RRH60-21 & RRH60-09A Model Offer Provisioning Guide

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PUBLICATION HISTORY

19/12/2014

Issue 01.34/ EN, Standard-Approved

This edition is published to inform that the two RRH:

RRH60-21 is Manufacture discontinue (30 june 2012). It can be replaced by RRH60-21C – (3BK28876AB)

RRH60-09A is Manufacture discontinue (March 31st 2013). It can be replaced by MCTRX67-09 (3BK28502AA)

10/10/ 2008

Issue 01.00/ EN, Draft

creation

7/11/ 2008

Issue 01.01/ EN, Draft

Update with codes RRH 2100 and 900

Update with order code provided by D Tanguy and T Boulay

24/11/ 2008

Issue 01.02/ EN, Draft

Update pole mounting kit

27/11/ 2008

Issue 01.03/ EN, Preliminary

19/1/2009

Issue 01.04/ EN, Preliminary

Update section power cable. Power cable RRH40-21 is re-used with RRH60-21

Typo on RRH RTU full power capacity

29/1/2009

Issue 01.05/ EN, Preliminary

Per Th Boulay request : the option Optical adaptors is not available yet and must be removed till we are not 100% confident

19/2/2009

Issue 01.06/ EN, Preliminary

the TMA 900 has been validated on the 9311 Macro NodeB only, and the RRH 60W 900 does not support the TMA. the TMA 900MHz must be removed in all documentation related to the RRH 60W 900MHz (Th Boulay)

4/6/2009

Issue 01.07/ EN, release

Update section 4.3.2 SFP with figure

16/7/2009

Issue 01.08/ EN, Standard

Add information on DDSM 900 associated with RRH60-09

31/7/2009

Issue 01.09/ EN, Standard

Update section cable DC

Change code BiasT 1AB240220001 to 1AF16123AAAA

28/08/2009

Issue 01.10/ EN, Standard

Introduction 2 new length optical fibers single mode, 5M and 10M (3JR30022AA, 3JR30023AA)

Introduction TMA900 MHZ, 1AF16418ABAA

Reintroduction of two optical adaptors SM and MM used to swap the RRH 40W to 60W (3JR30019AA, 3JR30020AA)

7/09/2009

Issue 01.11/ EN, Standard

Remove code for Kit DDSM 900, DC stop not used.

28/09/2009

Issue 01.12/ EN, Standard

Update power consumption typical from 260 to 280W

Update section optical cable to support daisy chain

Update table standard features to support UA07.1

Update rules for SFP to support daisy chain in UA07.1

Add evolium GSM mounting plate and cable connection for DDSM900

28/10/2009

Issue 01.13/ EN, Standard

Add RF jumper 1.5M

Remove kit RRH pole mount low profile (D=152-380MM) :301019386

Update section capacity licencing

Add optical cables Molex LC to Molex LC (codes unknown for instance)

6/11/2009

Issue 01.14/ EN, Standard

Update section capacity licencing

10/11/2009

Issue 01.15/ EN, Standard

Update 4 new optical fibers 5M Molex (LC to LC) and 15M for daisy-chain

Update section DDSM mounting plate

19/11/2009

Issue 01.16/ EN, Standard

Update the provisioning rules for SFP modules

19/01/2010

Issue 01.17/ EN, Standard

Add 2 new codes for DDSM 900 option (3BK28689AB, 3BK28689AC)

Add option TMA AISG-lite (2 new codes) in section 4.4.7

11/3/2010

Issue 01.18/ EN, Standard

Update with PB, RRH60-09 is a 3 carriers RRH.

Change code TMA 2100 (NTUM32CM)

Update section DDSM900 with new RF cables

Remove the section dedicated to capacity licensing, covered in a dedicated MOPG

Remove DDSM connector 3BK28182AA, replaced by 3BK28689AB.

3/6/2010

Issue 01.19/ EN, Standard

Update codes for DDSM connector boxes. These codes must be in 12 digits already existing in 2G.

Update DDSM900 section with introduction of the TMA 900 EGSM.

Update comments Th Boulay.

20/9/2010

Issue 01.20/ EN, Standard

Introduction new code pole mounting for RRH 109751768 to replace 301019378

10/11/2010

Issue 01.21/ EN, Standard

Add TMA grounding kit : 1AB240750001 in section 4.4.7

Update Smart bias tee code: NTUM83GA is replaced by 1AD147860001

Add option RETA for RRH section 4.4.8

23/03/2011

Issue 01.22/ EN, Standard

Add RRH 60-09A version, RRH 900MHz band operation at 20MHz and removal 9341

24/05/2011

Issue 01.23/ EN, Standard

Add 7/16 metallic cap reference

14/06/2011

Issue 01.24/ EN, Standard

Update 7/16 cap reference: 1AB309180001 instead of 3JR30038AA.

17/11/2011

Issue 01.25/ EN, Standard

Update pole mounting bracket: 109761072 instead 300973005

Update 4.4.7, add RRH 60-09A

3BK28689AAAA changed to 10 digits 3BK28689AA

27/1/2012

Issue 01.26/ EN, Standard

Update section 4.4.7 and 4.4.8 TMA and RETA (new figures, codes unchanged)

Section RETA: remove RCU and AISG cable references. This part is already covered in the HCC document (see ref in section 2.2)

24/2/2012

Issue 01.27/ EN, Standard

Replace SFP from 300M to 1AB codes (product alignment)

SFP MM 300976297 replaced by 1AB187280063

SFP SM-DF 301030433 replaced by 1AB187280065

Intro SFP SM-SF in 1AB, with this rule

- in daisy-chain config, use: 1AB194670018/1AB194670019
- in star config, still use: 300976305/300976313

update figure pole mounting kit low profile

14/6/2012

Issue 01.28/ EN, Standard

Due to issue with mounting bracket 109761072 (Some of the brackets, bolts, nuts are zinc plated rather than made of stainless steel or galvanized finish), it has been decided to introduce a new bracket galvanized finish for outdoor. In consequence 109761072 is replaced by 109796441 (BRACKET, PIPE MOUNTING(d=50-152MM)), section 4.4.6

26/6/2012

Issue 01.29/ EN, Standard

Remove option DDSM 900 section 4.5, this product is MD, last order end of march 2012.

19/9/2012

Issue 01.30/ EN, Standard

Remove jumper NTUM97JF, MD product

30/10/2012

Issue 01.31/ EN, Standard

Section 4.4: update rules for SFP. Remove SFP SM-SF 300976313, replaced by 1AB194670019

27/3/2014

Issue 01.32/ EN, Standard

Bias-T 1AD147860001 is replaced by 1AF23078AAAA

Section 4.5.4:To simplify portfolio, these codes have to be removed from the ordering tools.

3JR30025AA   LC IND to LC IND BIDI jumper-5M

3JR30025AC   LC IND to LC IND BIDI jumper-15M

3JR30025AD   LC IND to LC IND jumper - 15M

22/9/2014

Issue 01.33/ EN, Standard-Approved

Section 4.3: remove RRH 60W 900 reference 3JR21010AA; LOD june 2014

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1.   INTRODUCTION

1.1.   OBJECT

The objective of this document is to guide the reader to know what product codes need to be ordered with respect to the Remote Radio Head 60W in frequency 2100 MHz and 900 MHz.

1.2.   SCOPE OF THIS DOCUMENT

The scope of this document is the Model Offer Provisioning Guide for the products listed bellow:

- Long form name: Alcatel-Lucent Remote Radio Head 60W 2100 MHz

  Short form name: RRH60-21

  Where (60-21 = 60W at 2100 MHz – 3GPP band I)

- Long form name: Alcatel-Lucent Remote Radio Head 60W 900 MHz -A

  Short form name: RRH60-09 A

  Where (60-09 = 60W at 900 MHz – 3GPP band VIII)

In this document the short name is applied.

This edition will address the provisioning of the initial nodes of the RRH. It is applicable from UMTS Release **UA5.1.3U for RRH60-21, and UA7.1.x for RRH60-09A**. It is also applicable for further releases except if a new edition of this document is available. Please check the last available edition of this document.

Hardware is inside the scope of this document.

Software & Services are outside the scope of this document.

The process of how to order this equipment is outside the scope of this document.

The scope of regions is worldwide.

The Node B aspects not related to RRH system are covered in the BTS model offer provisioning guide.

1.3.   AUDIENCE FOR THIS DOCUMENT

This is primarily an external document and secondarily an internal document; the target audience is:

- Alcatel-Lucent Customers (Network Engineering and Network operations)
- Alcatel-Lucent Network Engineering, TSS, Sales, Product Marketing, Account teams (for information & alignment)
- Supply chain

2.   RELATED DOCUMENTS

2.1.   APPLICABLE DOCUMENTS

Not Applicable.

2.2.   REFERENCE DOCUMENTS

[R1]   ANDREW v1.1 6-27-08   UMTS 60W RRH product specifications

[R3]   UMT/COM/INF/025646   Product Bulletin introduction 9341 RRH60-21

[R4]   06-6236   Alcatel Lucent 9341 RRH60-21, RRH60-09, RRH60-09A Site
         Specification

[R5]   3DC 20008 0001 UZZZA   Hardware   Commercial   Configurator   for
Antenna system (HCCANT15r)

[R6]   3DC 20008 0003 UZZZA   Content of saleable items for Antenna system
(HCCANTSI15r)

https://all1.eu.alcatel-
lucent.com/sites/Notesmigration/Operation%20Support/Environmental%20Product%2
0Support/Antenna%20System/default.aspx

3. OVERVIEW

RRH is a solution to remote the transceiver, MCPA and filter functions apart from the NodeB, using the transport of base band digital signals over optical fibers.

This Remote Radio Head is an enhancement of Alcatel-Lucent RRH portfolio.

The figure below shows how the RRH system is integrated within the NodeB site.
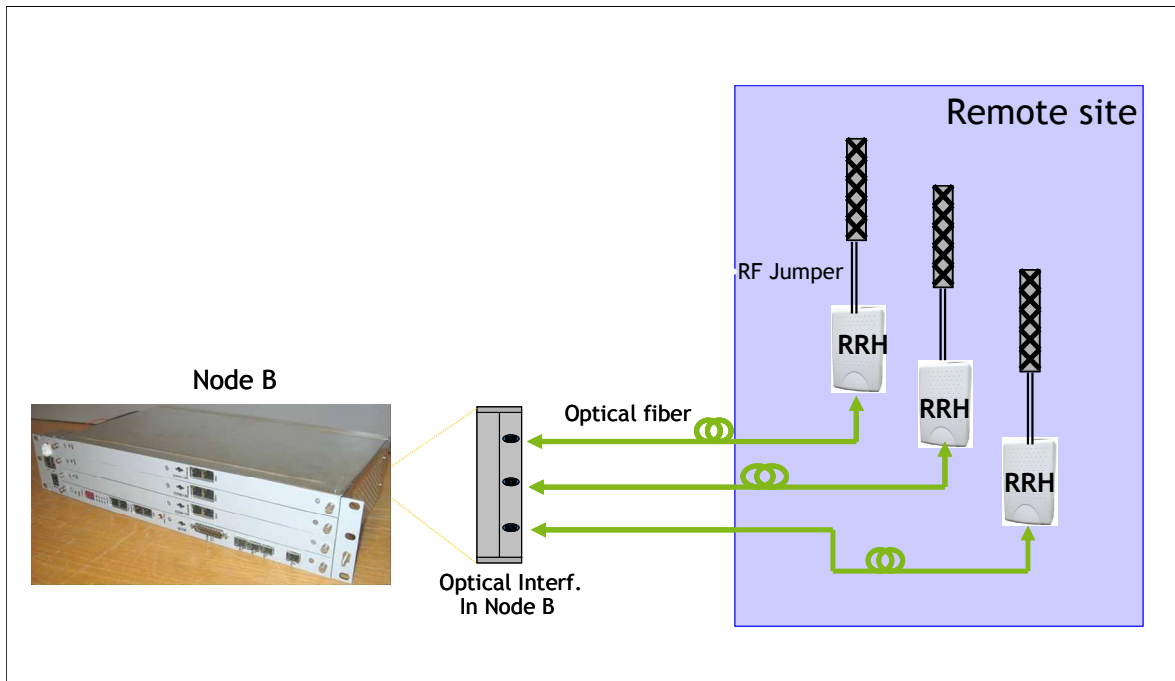
Figure 1: RRH System Overview

3.1. FUNCTIONALITY

RRH60W is a single sector self-contained radio module, including:

- Its own energy system
- a 2100MHz transceiver (for RRH60W Band I: 2100) or a 900MHz transceiver (for RRH60W Band 08: 900)
- One Power amplifier
- One duplexing system
- An optical interface

RRH is linked to Node B thanks to optical fibers, carrying UMTS downlink and uplink (main and diversity) base band signals, and OAM information.

3.2. HARDWARE PLATFORM

The distributed solution is composed by 2 main parts:

- The **Node B**

RRH60-21 and RRH60-09A are qualified with 9326 d2U (version 2, phase 2, i.e. using xCCM-U and xCEM-U modules). Both indoor and outdoor applicatrions are supported.

- The **RRH module**.

Between these 2 parts, an **optical fiber** carries the digital link compliant with the CPRI format.
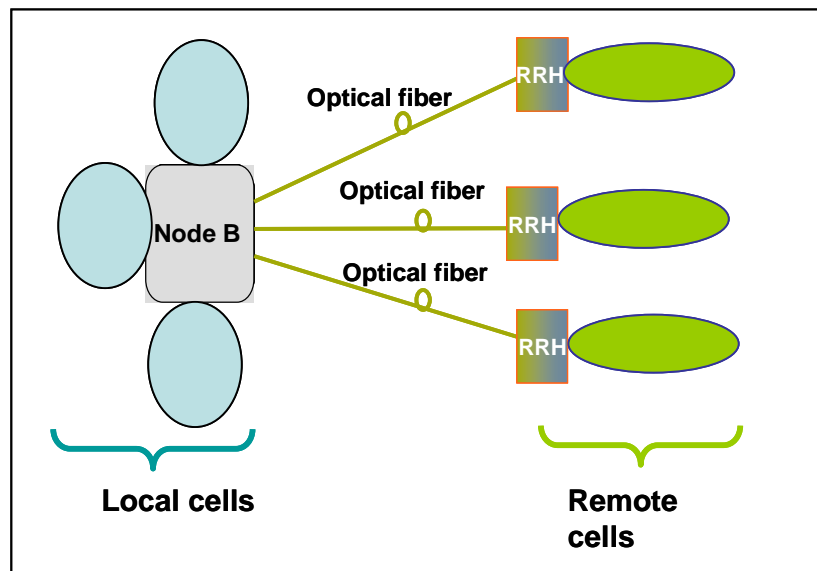
Figure 2: Node B and RRH in star configuration

3.3. RRH MAIN CHARACTERISTICS
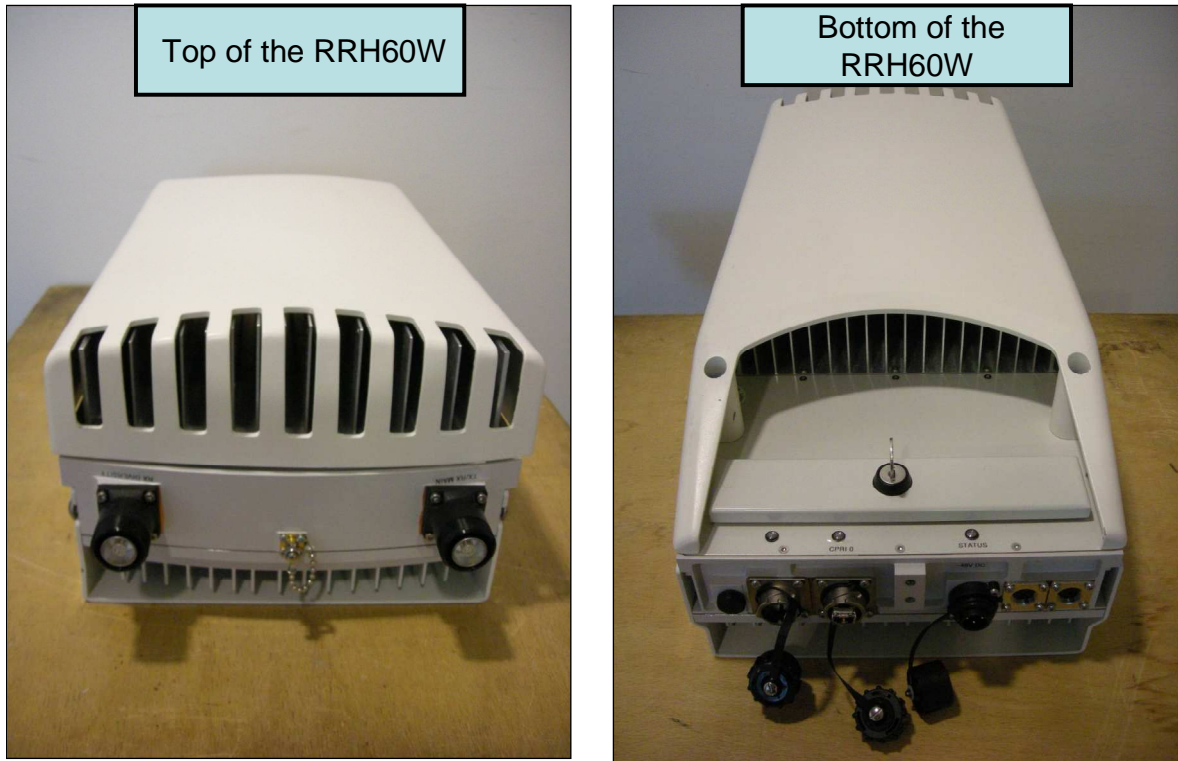
Figure 3: RRH 60W Physical Overviews

	RRH60-21	**RRH60-09**	**RRH60-09A**
3GPP Band	Band I, 3GPP TS25.104	Band VIII, 3GPP TS25.104	Band VIII, 3GPP TS25.104
Tx Band	Dl: 2110 - 2170 MHz Ul: 1920 - 1980 MHz	Dl: 925MHz – 960MHz Ul: 880MHz – 915MHz	Dl: 925MHz – 960MHz Ul: 880MHz – 915MHz
Nb of carriers	Up to 3 adjacent carriers (15 MHz)	Up to 3 adjacent carriers (15 MHz)	Up to 2 Carriers in 20 Mhz (Spacing between carriers limited to 15Mhz)
RF output power @ antenna port	60W nominal RF power, shared across transmitted carriers: 60W RF power x 1 carrier; 30W RF power x 2 carriers; 20W RF power x 3 carriers	60W nominal RF power, shared across transmitted carriers: 60W RF power x 1 carrier; 30W RF power x 2 carriers; 20W RF power x 3 carriers	40W nominal RF power, shared across transmitted carriers: 40W RF power x 1 carrier; 20W RF power x 2 carriers;
Size w/ solar shield HxWxD mm (litters)	572 x 250 x 265 (23.6 l) <16 kg	572 x 250 x 265 (23.6 l) <16 kg	572 x 250 x 265 (23.6 l) <16 kg
Optical	1,2 Gbps line bit rate (CPRI OS.12 & OL.12)		

Interface			
Operating temperature	-40℃ to +50℃, Up to +55℃ by linearly reducing to 40W the output power		
Environmental sealing	Outdoor – IP65		
Power supply	DC variant: -48V (-36V to -72V) 10 Amp max current	DC variant: -48V (-36V to -72V) 10 Amp max current	DC variant: -48V (-36V to -72V) 10 Amp max current
Power consumption (typical at 60W RF)	280W @ 60W RF output power	280W @ 60W RF output power	260W @ 60W RF output power

3.4.   INTERFACES

The RRH60-21 and RRH60-09A are designed to be installed in outdoor environment. It's weather resistant to prevent ingress of rain, snow, dust, and other solid foreign objects.
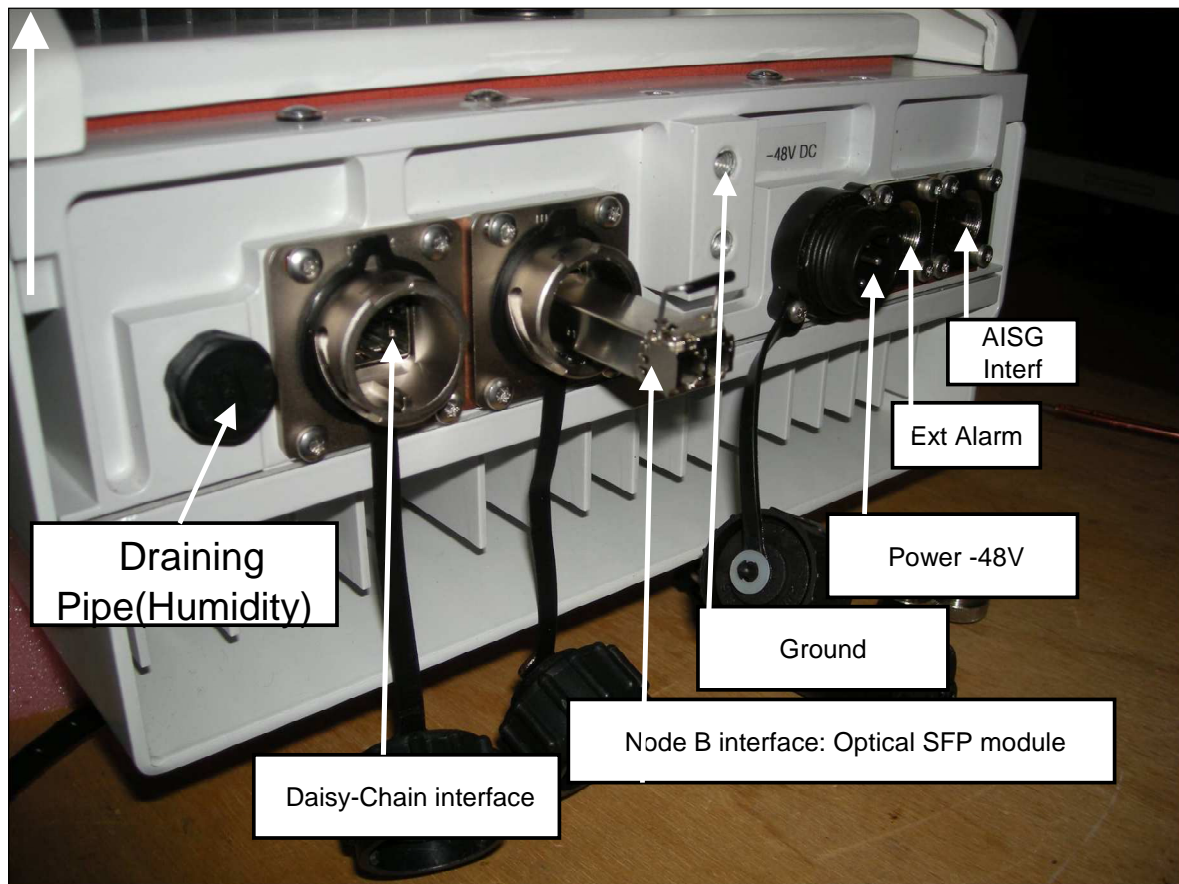
Figure 4: RRH 60W Bulkhead overview

The Bulkhead interfaces of the RRH are shown in the figure.

- **DC power connector** (Tyco series 3)

- **2 Optical connectors:** (Molex industrial SFP); one optical interface to connect to the Node B, the second optical interface to support daisy-chain (HW readiness).

- **1 external alarm connectors**: (12-pin Circular Din Female connector). The RRH is able to report 4 external alarms to the OMC.

- **1 AISG (RS485) connector:** (8-pin Circular Din Female connector). The RRH is HW ready to support RETA.

- **ANT Rx** : 7/16 DIN coaxial female connector for the connection with the diversity antenna
- **ANT Tx/Rx** : 7/16 DIN coaxial female connector for the connection with the main antenna

- **Maintenance Interface** : 9-pin D-Sub RS232 and RJ-45 100 Base-T

4.   RRH 60W INITIAL CONFIGURATIONS

This section explains the initial configurations that are available to the RRH60-21 and RRH60-09

4.1.   STANDARD FEATURES

SW Release	RRH	Frequency	Carrier	Configuration	Optical Interface	Power Supply
UA08.1	**RRH60-21**	**2100**	Up to 3 carriers	Star and daisy Chain	MM Dual fiber SM Single fiber SM Dual fiber	DC -48V
UA08.1	**RRH60-09A**	**900**	Up to 2 carriers	Star and daisy Chain	MM Dual fiber SM Single fiber SM Dual fiber	DC -48V

4.2.   OPTIONAL FEATURES

Optional Feature	Choice	Restrictions / Comments
Power cable connectorized	Yes/No	15M length; same cable used with RRH40-21
DC Power connector	Yes/No	Can be ordered to build a power cable on site.
Ground cable	Yes/No	16M length
Alarm cable	0 or 1	Alarm cable, 15m length. 1 cable supports 4 user alarms
Optical cable	Yes/No	several variants according to site cabling
OT box	Yes/No	Use to increase the distance between NodeB and RRH
Mounting Kit	Wall//Pole std/Pole low profile	Wall mounting is mandatory
RF Jumpers	0 , 2 or 4	Per sector
TMA	Yes/No	Frequency dependent
TMA connection kit	Yes/No	

4.3.   RRH 60W ORDER CODE

The RRH 60W consists of the pre-integrated RRH unit delivered with solar shield.

The SFP optical transceiver is not part of the pre-integrated unit and must be ordered separately.

Order Code	Code Description	Provisioning Rule
3JR21011AA	RRH60-2100 OD -48VDC	Manufacture Discontinue
3JR21010AB	RRH60-900A OD -48VDC	Manufacture Discontinue

4.4. SFP OPTICAL TRANSCEIVERS

The SFP optical transceiver is ordered separately from the pre-integrated unit, according to optical interface (Multi-Mode or Single-Mode). The optical mode (SM or MM) is given by the distance between the Node B and the RRH.

Three SFP types may exist in our solution:

- SFP Multi Mode (MM): One fiber carries the downlink signal and a second one the uplink signal. The MM fiber is used for short distance (<= 500 m). The SFP module in Multi-mode uses a transmitter 850 nm wavelength.

- SFP Single Mode-Single fiber (SM-SF): Single mode transceiver exists with Single fiber (One single fiber carries both downlink and uplink signal). Compared to the MM, the SM must be used for long distance (15, 20 Km). On both side of the optical fiber (SM-SF), the SFP must have a different wavelength transmitter:

  o The SFP module uses on the NodeB is a transmitter 1550 nm wavelength. On the Radio part, the SFP module, uses a transmitter 1310 nm wavelength

  o In case of RRH daisy-chain, the first RRH in the chain, uses a transmitter 1550 nm wavelength, at the other side of the fiber, the second RRH uses a transmitter 1310nm wavelength. This is summarized in the figure.
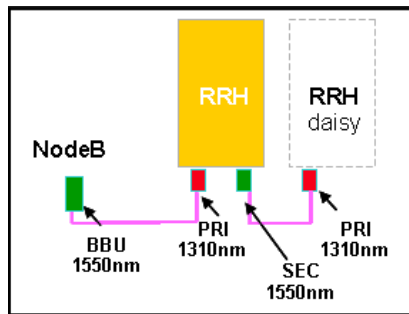
Figure 5: connectivity in daisy-chain Single Mode - Single fiber

- SFP Single Mode-Dual fiber (SM-DF): One fiber carries the downlink signal and a second one the uplink signal. This technology is older than the SM-SF, and can be proposed in a network already deployed with SM-DF. Otherwise the solution SM-SF is preferred.

4.4.1 RRH IN STAR AND DAISY-CHAIN CONFIGURATION

The RRH is hardware ready to support the features Star and daisy-chain.

The feature Star is always supported by the digital BBU.

The feature RRH daisy-chain is supported from UA07.1 UTRAN release.

The two tables bellow, summarizes the wavelength transmitter to be used for each type of SFP in star and daisy-chain configuration.
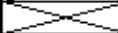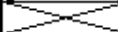
SFP type	BBU	RRH (star)	
		CPRI-PRI	CPRI-SEC
Multi-mode	850nm	850nm	
Single-mode DF	1310nm	1310nm	
Single-mode SF	1550nm	1310nm	

Figure 6: RRH in star configuration - SFP type
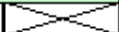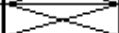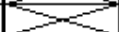
SFP type	BBU	Daisy-Chain			
		RRH1		RRH last	
		CPRI-PRI	CPRI-SEC	CPRI-PRI	CPRI-SEC
Multi-mode	850nm	850nm	850nm	850nm	
Single-mode DF	1310nm	1310nm	1310nm	1310nm	
Single-mode SF	1550nm	1310nm	1550nm	1310nm	

Figure 7: RRH in daisy-chain - SFP type

4.4.2 SFP TO ORDER ON RRH SIDE
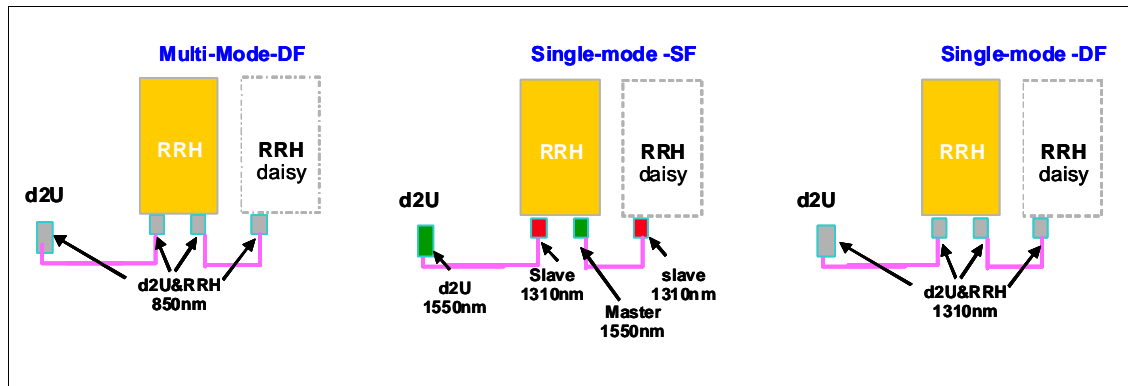
SFP MULTI-MODE OR SINGLE-MODE DUAL FIBER

In case of Star configuration, only primary port (Slave) is equipped.

In case of daisy chain configuration, both ports (Slave and Master) need to be equipped, except the Master port of the last RRH in the chain.

Order Code	Code description	Provisioning Rule
1AB187280063	SFP, CPRI RATE 3, 850NM, MULTI MODE DUAL FIBER	**Star Configuration (MM/DF)** **Qty = 0 …6**. Provide 1 x SFP per RRH. **Daisy-chain Configuration (MM/DF)** **Qty = 0 …10**. Qty = 2 x SFP per RRH and only one SFP for the last RRH in the chain.
1AB187280065	SFP,1310nm ,SM, 15KM, SINGLE MODE, DUAL FIBER	**Star Configuration (SM/DF)** **Qty = 0 …6**. Provide 1 x SFP per RRH. **Daisy-chain Configuration (SM/DF)** **Qty = 0 …10**. Qty = 2 x SFP per RRH and only one SFP for the last RRH in the chain.

SFP SINGLE-MODE SINGLE FIBER

In case of Star configuration, only primary port (Slave) is equipped.

In case of daisy chain configuration, both ports (Slave and Master) need to be equipped, except the Master port of the last RRH in the chain.

Order Code	Code description	Provisioning Rule	
1AB194670019	SFP, CPRI I-III, 1310nm, SINGLE MODE, SINGLE FIBER	**Slave Port**	**Star Configuration (SM/SF)** **Qty = 0 …6**. Provide 1 x SFP per RRH.
Daisy-chain Configuration (SM/SF)			
1AB194670019	SFP, CPRI I-III, 1310nm, SINGLE MODE, SINGLE FIBER	**Slave Port**	**Qty = 0 …6**. Provide 1 x SFP per RRH (port Slave).
1AB194670018	SFP, CPRI I-III, 1550nm, SINGLE MODE, SINGLE FIBER,	**Master Port**	**Qty = 0 …4**. Provide 1 x SFP per port Master used (Master port of the last RRH in the chain is not used).

4.5. CONFIGURATION OPTIONS

4.5.1 ANCILLARIES – POWER AND GROUND CABLE

Ancillaries are used to power the RRH from a DC power plant.
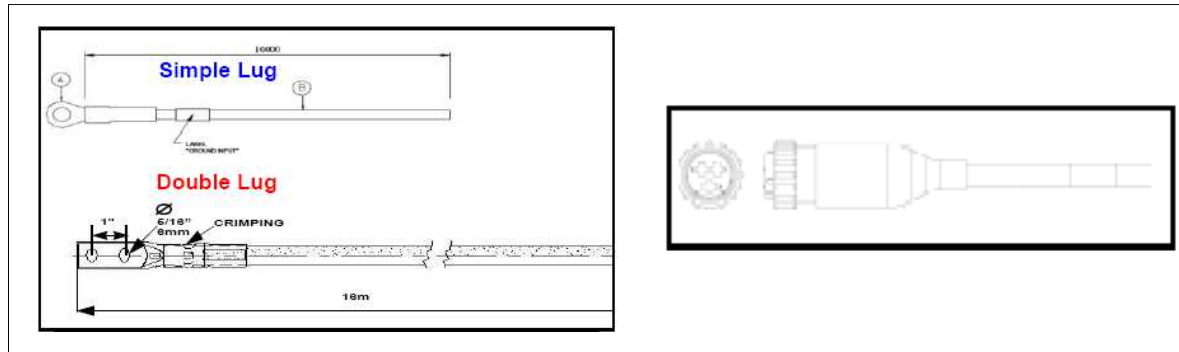
Figure 8: Cable power connectorized and GND

ITEMS TO ORDER

Order Code	Code Description	Provisioning Rule
300972874	KIT, CABLE, POWER, CONNECTORIZED 6 mm² (10 AWG), -48V, 15m (50 ft.)	Power cable, 15M length: Connect the RRH to a DC power plant
NTU707AQ	GROUND CABLE WITH A SIMPLE LUG – 16M – 16 mm²	Ground cable is mandatory for the RRH installation.

4.5.2 DC POWER CONNECTOR

OPTION DESCRIPTION

If the 15M power cable delivered with the RRH as an option is not long enough for the customer installation, it can be possible on site to create a customized power cable, by ordering a DC power connector (TYCO Serial 3). The upgrade procedure is described in the method document 53-6306.
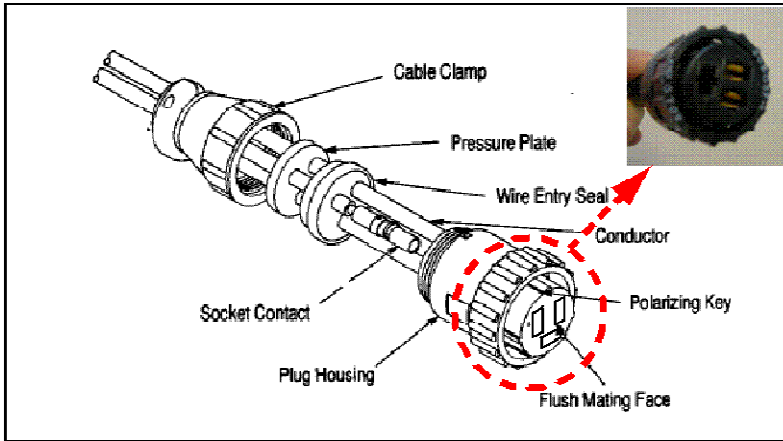
Figure 9: RRH40-21 DC power connector

ITEM TO ORDER

Order Code	Code Description	Provisioning Rule
300988607	POWER CONNECTOR ASSY RRH40-21	1 / RRH if option selected

Recommendation:

The DC cable type is HO7RN-F or equivalent, cable is composed of 2 core 10 AWG (6mm²), color wire Blue (-48vdc), Black (0V).

The power connector used on the RRH side (Tyco serial 3), accept Type XII power contacts which can carry up to 35 amps per contact. These contacts will accommodate a wire size range of 16 to 10 AWG (1,5 to 6 mm²).

More information on the DC power cable can be found in the 9341 RRH site specification document.

4.5.3 ALARM CABLE

The RRH manages and reports 4 external alarms to the OMC. The alarm cable can be connected to the User alarm interface of the RRH.

Figure 10: cable user alarm 15M

ITEMS TO ORDER

Order Code	Code Description	Provisioning Rule
3JR30016AA	CABLE, ALARM CONNECTORIZED X PAIR – 15M	**Qty = 0, 1** If the option is selected, 1 cable is provided.

4.5.4 OPTICAL CONNECTION

There are 3 considerations to take into account when ordering an optical connection:

- Optical mode : Single mode or multi mode

- Distance between the modules RRH and Node B

- RRH site location (Pole, terrace, …)

The different configurations available on site can be synthesised on 4 models. Combinations can be proposed, according to the engineering rules described in the Product Engineering Information document.

OPTICAL MODEL N°1: RRH-D2U DIRECT CABLE
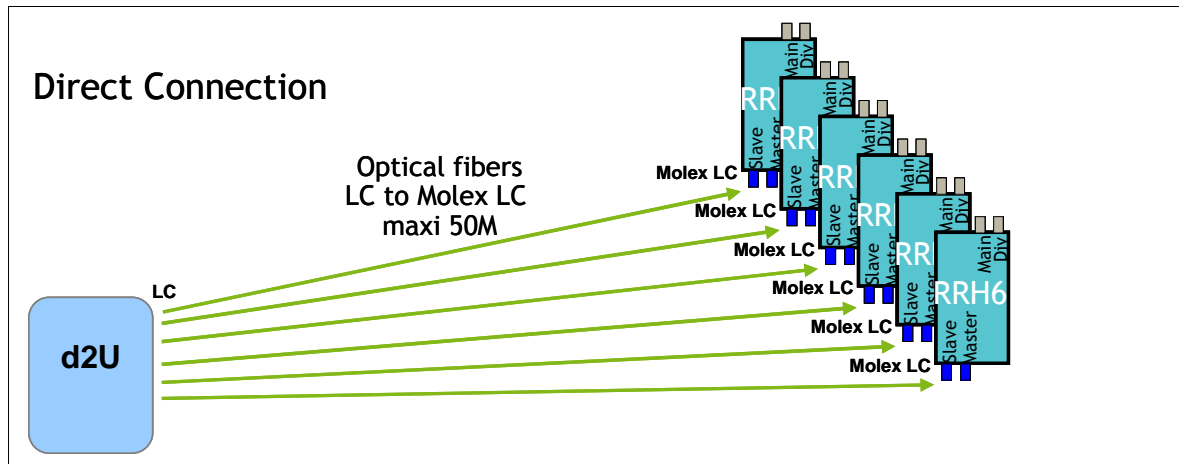
Figure 11: Optical model N°1: RRH-D2U direct

Each RRH is connected to the d2U through a LC to Molex LC optical cable, 2 lengths available from ALU.

OPTICAL MODEL N°2: RRH-D2U IN STAR CONFIGURATION TH ROUGH OT BOX
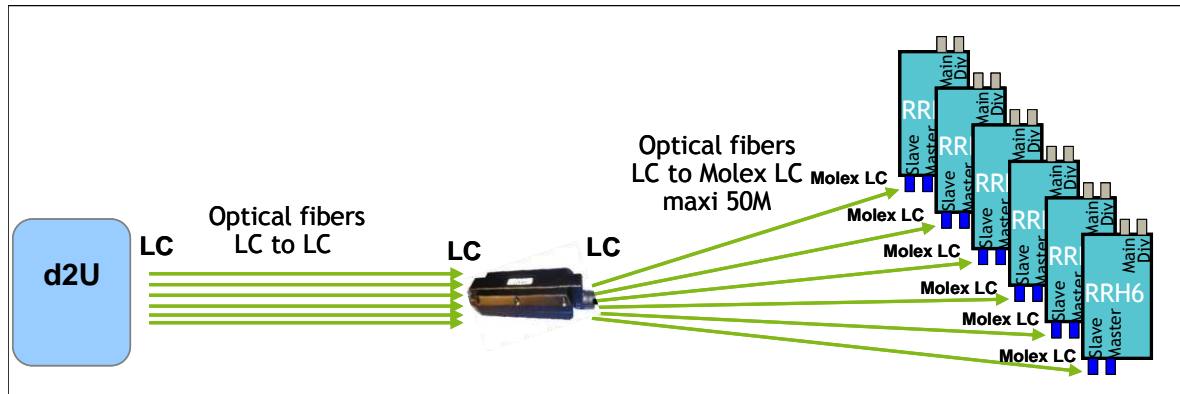
Figure 12: Optical Model N°2: RRH-D2U through OT-Box

This model covers a distance between the D2U and RRH, greater than 50 meters, which is the limit with the LC to Molex LC cables delivered by ALU.

To increase the distance, insert an OT-box between the d2U and the RRHs. The OT-box supports up to 6 optical cables LC to ODC (on the RRH side) and up to 6 optical cables LC to LC on the d2U side, as shown on the figure.

If the RRH is at more than 100M from the d2U (maximum cable set proposed by ALU), one solution is to get locally a specific LC-LC cable at the length you need, plug it to an OTBOX and add the last section OTBOX-RRH with the optical cable provided by ALU.

Note that the distance between d2U and RRH is limited by the length maximum supported by the fibers in Multi- mode (500m) or single mode (10 km).

OPTICAL MODEL N°3: RRH-D2U IN DAISY-CHAIN CONFIGURA TION –COLOC ATED RRH
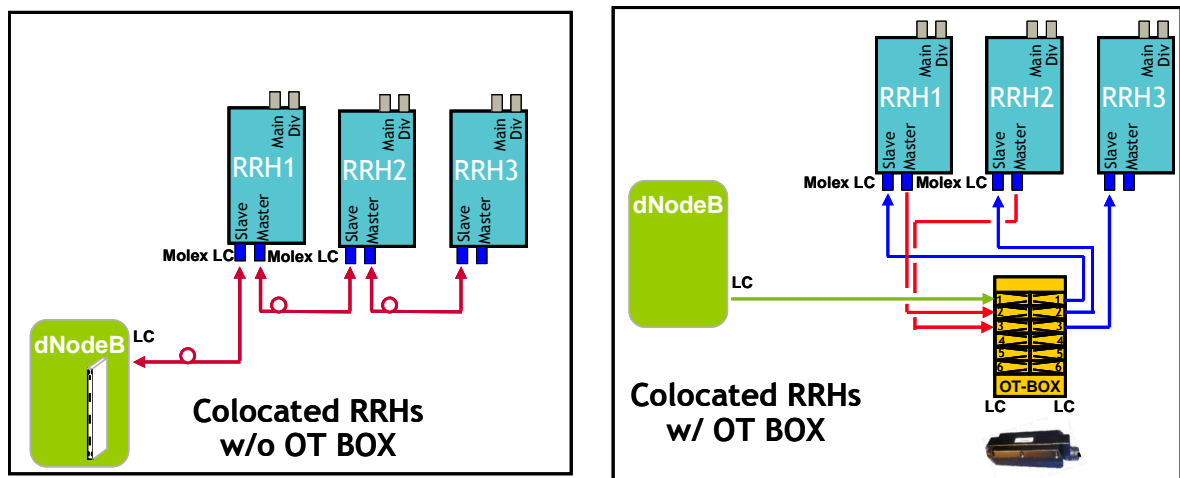
Figure 13: Optical model N°3: RRH-D2U in daisy-chain

In this model, we consider the RRHs located in the same area.

- If the distance between each RRH is compatible with the optical cables provided by ALU, the RRHs maybe connected directly to each other (left figure).

- If the distance between each RRH is greater than the longest optical cable ALU can provide, an other solution maybe to connect each RRH on the OTBOX, using the 50M LC-Molex LC optical cable (right figure).

OPTICAL MODEL N°4: RRH-D2U IN DAISY-CHAIN CONFIGURA TION –DISTANT RRH
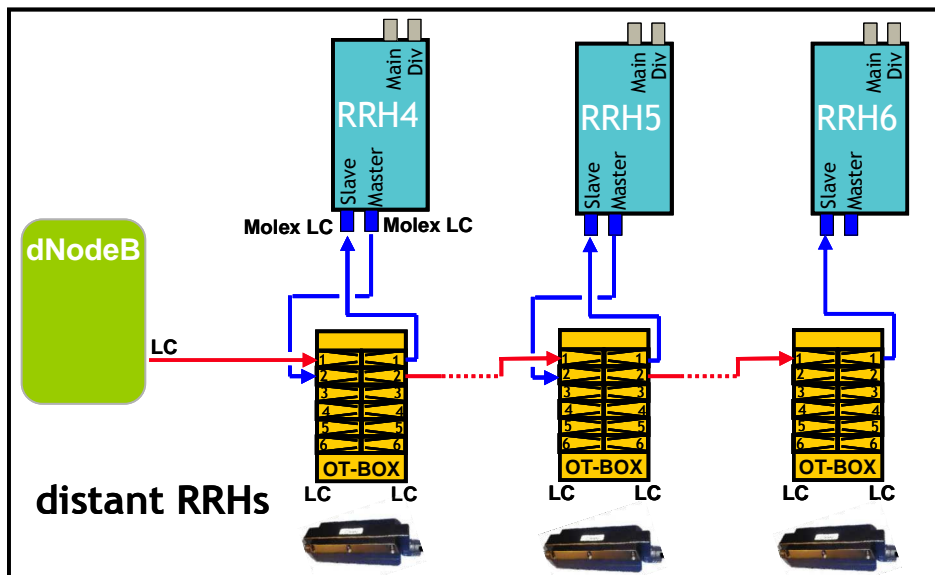
Figure 14: Optical model N°3: RRH-D2U in daisy-chain

Here, we consider that the distance between each RRH is not compatible with Model N°3. The OTBOX is used to convert the RRH por t from Molex LC to LC. To interconnect the OTBOX, you can use the LC to LC cable ALU can provide or you get locally a specific LC-LC cable at the length you need.

Note that the maximum distance between each RRH is limited by the length maximum supported by the fibers in Multi- mode (500m) or single mode (10 km).

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OPTICAL CABLE REFERENCES

Order Code	Connector Type D2U side	Connector Type RRH side	Length	Fiber Mode
3JR30022AA	**LC**	**Molex LC Industrial**	5 M	**SM - SF**
3JR30023AA	**LC**	**Molex LC Industrial**	10 M	**SM - SF**
3JR30013AA	**LC**	**Molex LC Industrial**	15 M	MM
3JR30011AA	**LC**	**Molex LC Industrial**	15 M	**SM - SF**
3JR30014AA	**LC**	**Molex LC Industrial**	50 M	MM
3JR30012AA	**LC**	**Molex LC Industrial**	50 M	**SM - SF**
Order Code	Connector Type D2U side	Connector Type OTBOX side	Length	Fiber Mode
300988268	**LC**	**LC**	15M	MM
300988250	**LC**	**LC**	15M	**SM - SF**
300988284	**LC**	**LC**	50M	MM
300988276	**LC**	**LC**	50M	**SM - SF**
Order Code	Connector Type RRH Main	Connector Type RRH Slave	Length	Fiber Mode
3JR30025AB	**Molex LC Industrial**	**Molex LC Industrial**	5 M	MM

OPTICAL TRANSMISSION BOX

The optical connection through OT box maybe used to interconnect two optical fibers together in order to increase the distance between the d2u and the RRH.

The OT box is not dependent of the fiber mode (single mode or multi mode fibers may be used with OT box)

In our RRH solution, OT-Box is a small optical connection box, 2 ports, supporting up to 6 cables per port or up to 12 fibers per port, as shown in the next figure. We use the OT box as soon as the optical fibers are not long enough to cover the distance between the d2U and the RRHs.
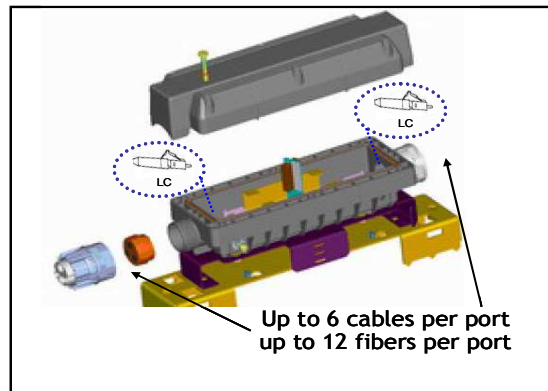
Figure 15: OT-Box

Order Code	Code Description	Provisioning Rule
300986031	ASSEMBLY, ENCLOSURE, OUTDOOR, FIBER CABLE MANAGEMENT, KS-24812,L1	OT box is required if the distance between d2U and RRH is greater than the longer fiber cable available. The number of OT-Box is dependent of the site configuration

4.5.5 OPTICAL ADAPTATION TO UPGRADE RRH40W TO RRH60W

In case of site upgrade from RRH40W to RRH60W, the existing optical cables can be reused by adding an optical adaptor.

The RRH40W used an ODC connector to connect the optical fiber cable, versus Molex LC Industrial connector on the RRH 60W.

ITEM TO ORDER

Order Code	Code Description	Provisioning Rule
3JR30019AA	OPTICAL ADAPTOR ODC TO MOLEX LC SINGLE MODE	**Single Mode:** Provide 1 adaptor per RRH 60W, reusing the optical fiber connection.
3JR30020AA	OPTICAL ADAPTOR ODC TO MOLEX LC MULTI MODE	**Multi Mode:** Provide 1 adaptor per RRH 60W, reusing the optical fiber connection.

4.5.6 MOUNTING KIT

The RRH can be either wall or pole mounted, using the appropriate mounting kit: this kit is designed to be easily fitted before hanging and locking the RRH on to it.

WALL MOUNTING KIT

Order Code	Code Description	Provisioning Rule
3JR30018AA	WALL MOUNTING, BRACKET/PLATE RRH	Wall mounting is mandatory per RRH whatever the mounting kit used.

POLE MOUNT STANDARD (D=152-380MM)

This kit is well adapted to mount 1-3 RRH at same elevation on 152-380mm pole, as shown in the figure.

Order code	Code Description	Provisioning Rule
3JR30018AA	WALL MOUNTING, BRACKET/PLATE RRH	QTY : 1 per RRH
109751768	KIT, STD POLE MOUNTING BRACKET AND BAND	QTY : 1 per RRH
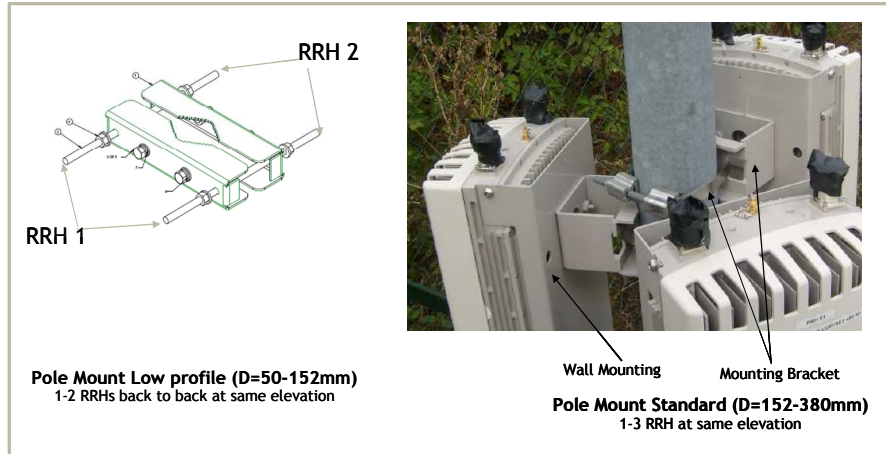
Figure 16: Pole mounting kit for RRH

POLE MOUNT LOW PROFILE (D=50-152MM)

Use this kit when mounting one RRH or RRHs back-to-back (1-2 RRHs at same elevation) on 50-152mm pole.

Subset	Code Description	Provisioning Rule
3JR30018AA	WALL MOUNTING, BRACKET/PLATE RRH	**QTY :** 1 per RRH
109796441	BRACKET, PIPE MOUNTING	**QTY :** 1 per RRH or 1 per back-to-back RRHs

4.5.7 TMA OPTION

9341 RRH can support TMA in two different modes:

- In current alarm mode (CWA): the RRH provides DC input (+12VDC) on each branch to power the TMA.

- In AISG mode, the RRH provides DC input (+24VDC) on the Tx/Rx port. The AISG signal is transmitted to the TMA, in order to manage an Antenna Line Device (ALD).
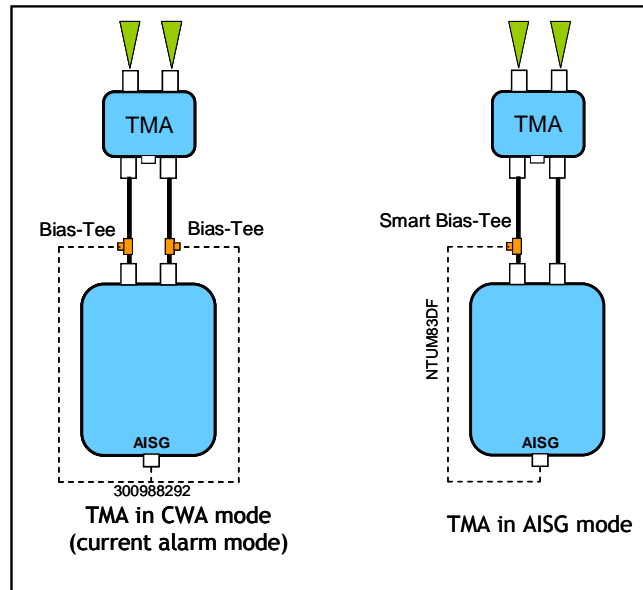
Figure 17: TMA in current alarm or AISG mode

TMA is under the scope of EPS team. Please refer to the Hardware Commercial Configurator Antenna System, link and reference in section 2.2

TMA CONNECTION KIT

The TMA connection kit consists of Bias-T/Smart Bias-T and cabling towards the AISG port of the RRH. One kit is required for TMA in CWA mode, one other kit for TMA in AISG mode. The TMA connection kit is the same for 900 or 2100 MHz.

Order Code	Code Description	Provisioning Rule
1AF16123AAAA	Bias-T BTS_DINm ANT_DINf	Per TMA in current alarm mode, provide: • Two bias tee • One cable
300988292	ASSEMBLY, CABLE, 2100RRH, BIAS-T, Y,AISG-SMA, BLK, 2M	
1AF23078AAAA	SMART BIAS TEE 800-2170 MHZ	Per TMA in AISG mode, provide: • One Smart bias tee • One AISG cable
NTUM83DF	CABLE: RCU ASSY (860.10008-K)	

4.5.8 RETA FOR RRH

OPTION DESCRIPTION

From UA07.1.3, The RCU can be managed without the need of a CCU at the NodeB side.

- If there is no TMA connected to the RRH (left fig.), the RCU is connected to the AISG port of the RRH, through AISG cable

- If there is a TMA connected to the RRH (right fig.), the TMA must be AISG, the RCU is connected to the AISG port of the TMA. On the RRH side, the TMA connection kit (AISG) is required.

Multiple RCUs may exist on site, they are depending of the Antenna used. Additional informations about the RCU can be found in a specific document dedicated to Antenna. Please refer to the Hardware Commercial Configurator for Antenna system, section 2.2.
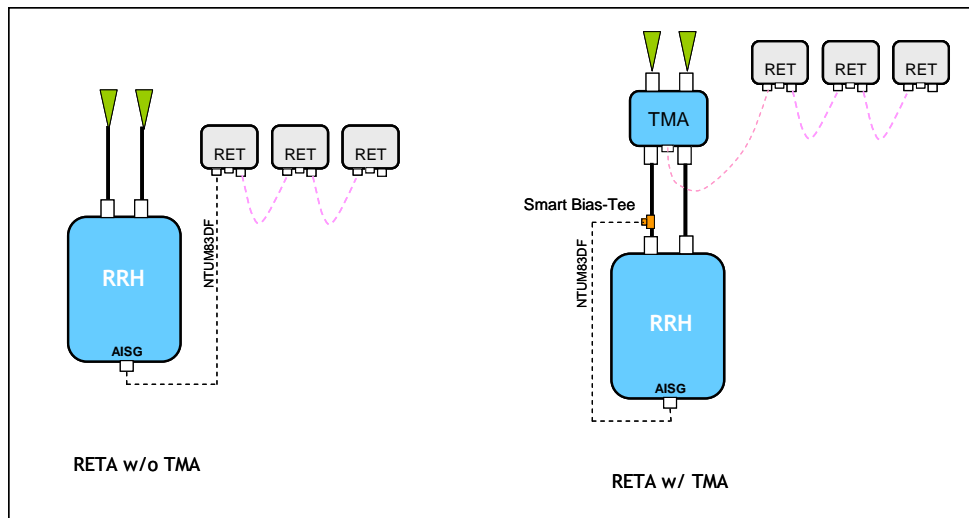

Figure 18: RETA for RRH overview

ORDERING CODE

Order Code	Code Description	Provisioning Rule
NTUM83DF	CABLE: RCU ASSY (*) (860.10008-K)	Provide this cable to connect the RET to the TMA port (right figure) or to the RRH (left figure).

(*) Additional RCU cable lengths can be found in the HCC document.

4.5.9 RF JUMPERS

OPTION DESCRIPTION

The RF jumpers are optional. The length of the jumpers must be chosen according to the installation site, the minimum bending radius should comply with the space available between the equipments. On our equipments, or on the feeder side, the RF connectors are always female, then the jumpers used to interconnect the equipments are male-male. An other parameter to take into account is the attenuation resulting of the length of these jumpers. For example, a jumper 2,5m length corresponds to 0,4 db losses.

ITEMS TO ORDER

Order Code	Code Description	Provisioning Rule
3BK05360CAAA	JUMPER 7/16 MM LG=2M	Provide two RF jumpers per sector on RRH side. If TMA option, provide 2 more RF jumpers per sector.

4.5.10 OPTIONAL 7/16 METALLIC CAP

Only if a site is configured with several RRH and if only one RF out port is cabled, the other RF out port must be having a Cap (mandatory). (Example two RRH in STSR x+y configuration a cap must be screwed on each RF Div port).

ITEMS TO ORDER

Order Code	Code Description	Provisioning Rule
1AB309180001	7/16 cap	1 cap by RRH on RF out port no cabled.

4.6.   CAPACITY LICENSING

The ordering codes of the capacity licensing feature introduced in UA06.0 release are now covered in a dedicated MOPG.

Refer to UMT/PFO/APP/030572: RNC & NodeB Capacity Licensing Model Offer Provisioning Guide.

5. 9341 RRH60-XX RU LIST

5.1. FRUS SPARES (FIELD REPLACEABLES UNIT)

	Order Code	Designation
Cabinet Items		
	3JR21011AA	RRH60-2100 OD -48VDC
	3JR21010AB	RRH60-900A OD -48VDC

5.2. SRU LIST (SHOP REPLACEABLE UNIT)

	Order Code	Designation
Optical transceiver		
	1AB187280063	SFP, CPRI RATE 3, 850NM, MULTI MODE DUAL FIBER
	1AB187280065	SFP,1310nm ,SM, 15KM, SINGLE MODE, DUAL FIBER,
	1AB194670019	SFP, CPRI I-III, 1310nm, SINGLE MODE, SINGLE FIBER,
	1AB194670018	SFP, CPRI I-III, 1550nm, SINGLE MODE, SINGLE FIBER,
Power cabling		
	NTU707AQ	GROUND CABLE WITH A SIMPLE LUG – 16M – 16 mm²
	300972874	KIT, CABLE, POWER, CONNECTORIZED 6 mm² (10 AWG) , -48V, 15m (50 ft.)
	300988607	POWER CONNECTOR ASSY RRH-4021
Alarm cable		
	3JR30016AA	CABLE, ALARM CONNECTORIZED X PAIR – 15M
Optical Cables		
	3JR30022AA	OPTICAL FIBRE: LC TO MOLEX LC 5M SM
	3JR30023AA	OPTICAL FIBRE: LC TO MOLEX LC 10M SM
	3JR30013AA	OPTICAL FIBRE: LC TO MOLEX LC 15M MM
	3JR30011AA	OPTICAL FIBRE: LC TO MOLEX LC 15M SM-SF
	3JR30014AA	OPTICAL FIBRE: LC TO MOLEX LC 50M MM
	3JR30012AA	OPTICAL FIBRE: LC TO MOLEX LC 50M SM-SF
	300988268	OPTICAL FIBRE: LC TO LC 15M MM
	300988250	OPTICAL FIBRE: LC TO LC 15M SM-SF
	300988284	OPTICAL FIBRE: LC TO LC 50M MM
	300988276	OPTICAL FIBRE: LC TO LC 50M SM - SF
	300986031	ASSEMBLY, ENCLOSURE, OUTDOOR, FIBER CABLE MANAGEMENT, KS-24812,L1
	3JR30019AA	OPTICAL ADAPTOR ODC TO MOLEX LC SINGLE MODE
	3JR30020AA	OPTICAL ADAPTOR ODC TO MOLEX LC MULTI MODE

	3JR30025AB	OPTICAL FIBER: MOLEX (LC TO LC) 5M MM
Mounting Kit		
	3JR30018AA	WALL MOUNTING, BRACKET/PLATE RRH
	109751768	KIT, STD POLE MOUNTING BRACKET AND BAND
	109796441	BRACKET, PIPE MOUNTING
TMA cabling		
	1AF16123AAAA	Bias-T BTS_DINm ANT_DINf
	300988292	SL-ASM,CBL,2100,AISYSMA,2
	1AF23078AAAA	SMART BIAS TEE 800-2170 MHZ
	NTUM83DF	CABLE: RCU ASSY (860.10008-K)
RF CAP		
	1AB309180001	7/16 Cap
Jumper		
	3BK05360CAAA	JUMPER 7/16MM LG=2M
Solar shield		
	3JR30021AA	SOLAR SHIELD RRH60-21

6. ABBREVATIONS AND DEFINITIONS

6.1. ABBREVIATIONS

AC	**A**lternative **C**urrent
AISG	**A**ntenna **I**nterface **S**tandard **G**roup
ALD	**A**ntenna **L**ine **D**evice
BBU	**B**ase **B**and **U**nit (Typically d2U)
BIP	**B**reaker **I**nterface **P**anel
BTBR	**B**i **T**ransmission **B**i **R**eception
BTS	**B**ase **T**ransceiver **S**tation
CCM	**C**ore **C**ontrol **M**odule
CEM	**C**hannel **E**lement **M**odule
C USER ICO	**C**ompact **U**ser **I**nter**CO**nnect **M**odule
CxOIM	**C**ompact **O**ptical **I**nterface **M**odule
CWDM	**C**oarse **W**avelength **D**ivision **M**ultiplexing
DDF	**D**igital **D**istribution **F**rame
DC	**D**irect **C**urrent
DDM	**D**ual **D**uplexer **M**odule
FRU	**F**ield **R**eplaceable **U**nit
FRUP	**F**ield **R**eplaceable **U**nit **P**revented
GPSAM	**G**lobal **P**ositioning **S**ystem **& A**larm **M**odule
GPxOIM	**M**odule supporting **GPSAM** functions and ready for **CxOIM** insertion
hTRM	**TR**anceiver **M**odule for **RRH**
ICCM	**I**ntegrated **C**ore **C**ontrol **M**odule
ICCM2	**2**nd generation of **iCCM (**integrated Core Control Module)
ICEM2	**2**nd generation of **iCEM** (integrated Channel Element Module)
IEAM	**I**ntegrated **E**xternal **A**larm **M**odule
iTRM	**I**ntegrated **T**ransceiver **M**odule
LPPCM	**PCM L**ightening **P**rotection
MCPA	**M**ulti **C**arrier **P**ower **A**mplifier
MS	**M**ilitary **S**pecification
MTBF	**M**ean **T**ime **B**etween **F**ailures
ODF	**O**ptical **D**istribution **F**rame
OIM	**O**ptical **I**nterface **M**odule
OT BOX	Optical Transmission BOX

OTOR	**O**mni **T**ransmission **O**mni **R**eception
OTBR	**O**mni **T**ransmission **B**i **R**eception
OTSR	**O**mni **T**ransmission **S**ectored **R**eception
PCM	**P**ulse **C**ode **M**odulation
RETA	**R**emote **E**lectrical **T**ilt **A**utomatic
rPAC	**P**ower **A**mplifier **C**ontroller for **RRH**
rPAM	**P**owe**r A**mplifier **M**odule for **RRH**
RETA	**R**emote **E**lectrical **T**ilt **A**ntenna
RRH	**R**emote **R**adio **H**ead
RF	**R**adio **F**requency
RNC	**R**adio **N**etwork **C**ontroller
RoHS	**R**estriction **o**f **H**azardous **S**ubstance
SDM	**S**ingle **D**uplexer **M**odule
STSR	**S**ectored **T**ransmission **S**ectored **R**eception
SRU	**S**hop **R**eplaceable **U**nit
TMA	**T**ower **M**asthead **A**mplifier
TTLNA	**T**ower **T**op **L**ow **N**oise **A**mplifier
iTRM/xTRM	**T**ransceiver **R**eceiver **M**odule
UE	**U**ser **E**quipment
UMTS	**U**niversal **M**obile **T**elecommunications **S**ystem

6.2. DEFINITIONS

Ancillaries	Miscellaneous hardware items used for installing and interconnecting Alcatel-Lucent equipment (ex: cables and connectors). The customer can either order them from Alcatel-Lucent or buy them locally.
Configuration	Defined list of values for the features associated with the product.
Extension	Adding more bandwidth to the current configuration.
Feature	Portion of the product design that represents a specific functionality.
Initial	Functional product configuration for a new installation.
Kit	Pre-defined bundle of parts/items providing a given product feature or option.
Optional feature	Non-mandatory feature that can be provided to enhance the configuration.
Package	A bundle of items that are NOT functional by themselves (e.g. configuration extension, upgrade, feature or option addition).
Product	Bundle of hardware and software items that provides a specific

	function in the telecom network.
SFP Small Form-Factor Pluggable	SFP, <application>, <fibre>, <reach>, <connector>, <temp> As example: 702073784 – SFP, GbE SX, MM, 550m, duplex LC, -40/85
Upgrade	When the hardware/software platform is being enhanced to add new functionality or value.
Long Term MTBF	The long term MTBF are reached only when the product is mature. The long term MTBF is target for year 3 or after.
Medium Term MTBF	An MTBF with margin is defined for penality discussion with the customer. The medium term MTBF is target for first 2 years of production. Return rate penalities in customer contracts should be aligned on medium Term MTBF.
BP Building Package	Building Package. A building package is a no functional model; for example a kit.
FRU Field Replaceable Unit	A Field Replaceable Unit is an HWI (Hardware Item) that may fail or is in the scope of preventive maintenance and that customers should have in stocks. FRUs have dependability data (MTBF or life duration). An FRU must be alarmed.
FRUP Field Replaceable Unit Prevented	It's an HWI (Hardware Item) with lifetime limited, periodically replace, and maintenance procedure associated with; for example an air filter.
SRU Shop Replaceable Unit	It's a HWI (Hardware Item) that might be replaced on site when broken. An SRU does not require a spare on field. SRU is not associated with a MTBF
SAV Spare Apart Volume	Is considered as SAV, technical items (HWI = Hardware Item) potentially requested by customers in case of damage and that ALU accept to sale as stand alone. A SAV item is a lowest orderable items and a SLI sub-element. A SAV item have to be codified and documented in PDM tool and ecat but not in the MOPG. A SAV item is not proposed in ALU customer catalog

☞ **END OF DOCUMENT** ☜