Exhibit 6 – Instruction Book

Confidential

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 the FCC when it becomes available.

Response: The installation and operating instructions for the Alcatel-Lucent's **PCS LTE 9764 Metro Cell Outdoor Transceiver System FCC ID: AS5BBTRX-21** is attached.

The Installation Manual in this exhibit, ***Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Hardware Installation,* 3MN-01707-0002-RJZZA Issue 3.05 | October 2014**, is not furnished to the user, except under very exceptional and very limited circumstances. This manual contains highly proprietary circuit, equipment and architecture descriptions that must not be made available for public inspection.

The cover/title page is explicitly labeled:

"**Alcatel-Lucent – Internal**
Proprietary – Use pursuant to Company instruction".

This information is proprietary both to Alcatel- Lucent and to Alcatel- Lucent's contracted manufacturer/supplier.

(ALCATEL-LUCENT USA CONFIDENTIAL PROPRIETARY INFORMATION)

Alcatel-Lucent 9764

Metro Cell Outdoor LTE 2x1W and 2x2W

Hardware Installation

3MN-01707-0002-RJZZA
Issue 3.05 | October 2014

Alcatel·Lucent

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About this document

Purpose

The purpose of this document is to provide hardware installation instructions for an Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and an Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W.

Procedures are provided for mounting, grounding, powering, and cabling the 9764 MCO LTE 2x1W and the 9764 MCO LTE 2x2W.

What's new

This is Issue 3.05 of *Alcatel-Lucent Metro Cell Outdoor LTE 2x1W and 2x2W Hardware Installation,* 3MN-01707-0002-RJZZA.

The major changes introduced in this issue of the document are described in the following paragraphs. Changes introduced in prior issues of the document are shown in Appendix D, “Document issue history”

Issue 3.05 (October 2014) - Document changes from the previous release

The document changes from Issue 3.03, September 2014 are shown in the following table:

Table 1 Document changes from Issue 3.03, September 2014

Feature/enhancement	Description	Location
Documentation changes		
Connect GPS antenna	Added information and steps for using weatherproof tape when attaching external GPS antenna.	“Connect external GPS antenna - B25, B7 or B2 MCO” (p. 4-9) “Connect external GPS antenna to MCO - B3 MCO” (p. 4-12) “Connect internal/external GPS antenna to Alcatel-Lucent 9764 MCO LTE 2x2W” (p. 4-15)
Hardware and Ancillary items	Added information about weatherproof tape when attaching external GPS antenna in the External antenna – GPS table.	“Hardware and ancillary items” (p. 2-17)

Intended audience

The audience for this document is Installation personnel.

Supported systems

This document applies to the following Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W products:

- Alcatel-Lucent 9764 Metro Cell Outdoor V1.0 B25 LTE 2x1W
- Alcatel-Lucent 9764 Metro Cell Outdoor V1.1 B2 LTE 2x1W
- Alcatel-Lucent 9764 MCO V1.1 B2/B25 LTE 2x1W
- Alcatel-Lucent 9764 Metro Cell Outdoor V1.1 B7 LTE 2x1W
- Alcatel-Lucent 9764 Metro Cell Outdoor V1.1 B2 LTE 2x2W
- Alcatel-Lucent 9764 Metro Dock.

How to use this document

Start with the first chapter and work through the manual to the end. Once you have done this, you will have carried out the hardware installation completely and in the proper sequence.

Prior to installing the equipment, the installer should be familiar with the safety precautions, warnings, and product conformance statements. Required tools and materials recommended for installation, and a process checklist, are listed in topic “Pre-installation information” .

Safety information

For your safety, this document contains safety statements. Safety statements are given at points where risks of damage to personnel, equipment, and operation may exist. Failure to follow the directions in a safety statement may result in serious consequences.

Prerequisites

None

Conventions used

Vocabulary conventions

The following vocabulary conventions are also used when referring to Alcatel-Lucent products:

Table 2 Terminology

Term	Description/Meaning
9764 MCO	The 9764 MCO consists of the following modules: 9764 Metro Dock module, and the 9764 MCO WCDMA module.
9764 Metro Dock	Refers to the Alcatel-Lucent 9764 Metro Dock, a module supporting backhaul for the 9764 MCO.
9764 MCO LTE	Refers to the module that contains the complete base station, including baseband unit, radio unit and antenna. It is attached to the front of the 9764 Metro Dock to form the 9764 MCO.
9764 MCO V1.1 B2/B25 LTE 2x1W	Refers to the Band 2/Band 25 (combined) 2x1W variant of the 9764 MCO LTE that is the focus of this document.
9764 MCO V1.1 B2 LTE 2x2W	Refers to the Band 2 2x2W variant of the 9764 MCO LTE that is the focus of this document.

Typographical conventions

The typographical conventions used in this document are described in the following table.

Appearance	Description
emphasis	Text that is emphasized
document titles	Titles of books or other documents
graphical user interface text	Text that is displayed in a graphical user interface
variables	A value or command-line parameter that the user provides

Technical conventions

Lengths and other measurements are given in metric units, with non-metric units given as equivalents for use in non-metric markets.

For manufactured parts, the following system of conventions is used:

- Metric sizes of nuts, bolts, flat washers, and lock washers are identified by an uppercase letter M followed immediately by a size in millimeters (example: M10)
- American fractional sizes of nuts, bolts, anchor bolts, and washers are identified by a number followed immediately by a double apostrophe (example: 3/8"). In the case of lengths measured in feet, “2 feet” is used rather than “2'” so that the single apostrophe is not overlooked.

The illustrations in this document do not contain all details and exceptions, but are intended to highlight main points. Dimensions are usually shown in millimeters, with inches in parenthesis. As an example, 680.0 (26.77) equals 680 millimeters or 26.77 inches.

Wire gauges are specified in metric units. Equivalent sizes in the American Wire Gauge (AWG) system are given in the following table:

Standard cross-sections and wire diameter of round copper conductors

The following table is from CEI/IEC 60947-1:2004, *Table 1, Standard cross-sections of round copper conductors and approximate relationship between mm^2 and AWG/kcmil sizes* for reference. Additional wire sizes are included in this document as appropriate for the topic.

ISO rated cross-sectional area (mm^2)	AWG/kcmil size
0.2	24
0.34	22
0.5	20
0.75	18
1	-
1.5	16
2.5	14
4	12
6	10
10	8
16	6
25	4
35	2
-	1
50	0 (1/0)
70	00 (2/0)

ISO rated cross-sectional area (mm^2)	AWG/kcmil size
95	000 (3/0)
-	0000 (4/0)
120	250 kcmil
150	300 kcmil
185	350 kcmil
-	400 kcmil
240	500 kcmil
300	600 kcmil
NOTE: The dash, when it appears, counts as a size when considering connecting capacity (see 7.1.7.2 in the standard).	

Related information

For information on subjects related to the content of this document, refer to the documents listed in the following table:

Table 3 Related documents

Refer to this document	At this location	For more information on
Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Site Preparation, 3MN-01707-0001-RJZZA	9764 MCO LTE (Metro Cell Outdoor for LTE) (https://support.alcatel-lucent.com/portal/productContent.do?entryId=1-0000000003997)	9764 MCO LTE 2x1W site preparation
Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Technical Description 9YZ-04152-0056- DEZZA (LR13.3.L) 9YZ-05817-0056- DEZZA (LR14.1.L)	9764 MCO LTE (Metro Cell Outdoor for LTE) (https://support.alcatel-lucent.com/portal/productContent.do?entryId=1-0000000003997)	9764 MCO LTE 2x1W technical overview
Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Maintenance and Troubleshooting 9YZ-04152-0057-REZZA (LR13.3.L) 9YZ-05817-0057-REZZA (LR14.1.L)	9764 MCO LTE (Metro Cell Outdoor for LTE) (https://support.alcatel-lucent.com/portal/productContent.do?entryId=1-0000000003997)	9764 MCO LTE 2x1W maintenance and troubleshooting

Table 3 Related documents (continued)

Refer to this document	At this location	For more information on
Alcatel-Lucent 9772 Wi-Fi Service Controller V1.0 L Hardware Installation, 3MN-01840-0001-RJZZA	OnLine Customer Support (OLCS) (http://support.alcatel-lucent.com)	Instructions for installing the 9772 WiSC-L hardware and accessing its management interfaces.
Alcatel-Lucent 9764 and 9772 Metro Cell Outdoor Wi-Fi AP and Wi-Fi Service Controller, Release WA5.5, System Reference Guide, 3MN-01840-0002-RKZZA	OnLine Customer Support (OLCS) (http://support.alcatel-lucent.com)	Instructions for accessing and using the web-based graphic user interface (GUI) to manage/administer the 9772 Wi-Fi Service Controller and 9764 MCO Wi-Fi Access Point
Alcatel-Lucent 9764 and 9772, Metro Cell Outdoor Wi-Fi AP and Wi-Fi Service Controller, Release WA 5.5, CLI Reference Guide, 3MN-01840-0003-RKZZA	OnLine Customer Support (OLCS) (http://support.alcatel-lucent.com)	Instructions for accessing and using command line interface (CLI) to manage/administer the 9772 Wi-Fi Service Controller and 9764 MCO Wi-Fi Access Point.
Library for LTE End-to-End Solution	LTE End-to-End Solution (https://infoproducts.alcatel-lucent.com/aces/cgi-bin/dbaccessproddoc.cgi.edit?entryId=1-0000000001078)	The full collection of documents in the LTE collection
Alcatel-Lucent LTE Radio Access Network (RAN) eNodeB Macro and Metro Products Release FDD Release Notes 9YZ-05817-0001-FMZZA (LR13.3.L) 9YZ-04152-0001-FMZZA (LR14.1.L)	LTE End-to-End Solution (https://infoproducts.alcatel-lucent.com/aces/cgi-bin/dbaccessproddoc.cgi.edit?entryId=1-0000000001078)	Release specific software and feature status information
9764 lightRadio Metro Cell Outdoor "Family" Model Offer Provisioning Guide, BCR/IRC/APP/038681	Subject to non-disclosure agreement and available from Alcatel-Lucent representatives	Product ordering codes

Table 3 Related documents (continued)

Refer to this document	At this location	For more information on
FDD eNodeB Product Engineering Guide, LTE/DCL/APP/041927	Subject to non-disclosure agreement and available from Alcatel-Lucent representatives	The different Alcatel-Lucent LTE eNodeB hardware configurations and the related engineering rules and guidelines.
Grounding and Lightning Protection Guidelines for Alcatel-Lucent Wireless System Cell Sites, 401-200-115	OnLine Customer Support (OLCS) (http://support.alcatel-lucent.com)	Grounding and Lightning protection systems
Standard for Installation of Lightning Protection Systems, NFPA	ANSI web site (http://webstore.ansi.org/default.aspx)	Lightning protection systems
Recommended Practices on Surge Voltages in Low Voltage AC Power Circuits, IEEE C62.41 (Latest Edition)	IEEE web site (http://www.ieee.org/index.html)	Power

Document support

For support in using this or any other Alcatel-Lucent document, contact Alcatel-Lucent at the following telephone numbers.

From United States

- If you are using a landline, a cellular phone or VoIP, dial this number: **1-888-582-3688**

From other countries

- If you are using a cellular phone or VoIP, dial this number: **+1-630-224-2485**
- If you are using a landline (phone without a plus [+] character), replace the plus sign with your country's exit code. Dial this number: *Exit code for the country of origin*: **1-630-224-2485. See the country-specific exit codes listed** here.

These numbers apply for document support only. Please see the section “Technical support” for details about product hardware, software, and technical support.

Technical support

For technical support, contact your local Alcatel-Lucent customer support team. See the Alcatel-Lucent Support web site (http://www.alcatel-lucent.com/support/) for contact information.

How to order

To order Alcatel-Lucent documents, contact your local sales representative or use Online Customer Support (OLCS) (http://support.alcatel-lucent.com).

How to comment

Note to reviewers: The following "How to comment" text will appear in the final document when it is published. However, the feedback method described below is for use only on final documents. Please send your review comments to the author using the process you were given when you received this draft document.

To comment on this document, go to the Online Comment Form (http://infodoc.alcatel-lucent.com/comments/) or e-mail your comments to the Comments Hotline (comments@alcatel-lucent.com).

1 Safety statements

Overview

Purpose

This chapter provides general information on the structure of safety instructions and summarizes general safety requirements.

General safety and residual risk

The equipment has been developed in line with state-of-the-art technology and conforms with current national and international safety requirements.

The equipment is considered safe during normal operation when safe working practices are complied with. However, hazards may arise if procedures are not followed correctly or safe working practices are not complied with.

Contents

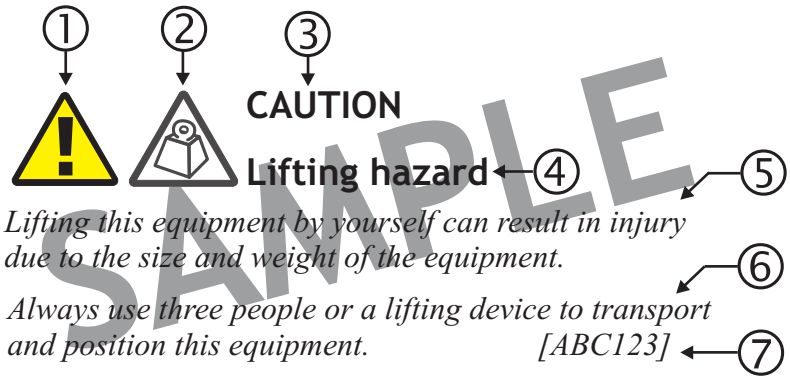
Structure of safety statements

Overview

This topic describes the components of safety statements that appear in this document.

General structure

Safety statements include the following structural elements:



Item	Structure element	Purpose
1	Safety alert symbol	Indicates the potential for personal injury (optional)
2	Safety symbol	Indicates hazard type (optional)
3	Signal word	Indicates the severity of the hazard
4	Hazard type	Describes the source of the risk of damage or injury
5	Safety message	Consequences if protective measures fail
6	Avoidance message	Protective measures to take to avoid the hazard
7	Identifier	The reference ID of the safety statement (optional)

Signal words

The signal words identify the hazard severity levels as follows:

Signal word	Meaning
DANGER	Indicates an extremely hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazardous situation not related to personal injury.

Safety

General precautions for installation procedures

WARNING

Failure to observe these safety precautions may result in personal injury or damage to equipment.

- *Read and understand all instructions.*
- *Follow all warnings and instructions marked on this product.*
- *Installation and maintenance procedures must be followed and performed by trained personnel only.*
- *The equipment must be provided with a readily accessible disconnect device as part of site preparation.*
- *Grounding and circuit continuity is vital for safe operation of the equipment. Never operate the equipment with grounding/bonding conductor disconnected.*
- *Before servicing, disconnect power input to reduce the risk of energy hazards.*
- *If installed in ambient temperatures above 46°C (115°F), this unit must be installed only in restricted access locations, where access is limited to qualified service personnel only.*

Safety - specific hazards

Danger

DANGER

Electric-shock hazard

Working in severe weather can result in personal injury or death and damage to the equipment.

Never install or perform maintenance during severe weather (high winds, lightning, blizzards, hurricane etc.).

DANGER

Noxious-substance hazard

Use of unspecified cleaning agents can result in personal injury.

Use only specified cleaning agents. Never use flammable solvents.

Always ensure there is adequate ventilation in the work area and wear the appropriate personal protective equipment.

Warning

WARNING

Laser hazard

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

Do not view directly into the laser beam with optical instruments such as a fiber microscope because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.

Never look into the end of an exposed fiber or an open connector as long as the optical source is switched on.

Ensure that the optical source is switched off before disconnecting optical fiber connectors.

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Caution

CAUTION

RF hazard

RF exposure in excess of applicable limits can result in adverse health effects.

Metro Cells are designed and installed in order to comply with the international exposure guidelines laid down by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and/or the Institute of Electrical & Electronics Engineers (IEEE) C95.1. ICNIRP guidelines have been implemented by the European Commission and a number of other countries. IEEE guidelines have been implemented in North America and some other countries.

Workers that are required to work in close proximity to the equipment, for example maintenance personnel, should strictly follow instructions provided by their employer.

Workers equipped with personal medical electronic devices, such as pacemakers and hearing aids, shall consult the manufacturer's instructions and consult their occupational health practitioner.

CAUTION

Electrical energy hazard

Some parts of all electrical installations are energized. Failure to observe this fact and the safety warnings may lead to bodily injury and property damage.

For this reason, only trained and qualified personnel (electrical workers as defined in IEC 60215 + A1 or EN 60215) may install or service the installation.

CAUTION

Electrical energy hazard

The power supply lines to the network element are energized. Contact with parts carrying voltage can cause health problems, possibly including death, even hours after the event.

Open and lockout the load disconnect switch in the distribution box to completely de-energize the network element.

Notices

NOTICE

ESD hazard

Semiconductor devices can be damaged by electrostatic discharges (ESD)

The following rules must be complied with when handling any module containing semiconductor components:

- *Wear conductive or antistatic working clothes (for example, coat made of 100% cotton).*
- *Wear a grounded wrist strap.*
- *Wear shoes with conductive soles on a conductive floor surface or conductive work mat.*
- *Leave the modules in their original packaging until ready for use.*
- *Make sure there is no difference in potential between yourself, the workplace, and the packaging before removing, unpacking, or packing a module.*
- *Whenever handling ESD-sensitive components, do not touch any connection pins or tracks.*
- *Place modules removed from the equipment on a conductive surface.*
- *Test or handle the module only with grounded tools on grounded equipment.*
- *Handle defective modules exactly like new ones to avoid causing further damage.*

NOTICE

Condensation

Sudden changes in the weather may lead to the formation of condensation on components. Operating the unit when condensation moisture is present can destroy the unit.

Units which show signs of condensation must be dried before installation.

NOTICE

Tools

Tools left in the working area can cause short circuits during operation which can lead to the destruction of units.

Make sure after finishing your work that no tools, testing equipment, flashlights, etc., have been left in or on the equipment.

Product safety

Equipment safety

Safety information for this equipment can be found on various Caution, Warning, Danger, information labels or instructions affixed to or included with the product or included within this document. Informational and cautionary labels may appear near the item they address or may be grouped in a single location on the equipment. Warnings are typically adjacent to the hazard that is noted on the label. The instructions, cautions and warnings found on these labels must be understood and observed by all personnel involved with the equipment installation and maintenance.

2 Product overview

Overview

Purpose

This chapter provides an overview of Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W products.

Contents

Functional description

General description

Alcatel-Lucent Metro Cells enable mobile service providers (MSPs) to deliver cost-effective capacity to urban spots, as well as affordable coverage to rural locations. They also enhance the quality of experience (QoE) for end users by enabling faster, more reliable data connections and higher data throughput on 4G networks.

The 9764 MCO LTE 2x1W and 9764 MCO LTE 2x2W products specified here are targeted for high user density locations where additional capacity is required or even in areas where cell phone coverage is needed on short notice. The product can be deployed by mobile operators to provide a transparent outdoor capacity layer to complement the macro cell “umbrella” coverage layer.

Product features and capabilities

The product features and capabilities in this release are:

- Supports LTE FDD
- Single LTE carrier
- Supports either B25 band, B2 band, B3 band or B7 band
- PCS 1900 MHz frequency band (B25 and B2)
- DCS 1800 MHz frequency band (B3)
- 2600 MHz frequency band (B7)
- 9764 MCO LTE 2x1W supports the following RF antenna capabilities:
  - Transmit power: 1W at each internal RF antenna connector, and a guaranteed Equivalent Isotropically Radiated Power (EIRP) of 37 dBm per path for the B2 MCO, B2/B25 (combined) MCO, B3 MCO, and B25 MCO, and 40 dBm per path for the B7 MCO. Transmit power can be reduced by a maximum of 14 dB to adjust the static cell power.
  - Integrated directional “Cube-based” antennas
  - Standard 2x2 MIMO configurations, 2 transmit and 2 receive diversity
- The 9764 MCO LTE 2x2W supports the following RF antenna capabilities:
  - Supports two external antenna connectors (QN-type) allowing an internal RF antenna configuration or an external RF antenna configuration. The operator must obtain the external RF antennas from third party vendors.
  - Transmit power of 2W at each external connector.
- Receiver sensitivity optimized to permit near far simultaneous operation (reference sensitivity:-98 dBm)
- Supports Plug and Play to automatically connect to the network.

- The 9764 Metro Dock supports Gigabit Ethernet backhaul (support for other backhaul variations are planned for the future).
- Supports optional modular and field replaceable Wi-Fi Access Points.

  Refer to *Alcatel-Lucent Small Cell Wi-Fi AP Technical Description,* 3MN-01840-0004-DEZZA for Wi-Fi AP product details.
- The 9764 MCO LTE products have feature parity with some but not all macro eNodeB features. See the release-specific version of the *Alcatel-Lucent LTE eNodeB Macro and Metro Products FDD Release Notes* for more information. Refer to the "Related Information" block in "About this document" for the applicable document versions.
- Supported user capacity - refer to the table below.

The number of active users and the number of Voice over LTE (VoLTE) calls supported is shown in the table below for the 9764 MCO LTE 2x1W and 9764 MCO LTE 2x2W models.

9764 MCO LTE 2x1W model	Supported Bandwidth	**# active users supported**	**# VoLTE calls supported**
B25	5 MHz	up to 64 active users with up to eight bearers per UE	up to 32 VoLTE calls
B2/B25 (combined)	10 MHz	up to 64 active users with up to eight bearers per UE	up to 64 VoLTE calls
B2 (see note 2)	5 MHz	up to 64 active users with up to eight bearers per UE	up to 64 VoLTE calls
B3	10 MHz	up to 64 active users with up to eight bearers per UE	up to 32 VoLTE calls
B7	10 MHz	up to 64 active users with up to eight bearers per UE	up to 32 VoLTE calls
B7	20 MHz	up to 16 active users with up to eight bearers per UE	up to 32 VoLTE calls

Notes:

1. The 9764 MCO LTE 2x1W and the 9764 MCO LTE 2x2W are *hardware ready* for 200 simultaneous active users.
2. The B2 capacity figures above apply to both the 9764 MCO V1.1 B2 LTE 2x1W and the 9764 MCO V1.1 B2 LTE 2x2W models.
3. In this release, the number of active users is the same as the number of RRC connected users.

Physical description

Product overview

The Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W are housed in an Alcatel-Lucent generic metallic case. The products are designed to be deployed close to the users, usually in streets, on light poles or on walls of buildings, with a vertical profile that hides cable connectors and mounting kit for a smooth integration into the surrounding environment.

The Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and Alcatel-Lucent 9764 MCO LTE 2x2W products are shown in the following figure.

Figure 2-1 9764 Metro Dock and 9764 MCO LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W

9764 Metro Dock

9764 Metro Dock
9764 MCO LTE 2x1W module
and
9764 MCO LTE 2x2W module
(reverse view)

Top view

Bottom view

Figure 2-2 9764 MCO LTE with 9764 MCO Wi-Fi AP

9764 Wi-Fi AP

9764 MCO front view with 9764 Wi-Fi AP

9764 MCO rear view with 9764 Wi-Fi AP

In order to simplify configurations the backhaul access function and the radio part functions are separated, with a common interface as defined:

Unit	Function	Description
9764 Metro Dock module	Backhaul access function	Supports backhaul options Holds the 9764 MCO LTE module in place
9764 MCO LTE module	Radio and baseband function	Radio functions Digital processing functions Power supply functions
9764 MCO Wi-Fi AP module	Wi-Fi function	Wi-Fi network access function. Refer to *Alcatel-Lucent Small Cell Wi-Fi AP Technical Description,* 3MN-01840-0004-DEZZA for Wi-Fi AP product details.

Weights and dimensions

The physical dimensions of the Alcatel-Lucent 9764 Metro Cell Outdoor are:

Dimensions (9764 MCO LTE module + 9764 Metro Dock) (Length x Width x Depth)	501 x 170 x 164 mm (19.7 x 7.0 x 6.5 in)
Dimensions (9764 MCO module + 9764 Metro Dock + 9764 MCO Wi-Fi AP) (Length x Width x Depth)	With 9764 MCO Wi-Fi AP V1.0 MG: 550 x 170 x 150 mm (21.7 x 6.7 x 5.9 in) With 9764 MCO Wi-Fi AP V1.0 HG: 590 x 170 x 150 mm (23.2 x 6.7 x 5.9 in)

Volume (9764 MCO LTE module + 9764 Metro Dock)	12.7 L (3.35 gal)
Weight (9764 MCO LTE module + 9764 Metro Dock)	10.1 kg (22.2 lb)
Weight (9764 MCO LTE module + 9764 Metro Dock + 9764 MCO Wi-Fi AP)	With 9764 MCO Wi-Fi AP V1.0 MG: 10.57 kg (23.30 lb) With 9764 MCO Wi-Fi AP V1.0 HG: 10.77 kg (23.74 lb)
Weight (9764 MCO LTE module only)	9.1 kg (20.1 lb)

Dimensions for optional pair-mount configuration

The physical dimensions when two 9764 MCOs are pair-mounted are as follows:

Configuration	Height	Width	Depth
4G MCO + 3G MCO With Wi-Fi AP, Minimal distance between MCOs, With full tilt mechanics	590 mm	410 mm including back-bracket (338 mm without back-bracket)	290 mm
4G MCO + 3G MCO NO Wi-Fi AP, Minimal distance between MCOs, NO tilt mechanics	501 mm	410 mm including back-bracket (338 mm without back-bracket)	210 mm

Alcatel-Lucent 9764 Metro Cell Outdoor LTE overview

The 9764 MCO LTE module is made up of three main units which are responsible for radio, digital processing and power supply functions.

Unit	Function
9764 MCO LTE module	Digital part: • Gigabit Ethernet switch • Processors to provide modem and controller functionality • 9764 Metro Dock interface (data, control and power supply) • 9764 MCO Wi-Fi AP interface Radio part • Radio part B25: – LTE Band 25 (1850 MHz - 1915 MHz (UL), 1930 MHz - 1995 MHz (DL)) – Two TX antenna connectors and two RX antenna connectors • Radio part 9764 MCO V1.1 B2 LTE 2x1W: – LTE Band 2 (1850 MHz - 1910 MHz (UL), 1930 MHz - 1990 MHz (DL)) – Two TX antenna connectors and two RX antenna connectors • Radio part 9764 MCO V1.1 B2 LTE 2x2W: – LTE Band 2 (1850 MHz - 1910 MHz (UL), 1930 MHz - 1990 MHz (DL)) – Two external RF antenna connectors (Type QN) • Radio part B2/B25 (combined): – LTE Band 25 (1850 MHz - 1915 MHz (UL), 1930 MHz - 1995 MHz (DL)) – Two TX antenna connectors and two RX antenna connectors • Radio part B3: – LTE Band 3 (1710 MHz - 1785 MHz (UL), 1805 MHz - 1880 MHz (DL)) – Two TX antenna connectors and two RX antenna connectors • Radio part B7: – LTE Band 7 (2500 MHz - 2570 MHz (UL), 2620 MHz - 2690 MHz (DL)) – Two TX antenna connectors and two RX antenna connectors 9764 MCO LTE 2x1W models: Internal GPS antenna connector (depending on the model) or an external GPS connector for localization synchronization (only one can be used) 9764 MCO LTE 2x2W models: A GPS connector that is switchable between internal GPS antenna and external GPS antenna. Power supply part - please see “Power supply” (p. 2-10) for internal power module unit information.
9764 MCO LTE 2x1W Antennas	• Integrated cube-based RF antennas configured for 2x2 MIMO. • internal GPS antenna configuration (depending on the model) or external GPS antenna configuration.

Unit	Function
9764 MCO LTE 2x2W Antennas	• Integrated 1-element RF antenna or cabling to external remote RF antennas. • Internal GPS antenna configuration or external GPS antenna configuration.
Power source	• AC power supply or DC power supply (see "Power supply" (p. 2-10) for further information)

9764 MCO LTE module connection interfaces

The following figure shows the connection interfaces for the 9764 MCO LTE module.

Figure 2-3 9764 MCO LTE module connection interfaces (1 of 2)

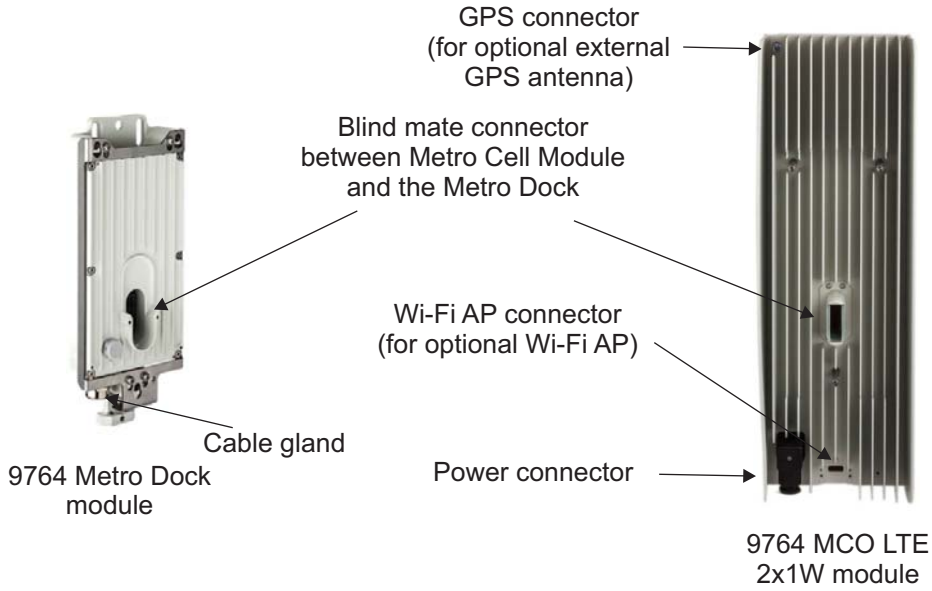


Figure 2-3 9764 MCO LTE module connection interfaces (2 of 2)

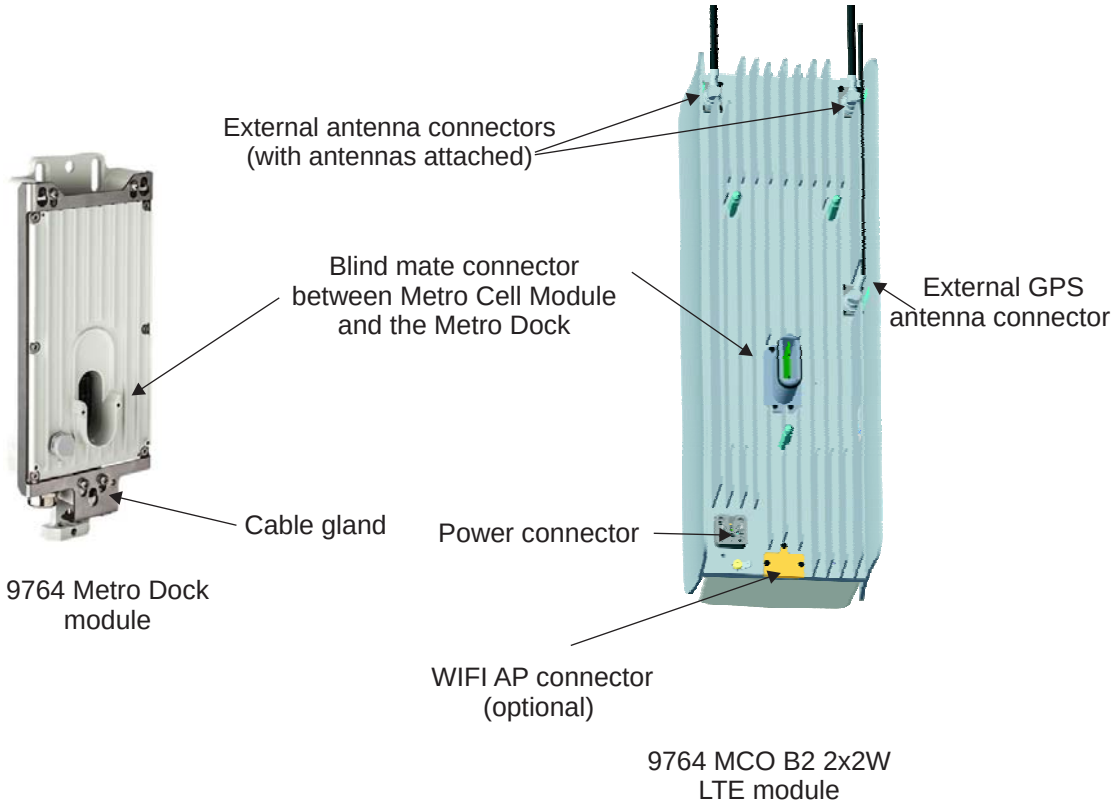


Figure 2-4 9764 MCO LTE module connection interfaces - double lug ground point detail

Connection location	Description
9764 MCO LTE module (back)	A power supply connector A blind mate connector for connecting the 9764 MCO LTE module and the 9764 Metro Dock 9764 MCO Wi-Fi AP (optional) connector External GPS antenna connector Internal GPS antenna connector (only 2x1W models supporting an internal GPS configuration)

Power supply

The 9764 MCO LTE module supports the following power source variants:

- AC power feed in the 100 V – 240 V AC range, ~2.0 A 50-60 Hz, with nominal voltages of 110 V and 230 V.

  The AC power is surge-protected as follows:

  – First level (no damage to equipment, no service interruption): 2 KV/1 KA
- DC power feed of -48 V, 3.5 A SELV Source.

Surge requirements satisfy GR-1089-CORE and IEC 61000-4-5, providing 6 KV (3KA) surge protection.

Grounding connection points, located below the power connector on the chassis, provide grounding for the power module.

A power module unit inside the 9764 MCO LTE 2x1W and Alcatel-Lucent 9764 MCO LTE 2x2W provides AC/DC conversion (5.3 V output) to its power board, which then provides secondary DC-DC conversion and distributes 5.3 V to the 9764 Metro Dock module and the 9764 MCO Wi-Fi AP module (if equipped).

The power module supports an average consumption of 100 W, as well as the peak 130 W consumption projected for the 9764 MCO LTE 2x1W and 9764 MCO LTE 2x2W (9764 MCO LTE module, 9764 Metro Dock module, and optional 9764 MCO Wi-Fi AP module). Without the optional 9764 MCO Wi-Fi AP module, average consumption is approximately 92 W (peak 120 W).

RF antenna

The 9764 MCO LTE 2x1W support an integrated RF antenna configured for 2x2 MIMO.

The 9764 MCO V1.1 B2 LTE 2x2W supports two external antenna connectors (Type QN) allowing the following RF antenna configurations:

- Internal 1-element RF antenna
- Cabling to external remote RF antennas. The external antennas are provided by third-party vendors selected by the operator.

GPS antenna

The 9764 MCO LTE 2x1W supports the following GPS antenna configurations:

- internal GPS antenna mounted behind the radome to provide localization synchronization of the unit, or
- an external GPS antenna connector (QMA) on the 9764 MCO LTE module, which can be used to connect to an external GPS antenna
- The 9764 MCO LTE 2x1W will be installed to use either the internal GPS antenna (if available for that model) or it will be connected to an external GPS antenna. When configured to use the internal GPS antenna, a bridge cable is used to connect the external GPS QMA connector to the internal GPS QMA connector.

A QMA GPS Antenna switch is available on the 9764 MCO V1.1 B2 LTE 2x2W model, which allows it to support both internal GPS antenna and external GPS antenna solutions without the use of a bridge cable. When no external GPS cable is attached to the QMA connector, the internal GPS antenna is engaged and active. When an external GPS antenna cable is attached to the QMA connector, a switch in the connector automatically sets the 9764 MCO V1.1 B2 LTE 2x2W up for the external GPS antenna configuration. When the external GPS antenna cable is removed, the switch in the QMA connector moves the 9764 MCO V1.1 B2 LTE 2x2W back to an internal GPS antenna configuration.

Table 2-1 GPS antenna options

Metro Cell model	Internal GPS antenna	External GPS antenna
9764 MCO V1.0 B25 LTE 2x1W		X
9764 MCO V1.1 B2 LTE 2x1W		X
9764 MCO V1.1 B3 LTE 2x1W	X	X
9764 MCO V1.1 B7 LTE 2x1W		X
9764 MCO V1.1 B2/B25 LTE 2x1W	X	X
9764 MCO V1.1 B2 LTE 2x2W	X	X

Status indicator

The 9764 MCO LTE supports a single bi-color LED (red/green) which is located on the rear lower portion of the 9764 MCO LTE module. The LED is not intended for use during normal operation of the equipment; however, it can provide a visual status of the equipment during initial installation and commissioning.

Product labelling

The 9764 MCO LTE module has the following labelling:

1. A product label reflecting:
   - Vendor name/Icon
   - Model name
   - Part number
   - Serial number
   - Data matrix barcode for Part number and Serial number
   - CLEI code
   - MAC address
2. A regulatory label reflecting:
   - Vendor name/Icon
   - Product name
   - Regulatory rules
   - Power input
   - Enclosure rating
   - Applicable regulatory and environmental certification logos
   - Manufacturer name
3. An FCC label reflecting (for B2, B25 and B2/B25 (combined) MCOs only):
   - Vendor name/Icon
   - FCC ID

Supported installation options

Overview

The following section describes the supported installation options for the Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor V1.1 B2 LTE 2x2W products. These include:

- Standard installation options for all 9764 MCO LTE 2x1W products.
- Standard installation options for all 9764 MCO LTE 2x2W products.
- Daisy chain installation options where two 9764 MCO modules are daisy chained together and share the same backhaul port.
- Pair-mount installation options where:
  - a 9764 MCO V1.1 B2 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W, or
  - a 9764 MCO V1.1 B2 LTE 2x2W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W, or
  - a 9764 MCO V1.1 B7 LTE 2x1W product is mounted with a 9764 MCO V1.0 B1 WCDMA 1W.
  - a 9764 MCO V1.1 B2/B25 LTE 2x1W product is mounted with a 9764 MCO V1.0 B1 WCDMA 1W.

Standard installation options

Alcatel-Lucent 9764 MCO LTE 2x1W and Alcatel-Lucent 9764 MCO LTE 2x2W products are designed to be deployed outdoors and close to the users, usually on light poles or lamp posts in streets or on building walls, with a vertical profile. Optional tilt mounting brackets can be used that allow the 9764 MCO module to be adjusted in vertical and/or horizontal direction at same time.

Figure 2-5 Installation examples

Pole mount installation

Wall mount installation

In addition, Alcatel-Lucent 9764 MCO LTE 2x1W and Alcatel-Lucent 9764 MCO LTE 2x2W products can be fitted with an optional 9764 MCO Wi-Fi AP module as shown in the following figure.

Figure 2-6 9764 MCO Wi-Fi AP module attached to 9764 MCO LTE module (front view)

Ethernet daisy chain installation options

In a daisy chain installation configuration two Alcatel-Lucent 9764 MCOs can be daisy chained together, where they share the same backhaul port, thus reducing the investment cost needed to connect the 9764 MCOs to the backhaul network and aggregating the uplink and downlink traffic. Daisy chained 9764 MCOs may be co-located or separated by some distance.

Figure 2-7 9764 MCO daisy chain installation example

Daisy chain configuration options are described in, "Pair mount and daisy chain requirements" (p. 3-13)

Pair-mount installation options

In a "pair-mount" installation configuration a 9764 MCO LTE 2x1W product or a 9764 MCO LTE 2x2W product can be mounted with a 9764 MCO WCDMA product to form a Multi-Standard Pair configuration. The supported pair-mount configurations are as follows:

- A 9764 MCO V1.1 B2 LTE 2x1W in a pair-mount configuration with a 9764 MCO V1.0 B2 WCDMA 1W.
- A 9764 MCO V1.1 B2/B25 LTE 2x1W in a pair-mount configuration with a 9764 MCO V1.0 B2 WCDMA 1W.
- A 9764 MCO V1.1 B2 LTE 2x2W in a pair-mount configuration with a 9764 MCO V1.0 B2 WCDMA 1W,
- A 9764 MCO V1.1 B7 LTE 2x1W in a pair-mount configuration with a 9764 MCO V1.0 B1 WCDMA 1W.

  Note: This 9764 MCO V1.1 B7 LTE 2x1W/9764 MCO V1.0 B1 WCDMA 1W pair-mount configuration applies to AC variants only.

Service providers can deploy these configurations on the same site to meet the growing demands of capacity on the 3G and 4G technologies.

Figure 2-8 9764 MCO pair-mount installation example

pair-mount configuration options are described in, "Pair mount and daisy chain requirements" (p. 3-13)

Hardware and ancillary items

Overview

The following section lists the Alcatel-Lucent 9764 Metro Cell Outdoor base hardware equipment, the installation kits and ancillary items that can be ordered from Alcatel-Lucent.

9764 MCO base items

The Alcatel-Lucent 9764 MCO LTE 2x1W or the Alcatel-Lucent 9764 MCO LTE 2x2W packaging contains the following base items:

- 9764 MCO LTE 2x1W module or
- 9764 MCO LTE 2x2W module

9764 Metro Dock base items

The Alcatel-Lucent 9764 Metro Dock packaging contains the following base items:

- Alcatel-Lucent 9764 Metro Dock (including lock and key)

9764 MCO Wi-Fi AP base items

The Alcatel-Lucent 9764 Metro Cell Outdoor Wi-Fi AP is an optional product. Two models are available:

- 9764 MCO Wi-Fi AP v1.0 MG model (medium-gain antenna)
- 9764 MCO Wi-Fi AP v1.0 HG model (high-gain antenna)

Ancillary items

The following tables list the ancillary items that are available for order from Alcatel-Lucent in support of the defined equipment installation and configuration options.

Installation kits

The following table list the installation kits that are available for order from Alcatel-Lucent in support of the equipment installation options.

Installation kit	Description	Use
Banding kit	Stainless steel bands Band buckles (Ear-Lokt)	Mandatory: • pole mount only
Banding tool	Standard BAND-IT® Banding Tool (CR00169), including operating instructions	Mandatory: • use with the Banding kit for pole mount only
Wall spacer kit	9764 Metro Dock wall spacer	Mandatory: • wall mount without tilt

Installation kit	Description	Use
Vertical tilt installation kit	Vertical tilt bracket	Mandatory: • pole mount with tilt • wall mount: with vertical only • wall mount: with vertical and horizontal tilt
Horizontal tilt installation kit	Horizontal tilt bracket	Mandatory: • wall mount: with horizontal tilt only • wall mount: with horizontal and vertical tilt

Power

Item	Description	Use
Power connector (AC)	AC power connector	Required for 9764 MCO module with AC power (International markets)
Power connector (DC)	DC power connector	Required for 9764 MCO module with DC power (International markets)
Power cable	Power cable IN/OUT 3G1,5mm², 100m roll or multiples of 1m length (as needed)	Required for 9764 MCO module (International markets)
Power cable (AC)	Power cable pre-assembled with AC power connector, various lengths (2m. 4.5m, 9m, 12m)	Required for 9764 MCO module with AC power (North America Regional markets)
Power cable (DC)	Power cable pre-assembled with DC power connector, various lengths (2m. 4.5m, 9m, 12m)	Required for 9764 MCO module with DC power (North America Regional markets)

Grounding

Item	Description	Use
Ground cable	Ground cable,Y/G 10mm² in 100m roll	Required for International markets
Ground cable	Ground cable, 8 AWG	Required for North America Regional markets

SFP modules

Item	Description	Use
SFP module	SFP GBE 10/100/1000BaseT (copper)	Optional Electrical backhaul only
SFP module	SFP GBE 1000BaseLX (Single mode)	Optional Optical backhaul, Daisy chaining

Item	Description	Use
SFP module	SFP GBE 1000BaseLX / CPRI (Single mode)	Optional Optical backhaul, Daisy chaining, Pair-mount configuration
SFP module	SFP GBE 1000BaseSX / CPRI (Multi mode)	Optional Optical backhaul, Daisy chaining, Pair-mount configuration

Surge arrestor

Item	Description	Use
Internal surge arrestor[1]	9764 Metro Dock internal Ethernet surge arrestor kit	Optional Highly recommended if GBE 1000BaseT backhaul connection is provided
External surge arrestor	External Ethernet surge arrestor kit, including: • mounting bracket • pole bands and buckle • Ethernet cable, 0.6 m (2 ft)	Optional Highly recommended if GBE 1000BaseT backhaul connection is provided

Notes:

1. The 9764 Metro Dock internal Ethernet surge arrestor is available within Release LR14.1.L.

Ethernet cable - Electrical

Item	Description	Use
Electrical Ethernet cable	2 meter outdoor, 4 pairs, 2 RJ45 (plus 1 spare)	Optional Use with SFP GBE 10/100/1000BaseT
Electrical Ethernet cable	25 meter outdoor, 4 pairs, 2 RJ45 (plus 1 spare)	Optional Use with SFP GBE 10/100/1000BaseT
Electrical Ethernet cable	100 meter outdoor, 4 pairs, 2 RJ45 (plus 1 spare)	Optional Use with SFP GBE 10/100/1000BaseT

Ethernet cable - Optical

Item	Description	Use
Fiber Optic cable	SMDF LC-LC 2SM 5m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 15m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)

Item	Description	Use
Fiber Optic cable	SMDF LC-LC 2SM 30m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 50m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 70m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 85m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 100m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 150m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 200m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 250m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	SMDF LC-LC 2SM 300m Single mode fiber duplex 250 mm Breakout on both sides	Optional Use with SFP GBE 1000BaseLX (Single mode)
Fiber Optic cable	MM LC-LC 2MM 5m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 15m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 30m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 50m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 70m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)

Item	Description	Use
Fiber Optic cable	MM LC-LC 2MM 85m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 100m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 150m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 200m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 250m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)
Fiber Optic cable	MM LC-LC 2MM 300m Multi mode fiber duplex, 250 mm Breakout on both sides	Optional SFP GBE 1000BaseSX (Multi mode)

External antenna - GPS

Item	Description	Use
GPS antenna	External GPS Antenna, 1575 MHz*26 dBi	Used if MCO is configured for external GPS antenna and cable loss <10dBi @ 1575MHz
GPS antenna	External GPS Antenna, 1575 MHz*40 dBi	Used if MCO is configured for external GPS antenna and cable loss >10dBi @ 1575MHz
Jumper cable	External GPS Antenna jumper cable (various lengths)	Mandatory 1 cable per MCO if external GPS antenna is used
Adapter cable	External GPS Antenna adaptor cable from the ancillary	Mandatory 1 cable per MCO if external GPS antenna is used
Weatherproof tape	For B25 MCO, B2 MCO and B2/B25 MCO - one layer of weatherproof tape applied to the cable connections. For B3 MCO and B7 MCO, the following two types of weatherproof tape must be applied to the cable connections: first the linerless rubber splicing tape and then the vinyl electrical tape (vinyl tape over rubber tape).	Mandatory

Note: The internal GPS antenna solution is not supported on the 9764 MCO V1.1 B7 LTE 2x1W, 9764 MCO V1.1 B2 LTE 2x1W and 9764 MCO V1.0 B25 LTE 2x1W models.

External RF antennas

The 9764 MCO V1.1 B2 LTE 2x2W module has two external RF antenna ports for the connection to third party supplied antennas.

For the RF antenna specifications refer to the *RF antenna* part of the *System architecture* section of the *9YZ-04152-0056-DEZZA - Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Technical Description* document.

Pair-mount configuration

Item	Description	Use
9764 Metro Dock double support plate	Support plate for mounting 9764 MCO in a pair-mount configuration	Use in a 9764 MCO pair-mount configuration
Extension plate	Alignment Plate for 3G 9764 MCO in a pair-mount configuration	Use in a 9764 MCO pair-mount configuration

3 Installation of the 9764 Metro Dock

Overview

Purpose

This chapter provides the information and procedures for mounting the 9764 Metro Dock onto a pole or wall, with or without the optional tilt mechanism.

Contents

9764 Metro Dock pre-installation

Overview

Purpose

This section provides pre-installation information as well as listing tools and materials required for Alcatel-Lucent 9764 Metro Dock mounting.

Contents

9764 Metro Dock Pre-installation information

Verify site preparation

The following site preparation requirements should be checked and met before the installation of the equipment can begin. If some of the requirements are not met, the installer must do so now:

- Ensure equipment is planned to be installed as high as possible to avoid obstructions
- Consider nearby sources of interference. Also check possibility of future obstructions such as plans to erect buildings and trees that may grow tall enough to obstruct the wireless path
- Ensure adequate clearance is provided for service access
- Ground, power and backhaul cabling has been routed and is in place
- Ensure any site specific fixing materials (screws, washers, wall plugs) for pole/wall mounting the equipment are available.

Product delivery contents

Unpack and examine the product packaging contents. If you notice any damage, or missing items as listed in the Packing List, immediately notify the carrier that delivered the unit and contact your Alcatel-Lucent representative.

The Alcatel-Lucent 9764 Metro Dock product packaging contains the following items:

- The 9764 Metro Dock module (including lock and key)

Installation kits

In addition to the standard product deliverable ensure the appropriate installation kits and ancillary items are available to support the product mounting options.

Installation Kits	Pole mount		Wall mount			
	No tilt	With tilt	No tilt	Vertical tilt only	Horizontal tilt only	Combined horiz./vert. tilt
Banding kit	Yes	Yes				
Banding tool	Yes	Yes				
Vertical tilt kit		Yes		Yes		Yes
Horizontal tilt kit					Yes	Yes
Wall spacer kit			Yes			
Basic kit	Yes	Yes	Yes	Yes	Yes	Yes

Tools required for installation

The following tools may be used during installation:

- Drill (pneumatic hammer) and assorted drill bits
- Pliers
- Adjustable spanners
- M17 socket wrench
- Screwdrivers (power and/or manual):
  - Phillips (flat blade)
  - Torx (T-25 and T-40)
- HRS (Hirose) HT206/TM21p-88p crimping tool (for RJ45 cable)
- Data cable tester for shielded RJ45 (optional)
- Measuring tape
- Digital compass (to aid establishing product orientation)
- Marker, to mark wall mounting holes
- Vacuum cleaner or equivalent (required for clearing debris from wall mounting holes)
- Spirit level
- Hammer
- PIB (self-amalgamating) tape and 3M Super 33+ vinyl tape
- Ear protectors and safety goggles/glasses
- Assorted cable ties (various lengths)
- Heavy duty tape
- Adjustable straps

Pole mount installation requirements

Purpose

This topic outlines the basic requirements, installation kits and recommended anchor materials when mounting the Alcatel-Lucent 9764 Metro Dock directly onto a pole, onto tilt brackets or onto a pair-mount bracket.

Pole mount options

The 9764 Metro Dock is less than 1 kg (2.2 lbs) and can be easily mounted onto a pole (wooden or metal) for the following installation options:

- 9764 Metro Dock screwed onto a wooden pole (without the tilt option).

  Mounting screws and washers have to be locally supplied. Two M8x50 stainless steel hex head screws and two M8x16x1.6 plain washers are recommended.

- 9764 Metro Dock banded onto a wooden or metal pole (without the tilt option)

  The pole band installation kit is used.

- 9764 Metro Dock attached to the vertical tilt bracket. Vertical tilt bracket is either screwed or banded onto a wooden or metal pole.

- 9764 Metro Dock pair (with or without tilt brackets) attached to a double Metro Dock support plate. Double Metro Dock support plate is banded onto a wooden or metal pole.

  This deployment option is used when a 9764 MCO V1.1 LTE 2x1W or a 9764 MCO LTE 2x2W product is mounted with a 9764 MCO WCDMA 1W product to form a Multi-Standard Pair configuration.

  The available pair-mount installation options are:

  – a 9764 MCO V1.1 B2 LTE 2x1W product mounted with a 9764 MCO V1.0 B2 WCDMA 1W product

  – a 9764 MCO V1.1 B2/B25 LTE 2x1W product with a 9764 MCO V1.0 B2 WCDMA 1W product

  – a 9764 MCO V1.1 B7 LTE 2x1W product mounted with a 9764 MCO V1.0 B1 WCDMA 1W product

  – a 9764 MCO V1.1 B2 LTE 2x2W product mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.

Pole mount installation kits and brackets

The following table provides the orderable installation kits and brackets that can be used, depending on the deployment scenario, for 9764 Metro Dock pole mounting.

Table 3-1 Pole mount installation kits and brackets

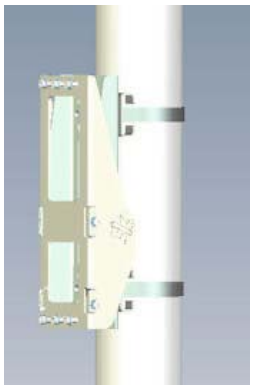
Item	Description
Banding kit	Required when directly attaching the 9764 Metro Dock or vertical tilt bracket to a pole (diameter 50 to 300 mm) using stainless steel bands. Stainless steel bands and buckles (Ear-Lokt)
Banding tool	Standard BAND-IT® Banding Tool (CR00169), including operating instructions Required in order to tighten stainless steel metal bands
Vertical tilt bracket	Provides +/- 30° vertical tilt (up/down) adjustment[1]
Double 9764 MCO support plate	Double 9764 MCO support plate for pair-mount deployment option
Double 9764 MCO extension plate	Extension plate for 3G 9764 MCO and 4G 9764 MCO alignment in a pair-mount deployment option

Notes:

1. Due to the length of the 9764 MCO LTE module, thermal limitations dictate maximum adjustment of +/- 20° vertical tilt.

The following figure shows the orderable brackets used for pole mount installation, depending on the deployment scenario.

Figure 3-1 Pole mount banding and brackets



Tilt bracket assembly
(single Metro Dock)

Tilt bracket assembly
(double Metro Dock)

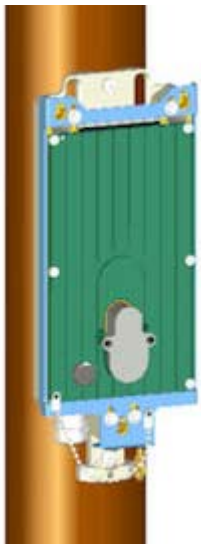
Recommended pole anchor materials

Surface structure	Recommended anchor materials	Recommended screw torque
Wood	Screw Hex T M8x50 stainless steel (x2) Washer plain M8x16x1.6 stainless steel (x2)	7.0 N.m (62.0 lb.in).

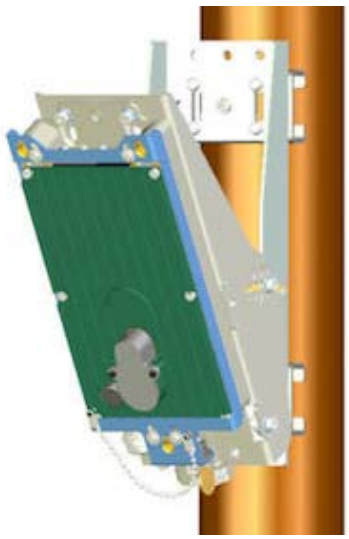
Pole mount installation examples

The following figures show examples of 9764 Metro Dock pole mount installation, pole mount installation using vertical tilt and pair-mount installation.

Figure 3-2 9764 Metro Dock pole mount using screws



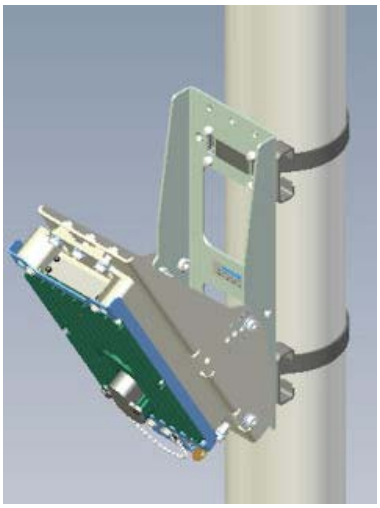
Pole mount - without tilt



Pole mount - with tilt

Figure 3-3 9764 Metro Dock pole mount using banding

Pole mount - without tilt



Pole mount - with tilt

Figure 3-4 Double 9764 Metro Dock pole mount

Wall mount installation requirements

Purpose

This topic outlines basic requirements, installation kits and recommended anchor materials when mounting the Alcatel-Lucent 9764 Metro Dock onto a solid concrete wall or flat surface, onto tilt brackets or onto a pair-mount bracket.

Wall mount options

The 9764 Metro Dock weighs less than 1 kg (2.2 lbs) and can be easily mounted onto any flat, sturdy wall for the following installation options:

- 9764 Metro Dock attached to directly to a wall or flat surface (using wall spacer)
- 9764 Metro Dock attached to the vertical/horizontal tilt bracket(s). Vertical/horizontal tilt bracket(s) are attached to a wall.
- 9764 Metro Dock pair (with or without tilt brackets) attached to a double Metro Dock support plate. Double Metro Dock support plate is attached to a wall.

  This deployment option is used when a 9764 MCO V1.1 LTE 2x1W product or a 9764 MCO LTE 2x2Wproduct is mounted with a 9764 MCO WCDMA 1W product to form a Multi-Standard Pair configuration.

  The available pair-mount installation options are: a 9764 MCO V1.1 B2 LTE 2x1W product mounted with a 9764 MCO V1.0 B2 WCDMA 1W, a 9764 MCO V1.1 B7 LTE 2x1W product mounted with a 9764 MCO V1.0 B1 WCDMA 1W product and a 9764 MCO V1.1 B2 LTE 2x2W product mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.

Wall mount installation brackets and kits

The following table lists the orderable installation brackets that can be used, depending on the deployment scenario, for 9764 Metro Dock wall mounting.

Table 3-2 Wall mount installation brackets

Item	Description
Wall spacer	Required when directly attaching the 9764 Metro Dock to a wall or flat surface and no tilt device is used. The wall spacer keeps a sufficient distance between the wall and 9764 Metro Dock for airflow purposes. **Note:** If vertical/horizontal tilt device is used, then the wall spacer is not required.
Vertical tilt bracket[1]	Provides +/- 30° vertical tilt (up/down) adjustment **Note:** Can be used in combination with the horizontal installation kit to provide: • +/- 30° vertical tilt (up/down) adjustment, and • +/-45° horizontal tilt (left/right) adjustment

Table 3-2 Wall mount installation brackets (continued)

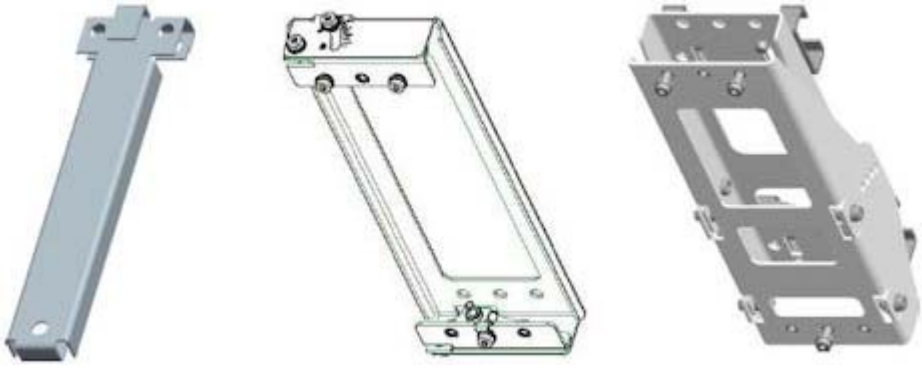
Item	Description
Horizontal tilt bracket	Provides +/-45° horizontal tilt (left/right) adjustment **Note:** Can be used in combination with the vertical tilt installation kit to provide: • +-45° horizontal tilt (left/right) adjustment, and • +/- 30° vertical tilt (up/down) adjustment
Double 9764 MCO support plate	Double 9764 MCO support plate for pair-mount deployment option
Double 9764 MCO extension plate	Extension plate for 3G 9764 MCO and 4G 9764 MCO alignment in a pair-mount deployment option

Notes:

1. Due to the length of the 9764 MCO LTE module, thermal limitations dictate maximum adjustment of +/- 20° vertical tilt.

The following figure shows the orderable brackets used for wall mount installation, depending on the deployment scenario.

Figure 3-5 Wall mount brackets



Spacer bracket (wall only) | Horizontal tilt bracket (wall only) | Vertical tilt bracket (wall/pole)

Recommended wall anchor materials

Surface structure	Recommended anchor materials	Recommended screw torque
Wood	Screw Hex T M8x70 stainless steel (x3) Washer plain M8x16x1.6 stainless steel (x3)	7.0 N.m (62.0 lb.in).
Concrete	Screw CHC M6x80 stainless steel (x3) Washer plain M6x12x1.6mm stainless steel (x3) Washer spring M6x12x1.2mm stainless steel (x3) Plug expansion Rawlnut M6x50 (x3)	7.0 N.m (62.0 lb.in).

Wall mount installation examples

The following figures show examples of 9764 Metro Dock wall mount installation, wall mount installation using horizontal/vertical tilt and pair-mount installation.

Figure 3-6 9764 Metro Dock wall mount (no tilt)

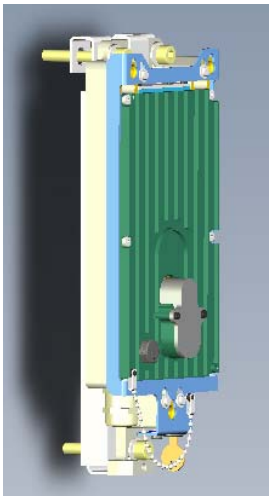
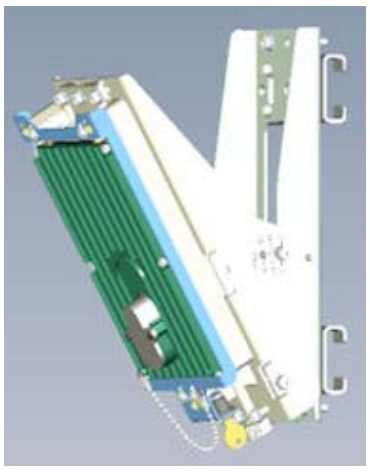
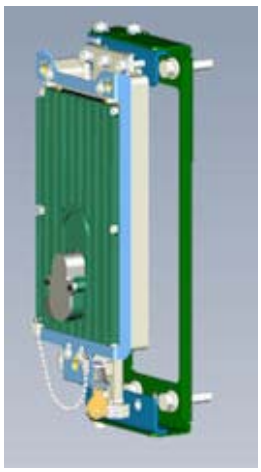


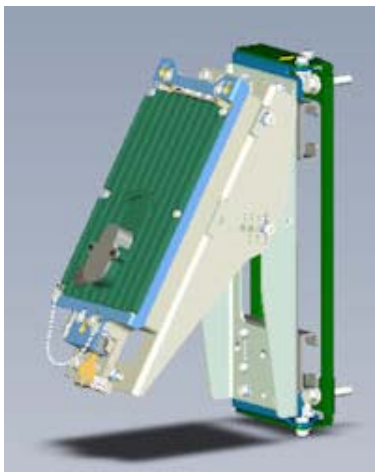
Figure 3-7 9764 Metro Dock wall mount (with tilt)



Vertical tilt only



Horizontal tilt only



Horizontal/Vertical tilt combination

Figure 3-8 Double 9764 Metro Dock wall mount

Pair mount and daisy chain requirements

Overview

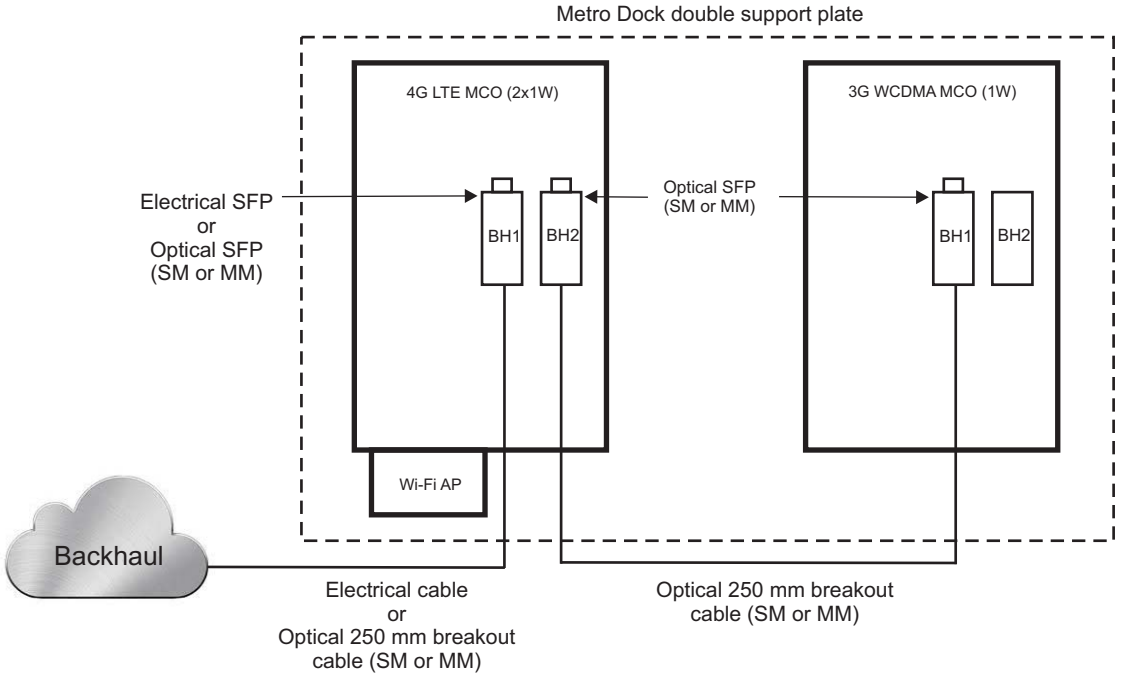
Two 9764 MCOs can be daisy chained together to share the same backhaul port, reducing the investment cost needed to connect the 9764 MCOs to the backhaul network and aggregating the uplink traffic. Daisy chain connectivity scenarios support 9764 MCOs that are co-located and connected together (for example, connectivity used for pair-mount configurations) or 9764 MCOs that are separated by some distance.

Pair-mount configuration with daisy chaining

A 9764 MCO LTE connected to the backhaul network plus a 9764 MCO WCDMA connected to the daisy chain port of the 9764 MCO LTE that is connected to the backhaul network.

Pair-mount installation options that form a Multi-Standard Pair configuration are:

- a 9764 MCO V1.1 B2 LTE 2x1W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,
- a 9764 MCO V1.1 B2/B25 LTE 2x1W product with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2 LTE 2x2W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,
- a 9764 MCO V1.1 B7 LTE 2x1W product is pair-mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.



Note:

- An optional Wi-Fi Access Point may be attached to the MCO that is connected to the backhaul network.
- To support Carrier Aggregation or Carrier Aggregation readiness the optical daisy chain SFPs should a Single Mode GBE/CPRI SFP or a Multi Mode GBE/CPRI SFP.

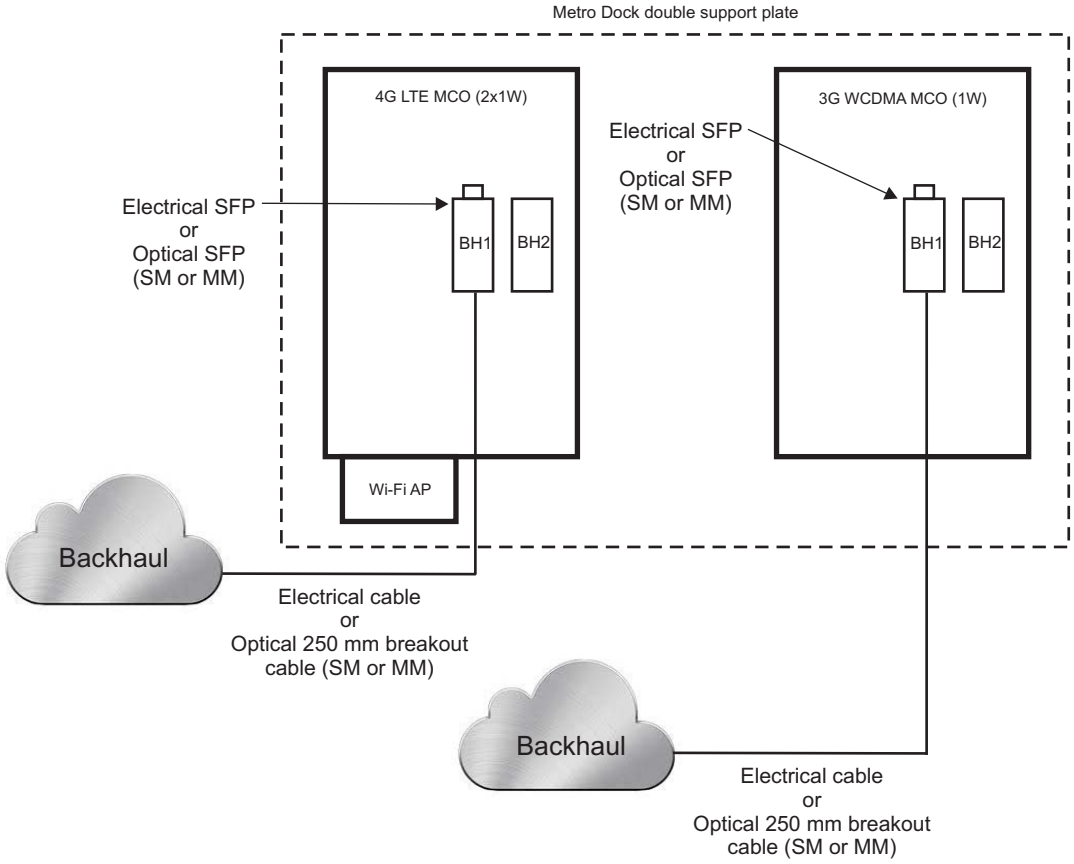
Pair-mount configuration without daisy chaining

A 9764 MCO LTE connected to the backhaul network plus a 9764 MCO WCDMA connected to the backhaul network, with no daisy chaining.

Pair-mount installation options that form a Multi-Standard Pair configuration are:

- a 9764 MCO V1.1 B2 LTE 2x1W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,

  a 9764 MCO V1.1 B2/B25 LTE 2x1W product with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2 LTE 2x2W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,
- a 9764 MCO V1.1 B7 LTE 2x1W product is pair-mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.



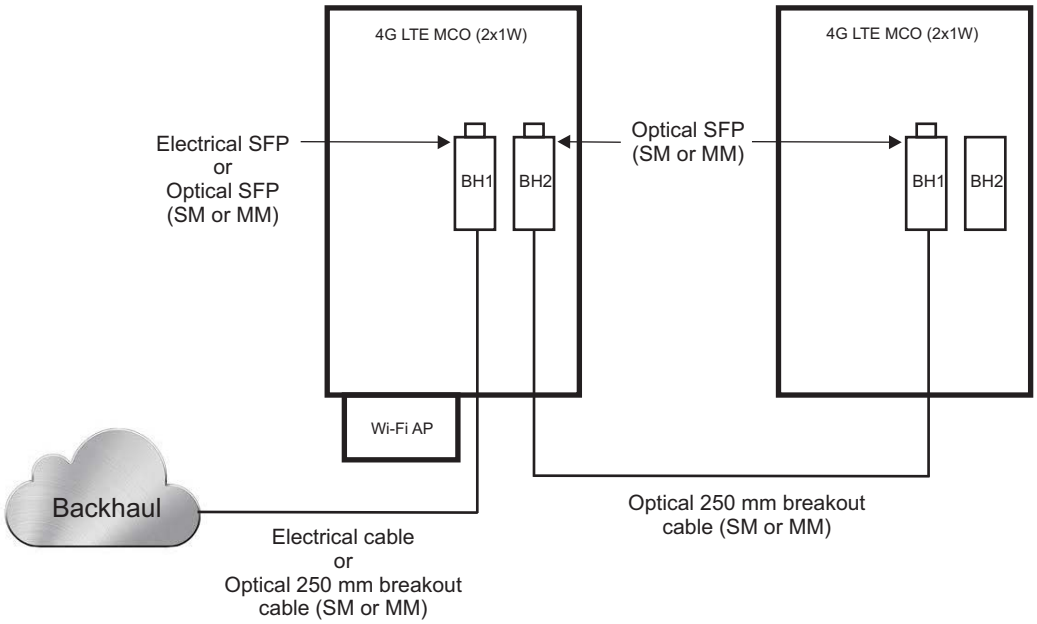
Note: An optional Wi-Fi Access Point may be attached to the MCO that is connected to the backhaul network.

Daisy chaining without pair-mount configuration

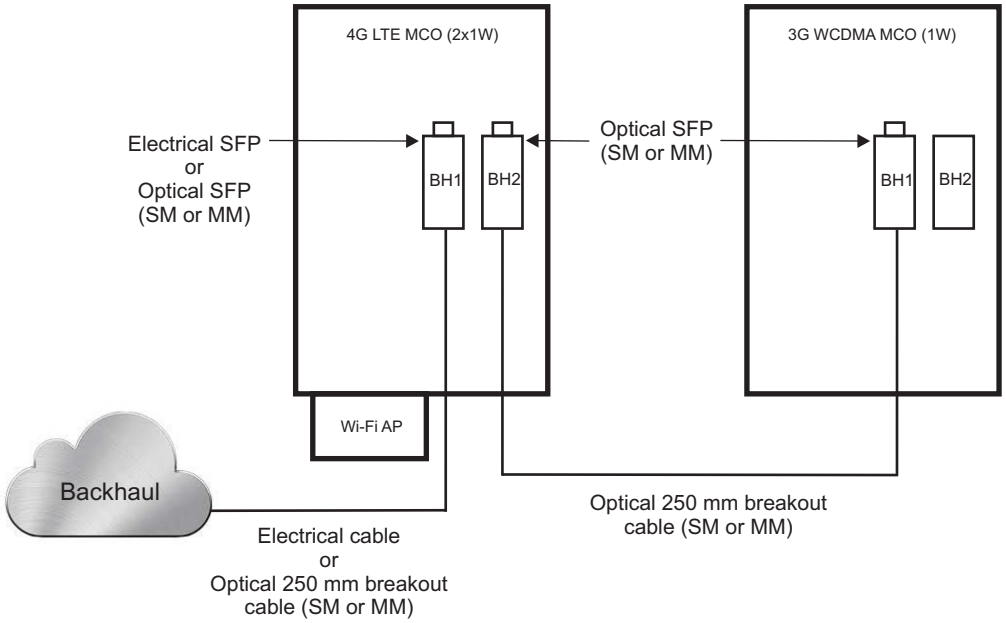
A maximum of two 9764 MCO modules and a single Wi-Fi Access Point may be daisy chained together.

The 9764 MCO LTE supports the following daisy chain configurations:

- A 9764 MCO LTE connected to the backhaul network plus a 9764 MCO LTE connected to the daisy chain port of the 9764 MCO LTE that is connected to the backhaul network.



- A 9764 MCO LTE connected to the backhaul network plus a 9764 MCO WCDMA connected to the daisy chain port of the 9764 MCO LTE.



If a 9764 MCO Wi-Fi AP module is to be included in the daisy chain configuration, the following Wi-Fi AP configurations are supported:

- A 9764 MCO Wi-Fi AP module can be attached to each daisy chained 9764 MCO when the daisy chained MCOs are installed in separate locations (e.g., not co-located on the same pole).
- If the daisy chained MCOs are co-located, only one 9764 MCO Wi-Fi AP module can be used and the 9764 MCO Wi-Fi AP module must be attached to the 9764 MCO LTE that is connected to the backhaul network.

  Note: An optional Wi-Fi Access Point may be attached to the MCO that is connected to the backhaul network.

9764 Metro Dock installation

Overview

Purpose

This section provides the installation instructions for mounting the Alcatel-Lucent 9764 Metro Dock onto either a pole or wall with or without the optional tilt mechanism. The section also provides the installation instructions for a pair-mount configuration. This deployment option is used when a 9764 MCO V1.1 LTE 2x1W product or a 9764 MCO V1.1 B2 LTE 2x2W product is mounted with a 9764 MCO WCDMA 1W product to form a Multi-Standard Pair configuration.

The available pair-mount installation options are:

- a 9764 MCO V1.1 B2 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2/B25 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B7 LTE 2x1W product is mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.
- a 9764 MCO V1.1 B2 LTE 2x2W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,

Contents

Procedure 3-1: Pole mount the 9764 Metro Dock

Purpose

This topic describes the procedures to be followed when installing the Alcatel-Lucent 9764 Metro Dock onto a pole (wooden or metal).

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific mounting and anchor materials are available.

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary supporting material is used.

Mounting requirements and materials

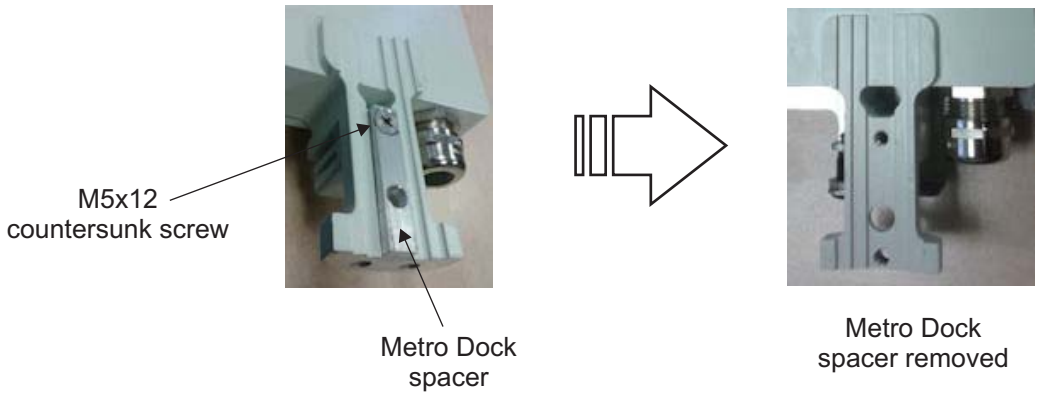
The 9764 Metro Dock can be mounted onto a wooden or metal pole. Refer to the following for the installation kits, anchor materials and tools for the installation type:

- For pole mount refer to, “Pole mount installation requirements” (p. 3-5).
- For a list of standard tools that may be required to support the installation, refer to “Tools required for installation” (p. 3-4)

Before you begin

Before mounting the 9764 Metro Dock:

- Record the 9764 Metro Dock 18 digit serial number
- On the 9764 Metro Dock ensure that the Metro Dock spacer is not attached. If the spacer is present remove it by unscrewing the M5 screw:



Metro Dock pole mount using bolts

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to mount the 9764 Metro Dock onto a wooden pole using bolts.

1 Measure the height at which the 9764 Metro Dock is to be positioned on the pole. Mark this point.

2 Using a digital compass determine the planned horizontal (left/right) orientation of the 9764 Metro Dock around the pole. Mark this position.

3 At the identified 9764 Metro Dock position on the pole, mark the upper and lower bolt anchor holes. The distance between the upper and lower bolt anchor holes should be 270 mm (10.63 inches).

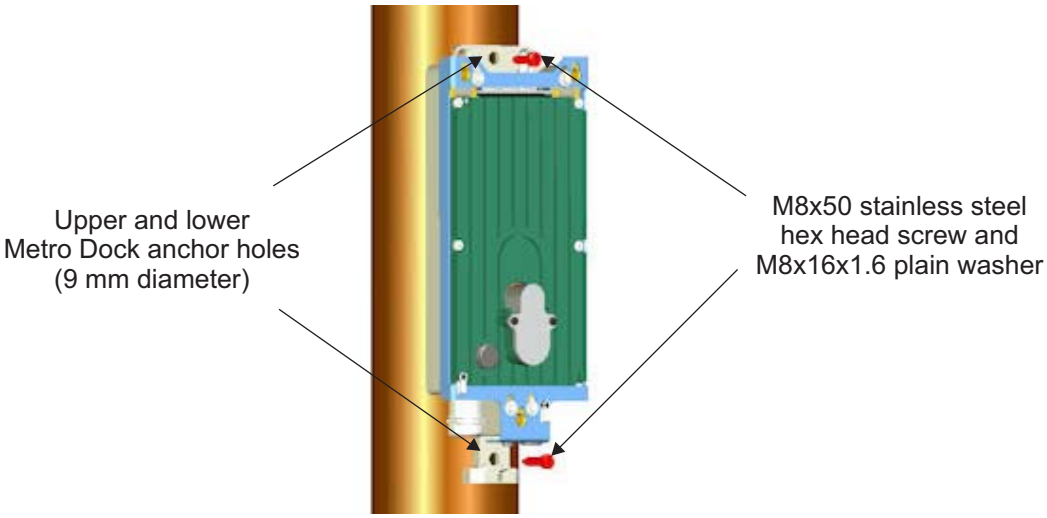
Tip: The 9764 Metro Dock can be placed against the pole and used as a template to mark the position of the upper and lower bolt anchor holes.

4 Place the 9764 Metro Dock against the pole aligning the upper and lower anchor holes on the 9764 Metro Dock with the marked anchor hole positions on the pole.

Tip: Use an adjustable strap, cable ties or heavy duty duct tape to temporarily hold the 9764 Metro Dock against the pole while the bolts are applied.

5 Place a washer on each of the anchor bolts. Using socket wrench (M8) screw the 9764 Metro Dock onto the pole.

Recommended screw torque; 7.0 N.m (62.0 lb.in).



6 Finally, check the 9764 Metro Dock is secure and there is no movement of the equipment on the pole.

END OF STEPS

Metro Dock pole mount using bands

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

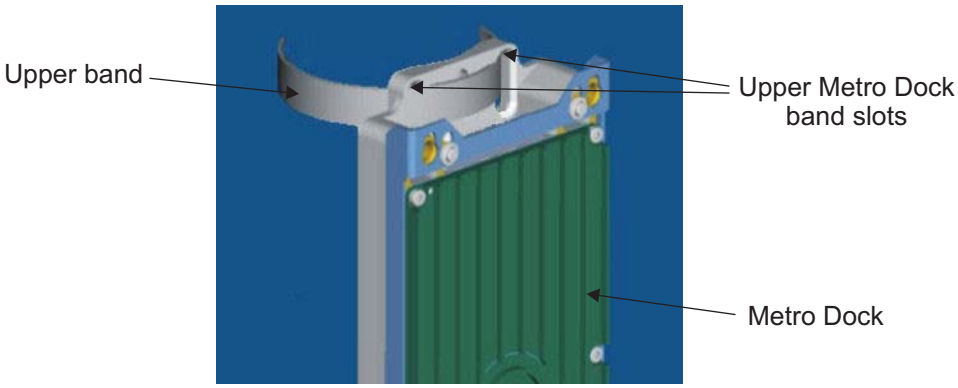
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to mount the 9764 Metro Dock onto a pole (wooden or metal) using standard pole bands.

1 Measure the height at which the 9764 Metro Dock is to be positioned on the pole. Mark this point.

2 Using a digital compass determine the planned horizontal (left/right) orientation of the 9764 Metro Dock around the pole. Mark this position.

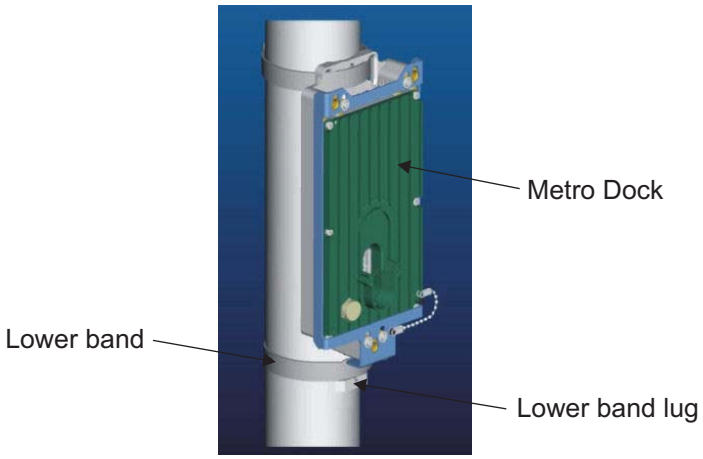
3 From the banding installation kit, take a steel pole band and thread the open end into the upper two slots on the 9764 Metro Dock.



4 At the marked installation point on the pole place the upper pole band around the pole at the determined height. Carry out any required adjustment of the 9764 Metro Dock around the pole so that it is pointing in the desired direction.

Tip: Use an adjustable strap, cable ties or heavy duty duct tape to temporarily hold the 9764 Metro Dock against the pole while the lower band is applied.

5 Taking the other steel band, place the band around the lower lug on the 9764 Metro Dock and the pole.



6 Once the 9764 Metro Dock is in the correct position and orientation tighten and secure the bands around the pole. Refer to *BAND-IT® C00169 Hand Tool Operation Instructions,* PO5886.

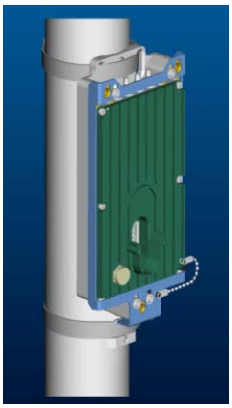
7 Finally, check the banding is secure, there is no movement of the 9764 Metro Dock around the pole and that the banding stubs (cut ends) are flattened down with a hammer.

END OF STEPS

Standard pole mount example

The following figure shows the 9764 Metro Dock mounted onto a wooden pole using bolts and a metal pole using bands.

Metro Dock screwed onto wooden pole



Metro Dock banded onto metal pole

How to continue

After mounting the 9764 Metro Dock onto a pole the cables need to be connected. Continue with the, "9764 Metro Dock cabling" (p. 3-89) section.

Procedure 3-2: Pole mount the 9764 Metro Dock using optional tilt brackets

Purpose

This topic describes the procedures to be followed when installing the Alcatel-Lucent 9764 Metro Dock onto a pole (wooden or metal) using optional vertical tilt brackets.

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific mounting and anchor materials are available.

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary supporting material is used.

Mounting requirements and materials

The 9764 Metro Dock can be mounted onto a wooden or metal pole. Refer to the following for the installation kits, anchor materials and tools for the installation type:

- For pole mount refer to, “Pole mount installation requirements” (p. 3-5).
- For a list of standard tools that may be required to support the installation, refer to “Tools required for installation” (p. 3-4)

Before you begin

Record the 9764 Metro Dock 18 digit serial number before mounting onto a pole.

Bracket pole mount using bolts

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure attach the vertical tilt bracket a wooden pole using bolts.

1 Measure the height at which the 9764 Metro Dock is to be positioned on the pole. Mark this point.

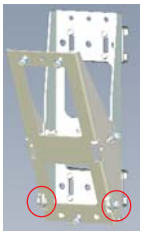
2 Using a digital compass determine the planned horizontal (left/right) orientation of the 9764 Metro Dock around the pole. Mark this position.

3 At the identified 9764 Metro Dock position on the pole, mark the upper and lower bolt anchor holes for the tilt bracket. The distance between the upper and lower bolt anchor holes should be 200 mm (7.87 inches).

Tip: The vertical tilt bracket can be placed against the pole and used as a template to mark the position of the upper and lower bolt holes.

4 Depending on the required vertical tilt orientation ensure the bracket is positioned the correct way up before placing on the pole:

If...	Then...	View...
upward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the top	

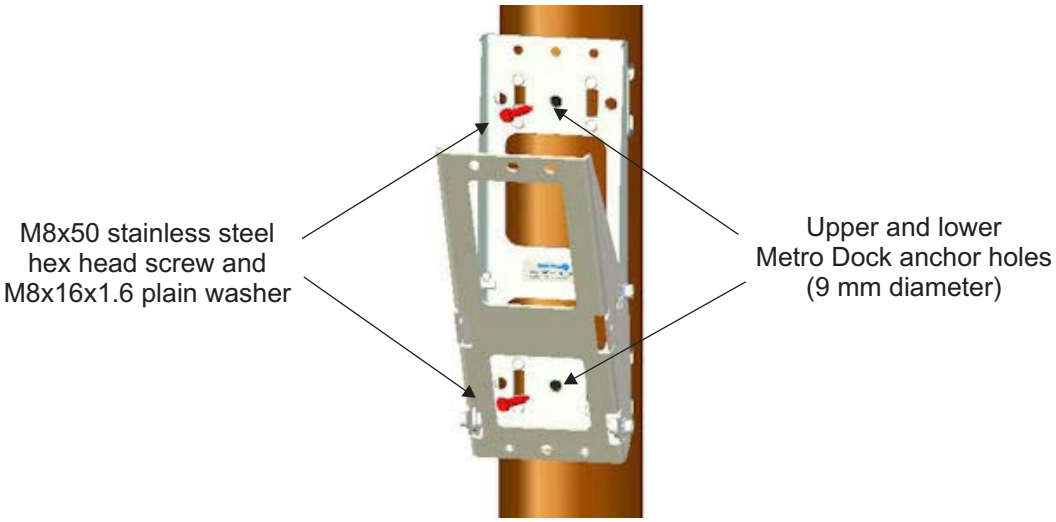
If...	Then...	View...
downward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the bottom	

5 Place the vertical tilt bracket against the pole aligning the upper and lower anchor holes on the bracket with the marked bolt hole positions on the pole.

Tip: Use an adjustable strap, cable ties or heavy duty duct tape to temporarily hold the 9764 Metro Dock against the pole while the bolts are applied.

6 Place a washer on each of the anchor bolts. Using a socket wrench (M8) screw the vertical tilt bracket onto the pole.

Recommended screw torque; 7.0 N.m (62.0 lb.in).



7 Finally, check the bolts are secure and there is no movement of the bracket on the pole.

8 Continue onto "Attach 9764 Metro Dock to the tilt bracket" (p. 3-30)

END OF STEPS

Bracket pole mount using bands

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

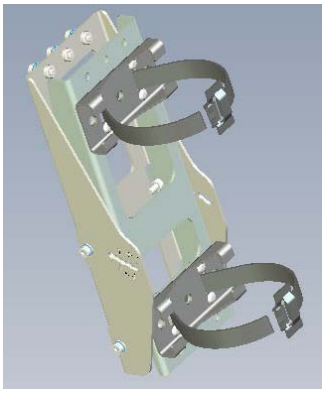
Perform the following procedure to mount the vertical tilt bracket onto a pole (wooden or metal) using standard pole bands.

1 Measure the height at which the 9764 Metro Dock is to be positioned on the pole. Mark this point.

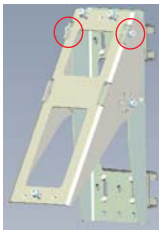
2 Using a digital compass determine the planned horizontal (left/right) orientation of the 9764 Metro Dock around the pole. Mark this position.

3 From the banding installation kit, take a steel pole band and thread the open end into the upper two slots on the tilt bracket.

Taking the other steel band insert and thread the open end into the lower two slots on the tilt bracket.



4 Depending on the required vertical tilt orientation ensure the bracket is positioned the correct way up before placing on the pole:

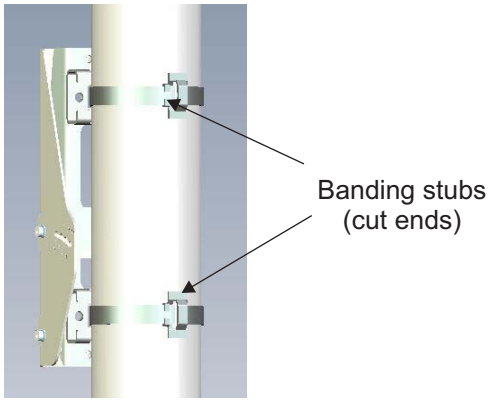
If...	Then...	View...
upward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the top	
downward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the bottom	

5 At the marked installation position on the pole wrap the upper and lower pole bands around the pole at the determined height. Carry out any required adjustment of the 9764 Metro Dock around the pole so that it is pointing in the planned direction.

Tip: Use an adjustable strap, cable ties or heavy duty duct tape to temporarily hold the 9764 Metro Dock against the pole while the bands are applied.

6 Once the 9764 Metro Dock is in the correct position and orientation tighten and secure the bands around the pole. Refer to *BAND-IT® C00169 Hand Tool Operation Instructions,* PO5886.

7 Finally, check the banding is secure, there is no movement of the bracket around the pole and that the banding stubs (cut ends) are flattened down with a hammer.



Rear view

8 Continue onto "Attach 9764 Metro Dock to the tilt bracket" (p. 3-30)

END OF STEPS

Attach 9764 Metro Dock to the tilt bracket

WARNING

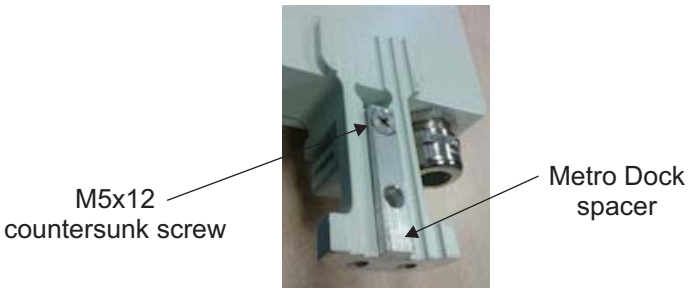
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

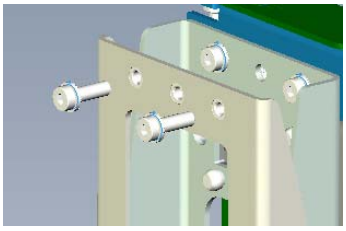
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach the 9764 Metro Dock to the tilt bracket.

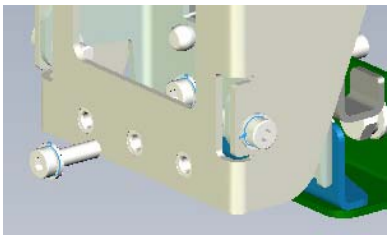
1 Before attaching the 9764 Metro Dock to the tilt bracket ensure that the Metro Dock spacer is fitted and in place.



2 Unscrew and remove the two upper M6 bolts and the one lower M6 bolt from the tilt bracket.



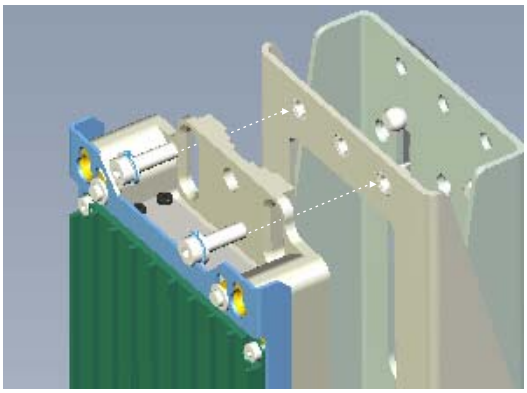
Upper M6 bolts x 2



Lower M6 bolt x 1

3 Position the 9764 Metro Dock against the front of the tilt bracket so that the two upper bolt holes and the single lower bolt hole on the 9764 Metro Dock are aligned with the bolts holes on the tilt bracket.

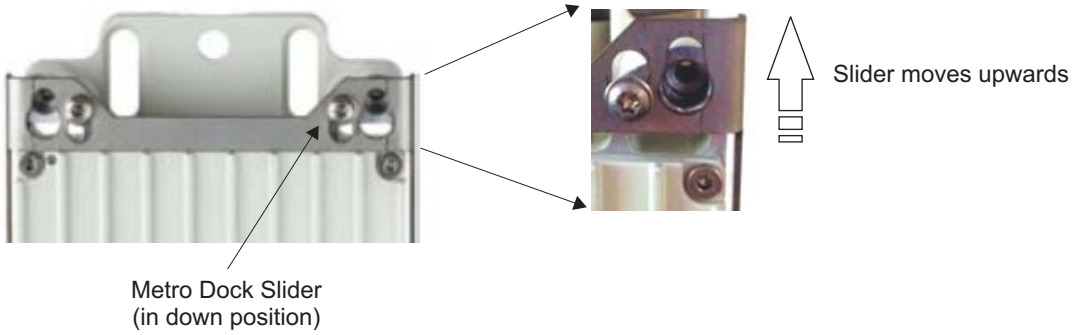
4 From the 9764 Metro Dock side, screw in the two M6 bolts through the upper bolt holes on the 9764 Metro Dock and into the upper tilt bracket bolt holes.



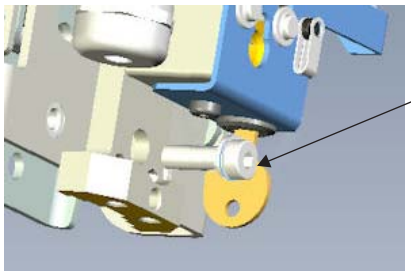
Note: Ensure the bolts are positioned at the upper (or lower) part of the elongated hole for better contact area with the Metro Dock (the chamfered midsection of the elongated hole is used for banding installation).

5 Move the 9764 Metro Dock metal slider to the "up" position as this allows easier access to the lower attachment bolt hole:

1. insert supplied key into lock
2. turn the key to its hard stop position to unlock the slider
3. push the slider upwards and turn the key to its hard stop position. The slider is now locked in the "up" position.



6 From the 9764 Metro Dock side, screw in t the single M6 bolts through the lower bolt hole on the 9764 Metro Dock and into the lower tilt bracket bolt hole.



7 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

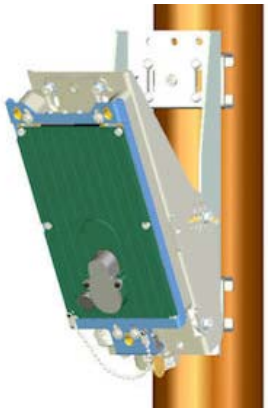
8 Finally move the 9764 Metro Dock metal slider to the "down" position:

1. turn the key to its hard stop position to unlock the slider. The slider will automatically spring into the "down" position.
2. turn the key to its hard stop position. The slider is now locked in the "down" position and the key can be removed from the lock.

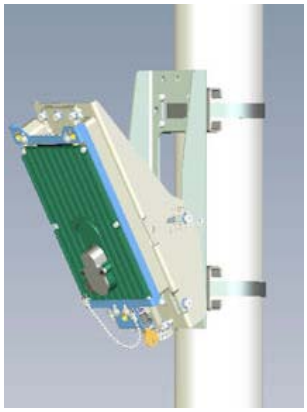
END OF STEPS

Pole mount example (with vertical tilt)

The following figure shows the 9764 Metro Dock, with vertical tilt, mounted onto a wooden pole using bolts and a metal pole using bands.



Metro Dock mounted on wooden pole with vertical tilt



Metro Dock mounted on metal pole with vertical tilt

How to continue

After mounting the 9764 Metro Dock onto a pole the cables need to be connected. Continue with the, "9764 Metro Dock cabling" (p. 3-89) section.

Procedure 3-3: Wall mount the 9764 Metro Dock

Purpose

This topic describes the procedures to be followed when installing the Alcatel-Lucent 9764 Metro Dock directly onto a wall or solid flat surface.

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific fixing materials are available (for example, bolts, washers and wall plug materials).

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary recommended supporting anchor fixings are used.

Mounting requirements and materials

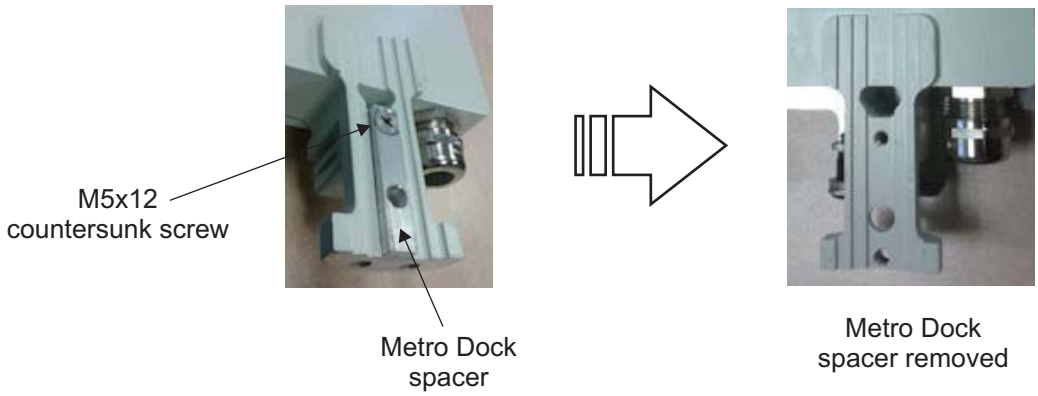
The 9764 Metro Dock is less than 1 kg (2.2 lbs) and can be easily mounted onto solid concrete or wooden flat surface. Refer to the following for the installation kits, anchor materials and tools for the installation type:

- For wall mount refer to, “Wall mount installation requirements” (p. 3-9).
- For a list of standard tools that may be required to support the installation, see “Tools required for installation” (p. 3-4)

Before you begin

Before mounting the 9764 Metro Dock:

- Record the 9764 Metro Dock 18 digit serial number
- On the 9764 Metro Dock ensure that the Metro Dock spacer is not attached. If the spacer is present remove it by unscrewing the M5 screw:



Perform standard wall mount installation

WARNING

Fall hazard

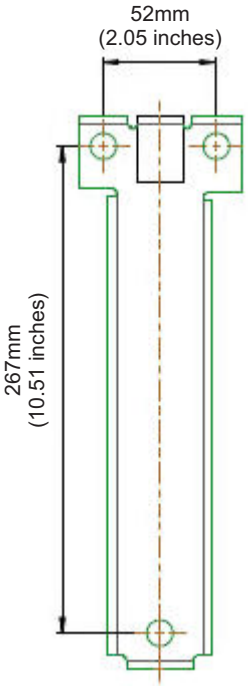
Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to mount the 9764 Metro Dock directly onto a wall.

1 Measure the height at which the 9764 Metro Dock is to be positioned on the wall. Mark this point.

2 At the selected installation location, mark the points on the wall for the anchor holes. See hole spacing pattern below to use as a guide:



Tip: The wall spacer bracket can placed against the wall and used as a template to mark the position of the upper and lower anchor holes.

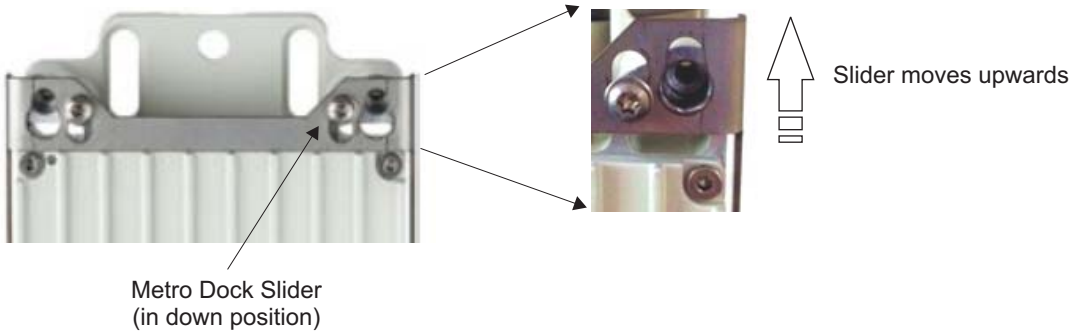
Check the horizontal position of the planned holes with a level.

3

If..	Then..
Surface structure is concrete	1. Drill two upper holes and one lower hole at the marked points to the appropriate depth. 2. Insert screw anchor plugs (Rawlnut M6x50) into the drilled holes and, using a hammer, tap home until the plugs are flush with the wall.
Surface structure is wood	Proceed with the next step.

4 Move the 9764 Metro Dock metal slider to the “up” position as this allows easier access to the lower attachment bolt hole:

1. insert supplied key into lock
2. turn the key to its hard stop position to unlock the slider
3. Push the slider upwards and turn the key to its hard stop position. The slider is now locked in the “up” position.

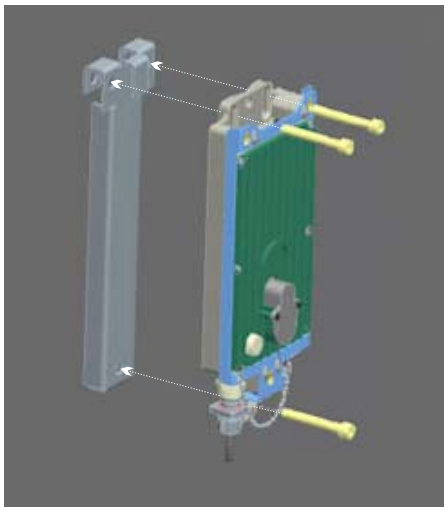


5 Place washers onto the anchor bolts.

Note: The type of anchor bolt used depends on the surface structure:

- Wooden surface: use Screw Hex T M8x70 stainless steel
- Concrete surface: use Screw CHC M6x80 stainless steel

6 Align the 9764 Metro Dock bolt holes with the wall spacer bolt holes and thread bolts through the corresponding set of holes.



7 Screw in the upper and lower bolts into the drilled anchor holes for a concrete surface, or directly into the wooden surface, to the appropriate depth so that the wall spacer and 9764 Metro Dock are securely attached to the wall.

Recommended screw torque; 7.0 N.m (62.0 lb.in).

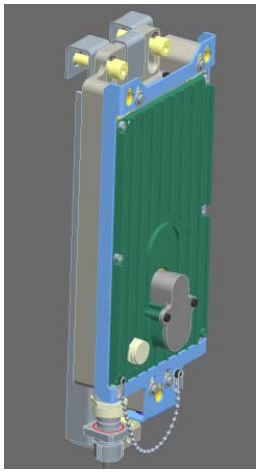
8 Finally move the 9764 Metro Dock metal slider to the “down” position:

1. turn the key to its hard stop position to unlock the slider. The slider will automatically spring into the “down” position
2. turn the key to its hard stop position. The slider is now locked in the “down” position and the key can be removed from the lock.

END OF STEPS

Standard wall mount example

The following figure depicts a standard wall mount.



How to continue

After mounting the 9764 Metro Dock onto a wall the cables need to be connected. Continue with the, “9764 Metro Dock cabling” (p. 3-89) section.

Procedure 3-4: Wall mount the 9764 Metro Dock using optional tilt brackets

Purpose

This topic describes the procedures to be followed when the Alcatel-Lucent 9764 Metro Dock is required to be mounted onto a wall or solid flat surface using tilt brackets (vertical, horizontal or combined horizontal/vertical).

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific fixing materials are available (for example, bolts, washers and wall plug materials).

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary supporting anchor fixings are used.

Mounting requirements and materials

The 9764 Metro Dock is less than 1 kg (2.2 lbs) and can be easily mounted onto solid concrete or wooden flat surface. Refer to the following for the installation kits, anchor materials and tools for the installation type:

- For wall mount refer to, “Wall mount installation requirements” (p. 3-9).
- For a list of standard tools that may be required to support the installation, see “Tools required for installation” (p. 3-4)

Before you begin

Record the 9764 Metro Dock 18 digit serial number before mounting onto a wall.

Prepare surface for bracket mounting

WARNING

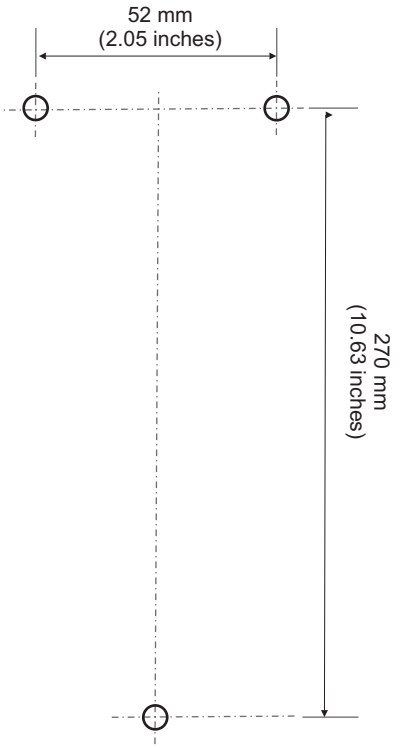
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to prepare a wall or solid flat surface for mounting tilt brackets.

1 At the selected installation location, mark the points on the wall for the bracket anchor holes. See drill hole pattern below to use as a guide:



Tip: If the tilt bracket is available it can be placed against the wall and be used as a template to mark the points on the wall for the bracket anchor holes.

Check the horizontal marked position of the holes with a level.

2

If..	Then..
Surface structure is concrete	1. Drill two upper holes and one lower hole at the marked points to the appropriate depth. 2. Insert screw anchor plugs (Rawlnut M6x50) into the drilled holes and, using a hammer, tap home until the plugs are flush with the wall.
Surface structure is wood	Mount combined horizontal/vertical tilt brackets

3 Once the mounting surface has been prepared the tilt brackets can be attached. Continue with one of the following procedures depending on the tilt configuration:

If..	Then..
Attaching vertical tilt brackets	Carry out the procedure, "Mount the vertical tilt bracket" (p. 3-42)
Attaching horizontal tilt brackets	Carry out the procedure, "Mount the horizontal tilt bracket" (p. 3-44)
Attaching combined horizontal and vertical tilt brackets	Carry out the procedure, "Mount combined horizontal/vertical tilt brackets" (p. 3-46)

END OF STEPS

Mount the vertical tilt bracket

WARNING

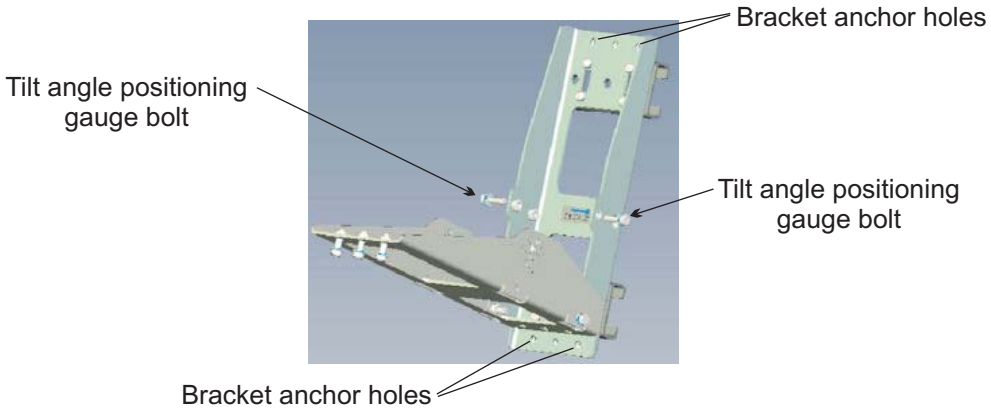
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

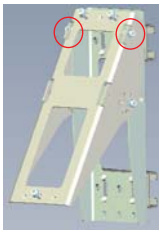
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach a vertical tilt bracket onto a flat surface or wall.

1 Remove the two tilt angle positioning gauge bolts on either side of the vertical tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



2 Depending on the required vertical tilt orientation ensure the bracket is positioned the correct way up before placing on the wall:

If...	Then...	View...
upward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the top	
downward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the bottom	

3 Place washers onto the anchor bolts.

Note: The type of anchor bolt used depends on the surface structure:

- Wooden surface: use Screw Hex T M8x70 stainless steel
- Concrete surface: use Screw CHC M6x80 stainless steel

4 At the selected installation location, position the tilt bracket so the anchor holes on the bracket align with the anchor holes either drilled or marked on the wall.

5 For each anchor hole (upper and lower) insert bolts through the tilt bracket anchor holes.

6 Screw the upper and lower bolts into the drilled anchor holes for a concrete surface, or directly into the wooden surface, to the appropriate depth so that the bracket is firmly secured to the wall or flat surface.

Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Once the tilt bracket is mounted the 9764 Metro Dock can be attached. Continue with "Attach 9764 Metro Dock to the tilt bracket" (p. 3-30).

END OF STEPS

Mount the horizontal tilt bracket

WARNING

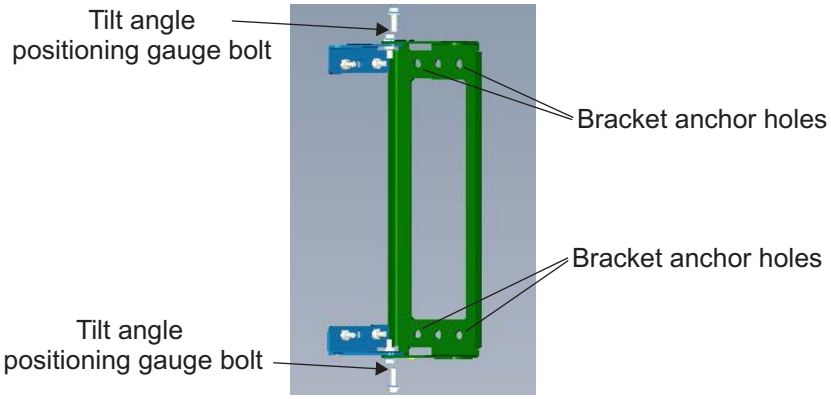
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

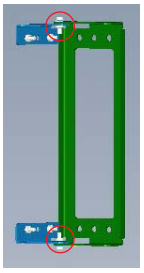
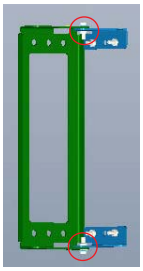
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach the horizontal tilt bracket onto a flat surface or wall.

1 Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



2 Depending on the required horizontal tilt orientation ensure the bracket is the correct way up before securing the bracket onto the wall:

If...	Then...	View...
left horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the left	
right horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the right	

3 Place washers onto the anchor bolts.

Note: The type of anchor bolt used depends on the surface structure:

- Wooden surface: use Screw Hex T M8x70 stainless steel
- Concrete surface: use Screw CHC M6x80 stainless steel

4 At the selected installation location, position the tilt bracket so the anchor holes on the bracket align with the anchor holes either drilled or marked on the wall.

5 For each anchor hole (upper and lower) insert bolts through the tilt bracket anchor holes.

6 Screw the upper and lower bolts into the drilled anchor holes for a concrete surface, or directly into the wooden surface, to the appropriate depth so that the bracket is firmly secured to the wall or flat surface.

Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Once the tilt bracket is mounted the 9764 Metro Dock can be attached. Continue with "Attach 9764 Metro Dock to the tilt bracket" (p. 3-30).

END OF STEPS

Mount combined horizontal/vertical tilt brackets

WARNING

Fall hazard

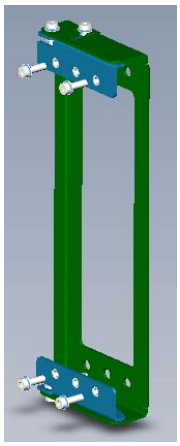
Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach the combined horizontal/vertical tilt bracket onto a flat surface or wall.

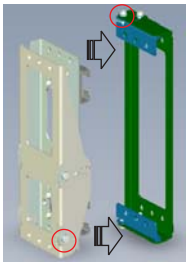
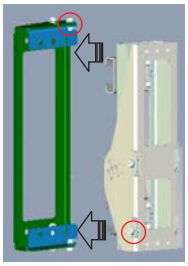
1 Firstly combine the horizontal and vertical tilt brackets.

Unscrew and remove the two upper and two lower M6 bolts on the front of the horizontal tilt bracket.



2 Align the attachment holes on the vertical tilt bracket with the attachments holes on the horizontal tilt bracket.

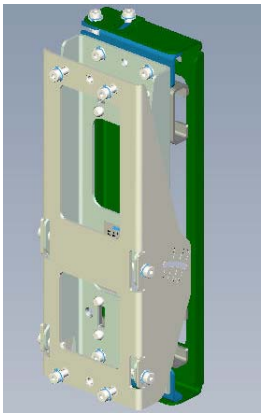
Important! Ensure the brackets are combined in the correct way based on the planned horizontal and vertical tilt orientation of the equipment.

If...	Then...	View...
left horizontal tilt and downward vertical tilt is required or right horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the left and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for right horizontal tilt and upward vertical tilt	
right horizontal tilt and downward vertical tilt is required or left horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the right and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for left horizontal tilt and upward vertical tilt	

3 Insert the two upper and two lower bolts through the attachment holes on the vertical tilt bracket and through the attachment holes on the horizontal tilt bracket.

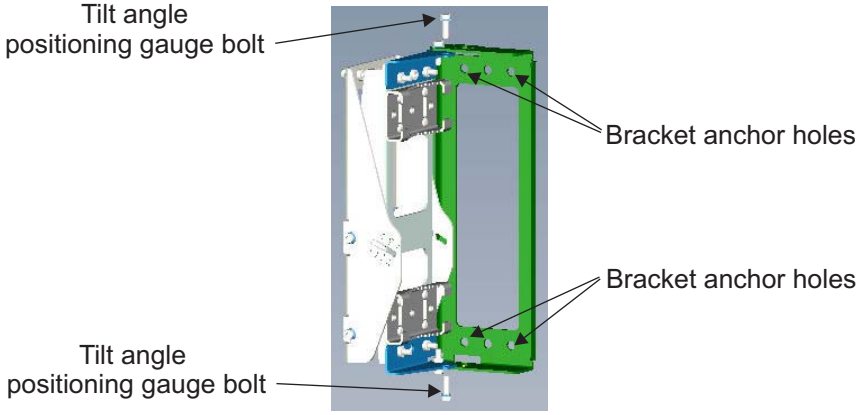
For each bolt, screw on the retaining nut. Using a 10 mm ratchet wrench, tighten the two upper and two lower M6 retaining bolts so that the brackets are securely attached.

Recommended screw torque; 7.0 N.m (62.0 lb.in).



4 The horizontal and vertical tilt brackets are now combined and can be attached to the wall.

Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing access to the bracket anchor holes.



5 Place washers onto the anchor bolts.

Note: The type of anchor bolt used depends on the surface structure:

- Wooden surface: use Screw Hex T M8x70 stainless steel
- Concrete surface: use Screw CHC M6x80 stainless steel

6 At the selected installation location, position the tilt bracket so the anchor holes on the bracket align with the anchor holes either drilled or marked on the wall.

Important! Ensure the combined brackets are positioned on the wall correctly based on the planned horizontal and vertical tilt orientation of the equipment.

7 For each anchor hole (upper and lower) insert bolts through the tilt bracket anchor holes.

8 Screw the upper and lower bolts into the drilled anchor holes for a concrete surface, or directly into the wooden surface, to the appropriate depth so that the bracket is firmly secured to the wall or flat surface.

Recommended screw torque; 7.0 N.m (62.0 lb.in).

9 Once the tilt bracket is mounted the 9764 Metro Dock can be attached. Continue with "Attach 9764 Metro Dock to the tilt bracket" (p. 3-30).

END OF STEPS

Attach 9764 Metro Dock to the tilt bracket

WARNING

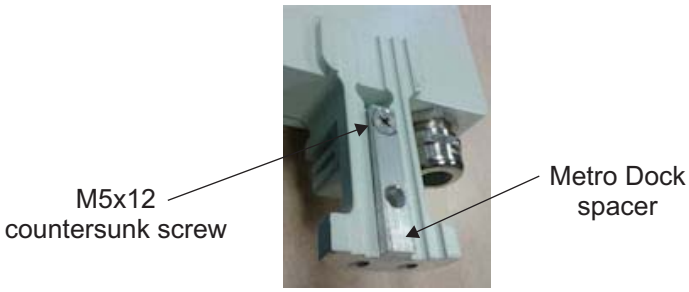
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

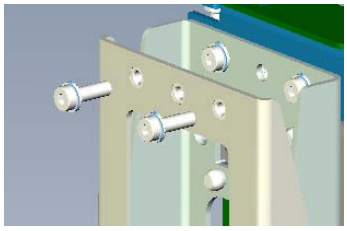
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach the 9764 Metro Dock to the tilt bracket.

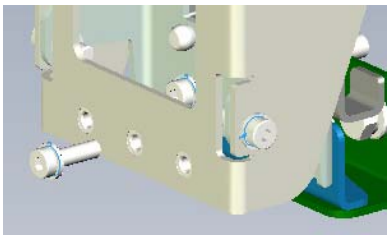
1 Before attaching the 9764 Metro Dock to the tilt bracket ensure that the Metro Dock spacer is fitted and in place.



2 Unscrew and remove the two upper M6 bolts and the one lower M6 bolt from the tilt bracket.



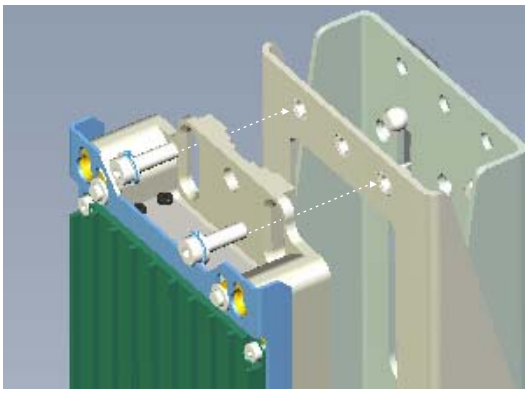
Upper M6 bolts x 2



Lower M6 bolt x 1

3 Position the 9764 Metro Dock against the front of the tilt bracket so that the two upper bolt holes and the single lower bolt hole on the 9764 Metro Dock are aligned with the bolts holes on the tilt bracket.

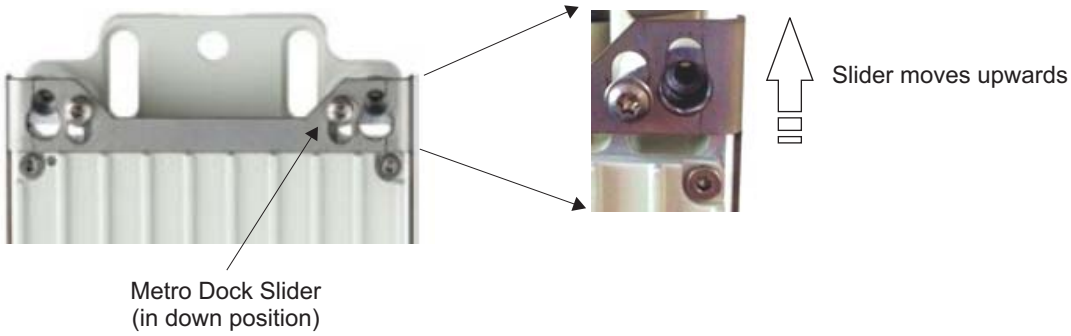
4 From the 9764 Metro Dock side, screw in the two M6 bolts through the upper bolt holes on the 9764 Metro Dock and into the upper tilt bracket bolt holes.



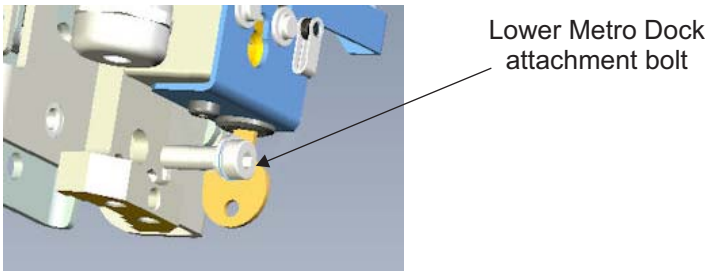
Note: Ensure the bolts are positioned at the upper (or lower) part of the elongated hole for better contact area with the Metro Dock (the chamfered midsection of the elongated hole is used for banding installation).

5 Move the 9764 Metro Dock metal slider to the "up" position as this allows easier access to the lower attachment bolt hole:

1. insert supplied key into lock
2. turn the key to its hard stop position to unlock the slider
3. push the slider upwards and turn the key to its hard stop position. The slider is now locked in the "up" position.



6 From the 9764 Metro Dock side, screw in t the single M6 bolts through the lower bolt hole on the 9764 Metro Dock and into the lower tilt bracket bolt hole.



7 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

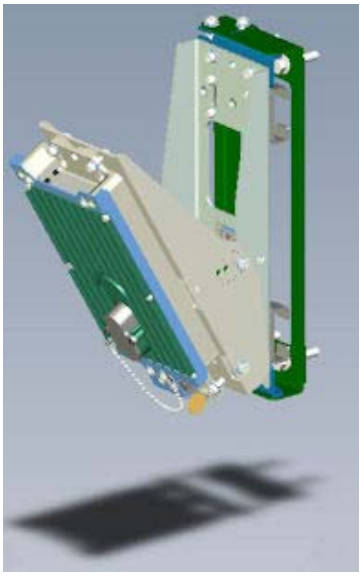
8 Finally move the 9764 Metro Dock metal slider to the “down” position:

1. turn the key to its hard stop position to unlock the slider. The slider will automatically spring into the “down” position.
2. turn the key to its hard stop position. The slider is now locked in the “down” position and the key can be removed from the lock.

END OF STEPS

Wall mount with horizontal/vertical tilt example

The following figure depicts a wall mount installation with horizontal/vertical tilt.



How to continue

After mounting the 9764 Metro Dock onto a wall the cables need to be connected. Continue with the, "9764 Metro Dock cabling" (p. 3-89) section.

Procedure 3-5: Pole mount the 9764 Metro Dock in a pair configuration

Purpose

This topic describes the procedures to be followed when installing the Alcatel-Lucent 9764 Metro Dock in a pair mount configuration onto a pole. This deployment option is used when a 9764 MCO V1.1 LTE 2x1W product or a 9764 MCO LTE 2x2W product is mounted with a 9764 MCO WCDMA 1W product to form a Multi-Standard Pair configuration.

The available pair-mount installation options are:

- a 9764 MCO V1.1 B2 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2/B25 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2 LTE 2x2W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,
- a 9764 MCO V1.1 B7 LTE 2x1W product is mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific mounting and anchor materials are available.

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary supporting material is used.

Mounting requirements and materials

For pole mounting the 9764 Metro Dock in a pair mount configuration refer to the following for the installation kits, anchor materials and tools required for this installation type:

- For pole mount installation kits and materials refer to, "Pole mount installation requirements" (p. 3-5).
- For a list of standard tools that may be required to support the installation, see "Tools required for installation" (p. 3-4)

Before you begin

Record both the 9764 Metro Dock 18 digit serial number for future reference before mounting onto the support bracket.

Attach support plate to a pole

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

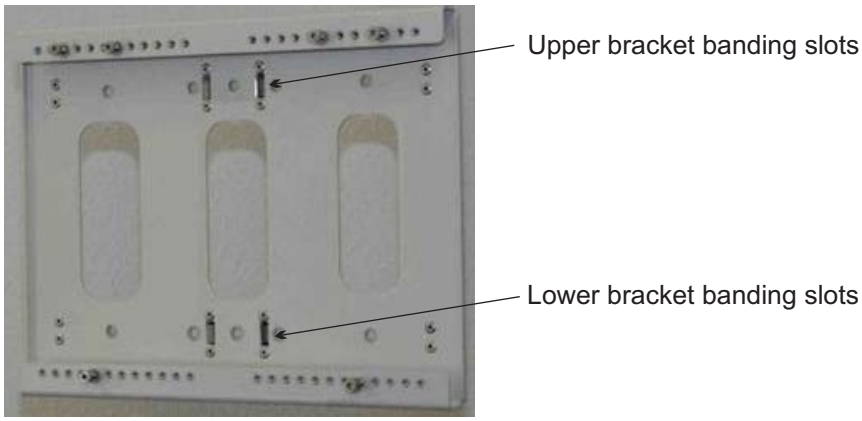
Perform the following procedure to mount the double Metro Dock support plate onto a pole. The procedure also includes attaching the extension plate to the support plate.

Note: The extension plate is required to mount the 3G MCO (allowing alignment with the 4G MCO in pair-mount deployment) and can be attached to either the left or right side of the double Metro Dock support plate, depending on customer preference.

1 Measure the height at which the double Metro Dock support plate is to be positioned on pole. Mark this point.

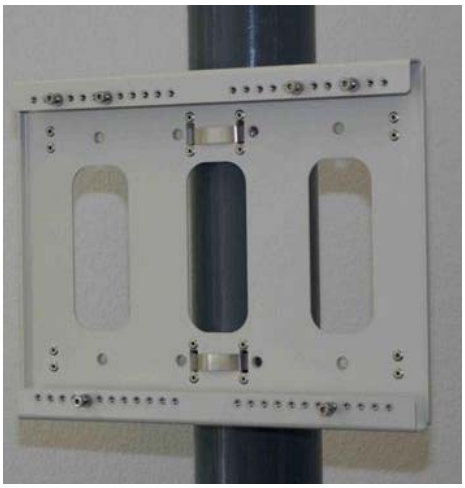
2 Using a digital compass determine the planned horizontal (left/right) orientation of the support plate around the pole. Mark this position.

3 From the banding installation kit, locate the two steel pole bands. Thread the open end of one band through the upper two banding slots on the support plate and the other pole band through the lower two banding slots on the support plate.



4 At the marked installation point on the pole place the upper and lower pole bands around the pole at the determined height. Carry out any required adjustment of the support plate around the pole so that it is pointing in the desired direction.

5 Once the support plate is in the correct position and orientation tighten and secure the bands around the pole using the banding tool.



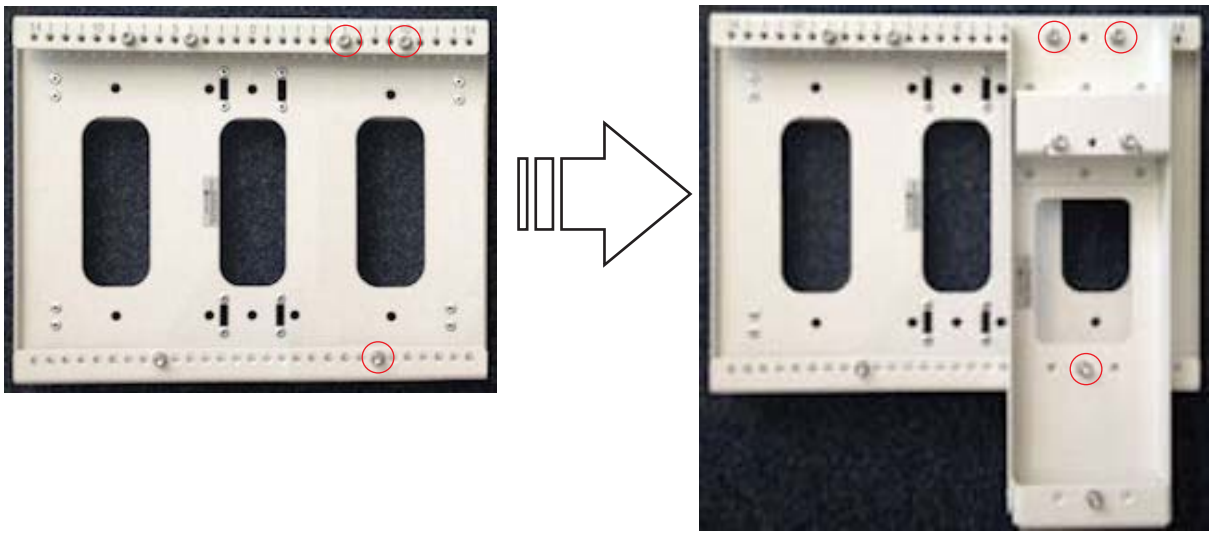
Refer to *BAND-IT ® C00169 Hand Tool Operation Instructions, PO5886.*

6 Check the banding is secure, there is no movement of the support plate around the pole and that the banding stubs (cut ends) are flattened down with a hammer.

7 Finally attach the extension plate to the double Metro Dock support plate.

Note: The extension plate used for mounting the 3G MCO can be attached to either the left or the right side of the double support plate depending on customer preference (the example shows the extension plate attached on the right side of the double support plate).

1. Remove the three bolts (either the left set of three or the right set of three) from the support plate.
2. Position the extension plate in front of the support plate so that both sets of attachment holes are aligned.
3. Replace the set of three bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).



8 Once the Metro Dock double support plate (including extension plate) has been mounted onto a pole continue with one of the following procedures:

- If no tilt is required, continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).
- If tilt is required continue with one of the following procedures depending on the tilt configuration:

For..	Then..
Vertical tilt only	Carry out the procedure, "Attach vertical tilt brackets" (p. 3-58)
Horizontal tilt only	Carry out the procedure, "Attach horizontal tilt bracket" (p. 3-60)
Combined horizontal and vertical tilt	Carry out the procedure, "Attach combined horizontal/vertical tilt brackets" (p. 3-63)

END OF STEPS

Attach vertical tilt brackets

WARNING

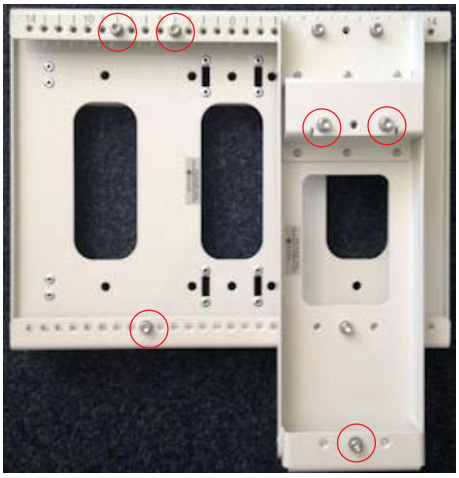
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

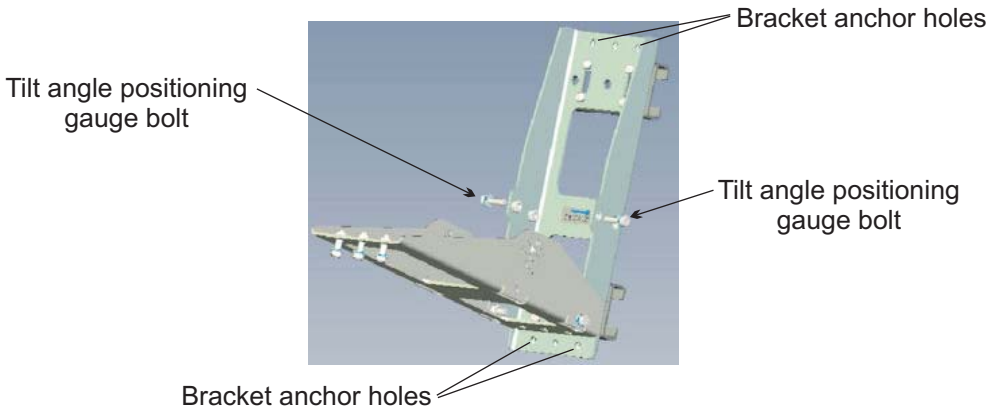
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach vertical tilt brackets to the double support bracket.

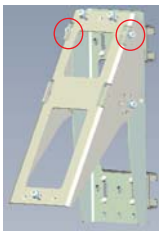
1 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



2 Remove the two tilt angle positioning gauge bolts on either side of the vertical tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



3 Depending on the required vertical tilt orientation ensure the bracket is positioned the correct way up before placing on the support plate:

If...	Then...	View...
upward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the top	
downward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the bottom	

4 Position the vertical tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

5 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

6 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Repeat the above procedure for attaching the second vertical tilt bracket to the extension plate.

8 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach horizontal tilt bracket

WARNING

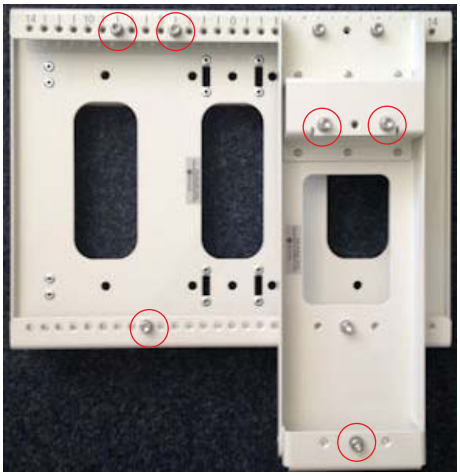
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

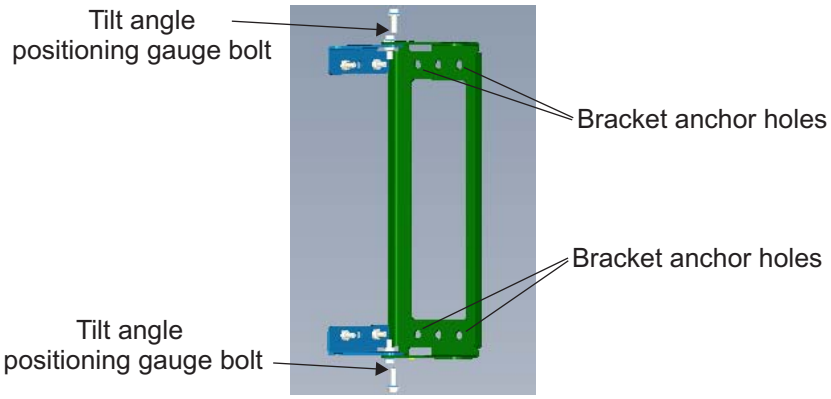
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach horizontal tilt brackets to the double support bracket.

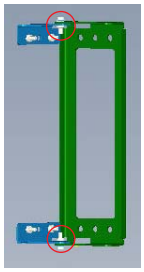
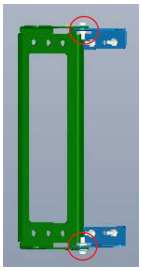
1 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



2 Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



3 Depending on the required horizontal tilt orientation ensure the bracket is the correct way up before securing the tilt brackets to the support plate:

If...	Then...	View...
left horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the left	
right horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the right	

4 Position the horizontal tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

5 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

6 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Repeat the above procedure for attaching the second horizontal tilt bracket to the extension plate.

8 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach combined horizontal/vertical tilt brackets

WARNING

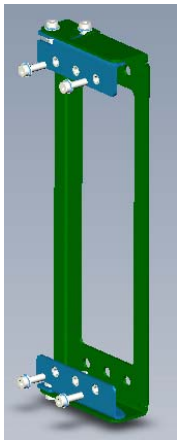
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

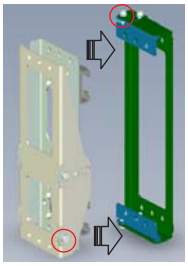
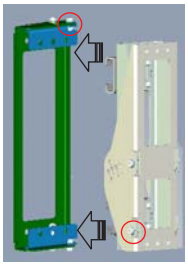
Perform the following procedure to attach the combined horizontal/vertical tilt brackets to the double support bracket.

1 Firstly combine the horizontal and vertical tilt brackets by unscrewing and removing the two upper and two lower M6 bolts on the front of the horizontal tilt bracket.



2 Align the attachment holes on the vertical tilt bracket with the attachments holes on the horizontal tilt bracket.

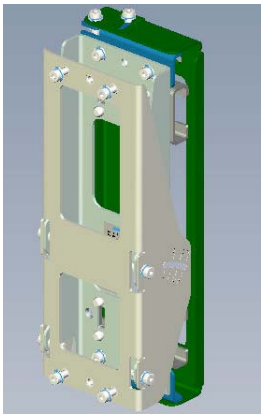
Important! Ensure the brackets are combined in the correct way based on the planned horizontal and vertical tilt orientation of the equipment.

If...	Then...	View...
left horizontal tilt and downward vertical tilt is required or right horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the left and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for right horizontal tilt and upward vertical tilt	
right horizontal tilt and downward vertical tilt is required or left horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the right and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for left horizontal tilt and upward vertical tilt	

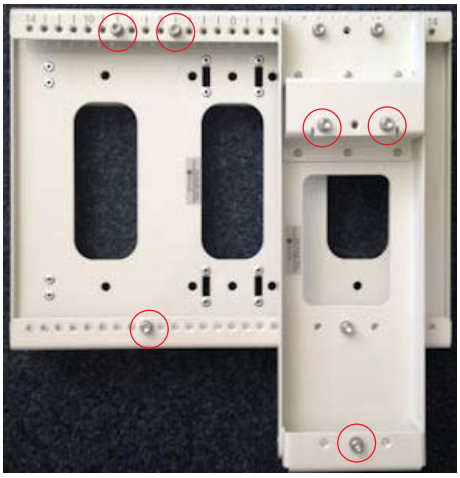
3 Insert the two upper and two lower bolts through the attachment holes on the vertical tilt bracket and through the attachment holes on the horizontal tilt bracket.

Using a 10 mm ratchet wrench, tighten the two upper and two lower M6 retaining bolts so that the brackets are securely attached.

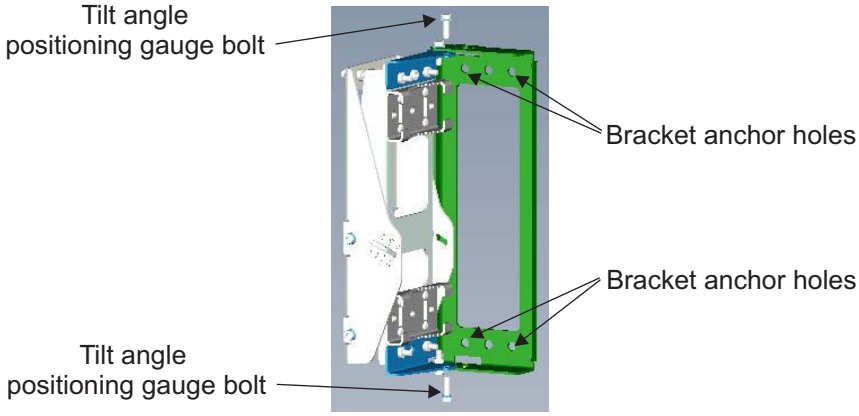
Recommended screw torque; 7.0 N.m (62.0 lb.in).



4 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



5 Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



6 Position the combined tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

7 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

8 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

9 Repeat the above procedure for attaching the second horizontal/vertical tilt bracket to the extension plate.

10 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach 9764 Metro Dock to brackets

WARNING

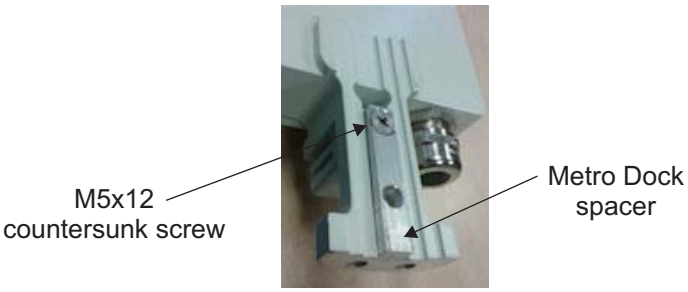
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach a pair of 9764 Metro Dock's directly to the support plate or to tilt brackets (attached to the support plate).

1 Before attaching each 9764 Metro Dock ensure that the Metro Dock spacer is fitted and in place on both 9764 Metro Dock's.



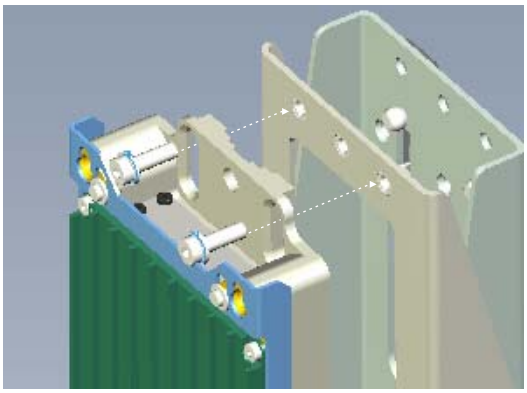
2 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from the both sides (left and right) of the support plate or if tilt brackets are attached from each of the tilt brackets.

9764 Metro Dock attachment bolts on support plate

9764 Metro Dock attachment bolts on tilt bracket

3 Position a 9764 Metro Dock against the front of the bracket (support plate or tilt) so that the two upper bolt holes and the single lower bolt hole on the 9764 Metro Dock are aligned with the bolts holes on the bracket.

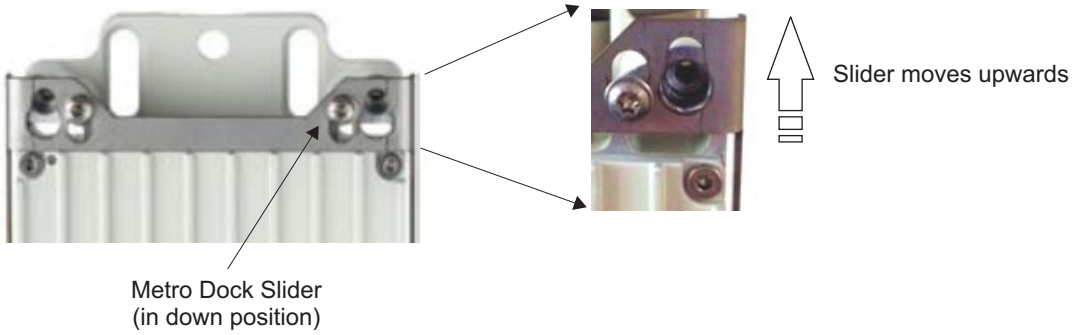
4 From the 9764 Metro Dock side, screw in the two M6 bolts back through the upper bolt holes on the 9764 Metro Dock and into the upper bracket bolt holes.



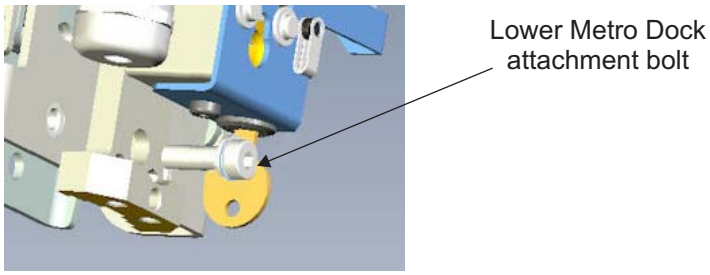
Note: Ensure the bolts are positioned at the upper (or lower) part of the elongated hole for better contact area with the Metro Dock (the chamfered midsection of the elongated hole is used for banding installation).

5 Move the 9764 Metro Dock metal slider to the "up" position as this allows easier access to the lower attachment bolt hole:

1. insert supplied key into lock
2. turn the key to its hard stop position to unlock the slider
3. push the slider upwards and turn the key to its hard stop position. The slider is now locked in the "up" position.



6 From the 9764 Metro Dock side, screw in the single M6 bolts back through the lower bolt hole on the 9764 Metro Dock and into the lower bracket bolt hole.



7 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

8 Finally move the 9764 Metro Dock metal slider to the "down" position:

1. turn the key to its hard stop position to unlock the slider. The slider will automatically spring into the "down" position.
2. turn the key to its hard stop position. The slider is now locked in the "down" position and the key can be removed from the lock.

9 Repeat the above procedure for attaching the second 9764 Metro Dock to the other side of the support plate or, if tilt brackets are attached, to the second tilt bracket.

END OF STEPS

Pole mount example (with tilt)

The following figure shows an example of a 9764 Metro Dock pair configuration (with tilt brackets attached), mounted onto a pole.

How to continue

After mounting the 9764 Metro Dock pair onto the double support bracket the cables need to be connected. Continue with the, “9764 Metro Dock cabling” (p. 3-89) section.

Procedure 3-6: Wall mount the 9764 Metro Dock in a pair configuration

Purpose

This topic describes the procedures to be followed when installing the Alcatel-Lucent 9764 Metro Dock in a pair-mount configuration onto a wall or flat surface. This deployment option is used when a 9764 MCO V1.1 LTE 2x1W product or a 9764 MCO LTE 2x2W product is mounted with a 9764 MCO WCDMA 1W product to form a Multi-Standard Pair configuration.

The available pair-mount installation options are:

- a 9764 MCO V1.1 B2 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2/B25 LTE 2x1W product is mounted with a 9764 MCO V1.0 B2 WCDMA 1W product
- a 9764 MCO V1.1 B2 LTE 2x2W product is pair-mounted with a 9764 MCO V1.0 B2 WCDMA 1W,
- a 9764 MCO V1.1 B7 LTE 2x1W product is mounted with a 9764 MCO V1.0 B1 WCDMA 1W product.

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated in order to maximize coverage. Before installation begins you should ensure the following are in place:

- Ensure adequate clearance is provided for service access
- Ground cable has been routed and the site grounding system is in place
- Backhaul cable has been routed and is in place
- Any site specific fixing materials are available (for example, bolts, washers and wall plug materials).

  Attention: The 9764 Metro Dock must be mounted with the appropriate mounting hardware suitable for the various supporting structures, building materials and construction methods. Following a site survey, it is the responsibility of the customer to ensure that:

  - the installation support structure is adequate and compliant with ICC IBC (2012): International Building Code, and all other national and local codes
  - the appropriate mounting hardware and any necessary recommended supporting anchor fixings are used.

Mounting requirements and materials

For wall mounting the 9764 Metro Dock in a pair-mount configuration refer to the following for the installation kits, anchor materials and tools required for this installation type:

- For wall mount installation kits and materials refer to, "Wall mount installation requirements" (p. 3-9).
- For a list of standard tools that may be required to support the installation, see "Tools required for installation" (p. 3-4)

Before you begin

Record both the 9764 Metro Dock 18 digit serial numbers for future reference before mounting onto the support bracket.

Attach support plate to a wall or flat surface

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

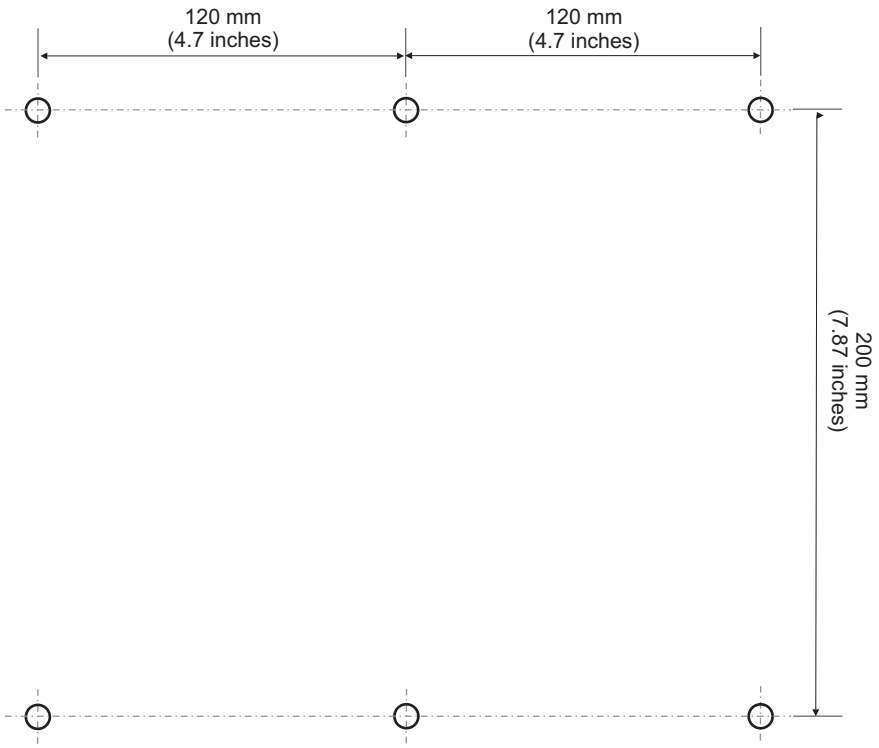
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to mount the double Metro Dock support plate onto a wall or flat surface. The procedure also includes attaching the extension plate to the support plate.

Note: The extension plate is required to mount the 3G MCO (allowing alignment with the 4G MCO in pair-mount deployment) and can be attached to either the left or right side of the double Metro Dock support plate, depending on customer preference.

1 Measure the height at which the double Metro Dock support plate is to be positioned on the wall. Mark this point.

2 At the selected installation location, mark the points on the wall for the six support plate anchor holes. See pattern below for the hole spacing dimensions.



Tip: If the double Metro Dock support plate is available it can placed against the wall and used as a template to mark the position of the upper and lower anchor holes.

3

If..	Then..
Surface structure is concrete	1. Drill three upper holes and three lower holes at the marked points to the appropriate depth. 2. Insert screw anchor plugs (Rawlnut M6x50) into the drilled holes and, using a hammer, tap home until the plugs are flush with the wall.
Surface structure is wood	Proceed with the next step.

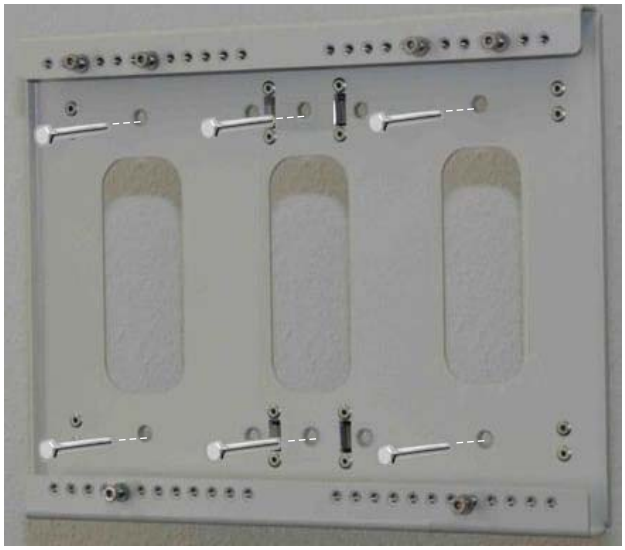
4 Place washers onto the anchor bolts.

Note: The type of anchor bolt used depends on the surface structure:

- Concrete surface: use Screw CHC M6x80 stainless steel
- Wooden surface: use Screw Hex T M8x70 stainless steel

5 Align the double Metro Dock support plate bolt holes with the corresponding holes on the wall.

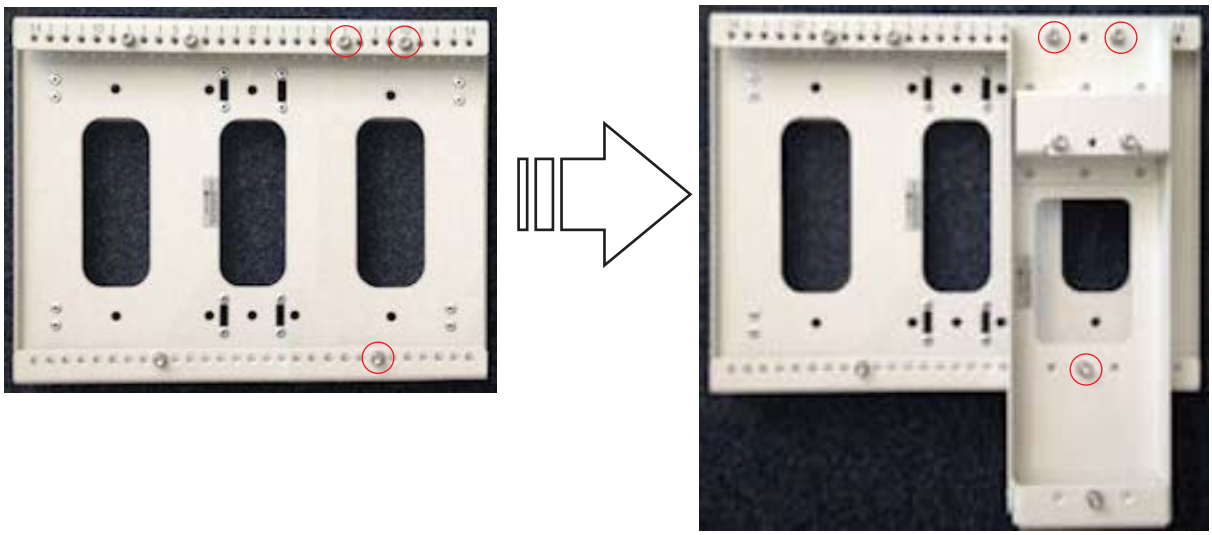
Screw in the upper and lower bolts into the drilled anchor holes for a concrete surface, or directly into the wooden surface, to the appropriate depth so that the support plate is securely attached to the wall. Recommended screw torque; 7.0 N.m (62.0 lb.in).



6 Finally attach the extension plate to the double Metro Dock support plate.

Note: The extension plate used for mounting the 3G MCO can be attached to either the left or the right side of the double support plate depending on customer preference (the example shows the extension plate attached on the right side of the double support plate).

1. Remove the three bolts (either the left set of three or the right set of three) from the support plate.
2. Position the extension plate in front of the support plate so that both sets of attachment holes are aligned.
3. Replace the set of three bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).



7 Once the Metro Dock double support plate (including extension plate) has been mounted onto a wall or flat surface continue with one of the following procedures:

- If no tilt is required, continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).
- If tilt is required continue with one of the following procedures depending on the tilt configuration:

For..	Then..
Vertical tilt only	Carry out the procedure, "Attach vertical tilt brackets" (p. 3-58)
Horizontal tilt only	Carry out the procedure, "Attach horizontal tilt bracket" (p. 3-60)
Combined horizontal and vertical tilt	Carry out the procedure, "Attach combined horizontal/vertical tilt brackets" (p. 3-63)

END OF STEPS

Attach vertical tilt brackets

WARNING

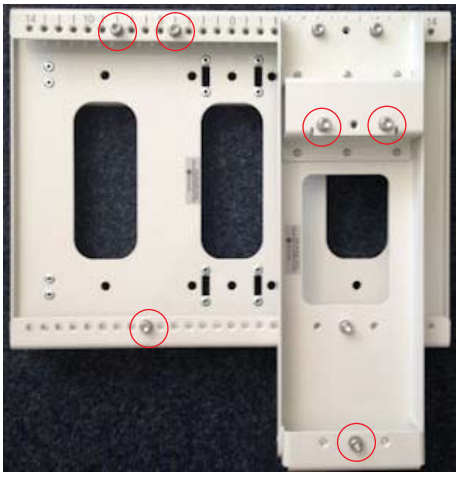
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

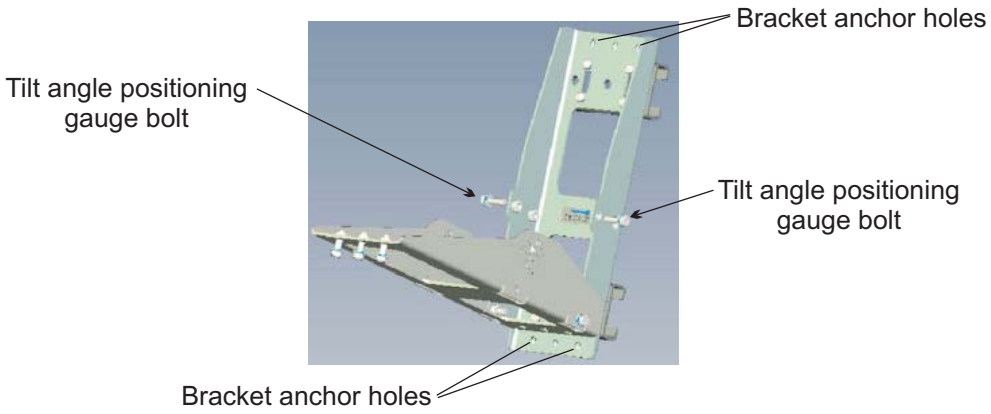
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach vertical tilt brackets to the double support bracket.

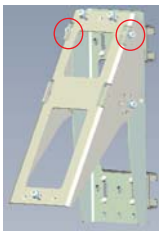
1 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



2 Remove the two tilt angle positioning gauge bolts on either side of the vertical tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



3 Depending on the required vertical tilt orientation ensure the bracket is positioned the correct way up before placing on the support plate:

If...	Then...	View...
upward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the top	
downward vertical tilt is required	the tilt bracket must be positioned with the pivot point at the bottom	

4 Position the vertical tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

5 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

6 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Repeat the above procedure for attaching the second vertical tilt bracket to the extension plate.

8 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach horizontal tilt bracket

WARNING

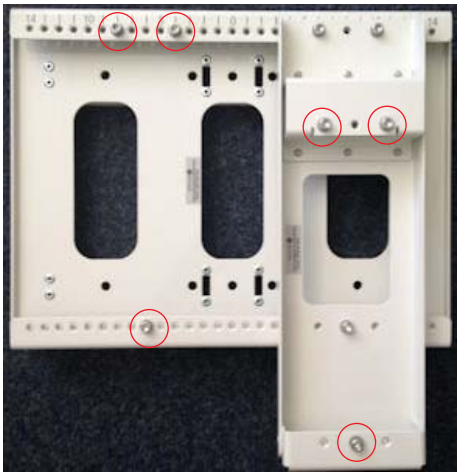
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

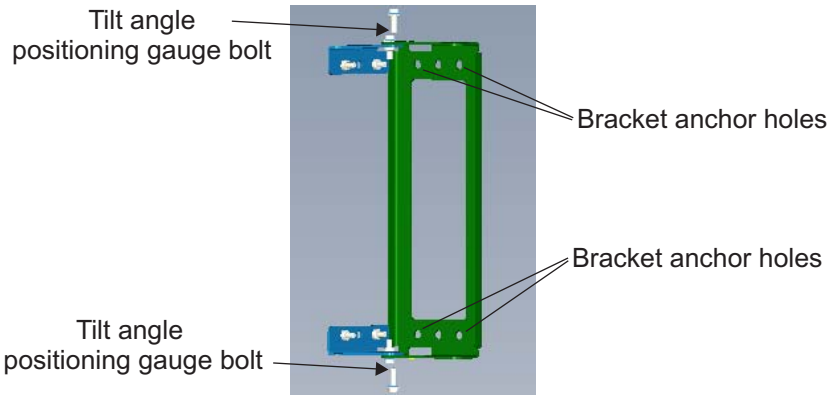
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach horizontal tilt brackets to the double support bracket.

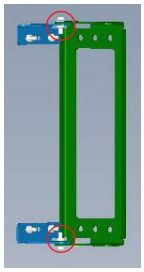
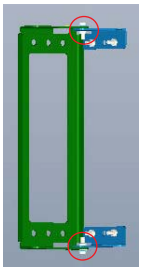
1 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



2 Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



3 Depending on the required horizontal tilt orientation ensure the bracket is the correct way up before securing the tilt brackets to the support plate:

If...	Then...	View...
left horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the left	
right horizontal tilt is required	the tilt bracket must be positioned with the pivot point on the right	

4 Position the horizontal tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

5 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

6 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

7 Repeat the above procedure for attaching the second horizontal tilt bracket to the extension plate.

8 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach combined horizontal/vertical tilt brackets

WARNING

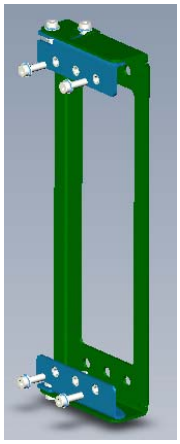
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

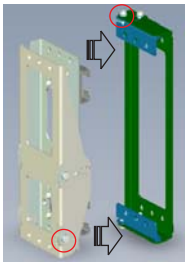
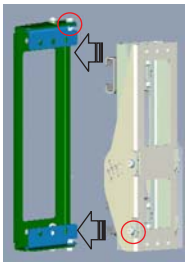
Perform the following procedure to attach the combined horizontal/vertical tilt brackets to the double support bracket.

1 Firstly combine the horizontal and vertical tilt brackets by unscrewing and removing the two upper and two lower M6 bolts on the front of the horizontal tilt bracket.



2 Align the attachment holes on the vertical tilt bracket with the attachments holes on the horizontal tilt bracket.

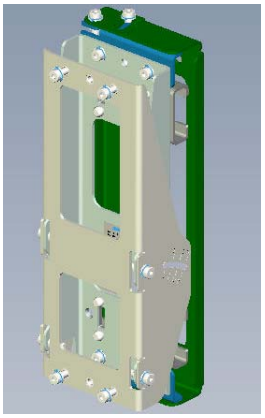
Important! Ensure the brackets are combined in the correct way based on the planned horizontal and vertical tilt orientation of the equipment.

If...	Then...	View...
left horizontal tilt and downward vertical tilt is required or right horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the left and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for right horizontal tilt and upward vertical tilt	
right horizontal tilt and downward vertical tilt is required or left horizontal tilt and upward vertical tilt is required	the brackets should be attached with the horizontal bracket pivot point on the right and the vertical bracket pivot point at the bottom **Note:** when positioning on a wall the bracket assembly can be turned through 180^0 for left horizontal tilt and upward vertical tilt	

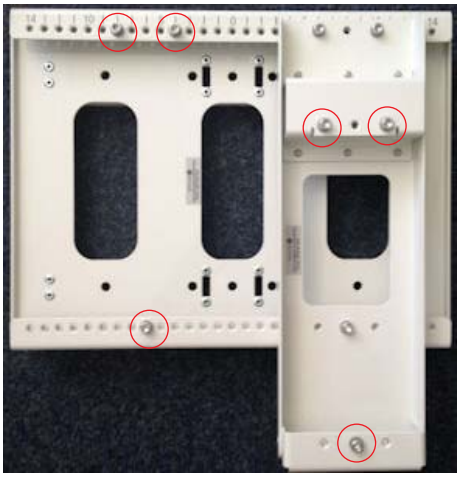
3 Insert the two upper and two lower bolts through the attachment holes on the vertical tilt bracket and through the attachment holes on the horizontal tilt bracket.

Using a 10 mm ratchet wrench, tighten the two upper and two lower M6 retaining bolts so that the brackets are securely attached.

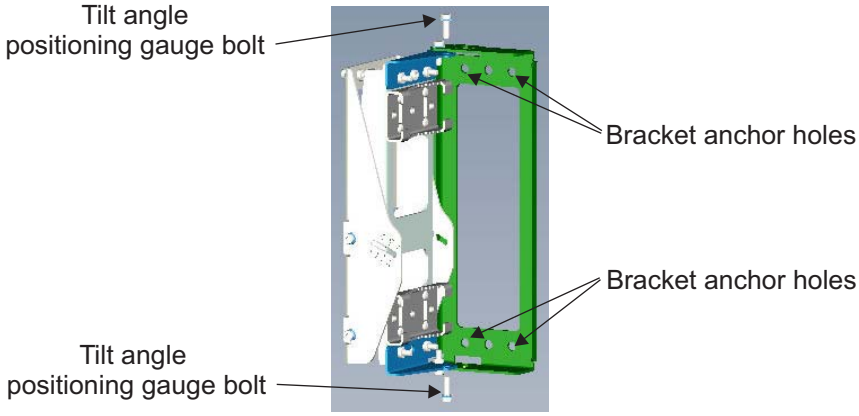
Recommended screw torque; 7.0 N.m (62.0 lb.in).



4 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from both the support bracket and the extension plate.



5 Remove the two tilt angle positioning gauge bolts from the top and bottom of the horizontal tilt bracket and allow the front part of the bracket to pivot away allowing easier access to the bracket anchor holes.



6 Position the combined tilt bracket against the front of the support bracket so that the two upper bolt holes and the single lower bolt hole on the tilt bracket are aligned with the bolts holes on the support bracket.

7 From the tilt bracket side, screw in the two upper and one lower M6 bolts through the anchor holes on the tilt bracket and into the support bracket bolt holes.

8 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

9 Repeat the above procedure for attaching the second horizontal/vertical tilt bracket to the extension plate.

10 Once the tilt brackets have been attached to the support plate the 9764 Metro Dock(s) can be attached to the tilt brackets. Continue with "Attach 9764 Metro Dock to brackets" (p. 3-66).

END OF STEPS

Attach 9764 Metro Dock to brackets

WARNING

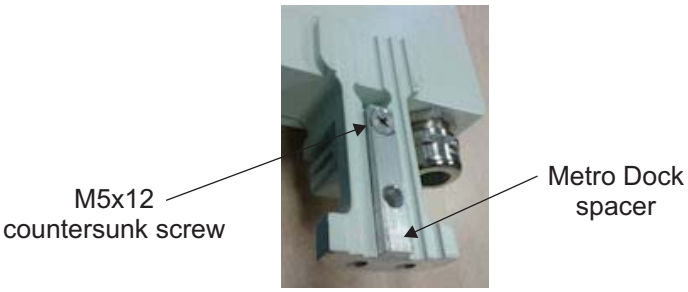
Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following procedure to attach a pair of 9764 Metro Dock's directly to the support plate or to tilt brackets (attached to the support plate).

1 Before attaching each 9764 Metro Dock ensure that the Metro Dock spacer is fitted and in place on both 9764 Metro Dock's.



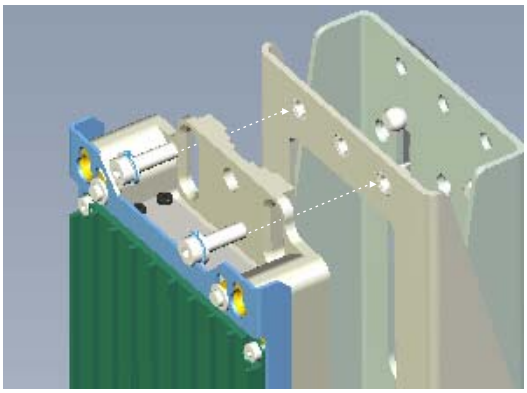
2 Unscrew and remove the set of two upper M6 bolts and the one lower M6 bolt from the both sides (left and right) of the support plate or if tilt brackets are attached from each of the tilt brackets.

9764 Metro Dock attachment bolts on support plate

9764 Metro Dock attachment bolts on tilt bracket

3 Position a 9764 Metro Dock against the front of the bracket (support plate or tilt) so that the two upper bolt holes and the single lower bolt hole on the 9764 Metro Dock are aligned with the bolts holes on the bracket.

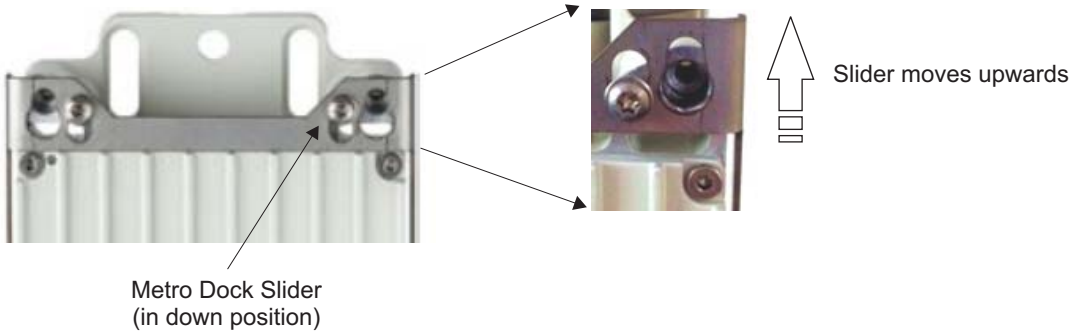
4 From the 9764 Metro Dock side, screw in the two M6 bolts back through the upper bolt holes on the 9764 Metro Dock and into the upper bracket bolt holes.



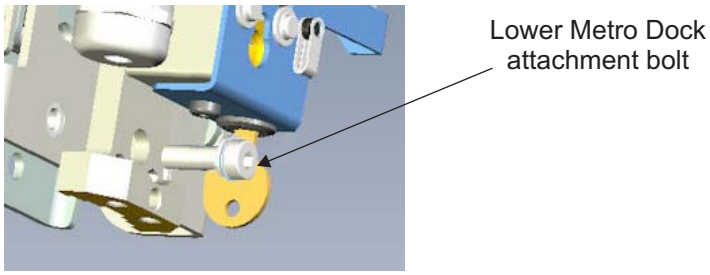
Note: Ensure the bolts are positioned at the upper (or lower) part of the elongated hole for better contact area with the Metro Dock (the chamfered midsection of the elongated hole is used for banding installation).

5 Move the 9764 Metro Dock metal slider to the "up" position as this allows easier access to the lower attachment bolt hole:

1. insert supplied key into lock
2. turn the key to its hard stop position to unlock the slider
3. push the slider upwards and turn the key to its hard stop position. The slider is now locked in the "up" position.



6 From the 9764 Metro Dock side, screw in the single M6 bolts back through the lower bolt hole on the 9764 Metro Dock and into the lower bracket bolt hole.



7 Using a 10 mm ratchet wrench, tighten the two upper and one lower M6 retaining bolts. Recommended screw torque; 7.0 N.m (62.0 lb.in).

8 Finally move the 9764 Metro Dock metal slider to the "down" position:

1. turn the key to its hard stop position to unlock the slider. The slider will automatically spring into the "down" position.
2. turn the key to its hard stop position. The slider is now locked in the "down" position and the key can be removed from the lock.

9 Repeat the above procedure for attaching the second 9764 Metro Dock to the other side of the support plate or, if tilt brackets are attached, to the second tilt bracket.

END OF STEPS

Wall mount example (with tilt)

The following figure shows an example of a 9764 Metro Dock pair configuration (with tilt brackets attached), mounted onto a wall or flat surface.

How to continue

After mounting the 9764 Metro Dock pair onto the double support bracket the cables need to be connected. Continue with the, “9764 Metro Dock cabling” (p. 3-89) chapter.

9764 Metro Dock cabling

Overview

Purpose

This section provides instructions for routing and connecting the following cables to the 9764 Metro Dock module:

- Grounding cable
- Ethernet cable

Note: For outdoor NAR installations, or where local regulations dictate, the facility and power cables are required to be routed to the equipment within rigid-steel or liquid-tight flexible metal conduit. As part of site preparation, the customer must provide the metal conduit and associated fittings for cable routes and connecting conduit to the outdoor equipment.

Contents

Procedure 3-7: 9764 Metro Dock ground cabling

Purpose

This topic describes the procedures to be followed when connecting the grounding cable to the 9764 Metro Dock.

Important! The following must be observed:

- This equipment must be externally grounded to an appropriate grounding system using: Yellow/Green 10 mm^2 insulated ground cable (required for International markets) or 8 AWG ground cable (required for North America Regional markets). Grounding cable can be ordered from Alcatel-Lucent or be locally supplied.
- All grounding system material (cable, connectors, etc.) must be of high quality, that resist deterioration and require little or no maintenance.
- Installation of the equipment must comply with local and national electrical codes and guidelines. If there is uncertainty that suitable grounding is available contact the appropriate site preparation contact or electrical inspection authority.

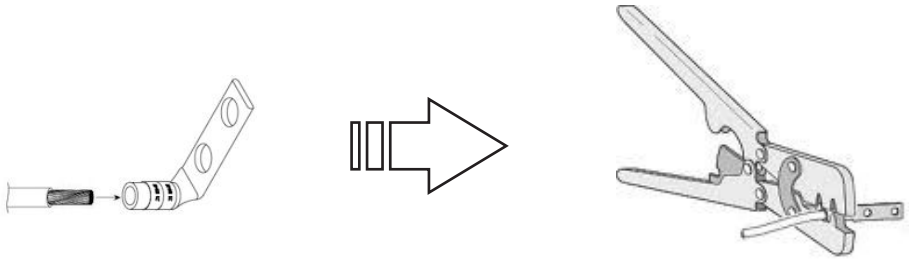
Connect the ground cable

To attach the ground cable to the 9764 Metro Dock perform the following steps.

1. Route the ground cable from the site grounding system to the 9764 Metro Dock.

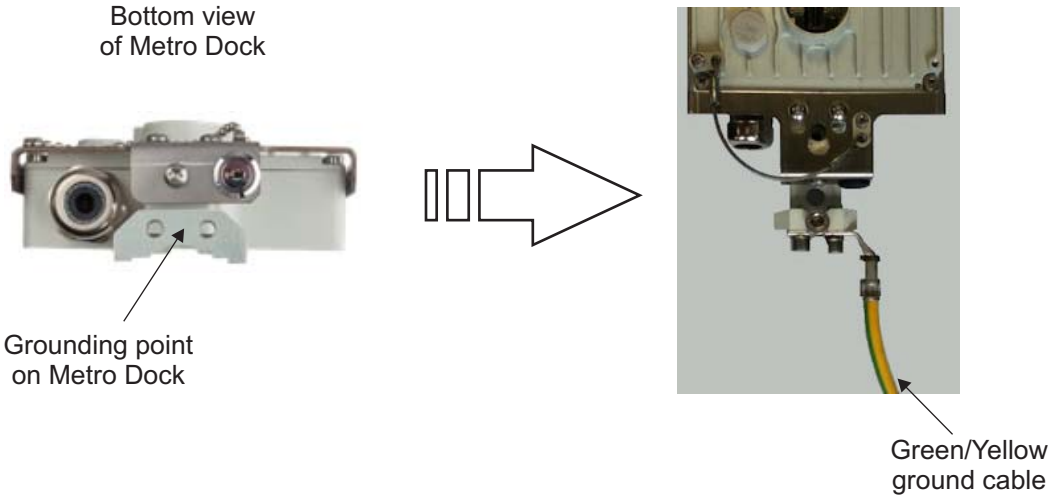
2. At the 9764 Metro Dock cut the ground cable to a proper length and strip the cable end to expose approximately 20 mm (0.75 in).

3. Place a double hole cable lug (with a holes suitable for M6 screws) onto the end of the cable. Using an appropriate crimping tool, crimp the lug onto the cable.



4. Clean the contact surface area of the cable lug and earthing point on the 9764 Metro Dock and use antioxidant to avoid oxidation.

5 Place one washer (wave spring washer) on each terminal screw, align the grounding cable lug holes with the earthing terminal holes on the 9764 Metro Dock, and secure the cable to the grounding point using the terminal screws.



6 Secure grounding cable to the wall/pole.

Important! The installation location (wall/pole) must be grounded in accordance with local regulatory guidelines

7 Finally, crimp on a double cable lug at the other end of the ground cable and attach to the main grounding system.

END OF STEPS

Procedure 3-8: 9764 Metro Dock Ethernet cabling - fiber optic

Purpose

This topic describes the procedures to be followed when connecting the optical Ethernet cable to the 9764 Metro Dock. The 9764 Metro Dock, may either be in a single configuration, or daisy chained to a second 9764 Metro Dock.

Cabling ancillary items

The following cabling related ancillary items can be ordered from Alcatel-Lucent when the backhaul infrastructure is configured for optical Ethernet:

- SFP GBE 1000BaseLX SFP module (SM or MM). See "SFP modules" (p. 2-18).
- Fiber Optic Ethernet cable with LC connector to optical SFP module at the 9764 Metro Dock module. See "Ethernet cable - Optical" (p. 2-19).

Install SFP transceiver module

WARNING

Laser hazard

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

Do not view directly into the laser beam with optical instruments such as a fiber microscope because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.

Never look into the end of an exposed fiber or an open connector as long as the optical source is switched on.

Ensure that the optical source is switched off before disconnecting optical fiber connectors.

NOTICE

ESD hazard

Semiconductor devices can be damaged by electrostatic discharges (ESD)

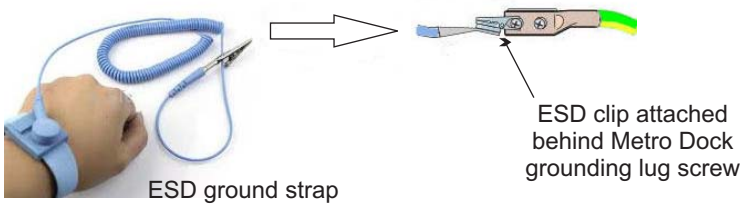
Follow the rules, outlined in the Safety chapter, see "Notices" (p. 1-7), for handling modules containing semiconductor components.

Before the optical Ethernet cable can be connected, the SFP port(s) must be equipped with the appropriate optical SFP transceiver. For backhaul, this can be either 1000Base-SX multi mode or 1000Base-LX single mode, according to the network specifications.

To install an SFP transceiver module into the 9764 Metro Dock module SFP port:

1 Firstly, carry out the following to attach the ESD wrist strap:

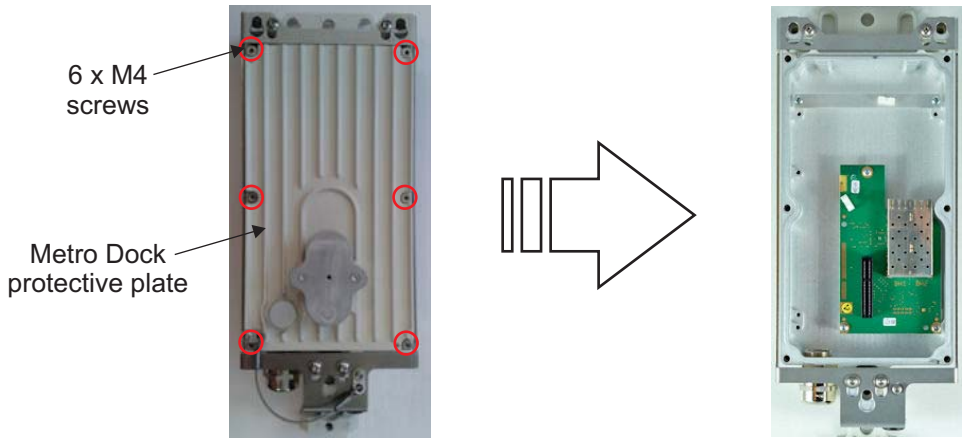
1. Attach the ESD strap over your wrist so that is in contact with your bare skin.
2. Momentarily touch the ESD clip onto a bare (unpainted) metal spot so that any built up static charge is dissipated.
3. Attach the ESD clip to the 9764 Metro Dock ground lug screw (the ground lug screw can be unscrewed slightly for easier ESD clip attachment).



2 In order to remove the 9764 Metro Dock protective plate, ensure the Metro Dock metal slider is in the default “down” position. This allows easier access to all six of the plate retention screws.

3 On the front of the protective plate unscrew and safely store the 6 x M4 plate retention screws (Hex wrench size, 2.5 mm).

Carefully lift off the 9764 Metro Dock protective plate.



4 Remove the SFP transceiver module(s) from their protective packaging.

Important! Do not remove the SFP transceiver module dust plugs until directed to do so later in the procedure.

5 Check the label on the SFP transceiver module bodies to verify that you have the correct model for your network.

6 Insert SFP transceiver modules into SFP ports.

If...	Then...	View
You are connecting a single cable from the backhaul system.	Align the backhaul optical SFP transceiver module with the SFP port labelled “BH 1” and insert the module into the socket until you feel the connector latch into place.	
You are connecting a daisy chain cable in addition to the cable from the backhaul system.	Align the daisy chain optical SFP transceiver module with the SFP port labelled “BH 2” and insert the module into the socket until you feel the connector latch into place.	

Attention: If the SFP module resists as you insert it, do not force it. Remove the module, turn it over, and try reinserting.

Push up and latch the SFP module locking bar into position to secure the SFP transceiver module into the port.

7 To check that the SFP transceiver module(s) are seated and latched properly, grasp each SFP module and try to remove it without releasing the latch.

- If the SFP module can be removed, reinsert it until the module is latched securely into the socket.
- If the SFP module cannot be removed, it is installed and seated properly.

END OF STEPS

Connect the Ethernet cable

WARNING

Laser hazard

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

Do not view directly into the laser beam with optical instruments such as a fiber microscope because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.

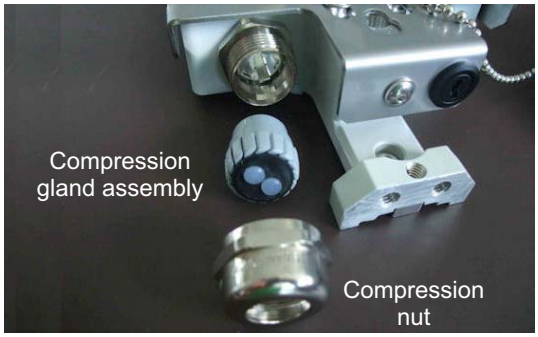
Never look into the end of an exposed fiber or an open connector as long as the optical source is switched on.

Ensure that the optical source is switched off before disconnecting optical fiber connectors.

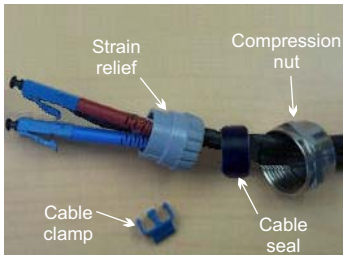
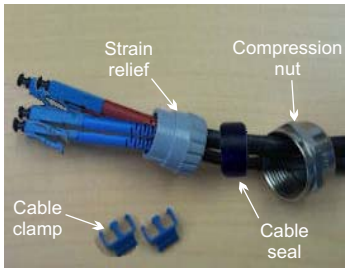
To connect the optical Ethernet cable to the Alcatel-Lucent 9764 Metro Dock perform the following steps:

1 Route the optical Ethernet cable coming from the backhaul system to the 9764 Metro Dock. If daisy chaining to a second 9764 MCO also route optical Ethernet cable to this MCO.

2 Unscrew and remove the rounded compression nut from the cable gland located on the bottom of the 9764 Metro Dock casing, as shown in the following figure:



3 Feed the compression gland assembly items onto the Ethernet cable (either single cable or double cable).

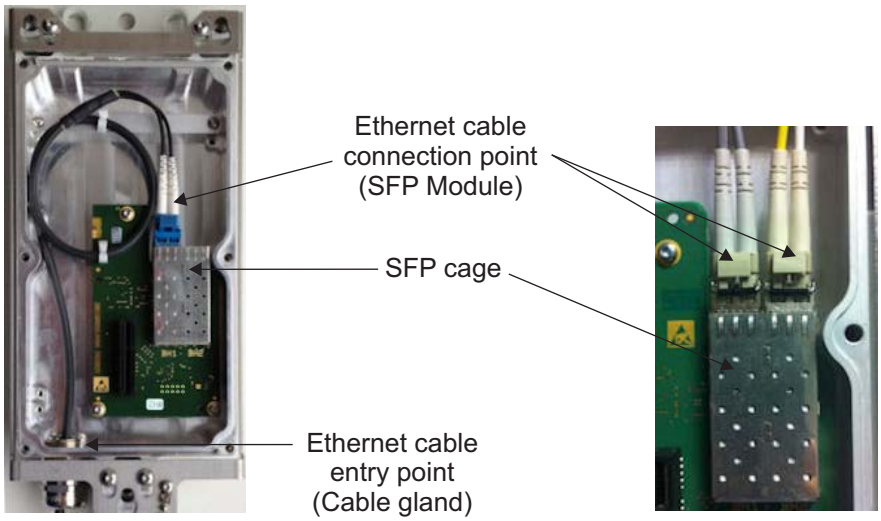
If...	Then...	View
You are connecting a single cable from the backhaul system	Firstly remove the cable clamp from the optical cable, then in the following order, place the rounded compression nut, the double slotted cable seal and the strain relief onto the cable, as shown.	
You are connecting a daisy chain cable in addition to the cable from the backhaul system	Firstly remove the cable clamp from both the optical cables, then in the following order, place the rounded compression nut, the double slotted cable seal and the strain relief onto both cables, as shown.	

4 Feed the Ethernet cables through the gland opening on the Metro Dock and then insert the gland assembly into the gland housing.

Note: The gland assembly with cable may need to be turned slightly in order to fully slide into the gland housing before the compression nut can be screwed on.

5 Replace the cable clamp onto the optical cable and within the 9764 Metro Dock casing, carefully route cables to the SFP cage.

Remove dust plugs from the optical cable LC connectors and the SFP transceiver modules and immediately insert the optical cable LC connectors into the SFP transceiver modules.

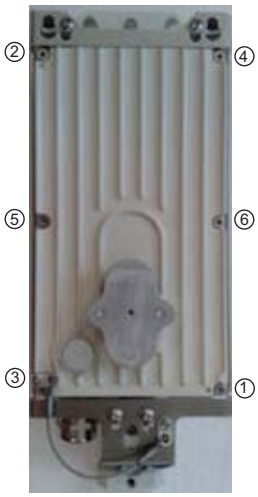


6 Screw the rounded compression nut back onto the main body of the gland. Use an adjustable or open-end wrench to tighten the compression nut

Important! It is recommended that the compression nut is torqued to 2.5 N.m (22.1 lb.in) in order to create a watertight seal and avoid a potential loose connection.

7 Replace and reattach the 9764 Metro Dock protective plate via the six plate retention screws.

Important! Ensure the plate gasket is seated correctly in the groove on the underside of the plate. Tighten the six plate retention screws in the sequence shown. Recommended torque, 2.3 N.m (20.4 lb.in).



8 Finally, secure the Ethernet cable to the wall/pole.

Important! When securing cables ensure the following to avoid cable damage:

- Secure cables with tie wraps. Use additional tie wraps wherever necessary for neatness
- All cables should be run parallel with no twisting or tangled cables
- Avoid excessive tension on the cable.

END OF STEPS

How to continue

After the grounding and Ethernet cable connections are completed:

If...	Then...
The 9764 MCO module is to be installed at a later time	continue with Procedure 3-10: "Final installation activities and checks" (p. 3-112).
A 9764 MCO Wi-Fi AP module is to be installed along with the 9764 MCO module immediately after Metro Dock installation	continue with Appendix B, "Installation of the 9764 MCO Wi-Fi AP"
The 9764 MCO module is to be installed immediately after Metro Dock installation	continue with Chapter 4, "Installation of the 9764 MCO module" before installing the 9764 MCO module.

Procedure 3-9: 9764 Metro Dock Ethernet cabling - electrical

Purpose

This topic provides the following procedures associated with connecting electrical Ethernet cable to the 9764 Metro Dock:

- SFP transceiver module installation.
- Optional internal surge arrestor module installation.
- Connection electrical backhaul Ethernet cable.

Cabling ancillary items

The following Ethernet cabling related ancillary items are required when the backhaul infrastructure is configured for electrical Ethernet:

- 10/100/1000BaseT Electrical SFP module. See "SFP modules" (p. 2-18).
- Electrical Ethernet cable with RJ45 connector to electrical SFP module at the 9764 Metro Dock module. See "Ethernet cable - Electrical" (p. 2-19).
- Optional Ethernet surge arrestor (either external or internal)

  Can be installed if additional surge protection is required.

Install SFP transceiver module

NOTICE

ESD hazard

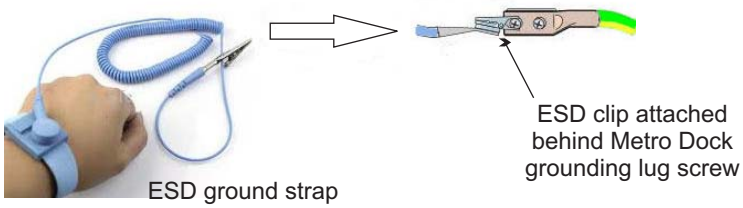
Semiconductor devices can be damaged by electrostatic discharges (ESD)

Follow the rules, outlined in the Safety chapter, see "Notices" (p. 1-7), for handling modules containing semiconductor components.

To install SFP transceiver modules into the 9764 Metro Dock module SFP ports:

1 Firstly, carry out the following to attach the ESD wrist strap:

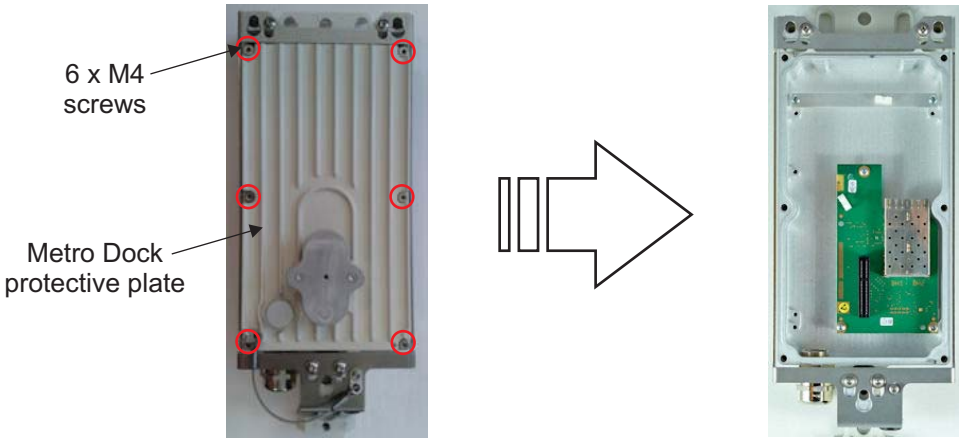
1. Attach the ESD strap over your wrist so that is in contact with your bare skin.
2. Momentarily touch the ESD clip onto a bare (unpainted) metal spot so that any built up static charge is dissipated.
3. Attach the ESD clip to the 9764 Metro Dock ground lug screw (the ground lug screw can be unscrewed slightly for easier ESD clip attachment).



2 Firstly ensure the Metro Dock metal slider is in the default “down” position as this allows easier access to all six of the Metro Dock protective plate retention screws.

3 On the front of the protective plate unscrew the captive 6 x M4 plate retention screws (Hex wrench size, 2.5 mm).

Carefully lift off the 9764 Metro Dock protective plate.



4 Remove the SFP transceiver module(s) from the protective packaging.

5 Check the label on the SFP transceiver module body to verify that you have the correct model for your network.

6 Insert SFP transceiver modules into SFP ports.

If...	Then...	View
You are connecting a single cable from the backhaul system.	Align the backhaul electrical SFP transceiver module with the SFP port labelled “BH 1” and insert the module into the socket until you feel the connector latch into place.	
You are connecting a daisy chain cable in addition to the cable from the backhaul system.	Align the daisy chain optical SFP transceiver module with the SFP port labelled “BH 2” and insert the module into the socket until you feel the connector latch into place.	

Attention: If the SFP module resists as you insert it, do not force it. Remove the module, turn it over, and try reinserting.

Push up and latch the SFP module locking bar into position to secure the SFP transceiver module into the port.

7 To check that SFP modules are seated and latched properly, grasp the SFP module and try to remove it without releasing the latch.

- If the SFP module can be removed, reinsert it until the module is latched securely into the socket.
- If the SFP module cannot be removed, it is installed and seated properly.

8 How to continue.

If...	Then...
The internal surge arrestor module is to be installed (available in Release LR14.1.L)	continue onto, “Install optional internal surge arrestor” (p. 3-102)
No internal surge arrestor module is required	continue onto, “Connect the backhaul Ethernet cable” (p. 3-104)

END OF STEPS

Install optional internal surge arrestor

NOTICE

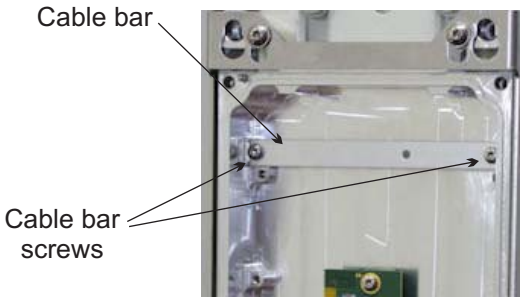
ESD hazard

Semiconductor devices can be damaged by electrostatic discharges (ESD)

Follow the rules, outlined in the Safety chapter, see "Notices" (p. 1-7), for handling modules containing semiconductor components.

Follow these steps in order to install and cable the optional internal surge arrestor module into the 9764 Metro Dock casing.

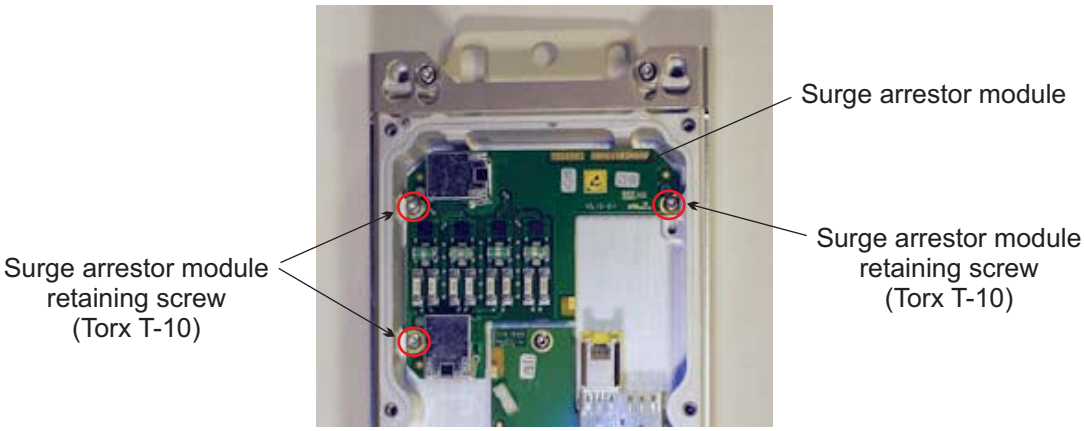
1 Within the 9764 Metro Dock casing remove the Metro Dock cable bar by unscrewing the two retaining screws.



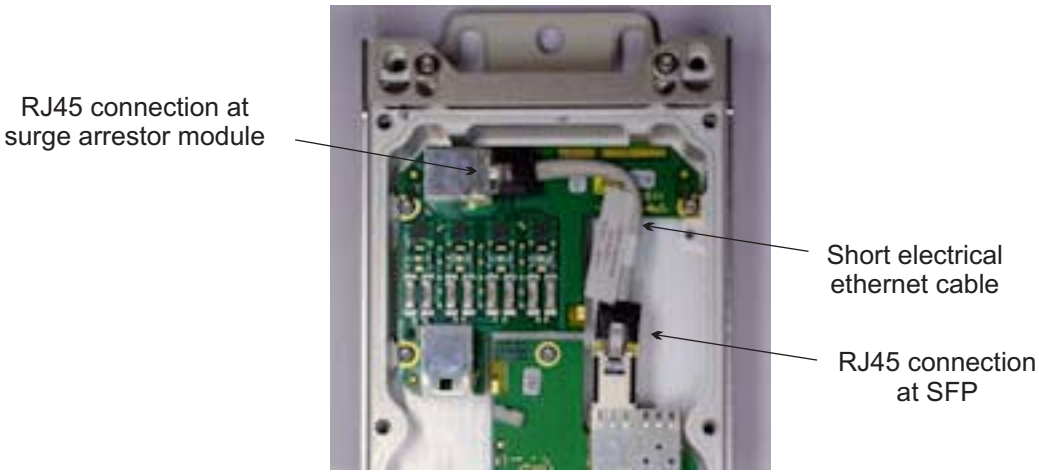
2 From the surge arrestor kit packaging obtain the internal surge arrestor module and the three T-10 Torx fixing screws.

3 Align the three screw holes on the surge arrestor module with the three screw holes within the 9764 Metro Dock casing and secure the module into place with the supplied T-10 Torx screws.

Tip: The three T-10 Torx screws are small, therefore it is recommended to use a magnetized Torx screwdriver.



4 Finally, using the short Ethernet cable (CA-SAEC) from the kit, plug one RJ45 cable connector into the RJ45 port on the surge arrestor module and the other RJ45 cable connector into the SFP transceiver located in port “BH1”.



5 Continue with the next procedure, “Connect the backhaul Ethernet cable” (p. 3-104)

END OF STEPS

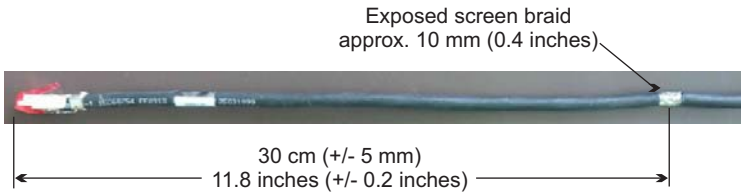
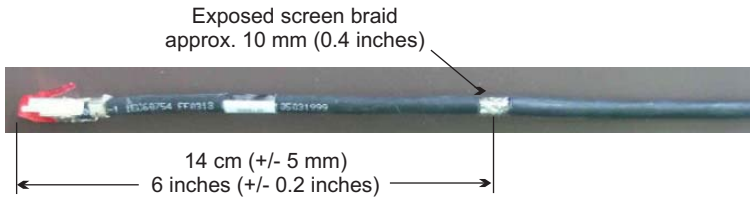
Connect the backhaul Ethernet cable

Follow these step in order to connect the electrical Ethernet backhaul cable to the SFP module in the 9764 Metro Dock or the optional internal surge arrestor module (if installed).

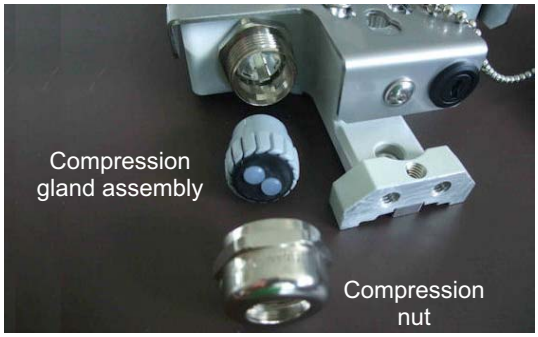
1 Obtain, from the packaging, the Alcatel-Lucent electrical Ethernet cable. The RJ45 connector without connector cover should be used at the 9764 Metro Dock side.

Note: If an external surge arrestor is installed then use a short cable from the surge arrestor to the 9764 Metro Dock.

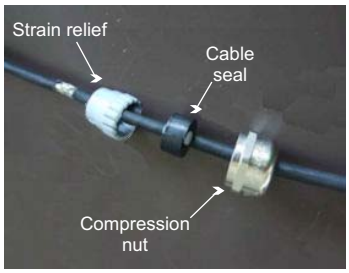
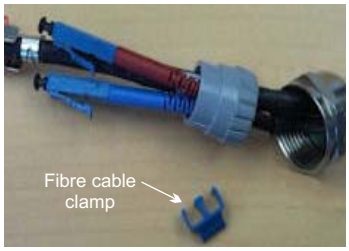
2 For increased cable connection within the cable gland, expose a section of screen braid (approximately 10 mm) by cutting through the cable jacket. The exposed section should measured from the leading edge of the RJ45 connector to the center of the exposed area.

If...	Then...
Cable connection is directly to SFP	
Cable connection is to surge arrestor module	

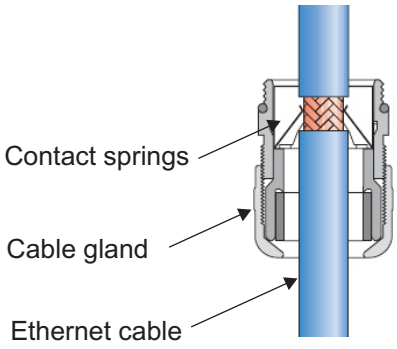
3 Unscrew and remove the rounded compression nut from the cable gland located on the bottom of the 9764 Metro Dock casing, as shown in the following figure:

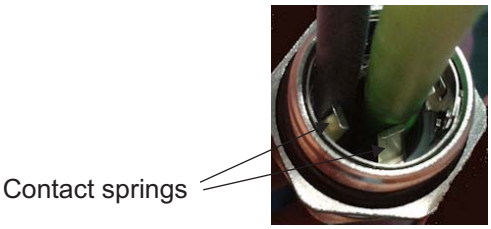


4 Feed the compression gland assembly items onto the Ethernet cable (either single cable or double cable).

If...	Then...	View
You are connecting a single cable from the backhaul system	In the following order place the rounded compression nut, the double slotted cable seal and the strain relief onto the cable, as shown.	
You are connecting a daisy chain cable in addition to the cable from the backhaul system	Firstly remove the cable clamp from the optical cable, then in the following order, place the rounded compression nut, the double slotted cable seal and the strain relief onto both cables, as shown.	

5 Pull the cable through the gland assembly parts until a connection is made between the exposed cable screen braid and the gland contact springs.



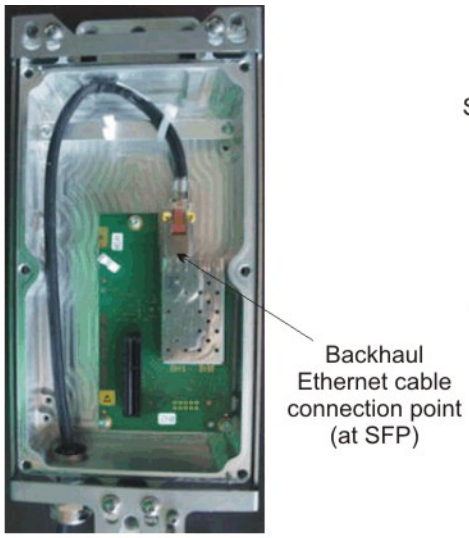


6 Feed the Ethernet cable(s) through the gland opening on the Metro Dock and loosely insert the gland assembly into the gland housing.

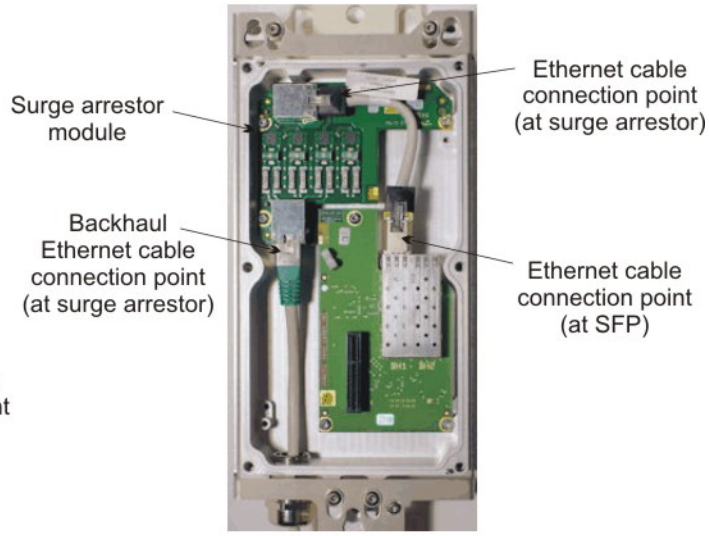
Note: The gland assembly with cable may need to be turned slightly in order to fully slide into the gland housing before the compression nut can be screwed on.

7 Within the 9764 Metro Dock casing:

- route the electrical (backhaul) cable to either the SFP transceiver (“BH1”) or, if the internal surge arrestor is installed, to the connector on the surge arrestor module. Insert the Ethernet cable connector into the SFP transceiver or surge arrestor RJ45 port.

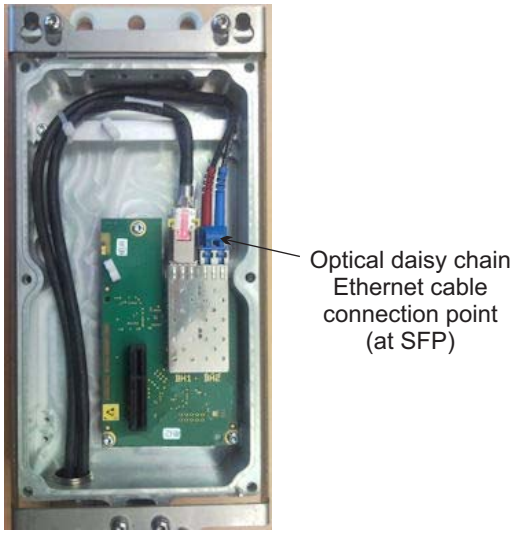


Electrical Backhaul
Ethernet cable connection
(no surge arrestor module)

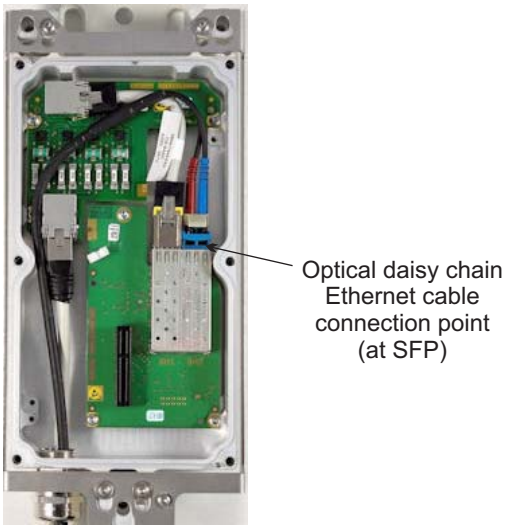


Electrical Backhaul
Ethernet cable connection
(with surge arrestor module)

- if daisy chaining to a second 9764 MCO, route the optical (daisy chain) cable to the SFP transceiver ("BH2"). Remove the dust plugs from the optical cable LC connectors and the SFP transceiver module and immediately insert the LC connectors into the SFP transceiver.



Optical daisy chain
Ethernet cable connection
(no surge arrestor module)



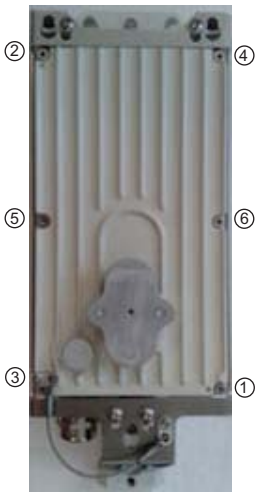
Optical daisy chain
Ethernet cable connection
(with surge arrestor module)

8 Screw the rounded compression nut back onto the main body of the gland. Use an adjustable or open-end wrench to tighten the compression nut.

Important! It is recommended that the compression nut is torqued to 2.5 N.m (22.1 lb.in) in order to create a watertight seal and avoid a potential loose connection.

9 Replace and reattach the 9764 Metro Dock protective plate via the six plate retention screws.

Important! Ensure the plate gasket is seated correctly in the groove on the underside of the plate. Tighten the six plate retention screws in the sequence shown. Recommended torque, 2.3 N.m (20.4 lb.in).



10 Finally, secure the Ethernet cable to the wall/pole.

Important! When securing cables ensure the following to avoid cable damage:

- Secure cables with tie wraps. Use additional tie wraps wherever necessary for neatness
- All cables should be run parallel with no twisting or tangled cables
- Avoid excessive tension on the cable.

END OF STEPS

Mount and cable the external surge arrestor

Follow these steps to mount (either pole or wall) the optional external surge arrestor onto the surge arrestor bracket and connect the Ethernet cables.

1 On the surge arrestor, unscrew the lower weatherized strain relief connector and locking nut from the surge arrestor.

2 Site the surge arrestor onto the bracket so that the lower threaded Ethernet connection point is positioned through the arrestor mounting hole.

3 Screw the arrestor locking nut back onto the arrestor and tighten so that the arrestor is securely attached to the bracket.

4 Carefully feed the end of Ethernet cable coming from the Customer Network Interface Device through the previously unscrewed lower strain relief connector.

5 Plug the Ethernet cable RJ45 connector into the lower connector on the arrestor. Screw the weatherized strain relief connector back onto the arrestor and tighten.

6 At the top of the arrestor, unscrew the upper weatherized strain relief connector from the surge arrestor.

7 Carefully feed the end of Ethernet cable coming from the 9764 Metro Dock through the upper strain relief connector.

8 Plug the Ethernet cable RJ45 connector into the upper connector on the arrestor. Screw the weatherized strain relief connector back onto the arrestor and tighten.

9 Finally, secure the Ethernet cable to the wall/pole.

Important! When securing cables ensure the following to avoid cable damage:

- Secure cables with tie wraps. Use additional tie wraps wherever necessary for neatness
- All cables should be run parallel with no twisting or tangled cables
- Avoid excessive tension on the cable.

END OF STEPS

How to continue

After the grounding and Ethernet cable connections are completed:

If...	Then...
The 9764 MCO module is to be installed at a later time	continue with Procedure 3-10: “Final installation activities and checks” (p. 3-112).
A 9764 MCO Wi-Fi AP module is to be installed along with the 9764 MCO module immediately after Metro Dock installation	continue with Appendix B, “Installation of the 9764 MCO Wi-Fi AP”
The 9764 MCO module is to be installed immediately after Metro Dock installation	continue with Chapter 4, “Installation of the 9764 MCO module” before installing the 9764 MCO module.

9764 Metro Dock post-installation

Overview

Purpose

This section provides post-installation information and activities that should be carried out after the Alcatel-Lucent 9764 Metro Dock has been installed.

Contents

Procedure 3-10: Final installation activities and checks

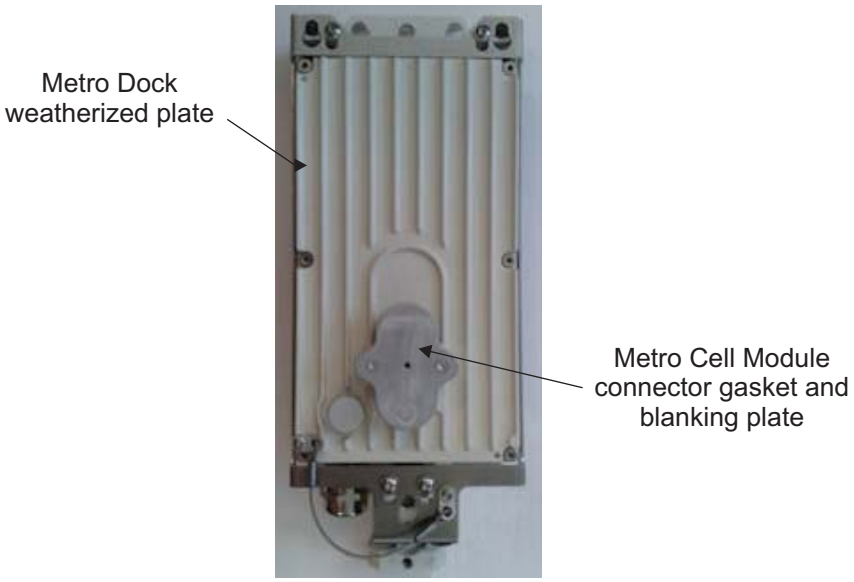
Overview

This topic describes the final 9764 Metro Dock installation activities and checks to be carried out if the 9764 MCO module is to be connected at a later time.

9764 Metro Dock plate and connection covers

If the 9764 MCO module is to be connected at a later time ensure that the following are in place in order to protect the 9764 Metro Dock against the elements.

- The 9764 Metro Dock is fitted with its weatherized plate
- The 9764 MCO module connector is fitted with its gasket and blanking plate.



Final installation checks

Before leaving the installation site, check the following:

1. Check the overall installation. Verify that mounted equipment is secure and that no unintentional mechanical alteration has occurred to either the equipment itself or the installation infrastructure.

2. Ensure all the exterior connections are secure.

3. Ensure all cables are secured along their routes.

4 Finally, inspect the site for loose tools, materials, and parts. Remove all such loose tools, materials, and parts.

END OF STEPS

4 Installation of the 9764 MCO module

Overview

Purpose

This chapter provides instructions for installing the Alcatel-Lucent 9764 Metro Cell Outdoor module.

Contents

9764 MCO pre-installation

Overview

Purpose

This section provides pre-installation information and lists tools and materials required to install the Alcatel-Lucent 9764 Metro Cell Outdoor.

Contents

Pre-installation information

Product delivery contents

The following items are supplied with the 9764 MCO module:

- The 9764 MCO module

Variable parts and ancillary items

In addition to the standard delivered parts, the following variable and ancillary items are available:

- Molex 1212010001 AC power connector
- Molex 1212060025 DC power connector
- Power supply cable (100 m roll)

Installation tools required

The following tools may be used during installation:

- Pliers
- Screwdrivers (power and/or manual):
  - Phillips (flat blade)
  - Torx (T-25 and T-40)
- Assorted cable ties

Wi-Fi AP installation

If you intend to attach an Alcatel-Lucent 9764 Metro Cell Outdoor Wi-Fi AP to the 9764 MCO module, attach it before you attach the 9764 MCO module to the 9764 Metro Dock. For instructions, refer to Appendix B, “Installation of the 9764 MCO Wi-Fi AP”

9764 MCO cabling

Overview

Purpose

This section provides instructions for routing and connecting the following cables to the Alcatel-Lucent 9764 Metro Cell Outdoor module:

- RF antenna cables for 9764 MCO V1.1 B2 LTE 2x2W model
- GPS antenna cable
- Ground cable
- Power cable

  The Alcatel-Lucent 9764 MCO LTE 2x1W and Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x2W have AC and DC powered variants. You must ensure that you follow the correct power requirements and cabling procedure for the variant you have.

Note: For outdoor NAR installations, or where local regulations dictate, the facility and power cables are required to be routed to the equipment within rigid metal conduit (RMC) or liquid-tight flexible metal (LTFMC) conduit. As part of site preparation, the customer must provide the metal conduit and associated fittings for cable routes and connecting conduit to the outdoor equipment.

Alternatively, an allowable outdoor armored cable described in the National Electrical Code and Canadian Electrical Code, Part I, may be used without a conduit.

Cable types that may be used without a conduit include:

- Type MC cable, such as Hybriflex cable
- Outdoor tray cable Type TC-ER

Contents

Procedure 4-1: Connect external RF antenna to the Alcatel-Lucent 9764 MCO LTE 2x2W

Purpose

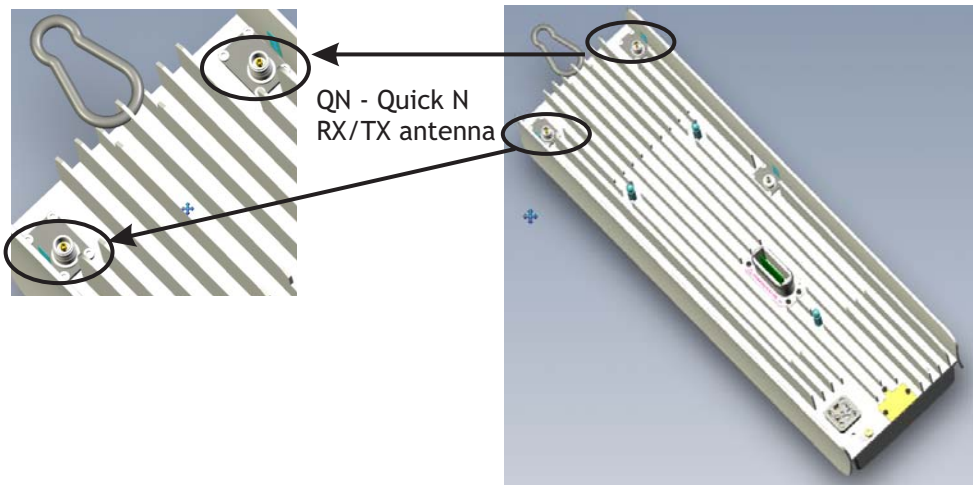
This procedure describes how to connect the external duplex RF antenna to an Alcatel-Lucent 9764 MCO LTE 2x2W module.

Procedure

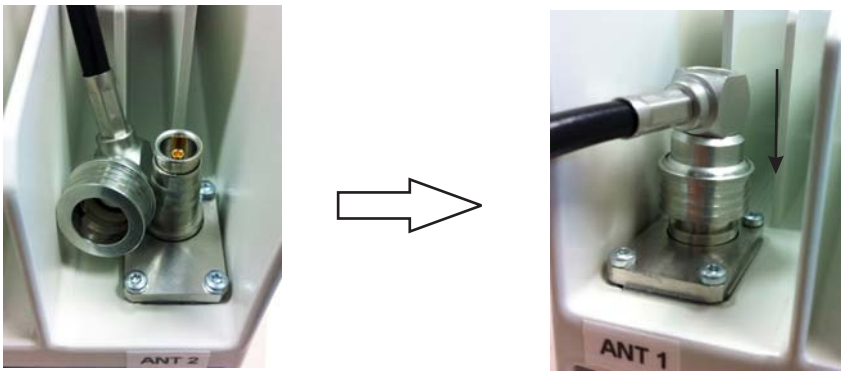
To connect the RF cables:

1 Refer to the RF antenna mounting instructions included with the RF antenna kit for the steps to mount the antenna.

2 Locate the external RF antenna connectors (RX/TX) at the top of the heat sink side of the 9764 MCO module and remove the protective caps if present.



3 Connect the external RF antenna adapter cables to the corresponding QN connectors on the back of the 9764 MCO module.



END OF STEPS

Procedure 4-2: Connect GPS antenna

Purpose

'For an MCO with 2 GPS antenna connectors, use this procedure to connect an external GPS antenna cable to the 9764 MCO.

MCOs with 2 GPS antenna connectors are supplied with an internal GPS antenna, and with a bridging cable connected between the internal and external GPS antenna connectors. For these MCOs, use this procedure to verify that the bridging cable is correctly connected, or to connect the internal or external GPS antenna.

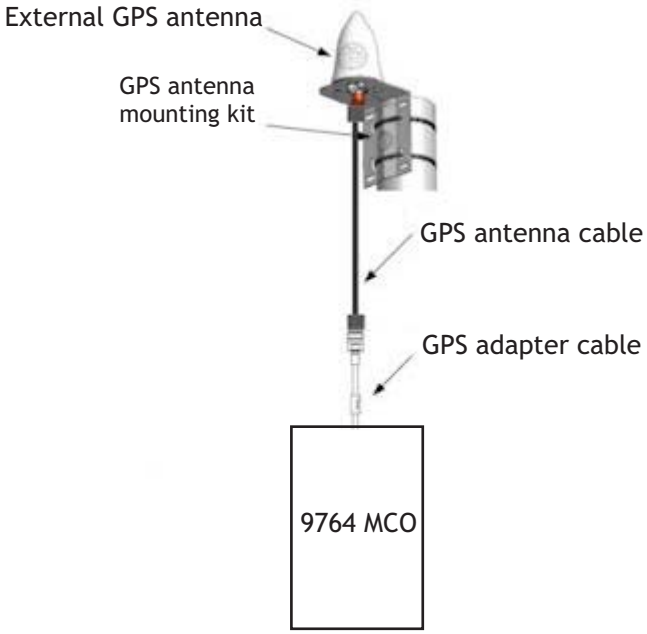
For a Alcatel-Lucent 9764 MCO LTE 2x2W, use this procedure to connect an external antenna or switch between the internal and external antennas.

Note: The internal GPS antenna solution is not supported on the 9764 MCO V1.1 B7 LTE 2x1W, 9764 MCO V1.1 B2 LTE 2x1W and 9764 MCO V1.0 B25 LTE 2x1W models.

External GPS antenna

The following figure shows the external GPS antenna and its mounting kit.

Figure 4-1 External GPS antenna configuration



Two different external GPS antennas are available. The 26 dB gain GPS antenna is used when antenna cable loss is less than 10 dB at 1575 MHz. For antenna cable loss greater than 10 dB at 1575 MHz, the 40 dB gain antenna must be used.

Before you begin

Ensure that the following tools are available:

- Adjustable (crescent) wrenches
- Torque ratchet (socket wrench)
- Items such as crimping tools that are appropriate for attaching a new cable connector to the GPS cable
- Protective eye wear

Important! Do not mount the GPS antenna within 10 feet (3 m) of any transmit antenna.

Safety statements

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

NOTICE

ESD hazard

Semiconductor devices can be damaged by electrostatic discharges (ESD)

Follow the rules, outlined in the Safety chapter, see "Notices" (p. 1-7), for handling modules containing semiconductor components.

These admonishments apply throughout this procedure. Refer to the Safety statements chapter for general safety information.

Connect GPS antenna

1

If...	Then...
You are connecting an external GPS antenna to an MCO with 1 GPS antenna connector	Follow procedure "Connect external GPS antenna - B25, B7 or B2 MCO" (p. 4-9)

If...	Then...
You are connecting an external GPS antenna to an MCO with 2 GPS antenna connectors	Follow procedure "Connect external GPS antenna to MCO - B3 MCO" (p. 4-12)
You are verifying or connecting the internal GPS antenna to an MCO with 2 GPS antenna connectors	Follow procedure "Connect internal GPS antenna to MCO" (p. 4-14)
You are connecting a GPS antenna to the Alcatel-Lucent 9764 MCO LTE 2x2W	Follow the procedure "Connect internal/external GPS antenna to Alcatel-Lucent 9764 MCO LTE 2x2W" (p. 4-15)

Note: The internal GPS antenna solution is not supported on the 9764 MCO V1.1 B7 LTE 2x1W, 9764 MCO V1.1 B2 LTE 2x1W and 9764 MCO V1.0 B25 LTE 2x1W models.

END OF STEPS

Connect external GPS antenna - B25, B7 or B2 MCO

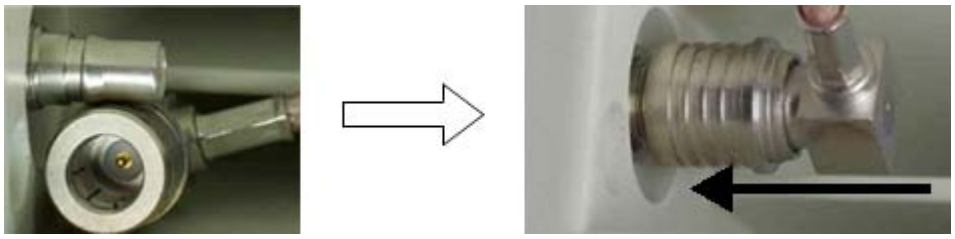
1 Refer to the GPS antenna mounting instructions included with the GPS antenna kit for the steps to mount the antenna.

2 Locate the GPS antenna connection on the back of the 9764 MCO module and remove the protective cap if one is present.

Figure 4-2 External GPS antenna connector

3 Connect the GPS adapter cable by pushing the adapter cable connector onto the 9764 MCO module QMA-type connector until it clicks into place.

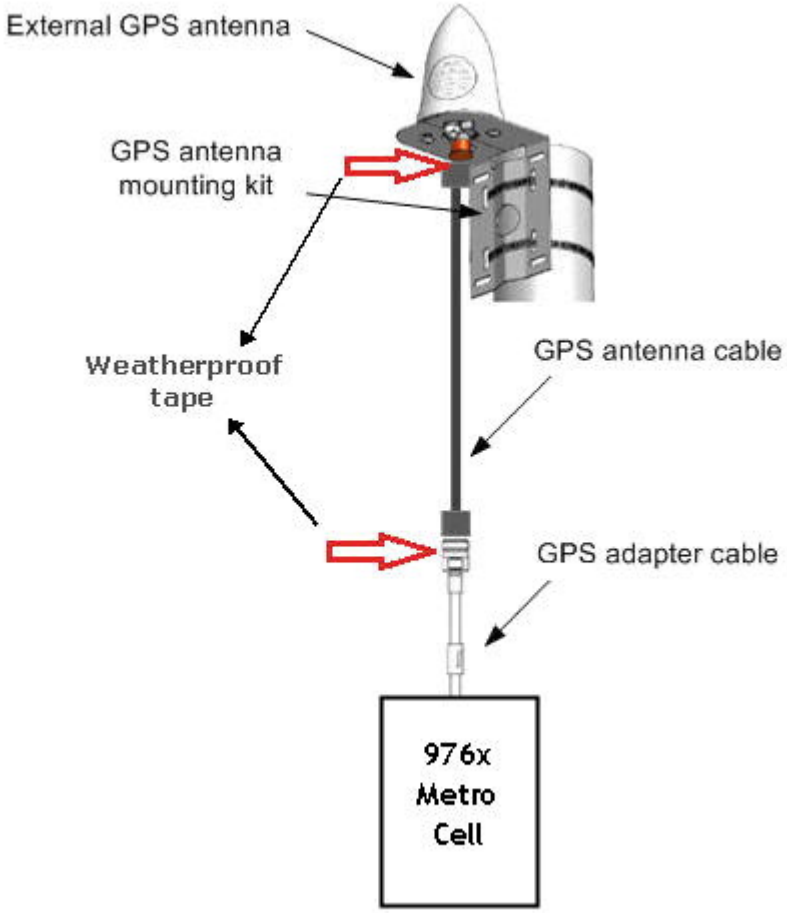
Figure 4-3 GPS antenna connection



4 Apply weatherproof tape to the cable connectors as follows (see figure below for tape placement):

- For B25 MCO, B2 MCO and B2/B25 MCO, apply one layer of new weatherproof tape to the cable connections.
- For B3 MCO and B7 MCO, apply linerless rubber splicing tape first to the cable connections, then cover with vinyl electrical tape (vinyl tape over rubber tape).

Figure 4-4 Weatherproof tape placement for external GPS antenna



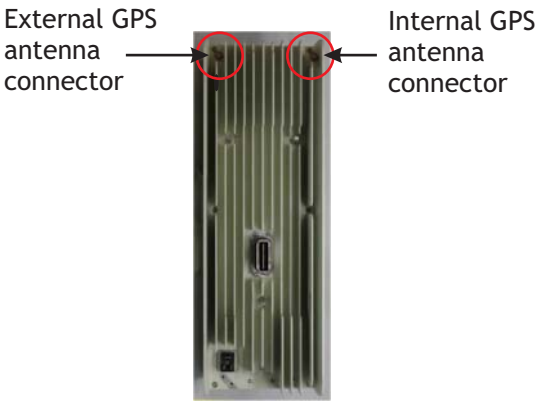
END OF STEPS

Connect external GPS antenna to MCO - B3 MCO

1 Refer to the GPS antenna mounting instructions included with the GPS antenna kit for the steps to mount the antenna.

2 Locate the internal and external GPS antenna connectors, that are on the top part of the heatsink side of the 9764 MCO module.

Figure 4-5 Internal and external GPS antenna connectors

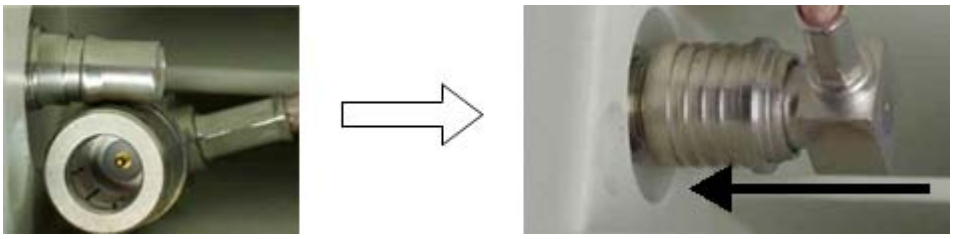


3 Disconnect and remove the bridging cable that connects the two internal and external GPS antenna connectors.

4 Place a protective cap on the right hand QMA-type connector (looking at the 9764 MCO module from the heatsink side).

5 Connect the external GPS adapter cable (coming from the external GPS antenna) to the external GPS connector (left hand QMA-type connector when looking at the 9764 MCO module from the heatsink side), by pushing the adapter cable connector onto the 9764 MCO module QMA-type connector until it clicks into place.

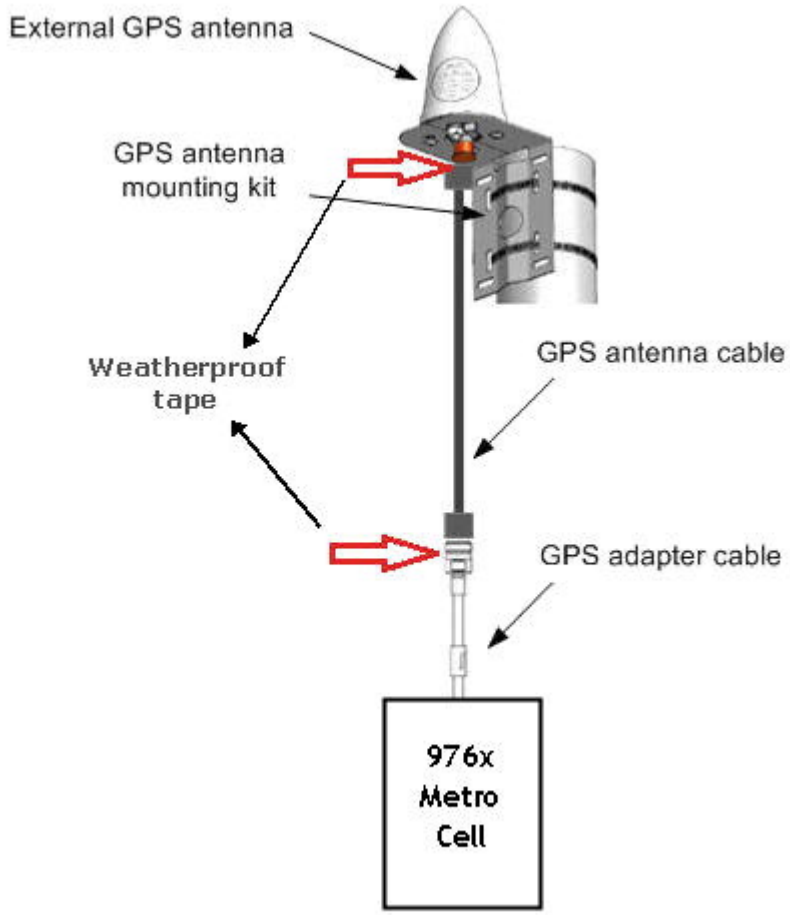
Figure 4-6 GPS antenna connection



6 Apply weatherproof tape to the cable connectors as follows (see figure below for tape placement):

- For B25 MCO, B2 MCO and B2/B25 MCO, apply one layer of weatherproof tape to the cable connections.
- For B3 MCO and B7 MCO, apply linerless rubber splicing tape first to the cable connections, then cover with vinyl electrical tape (vinyl tape over rubber tape).

Figure 4-7 Weatherproof tape placement for external GPS antenna



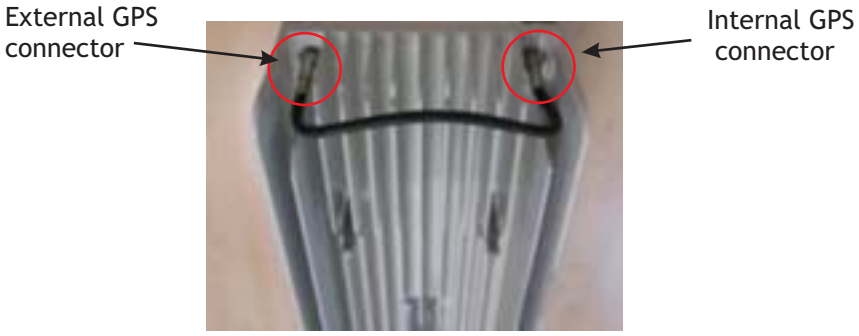
END OF STEPS

Connect internal GPS antenna to MCO

Note: The internal GPS antenna solution is not supported on the 9764 MCO V1.1 B7 LTE 2x1W, 9764 MCO V1.1 B2 LTE 2x1W and 9764 MCO V1.0 B25 LTE 2x1W models.

1 Verify that a bridge cable is connected to both GPS connectors as shown in the following figure:

Figure 4-8 Bridge cable between external and internal GPS antenna connectors



2 If a bridge cable is not connected to the GPS connectors, then connect a bridge cable to both GPS connectors by pushing the bridge cable connector onto each 9764 MCO module QMA-type connector until it clicks into place.

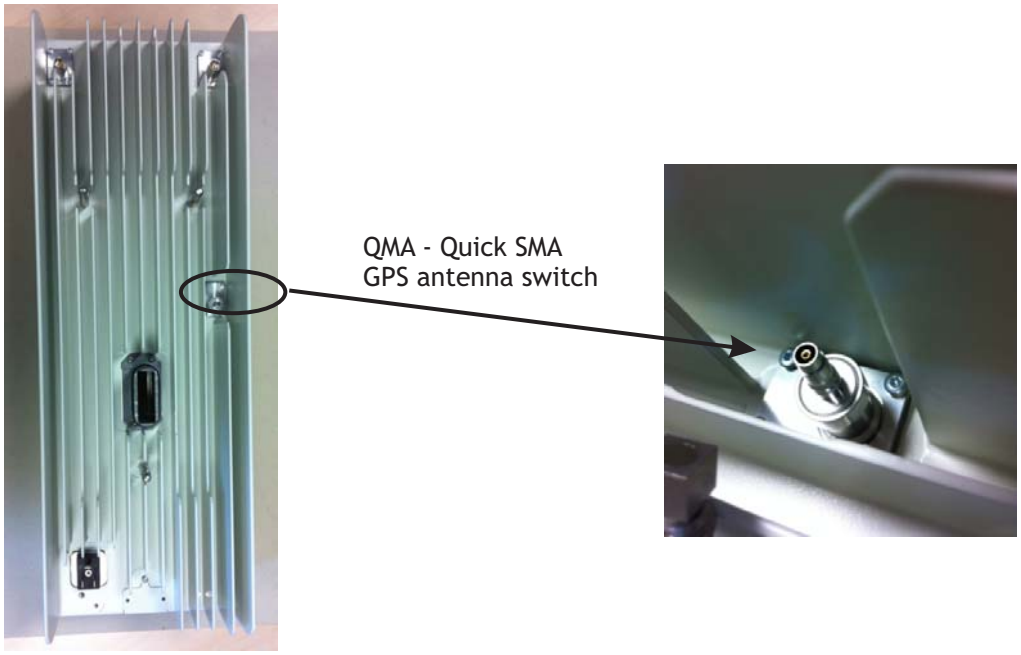
END OF STEPS

Connect internal/external GPS antenna to Alcatel-Lucent 9764 MCO LTE 2x2W

1 Refer to the GPS antenna mounting instructions included with the GPS antenna kit for the steps to mount the antenna.

2 Locate the GPS antenna connector on the back of the 9764 MCO module.

Figure 4-9 Internal/external GPS antenna connector

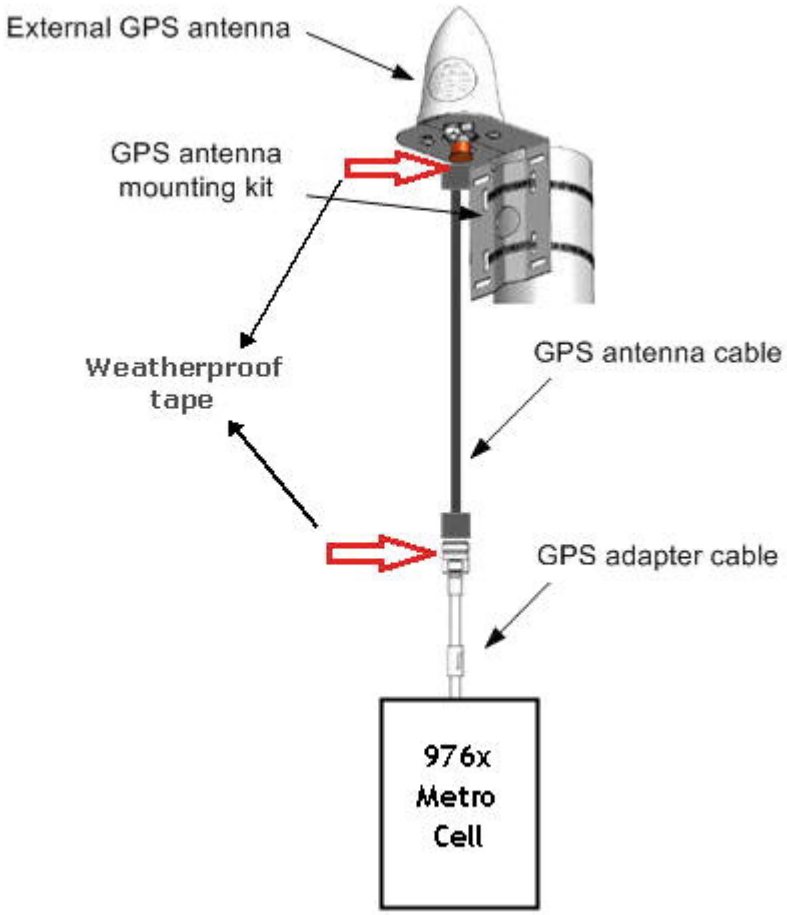


3 The internal GPS antenna is by default connected. If an external GPS antenna is needed, connect the external GPS adapter cable (coming from the external GPS antenna) to the QMA GPS antenna switch connector, by pushing the adapter cable connector onto the 9764 MCO module QMA-type connector until it clicks into place.

4 In case an external GPS is used, apply weatherproof tape to the cable connectors as follows (see figure below for tape placement):

- For B25 MCO, B2 MCO and B2/B25 MCO, apply one layer of weatherproof tape to the cable connections.
- For B3 MCO and B7 MCO, apply linerless rubber splicing tape first to the cable connections, then cover with vinyl electrical tape (vinyl tape over rubber tape).

Figure 4-10 Weatherproof tape placement for external GPS antenna



END OF STEPS

Procedure 4-3: 9764 MCO module ground cabling

Purpose

This topic describes the procedures to be followed for grounding the 9764 MCO module.

Note:

- Grounding of the 9764 MCO module is carried out via bonding from the 9764 Metro Dock module using the ground cable and materials (screws and washers) contained in the Basic Installation Kit.
- Grounding of the equipment must comply with local and national electrical codes and guidelines. If there is uncertainty that suitable grounding is available contact the appropriate site preparation personnel or electrical inspection authority.

Connect the ground cable

To carry out grounding of the 9764 MCO module from the 9764 Metro Dock module perform the following steps.

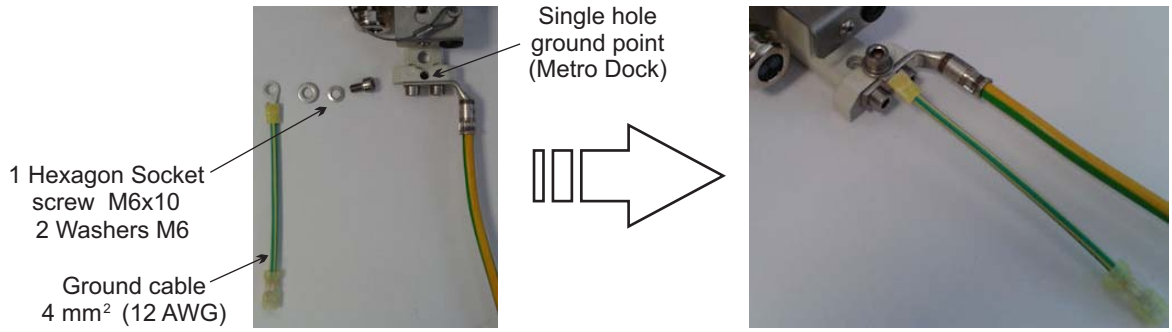
1 Ensure that the power is off before proceeding with the ground cable connection.

2 Acquire the short 4mm^2 (12 AWG) grounding cable, M6 terminal screw and M6 washers from the basic installation kit.

3 Clean the contact surface area of the M6 lug ring at one of the short ground cable and grounding point on the 9764 Metro Dock. Use antioxidant to avoid oxidation.

4 Thread the supplied washer then the lock washer onto the M6 terminal screw.

Align the cable lug ring with the 9764 Metro Dock single terminal hole and secure the cable to the grounding point using the terminal screw.

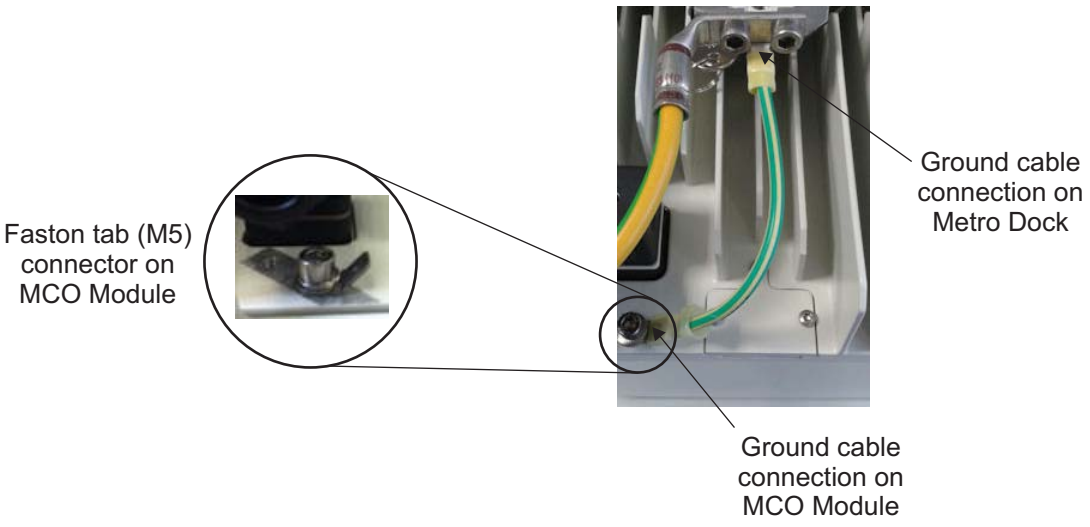


Note: The short ground cable is green/yellow, however the cable may be black in some older installation kits.

5 Carry out the following:

Action:	Refer to:
Connect the power cable to the 9764 MCO module	Procedure 4-4: "Connect power cable" (p. 4-29)
Attach the 9764 MCO module to the 9764 Metro Dock module	Procedure 4-5: "Attach 9764 MCO module to 9764 Metro Dock" (p. 4-41)

6 Finally, from the underside of the 9764 MCO module secure the ground cable connector onto the cable connector tab on the 9764 MCO module.



END OF STEPS

Site power requirements (AC)

Purpose

This section describes the power and grounding requirements that must be considered when planning site facilities for Alcatel-Lucent installed equipment and products.

General requirements

All power and grounding system wiring, short-circuit (over-current) protection and surge protection devices must be installed by the appropriately licensed personnel. Installation must be performed in accordance with national and local electrical codes, for example:

- In the United States:

  National Electrical Code, NFPA 70

- In Canada:

  Canadian Electrical Code, part I, CSA C22.1

- In other countries:

  International Electrotechnical Commission (IEC) 60364, parts 1 through 7

In addition, adherence to all additional requirements mandated by the “country of use” is the customer's responsibility.

The appropriate power supply ground connections and site equipment ground connections must be in place before commercial AC power service can be connected to the equipment installed at the site.

Customer AC power supply

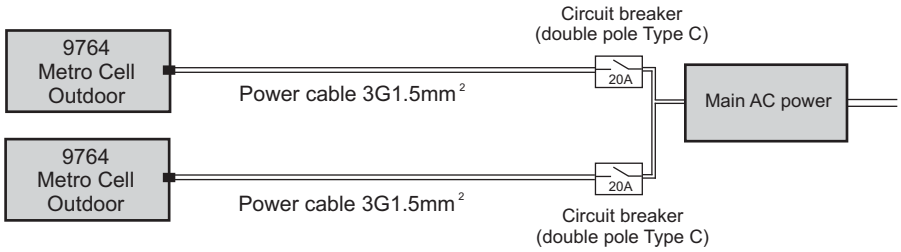
The equipment installed on site must be supported with a customer supplied AC power service. The AC connection point should be easily accessible by the service team and be marked as the disconnect device of the equipment.

Note:

- The service board (or load center), circuit breakers and surge protectors devices are not supplied with the product. They must be ordered and installed as part of site preparation by the customer.
- All wiring (including grounding) and over-current protection must be installed at the service panel by suitably trained and licensed personnel and in accordance with the national and local electrical codes.
- An appropriate earth ground connection is required before commercial power service can be connected to any equipment at the site.

In the United States and Canada, the branch circuit breaker shall be installed in accordance with the National Electrical Code, or the Canadian Electrical Code, Part I.

The branch circuit breaker should always be situated upstream of the equipment and must be a double pole 20A Type C disconnect device.



Line surge protection

A surge protection device is not supplied with the product. It must be ordered and installed as part of site preparation by the customer.

The equipment can be connected to an AC mains distribution system classified as CAT II (equipment dedicated for connection to the mains distributed within a building). If the category of the AC mains is higher than CAT II (III or IV), then upstream surge protection must be installed by the customer to reduce the voltage range of transients in accordance with CAT II.

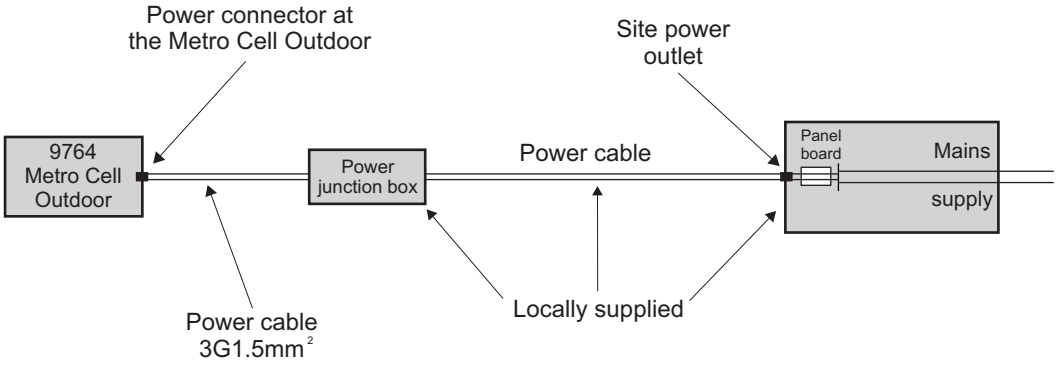
Power source	Over-voltage category
Equipment connected to building mains	CAT II
Equipment connected directly to low voltage mains	CAT III or CAT IV

The installation wiring for all outdoor AC units must be provided with a Listed/Approved surge protection device. In the United States and Canada the installation must be in accordance with the National Electrical Code or the Canadian Electrical Code, Part I.

Power junction box

For outdoor installations, in countries where local regulations dictate, a customer-supplied power junction box, or a mating plug and receptacle, may need to be installed as part of site preparation. As part of site preparation, the customer must provide the appropriate junction box and associated fittings.

In the United States and Canada, outdoor cord pendants, if used, shall comply with NEC Article 400 or Canadian Electrical Code, Part I Rule 4-012



Conduit requirements

For outdoor installations, in countries where local regulations dictate, the power cables are required to be routed to the equipment within rigid metal conduit (RMC) or liquid-tight flexible metal (LTFMC) conduit. As part of site preparation, the customer must provide the metal conduit and associated fittings for cable routes and connecting conduit to the outdoor equipment.

Alternatively, an allowable outdoor armored cable described in the National Electrical Code and Canadian Electrical Code, Part I, may be used without a conduit.

Cable types that may be used without a conduit include:

- Type MC cable, such as Hybriflex cable
- Outdoor tray cable Type TC-ER

Site power requirements (DC)

Purpose

This section describes the power and grounding requirements that must be considered when planning site facilities for Alcatel-Lucent installed equipment and products.

General requirements

All power and grounding system wiring, short-circuit (over-current) protection and surge protection devices must be installed by the appropriately licensed personnel. Installation must be performed in accordance with national and local electrical codes, for example:

- In the United States:

  United States National Fire Protection Association (NFPA) 70 and United States National Electrical Code (NEC)

- In Canada:

  Canadian Electrical Code, part I, CSA C22.1

- In other countries:

  International Electrotechnical Commission (IEC) 60364, parts 1 through 7

In addition, adherence to all additional requirements mandated by the “country of use” is the customer's responsibility.

The appropriate power supply ground connections and site equipment ground connections must be in place before commercial AC power service can be connected to the equipment installed at the site.

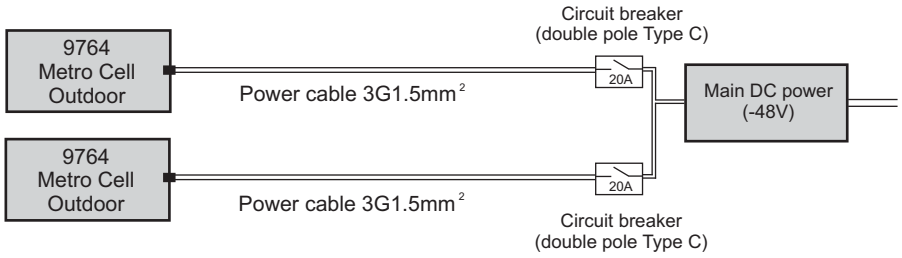
Customer DC power supply

The equipment installed on site must be supported with a customer supplied nominal -48V DC power service. The DC connection point should be easily accessible by the service team and be marked as the disconnect device of the equipment.

Note:

- The service board (or load center), circuit breakers and surge protectors devices are not supplied with the product. They must be ordered and installed as part of site preparation by the customer.
- All wiring (including grounding) and over-current protection must be installed at the service panel by suitably trained and licensed personnel and in accordance with the national and local electrical codes.
- An appropriate earth ground connection is required before commercial power service can be connected to any equipment at the site.

The branch circuit breaker should always be situated upstream of the equipment and must be a double pole 20A Type C disconnect device.

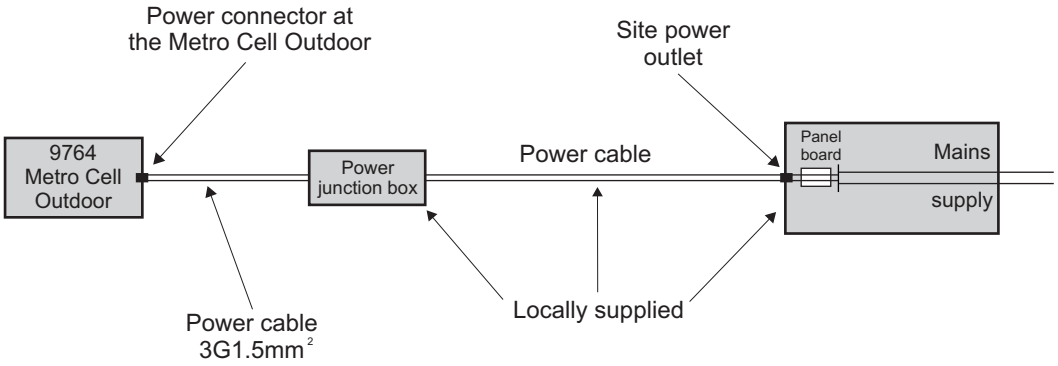


Line surge protection

A surge protection device is not supplied with the product. It must be ordered and installed as part of site preparation by the customer.

Power junction box

For outdoor installations, in countries where local regulations dictate, a customer supplied power junction box may need to be installed as part of site preparation. As part of site preparation, the customer must provide the appropriate junction box and associated fittings.



In the United States and Canada, outdoor cord pendants, if used, shall comply with NEC Article 400 or Canadian Electrical Code, Part I Rule 4-012.

Conduit requirements

For outdoor installations, in countries where local regulations dictate, the power cables are required to be routed to the equipment within rigid metal conduit (RMC) or liquid-tight flexible metal (LTFMC) conduit. As part of site preparation, the customer must provide the metal conduit and associated fittings for cable routes and connecting conduit to the outdoor equipment.

Alternatively, an allowable outdoor armored cable described in the National Electrical Code and Canadian Electrical Code, Part I, may be used without a conduit.

Cable types that may be used without a conduit include:

- Type MC cable, such as Hybriflex cable
- Outdoor tray cable Type TC-ER

Product power requirements

Product power data

The following table provides power related information applicable to the Alcatel-Lucent 9764 MCO LTE 2x1W and the Alcatel-Lucent 9764 MCO LTE 2x2W

Power supply	
AC Electrical Rating	100V-110 V AC, 200-230 V AC, single phase, 2 A, 50/60 Hz
DC Electrical Rating	-48 V DC, 3.5 A, powered from SELV source
Earthing system	
Supported earthing systems	TT or TN
Unsupported earthing systems	IT
Power consumption	
Gigabit Ethernet backhaul (Without 9764 MCO Wi-Fi AP module)	< 34W
Gigabit Ethernet backhaul (With 9764 MCO Wi-Fi AP module)	< 42W

Power ancillary items

The following Alcatel-Lucent power related ancillary items must be used. Refer to the *9764 lightRadio Metro Cell Outdoor "Family" Model Offer Provisioning Guide*, BCR/IRC/APP/038681

Table 4-1 Power materials

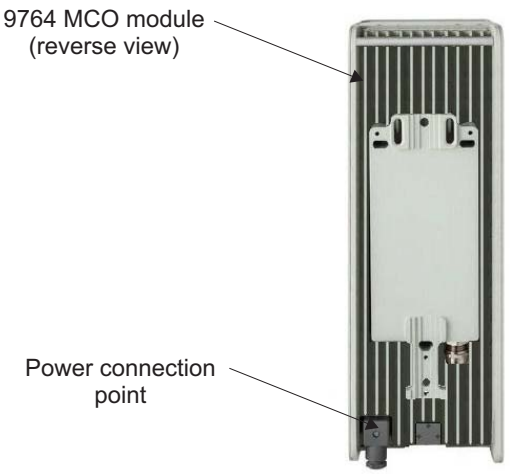
Item	Description	Use
Power connector (AC)	AC power connector Cable diameter 8 – 9mm Conductor cross-section: 1.5 mm_2 Approval according to EN 50525-3-21	Required for 9764 MCO module with AC power (International markets)
Power connector (DC)	DC power connector	Required for 9764 MCO module with DC power (International markets)

Table 4-1 Power materials (continued)

Item	Description	Use
Power cable	Power cable IN/OUT 3G1,5mm², 100m roll or multiples of 1m length (as needed)	Required for 9764 MCO module (International markets)
Power cable (AC)	Power cable pre-assembled with AC power connector, various lengths (2m. 4.5m, 9m, 12m)	Required for 9764 MCO module with AC power (North America Regional markets)
Power cable (DC)	Power cable pre-assembled with DC power connector, various lengths (2m. 4.5m, 9m, 12m)	Required for 9764 MCO module with DC power (North America Regional markets)

Power connection point

Power is supplied to the 9764 MCO module, the 9764 Metro Dock module and the optional 9764 MCO Wi-Fi AP module via either an AC or DC connector on the reverse side of the 9764 MCO module.



Procedure 4-4: Connect power cable

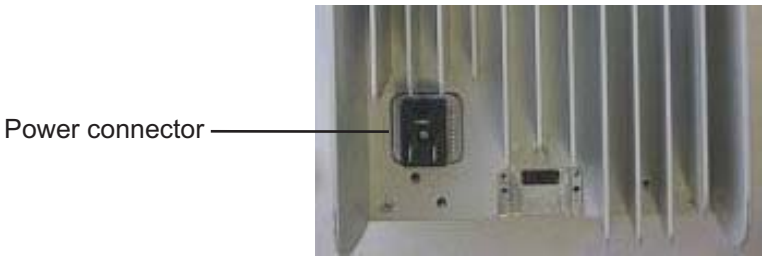
Purpose

This topic describes the procedures to be followed when connecting the power cable to the 9764 MCO module.

Connections

The following figure shows the connection interfaces of the 9764 MCO module:

Figure 4-11 connection interfaces



Before you begin

You must connect the power cable to the 9764 MCO module before you attach the 9764 MCO module to the 9764 Metro Dock, otherwise you will not be able to access the AC power connector on the 9764 MCO module.

Depending on whether your 9764 MCO requires AC or DC power, and whether you have a pre-assembled power cord or you need to assemble the power cord, select the appropriate procedure from the following table:

If...	Then follow this procedure
your MCO requires AC power and you need to assemble the power cable	"Assemble AC power cable onto connector" (p. 4-30)
your MCO requires AC power and you need to use a pre-assembled power cord	"Connect AC power cord" (p. 4-33)
your MCO requires DC power and you need to assemble the power cable	"Assemble DC power cable onto connector" (p. 4-34)
your MCO requires DC power and you need to use a pre-assembled power cord	"Connect DC power cord" (p. 4-38)

In the United States and Canada, outdoor cords, whether installed as cord pendants or with mating plug/receptacles, shall comply with NEC Article 400 or Canadian Electrical Code, Part I Rule 4-012.

Assemble AC power cable onto connector

DANGER

Electric-shock hazard

Since the 9764 MCO operates on 120-220 V AC, the risk of serious injury or death from electrocution exists throughout this procedure.

Follow the first step of this procedure carefully and completely.

WARNING

Electric-shock hazard

The current to the unit must be limited by an external fuse or circuit breaker incorporated in the fixed wiring. The fuse or circuit breaker can be used as a disconnect device to turn off the power to the system.

Ensure that the system power is off and that power cables are safe to handle before you proceed with this procedure.

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

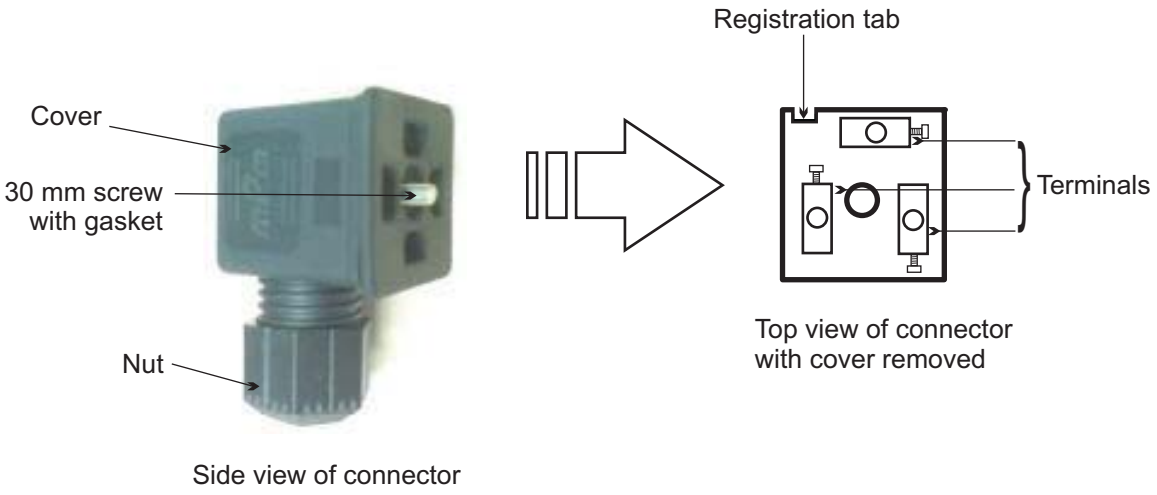
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Use this procedure if you have a separate AC power connector and cable.

1 Ensure that the power that feeds the AC power cable to the 9764 MCO is OFF, and block access so that no one can restore power to that cable during this procedure.

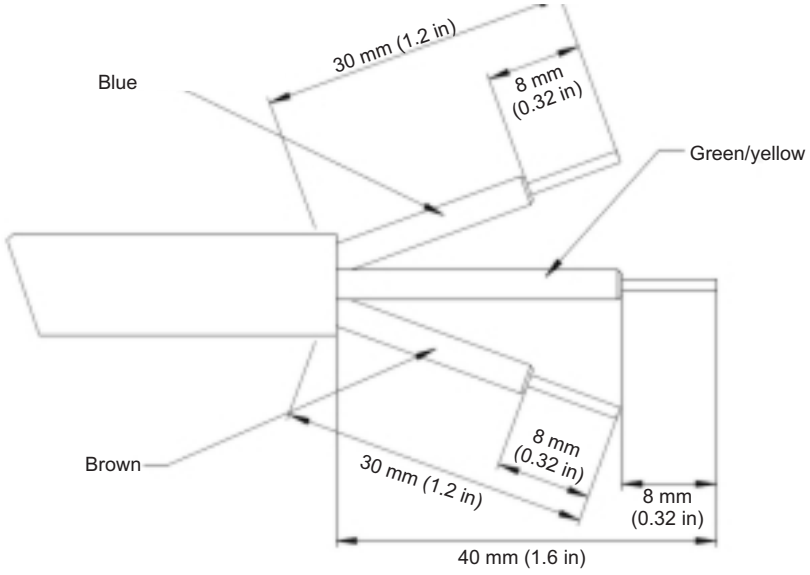
2 Cut the power cable to the required length.

3 Disassemble the cover assembly of the power connector. See the following figure:

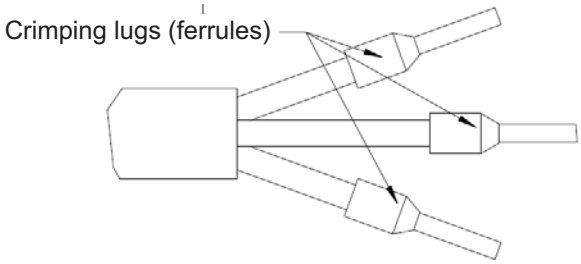


4 Feed the cable through the cable opening in the cover of the power connector and out through the bottom of the cover.

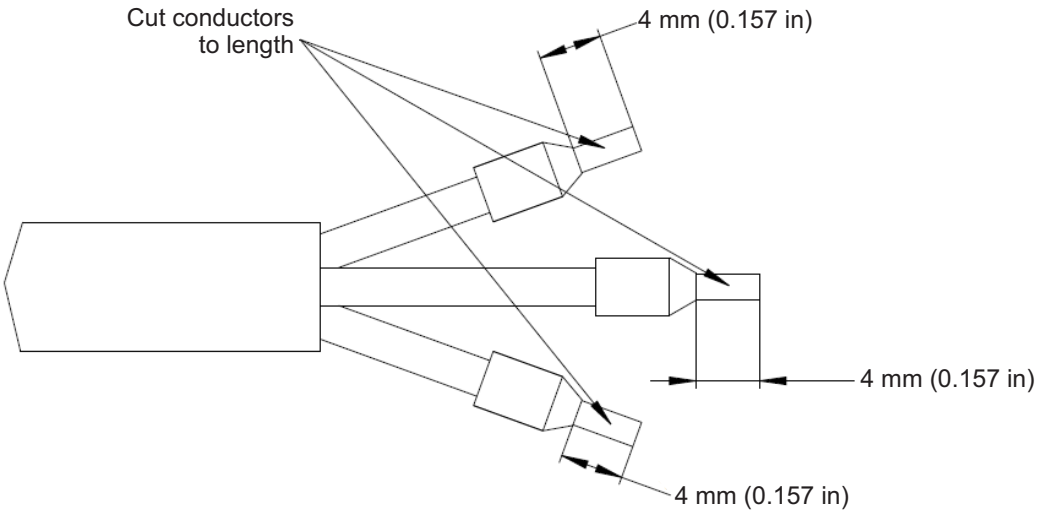
5 Strip the cable according to the dimensions in the figure below. Assuming an H12 ground position, the longest wire is the ground wire.



6 Crimp the exposed cable conductor with 8 mm ferrules, as shown in the following figure:

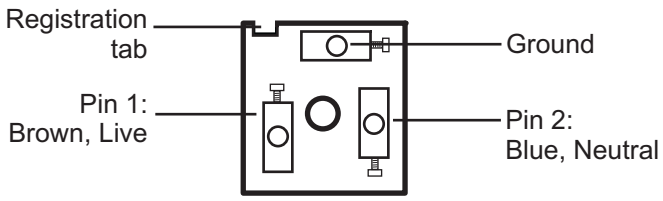


7 Cut the exposed ends of the cable to the length of the pins in the connector, as shown in the following figure:



8 Screw the wires into the terminal blocks to a torque of 0.4 Nm.

Attention: Ensure that you connect the Live, Neutral, and Ground wires to the correct pins as shown in the following figure:



Top view of connector with cover removed

9 Insert the connector assembly into the cover (with the correct ground position) and pull the excess cable back out through the cable opening of the connector cover.

10 Ensure that the cable gasket is correctly seated, and tighten the nut to a torque of 1 Nm (0.737 lb-ft).

11 Attach the gasket and insert the fixing screw.

12 Plug the AC power connector into the power connector on the bottom left of the 9764 MCO module.

13 Fix the AC power connector in position by tightening the screw on the AC power connector. Using a screwdriver with a Phillips head, torque to 0.4 Nm (0.295 lb ft).

END OF STEPS

Connect AC power cord

DANGER

Electric-shock hazard

Since the 9764 MCO operates on 120-220 V AC, the risk of serious injury or death from electrocution exists throughout this procedure.

Follow the first step of this procedure carefully and completely.

WARNING

Electric-shock hazard

The current to the unit must be limited by an external fuse or circuit breaker incorporated in the fixed wiring. The fuse or circuit breaker can be used as a disconnect device to turn off the power to the system.

Ensure that the system power is off and that power cables are safe to handle before you proceed with this procedure.

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Use this procedure if you have a pre-assembled AC power cord.

1 Ensure that the power that feeds the AC power cable to the 9764 MCO is OFF, and block access so that no one can restore power to that cable during this procedure.

2 Plug the AC power connector on the power cord into the power connector on the bottom left of the 9764 MCO module.

3 Fix the AC power connector in position by tightening the screw on the AC power connector. Using a screwdriver with a Phillips head, torque to 0.4 Nm (0.295 lb ft).

END OF STEPS

Assemble DC power cable onto connector

DANGER

Electric-shock hazard

Since the 9764 MCO operates on DC power, the risk of serious injury or death from electrocution exists throughout this procedure.

Follow the first step of this procedure carefully and completely.

WARNING

Electric-shock hazard

The current to the unit must be limited by an external fuse or circuit breaker incorporated in the fixed wiring. The fuse or circuit breaker can be used as a disconnect device to turn off the power to the system.

Ensure that the system power is off and that power cables are safe to handle before you proceed with this procedure.

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

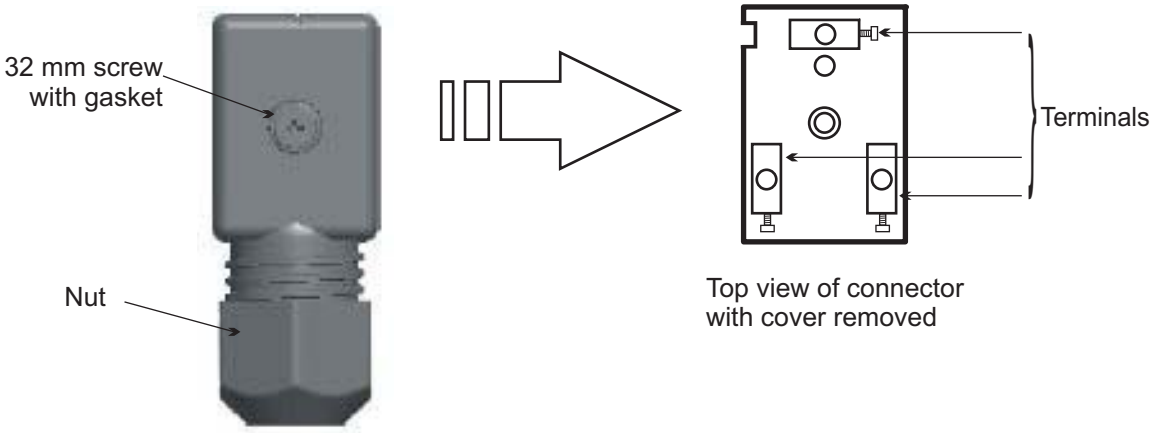
To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Use this procedure if you have a separate DC power connector and cable.

1 Ensure that the power that feeds the DC power cable to the 9764 MCO is OFF, and block access so that no one can restore power to that cable during this procedure.

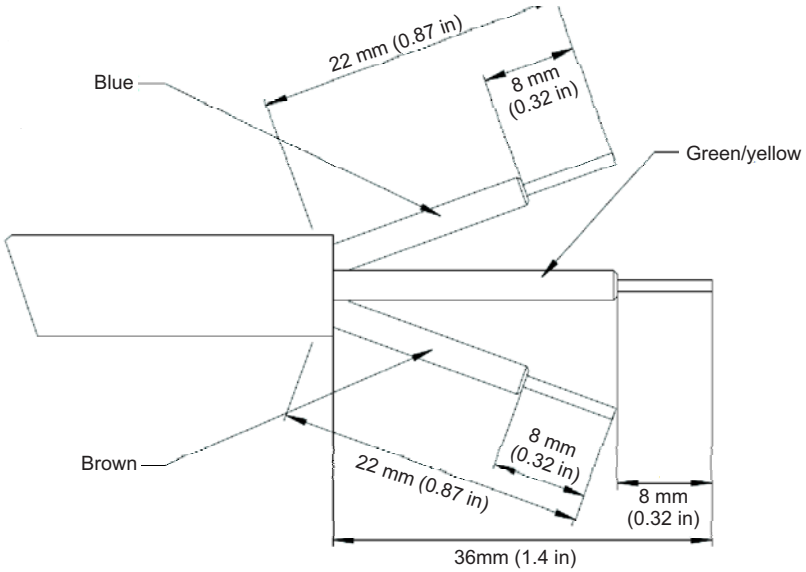
2 Cut the power cable to the required length.

3 Disassemble the cover assembly of the power connector. See the following figure:

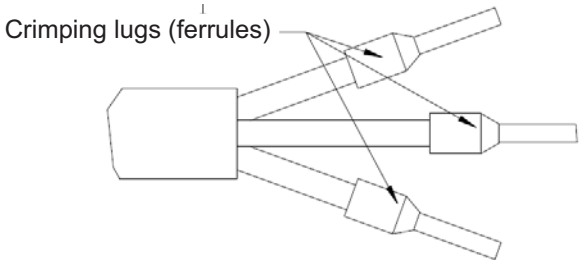


4 Feed the cable through the cable opening in the cover of the power connector and out through the bottom of the cover.

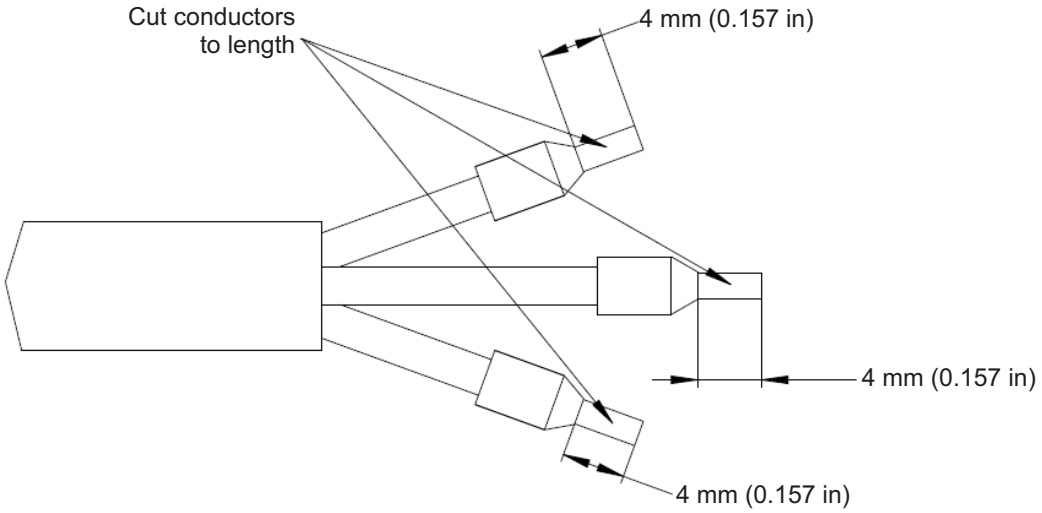
5 Strip the cable according to the dimensions in the figure below. Assuming an H12 ground position, the longest wire is the ground wire.



6 Crimp the exposed cable conductor with 8 mm ferrules, as shown in the following figure:

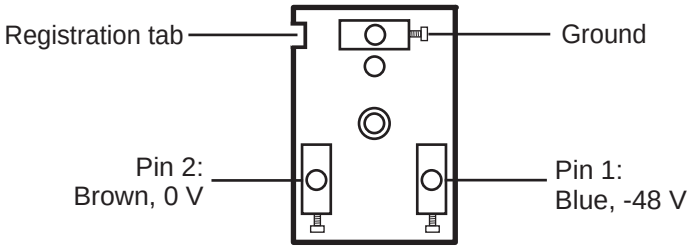


7 Cut the exposed ends of the cable to the length of the pins in the connector, as shown in the following figure:



8 Screw the wires into the terminal blocks to a torque of 0.4 Nm.

Attention: Ensure that you connect the 0 V, -48 V, and Ground wires to the correct pins as shown in the following figure:



Top view of connector
with cover removed

9 Insert the connector assembly into the cover (with the correct ground position) and pull the excess cable back out through the cable opening of the connector cover.

10 Ensuring that the cable gasket is correctly seated, and tighten the nut to a torque of 1 Nm (0.737 lb-ft).

11 Attach the gasket, aligning the cutout in the gasket for the ground terminal over the ground terminal on the connector. Insert the fixing screw

Attention: If the cutout in the gasket is not aligned with the ground terminal on the connector, you will not be able to assemble the connector.

12 Plug the DC power connector into the power connector on the bottom left of the 9764 MCO module.

13 Fix the DC power connector in position by tightening the screw on the DC power connector. Using a screwdriver with a Phillips head, torque to 0.4 Nm (0.295 lb ft).

END OF STEPS

Connect DC power cord

DANGER

Electric-shock hazard

Since the 9764 MCO operates on DC power, the risk of serious injury or death from electrocution exists throughout this procedure.

Follow the first step of this procedure carefully and completely.

WARNING

Electric-shock hazard

The current to the unit must be limited by an external fuse or circuit breaker incorporated in the fixed wiring. The fuse or circuit breaker can be used as a disconnect device to turn off the power to the system.

Ensure that the system power is off and that power cables are safe to handle before you proceed with this procedure.

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Use this procedure if you have a pre-assembled DC power cord.

1 Ensure that the power that feeds the DC power cable to the 9764 MCO is OFF, and block access so that no one can restore power to that cable during this procedure.

2 Plug the DC power connector on the power cord into the power connector on the bottom left of the 9764 MCO module.

3 Fix the DC power connector in position by tightening the screw on the DC power connector. Using a screwdriver with a Phillips head, torque to 0.4 Nm (0.295 lb ft).

END OF STEPS

How to continue

After connection of the power cable has been completed, continue with procedure Procedure 4-5: “Attach 9764 MCO module to 9764 Metro Dock” (p. 4-41).

9764 MCO installation

Overview

Purpose

This section provides the installation instructions for mounting the Alcatel-Lucent 9764 Metro Cell Outdoor onto a 9764 Metro Dock.

Contents

Procedure 4-5: Attach 9764 MCO module to 9764 Metro Dock

Purpose

This topic describes the procedures to attach the Alcatel-Lucent 9764 Metro Cell Outdoor module to the 9764 Metro Dock.

Prerequisites

A site survey has been conducted and a location for the device has been selected that is both central to the public space and elevated to maximize coverage.

Before installation begins, ensure that the following are in place:

- Internet service is available for backhaul.
- The 9764 Metro Dock has been installed and is in place.
- The 9764 Metro Dock has been closed.
- The power cable has been connected to the 9764 MCO module.
- The key that was supplied with the 9764 Metro Dock is available.
- The key extension tool is available.

Before you begin

Record the 18 digit serial number before mounting the 9764 MCO module.

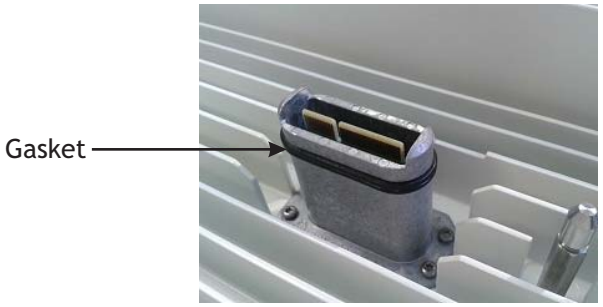
Attention: Do not wear tinted glasses of any kind (for example, sunglasses or tinted safety glasses) while performing this procedure, because they will reduce the clarity of your vision.

Attach 9764 MCO module to 9764 Metro Dock

Perform the following steps to attach the 9764 MCO module to the 9764 Metro Dock:

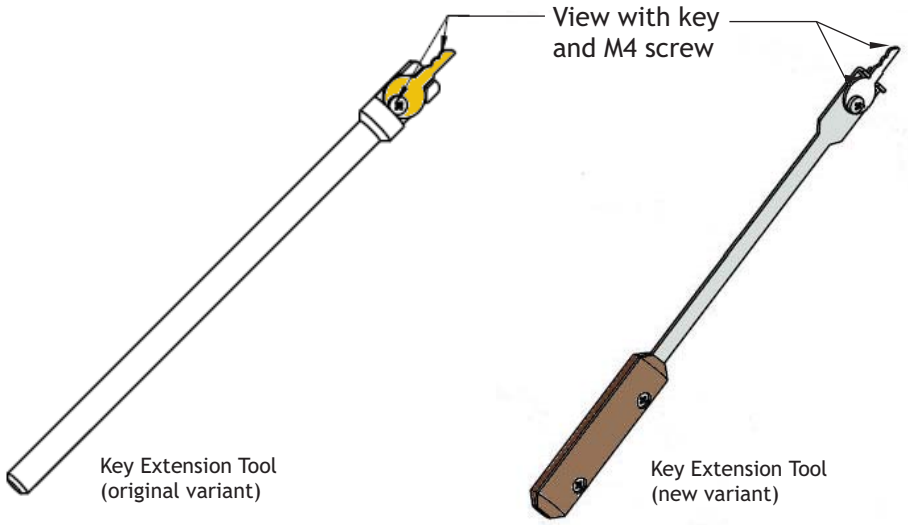
1. Remove the cover from the blind mate connector on the 9764 Metro Dock by unscrewing the two M3x6 Torx screws that hold it in position.

2. Lubricate the sealing gasket on the blind mate connector by wiping a small quantity of a suitable lubricant, such as Silicone O-Ring grease or Vaseline, over the entire gasket. The following figure shows the sealing gasket:



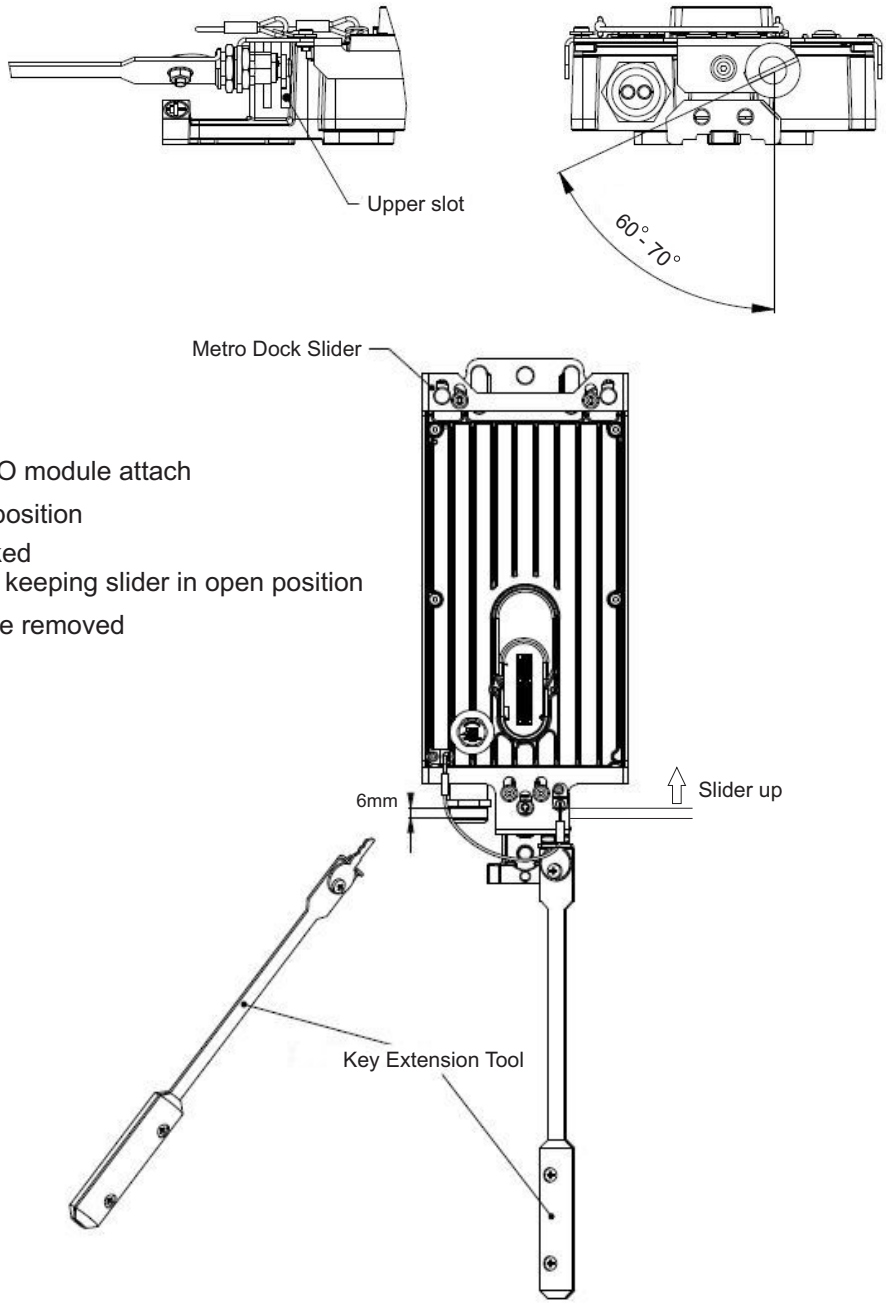
3 Attach the 9764 MCO key to the key extension tool:

1. Remove the M4 screw from the key extension tool.
2. Position the key on the key extension tool and replace the screw so that the key is securely clamped onto the extension tool.

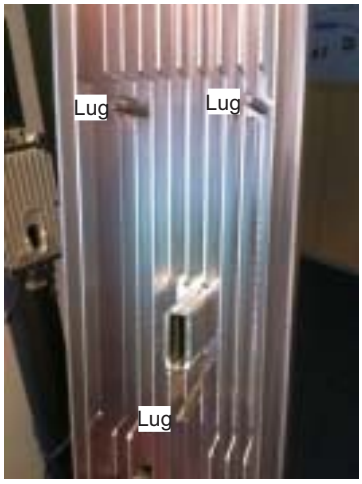


4 To attach the 9764 MCO module to the 9764 Metro Dock, the 9764 Metro Dock metal slider must be in the "open" ("up") position:

1. Insert the key into the 9764 Metro Dock lock.
2. Turn the key through an angle of approximately 90º to its hard stop position to unlock the slider.
3. Push the slider upwards and turn the key through an angle of approximately 60º to its hard stop position. The slider is now locked in the "open" ("up") position.



5 Position the 9764 MCO module in front of the 9764 Metro Dock. Ensure the three metal lugs on the 9764 MCO module are in front of the holes on the 9764 Metro Dock.



Align lugs to holes on Metro Dock

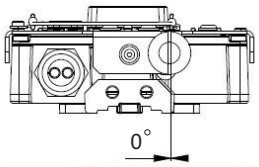
Push MCO module onto Metro Dock

6 Push the 9764 MCO module into the 9764 Metro Dock.

Important! Do not apply excessive or prolonged pressure when pushing the 9764 MCO module into the 9764 Metro Dock, otherwise the slider will not spring back to the “closed” (“down”) position.

7 To free the slider and then lock the 9764 MCO module onto the 9764 Metro Dock:

1. Turn the key through an angle of approximately 60º to its hard stop position to free the slider. The slider will automatically spring into the “down” position.



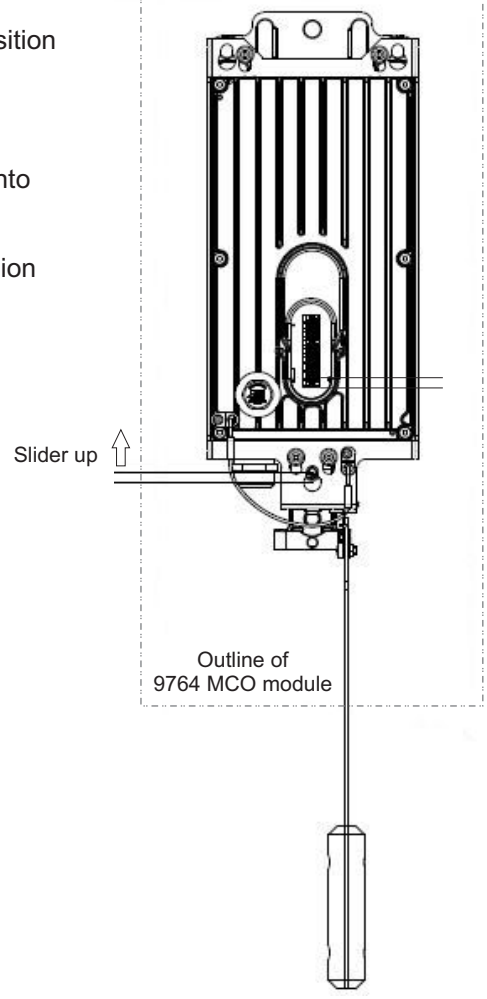
FREE

MCO assembled (not shown) and in free position

Slider springs into down position *

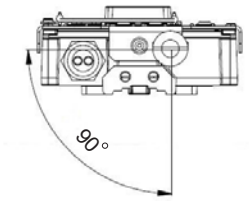
Key cam free (0°)

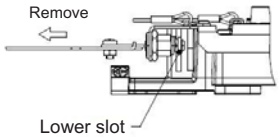
* If the Slider does not automatically spring into the down position, move the MCO slightly sideways or outwards to release the Slider. Additionally pulling down on the key extension tool may also release the Slider.

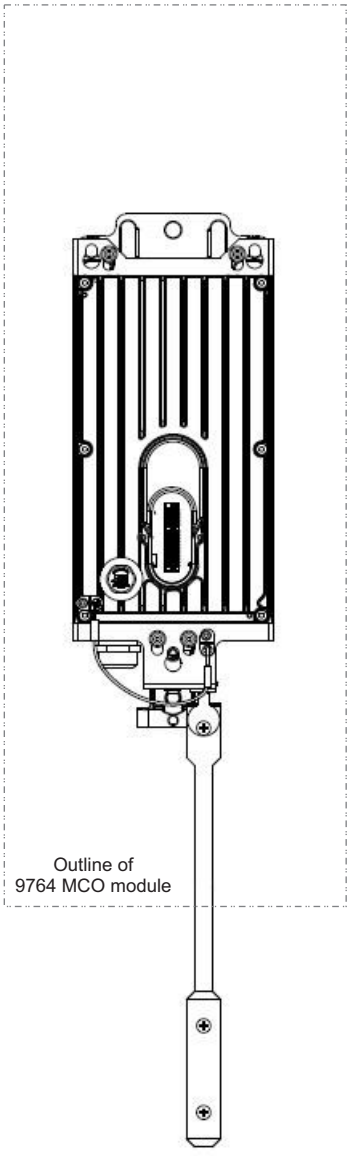


If slider does not automatically spring into the "down" position, move the 9764 MCO very slightly sideways or outwards (away from the 9764 Metro Dock) to release the slider.

2. Turn the key through an angle of approximately 90º to its hard stop position. The slider is now locked in the "closed" ("down") position and the key can be removed from the lock.







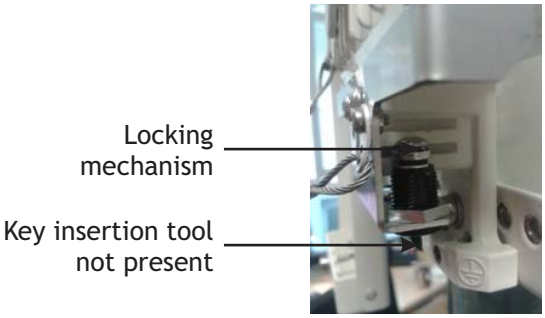
LOCKED

MCO assembled (not shown) and Locked

Slider in down position and Locked

Key cam (90°) / Key removable

8 Finally, remove the key from the key extension tool.



END OF STEPS

How to continue

After 9764 MCO module has been attached to the 9764 Metro Dock, continue with procedure Procedure 4-6: “Orient 9764 MCO module ” (p. 4-48).

Procedure 4-6: Orient 9764 MCO module

Purpose

This topic describes the procedures to orient the Alcatel-Lucent 9764 Metro Cell Outdoor module towards its target using tilt and/or azimuth brackets.

Prerequisites

Ensure that the following are in place:

- The 9764 Metro Dock has been installed and is in place.
- The 9764 MCO has been attached to the 9764 Metro Dock.
- You have the equipment orientation plan.

Orient 9764 MCO module

WARNING

Fall hazard

Falls can occur when working at heights resulting in serious personal injury or death.

To prevent a fall when working at heights (ladder, scaffold, manlift, roof etc.) follow safe work practices and wear appropriate fall protection equipment.

Perform the following steps to angle the 9764 MCO module towards its target:

1 Refer to the equipment orientation plan.

If...	Then...
If the 9764 Metro Dock is installed on either a pole or a wall, and a tilt bracket has been used	1. Using the tilt angle positioning gauge, adjust the 9764 Metro Dock tilt (+- 20° up/down) to the desired angle.  2. Using a ratchet wrench, tighten all the tilt positioning gauge bolts and the bracket assembly hex bolts to fix the orientation of the 9764 Metro Dock.

If...	Then...
If the 9764 Metro Dock is installed on a wall, and an azimuth bracket has been used	1. Using the azimuth angle positioning gauge, adjust the 9764 Metro Dock azimuth (+- 45° left/right) to the desired orientation.  2. Using a ratchet wrench, tighten all the azimuth positioning gauge bolts and the bracket assembly hex bolts to fix the orientation of the 9764 Metro Dock.
If the 9764 Metro Dock is installed on a wall, and both the tilt bracket the azimuth bracket have been used	Perform both of the above procedures.

END OF STEPS

How to continue

After 9764 MCO module has been attached to the 9764 Metro Dock, continue with procedure Procedure 4-7: “Post installation activities” (p. 4-51).

9764 MCO post-installation

Overview

Purpose

This section provides post-installation information and activities that should be carried out after the Alcatel-Lucent 9764 Metro Cell Outdoor has been installed.

Contents

Procedure 4-7: Post installation activities

Final installation checks

Before leaving the installation site, check the following:

1 Secure all cables along their routes.

2 Verify that all the exterior conduit and cable connections are secure.

3 Inspect the site for loose tools, materials, and parts. Remove all such loose tools, materials, and parts.

4 Continue with procedure Procedure 4-8: “Power on the 9764 MCO” (p. 4-52)

END OF STEPS

Procedure 4-8: Power on the 9764 MCO

Purpose

This topic describes how to power on the 9764 MCO.

Troubleshooting

If any problems occur during power on, refer to the following document:

- *Alcatel-Lucent 9764 Metro Cell Outdoor LTE 2x1W and 2x2W Maintenance and Troubleshooting*

  9YZ-04152-0057-REZZA (LR14.1.L)

  9YZ-05817-0057-REZZA (LR13.3.L)

Power on the 9764 MCO

Perform the following step to power on the 9764 MCO:

1 Follow site-specific procedures to power on the 9764 MCO by applying power to the power cable.

After one to three seconds, the LED illuminates steady red, followed by approximately 15 minutes of steady green, and then ceases to illuminate.

If the LED does not follow this pattern of illumination, refer to Appendix A, “LED State Description” to troubleshoot the problem.

END OF STEPS

Appendix A: LED State Description

Overview

Purpose

This chapter describes the LED status and descriptions for 9764 MCO LTE.

Contents

LED status for 9764 MCO LTE

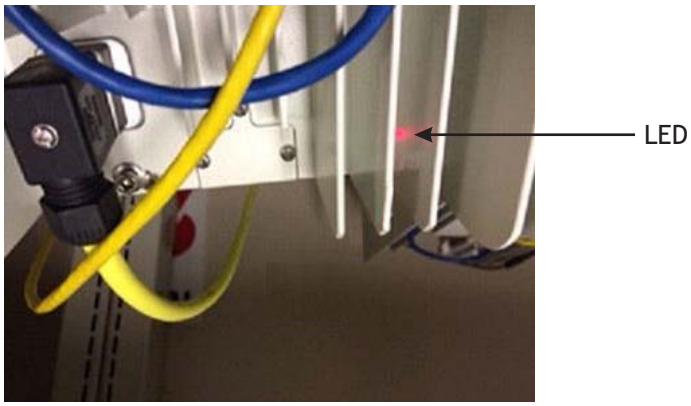
Overview

This topic describes the LED status on the9764 MCO LTE 2x1W and 9764 MCO LTE 2x2W devices.

Location of LED

The following figure shows the location of the LED on the back of the 9764 MCO LTE 2x1W and 9764 MCO LTE 2x2W:

Figure A-1 Location of LED



Hardware LED interpretation table

The following table describes the possible states for the single bi-color LED:

State	Description	LED
Power off	Power off	OFF
Initial state	Power on or Restart	ON (Red)
Software downloading during system initialization	Software downloading	Blinking (Green)
Failure	9764 MCO LTE start-up or operational failure	ON (Red)
9764 MCO LTE becomes operational	9764 MCO LTE becoming operational	ON (Green) (Note: LED is switched OFF after 15 minutes of stable operation)
9764 MCO LTE is operational	9764 MCO LTE has been in stable operation for 15 minutes	OFF

Appendix B: Installation of the 9764 MCO Wi-Fi AP

Overview

Purpose

This appendix provides instructions for attaching the Alcatel-Lucent 9764 Metro Cell Outdoor Wi-Fi AP to the 9764 MCO module.

The 9764 MCO Wi-Fi AP is optional. If you do not have a 9764 MCO Wi-Fi AP, then do not perform the procedures in this appendix.

Contents

Physical description

Product overview

The 9764 Metro Cell Outdoor Wi-Fi AP is housed in a weatherized enclosure containing the following active components:

- Integrated antennas supporting 2x2 MIMO.

This figure reflects the location of the 9764 MCO Wi-Fi AP module when attached to the technology-specific module (9764 MCO WCDMA module or 9764 MCO LTE module) of the Alcatel-Lucent 9764 Metro Cell Outdoor.

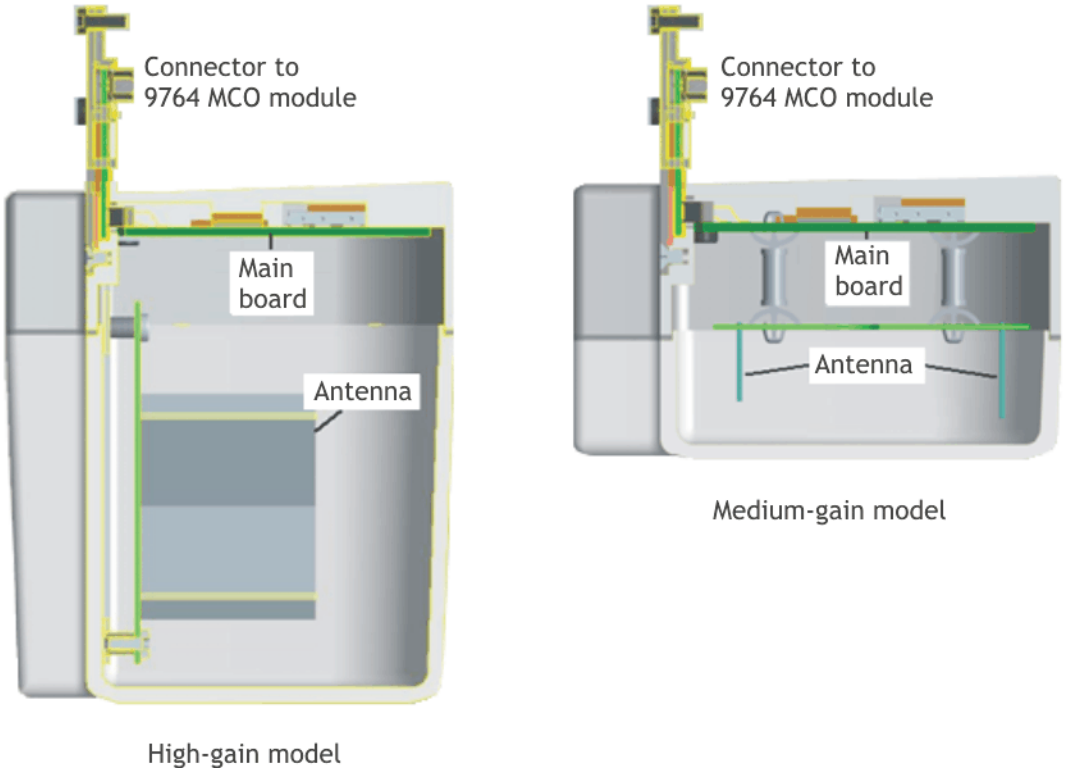
Figure B-1 9764 MCO Wi-Fi AP attached to 9764 MCO hardware variants

This figure reflects the available 9764 MCO Wi-Fi AP module models (9764 Metro Cell Outdoor Wi-Fi AP V1.0 HG [high gain] and 9764 Metro Cell Outdoor Wi-Fi AP V1.0 MG [medium gain]).

Figure B-2 9764 MCO Wi-Fi AP - closed housing

This figure reflects the major components of both the High-gain and Medium-gain models of the 9764 MCO Wi-Fi AP.

Figure B-3 9764 MCO Wi-Fi AP - cutaway view



The physical dimensions of the 9764 MCO Wi-Fi AP module are:

Table B-1 9764 MCO Wi-Fi AP physical characteristics

Physical property	9764 MCO Wi-Fi AP V1.0 MG model	9764 MCO Wi-Fi AP V1.0 HG model
Dimension (Height x Width x Depth)	5cm x 13cm x 7cm	9cm x 13cm x 7cm
Volume	0.5 liters	0.8 liters
Weight	0.35 kg	0.4 kg

Product base items and configurations

The 9764 MCO Wi-Fi AP module is a single, field-replaceable, unit that may be mounted to many Alcatel-Lucent 9764 Metro Cell Outdoor variants.

Available models include:

- 9764 Metro Cell Outdoor Wi-Fi AP V1.0 HG (contains High-gain integrated antennas)
- 9764 Metro Cell Outdoor Wi-Fi AP V1.0 MG (contains Medium-gain integrated antennas)

The unit is shipped with 3 M3 10mm Torx screws (part number 1AD013170007) used to secure the 9764 MCO Wi-Fi AP module to the 9764 MCO module.

Connection interfaces

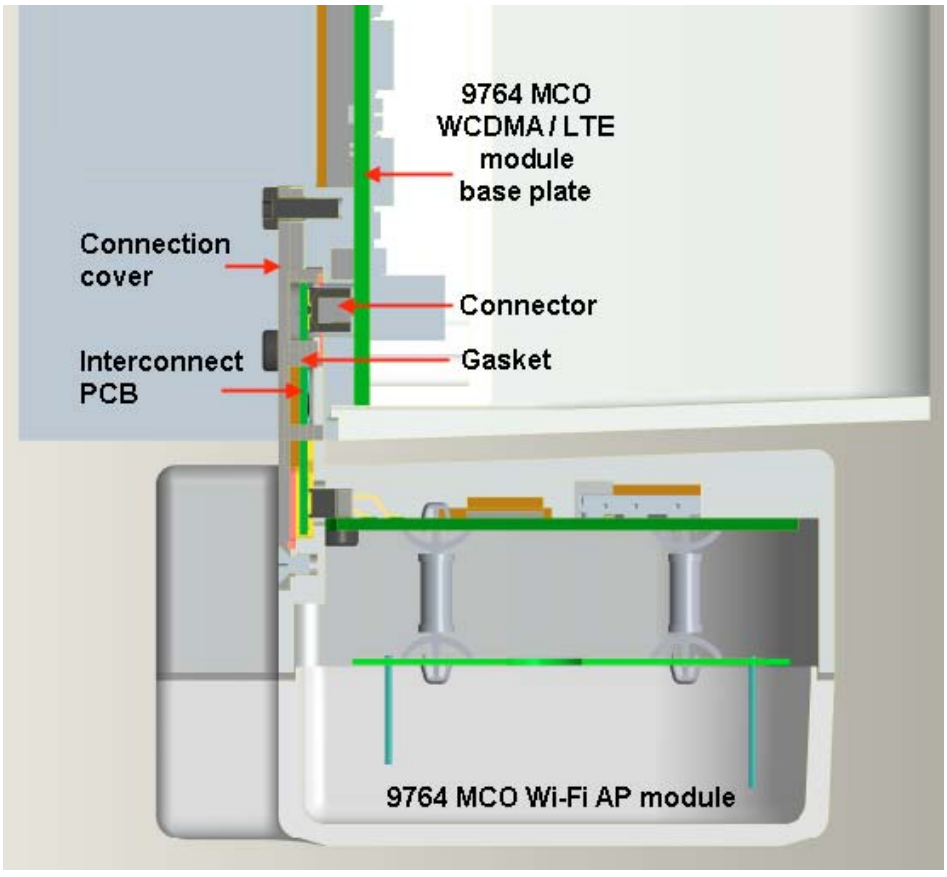
The 9764 MCO Wi-Fi AP module has a single interface connector that plugs into the back bottom of the technology-specific module (9764 MCO WCDMA module or 9764 MCO LTE module) of the Alcatel-Lucent 9764 Metro Cell Outdoor, carrying both power and all communication between the two components.

This figure reflects the connection point on the back bottom of the technology-specific module (Alcatel-Lucent 9764 Metro Cell Outdoor WCDMA or Alcatel-Lucent 9764 Metro Cell Outdoor LTE) of the Alcatel-Lucent 9764 Metro Cell Outdoor.

Figure B-4 9764 MCO Wi-Fi AP connection point on 9764 MCO

This figure provides a cutaway side view of the 9764 MCO Wi-Fi AP module when connected to the technology-specific module (9764 MCO WCDMA module or 9764 MCO LTE module) of the Alcatel-Lucent 9764 Metro Cell Outdoor.

Figure B-5 9764 MCO Wi-Fi AP connected to 9764 MCO (cutaway side view)



Antennas

The 9764 MCO Wi-Fi AP supports 2 integrated antennas optimized for 2x2 MIMO with up to 2 spatial streams.

Two hardware models are available:

- 9764 MCO Wi-Fi AP V1.0 MG model with Medium-gain integrated antennas.
- 9764 MCO Wi-Fi AP V1.0 HG model with High-gain integrated antennas.

Status indicators

There is an external single bi-color LED (amber/green) on the upper side of the 9764 MCO Wi-Fi AP module housing (pointing up towards the 9764 MCO LTE/WCDMA module radome).

Although external, this LED is not easily visible and is not used for post-installation troubleshooting. During initial cell power-up, however, the installation technician may observe the LED changes as the unit goes through its booting sequences. Once the cell is in normal operation for 30 minutes, the LED will turn off automatically.

Refer to "LED state description - 9764 MCO Wi-Fi AP" (p. B-25) for details.

The 9764 MCO Wi-Fi AP is monitored/managed remotely at the Alcatel-Lucent 9772 Wi-Fi Service Controller.

Product labeling

To the top of the 9764 MCO Wi-Fi AP module will be affixed three labels:

1. A product label reflecting:
   - Vendor name/Icon
   - Customer ID
   - Model name
   - Part number
   - Lock / Unlock mode icon

     Note: The "Unlock" icon applies only to units designated as R&D lab mode.
   - Serial number
   - MAC address
   - CLEI code (U.S. only)
   - Data matrix barcode (2D MicroPDF Symbol) for Part number, Serial number, MAC address, and CLEI code (CLEI code is for U.S. only)
2. A regulatory label reflecting:
   - Vendor name/Icon
   - Product name

- Regulatory rules
- Power input
- Enclosure rating
- Applicable regulatory and environmental certification logos (for example, CE and WEEE recycling logos)
- Manufacturer name

3. (NAR only) An FCC label reflecting:
   - Vendor name/Icon
   - FCC ID

9764 MCO Wi-Fi AP pre-installation information

Introduction

Important! The 9764 Metro Cell Outdoor Wi-Fi AP cannot be attached to the 9764 MCO module when the 9764 MCO module is attached to the 9764 Metro Dock.

If the 9764 MCO module is already attached to the 9764 Metro Dock, then the 9764 MCO module must first be removed from the 9764 Metro Dock. Refer to Procedure B-1: “Remove 9764 MCO module from 9764 Metro Dock” (p. B-9).

When installing a 9764 MCO module for the first time, if a 9764 MCO Wi-Fi AP is also to be installed, then attach the 9764 MCO Wi-Fi AP module to the 9764 MCO module before attaching the 9764 MCO module to the 9764 Metro Dock.

Product delivery contents

The following items are supplied with the 9764 MCO Wi-Fi AP:

- The 9764 MCO Wi-Fi AP module
- Three M3 10mm Torx screws (to secure the 9764 MCO Wi-Fi AP module to the 9764 MCO module).

Variable parts and ancillary items

In addition to the standard delivered parts, the following variable and ancillary items are available:

- There are no ancillary parts for the 9764 MCO Wi-Fi AP.

Installation tools required

The following tools may be used during installation:

- Snips
- Screwdrivers (power and/or manual):
  - Phillips (flat blade)
  - Torx (T10)
- 9764 Metro Dock key

Procedure B-1: Remove 9764 MCO module from 9764 Metro Dock

Purpose

This topic describes the procedure to remove the 9764 MCO module from the 9764 Metro Dock if the 9764 MCO module has already been attached to the 9764 Metro Dock.

Prerequisites

Before installation begins, ensure the following are available:

- The key that was supplied with the 9764 Metro Dock
- Snips (to cut cable tie)
- Phillips-head screwdriver (to loosen power cable screw)

DANGER

Electric-shock hazard

Risk of personal injury or death, property damage, and/or equipment damage.

Refer to the Safety chapter for all Dangers, Warnings, Cautions and Notices.

NOTICE

Service-disruption hazard

Following the procedure below will result in service disruption.

Notify the OMC administrator of a service outage before commencing.

Before you begin

Perform this procedure only if the 9764 MCO module has been installed on the 9764 Metro Dock.

Remove the 9764 MCO module

1 Shut off the power that feeds the power cable to the 9764 MCO.

2 Block access so that no one can restore power to that cable during the course of this replacement procedure.

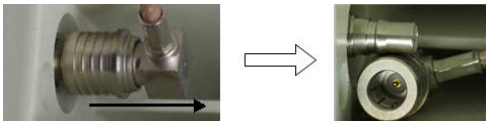
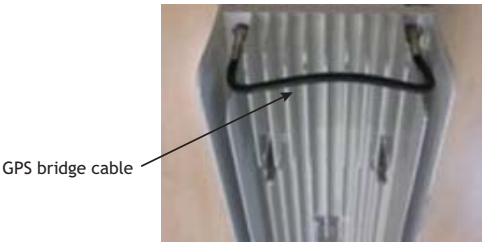
Attention: Blocking access likely consists of not only putting a physical impediment in the way, but also broadly circulating or broadcasting a warning about the hazard and getting the cooperation of persons who have the authority to limit the access of others.

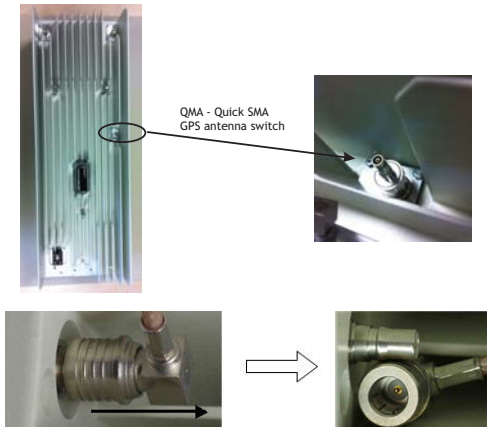
3 If a cable tie will inhibit separating the 9764 MCO module from the 9764 Metro Dock, snip the cable tie.

4 Perform this step only if:

- you are replacing the 9764 MCO module, or
- if there is an external GPS antenna connection and the GPS cable is too short, prohibiting you from easily removing the MCO.

The 9764 MCO module could be deployed using either an external GPS antenna or the internal GPS antenna. Follow the appropriate procedure below for type of 9764 MCO module deployed and the GPS antenna configuration used, and note which type of GPS antenna was used for reference when reattaching the 9764 MCO module.

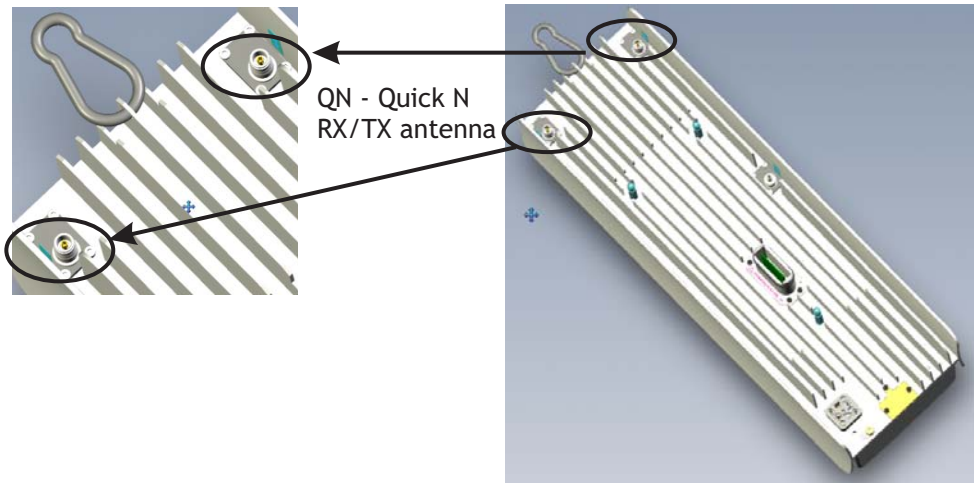
If...	Then...	View
deployed with an external GPS antenna on the 2x1W MCO	disconnect the GPS adapter cable by pulling it off of the QMA-type connector. The GPS antenna QMA connection is located on the upper backside of the 9764 MCO module. **Tip:** Unplugging the GPS QMA connector needs very little force. If the access makes it difficult to unplug, use a non-metallic screw driver as a lever to gently release the connector.	
deployed using the internal GPS antenna on the 2x1W MCO	the GPS bridge cable, attached to the QMA-type connectors located on the top part of the heatsink side of the 9764 MCO module, can remain in place	

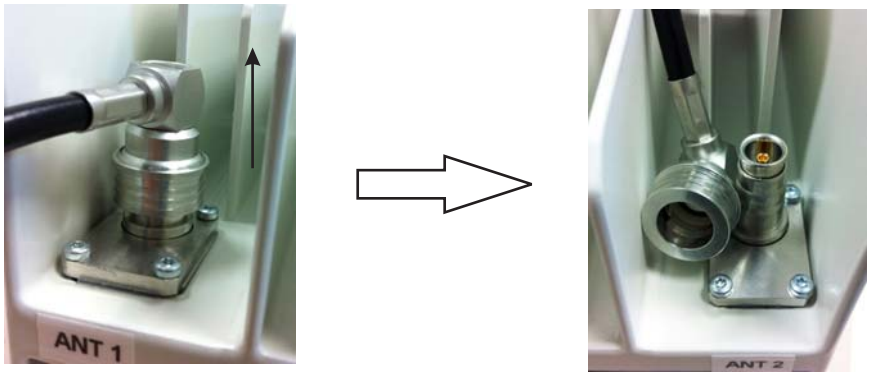
If...	Then...	View
deployed with an external GPS antenna on the 2x2W MCO	disconnect the GPS adapter cable by pulling it off of the QMA-type connector. The GPS antenna QMA connection is located half way down the heat sink on the right hand side of the 9764 MCO module. **Tip:** Unplugging the GPS QMA connector needs very little force. If the access makes it difficult to unplug, use a non-metallic screw driver as a lever to gently release the connector.	
deployed using the internal GPS antenna on the 2x2W MCO	no action is needed.	

5 Perform this step for the 9764 MCO LTE 2x2W MCOs only and only if:

- you are replacing the 9764 MCO module, or
- there is an attached RF antenna and the RF antenna cable is too short, prohibiting you from easily removing the MCO.

For the 9764 MCO LTE 2x2W MCOs only: Disconnect the external RF antennas by pulling them off of the QN connectors located at the top of the heat sink side of the 9764 MCO module.

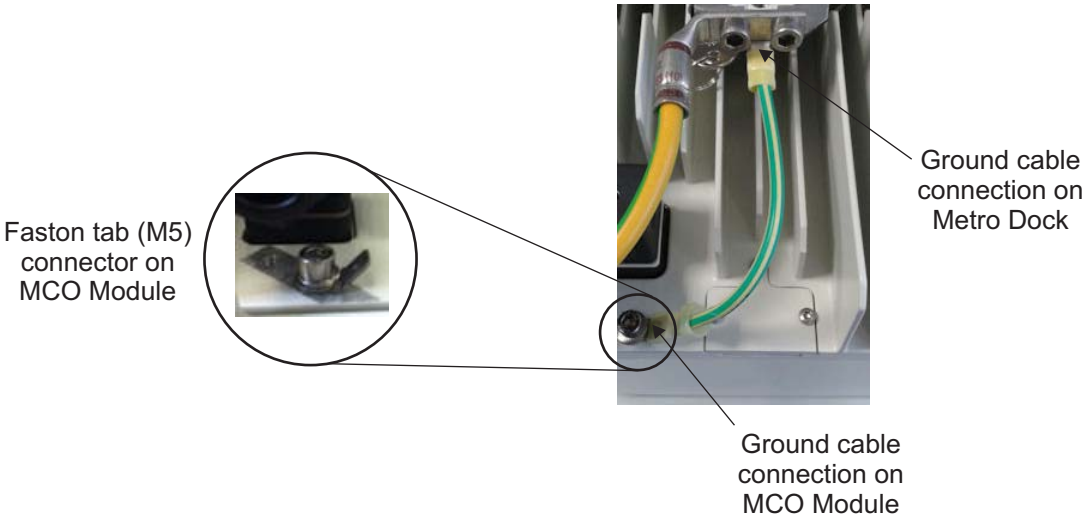




6 Disconnect the ground cable.

The LTE 9764 MCO module utilizes a short ground cable to the 9764 Metro Dock. From the underside of the 9764 MCO module unclip and disconnect the ground cable connector from the ground cable connection tab on the 9764 MCO module.

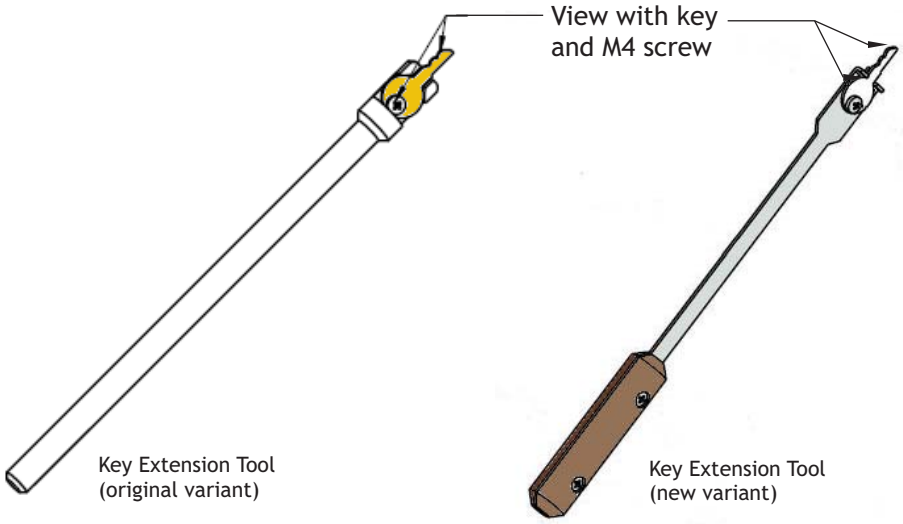
Figure B-6 9764 Metro Dock to LTE 9764 MCO module grounding cable



7 If the 9764 MCO configuration requires use of the key extension to reach the lock, then attach the key to the key extension.

1. Remove the M4 screw from the key extension.
2. Insert the key.
3. Replace the screw so that the tool clamps firmly onto the key.

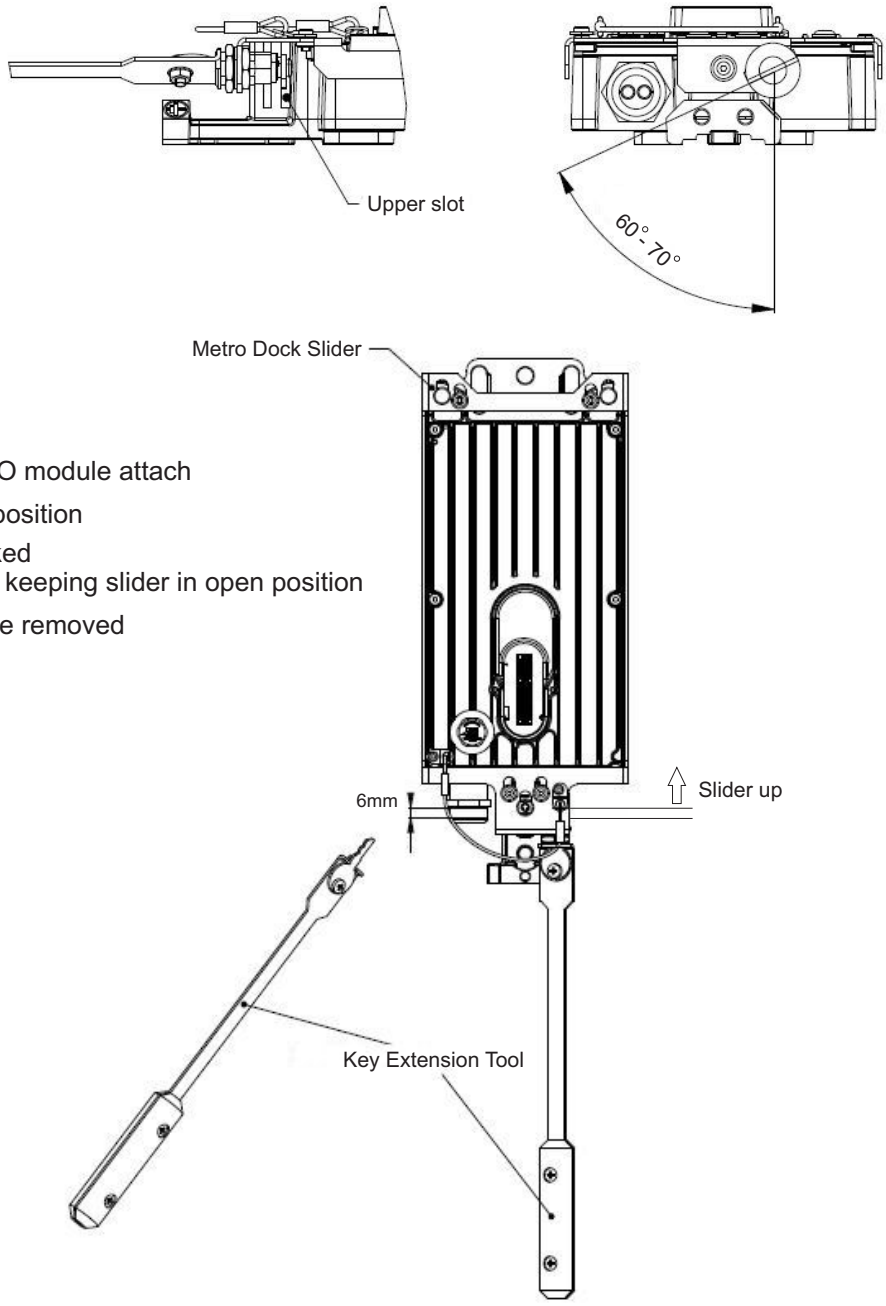
Figure B-7 Key extension



8 To remove the 9764 MCO module from the 9764 Metro Dock, the 9764 Metro Dock metal slider must be in the “open” (“up”) position:

1. Insert the key into the 9764 Metro Dock lock.
2. Turn the key through an angle of approximately 90° to its hard stop position to unlock the slider.

   Note: Keep a grip on the key extension tool, because with the slider in the “down” position, the key can slip out of the lock and fall to the ground.
3. Push the extension tool upwards to move the slider up and turn the key through an angle of approximately 60° to its hard stop position. The slider is now locked in the “open” (“up”) position.



The key and extension may remain in the lock while completing the subsequent hardware replacement steps.

9 Pull the 9764 MCO module straight out of and clear from the 9764 Metro Dock.

Figure B-8 Pull 9764 MCO module from Metro Dock

Pull MCO module out of Metro Dock

10 On the bottom left of the 9764 MCO module, loosen the screw that locks the power line connector into its mating connector in the 9764 MCO module.

Figure B-9 AC power line connector

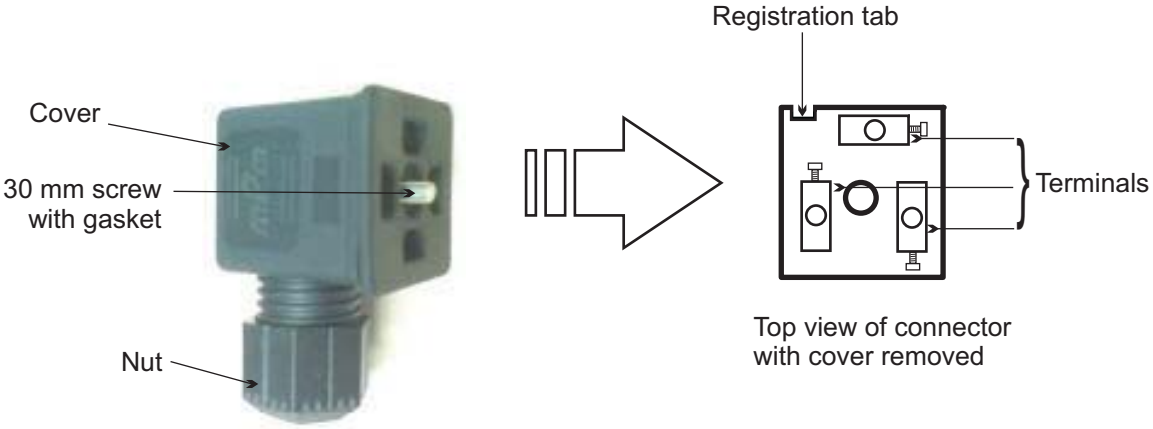
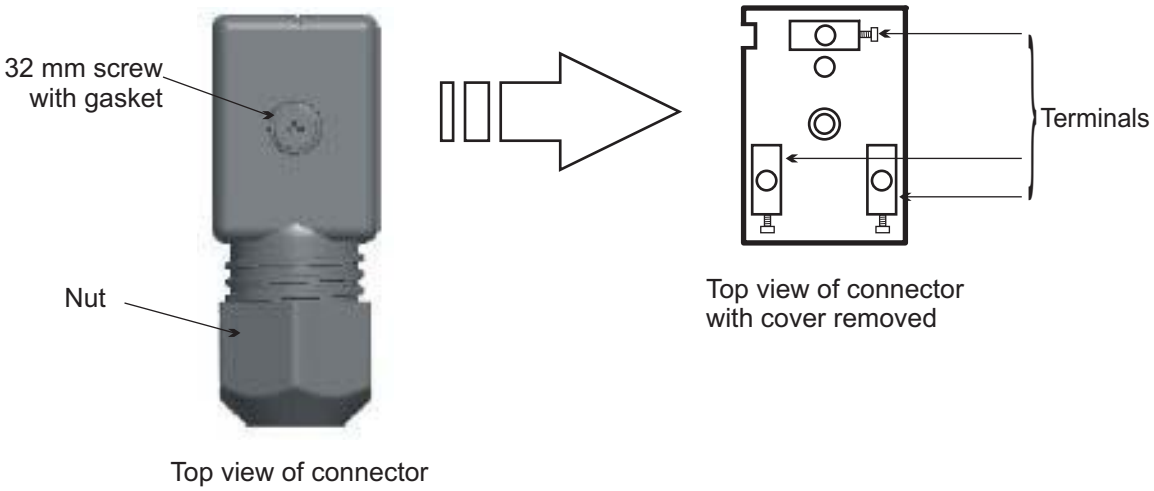


Figure B-10 DC power line connector



11 Pull the power cable plug straight out of its mating connector in the 9764 MCO module.

12 **Important!** If a Wi-Fi AP is attached to the 9764 MCO module, perform this step as well as the following two steps **only if the 9764 MCO module is being replaced**; otherwise skip to Step 14. If a Wi-Fi AP is not attached to the 9764 MCO module, skip to Step 14.

Using a T10 Torx screwdriver, loosen the three M3 10mm Torx screws from the attachment plate on the back of the 9764 MCO module and 9764 MCO Wi-Fi AP module.

Figure B-11 9764 MCO Wi-Fi AP module attached to 9764 MCO module

13 Set the screws and the attachment plate aside (retain for later use).

14 Pull the 9764 MCO Wi-Fi AP module off of the 9764 MCO module and set the 9764 MCO Wi-Fi AP module aside.

15 Rest the 9764 MCO module gently against a secure, supportive, flat surface and block it from falling.

END OF STEPS

How to continue

Continue to Procedure B-2: “Attach 9764 MCO Wi-Fi AP module to 9764 MCO module” (p. B-19).

Procedure B-2: Attach 9764 MCO Wi-Fi AP module to 9764 MCO module

Purpose

This topic describes the procedures to attach the 9764 MCO Wi-Fi AP module to the 9764 MCO module.

Prerequisites

Before installation begins, ensure the following:

- T10 Torx screwdriver (power and/or manual) is available.
- Internet service is available.
- The 9764 MCO module is not attached to the 9764 Metro Dock.

  If removal is necessary, refer to procedure Procedure B-1: “Remove 9764 MCO module from 9764 Metro Dock” (p. B-9).

Attach 9764 MCO Wi-Fi AP module to 9764 MCO module

NOTICE

ESD hazard

Semiconductor devices can be damaged by electrostatic discharges (ESD)

The following rules must be complied with when handling any module containing semiconductor components:

- *Wear conductive or antistatic working clothes (for example, coat made of 100% cotton).*
- *Wear a grounded wrist strap.*
- *Wear shoes with conductive soles on a conductive floor surface or conductive work mat.*
- *Leave the modules in their original packaging until ready for use.*
- *Make sure there is no difference in potential between yourself, the workplace, and the packaging before removing, unpacking, or packing a module.*
- *Whenever handling ESD-sensitive components, do not touch any connection pins or tracks.*
- *Place modules removed from the equipment on a conductive surface.*
- *Test or handle the module only with grounded tools on grounded equipment.*
- *Handle defective modules exactly like new ones to avoid causing further damage.*

Perform the following steps to attach the 9764 MCO Wi-Fi AP module to the 9764 MCO module:

1 Remove the 9764 MCO Wi-Fi AP module from its packaging.

2 Using a T10 Torx screwdriver, remove the cover over the Wi-Fi AP connector on the lower back of the 9764 MCO module by unscrewing the three screws.

The following figure shows the Wi-Fi AP connector cover:

Figure B-12 Wi-Fi AP connector cover on 9764 MCO module

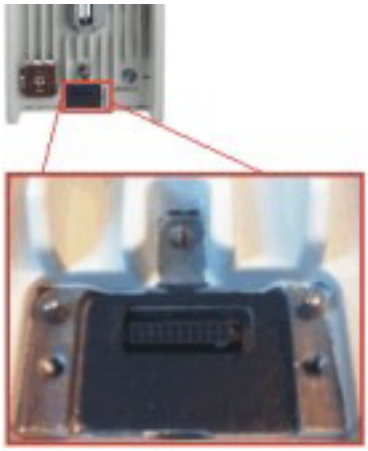
Cover over 9764 MCO Wi-Fi AP connector

Important! Ensure that the appropriate gasket surrounding the connector is in place on the 9764 MCO module (as shown in Figure B-13, “Wi-Fi AP connector on 9764 MCO module” (p. B-21)).

Note: Retain the cover and the three (3) cover screws. Should the need arise to remove but not replace the 9764 MCO Wi-Fi AP module in the future, the dummy cover and its screws must be reattached to the 9764 MCO module.

3 Push the 9764 MCO Wi-Fi AP module onto the Wi-Fi AP connector.

Figure B-13 Wi-Fi AP connector on 9764 MCO module



9764 MCO Wi-Fi AP connector

4 Using a T10 Torx screwdriver and the three M3 10mm Torx screws shipped with the 9764 MCO Wi-Fi AP module, screw the attachment plate to the 9764 MCO module and to the back of the 9764 MCO Wi-Fi AP module, and tighten all screws.

Torque screws to 0.6 Nm (0.443 lb ft).

The following figure shows the 9764 MCO Wi-Fi AP module attached to the 9764 MCO module:

Figure B-14 9764 MCO Wi-Fi AP module attached to 9764 MCO module

END OF STEPS

How to continue

Attach the 9764 MCO module to the 9764 Metro Dock module by following the procedures in Chapter 4, “Installation of the 9764 MCO module”.

9764 MCO Wi-Fi AP integration overview

Integration refers to the entire process from hardware installation to “normal operation”.

9764 MCO Wi-Fi AP integration proceeds as follows:

1. Hardware is installed.

   The 9764 MCO Wi-Fi AP module is physically installed on the 9764 MCO module, and the 9764 MCO module is physically installed on the 9764 Metro Dock module and all cabling completed.

2. Power is applied to the 9764 MCO (and by default, to the 9764 MCO Wi-Fi AP module).

3. The switch on the 9764 MCO module contains a default configuration that connects the 9764 MCO Wi-Fi AP port to the backhaul port (there are no 9764 MCO Wi-Fi AP OAM parameters to be configured prior to initial power-up).

   The switch will forward Wi-Fi packages as soon as the 9764 MCO module software has booted and as soon as the 9764 MCO Wi-Fi AP software is running.

4. A connection between 9764 MCO Wi-Fi AP and Alcatel-Lucent 9772 Wi-Fi Service Controller (9772 Wi-Fi SC) is automatically established.

5. The 9764 MCO Wi-Fi AP downloads the latest software version from the appropriate file server (if applicable).

6. The 9764 MCO Wi-Fi AP is provisioned and configured via the 9772 Wi-Fi SC.

   A 30-minute timer is started after the configuration is sent successfully from the 9772 Wi-Fi SC. During this 30 minutes, the LED on top of the 9764 MCO Wi-Fi AP module illuminates and is visible through the narrow gap between the bottom of the 9764 MCO module and the top of the 9764 MCO Wi-Fi AP module.

   For information on the 9772 Wi-Fi SC, refer to the documents listed in the following table:

Refer to this document	At this location	For more information on
Alcatel-Lucent 9772 Wi-Fi Service Controller V1.0 L Hardware Installation, 3MN-01840-0001- RJZZA	(http://support.alcatel-lucent.com)	Instructions for installing the 9772 WiSC-L hardware and accessing its management interfaces.
Alcatel-Lucent 9764 and 9772 Metro Cell Outdoor Wi-Fi AP and Wi-Fi Service Controller, Release WA5.5, System Reference Guide, 3MN-01840-0002-RKZZA	(http://support.alcatel-lucent.com)	Instructions for accessing and using the web-based graphic user interface (GUI) to manage/administer the 9772 Wi-Fi Service Controller and 9764 MCO Wi-Fi Access Point
Alcatel-Lucent 9764 and 9772, Metro Cell Outdoor Wi-Fi AP and Wi-Fi Service Controller, Release WA 5.5, CLI Reference Guide, 3MN-01840-0003-RKZZA	(http://support.alcatel-lucent.com)	Instructions for accessing and using command line interface (CLI) to manage/administer the 9772 Wi-Fi Service Controller and 9764 MCO Wi-Fi Access Point.

7. The field technician may choose to observe the LED colors and blinking patterns to ensure error-free boot-up and normal operation. Refer to "LED state description - 9764 MCO Wi-Fi AP" (p. B-25) for details.

- If normal operation is achieved, then the LED is automatically turned off when the 30-minute timer expires.

- If there are problems, then the LED displays the applicable error color/pattern. Refer to "LED state description - 9764 MCO Wi-Fi AP" (p. B-25) for details.

8. The field technician will make the first test call – provided all necessary core network elements (NEs) are configured properly (for example, WLAN GW, AAA, etc.).

LED state description - 9764 MCO Wi-Fi AP

Overview

The 9764 MCO Wi-Fi AP module has a single external bi-color LED (red/green) on the top of the module housing.

The LED illuminates with different colors and blinking patterns during boot-up, then is automatically turned off after normal operation has been achieved and the 30-minute timer expires. If there are problems, then the LED displays the applicable error color/pattern.

Due to limited visibility requiring direct line-of-site between the 9764 MCO Wi-Fi AP module and the 9764 MCO module, the LED is not intended for ongoing troubleshooting after the unit has been successfully deployed. However, the field technician installing/replacing the 9764 MCO Wi-Fi AP module may watch the LED during boot-up if desired.

LED statuses during boot-up

Tip: In the following table, note that "Slow blinking" refers to an LED blink cycle of 2500 ms on, 2500 ms off; "Fast blinking" refers to an LED blink cycle of 500 ms on, 500 ms off.

After the 9764 MCO Wi-Fi AP hardware has been installed, upon power-up the LED reflects 9764 MCO Wi-Fi AP statuses as follows:

Table B-2 9764 MCO Wi-Fi AP LEDs during boot-up

Installation / commissioning step	9764 MCO Wi-Fi AP State	Red LED segment	Green LED segment	Combined LED behavior
1. Power-up with autotest	BOOTING	Solid On	Solid On	Solid On (appears orange)
2. 9764 MCO Wi-Fi AP tries to get adopted by the 9772 Wi-Fi Service Controller	ADOPTING	Slow blinking	Off	Slow red blinking
3. (optional) 9772 Wi-Fi Service Controller pushes a software upgrade	UPGRADING	Off	Slow blinking	Slow green blinking

Table B-2 9764 MCO Wi-Fi AP LEDs during boot-up (continued)

Installation / commissioning step	9764 MCO Wi-Fi AP State	Red LED segment	Green LED segment	Combined LED behavior
4. WLANs are mapped to radios, normal service	OPERATIONAL	Service on 5 GHz: Slow blinking	Service on 2.4 GHz: Slow blinking	With both radios operating: slow orange blinking
5. After 30 minutes in the same state (Note: the LED timeout default setting is 30 minutes, but is configurable by the Administrator to any value from 15 to 1440 minutes.)	HIDING	Off	Off	Off

LED functionality during OPERATIONAL states

The 2 9764 MCO Wi-Fi AP radios are mapped to a color segment of the LED:

- Radio 1 (2.4 GHz) maps to the GREEN segment.
- Radio 2 (5 GHz) maps to the RED segment.

There are 2 factors that affect the LED segment that is associated with each radio:

- If the radio is disabled (shutdown) or not by the administrator (this factor takes precedence).
- If a WLAN is mapped to the radio, making the radio usable.

If a radio has at least a WLAN mapped to it and it is enabled, then it is operational (meaning, it will beacon and provide client service).

Tip: In the following tables, note that “Slow blinking” refers to an LED blink cycle of 2500 ms on, 2500 ms off; “Fast blinking” refers to an LED blink cycle of 500 ms on, 500 ms off. An asterisk (*) means that the setting does not matter.

Table B-3 9764 MCO Wi-Fi AP LEDs based on Admin status and WLAN mapping

Radio's Admin status	Radio's WLAN mapping	LED segment
Disabled	*	Off
Enabled	no WLAN mapped	Fast blinking
Enabled	WLAN mapped	Slow blinking

Table B-4 9764 MCO Wi-Fi AP LEDs during normal operation states

RADIO 1 / 2.4 GHz / GREEN LED Segment			RADIO 2 / 5 GHz / RED LED Segment			COMBINED LED Behavior
Admin status	**WLAN mapping**	**Segment Behavior**	**Admin status**	**WLAN mapping**	**Segment Behavior**	
Disabled	*	Off	Disabled	*	Off	Off
Enabled	no WLAN	Fast	Disabled	*	Off	Fast Green
	WLAN	Slow				Slow Green
Disabled	*	Off	Enabled	no WLAN	Fast	Fast Red
	*			WLAN	Slow	Slow Red
Enabled	no WLAN	Fast	Enabled	no WLAN	Fast	Fast Orange
	WLAN	Slow		WLAN	Slow	Slow Orange
	WLAN	Slow		no WLAN	Fast	Fast Red + Slow Green (results in a green/orange/ red pattern)
	no WLAN	Fast		WLAN	Slow	Slow Red + Fast Green (results in a green/orange/ red pattern)

Appendix C: Product conformance statements

Overview

Purpose

This section presents the product conformance statements that apply to the 9764 MCO Access Point equipment.

The statements that are required are determined primarily by national or multinational regulations. However, in some regions, contract terms determine which statements are required.

The presence of the statement indicates that the product does comply with that statement wherever it is required to do so.

Contents

United States compliance

Introduction

Purpose

The statements that follow are the product conformance statements that apply to the 9764 MCO when deployed in the United States.

Contents

Federal Communications Commission

Federal Communications Commission

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

This device complies with Part 15 of the 47 CFR FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

47 CFR FCC Part 15 Class B

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 47 CFR 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 not occur 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.

RF approval

This equipment complies with Part 2, Subpart J - Equipment Authorization Procedures, of the 47 CFR FCC Rules.

This device complies with Part 22 – Public Mobile Services, Subpart H – Cellular Radiotelephone Services.

This equipment complies with Part 24 - Personal Communications Services, Subpart E - Broadband PCS.

Product safety and RF exposure

Product safety

The equipment complies with the following product safety specifications:

Standard reference	Title
Safety	EN 60950-22 (including EN 60950-1)

RF exposure

North America:

- Canada Safety Code 6 – Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz. Together with Canada RSS 102 for compliance of radio communication apparatus.
- USA FCC 47CFR 1.1310 – Radio frequency radiation exposure limits. Together with FCC OET Bulletin 65 and its supplements for evaluating compliance with FCC guidelines for human exposure to RF fields.

  Note: The results of the RF exposure assessment for NAR regulations and derived recommendations may be extended to other countries using similar regulations.

The 9764 MCO is basically a radio transmitter and receiver. When it is turned on, it receives and transmits radio frequency (RF) signals.

The system controls the transmitted power level within a range up to 1W per antenna port for the following models:

- 9764 MCO V1.0 B25 LTE 2x1W
- 9764 MCO V1.1 B2 LTE 2x1W
- 9764 MCO V1.1 B2/B25 LTE 2x1W

and up to 2W per antenna port for the 9764 MCO V1.1 B2 LTE 2x2W model.

Installation of 9764 MCO shall be performed in accordance with all applicable manufacturer's recommendations, and national laws and regulations. In particular:

- Workers that are required to work in close proximity to the equipment, for example maintenance personnel, should strictly follow instructions provided by their employer.
- Workers equipped with personal medical electronic devices, such as pacemakers and hearing aids, shall consult the manufacturer's instructions and consult their occupational health practitioner.

The 9764 MCO shall be installed and operated with a minimum separation distance of 20 cm (8 inches) between the radiator and user (see: USA – FCC OET Bulletin 65 and supplements and Canada – RSS 102).

FDA/IEC optical transmitter product compliance statements

FDA/IEC optical transmitter product compliance

Alcatel-Lucent declares that this equipment complies with the Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) regulations 21 CFR 1040.10 and 1040.11. It is a Class I/1 laser optical fiber communication systems "product" under the FDA.

This Product is designed to ensure that personnel operating the product are not endangered by laser radiation during normal operation and fault conditions. This product does not present a risk of eye injury because it is fully enclosed and does not contain embedded lasers greater than Class I/1 unless otherwise noted.

Laser warning

WARNING

Laser hazard

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

Do not view directly into the laser beam with optical instruments such as a fiber microscope because viewing of laser emission in excess of Class 1 limits significantly increases the risk of eye damage.

Never look into the end of an exposed fiber or an open connector as long as the optical source is switched on.

Ensure that the optical source is switched off before disconnecting optical fiber connectors.

Eco-environmental statements

Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established.

For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, contact the Alcatel-Lucent Environment, Health and Safety organization or Alcatel-Lucent Hazardous Waste Center technical support at (888) 539-2783.

Material content compliance

The following notification applies to Alcatel-Lucent products distributed for sale, resale, or use.

This product, part, or both may include a lithium-manganese dioxide battery, which contains very small amounts of a perchlorate substance. Special handling may apply.

For California:

Perchlorate Material - special handling may apply.

See (https://dtsc.ca.gov/HazardousWaste/Perchlorate/index.cfm).

European Union

Introduction

Purpose

The statements that follow are the product conformance statements that apply to the Alcatel-Lucent 9764 B7 MCO LTE equipment when deployed in the European Union.

Declaration of Conformity for radio and telecommunication terminal equipment under the scope of *Directive 1999/5/EC*.

Hereby, Alcatel-Lucent declares that the equipment documented in this publication is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The technical documentation as required by the Conformity Assessment procedure is kept at the Alcatel-Lucent location which is responsible for this product. For more information please contact your local Alcatel-Lucent Customer Service Organization.

Contents

CE marking

CE marking

This product has been CE-marked in accordance with the following European Directives:

- 1999/05/EC Radio and Telecommunication Terminal Equipment (R&TTE)

EMC and radio spectrum compliance

EMC compliance

The equipment complies with the following EMC specifications:

Standard reference	Title
EN 301 489-1 V1.9.2	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
EN 301 489-23 V1.5.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 23: Specific conditions for IMT-2000 CDMA, Direct Spread (UTRA and E-UTRA) Base Station (BS) radio, repeater and ancillary equipment
EN 55022:2006/A1:2007 Class B	Limits and methods of measurement of radio disturbance characteristics of information technology equipment
EN 55024:1998/A1:2001/A2:2003	Information technology equipment. Immunity characteristics. Limits and methods of measurement and measuring.

Radio spectrum compliance

The equipment complies with the following radio spectrum specifications:

Standard reference	Title
EN 301 908-1 V5.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R Directive; Part 1: Introduction and common requirements
EN 301 908-3 V5.2.1	IMT cellular networks; Harmonized EN covering the essential requirements of article 3.2 of the R Directive; Part 3: CDMA Direct Spread (UTRA FDD) Base Stations (BS)

Product safety and RF exposure

Product safety

The equipment complies with the following product safety specifications:

Standard reference	Title
EN 60950-1: Ed 2 of 2006 + A1 (2010) + A11 (2009) + A12 (2011)	Information Technology Equipment – Safety – Part 1: General Requirements
EN 60950-22 (Ed 1 of 2006) + A11 (2008)	Information Technology Equipment – Safety – Part 22: Equipment to be installed outdoors

RF exposure

Europe:

- European Council recommendation 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz). Together with EN 50383, EN 50384, EN 50385 and IEC 62232.
- Directive 2013/35/EU of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields). Together with IEC 62232.

  Note: These standards are aligned with the Guidelines of 1998 from the International Commission for Non-Ionizing Radiation Protection (ICNIRP). The recommendations provided below may also be extended to other ICNIRP based regulations.

The Alcatel-Lucent 9764 MCO V1.1 LTE 2x1W B3/B7 is basically a radio transmitter and receiver. When it is turned on, it receives and transmits radio frequency (RF) signals. The system controls the transmitted power level within a range up to 1 W per antenna connector.

The Specific Absorption Rate (SAR) is a value that corresponds to the relative amount of RF energy absorbed in the body of a person standing in the close vicinity of the equipment. Measured SAR values result from an extensive assessment process defined by international standards. Tests are performed in strict laboratory settings at the highest transmitted power of the equipment. When in operation, the SAR resulting from of the equipment emissions will most likely be substantially less than the measured values because of a variety of factors including number and proximity of connected end users, telecom traffic etc..

Installation for the Alcatel-Lucent 9764 MCO V1.1 LTE 2x1W B3/B7 equipment shall be performed in accordance with all applicable manufacturer's recommendations, and national laws and regulations. In particular:

- Workers that are required to work in close proximity to the equipment, for example maintenance personnel, should strictly follow instructions provided by their employer.
- Workers equipped with personal medical electronic devices, such as pacemakers and hearing aids, shall consult the manufacturer's instructions and consult their occupational health practitioner.

Europe and countries with ICNIRP based regulations:

Alcatel-Lucent 9764 MCO LTE B3

According to the results of the SAR assessment of the Alcatel-Lucent 9764 MCO LTE B3, the installation shall at least adhere to the following recommendations:

- The equipment shall be installed in a location restricting access by the general public to the area within 70 millimeters directly in front of the equipment shroud at full transmit power. One practical implementation of this requirement is to ensure that the equipment is mounted a minimum of 3 meters above local ground, this vertical distance being measured from the local ground or closest walkway to the bottom of the equipment.
- The compliance distance with the ICNIRP/EU exposure limits values for workers is 20 mm at full transmit power. The equipment shall be powered off before any operation or maintenance in the close vicinity of the shroud.
- The operator or the entity putting the equipment into service shall stick the ISO 3866-2 warning label (cf. 2013/35/EU, 92/58/ECC & 2007/30/EC) provided together with the equipment according to manufacturer’s instructions before the first power switch on.

According to the results of the SAR assessment of the Alcatel-Lucent 9764 MCO LTE B3, touch safe conditions for workers are achieved if the Tx power is less than or equal to 2*0.38 W and touch safe conditions for general public are achieved if the Tx power is less than or equal to 2*0.076 W.

For further information on RF exposure, the following table provides indicative values of electromagnetic field reference levels in the main lobe in front of the antenna:

Table C-1 Distances corresponding to reference levels for the general public and workers at maximum Tx power

PTX max (2*1 W)	Electric field (V/m)	Distance from the shroud (m)
ICNIRP reference level and EU action level for workers	130	0.13

Table C-1 Distances corresponding to reference levels for the general public and workers at maximum Tx power (continued)

PTX max (2*1 W)	Electric field (V/m)	Distance from the shroud (m)
EU/ICNIRP reference level for the general public	58	0.32

Alcatel-Lucent 9764 MCO LTE B7

According to the results of the SAR assessment of the Alcatel-Lucent 9764 MCO LTE B7, the installation shall at least adhere to the following recommendations:

- The equipment shall be installed in a location restricting access by the general public to the area within 90 millimeters directly in front of the equipment shroud at full transmit power. One practical implementation of this requirement is to ensure that the equipment is mounted a minimum of 3 meters above local ground, this vertical distance being measured from the local ground or closest walkway to the bottom of the equipment.
- The compliance distance with the ICNIRP/EU exposure limits values for workers is 10 mm at full transmit power. The equipment shall be powered off before any operation or maintenance in the close vicinity of the shroud.
- The operator or the entity putting the equipment into service shall stick the ISO 3866-2 warning label (cf. 2013/35/EU, 92/58/ECC & 2007/30/EC) provided together with the equipment according to manufacturer's instructions before the first power switch on.

According to the results of the SAR assessment of the Alcatel-Lucent 9764 MCO LTE B7, touch safe conditions for workers are achieved if the Tx power is less than or equal to 2*0.66 W and touch safe conditions for general public are achieved if the Tx power is less than or equal to 2*0.13 W.

For further information on RF exposure, the following table provides indicative values of electromagnetic field reference levels in the main lobe in front of the antenna:

Table C-2 Distances corresponding to reference levels for the general public and workers at maximum Tx power

PTX max (2*1 W)	Electric field (V/m)	Distance from the shroud (m)
ICNIRP reference level and EU action level for workers	140	0.1
EU/ICNIRP reference level for the general public	61	0.4

Eco-environmental statements

Packaging collection and recovery requirements

Countries, states, localities, or other jurisdictions may require that systems be established for the return and/or collection of packaging waste from the consumer, or other end user, or from the waste stream. Additionally, reuse, recovery, and/or recycling targets for the return and/or collection of the packaging waste may be established. For more information regarding collection and recovery of packaging and packaging waste within specific jurisdictions, contact the Alcatel-Lucent Environment, Health and Safety organization.

Recycling / take-back / disposal of products

In compliance with Waste Electrical and Electronic Equipment Directive (WEEE Directive) 2002/96/EC 01/2003, amended by WEEE Directive 2003/108/EC 12/2003, electronic products bearing or referencing the symbols shown below shall be collected and treated at the end of their useful life, in compliance with applicable European Union and other local legislation. They shall not be disposed of as part of unsorted municipal waste. Due to materials that may be contained in the product, such as heavy metals, the environment and human health may be negatively impacted as a result of inappropriate disposal.

Note 1: For electronic products put on the market in the European Union, a solid bar under the crossed-out wheeled bin indicates that the product was put on the market after 13 August 2005.

Moreover, in compliance with legal requirements and contractual agreements, where applicable, Alcatel-Lucent will offer to provide for the collection and treatment of Alcatel-Lucent products bearing the logo at the end of their useful life, or products displaced by Alcatel-Lucent equipment offers.

For information regarding take-back of equipment by Alcatel-Lucent, or for more information regarding the requirements for recycling/disposal of a product, please contact your Alcatel-Lucent account manager. Visit the Alcatel-Lucent Take-Back (http://www.alcatel-lucent.com/product_takeback) web page, or contact Alcatel-Lucent

Takeback Support at (mailto:takeback@alcatel-lucent.com). For technical information on product treatment, consult the Alcatel-Lucent Recycling Information (http://www.alcatel-lucent.com/product_recycling) web page.

Material content compliance

European Union

The European Union (EU) Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive [2002/95/EC and its recast 2011/65/EU] as amended restricts the use of lead, mercury, cadmium, hexavalent chromium, and polybrominated biphenyls and polybrominated diphenyl ethers in electrical and electronic equipment. This Directive applies to electrical and electronic products placed on the EU market after 1 July 2006, with various exemptions, including an exemption for lead solder in network infrastructure equipment. Alcatel-Lucent products shipped to the EU after 1 July 2006 comply with the EU RoHS Directive.

EU REACH

On June 1, 2007, European Regulation No 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) entered into force. Under REACH, companies operating in the EU may face certain obligations as manufacturers, importers and/or downstream users.

Alcatel-Lucent complies with the current requirements of REACH. In particular, Article 33 of REACH requires suppliers to inform the recipients and consumers if an article received contains more than 0.1% (by weight per article) of any substance(s) on the Substances of Very High Concern (SVHC) candidate list. Alcatel-Lucent has verified the use of substances listed on the candidate list of Substances of Very High Concern as published on the ECHA website. Based on information received from our supply chain we have no indication that any of the listed substances are present in any of our products, subassemblies or expansion items over 0.1% weight for weight. We will continue to monitor the status of the candidate list as part of our ongoing compliance activities.

Appendix D: Document issue history

Overview

Purpose

This chapter provides the reissue history of this document.

Contents

Document issue history

Purpose

The reissue history of this document is described in the following paragraphs.

Issue 3.03 (September 2014)

The document changes from Issue 3, August 2014 are shown in the following table:

Table D-1 Document changes from Issue 3, September 2014

Feature/enhancement	Description	Location
Documentation changes		
9764 MCO V1.1 B2/B25 LTE 2x1W model	Added information regarding the B2/B25 (combined) MCO.	"Supported installation options" (p. 2-13) "Product features and capabilities" in "Functional description" (p. 2-2) "Alcatel-Lucent 9764 Metro Cell Outdoor LTE overview" and "Product labelling" in "Physical description" (p. 2-4) Pole mount options in:"Pole mount installation requirements" (p. 3-5) Wall mount in a pair configuration:Procedure 3-6: "Wall mount the 9764 Metro Dock in a pair configuration" (p. 3-71)

Issue 3 (August 2014)

The document changes from Issue 2, June 2014 are shown in the following table:

Table D-2 Document changes from Issue 2,June 2014

Feature/enhancement	Description	Location
Documentation changes		
MCO to MetroDock attachment procedure	Added rotation angles for key and detailed graphics	Procedure 4-5: "Attach 9764 MCO module to 9764 Metro Dock" (p. 4-41)
MCO module ground cabling	Added new step to ensure that the power is off before performing the procedure	Procedure 4-3: "9764 MCO module ground cabling" (p. 4-18)
Physical description	Update to the AC power surge protection	"Physical description" (p. 2-4)
Product power requirements	Update to the AC and DC electrical rating in order to align with the product label specification. Update to the statement regarding about power related ancillary items.	"Product power requirements" (p. 4-27)
Pre-installation information	Added the DC power connector type	"Pre-installation information" (p. 4-3)

Table D-2 Document changes from Issue 2,June 2014 (continued)

Feature/enhancement	Description	Location
Installation procedures for the 9764 MCO LTE 2x2W	Added procedure for the installation of the RF antenna Added procedure for the installation of the GPS antenna	Procedure 4-1: "Connect external RF antenna to the Alcatel-Lucent 9764 MCO LTE 2x2W" (p. 4-5) Procedure 4-2: "Connect GPS antenna" (p. 4-7)
Pair-mount installation options	Added pair-mount information throughout the document.	"Supported installation options" (p. 2-13) "Pole mount installation requirements" (p. 3-5) "Wall mount installation requirements" (p. 3-9)

Issue 2 (June 2014)

The document changes from Issue 1.06, May 2014 are shown in the following table:

Table D-3 Document changes from Issue 1.06, May 2014

Feature/enhancement	Description	Location
Documentation changes		
External GPS antenna	Added 26/40 dB antenna selection rule and warning re proximity to other antennas; updated purpose and procedure selection table.	Procedure 4-2: "Connect GPS antenna" (p. 4-7)
Power up procedure	Added procedure for powering on and troubleshooting the MCO	Procedure 4-8: "Power on the 9764 MCO" (p. 4-52)

Issue 1.06 (May 2014)

The document changes from Issue 1.05, May 2014 are shown in the following table:

Table D-4 Document changes from Issue 1.05, May 2014

Feature/enhancement	Description	Location
Features		
Internal surge arrestor	Updates for internal surge arrestor for electrical Ethernet	"Hardware and ancillary items" (p. 2-17), "Install optional internal surge arrestor" (p. 3-102)
Documentation changes		
Documentation standards update	Implementation of the new documentation standard for the "What's new" block (replaces the former "Reason for reissue" block).	"What's new" (p. xiii)
Sealing gasket lubrication	Updates to MCO attachment procedure to include gasket lubrication step and new graphics and clarifications	Procedure 4-5: "Attach 9764 MCO module to 9764 Metro Dock" (p. 4-41)

Table D-4 Document changes from Issue 1.05, May 2014 (continued)

Feature/enhancement	Description	Location
LED location	Added graphic to show location of LED	"LED status for 9764 MCO LTE" (p. A-2)

Issue 1.05 (May 2014)

The document changes from Issue 1.04, May 2014 are shown in the following table:

Table D-5 Document changes from Issue 1.04, April 2014

Feature/enhancement	Description	Location
Documentation changes		
ESD wrist strap	Added ESD wrist strap attachment step at the beginning of relevant procedures	"9764 Metro Dock cabling" (p. 3-89)

Issue 1.04 (April 2014)

The document changes from Issue 1.03, February 2014 are shown in the following table:

Table D-6 Document changes from Issue 1.03, February 2014

Feature/enhancement	Description	Location
Features		
Conformance statements	Product conformance statements for MCO B3 and B7 variants	"Product safety and RF exposure" (p. C-10)

Issue 1.03 (February 2014)

The document changes from Issue 1.02, January 2014 are shown in the following table:

Table D-7 Document changes from Issue 1.02, January 2014

Feature/enhancement	Description	Location
Features		
Internal GPS antenna	Updates for internal GPS antenna solution	"Physical description" (p. 2-4), Procedure 4-2: "Connect GPS antenna" (p. 4-7)

Issue 1.02 (January 2014)

The document changes from Issue 1.01, December 2013 are shown in the following table:

Table D-8 Document changes from Issue 1.01, December 2013

Feature/enhancement	Description	Location
Documentation changes		
Wi-Fi AP LED	Updates to Wi-Fi AP LED state table	"LED status for 9764 MCO LTE" (p. A-2)

Issue 1.01 (December 2013)

The document changes from Issue 1, November 2013 are shown in the following table:

Table D-9 Document changes from Issue 1, November 2013

Feature/enhancement	Description	Location
Features		
Pair mount and daisy chain	Pair-mount and daisy chain installation configurations	"Supported installation options" (p. 2-13), Chapter 3, "Installation of the 9764 Metro Dock"
Wi-Fi AP	Wi-Fi AP installation procedures	"Supported installation options" (p. 2-13), Appendix B, "Installation of the 9764 MCO Wi-Fi AP"

Issue 1

Issue 1, November 2013, was the first publication of this document in support of the product's first commercial availability in LR13.3.L.

Glossary

Numerics

3GPP

3rd Generation Partnership Project

A

A (Ampere)

Base SI unit of electrical current.

AC (Alternating Current)

Continuously variable current, rising to a maximum in one direction, falling to zero, then reversing direction and repeating the cycle in the other direction.

AC convenience outlet

Sites must be equipped with at least two duplex outlets for installation and maintenance procedures. The outlets are required to power test equipment and installation tools.

Ambient temperature

The temperature of air or other media in a designated area, particularly the area

ANSI (American National Standards Institute)

An organization chartered to accredit standards developed by a wide variety of industry groups, without influence from any one company or organization. Does not develop standards, but reviews and implements those developed by other organizations. ANSI is a member of the International Standards Organization (ISO).

Antenna

An elevated device for radiating or receiving radio waves. It changes electrical currents into electromagnetic waves, and vice versa.

AP

Access Point

AWG (American Wire Gauge)

American standard for classifying wire diameter.

B

Backup

Facility used to replace an element which has failed.

Base station

The equipment that provides the air interface that allows mobile terminals to communicate with the telecommunications network.

BBU

BaseBand Unit

BOCA

Building Officials and Code Administrators

Bonding

Permanent connection of metallic parts to form an electrically conductive path that will assure electrical continuity and have the capability to safely conduct any current likely to be imposed.

Branch circuit

The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

Breaker, circuit

A cut-out device which breaks a circuit when preset limits of current are exceeded.

Buried ring ground

A buried, bare, tinned, solid copper cable encircling the site building and/or tower foundation.

C

CDRH

Center for Devices and Radiological Health

Cell site

An installation located within a cell that houses the equipment needed to set up and complete calls on a cellular telephone.

CIC ((Customer Information Center))

Source for locating and obtaining delivery of Alcatel-Lucent customer documents.

Circuit

1. The complete path between two terminals over which one-way or two-way communications may be provided. 2. An electronic path between two or more points, capable of providing a number of channels. 3. A number of conductors connected together for the purpose of carrying an electrical current. 4. An electronic closed-loop path among two or more points used for signal transfer. 5. A number of electrical components, such as resistors, inductances, capacitors, transistors, and power sources connected together in one or more closed loops.

Configuration

An arrangement of functional units according to their nature, number, and chief characteristics.

Controlled environment

An indoor location in which temperature, humidity, and ventilation are maintained at specific levels.

CPRI (Common Public Radio Interface)

Specification for the key internal interface of radio base stations between the Radio Equipment Control (REC) and the Radio Equipment (RE).

CSA (Canadian Standards Association)

An independent, non-government, not-for-profit association for the development, by consensus, of Canadian standards and product certifications.

CSC (Cell Site Configuration)

Sheets provided in this document for documenting cell site configuration, conditions, and other pertinent information for reference during product deployment, and future additions.

D

dB (Decibel)

A unit which expresses the ratio of two voltages, currents, or powers. It is used to specify transmission loss, gain, or relative level. It is equal to 20 times the common logarithm of the ratio of two voltages or two currents, or 10 times the common logarithm of the ratio of two powers.

DC (Direct Current)

Current flow in one direction.

Diversity

A method of radio transmission and/or reception, which counteracts the effects of fading by combining several signals all bearing the same information.

Driven ground rod

A copper-clad steel or stainless steel rod, a minimum of 2.4 meters (8 feet) long and 5/8 inch in diameter.

E

Earthquake zone

Seismic ratings ranging from zone 1 (relatively low central office operational shock and vibration levels) to the most severe zone 4 levels. Equipment must be able to withstand earthquake zone requirements under both operational and non-operational conditions.

Electrolytic ground rod

A low resistance grounding rod (pipe) using low resistivity materials.

EU

European Union

Exothermic weld

A method of making electrical connections of copper to copper or copper to steel using high temperature fusion. The molten copper flows over conductors in a mold, melting and welding them together.

F

Facility

Any element of physical telephone equipment needed to provide service, such as cables, switching systems, and microwave radio transmission systems.

FCC (Federal Communications Commission)

A group founded in 1934 to regulate all types of communications in the United States.

FDA

Food and Drug Administration

Frequency

For a periodic wave, such as alternating current, the number of complete cycles per unit of time. The unit of frequency is cycles per second, or hertz.

Fuse

An overcurrent protective device that has as its critical component a metal wire or strip that will melt when heated by a prescribed (design) amperage, creating an open in the circuit of which it is a part, thereby protecting the circuit from an overcurrent condition.

G

Gain

The ratio of output current, voltage, or power to input current, voltage, or power, respectively. Gain is usually expressed in dB. If the ratio is less than unity, the gain, expressed in dB, will be negative, in which case there is a loss between input and output.

GBE

GigaBit Ethernet

GFCI (Ground Fault Circuit Interrupter)

A device intended for protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

GPS (Global Positioning System)

A system of 24 satellites that provides, among other things, extremely accurate timing information to the cell sites.

Ground

A conducting connection between equipment or an electrical circuit and earth, or conductive body that is used in place of earth.

Ground conductor

A conductor used to connect equipment or a grounded electrical circuit to the grounding electrode system.

Grounding electrode system

The conductive objects that are intentionally bonded to furnish connection to earth (i.e., buried ring ground with ground rods, electrically continuous buried metallic water pipe, electrolytic ground electrode, etc.).

Guy

Steel wire or rope used to hold a pole upright.

H

Heat dissipation

The heat generated by equipment during operation.

HSDPA

High Speed Downlink Packet Access

HSUPA

High Speed Uplink Packet Access

HV

High Voltage

Hz (Hertz)

A unit of frequency of a periodic process equal to one cycle per second.

I

ICNIRP

International Commission for Non-Ionizing Radiation Protection

IEEE

Institute of Electrical and Electronics Engineers

INTR (Intrusion Alarm)

The Intrusion (INTR) alarm indicates a door or access panel to the power system is open.

IT

In an IT earthing system, the electrical distribution system has no connection to earth at all, or it has only a high impedance connection. In such systems, an insulation monitoring device is used to monitor the impedance.

L

LAN

Local Area Network

Load

The power consumed by a device or circuit in performing its function.

Loss

The diminution, usually expressed in dB, of signal level in a communications medium. The power, usually expressed in watts, consumed by a circuit or component. The energy dissipated without accomplishing useful work or purpose.

LV

Low Voltage

M

MHz (Megahertz)

Reference of radio frequency spectrum of one-million cycles.

MOP (Method of Procedure)

Cell site walk-through where site preparation activities are verified prior to installing the 9412 eNodeB Compact equipment.

MSP

Mobile Service Provider

N

NEC (National Electric Code)

Standard that governs the use of electric wire, cable, and fixtures, and electrical and optical communication cable installed in buildings.

Network

A set of terminals, the communications link that joins them, and the protocols that allow them to function together and communicate with each other.

NFPA (National Fire Protection Association)

Standards and code writing organization made up of volunteer industrial and institutional subject-matter-expert committees.

NFPA

National Fire Protection Association

Nominal

Specified value or intended value independent to any uncertainty in its realization. In a device that realizes a physical quantity, it is the value of such a quantity specified by the manufacturer.

Non Alcatel-Lucent power

3rd party power systems, or power systems other than Alcatel-Lucent.

P **Phase**

The number of separate voltage waves in commercial alternating current, designated as "single phase", "three phase", etc.

Q **QAM**

Quadrature Amplitude Modulation

QoE

Quality Of Experience

R **RCD**

Residual Current Device

RF (Radio Frequency)

Electromagnetic wave used for, among other things, cellular voice and data communications.

RMS (Root Mean Square)

Effective value of an alternative wave. For AC, this is numerically equal to DC value of the current with the same heating effect.

RoHS

Restriction of Hazardous Substances

Rx (Receive)

S **SAR (Specific Absorption Rate)**

A measure of the rate at which energy is absorbed by the body when exposed to radio frequency energy.

Sector

The coverage area within the degree of directionality of the antennas.

SFP

Small Form-Factor Pluggable (a transceiver module)

Shield

A housing, screen, sheath, or cover that substantially reduces the coupling of electric, magnetic, or electromagnetic fields into or out of circuits or transmission lines.

Site

An installation that houses the equipment needed to set up and complete calls on a cellular telephone.

Site preparation

To perform the requirements necessary at the site before installation can begin.

Stranded

Wires twisted together to form a strong flexible cable.

Surge protector

Protective device used to limit surge voltages by discharging or bypassing any unwanted surge current that may enter a building or equipment.

T

T1

A four-wire voice and data trunking facility that carries 24 duplex channels over 56-kbps time slots.

TN

In a TN earthing system, one of the points in the generator or transformer is connected with earth, usually the star point in a three-phase system. The body of the electrical device is connected with earth via this earth connection at the transformer.

TT

In a TT earthing system, the protective earth connection of the consumer is provided by a local connection to earth, independent of any earth connection at the generator.

Twisted pair cable

Cable made up of one or more separately insulated twisted-wire pairs, none of which is arranged with another to form quads.

Tx (Transmit)

U

UBC

Uniform Building Code

UL (Underwriters Laboratories)

Laboratories that test and approve materials and equipment against pre-determined performance standards.

V

V (Volt)

The derived SI unit of electrical potential difference. It is the difference in potential between two points of a conducting wire carrying a constant current of 1 ampere when the power dissipated between these two points is equal to 1 watt.

V AC (Volts Alternating Current)

V DC (Volts Direct Current)

V rms (Volts Root Mean Square)

VSWR (Voltage Standing Wave Ratio)

In a transmission line, the ratio of maximum to minimum voltage in a standing wave pattern. The VSWR is a measure of impedance mismatch between the transmission line and its load. The higher the VSWR, the greater the mismatch. The minimum VSWR, i.e., that which corresponds to a perfect impedance match, is unity.

W

W (Watts)

The derived SI unit of power. It is equivalent to 1 joule per second, or 1 volt-ampere.

Walk-through

A critical examination of a design or product undertaken to ensure that it is of adequate quality.

Waveform

The characteristic shape of a periodic wave, determined by the frequencies present and their amplitudes and relative phases.

WCDMA

Wideband Code Division Multiple Access

WEEE

Waste Electrical and Electronic Equipment

Index

DRAFT