USERS MANUAL

Section 2.1033(C)(3)

USERS MANUAL

SECTION 2.1033(c) (3)

A copy of the installation and operating instructions to be furnished the user. A draft copy of the instructions may be submitted if the actual document is not available. The actual document shall be furnished to FCC when it becomes available.

RESPONSE:

A copy of **TD-RRH8X20-25** User Manual is attached

Alcatel·Lucent

Alcatel-Lucent TD-RRH8X20-25

User Manual

Document Number:	TDD-LTE
Document Issue:	01.00/ EN
Document Status:	Standard
Date of Issue:	06/Dec/2013

About Alcatel-Lucent

Alcatel-Lucent (Euronext Paris and NYSE: ALU) provides solutions that enable service providers, enterprises and governments worldwide, to deliver voice, data and video communication services to end-users. As a leader in fixed, mobile and converged broadband networking, IP technologies, applications, and services, Alcatel-Lucent offers the end-to-end solutions that enable compelling communications services for people at home, at work and on the move. For more information, visit Alcatel-Lucent on the Internet: **www.alcatel-lucent.com**

Notice

The information contained in this document is subject to change without notice. At the time of publication, it reflects the latest information on Alcatel-Lucent's offer, however, our policy of continuing development may result in improvement or change to the specifications described.

Trademarks

The following trademarks are used throughout this document:

Alcatel-Lucent, Alcatel, Lucent Technologies and their respective logos are trademarks and service marks of Alcatel-Lucent, Alcatel and Lucent Technologies.

CONTENTS

1 INTRODUCTION 5

1.1 OVERVIEW 5
1.2 SCOPE OF THIS DOCUMENT 5

2 TD-RRH8X20-25 SOLUTION OVERVIEW 6

2.1 OVERVIEW 6

3 TD-RRH8X20-25 PRODUCT DESCRIPTION 8

3.1 OVERVIEW 8
3.2 MAIN CHARACTERISTICS AND TECHNICAL DATA 9
3.2.1 Connectivity and Interfaces 9
3.3 MECHANICAL CHARACTERISTICS 10
3.3.1 Mechanical mounting solutions 10
3.3.2 Solar shield 11

4 ENVIRONMENTAL AND REGULATORY COMPLIANCE 13

4.1 ENVIRONMENTAL COMPLIANCE 13
4.1.1 Operation Temperature and Humidity 13
4.1.2 Storage 13
4.1.3 Transportation 13
4.2 REGULATORY COMPLIANCE 13
4.2.1 Safety 13
4.2.2 EMC 14
4.2.3 Eco-environmental compliancy 17

5 APPENDICES 18

5.1 APPENDIX A: PUBLICATION HISTORY 18
5.2 APPENDIX C: GLOSSARY & ACRONYMS 18
5.2.1 Glossary 18
5.2.2 Acronyms 18

LIST OF FIGURES

Figure 1 – Alcatel-Lucent TD-RRH8X20-25 Product 6
Figure 2 – TD-RRH8X20-25 System Overview (Star Configuration Supported From BBU) 7
Figure 3 - TD-RRH8X20-25 Functional Architecture 8
Figure 4 -TD-RRH8X20-25 mounted on a pole 10
Figure 5 -TD-RRH8X20-25 with solar shield 12

LIST OF TABLES

Table 1 - TD-RRH8X20-25 Main Characteristics 9

1 INTRODUCTION

1.1 Overview

This document provides an overview and describes the characteristics of the TD-LTE Remote Radio Head TD-RRH8X20-25 using 3GPP bands 41 (working band 2496 up to 2690MHz).

The content of this document is not a commitment from Alcatel-Lucent. Alcatel-Lucent reserves the right to change the technical specifications without notice until General Availability of the product. For more information on features availability, please refer to the Product Bulletins, Feature Planning Guides, Baseline and Release Notes.

1.2 Scope of this Document

The scope of this document is the Product Description for Alcatel-Lucent TD-RRH8X20W 2500MHz

Other RRH products are available from Alcatel-Lucent's portfolio. In addition, there will further extensions to the portfolio in future releases.

2 TD-RRH8X20-25 SOLUTION OVERVIEW

2.1 Overview

The Alcatel-Lucent distributed solution is composed of two main parts:

- The **Alcatel-Lucent** Base Band Unit
- The **Alcatel-Lucent TD-RRH8X20-25**, located locally or on a remote site: TD-RRH8X20-25 provides the RF transceiver, PA and filter functions typically found in the conventional Node B.

Figure 1 – Alcatel-Lucent TD-RRH8X20-25 Product

These two equipments are linked by optical fibres, carrying downlink and uplink base band digital signals along with OAM information.

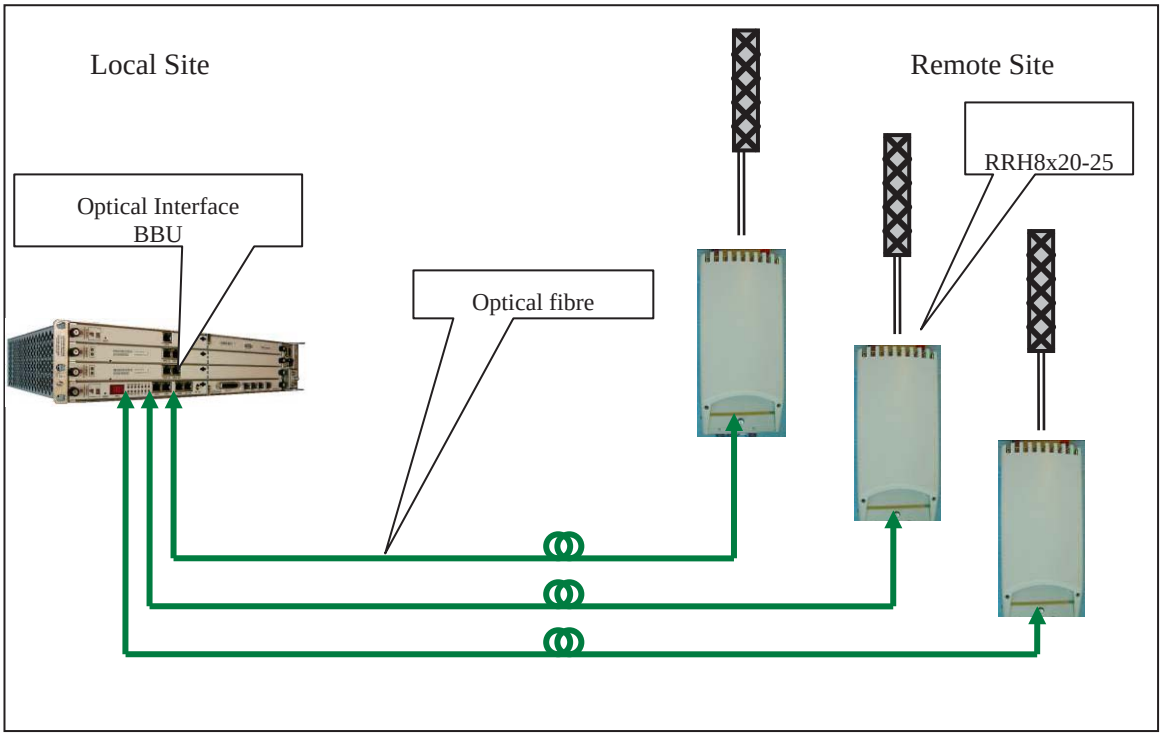


Figure 2 – TD-RRH8X20-25 System Overview
(Star Configuration Supported From BBU)

3 TD-RRH8X20-25 PRODUCT DESCRIPTION

3.1 Overview

The RRH includes:

- Eight (8) 2500MHz transmit paths of up to 20W per path
- Eight (8) receive paths
- Eight (8) Broadband Power Amplifiers of 196MHz bandwidth each
- Three (3) fibre interfaces carrying downlink and uplink base band signals, as well as OAM information and timing signal
- An AISG controller supporting Remote Electrical Tilt via the calibration port (OOK signal) or the AISG port (RS485 signal)
- A PSU (power supply unit) converting the input voltage into the target voltage for the different internal units.

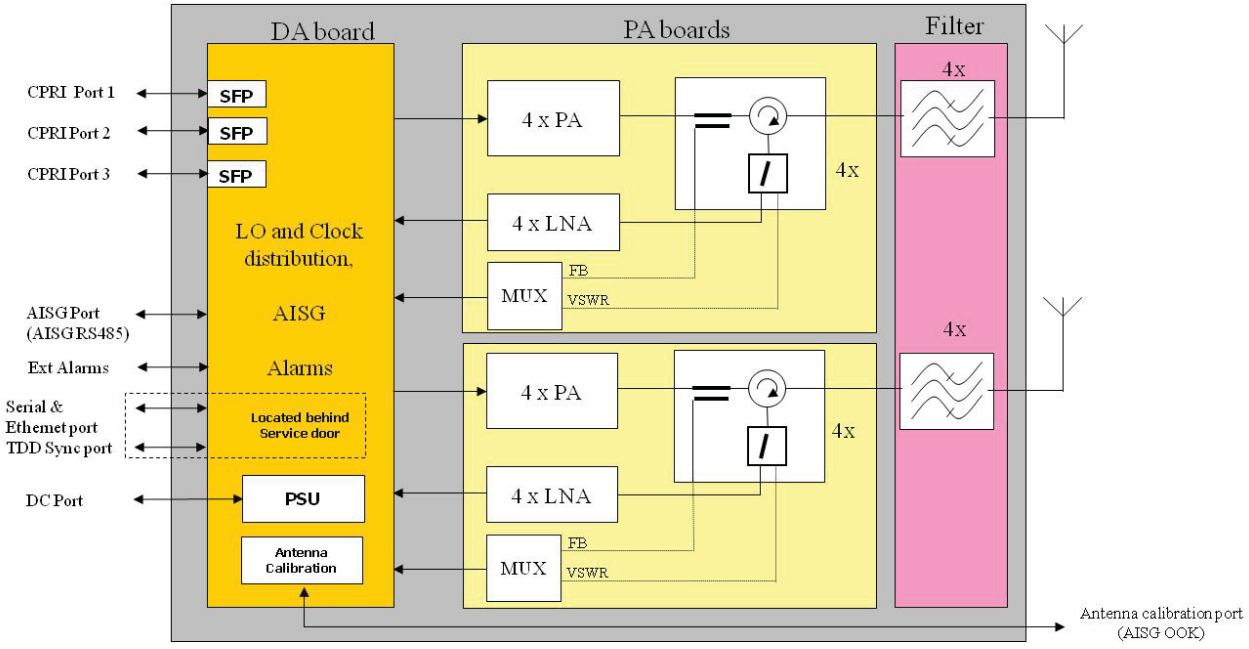


Figure 3 - TD-RRH8X20-25 Functional Architecture

3.2 Main Characteristics and Technical Data

TD-RRH8X20-25 main characteristics are summarized in the following table:

dimensions	
Sizes (HxWxD)	645 x 445 x 145 mm
Temperature range	-40ºC to +55ºC
Environmental (Other)	Fan-free (natural convection cooling)
RF Characteristics	
RF output power @antenna port	Up to 20W at each antenna port
Working frequency band	2496MHz to 2690MHz (194MHz bandwidth)
Supported antenna type	8 port dual polarization smart antenna
Optical Characteristics	
Supported fibre type	Single mode dual fibres (SMDF) or Multi mode dual
Electrical/Other Characteristics	
Power supply	-48V (-38V/-57V)

Table 1 - TD-RRH8X20-25 Main Characteristics

3.2.1 Connectivity and Interfaces

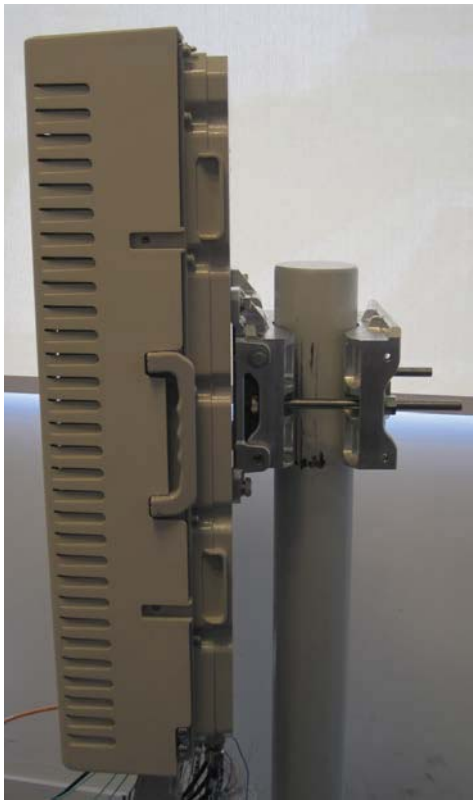
The RRH provides the following external interfaces:

- Three (3) optical CPRI links
- Eight (8) antenna ports
- One (1) antenna calibration port
- One (1) AISG port for RET support
- One (1) alarm port
- One (1) DC power input port

3.3 Mechanical Characteristics

3.3.1 Mechanical mounting solutions

TD-RRH8x20-25 can be either pole or wall mounted, using the appropriate mounting brackets: these brackets are designed to be easily fitted before hanging and locking the RRH on to it.



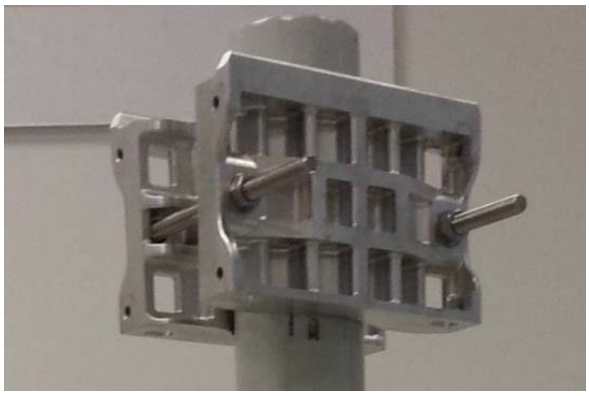
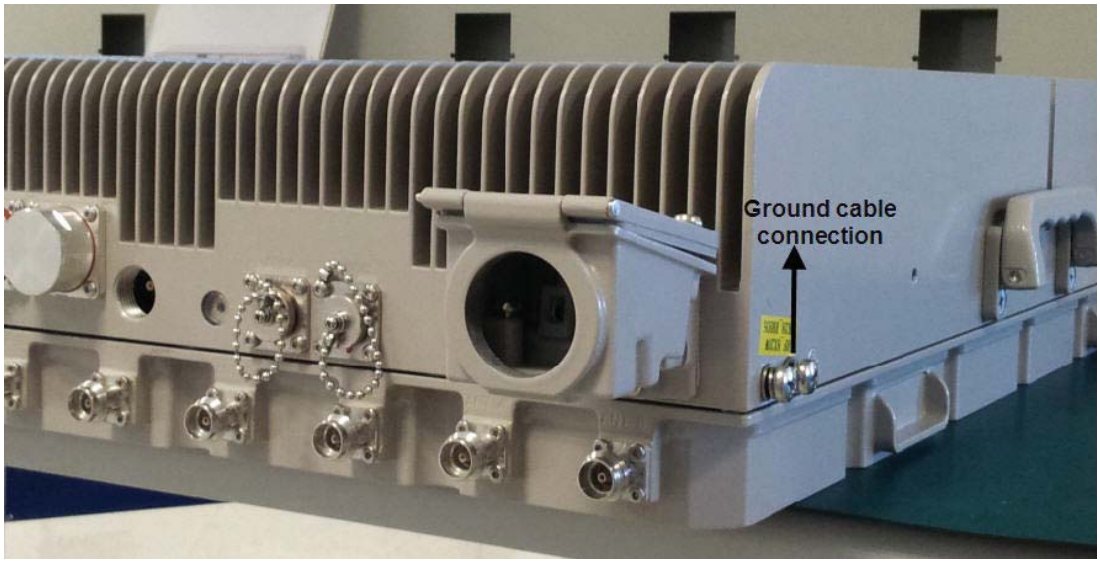


Figure 4 -TD-RRH8X20-25 mounted on a pole

3.3.2 Grounding:



3.3.3 Solar shield

TD-RRH8x20-25 does not use any fan as natural convection cooling is employed. It is equipped with an aesthetic solar shield that may be removed, if desired, for indoor installation only.

In case of outdoor installations, a solar shield is used. The cover is of low weight and easy to install.

Figure 5 -TD-RRH8X20-25 with solar shield

The solar shield is part of the thermal concept of the TD-RRH8X20-25, protecting the RRH against direct sun radiation.

4 ENVIRONMENTAL AND REGULATORY COMPLIANCE

4.1 Environmental Compliance

4.1.1 Operation Temperature and Humidity

The following requirements for environmental conditions apply for the RRH:

RRH meets the requirements as specified in IEC 60721-3-4 "Classification of Groups of Environmental Parameters and their Severities Stationary use at Non-weather protected locations" Classes 4K2/4Z5/4Z7/4B1/4C2/4S2/4M5.

4.1.2 Storage

RRH meets the requirements as specified IEC 60721-3-1 "Classification of groups of environmental parameters and their severities – Storage" Classes 1K4/1Z2/1Z3/1Z5/1B2/1C2(1C1)/1S3/1M2 (Weather protected, not temperature controlled storage locations).

4.1.3 Transportation

RRH meets the requirements as specified IEC 60721-3-2 "Classification of groups of environmental parameters and their severities – Transportation "Classes 2K3/2B2/2C2/2S2/2M1 (Careful transportation).

4.2 Regulatory Compliance

4.2.1 Safety

RRH meets Safety Regulatory standards IEC/EN60950-1 & IEC/EN 60950-22 or equivalent regulatory standards

4.2.2 EMC

Product conformance statements

Introduction:

The statements that follow are the product conformance statements that apply to the FDDRRH when deployed in Canada.

Industry Canada:

ICES-003: Interference- Causing Equipment Standard Digital Apparatus

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

ICCS-03: Specification for Terminal Equipment, Terminal Systems, Network Protection Devices, Connection Arrangements and Hearing Aids Compatibility

This product meets the applicable Industry Canada technical specifications.

RF approval:

• RSS-132: Cellular Telephones Employing New Technologies Operating in the Bands **2496 - 2690MHz**

The term “IC” before the certification/registration number only signifies that the Industry Canada technical specifications were met.

• RSS-133: Broadband Radio Service (BRS) and the Educational Broadband Service (EBS) bands.

The term “IC” before the certification/registration number only signifies that the Industry Canada technical specifications were met

United States:

Introduction:

The statements that follow are the product conformance statements that apply to the TDRRH when deployed in the United States.

Federal Communications Commission:

Important!

Changes or modifications not expressly approved by Alcatel-Lucent, Inc. could void the user's authority to operate the equipment.

.FCC Part 15:

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

This device meets FCC Part 15 Subpart B Class B requirements

. FCC Part15 Class A (as marketed)

Important!

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part15 of the FCC Rules. These limits are designed to provide reasonable protections against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's expense.

FCC Part15 Class B (as marketed)

Important!

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will no to ccur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna

• Increase the separation between the equipment and receiver

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

• Consult the dealer or an experienced radio/TV technician for help.

FCC Part 68:

Not applicable for this Device

RF approval:

This equipment complies with Part 2, Sub part J-Equipment Authorization Procedures, of the FCC Rules. This equipment complies with Part 27-Broadband Radio Service (BRS) and the Educational Broadband Service (EBS) bands.

Antenna exposure:

Antenna installations for the TDRRH shall be performed in accordance with all applicable manufacturer's recommendations, and national laws and regulations.

To ensure correct antenna installation, the antenna installer shall perform all necessary calculations and/or field measurements to evaluate compliance with applicable national laws or regulations regarding exposure to electromagnetic fields. The supplier of radio equipment, the supplier of antenna equipment and the integrator and builder of the site must provide sufficient information so that the limits of the exclusion zones can be determined. Any changes to the antenna or other equipment in the transmit path may require re-evaluation of the exposures to electromagnetic fields.

Pursuant to 47 CFR Part1, Subpart I, subject to the provisions of section 1.1307, all installations must be evaluated for requirements contained in Table 1, “Limits for maximum permissible exposure,” in section 1.1310.

RRH meets the requirements as specified in:

- EN 55022 / CISPR22, class B to fulfil Radiated Emissions (RE) requirement.
- EN 55022 / CISPR22, class B to fulfil Conducted Emissions (CE) requirement.
- IEC 61000-4-2 to fulfil Electrostatic Discharge (ESD) Immunity requirement
- EN61000-4-3/A1 to fulfil Immunity to RF EM field (enclosure port) requirement.
- IEC 61000-4-4 to fulfil Electrical Fast Transient (EFT) Immunity requirement.
- IEC 61000-4-6 to fulfil Conducted Immunity requirement.
- 3GPP TS 36.113 and ETSI EN 300 386
- ETSI TS 136 113 for Radiated Immunity
- ETSI TS 136 113 for Conducted Immunity
- FCC Part 15 Subpart B Class B for Radiated Immunity
- GR-1089-CORE, Sections 3.2.2 and 3.2.3 for conducted spurious emissions
- GR-1089-CORE, Sections 2.1.2 for ESD immunity

4.2.3 Eco-environmental compliancy

RRH complies with:

- RoHS 6/6 (lead solder free), Restriction on the use of certain Hazardous Substances (RoHS), Directive 2002/95/EC
- PBEMS-L4-01, titled Country-Specific Eco-Environmental Requirements

5 APPENDICES

5.1 Appendix A: Publication History

06/DEC/2013

Issue 01.00 / EN, Released

5.2 Appendix C: Glossary & Acronyms

5.2.1 Glossary

Fibre link A fibre link is:

- Either one physical fibre when Single-Mode optical propagation is used (using CWDM),
- Either a pair of fibres when Multi-Mode optical propagation is used: one fibre carries the downlink signal, the other one the uplink signals (Main and Diversity digital streams are multiplexed into a single HSSL stream).

5.2.2 Acronyms

1 - 10

3GPP	Third Generation Partnership Project

A - D

AISG	Antenna Interface Standard Group
CWDM	Coarse Wavelength Division Multiplexing
DL	Downlink
EMC	Electro-Magnetic Compatibility
FDD	Frequency Division Duplex

G - S

HW	Hardware
IEC	International Electrotechnical Commission
IP	Ingress Protection
LTE	Long Term Evolution
MM	Multi-Mode (fibre)
RET	Remote Electrical Tilt
RF	Radio Frequency
RoHS	Restriction of the use of certain Hazardous Substances
RRH	Remote Radio Head
RX	Receiver/Receive
SFP	Small Form-factor Pluggable
SW	Software

T - W

TX	Transmitter/Transmit
VSWR	Voltage Standing Wave Ratio
WEEE	Waste of Electrical and Electronic Equipment