid short circuit, all cables / connectors connections (RJ45, Coaxial, Ethernet, Optical Fiber..) made on the field have to be verified and checked with Cable tester. The waterproofness must be also checked.

For installation on the type N connectors and grounding kits please refer to the installation notice provided with the connector and the grounding kit.

IMPORTANT:

To prevent potential risks of dysfunction it is recommended and a particular attention will be carried in the realization of the waterproofing of connectings (see following page).
For the holding in the bad weather, do not forget the waterproofing at the end of the operation with the Self auto-amalgamating + UV protection vinyl tape by necklaces Colson / Tie raps in every extremity.
For the assembly between the cable, grounding kit and ODU realized outside, it is recommended to use the Self auto-amalgamating (several turns) to assure the waterproofing. Then to cover the set by the UV protection vinyl tape to avoid the unsticking of the self-amalgamating and ended with a necklace Colson / Tie raps.

4.1.6.17.1 Example of Connector N waterproofing



4.1.6.17.2 Example of N Connector & Waterproofing

The principle of waterproofing given above is valid for the connections cable / ODU and for the grounding kits of the coaxial cable. It is recommended to make this waterproofing by "dry" weather, to avoid locking the humidity into the system.

Surround the connector with the auto amalgamate tape from up to down

Surround the connector with the adhesive UV tape from up to down

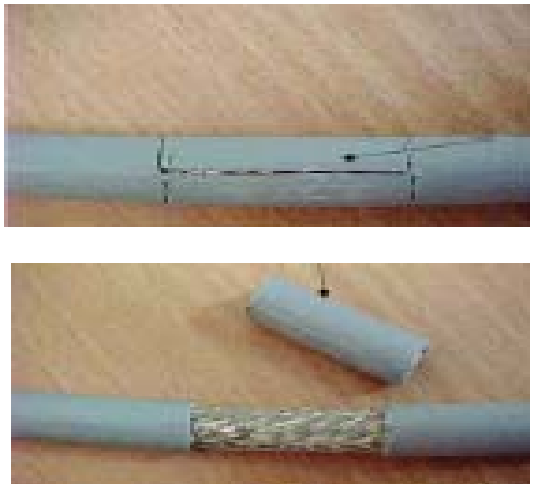
Put necklace Colson / tie raps on the up and the down of the connector

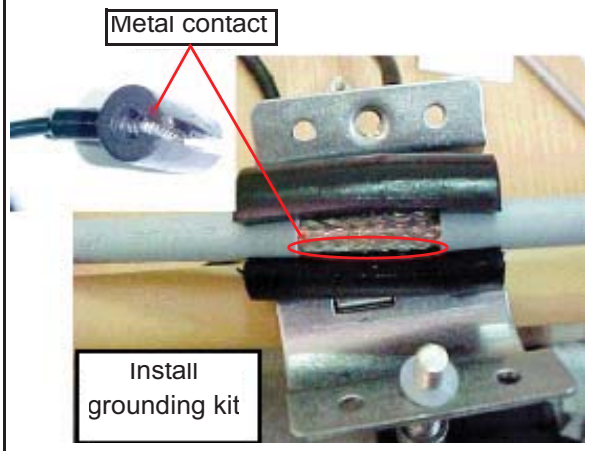
4.1.6.17.3 Example of Grounding Kit & Waterproofing

In every kit for Power Supply cable and in every kit for Ethernet electrical cable is joined a detailed assembling instruction.

Make then the Installation of the kit on the coaxial cable by not forgetting the waterproofing as example below.

Example of realization. Detail of the waterproofing of the kit.






Thighten with allen key 8 mm
Thighten With Allen Key 8mm
ขันยึดด้วยประแจหกเหลี่ยมให้แน่น


Waterproofing with
Almagamating + UV protection vinyl tape +
Necklace Colson / Tie rap

4.1.7 MPT-HC V2 Installation

The MPT-HC installation section is divided in:

4.1.7.1 Types of MPT-HC V2

The MPT-HC V2 consists of one or two cabinets including the Ethernet interface + modem + RF transceiver + branching of a channel.

Two mechanical solutions are adopted:

[1] with embedded diplexer for cost optimisation (**6 GHz and 11 GHz to 38 GHz**), shown in Figure 498., where the branching (diplexer) is internal to the MPT-HC V2 cabinet; this type of MPT-HC V2 is identified by one **Logistical Item** only;

[2] with external diplexer: due to an high number of shifters the diplexer is external for the flexibility of the shifter customization (**7 GHz and 8 GHz**), where MPT-HC V2 is composed by two independent units: the BRANCHING assembly (containing the diplexer) and the RF TRANSCEIVER assembly (containing the RF section); each of this type of MPT-HC V2 is identified by two **Logistical Items**, one for the BRANCHING assembly and another for the RF TRANSCEIVER assembly. To read the BRANCHING assembly identification label it is necessary to separate the BRANCHING assembly from the RF TRANSCEIVER assembly.

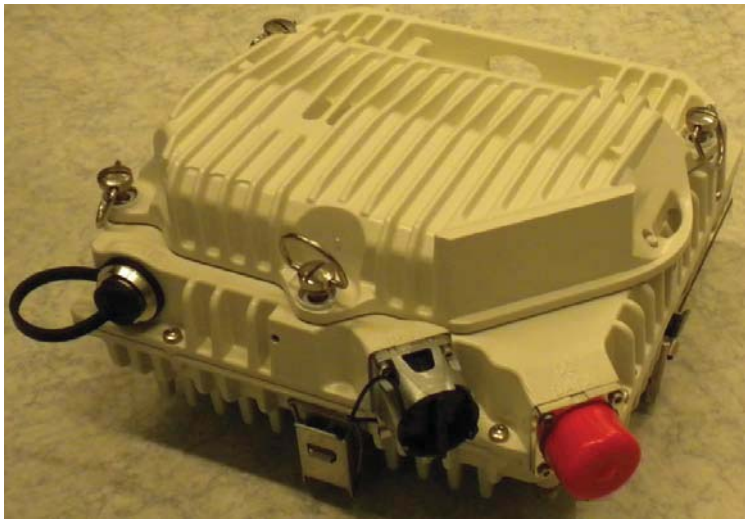


Figure 498. Views of MPT-HC V2 with embedded diplexer (6 GHz and 11-38 GHz)

4.1.7.2 External module to be installed

The MPT-HC V2 is delivered from the factory in one packing-case in the basic configuration (without any external module). The external module (RPS or XPIC+RPS) is delivered in another packing-case.

The external module must be installed in field on the MPT-HC V2.

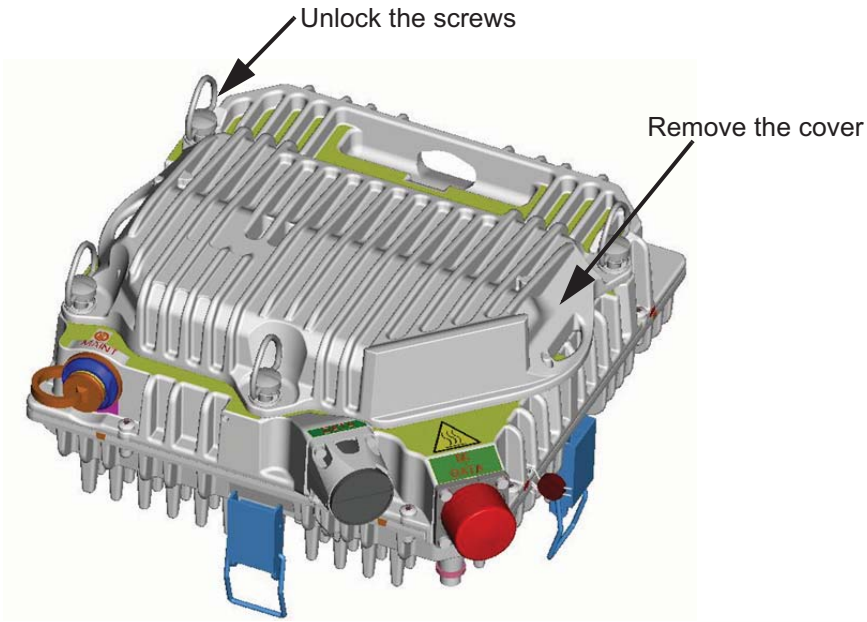
Note: Before installing an external module (XPIC module or XPIC-RPS module) on a MPT-HC V2, the corresponding MPT-HC V2 must be switched OFF. Switch ON can be done once the module has been properly screwed.

To install it follow the following procedure:

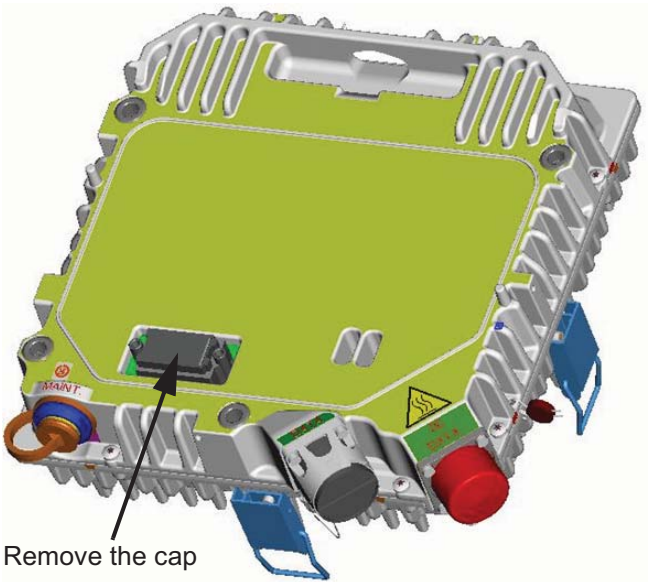
1) Disinstall the solar shield by unlocking the 3 screws.

2) Unlock the 4 screws with a screwdriver.

3) Remove the basic cover.



4) Remove the cap.



5) Withdraw the external module from the packing-case (RPS: refer to Figure 499. or XPIC+RPS: refer to Figure 500.) and remove the cap.

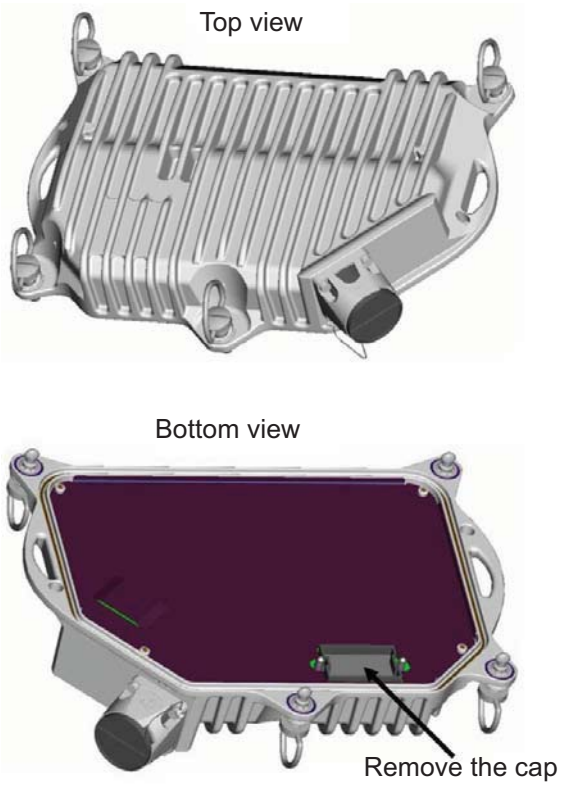


Figure 499. RPS module

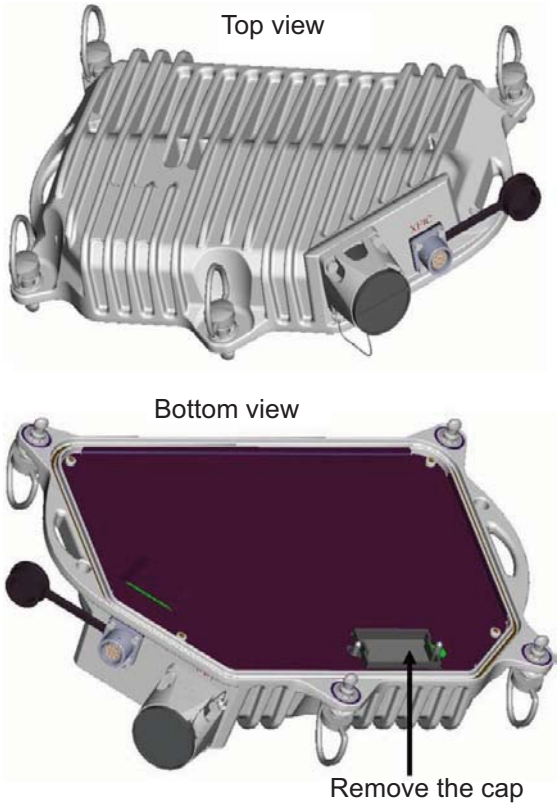


Figure 500. XPIC + RPS module

6) Install the module on the MPT-HC V2 and lock the 4 screws with a screwdriver. Pay attenation to the correct position of the screws, as shown in Figure 501. The slot of the screw must be aligned with the indication on the MPT-HC V2.

Note: Waterproofness is guaranteed only if the 4 screws are perfectly screwed.

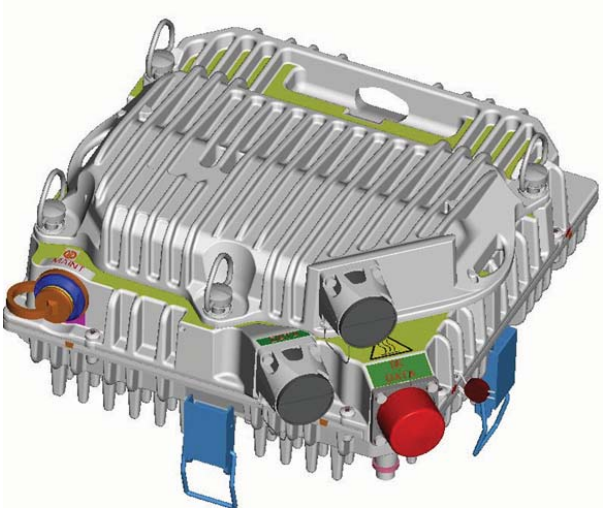


Figure 501. External module installed

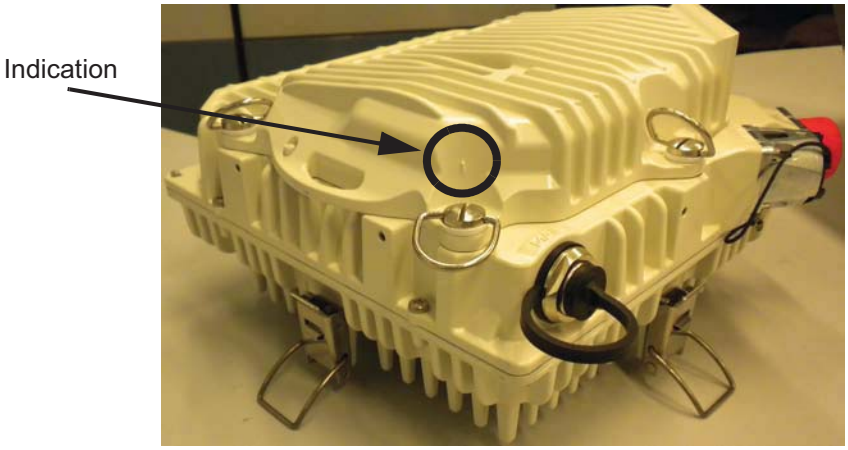


Figure 502. Correct screw position

7) Install the solar-shield taking into account the polarization to be used.

4.1.7.3 MPT-HC V2 operative information

This paragraph gives operative information, for installation regarding:

– **MPT-HC V2 with embedded or external diplexer** herebelow

– **MPT-HC V2 with external diplexer (additional information)** on page 722

4.1.7.3.1 Operative information on MPT-HC V2 with embedded or external diplexer

4.1.7.3.1.1 General, views and access points

Figure 503. on page 720 (for MPT-HC V2 with embedded diplexer) and Figure 504. on page 721 (for MPT-HC V2 with external diplexer) show MPT-HC V2 views and access points.

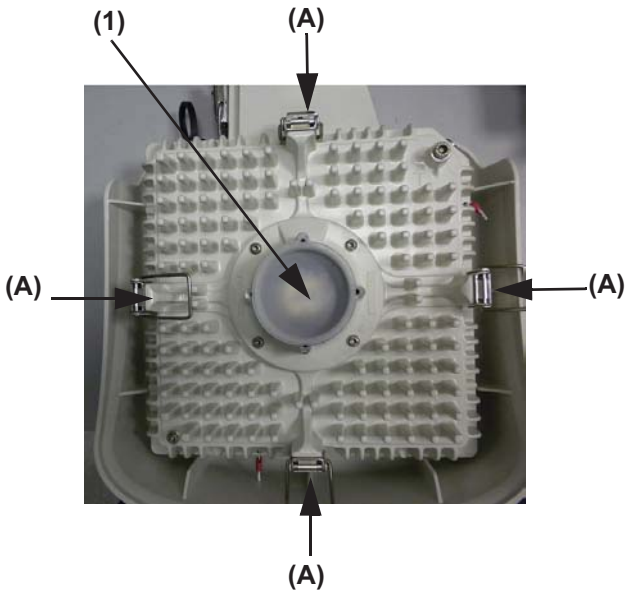
The external interfaces are listed in Table 52. below with the corresponding connectors.

Table 52. MPT-HC V2 external interfaces

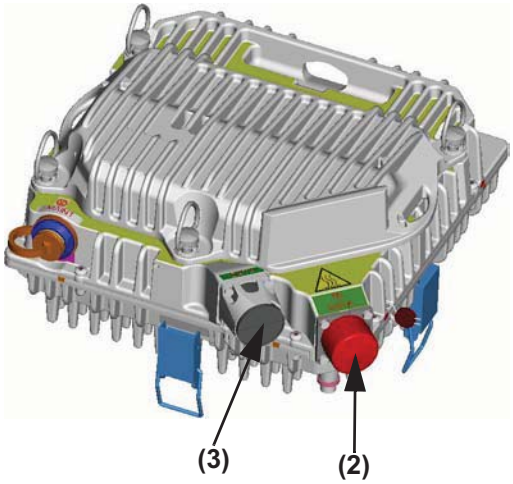
Ref. in Figure 503. and Figure 504.	Interface	Connector	Further information
(1)	RF interface	Waveguide	Connection to antenna or coupler. Refer to Table 53. herebelow
(2)	Connector for power supply cable or for PFoE (Power Supply + Ethernet Traffic) cable	RJ45 + R2CT	Connection to MSS-4/MSS-8
(3)	Optical Ethernet connection	LC + Q-XCO	Connection to MSS-4/MSS-8
(4)	RPS connector	LC + Q-XCO	Connection to a second MPT-HC V2 in 1+1
(5)	XPIC connector	Round proprietary	Connection to a second MPT-HC V2 in XPIC configuration

Table 53. RF interface

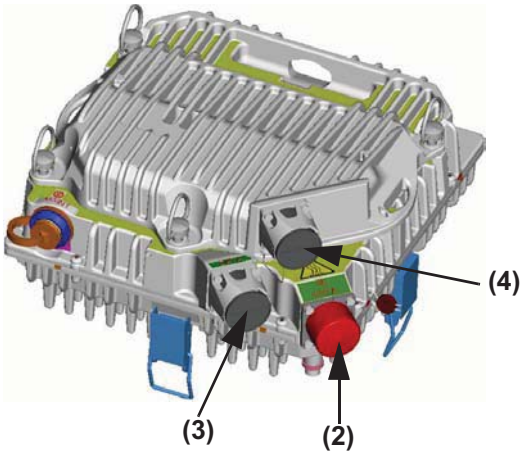
FREQUENCY GHz ->	6	7	8	11	13-15	18-26	38
Waveguide type ->	WR137	WR112	WR112	WR75	WR62	WR42	WR28



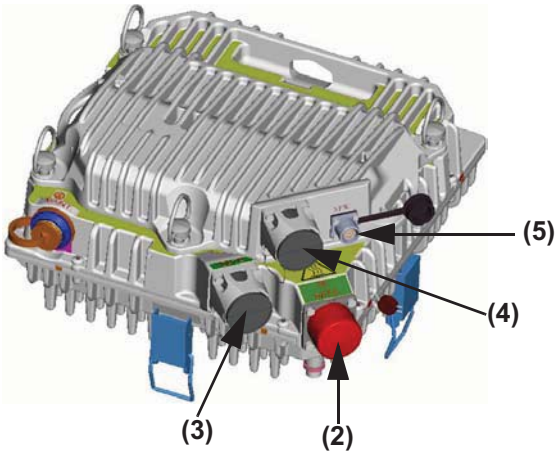
MPT-HC V2 basic



MPT-HC V2 equipped with RPS module



MPT-HC V2 equipped with XPIC-RPS module

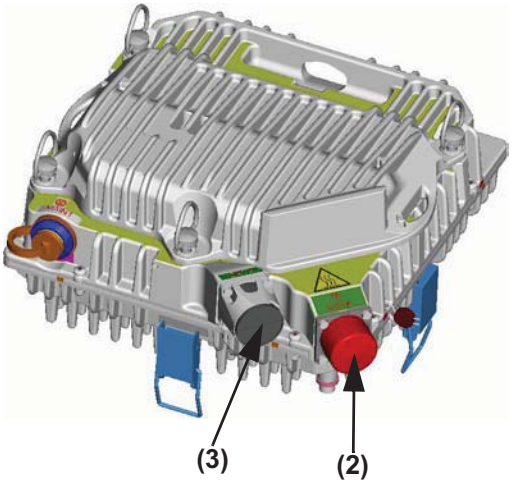


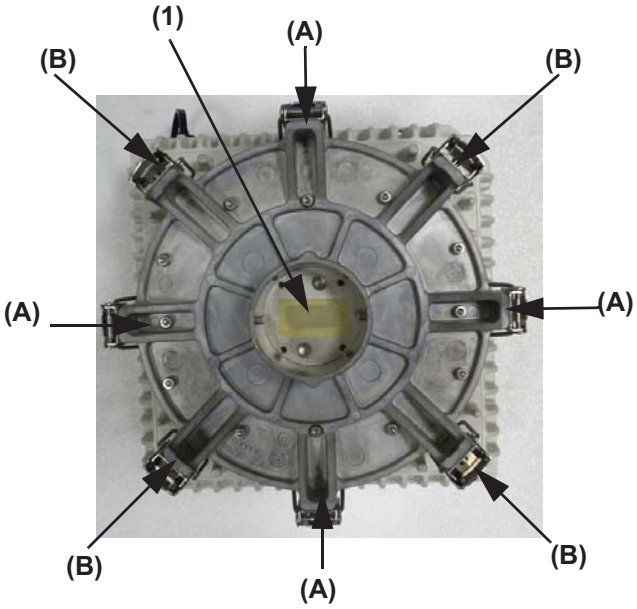
(A) Locking hooks **(4)** to fix/unfix MPT-HC V2 assembly to antenna or coupler

(1) RF interface for connection of antenna or coupler. Remove the plastic cover.
WARNING: A waterproofness tape is glued on the waveguide of the MPT-HC V2. It must never be removed.

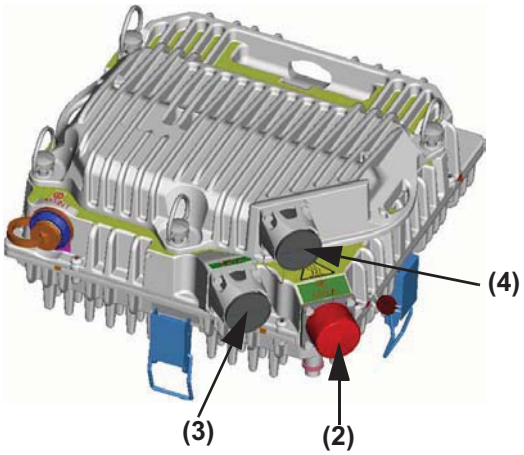
Figure 503. Views of MPT-HC V2 with embedded diplexer (6 GHz and 11-38 GHz)

MPT-HC V2 basic

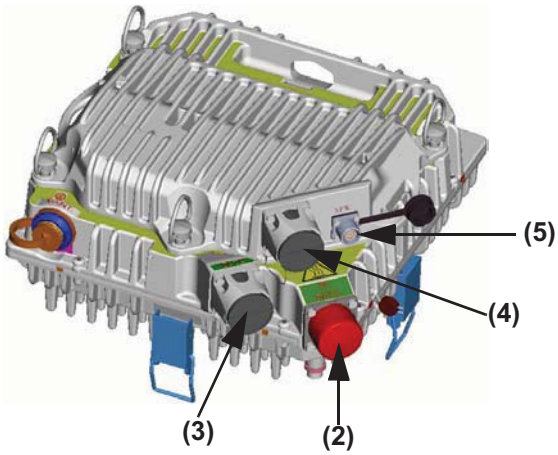




MPT-HC V2 equipped with RPS module



MPT-HC V2 equipped with XPIC-RPS module



(A) 4 locking hooks to fix/unfix branching assembly (diplexer) to transceiver

(B) 4 locking hooks to fix/unfix branching assembly (diplexer) to antenna or coupler

(1) RF interface for connection of antenna or coupler. Remove the plastic cover.
WARNING: A waterproofness tape is glued on the waveguide of the MPT-HC V2. It must never be removed.

Figure 504. Views of MPT-HC V2 with external diplexer (7 GHz and 8 GHz)

4.1.7.3.2 Fully equipped MPT-HC V2

Here below is given an example of a fully equipped MPT-HC V2:

– fiber for data,

– fiber for 1+1 (black),

– cat5e for power (silver),

– cat7e for XPIC (black).

Figure 505. Fully equipped MPT-HC V2

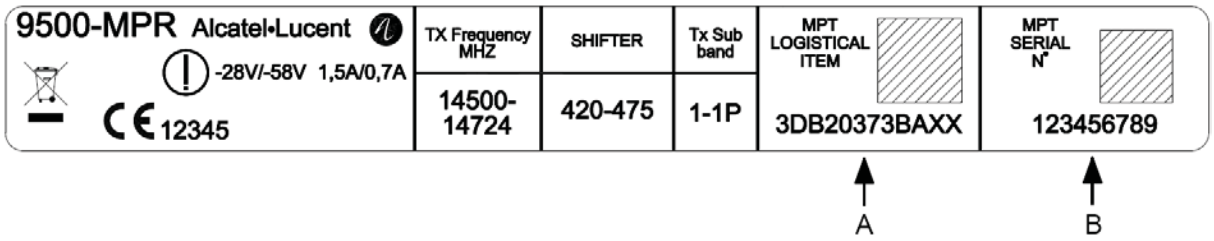
4.1.7.3.3 Additional operative information on MPT-HC V2 with external diplexer

Refer to paragraph 4.1.6.2.2 on page 659.

4.1.7.3.4 Labels affixed on the MPT-HC V2

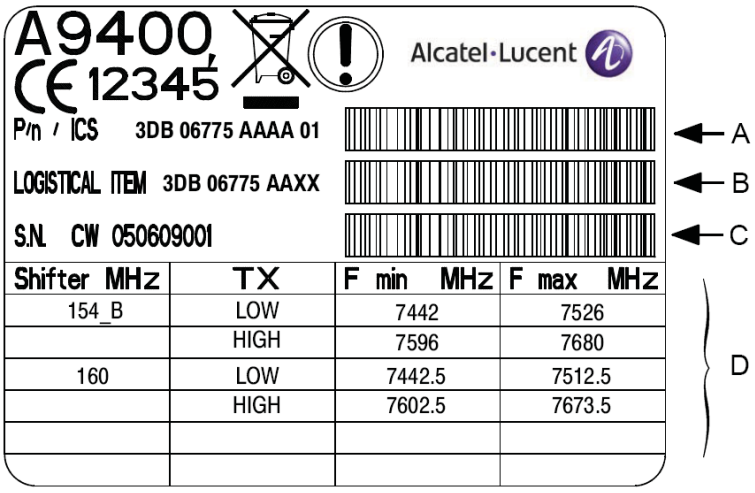
a) The label depicted in Figure 506. below is affixed externally to all types of MPT-HC V2 and MPT-HC V2 TRANSCEIVER boxes;

b) Only for MPT-HC V2 with external diplexers, an additional label, depicted in Figure 507. on page 724, is placed on the branching assembly.



SYMBOL OR WRITING	MEANING
9500-MPR	Equipment Acronym & Alcatel-Lucent Logo
CE	European Community logo
!	Not harmonized frequency logo
	2002/96/EC WEEE (Waste Electrical and Electronic Equipment) Logo
-28 V / -58 V 1,5 A / 0,7 A	Power supply range and current range
Logistical Item (shown numbers as examples)	Logistical Item for Customer
A	Logistical Item for Customer, bar code 128
Serial n° (shown numbers as examples)	Factory Serial number
B	Factory Serial number bar code 128
TX Frequency MHz (shown numbers as examples)	Working frequency range
Shifter MHz (shown numbers as examples)	Shifter
TX Sub-band (shown numbers as examples)	TX Sub-band

Figure 506. Label affixed on the MPT-HC V2 and MPT-HC V2 TRANSCEIVER box



N.B. In the label A9400 is written because the diplexers are also used in A9400 AWY.

SYMBOL OR WRITING	MEANING
A9400	Equipment Acronym & Alcatel-Lucent Logo
CE	European Community logo
12345 (example)	Notified body
!	Not harmonized frequency logo
	2002/96/EC WEEE (Waste Electrical and Electronic Equipment) Logo
PN/ICS 3DB 06775 AAAA 01 (example)	Factory Technical Code + ICS
A	Factory Technical Code + ICS, bar code 128
Logistical Item 3DB 06775 AAXX (example)	Logistical Item for Customer
B	Logistical Item for Customer, bar code 128
S/N CW 050609001 (example)	Factory Serial number
C	Factory Serial number bar code 128
D (shown numbers as examples)	– the field “Shifter MHz” indicates the possible frequency bands that can be used with this branching assembly. The choice between different shifters is done byCraft Terminal; – for each “Shifter MHz”, the TX “LOW” and “HIGH” rows indicate the frequency range assumed by transceiver TX section, according to the TRANSCEIVER and BRANCHING boxes coupling.

Figure 507. Label affixed inside the MPT-HC V2 BRANCHING box

4.1.7.4 How to change polarization in the MPT-HC V2

Refer to paragraph 4.1.6.3 on page 664.

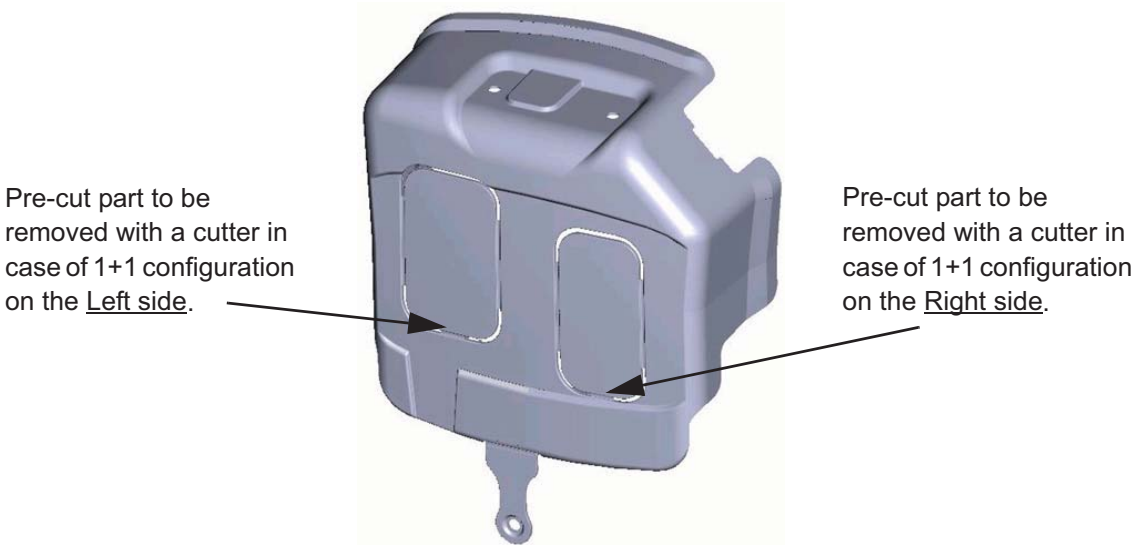
4.1.7.5 Types of RF couplers

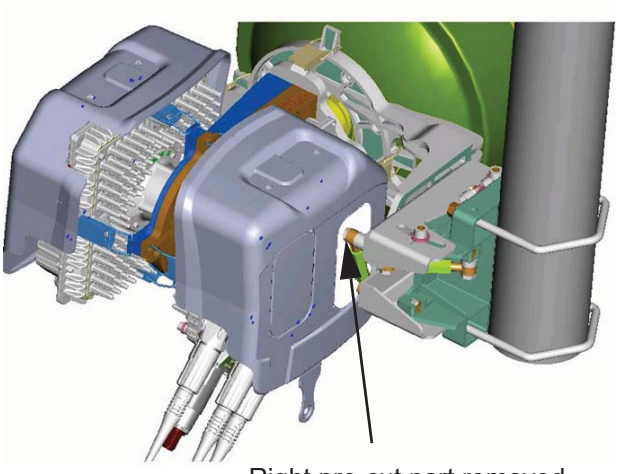
Refer to paragraph 4.1.6.4 on page 666.

4.1.7.6 Types of Pole Mounting Installation kits

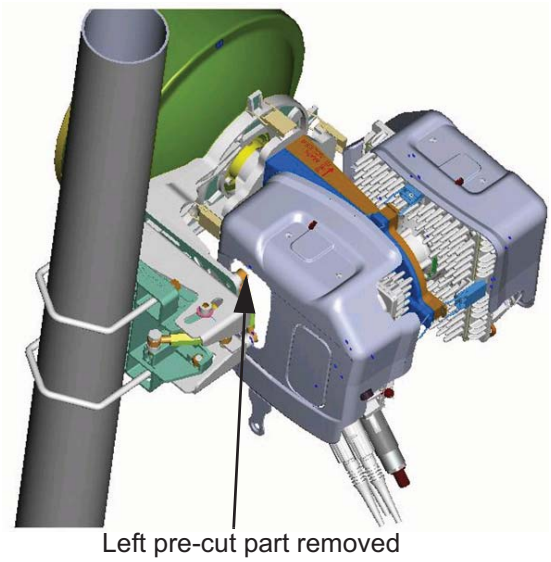
Refer to paragraph 4.1.6.5 on page 668.

WARNING: **Re-use of already installed Pole mounting 3CC10752AAAA and couplers in 1+1 configuration**
The 2 already installed “MELODY” or “AWY” ODU can be replaced with two MPT-HC V2 after having removed the pre-cut part of the solar-shield which faces the pole.
It concerns 13 GHz to 38 GHz frequency range.





Right pre-cut part removed



Left pre-cut part removed

4.1.7.7 Types of nose adapters

Refer to paragraph 4.1.6.6 on page 669.

4.1.7.8 1+0 MPT-HC V2 installation (integrated antenna)

Refer to paragraph 4.1.6.7 on page 670.

4.1.7.9 1+0 MPT-HC V2 installation (non integrated antenna)

Refer to paragraph 4.1.6.8 on page 673.

4.1.7.10 1+1 MPT-HC V2 installation (integrated antenna)

Refer to paragraph 4.1.6.9 on page 675.

4.1.7.11 1+1 MPT-HC V2 installation (non integrated antenna)

Refer to paragraph 4.1.6.10 on page 684.

4.1.7.12 Cable connections (MPT-HC V2 to MSS)

4.1.7.12.1 Electrical Ethernet cable

If the PFoE has been implemented, only one cable interconnects the MPT-HC V2 with the MSS. Refer to paragraph 4.1.8.11 on page 760.

4.1.7.12.2 Optical cable connection

An optical cable must be used, if the PFoE has not been implemented.

The cable is shown in Figure 508. The cable is a preassembled cable available in different lengths (refer to paragraph 4.1.3.7 on page 587).

Figure 508. LC/Q-XCO to LC Fiber cord

To pull-up the cable take a cord and insert it in the slot of the cable cap. Make a knot on the cord and pull-up the cable.

Remove the cap and connect the connector to the Q-XCO connector in the MPT-HC V2.

4.1.7.12.3 Power supply cable connection

The power supply cable is a coaxial cable, which is used only if the optical cable is used to transport the Ethernet traffic. Two types of coaxial cables are available according to the length (less than 200 m or more than 200 m).

The coaxial cable must be connected to:

– IDU-side to the MPT Access unit;

– ODU-side to the 1 m cord adapter (from N female to RJ45 plug). The RJ45 must be then connected to the relevant connector on the MPT-HC V2.

4.1.7.13 Direct Interconnection between two MPT-HC V2

4.1.7.13.1 Cable connection in 1+1 configuration

In 1+1 configuration the two MPT-HC V2 must be interconnected by using a preassembled jumper (Figure 509.). The jumper is available in different lengths (refer to paragraph 4.1.3.7 on page 587).

Figure 509. RPS Q-XCO to Q-XCO optical jumper

4.1.7.13.2 Cable connection in XPIC configuration

The two MPT-HC V2 must be linked with a cat7 cable with round connectors.

Three lengths are available: 1 m, 2.5 m, 8 m, to be chosen depending on the way the MPT-HC V2 are installed.

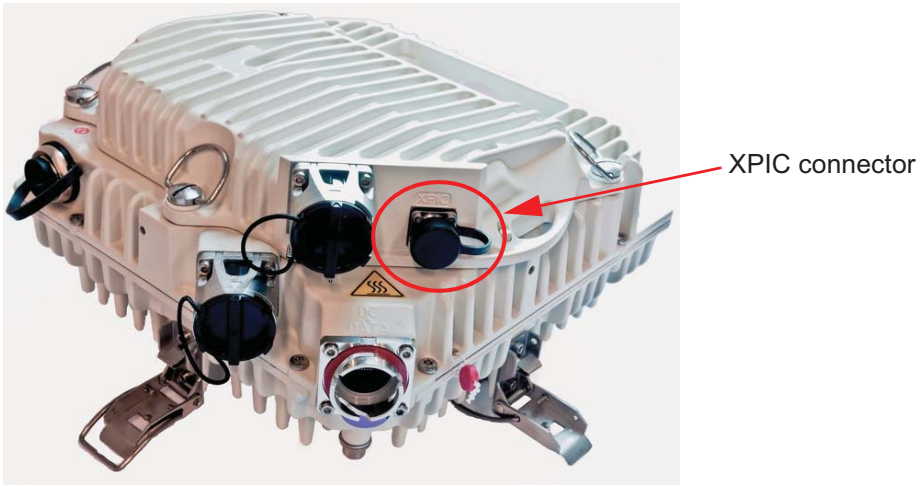


Figure 510. XPIC connector position

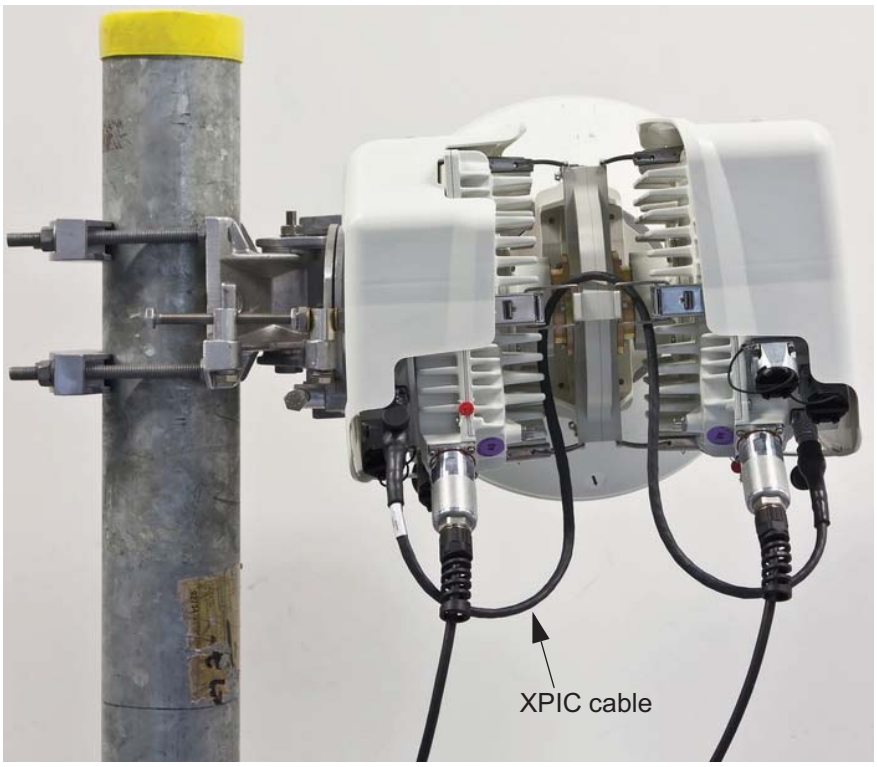


Figure 511. XPIC cable interconnection

4.1.7.14 Installing the “Flextwist“ waveguide (not integrated antenna cases)

Refer to paragraph 4.1.6.14 on page 707.

4.1.7.15 MPT-HC V2 system grounding

Refer to paragraph 4.1.6.15 on page 709.

4.1.7.16 Cable Grounding

Refer to paragraph 4.1.6.16 on page 710.

4.1.8 MPT-MC Installation

The MPT-MC installation section is divided in:

4.1.8.1 Types of MPT-MC

The MPT-MC consists of one or two cabinets including the Ethernet interface + modem + RF transceiver + branching of a channel.

Two mechanical solutions are adopted:

[1] with embedded diplexer for cost optimisation (**6 GHz** and **11 GHz to 38 GHz**), shown in Figure 512., where the branching (diplexer) is internal to the MPT-MC cabinet; this type of MPT-MC is identified by one **Logistical Item** only;

[2] with external diplexer: due to an high number of shifters the diplexer is external for the flexibility of the shifter customization (**7 GHz and 8 GHz**), shown in Figure 513., where MPT-MC is composed by two independent units: the BRANCHING assembly (containing the diplexer) and the RF TRANSCEIVER assembly (containing the RF section); each of this type of MPT-MC is identified by two **Logistical Items**, one for the BRANCHING assembly and another for the RF TRANSCEIVER assembly. To read the BRANCHING assembly identification label it is necessary to separate the BRANCHING assembly from the RF TRANSCEIVER assembly.

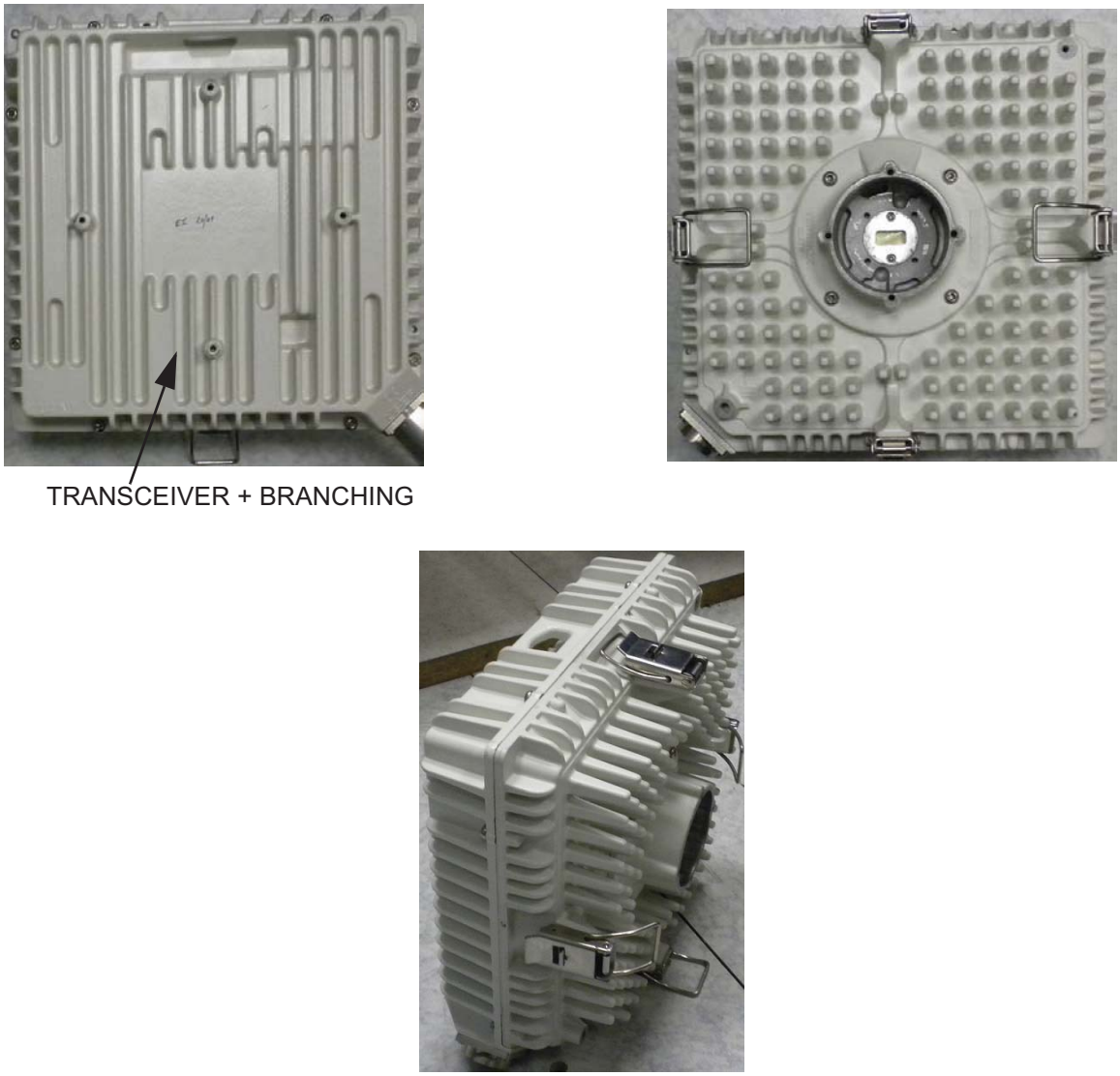


Figure 512. Views of MPT-MC with embedded diplexer (6 and 11-38 GHz)

Figure 513. Views of MPT-MC with external diplexer (7 GHz and 8 GHz)

4.1.8.2 MPT-MC operative information

This paragraph gives operative information, for installation regarding:

– **MPT-MC with embedded or external diplexer** herebelow

– **MPT-MC with external diplexer (additional information)** on page 733

4.1.8.2.1 Operative information on MPT-MC with embedded or external diplexer

4.1.8.2.1.1 General, views and access points

Figure 514. on page 732 (for MPT-MC with embedded diplexer) and Figure 515. on page 732 (for MPT-MC with external diplexer) show MPT-MC views and access points.

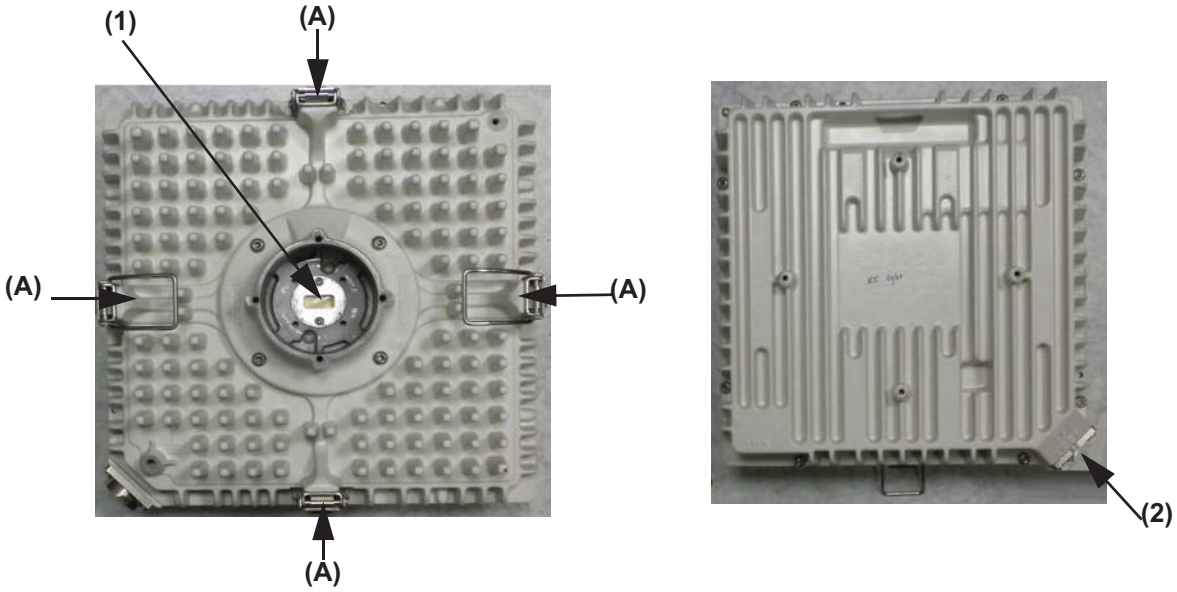
The external interfaces are listed in Table 54. below, with the corresponding connector.

Table 54. MPT-MC external interfaces

Ref. in Figure 514. and Figure 515.	Interface	Connector	Further information
(1)	RF interface for connection of antenna or coupler	waveguide	Table 55. herebelow
(2)	Ethernet electrical cable	R2CT	

Table 55. RF interface

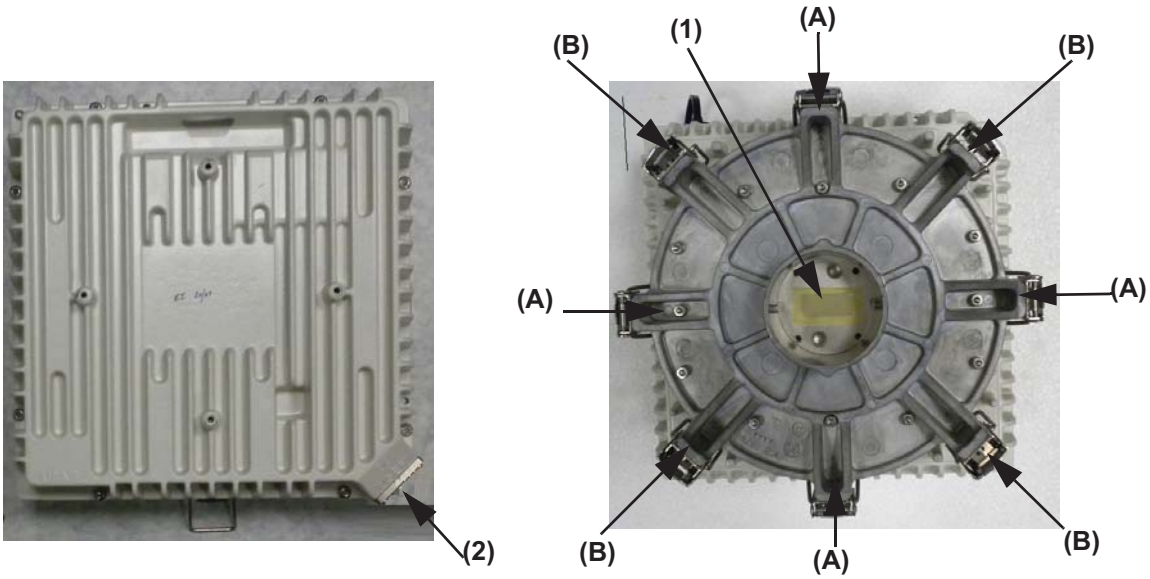
FREQUENCY GHz ->	6	7	8	11	13-15	18-26	38
Waveguide type ->	WR137	WR112	WR112	WR75	WR62	WR42	WR28



(A) Locking hooks **(4)** to fix/unfix MPT-MC assembly to antenna or coupler

(1) RF interface for connection of antenna or coupler. Remove the plastic cover.
WARNING: A waterproofness tape is glued on the waveguide of the MPT-MC. It must never be removed.

Figure 514. Views of MPT-MC with embedded diplexer (6 and 11-38 GHz)



(A) 4 locking hooks to fix/unfix branching assembly (diplexer) to transceiver

(B) 4 locking hooks to fix/unfix branching assembly (diplexer) to antenna or coupler

(1) RF interface for connection of antenna or coupler. Remove the plastic cover.
WARNING: A waterproofness tape is glued on the waveguide of the MPT-MC. It must never be removed.

Figure 515. Views of MPT-MC with external diplexer (7 GHz and 8 GHz)

4.1.8.2.2 Additional operative information on MPT-MC with external diplexer

4.1.8.2.2.1 MPT-MC composition

As shown in Figure 516., the MPT-MC assembly is made up of two boxes, one for diplexer system (BRANCHING) and the other for the all other active functions (TRANSCEIVER) connected together to form the MPT-MC.

An O-RING present in the TRANSCEIVER box guarantees the MPT-MC assembly waterproofness.

N.B. This is a conductive O-RING and must be left dry. Do not wet it with silicon grease (silicon grease must be used only on O-ring between MPT-MC and antenna).

Figure 516. Composition of MPT-MC with external diplexer

WARNING 1: A waterproofness tape is glued on the waveguide of the MPT-MC. It must never be removed.

WARNING 2: This gasket must never be removed.

The TRANSCEIVER box performs all the functions, but does not include the diplexer system.

The BRANCHING box provides the interface between the pole mounting/antenna and the TRANSCEIVER.

The favorite solution foresees the possibility to change in field a spare part TRANSCEIVER without disconnecting the BRANCHING box from the pole mounting/antenna. The TRANSCEIVER and BRANCHING boxes fixing and unfixing are obtained through the four levers.

4.1.8.2.2.2 TRANSCEIVER and BRANCHING boxes coupling

Figure 517. below shows the TRANSCEIVER and BRANCHING boxes coupling surfaces:

– **(A) BRANCHING box label informative content**
described in Figure 520. on page 737

– **(B) (HIGH FREQ)** and **(C) (LOW FREQ)** RF interfaces on BRANCHING box

– **(D) (TX)** and **(E) (RX)** RF interfaces on TRANSCEIVER box

The TRANSCEIVER and BRANCHING boxes can be coupled in two alternative ways (180°-rotated with respect to each other):

– BRANCHING box **(B) (HIGH FREQ)** coupled to TRANSCEIVER box's **(D) (TX)**
in this case the TX part of the transceiver uses the HIGH frequency range of the Shifter set by the WebEML (see field **D** in Figure 520. on page 737); obviously the RX part of the transceiver uses the corresponding LOW frequency range;

– BRANCHING box **(C) (LOW FREQ)** coupled to TRANSCEIVER box's **(D) (TX)**
in this case the TX part of the transceiver uses the LOW frequency range of the Shifter set by the WebEML (see field **D** in Figure 520. on page 737); obviously the RX part of the transceiver uses the corresponding HIGH frequency range.

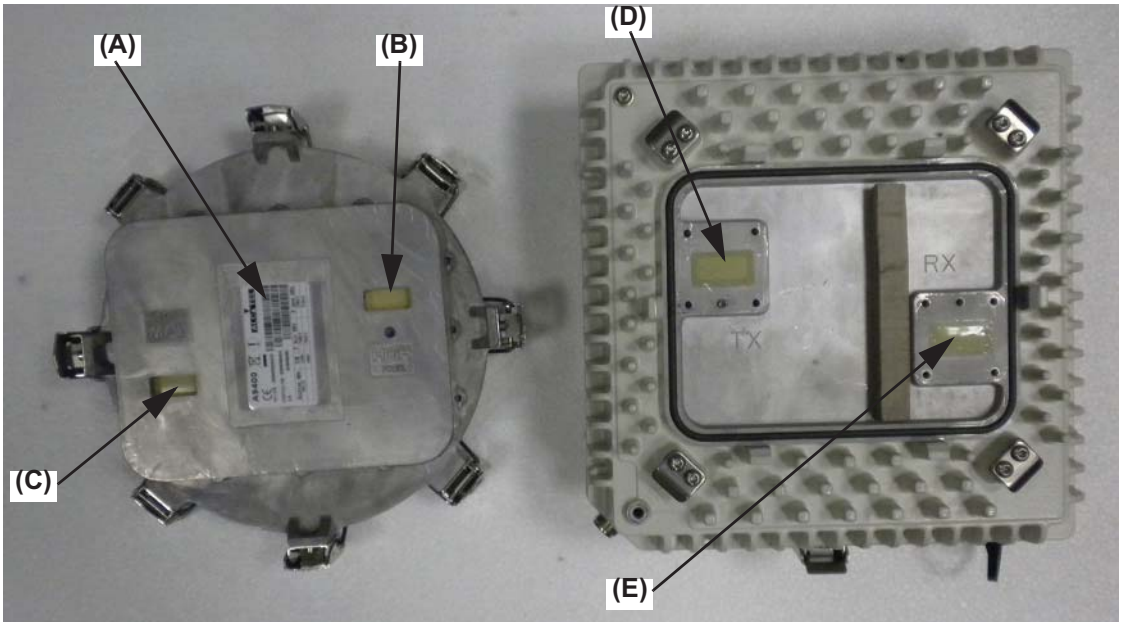


Figure 517. MPT-MC TRANSCEIVER and BRANCHING boxes coupling surfaces

N.B. There is only one possible way to couple the BRANCHING box and the TRANSCEIVER box: there is a mistake-proofing put by the factory on the TRANSCEIVER box, whose position depends on the type of transceiver (low or high band, as shown in Figure 518.) to ensure that the association with the BRANCHING box is always the right one.

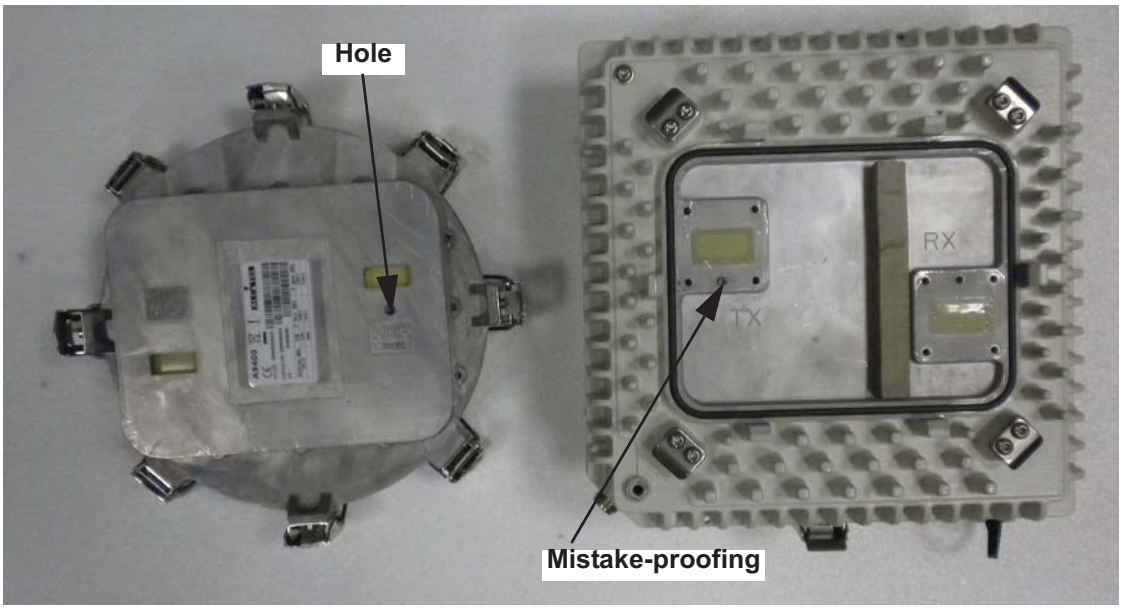
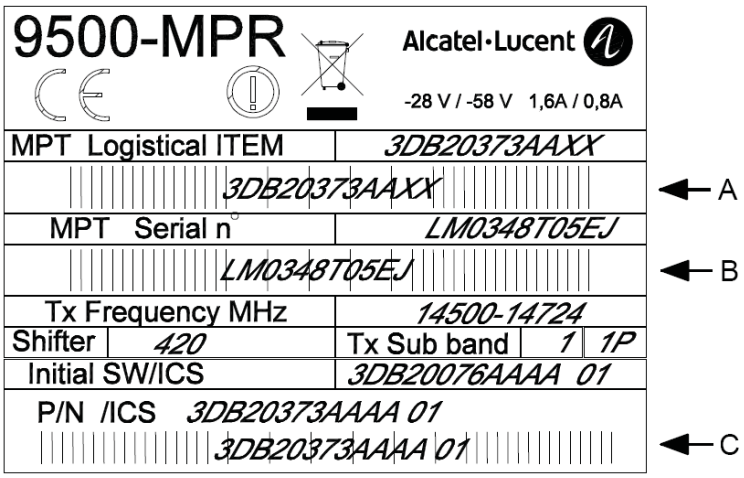


Figure 518. 7-8 GHz MPT-MC BRANCHING box mistake-proofing

4.1.8.2.3 Labels affixed on the MPT-MC

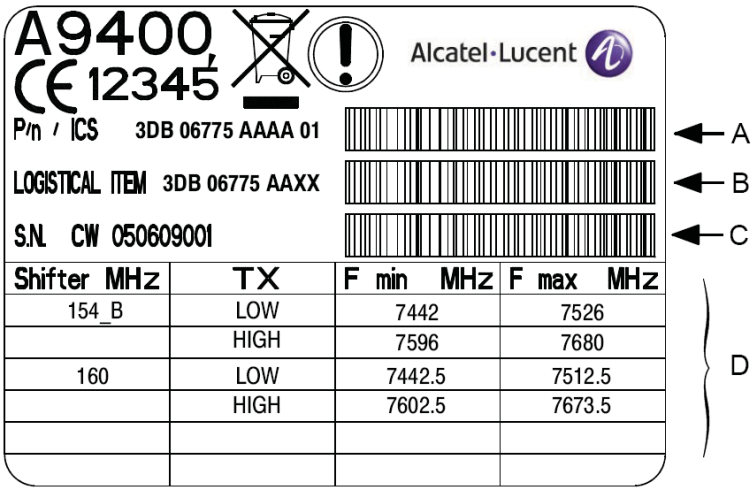
a) The label depicted in Figure 519. below is affixed externally to all types of MPT-MC and MPT-MC TRANSCEIVER boxes;

b) Only for MPT-MC with external diplexers, an additional label, depicted in Figure 520. on page 737, is placed on the branching assembly.



SYMBOL OR WRITING	MEANING
9500-MPR	Equipment Acronym & Alcatel-Lucent Logo
CE	European Community logo
!	Not harmonized frequency logo
	2002/96/EC WEEE (Waste Electrical and Electronic Equipment) Logo
-28 V / -58 V 1,6 A / 0,8 A	Power supply range and current range
Logistical Item (shown numbers as examples)	Logistical Item for Customer
A	Logistical Item for Customer, bar code 128
Serial n° (shown numbers as examples)	Factory Serial number
B	Factory Serial number bar code 128
TX Frequency MHz (shown numbers as examples)	Working frequency range
Shifter MHz (shown numbers as examples)	Shifter
TX Sub-band (shown numbers as examples)	TX Sub-band
Initial SW/ICS (shown numbers as examples)	P/N and ICS of the software loaded in factory
PN/ICS (shown numbers as examples)	Factory P/N + ICS
C	Factory P/N + ICS bar code 128

Figure 519. Label affixed on the MPT-MC and MPT-MC TRANSCEIVER box



Shifter MHz	TX	F min MHz	F max MHz
154_B	LOW	7442	7526
	HIGH	7596	7680
160	LOW	7442.5	7512.5
	HIGH	7602.5	7673.5

N.B. In the label A9400 is written because the diplexers are also used in A9400 AWY.

SYMBOL OR WRITING	MEANING
A9400	Equipment Acronym & Alcatel-Lucent Logo
CE	European Community logo
12345 (example)	Notified body
!	Not harmonized frequency logo
	2002/96/EC WEEE (Waste Electrical and Electronic Equipment) Logo
PN/ICS 3DB 06775 AAAA 01 (example)	Factory Technical Code + ICS
A	Factory Technical Code + ICS, bar code 128
Logistical Item 3DB 06775 AAXX (example)	Logistical Item for Customer
B	Logistical Item for Customer, bar code 128
S/N CW 050609001 (example)	Factory Serial number
C	Factory Serial number bar code 128
D (shown numbers as examples)	– the field “Shifter MHz” indicates the possible frequency bands that can be used with this branching assembly. The choice between different shifters is done byCraft Terminal; – for each “Shifter MHz”, the TX “LOW” and “HIGH” rows indicate the frequency range assumed by transceiver TX section, according to the TRANSCEIVER and BRANCHING boxes coupling.

Figure 520. Label affixed inside the MPT-MC BRANCHING box

4.1.8.3 How to change polarization in the MPT-MC

4.1.8.3.1 6 and 11-38 GHz MPT-MC

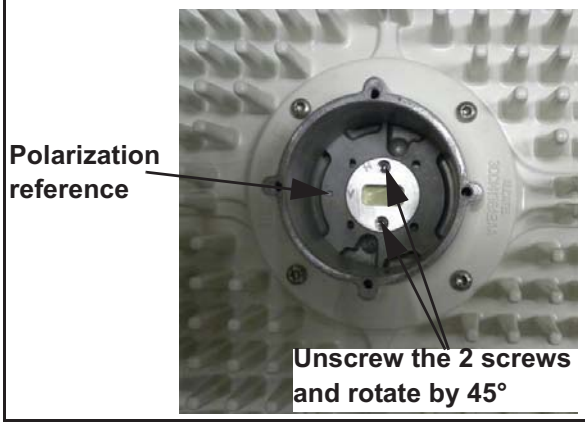
Note

The polarization must be changed to match the antenna polarization and the coupler nose waveguide.

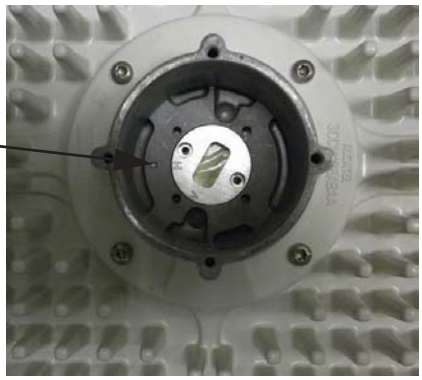
WARNING: A waterproofness tape is glued on the waveguide of the MPT-MC. It must never be removed.

1 Remove the plastic protection cover from the MPT-MC.

2 Change the polarization of the MPT-MC, if required (default: vertical polarization).



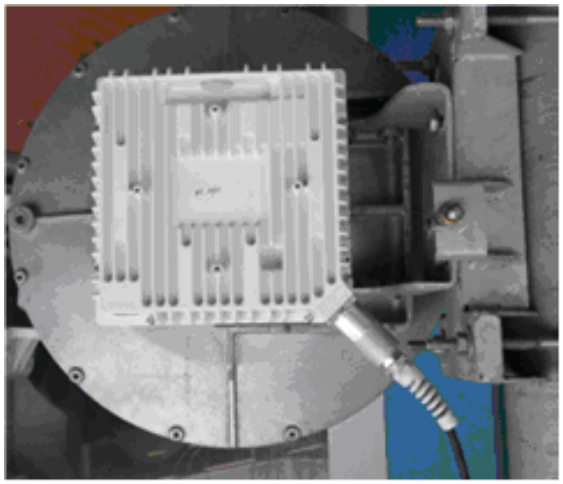
3 Horizontal polarization.



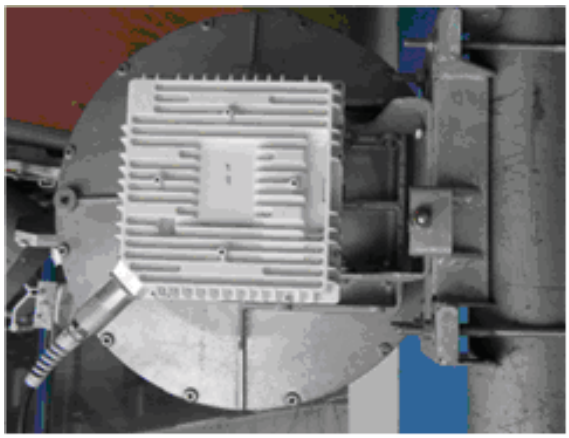
4.1.8.3.2 7-8 GHz MPT-MC

These MPT-MC have fixed polarization (vertical polarization). To change the polarization it is necessary to change the antenna polarization and to install the MPT-MC 90° rotated.

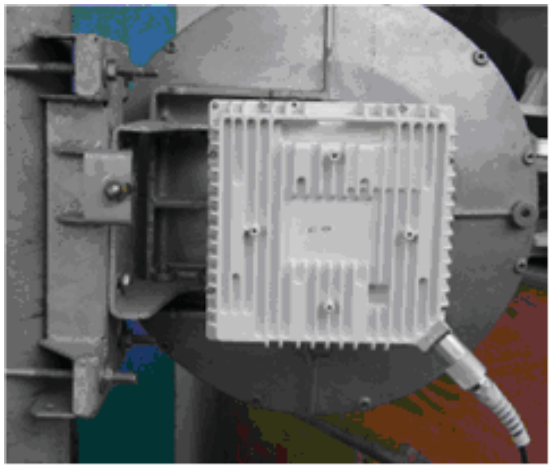
1 Example of vertical polarization (left offset).



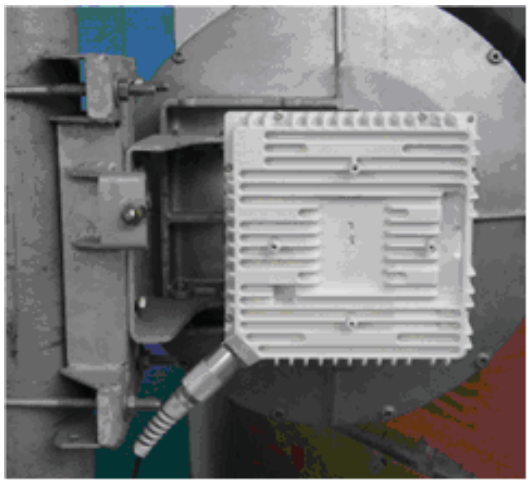
2 Example of horizontal polarization (left offset).



3 Example of vertical polarization (right offset).



4 Example of horizontal polarization (right offset).



4.1.8.4 Types of RF couplers

Refer to paragraph 4.1.6.4 on page 666.

4.1.8.5 Types of Pole Mounting Installation kits

Refer to paragraph 4.1.6.5 on page 668.

4.1.8.6 Types of nose adapters

Refer to paragraph 4.1.6.6 on page 669.

4.1.8.7 1+0 MPT-MC installation (integrated antenna) - all frequencies

[1] Check/Set the coupling between the TRANSCEIVER and BRANCHING boxes (only for MPT-MC with external diplexer).

[2] Install the Antenna and Pole Mounting.
This pole mounting is delivered as “pole mounting”, “antenna”, and frequency-specific “nose adapter” already assembled. The integrated antenna is mounted on the pole front.
Antenna and pole mounting must be installed in accordance with the manufacturer’s instructions.

[3] Check or change the polarization on the Antenna nose.
To change the polarization, follow the instructions supplied with each antenna. Figure below shows an example.

N.B. The antennas are normally supplied with vertical polarization.

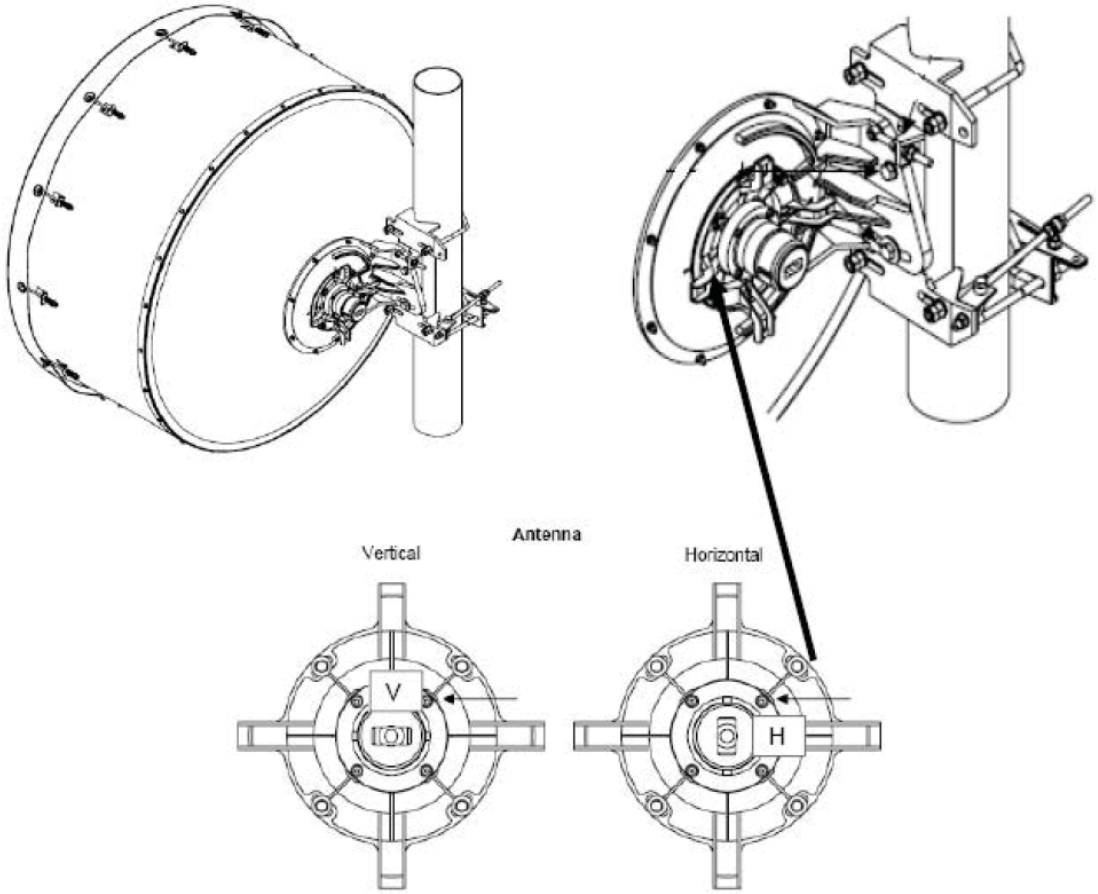


Figure 521. Example of antenna polarization change (“1+0” MPT-MC integrated antenna)

[4] Take off the solar shield from the MPT-MC transceiver by unscrewing the screws placed on the solar shield back panel.

[5] Install the MPT-MC on the Antenna nose adapter.

N.B. Before inserting the MPT-MC on nose adapter, it is mandatory to put SILICONE grease on the O-ring.

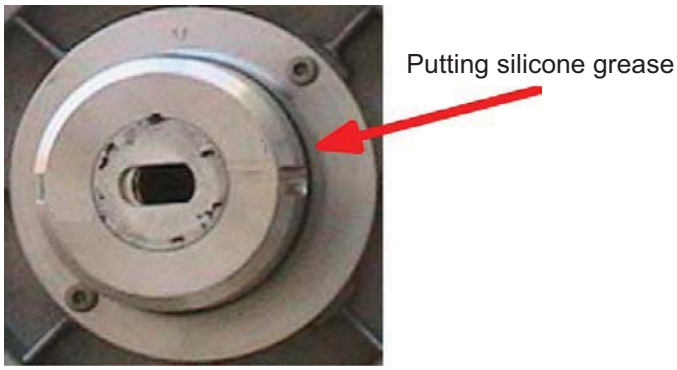


Figure 522. Putting silicone grease on O-ring before MPT-MC insertion

1) Grasp the MPT-MC module by the handle.

2) Open the four looking hooks **(1)** arranged on the four walls of the MPT-MC unit.

3) For 7-8 GHz MPT-MC only rotate the MPT-MC depending on the horizontal or vertical polarization, and slide it on the nose adapter.

4) Secure the MPT-MC module through the four hooks **(1)** on the relative brackets **(2)**.

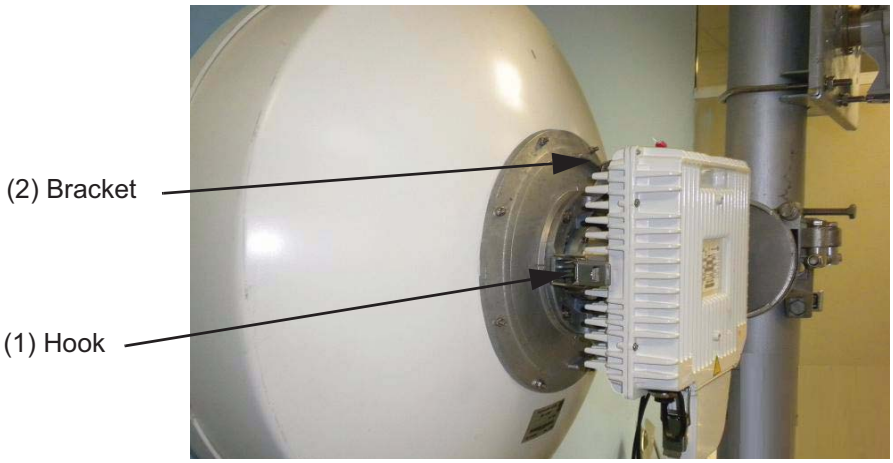


Figure 523. MPT-MC 1+0 installation for integrated antenna (6 GHz and 11-38 GHz)

N.B. For 6 GHz and 11-38 GHz MPT-MC remember to set first the correct polarization.

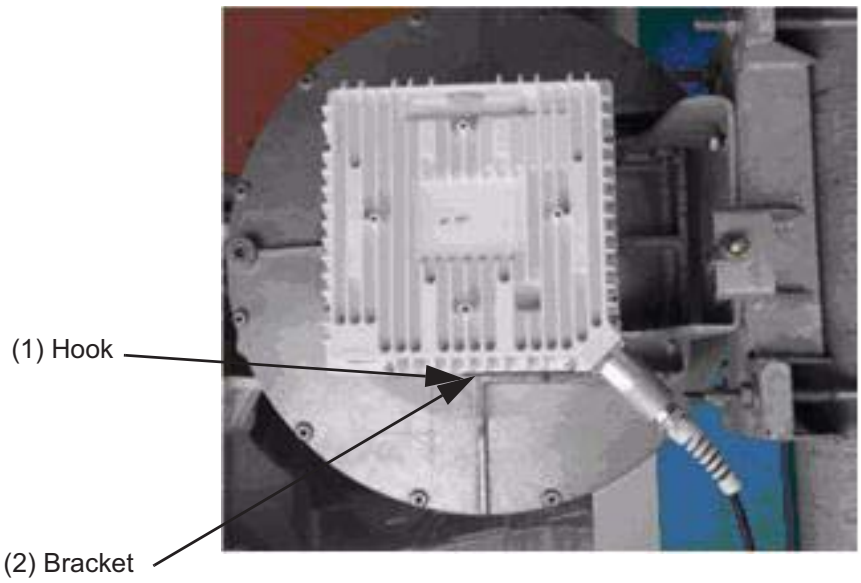


Figure 524. MPT-MC 1+0 installation for integrated antenna (7-8 GHz: vertical polarization)

Figure 525. MPT-MC 1+0 installation for integrated antenna (7-8 GHz: horizontal polarization)

REMINDER: The MPT-MC/antenna assembly requires no additional seal on the SHF flanges; the two ends are smooth. The O-ring seal around the male “nose” provides sealing.

[6] Ground the MPT-MC system.

[7] Pre-point the antenna.

[8] Reinstall the solar shield onto the MPT-MC transceiver by screwing on it the solar shield screws.

[9] Affix the EMF stickers.

4.1.8.8 1+0 MPT-MC installation (non integrated antenna) - all frequencies

[1] Check/Set the coupling between the TRANSCEIVER and BRANCHING boxes (only for MPT-MC with external diplexer).

[2] Install the Nose Adapter on the “Pole Mounting for Remote ODU”.

[3] Install the “Pole Mounting for Remote ODU”.
Pole mounting must be installed in accordance with the manufacturer’s instructions.
In case of missing instructions, fix the U-bolts with 34 N x m tightening torque.

N.B. The pole mounting can be installed on the Right or Left hand side of the pole depending on the azimuth and on the configuration of the tower.

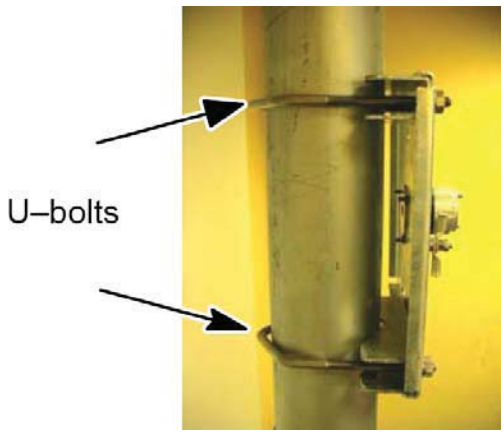


Figure 526. "Pole Mounting for Remote ODU" installation

[4] Take off the solar shield from the MPT-MC transceiver by unscrewing the screws placed on the solar shield back panel.

[5] Install the MPT-MC.

N.B. Before inserting the MPT-MC on nose adapter, it is mandatory to put SILICONE grease on the O-ring.

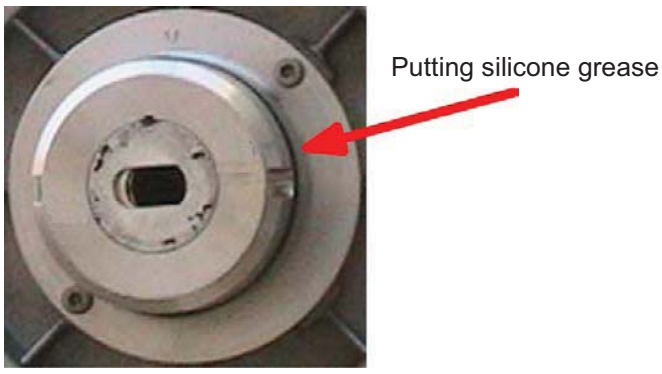


Figure 527. Putting silicone grease on O-ring before MPT-MC insertion

1) Grasp the MPT-MC module by the handle. Open the four looking hooks arranged on the four walls of the MPT-MC unit.

2) Position the Pole mounting support on the pole side as shown in the plant documentation.

3) Position the MPT-MC and slide it on the nose adapter.

4) Secure the MPT-MC module through the four hooks onto the relative brackets.

Figure 528. MPT-MC 1+0 installation for not integrated antenna (with pole mounting P/N 3DB 10137 AAAB)

[6] Install the external Antenna with its own Pole Mounting.
The installation of the antenna and of its own pole mounting, as well as the antenna polarization check/change, must be done in accordance with the manufacturer's instructions.

[7] Connect the antenna side (flange) of the Pole Mounting's nose adapter to the external antenna, by means of the "Flextwist" waveguide.

[8] Ground the MPT-MC system.

[9] Pre-point the antenna.

[10] Reinstall the solar shield onto the MPT-MC transceiver by screwing on it the solar shield screws.

[11] Affix the EMF stickers.

4.1.8.9 1+1 MPT-MC installation (integrated antenna)

4.1.8.9.1 6 GHz and 11-38 GHz

[1] Install the Antenna and Pole Mounting.
This pole mounting is delivered as “pole mounting”, “antenna”, and frequency-specific “nose adapter” already assembled. The integrated antenna is mounted on the pole front.
Antenna and pole mounting must be installed in accordance with the manufacturer’s instructions.

[2] Check or change the polarization of the RF coupler.
The axial adaptation between H polarization to V polarization (and viceversa) is a mechanical/electrical adjustment. Every mechanical “STEP” is a 30° adjustment.

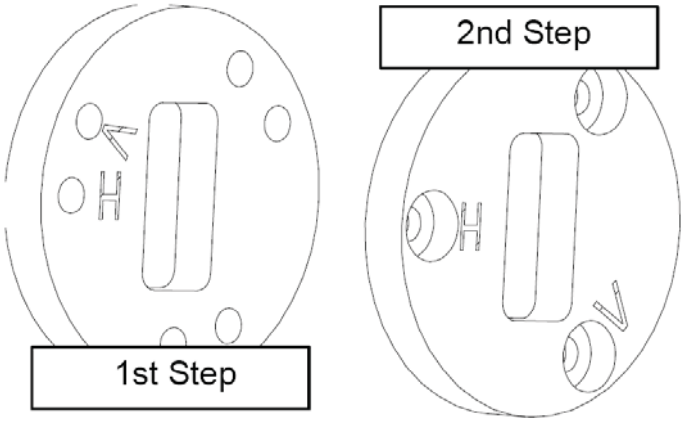


Figure 529. Coupler Polarization Change (6 GHz and 11-38 GHz) - 1st Step and 2nd step

The final result must be as shown in Figure 476. on page 676 (example for V polarization): the engraved polarization symbols (H or V) must coincide with the reference blind hole.

Change Polarization Procedure

1) 1st Step = internal 30° rotate

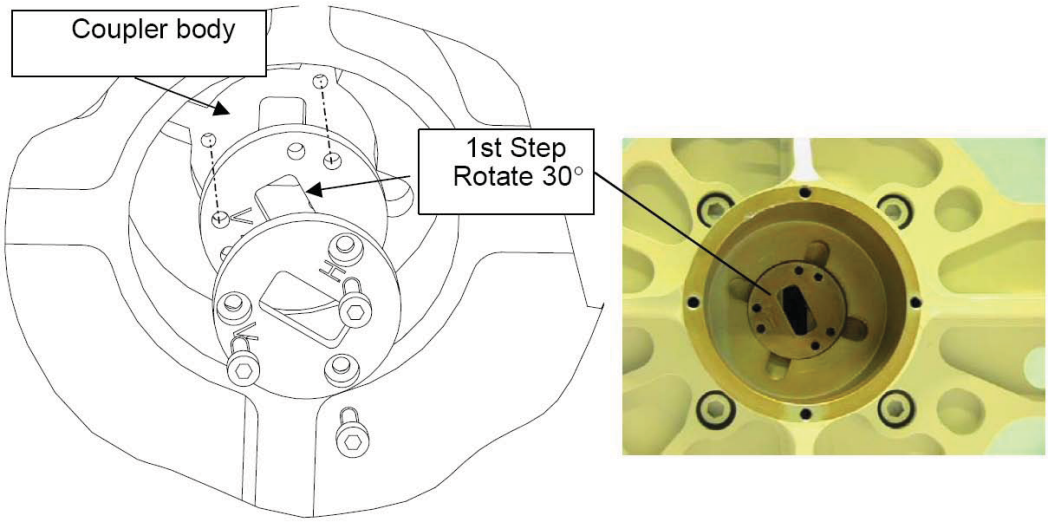


Figure 530. Coupler Polarization Change (6 GHz and 11-38 GHz) - 1st Step execution

2) 2nd Step= cover + screws 60°(30°+ 30°) rotate

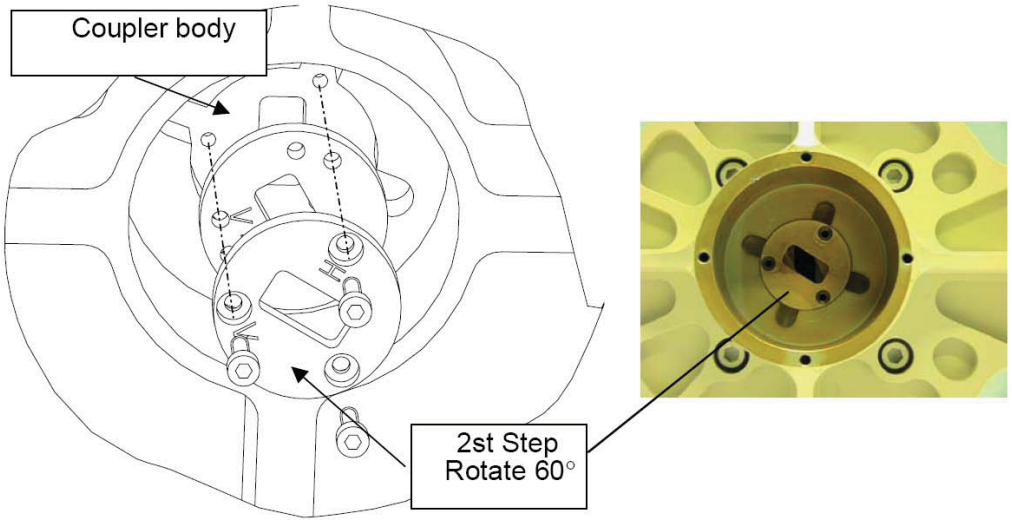
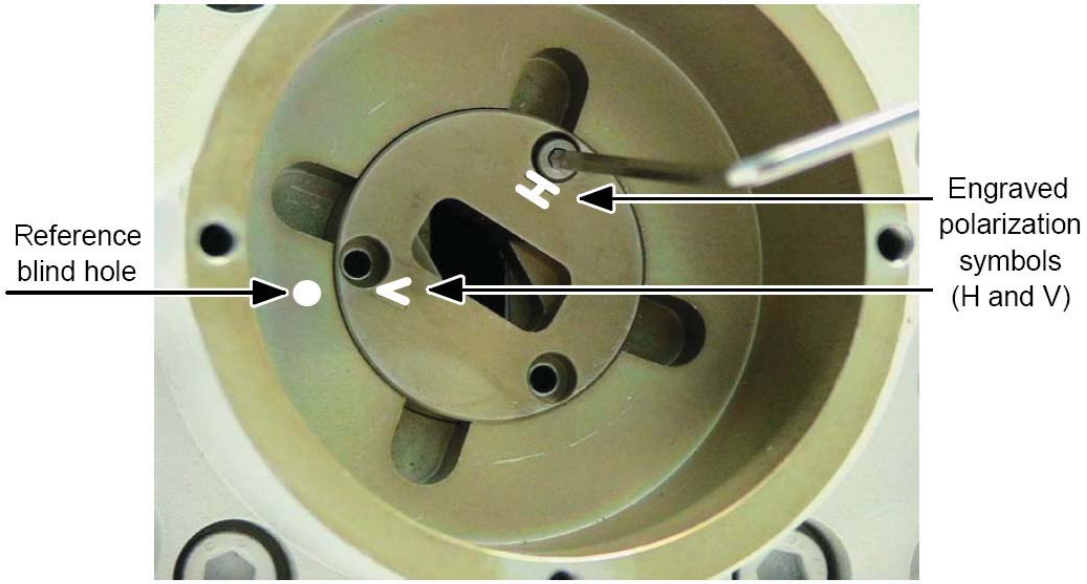


Figure 531. Coupler Polarization Change (6 GHz and 11-38 GHz) - 2nd Step execution

The “spigot” in the integrated antenna configuration is 30° and complete the change of polarization (90°).



Note: shown example is for V polarization

Figure 532. Coupler Polarization Change (6 GHz and 11-38 GHz) - Screws fixing

[3] Install the RF coupler on antenna’s nose adapter.

N.B. Before inserting the RF coupler on antenna’s nose adapter, it is mandatory to put SILICONE grease on the O-ring.

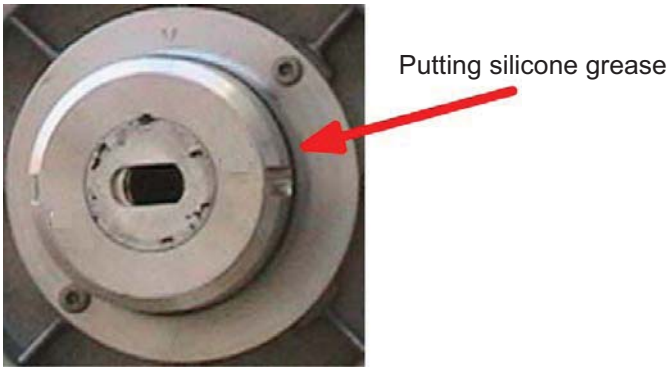


Figure 533. Putting silicone grease on O-ring before RF coupler insertion (6 GHz and 11-38 GHz)

Grasp the coupler by the handle. Fasten the coupler to the support through the four locking hooks that will be tightened onto the relative fastening brackets on the radio support. The label corresponds to the side of the pole.

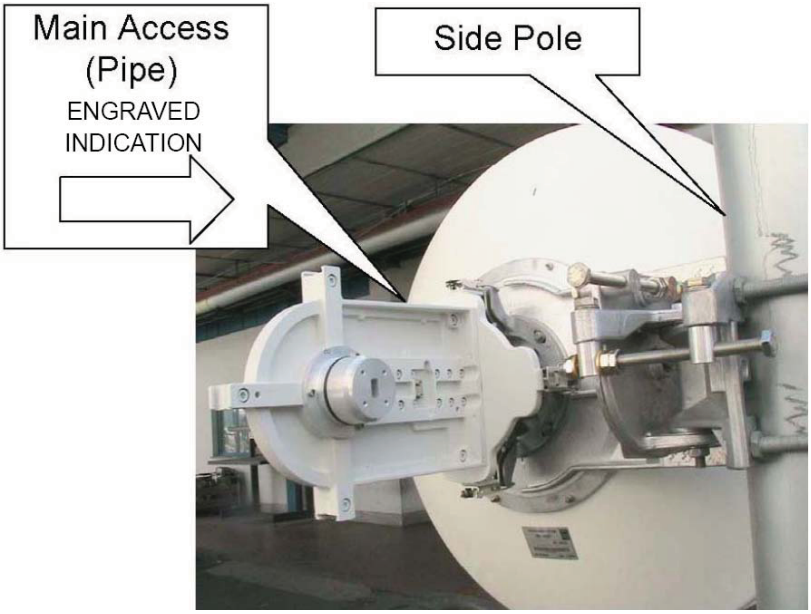
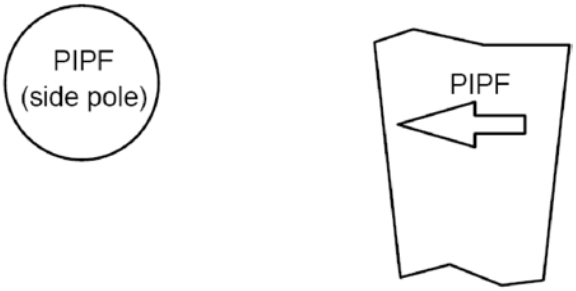


Figure 534. Installing the RF coupler to the radio support (6 GHz and 11-38 GHz)

WARNING: verify that the indication PIPF, engraved on the coupler, is directed toward the side pole:



[4] For each MPT-MC transceiver, take off the solar shield by unscrewing the screws placed on the solar shield back panel.

[5] Install the MPT-MC transceivers on the RF coupler.

N.B. Before inserting each MPT-MC on RF coupler's nose adapters, it is mandatory to put SILICONE grease on the O-rings.

Figure 535. Putting silicone grease on RF coupler's O-ring before MPT-MC insertion (6 GHz and 11-38 GHz)

Grasp each MPT-MC by the handle. Fasten the MPT-MC module to the support through the locking hooks that will be tightened onto the relative fastening bracket on the coupler.

Warning: Remember to set the correct polarization on the MPT-MC to match the coupler nose waveguide.

Warning: For the Horizontal polarization keep the Vertical polarization on the MPT-MC, but rotate and install the MPT-MC on the coupler in order to match the coupler waveguide, as shown in Figure 536.

The position of the PROTECTION MPT-MC is on the left side (as shown in Figure 536.).

The position of the MAIN MPT-MC is on the right side (as shown in Figure 537.).

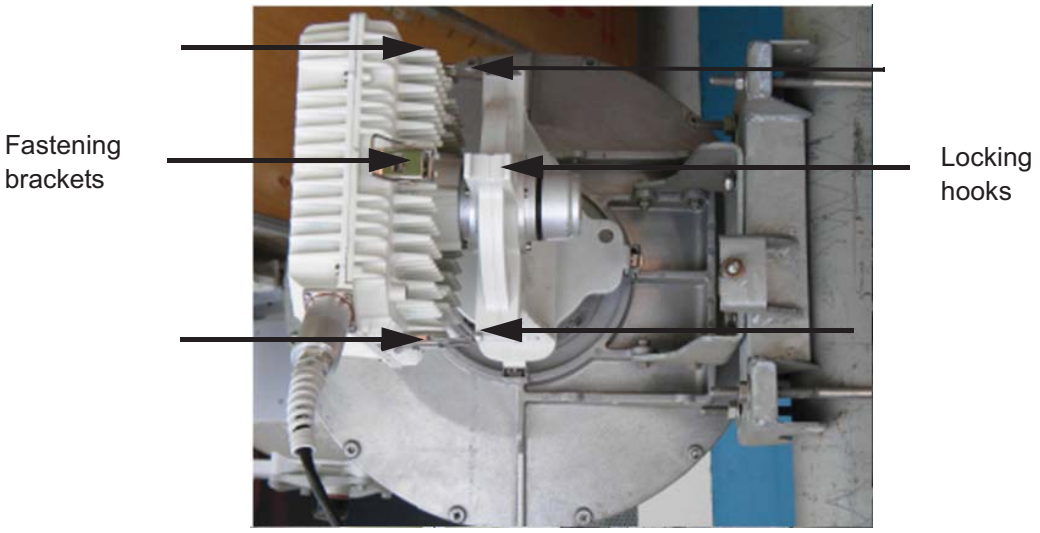


Figure 536. Installing the MAIN MPT-MC 1+1 on the RF coupler (6 GHz and 11-38 GHz)

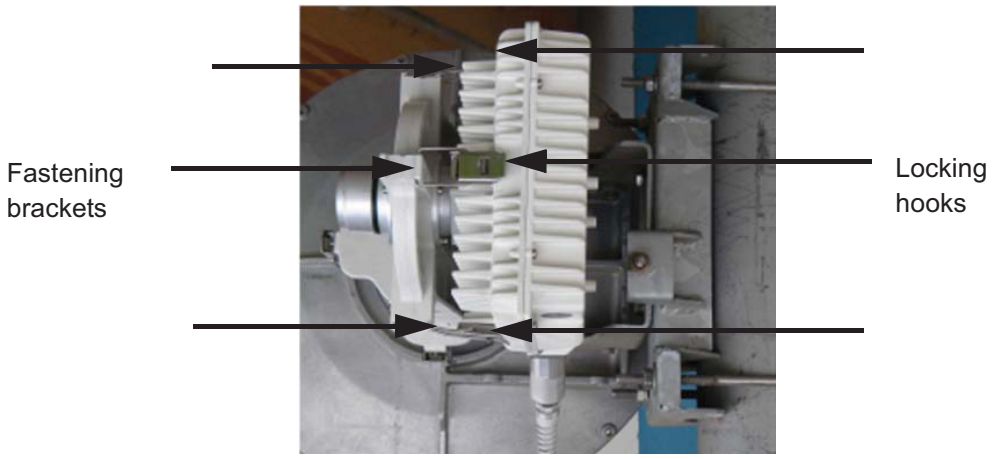


Figure 537. Installing the PROTECTION MPT-MC 1+1 on the RF coupler (6 GHz and 11-38 GHz)

[6] Ground the MPT-MC system.

[7] Pre-point the antenna.

[8] Reinstall the solar shield onto each MPT-MC transceiver by screwing on it the solar shield screws.

[9] Affix the EMF stickers.

4.1.8.9.2 7-8 GHz

[1] Check/Set the coupling between the TRANSCEIVER and BRANCHING boxes (only for MPT-MC with external diplexer).

[2] Install the Antenna and Pole Mounting.
This pole mounting is delivered as “pole mounting”, “antenna”, and frequency-specific “nose adapter” already assembled. The integrated antenna is mounted on the pole front.
Antenna and pole mounting must be installed in accordance with the manufacturer’s instructions.

[3] Check or change the polarization of the RF coupler (**solution A**).

a) Vertical Polarization to Horizontal Polarization
The point of reference is on the position V (Vertical Polarization).
To change the polarization, perform the following operations:
7) Unscrew the three screws.
8) Turn the thin twist and to make to coincide the position H to the point of reference ”A”
9) Screw the screws.

b) Horizontal Polarization to Vertical Polarization
The point of reference is on the position H (Horizontal Polarization).
To change the polarization, perform the following operations:
10) Unscrew the three screws.
11) Turn the thin twist and to make to coincide the position V to the point of reference ”A”
12) Screw the screws.

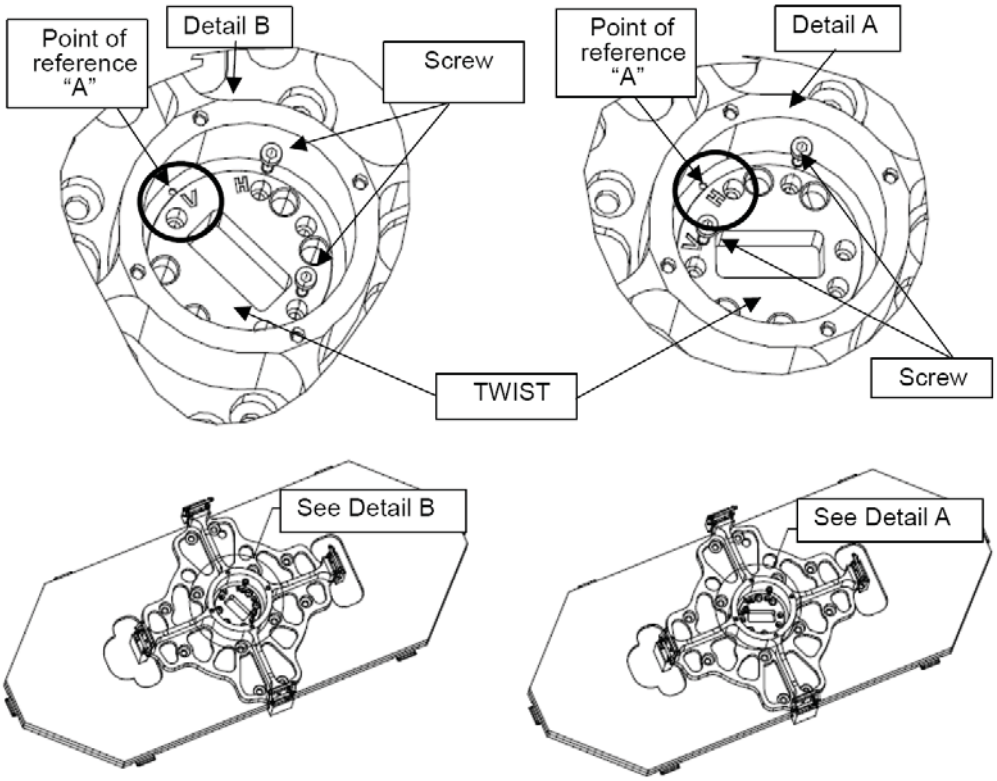


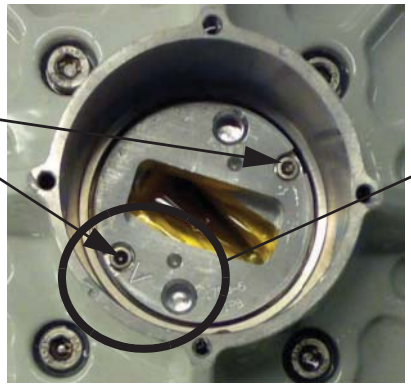
Figure 538. Coupler Polarization Change (7-8 GHz)

[4] Check or change the polarization of the RF coupler (**solution B**).

1

2 Vertical polarization

Unscrew the screws



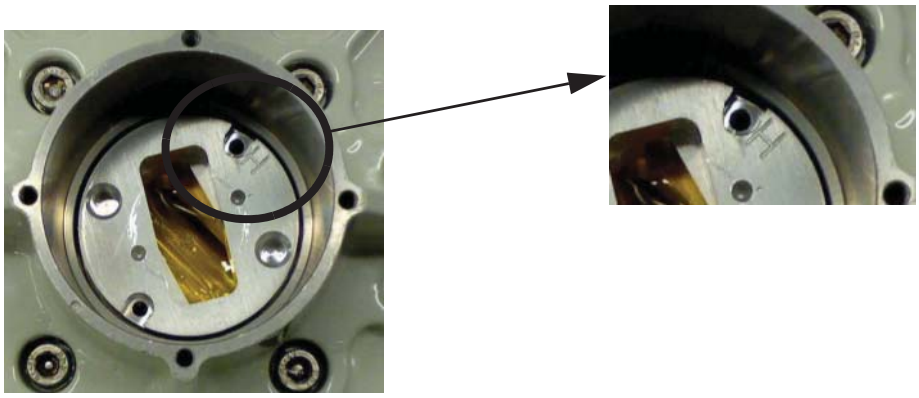
3 Remove the disk.

4

5 Rotate clockwise the disk on the bottom.

6 Upset the removed disk in order to show the side with H indication.

7 Reinsert the disk by setting letter H as in the figure.



[5] Install the RF coupler on antenna's nose adapter.

N.B. Before inserting the RF coupler on antenna's nose adapter, it is mandatory to put SILICONE grease on the O-ring.

Grasp the coupler by the handle. Fasten the coupler to the support through the four locking hooks that will be tightened onto the relative fastening brackets on the radio support .The label corresponds to the side of the pole.

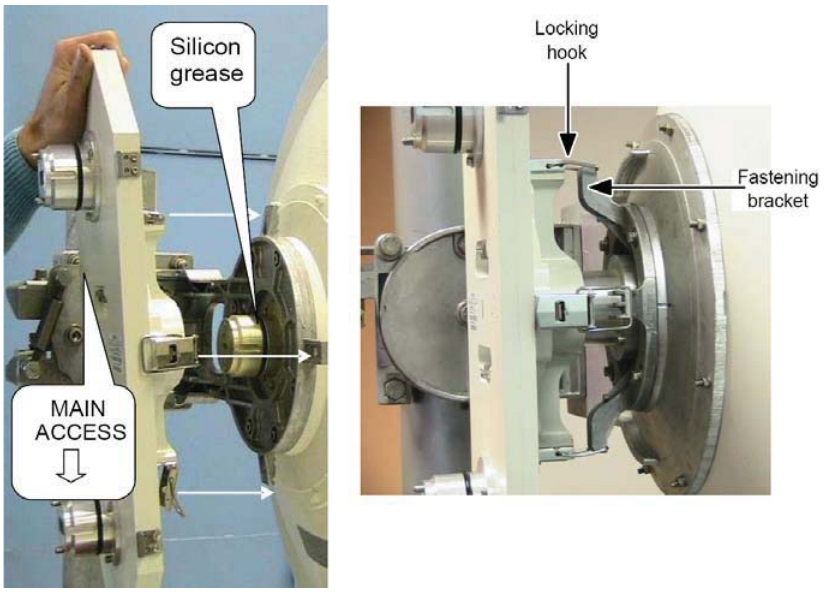


Figure 539. Installing the RF coupler to the radio support (7-8 GHz)

[6] For each MPT-MC transceiver, take off the solar shield by unscrewing the screws placed on the solar shield back panel.

[7] Install the MPT-MC transceivers on the RF coupler.

N.B. Before inserting each MPT-MC on RF coupler's nose adapters, it is mandatory to put SILICONE grease on the O-rings.

Figure 540. Putting silicone grease on O-ring before MPT-MC insertion (7-8 GHz)

Grasp the MPT-MC transceiver by the handle, and fasten it to the coupler support through the four locking hooks that will be tightened onto the relative fastening brackets on coupler.

The figure below shows the position of the MAIN MPT-MC. The PROTECTION MPT-MC must be installed on the upper side.

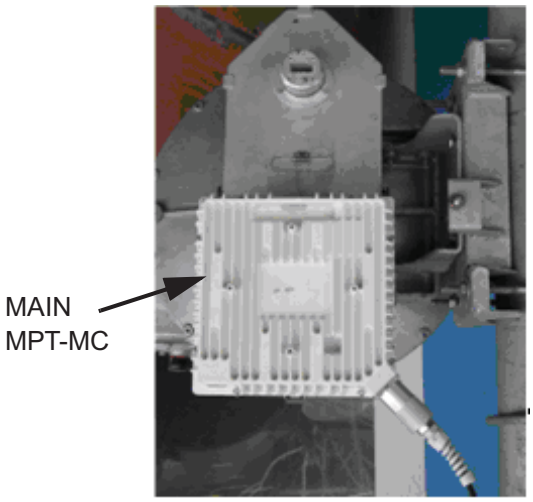


Figure 541. Installing the MPT-MC 1+1 on the RF coupler (7-8 GHz)

[8] Ground the MPT-MC system.

[9] Pre-point the antenna.

[10] Reinstall the solar shield onto each MPT-MC transceiver by screwing on it the solar shield screws.

[11] Affix the EMF stickers.

4.1.8.10 1+1 MPT-MC installation (non integrated antenna)

4.1.8.10.1 6 GHz and 11-38 GHz

[1] Install the Nose Adapter on the "Pole Mounting for Remote ODU" for MPT-MC.

[2] Install the "Pole Mounting for Remote ODU" for MPT-MC.
Pole mounting must be installed in accordance with the manufacturer's instructions.
In case of missing instructions, fix the U-bolts with 34 N x m tightening torque.

N.B. The pole mounting can be installed on the Right or Left hand side of the pole depending on the azimuth and on the configuration of the tower.

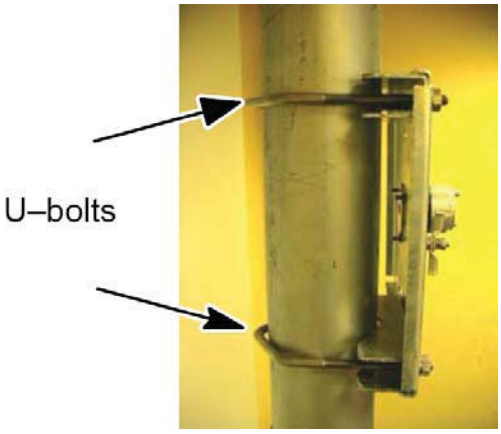


Figure 542. "Pole Mounting for Remote ODU" installation

[3] Install the RF coupler on the nose adapter.

N.B. Before inserting the RF coupler on nose adapter, it is mandatory to put SILICONE grease on the O-ring.

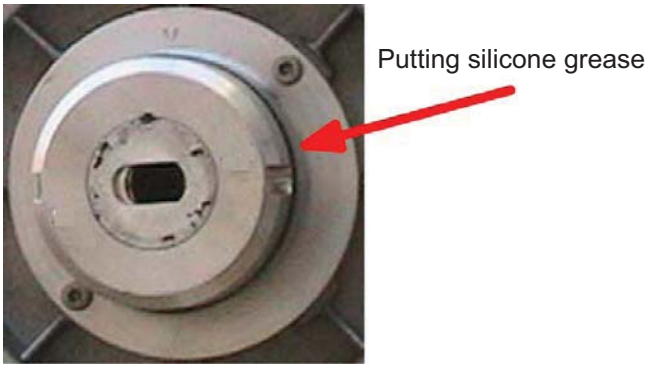


Figure 543. Putting silicone grease on O-ring before RF coupler insertion

Grasp the coupler by the handle. Fasten the coupler to the support through the four locking hooks that will be tightened onto the relative fastening brackets on the Pole Mounting.

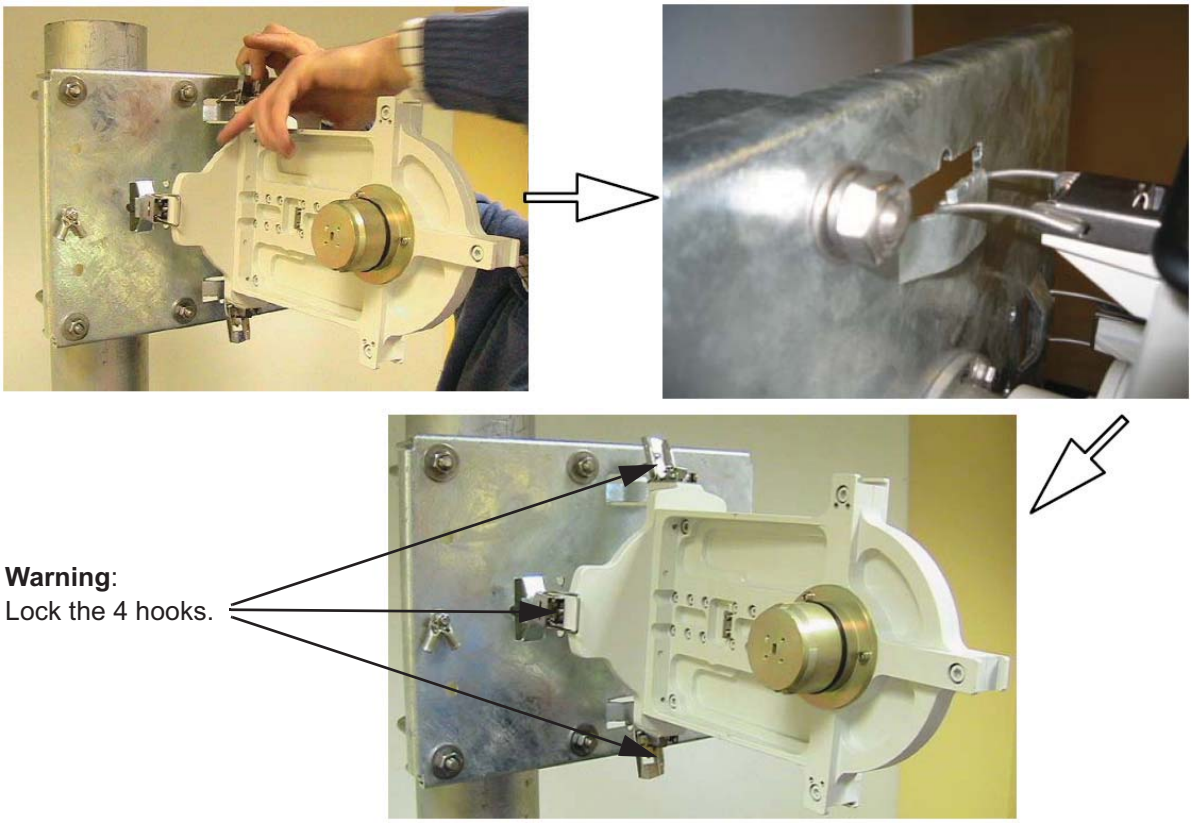


Figure 544. 6 GHz and 11-38 GHz RF coupler installation (with pole mounting P/N 3DB10137AAXX)

[4] For each MPT-MC transceiver, take off the solar shield by unscrewing the screws placed on the solar shield back panel.

[5] Install the MPT-MC transceivers on the RF coupler.

N.B. Before inserting each MPT-MC on RF coupler's nose adapters, it is mandatory to put SILICONE grease on the O-rings.

Figure 545. Putting silicone grease on RF coupler's O-ring before MPT-MC insertion (6 GHz and 11-38 GHz)

Grasp each MPT-MC by the handle. Fasten the MPT-MC module to the support through the locking hooks that will be tightened onto the relative fastening bracket on the coupler.

The figure below shows the position of the MAIN MPT-MC. The PROTECTION MPT-MC must be installed on the left side.

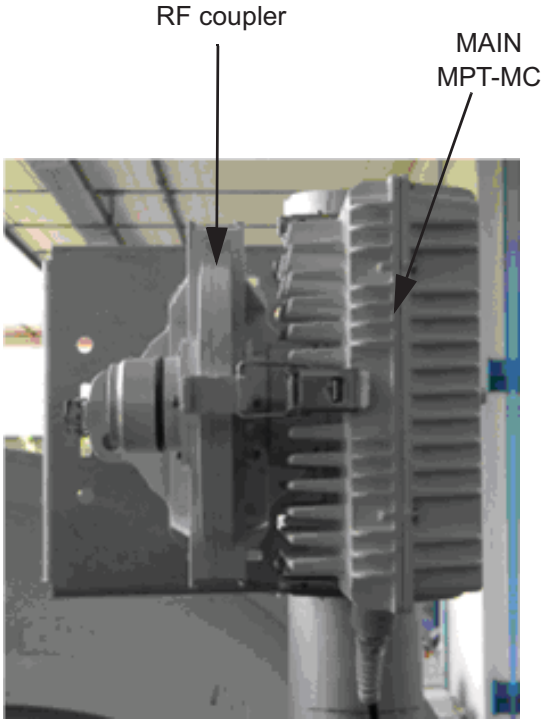


Figure 546. Installation of MPT-MC 1+1 (6 GHz and 11-38 GHz)

[6] Install the external Antenna with its own Pole Mounting.
The installation of the antenna and of its own pole mounting, as well as the antenna polarization check/change, must be done in accordance with the manufacturer's instructions.

[7] Connect the antenna side (flange) of the MPT-MC Pole Mounting's nose adapter to the external antenna, by means of the "Flextwist" waveguide.

[8] Ground the MPT-MC system.

[9] Pre-point the antenna.

[10] Reinstall the solar shield onto each MPT-MC transceiver by screwing on it the solar shield screws.

[11] Affix the EMF stickers.

4.1.8.10.2 7-8 GHz

[1] Check/Set the coupling between the TRANSCEIVER and BRANCHING boxes (only for MPT-MC with external diplexer).

[2] Install the Nose Adapter on the "Pole Mounting for Remote ODU" for MPT-MC.

[3] Install the "Pole Mounting for Remote ODU" for MPT-MC.
Pole mounting must be installed in accordance with the manufacturer's instructions.
In case of missing instructions, fix the U-bolts with 34 N x m tightening torque.

N.B. The pole mounting can be installed on the Right or Left hand side of the pole depending on the azimuth and on the configuration of the tower.

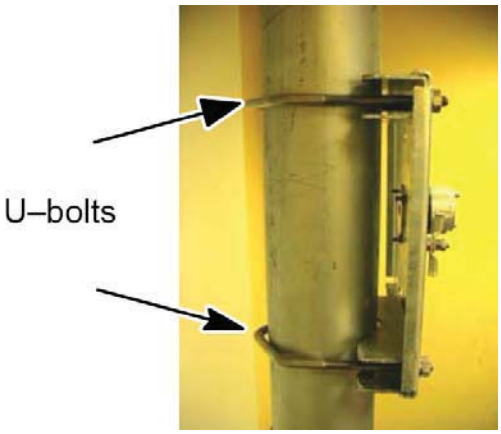


Figure 547. "Pole Mounting for Remote ODU" installation

[4] Install the RF coupler on the nose adapter.

N.B. Before inserting the RF coupler on nose adapter, it is mandatory to put SILICONE grease on the O-ring.

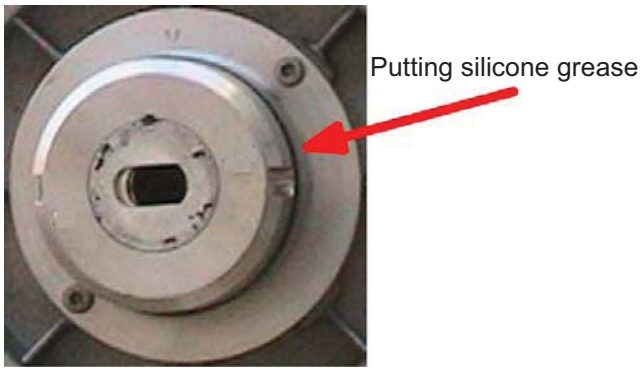


Figure 548. Putting silicone grease on O-ring before RF coupler insertion

Grasp the coupler by the handle. Fasten the coupler to the support through the four locking hooks that will be tightened onto the relative fastening brackets on the Pole Mounting.

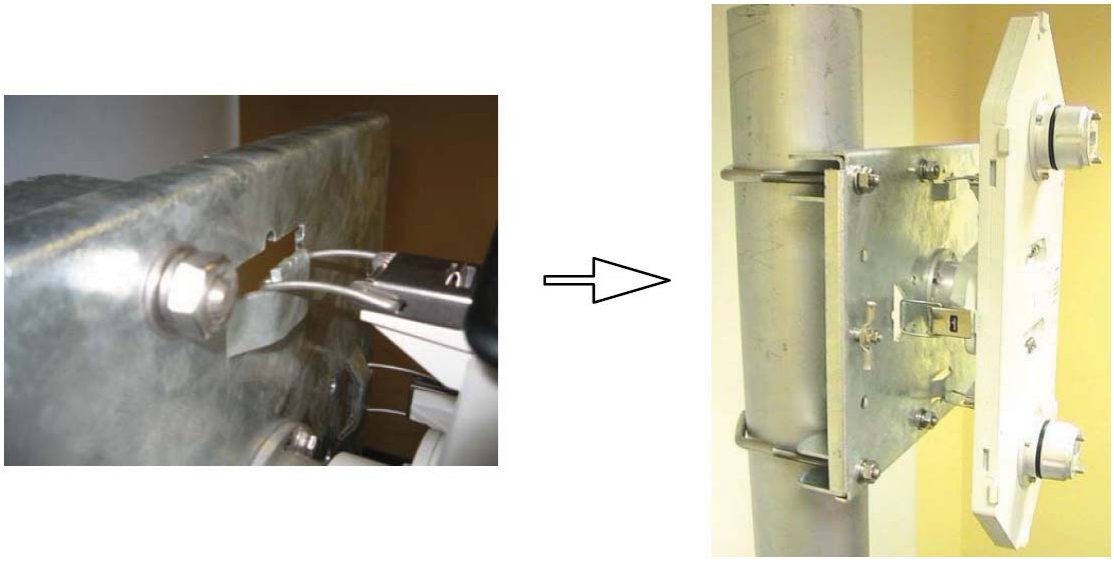


Figure 549. 7-8 GHz RF coupler installation (with pole mounting P/N 3DB10137AAAB)

[5] For each MPT-MC transceiver, take off the solar shield by unscrewing the screws placed on the solar shield back panel.

[6] Install the MPT-MC transceivers on the RF coupler.

N.B. Before inserting each MPT-MC on RF coupler's nose adapters, it is mandatory to put SILICONE grease on the O-rings.

Figure 550. Putting silicone grease on O-ring before MPT-MC insertion (7-8 GHz)

Grasp the MPT-MC transceiver by the handle, and fasten it to the coupler support through the four locking hooks that will be tightened onto the relative fastening brackets on coupler.

The figure below shows the position of the PROTECTION MPT-MC. The MAIN MPT-MC must be installed on the lower side.

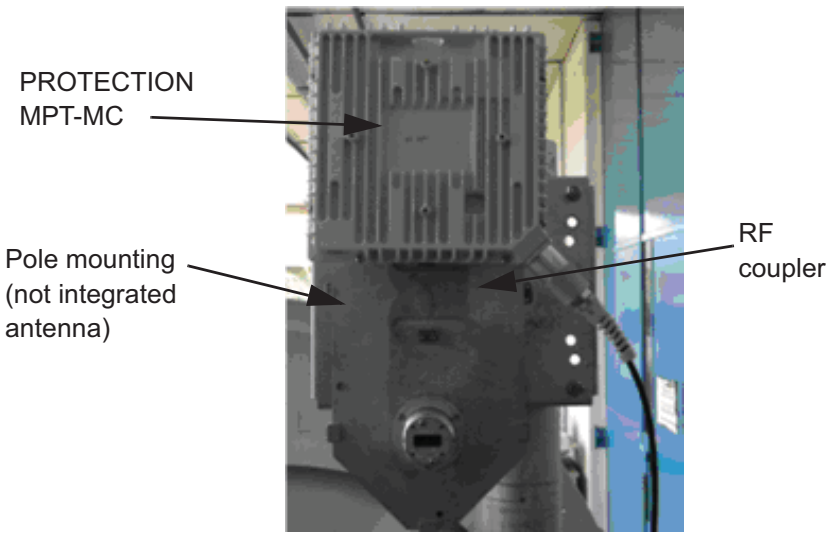


Figure 551. MPT-MC 1+1 installed on the RF coupler (7-8 GHz)

[7] Install the external Antenna with its own Pole Mounting.
The installation of the antenna and of its own pole mounting, as well as the antenna polarization check/change, must be done in accordance with the manufacturer's instructions.

[8] Connect the antenna side (flange) of the MPT-MC Pole Mounting's nose adapter to the external antenna, by means of the "Flextwist" waveguide.

[9] Ground the MPT-MC system.

[10] Pre-point the antenna.

[11] Reinstall the solar shield onto each MPT-MC transceiver by screwing on it the solar shield screws.

[12] Affix the EMF stickers.

4.1.8.11 How to terminate and to connect the Ethernet cable (MPT side)

Warning: to make sure of the continuity and avoid short circuit, all cables / connectors connections (RJ45, Coaxial, Ethernet, Optical Fiber..) made on the field have to be verified and checked with Cable tester. The waterproofness must be also checked.

To terminate the cable the Plug kit R2CT must be used.

The kit is made up of 10 items as shown in Figure 553.

Figure 552. Plug kit R2CT

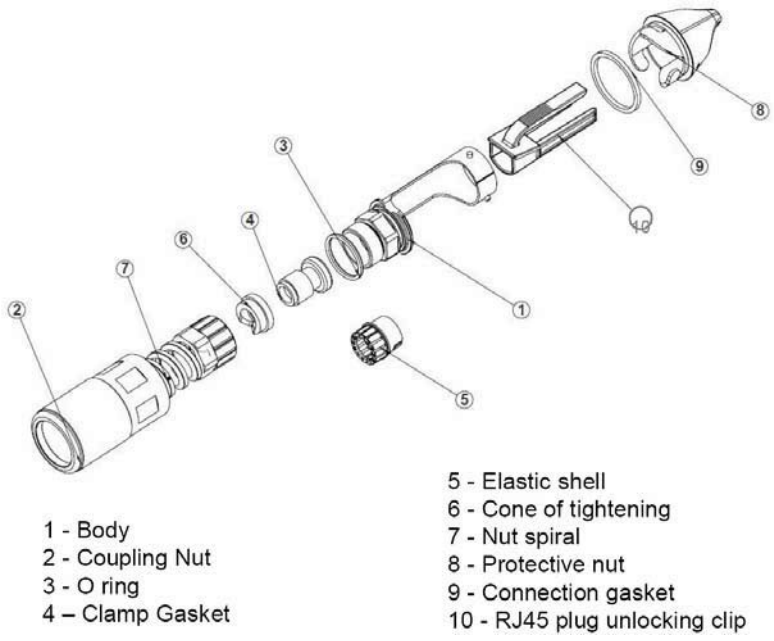


Figure 553. Plug kit R2CT items

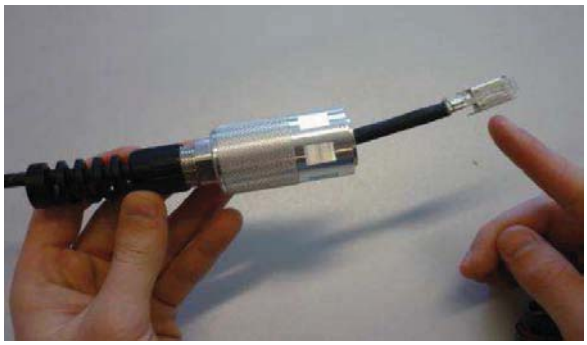
Note: The boot delivered with the RJ45 connector must not be used together with the R2CT.

4.1.8.11.1 Mating sequence instructions

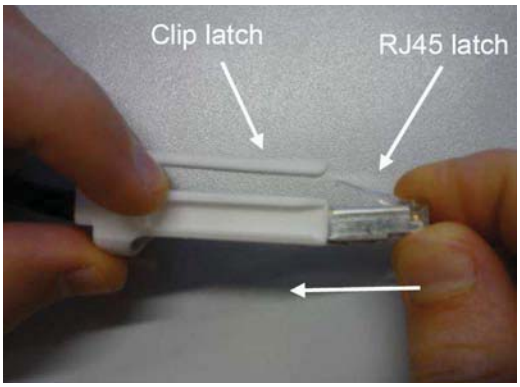
1 Turn and remove the protection cap.

2 Unscrew partially the nut spiral.

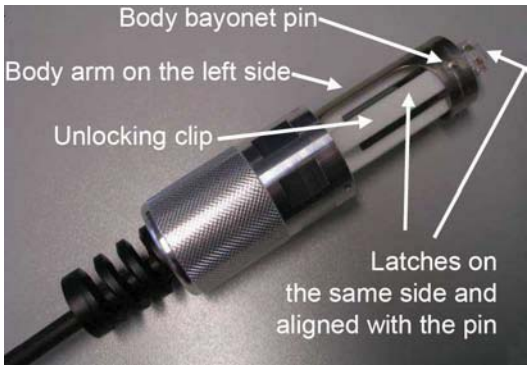
3 Pass the cable through the mini short kit plug and crimp the RJ45 plug according to the standard procedure. The boot of the connector must not be mounted.



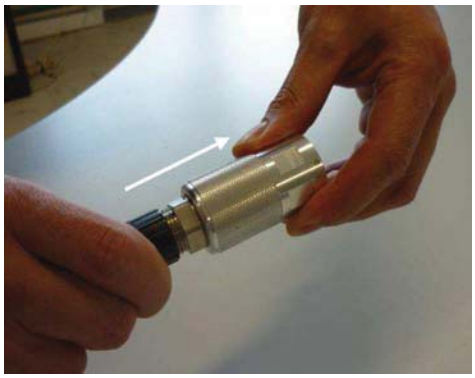
4 Insert the RJ45 plug inside the unlocking clip (keep attention to have the latches mechanisms on the same side)

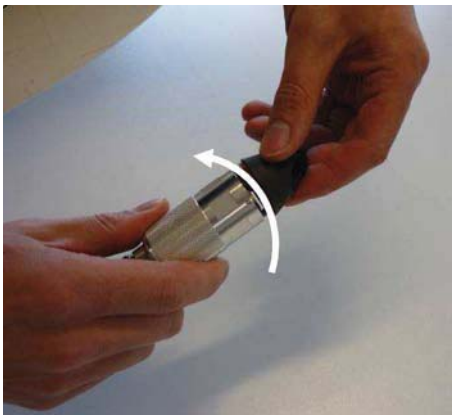


5 Pull the cable and insert the unlocking clip together with the RJ45 plug inside the body, the latches being aligned with the body bayonet pin. Place the body arm on the left side.



6 If you need to hoist the assembly, pull the coupling nut so as to cover the plug body and put back the protection cap on

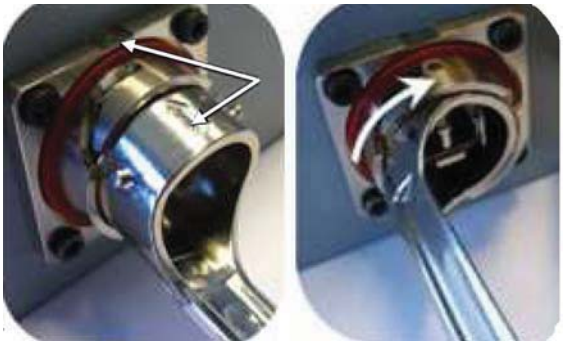




7 Tighten the nut spiral with a 21 mm wrench with a torque of 3N.m mini and 3,5 maxi. The cable is now fixed with the plug and ready to be pulled.

8 Install the cable then unscrew partially the nut spiral and remove the protection cap to connect to the receptacle

9 Align the two marks on the plug body and the receptacle, insert and rotate clockwise the plug body into the receptacle



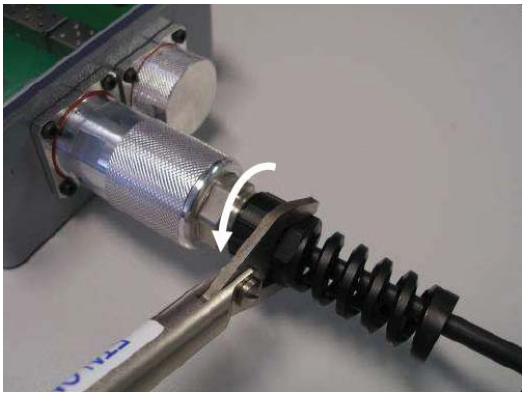
10 Connect the RJ45 plug to its socket by pushing the cable.

11 Push and rotate clockwise the coupling nut until secured onto the receptacle

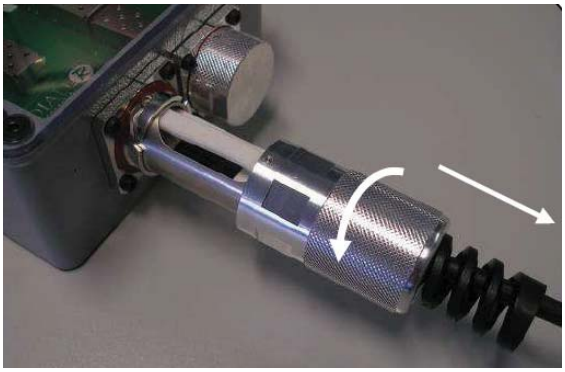
12 Secure the assembly by screwing the nut spiral with a 21mm wrench with a torque of 3 N.m mini and 3,5 N.m maxi

4.1.8.11.2 Unmating sequence instructions

1 Unscrew the nut spiral via 21 mm adapted wrench.



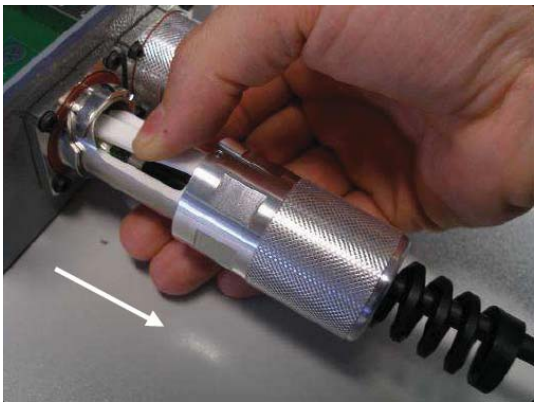
2 Rotate and unlock the coupling nut.



3 Engage the RJ45 unlocking clip forward until front stop.

4 Press on the unlocking clip latch.

5 Pull the clip and the cable rearward to disconnect the RJ45 plug.



6 Rotate and disconnect the R2CT plug body.

4.1.8.12 Installing the “Flextwist“ waveguide (not integrated antenna cases)

Refer to paragraph 4.1.6.14 on page 707.

4.1.8.13 MPT-MC system grounding

Refer to paragraph 4.1.6.15 on page 709.

4.1.8.14 Cable Grounding

Refer to paragraph 4.1.6.16 on page 710.

4.1.9 Power Extractor

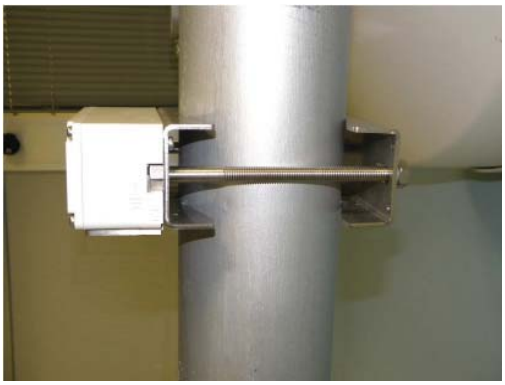
With the Power Extractor, to be installed close to the MPT-HC, the interconnection between the MSS and the MPT-HC can be made with a single electrical Ethernet cable by using the “Power Feed over Ethernet” solution (Ethernet traffic and Power Supply on the same cable). The Power Extractor then separates the Power Supply from the Ethernet traffic, which are separately sent to the MPT-HC.

The two cables, interconnecting the Power Extractor to the MPT-HC (the Power Supply cable to be connected to the **DC Out** connector of the Power Extractor and Ethernet cable to be connected to the **Data Out** connector of the Power Extractor), are provided, already terminated (2 m long), with the Power Extractor itself.

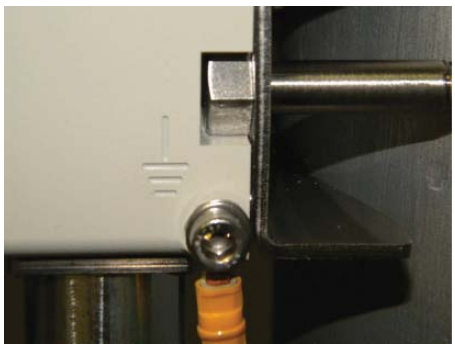
To prepare and to terminate the “Ethernet data + Power Supply” cable (to be connected to MSS and to the **DC+Data In** connector of the Power Extractor) follow the instructions given in para. 4.1.8.11 on page 760.

The R2CT connector used to terminate the cable (Power Extractor side) is provided with the Power Extractor.

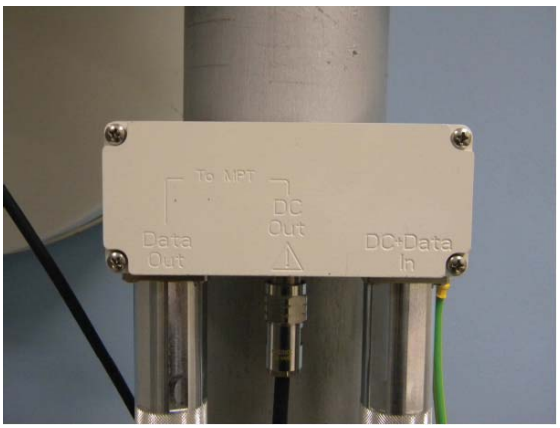
1 Install the Power Extractor on the pole close to the MPT-HC.



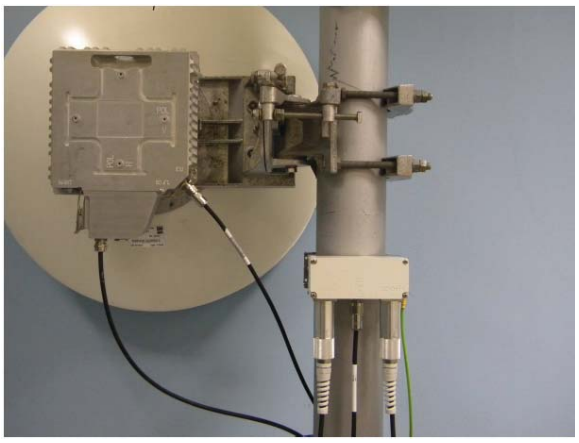
2 Connect the Power Extractor to the ground by using the 6 mm^2 grounding cable provided with the Power Extractor.



3 Connect the 3 cables (2 cables to the MPT-HC and 1 cable to the MSS).



4 The final installation is shown in the figure.



4.1.10 Nose Adapter for MPT-HC/V2 and MPT-MC

3DB01460AAXX	6 GHz Nose Adapter (for Not Integrated Antenna)
3DB01459AAAA	7/8 GHz Nose Adapter (for Not Integrated Antenna)
3CC50125AAXX	11 GHz Nose Adapter (for Not Integrated Antenna)
1AB146090003	13 GHz Nose Adapter (for Not Integrated Antenna)
1AB146090001	15 GHz Nose Adapter (for Not Integrated Antenna)
1AB146090002	18/23/25 Nose Adapter (for Not Integrated Antenna)
3DB02082AAXX	28/38 Nose Adapter (for Not Integrated Antenna)

4.1.11 Flextwists for MPT-HC/V2 and MPT-MC

1AF02951ABAA	6 GHz flextwist L = 1m (PDR-UDR)
1AF11977AAAA	7/8 GHz flextwist WR112 L = 1m (PDR84/UBR84)
3CC05751ACAA	11 GHz flextwist L = 0.6m
3CC05751ACAA	13 GHz flextwist L = 0.6m
3CC05750ACAA	15 GHz flextwist L = 0.6m
3CC05749ACAA	18/23/25 GHz flextwist L = 0.6m
3DB00682AAXX	28/38 GHz flextwist L = 0.6m

4.1.12 Antenna Alignment

This section includes:

4.1.12.1 Preparation

Warning: to make sure of the continuity and avoid short circuit, all cables / connectors connections (RJ45, Coaxial, Ethernet, Optical Fiber..) made on the field have to be verified and checked with Cable tester. The waterproofness must be also checked.

Before aligning antennas ensure:
– The ODUs are powered up at both ends of the link.
– Transmit and receive frequencies are correctly set.
– Transmit powers are correctly set and transmit mute is turned off.

Note

If frequency and/or power settings are not correct for the application, interference may be caused to other links in the same geographical area.

4.1.12.2 Signal Measurement

Two receive signal-strength indicators are provided to assist antenna alignment, RSL in the WebEML Performance screen, and the RSSI voltage at the BNC connector on the ODU300 and at LEMO connector on the MPT-HC/MPT-HC V2/MPT-MC. Refer to:

4.1.12.2.1 Using RSL Data

As WebEML is accessed via connection to the MSS, a separate means of communication such as two-way radio or cell phone is required between the WebEML operator and the person at the antenna.

To align using RSL:

1) Monitor RSL in the WebEML Performance screen.
2) Set antenna alignment for maximum RSL.
3) Repeat for the far end of the link.
4) Compare actual RSLs with the expected RSLs from the link installation datapack. RSL measurement accuracies:

   a) ± 2 dB for levels -40 to -70 dBm, over a temperature range of 0 to +35°C.
   b) ±4 dB for levels -25 to -85 dBm, over an extended -33 to +55°C range.

4.1.12.2.2 Using the RSSI Voltage at the ODU300

A voltmeter, such as a multimeter, is used to measure RSSI voltage at the BNC connector on the ODU. A suitable BNC to banana-plug connecting cable is available as an optional ODU accessory.

1) Connect the voltmeter to the BNC connector. Center pin is positive. Use a low voltage range for best resolution, nominally 2.5 Vdc FSD.

2) Adjust antenna alignment until the voltmeter reading is at minimum value.

3) Repeat for the far end of the link.

Check and record the peak voltage at each end. The RSSI voltage provides a direct relationship with RSL, as follows:

Units	Measurement (with ODU300)									
BNC (Vdc)	0.25	0.5	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5
RSL (dBm)	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100

4) Compare actual RSLs to the expected RSLs from the link installation datapack. Refer to par. 4.1.12.2.3.1 - RSL Measurement Guidelines.

5) Replace the BNC weatherproofing.

Note

Failure to replace the RSSI BNC weatherproof cap may result in damage to the ODU.

4.1.12.2.3 Using the RSSI Voltage at the MPT-HC/MPT-MC

A voltmeter, such as a multimeter, is used to measure RSSI voltage.

Use the MPT/AWY Service Cord for the power monitoring in addition to a voltmeter.

1) Connect a voltmeter to the MPT-HC/MPT-MC through the MPT/AWY Service Cord.

2) Adjust antenna alignment until the voltage reading is at maximum value.

3) Repeat for the far end of the link.

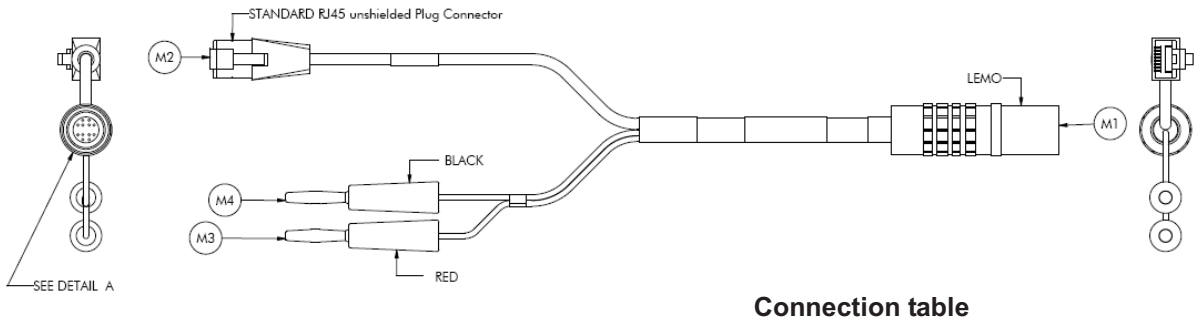
Check and record the peak voltage at each end. The RSSI voltage provides a direct relationship with RSL, as follows:

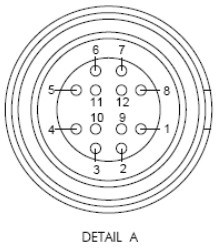
Units	Measurement (with MPT-HC/MPT-MC)									
Service kit cable (Vdc)	5	4.71	4.12	3.5	2.9	2.3	1.71	1.11	0.59	0.14
RSL (dBm)	-10	-20	-30	-40	-50	-60	-70	-80	-90	-100

4) Compare actual RSLs to the expected RSLs from the link installation datapack. Refer to par. 4.1.12.2.3.1 - RSL Measurement Guidelines.

MPT/AWY Service Cord operative information

Figure 554. herebelow shows the cable P/N 3CC52191AAXX to be used during the Commissioning to point the antenna.





LEMO wire 6 = ground

Connection table

Signal	M1	M2	M3	M4
ETH_TXP_T	1	3		
ETH_TXN_T	2	6		
GND	3			X
ETH_RXP_T	4	1		
ETH_RXN_T	5	2		
PRX_OUT	12		X	

Figure 554. MPT/AWY Service Cord

Connector usage:

– **(M1)** LEMO connector, to be plugged into LEMO connector on MPT-HC/MPT-HC V2/MPT-MC.

– banana plugs **(M3)** and **(M4)**: output is a 0 to +5V DC voltage proportional to the radio Rx field. Duringequipment line–up, through a multi–meter it is possible to easily point the antenna until the measuredvoltage is the maximum, corresponding to the maximum radio Rx field.

– **(M2)** Connector: for Alcatel–Lucent internal use only.

4.1.12.2.3.1 RSL Measurement Guidelines

Interference for ODU300 (Not applicable for MPT-HC/MPT-MC)

The RSSI filter has a nominal 56 MHz bandwidth, which means that depending on the channel bandwidth used, multiple adjacent channels will be included within the filter passband. Normally this will not cause a problem as antenna discrimination (beamwidth) and good frequency planning should exclude adjacent channel interferers. However at sites where this is not the case, ATPC should not be enabled.

– ATPC operates on the RSL. Any interferer that affects the RSL will adversely affect ATPC operation

– Check for interference by muting the Tx at the far end and checking RSSI/RSL at the local end

RSSI/RSL Accuracy

When checking RSSI/RSL against the predicted link values ensure appropriate allowances are made for Tx power-setting accuracy, path-loss calculation accuracy, and RSSI/RSL measurement accuracy.

– For a worst-case the overall accuracy is the sum of the individual accuracy limits, which for an ODU300 link would be ±4 dB of the predicted value (±2 dB for transmit, ±2 dB for receive, 0 to 35°C), aside from the path-loss calculation accuracy, which should be within limits of ±3 dB.

– Typically, where the measured RSSI/RSL is more than 4 dB lower than the expected receive level you should check the path survey results, path calculations and antenna alignment.

Note

When checking RSSI/RSL ensure the measurement is made under normal, unfaded and interference-free path conditions.

– A discrepancy of 20 dB or greater between the measured and calculated RSSI/ RSLs suggests an antenna is aligned on a side lobe, or there is a polarization mismatch.

4.1.12.3 Aligning the Antenna

Antenna alignment involves adjusting the direction of each antenna until the received signal strength reaches its maximum level at each end of the link.

Fine adjustment for azimuth (horizontal angle) and elevation (vertical angle) is built into each antenna mount.

Adjustment procedures will be provided with each antenna.

If the horizontal adjuster does not provide sufficient range to locate the main beam, the antenna mounting brackets will need to be loosened and the antenna swiveled on its pole mount to locate the beam.

Before doing this ensure the horizontal adjuster is set for mid-travel.

Some mounts for larger antennas have a separately clamped swivel base to allow the loosened antenna to swivel on it without fear of slippage down the pole. Where such a mount is not provided a temporary swivel clamp can often be provided using a pair of pipe brackets bolted together immediately below the antenna mount.

Note

Ensure antennas are aligned on the main beam, and not a side lobe.
For guidance, refer to the sections Locating the Main Beam (see par. 4.1.12.4.1 on page 776) and Tracking Path Error (see par. 4.1.12.4.2 on page 777).
Ensure ATPC is turned off during the alignment procedure.

4.1.12.3.1 Standard Alignment Procedure

To align an antenna:

1) Loosen the azimuth adjuster on the antenna mount (horizontal angle) and adjust azimuth position for maximum signal strength. Ensure antennas are aligned on the main beam, and not a side lobe.

2) Tighten the azimuth securing mechanism. Ensure signal strength does not drop as it is tightened.

3) Loosen the elevation adjuster (vertical angle) and adjust for maximum signal strength. Ensure antennas are aligned on the main beam, and not a side lobe.

4) Tighten the elevation securing mechanism. Ensure signal strength does not drop as it is tightened. The terminal is now aligned and ready to carry operational traffic.

5) Record RSL and/or RSSI voltage in the commissioning log.

4.1.12.3.2 Additional procedure for CCDP XPIC links with MPT-HC V2

Note

Procedures are provided for the alignment of dual polarized antennas, and for protected XPIC links.

For CCDP (Co-channel Dual Polarized) XPIC (Cross Polarized Interference Cancellation) links it is important that antenna feeds are correctly aligned to achieve optimum XPIC performance.

While a dual-feed antenna may be specified with a cross polarization discrimination of 30 dB, unless the antenna-to-antenna alignment over a link is correct, the effective discrimination can be significantly less.

– The horizontal-to-vertical receive signal discrimination for satisfactory XPIC operation must not be less than 20 dB, and where possible should be set for optimum discrimination using this procedure.

– High performance shielded antennas typically exhibit 30 dB cross polarization discrimination whereas 40 dB is typical for purpose-designed, high polarization discrimination antennas.

– The received-signal V and H discrimination can be checked using the **Measurement** tab-panel of the MPT-HC V2, as shown in Figure 555.

Figure 555. XPD measurement

The cross pole discrimination measures the V and H signal discrimination in dB at the input to the MPT-HC V2 (from the antenna feeds). The improvement in signal discrimination provided by the XPIC function is in addition to this measurement.

Note

This alignment procedure is intended for dual-polarized antennas, but is also generally applicable to installations using separate antennas for V and H planes.

4.1.12.3.3 Alignment Procedure for Dual polarized Antenna

The following procedure details steps required to:

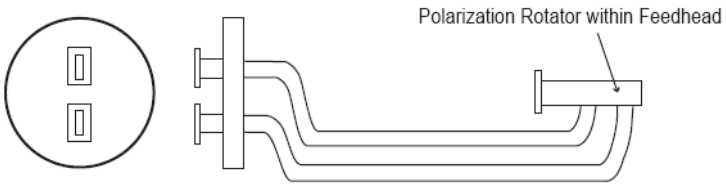
– Check and if necessary set feedhead alignment using a spirit level.

– Align the antennas at each end using just one of the feeds, H or V (Standard co-plane antenna alignment).

  • Where the V and H waveguide ports on an antenna are not marked they can be identified by the orientation of the waveguide slots.

  • Where a dual-polarized antenna presents the same orientation on both ports, one should have a straight waveguide feed to the antenna feedhead, the other will include a 90 degree twist or have a straight waveguide feed but with a polarization rotator in the feedhead. Generally the polarization rotator will act on the outer-most waveguide on the feedhead.

  • For convention, if ports are not marked for V and H, it is recommended that the port that has the straight waveguide feed or is connected to the inner-most waveguide at the feedhead is selected as the horizontal antenna feed port. The following graphic of an antenna feedhead assembly illustrates this. The top port is connected to the inner feed on the feedhead, and with the port orientation shown provides a horizontally polarized feed. The lower port has a rotator included in the feedhead to provide a vertical feed.



- Ensure the same port is selected for vertical at both ends.
  Where possible, the same 'above and below' relationship of the feed ports should be used at both ends. For example, if at one end the horizontal feed port is located above the vertical port, as in the example above, then the same relationship should be used at the other end.

– Check cross pole discrimination (XPD) in the Measruement tab-panel of the MPT-HC V2.

– Optimize alignment of the feed-heads to achieve maximum cross polarization discrimination.

Note

This procedure assumes that the antennas used at each end of the link do comply with their cross-polarization discrimination specification. If in doubt, refer to the antenna supplier.

Procedure:

[1] Static Feedhead Alignment

This procedure would normally be completed in conjunction with antenna alignment, step 2, to ensure no misalignment of skew angle is introduced during the pan and tilt process.It should be completed before any feedhead weatherproofing is applied, so that a spirit level can be used against the flange to check and set precise physical vertical / horizontal alignment of the feeds:

- Do not rely on antenna markings as these will not be accurate where a mount is not perfectly level.

- Set the spirit level against the flange of the feedhead. Take care that only the flange of the feedhead is measured, so that no error is introduced by any minor misalignment of the mating flexible waveguide flange. See Figure 556.

Figure 556. Checking Feedhead Flange with a Spirit level

- If not exactly vertical or horizontal, adjust the feedhead skew angle (rotate the feedhead) until correct (spirit level bubble is precisely centered). For a typical feedhead check both flanges for level, using an end point half way between the level points of the two flanges should there be any discrepancy between the two.

[2] Align Antennas

Align the antennas at both ends using the standard (co-plane) alignment procedure, but using just one of the feeds, V or H. Refer to Standard Alignment Procedure (see par. 4.1.12.3.1 on page 771).

If major adjustment to the pointing of the antenna is made during this process, recheck the feedhead skew angle.

When correct, proceed to step 3.

[3] Check Operation and End-End Feedhead Alignment

Power-up both V and H links and check they are operating normally and are alarm-free. Use the Measurement tab-panel of the MPT-HC V2 to check that:

- Tx power measurements are within 1 dB (typically). If not check Tx power settings.
- RSL measurements are within 2 dB. See Using RSL Data (see par. 4.1.12.2.1 on page 767) for guidance on measurement accuracy.
- Links are operating error-free.

Note

Where there is potential for interference from other links in the same geographical area, check by turning the far end transmitter(s) off and measuring the local end RSL on both V and H feeds.

[4] Use the cross pole discrimination (XPD) measurement provided in the Measurement tab-panel of the MPT-HC V2 to measure the actual V and H signal discrimination from each antenna.

- Where measured XPDs are better than 25 dB no further adjustment is needed
- Where less than 25 dB proceed to the next step.

Caution. It is possible for a spurious XPD figure of about 50 dB to appear in instances where there is major mis-alignment. Note that the raw XPD should never read higher than the XPD specification of the antennas, which for most high performance dual-pol antennas will be between 30 dB to 35 dB.

Note

The alignment procedures listed under steps 1 and 2 should result in a discrimination of better than 25 dB, as measured in the Measurement tab-panel of the MPT-HC V2, which is comfortably within the operating limits of XPIC. However, for best results and greater operating margins during fading, feedhead alignment should be optimized using the following procedure.

[5] Optimize End-End Feedhead Alignment

This procedure corrects for any minor rotational alignment between antennas at each end.

One antenna is the reference antenna and its feed-head assembly is not adjusted during this procedure.

Note

Only check/adjust skew angles on one antenna. If both antennas are adjusted and re-adjusted there is potential for progressive misalignment to occur. Select one antenna as the reference antenna.
On long hops and where fading is prevalent there is potential for the V and H plane paths to be affected differently and to therefore exhibit variable cross-polarization discrimination. This alignment procedure must be conducted during periods of known, stable path conditions.

[6] Determine which end of the link is to provide the reference antenna, and at the opposite end open the Measurement tab-panel of the MPT-HC V2 for the V and H.

[7] Adjust the feedhead skew angle of the antenna for maximum XPD on both V and H link. If the maximums for each are at (slightly) different angles, adjust for a mid-point.

Note

Ensure that as you adjust the skew angle, the physical antenna alignment does not shift, which would make it necessary to repeat step 2. Check that antenna mounting bolts and azimuth and elevation adjuster locks have been correctly tightened.
The maximum points may be quite sharp, rotate the feedhead slowly to ensure they are not missed.

[8] Check the XPD on the link at the reference end of the link, which should be within 1 to 2 dB of the measurements at the adjusted end.

[9] On completion ensure feedhead bolts are correctly tightened - check that XPDs do not change during tightening.

[10] Retain feed-head adjustment data for the commissioning records.

4.1.12.4 Main Beams and Side Lobes

This section describes how to locate the main beam, and typical tracking path errors.

4.1.12.4.1 Locating the Main Beam

Ensure the antennas are aligned on the main beam, and not a side lobe.

Once a measurable signal is observed, very small alignment adjustments are required to locate the main beam. For instance, a 1.2m antenna at 23 GHz typically has 0.9° of adjustment from center of main beam to the first null (0.4° to the -3 dB point). Antenna movement across the main beam will result in a rapid rise and fall of signal level. As a guide, 1 degree of beam width is equivalent to moving approximately 1.0 mm around a standard 114 mm (4.5 in.) diameter O/D pipe.

Antennas can be verified as being on main beam (as opposed to a side lobe) by comparing measured receive signal level with the calculated level.

Signal strength readings are usually measurable when at least a main beam at one end and first side lobes at the other are aligned.

The strongest signal occurs at the center of the main beam. The highest first lobe signal is typically 20 - 25 dB less than the main beam signal. When both antennas are aligned for maximum main beam signal strength, the receive signal level should be within 2 dB of the calculated level for the path. This calculated level should be included in the installation datapack for the link.

Figure 557. is an example of a head-on, conceptual view of the beam signal strength, with concentric rings of side lobe peaks and troughs radiating outward from the main beam.

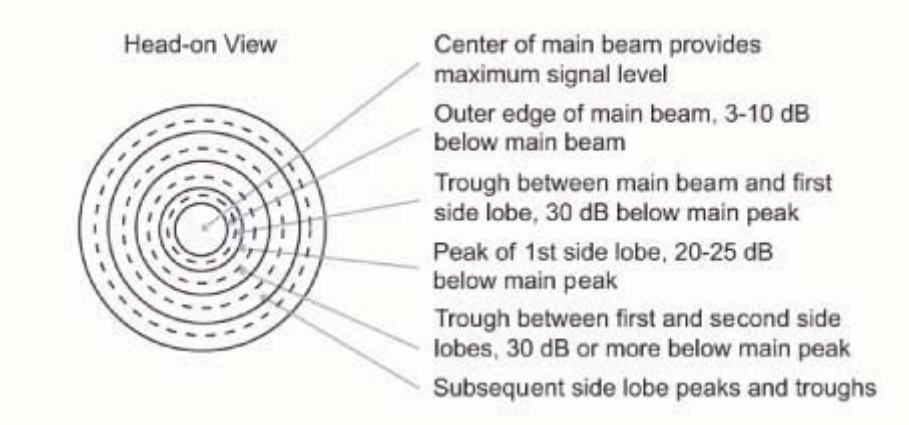


Figure 557. Indicative head-on signal pattern for a parabolic antenna

4.1.12.4.2 Tracking Path Error

Side lobe signal readings can be confused with main beam readings. This is particularly true for the first side lobe as the signal level at its center is greater than the signal level at the edges of the main beam, and if tracking on an incorrect elevation (or azimuth) a false impression of main beam reception can be obtained. This illustration shows an example of this with a simplified head-on view of an antenna radiation pattern, and tracking paths for three elevation settings.

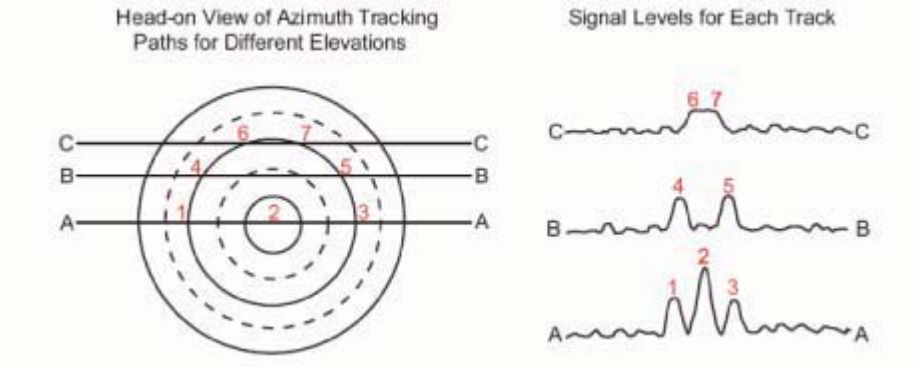


Figure 558. Example Tracking Path Signals

Line AA represents the azimuth tracking path of a properly aligned antenna.The main beam is at point 2, and the first side lobes at points 1 and 3. Line BB represents the azimuth tracking path with the antenna tilted down slightly. Signal strength readings show only the first side lobe peaks, 4 and 5. In some instances the side lobe peaks are unequal due to antenna characteristics, which can lead to the larger peak being mistaken for the main beam. The correct method for locating the main beam in this case is to set the azimuth position midway between the first side lobe peaks, and then adjust the elevation for maximum signal.

Line CC represents an azimuth tracking path with the antenna tilted down further still. The first side lobe signal peaks (6 and 7) appear as one peak, leading to a mistaken interpretation of a main beam. The correct method for locating the main beam is to set the azimuth at mid peak, between 6 and 7, and then adjust elevation for maximum signal.

This first side lobe peaking is probably the most frequent cause of misalignment in both azimuth and elevation, especially so if one side lobe peaks higher than the other, as shown in Figure 559. A common error is to move the antenna left to right along line DD, or top to bottom along line EE, always ending up with the maximum signal at position 1.

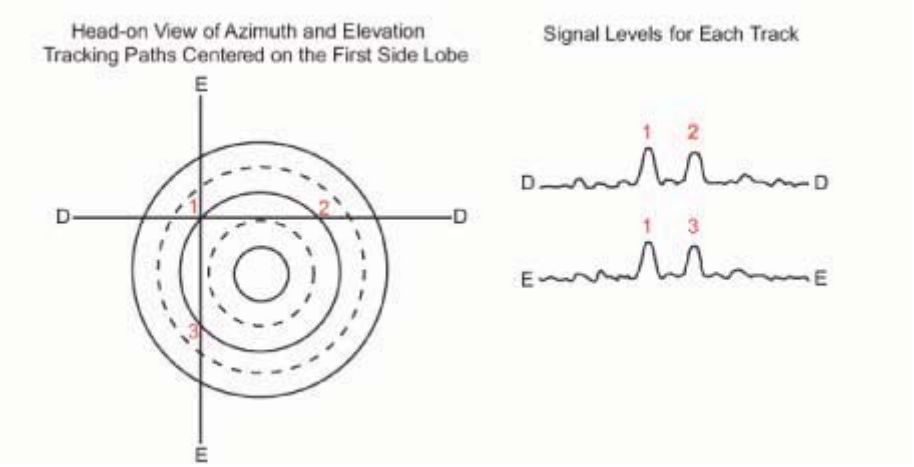


Figure 559. Example Tracking Path Signals on the First Side Lobe

4.2 Software local copy

This section explains how to prepare the TCO Suite and WebEML environment in your PC.

– Getting Started (par. 4.2.1 on page 779)

– PC Characteristics (par. 4.2.2 on page 779)

– Local copy of the Software Package (SWP) to the PC (par. 4.2.3 on page 780)

– Local copy of the WebEML and TCO Suite Software to PC (par. 4.2.4 on page 782)

  • Java JRE Package Installation (par. 4.2.4.1 on page 787)

  • Local Copy of WebEML (JUSM/ WebEML) (par. 4.2.4.2 on page 787)

  • Local Copy of TCO Suite Installation (par. 4.2.4.3 on page 788)

– Configure PC Network Card to Connect to NE (par. 4.2.5 on page 790)

– Download Software Package to NE (par. 4.2.6 on page 794)

  • Server Access Configuration (par. 4.2.6.1 on page 794)

  • Init SW Download (par. 4.2.6.2 on page 795)

  • Software Status Detail (par. 4.2.6.3 on page 798)

4.2.1 Getting Started

Note

Read the following before starting.

– The operator must be familiar with the use of personal computers in WINDOWS environment, internally from which the NE application software operates.

– TCO Suite and WebEML applications are on one CD. Software Package (SWP) is on another CD. Verify versions of the CD-ROM.

– To properly install TCO Suite and WebEML applications, a PC is required, having the characteristics specified here below.

4.2.2 PC Characteristics

The PC to use for TCO Suite and WebEML applications must meet following characteristics:

PC Hardware Configuration:

– CPU: AMD Atlhon/Intel Celeron/Intel Pentium 4 or higher

– RAM: 500 MB (1 GB recommended - strongly recommended with Windows Vista)

– Hard Disk space: 1.5 GB (available space for log files, JRE excluded)

– Display Resolution: 1024x768 pixel

– DVD-ROM Drive

– Ethernet Interface: Ethernet Card 10/100 Mbps

Operating Systems Supported:

– Microsoft Windows XP Professional service pack 3 or Microsoft Windows Vista Ultimate service pack 2

Additional requirements:

– Microsoft Internet Explorer 6 SP1, 7, 8, Mozilla Firefox 2, 3, 3.5

– The Administrator password is needed only for Java installation.

– When Java has been installed, the standard user can run the TCO Suite

– Java Runtime Environment (JRE) 6 Update 14

– Disable all Firewall software on PC used

4.2.3 Local copy of the Software Package (SWP) to the PC

Follow these steps to copy the Software Package (SWP) to the PC.

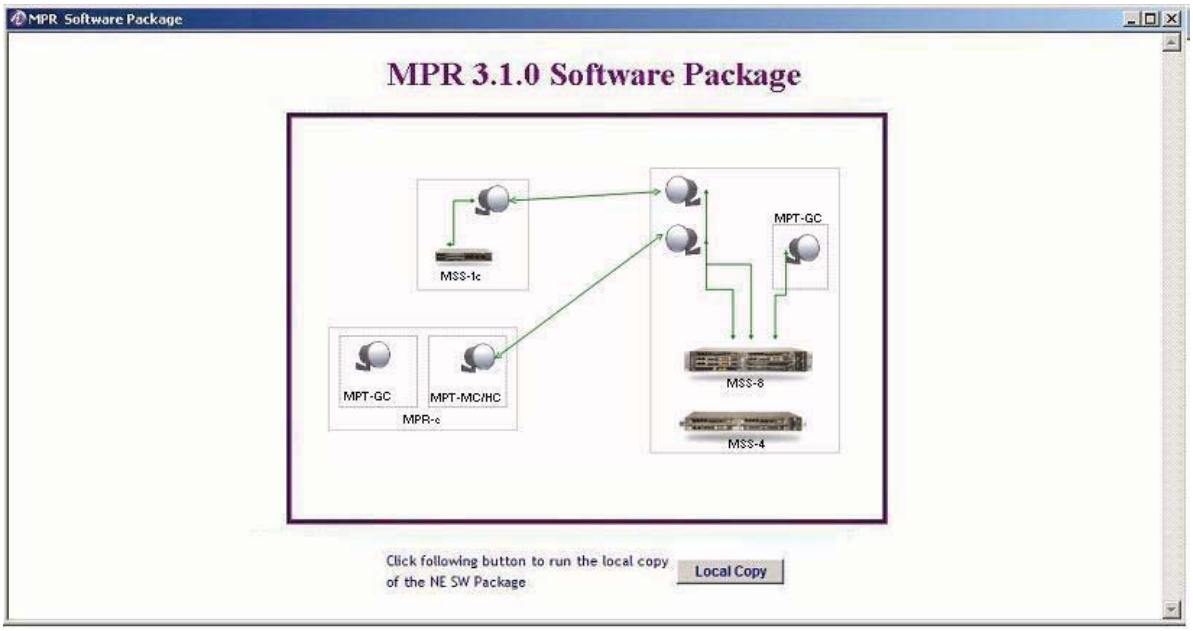
N.B. With Internet Explorer 8 on Windows 7 before inserting both the SWP CD-ROM and the TCO SW Suite one, the user (only in Windows 7 when Internet Explorer is the default browser) has to disable the Internet Explorer "Protected Mode". This can be performed via the "Internet Options" icon in the control panel, selecting the "Security" tab and unchecking the related option "Enable Protected Mode (requires restarting Internet Explorer)". Without this, the browser is opened but the CD-ROM content is not displayed (an empty page is shown), because it's blocked by IE Protected Mode.

[1] Insert the SWP CD into the CD-ROM drive.

Note

The Software Package will auto-run and open up the computer's default browser program (if auto-run feature is enabled on user's PC) as soon as the CD-ROM is read by the PC. If auto-run does not start, the user must run (double-click with left mouse button on it) the aluopener.exe file, available on CD-ROM root, in order to launch the Software Package.

[2] Click on the **Local Copy** button to copy the software to your local PC.



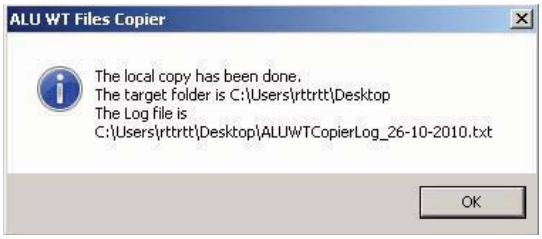
[3] Click on the **Start Copying** button.

[4] Choose a directory location for the Local Copy of Software Package. Select the directory and click on **OK** to begin the copy process.

Warning: Special characters (\ / : * ? < > |) cannot be used.

[5] The files will be copied from the CD to the PC and will create a directory named **ECT**.

[6] A successful copy message will display, when all files have been copied. Click **OK**.



[7] Remove the SWP CD from the CD-ROM drive.

4.2.4 Local copy of the WebEML and TCO Suite Software to PC

Follow these steps to copy the WebEML/TCO Suite software to the PC.

N.B. With Internet Explorer 8 on Windows 7 before inserting both the SWP DVD-ROM and the TCO SW Suite one, the user (only in Windows 7 when Internet Explorer is the default browser) has to disable the Internet Explorer "Protected Mode". This can be performed via the "Internet Options" icon in the control panel, selecting the "Security" tab and unchecking the related option "Enable Protected Mode (requires restarting Internet Explorer)". Without this, the browser is opened but the CD-ROM content is not displayed (an empty page is shown), because it's blocked by IE Protected Mode.

[1] Insert the TCO SW Suite DVD-ROM into the DVD-ROM drive.

Note

The TCO SW Suite DVD-ROM will **auto-run** and open up the computer's default browser program (if auto-run feature is enabled on user's PC) as soon as the DVD-ROM is read by the PC. If auto-run does not start, user must run (double-click with left mouse button on it) the **Start.exe** file, available on DVD-ROM root, in order to launch the Software Package.

[2] Click on **MPR Tools**.

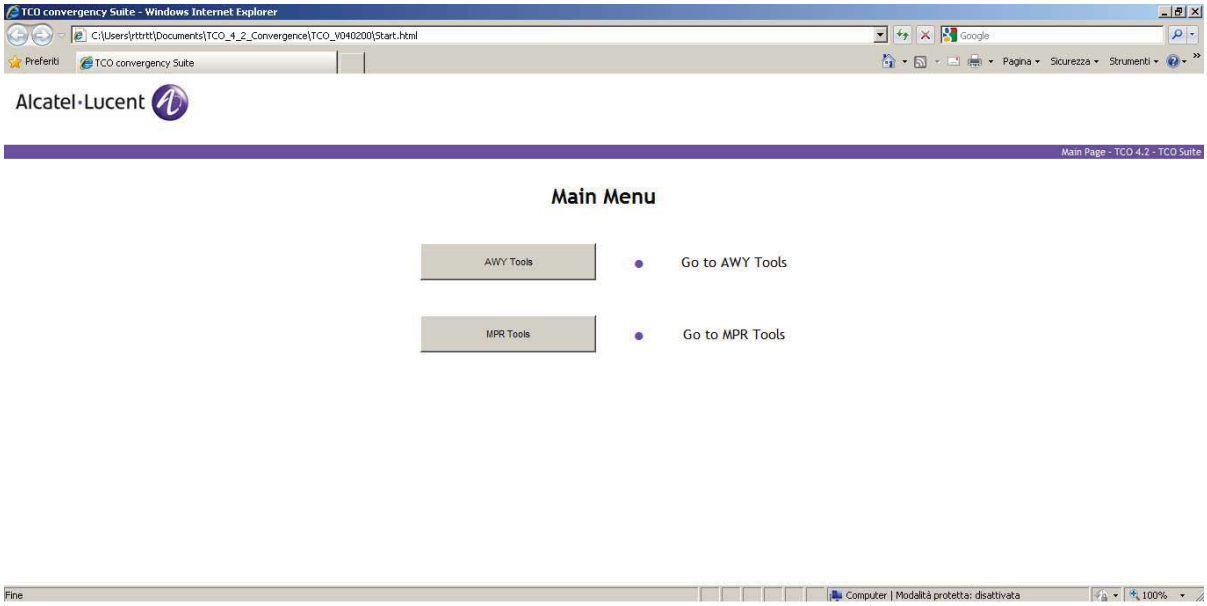
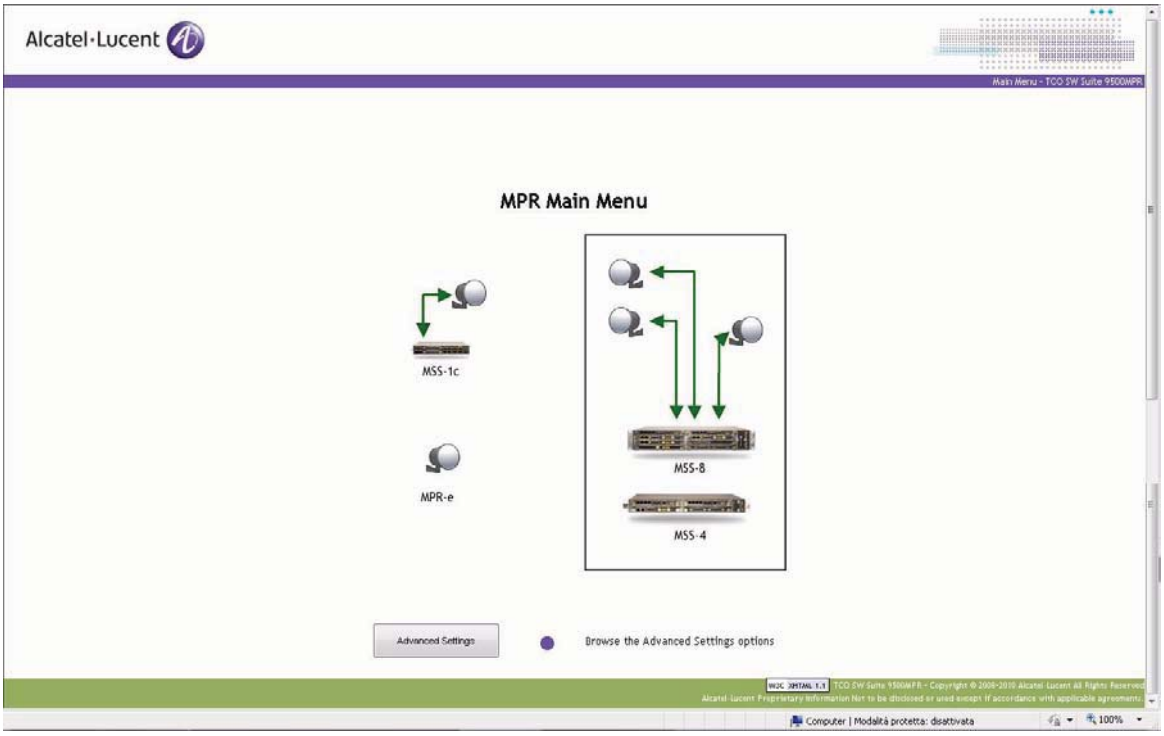
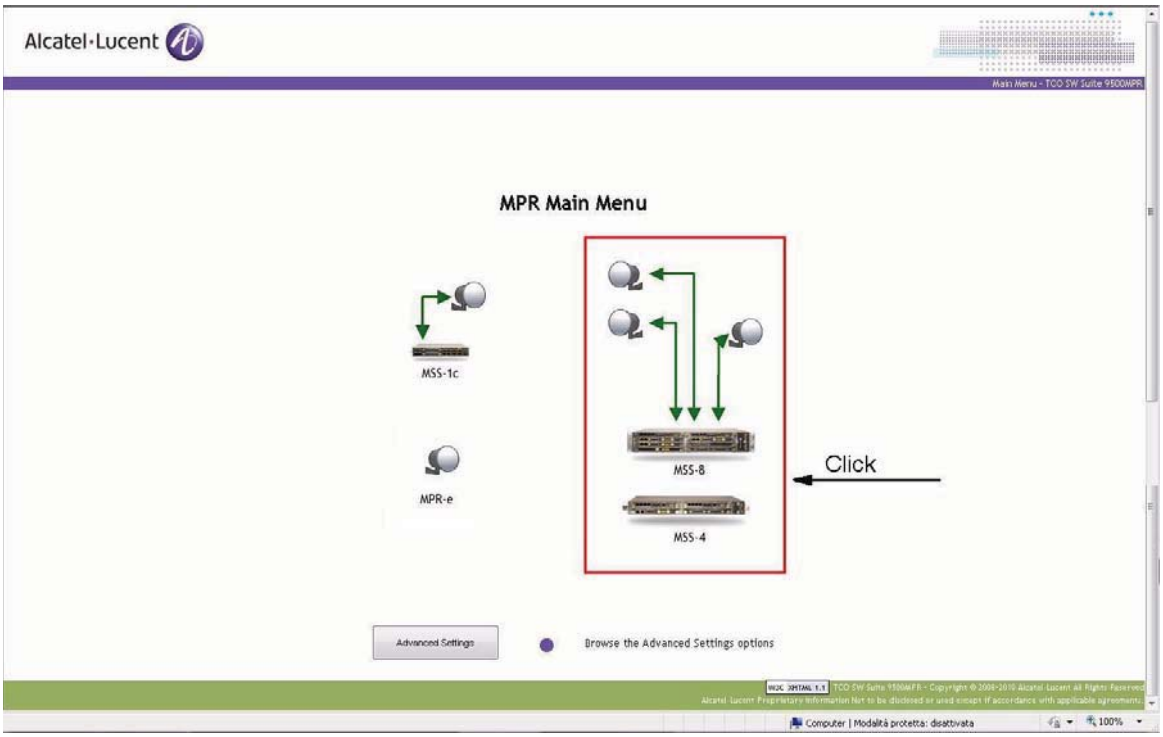


Figure 560. TCO Convergence (MPR Tools)

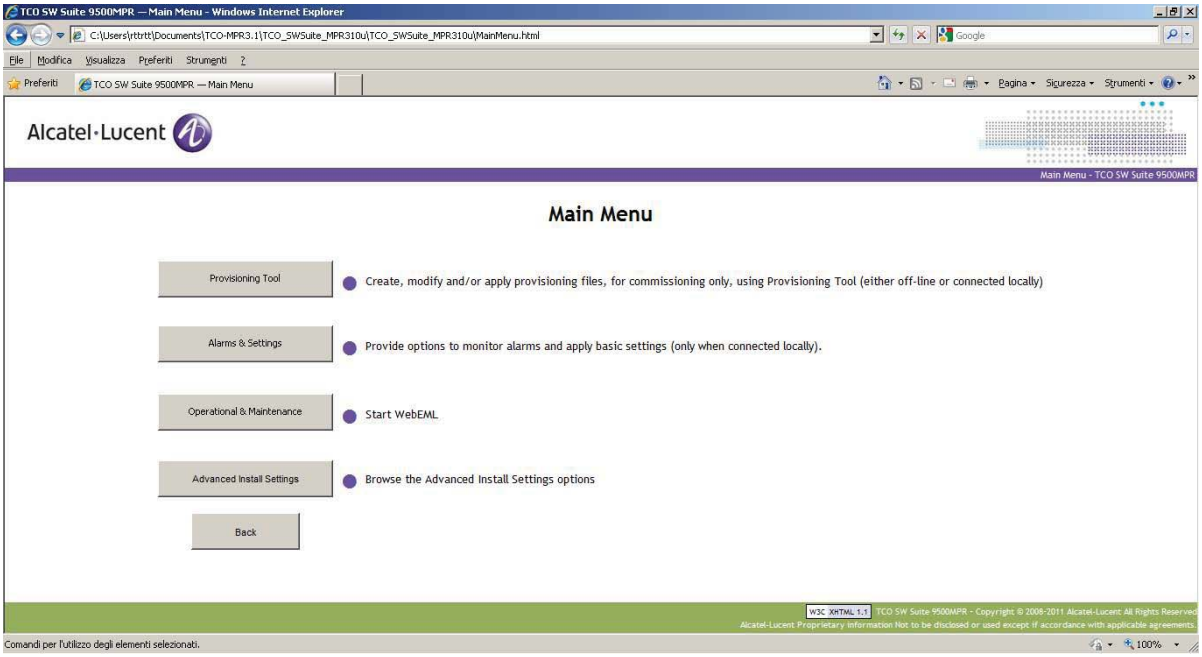
[3] The following screen opens.



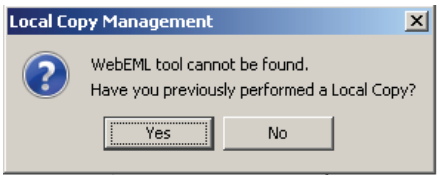
[4] Click on **MSS-8/MSS-4** icon to perform the Local Copy of the WebEML.



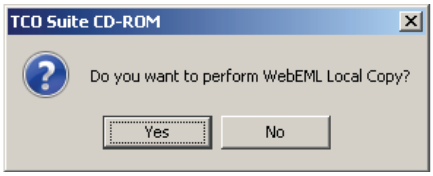
[5] Click on **Operational and Maintenance**.



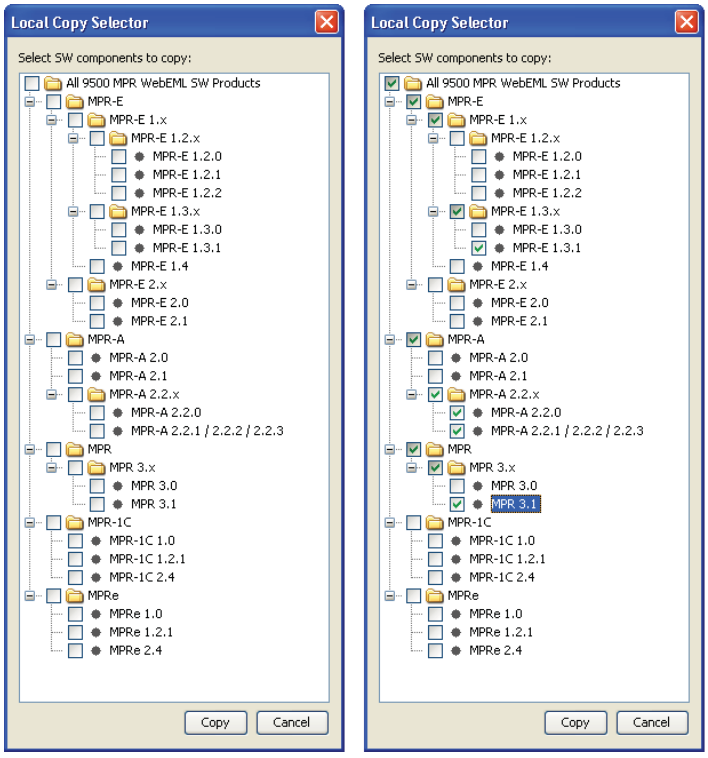
[6] Click **No**.



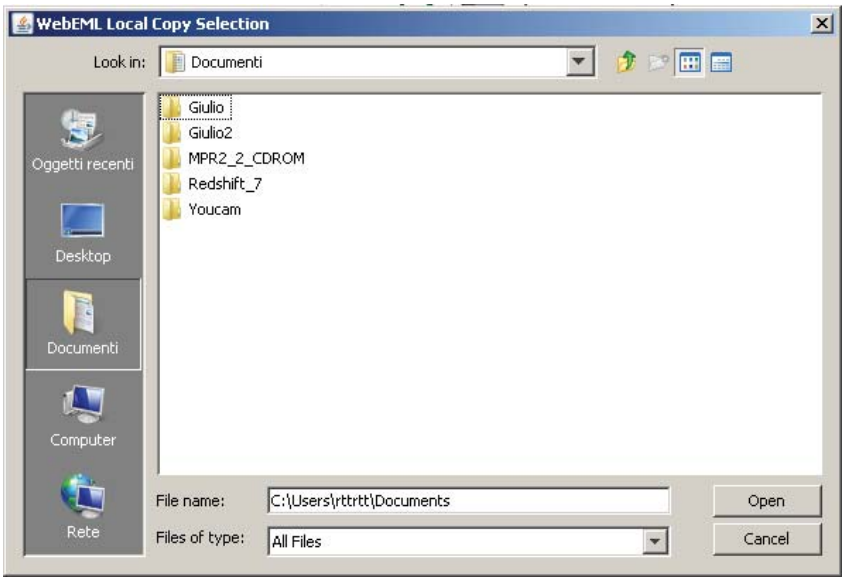
[7] Click **Yes** to perform the WebEML Local Copy.



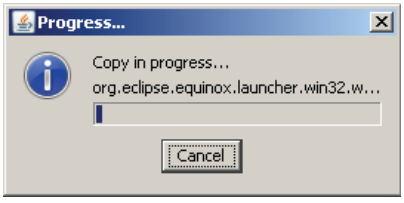
[8] Select the SW component to copy and click on **Copy**.



[9] Select the directory and click **Open**.

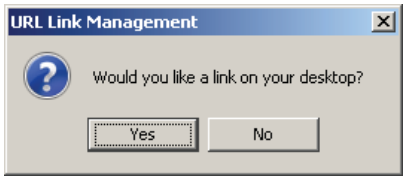


[10] The copy is now in progress.



[11] Wait until the following message will appear. Click **OK**.

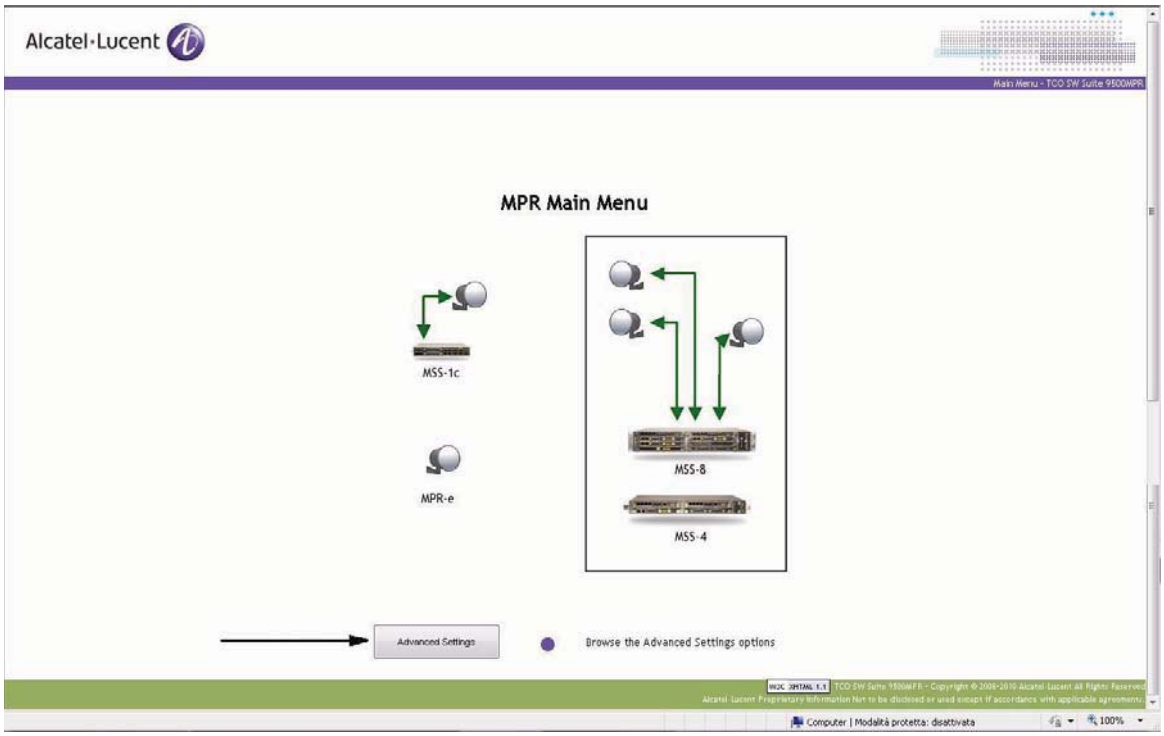
[12] Click **Yes** to set a link on the desktop.



[13] Click on the **WebEML icon** on the desktop to start the application.

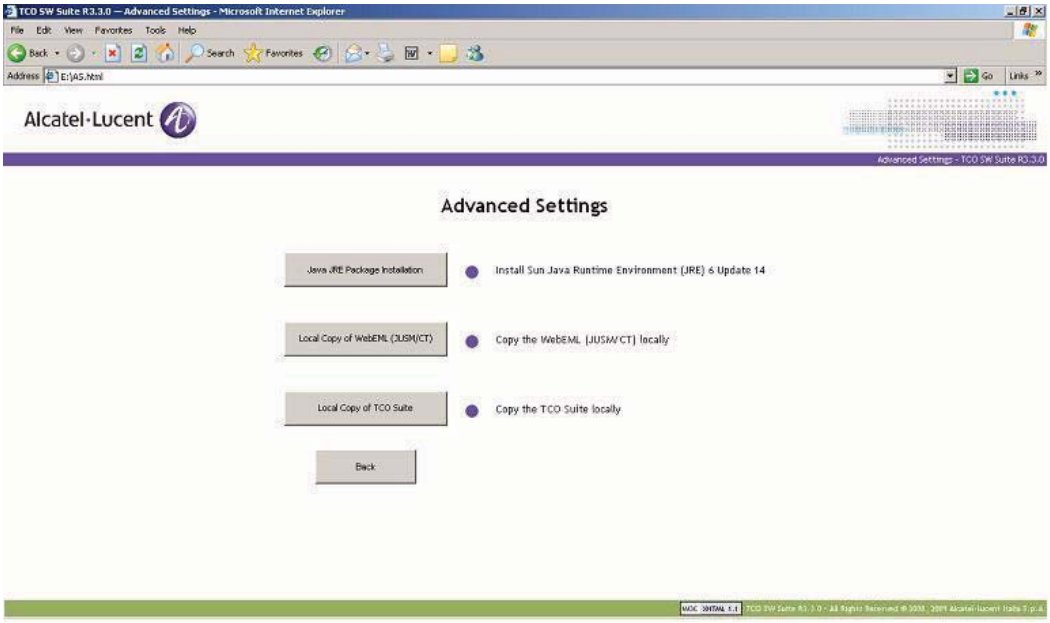
N.B. An alternative way to perform the Local Copy of the WebEML is the following:

[1] Click on the **Advanced Settings** button below.



[2] Select one of the three **Advanced Settings** options to copy software to the PC.

- **Java JRE Package Installation** (par. 4.2.4.1 on page 787)
- **Local Copy of WebEML (JUSM/ WebEML)** (par. 4.2.4.2 on page 787)
- **Local Copy of TCO Suite** (par. 4.2.4.3 on page 788)

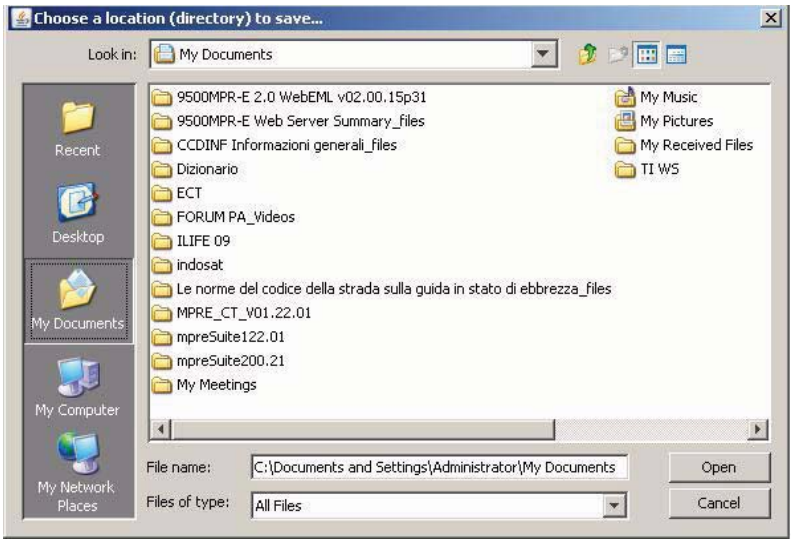


4.2.4.1 Java JRE Package Installation

[1] Click on the **Java JRE Package Installation** button to install the Sun Java Runtime Environment (JRE) 6 Update 14 version to your PC.

4.2.4.2 Local Copy of WebEML (JUSM/ WebEML)

[1] Click on the **Local Copy of WebEML (JUSM/WebEML)** button to copy the WebEML software to your PC. Choose the directory location and click Open and then **OK**.

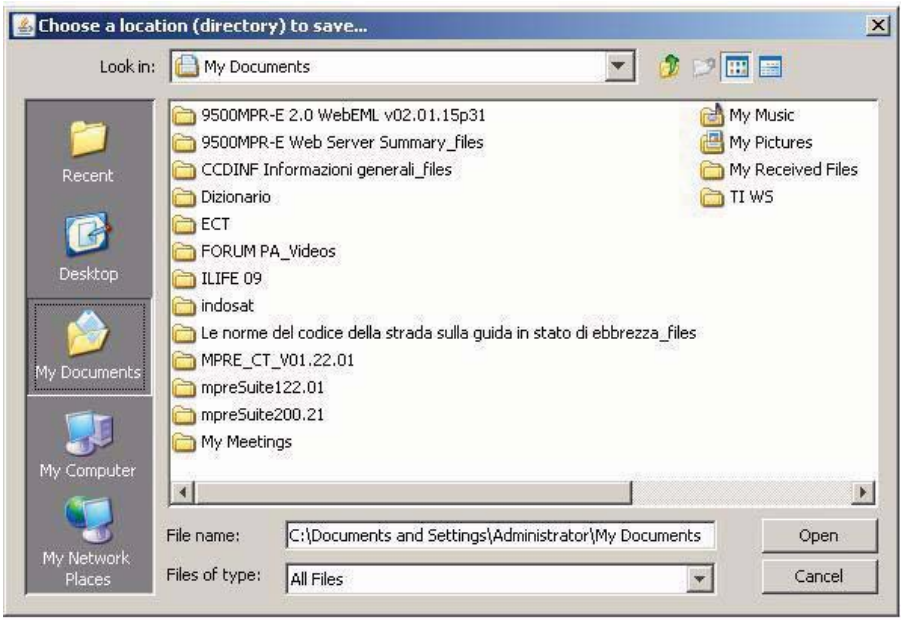


[2] When the files have finished copying, this window will display. Click the **OK** button. The files will be copied to a created directory named **MPRE_WebEML_VXX.XX.XX** (where the X's are the version number).

[3] An icon will be created on the desktop if the user clicked yes.

4.2.4.3 Local Copy of TCO Suite Installation

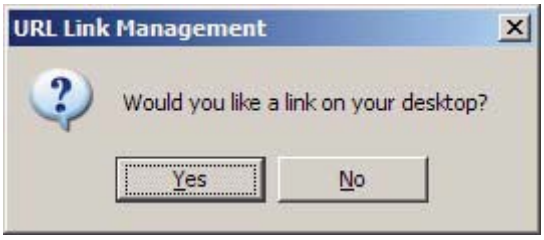
[1] Click on the **Local Copy of TCO Suite** button to install the TCO Suite software to your PC. Choose the directory location and click **Open** and then **OK**.



The files will be copied from the CD to the PC in a created directory.

[2] When the file has been successfully copied, click the **OK** button.

[3] The user has the option to create a shortcut link on the PC desktop. Click **Yes** or **No**.



An icon similar to this one will be created on the desktop if the user clicked yes.

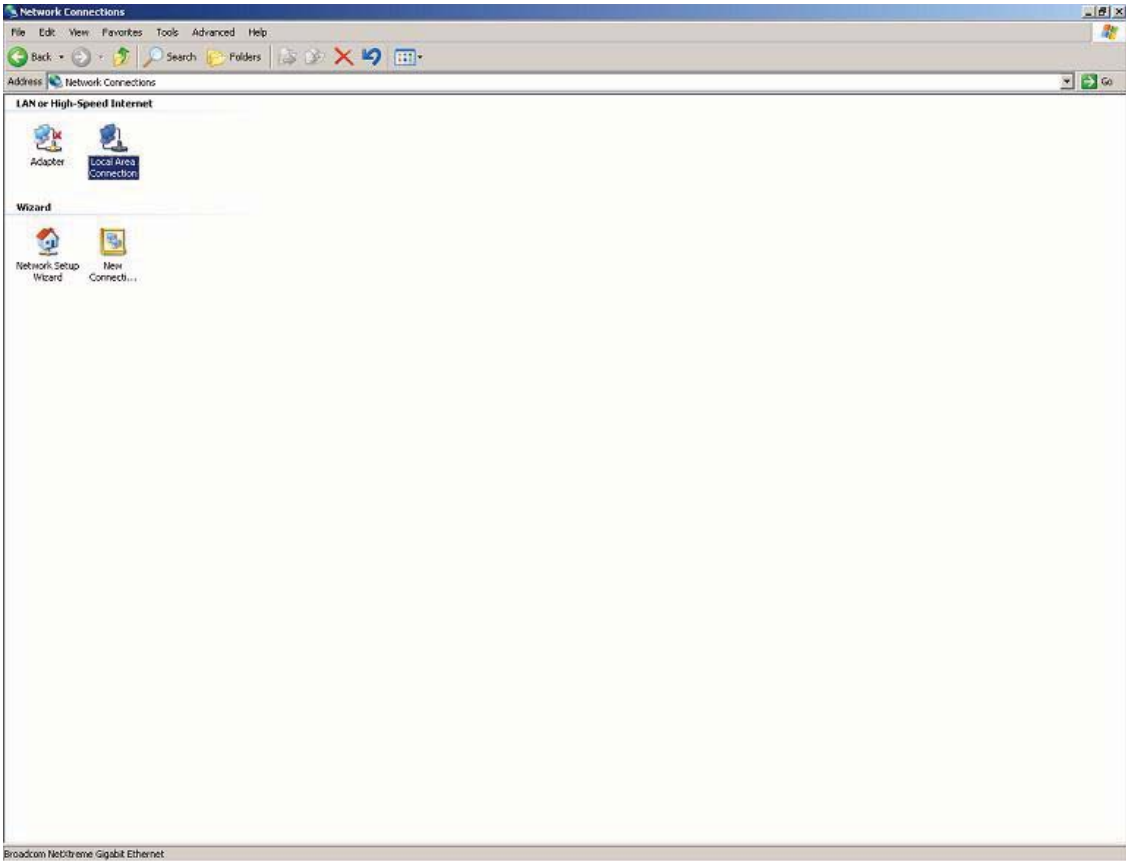
4.2.5 Configure PC Network Card to Connect to NE

This example uses a Microsoft Windows XP Professional system.

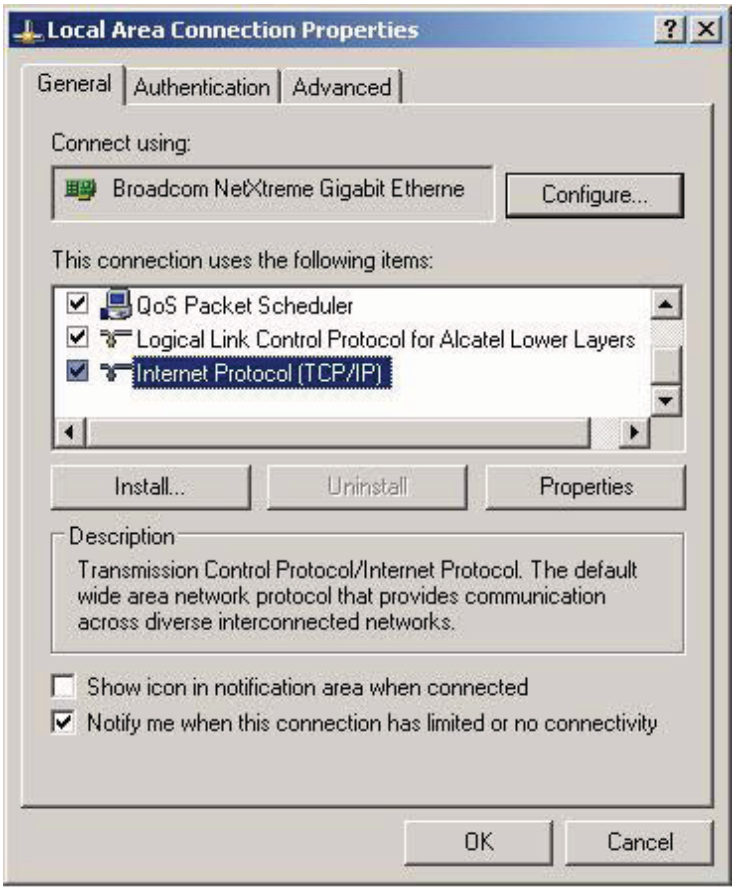
[1] Connect a CAT 5/5E cable from the PC network card to NMS connector on Slot 1 Core-E card.

[2] Click on the **START** menu on the Windows desktop and open up the **CONTROL PANEL**.

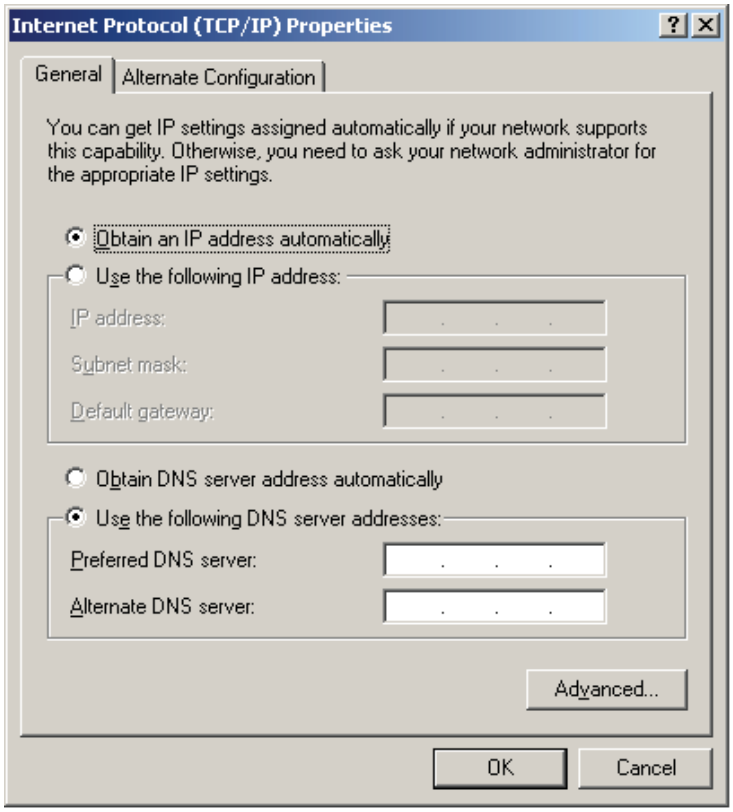
[3] Open up the **NETWORK CONNECTIONS**. Highlight the network card as shown below.



[4] Dobule click on **Properties** to display the screen below and scroll down the list to highlight the **Internet Protocol (TCP/IP)** line. Click the **OK** button.



[5] As default the DHCP server on the MPR is enabled. Set the PC to get automatically an IP address.



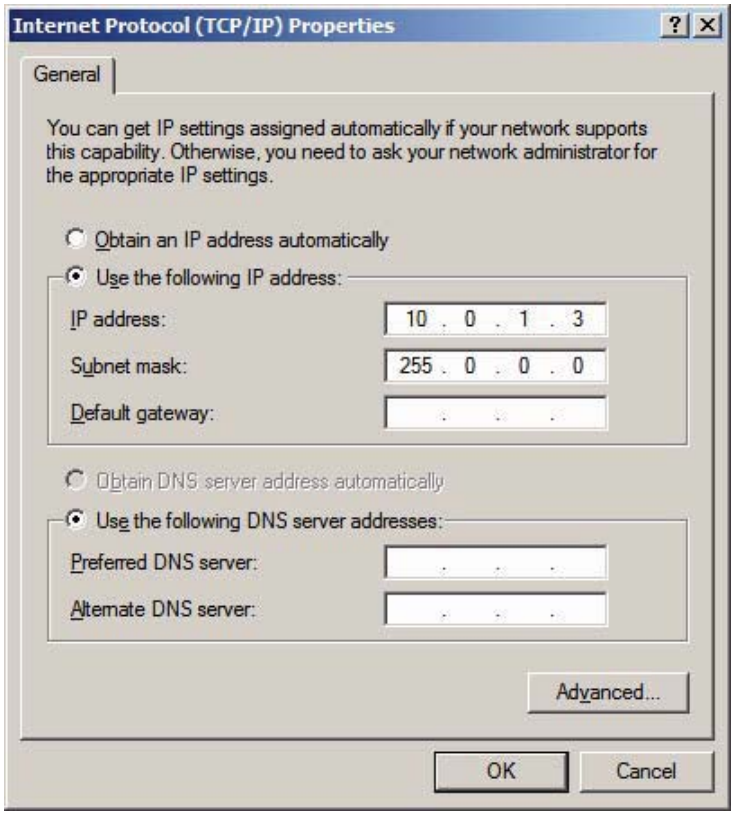
[6] If for any reason the DHCP server on the MPR has been disabled, enter the IP address of 10.0.1.3 for the PC network card as shown below. Click **OK**.

Note

The 10.0.1.3 IP address example shown below is derived from the default NE IP address (10.0.1.2) plus 1. If there is an IP address conflict within your network, increment the last number by two.

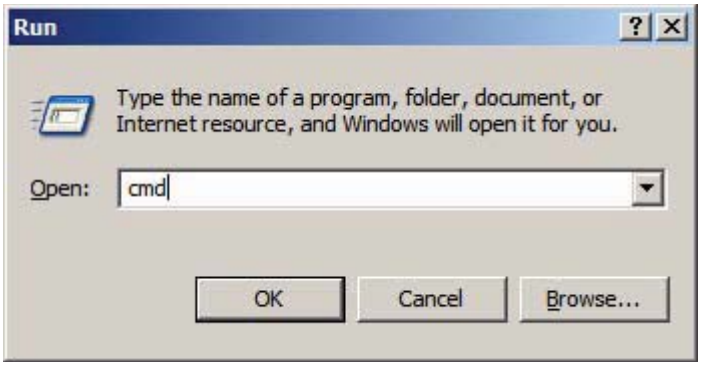
Note

It is suggested to keep enabled only one network connection on a PC.

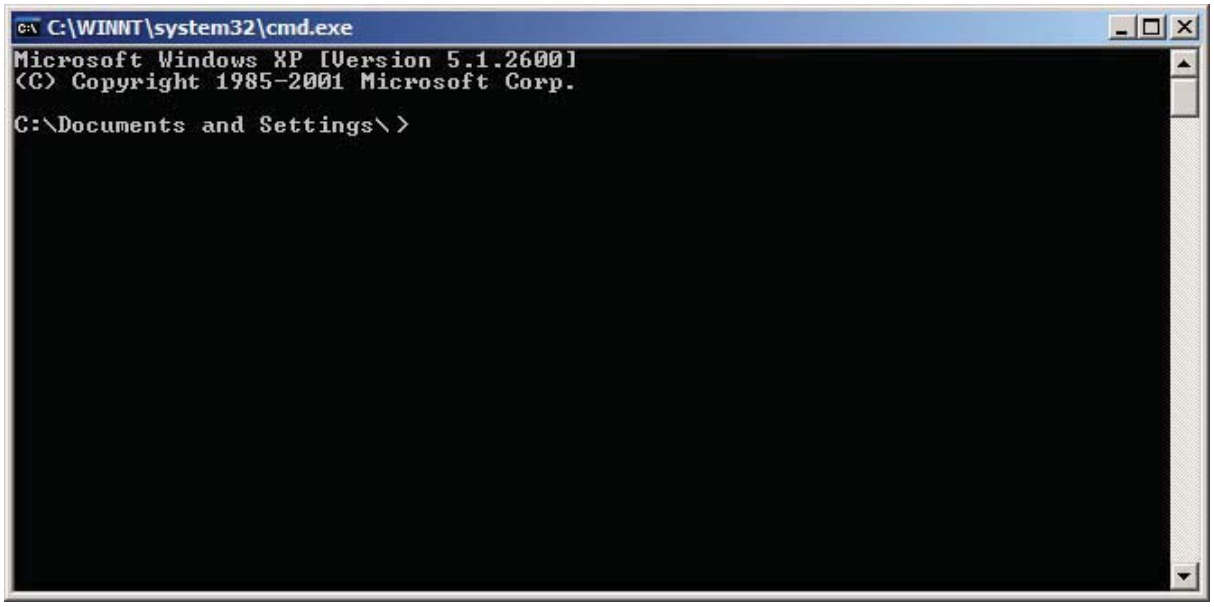


[7] To check the connectivity between the PC and the NE, open up a DOS window or Command Prompt. Click on the **START** menu on the Windows desktop and open up the **RUN** window as shown below.

[8] Type **cmd** and click **OK** to open up a DOS window.



The DOS window will display.



[9] In the DOS window, click the cursor after the > and type **ping 10.0.1.2** to verify a connection between the PC and the NE. The Ping statistics for the IP address 10.0.1.2 should display 4 packets sent and and 4 packets received.

Note

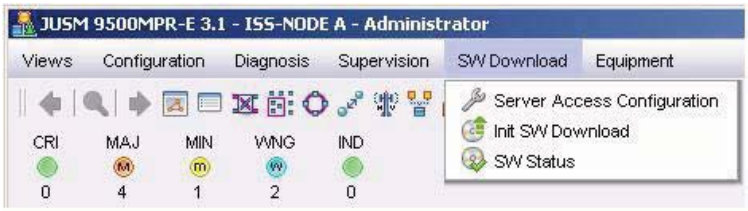
The 10.0.1.2 IP address is the default NE IP address.

4.2.6 Download Software Package to NE

After the switching on of the equipment click on the MPRE-WebEML icon on your desktop.

The Server Access Configuration menu option in the menu bar allows the user to configure the FTP server to be used to download the Software Package (SWP) to the NE.

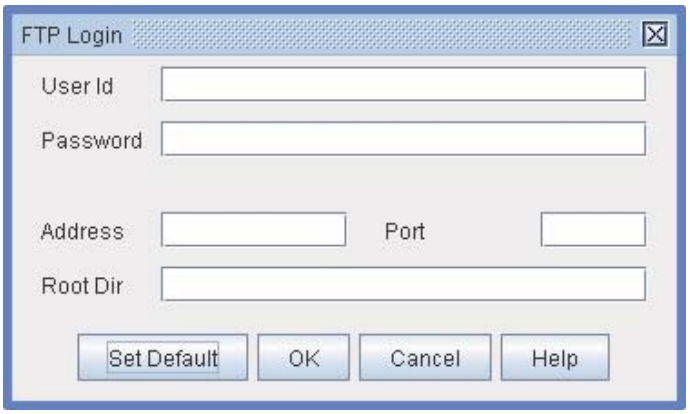
[1] On the WebEML main screen, click on the **SW Download** dropdown menu and select **Server Access Configuration**.



4.2.6.1 Server Access Configuration

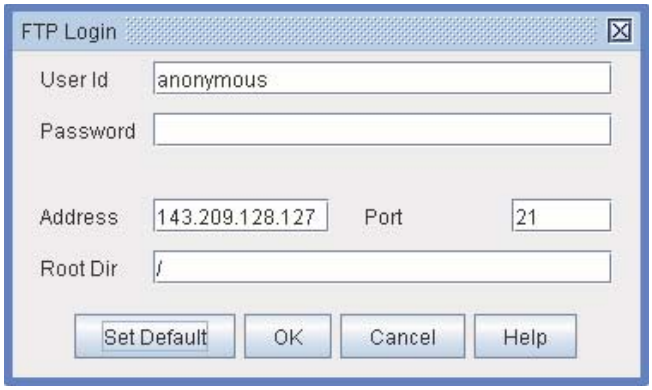
The user has the choice of implementing Step 2 **OR** Step 3 below. Afterwards, continue to Step 4.

[2] Enter the **User Id and Password** login information to access the FTP server. In the **Address** field, write the IP address of the FTP server. In the **Port** field, write the port to be used and in the **Root Directory** field, write the directory into which the software has been downloaded.



[3] Click the **Set Default** button and the screen below will appear showing the default configuration. The WebEML is the default FTP server with the following parameters:

- User Id: anonymous
- Password
- Address: Local host IP address
- Port: 21
- Root Dir: /



Note

*The set default parameters can be changed by writing different values in the fields and then by clicking on the **OK** button.*

[4] Click the **OK** button.

4.2.6.2 Init SW Download

The download takes the following times:

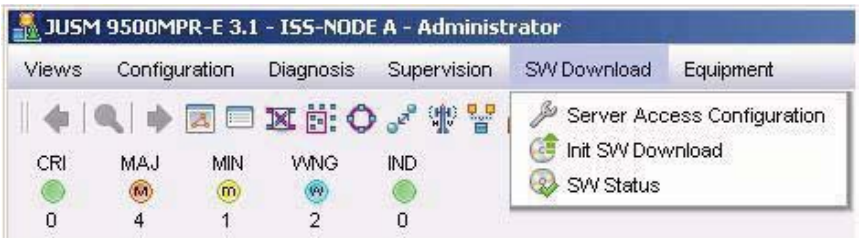
– SWP download (from PC to Core-E): 11 minutes

– MPT download (automatically starts after the SWP download: all the MPT are downloaded in parallel): 5 minutes

– activation of the FPGA of the units:
  - PDH: 3 minutes
  - SDH: 20 minutes
  - EAS: 1 minute
  - Modem: 20 minutes
  - MPT access: 15 minutes
  - ASAP: 1 minute
  - AUX: less than 1 minute
  - ODU300: 40 seconds

  All the units are activated in series. At the end of the activation of an FPGA a traffic hit is caused.

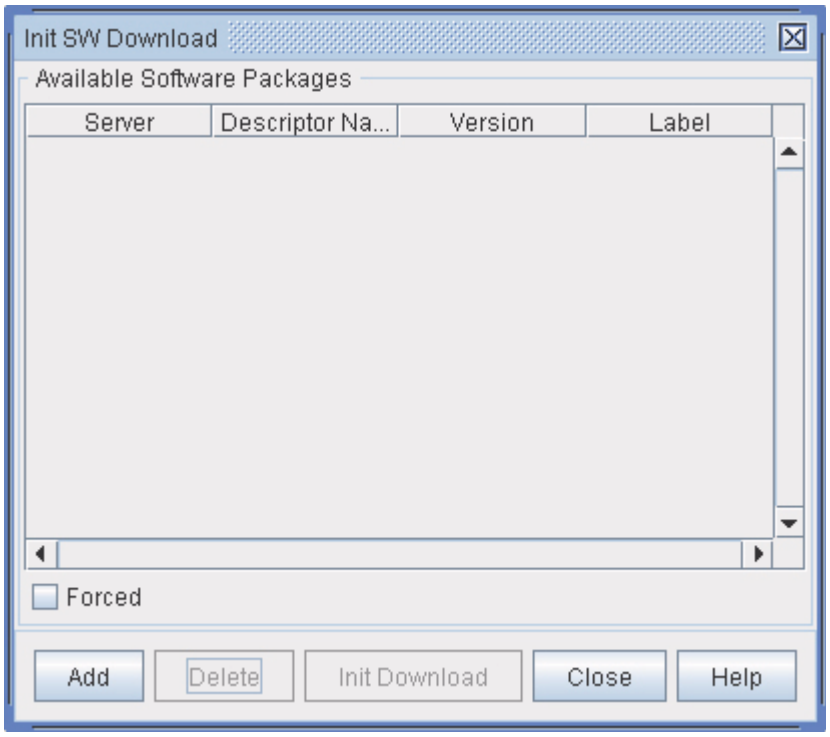
[1] On the WebEML main screen, click on the **SW Download** dropdown menu and select **Init SW Download**. This menu option allows the user to download software to the NE for initial downloads and upgrades.



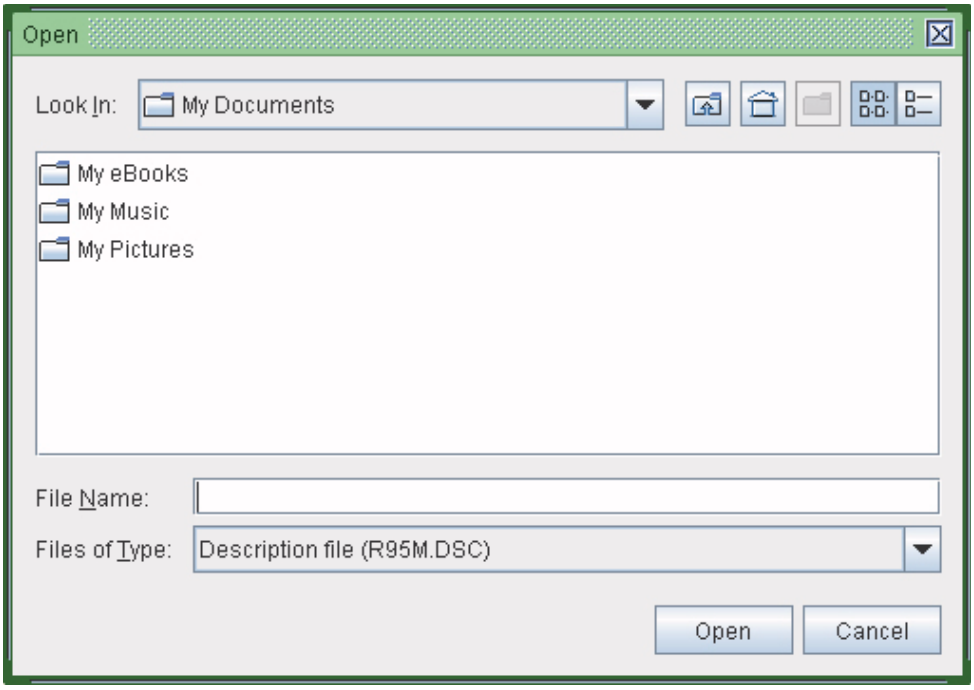
[2] Click the **Add** button to add the available software packages on the PC.

Note

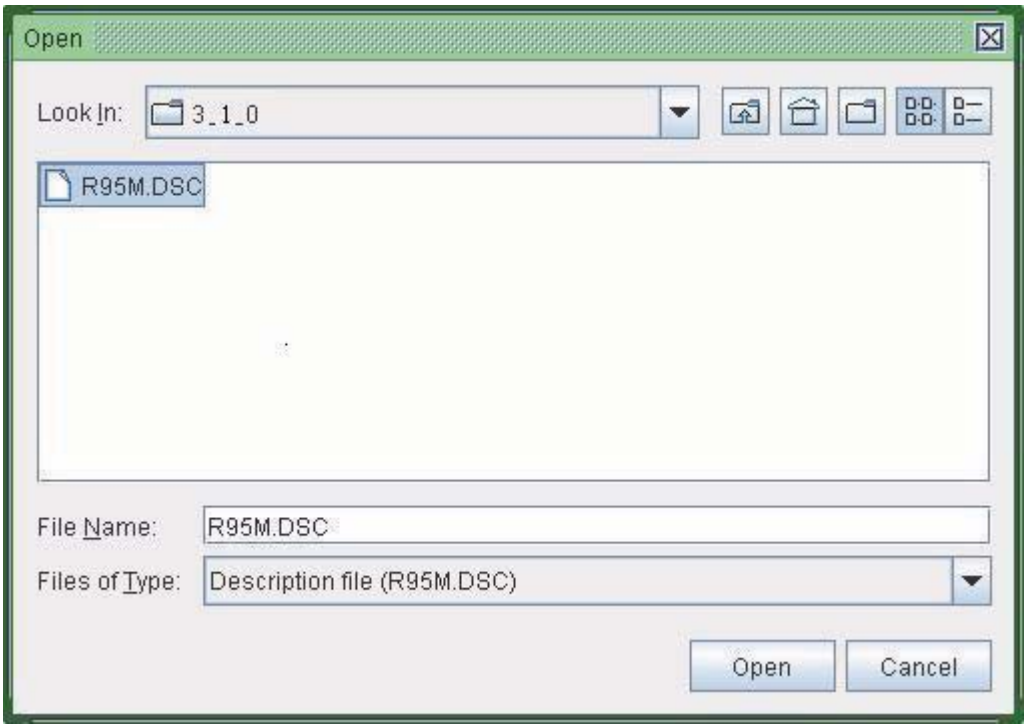
Before the starting the software download it is recommended to set the RTPC mode to the maximum Tx power.



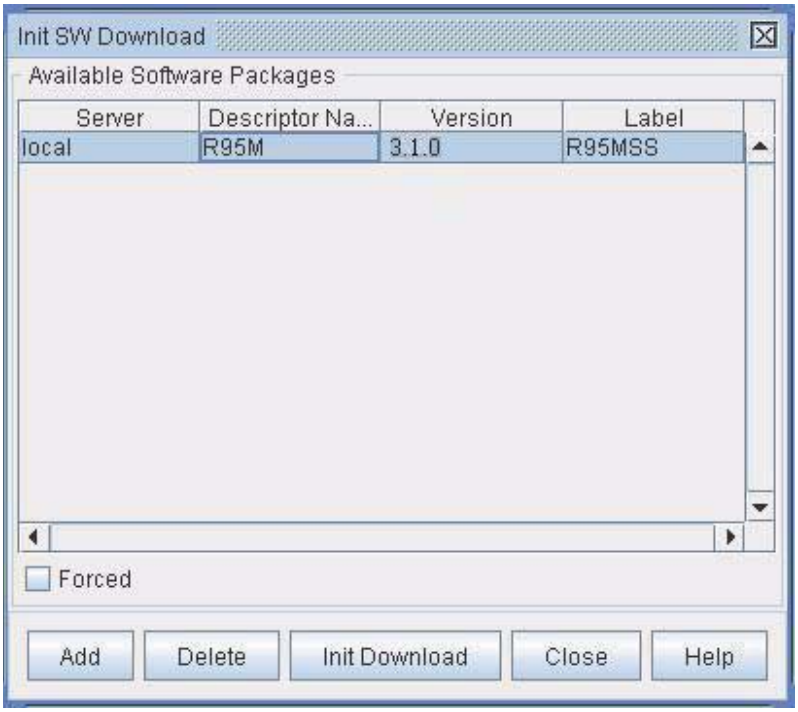
[3] Browse to the directory where the NE software was installed and click the **Open** button.



[4] Highlight the description file (i.e. R95M.DSC) and click the **Open** button.



[5] Highlight the line as shown below and click on the **Init Download** button.



[6] Click the **Yes** button to begin the download process.

Note: The complete SWP of 3.1.0 is made up of two packages:
- SWP 3.1.0 to upgrade from Rel. 2.1ICS2 to Rel. 3.1.0
- SWP 3.1.0 to upgrade from Rel. 3.0.0 to Rel. 3.1.0

When the SW download starts, a screen showing the in progress operation of the download appears. The download is aborted when the **Abort** button is pressed.

[7] Click **Ok**.

4.2.6.3 Software Status Detail

[1] On the WebEML main screen, click on the **SW Download** dropdown menu and select **SW Status**. This screen shows the last two software versions details (par. 4.2.6.3.1 and par. 4.2.6.3.2) stored on the NE. In this example, par. 4.2.6.3.1 shows the current committed software running on the NE. par. 4.2.6.3.2 shows the standby software or previous software.