

Link Budget Calculator

Overview

The Link Budget Calculator is a utility for calculating the expected performance of the RADWIN 1000/2000 wireless link and the possible configurations for a specific link range.

The utility allows you to calculate the expected RSS of the link, and find the type of services and their effective throughput as a function of the link range and deployment conditions.

User Input

You are required to enter or choose the following parameters. Depending on the product, some of the parameters have a default value that cannot be changed.

- Product (or Regulation and Band)
- Channel Bandwidth (fixed to 20 MHz for RADWIN 1000/2000)
- Tx Power (maximum Tx power per modulation is validated)
- Antenna Type (cannot be changed for ODU with integrated antenna)
- Antenna Gain per site (cannot be changed for integrated antenna)
- Cable Loss per site (cannot be changed for integrated antenna)
- Required Fade Margin
- Rate (and Adaptive check box)
- Service Type (Ethernet Only for RADWIN 1000/2000 version 2.1)
- Required Range

Link Budget Calculator Internal Data

For each product (or Regulation and Band) the calculator stores the following data required for link budget calculations:

- Maximum Transmit power (per modulation)
- Receiver Sensitivity (per modulation) for Ethernet service and for TDM services at various BER
- Maximum linear input power (used to calculate minimum distance)

- Antenna gain and cable loss for ODU with integrated antenna
- Available Channel Bandwidths

Calculations

EIRP

$$EIRP = TxPower + AntennaGain_{SiteA} - CableLoss_{SiteA}$$

Expected RSS and Fade Margin

$$ExpectedRSS = EIRP - PathLoss + AntennaGain_{SiteB} - CableLoss_{SiteB}$$

where:

Site A is the transmitting site

Site B is the receiving site

PathLoss is calculated according to the free space model,

$$PathLoss = 32.45 + 20 \times \log_{10}(frequency_{MHz}) + 20 \times \log_{10}(RequiredRange_{Km})$$

$$ExpectedFadeMargin = Sensitivity - ExpectedRSS$$

where Sensitivity is dependent on air-rate.

Min and Max Range

MinRange is the shortest range for which

$$ExpectedRSS \leq MaxInputPower \text{ per air-rate.}$$

MaxRange (with Adaptive checked) is the largest range for which

$ExpectedRSS \geq Sensitivity$, at the highest air-rate for which this relationship is true. In a link with adaptive rate this will be the actual behavior.

MaxRange (for a given air-rate) is the largest range for which

$$ExpectedRSS \geq Sensitivity + RequiredFadeMargin .$$

Service

The Ethernet throughput is calculated according to internal product algorithms.

Availability

The Service Availability calculation is based on the Vigants Barnett method which predicts the downtime probability based on a climate factor (C factor).

$$Availability = 6 \times 10^{-7} \times Cfactor \times frequency_{GHz} \times (RequiredRange_{KM})^3 \times 10^{\frac{-ExpectedFadeMargin}{10}}$$

Antenna Height

The recommended antenna height required for line of sight is calculated as the sum the Fresnel zone height and the boresight height. See [About the Fresnel Zone](#) below.

The Fresnel zone height is calculated as:

$$0.6 \times \sqrt{\frac{300}{frequency_{GHz}} \times \left[\frac{ExpectedRange}{2} \right]^2 \div \left[\frac{ExpectedRange}{2} + \frac{ExpectedRange}{2} \right]}$$

The boresight clearance height is calculated as:

$$\sqrt{R_{Mean}^2 + \left[\frac{ExpectedRange}{2} \right]^2} - R_{Mean}$$

where $R_{Mean} = 6367.4425 Km$.

Running the Link Budget Calculator

The Link Budget Calculator is supplied on the RADWIN Manager CD. It may be run stand-alone from the CD or from the RADWIN Manager application.

➤ To run the Link Budget Calculator from the CD:

1. Insert the RADWIN Manager CD into the drive on the managing computer. In the window which opens, click the Link Budget Calculator option.
2. If the CD autorun application does not start by itself, then point your browser to

Z:\RADWIN\Setup\DATA\Link Budget Calculator.htm

where Z should be replaced with your own CD drive name.

➤ To run the Link Budget Calculator from the RADWIN Manager:

- Choose **Help | Link Budget Calculator** from the main menu of the RADWIN Manager as in the following figure:

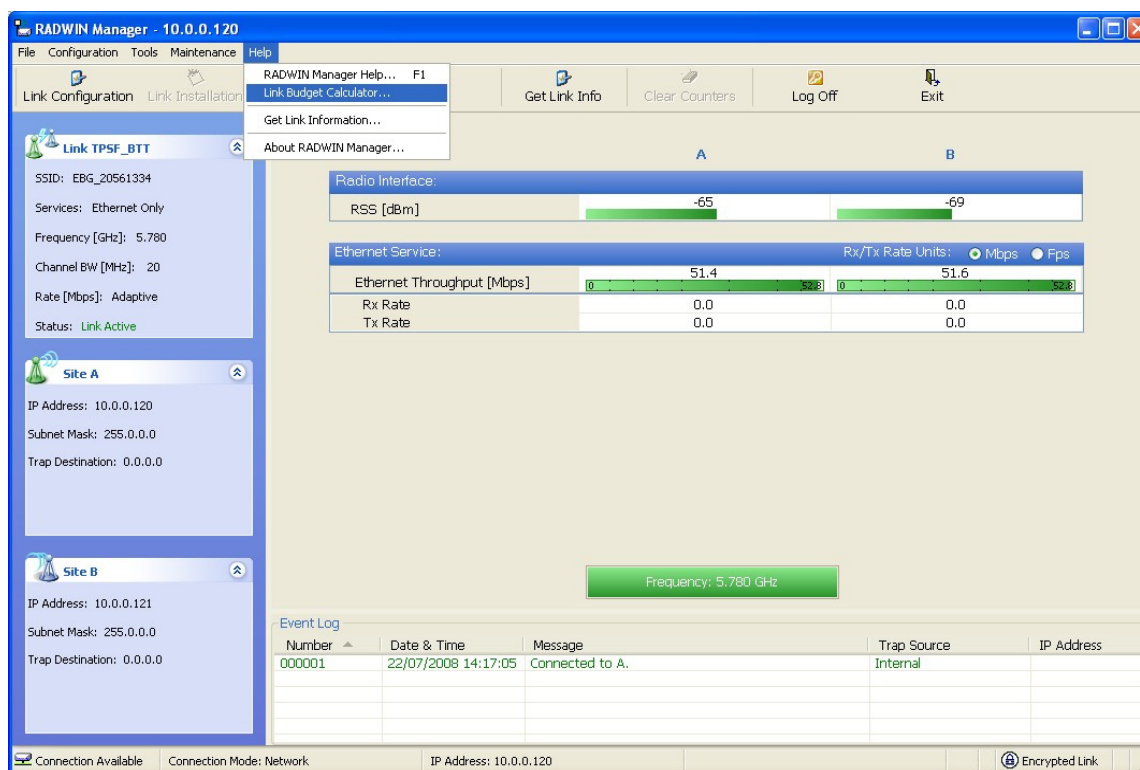


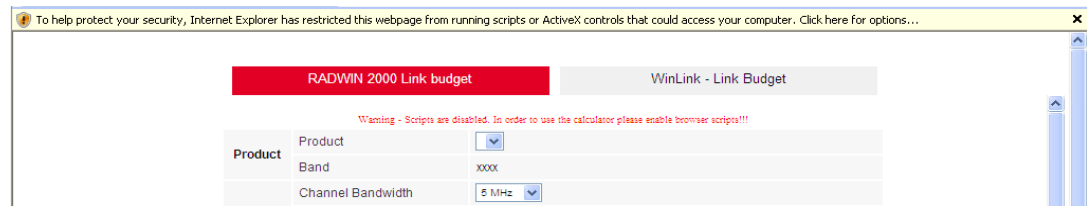
Figure D-1: Accessing the Link Budget Calculator

However invoked, your browser displays the following page:

RADWIN 2000 Link budget		WinLink - Link Budget	
Product	Product	RW-2050-0150	
	Band	5.740-5.835 GHz FCC	
Radio	Channel Bandwidth	20 MHz	
	Tx Power	18 dBm [-8 - 18]	
	Antenna Type	Dual	
	Antenna Gain	Site A 23 Site B 23 dBi	
	Cable Loss	Site A 0 Site B 0 dB	
	EIRP	41 dBm / 12.6 Watt	
	Fade Margin	6 dB	
	Rate	130 Mb/s (2 x 64-QAM 0.83) Adaptive ☒	
	Expected RSS / Fade Margin	-64 dBm	
	Range	Min	0.1 Km / 0.1 Miles
Max		15 Km / 9.3 Miles	
Required/Climate		10 Km	Coordinates / Good (C=0.25) ?
Services	Type	Ethernet Only	
	Ethernet Rate (Full Duplex)	48.5 Mb/s	
Installation	Antenna height for LOS	13 Meter / 43 Feet	
		11 Meter / 36 Feet (0.6 Fernel)	
		2 Meter / 7 Feet (Boresight clearance)	
Calculate			

Figure D-2: Link Budget Screen

- Microsoft Internet Explorer users may see a warning message like this:



Click the yellow bar and follow the instructions to allow blocked content.

- Mozilla FireFox and Google Chrome users may see a warning message like this:



You may ignore it and continue.

➤ To use the Link Budget Calculator for RADWIN 1000/2000:

1. Choose a product from the drop-down list (or choose a Regulation and Band):

RADWIN 2000 Link budget		WinLink - Link Budget	
Product	Product	RW-2050-0150	
	Band	RW-2050-0150	
Radio	Channel Bandwidth	RW-2050-0250	
	Tx Power	RW-2450-0150	
	Antenna Type	RW-2450-0250	
	Antenna Gain	RW-2850-0150	
	Cable Loss	RW-2850-0250	
	EIRP	RW-2050-0150 Universal 4.9	
	Fade Margin	RW-2050-0250 Universal 4.9	
	Rate	RW-2050-0150 Universal 5.3	
	Expected RSS / Fade Margin	RW-2050-0250 Universal 5.3	
	Range	RW-2050-0150 Universal 5.4	
Services	Type	RW-2050-0250 Universal 5.4	
	Ethernet Rate (Full Duplex)	41 dBm / 12.6 Watt	
Installation	Antenna height for LOS	6 dB	
		130 Mb/s (2 x 64-QAM 0.83) Adaptive ☒	
		-64 dBm	
Range	Min	0.1 Km / 0.1 Miles	
	Max	15 Km / 9.3 Miles	
Services	Required/Climate	10 Km	Coordinates / Good (C=0.25) ?
	Type	Ethernet Only	
Installation	Ethernet Rate (Full Duplex)	48.5 Mb/s	
	Antenna height for LOS	13 Meter / 43 Feet 11 Meter / 36 Feet (0.6 Fernel) 2 Meter / 7 Feet (Boresight clearance)	
Calculate			

Figure D-3: Product selector

2. Enter the radio details. Note that Rate is chosen from a drop-down list:

RADWIN 2000 Link budget		WinLink - Link Budget	
Product	Product	RW-2050-0150	
	Band	5.740-5.835 GHz FCC	
Radio	Channel Bandwidth	20 MHz	
	Tx Power	25 dBm [-8 - 25]	
	Antenna Type	Dual	
	Antenna Gain	Site A 23 Site B 23 dBi	
	Cable Loss	Site A 0 Site B 0 dB	
	EIRP	48 dBm / 63.1 Watt	
	Fade Margin	6 dB	
	Rate	39 Mb/s (2 x QPSK 0.75) Adaptive ☐	
	Expected RSS / Fade Margin	13 Mb/s (2 x BPSK 0.5) 26 Mb/s (2 x QPSK 0.5) 39 Mb/s (2 x QPSK 0.75) 52 Mb/s (2 x 16-QAM 0.5) 78 Mb/s (2 x 16-QAM 0.75) 104 Mb/s (2 x 64-QAM 0.66) 117 Mb/s (2 x 64-QAM 0.75) 130 Mb/s (2 x 64-QAM 0.83)	
	Range	Min	13 Meter / 43 Feet
	Max	11 Meter / 36 Feet (0.6 Fernel)	
	Required/Climate	130 Mb/s (2 x 64-QAM 0.83) rates / Good (C=0.25) ?	
Services	Type	Ethernet Only @ 99.9999% availability (downtime 1 min/year)	
	Ethernet Rate (Full Duplex)	14.5 Mb/s	
Installation	Antenna height for LOS	13 Meter / 43 Feet	
		11 Meter / 36 Feet (0.6 Fernel)	
		2 Meter / 7 Feet (Boresight clearance)	
Calculate			

Figure D-4: Rate selector

The **Rate** shown, defines the air-interface rate in Mbps. The system operates in TDD mode and has the overhead of the air-interface protocol. Thus, the Ethernet actual throughput is provided by the **Ethernet Rate**.



For a given air-rate, Ethernet throughput will decrease with increasing range due to propagation delay.

The Fade margin is the minimum required for LOS conditions. For degraded link conditions, a larger Fade margin should be used.

The EIRP is given in dBm and Watts.

3. If the required range between the two link sites is known, you may enter it directly. Alternatively, you may enter the latitude and longitude of each site in the link, in which case the distance between them will be calculated and displayed.

RADWIN 2000 Link budget			WinLink - Link Budget	
Product	Product	RW-2050-0150		
	Band	5.740-5.835 GHz FCC		
Radio	Channel Bandwidth	20 MHz		
	Tx Power	18 dBm [-8 - 18]		
	Antenna Type	Dual		
	Antenna Gain	Site A 23 Site B 23 dBi		
	Cable Loss	Site A 0 Site B 0 dB		
		41 dBm / 12.6 Watt		
Name	Site A	Site B	6 dB	
Latitude			130 Mb/s (2 x 64-QAM 0.83) Adaptive ☒	
Longitude			-64 dBm	
Antenna Height (m)	10	10	0.1 Km / 0.1 Miles	
		15 Km / 9.3 Miles		
		10 Km / Coordinates / Average (C=1) ?		
Services	Type	Ethernet Only		
	Ethernet Rate (Full Duplex)	48.5 Mb/s		
Installation	Antenna height for LOS	13 Meter / 43 Feet		
		11 Meter / 36 Feet (0.6 Fernel)		
		2 Meter / 7 Feet (Boresight clearance)		
Calculate				

Figure D-5: Calculation of distance from site coordinates

4. Located to the right of the green Coordinates button is a dropdown list of Climactic C Factor values.

RADWIN 2000 Link budget		WinLink - Link Budget	
Product	Product	RW-2050-0150	
	Band	5.740-5.835 GHz FCC	
Radio	Channel Bandwidth	20 MHz	
	Tx Power	25 dBm [-8 - 25]	
	Antenna Type	Dual	
	Antenna Gain	Site A 23 Site B 23 dBi	
	Cable Loss	Site A 0 Site B 0 dB	
	EIRP	48 dBm / 63.1 Watt	
	Fade Margin	6 dB	
	Rate	39 Mb/s (2 x QPSK 0.75) Adaptive ☐	
	Expected RSS / Fade Margin	-57 dBm / 26 dB	
	Range	Min	0.2 Km / 0.1 Miles
Max		109 Km / 67.7 Miles	
Required/Climate		10 Km	Coordinates / Average (C=1) ?
Services	Type	Ethernet Only @ 99.9995% avail	Average (C=1) in/year
	Ethernet Rate (Full Duplex)	14.5 Mb/s	
Installation	Antenna height for LOS	13 Meter / 43 Feet	
		11 Meter / 36 Feet (0.6 Fernel)	
		2 Meter / 7 Feet (Boresight clearance)	
Calculate			

Figure D-6: Climactic C Factors

For help about what these mean, click the ? button to the right of the list in [figure D-6](#).

RADWIN 2000 Link budget

WinLink - Link Budget

Climate/Terrain Factor

Value	Description
Good (C=0.25)	Mountains and dry climate
Average (C=1)	Average terrain and climate
Moderate (C=2)	Moderate terrain and climate
Difficult (C=4)	Over water or humid climate
Very Difficult (C=6)	Extreme humid climate

Close

Product	Product: RW-2050-0150
	Band: 5.740-5.835 GHz FCC
	Channel Bandwidth: 20 MHz
	Tx Power: 25 dBm [-8 - 25]
	Antenna Type: Dual
	Antenna Gain: Site A 23 Site B 23 dBi
	Cable Loss: Site A 0 Site B 0 dB
	EIRP: 48 dBm / 63.1 Watt
	Fade Margin: 6 dB
	Rate: 39 Mb/s (2 x QPSK 0.75) Adaptive ☐
	Expected RSS / Fade Margin: -57 dBm / 26 dB
	Min: 0.2 Km / 0.1 Miles
	Max: 109 Km / 67.7 Miles
	Required/Climate: 10 Km Coordinates / Average (C=1) ?
	Type: Ethernet Only @ 99.9995% availability (downtime 3 min/year)
	Ethernet Rate (Full Duplex): 14.5 Mb/s
Installation	Antenna height for LOS: 13 Meter / 43 Feet 11 Meter / 36 Feet (0.6 Fernel) 2 Meter / 7 Feet (Boresight clearance)
Calculate	

Figure D-7: Climactic C Factor description

In [figure D-8](#) we display a map of the world showing C Factor contours:

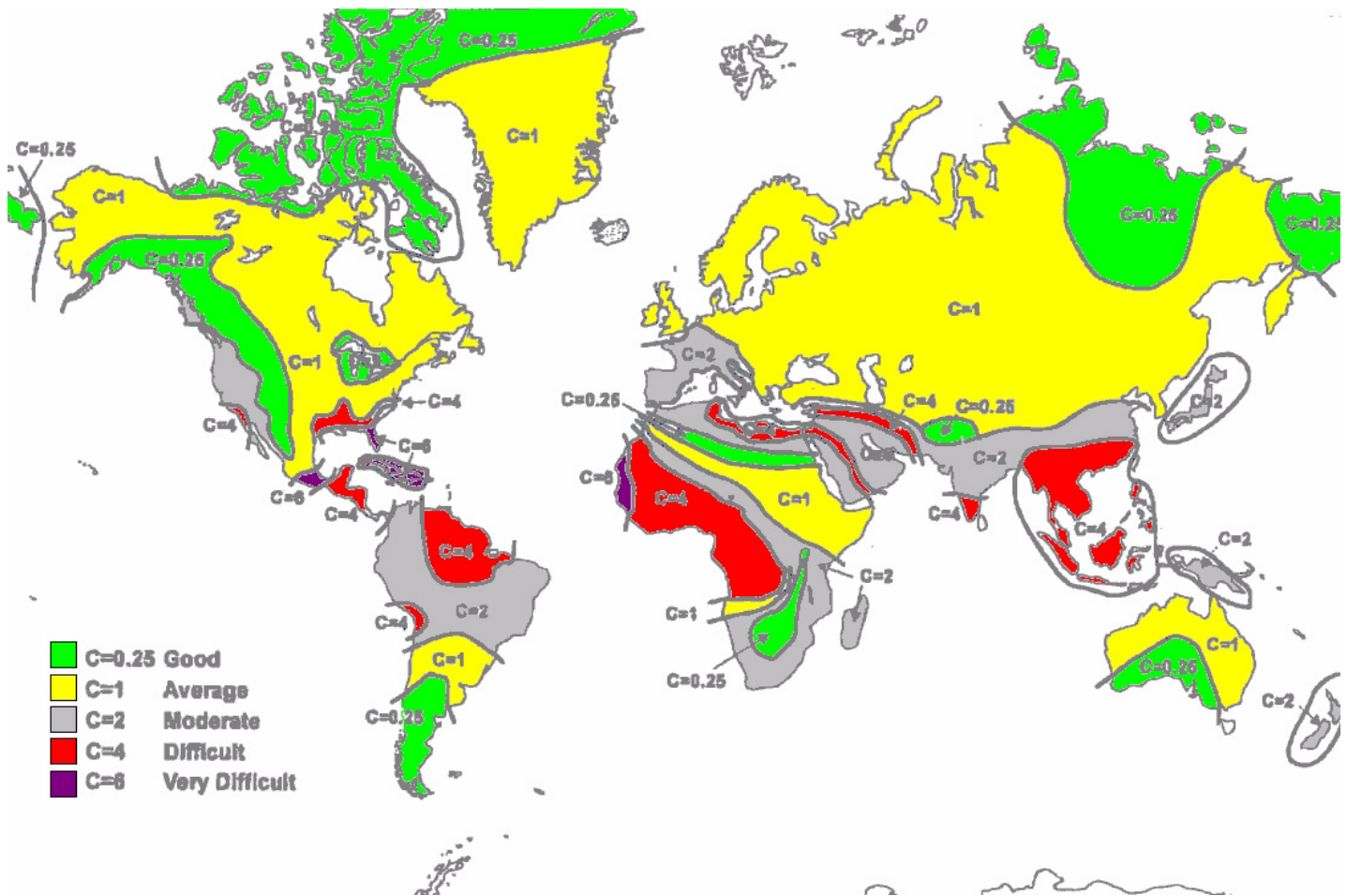


Figure D-8: World map showing C Factor contours

5. Click **Calculate** to obtain the required performance estimate.



Placing the cursor in any other calculated field will also update the calculated results.

The Expected Performance parameters are calculated and displayed:

- **Expected RSS** - the expected RSS that the RADWIN Manager shows when the RADWIN 1000/2000 ODUs are optimally aligned
- **Ethernet Rate** - maximum throughput available for the chosen parameter combination
- **Antenna height for LOS** – the minimum antenna height required for line-of-sight operation. It is the sum of the height required for boresight clearance due to the earth's curvature plus the height required to clear the Fresnel zone

If the expected performance is not suitable for your application, try different parameters and repeat the calculation.

About the Fresnel Zone

The Fresnel zone (pronounced "frA-nel", with a silent "s") is an elliptically shaped conical zone of electromagnetic energy that propagates from the transmitting antenna to the receiving antenna. It is always widest in the middle of the path between the two antennas.

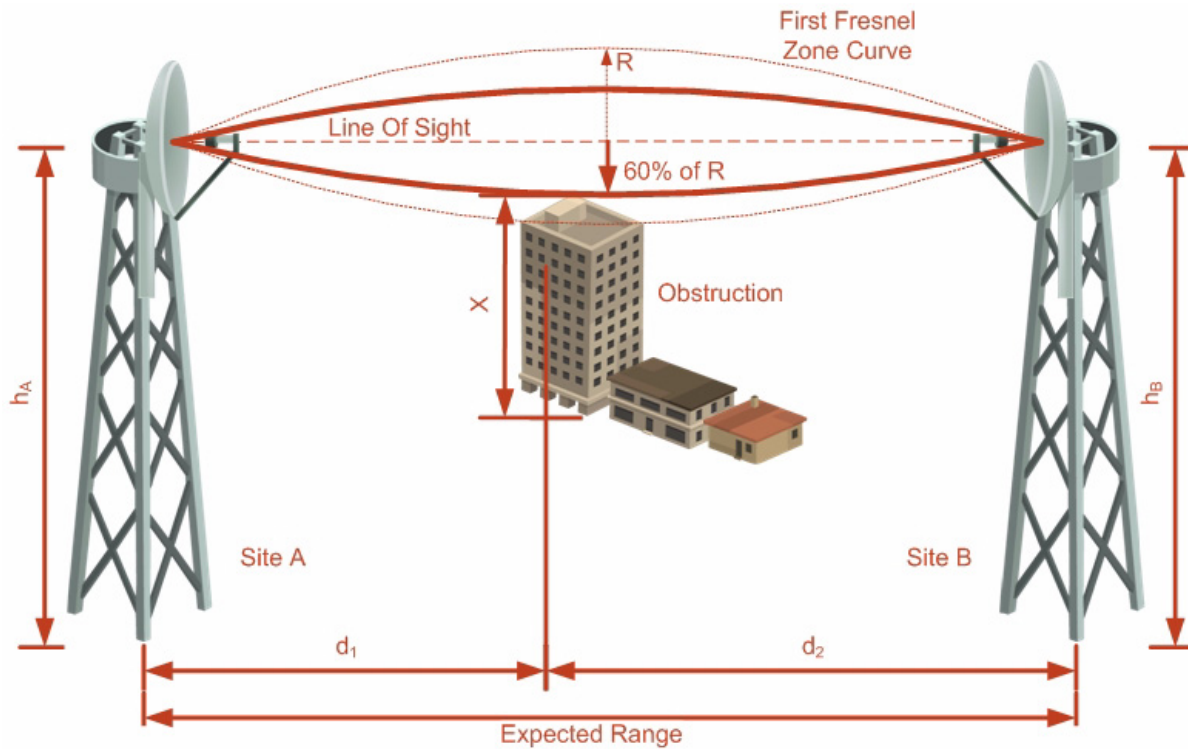


Figure D-9: Fresnel zone

Fresnel loss is the path loss occurring from multi-path reflections from reflective surfaces such as water, and intervening obstacles such as buildings or mountain peaks within the Fresnel zone.

Radio links should be designed to accommodate obstructions and atmospheric conditions, weather conditions, large bodies of water, and other reflectors and absorbers of electromagnetic energy.

The Fresnel zone provides us with a way to calculate the amount of clearance that a wireless wave needs from an obstacle to ensure that the obstacle does not attenuate the signal.

There are infinitely many Fresnel zones located coaxially around the center of the direct wave. The outer boundary of the first Fresnel zone is defined as the combined path length of all paths, which are half wavelength ($1/2 \lambda$) of the frequency transmitted longer than the direct path. If the total path distance is one wavelength (1λ) longer than the direct path, then the outer boundary is said to be two Fresnel zones. Odd number Fresnel zones reinforce the direct wave path signal; even number Fresnel zones cancel the direct wave path signal.

The amount of the Fresnel zone clearance is determined by the wavelength of the signal, the path length, and the distance to the obstacle. For reliability, point-to-point links are designed to have at least 60% of the first Fresnel zone clear to avoid significant attenuation.

The concept of the Fresnel zone is shown in **figure D-9** above. The top of the obstruction does not extend far into the Fresnel zone, leaving 60% of the Fresnel zone clear; therefore, the signal is not significantly attenuated.

For more about Fresnel zone, see http://en.wikipedia.org/wiki/Fresnel_zone.

Lightning Protection and Grounding Guidelines

Meticulous implementation of the guidelines in this appendix will provide best protection against electric shock and lightning.



Warning

100% protection is neither implied nor possible.



Note

This appendix is at best a guide. The actual degree of lightning protection required depends on local conditions and regulations.

The RADWIN 1000/2000™ Lightning protection system consists of the following components:

- Grounding for the antenna coax cable
- Grounding for each IDU and ODU
- External Primary Surge Suppressor units and grounding for the outdoor cable
- Internal ESD protection circuits over the Power/Telecom lines

Grounding for Antenna Cable

A Grounding Kit must be connected to the coax antenna cable and reliably grounded as shown in Figure X. The grounding kit is an Andrew Type 223158-2 (www.andrew.com). See [figure E-1](#) below.

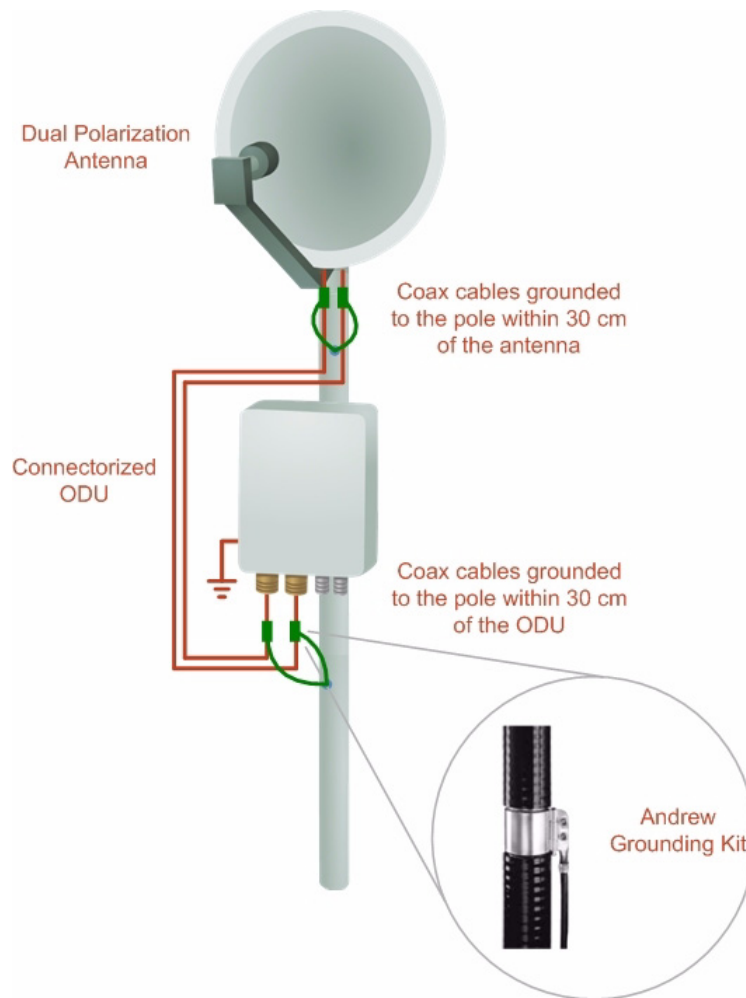


Figure E-1: Grounding antenna cables

Grounding for Indoor/Outdoor Units

ODU Grounding

RADWIN 1000/2000™ uses a Shielded CAT-5e cable to interconnect the Outdoor (ODU) and Indoor (IDU) units.

However, this shielding does not provide a good Lightning Discharge path, since it can not tolerate the high Lightning Current surges.

To provide an alternate Lightning Discharge path, the ODU and antenna grounding posts should be connected to ground point by a 10 AWG short copper wire.

The device should be permanently connected to ground.

IDU Grounding

The IDUs grounding post should be connected to the internal ground point, using a grounding wire of at least 10 AWG. The grounding wire should be connected to a grounding rod or the building grounding system.

The device should be permanently connected to ground.

External Lightning Surge Suppressors and Grounding

A Grounding Kit and Surge Arrestor Unit must be located near the ODU and properly grounded as illustrated in [figure E-2](#) and [figure E-3](#) below:

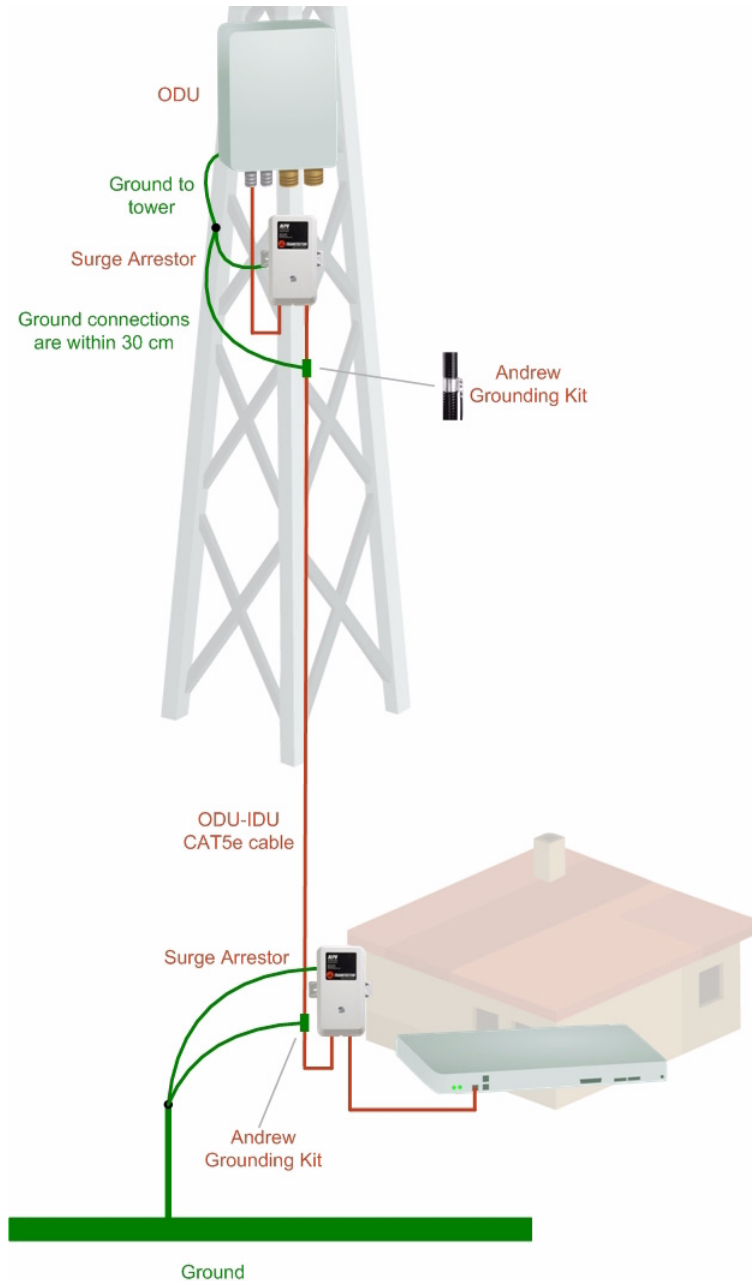


Figure E-2: Grounding a typical pole installation

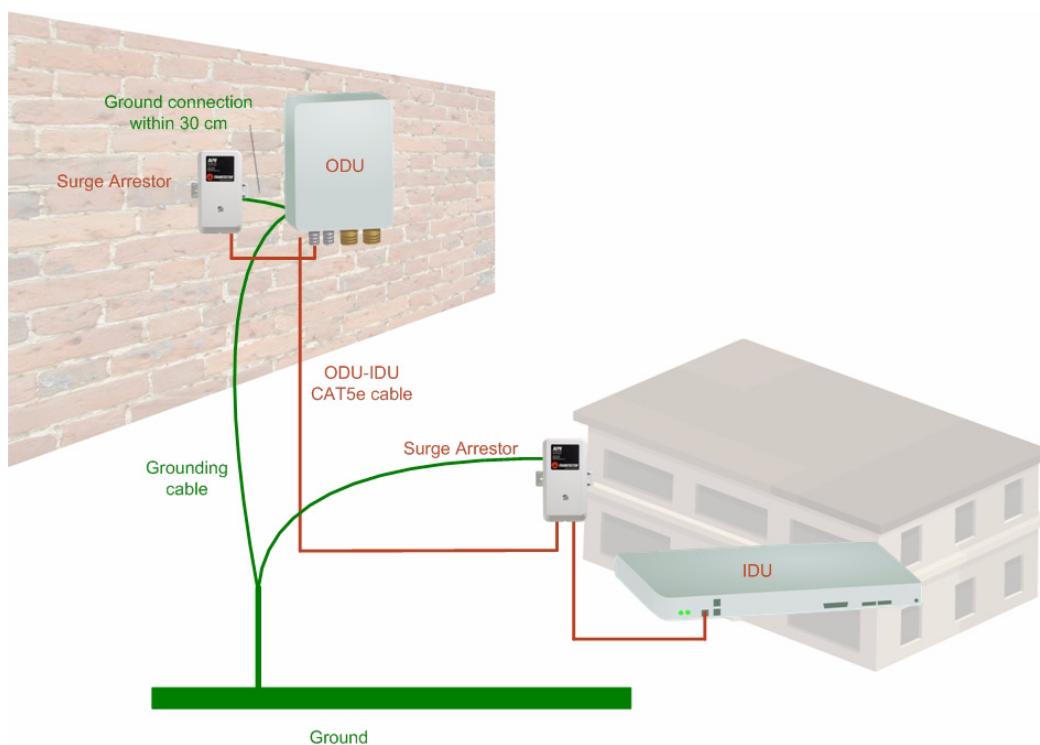


Figure E-3: Grounding a typical wall installation

The next figure shows a close-up of the rear of grounded ODU:

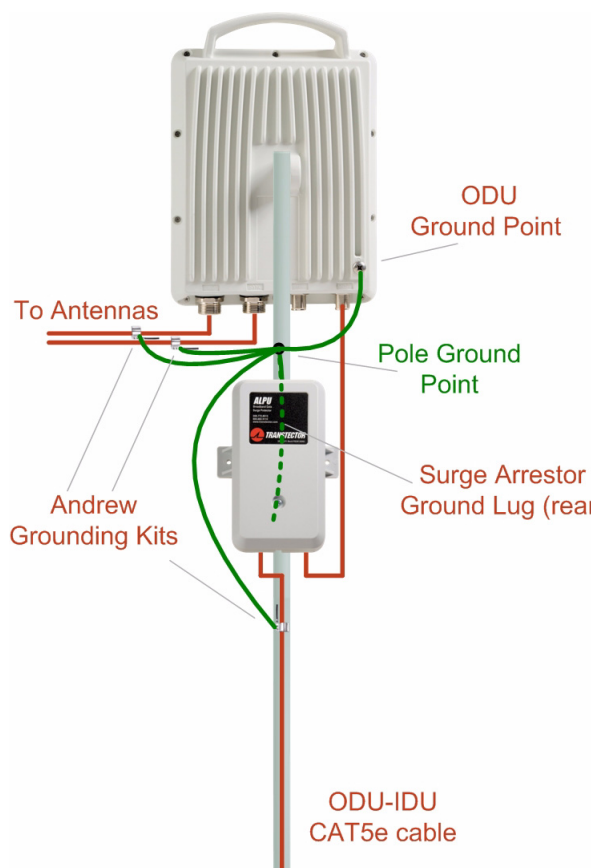


Figure E-4: ODU Surge Suppressor and grounding

The Transtector protection circuits shown in [figure E-5](#) below, utilize silicon avalanche diode technology. The unit consists of an outdoor rated NEMA 3R type enclosure with easy mounting flanges, ground stud attachment and easy wiring.

The ALPU-POE features RJ-45 protection circuits for the ODU-IDU data pairs (pins 1,2 & 3,6) and DC power (pins 4,5 & 6,7 with the pairs bonded).

The unit is designed to be wall mounted. An optional set of bracket is available to allow a wide range of pole mount applications. A dedicated ground stud is provided inside the unit that must be bonded to the nearest grounding system (or Master Ground bar) for proper surge protection.

The system wiring is installed with RJ-45 type connectors that can feed directly into the chassis without having to cut, splice or route through awkward strain relief holes.



Figure E-5: Transtector's Surge Suppressor

➤ **To mount the lightning protection devices:**

1. Mount the device as close to the ODU as possible. Mount the unit so that the cable connectors are at the bottom (to prevent water from penetrating), with the strain reliefs facing the ground.
2. Remove the cover by unscrewing the front of the unit.
3. Mount the unit to an outside surface using the two mounting holes.
4. Connect the ODU-IDU cable using the RJ-45 jack.
5. Connect one cable between the ODU and the suppressor using an RJ-45 jack.
6. Connect the suppressor's ground stud to a grounding point. Use the appropriate wire gauge and type, keeping the wire as short as possible, less than 1m (3'), between the stud and the site grounding point.

7. Replace the cover.



There may also be regulatory requirements to cross bond the ODU-IDU CAT-5e cable at regular intervals up the mast. This may be as frequent as every 10 meters (33 feet).

A second Surge Arrestor Unit should be mounted at the building entry point and must be grounded, as shown in [figure E-3](#) above.

➤ **To mount the lightning protection at the building entry point:**

1. Mount the device outside the building, located as near as possible to the entrance of the CAT-5e ODU-IDU cable. Mount the unit so that the cable connectors are at the bottom (to prevent water from penetrating), with the strain reliefs facing the ground.
2. Remove the cover by unscrewing the front of the unit.
3. Mount the unit to an outside surface using the two mounting holes.
4. Connect the ODU-IDU cable using the RJ-45 jack.
5. Connect one cable between the IDU and the suppressor using an RJ-45 jack.
6. Connect the suppressor's ground stud to a grounding point. Use the appropriate wire gauge and type, keeping the wire as short as possible, less than 1m (3'), between the stud and the site grounding point.
7. Replace the cover

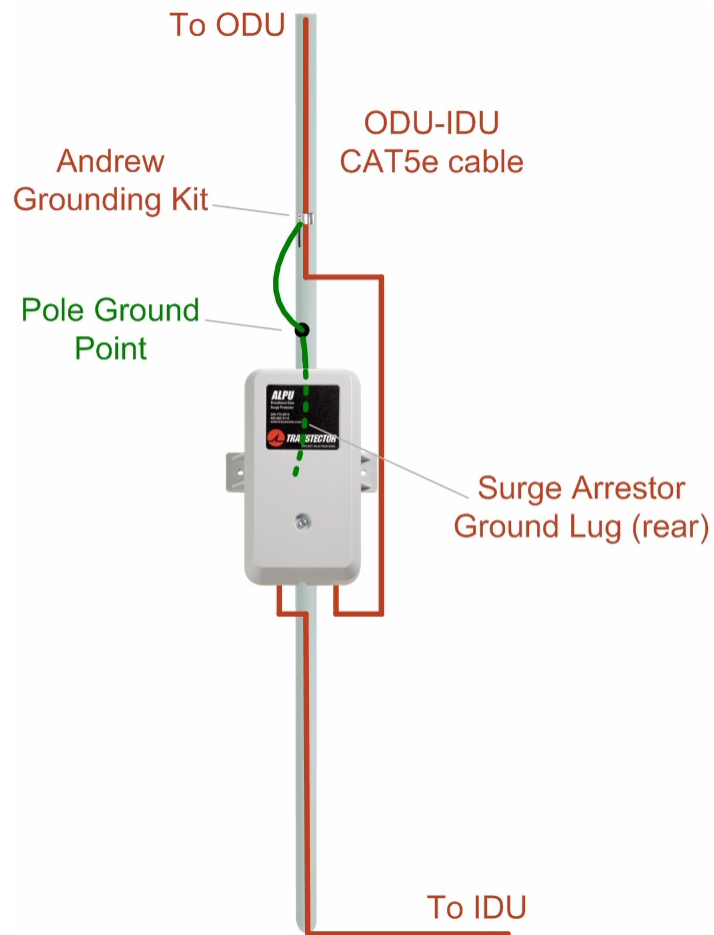


Figure E-6: Surge Suppressor and grounding at building entry point

Internal ESD Protection circuits

RADWIN 1000/2000™ is designed to meet the ETSI/FCC/Aus/NZ/CSA EMC and Safety requirements. To fulfill these requirements, the system's Telecom lines at the ODU/IDU are Transformer-isolated and include internal ESD (Electro-Static-Discharge) Protection circuits.

MIB Reference

Introduction

About the MIB

The RADWIN MIB is a set of APIs that enables external applications to control RADWIN equipment.

The MIB is divided into public and a private API groups:

- **Public:** RFC-1213 (MIB II) variables, RFC-1214 (MIB II) System and Interfaces sections
- **Private:** Controlled by RADWIN and supplements the public group.

This appendix describes the public and private MIB used by RADWIN.

Terminology

The following terms are used in this appendix.

Term	Meaning
MIB	Management Information Base
API	Application Programming Interface
SNMP	Simple Network Management Protocol

In addition, the MIB uses internally, the older notions of **Local site** and **Remote site** where this manual would use site A and site B.

To avoid burdening the reader, this appendix will follow the MIB usage.

Interface API

Control Method

The RADWIN Manager application provides all the means to configure and monitor a RADWIN 1000/2000 link, communicating with the SNMP agent in each ODU. Each SNMP agent contains data on each of the IDUs and ODUs

in the link. Both agents communicate with each other over the air using a proprietary protocol.

**Note**

Each ODU has a single MAC address and a single IP address.

To control and configure the device using the MIB, you should adhere to the following rules:

- The connection for control and configuration is to the local site, over any SNMP/UDP/IP network.
- All Parameters should be consistent between both of the ODUs. Note that inconsistency of air parameters can break the air connection. To correct air parameters inconsistency you must reconfigure each of the ODUs.
- Common practice is to configure the remote site first and then to configure the local site.
- For some of the configuration parameters additional action must be taken before the new value is loaded. Please refer to the operation in the parameters description.
- Some of the MIB parameters values are product dependent. It is strongly recommend using the RADWIN Manager Application for changing these values. Setting wrong values may cause indeterminate results.

Community String

To control a link, all SNMP requests should go to the local site IP address.

The RADWIN Manager uses the Read Community strings **public** for the local ODU and **public-remote** for the remote ODU. It uses Write Community strings **netman** for the local ODU and **netman-remote** for the remote ODU. These are the factory defaults.

Private MIB Structure

The sections in the private RADWIN MIB and its location in the MIB tree are shown in [figure F-1](#) below:

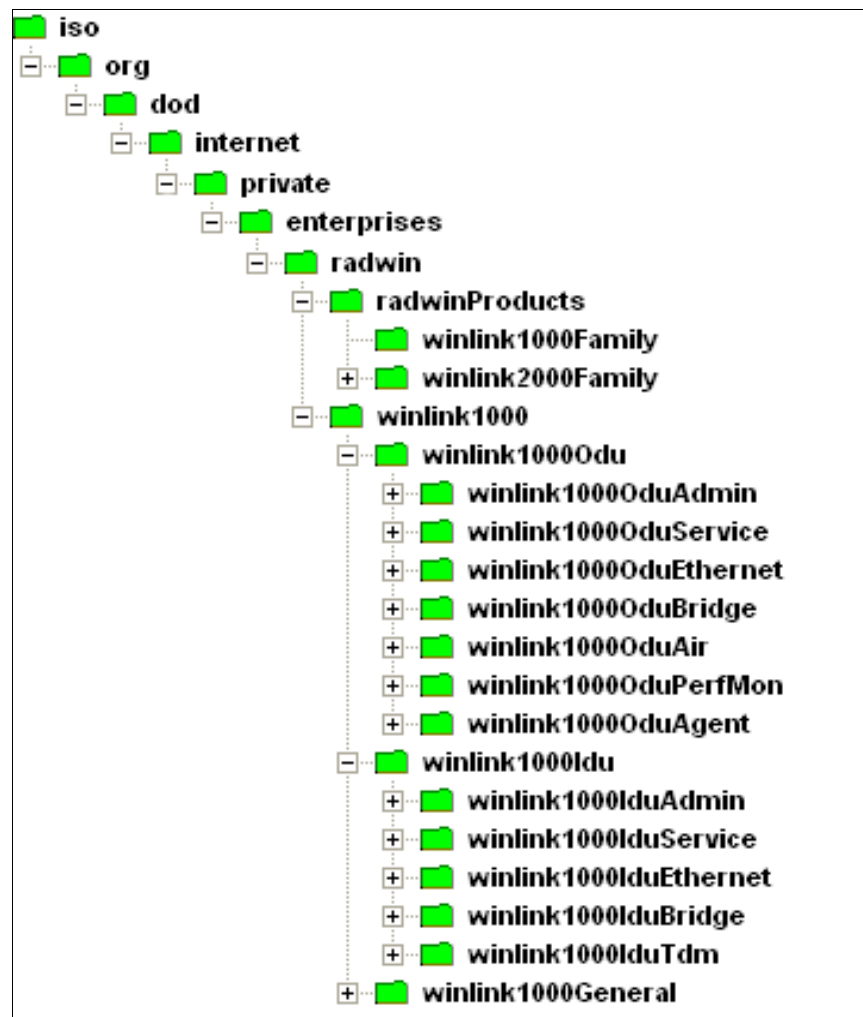


Figure F-1: Top Level Sections of the private MIB

The products MIB section contains the definition of the Object IDs for the two form factors of the ODU, Integrated Antenna and Connectorized (referred in the MIB as **external antenna**):



The ODU MIB contains the sections: Admin, Service, Ethernet, Bridge, Air, PerfMon and Agent.

The IDU MIB contains the sections: Admin, Service, Ethernet, Bridge and TDM.

The general MIB include a single generic parameter that is used by all traps as a trap description parameter.

MIB Parameters

The following section describes all of the MIB parameters. The MIB parameters follow the following naming convention:

<winlink1000><Section 1>...<Section n><Parameter Name>

For each of the configuration and control parameters (parameters with read-write access), the "Description" column describes when the new value is effective. It is recommended that you perform the appropriate action to make the values effective immediately after any change. Where a change is required on both sides of the link, it is recommended that you change both sides of the link first and then perform the action.

Supported Variables from the RFC 1213 MIB

Table F-1: Supported RFC 1213 Variables (Sheet 1 of 2)

Name	OID	Type	Access	Description
ifIndex	.1.3.6.1.2.1.2.2.1.1.x ^a	Integer	RO	A unique value for each interface. Its value ranges between 1 and the value of ifNumber. The value for each interface must remain constant at least from one re-initialization of the entity's network management system to the next re-initialization.
ifDescr	.1.3.6.1.2.1.2.2.1.2	DisplayString	RO	A textual string containing information about the interface. This string should include the name of the manufacturer, the product name and the version of the hardware interface.
ifType	.1.3.6.1.2.1.2.2.1.3	Integer	RO	The type of interface, distinguished according to the physical/link protocol(s) immediately 'below' the network layer in the protocol stack.
ifSpeed	.1.3.6.1.2.1.2.2.1.5	Gauge	RO	An estimate of the interface's current bandwidth in bits per second. For interfaces which do not vary in bandwidth or for those where no accurate estimation can be made, this object should contain the nominal bandwidth.
ifPhysAddress	.1.3.6.1.2.1.2.2.1.6	Phys-Address	RO	The interface's address at the protocol layer immediately 'below' the network layer in the protocol stack. For interfaces which do not have such an address (e.g., a serial line), this object should contain an octet string of zero length.
ifAdminStatus	.1.3.6.1.2.1.2.2.1.7	Integer	RW	The desired state of the interface. The testing(3) state indicates that no operational packets can be passed.
ifOperStatus	.1.3.6.1.2.1.2.2.1.8	Integer	RO	The current operational state of the interface. The testing(3) state indicates that no operational packets can be passed.
ifInOctets	.1.3.6.1.2.1.2.2.1.10.x	Counter	RO	The total number of octets received on the interface, including framing characters.
ifInUcastPkts	.1.3.6.1.2.1.2.2.1.11.x	Counter	RO	The number of subnetwork-unicast packets delivered to a higher-layer protocol.
ifInNUcastPkts	.1.3.6.1.2.1.2.2.1.12.x	Counter	RO	The number of non-unicast (i.e., subnetwork-broadcast or subnetwork-multicast) packets delivered to a higher-layer protocol.

Table F-1: Supported RFC 1213 Variables (Sheet 2 of 2)

Name	OID	Type	Access	Description
ifInErrors	.1.3.6.1.2.1.2.2.1.14.x	Counter	RO	The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
ifOutOctets	.1.3.6.1.2.1.2.2.1.16.x	Counter	RO	The total number of octets transmitted out of the interface, including framing characters.
ifOutUcastPkts	.1.3.6.1.2.1.2.2.1.17.x	Counter	RO	The total number of packets that higher-level protocols requested be transmitted to a subnetwork-unicast address, including those that were discarded or not sent.
ifOutNUcastPkts	.1.3.6.1.2.1.2.2.1.18.x	Counter	RO	The total number of packets that higher-level protocols requested be transmitted to a non-unicast (i.e., a subnetwork-broadcast or subnetwork-multicast) address, including those that were discarded or not sent.

a. x is the interface ID

MIB Parameters

Table F-2: Private MIB Parameters (Sheet 1 of 14)

Name	OID	Type	Access	Description
winlink1000OduAdmProductType	1.3.6.1.4.1.4458.1000.1.1.1	DisplayString	RO	ODU configuration description.
winlink1000OduAdmHwRev	1.3.6.1.4.1.4458.1000.1.1.2	DisplayString	RO	ODU Hardware Version.
winlink1000OduAdmSwRev	1.3.6.1.4.1.4458.1000.1.1.3	DisplayString	RO	ODU Software Version.
winlink1000OduAdmLinkName	1.3.6.1.4.1.4458.1000.1.1.4	DisplayString	RW	Link Name. A change is effective immediately.
winlink1000OduAdmResetCmd	1.3.6.1.4.1.4458.1000.1.1.5	Integer	RW	Reset Command. A set command with a value of 3 will cause a device reset. The read value is always 0.
winlink1000OduAdmAddress	1.3.6.1.4.1.4458.1000.1.1.6	IpAddress	RW	ODU IP address. A change is effective after reset. The parameter is kept for backward compatibility. Using the alternative parameter: winlink1000OduAdmIpParamsCnfg is recommended.
winlink1000OduAdmMask	1.3.6.1.4.1.4458.1000.1.1.7	IpAddress	RW	ODU Subnet Mask. A change is effective after reset. The parameter is kept for backward compatibility. Using the alternative parameter: winlink1000OduAdmIpParamsCnfg is recommended.
winlink1000OduAdmGateway	1.3.6.1.4.1.4458.1000.1.1.8	IpAddress	RW	ODU default gateway. A change is effective after reset. The parameter is kept for backward compatibility. Using the alternative parameter: winlink1000OduAdmIpParamsCnfg is recommended.
winlink1000OduAdmBroadcast	1.3.6.1.4.1.4458.1000.1.1.10	Integer	RW	This parameter is reserved for the Manager application provided with the product.
winlink1000OduAdmHostsTable			N/A	Trap destinations table. Each trap destination is defined by an IP address and a UDP port. Up to 10 addresses can be configured.
winlink1000OduAdmHostsEntry			N/A	Trap destinations table entry.
winlink1000OduAdmHostsIndex			RO	Trap destinations table index.
winlink1000OduAdmHostsIp	1.3.6.1.4.1.4458.1000.1.1.12.1.2	IpAddress	RW	Trap destination IP address. A change is effective immediately.

Table F-2: Private MIB Parameters (Sheet 2 of 14)

Name	OID	Type	Access	Description
winlink1000OduAdmHostsPort	1.3.6.1.4.1.4458.1000.1.1.12.1.3	Integer	RW	UDP port of the trap destination. A change is effective immediately.
winlink1000OduBuzzerAdminState	1.3.6.1.4.1.4458.1000.1.1.13	Integer	RW	This parameter controls the activation of the buzzer while the unit is in install mode. A change is effective immediately. The valid values are: disabled (0) enabled (1).
winlink1000OduProductId	1.3.6.1.4.1.4458.1000.1.1.14	DisplayString	RO	This parameter is reserved for the Manager application provided with the product.
winlink1000OduReadCommunity	1.3.6.1.4.1.4458.1000.1.1.15	DisplayString	RW	Read Community String. This parameter always returns ***** when retrieving its value. It is used by the Manager application to change the Read Community String. The SNMP agent accepts only encrypted values.
winlink1000OduReadWriteCommunity	1.3.6.1.4.1.4458.1000.1.1.16	DisplayString	RW	Read/Write Community String. This parameter always returns ***** when retrieving its value. It is used by the Manager application to change the Read/Write Community String. The SNMP agent accepts only encrypted values.
winlink1000OduTrapCommunity	1.3.6.1.4.1.4458.1000.1.1.17	DisplayString	RW	Trap Community String. This parameter is used by the Manager application to change the Trap Community String. The SNMP agent accepts only encrypted values.
winlink1000OduAdmSnmpAgentVersion	1.3.6.1.4.1.4458.1000.1.1.18	Integer	RO	Major version of the SNMP agent.
winlink1000OduAdmRemoteSiteName	1.3.6.1.4.1.4458.1000.1.1.19	DisplayString	RO	Remote site name. Returns the same value as sysLocation parameter of the remote site.
winlink1000OduAdmSnmpAgentMinorVersion	1.3.6.1.4.1.4458.1000.1.1.20	Integer	RO	Minor version of the SNMP agent.
winlink1000OduAdmLinkPassword	1.3.6.1.4.1.4458.1000.1.1.21	DisplayString	RW	Link Password. This parameter always returns ***** when retrieving its value. It is used by the Manager application to change the Link Password. The SNMP agent accepts only encrypted values.
winlink1000OduAdmSiteLinkPassword	1.3.6.1.4.1.4458.1000.1.1.22	DisplayString	RW	Site Link Password. This parameter always returns ***** when retrieving its value. It is used by the Manager application to change the Link Password of the site. The SNMP agent accepts only encrypted values.
winlink1000OduAdmDefaultPassword	1.3.6.1.4.1.4458.1000.1.1.23	Integer	RO	This parameter indicates if the current Link Password is the default password.
winlink1000OduAdmConnectionType	1.3.6.1.4.1.4458.1000.1.1.24	Integer	RO	This parameter indicates if the Manager application is connected to the local ODU or to the remote ODU over the air. A value of 'unknown' indicates community string mismatch.
winlink1000OduAdmBackToFactorySettingsCmd	1.3.6.1.4.1.4458.1000.1.1.25	Integer	RW	Back to factory settings Command. A change is effective after reset. The read value is always 0.
winlink1000OduAdmIpParamsCnfg	1.3.6.1.4.1.4458.1000.1.1.26	DisplayString	RW	ODU IP address Configuration. The format is: <IP_Address> <Subnet_Mask> <Default_Gateway>
winlink1000OduAdmVlanID	1.3.6.1.4.1.4458.1000.1.1.27	Integer	RW	VLAN ID. Valid values are 1 to 4094. Initial value is 0 meaning VLAN unaware.
winlink1000OduAdmVlanPriority	1.3.6.1.4.1.4458.1000.1.1.28	Integer	RW	VLAN Priority. 0 is lowest priority 7 is highest priority.
winlink1000OduAdmSN	1.3.6.1.4.1.4458.1000.1.1.29	DisplayString	RO	IDU Serial Number
winlink1000OduSrvMode	1.3.6.1.4.1.4458.1000.1.2.1	Integer	RW	System mode. The only value that can be set is installMode; normalMode reserved to the Manager application provided with the product. A change is effective after link re-synchronization.

Table F-2: Private MIB Parameters (Sheet 3 of 14)

Name	OID	Type	Access	Description
winlink1000OduSrvBridging	1.3.6.1.4.1.4458.1000.1.2.3	Integer	RO	Bridging Mode. Valid values are: disabled (0) enabled (1).
winlink1000OduEthernetRemainingRate	1.3.6.1.4.1.4458.1000.1.3.1	Integer	RO	Current Ethernet bandwidth in bps.
winlink1000OduEthernetIfTable			N/A	ODU Ethernet Interface table.
winlink1000OduEthernetIfEntry			N/A	ODU Ethernet Interface table entry.
winlink1000OduEthernetIfIndex	1.3.6.1.4.1.4458.1000.1.3.2.1.1	Integer	RO	ODU Ethernet Interface Index.
winlink1000OduEthernetIfAddress	1.3.6.1.4.1.4458.1000.1.3.2.1.5	DisplayString	RO	ODU MAC address.
winlink1000OduEthernetIfAdminStatus	1.3.6.1.4.1.4458.1000.1.3.2.1.6	Integer	RW	Required state of the interface.
winlink1000OduEthernetIfOperStatus	1.3.6.1.4.1.4458.1000.1.3.2.1.7	Integer	RO	Current operational state of the interface.
winlink1000OduEthernetIfFailAction	1.3.6.1.4.1.4458.1000.1.3.2.1.8	Integer	RW	Failure action of the interface.
winlink1000OduEthernetNumOfPorts	1.3.6.1.4.1.4458.1000.1.3.3	Integer	RO	Number of ODU network interfaces.
winlink1000OduBridgeBasePortTable			N/A	ODU Bridge Ports table.
winlink1000OduBridgeBasePortEntry			N/A	ODU Bridge Ports table entry.
winlink1000OduBridgeBasePortIndex			RO	ODU Bridge Port Number.
winlink1000OduBridgeBaseIfIndex			RO	IfIndex corresponding to ODU Bridge port.
winlink1000OduBridgeTpMode	1.3.6.1.4.1.4458.1000.1.4.4.101	Integer	RW	ODU bridge mode. A change is effective after reset. Valid values: hubMode (0) bridgeMode (1).
winlink1000OduBridgeTpPortTable			N/A	ODU Transparent Bridge Ports table.
winlink1000OduBridgeTpPortEntry			N/A	ODU Transparent Bridge Ports table entry.
winlink1000OduBridgeTpPortIndex			RO	ODU Transparent Bridge Port Number.
winlink1000OduBridgeTpPortInFrames	1.3.6.1.4.1.4458.1000.1.4.4.3.1.3	Counter	RO	Number of frames received by this port.
winlink1000OduBridgeTpPortOutFrames	1.3.6.1.4.1.4458.1000.1.4.4.3.1.4	Counter	RO	Number of frames transmitted by this port.
winlink1000OduBridgeTpPortInBytes	1.3.6.1.4.1.4458.1000.1.4.4.3.1.101	Counter	RO	Number of bytes received by this port.
winlink1000OduBridgeTpPortOutBytes	1.3.6.1.4.1.4458.1000.1.4.4.3.1.102	Counter	RO	Number of bytes transmitted by this port.
winlink1000OduAirFreq	1.3.6.1.4.1.4458.1000.1.5.1	Integer	RW	Installation Center Frequency. Valid values are product dependent. A change is effective after link re-synchronization.
winlink1000OduAirDesiredRate	1.3.6.1.4.1.4458.1000.1.5.2	Integer	RW	Deprecated parameter actual behavior is read-only. Required Air Rate. For Channel Bandwidth of 20 10 5 MHz divide the value by 1 2 4 respectively.
winlink1000OduAirSSID	1.3.6.1.4.1.4458.1000.1.5.3	DisplayString	RW	Reserved for the Manager application provided with the product.
winlink1000OduAirTxPower	1.3.6.1.4.1.4458.1000.1.5.4	Integer	RW	Required Transmit power in dBm . This is a nominal value while the actual transmit power includes additional attenuation. The min and max values are product specific. A change is effective immediately.
winlink1000OduAirSesState	1.3.6.1.4.1.4458.1000.1.5.5	Integer	RO	Current Link State. The value is active (3) during normal operation.
winlink1000OduAirMstrSlv	1.3.6.1.4.1.4458.1000.1.5.6	Integer	RO	This parameter indicates if the device was automatically selected into the radio link master or slave. The value is undefined if there is no link.
winlink1000OduAirResync	1.3.6.1.4.1.4458.1000.1.5.8	Integer	RW	Setting this parameter to 1 will cause the link to restart the synchronization process.
winlink1000OduAirRxPower	1.3.6.1.4.1.4458.1000.1.5.9.1	Integer	RO	Received Signal Strength in dBm.
winlink1000OduAirTotalFrames	1.3.6.1.4.1.4458.1000.1.5.9.2	Counter	RO	Total Number of received radio frames.
winlink1000OduAirBadFrames	1.3.6.1.4.1.4458.1000.1.5.9.3	Counter	RO	Total number of received radio frames with CRC error.
winlink1000OduAirCurrentRate	1.3.6.1.4.1.4458.1000.1.5.9.4	Integer	RO	Deprecated parameter. Actual rate of the air interface in Mbps. For Channel Bandwidth of 20 10 5 MHz divide the value by 1 2 4 respectively.

Table F-2: Private MIB Parameters (Sheet 4 of 14)

Name	OID	Type	Access	Description
winlink1000OduAirCurrentRateIdx	1.3.6.1.4.1.4458.1000.1.5.9.5	Integer	RO	Index of current air rate.
winlink1000OduAirTxPower36	1.3.6.1.4.1.4458.1000.1.5.10	Integer	RW	Deprecated parameter. Actual behavior is read-only.
winlink1000OduAirTxPower48	1.3.6.1.4.1.4458.1000.1.5.11	Integer	RW	Deprecated parameter. Actual behavior is read-only.
winlink1000OduAirCurrentTxPower	1.3.6.1.4.1.4458.1000.1.5.12	Integer	RO	Current Transmit Power in dBm. This is a nominal value while the actual transmit power includes additional attenuation.
winlink1000OduAirMinFrequency	1.3.6.1.4.1.4458.1000.1.5.13	Integer	RO	Minimum center frequency in MHz.
winlink1000OduAirMaxFrequency	1.3.6.1.4.1.4458.1000.1.5.14	Integer	RO	Maximum center frequency in MHz.
winlink1000OduAirFreqResolution	1.3.6.1.4.1.4458.1000.1.5.15	Integer	RO	Center Frequency resolution. Measured in MHz if value < 100 otherwise in KHz.
winlink1000OduAirCurrentFreq	1.3.6.1.4.1.4458.1000.1.5.16	Integer	RO	Current Center Frequency. Measured in MHz if center frequency resolution value < 100 otherwise in KHz.
winlink1000OduAirNumberOfChannels	1.3.6.1.4.1.4458.1000.1.5.17	Integer	RO	Number of channels that can be used.
winlink1000OduAirChannelsTable			N/A	Table of channels used by automatic channels selection (ACS).
winlink1000OduAirChannelsEntry			N/A	ACS channels table entry.
winlink1000OduAirChannelsIndex	1.3.6.1.4.1.4458.1000.1.5.18.1.1	Integer	RO	Channel Index.
winlink1000OduAirChannelsFrequency	1.3.6.1.4.1.4458.1000.1.5.18.1.2	Integer	RO	Channel frequency in MHz.
winlink1000OduAirChannelsOperState	1.3.6.1.4.1.4458.1000.1.5.18.1.3	Integer	RW	Channel state. Can be set by the user. Automatic Channel Selection uses channels that are AirChannelsOperState enabled and AirChannelsAvail enabled. A change is effective after link re-synchronization. Valid values: disabled (0) enabled (1).
winlink1000OduAirChannelsAvail	1.3.6.1.4.1.4458.1000.1.5.18.1.4	Integer	RO	Channel state. Product specific and cannot be changed by the user. Automatic Channel Selection uses channels that are AirChannelsOperState enabled and AirChannelsAvail enabled. Valid values: disabled (0) enabled (1).
winlink1000OduAirDfsState	1.3.6.1.4.1.4458.1000.1.5.19	Integer	RO	Radar detection state. Valid values: disabled (0) enabled (1).
winlink1000OduAirAutoChannelSelection State	1.3.6.1.4.1.4458.1000.1.5.20	Integer	RO	Deprecated parameter. Indicating Automatic Channel Selection availability at current channel bandwidth. Valid values: disabled (0) enabled (1).
winlink1000OduAirEnableTxPower	1.3.6.1.4.1.4458.1000.1.5.21	Integer	RO	Indicating Transmit power configuration enabled or disabled.
winlink1000OduAirMinTxPower	1.3.6.1.4.1.4458.1000.1.5.22	Integer	RO	Minimum Transmit power in dBm.
winlink1000OduAirMaxTxPowerTable			N/A	Table of Maximum transmit power per air rate in dBm.
winlink1000OduAirMaxTxPowerEntry			N/A	Maximum Transmit power table entry.
winlink1000OduAirMaxTxPowerIndex	1.3.6.1.4.1.4458.1000.1.5.23.1.1	Integer	RO	Air interface rate index.
winlink1000OduAirMaxTxPower	1.3.6.1.4.1.4458.1000.1.5.23.1.2	Integer	RO	Maximum Transmit power in dBm.
winlink1000OduAirChannelBandwidth	1.3.6.1.4.1.4458.1000.1.5.24	Integer	RW	Channel bandwidth in KHz. A change is effective after reset.
winlink1000OduAirChannelBWTable			N/A	Channel Bandwidths table.
winlink1000OduAirChannelBWEntry			N/A	Channel Bandwidth table entry.
winlink1000OduAirChannelBWIndex	1.3.6.1.4.1.4458.1000.1.5.25.1.1	Integer	RO	Channel Bandwidth index.
winlink1000OduAirChannelBWAvail	1.3.6.1.4.1.4458.1000.1.5.25.1.2	Integer	RO	Channel Bandwidth availability product specific. Options are: Not supported supported with manual channel selection supported with Automatic Channel Selection.

Table F-2: Private MIB Parameters (Sheet 5 of 14)

Name	OID	Type	Access	Description
winlink1000OduAirRFD	1.3.6.1.4.1.4458.1000.1.5.26	Integer	RO	Current radio frame duration in microseconds.
winlink1000OduAirRatesTable			N/A	Air Rate indexes table for current channel bandwidth.
winlink1000OduAirRatesEntry			N/A	Air Rate indexes table entry.
winlink1000OduAirRatesIndex	1.3.6.1.4.1.4458.1000.1.5.27.1.1	Integer	RO	Air Rate index.
winlink1000OduAirRatesAvail	1.3.6.1.4.1.4458.1000.1.5.27.1.2	Integer	RO	Air Rate availability depending on air interface conditions.
winlink1000OduAirDesiredRateIdx	1.3.6.1.4.1.4458.1000.1.5.28	Integer	RW	Required Air Rate index. 0 reserved for Adaptive Rate. A change is effective immediately after Set operation to the master side while the link is up.
winlink1000OduAirLinkDistance	1.3.6.1.4.1.4458.1000.1.5.29	Integer	RO	Link distance in meters. A value of -1 indicates an illegal value and is also used when a link is not established.
winlink1000OduAirLinkWorkingMode	1.3.6.1.4.1.4458.1000.1.5.30	Integer	RO	Link working mode as a result of comparing versions of both sides of the link. Possible modes are: Unknown - no link Normal - versions on both sides are identical with full compatibility with restricted compatibility or versions on both sides are different with software upgrade or versions incompatibility.
winlink1000OduAirMajorLinkIfVersion	1.3.6.1.4.1.4458.1000.1.5.31	Integer	RO	Major link interface version
winlink1000OduAirMinorLinkIfVersion	1.3.6.1.4.1.4458.1000.1.5.32	Integer	RO	Minor link interface version
winlink1000OduAirHssDesiredOpState	1.3.6.1.4.1.4458.1000.1.5.40.1	Integer	RW	Required Hub Site Synchronization operating state.
winlink1000OduAirHssCurrentOpState	1.3.6.1.4.1.4458.1000.1.5.40.2	Integer	RO	Current Hub Site Synchronization operating state.
winlink1000OduAirHssSyncStatus	1.3.6.1.4.1.4458.1000.1.5.40.3	Integer	RO	Hub Site Synchronization sync status.
winlink1000OduAirHssExtPulseStatus	1.3.6.1.4.1.4458.1000.1.5.40.4	Integer	RO	Hub Site Synchronization external pulse detection status.
winlink1000OduAirHssExtPulseType	1.3.6.1.4.1.4458.1000.1.5.40.5	Integer	RO	Hub Site Synchronization external pulse type.
winlink1000OduAirHssDesiredExtPulseType	1.3.6.1.4.1.4458.1000.1.5.40.6	Integer	RW	Hub Site Synchronization required external pulse type. Valid values for read write: {typeA(2) typeB(3) typeC(4) typeD(5)}. Valid value for read only: {notApplicable(1)}.
winlink1000OduAirHssRfpTable			N/A	ODU Radio Frame Patterns (RFP) Table.
winlink1000OduAirHssRfpEntry			N/A	ODU RFP Table entry.
winlink1000OduAirHssRfpIndex	1.3.6.1.4.1.4458.1000.1.5.40.7.1.1	Integer	RO	ODU RFP Table index. The index represent the Radio Frame Pattern: typeA(2) typeB(3) typeC(4) typeD(5).
winlink1000OduAirHssRfpEthChannelBW5MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.2	Integer	RO	Represents the compatibility of Ethernet service under Channel BW of 5MHz in the specific Radio Frame Pattern.
winlink1000OduAirHssRfpTdmChannelBW5MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.3	Integer	RO	Represents the compatibility of TDM service under Channel BW of 5MHz in the specific Radio Frame Pattern.
winlink1000OduAirHssRfpEthChannelBW10MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.4	Integer	RO	Represents the compatibility of Ethernet service under Channel BW of 10MHz in the specific Radio Frame Pattern.
winlink1000OduAirHssRfpTdmChannelBW10MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.5	Integer	RO	Represents the compatibility of TDM service under Channel BW of 10MHz in the specific Radio Frame Pattern.
winlink1000OduAirHssRfpEthChannelBW20MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.6	Integer	RO	Represents the compatibility of Ethernet service under Channel BW of 20MHz in the specific Radio Frame Pattern.
winlink1000OduAirHssRfpTdmChannelBW20MHz	1.3.6.1.4.1.4458.1000.1.5.40.7.1.7	Integer	RO	Represents the compatibility of TDM service under Channel BW of 20MHz in the specific Radio Frame Pattern.

Table F-2: Private MIB Parameters (Sheet 6 of 14)

Name	OID	Type	Access	Description
winlink1000OduAirLockRemote	1.3.6.1.4.1.4458.1000.1.5.41	Integer	RW	This parameter enables locking the link with a specific ODU. The following values can be set: Unlock (default) - The ODU is not locked on a specific remote ODU. Unlock can only be performed when the link is not connected. Lock - The ODU is locked on a specific remote ODU. Lock can only be performed when the link is active.
winlink1000OduAirAntennaGain	1.3.6.1.4.1.4458.1000.1.5.42	Integer	RW	Current Antenna Gain in 0.1 dBi resolution. User defined value in case of external antenna. Legal range: MinAntennaGain<AntennaGain<MaxAntennaGain.
winlink1000OduAirFeederLoss	1.3.6.1.4.1.4458.1000.1.5.43	Integer	RW	Current Feeder Loss in 0.1 dBm resolution. User defined value in case of external antenna.
winlink1000OduAirMaxAntennaGain	1.3.6.1.4.1.4458.1000.1.5.44	Integer	RO	Maximum allowed Antenna Gain in 0.1 dBi resolution.
winlink1000OduAirMinAntennaGain	1.3.6.1.4.1.4458.1000.1.5.45	Integer	RO	Minimum allowed Antenna Gain in 0.1 dBi resolution.
winlink1000OduAirMaxEIRP	1.3.6.1.4.1.4458.1000.1.5.46	Integer	RO	Maximum EIRP value as defined by regulation in 0.1 dBm resolution.
winlink1000OduAirAntennaGainConfigSupport	1.3.6.1.4.1.4458.1000.1.5.47	Integer	RO	Antenna Gain Configurability options are product specific: supported not supported.
winlink1000OduAirAntennaType	1.3.6.1.4.1.4458.1000.1.5.48	Integer	RW	External Antenna Type: Monopolar or Bipolar.
winlink1000OduAirRssBalance	1.3.6.1.4.1.4458.1000.1.5.49	Integer	RO	RSS balance. Relation between RSS in radio 1 and RSS in radio 2.
winlink1000OduAirTotalTxPower	1.3.6.1.4.1.4458.1000.1.5.50	Integer	RO	Total Transmit Power in dBm. This is a nominal value While the actual transmit power includes additional attenuation.
winlink1000OduPerfMonCurrTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonCurrEntry			N/A	This is an entry in the Current Interval Table.
winlink1000OduPerfMonCurrUAS	1.3.6.1.4.1.4458.1000.1.6.1.1.1	Gauge	RO	The current number of Unavailable Seconds starting from the present 15 minutes period.
winlink1000OduPerfMonCurrES	1.3.6.1.4.1.4458.1000.1.6.1.1.2	Gauge	RO	Current number of Errored Seconds starting from the present 15 minutes period.
winlink1000OduPerfMonCurrSES	1.3.6.1.4.1.4458.1000.1.6.1.1.3	Gauge	RO	Current number of Severely Errored Seconds starting from the present 15 minutes period.
winlink1000OduPerfMonCurrBBE	1.3.6.1.4.1.4458.1000.1.6.1.1.4	Gauge	RO	Current number of Background Block Errors starting from the present 15 minutes period.
winlink1000OduPerfMonCurrIntegrity	1.3.6.1.4.1.4458.1000.1.6.1.1.5	Integer	RO	Indicates the integrity of the entry.
winlink1000OduPerfMonIntervalTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonIntervalEntry			N/A	This is an entry in the Interval Table.
winlink1000OduPerfMonIntervalIdx			RO	This table is indexed per interval number. Each interval is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonIntervalUAS			RO	The current number of Unavailable Seconds per interval.
winlink1000OduPerfMonIntervalES			RO	Current number of Errored Seconds per interval.
winlink1000OduPerfMonIntervalSES			RO	Current number of Severely Errored Seconds per interval.
winlink1000OduPerfMonIntervalBBE			RO	Current number of Background Block Errors per interval.
winlink1000OduPerfMonIntervalIntegrity			RO	Indicates the integrity of the entry per interval.

Table F-2: Private MIB Parameters (Sheet 7 of 14)

Name	OID	Type	Access	Description
winlink1000OduPerfMonDayTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonDayEntry			N/A	This is an entry in the Days Table.
winlink1000OduPerfMonDayIdx			RO	This table is indexed per interval number. Each interval is of 24 hours and the oldest is 30.
winlink1000OduPerfMonDayUAS			RO	The current number of Unavailable Seconds per interval of 24 hours.
winlink1000OduPerfMonDayES			RO	Current number of Errored Seconds per interval of 24 hours.
winlink1000OduPerfMonDaySES			RO	Current number of Severely Errored Seconds per interval of 24 hours.
winlink1000OduPerfMonDayBBE			RO	Current number of Background Block Errors per interval of 24 hours.
winlink1000OduPerfMonDayIntegrity			RO	Indicates the integrity of the entry per interval of 24 hours.
winlink1000OduPerfMonAirCurrTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonAirCurrEntry			N/A	This is an entry in the Current Interval Table.
winlink1000OduPerfMonAirCurrMinRSL	1.3.6.1.4.1.4458.1000.1.6.4.1.1	Integer	RO	Current Min Received Level Reference starting from the present 15 minutes period.
winlink1000OduPerfMonAirCurrMaxRSL	1.3.6.1.4.1.4458.1000.1.6.4.1.2	Integer	RO	Current Max Received Level Reference starting from the present 15 minutes period.
winlink1000OduPerfMonAirCurrRSLThresh1Exceed	1.3.6.1.4.1.4458.1000.1.6.4.1.3	Gauge	RO	Number of seconds Receive Signal Level exceeded the RSL1 threshold in the last 15 minutes.
winlink1000OduPerfMonAirCurrRSLThresh2Exceed	1.3.6.1.4.1.4458.1000.1.6.4.1.4	Gauge	RO	Number of seconds Receive Signal Level exceeded the RSL2 threshold in the last 15 minutes.
winlink1000OduPerfMonAirCurrMinTSL	1.3.6.1.4.1.4458.1000.1.6.4.1.5	Integer	RO	Current Min Transmit Signal Level starting from the present 15 minutes period.
winlink1000OduPerfMonAirCurrMaxTSL	1.3.6.1.4.1.4458.1000.1.6.4.1.6	Integer	RO	Current Max Transmit Signal Level starting from the present 15 minutes period.
winlink1000OduPerfMonAirCurrTSLThresh1Exceed	1.3.6.1.4.1.4458.1000.1.6.4.1.7	Gauge	RO	Number of seconds Transmit Signal Level exceeded the TSL1 threshold in the last 15 minutes.
winlink1000OduPerfMonAirCurrBBERThresh1Exceed	1.3.6.1.4.1.4458.1000.1.6.4.1.8	Gauge	RO	Number of seconds Background Block Error Ratio exceeded the BBER1 threshold in the last 15 minutes.
winlink1000OduPerfMonAirIntervalTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonAirIntervalEntry			N/A	This is an entry in the Interval Table.
winlink1000OduPerfMonAirIntervalIdx			RO	This table is indexed per interval number. Each interval is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonAirIntervalMinRSL			RO	Current Min Received Level Reference per interval.
winlink1000OduPerfMonAirIntervalMaxRSL			RO	Current Max Received Level Reference per interval.
winlink1000OduPerfMonAirIntervalRSLThresh1Exceed			RO	Number of seconds Receive Signal Level exceeded the RSL1 threshold per interval.
winlink1000OduPerfMonAirIntervalRSLThresh2Exceed				Number of seconds Receive Signal Level exceeded the RSL2 threshold ACCESS read-only per interval.
winlink1000OduPerfMonAirIntervalMinTSL			RO	Current Min Transmit Signal Level per interval.

Table F-2: Private MIB Parameters (Sheet 8 of 14)

Name	OID	Type	Access	Description
winlink1000OduPerfMonAirIntervalMaxTSL			RO	Current Max Transmit Signal Level per interval.
winlink1000OduPerfMonAirIntervalTSLThresh1Exceed			RO	Number of seconds Transmit Signal Level exceeded the TSL1 threshold per interval.
winlink1000OduPerfMonAirIntervalBBERThresh1Exceed			RO	Number of seconds Background Block Error Ratio exceeded the BBER1 threshold per interval.
winlink1000OduPerfMonAirDayTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonAirDayEntry			N/A	This is an entry in the Days Table.
winlink1000OduPerfMonAirDayIdx			RO	This table is indexed per Day number. Each Day is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonAirDayMinRSL			RO	Current Min Received Level Reference per Day.
winlink1000OduPerfMonAirDayMaxRSL			RO	Current Max Received Level Reference per Day.
winlink1000OduPerfMonAirDayRSLThresh1Exceed			RO	Number of seconds Receive Signal Level exceeded the RSL1 threshold per Day.
winlink1000OduPerfMonAirDayRSLThresh2Exceed			RO	Number of seconds Receive Signal Level exceeded the RSL2 threshold per Day.
winlink1000OduPerfMonAirDayMinTSL			RO	Current Min Transmit Signal Level per Day.
winlink1000OduPerfMonAirDayMaxTSL			RO	Current Max Transmit Signal Level per Day.
winlink1000OduPerfMonAirDayTSLThresh1Exceed			RO	Number of seconds Transmit Signal Level exceeded the TSL1 threshold per Day.
winlink1000OduPerfMonAirDayBBERThresh1Exceed			RO	Number of seconds Background Block Error Ratio exceeded the BBER1 threshold per Day.
winlink1000OduPerfMonEthCurrTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonEthCurrEntry			N/A	This is an entry in the Current Interval Table.
winlink1000OduPerfMonEthCurrRxMBytes	1.3.6.1.4.1.4458.1000.1.6.7.1.1	Gauge	RO	Current RX Mega Bytes starting from the present 15 minutes period.
winlink1000OduPerfMonEthCurrTxMBytes	1.3.6.1.4.1.4458.1000.1.6.7.1.2	Gauge	RO	Current Transmit Mega Bytes starting from the present 15 minutes period.
winlink1000OduPerfMonEthIntervalTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonEthIntervalEntry			N/A	This is an entry in the Interval Table.
winlink1000OduPerfMonEthIntervalIdx			RO	This table is indexed per interval number. Each interval is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonEthIntervalRxMBytes			RO	Current RX Mega Bytes per interval.
winlink1000OduPerfMonEthIntervalTxMBytes			RO	Current Transmit Mega Bytes per interval.
winlink1000OduPerfMonEthDayTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonEthDayEntry			N/A	This is an entry in the Days Table.
winlink1000OduPerfMonEthDayIdx			RO	This table is indexed per Day number. Each Day is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonEthDayRxMBytes			RO	Current RX Mega Bytes per day.
winlink1000OduPerfMonEthDayTxMBytes			RO	Current Transmit Mega Bytes per day.
winlink1000OduPerfMonTdmCurrTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonTdmCurrEntry			N/A	This is an entry in the Current Interval Table.

Table F-2: Private MIB Parameters (Sheet 9 of 14)

Name	OID	Type	Access	Description
winlink1000OduPerfMonTdmCurrActiveSeconds			RO	Parameter indicating whether the TDM service was active. Under TDM backup link the parameter indicates whether the backup link was active.
winlink1000OduPerfMonTdmIntervalTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonTdmIntervalEntry			N/A	This is an entry in the Interval Table.
winlink1000OduPerfMonTdmIntervalIdx			RO	This table is indexed per interval number. Each interval is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonTdmIntervalActiveSeconds			RO	Parameter indicating whether the TDM service was active. Under TDM backup link the parameter indicates whether the backup link was active.
winlink1000OduPerfMonTdmDayTable			N/A	This table defines/keeps the counters of the current 15 min interval.
winlink1000OduPerfMonTdmDayEntry			N/A	This is an entry in the Days Table.
winlink1000OduPerfMonTdmDayIdx			RO	This table is indexed per Day number. Each Day is of 15 minutes and the oldest is 96.
winlink1000OduPerfMonTdmDayActiveSeconds			RO	Parameter indicating whether the TDM service was active. Under TDM backup link the parameter indicates whether the backup link was active.
winlink1000OduPerfMonTxThresh1	1.3.6.1.4.1.4458.1000.1.6.20	Integer	RW	When the Transmit power exceeds this threshold a performance monitoring TSL1 counter is incremented.
winlink1000OduPerfMonRxThresh1	1.3.6.1.4.1.4458.1000.1.6.21	Integer	RW	When the RX power exceeds this threshold a performance monitoring RSL1 counter is incremented.
winlink1000OduPerfMonRxThresh2	1.3.6.1.4.1.4458.1000.1.6.22	Integer	RW	When the RX power exceeds this threshold a performance monitoring RSL2 counter is incremented.
winlink1000OduPerfMonBBERThresh1	1.3.6.1.4.1.4458.1000.1.6.23	Integer	RW	When the BBER exceeds this threshold a performance monitoring BBER counter is incremented. The units are 1/10 of a percent.
winlink1000OduAgnGenAddTrapExt	1.3.6.1.4.1.4458.1000.1.7.1.1	Integer	RW	If 'yes' is chosen the ifIndex Unit Severity Time_T and Alarm Id from the winlink1000OduAgnCurrAlarmTable will be bind to the end of each private trap.
winlink1000OduAgnNTPCfgTimeServerIP	1.3.6.1.4.1.4458.1000.1.7.2.1	IpAddress	RW	IP address of the server from which the current time is loaded.
winlink1000OduAgnNTPCfgTimeOffsetFromUTC	1.3.6.1.4.1.4458.1000.1.7.2.2	Integer	RW	Offset from Coordinated Universal Time (minutes). Possible values: -1440..1440.

Table F-2: Private MIB Parameters (Sheet 10 of 14)

Name	OID	Type	Access	Description																																								
winlink1000OduAgnRealTimeAndDate	1.3.6.1.4.1.4458.1000.1.7.2.3	OctetString	RW	This parameter specifies the real time and date Format 'YYYY-MM-DD HH:MM:SS' (Hexadecimal). A date-time specification: <table><thead><tr><th>field</th><th>octets</th><th>contents</th><th>range</th></tr><tr><th>----</th><th>-----</th><th>-----</th><th>-----</th></tr></thead><tbody><tr><td>1</td><td>1-2</td><td>year</td><td>0..65536</td></tr><tr><td>2</td><td>3</td><td>month</td><td>1..12</td></tr><tr><td>3</td><td>4</td><td>day</td><td>1..31</td></tr><tr><td>4</td><td>5</td><td>hour</td><td>0..23</td></tr><tr><td>5</td><td>6</td><td>minutes</td><td>0..59</td></tr><tr><td>6</td><td>7</td><td>seconds</td><td>0..60</td></tr><tr><td></td><td></td><td>(use 60 for leap-second)</td><td></td></tr><tr><td>7</td><td>8</td><td>deci-seconds</td><td>0..9</td></tr></tbody></table> For example Tuesday May 26 1992 at 1:30:15 PM EDT would be displayed as: 07 c8 05 1a 0d 1e 0f 00 (1992 -5 -26 13:30:15)	field	octets	contents	range	----	-----	-----	-----	1	1-2	year	0..65536	2	3	month	1..12	3	4	day	1..31	4	5	hour	0..23	5	6	minutes	0..59	6	7	seconds	0..60			(use 60 for leap-second)		7	8	deci-seconds	0..9
field	octets	contents	range																																									
----	-----	-----	-----																																									
1	1-2	year	0..65536																																									
2	3	month	1..12																																									
3	4	day	1..31																																									
4	5	hour	0..23																																									
5	6	minutes	0..59																																									
6	7	seconds	0..60																																									
		(use 60 for leap-second)																																										
7	8	deci-seconds	0..9																																									
winlink1000OduAgnCurrAlarmLastChange	1.3.6.1.4.1.4458.1000.1.7.3.1	Integer	RO	This counter is initialized to 0 after a device reset and is incremented upon each change in the winlink1000OduAgnCurrAlarmTable (either an addition or removal of an entry).																																								
winlink1000OduAgnCurrAlarmTable			N/A	This table includes the currently active alarms. When a RAISED trap is sent an alarm entry is added to the table. When a CLEAR trap is sent the entry is removed.																																								
winlink1000OduAgnCurrAlarmEntry			N/A	Entry containing the details of a currently RAISED trap.																																								
winlink1000OduAgnCurrAlarmCounter			RO	A running counter of active alarms. The counter is incremented for every new RAISED trap. It is cleared after a device reset.																																								
winlink1000OduAgnCurrAlarmSeverity			RO	Current Alarm severity.																																								
winlink1000OduAgnCurrAlarmId			RO	Unique Alarm Identifier (combines alarm type and interface). The same AlarmId is used for RAISED and CLEARED alarms.																																								
winlink1000OduAgnCurrAlarmIfIndex			RO	Interface Index where the alarm occurred. Alarms that are not associated with a specific interface will have the following value: 65535.																																								
winlink1000OduAgnCurrAlarmUnit			RO	Unit associated with the alarm.																																								
winlink1000OduAgnCurrAlarmTrapID			RO	ID of the raised trap that was sent when this alarm was raised.																																								
winlink1000OduAgnCurrAlarmTimeT			RO	Timestamp of this alarm. This number is in seconds from Midnight January 1st 1970.																																								
winlink1000OduAgnCurrAlarmText			RO	Alarm display text (same as the text in the sent trap).																																								
winlink1000IduAdmProductType	1.3.6.1.4.1.4458.1000.2.1.1	DisplayString	RO	IDU configuration description.																																								
winlink1000IduAdmHwRev	1.3.6.1.4.1.4458.1000.2.1.2	DisplayString	RO	IDU Hardware Revision.																																								
winlink1000IduAdmSwRev	1.3.6.1.4.1.4458.1000.2.1.3	DisplayString	RO	IDU Software Revision.																																								
winlink1000OduAdmNumOfExternalAlarmIn	1.3.6.1.4.1.4458.1000.2.1.4	Integer	RO	Indicates the number of currently available External Alarm Inputs.																																								
winlink1000OduAdmExternAlarmInTable			N/A	This is the External Alarm Inputs table.																																								
winlink1000OduAdmExternAlarmInEntry			N/A	Entry containing the elements of a single External Alarm Input.																																								

Table F-2: Private MIB Parameters (Sheet 11 of 14)

Name	OID	Type	Access	Description
winlink1000OduAdmExternAlarmInIndex	1.3.6.1.4.1.4458.1000.2.1.5.1.1	Integer	RO	This value indicates the index of the External Alarm Input entry.
winlink1000OduAdmExternAlarmInText	1.3.6.1.4.1.4458.1000.2.1.5.1.2	DisplayString	RW	This field describes the External Alarm Input. It is an optional string of no more than 64 characters which will be used in the event being sent as a result of a change in the status of the External Alarm Input. DEFVAL {Alarm Description}
winlink1000OduAdmExternAlarmInAdminState	1.3.6.1.4.1.4458.1000.2.1.5.1.3	Integer	RW	This value indicates if this External Alarm Input is enabled or disabled.
winlink1000OduAdmExternAlarmInStatus	1.3.6.1.4.1.4458.1000.2.1.5.1.4	Integer	RO	This value indicates the current status of the External Alarm Input.
winlink1000IduAdmSN	1.3.6.1.4.1.4458.1000.2.1.6	DisplayString	RO	Idu Serial Number
winlink1000IduSrvDesiredTrunks	1.3.6.1.4.1.4458.1000.2.2.2	Integer	RW	Required trunks bitmap. Note that the number of possible trunks that can be configured may vary based on the IDU hardware configuration the selected air interface rate and the range of the installation. The provided Manager application enables the user to select only available configurations. A change is effective immediately if applied to a master unit and the link is in service mode.
winlink1000IduSrvServices	1.3.6.1.4.1.4458.1000.2.2.4	ObjectID	RO	This parameter is reserved to the Manager application provided with the product.
winlink1000IduSrvActiveTrunks	1.3.6.1.4.1.4458.1000.2.2.6	Integer	RO	A bitmap describing the currently open TDM trunks.
winlink1000IduSrvAvailableTrunks	1.3.6.1.4.1.4458.1000.2.2.8	Integer	RO	A bitmap describing the number of TDM trunks that can be opened in the current configuration. The values take into account the IDU hardware configuration the air rate and the installation range.
winlink1000IduSrvPossibleServicesTable			N/A	IDU Possible Services table.
winlink1000IduSrvPossibleServicesEntry			N/A	IDU Services table entry.
winlink1000IduSrvPossibleServicesIndex	1.3.6.1.4.1.4458.1000.2.2.10.1.1	Integer	RO	Table index Rate index of the air interface.
winlink1000IduSrvPossibleTdmServices	1.3.6.1.4.1.4458.1000.2.2.10.1.2	Integer	RO	Deprecated parameter. A bitmap describing the TDM trunks that can be opened in the corresponding Air Rate.
winlink1000IduSrvPossibleEthServices	1.3.6.1.4.1.4458.1000.2.2.10.1.3	Integer	RO	Deprecated parameter. This parameter describes if the Ethernet Service can be opened in the corresponding Air Rate. The valid values are: disabled (0) enabled (1).
winlink1000IduSrvRemainingRate	1.3.6.1.4.1.4458.1000.2.2.10.1.4	Integer	RO	Current Ethernet bandwidth in bps per air rate.
winlink1000IduSrvTrunkCost	1.3.6.1.4.1.4458.1000.2.2.10.1.5	Integer	RO	Cost of the TDM Service in bps.
winlink1000IduSrvAvailServicesTable			N/A	ODU Possible TDM Services table.
winlink1000IduSrvAvailServicesEntry			N/A	ODU TDM Services table entry.
winlink1000IduSrvAvailServicesIndex	1.3.6.1.4.1.4458.1000.2.2.11.1.1	Integer	RO	Table index. The index is the bit mask of the TDM service.
winlink1000IduSrvAvailServicesState	1.3.6.1.4.1.4458.1000.2.2.11.1.2	Integer	RO	Represents the TDM service availability.
winlink1000IduSrvAvailServicesMinRateIdx	1.3.6.1.4.1.4458.1000.2.2.11.1.3	Integer	RO	Minimum rate index of the air interface which make the service possible.
winlink1000IduSrvAvailServicesMaxRateIdx	1.3.6.1.4.1.4458.1000.2.2.11.1.4	Integer	RO	Maximum rate index of the air interface which make the service possible.

Table F-2: Private MIB Parameters (Sheet 12 of 14)

Name	OID	Type	Access	Description
winlink1000IduSrvAvailServicesReason	1.3.6.1.4.1.4458.1000.2.2.11.1.5	Integer	RO	Information about the TDM Service availability. - Not Applicable if the service is available. The reasons for TDM Service unavailability: - The available throughput isn't sufficient for Service demands; - The IDU HW doesn't support the service; - A Link Password mismatch was detected; - The external pulse type detected is improper for TDM services; - A Software versions mismatch was detected.
winlink1000IduSrvEthActive	1.3.6.1.4.1.4458.1000.2.2.12	Integer	RO	Represents the Ethernet service activation state.
winlink1000IduSrvEthAvailable	1.3.6.1.4.1.4458.1000.2.2.13	Integer	RO	Represents the Ethernet service availability state.
winlink1000IduSrvEthThroughput	1.3.6.1.4.1.4458.1000.2.2.14	Gauge	RO	Current available Ethernet service throughput in bps.
winlink1000IduSrvEthMaxInfoRate	1.3.6.1.4.1.4458.1000.2.2.15	Integer	RW	Holds the maximum bandwidth (kbps) to be allocated for Ethernet service. Value of zero means that Ethernet service works as best effort. The maximum value is product specific. Refer to the user manual.
winlink1000IduEthernetIfTable			N/A	IDU Ethernet Interface table.
winlink1000IduEthernetIfEntry			N/A	IDU Ethernet Interface table entry.
winlink1000IduEthernetIfIndex			RO	If Index corresponding to this Interface.
winlink1000IduEthernetIfAddress	1.3.6.1.4.1.4458.1000.2.3.1.1.5	DisplayString	RO	IDU MAC address.
winlink1000IduEthernetNumOfLanPorts	1.3.6.1.4.1.4458.1000.2.3.3	Integer	RO	Number of LAN interfaces in the IDU.
winlink1000IduBridgeTpAging	1.3.6.1.4.1.4458.1000.2.4.4.2	Integer	RW	Timeout in seconds for aging. Note that for this parameter to be effective the ODU must be configured to HUB mode. A change is effective immediately.
winlink1000IduTdmTxClockAvailStates	1.3.6.1.4.1.4458.1000.2.6.1.1	Integer	RO	Available states of the TDM Transmit Clock Control each input status is represented by a bit. When the state is available the bit value is 1. When the state is unavailable the bit value is 0. The available states are: bit 2 = Transparent. bit 3 = Local Loop Timed. bit 4 = Remote Loop Timed. bit 5 = Local Internal. bit 6 = Remote Internal.
winlink1000IduTdmTxClockDesiredState	1.3.6.1.4.1.4458.1000.2.6.1.2	Integer	RW	Required state of the TDM Transmit Clock Control. A change is effective after re-activation of the TDM service.
winlink1000IduTdmTxClockActualState	1.3.6.1.4.1.4458.1000.2.6.1.3	Integer	RO	Actual state of the TDM Transmit Clock Control.
winlink1000IduTdmMasterClockAvailOptions	1.3.6.1.4.1.4458.1000.2.6.2.1	Integer	RO	Available options of the TDM Master Clock Control each input status is represented by a bit. When the option is available the bit value is 1. When the option is unavailable the bit value is 0. The available options are: bit 2 = Automatic. bit 3 = Trunk #1. bit 4 = Trunk #2. bit 5 = Trunk #3. bit 6 = Trunk #4. When no options are available the returned value is: 1
winlink1000IduTdmMasterClockDesired	1.3.6.1.4.1.4458.1000.2.6.2.2	Integer	RW	Required TDM Master Clock. A change is effective after re-activation of the TDM service.
winlink1000IduTdmMasterClockActual	1.3.6.1.4.1.4458.1000.2.6.2.3	Integer	RO	Actual Trunk used for TDM Master Clock.
winlink1000IduTdmConfigTable			N/A	IDU TDM Links Configuration table.
winlink1000IduTdmConfigEntry			N/A	IDU TDM Links Configuration table entry.
winlink1000IduTdmConfigIndex			RO	Table index.
winlink1000IduTdmIfIndex			RO	Link index in the interface table.

Table F-2: Private MIB Parameters (Sheet 13 of 14)

Name	OID	Type	Access	Description
winlink1000IduDtmLineCoding	1.3.6.1.4.1.4458.1000.2.6.6.1.6	Integer	RW	This parameter applies to T1 trunks only. The parameter controls the line coding. Setting the value to each of the indices applies to all. A change is effective after the next open of the TDM service.
winlink1000IduDtmLoopbackConfig	1.3.6.1.4.1.4458.1000.2.6.6.1.9	Integer	RW	Loop back configuration table. Each of the trunks can be set Normal Line loop back or Reverse line loop back. A change is effective immediately.
winlink1000IduDtmLineStatus	1.3.6.1.4.1.4458.1000.2.6.6.1.10	Integer	RO	Line status.
winlink1000IduDtmCurrentTable			N/A	IDU TDM Links Statistics table.
winlink1000IduDtmCurrentEntry			N/A	IDU TDM Links Statistics table entry.
winlink1000IduDtmCurrentIndex			RO	Table index (Same as winlink1000IduDtmLineIndex).
winlink1000IduDtmCurrentBlocks	1.3.6.1.4.1.4458.1000.2.6.7.1.101	Counter	RO	Number of correct blocks transmitted to the line.
winlink1000IduDtmCurrentDrops	1.3.6.1.4.1.4458.1000.2.6.7.1.102	Counter	RO	Number of error blocks transmitted to the line.
winlink1000IduDtmCurrentTxClock	1.3.6.1.4.1.4458.1000.2.6.7.1.103	Integer	RW	TDM Transmit Clock. A change is effective after re-activation of the TDM service.
winlink1000IduDtmCurrentBlocksHigh	1.3.6.1.4.1.4458.1000.2.6.7.1.104	Counter	RO	High part of the 64 bits counter Current Blocks
winlink1000IduDtmRemoteQual	1.3.6.1.4.1.4458.1000.2.6.8	Integer	RO	Estimated average interval between error second events. The valid values are $1-2^{31}$ where a value of -1 is used to indicate an undefined state.
winlink1000IduDtmRemoteQualEval	1.3.6.1.4.1.4458.1000.2.6.9	Integer	RO	Estimated average interval between error second events during evaluation process. The valid values are $1-2^{31}$ where a value of -1 is used to indicate an undefined state.
winlink1000IduDtmSrvEval	1.3.6.1.4.1.4458.1000.2.6.10	Integer	RW	Evaluated TDM service bit mask. Setting this parameter to value that is bigger than the activated TDM service bit mask will execute the evaluation process for 30 seconds. Setting this parameter to 0 will stop the evaluation process immediately.
winlink1000IduDtmBackupAvailableLinks	1.3.6.1.4.1.4458.1000.2.6.11	Integer	RO	Number of TDM backup trunks.
winlink1000IduDtmBackupTable			N/A	IDU TDM Links Statistics table.
winlink1000IduDtmBackupEntry			N/A	IDU TDM Links Statistics table entry.
winlink1000IduDtmBackupIndex	1.3.6.1.4.1.4458.1000.2.6.12.1.1	Integer	RO	Table index.
winlink1000IduDtmBackupMode	1.3.6.1.4.1.4458.1000.2.6.12.1.2	Integer	RW	TDM backup mode: Enable or Disable where the main link is the air link or the external link. Changes will be effective immediately.
winlink1000IduDtmBackupCurrentActive Link	1.3.6.1.4.1.4458.1000.2.6.12.1.3	Integer	RO	TDM backup current active link: N/A air link is active or external link is active.
winlink1000IduDtmJitterBufferSize	1.3.6.1.4.1.4458.1000.2.6.13	Integer	RW	TDM Jitter Buffer Size. The value must be between the minimum and the maximum TDM Jitter Buffer Size. The units are 0.1 x millisecond.
winlink1000IduDtmJitterBufferDefaultSize	1.3.6.1.4.1.4458.1000.2.6.14	Integer	RO	TDM Jitter Buffer Default Size. The units are 0.1 x millisecond.
winlink1000IduDtmJitterBufferMinSize	1.3.6.1.4.1.4458.1000.2.6.15	Integer	RO	TDM Jitter Buffer Minimum Size. The units are 0.1 x millisecond.
winlink1000IduDtmJitterBufferMaxSize	1.3.6.1.4.1.4458.1000.2.6.16	Integer	RO	TDM Jitter Buffer Maximum Size. The units are 0.1 x millisecond.
winlink1000IduDtmJitterBufferSizeEval	1.3.6.1.4.1.4458.1000.2.6.17	Integer	RW	TDM Jitter Buffer Size for evaluation. The value must be between the minimum and the maximum TDM Jitter Buffer Size. The units are 0.1 x millisecond.
winlink1000IduDtmType	1.3.6.1.4.1.4458.1000.2.6.18	Integer	RW	TDM Type (The value undefined is read-only).
winlink1000IduDtmTypeEval	1.3.6.1.4.1.4458.1000.2.6.19	Integer	RW	TDM Type for evaluation.
winlink1000IduDtmLineStatusStr			RO	Line status.

Table F-2: Private MIB Parameters (Sheet 14 of 14)

Name	OID	Type	Access	Description
winlink1000GeneralTrapDescription	1.3.6.1.4.1.4458.1000.100.1	DisplayString	RO	Trap's Description. Used for Trap parameters.
winlink1000GeneralTrapSeverity	1.3.6.1.4.1.4458.1000.100.2	Integer	RO	Trap's Severity. Used for Trap parameters.
winlink1000GeneralCookie	1.3.6.1.4.1.4458.1000.100.3	DisplayString	RW	Reserved for the Manager application provided with the product used for saving user preferences affecting ODU operation.
winlink1000GeneralEcChangesCounter	1.3.6.1.4.1.4458.1000.100.4	Integer	RO	This counter is initialized to 0 after a device reset and is incremented upon each element constant write operation via SNMP or Telnet.

MIB Traps

General

Each ODU can be configured with up to 10 different trap destinations. When the link is operational, each ODU sends traps originating from both Site A and Site B.

The source IP address of the trap is the sending ODU. The trap originator can be identified by the trap Community string or by the trap description text. The public Community string is used for Site A ODU traps and public-remote (as set by the user) is used for Site B ODU traps.

Each trap contains a trap description and additional relevant information such as alarm severity, interface index, time stamp and additional parameters. See [table F-3](#) for additional information.

Trap parameters

Table F-3: MIB Traps (Sheet 1 of 4)

Name	ID	Severity	Description
trunkStateChanged	1	normal	Indicates a change in the state of one of the TDM trunks. Raised by both sides of the link. Contains 3 parameters: 1 - Description: TDM Interface %n - %x. 2 - %n: Is the trunk number. 3 - %x: Is the alarm type and can be one of the following: Normal, AIS, LOS, Loopback.
linkUp	2	normal	Indicates that the radio link is up. Contains a single parameter, which is its description: 1 - Description: Radio Link - Sync on channel %n GHz. %n Is the channel frequency in GHz.
linkDown	3	critical	Indicates that the radio link is down. Contains a single parameter, which is its description: 1 - Description: Radio Link - Out of Sync. The reason is: %s. %s Is the reason.
detectIDU	4	normal	Indicates that the IDU was detected. Raised by both sides of the link. Contains a single parameter, which is its description: 1 - Description: IDU of Type %s was Detected. %s Is the type of the IDU.
disconnectIDU	5	major	Indicates that the IDU was disconnected. Raised by both sides of the link. Contains a single parameter, which is its description: 1 - Description: IDU Disconnected.
mismatchIDU	6	major	Indicates a mismatch between the IDUs. Raised by the master only. Contains a single parameter, which is its description: 1 - Description: IDUs Mismatch: One Side is %s and the Other is %s. %s Is the type of the IDU.

Table F-3: MIB Traps (Sheet 2 of 4)

Name	ID	Severity	Description
openedServices	7	normal	Indicates that services were opened. Raised by the master only. Contains 3 parameters: 1 - Description: %n2 out of %n1 Requested TDM Trunks have been Opened. 2 - %n1: Is the requested number of TDM trunks. 3 - %n2: Is the actual number of TDM trunks that were opened.
closedServices	8	normal	Indicates that services were closed. Raised by the master only. Contains a single parameter, which is its description: 1 - Description: TDM Service has been closed. The reason is: %s. %s Is the reason.
incompatibleODUs	9	critical	Indicates that the ODUs are incompatible. Contains a single parameter, which is its description: 1 - Description: Incompatible ODUs.
incompatibleIDUs	10	major	Indicates that the IDUs are incompatible. Contains a single parameter, which is its description: 1 - Description: Incompatible IDUs.
incompatibleOduIdu	11	major	Indicates that the ODU and IDU are incompatible. Contains a single parameter, which is its description: 1 - Description: The IDU could not be loaded. The reason is: %s. %s Is the incompatibility type.
probingChannel	12	normal	Indicates that the ODU is monitoring radar activity. Contains a single parameter, which is its description: 1 - Description: Monitoring for radar activity on channel %n GHz. %n is the channel frequency in GHz.
radarDetected	13	normal	Indicates that radar activity was detected. Contains a single parameter, which is its description: 1 - Description: Radar activity was detected in %s, on channel %n GHz. %s Is the site name. %n Is the channel frequency in GHz.
transmittingOnChannel	14	normal	Indicates that the ODU is transmitting on channel. Contains a single parameter, which is its description: 1 - Description: Transmitting on channel %n GHz. %n Is the channel frequency in GHz.
scanningChannels	15	normal	Indicates that the ODU is scanning channels. Contains a single parameter, which is its description: 1 - Description: Channel scanning in progress.
incompatiblePartner	16	critical	Indicates that configuration problem was detected and that link installation is required to fix it. Contains a single parameter, which is its description: 1 - Description: Configuration problem detected. Link installation required.
timeClockSet	17	normal	Indicates that the ODU time clock was set. Contains a single parameter, which is its description: 1 - Description: The time was set to: %p. %p Is the date and time.
configurationChanged	18	normal	Indicates that the ODU was recovered from an error, but there are configuration changes. Contains two parameters: 1 - Description: Configuration changed. Error code is: %n. 2 - %n number.
vlanModeActive	22	normal	Indicates to non-VLAN PC that after 2 minutes the system will support only VLAN tag on management interface. Contains a single parameter, which is its description: 1 - Description: VLAN Mode is active. Non-VLAN traffic will be blocked in 2 minutes.
tdmServiceAlarm	100	major	Indicates that TDM Service is in alarm state. Contains a single parameter, which is its description: 1 - Description: TDM Service - Alarm.
ethServiceClosed	101	major	Indicates that Ethernet Service is closed. Contains a single parameter, which is its description: 1 - Description: Ethernet Service is closed.
ethServiceNotPermitted	102	major	Indicates that Ethernet Service is not permitted. Contains a single parameter, which is its description: 1 - Description: A valid Idu could not be detected at %s. Please check your configuration. %s - Is the Local Site name or Remote Site name or both sides of the Link.
encryptionAlarm	103	major	Indicates an encryption key mismatch. Contains a single parameter which is its description: 1 - Description: Encryption Status - Failed. No Services are available.
changeLinkPasswordAlarm	104	major	Indicates that a failure has occurred while attempting to change the Link Password. Contains a single parameter which is its description: 1 - Description: Failed to change the Link Password at/on: %s. %s - Is the Local Site name or Remote Site name or both sides of the Link.

Table F-3: MIB Traps (Sheet 3 of 4)

Name	ID	Severity	Description
externalAlarmInPort1Alarm	105	major	The trap is sent every time an alarm occurs in the External Alarm Input of port #1. Contains a single parameter which is its description: 1 - Description: External Alarm 1 - <User Text> - Alarm.
externalAlarmInPort2Alarm	106	major	The trap is sent every time an alarm occurs in the External Alarm Input of port #2. Contains a single parameter which is its description: 1 - Description: External Alarm 2 - <User Text> - Alarm.
bitFailedAlarm	107	critical	The trap is sent in case there is no way to recover from the situation. Contains two parameters: 1 - Description: ODU power up built in test failed. Error code is: %n. 2 - %n number.
wrongConfigurationLoadedAlarm	108	major	The trap is sent in case there is a way to recover from the situation. Contains two parameters: 1 - Description: Wrong configuration loaded. Error code is: %n. 2 - %n number.
lanPort1DisconnectedAlarm	109	major	Indicates the LAN port 1 status changed to disconnected. Contains a single parameter which is its description: 1 - Description: LAN port 1 status changed to disconnected.
lanPort2DisconnectedAlarm	110	major	Indicates the LAN port 2 status changed to disconnected. Contains a single parameter which is its description: 1 - Description: LAN port 2 status changed to disconnected.
mngPortDisconnectedAlarm	111	major	Indicates the management port status changed to disconnected. Contains a single parameter which is its description: 1 - Description: Management port status changed to disconnected.
externalAlarmInPort3Alarm	112	major	The trap is sent every time an alarm occurs in the External Alarm Input of port #3. Contains a single parameter which is its description: 1 - Description: External Alarm 3 - <User Text> - Alarm.
externalAlarmInPort4Alarm	113	major	The trap is sent every time an alarm occurs in the External Alarm Input of port #4. Contains a single parameter which is its description: 1 - Description: External Alarm 4 - <User Text> - Alarm.
swVersionsMismatchFullCompatibilityAlarm	114	warning	The trap is sent in case SW versions mismatch with full link functionality. Contains a single parameter which is its description: 1 - Description: Software versions mismatch - full link functionality
swVersionsMismatchRestrictedCompatibilityAlarm	115	minor	The trap is sent in case SW versions mismatch with restricted link functionality. Contains a single parameter which is its description: 1 - Description: Software versions mismatch - restricted link functionality
swVersionsMismatchSoftwareUpgradeRequired	116	major	The trap is sent in case SW versions mismatch and SW upgrade is required. Contains a single parameter which is its description: 1 - Description: Software versions mismatch - Software upgrade required
swVersionsIncompatible	117	critical	The trap is sent in case SW versions are incompatible. Contains a single parameter which is its description: 1 - Description: SW Versions incompatible
tdmBackupAlarm	121	major	Indicates that the TDM backup link was activated. Contains a single parameter, which is its description: 1 - Description: TDM backup alarm - backup link was activated.
linkLockUnauthorizedRemoteODU	122	major	Indicates that the remote ODU is unauthorized. Contains a single parameter which is its description: 1 - Description: Unauthorized remote ODU connection rejected.
linkLockUnauthorizedODU	123	major	Indicates that the ODU is unauthorized. Contains a single parameter which is its description: 1 - Description: Unauthorized ODU connection rejected.
tdmServiceClear	200	normal	Indicates that TDM Service fault is cleared. Contains a single parameter, which is its description: 1 - Description: TDM Service - Normal.
ethServiceOpened	201	normal	Indicates that Ethernet Service has been opened. Contains a single parameter,3 which is its description: 1 - Description: Ethernet Service has been opened.
encryptionClear	203	normal	Indicates that encryption is OK. Contains a single parameter which is its description: 1 - Description: Encryption Status - Normal.

Table F-3: MIB Traps (Sheet 4 of 4)

Name	ID	Severity	Description
changeLinkPasswordClear	204	normal	Indicates that the Link Password was changed successfully. Contains a single parameter which is its description: 1 - Description: Link Password has been changed at/on: %s. %s - Is the Local Site name or Remote Site name or both sides of the Link.
externalAlarmInPort1Clear	204	normal	This Trap is sent every time an External Alarm Input fault of port # 1 is cleared. Contains a single parameter which is its description: 1 - Description: External Alarm 1 - <User Text> - Alarm Cleared.
externalAlarmInPort2Clear	206	normal	This Trap is sent every time an External Alarm Input fault of port # 2 is cleared. Contains a single parameter which is its description: 1 - Description: External Alarm 2 - <User Text> - Alarm Cleared.
lanPort1Clear	209	normal	Indicates the LAN port 1 status changed to connected. Contains two parameters: 1 - Description: LAN port 1 status changed to connected - %s. 2 - %s Is the Eth. mode (speed & duplex).
lanPort2Clear	210	normal	Indicates the LAN port 2 status changed to connected. Contains two parameters: 1 - Description: LAN port 2 status changed to connected - %s. 2 - %s Is the Eth. mode (speed & duplex).
mngPort2Clear	211	normal	Indicates the management port status changed to connected. Contains two parameters: 1 - Description: Management port status changed to connected - %s. 2 - %s Is the Eth. mode (speed & duplex).
externalAlarmInPort3Clear	211	normal	This Trap is sent every time an External Alarm Input fault of port # 3 is cleared. Contains a single parameter which is its description: 1 - Description: External Alarm 3 - <User Text> - Alarm Cleared.
externalAlarmInPort4Clear	213	normal	This Trap is sent every time an External Alarm Input fault of port # 4 is cleared. Contains a single parameter which is its description: 1 - Description: External Alarm 4 - <User Text> - Alarm Cleared.
swVersionsMatchFullCompatibilityClear	214	normal	The trap is sent in case SW versions match. Contains a single parameter which is its description: 1 - Description: Software Versions compatible
swVersionsMatchRestrictedCompatibilityClear	215	normal	The trap is sent in case SW versions match and link functionality is not restricted. Contains a single parameter which is its description: 1 - Description: Software Versions compatible
swVersionsMatchSoftwareUpgradeRequiredClear	216	normal	The trap is sent in case SW versions match and SW upgrade is successful. Contains a single parameter which is its description: 1 - Description: Software Versions compatible
swVersionsCompatibleClear	217	normal	The trap is sent in case SW versions compatible Contains a single parameter which is its description: 1 - Description: Software Versions compatible
tdmBackupClear	221	normal	
linkLockAuthorizedODU	223	normal	Indicates that the ODU is authorized. Contains a single parameter which is its description: 1 - Description: Authorized ODU connection permitted.
linkAuthenticationDisabled	224	normal	Indicates that the Link Lock is disabled. Contains a single parameter which is its description: 1 - Description: Link Authentication has been disabled

RADWIN Manager Traps

The RADWIN Manager application issues traps to indicate various events. These traps are shown in the RADWIN Manager Events Log.

A list of Trap Messages as displayed by the RADWIN Manager is shown in [table 7-5](#).

External Alarms Specification

External Alarms Specification

The IDU-C supports external input and output alarms through a standard DB25 pin female connector.

Input alarms

The input alarms are raised by events from external equipment, such as a fire warning, door open or air conditioner failure.

Output alarms

Output alarms are generated through dry contact relays to indicate various system events according to the following table. An alarm is raised if at least one of the conditions is met.

Table G-1: Output Alarms Pinout

Alarm	Description	Alarm On Conditions	Alarm Off Condition
Output 1	Air interface Alarm	- Link is down - Link in installation mode - Link authentication problem	Link is up
Output 2	Equipment Alarm	- Built in Test (BIT) error - No connection to the ODU - Incompatible software	Both ODU and IDU are in operational state
Output 3	Service Alarm at Site B	N/A	Permanently off
Output 4	Power Failure at Site B	Link Loss due to Power Failure at Site B	Link is up or down without power failure indication within the last two seconds

Combo Configuration Tool

What is the Combo Configuration Tool?

The RADWIN 1000/2000 is supplied preconfigured to a default frequency band and regulation. The user may however, reconfigure it to use any one of the supported frequency bands shown in the following example:

Product	Default Band
2050	FCC/IC 5.8 GHz

The Combo Configuration Tool is a software utility supplied by RADWIN to change the link frequency band. It runs as familiar Windows Wizard.

This appendix will walk you through the Wizard. It also provides help for common problems encountered during the configuration.

Who may use the Combo Configuration Tool

The Combo Configuration Tool is a password protected utility intended for the use of RADWIN accredited personnel at the user's site, RADWIN Customer Support Engineers or Professional Installers conversant with FCC requirements.

Caveat to the use of the Combo Configuration Tool

It is the user's responsibility to operate the system according to local regulations and to acquire the relevant permits or licenses for the frequency band selected, if applicable.

Prerequisites to using the Combo Configuration Tool

To use the Tool, you need a PC running Windows 2000 or Windows XP Pro to be connected to the RADWIN 1000/2000 link.

Operating the Combo Configuration Tool

The tool is supplied as an executable called ComboConfigurationTool.exe. It should be copied to a convenient directory on a hard disk from where it can be run from a command line, or placed on the desktop and opened with a double click.

The Combo Configuration Tool is a Wizard, which guides you through the process of changing the frequency band.

Before using the Combo Configuration Tool

Before starting:

- ⇒ Obtain the IP address of both the local ODU and remote ODUs of the link
- ⇒ Make a note of the correct required frequency band
- ⇒ If the link uses external antennas, ensure that they support your required frequency band

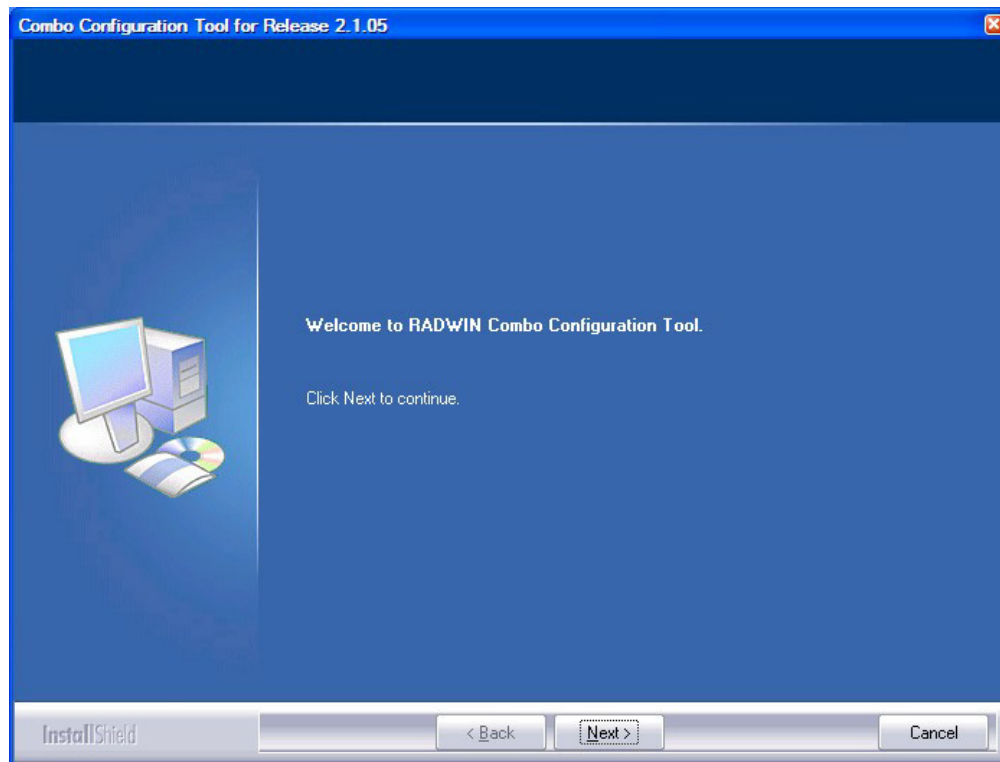
Also, note that

1. The procedure below must be carried out for both ODUs in the link.
2. Changing the frequency band may affect the available Link Budget and system performance.

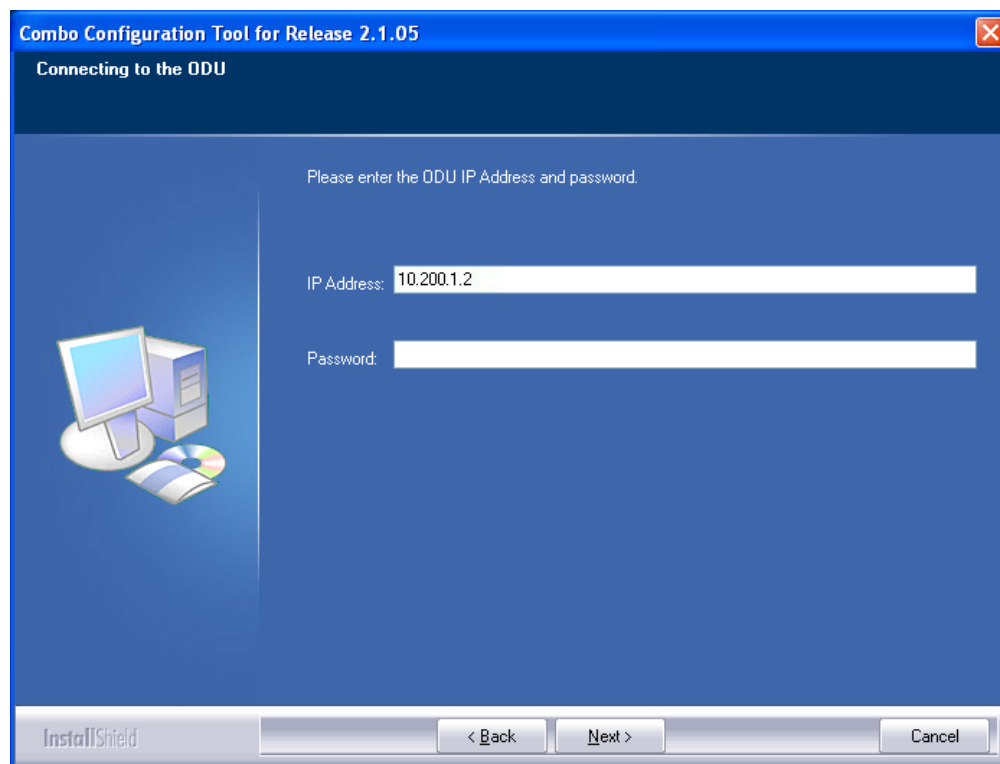
Using the Combo Configuration Tool

➤ To change the link frequency band:

1. Open the Tool from a command line or double clicking it on the desktop. The following Welcome screen appears:



2. Click Next. The window below is displayed:

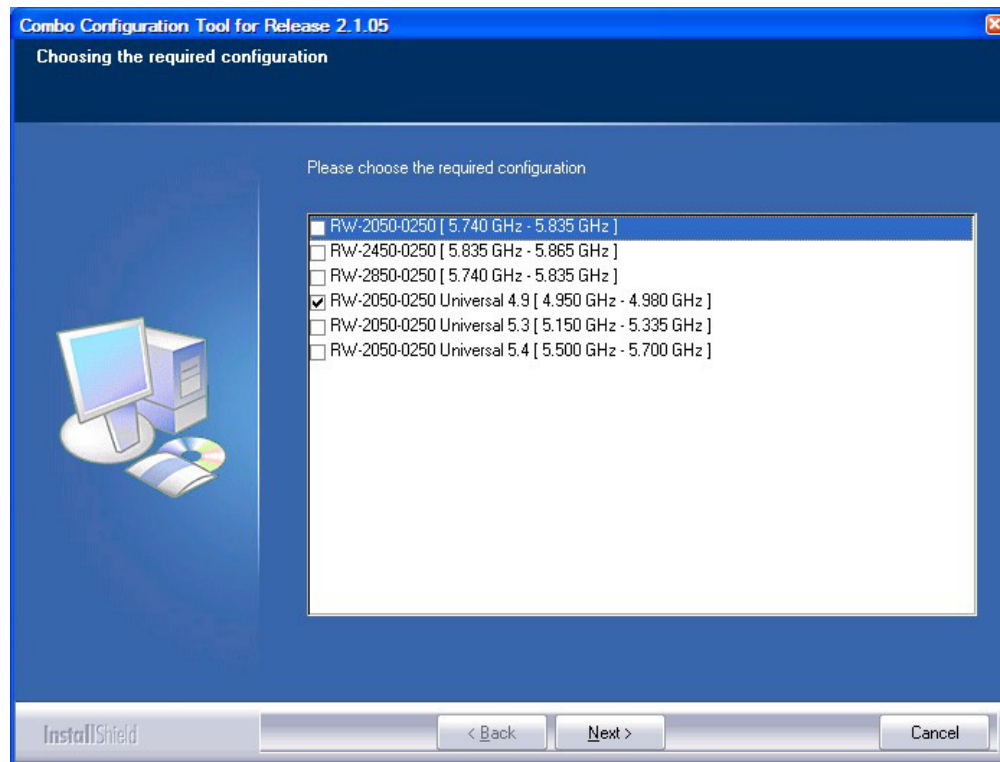


3. Enter the ODU IP address and password.

4. Click Next. The following progress panel is displayed:

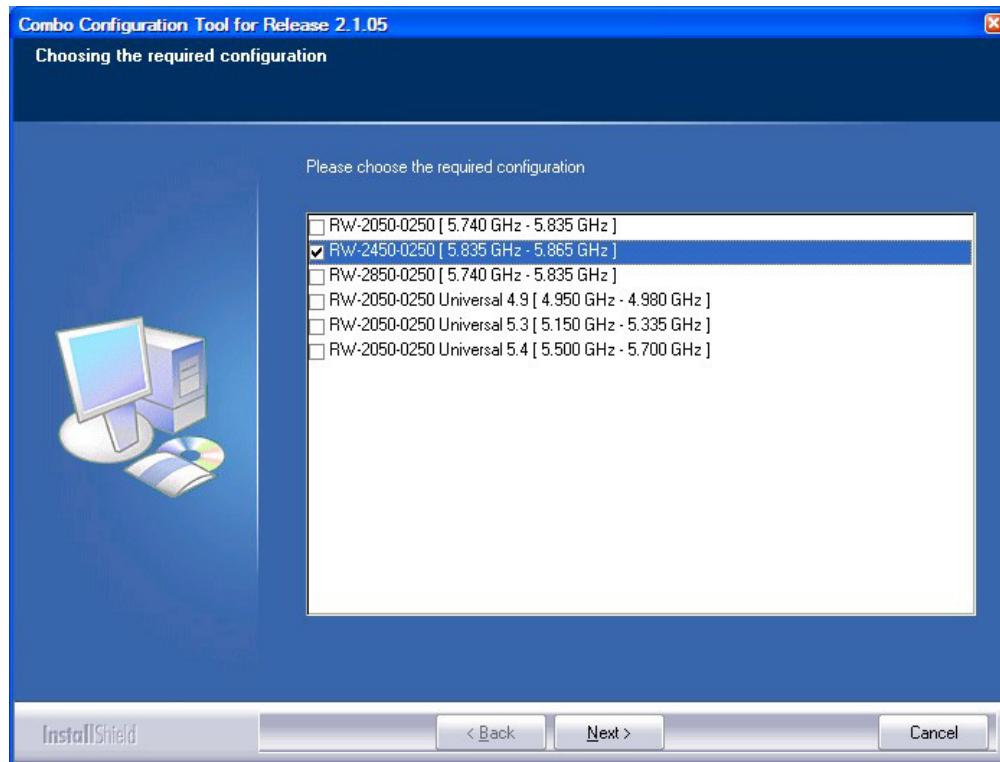


Upon completion the following screen is displayed:

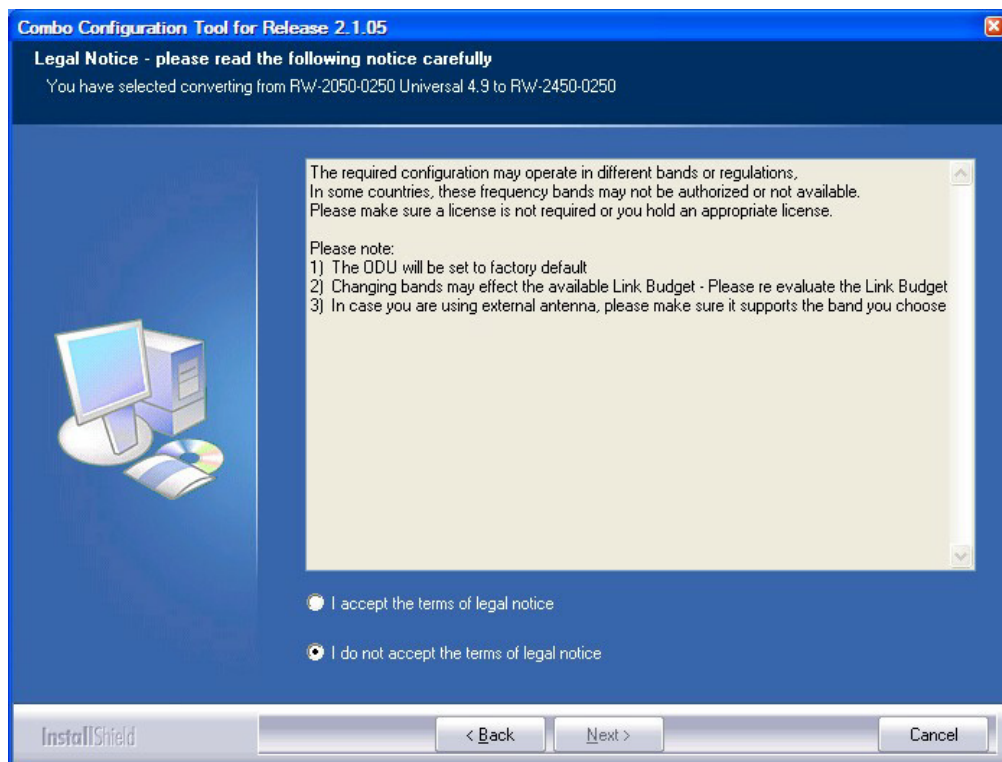


The checked item is the currently configured frequency band.

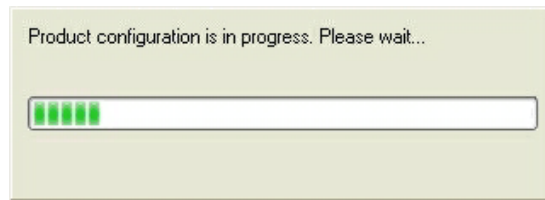
5. Check the box with the required frequency band. If you do not see the required frequency band in the above window, click **Cancel** and consult RADWIN Customer Support.



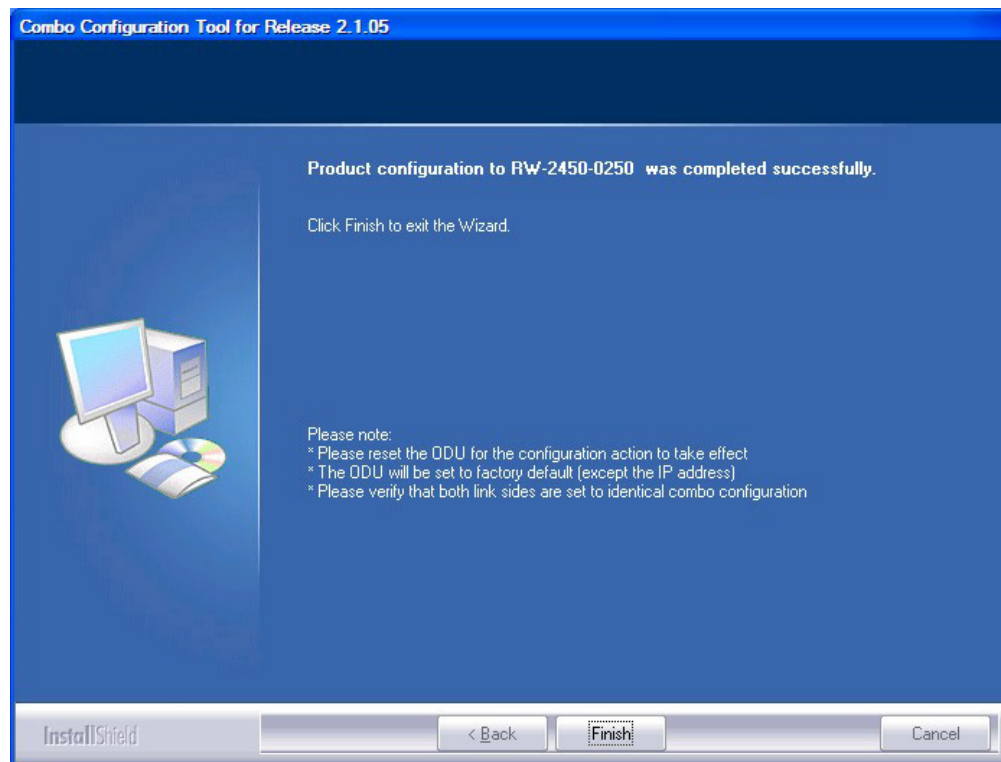
6. Otherwise, click **Next**. The following window is displayed:



7. If the legal notice is acceptable, click the "I accept" radio button, and then click Next. Two successive progress panels are displayed. The configuration may take several minutes.



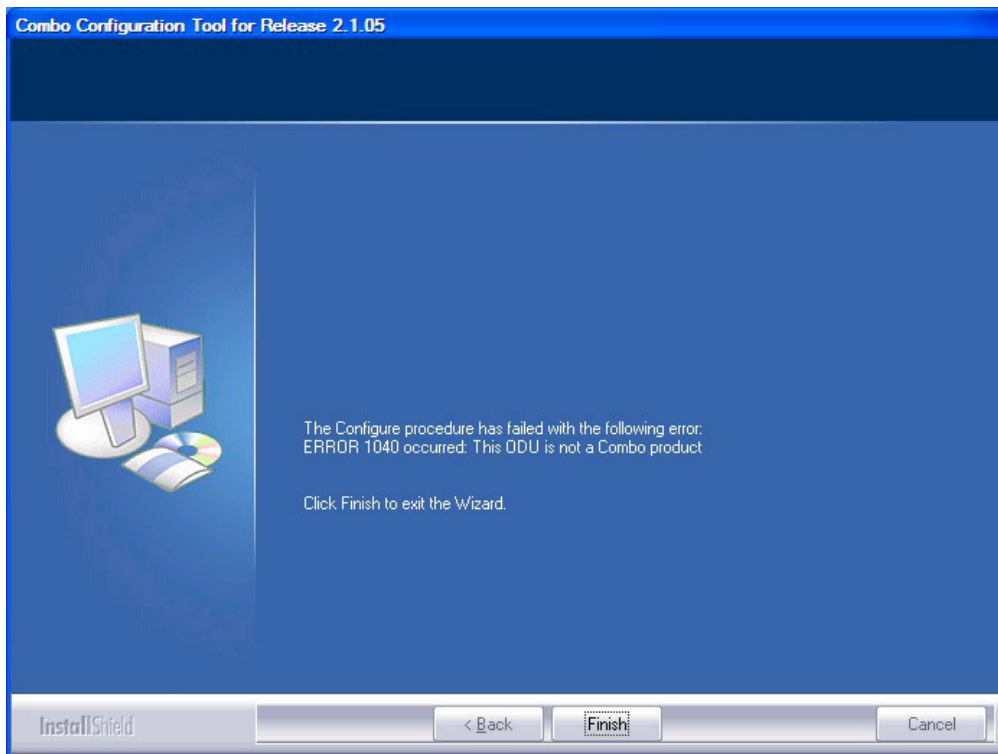
Upon successful completion of the configuration process, the following termination window is displayed:



8. Click Finish to exit the Wizard as shown.
9. Repeat the whole process for the second ODU in the link.

If you receive an error message

The last stage above may terminate unsuccessfully due to an error. Error messages are posted to a window like this:



The following table sets out possible errors:

Error Number (nn)	Error Text Message
Common message preamble:	The Configure procedure has failed with the following error: ERROR nn occurred:
120	Failed to communicate with the ODU. Please verify the existence of a stable IP connection and try again.
940	Product is not identified.
1040	The ODU is not a Combo product.
1020	A configuration problem detected. Aborting.

The only items requiring explanation are errors 940 and 1020.

Error 940 may arise as a results of an ODU firmware problem. Error 1020 will appear for any reason not caught by the other entries in the table. In all such cases, you should consult with RADWIN Customer Support.

Regional Notice: French Canadian

Procédures de sécurité

Généralités

Avant de manipuler du matériel connecté à des lignes électriques ou de télécommunications, il est conseillé de se défaire de bijoux ou de tout autre objet métallique qui pourrait entrer en contact avec les éléments sous tension.

Mise à la terre

Tous les produits RADWIN doivent être mis à la terre pendant l'usage courant. La mise à la terre est assurée en reliant la fiche d'alimentation à une prise de courant avec une protection de terre. En outre:

- La cosse de masse sur l'IDU-C doit être constamment connectée à la protection de terre, par un câble de diamètre de 18 AWG ou plus. Le matériel monté sur rack doit être installé seulement sur des racks ou armoires reliés à la terre
- Une ODU doit être mise à la terre par un câble de diamètre de 12 AWG ou plus
- Il ne doit pas y avoir de fusibles ou d'interrupteurs sur la connection à la terre

De plus:

- Il faut toujours connecter la terre en premier et la déconnecter en dernier
- Il ne faut jamais connecter les câbles de télécommunication à du matériel non à la terre
- Il faut s'assurer que tous les autres câbles sont déconnectés avant de déconnecter la terre

Protection contre la foudre

L'utilisation de dispositifs de protection contre la foudre dépend des exigences réglementaires et de l'utilisateur final. Toutes les unités extérieures RADWIN sont conçues avec des circuits de limitation de surtension afin de minimiser les risques de dommages dus à la foudre. RADWIN conseille l'utilisation d'un dispositif de parafoudre supplémentaire afin de protéger le matériel de coups de foudre proches.

Matériel supplémentaire requis

L'équipement requis pour l'installation du matériel est le suivant:

- Pince à sertir RJ-45 (si un câble pré-assemblé ODU/IDU n'est pas utilisé)
- Perceuse (pour le montage sur mur seulement)
- Câbles de terre IDU et ODU
- Clef 13 mm (1/2")
- Câble ODU - IDU si non commandé (type extérieur, CAT-5e, 4 paires torsadées, 24 AWG)
- Colliers de serrage
- Ordinateur portable avec Windows 2000 ou Windows XP.

Précautions de sécurité pendant le montage de ODU

Avant de connecter un câble à l'ODU, la borne protectrice de masse (visse) de l'ODU doit être connectée à un conducteur externe protecteur ou à un pylône relié à la terre. Il ne doit pas y avoir de fusibles ou d'interrupteurs sur la connection à la terre.

Seulement un personnel qualifié utilisant l'équipement de sécurité approprié doit pouvoir monter sur le pylône d'antenne. De même, l'installation ou le démontage de ODU ou de pylônes doit être effectuée seulement par des professionnels ayant suivi une formation.

➤ Pour monter l'ODU:

1. Vérifier que les supports de fixation de l'ODU sont correctement mis à la terre.
2. Monter l'unité ODU sur le pylône ou sur le mur; se référer à la [Installation sur pylône et mur](#) au dessous.
3. Connecter la câble de terre au point de châssis sur l'ODU.
4. Relier le câble ODU-IDU au connecteur ODU RJ-45.
5. Visser les presses-étoupe de câbles pour assurer le scellement hermétique des unités ODU.
6. Attacher le *câble au pylône ou aux supports en utilisant des colliers classés UV*.
7. Répéter la procédure sur le site distant.

**Prudence**

Ne pas se placer en face d'une ODU sous tension.

Connecter la terre à IDU-C

Connecter un câble de terre de 18 AWG à la borne de masse de l'appareil. L'appareil doit être constamment connecté à la terre.

**Prudence**

- Les appareils sont prévus pour être installés par un personnel de service.
 - Les appareils doivent être connectés à une prise de courant avec une protection de terre.
 - Le courant CC du IDU-C doit être fourni par l'intermédiaire d'un disjoncteur bipolaire et le diamètre du câble doit être de 14 mm avec un conduit de 16 mm.
-

Installation sur pylône et mur

L' ODU ou l'O-PoE peuvent être montés sur un pylône ou un mur.

Contenu du kit de montage ODU

Le kit de montage ODU comprend les pièces suivantes:

- une grande clame (voir [figure I-1](#))
- une *petite clame* (voir [figure I-2](#))
- un bras (voir [figure I-3](#))
- quatre vis hex tête M8x40
- deux vis hex tête M8x70
- quatre rondelles plates M8
- trois rondelles élastiques M8
- deux écrous M8.

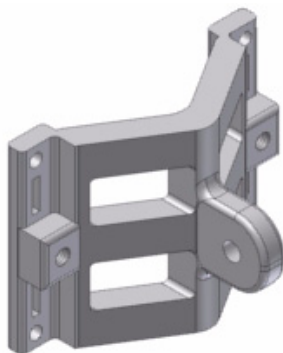


Figure I-1: grande clame

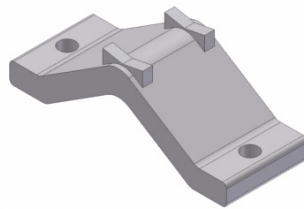


Figure I-2: petite clame

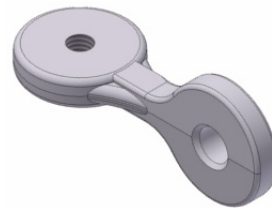


Figure I-3: bras

Montage sur un pylône

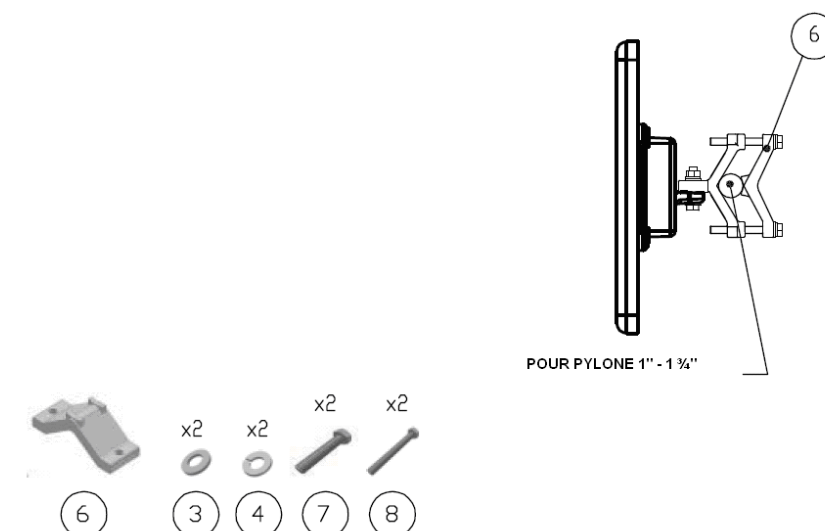
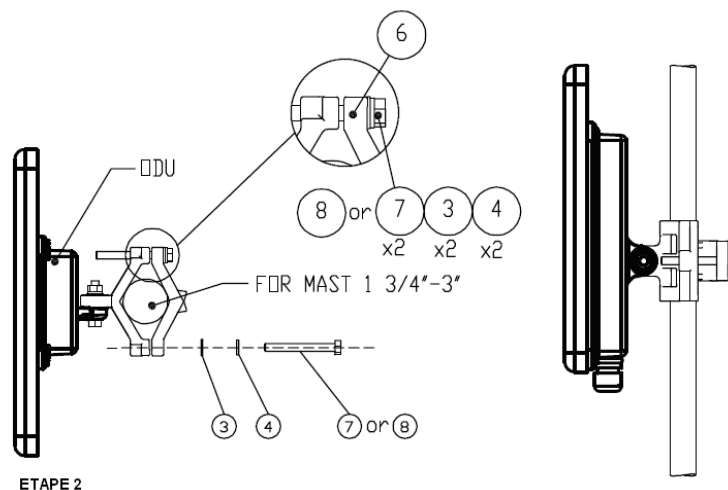
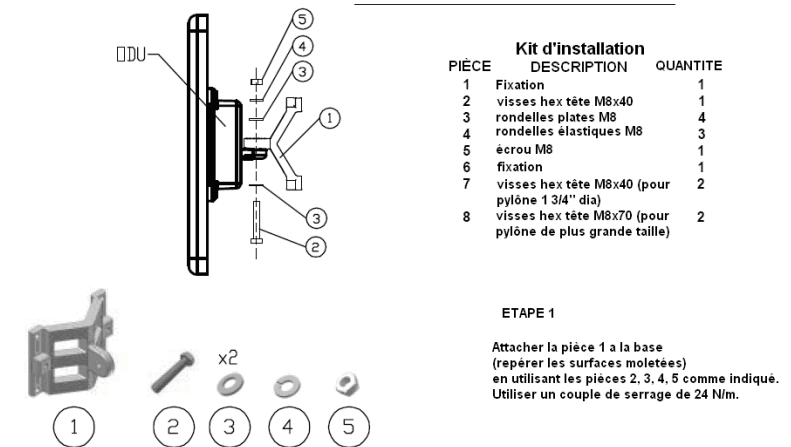
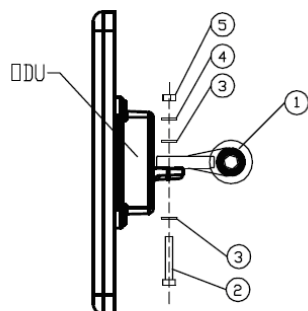
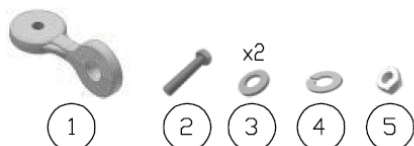


Figure I-4: Montage sur un pylône

Montage sur un mur

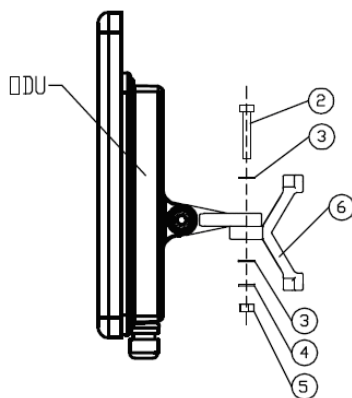


Kit d'installation		
PIÈCE	DESCRIPTION	QUANTITE
1	Bras	1
2	vissés hex tête M8x40	2
3	rondelles plates M	4
4	rondelles élastiques M8	2
5	écrou M8	2
6	base	1



ETAPE 1

Attacher la pièce 1 à la base (repérer les surfaces moletées) en utilisant les pièces 2, 3, 4, 5 comme indiqué. Utiliser un couple de serrage de 24 N/m.



ETAPE 2

Attacher la pièce 6 au bras (repérer les surfaces moletées) en utilisant les pièces 2, 3, 4, 5 comme indiqué. Utiliser un couple de serrage de 24 N/m.

ETAPE 3

Installer l'antenne sur le mur (matériel fourni par le client)

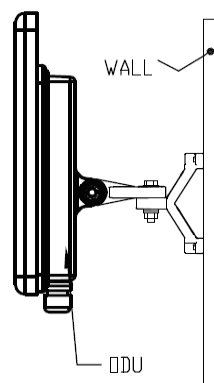


Figure I-5: Montage sur un mur

Montage d'une antenne externe

L'antenne externe optionnelle peut être montée sur un pylône.

Contenu du kit de montage d'une antenne externe

Le kit de montage d'une antenne externe comprend les pièces suivantes

- Douze rondelles plates
- Huit rondelles élastiques
- Huit écrous hex
- Quatre boulons
- Un support en U
- Un support à pivotement
- Deux courroies de fixation en métal

➤ Pour installer une antenne externe sur un pylône:

1. Attacher le support en U à l'arrière de l'antenne en utilisant quatre rondelles plates, quatre rondelles élastiques et quatre écrous hex.
 2. Attacher le support à pivotement au support en U en utilisant huit rondelles plates, quatre rondelles élastiques, quatre écrous hex et quatre boulons.
 3. Passer les deux courroies de fixation par les fentes verticales dans le support à pivotement.
 4. Attacher l'antenne au pylône en utilisant les deux courroies de fixation .
- Ajuster l'inclinaison nécessaire en utilisant l'échelle angulaire et serrer tous les boulons et écrous à la position requise.

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