TrangoLINK™ Giga PRO

High-Capacity Point-to-Point Wireless Microwave System

Installation Guide and User Manual

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Revision 1.1

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Table of Contents

Figures

Tables

Preface

This manual covers the configuration and installation of the TrangoLINK™ GigaPRO Wireless Microwave System, and applies to the following radio part numbers:

Table 1: TrangoLINK™ main GigaPRO Part numbers

Part Number	Description
Giga PRO-IDU-1	TrangoLINK™ Giga PRO Indoor Unit, 100Mbps Full Duplex, 1U rack mount (All Frequency Versions) ANSI/ETSI
GigaXX-ODU-ZZ	TrangoLINK™ Standard Power (SP) Outdoor Unit, 11-23 GHz
HP-XX-YYY-ZZ	TrangoLINK™ High Power (HP) Outdoor Unit, 6-38 GHz
DPMC-XX	Dual Polarization Microwave Combiner

Where:
XX - Represents the Frequency Band in GHz (ex.: 6, 18)
YYY- Represents the Transmit/Receive (T/R) spacing or Duplex Distance in MHz (ex.: 0252, 1200)
ZZ - Represents the Radio sub-band (ex.: 1A, 1B, 2A, 2B)

Additional Part numbers for accessories, license keys, and detailed ODU part numbers by frequency band can be found in Appendix E at the end of this manual

FCC Emission Designators

- 10M0D7W for 10 MHz BW rates and all modulations
- 20M0D7W for 20 MHz BW rates and all modulations
- 30M0D7W for 28/30 MHz BW rates and all modulations
- 40M0D7W for 40 MHz BW rates and all modulations
- 50M07DW for 50 MHz BW rates and all modulations
- 56M0D7W for 56/80 MHz BW rates and all modulations

European Telecommunications Standards Institute (ETSI)

The GigaPRO product line has been tested and found to comply with the European Telecommunications Standards:

EN 302 217-2-1 V1.2.1 (2007-02)
EN 302 217-2-2 V1.2.2 (2007-04)
EN 301 489-1 V1.8.1 (2008-04)
EN 301 489-4 V1.4.1 (2008-09)
EN 60950-1

These standards cover all the essential requirements of Directive 1999/5/EC.

Warranty Information

Radios from Trango Systems, Inc. are warranted for one year from date of purchase. Please see www.trangosys.com for a complete description of warranty coverage and limitations. Extended warranty protection can be purchased through Trango Sales or Customer Service (1-858-391-0010).

Chapter 1 - Overview

About this Chapter

This chapter introduces the TrangoLINK™ GigaPRO system, features, and its components

Introduction

The TrangoLINK™ GigaPRO is a carrier grade high-performance point-to-point wireless microwave system designed for Carrier, Service Provider, Municipal/Government, and Enterprise, networks using licensed microwave spectrum. The TrangoLINK™ GigaPRO provides a full duplex wireless connection over the air that is ideal for mixed traffic that requires both Ethernet IP and traditional Time Division Multiplex (TDM) connectivity through STM-1, OC-3, T1 and E1 interfaces.

The TrangoLINK ™GigaPRO is a split architecture system complying with standard Frequency Division Duplexing (FDD) channel arrangements used under the FCC Part 101 and ITU Frequency plans. Outdoor Units (ODUs) are available in standard power and high power versions and support the frequency spectrum from 6 to 38 GHz.

Utilizing Hitless Adaptive Coding and Modulation (ACM), hitless 1+1 operation, and Advanced QoS Features, the system can achieve reliability levels and link distances for voice and data not previously achievable using conventional fixed modulation techniques.

Configured appropriately, a single link can provide latency of less than 100 microseconds, over 2 million packets per second, and up to 1.5 Gbps of aggregate payload capacity (750 Mbps Full Duplex). The TrangoLINK™ GigaPRO utilizes 4 GigE copper ports, 2 GigE Fiber ports, up to 32 T1/E1 ports and 2 STM-1/OC-3 ports in combination with VLAN and QoS prioritization to offer great flexibility in offering high value added services.

Consult the GigaPRO datasheet for individual specifications based on frequency.

ADDITIONAL ACCESSORIES ARE REQUIRED FOR COMPLETE INSTALLATION OF THE TRANGOLINK™ GIGAPRO SUCH AS POWER SUPPLIES, IDU TO ODU IF CABLES, WAVEGUIDE TRANSITIONS, AND ANTENNAS.

System Configurations

The TrangoLink GigaPRO was designed with flexibility in mind. The Product supports a number of system configurations to suit different network architectures and reliability requirements. Each configuration is explained below with a simplified diagram showing the active datapaths and Modems inside the Indoor unit.

Speed upgrades, cable grounding equipment, lightning protection, and TDM/SFP interface options are not shown.

1+0 Single Modem Configuration – This is the simplest form of link using the GigaPRO. Link reliability enhancement is in the form of hitless ACM on the active link. Only Modem 1 (M1) is used, so only ODU1 will be available. All Ethernet Interfaces are available and map to M1 through an internal Ethernet switch. Only T1/E1 ports 1-16 and STM-1-1 fiber ports are available for use .

- License keys are required for T1/E1 and STM-1/OC-3 operation

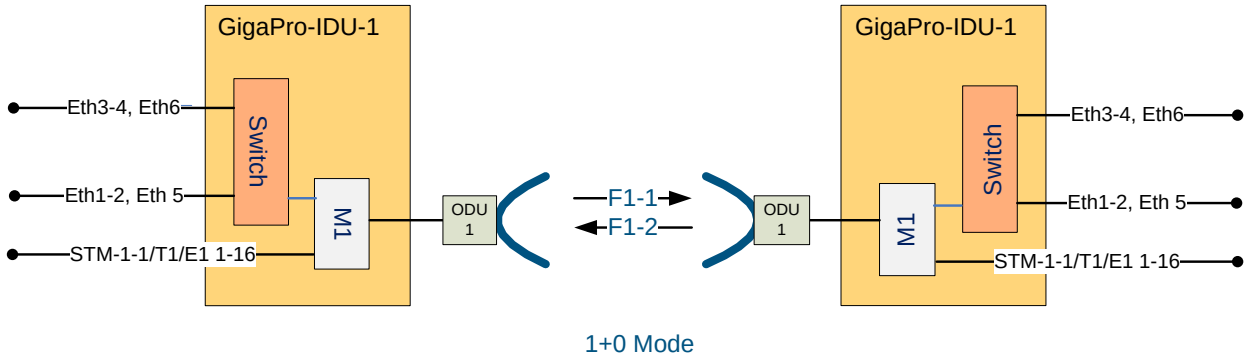


Figure 1: 1+0 Configuration

1+0 East/West Configuration - This is a relay link designed to extend the length of a link or relay a traffic path in a different direction without having to add an extra IDU, power supply and associated rack space. A single IDU can relay traffic from one ODU to the Other ODU by siply adding the appropriate cabling to the front of the unit. If traffic needs to be added or dropped, an external switch can be added to the link. (See Application Note for more detail)

- In this mode M1 and M2 act independently.
- **IMPORTANT NOTE: Even though the switch is present the Ethernet ports are divided between the two modems:**
    - **Ethernet ports Eth1/Eth2, T1/E1 ports 1-16, and STM-1-1/Eth5 map to M1/ODU1.**
    - **Ethernet Eth3/Eth4, T1/E1 ports 17-32, and STM-1-2/Eth6 map to M2/ODU2.**
- A license key is required to enable Modem 2 for at least two IDUs. Up to 2 ports of GigE copper, 16 ports of T1/E1 and 1 optical port traffic may be relayed.
- License keys are required for T1/E1 and STM-1/OC-3 operation

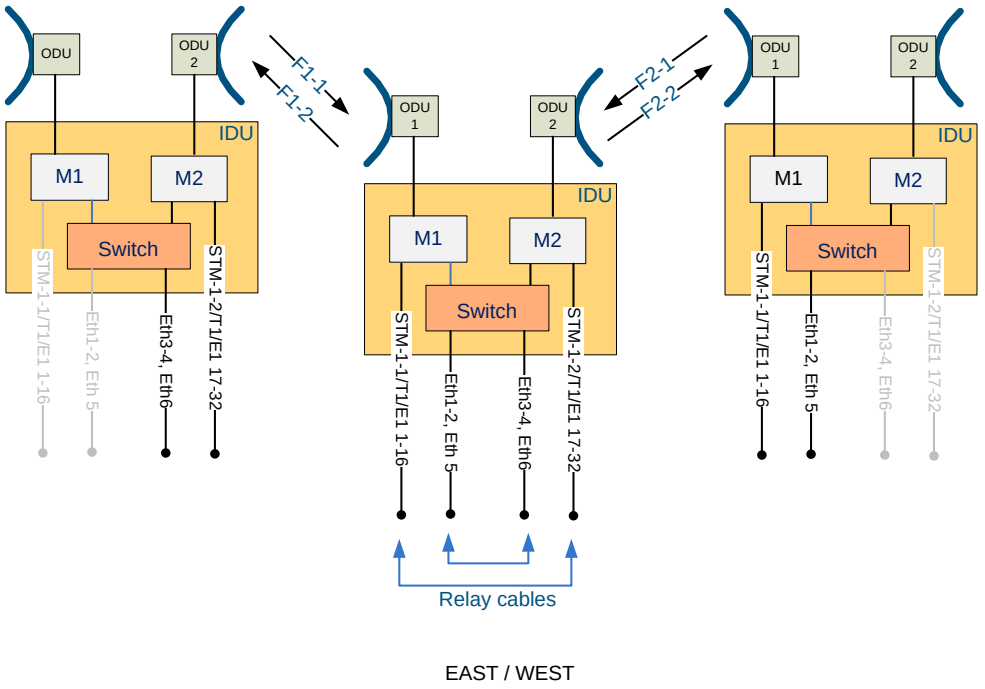


Figure 2: East West Configuration

2+0 Dual Modem Configuration – This is a double capacity link which utilizes two ODUs at each end of the link connected to a single IDU, combined on a single antenna (shown) or on separate antennas if desired. Each ODU pair forms a single RF link carrying up to 375 Mbps Full Duplex, for a total capacity of up to 750 Mbps Full Duplex.

- The Ethernet traffic is split between the two ODUs by the internal switch and then reassembled at the far end, enabling a single Ethernet port to be used if desired. Link aggregation mode is used to do this, with the hashing being done on both source and destination MAC addresses. At least two flows to different MAC destinations will be required to utilize the full capacity of the link.

- The 2 RF channels (F1 and F2) may be assigned in any frequency or polarization combination **except** on the same RF channel (co-channel). In addition, multiple channel bandwidths may be used if desired due to frequency congestion. Link reliability enhancement is in the form of hitless ACM on both active links, working independently such that frequency selective fading only affects one link. If one of the two links is disabled, the critical traffic is moved to the remaining link based on QoS rules.

- A license key is required to enable Modem 2 for two IDUs. Up to 4 ports of GigE copper, 32 ports of T1/E1 and 2 Optical ports (GigE fiber or STM-1/OC3) traffic may be used. (STM-1 and GigE Fiber ports are multiplexed)

- License keys are required for T1/E1 and STM-1/OC-3 operation

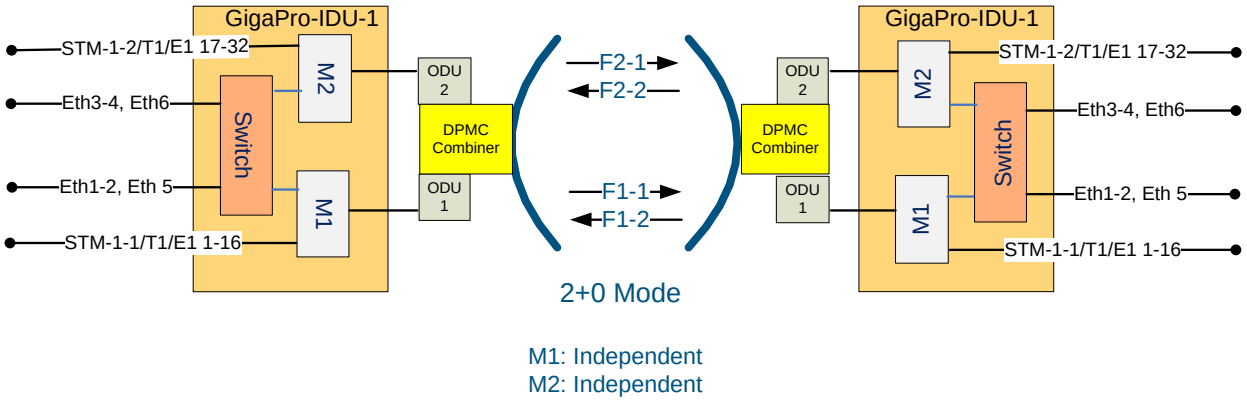


Figure 3: 2+0 Configuration

1+1 HSB (Hot Standby) – This is the basic protected mode configuration which provides for hitless failover of ALL traffic if one link fails. With the GigPro, the RX path is hitless after a failure, with the TX path recovering within 1-4 seconds if a hardware failure occurs. M1/ODU1 is always the active link, with M2/ODU2 acting as standby. Both ODUs receive the same transmitted signal and internally select on a frame by frame basis which modem is producing the error free packet.

- **This mode provides for hitless RX hardware failure and near hitless TX hardware failure protection**.
- A license key is required to enable Modem 2 for two IDUs. Up to 4 ports of GigE copper, 2 GigE Fiber, 16 ports of T1/E1 and 1 STM-1/OC3 port may be used (STM-1 and GigE Fiber ports are multiplexed)
- License keys are required for T1/E1 and STM-1/OC-3 operation

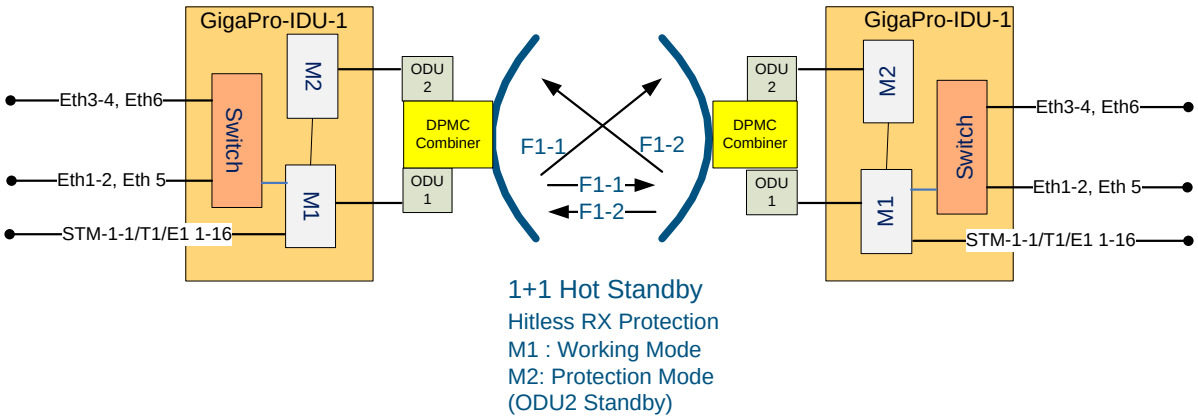


Figure 4: 1+1 HSB Configuration

1+1 FD (Frequency Diversity) – This configuration provides for hitless redundancy by sending the same data over two independent RF channels, usually using a combiner on a single antenna. This configuration guards against data loss in high multipath environments. Since multipath nulls usually occur at specific frequencies, there is very little chance that both channels will be disabled at the same time. The best path through M1 or M2 is selected by the IDU automatically.

- **This mode provides for hitless transmit and receive hardware failure protection**.
- A license key is required to enable Modem 2 for two IDUs. Up to 4 ports of GigE copper, 2 GigE Fiber, 16 ports of T1/E1 and 1 STM-1/OC3 port may be used (STM-1 and GigE Fiber ports are multiplexed)
- License keys are required for T1/E1 and STM-1/OC-3 operation.

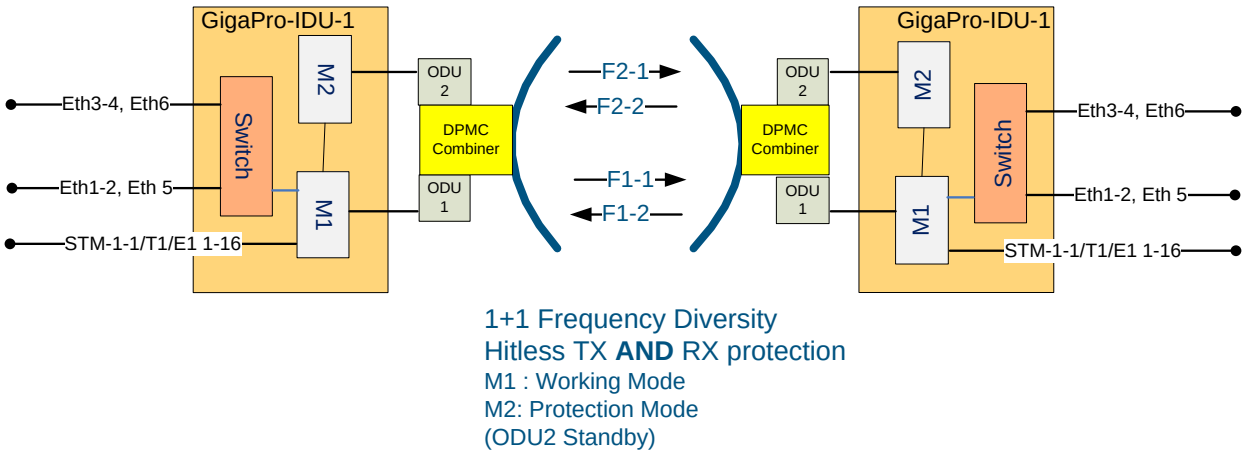


Figure 5: 1+1 Frequency Diversity Configuration

1+1 SD (Space Diversity)- This configuration is similar to 1+1 HSB except that two antennas are used with one ODU on each, to protect against high multipath environments over highly reflective links such as water and flat land when two frequencies cannot be used. Multipath nulls will only affect one path at a time, and the IDU will select which path to use automatically at the packet level.

- **This configuration provides for hitless RX hardware protection, near hitless TX hardware failure protection, and protection from multipath fading**.
- A license key is required to enable Modem 2 for two IDUs. Up to 4 ports of GigE copper, 2 GigE Fiber, 16 ports of T1/E1 and 1 STM-1/OC3 port may be used (STM-1 and GigE Fiber ports are multiplexed)
- License keys are required for T1/E1 and STM-1/OC-3 operation.

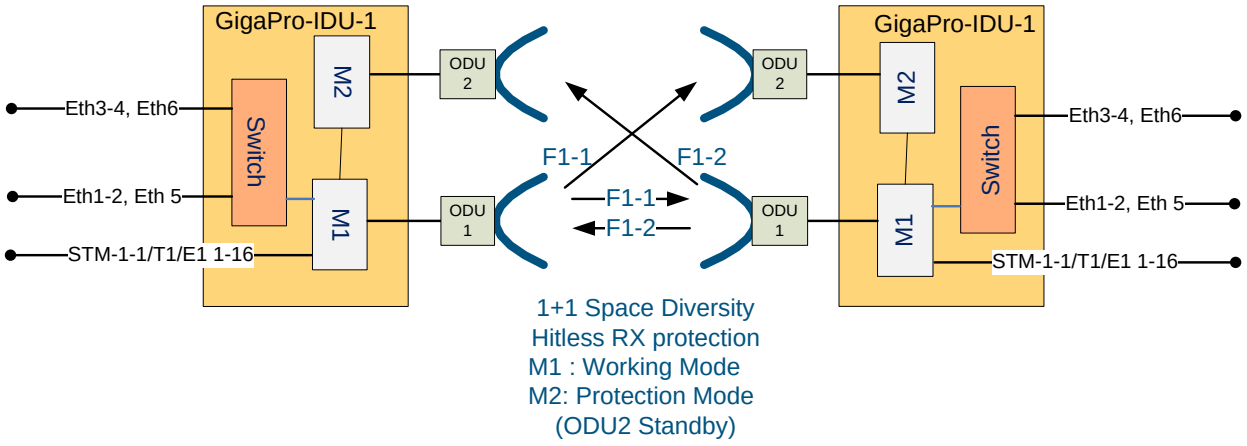


Figure 6: 1+1 Space Diversity Configuration

Indoor Unit Front Panel

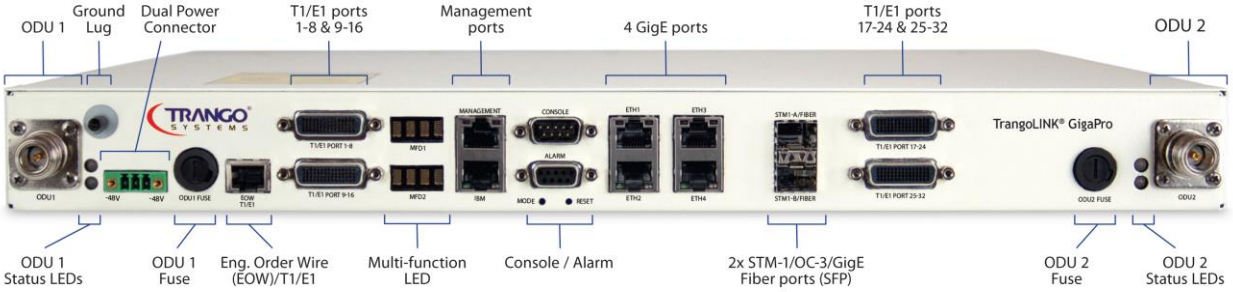


Figure 7: Front Panel of GigaPro IDU

The TrangoLINK™ GigaPRO front panel interface is described below:

N-Type Connector (ODU1 & ODU2): The N-Type Connector connects the IDU to the ODU through coaxial cable. This port carries the transmit and receive IF frequencies, the ODU control signal, and the -48 VDC power to the ODU on the center conductor. N-Male to N-Male cable terminations are required and LMR400 is recommended for most installations. Lightning protection is required on this port at the entrance to the shelter and at the ODU N- Connector at a minimum.

Ground Lug: Allows for proper grounding of the chassis to the rack

ODU 1&2 Status LEDs(2): The top LED provides ODU power status while the bottom LED provides RF link status. If the top LED is amber, the ODU is not powered on, not connected, or one of the Phase Locked Loops (PLLs) in the ODU is faulty. If the bottom LED is amber, RF link is not established. If the link is established both LEDs will be green.

Dual Power Connector: This is a three pin pluggable terminal block. The IDU is powered by a -48V power supply (not included). The GigaPRO IDU does support the use of two power supplies for power redundancy.

USING TWO POWER SUPPLIES FOR REDUNDANCY

The positive (+) ground wire on both power supplies should be connected to the center pin of the three pin pluggable terminal block. One negative wire from the first power supply should be connected to the left pin while the other negative wire of the second power supply should be connected to the right pin.

ODU1 & ODU2 Fuse: These fuses protect the ODU in case of surges and power spikes

THE ODU USES A 1.6 AMP 250W FUSE

Ensure that the -48 VDC power supply can supply at least 3.5 Amps to allow handling on turn on (inrush) current and support for two ODUs.

(EOW)/T1/E1: Eng. Order Wire provides a dial tone for voice connection to opposite side of the link.

T1/E1 ports (1 – 8 & 9 – 16): 60 pin High Density Molex connector(s) connects to the T1/E1 expansion Patch Panel. The Patch panel breaks out all the T1/E1 ports into 16 RJ45 120 Ohm connectors.

2x Multi-function Display: Displays Receive Signal Strength Indicator (RSSI) digitally displayed in negative dBm (negative sign not shown). Example: display of "40" represents a -40 dBm receive level.

Management Ports (RJ45 – 10/100BaseT Autosensing/Auto-negotiating): Ethernet port used for management access.

Serial Console Port (DB9 male): 1 serial RS-232 port used to manage unit.

Alarms (DB9 female): The alarms are dry contact alarms and are user configurable.

MODE: Resets settings to factory defaults, except for the IP address configuration and license key. Press and hold the MODE button for 3 seconds to default the IDU.

RESET: Reboots IDU without disconnecting the power supply.

4 GigE ports: 4 RJ-45 10/100/1000BaseT auto-sensing GigE ports.

2x STM-1/OC-3/GigE Fiber ports (SFP): STM1-1-1/ETH5 and STM-1-2/ETH6 ports provides fiber data paths through the IDU. STM-1-1/ETH 5 is bonded with Modem 1/ODU 1 and STM-1-2/ETH 6 is bonded with Modem 2 and ODU2. In 1+0 system configuration only STM-1-1/ETH5 will be available.

Additional SFP modules are required, as well as license keys when using the STM-1 or OC3 interfaces.

T1/E1 ports (17 – 24 & 25 – 32): 60 pin High Density Molex connector(s) connects to the T1/E1 expansion Patch Panel. The Patch panel breaks out all the T1/E1 ports into 16 RJ45 120 Ohm connectors

Location of Serial Number and MAC address

Figure 8: Back of Radio (Shows where MAC address can be found)

Outdoor Unit Ports

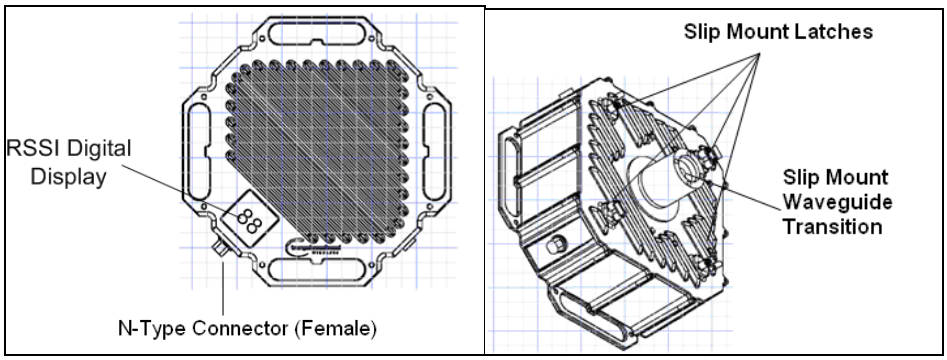


Figure 9: Outdoor Unit Connectors/Indicators (SP Model)

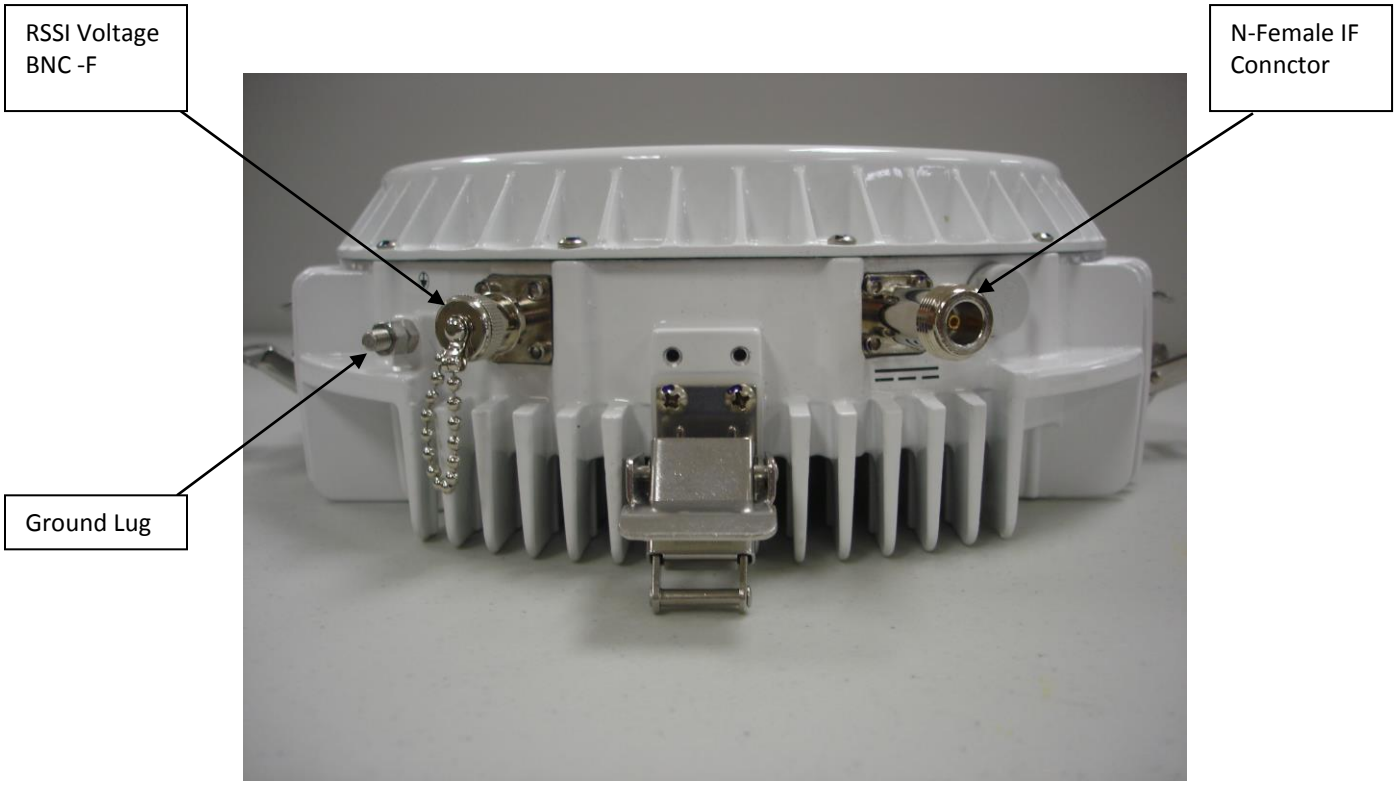


Figure 10: Outdoor Unit Connectors/Indicators (HP Model)

N-Type Connector: The N-Type Connector (Female) connects the IDU to the ODU through LMR-400 Cable

RSSI Digital Display: RSSI value of the link is displayed on the digital display for Giga-ODU models only.

NOTE: For The display window has an RF shield mesh that may make the display window appear to have condensation.

For HP models, a BNC connector is provided that supplies a voltage relative to the received signal strength. The lower the voltage the lower the signal strength. For -90 dBm input level the voltage is approximately 0.1 VDC.

Slip Mount Latches/Strikes: Secures the ODU to the Antenna Assembly or mounting bracket and allows easy removal during maintenance.

Slip Mount Waveguide Transition: Transitions rectangular waveguide of the ODU to the antenna waveguide. The HP ODU does not require a separate transition since it is integrated into the unit.

Chapter 2 - Getting Started

About this Chapter

This chapter discusses the basic steps to get started. The following topics will be covered in this chapter:

- Connection and Power
- Basic Configuration Concepts
- Management

It is recommended that you first provision and test the radios on the bench before deploying them in the field. This is a particularly useful exercise for the novice user.

Additional accessories are required for complete installation of the TrangoLINK™ GigaPRO such as power supplies, IF cables, lightning protection, and antennas.

Connections and Power

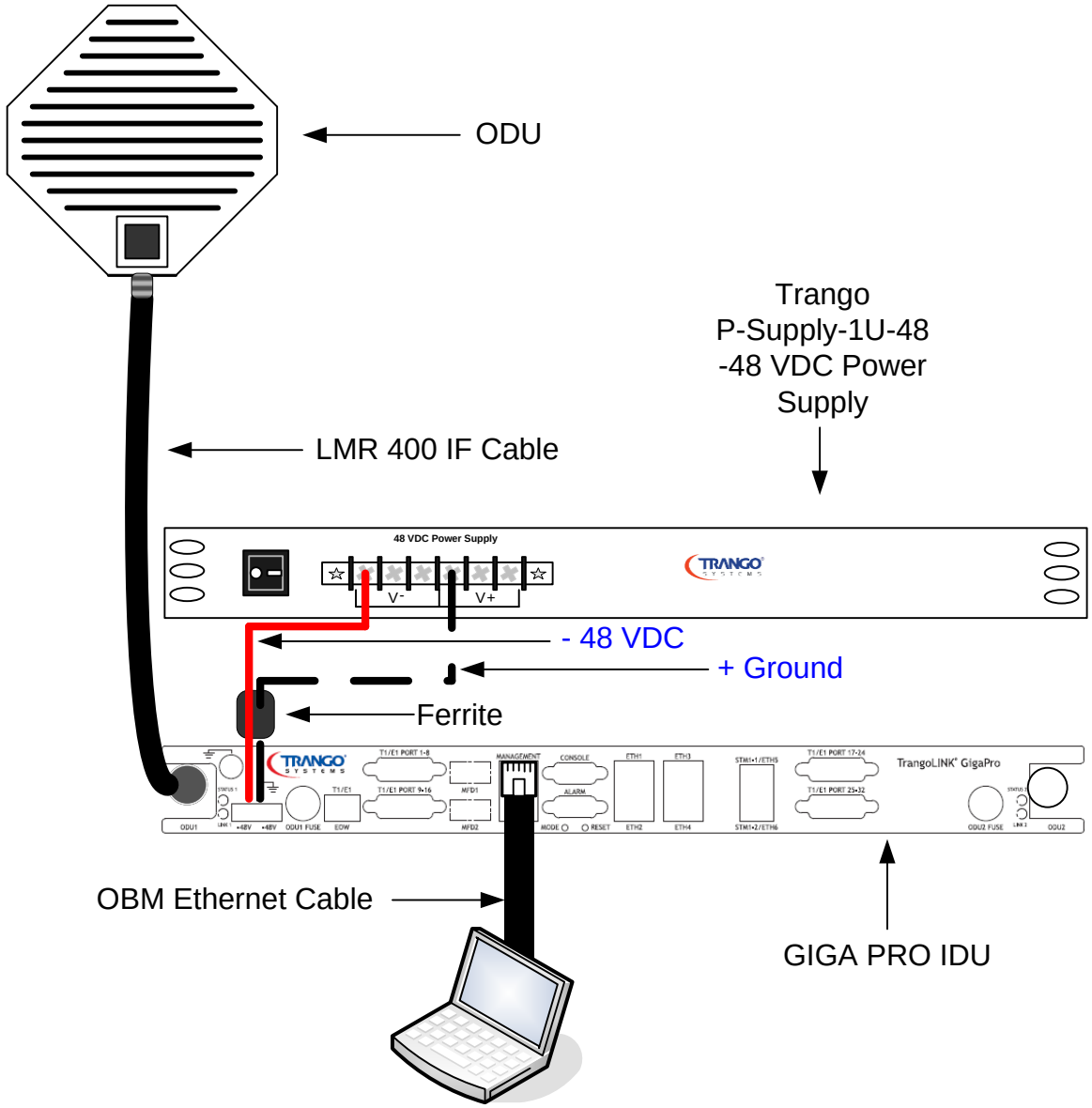


Figure 11: Wiring Diagram

1) Connect LMR-400 cable between the ODU (outdoor unit) and the N-Type port of the IDU. Note that this cable carries the Transmit IF, the Receive IF, telemetry signals, and -48 VDC to the ODU.

> ⚠ Ensure that only 50 ohm "N" type connectors are used. Any other type of connector will prevent proper communication between the IDU and ODU.

2) Connect a Cat-5 cable with RJ-45 connectors to the Out of Band Management Port. This is a 10/100 Autosensing/Auto negotiating port.

3) Connect the P-Supply-1U-48 power supply to the IDU. Make certain to use a ferrite suppressor (supplied with the power connector) to reduce noise that may couple into the IDU on the power line. Wrap both the + and – wires one time around the ferrite. See appendix C for a complete listing of accessories. After connecting the supply wires, insert the terminal block into the IDU power jack and tighten the screws to prevent the plug from coming off.

    a. The two outside pins of the three pin pluggable terminal block are marked with a Negative (-) symbol. The middle pin of the power plug connects to the + or positive ground.

    b. NOTE: Two power supplies may be used in tandem for redundancy purposes. The center ground pin on the terminal block is shared in this case.

⚠ **MAKE SURE YOU USE A -48V POWER SUPPLY. IF CONNECTED TO A +48V POWER SUPPLY, YOU MAY CAUSE DAMAGE TO THE UNIT. INCORRECT POWER SUPPLY CONNECTION IS NOT COVERED UNDER WARRANTY.**

4) The fan should turn on and the LEDs on the front panel should illuminate.

5) You are now ready to configure the radio via the management Ethernet port.

⚠ If you cannot access the radio's management functions via the management Ethernet port, it is possible that your PC is not set up with a properly routable subnet. If the access the radio via the management Ethernet port is not functioning, use the Console Programming Cable and attach it to the Console Port located on the front panel of the IDU. The serial port setting can be found in the Console port section in this Chapter

Basic Concepts

The TrangoLINK™ GigaPRO can be configured using either the Command Line Interface (CLI), or the Web Browser (HTTP) interface. Although both methods are comprehensive and powerful, the CLI method provides more functionality. Both methods of radio configuration require an understanding of the concept of Operation Mode (Opmode).

Opmode Concept

Before logging into a radio, it is important to understand the "Opmode" concept of the TrangoLINK GigaPRO™. TrangoLINK™ GigaPRO can be in one of two operational modes: Opmode "On" or Opmode "Off." When in Opmode is "Off", the ODU Transmitter circuitry is not active, but the receiving side will still function and may establish a link if the far end Opmode is on.

Alternatively, when in Opmode "On," the ODU Transmitter circuitry is active, and the far end will be attempting to lock onto the transmitted signal to make a wireless connection. The radio can still be managed when the Opmode is "Off".

The radio default setting is Opmode "Off". This ensures that there is no unintentional RF radiation during the installation and risk of accidentally interfering with other microwave links in the area.

Default Opmode

The Default Opmode setting controls whether opmode will be turned on after the boot process has completed. If Default Opmode is "Off" but the current Opmode is "On", the radio will not resume transmission after rebooting. The default setting is Opmode "Off".

Why is Opmode Important?

Opmode is important because if Opmode is not configured correctly the radio will not transmit to establish a link. There are also certain functions that can only be performed while the radio Opmode is "Off." The following commands can only be performed with Opmode "Off"

- Setting / Changing Transmit Frequency

FACTORY DEFAULT OPMODE IS "OFF." DEFAULT OPMODE SHOULD BE CHANGED TO "ON" BEFORE RADIOS ARE DEPLOYED. CONSOLE MANAGEMENT IS POSSIBLE REGARDLESS OF OPMODE.

Mean Squared Error Concept

Mean Squared Error (MSE) is similar to Signal to Noise Ratio (SNR) except that is accounts for distortion and interference in addition to noise power. Distortion may come from several sources such as IF cables that are improperly constructed, and path degradations such as multi-path or Fresnel zone encroachment. Interference may not only come from other transmitters on the tower, but also from high power transmitters in the indoor shelter where the IDU is located or from transmitter located very close to the cable. There are maximum acceptable MSE values for each modulation which are useful in determining the quality of the link. The MSE value reported is only relevant to one tx-rx path, so the MSE of each tx-rx path must be evaluated to verify the link is operating cleanly. The lower the number the better, therefore a -35dB is better than a -30dB. The table below shows the maximum MSE value to expect in IF Loopback, Normal Operation, and Absolute Maximum.

MSE Expected and Maximum values	QAM256	QAM128	QAM64	QAM32	QAM16	QPSK
Maximum Expected value IF loopback	-36	-36	-36	-36	-36	-36
Maximum Expected value Normal operation	-32	-32	-32	-32	-32	-32
Absolute Maximum for 1E-6 BER	-28	-25	-22	-19	-16	-9

Table 2: MSE Values

Max Receiver RF Input Power (Standard Power ODUs)

The maximum RF power input, measured by RSSI, for SP ODUs is listed in Table 3. If the RSSI value is higher than listed for the current modulation, the link may show bit errors or link loss, and in extreme cases permanent damage to the system may occur.

256 QAM:	-34 dBm
128 QAM:	-32 dBm
64QAM:	-30 dBm
32QAM:	-28 dBm
16QAM:	-26 dBm
QPSK:	-24 dBm

Table 3: Max Power Input (SP ODUs)

Max Receiver RF Input Power (High Power ODUs)

The maximum RF power input, measured by RSSI, for HP ODUs is listed in Table 4. If the RSSI value is higher than listed for the current modulation, the link may show bit errors or link loss, and in extreme cases permanent damage to the system may occur.

256 QAM:	-28 dBm
128 QAM:	-27 dBm
64QAM:	-26 dBm
32QAM:	-24 dBm
16QAM:	-22 dBm
QPSK:	-20 dBm

Table 4: Max Power Input (HP ODUs)

Hitless ACM: Adaptive Coding & Modulation

The ACM feature works in conjunction with the Mean Square Error (MSE) values. The ACM command is an on/off setting. When ACM is enabled (on) and the MSE becomes degraded due to environmental conditions such as fading or multipath, the system will automatically shift down in modulation and forward error coding levels based on the MSE threshold setting specified of the ACM table (Table 5).

The GigaPro shifts without dropping any traffic below the carrying capacity of the modulation/coding level that is being transitioned to by coordinating the shift between the two ends of the link seamlessly.

ACM effectively allows the radio to operate with a lower Signal to Noise Ratio (SNR) with less traffic capacity, which will occur in rain fading events and similar channel degradation conditions

Another important point is that ACM works independently in both directions. Both modems are in constant contact with each other using the a low bit rate QPSK control protocol mixed in with the higher modulation traffic and will send the MSE information. If the MSE is degrading on one receiver, the two ends of the link will coordinate a switch to the lower modulation as soon as the MSE threshold for degrade has been passed. That is why the switch is hitless.

Since a full duplex radio link has two transmission frequencies, only one of the channels may be affected while the other one is not, especially by multipath reflections which will degrade the MSE of one frequency but not the other. Trango ACM modes allow one channel to rate shift down or up while the other one is unchanged. This is a benefit since the capacity will only be reduced in the direction that the channel impairment is occurring.

The ACM feature will automatically shift the modulation up or down based on the MSE value and the above specified thresholds. To prevent the radio from changing the speed, disable ACM.

Speed Setting QAM256					
Profile #	Modulation	Improve	Next	Degrade	Next
0	QAM256	-32.1	0	-27.2	1
1	QAM64	-29.2	0	-24.3	2
2	QAM16	-26.3	1	-21.3	3
3	QPSK	-23.3	2	-18.5	3
Speed Setting QAM128					
Profile # Modulation		Improve	Next	Degrade	Next
0	QAM128	-32.1	0	-27.2	1
1	QAM64	-29.2	0	-24.3	2
2	QAM32	-26.3	1	- 21.3	3
3	QAM16	-23.3	2	-18.5	4
4	QPSK	-20.3	3	-17.1	4
Speed Setting QAM64					
Profile # Modulation		Improve	Next	Degrade	Next
0	QAM64	-29.2	0	-24.3	1
1	QAM32	-26.3	0	- 21.3	2
2	QAM16	-23.3	1	-18.5	3
3	QPSK	-20.3	2	-17.1	3
Speed Setting QAM32					
Profile # Modulation		Improve	Next	Degrade	Next
0	QAM32	-26.3	0	- 21.3	1
1	QAM16	-23.3	0	-18.5	2
2	QPSK	-20.3	1	-17.1	2
Speed Setting QAM16					
Profile # Modulation		Improve	Next	Degrade	Next
0	QAM16	-23.3	0	-18.5	1
1	QPSK	-20.3	0	-17.1	1

Table 5: ACM Shift Profile Table

ATPC & TargetRSSI

ATPC and TargetRSSI work together to control the remote side power achieving optimal signal strength. ATPC is an enable/ disable setting. Once enabled, ATPC will adjust the power of the remote side based on the local TargetRSSI setting. If the RSSI value is lower than the TargetRSSI setting of the local radio, the remote radio will attempt to increase the output power in attempt to achieve the TargetRSSI setting.

ATPC has step size and max power settings to limit the output power of the unit and prevent a violation of the FCC license.

The Target RSSI should be set to the expected Received Signal Strength before Antenna Alignment.

> ⚠ POWER SETTING CAN NOT BE CHANGED ONCE ATPC IS ENABLED. IN ORDER TO MANUAL CHANGE THE POWER, ATPC WILL NEED TO BE DISABLED.

ATPC Max Power & Step Size

The ATPC Max Power and the Step Size control how the unit will behave in attempting to achieve the TargetRSSI. ATPC Max Power is the maximum power the unit will be configured to when trying to reach the TargetRSSI. The ATPC Step Size is the amount of dB per attempt that ATPC can change power output.

Port Mapping (802.1q) & Port Priority (802.1p)

The Port Mapping feature of the TrangoLINK™ GigaPRO is a fixed setting and provides an additional amount of data security since traffic is segmented and isolated from other traffic across the link. Port Mapping allows for traffic from IDU1 port 1 to only be available from IDU2 port 1. This is applied to all GigE and T1 ports on the TrangoLINK GigaPRO. The Port Priority feature allows for an individual GigE port to have priority over the remaining GigE ports. The priority groups are 0-3 and can only be applied to GigE ports.

> ⚠ T1/E1 PORT WILL ALWAYS HAVE THE HIGHEST PRIORITY REGARDLESS OF GIGE PORT PRIORITY.

Class of Service (802.1p)

TrangoLINK™ GigaPRO has Class Of Service (CoS) capabilities that provide priority of types of traffic across the link. The traffic can be classified into 8 priorities 0-7, which can then be assigned to 4 queues.

Rapid Port Shutdown

The Rapid Port Shutdown (RPS) when enabled, will shutoff the GigE interfaces of the IDU when the link is lost. This benefits networks that use Spanning Tree Protocol or other protocols which require ports to be shutdown in order to traffic to be re-routed.

Cable Loss

Cable loss refers to the amount of attenuation (in dB) caused by the IF Cable Equalization circuits in the ODU compensate for varying amounts of loss. Although Trango recommends LMR-400, other cable selections can be accommodated (new or legacy installations) by requiring losses be entered in dB at each of the three frequencies exchanged between the IDU and ODU (IF up, IF down, and telemetry).

The 3 frequencies used to communicate between the IDU and ODU are 140MHz (IF up), 315MHz (IF down), and 915MHz (telemetry). If installing one of Trango's pre-assembled IF Cables, Table 6 will identify the values that must be entered to properly configure the IDU to ODU interface. If the installation team is fabricating the IF Cable on site using LMR-400, a linear interpolation between values shown in Table 5. For example: a 75 ft LMR-400 IF Cable would have 1.11 dB of loss at 140 MHz (0.74 dB/50 ft * 75 ft = 1.11 dB).

If another coax cable type is used to connect the IDU and ODU, the installation team must know the cable loss characteristics at 140, 315, and 915 MHz and enter the correct values during configuration.

⚠	THE HIGH POWER (HP) ODU WILL AUTOMATICLY ADJUST CABLE LOSS SETTINGS. THEREFORE, THERE IS NO NEED TO CONFIGURE THESE PARAMETERS WHEN WORKING WITH THE HP ODU.
⚠	IN NO CASE CAN ANY IF CABLE LOSS EXCEED 15 dB @ 140MHz, 23 dB @ 315/350 MHz, OR 40 dB @ 915MHz SINCE THE ODU EQUALIZATION CIRCUITS CANNOT COMPENSATE FOR LOSSES OUTSIDE THIS RANGE.

LMR-400	140MHz	315MHz	915MHz
50ft	0.74 dB	1.13 dB	1.95 dB
100ft	1.48 dB	2.25 dB	3.9 dB
250ft	3.71 dB	5.63 dB	9.76 dB
500ft	7.42 dB	11.26 dB	19.51 dB
1000ft	14.83 dB	22.52 dB	39.03 dB

Table 6: Cable loss table

THE CABLE LOSS SETTING OF THE RADIO IS IMPORTANT. FAILURE TO SET THE PROPER SETTING CAN RESULT IN A NON-FUNCTIONAL LINK

Management

The TrangoLINK™ GigaPRO can be managed through HTTP, HTTPS, Telnet, SSH, SNMP and console port. The default IP address is 192.168.100.100 and the passwords for the TrangoLINK™ GigaPRO are below:

Access mode	Username	Password
CLI View Mode	admin	trango
CLI Config Mode	N/A	trango
Web Interface	admin	trango
SNMP Read Community	N/A	public
SNMP Write Community	N/A	private
SNMP Trap	N/A	trapstr

Table 7: Default Login Passwords

ALL TRANGO RADIOS ARE PRE-CONFIGURED AT THE FACTORY WITH A DEFAULT IP ADDRESS OF 192.168.100.100.

Command Line Interface

All typical radio functions can be managed via the browser interface, but the Command Line Interface (CLI) has functionality that facilitates installation. The Command Line Interface has 4 nodes; View, Config, Debug and Radio. The Radio node can only be accessed once the system (second modem) license is purchase. The Radio node allows for configuration of each internal radio when using 1+1 HSB, Space Diversity, Frequency Diversity, E+W, and 2+0 configurations

Logging into the radio via Command Line Interface is covered here briefly. A complete listing of all CLI commands is provided in Appendix A - Command Line Interface.

Launch Telnet

Open a command prompt (DOS) session on your PC (Windows® Start icon and select "Run"). Open a Telnet session by typing:

`telnet [`*`ip address of radio`*`]`

Example:

```
C:>telnet 192.168.100.100
```

Once at the CLI login prompt, type in the login and press enter, then the password and press enter.

```
CLI login: admin
Password:          (No characters will be display during input)

Trango System:  TrangoLINK GigaPro Command Line Interface v1.0.0

(CLI-view)#
```

If the incorrect password is entered during login, the system will allow two more tries before terminating a telnet session. A new session will need to be open to try again.

To terminate a CLI session (Telnet or Console) simply close the console window.

A CLI SESSION CAN ALSO BE TERMINATED FROM THE **DEBUG MODE** WITH "*EXIT*" COMMAND.

View Mode : *(CLI-view)#* prompt allows for a quick revision of settings.

Config Mode: (CLI-config)#, This mode can access by typing in the command "*config*" from the view mode. The system will prompt for a password and after successful authentication, the Config mode is enable. All configuration settings are changed within the Config mode.

Any command entered without any parameters returns the current configured values similar to "view" mode.

Most configuration changes are applied immediately and do not require a reboot. All config changes must be saved by issuing the "*config save*" command. If the configuration is not saved, the system will restore the last saved settings after reboot.

ALL CONFIGURATION CHANGES HAVE TO BE SAVED IN ORDER TO BE PERSISTENT ACROSS A REBOOT. A SINGLE "CONFIG SAVE" COMMAND WILL SAVE ALL CONFIGURATION CHANGES

Users can go back to the "view" Mode by using the "*exit*" command.

Example:

```
CLI login: admin
Password:

Trango System:  TrangoLINK GigaPro Command Line Interface v1.0.0
```

```
(CLI-view)# config
Password:


(CLI-config)#
(CLI-config)#exit

SUCCESS
(CLI-view)#
```

The Command Line Interfaces keeps a history of commands used, pressing the up arrow will display previous commands used. The CLI can complete a command being typed by pressing <tab> key. If a command is partially typed followed immediately by a "?" it will display all related commands.

Example:

```
(CLI-config)# t? (The ? will not be display)
  targetrssi  Set target RSSI level for ATPC and ODU AGC control
  tdm         Display TDM configuration
  telnetd     Enable/Disable telnetd
  temp        Display IDU and ODU temperature
  tftpd       Enable/Disable tftpd
  threshold   Set the threshold for the radio parameters
  trap        Display snmp trap managment information
(CLI-config)#
```

TYPE "?" FOR A LISTING OF ALL CLI COMMANDS.

Changing Password

The debug and view mode share the same password. The config mode has a separate password. The radio mode does not require a password and it is accessed from the config mode and only after entering the system license key. The view and debug mode password is changed in the debug mode. The config mode password is changed in the config mode. Use the CLI command "`passwrd`" to change the password. The example below demonstrates changing the password for the config mode to "control"

Syntax: *password <newpassword> <newpassword>*

Example:

```
(CLI-config)# passwrd control control  (The password must be entered twice)
```

If the command is properly executed, the system will return a "SUCCESS" and return to the CLI-config prompt.

If the password is lost and the unit is locked, contact Product Support for assistance.

Console Port

TrangoLINK GigaPRO IDU features a console port. The console port is useful in the event that the unit cannot be accessed via TCP/IP (HTTP or Telnet). A Terminal Emulation program such as HyperTerminal or Putty can be used to access the radio's CLI via the console port as shown in Figure 12.

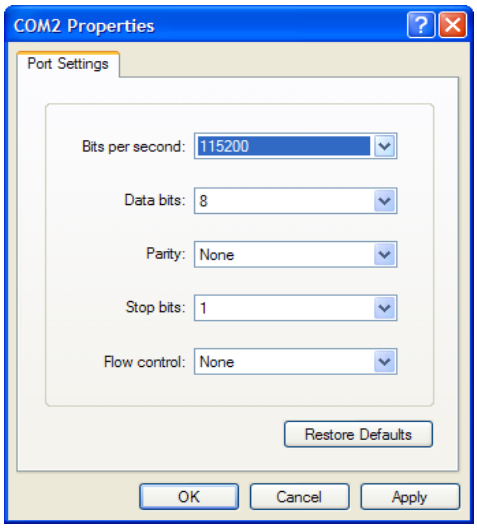


Figure 12: Hyper-Terminal Settings

Browser Interface

To access the Browser interface simply open a web browser and enter the IP address of the radio (Figure 13).

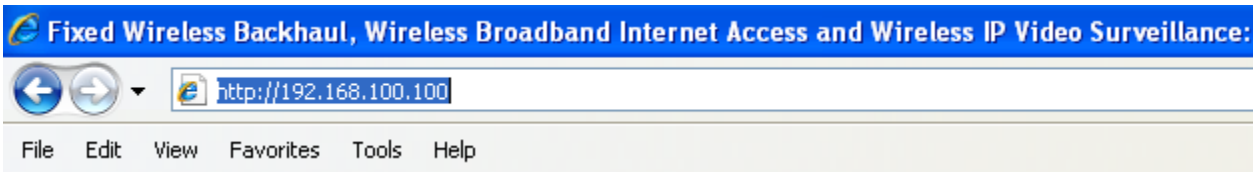


Figure 13: HTTP Login

A login window will pop up, requiring the user to enter username and password (See Figure 14).

Enter the assigned user name and password and click OK.

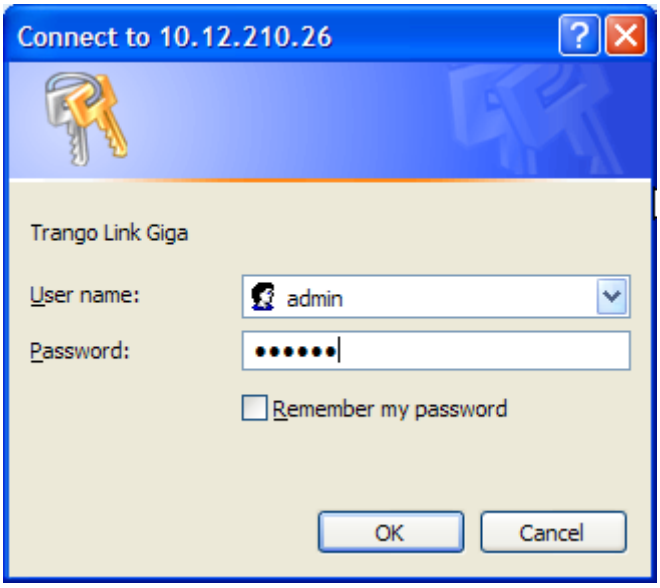


Figure 14: Web Browser Login

Once the user name and password are authenticated, the System Info page will be displayed (See Figure 15)

Figure 15: HTTP System Information Page

The Web Browser interface is structured with the Radio status on the Top right corner and navigation bar on the left side. The middle of the page shows the current contents of the folder and settings selected.

Radio Status: Found at the top left corner, it display the current remarks configured as well as the IP address which is found inside the parentheses. The last two lines, displayed current RSSI and MSE values for Radio 1 and Radio 2. (See figure 16)

Figure 16: Radio Status display

Navigation Bar: The navigation bar will be located running perpendicularly at the left in all the pages. Each one of the folders found on the navigation bar provides access to the configuration pages or display pages of the current settings, like the system info page (version). Clicking on each folder causes the folder to collapse and reveal the pages each folder allows access to (See figure 17 below).

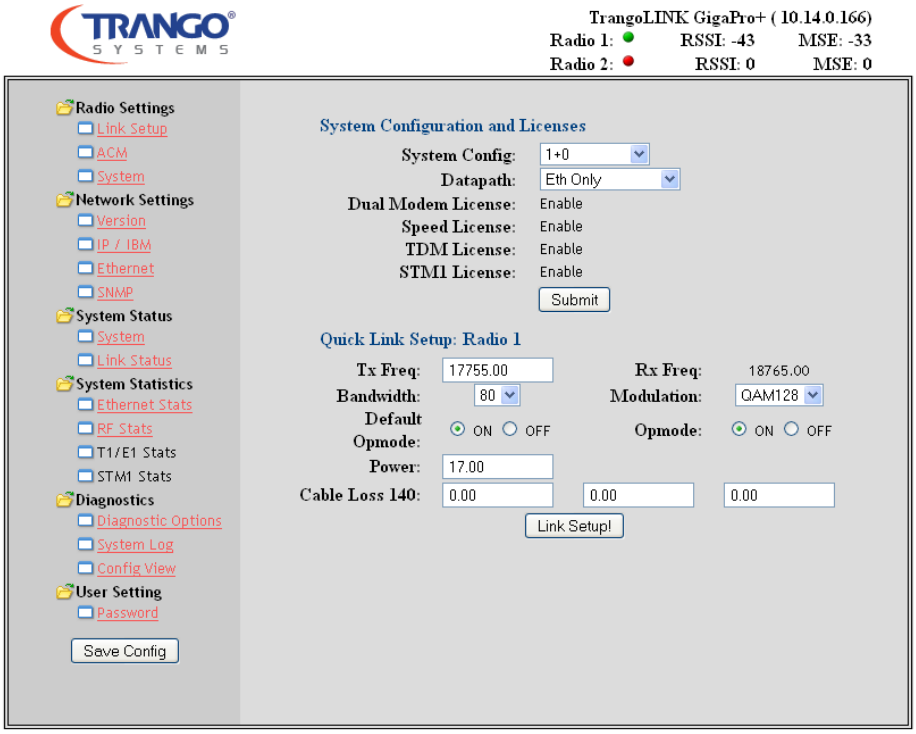


Figure 17: All Folders Collapsed

Radio Settings Page: This folder permits access to the Link Setup, ACM, and System settings.

Link Setup: Parameters to configure the system type (1+0, E + W, etc.) as well Link Setup are found on this page. (See figure 12 below)

The Rx Freq is automatically configured once the Tx Freq is entered and the "Link Setup!" icon is click.

The cable loss settings are also configured here, but are no essential if using the HP ODU.

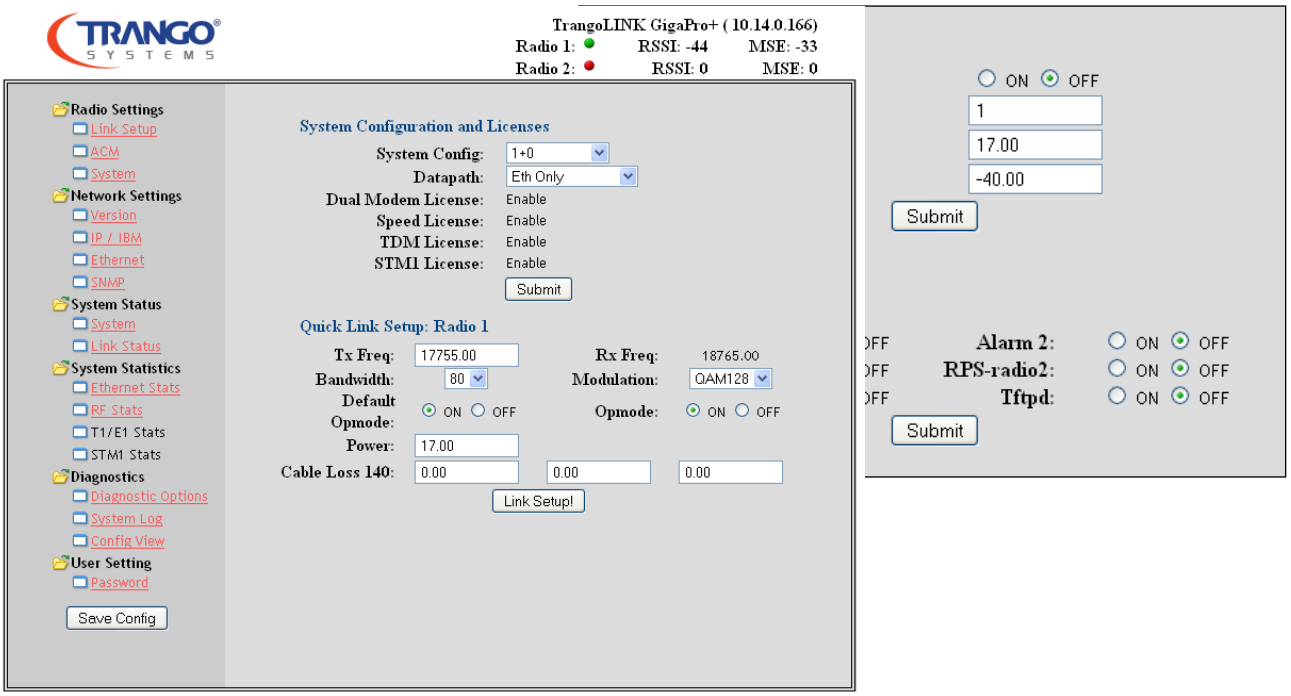


Figure 18: Link Setup page

Adaptive Coding Modulation (ACM): Enabling ACM permits configuration of the MSE Improve and Degrade thresholds. It is recommended to use the default values for best performance. (See Figure 19)

Figure 19: ACM

System: Displays ATPC settings and System settings as shown by Figure 20.

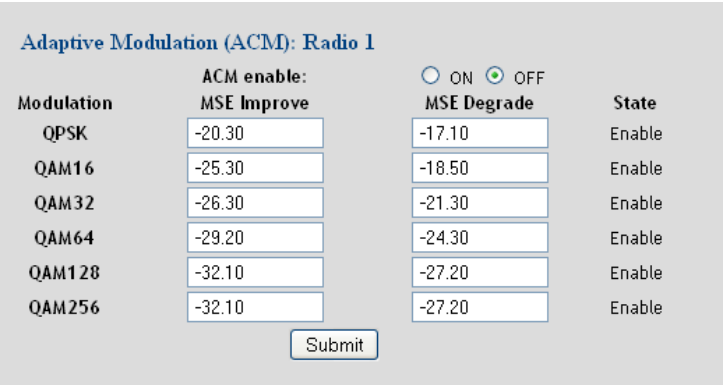


Figure 20: ATPC and System setting

Network Settings: Current Version or System info page can be display from Network Settings. Serial numbers, firmware version, OS versions, and basic information for IDU and ODU can be view under this page, as well as the System Uptime, Remarks, and more (See figure 21 below).

IP / IBM, Ethernet, and SNMP can also be access for configuration from the Network Settings folder.

Figure 21: Network Settings folder

IP / IBM: Configuration of IP parameters as well as displaying current In Band Management (IBM). (Figure 22)

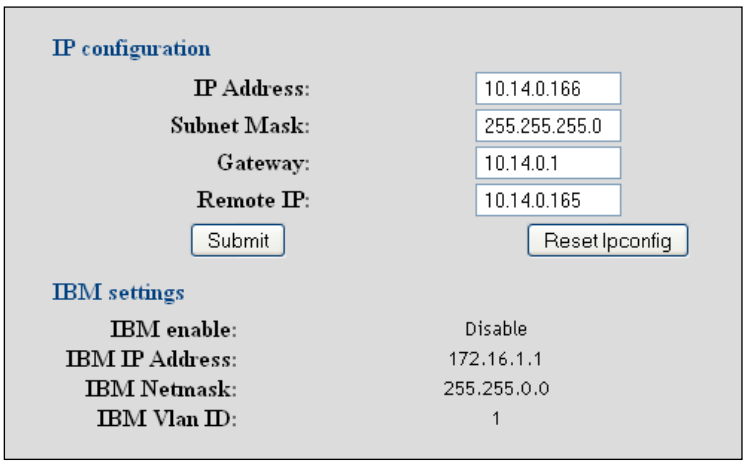


Figure 22: IP & IBM settings

Ethernet: Configuration of the Small Form-Factor Plug (SFP) module as well as the four GigEthernet ports and the Fiber Port Settings can be achieve from this page.

If the AutoNego is set to "disable", the Autosensing function is also disable and the correct cables must be use. Otherwise the link between the device and the IDU via the Ethernet cable for the specific GEX port will be lost.

Setting the Priority on a GEx port will only take precedence over the other Ethernet ports but will not affect the T1/E1 traffic.

Clicking the "Submit" icon under the Ethernet Port Settings section will not change the setting under the Fiber Port Settings or vise-versa. (Figure 23)

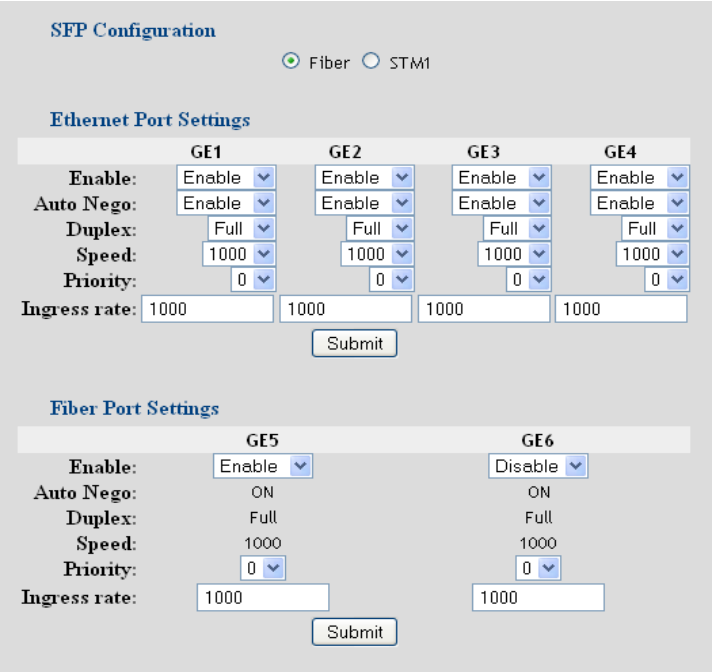


Figure 23: Ethernet page

SNMP: This page displays the passwords for Read, Write, and trap community string. Enabling and Disabling the SNMP trap as well as the IP address for the SNMP mangers can be configuration from this page.

System Folder: Displays the Link Status and System Status. The System contains information on the Alarms, temperature, and fan. The Radio status displays RSSI, MSE, BER, FER and ODU temp. (Figure 24)

Figure 24: System Status

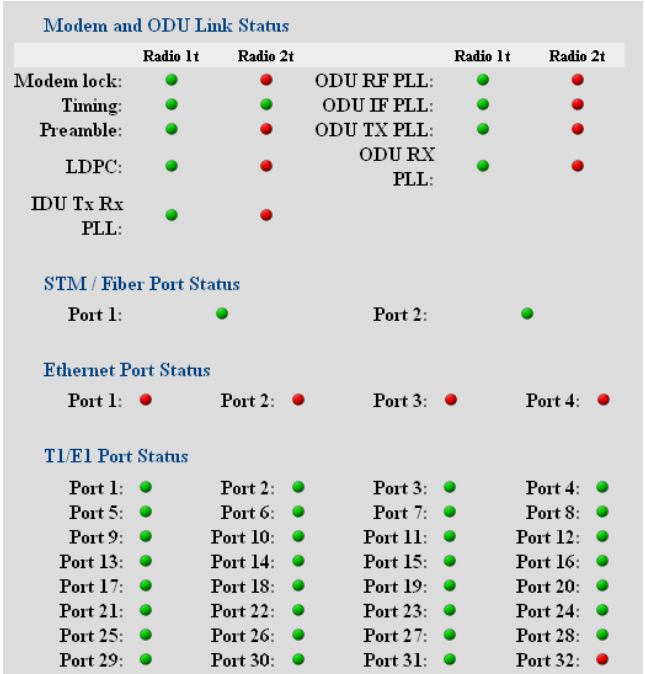
Link Status: Contains the status on the modem, fiber, T1/E1, and Ethernet ports (Figure 25)

All the status likes should be Green when working properly. Red when there are problems or the particular radio is off or not connected.

Figure 25: Link Status

> ⚠ IF THE STATUS INDICATOR IS GRAY, THE PARTICULAR PARAMETER DOES NOT APPLY TO THE ODU CONNECTED.

System Statistics Page: Counter information on all interfaces RF, T1/E1, and GigE is displayed. These statistics are used to determine the error rate of traffic and the traffic flow.



Ethernet counters: This page provides information on the current configuration of the GE*x* ports as well as counters for the traffic flow on each individual port. (See figure 26)

IN: Means traffic been received from the device (Switch / Router) attached to the particular GigE port.

OUT: Means traffic been sent from the IDU to the device attached to the particular GigE port

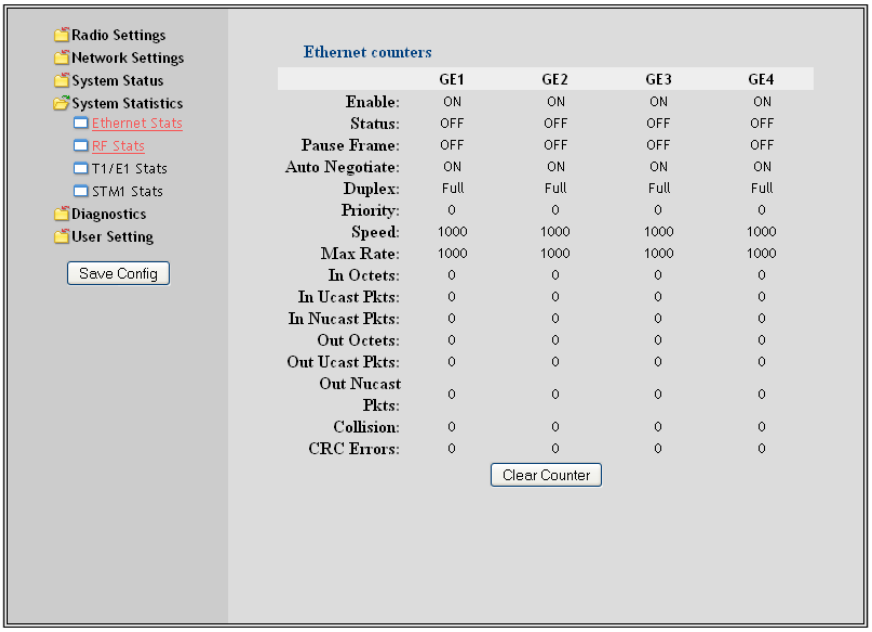


Figure 26: Ethernet counters

RF Stats: The RF counters will provide a true indication on how the link is performing. The Port Rate (Mbps) and Port Util (%), when used properly, it will give a true indication of the RF throughput. Traffic will have to continuously flow for a period of 5 minutes before an accurate display on the Rate and Util counter. (Figure 27)

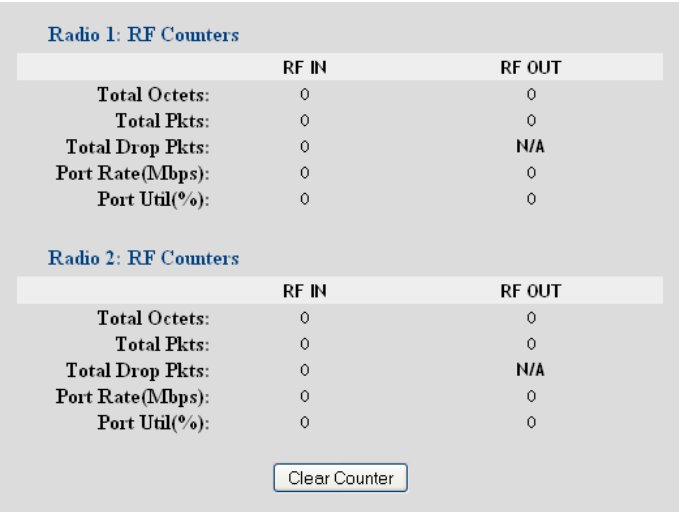


Figure 27: RF Stats

T1 / E1 Stats: These counters are dived into events and errors per every 16 T1/E1 ports. The first 16 port's events are display by default. To displaying other errors or events click on each label at the top of the page for the specific range of ports in question. (Figure 28)

LOS: Loss of Signal
LOF: Loss of Frame
AIS: Alarm Indicating Signal
TS16: Time Slots (To..T15)
RAI: Remote Alarm Indicator
RMA:
LCMFA:
LSMFA:

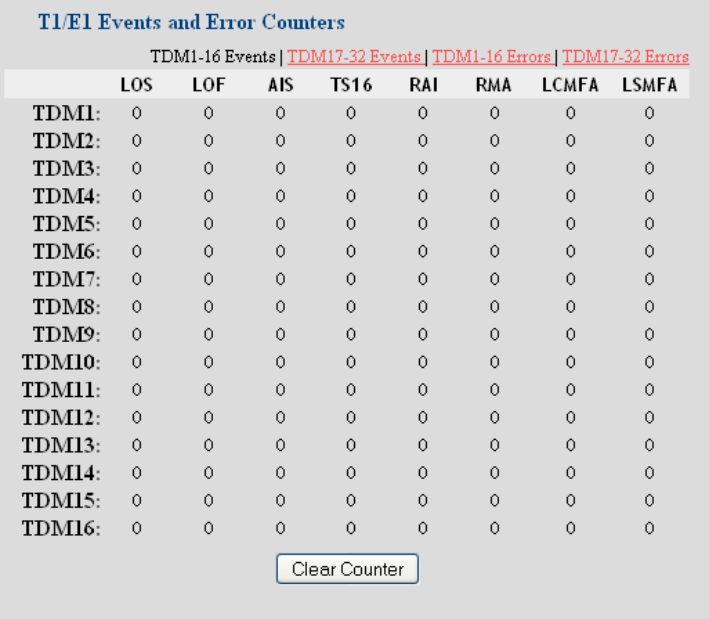


Figure 28: T1/E1 Events and Error Counters

STM1 Stats:
LOS: Loss of Signal
OOF:
LOF: Loss of Frame
AIS: Alarm Indicating Signal
RDI: Remote Defect Indication
TIM:
REI: Remote Error Indicator

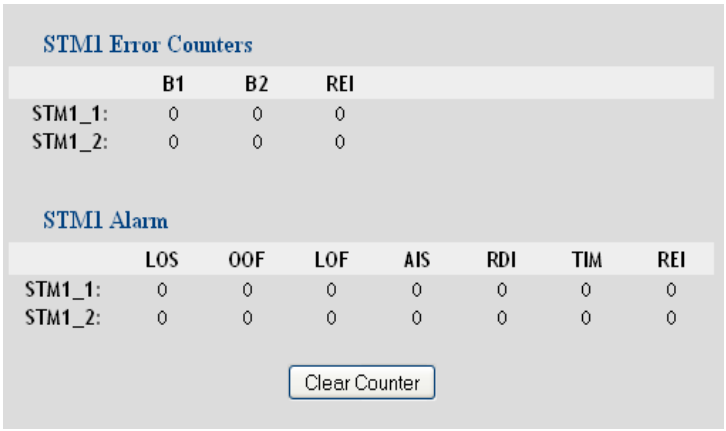


Figure 29: STM Counters

Diagnostic: This folder allows access to Diagnostic Options, System Log, and Config View pages.

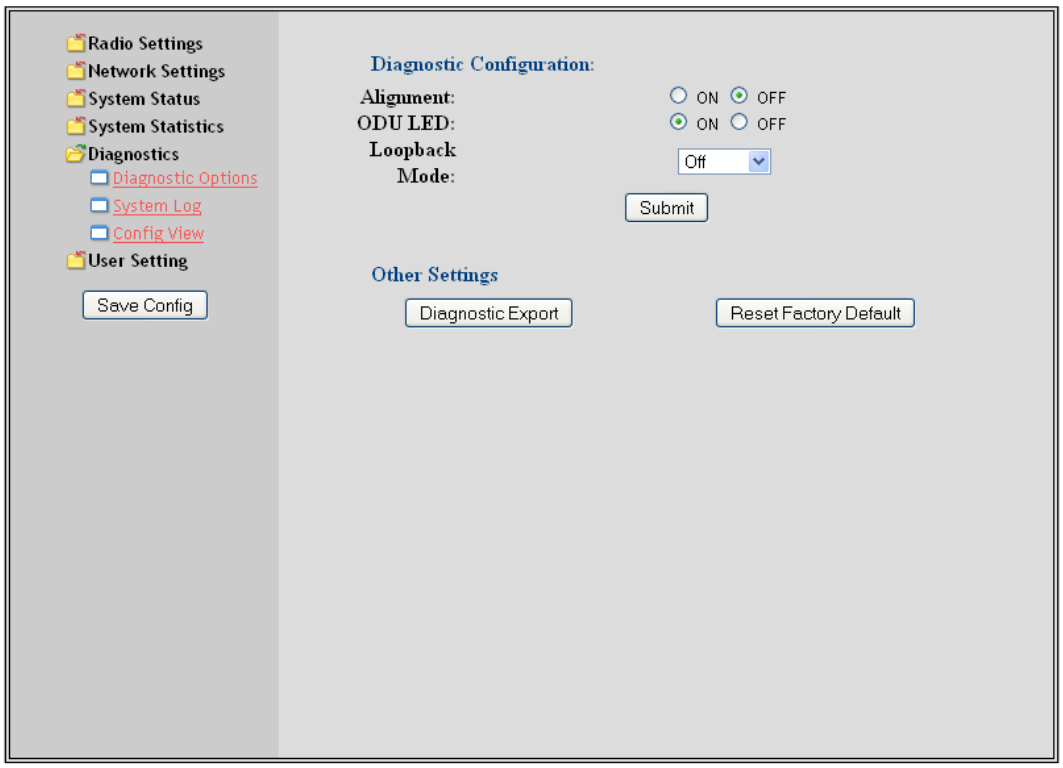


Figure 30: Diagnostic Configuration

Diagnostic Options: Alignment, ODU LED, Loopback mode as well as Other Settings options are found under the Diagnostic Options page. (See Figure 30 above)

Alignment mode is use during the commissioning of the link. By selecting on the "ON" for Alignment and clicking the "Submit" button, the radio's RSSI display and RSSI counter is updated continuously 5 times per second. Alignment mode facilitates finding the strongest RSSI possible during the installation. It is recommended that once alignment is done, the Alignment mode be turn off.

Loopback Mode is use for evaluating the communication between the IDU and ODU. This feature is used in conjunction with the "LINKTEST" command. See Chapter 6 for more information on Trouble Shooting.

Clicking on **Diagnostic Export** generates a diagnostic.bin file. To download this file, the TFPT function of the IDU will have to be enabled. Then from the PC's command prompt, execute the following command: *tftp - i* [IP address of the IDU*] get diagnostic.bin* The file will have to be submitted to Product Support for processing.

Reset Factory Default will restore all the setting on the IDU to factory except the IP stack and the license keys.

System Log: The system log will by default display any link statistics [2 STAT] activities. The log level can be adjusted via the CLI. Log levels are 0, 1 and 2. (See Figure 31 below) The Syslog Exported process is similar to the Diagnostic Export process (See **Diagnostic Export** above). The name of the file to download is syslog.txt

Level 0 is use to identified any configuration executed at boot up by the IDU as well as any errors reported at bootup.

Level 1 is use to identified any events that are trigger at command line, like saving the configuration.

Level 2 is use to identified any link statistics.

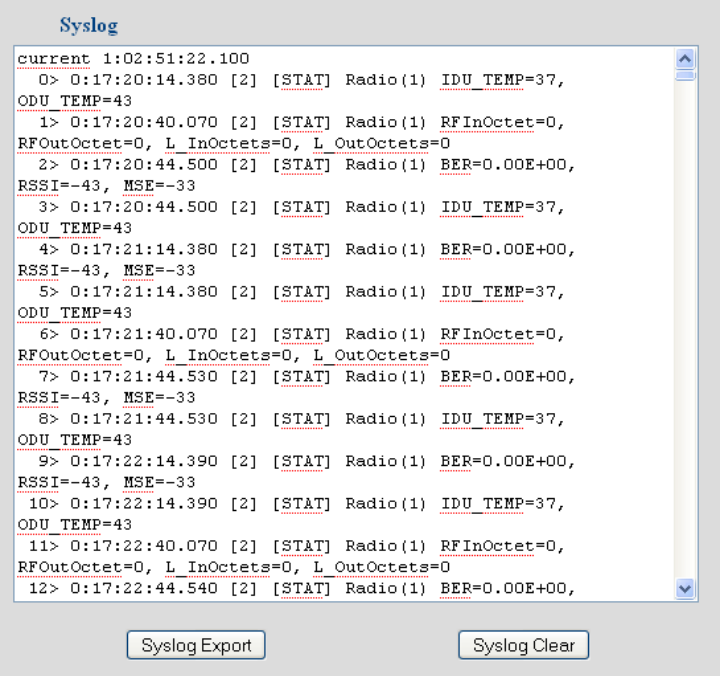


Figure 31: Syslog

Config View allows complete display of the system configuration and also exporting the configuration file. By clicking on the "Config Export" button, the system will generate a config.txt file. Follow the same procedures mentioned under the **Diagnostic Export** section above to download the config.txt file. (See figure 32)

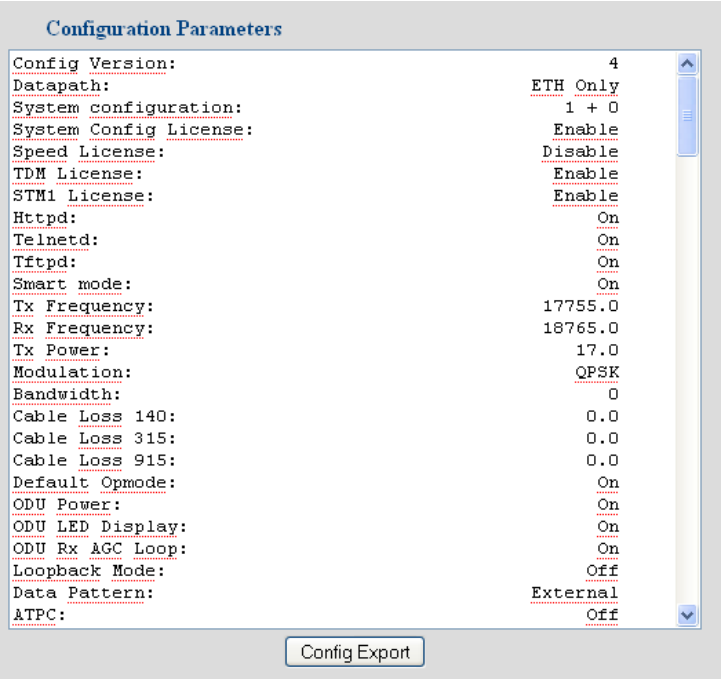


Figure 32: Configuration Parameters

User Settings: This folder allows changing loging password as well as setting the system remarks. Changing this password only changes the HTTP access password. (Figure 33)

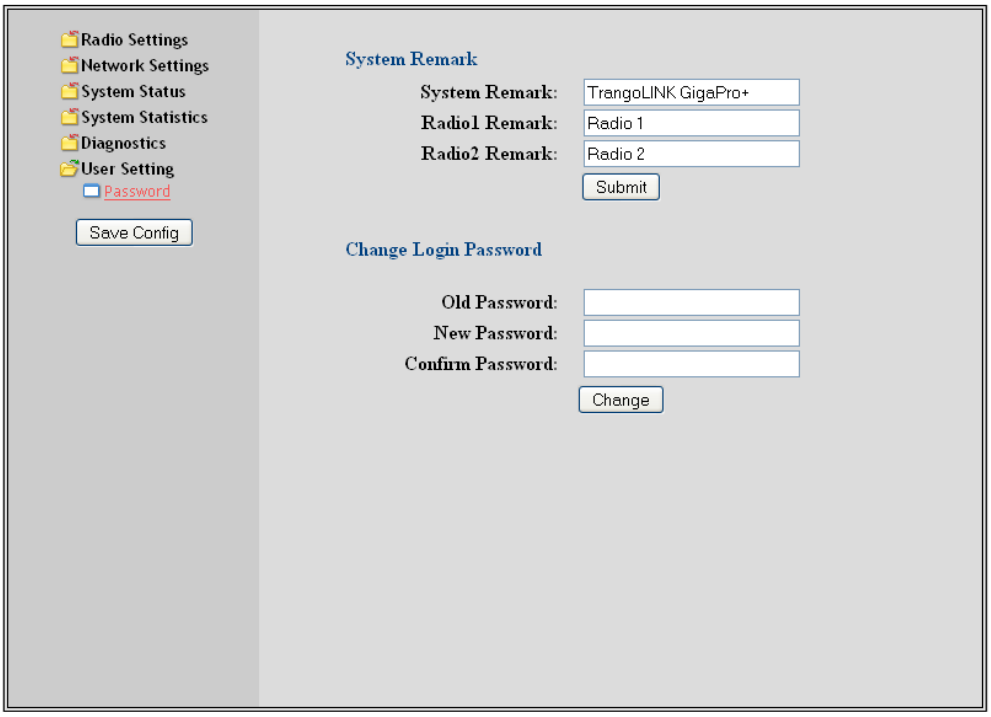


Figure 33: Password

Chapter 3 - Configuration

About this Chapter

This section describes how to establish a wireless link with the TrangoLINK™ GigaPRO, using the Browser (HTTP) Interface. This section addresses the basic steps in establishing a link in the lab environment. Trango strongly recommends that this manual be properly study to gain an understanding and mastery of all important configuration parameters and procedures prior to deploying any wireless equipment.

In this section:

1) Network Settings
2) Link Setup (via Browser)
3) Evaluating the Link
4) Parameters Description
5) Link Commissioning (See Appendix F)

Configuration

Network Settings

The IDU can be reach via the default IP address of 192.168.100.100 and subnet mast of 255.255.255.0 (See Chapter 2 for more information on accessing the IDU). Once a session is establish, the correct IP address can be configured by selecting the **IP/IBM** page under the **Network Settings** folder. See figure 34 for an example image of this page.

For a basic setup, only the **IP Configuration** section is require. Once the correct IP stack is entered, click on **Submit.** It is normal to lose connectivity as the matching IP stack will have to be configured on the PC to regain access to the unit.

The **IBM Configuration** section can be configured but is not necessary for a basic installation.

Once the network settings have been configured with the correct addresses, and access re-establish, the Link Setup can now be configure.

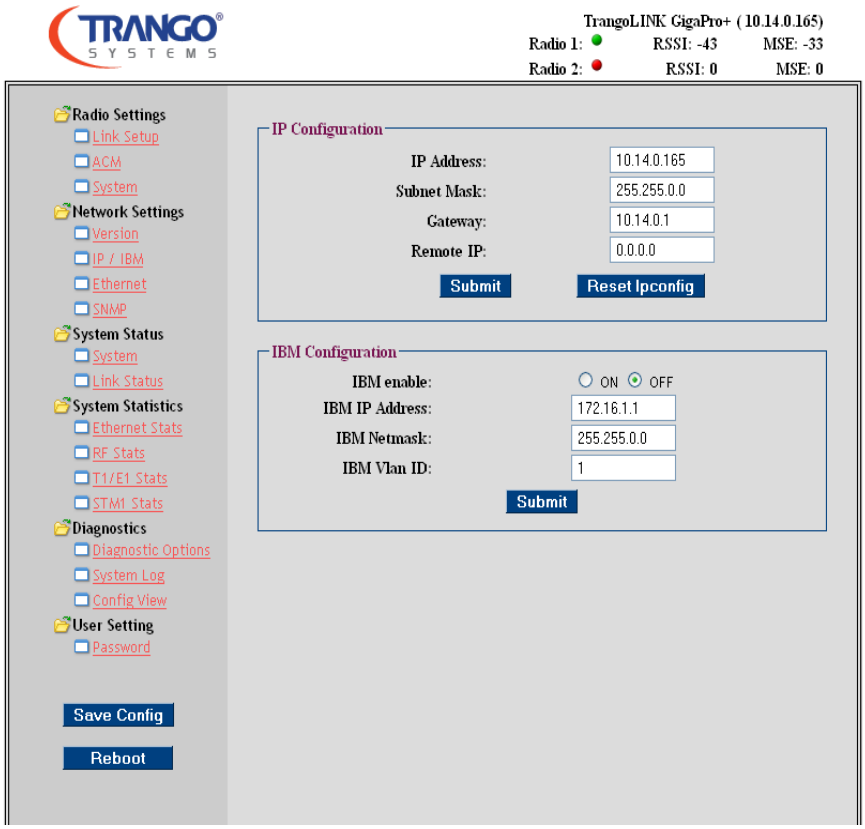


Figure 34: IP/IBM Page

Link Setup

To begin configuration of TrangoLINK GigaPro, select the **Link Setup** page from the **Radio Settings** folder. The following basic parameters are required to configure the link. See Figure 35 below for an example. This section assumes that the IDU and ODU are properly connected and powered (See Chapter 1 for information on connecting the hardware):

System Config: Select the system type (1+0, 1+1, E/W etc.)

Datapath: Select Eth only or option that matches the required configuration (Eth +T1, etc.)

ODU Power: Select ON and click submit. This is required before the Tx Frequency can be configured.

Tx Freq: Input the Transmit Frequency of the radio in MHz. (The Rx freq is automatically calculated by the system.)

Bandwith: Select channel bandwith (4, 7, .. 80MHz)

Modulation: Select the speed base on modulation (QPSK … 256QAM)

Default Opmode: Set default Opmode to ON

Opmode: Select ON to have the radio begin Transmitting on the Freq. entered

Power: Set the power according to the links required max transmits power.

Cable Loss: Enter the cable loss settings for 140, 315 and 915MHz (See Table 5 in Chapter 1 for more information)

To complete this page configuration click on **Link Setup** Icon. Save the settings by clicking on the **Save Config** icon and reboot unit. Proceed to configure opposite side.

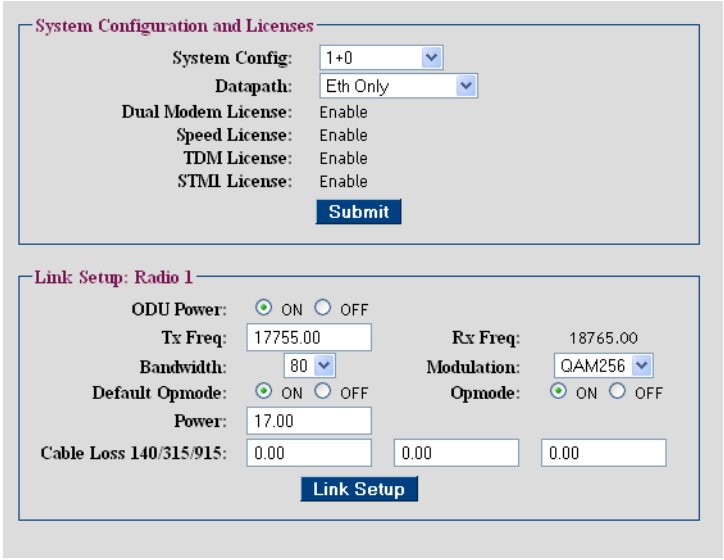


Figure 35: Radio Settings

Evaluate Link

Once both sides of the link have the basic Link Setup configured, settings are saved and IDU rebooted, the link should be establish and ready to pass traffic. The top left corner of the web

browser display indicates this with a green LED for Radio 1, RSSI with a – value and a – value for the MSE. See Figure 36 for example of this display

.

Figure 36: Link Status

For further evaluation of the link, the *linktest* command can be run from the command line which will yield BER as well as any fluctuation on the links RSSI and MSE. This should be an indication of the links stability.

To run this command access the command line interface to the unit via either a telnet session or SSH session, see sample below:

After accessing the CLI and under configuration mode, execute the *linktest* command.

```
(CLI-config)# linktest 10
            LOCK    RSSI    MSE     BER
 1>   Radio 1     1    -43.70 -33.80 0.00E+00
 2>   Radio 1     1    -43.70 -33.80 0.00E+00
 3>   Radio 1     1    -43.80 -33.70 0.00E+00
 4>   Radio 1     1    -43.80 -33.80 0.00E+00
 5>   Radio 1     1    -43.80 -33.80 0.00E+00
 6>   Radio 1     1    -43.80 -33.70 0.00E+00
 7>   Radio 1     1    -43.70 -33.70 0.00E+00
 8>   Radio 1     1    -43.80 -33.70 0.00E+00
 9>   Radio 1     1    -43.80 -33.80 0.00E+00
10>   Radio 1     1    -43.80 -33.80 0.00E+00
(CLI-config)#
```

These results indicate that the unit has no bit errors and the both RSSI and MSE are relatively constant. The link is suitable to pass traffic and/or throughput testing can now be evaluated.

For further definition of the *linktest* command, see Parameters Description section below.

IF THE LINK CAN NOT BE ESTABLISH, CHECK THE LINK SETUP CONFIGURATION ON BOTH IDU. IF FURTHER ASSISTANCE IS REQUIRED, SEE TROUBLESHOOTING SECTION.

Parameters Description

Radio Settings - Link Setup

System Config: Allows the configuration of a 1+0, 1+1, East & West and 2+0 system setup. Once the correct system is selected, other menu options pertaining to the particular system setup will be come available.

Datapath: This parameter is use to configured type of traffic that will use with your link. The options are; Eth only, Eth + T1, Eth + E1, Eth + T1 + STM1 and Eth + E1 + STM1. Note that the Ethernet via fiber is always available and only STM1 requires a license to access this feature.

Dual Modem License: After configuring this license, the second modem is available for use within the TrangoLink GigaPro system. Also, menu options for the second modem became available.

Speed License: This license grants access to speed higher than 110Mbps.

TDM License: This license keys grants access to the T1/E1 interfaces.

STM1 License: This license grants access to the STM1 speed. STM1 license also includes access level 1 Speed License key.

ODU Power: By default this setting is set to OFF. Once turn ON, the IDU will allow frequency configuration.

Tx Freq: Set the Center Frequency in accordance with the FCC License grant (MHz).

RADIO CONFIGURATIONS FOR CENTER FREQUENCY, BANDWIDTH, AND MAXIMUM TRANSMIT POWER MUST BE SET IN COMPLIANCE WITH THE FCC LICENSE GRANTED FOR THE LINK. THE TRANGOLINK™ GIGAPRO USER IS RESPONSIBLE FOR CONFIGURING THE RADIO CORRECTLY.

RX Freq: Although not configurable, displays the received frequency calculated once the Tx Freq is configured.

Bandwidth: This setting configures the channel width in MHz. Set the channel bandwidth in accordance with the License grant. The bandwidth options are: 4, 7, 10, 14, 20, 28, 30, 40, 50, 55, 56, and 80MHz. (Note: the 4 MHz bandwidth corresponds to the 3.5 ETSI standard channel width)

Opmode: Opmode is short for operation mode. When opmode is enabled the unit will be transmit RF. If opmode is disabled the unit can still be managed but the RF portion of the device will be disabled.

NOTE: DO NOT ENABLE OPMODE UNTIL THE TRANSMIT FREQUENCY HAS BEEN SET TO THE LICENSED FREQUENCY

Default Opmode: Operation mode of the radio after a power cycle or reboot. Upon startup the unit will go into OPMODE "on" if Default Opmode is ENABLED. When the radio enters Opmode "on" it will be transmitting. When the radio enters Opmode "off" the radio is not transmitting, but can be accessed via the Ethernet port.

Power: Transmit power (dBm). Transmit power is limited by two factors. First, the TrangoLINK™ Giga PRO has equipment limitations (described in the Specification Appendix) that are a function of the channel bandwidth and signal modulation. At no time should the transmit power be set for a value greater than specified since this will degrade the link availability (BER will increase). Second, the FCC License grant may constrain power below what the TrangoLINK™ Giga PRO can deliver so as to ensure there is no interference with an existing user. So the Power should be set to the lower of these two values (equipment limitations and FCC license grant).

Cable Loss: The cable loss of the IF cable between the IDU and ODU is required for 140, 315, and 915MHz

ACM

ACM: Adaptive Coding Modulation allows the radio to adjust modulation (speed) during fading conditions. Once the signal improves, with ACM enable, the system will return to its original configured modulation.

For more information on the modulation setting for ACM, see Chapter 2, Hitless ACM section.

System

ATPC (Automatic Transmit Power Control): ATPC enabled will allow the link elements to automatically adjust the output power of the ODU's to achieve the Target RSSI. This feature mitigates the effects of flat fading across the link.

ATPC Step Size: This is amount of dB that the system will use to increment the transmit power or reduce it; i.e if the power is set to 17dBm and needs to reduce, the ATPC Step Size when set to 2, will reduce the power to 15dBm.

ATPC Max Power: This is the threshold to which the system will not exceed it's transmit power. This value should be set according to the Max power allowed per FCC licensed

Target RSSI: This is the RSSI value the unit will try to achieve. If ATPC is enabled, then the remote radio will increase or decrease output power in order to achieve the Target RSSI.

Network Settings – IP/ IBM

IP Address: The IP address assigned to the Unit.

Subnet Mask: The subnet mask assigned to the Unit.

Gateway: The gateway assigned to the Unit.

Remote IP: Future use

IBM: In Band Management, this function allows the radio to be access remotely via the data stream rather than connecting the management port in the front panel. The proper operation of this function requires a vlan tag. Therefore, any IBM management traffic will have to tag with the corresponding VLAN ID.

Ethernet

Auto Nego: When disabling this function, the system will require a reboot. Also, the correct cable will have to use to ensure that the Ethernet traffic with the port is not interrupted.

Ingress Rate: The Ingress Rate is the amount of traffic that a port is limited on passing.

SNMP

SNMP Manager *x* IP: The IP address of the device that will receive SNMP traps. The TrangoLink GigaPro allows for up to 5 different manager IP address to be configured. Each manager has to be enable individually.

System Status

The System status section of the statistic page will show how many alarms have been trigger, the IDU temp and which fan is currently running. The section will also provides the RSSI, MSE, BER, FER and ODU temp.

Link Status

The Link status section provides modem lock and pll information. This information is either Red for off or Green for on.

IF A STATUS LED IS NOT APPLICABLE TO THE HARDWARE IN USE, THE COLOR OF THIS STATUS LED WILL BE GRAY.

The Link Status page will also indicate which ports have physical connection via a green status led and which ports are not connected by the use a red status led.

PLL definitions

- ODU RF – Outdoor unit RF Local PLL – Normally green
- ODU IF – Outdoor Unit RF Module Intermediate Frequency PLL Normally green
- ODU TX – Outdoor Unit transmit IF PLL - Normally green
- ODU RX – Outdoor Unit receive IF PLL - Normally green
- IDU PLL – Indoor Unit transmit IF PLL - Normally green
- LDPC – Low Density Parity Check – Normally green

Ethernet Status

The Ethernet status section provides the configuration information of each GigE ports along with the following counters.

GigE Status

- Enabled – The GigE port can be either ON or OFF
- Pause Frame – The Pause frame can be either ON or OFF
- Duplex- The Duplex setting is either Half or Full
- Priority- The Priority ranges between 0 and 3
- Speed – Displays either 10, 100, or 1000
- Max Rate- Max Rate can by any value between 0-1000
- In Octets – Total number of octets received for the port
- In Ucast Pkts – Total number of unicast packets received on the GigE port.

- InNUcast Pkts– Total number of Non-unicast packets received on the GigE port.
- Out Octets - Total number of octets transmitted
- OutUcast Pkts- Total number of unicast packets transmitted on the GigE port.
- OutNUcast Pkts- Total number of Non-unicast packets transmitted on the GigE port.
- Collisions – Total number of collisions on the port
- CRC errors – Total number of CRC errors on the port

RF Status

The RF status section will display the following counter in both IN and OUT with the exception of dropped Ethernet and T1/E1 which only display as IN.

- Total Octets- The Total number of octets received and transmitted
- Total Pckts- The Total number of Data packets received and transmitted
- Total Drop Pckts- The Total number of received packets that were dropped
- Port Rate(Mbps) - Total Mbps been received and Transmitted
- Port Util(%)- The percentage of the total available port been use

PORT RATE AND PORT UTIL WILL DISPLAY A COUNT ONLY AFTER A MINIMUM PERIOD OF TWO MINUTES OF CONTINUOUS TRAFFIC FLOW.

T1/E1 Stats

The T1/E1 status section will display the following settings.

- LOS:
- LOF:
- AIS:
- TS16:
- RAI:
- RMA:
- LCMFA:
- LSMFA:

STM1 Stats

- LOS:
- OOF:

- LOF:
- AIS:
- RDI:
- TIM:
- REI:

Chapter 4 – Installation & Commissioning

About this Chapter

Once you are familiar with the basic operation of the radios you are ready for installation in the field. The installation process consists of the following steps:

1) Select the installation site
2) Installation of IDU, combiner, ODU
3) Install cabling
4) Install Lightning/Grounding protection
5) Weather Proofing
6) Antenna alignment
7) Upgrading Firmware

Trango highly recommends obtaining detailed information about the installation process and the initial equipment configuration to have as a record. This will ensure that the proper process was followed and help any future troubleshooting efforts, should they be required. To assist the installer, two forms are shown in Appendix F, the Installation Log and the Commissioning Log.

REFER TO CHAPTER 7 FOR BENCH TESTING THE EQUIPMENT

Select the Installation Site

The IDU is designed for a controlled environment and must be housed inside a temperature controlled shelter that maintains a temperature within the specifications of the IDU. The ODUs are designed for uncontrolled outdoor environments and typically directly mount onto the antenna using a waveguide fitting.

Ensure that the site selected has easy access if possible and a clean source of -48 VDC or 110-240 VAC. The location for the Antenna must be no further than 1000 feet (330meters) away from the IDU. Ensure that cable run trays are accounted for in the calculation to avoid problems

Installation

Mounting IDU and ODU

The IDU is supplied with mounting brackets and screws for installation in a standard 19inch rack. The IDU is provided with a ground lug that should be connected to the rack ground with a short length of stranded copper wire to ensure a low impedance path to ground.

The ODU has a slip-mount adapter design which allows for the ODU waveguide output to be coupled into antenna input with a minimum of loss and ease of installation. The ODU is secured to the antenna assembly using 4 easy, slip-mount latches. Please refer to the antenna installation instructions for proper installation of the antenna. The ODU can be secured to the tower/pole with high strength cable strung through any of the four carrying handles to discourage theft. Trango recommends using combination locks so that maintenance is not frustrated by lost keys.

Screw or Nut Size	Torque (in-lbs)
4-40	6
6-32	12
8-32	22
10-32	37
¼-20	65

Table 8: Torque

PLEASE REFER TO THE ANTENNA INSTALLATION INSTRUCTIONS FOR PROPER INSTALLATION OF THE ANTENNA.

Figure 37: IDU with Rack Ears installed

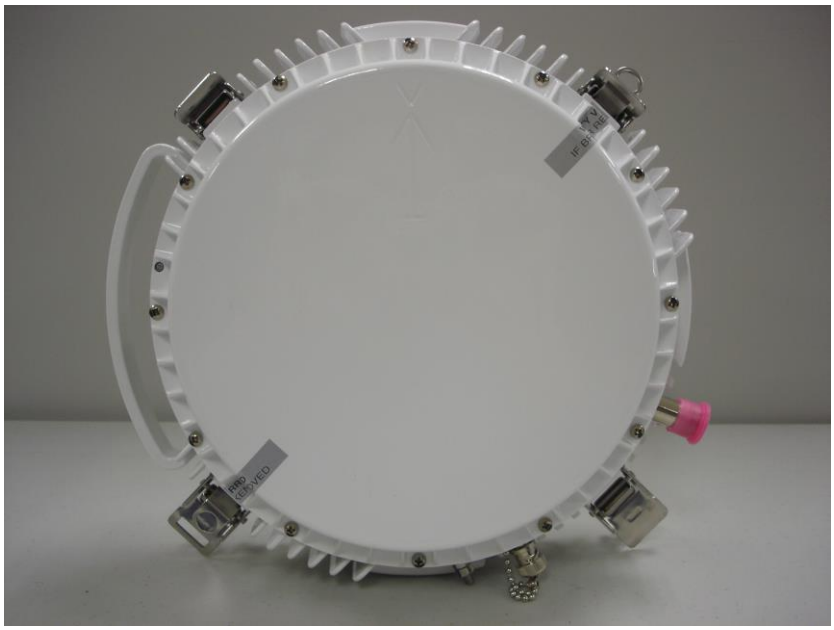


Figure 38: High Power (HP) ODU

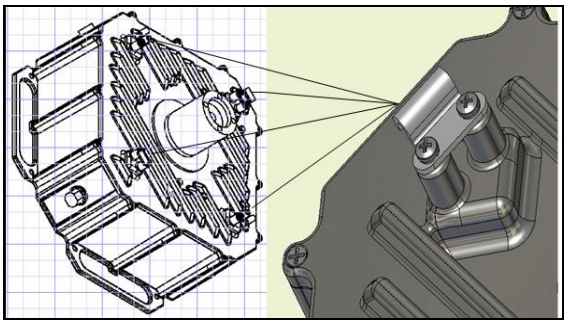


Figure 39: Standard Power (SP) ODU with Waveguide Transition attached

Ferrite Installation

The IDU ships with a ferrite (Figure 40) to prevent noise from entering the unit through the power cable. To install the ferrite, loop the power cable through at least once and close the ferrite. Be sure to install the ferrite as close as possible to the IDU power plug as shown in Figure 41 to improve the noise rejection.

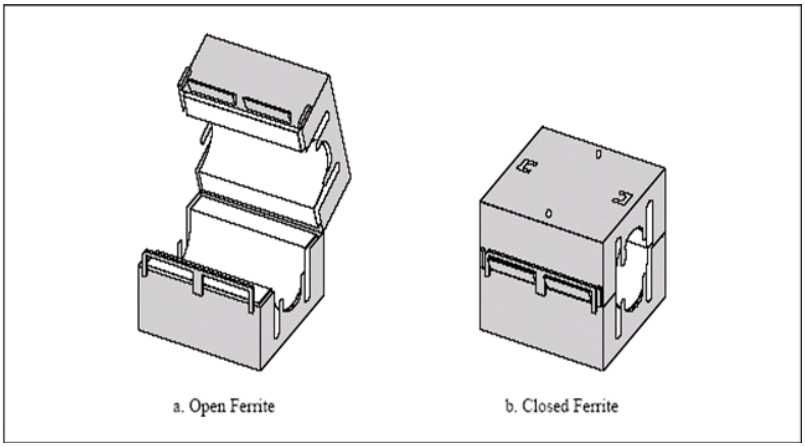


Figure 40: Ferrite

18 AWG TYPE STRANDED WIRE IS RECOMMEND TO CONNECT THE POWER SUPPLY TO THE IDU. THIS WIRE IS NOT SUPPLIED WITH PURCHASE. PLEASE REFERENCE CHAPTER 3 FOR POWER CONNECTION ASSEMBLY.

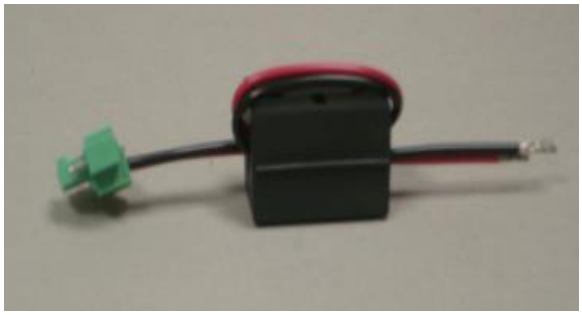


Figure 41: Ferrite Installed

When installing the ODU there are 2 key factors in determining the polarity of radio.

1. The installation of the waveguide

2. The mounting of the ODU to the antenna.

⚠	IT IS IMPORTANT THAT THE WAVEGUIDE AND ODU ARE INSTALLED CORRECTLY. THE RESULTS OF IMPROPER INSTALLATION WILL RESULT IN TRANSMITTING AN INCORRECT POLARITY IN VIOLATION OF THE FCC LICENSE AND POTENTIAL LINK FAILURE.

Waveguide Transition Installation (SP ODUs)

Place the Waveguide Transition into the bore on the ODU. Use a small amount of silicone lubricant which is supplied with the transition. Evenly but not excessively, lubricate the O-Ring before placing on the ODU groove. Note to avoid any spills or run off into the interface opening. Do not disturb the O-Ring position. Attach the waveguide transition using a Phillips screw driver and tighten securely. Note the alignment of the transition to the waveguide opening on the ODU.

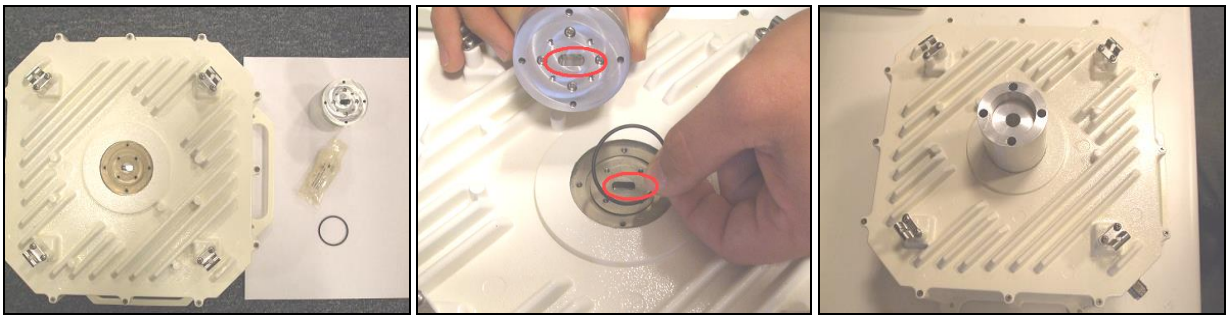


Figure 42: Waveguide transition installation for SP ODU.

> ⚠ INSTALLING THE WAVEGUIDE ADAPTER REQUIRES A SMALL DIAMETER SCREWDRIVER WITH A PHILLIPS HEAD WITH A MAX DIAMETER OF .225 AND ABOUT 2 1/2 INCHES LONG
>
> THE INSTALLATION KIT MAY INCLUDE MATERIALS THAT ARE NOT USED FOR EVERY INSTALLATION. YOU MAY RECEIVE EXTRA OR NON-FITTING O-RINGS.

When placing the waveguide adapter onto the ODU ensure that orientation matches. Figure 42 shows the placement of the waveguide adapter. The waveguide adapter is only required for Standard Power ODUs.

Waveguide Transition Installation (HP ODUs)

The HP ODUs do not require a special transition to be installed since the ODU itself has a circular waveguide fitting that connect directly to the antenna or combiner. Follow the antenna installation instructions for HP ODUs Figure 43 shows the waveguide interface looking into the HP ODU for reference.

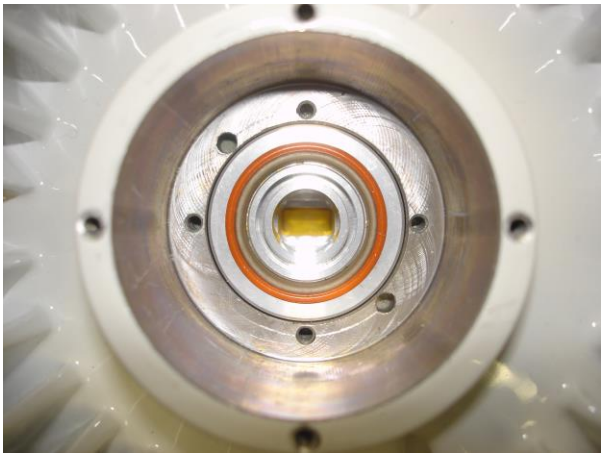


Figure 43: High Power (HP) ODU Waveguide opening

Polarization

ODU mounting determines if the transmit signal polarity as vertical or horizontal. Changing polarity from vertical to horizontal is easy. Unlatch the ODU from the antenna and rotate counter-clockwise and latch the ODU to the antenna. Figure 44 and 45 show a unit mounted, with vertical polarization as well as one mounted with horizontal polarization. Please take special note of the LED panel and N-Connector position as this is used for polarity selection. The Trango logo should not be used for orientation purposes as different models of ODU may have the logo stamped in different positions.

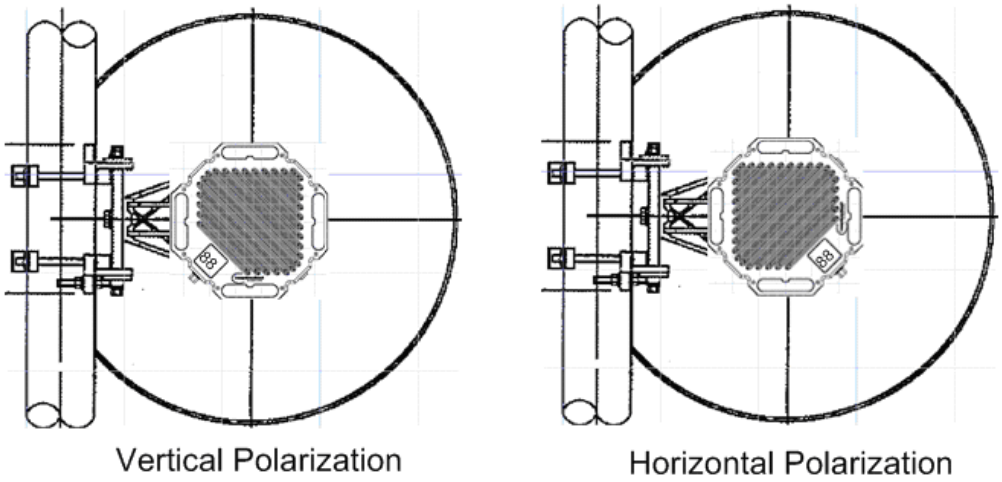


Figure 44: ODU Polarization (Left side mount)

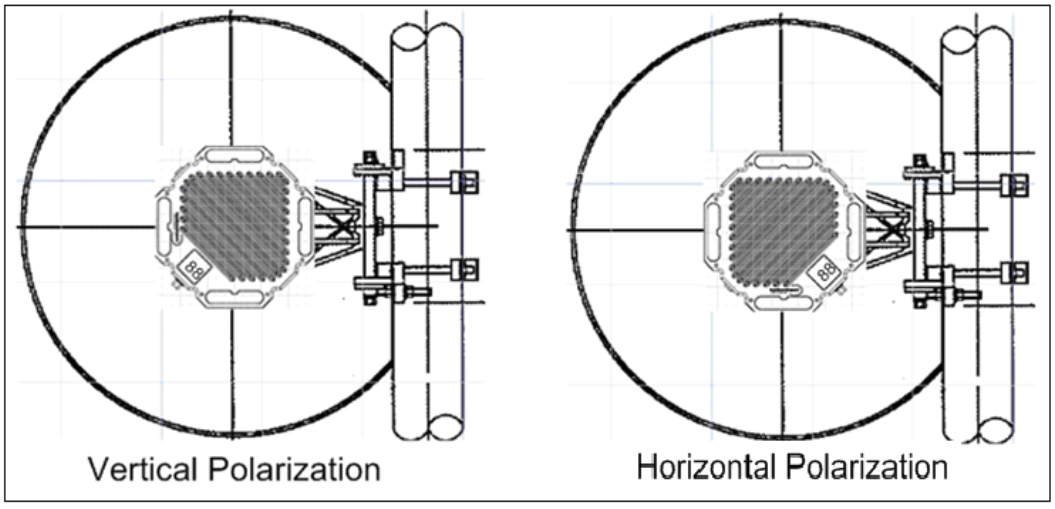


Figure 45: ODU Polarization (Right side mount)

Combiner Installation

A Dual Polarization Microwave Combiner (DPMC) is recommended when installing two ODUs to a single antenna. The combiner has a single circular waveguide slip-fit coupling centered on the front side (Figure 46). There are two slip fit ports are on each side of the combiner and perpendicular to the front coupler for the ODUs.

Figure 46: Dual Polarization Microwave Combiner

To install the mount simply attach the front side of the DPMC to the antenna slip fit mount and secure the latches as shown in Figure 47. **Remember to use the supplied silicone lubricant as mentioned in the DPMC Installation Manual to avoid damaging the O-ring**.

Figure 47: DPMC attachment to the antenna

Once the DPMC has been installed (Figure 48) the ODUs can be mounted to the coupler. Since each DPMC port supports Horizontal or Vertical Polarization and utilizes the same mounting structure as the antenna, simply select the polarization desired by attaching the ODU to the DPMC in the correct orientation as shown in Figures 44 and 45.

Figure 48: DPMC with ODUs installed on Antenna

⚠	THE ODU POLARIZATION IS SET BY MOUNTING ORIENTATION, WHICH IS DONE IN THE SAME MANNER AS MOUNTING AN ODU TO THE ANTENNA.

IF Cable Installation

DO NOT USE THE N CONNECTORS TO PULL THE IF CABLE THROUGH CONDUIT OR RACEWAY. THIS MAY STRESS THE SHIELD OR CENTER CONDUCTOR RESULTING IN INTERCONNECT PROBLEMS THAT ARE DIFFICULT TO FAULT ISOLATE AND MAY NOT OCCUR UNTIL LONG AFTER INSTALLATION.

Lightning Mitigation Recommendations – Trango strongly recommends installing Lightning arrestors at a minimum two points in the IF Cable routing:

1) At the closest point of the radio possible
2) At the entry point to the building or equipment shelter
3) For optimum protection, Trango recommends installing at every 50ft

These connections should be secured to the tower or pole at a point where there all paint/plating has been removed to ensure a low impedance path to ground. NOTE: there is no guarantee that use of these arrestors will prevent Lightning damage to the radio or other electronics, but it is prudent system design to aggressively mitigate the effects. [See Appendix for Lightning Arrestor Kits compatible with LMR-400 IF Cables]

Cable Length Recommendations – Trango recommends that the IF Cable be installed with a 2 ft service loop next to each connector (i.e. below the ODU, next to Lightning Arrestors, next to the IDU, etc.) to allow for replacement terminations in the future.

Cable Connectivity – The IF Cable can be connected to the ODU and IDU with right angle N adapters (female towards the cable and male to the IDU/ODU) which prevent the bend radius (minimum 1 inch) from obstructing cabinet doors.

Cable Dress Recommendations – Properly securing the IF Cable to the tower or pole structure is important since poorly dressed cables can be abraded by the friction of wind action and cable connection can be degraded over time by the same stresses. When securing the IF Cable to the tower or pole, Trango recommends using tie wraps that are UV resistant (black) to minimize deterioration. Tie wraps should be at least ¼ in wide and pulled only as tight as needed to snug the cable to the structure. Narrow tie wraps or over-tightening a tie wrap can compromise the internal structure of the coax and degrade performance. The IF Cable should be secured to the tower or mounting pole at least every 3 to 6 ft with tie wraps or other approved methods. Hanger Assemblies and Cable Clamps are offered by tower companies that can provide an even more rigid attachment for high wind environments.

Cable Terminations - Robust cable and cable connections are CRITICAL to the long-term performance of the link. Any compromise in material, connection precision, or weatherproofing may result in problems that are difficult to fault isolate and only emerge after the link has been exposed to the normal stresses of temperature, rain, and winds.

Cable Type -Trango strongly recommends the use of quality LMR-400 cable and top of the line connectors complimented by well trained installation personnel following manufacturer's instructions. Other types of cable may not have adequate shielding and may cause or receive outside interference.

Grounding

Cable Grounding Recommendations – Ensure that the tower or mounting pole has been properly installed with a high current/low resistance path to earth ground. If this is not the case the IF Cable grounding and Lightning Arrestor will not be effective. The IF Cable should be grounded at the antenna and at a solid ground connection as close as possible to the building or equipment shelter entry point and every 75 feet along the tower leg. Appendix C provides information on IF Cable Grounding Kits available from Trango.

IF THE ANTENNA SUPPORT STRUCTURE IS NOT EARTH-GROUNDED THROUGH A LOW RESISTANCE, HIGH CURRENT PATH,DO NOT PROCEED WITH THE INSTALLATION.

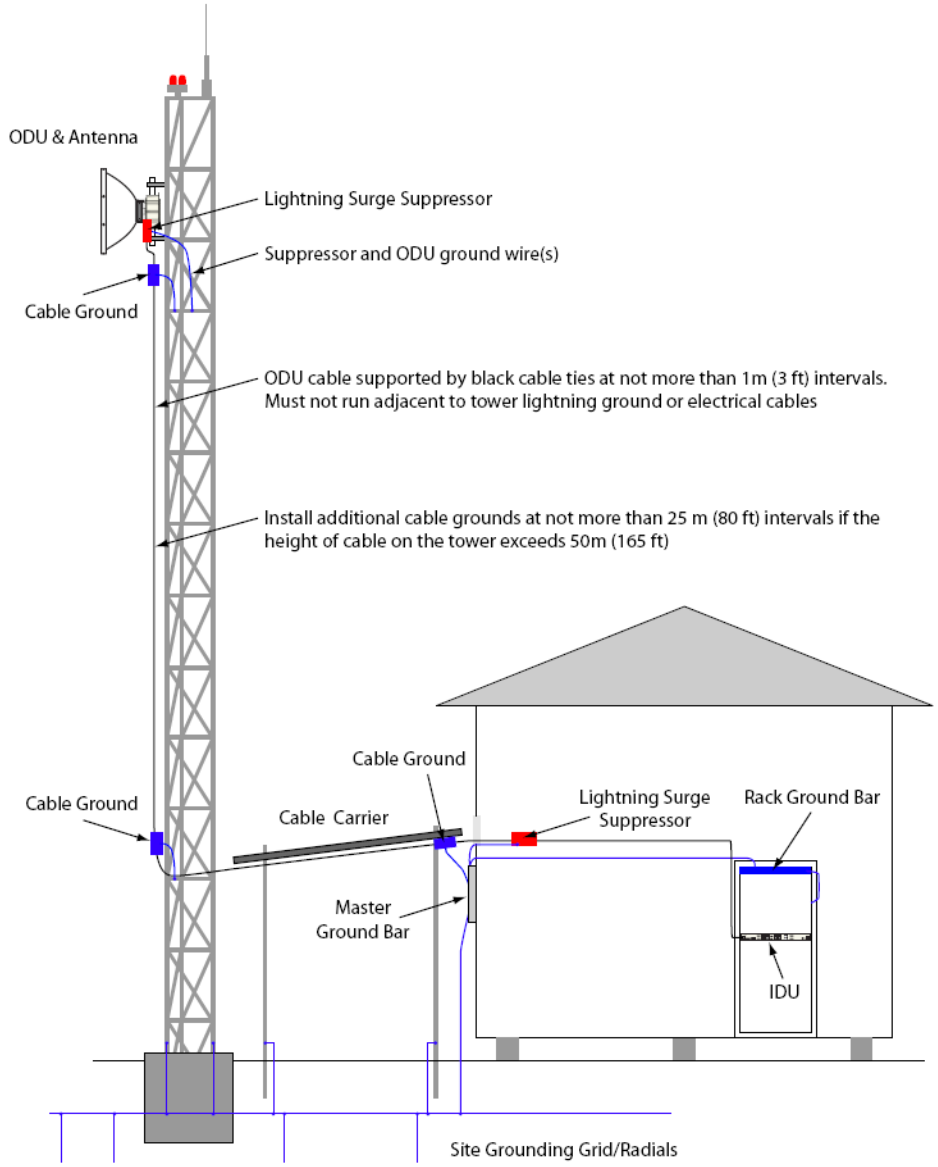
IDU/ODU Grounding Recommendations

The ODU doesn't require any additional grounding since the ODU is attached directly to the antenna. Please note that if the antenna is attached to a metal pole that is earth-grounded, no other grounding is necessary unless directly specified by other electrical jurisdictions. The IDU includes a grounding lug located on the front left side of the panel and should be connected to a low resistance path to earth ground (typically through the rack frame (Figure 49). If your equipment rack chassis is not grounded you may experience intermittent issues and possibly damage the equipment. Equipment damage due to lack of grounding is not covered under warranty. Ensure all ground points have a +/- ov to earth ground.

⚠ PLEASE NOTE TRANGOLINK™ GIGAPRO USES A -48V POWER SUPPLY AND HAS A POSITIVE GROUND CHASSIS.

Figure 49: IDU Grounding

⚠ GROUNDING IS NOT TO BE CONSIDERED LIGHTNING PROTECTION. THE PURCHASE AND INSTALLATION OF LIGHTNING PROTECTION IS RECOMMENDED.



Weather Proofing Cabling

It is important to properly seal each antenna connection to protect against moisture and corrosion. Trango Systems recommends using Coax-Seal which should be applied over the ODU N-Type connector. Coax-Seal is a gum-like tape which is applied by wrapping around the connector and then compressed/molded to form a single cohesive protective covering over the connector.

To properly apply the Coax-Seal product first wrap the connector/case as shown in Figure 50:

Figure 50: Weather Proofing of cable

Secondly, compress the Coax-Seal product to mold into a single protective covering (Figure 51):

Figure 51: Complete weather proofing of cable

> ⚠ **IT IS IMPORTANT THAT THE COAXSEAL IS APPLIED PROPERLY TO THE CONNECTOR TO PREVENT WATER INTRUSION**

Antenna Alignment

Aligning narrow beam width (< 2°) over long distances can be a difficult process without the proper equipment, patience, and a careful process. Using a GPS compass and the Path Analysis to establish a crude azimuth and elevation the installation crew can mount the Antenna Assembly (Antenna and Mounting Kit) on the supporting structures at each end of the link. Once the antennas are installed and a rough antenna alignment has been established, then the fine alignment process can begin at one end of the link (typically the site with the smaller antenna). Once one side is aligned to achieve best RSSI, MSE, and BER then you can adjust the other side to improve the link. Alignment can be done using the Digital RSSI panel on the ODU.

Antenna Alignment Procedure

1. Ensure that both sides of the link are configured correctly.
2. Connect to the IDU from the management port or via the console port.
3. Login and enter config mode. Once in config mode enable the "alignment_mode"

```
login as: admin
Password:

Trango System:  TrangoLink GigaPro Command Line Interface v1.0.0
(CLI-view)# config
Password:
```

```
(CLI-config)# alignment on
Alignment mode: on
SUCCESS
```

4. Once alignment mode is enabled the ODU's digital RSSI panel will update 5 times every second for SP ODUs.

NOTE: For HP ODUs, the voltage at the BNC should be used and will range from 0.1 Volts at -90 dBm input level to 4.5 Volts at -20 dBm input level. Use a voltmeter to monitor the voltage while adjusting the antenna. The following equation can be used to determine the RSL within 3 dB accuracy:

RSL (dBm) = 15.77 x V_{BNC} -91.58

Below is a table showing the voltage to RSL for convenience.

Voltage at BNC (Volts)	Receive Signal Level (dBm)
0.1	-90.0
0.25	-87.6
0.5	-83.7
0.75	-79.8
1	-75.8
1.25	-71.9
1.5	-67.9
1.75	-64.0
2	-60.0
2.25	-56.1
2.5	-52.2
2.75	-48.2
3	-44.3
3.25	-40.3
3.5	-36.4
3.75	-32.4
4	-28.5
4.25	-24.6
4.5	-20.6

5. Once you are satisfied with the RSSI reading, tighten down the antenna in the optimum position.

6. Disable the alignment mode

> ⚠ **WHEN ALIGNING THE ANTENNA, THE CLOSER TO ZERO THE BETTER THE RSSI SINCE THE DISPLAY READ IN NEGATIVE dBm. "80" EQUATES TO -80 dBm WHEREAS "40" EQUATES TO -40 dBm, A SIGNAL 10,000 TIMES MORE POWERFUL.**

Upgrading Firmware

The firmware on the TrangoLINK GigaPRO can be upgraded through the management Ethernet port. A firmware release constist of 2 files and ODU and IDU file:

IDU OS Image Firmware File <idu_gigapro_<version>.tar.gz>

ODU Image Firmware File <odu_fw.bin>

Before beginning the upgrade procedure, be certain that all (sometimes it will be a subset of the above files) of these files have been downloaded and extracted to an easily accessible directory on your local hard drive.

Upgrade Procedures

> ⚠ ALWAYS CONSULT THE UPGRADE INSTRUCTIONS THAT ARE INCLUDED WITH A NEW FIRMWARE RELEASE AS CERTAIN FILES MAY NOT BE REQUIRED FOR AN UPGRADE.

Place the firmware files in an easily accessible directory path on your computer.

Telnet into the radio by Clicking on Start menu then RUN. (Figure 52) The figures use the default IP address; you must use the correct IP address for the TrangoLINK GigaPRO.

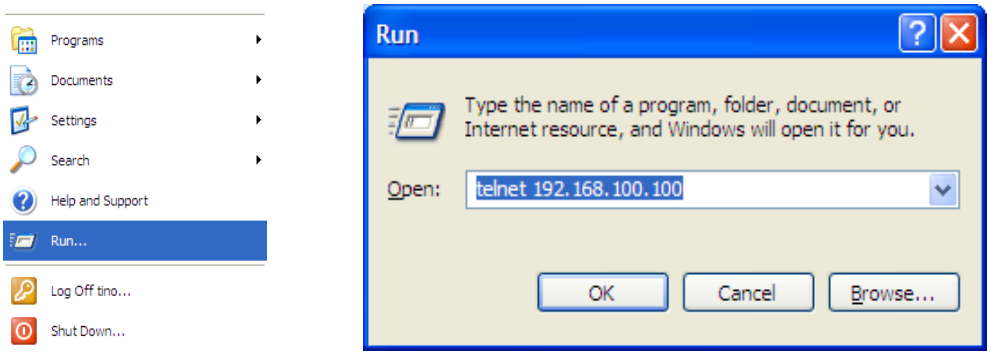


Figure 52: Windows Start & Telnet

1. At the login enter your username and password. The username is "*admin* "and default password is "*trango"*
2. Enter Config mode by typing "*config*" and entering you write access password. The default config mode password is "*trango"*
3. Enable the tftp daemon using the TFTPD command as shown below.

```
Login as: admin
Password:
Trango System:  TrangoLink Giga PRO Command Line Interface v1.0

(CLI-view)# config
Password:
(CLI-config)#

(CLI-config)# tftpd on
tftpd:  on
SUCCESS
(CLI-config)#
```

4. Open a MS-DOS prompt (or other CLI interface) window and access the directory that you extracted the firmware files.

```
C:\CD Firmware
C:\Firmware
```

5. Using windows TFTP command line tool, we will upload the firmware file. The tftp syntax and an example are below.

```
TFTP [-i] host [GET | PUT] source [destination]

C:\firmware>tftp -i 192.168.100.100 put idu_gigapro_v10.tar.gz
Transfer successful: 1951744 bytes in 15 seconds, 130116 bytes/s
```

> ⚠ IF UPGRADING MULITPLE IMAGES AT A TIME. REPEAT STEP 5 WITH THE CORRECT FILE NAME.
>
> YOU MAY NEED TO DISABLE YOUR FIREWALL FOR TFTP TO WORK PROPERLY

6. Once all file have been transferred successfully. Log back into the unit and apply the updates using the "bootimage" command from the config mode. Each firmware needs to be upgraded on the unit using the "bootimage upgrade" command.

```
(CLI-config)#
(CLI-config)# bootimage upgrade idu
```

Please note the following options for the "bootimage" command:

```
(CLI-config)# bootimage upgrade <idu , odu1 , odu2>
```

7. A reboot of the radio is required to load the new image after upgrade

```
(CLI-config)# reboot
```

The upgrade time varies depending upon the images and the size of the image.

The firmware can be verified by logging into the radio via the CLI through the "version" command or Web browser version page under the Firmware Version section(Figure 8, Chapter 2).

The Current images is the currently running firmware. The firmware which was replaced will be located in the Previous images.

> ⚠ PLEASE REFER TO THE CURRENT FIRMWARE UPGRADE INSTRUCTIONS FOR CORRECT AND UPDATED FIRMWARE VERSION NUMBERS. THIS INFORMATION IS OBTAINED BY CONTACTING TRANGO PRODUCT SUPPORT.

Chapter 5 - Management

About this Chapter

The TrangoLINK™ GigaPRO microwave link can be managed though the methods listed below:

1) Browser Interface (HTTP, HTTPS) – See the Configuration Section - Chapter 3
2) CLI (Console, Telnet, SSH) – See the Command Set Reference in Appendix A
3) Remote SNMP Manager - Discussed in this section

SNMP

TrangoLINK™ GigaPRO supports Simple Network Management Protocol (SNMP) for network management. Network management consists of the following 4 categories: configuration, accounting, alarm, and monitoring and control. These capabilities allow the network operator to provide superior services through higher network accessibility and integrated accounting system. Use of SNMP requires the customer to have already implemented a NMS software package.

The Trango SNMP solution supports MIB-II (system only) and the Trango proprietary Management Information Base (MIB).

Users interested in using the SNMP functionality should review the entire TrangoLINK™ Giga PRO MIB for a complete understanding of its features.

The following is an overview of a few of the more commonly used SNMP objects in the TrangoLINK™ GigaPRO system.

Objects for Monitoring and Control

GigE Bandwidth Monitoring

1) **gigeEth1InOctets** – Number of octets of payload received on GigE port 1.
2) **gigeEth2InOctets** – Number of octets of payload received on GigE port 2.
3) **gigeEth3InOctets** – Number of octets of payload received on GigE port 3.
4) **gigeEth4InOctets** – Number of octets of payload received on GigE port 4.
5) **gigeEth1OutOctets** – Number of octets of payload transmitted on GigE port 1.
6) **gigeEth2OutOctets** – Number of octets of payload transmitted on GigE port 2.
7) **gigeEth3OutOctets** – Number of octets of payload transmitted on GigE port 3.
8) **gigeEth4OutOctets** – Number of octets of payload transmitted on GigE port 4.

RF Monitoring

1) **rfInOctet** – Number of octets of payload received on the RF port.
2) **rfOutOctet** – Number of octets of payload transmitted on the RF port.
3) **rfEthernetInPackets** – Number of octets of payload received from the GigE ports to transmit on RF port.
4) **rfEthernetOutPackets** – Number of octets of payload transmitted to GigE ports from RF port.
5) **rfT1E1InPackets** – Number of octets of payload received from the T1/E1 ports to transmit on RF port.

6) **rfT1E1OutPackets** – Number of octets of payload transmitted to T1/E1 ports from RF port.
7) **rfRSSI** – The Receive Signal Sensitivity Indicator the unit receives from the distance end of the link.

Link Status Traps –Various traps are defined as follows:

1) **trapReboot**– trap is triggered when the unit is rebooted
2) **trapStartUp** – trap is triggered when the unit boots up.
3) **trapBackupLink** – trap triggered when the backup status changes.
4) **trapBackupTakeover** – The trap is triggered when the Backup unit has taken over.

Please review Appendix D for a complete listing of MIB Objects.

Chapter 6 - Troubleshooting

About this Chapter

This chapter covers some of the more common problems encountered during setup of the TrangoLINK™ GigaPRO, and explains how they are resolve them

- No Link
- High BER
- Ethernet Port
- T1 Port
- STM-1 port
- Web Interface

No LINK

- Ensure that Opmode is turned enabled for both sides of the link
- Verify that 50 ohm N-Type connectors have been used.
- Verify that the fuses are functional by using a multi-meter and check for continuity.
- Verify the Transmit frequency is configured correctly for each side of the link.
- Ensure the ODU's for the link are paired correctly. The pair must be 1A and 1B or 2A and 2B for a link to be established.
- Both sides of the link must be configured for the same speed, channel bandwidth and modulation
- Speed configuration changed without saving and rebooting.
- TargetRSSI incorrectly configured. Ensure that the targetrssi is set correctly so that the link doesn't decrease power to the point of losing the link.
- Check the power setting on both sides of the link
- Cable loss setting is set too high or too low.
- Check to make sure Loopback is disabled.
- Antennas are misaligned, verify RSSI values

High BER

A high Bit Error Rate can be caused by the following:

- Transmitter power too high for the modulation selected. Reduce the transmit power.
- Receiver overload. Enable ATPC if the RSSI is too high for the desired modulation.
- Ensure the TargetRSSI is set correctly (SP ODUs only).
- Enabling ODURXAGC is also recommended to control the gain received during a fade event.
- Incorrect cableloss values. (If using HP ODU, remove cableloss values)
- Ensure IF cables are properly installed with no sharp bends or kinks.

- Make sure IF connectors are secure on the IDU and ODU.
- Improper grounding at the IDU and or ODU locations. Ensure that all grounds are connected properly.
- Ensure ferrite bead are installed on the power supply leads

GigE Port

No traffic is passing

- Ensure cables are connected into correct ports. Port 1 traffic passes through the link so only Port 1 on the other side can see the traffic.
- Check the Ethernet cables to ensure they work properly.
- Ensure that the GigE port is enabled

Errors on GigE port

- Ensure there is no duplex mismatch. The TrangoLINK™ Giga PRO can be configured for Auto-negotiate, 1000 Full duplex, 1000 Half-duplex, 100 Full duplex, 100 Half-duplex, 10 Full-duplex, and 10 Half-duplex. The setting of the TrangoLINK™ Giga PRO should match the setting of the connecting device.
- Verify correct Ethernet cable type is being used for GigE setting.
- The Ethernet cable connector is not properly crimped.

T1/E1 Port

Not passing traffic

- Mismatched T1 ports, since the T1 ports are port mapped T1 port 1 on IDU one must be connected to T1 port 1 on the second IDU.
- Ensure the port is enabled
- Verify pin outs of the T1 connector
- License Key not activated

STM-1/OC-3 Port

Not passing traffic

- Wrong Fiber module used. Consult Trango Sales for the correct module part numbers and availability.
- License Key not activated. Consult Trango Sales for the correct License key part numbers and availability.
- Ensure the port is enabled using the DataPath command and rebooting
- Wrong System Configuration. STM-1/OC3 Port 2 is only available if Modem 2 is active (License Key required) and the Sysconfig is set to 2+0 or E/W
- The fiber optic cable is not correct.

Management

If you cannot telnet into the radio or open an HTTP browser session,

- Check your cable connections
- Ensure proper cable is being used cross-over vs. straight-through cable
- Check PC's subnet to make sure it is routable to the radio's IP address.
- Ensure snmpd is not disabled
- If you just performed a firmware upgrade and one file did not load properly and the system rebooted, you will lose management. Please call Technical Support for further assistance.

If there are still issues please contact Technical Support at 858-391-0010 or Email at

techsupport@trangosys.com

Before calling please make sure you have the following information.

- Serial Number

- Description of the problem
- Steps taken so far to resolve the problem
- Commissioning log

.

The serial number can be located on the back of the IDU or can (Chapter 1, Figure 3).

Chapter 7 – Bench Testing

About this Chapter

This chapter covers the basic tips in setting up the equipment for bench testing the before deployment.

Bench test setup

Benching testing equipment before installation is a common practice for installers to perform before deploying the equipment. Bench testing provides the user with a baseline of results and helps ensures that the equipment operates according to specification before deployment. It is a preventive measure that saves time since equipment can be preconfigured before deployment. Please refer to Chapter 3 for configuration of the units.

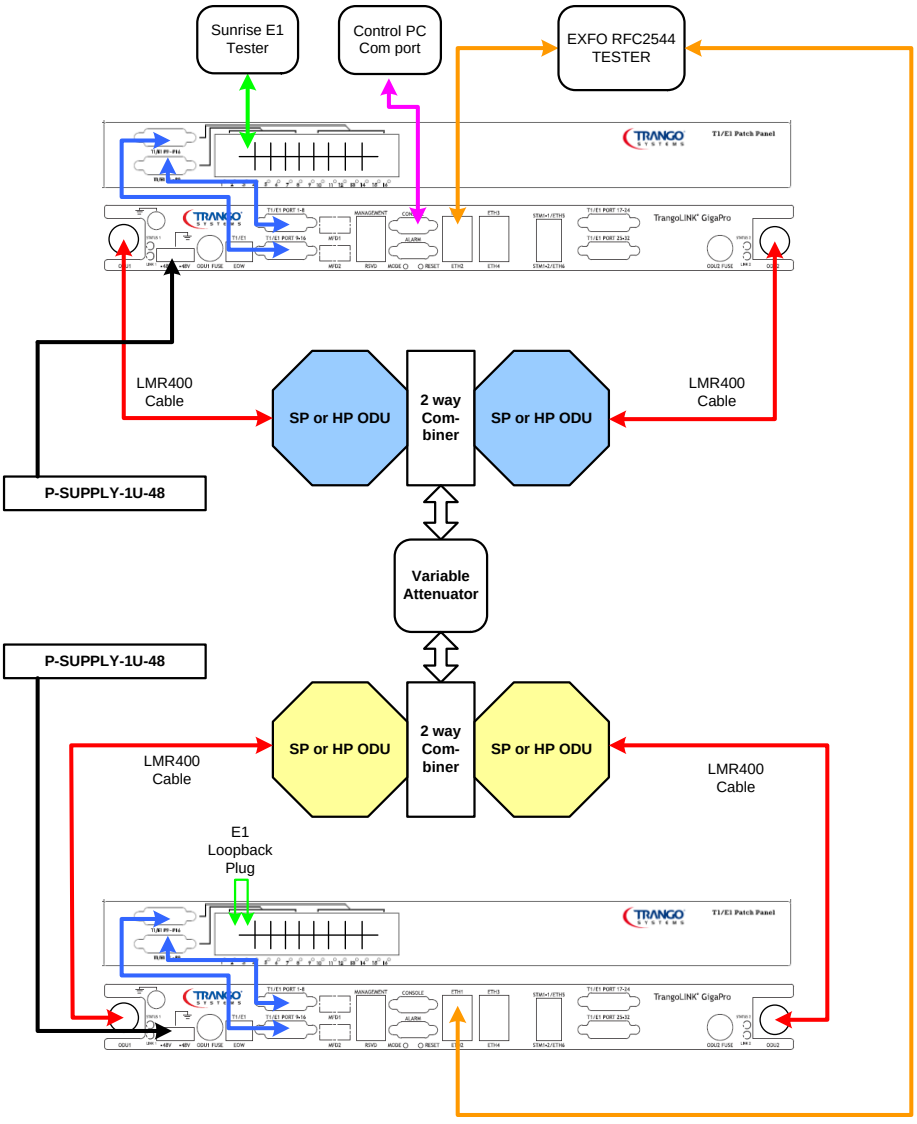


Figure 53: Bench test setup (1+1 configuration)

The following are tips to ensure your bench test setup is done properly (Figure 53).

1. Ensure cable loss is correct for short IF cables
2. Have at least 45db of attenuation between ODU's
3. Connect attenuator directly to the ODU or combiner without waveguide adapter. (Figure 54)

Figure 54: Waveguide Attenuator

4. Ensure the RSSI is less than -28dBm. A RSSI reading of above -28dBm may cause link degradation and possible damage, depending on the level.

Appendix A - Command Set Summary

System Command Keying

Key Functions

Tab

Completes a partial command name entry. When you enter a unique set of characters and press the Tab key, the system completes the command name. If you enter a set of characters that could indicate more than one command, the system beeps to indicate an error. Enter a question mark (?) immediately following the partial command (no space). The system provides a list of commands that begin with that string.

Del or Backspace

Erases the character to the left of the cursor.

Return

At the command line, pressing the Return key performs the function of processing a command. At the –More-- prompt on a terminal screen, pressing the Return key scrolls down a line.

Space Bar

Allows you to see more output on the terminal screen. Press the space bar when you see the More prompt on the screen to display the next screen.

Left Arrow

Moves the cursor one character to the left.

Right Arrow

Moves the cursor one character to the right.

Up Arrow

Recalls commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.

DownArrow

Return to more recent commands in the history buffer after recalling commands with the Up Arrow or Ctrl-P. Repeat the key sequence to recall successively more recent commands.

Different Node Levels

View Node

This is the default node the users log in. This is strictly configuration and statisic view only. No configuration changes can be made at this level

Command List in View Node

acm	Display ACM feature status
alarm	Display Alarm status
alignment	Display alignment mode status
atpc	Display ATPC status
ber	Display ber test parameters
cableloss	Display Cable loss values
config	Enable Trango configuration mode
cos	Display current status for class of service
datapath	Display datapath from FPGA
datapattern	Display data source for data pattern
date	Display Time of Day
default_opmode	Display default Opmode status
eth_info	Display ethernet port status and configuration
fan	Display Fan status
freq	Display Rf Tx/Rx frequency
help	Display help command
httpd	Display Web server (httpd) status
Ibm	Display In Band Management configuration
ipconfig	Display radio management port configuration
license	Display license enable status
linktest	Display link test values (RSSI, MSE, BER)
loopback	Display loopback Mode
model	Display IDU/ODU Model and serial number
mse	Display the MSE (Mean Square Errors) value
oduled	Display ODU rssiled status
odupower	Display ODU Power status
odurxagc	Display ODU Rx AGC status
opmode	Display Operation Mode status
power	Display Tx power in dBm
remark	Display product remarks
rps	Display current status of rapid port shutdown
rssi	Display RSSI value
sfp	Display fiber/stm1 switch option
show	Show running system information
snmpd	Display SNMP Agent Daemon (snmpd) status
speed	Display current modulation and symbol rate(speed)

status	Display status for different device and ports
sysconfig	Display current system configuration
sysinfo	Display MSE, FER information
syslog	Display system event log
targetrssi	Display target rssi value
tdm	Display TDM configuration
telnetd	Display telnetd server (telnetd) status
temp	Display IDU and ODU temperature
tftpd	Display tftp server (tftpd) status
trap	Display SNMP Trap IP configuration
uptime	Display system uptime
version	Display IDU/ODU Software version
Voltage	Read voltage values from PIC

Config Node

Users can enter this node by typing in the command "config" from the view node. They will be prompted for a password and after successful authentication users enters the config mode. All configuration settings can be changed here.

- All the commands entered without any parameters returns the current configured values and are similar to "view" node.
- All configuration changes are applied immediately and don't require any reboot (except "speed" in which the settings are applied immediately, but it does require reboot after save).
- All configuration changes have to be saved in order to be persistent across reboot. A single "save" command will save all configuration changes
- Users can go back to the "view" node by typing in the command exit

Command List in Config Node

CLI	Ranges	Default Value
alarm	on/off	Off
alignment_mode	on/off	Off
atpc	on/off	Off
ber		N/A
bootimage	<upgrade | toggle> <0-5>	N/A
cableloss	<0-20> <0-30> <0-50>	0,0,0
config	export, import,remove,view	N/A

cos		Priority 0: COS Queue = 0 Priority 1: COS Queue = 0 Priority 2: COS Queue = 1 Priority 3: COS Queue = 1 Priority 4: COS Queue = 2 Priority 5: COS Queue = 2 Priority 6: COS Queue = 3 Priority 7: COS Queue = 3
datapath	<0-2>	2
datapattern	<fpga | modem>	fpga
date	<0-99><1-12><1-31><0-23><0-60>	Linux System Date
debug	N/A	N/A
default_opmode	<on/off>	Off
diagnostic	N/A	N/A
eth_info	<1-6>	N/A
exit	N/A	N/A
fanctrl	<0-2>	1
freq	depends on ODU model	0 (this is exception to the valid range)
help / ?	N/A	N/A
httpd	<on/off>	On
ibm	<on/off> <ip address> <Vlan>	off
ipconfig	<ip address><netmask><gateway>	ip 192.168.100.100 netmask: 255.255.255.0 gateway: 192.168.100.100 Reset will not reset ipconfig, use "reset ipconfig" to reset the ip address settings.
license	N/A	None N/A
license_speed	<1-2> Key	N/A
license_stm1	Key	N/A
license_system	Key	N/A
license_tdm	Key	N/A
linktest	duration <1-99>	Default 1 (if duration not entered by user)
loglevel	<0: Setting, 1: Event, 2: Status>	0,1
loopback	<dig | if | rf_gen | rf_refl | off>	Off
model	N/A	No defaults, read directly from the IDU/ODU
mse	duration <1-99>	Default 1 (if duration not entered by user)
oduled	<on/off>	On
odupower	<on/off>	Off
odurxagc	<on/off>	Off
opmode	<on/off>	Off
passwd	<passwd> <confirm_passwd> (8char)	trango
port	<eth > <1-6> <auto_nego, duplex, enable, maxrate, pause, priority, speed	All 4 ports configured in the Auto-Neg Mode

power	0-20	10dBm
prompt	Character string	N/A
reboot	N/A	N/A
remark	<string 1-100bytes>	TrangoLink GigaPro Reset will not change the remark settings
reset	N/A	N/A
rps	on/off	off
rssi	Duration <1-99>	Default 1 (if duration not entered by user)
sfp	<fiber, stm1n>	fiber
show	<passwords>	CLI View Node: trango CLI Config Node: trango SNMP read comm: public SNMP write comm: private Web Interface: trango snmp trap: trapstr
snmpd	<on | off >	On
speed	<channel_bw> <modulation>	<0> <qam16>
channel_bw	4/7/10/14/20/28/30/40/50/55/56/80	0
modulation	qpsk, qam16, qam64,qam128,qam256	qam16
status	<modem | fifo | pll | port | all | clear>	N/A
sysconfig	<0 – 5 >	0
sysinfo	<0-6>	0 (if command executed without any param)
syslog	<clear>	N/A
targetrssi	<-88 - -25)	-40
tdm	<coding. <mode>	AMI T1
temp	N/A	N/A
tftpd	on/off	Off
threshold	<param> <min | max> <value> <action> param : 0 rssi, 1 mse, 2 ber, 3 fer, 4 idu_temp, 5 odu_temp min|max: param dependent action: 0 none, 1 alaram1, 2 alarm2 ,3 snmptrap	Default action is None.
trap	<enable, ip, cr>	0.0.0.0 Reset will change the prev configured trapip
enable	<0 – 5>	N/A
ip	<1 -5 > <A.B.C.D>	N/A
cr	N/A	N/A
uptime	N/A	N/A
utype	N/A	Main
version	N/A	N/A
voltage	N/A	N/A

Debug Node

This node is additional management port related settings and users enter the debug node, by typing in the "Exit" command from the "*config*" node. Users can re-enter the view node by entering the command "cli" from within the debug node.

Command List in Debug Node

cli	N/A	Used to Enter the CLI (trango-view) node
help	N/A	Display list of commands in the debug node
ping	<ip address>	ping network hosts
route	N/A	Display the current system routing table
ssh	<ip address>	ssh into another host
syslog	N/A	print system log
telnet	<ip address>	telnet into another host
tg_reboot	N/A	Reboot radio

CLI Command Description

acm

<table>
<tr><td>SYNTAX</td><td>
acm
acm enable < on| off >
acm mod <modulation> mse_im <-40 - 0>
acm mod <modulation> mse_de <-40 - 0>

<table>
<tr><th>profile</th><th>mse_im</th><th>mse_de</th><th>enable</th></tr>
<tr><td>QPSK</td><td>-20.3</td><td>-17.10</td><td>enabled</td></tr>
<tr><td>16QAM</td><td>-25.3</td><td>-18.5</td><td>enabled</td></tr>
<tr><td>32QAM</td><td>-26.3</td><td>-21.3</td><td>enabled</td></tr>
<tr><td>64QAM</td><td>-29.2</td><td>-24.3</td><td>enabled</td></tr>
<tr><td>128QAM</td><td>-32.1</td><td>-27.2</td><td>enabled</td></tr>
<tr><td>256QAM</td><td>-32.1</td><td>-27.2</td><td>enabled</td></tr>
</table>

Configuration Storage: Yes
acm without any parameter will display the current status of ACM feature for both Modem1 and Modem2.
acm under “config” node will set action on both modem.
acm under “radio1” node will only set action on Modem1.
acm under “radio2” node will only set action on Modem2.
</td></tr>
<tr><td>DESCRIPTION</td><td>
acm is used to display ACM features parameters including ACM enable, and MSE values in the improve/degrade threshold tables.

acm enable is to turn on the adaptive modulation feature. When enabled, the current Rx modulation may shift to different profile based on the current MSE value and a set of pre-defined MSE degrade and improve thresholds. Speed commands needs to be issued after “acm enable on/off” command.

ACM is not symmetric and each end (Tx Rx) may have different profiles at a given time depending upon the MSE values on each end.

acm mode is used to update MSE value for degrade or improve threshold table. The new threshold values should be effect immediately upon
</td></tr>
</table>

	execution. Certain profiles are not available when initial speed modulation is at QAM256. Below is the available profiles: profile / mse_im / mse_de / enable QPSK / -20.3 / -17.10 / enabled 16QAM / -25.3 / -18.5 / enabled 64QAM / -29.2 / -24.3 / enabled 256QAM / -32.1 / -27.2 / enabled Note: Enable/disable certain profile functionality is not supported in this release.

alarm

SYNTAX	*alarm* *alarm <alarm1 | alarm2> <off>* Default: alarm 1 OFF, alarm 2 OFF Configuration Storage: No *alarm* without any parameter will display the current status for both alarm1 and alarm2 *alarm* is a system-level command.
DESCRIPTION	User may specify alarm1 or alarm2 as the action in the threshold settings. This command is used to turn off the alarm after the alarm has been triggered. Users are not allowed to turn ON the alarms manually through CLI commands. Alarms are only set by the system internally when certain configured thresholds are exceeding its expected range.

alignment

SYNTAX	*alignment* *alignment < on | off >* Default: OFF Configuration Storage: Yes *alignment* without any parameter will display the current status for both ODU1 and ODU2 *alignment* under "config" node will set action on both ODU. *alignment* under "radio1" node will only set action on ODU1. *alignment* under "radio2" node will only set action on ODU2.
DESCRIPTION	*alignment* is used to assist initial antenna alignment. When *alignment* is enabled, instead of updating the RSSI value on IDU/ODU LED every 4 seconds, this command allows system to retrieve new RSSI value up to 5 times a second. It is recommended to disable *alignment* during normal operation.

atpc

SYNTAX	*atpc* *atpc enable < on| off >* *atpc max_power <0-30>* *atpc step_size <0-5>* Default: enable OFF, max power 17 dBm, step size 1 Configuration Storage: Yes *atpc* without any parameter will display the current status of ATPC feature for both ODU1 and ODU2. *atpc* under "config" node will set action on both ODU. *atpc* under "radio1" node will only set action on ODU1. *atpc* under "radio2" node will only set action on ODU2.

DESCRIPTION	*atpc* is used to display ATPC features parameters including ATPC step size, ATPC enable, and ATPC max power. *atpc enable:* ATPC is used to automatically adjust the remote end ODU transmit power in order to maintain the desired level of RSSI (targetrssi) at the local end. This feature will work only when both local and remote radio are enabled. *atpc max_power:* Set the maximum ATPC power. This parameter is used only when the ATPC is enabled. User cannot execute the *power* command when ATPC is turned on. The system will adjust the power automatically based on the "max_power" and "step_size". *atpc step_size:* Specified the step size for each of the ATPC command for power up/down By default, for each of the atpc power up/down command from the remote unit, there will be 1 dB increment/decrement. The user may specify this step size to maximum of 5 dB per command. The *power* command to ODU is 1 dB at a time, but will go up to number of step size per ATPC command. User is responsible for meeting legal/regulatory requirements for Tx power.
EXAMPLE	*(CLI-view) atpc*

ber

SYNTAX	*ber* *ber <0-99 duration in seconds>* Default: 1 second Configuration Storage: Yes *ber* without any parameter will display the current BER, LOCK, MSE, RSSI values *cableloss* under "config" node will display value for both ODU. *ber* under "radio1" node will only display values of ODU1.

	ber under “radio2” node will only display values of ODU2.
DESCRIPTION	

bootimage

SYNTAX	*bootimage toggle* *bootimage upgrade <idu | odu1 | odu2>* Default: N/A Configuration Storage: NO *bootimage* is a system-level command.
DESCRIPTION	*bootimage toggle:* To switch current images back to the previous updated image in a set of FPGA1, FPGA2, OS, FW. PIC and ODU firmware are not allowed to be toggle back unless perform *bootimage upgrade* again. *bootimage upgrade:* upgrade the required software images on the radio, after the image is transferred on the radio via tftp. <idu> option will upgrade all the IDU firmware in sequence of FPGA1, FPGA2, OS, FW, PIC from ONE tar file under /tmp/idu_GigaPro_vX.X.tar “*reboot”* is required after the idu upgrades. <odu1> or <odu2> option will upgrade ODU firmware with the file under /tmp/odu_fw.bin (name is not exchangeable)

cableloss

SYNTAX	*cableloss* *cableloss <loss140> <loss315> <loss915>* Default: 0 for all three channels Configuration Storage: Yes *cableloss* without any parameter will display the current cableloss values for both ODU1 and ODU2 *loss140:* range 0-20, *loss315:* range 0-30, *loss915:* range 0-50 *cableloss* under “config” and “eng” node will set action on both ODU. *cableloss* under “radio1” node will only set action on ODU1. *cableloss* under “radio2” node will only set action on ODU2.

DESCRIPTION	*cableloss* command is used to set the appropriate cable loss for the 3 frequencies based on the length of the LMR cable used to connect the IDU and ODU. *cableloss* info must be sent to the ODU so that it can maintain the output Tx/Rx power level accurately. This is only for SP ODU's. For systems with HP ODU's no cableloss setting is required. It the cable loss compensation is builit-in into the ODU.
	Only applicable for SP ODU's

config

SYNTAX	*config export* *config import* *config remove* *config save* *config view* Default: N/A Configuration Storage: No *config* is a system-level command.
DESCRIPTION	*config export::* The option allows the user to create a ASCII file (config.txt) of the current system configuration, which can then be tftp from the PC, which the user can edit/print or import to other system *config import:* This option allows the user to push a configuration file (should be in the format as created by export) into the system through tftp and then issue the "config import" command to apply the settings from the config.txt file to the system. *config remove:* This option allows removing the current system configuration file config.bin and all settings will be reset to factory defaults. This is different than the *"reset config*" where all the password settings are also being reset. *config save:* Save command is used to save the current system configuration to the flash, so that system settings are persistent across reboot/power cycles.

	Save command should be used after system setting change. Otherwise it will be lost after reboot. Multiple changes can be saved by one save command. *config view:* The option displays the current system configuration in ASCII format on the console. The saved config is displayed.

cos

SYNTAX	*cos* *cos <priority> <queue>* Default: Priority 0 — COS Queue = 0 Priority 1 — COS Queue = 0 Priority 2 — COS Queue = 1 Priority 3 — COS Queue = 1 Priority 4 — COS Queue = 2 Priority 5 — COS Queue = 2 Priority 6 — COS Queue = 3 Priority 7 — COS Queue = 3 Configuration Storage: YES *cos* is a system-level command.
DESCRIPTION	This command is used to map the priority of the incoming packet to one of the 4 COS queues. The traffic class of the incoming packet is mapped 1:1 to the 8 priorities. The scheduling is strict priority with COSQ3 > COSQ2 > COSQ1 > COSQ0

datapath

SYNTAX	datapath <0-4>

	0:ETH only, 1:ETH+T1, 2:ETH+E1, 3:ETH+T1+STM1, 4:ETH+E1+STM1
DEFAULT VALUE	0: Eth Only
DESCRIPTION	Select the profile to be used on the datapath of the radio. License keys are required for STM and TDM (T1/E1) mode. Bandwidth for STM1 and TDM is always reserved once selected, irrespective of whether data is being sent or not. Refer to Appendix A for valid profiles applicable to specific datapath mode
RELATED	Speed, license

datapattern

SYNTAX	*datapattern* <external | internal> Default: external datapattern Configuration Storage: Yes *datapattern* without any parameter will display the current status for both Modem1 and Modem2 *datapattern* under "config" and "eng" node will set action on both ODU. *datapattern* under "radio1" node will only set action on ODU1. *datapattern* under "radio2" node will only set action on ODU2.
DESCRIPTION	Sets datasource for the modem. datapattern can be generated from either fpga (external) or the modem (internal), used to generate PRBS data The datapattern should be set to "fgpa" during normal mode of operation, otherwise no user data from GigE or the T1 ports will be transmitted.

date

SYNTAX	*date* <year> <month> <day> <hour> <minute> Default: N/A Configuration Storage: No *date* without any parameter will display the current time of date. *date* is a system-level command.
DESCRIPTION	Allow the user to set and read the current time and date

debug

SYNTAX	*debug* Default: N/A Configuration Storage: No *debug* is a system-level command.
DESCRIPTION	Exit current node and enter the debug mode.
EXAMPLE	To enter debug mode (trango-config)# debug debug>
RELATED	cli

defaultOpmode

SYNTAX	*default_opmode* *default opmode [on | off]* Default: default operation mode OFF Configuration Storage: Yes

	default_opmode without any parameter will display the default operational mode for both ODU1 and ODU2 *default_opmode* under "config" and "eng" node will set action on both ODU. *default_opmode* under "radio1" node will only set action on ODU1. *default_opmode* under "radio2" node will only set action on ODU2.
DESCRIPTION	Set the default opmode to user specified input. If ON, the system to power on with ready to be operational if OFF, the user have to explicitly turn on opmode. Opmode settings are dependent upon "default_opmode" after power up

diagnostics

SYNTAX	*diagnostic* Default: N/A Configuration Storage: No *diagnostic* is a system-level command.
DESCRIPTION	Diagnostic command is to communicate with all system devices and get a current snapshot of the system status. This is mainly used for debugging purposes.

eth_info

SYNTAX	*eth_info* *eth_info <1-4> <1-4> <1-4> <1-4>* Default: N/A Configuration Storage: No *eth_info* without any parameter will display configuration for all 4 ports. *eth_info* is a system-level command.

DESCRIPTION	Display Ethernet port configurations include: enable, status, pause frame, auto negotiation, duplex, priority, speed and max rate. User have the options to display one or more port configuration for up to 4 ports for display

exit

SYNTAX	*exit* Default: N/A Configuration Storage: No *exit* is a system-level command.
DESCRIPTION	Exit command is used to logout from the current node to the lower node. Typing exit from the debug> node will bring user to the login prompt.
EXAMPLE	To Switch to view node from "trango-config" node *(trango-config)# exit* *(trango-view)* To logout from the system *debug>exit*
RELATED	cli, config

fanctrl

SYNTAX	*fanctrl* *fanctrl <0-2>* Default: fan 1 ON Configuration Storage: Yes *fanctrl* without any parameter will display the current status for the fan

	status. *fanctrl* is a system-level command.
DESCRIPTION	Display of the fan that's current been in used. Only one fan can be turn on at a time. *Fanctrl 0*: Turn off both Fan1 and Fan2 *Fanctrl 1*: Turn on Fan1 *Fanctrl 2*: Turn on Fan2

freq

SYNTAX	freq [tx_freq] Default: no default frequency. 0 Configuration Storage: Yes *freq* without any parameter will display the current Tx and Rx frequency for both ODU1 and ODU2 *freq* under "config" and "eng" node will set action on both ODU. *freq* under "radio1" node will only set action on ODU1. *freq* under "radio2" node will only set action on ODU2.
DESCRIPTION	Sets the transmit frequency and therefore the receive frequency. Only certain Tx-Rx frequency pairs are valid for each model of the radio. Certain IDU/ODU PLL synthesizers are programmed for each and every individual frequency. GigaPro supports model 11, 11E, 15E, 18, 18E, 23, 23E of SP ODUs as well as 6-38Ghz HP ODUs.

help / ?

SYNTAX	*?*

	Default: N/A Configuration Storage: No *?* is a system-level command.
DESCRIPTION	Typing the ? command will display the list of commands in the current node with a one line description of the commands
EXAMPLE	*(trango-config)#?* *<Display the List of cmds>*
RELATED	N/A

httpd

SYNTAX	*httpd* *httpd* <on | off> Default: *httpd ON.* Configuration Storage: Yes *httpd* without any parameter will display the current status for the web interface daemon *httpd* is a system-level command.
DESCRIPTION	Turn on httpd server for web interface access. The web interface supports both secure (https) and normal (http) access.

ibm

SYNTAX	*ibm* *ibm enable < on | off >* *ibm ip <ip_addr> <netmask>* *ibm vlanid <1-4090>* Default: enable=OFF, ip=172.16.10.0, netmask=255.255.0.0, vlanid=100.

	Configuration Storage: Yes *Ibm* without any parameter will display the current IBM features parameters. *ibm* is a system-level command.
DESCRIPTION	*Ibm* is used to configure the In Band Management (IBM) channel to manage the system. Both IBM and the Out of Band Management (OBM) can be used together. The management VLAN ID can be configured based on the user requirement from 1-4090. The IP address for the IBM channel is independent of the OBM port on the IDU. The 2 IP addresses need to be unique.

ipconfig

SYNTAX	*ipconfig* *ipconfig ip [ip_addr] [netmask]* *ipconfig gateway [default_gateway_ip]* *ipconfig remote [remote_unit_ip]* Default: IP=192.168.100.100, NETMASK=255.255.255.0, GATEWAY=192.168.100.100, REMOTE_IP= 0.0.0.0 Configuration Storage: Yes *ipconfig* without any parameter will display the current IP configuration and remote IP address. *ipconfig* is a system-level command.
DESCRIPTION	This command is used to set IP address, subnet mask and default gateway for the management port of the system. The system MAC address can be displayed via this command. The change takes place effect immediately. *Ipconfig ip:* Both IP and netmask parameters must be present. *Ipconfig gateway:* Configure the default gateway IP. Valid for both Inband and Out-of-band port. *ipconfig remote_ip:* ***Remote IP is currently reserved for future use***

license

SYNTAX	*license* *Display license enable status* *license_speed <1-2> < GigaPro-Key-1 or GigaPro-Key-2 >* *license_stm1 < GigaPro-Key-SDH >* *license_system < GigaPro-Key-M2 >* *license_tdm <GigaPro-Key-PDH >* Default: N/A Configuration Storage: No
DESCRIPTION	License key command is used to set the license required for using higher speed (> 100Mbps) on the radio. Speed key 1 enables speed up to 200Mbps and speed key 2 enables Max speed. Please refer to the actual speed/modulation/channel_width combination for valid profiles. The license key is specific to each unit (management port Ethernet MAC address) and is not transferable. The PDH key enables all T1/E1 ports on the IDU. The SDH key enables the STM-1/OC3 capability on the IDU. The M2 key enables the second modem. Only one of each PDH/SDH keys are required since each is applicable to both modems. Please refer to valid speed profiles.

linktest

SYNTAX	*linktest <iteration>* Iteration range from 1-99 seconds Default: default iteration = 1 second Configuration Storage: NO *mse* without any parameter will display the current mse value for both Modem1 and Modem2 *linktest* under “config” and “eng” node will set action on both Modems. *linktest* under “radio1” node will only set action on Modem1.

	linktest under "radio2" node will only set action on Modem2.
DESCRIPTION	Linktest command is used to test the current link status and can be used to monitor the link, based on the specified duration. CLI prompt will not be accessible while linktest is running The linktest shows the following in the output Lock: Radio Lock Status 1: if all modem locks are locked 0: if any lock indicator shows unlocked RSSI: The current RSSI value MSE: The current MSE value BER : The instantaneous BER value (1sec interval) **NOTE:** The output may be misaligned based on the remark setting for Radio1 and Radio2

loglevel

SYNTAX	loglevel [0-2] <0: Setting, 1: Event, 2: Status>Default: N/A Configuration Storage: Yes
DESCRIPTION	loglevel is used to set the appropriate logging for the system. This command is used to set required log levels for system logging. The log level needs to be set for each activity to be monitored. Once the loglevels are set, the logs can be monitored through the *"syslog"* command

loopback

SYNTAX	*loopback* *loopback <off| if |dig | rfl_gen | rf_refl| baseband >* Default: OFF Configuration Storage: Yes

	loopback without any parameter will display the current status of the loopback mode for both radio1 and radio2 *loopback* under "config" and "eng" node will set action on both modems. *loopback* under "radio1" node will only set action on Modem1. *loopback* under "radio2" node will only set action on Modem2.
DESCRIPTION	Activates one of the loopback modes for test purposes. Must be turned off by a command. The CLI is still be active while the mode is on to allow monitoring of various parameters. During IF and digital loopback, the IDU Tx is not muted completely. Therefore, the odupower OFF on the remote end of may be required to eliminate any signal from the far end which may corrupt the result. All loopback modes will affect live traffic

model

SYNTAX	*model* Default: N/A Configuration Storage: No
DESCRIPTION	Display current ODU/IDU model and serial ID. The following information are been displayed: ODU model, IDU model, ODU Serial ID, IF Rev, IF Serial, IDU Model, IDU Serial ID for each radio

mse

SYNTAX	*Mse* *mse <duration>: duration range from 1-99 seconds* Default: default duration = 1 second

	Configuration Storage: NO *mse* without any parameter will display the current mse value for both Modem1 and Modem2 *mse* under "config" and "eng" node will set action on both Modems. *mse* under "radio1" node will only set action on Modem1. *mse* under "radio2" node will only set action on Modem2.
DESCRIPTION	*mse* command is used to monitor the Mean Square Error (MSE) of the link based on the specified duration. CLI prompt will not be accessible while linktest is running.

oduled

SYNTAX	*oduled* *oduled < on| off >* Default: ON Configuration Storage: YES *oduled* without any parameter will display the current status of ODU LED display for both ODU1 and ODU2 *oduled* under "config" and "eng" node will set action on both ODU. *oduled* under "radio1" node will only set action on ODU1. *oduled* under "radio2" node will only set action on ODU2.
DESCRIPTION	Turn ON/OFF ODU led for display RSSI value. Applies only to SP ODUs

odupower

SYNTAX	*odupower* *odupower < on| off >* Default: OFF Configuration Storage: Yes *odupower* without any parameter will display the current status of ODU power for both ODU1 and ODU2 *odupower* under "config" and "eng" node will set action on both ODU. *odupower* under "radio1" node will only set action on ODU1. *odupower* under "radio2" node will only set action on ODU2.

DESCRIPTION	The command is used to Turn ON/OFF odupower. The ODU is powered from the IDU over the IF cable with -48VDC It is recommended to turn off the ODU power during initial installing of the ODU on the tower and other maintenance The response time for ODU power ON will vary depending upon the ODU model. It is longer for HP ODUs

odurxac

SYNTAX	odurxagc <on | off>
DEFAULT VALUE	Off
DESCRIPTION	The command is used to set the odurx gain control loop in the system. This controls the receive level into the IDU from the ODU and keeps the received level within a predefined range. This helps to reduce MSE and maintain better system performance. Applicable only for SP ODU [11,11E,18,18E Model]
EXAMPLE	To turn ON/OFF odurxagc loop *(trango-config)# odurxagc on* *ODU Rx AGC: on* *SUCCESS* To view current odurxagc status: *(trango-config)# odurxagc* *ODU Rx AGC: off*
RELATED	targetrssi, cableloss

opmode

SYNTAX	*opmode* *opmode < on| off >* Default: OFF Configuration Storage: NO *opmode* without any parameter will display the current status of ODU operation mode for both ODU1 and ODU2 *opmode* under "config" and "eng" node will set action on both ODU. *opmode* under "radio1" node will only set action on ODU1. *opmode* under "radio2" node will only set action on ODU2.
DESCRIPTION	Opmode command is used to enable the transmitter on the ODU. Opmode settings are not persistent across reboot. See default_opmode command *freq* and *speed* settings are required to be set to valid value **before** opmode can be turned ON.

passwd

SYNTAX	*Passwd <new_password> <confirm_password>* Default: *N/A. Default config node passwd is trango* Configuration Storage: Yes *passwd* is a system-level command. <new_password> must be at least 4 characters and no more than 10 characters <new_password> and <confirm_password> must be identical for the new password to take effect
DESCRIPTION	Update the current password for entering "config-node". The new pasword takes effect only after a *reboot* command or re-enter the "view-node" from debug prompt with *cli* command.

port

SYNTAX	*port eth <1-6> auto_negotiate <on| off>* *port eth <1-6> duplex <half | full>* *port eth <1-6> enable <on| off>* *port eth <1-6> maxrate <0-1000>* *port eth <1-6> pause <on| off>* *port eth <1-6> priority <0-7>* *port eth <1-6> speed <0-1000>* *port tdm <1-32> cable_config <0-4 >*
DESCRIPTION	This command is used to set Ethernet and TDM port settings. Ethernet: enable/disable, speed, priority, pause frame, duplex and max rate. ***TDM cable config [Reserved for future use]***

power

SYNTAX	*power* *power < 0-30 >* Default: 10 dBm Configuration Storage: Yes *opmode* without any parameter will display the current status of ODU TX transmit power level for both ODU1 and ODU2 *power* under "config" and "eng" node will set action on both ODU. *power* under "radio1" node will only set action on ODU1. *power* under "radio2" node will only set action on ODU2.
DESCRIPTION	Power command is used to set the ODU transmit power level. The maximum level is dependent upon the modulation and ODU model. When the user sets the power to 20 for QAM256, it is internally adjusted to 17 (Max for QAM256).

	The user cannot change power when ATPC is ON.

prompt

SYNTAX	*promt <prompt_str>* Default: CLI Configuration Storage: Yes *prompt* is a system-level command.
DESCRIPTION	Prompt command is used to update the CLI prompt with more descriptive name of the system. Default prompt are <CLI-view>, <CLI-config>, <CLI-radio1>, <CLI-radio2>. User may update to a string that is more meaningful.

reboot

SYNTAX	*reboot* Default: N/A Configuration Storage: No *reboot* is a system-level command.
DESCRIPTION	Reboots entire system including datapath. No configuration changes after the system reboot.

remark

SYNTAX	*remark* *remark radio1 [device_name]* *remark radio2 [device_name]* *remark system [system_remark]* Default: radio1_string=Radio 1, radio2_string=Radio2,

	system_remark=Trango GigPro Configuration Storage: No *remark* is a system-level command.
DESCRIPTION	Remark of the system. Device string is used to display the device name on the top of the row for all the device-level parameters.

reset

SYNTAX	*reset config* *reset ipconfig* *reset license_key* Default: N/A Configuration Storage: No *reset* is a system-level command.
DESCRIPTION	*reset config:* Restore all factory default configuration setting including resetting password for system login, CLI config node, Web interface login. Excluding license key and IP configuration. A reboot of the system is required for the command to take effect. *reset ipconfig:* Reset only the IP configuration to default. *reset license_key:* Remove up to 5 license keys.

rps

SYNTAX	*rps < on | off>*
DEFAULT VALUE	Off

DESCRIPTION	This command is used to configure Rapid Port Shutdown (RPS) functionality. The RPS setting needs to be the same on both side of the link for proper operation. If the RPS is enabled the dataports (GigE) on both side of the link are immediately shutdown in the event of a link loss in order to provide a fast switchover mechanism to the external routers and switches.
RELATED	Sysinfo

rssi

SYNTAX	*rssi <iteration>* Iteration range from 1-99 seconds Default: default iteration = 1 second Configuration Storage: NO *rssi* without any parameter will display the current mse value for both ODU1 and ODU2 *rssi* under "config" and "eng" node will display value for both ODUs. *rssi* under "radio1" node will only set action on ODU1. *rssi* under "radio2" node will only set action on ODU2.
DESCRIPTION	rssi command is used to monitor the received signal level. It is used to monitor the link, based on the specified duration. CLI prompt will not be accessible while rssi command is running. RSSI value will display LO if below –90 and display HI if above -30

sfp

SYNTAX	*sfp* *sfp <0: fiber Ethernet, 1: stm1/OC-3>* Default: fiber GigE(0). Configuration Storage: Yes *sfp* without any parameter will display the current status for the fiber/stm1 switch

	sfp is a system-level command.
DESCRIPTION	This is used to configure the fiber port as GigE or STM-1/OC-3 interface. It is also automatically set with datapath setting, depending upon the profile selected.

snmpd

SYNTAX	snmpd <on | off>
DEFAULT VALUE	ON
DESCRIPTION	Turn on/off snmpd agent on the radio. Must be on to perform any SNMP get/set.
EXAMPLE	To turn snmpd off *(trango-config)# snmpd off* *snmpd: off* *SUCCESS*
RELATED	Ipconfig, snmptrap, trapip

speed

SYNTAX	*speed <bandwidth> <modulation>* <bandwidth>: 4,7,10,14,20,28,30,40,50,56,80 <modulation>: qpsk, qam16, qam32, qam64, qam128, qam256 Default: bandwidth 20, QAM128 Configuration Storage: Yes *speed* without any parameter will display the current speed setting for both Modem1 and Modem2 *speed* under "config" and "eng" node will set action on both Modems. *speed* under "radio1" node will only set action on Modem1. *speed* under "radio2" node will only set action on Modem2.

DESCRIPTION	Load the corresponding the modem binary and configure Tx and Rx bandpass filters. The *speed* command will also configure the modem protection mode based on the *system_mode* configuration. Only when the 1+1 HSB mode is set, the modem may be configured as working or protection mode. Binaries selection for the speed command is based on 5 different configuration: tdm_mode, sfp, acm enable, modulation and bandwidth. **Making changes via the tdm_mode, sfp, or acm enable commands will require a subsequent re-load of the speed setting for proper operation.**

Symrate	Modulation	TX BPF	RX BPF	Speed	Symrate	License key
4	QPSK	18.75	22	10	3.50	None
7	QPSK	18.75	22	10	5.6	None
10	QPSK	18.75	22	15	8.32	None
14	QPSK	18.75	22	22	12.20	None
20	QPSK	30	38	30	17.42	None
28	QPSK	30	38	46	26	None
30	QPSK	50	39	46	26	None
40	QPSK	50	66	64	35.42	None
50	QPSK	75	66	77	43	None
56	QPSK	75	66	88	49.50	None
80	QPSK	75	66	88	49.50	None
4	16QAM	18.75	22	10	3.0	None
7	16QAM	18.75	22	10	5.6	None
10	16QAM	18.75	22	30	8.32	None
14	16QAM	18.75	22	42	12.20	None
20	16QAM	30	38	63	17.42	None
28	16QAM	30	38	94	26	None
30	16QAM	50	39	94	26	None
40	16QAM	50	66	128	35.42	Key-1
50	16QAM	75	66	156	43	Key-1
56	16QAM	75	66	179	49.50	Key-1
80	16QAM	75	66	179	49.50	Key-1
4	32QAM	18.75	22	37	3.0	None
7	32QAM	18.75	22	37	5.6	None
10	32QAM	18.75	22	37	8.32	None
14	32QAM	18.75	22	52	12.20	None

20	32QAM	30	38	79	17.42	None
28	32QAM	30	38	117	26	Key-1
30	32QAM	50	39	117	26	Key-1
40	32QAM	50	66	159	35.42	Key-1
50	32QAM	75	66	195	43	Key-1
56	32QAM	75	66	227	49.50	Key-2
80	32QAM	75	66	227	49.50	Key-2
4	64QAM	18.75	22	45	3.0	None
7	64QAM	18.75	22	45	5.6	None
10	64QAM	18.75	22	45	8.32	None
14	64QAM	18.75	22	64	12.20	None
20	64QAM	30	38	95	17.42	None
28	64QAM	30	38	142	26	Key-1
30	64QAM	50	39	142	26	Key-1
40	64QAM	50	66	194	35.42	Key-1
50	64QAM	75	66	236	43	Key-2
56	64QAM	75	66	272	49.50	Key-2
80	64QAM	75	66	272	49.50	Key-2
4	128QAM	18.75	22	52	3.0	None
7	128QAM	18.75	22	52	5.6	None
10	128QAM	18.75	22	52	8.32	None
14	128QAM	18.75	22	75	12.20	None
20	128QAM	30	38	110	17.42	None
28	128QAM	30	38	165	26	Key-1
30	128QAM	50	39	165	26	Key-1
40	128QAM	50	66	226	35.42	Key-2
50	128QAM	75	66	275	43	Key-2
56	128QAM	75	66	315	49.50	Key-2
80	128QAM	75	66	315	49.50	Key-2
4	256QAM	18.75	22	60	3.0	None
7	256QAM	18.75	22	60	5.6	None
10	256QAM	18.75	22	60	8.32	None
14	256QAM	18.75	22	86	12.20	None
20	256QAM	30	38	126	17.42	Key-1
28	256QAM	30	38	188	26	Key-1
30	256QAM	50	39	188	26	Key-1
40	256QAM	50	66	258	35.42	Key-2
50	256QAM	75	66	314	43	Key-2
56	256QAM	75	66	366	49.50	Key-2
80	256QAM	75	66	375	49.50	Key-2

status

SYNTAX	*status modem* *status pll* *status port* *status stm1* *status tdm1* *status clear* Default: N/A Configuration Storage: No *status* is a system-level command.
DESCRIPTION	*Status modem:* display modem link status. MSE, RSSI, BER, FER *Status pll:* display ODU / IDU pll lock status. *Status port:* display Ethernet counters for each ports, RF counters and port utilizations. *status stm1:* display stm1 counters and error status *status tdm:* display tdm counters and error status *status clear:* clear all Ethernet, RF, STM1, TDM counters and port utilization.

sysconfig

SYNTAX	*sysconfig* *sysconfig [0-5]* Default: Option 0: 1+0 mode Configuration Storage: Yes *sysconfig* without any parameter will display current system mode. *sysconfig* is a system-level command. ***sysconfig* requires an immediate reboot for the action to take**

	effect.
DESCRIPTION	There are five different system configurations in GigaPro: 1. Option 0: 1+ 0 mode. • No system_license required. • No setting or displaying of ODU2 configuration. • No transmitter on Modem2/ODU2. ODU2 is powered OFF automatically. 2. Option 1: 1+1 space diversity. • system_license enable required. • No frequency setting allowed on ODU2. Internally program to the same frequency as ODU1. • Modem1 (ODU1) is configured as working mode and Modem2 (ODU2) is configured as protection mode. No Tx protection switch. • Only working modem is transmitting. 3. Option 2: 1+1 frequency diversity. • system_license enable required. • Frequency settings should be different on ODU1 and ODU2. • Modem1 (ODU1) is configured as working mode and Modem2 (ODU2) is configured as protection mode. No Tx protection switch. • Both modems/ODUs are transmitting. 4. Option 3: 1+1 Hard Standby. • system_license enable required. • No frequency setting allowed on ODU2. Internally program to the same frequency as ODU1. • Modem1 (ODU 1) is configured as the working mode and Modem2 (ODU2) is configured as protection mode. Enable Tx protection switchover mechanism • Only the working modem is transmitting. 5. Option 4: East-west mode. • system_license enable required. • No blocking of any radio settings. • Both ODU1 and ODU2 are transmitting. • Port ge1,ge2 are for ODU1 and ge3.ge4 are for ODU2. Ge5, is for ODU1 and ge6 is for ODU2 • STM1-1 is ODU1 and STM1-2 is ODU2

	• TDM1-16 is ODU1 and TDM17-32 is ODU2 6. Option 5: 2+0 mode. • system_license enable required. • Frequency settings should be different on ODU1 and ODU2. • Two transmitters and 2 receivers active. • All data ports are active. • Ethernet data is transferred over trunk using Link aggregation

sysinfo

SYNTAX	*sysinfo* *sysinfo <0-6>* Default: N/A Configuration Storage: No *sysinfo* without any parameter will display the current IDU and ODU configuration parameters. *sysinfo* takes a parameter for information category: 0=version info, 1=Management, 2=Radio Config, 3= System Config , 4=Ethernet 5=ACM, 6=threshold settings *sysinfo* is a system-level command.
DESCRIPTION	View the current configuration status of IDU, ODU1 and ODU2. To select a subset of the entire system info, add the argument 0 through 6 after the *sysinfo* command

syslog

SYNTAX	*syslog* *syslog [0-2]* *syslog clear* *syslog export*

	Default: 0: SET, 1: EVENT Configuration Storage: Yes *syslog* without any parameter will display all the system log message for up to 3000 lines. *syslog* takes a parameter for log level: 0=SET, 1=EVENT, 2=STAT syslog export, export the syslog to a syslog.txt file which can be tftp by customer. *syslog* is a system-level command.
DESCRIPTION	*syslog:* will display all the system log entries that have been recorded since the boot up. *syslog clear*: Clear all syslog. Only 3000 log entries will be captured and will wrap around when overflows.

targetrssi

SYNTAX	*targetrssi* *targetrssi < -30 - 80 >* Default: -40 Configuration Storage: YES *targetrssi* without any parameter will display the current status of ODU operation mode for both ODU1 and ODU2 *targetrssi* under "config" node will set action on both ODUs. *targetrssi* under "radio1" node will only set action on ODU1. *targetrssi* under "radio2" node will only set action on ODU2.
DESCRIPTION	Configure the target RSSI level that the ATPC and ODU gain control will try to maintain. The number should be 2-3 dB above the expected RSSI based on path calculations.

tdm

SYNTAX	*tdm* Default: N/A Configuration Storage: No
DESCRIPTION	Display TDM port mode and coding For E1: GDB3 For T1: HDB3

telnetd

SYNTAX	*telnetd* *telnetd* <on | off> Default: *telnetd OFF.* Configuration Storage: Yes *telnetd* without any parameter will display the current status for the telnetd daemon *telnetd* is a system-level command.
DESCRIPTION	Linux system command to start the telnetd daemon

temp

SYNTAX	*temp* Default: N/A Configuration Storage: No *temp* without any parameter will display the current IDU and ODU temperatures. *temp* is a system-level command.

	Display of this status is through shared memory.
DESCRIPTION	View the current temperature of IDU, ODU1 and ODU2. The temperature reported is the temperature inside the unit in degrees Celcius

tftpd

SYNTAX	*tftpd* *tftpd* <on | off> Default: *tftpd OFF.* Configuration Storage: Yes *tftpd* without any parameter will display the current status for the tftpd daemon *tftpd* is a system-level command.
DESCRIPTION	Turn on the tftp server. Used to transfer diagnostic file, configuration file and software images during upgrades.

threshold

SYNTAX *threshold*

Default: see the table below. Same for both ODU1 and ODU2

parameters	min	max	Action
RSSI	-85	-20	none
MSE	-45	-15	none
BER	0.00E+0	1.00E-4	none
BER	0.00E+0	1.00E-4	none
IDU temp	-10	55	none
ODU temp	-40	58	none
In port util	0.0	100.0	none
Out port util	0.0	100.0	none

	Configuration Storage: Yes *threshold* without any parameter will display the current status for threshold setting information *threshold* is a device-level command.
DESCRIPTION	*threshold* command is used to set rules for monitoring the system. Whenever the threshold exceeds the programmed values the desired action is set. The utilization rate is expressed as percentage of the current max speed based on the modulation.

trap

SYNTAX	*trap* *trap enable <trap #> <on | off>* *trap ip <trap #> <ip_addr>* Default: see table 6.5 trap # | IP | enable Trap 1 manager | 0.0.0.0 | OFF Trap 2 manager | 0.0.0.0 | OFF Trap 3 manager | 0.0.0.0 | OFF Trap 4 manager | 0.0.0.0 | OFF Trap 5 manager | 0.0.0.0 | OFF Configuration Storage: Yes *trap* without any parameter will display the current status for the snmptrap information *trap* is a system-level command.
DESCRIPTION	*trap* is used to enable and configure traps and the IP address which they will be sent to

uptime

SYNTAX	Uptime
DEFAULT VALUE	N/A
DESCRIPTION	Uptime is used to display how long the system has been running, since the last reboot/power cycle. It shows the current time and uptime.
EXAMPLE	To display current uptime *(trango-config)# uptime* *20:45:58 up 1:49, load average*
RELATED	Date

version

SYNTAX	Version
DEFAULT VALUE	N/A
DESCRIPTION	Version command is used to display the current /previous software images on the radio. The system is capable of have multiple images.
RELATED	bootimage

voltage

SYNTAX	*voltage* Default: N/A Configuration Storage: No

	voltage without any parameter will display the current status for the IDU power voltage at different source *voltage* is a system-level command.
DESCRIPTION	Query the voltage level at different power source on IDU. The following power source are being look at: V1.25: V2.5: V3.3: V5.0: V12.0:

Appendix B - Specifications

Interface Specifications

	Physical Interface	Bit rate	Impedance	Line Code	Standard	Jitter transfer and jitter tolerance requirement Compliance
E1	Electrical	2048 Kb/s +/-50 PPM	120 Ohm, balanced	HDB3	ITU-T G.703	ITU-T G.823
T1 (DS1)	Electrical	1544 Kb/s +/- 10 PPM	100 OHM balanced	AMI or B8ZS	GR-499-CORE, ANSI T1.102-1993	GR-499-CORE, ANSI T1.102-1993, ITU-T G.824
10 Base-T	Electrical	10 Mb/s	100 Ohm, balanced	Manchester 4B/5B	IEEE 802.3	IEEE 802.3
100 Base-T	Electrical	100 Mb/s	100 Ohm, balanced	Manchester 4B/5B	IEEE 802.3	IEEE 802.3
1000 Base-T	Electrical	1 Gb/s	100 Ohm, balanced	Manchester 4B/5B	IEEE 802.3	IEEE 802.3

Appendix C – Cable Pin outs

DB9 Console cable Pin-outs

The console cable is a DB9 female (FigureC-1) on both sides. The pin outs for creating a console cable are listed in Table C-1.

Console Cable Pin outs			
IDU	Signal	Direction	PC
1,6	CD	IN	4
2	RxD	IN	3
3	TxD	OUT	2
4	DTR	OUT	1,6
5	GND		5
7	RTS	OUT	8
	CTS	IN	7

Table C-1: Console cable pin outs

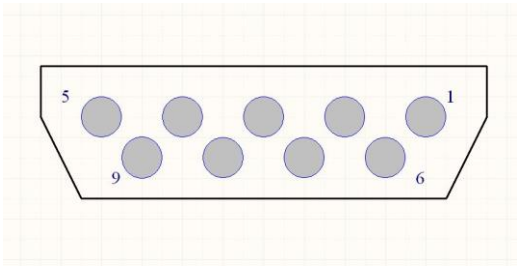


Figure C-1: DB9 pinout

DB9 Alarm Pin-outs

The alarm port on the IDU is a DB9 female connector (Figure C-1). The pin outs of the alarm port are listed in Table C-2.

Pins	Function
1	Relay 1 Com
2	Relay 1 NC
3	Relay 1 NO
4	Input 1, 0-5V input
5	Ground

6	Relay 2 Com
7	Relay 2 NC
8	Relay 2 NO
9	Input 1, 0-5V input

Table C-2: Alarm Pin outs

Industry Standard CAT-5 Pin-outs

Below are pictures depicting the cable pin-outs for straight-through and cross-over cables. The images below conform to EIA/TIA industry standard for 568 A and B. IF the first and second pin are orange, the cable is 568B. If the first and second pins are green, the cable is 568A (Figure C-2). If one end of the cable is A and the other end is B then you now have a cross-over.

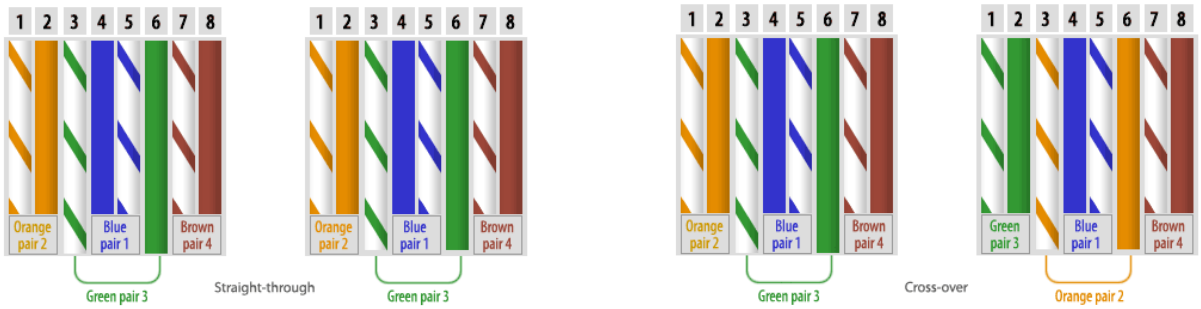


Figure C-2: EIA/TIA 568 A & B pin outs.

Grounding Detail

Grounding of the IF cable should be at 75 ft intervals starting at the point of entry to the equipment enclosure room or base of the tower structure. Trango Systems recommends the use of Trango part number LP-GND-1 (single LMR400 cable) or LP-GND (up to 9 LMR 400 cables). Please note that the use of Times Microwave ST-BC1 and ST-BC2 cable prep tools are recommended for these grounding kits. The same cable preparations can be made using a utility knife and/or a straight razor.

In addition to the cable prep tools Trango Systems recommends the use of Times Microwave WK-TBC for weatherproofing the ground points.

Further detailed instructions can be obtained from Trango Systems Technical support or your Trango Systems Sales Representative.

Appendix D – MIB

The MIB appendix is broken down into the following sections: System, Modem, RF, GigE, T1, and Traps.

System OID's

Object ID	Name	Type	Access	Range Limit	Default Value
.1.3.6.1.2.1.1.1.0	sysDescr	DisplayString	RO	N/A	GigaPro-1.0
.1.3.6.1.2.1.1.2.0	sysObjectID	OID	RO	N/A	.1.3.6.1.4.1.5454.1.70
.1.3.6.1.2.1.1.3.0	sysUpTime	TimeTicks	RO	N/A	N/A
.1.3.6.1.2.1.1.4.0	sysContact	DisplayString	RO	N/A	Tech Support
.1.3.6.1.2.1.1.5.0	sysName	DisplayString	RO	N/A	Administrator
.1.3.6.1.2.1.1.6.0	sysLocation	DisplayString	RO	N/A	USA
.1.3.6.1.4.1.5454.1.70.1.1.1	sysFPGA1Ver	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.2	sysFPGA2Ver	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.3	sysOSVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.4	sysFWVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.5	sysPICVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.6	sysModemVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.7	sysODU1FWVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.8	sysODU2FWVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.9	sysIF1RevVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.1.10	sysIF2RevVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.1	sysFPGA1PreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.2	sysFPGA2PreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.3	sysOSPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.4	sysFWPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.5	sysPICPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.6	sysModemPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.7	sysODU1FWPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.2.8	sysODU2FWPreVer	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.1	sysIDUModel	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.2	sysIDUSerialID	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.3	sysODU1Model	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.4	sysODU2Model	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.5	sysODU1SerialID	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.6	sysODU2SerialID	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.7	sysIF1SerialID	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.3.8	sysIF2SerialID	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.4.1	sysMACFPGA	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.4.2	sysMACeth1	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.4.3	sysMACeth2	DisplayString	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.5.1	sysIpAddress	IpAddr	RW	string size 16 (A.B.C.D)	192.168.100.100
.1.3.6.1.4.1.5454.1.70.1.5.2	sysSubnetMask	IpAddr	RW	string size 16 (A.B.C.D)	255.255.255.0
.1.3.6.1.4.1.5454.1.70.1.5.3	sysDefaultGateway	IpAddr	RW	string size 16 (A.B.C.D)	192.168.100.100
.1.3.6.1.4.1.5454.1.70.1.5.4	sysRemoteIp	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0

.1.3.6.1.4.1.5454.1.70.1.6.1	sysRemarkSystem	DisplayString	RW	string size 1..100	TrangoLink GigaPro
.1.3.6.1.4.1.5454.1.70.1.6.2	sysRemarkRadio1	DisplayString	RW	string size 1..15	Radio 1
.1.3.6.1.4.1.5454.1.70.1.6.3	sysRemarkRadio2	DisplayString	RW	string size 1..15	Radio 2
.1.3.6.1.4.1.5454.1.70.1.7.1	sysIBMEnable	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.7.2	sysIBMIp	IpAddr	RW	string size 16 (A.B.C.D)	172.168.1.1
.1.3.6.1.4.1.5454.1.70.1.7.3	sysIBMNetmask	IpAddr	RW	string size 16 (A.B.C.D)	255.255.0.0
.1.3.6.1.4.1.5454.1.70.1.7.4	sysIBMVlanID	Integer	RW	0-4090	1
.1.3.6.1.4.1.5454.1.70.1.8.1	sysSNMPReadCommStr	DisplayString	RW	string size 1-32	public
.1.3.6.1.4.1.5454.1.70.1.8.2	sysSNMPWriteCommStr	DisplayString	RW	string size 1-32	private
.1.3.6.1.4.1.5454.1.70.1.8.3	sysSNMPTrapCommStr	DisplayString	RW	string size 1-32	trapstr
.1.3.6.1.4.1.5454.1.70.1.9.1.1	sysSNMPTrap1Enable	Integer	RW	0(Off), 1(On)	0(OFF)
.1.3.6.1.4.1.5454.1.70.1.9.1.2	sysSNMPTrap1Ip	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0
.1.3.6.1.4.1.5454.1.70.1.9.2.1	sysSNMPTrap2Enable	Integer	RW	0(Off), 1(On)	0(OFF)
.1.3.6.1.4.1.5454.1.70.1.9.2.2	sysSNMPTrap2Ip	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0
.1.3.6.1.4.1.5454.1.70.1.9.3.1	sysSNMPTrap3Enable	Integer	RW	0(Off), 1(On)	0(OFF)
.1.3.6.1.4.1.5454.1.70.1.9.3.2	sysSNMPTrap3Ip	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0
.1.3.6.1.4.1.5454.1.70.1.9.4.1	sysSNMPTrap4Enable	Integer	RW	0(Off), 1(On)	0(OFF)
.1.3.6.1.4.1.5454.1.70.1.9.4.2	sysSNMPTrap4Ip	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0
.1.3.6.1.4.1.5454.1.70.1.9.5.1	sysSNMPTrap5Enable	Integer	RW	0(Off), 1(On)	0(OFF)
.1.3.6.1.4.1.5454.1.70.1.9.5.2	sysSNMPTrap5Ip	IpAddr	RW	string size 16 (A.B.C.D)	0.0.0.0
.1.3.6.1.4.1.5454.1.70.1.10.1	sysImageUpgrade	Integer	RW	1(IDU), 2(ODU1), 3(ODU2)	0 (NA)
.1.3.6.1.4.1.5454.1.70.1.10.2	sysImageUpgradeStatus	Integer	RO	0(NA), 1(Failed)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.10.3	sysImageToggle	Integer	RW	1(Toggle)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.11	sysConfigOption	Integer	RW	1(Export), 2(Import), 3(Remove), 4(Save)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.12.1	sysDiagnostic	Integer	RW	1(Export)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.12.2	sysDiagnosticStatus	Integer	RO	0(NA), 1(Failed)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.13.1	sysSyslogExport	Integer	RW	1(Export), 2(Clear)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.13.2	sysSyslogLevel	Integer	RW		3
.1.3.6.1.4.1.5454.1.70.1.14	sysReboot	Integer	RW	1(REBOOT)	0 (NA)
.1.3.6.1.4.1.5454.1.70.1.15	sysResetOption	Integer	RW		0 (NA)
.1.3.6.1.4.1.5454.1.70.1.16	sysSystemConfig	Integer	RW		
.1.3.6.1.4.1.5454.1.70.1.17	sysDatapath				
.1.3.6.1.4.1.5454.1.70.1.18.1	sysAlarm1	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.18.2	sysAlarm2	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.19	sysFanCtrl	Integer	RW	0(FanOff), 1(Fan1On), 2 (Fan2On)	1(Fan1On)
.1.3.6.1.4.1.5454.1.70.1.20	sysIDUTemp	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.21.1	sysReserved	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.21.2	sysHTTPD	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.1.21.3	sysSNMPD	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.1.21.4	sysTFTPD	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.21.5	sysTelnetD	Integer	RW	0(Off), 1(On)	1(On)

.1.3.6.1.4.1.5454.1.70.1.22	sysRPSEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.23	sysSmartMode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.1.24	sysClearCounter	Integer	RW	1(Clear)	0(NA)
.1.3.6.1.4.1.5454.1.70.1.25.1	sysTdmMode	Integer	RO	0(T1), 1(E1)	0(T1)
.1.3.6.1.4.1.5454.1.70.1.25.2	sysTdmCoding	Integer	RO	0(AMI), 1(B8ZS), 2(HDB3)	0(AMI)
.1.3.6.1.4.1.5454.1.70.1.26.1.1	sysSystemLicenseEnable	Integer	RO	0(Disable), 1(Enable)	0(Disable)
.1.3.6.1.4.1.5454.1.70.1.26.1.2	sysSystemLicenseKey	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.2.1	sysSpeedLicenseEnable	Integer	RO	0(Disable), 1(Enable)	0(Disable)
.1.3.6.1.4.1.5454.1.70.1.26.2.2	sysSpeedLicenseKey1	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.2.3	sysSpeedLicenseKey2	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.2,4	sysSpeedLicenseKey3	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.2.5	sysSpeedLicenseKey4	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.2.6	sysSpeedLicenseKey5	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.3.1	sysSTM1LicenseEnable	Integer	RO	0(Disable), 1(Enable)	0(Disable)
.1.3.6.1.4.1.5454.1.70.1.26.3.2	sysSTM1LicenseKey	String	RW	N/A	N/A
.1.3.6.1.4.1.5454.1.70.1.26.4.1	sysTDMLicenseEnable	Integer	RO	0(Disable), 1(Enable)	0(Disable)
.1.3.6.1.4.1.5454.1.70.1.26.4.2	sysTDMLicenseKey	String	RW	N/A	N/A

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.2.1.1	modem1LoopbackMode	Integer	RW	0(Off), 1(Digital), 2(IF), 3(Rf_gen), 4(Rf_refl)	0(Off)
.1.3.6.1.4.1.5454.1.70.2.1.2	modem1DataPattern	Integer	RW	0(FPGA), 1(Modem)	0(FPGA)
.1.3.6.1.4.1.5454.1.70.2.1.3.1	modem1ProtectionModeTX	Integer	RW	0(none), 1(working), 2(protection)	1(working)
.1.3.6.1.4.1.5454.1.70.2.1.3.2	modem1ProtectionModeRX	Integer	RO	0(none), 1(working), 2(protection)	1(working)
.1.3.6.1.4.1.5454.1.70.2.1.4.1	modem1ACMEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.1	modem1ACMProfileQPSKEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.2	modem1ACMProfile16QEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.3	modem1ACMProfile32QEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.4	modem1ACMProfile64QEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.5	modem1ACMProfile128QEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.2.6	modem1ACMProfile256QEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.1.4.3.1	modem1ACMQPSKMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-20.3
.1.3.6.1.4.1.5454.1.70.2.1.4.3.2	modem1ACM16QMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-25.3
.1.3.6.1.4.1.5454.1.70.2.1.4.3.3	modem1ACM32QMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-26.3
.1.3.6.1.4.1.5454.1.70.2.1.4.3.4	modem1ACM64QMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-29.2
.1.3.6.1.4.1.5454.1.70.2.1.4.3.5	modem1ACM128QMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-32.1
.1.3.6.1.4.1.5454.1.70.2.1.4.3.6	modem1ACM256QMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-32.1
.1.3.6.1.4.1.5454.1.70.2.1.4.4.1	modem1ACMQPSKMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-17.1
.1.3.6.1.4.1.5454.1.70.2.1.4.4.2	modem1ACM16QMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-18.5
.1.3.6.1.4.1.5454.1.70.2.1.4.4.3	modem1ACM32QMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-21.3

.1.3.6.1.4.1.5454.1.70.2.1.4.4.4	modem1ACM64QMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-24.3
.1.3.6.1.4.1.5454.1.70.2.1.4.4.5	modem1ACM128QMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-27.2
.1.3.6.1.4.1.5454.1.70.2.1.4.4.6	modem1ACM256QMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-27.2
.1.3.6.1.4.1.5454.1.70.2.1.5.1	modem1BER	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.1.5.2	modem1MSE	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.1.5.3	modem1FER	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.1.6.1	modem1LockStatus	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.1.6.2	modem1TimingLock	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.1.6.3	modem1PreambleLock	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.1.6.4	modem1LDPCLock	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.2.1	modem2LoopbackMode	Integer	RW	0(Off), 1(Digital), 2(IF), 3(Rf_gen), 4(Rf_refl)	0(Off)
.1.3.6.1.4.1.5454.1.70.2.2.2	modem2DataPattern	Integer	RW	0(FPGA), 1(Modem)	0(FPGA)
.1.3.6.1.4.1.5454.1.70.2.2.3.1	modem2ProtectionModeTX	Integer	RW	0(none), 1(working), 2(protection)	1(protection)
.1.3.6.1.4.1.5454.1.70.2.2.3.2	modem2ProtectionModeRX	Integer	RO	0(none), 1(working), 2(protection)	1(working)
.1.3.6.1.4.1.5454.1.70.2.2.4.1	modem2ACMEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.1	modem2ACMProfileQPSKEnable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.2	modem2ACMProfileQAM16Enable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.3	modem2ACMProfileQAM32Enable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.4	modem2ACMProfileQAM64Enable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.5	modem2ACMProfileQAM128Enable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.2.6	modem2ACMProfileQAM256Enable	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.2.2.4.3.1	modem2ACMQPSKMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-20.3
.1.3.6.1.4.1.5454.1.70.2.2.4.3.2	modem2ACM16QAMMSEImprove	Opaque(Float)	RW	(-45) ~ 0	-25.3
.1.3.6.1.4.1.5454.1.70.2.2.4.3.3	modem2ACMQAM32MSEImprove	Opaque(Float)	RW	(-45) ~ 0	-26.3
.1.3.6.1.4.1.5454.1.70.2.2.4.3.4	modem2ACMQAM64MSEImprove	Opaque(Float)	RW	(-45) ~ 0	-29.2
.1.3.6.1.4.1.5454.1.70.2.2.4.3.4	modem2ACMQAM128MSEImprove	Opaque(Float)	RW	(-45) ~ 0	-32.1
.1.3.6.1.4.1.5454.1.70.2.2.4.3.6	modem2ACMQAM256MSEImprove	Opaque(Float)	RW	(-45) ~ 0	-32.1
.1.3.6.1.4.1.5454.1.70.2.2.4.3.1	modem2ACMQPSKMSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-17.1
.1.3.6.1.4.1.5454.1.70.2.2.4.3.2	modem2ACMQAM16MSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-18.5
.1.3.6.1.4.1.5454.1.70.2.2.4.3.3	modem2ACMQAM42MSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-21.3
.1.3.6.1.4.1.5454.1.70.2.2.4.3.4	modem2ACMQAM64MSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-24.3
.1.3.6.1.4.1.5454.1.70.2.2.4.3.5	modem2ACMQAM128MSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-27.2
.1.3.6.1.4.1.5454.1.70.2.2.4.3.6	modem2ACMQAM256MSEDegrade	Opaque(Float)	RW	(-45) ~ 0	-27.2
.1.3.6.1.4.1.5454.1.70.2.2.5.1	modem2BER	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.2.5.2	modem2MSE	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.2.5.3	modem2FER	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.2.2.6.1	modem2LockStatus	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.2.6.2	modem2TimingLock	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.2.6.3	modem2PreambleLock	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.2.2.6.4	modem2LDPCLock	Integer	RO	0(No Lock), 1(Lock)	N/A

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.3.1.1.1	rf1TxFrequency	Opaque(Float)	RW	ODU model dependant	17920
.1.3.6.1.4.1.5454.1.70.3.1.1.2	rf1RxFrequency	Opaque(Float)	RO	ODU model dependant	19480
.1.3.6.1.4.1.5454.1.70.3.1.2	rf1DefaultOpmode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.3	rf1Opmode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.4	rf1Power	Integer	RW	0-25	10
.1.3.6.1.4.1.5454.1.70.3.1.5.1	rf1Cableloss140	Opaque(Float)	RW	0-20	0
.1.3.6.1.4.1.5454.1.70.3.1.5.2	rf1Cableloss350	Opaque(Float)	RW	0-30	0
.1.3.6.1.4.1.5454.1.70.3.1.5.3	rf1Cableloss915	Opaque(Float)	RW	0-50	0
.1.3.6.1.4.1.5454.1.70.3.1.6.1	rf1ChannelsWidth	Integer	RW	3-100	20
.1.3.6.1.4.1.5454.1.70.3.1.6.2	rf1Modulation	Integer	RW	0(QPSK), 1(16Q),2(32Q),3(64Q),4(128Q), 5(256Q)	QAM128
.1.3.6.1.4.1.5454.1.70.3.1.6.4	rf1Symrate	Opaque(Float)	RO	N/A	24.6
.1.3.6.1.4.1.5454.1.70.3.1.6.5	rf1Speed	Opaque(Float)	RO	N/A	110
.1.3.6.1.4.1.5454.1.70.3.1.7.1	rf1ATPCEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.7.2	rf1ATPCMaxPower	Integer	RW	ODU model dependant	ODU model dependant
.1.3.6.1.4.1.5454.1.70.3.1.7.3	rf1ATPCStepSize	Integer	RW	0-5	1
.1.3.6.1.4.1.5454.1.70.3.1.8	rf1AlignmentMode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.9	rf1TargetRSSI	Opaque(Float)	RW	(-88) ~ (-25)	-40
.1.3.6.1.4.1.5454.1.70.3.1.10	rf1ODULEDEnable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.3.1.11	rf1ODUPowerEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.12	rf1ODURxAGCEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.1.13	rf1ODUTemp	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.14	rf1RSSI	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.15.1	rf1ODURFpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.1.15.2	rf1ODUIFpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.1.15.3	rf1IDUTxpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.1.15.4	rf1IDURxpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.1.16.1	rf1InDataOctets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.16.2	rf1InDataPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.16.3	rf1InDropPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.16.4	rf1InPortRate	Counter32	RO	N/A	
.1.3.6.1.4.1.5454.1.70.3.1.16.5	rf1InPortUtil	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.17.1	rf1OutDataOctets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.17.2	rf1OutDataPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.1.17.3	rf1OutPortRate	Counter32	RO	N/A	
.1.3.6.1.4.1.5454.1.70.3.1.17.4	rf1OutPortUtil	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.1.1	rf2TxFrequency	Opaque(Float)	RW	ODU model dependant	17920
.1.3.6.1.4.1.5454.1.70.3.2.1.2	rf2RxFrequency	Opaque(Float)	RO	ODU model dependant	19480
.1.3.6.1.4.1.5454.1.70.3.2.2	rf2DefaultOpmode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.3	rf2Opmode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.4	rf2Power	Opaque(Float)	RW	0-25	10

.1.3.6.1.4.1.5454.1.70.3.2.5.1	rf2Cableloss140	Opaque(Float)	RW	0-20	0
.1.3.6.1.4.1.5454.1.70.3.2.5.2	rf2Cableloss350	Opaque(Float)	RW	0-30	0
.1.3.6.1.4.1.5454.1.70.3.2.5.3	rf2Cableloss915	Opaque(Float)	RW	0-50	0
.1.3.6.1.4.1.5454.1.70.3.2.6.1	rf2ChannelsWidth	Integer	RW	3-100	20
.1.3.6.1.4.1.5454.1.70.3.2.6.2	rf2Modulation	Integer	RW	0(QPSK), 1(16Q),2(32Q),3(64Q),4(128Q), 5(256Q)	QAM128
.1.3.6.1.4.1.5454.1.70.3.2.6.3	rf2Symrate	Opaque(Float)	RO	N/A	24.6
.1.3.6.1.4.1.5454.1.70.3.2.6.4	rf2Speed	Opaque(Float)	RO	N/A	110
.1.3.6.1.4.1.5454.1.70.3.2.7.1	rf2ATPCEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.7.2	rf2ATPCMaxPower	Integer	RW	ODU model dependant	ODU model dependant
.1.3.6.1.4.1.5454.1.70.3.2.7.3	rf2ATPCStepSize	Integer	RW	0-5	1
.1.3.6.1.4.1.5454.1.70.3.2.8	rf1AlignmentMode	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.9	rf2TargetRSSI	Opaque(Float)	RW	(-88) ~ (-25)	-40
.1.3.6.1.4.1.5454.1.70.3.2.10	rf2ODULEDEnable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.3.2.11	rf2ODUPowerEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.12	rf2ODURxAGCEnable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.3.2.13	rf2ODUTemp	Integer	RO		
.1.3.6.1.4.1.5454.1.70.3.2.14	rf2RSSI	Opaque(Float)	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.15.1	rf2ODURFpll	Integer	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.15.2	rf2ODUIFpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.2.15.3	rf2IDUTxpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.2.15.4	rf2IDURxpll	Integer	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.2.16.1	rf2InDataOctet	Counter32	RO	0(No Lock), 1(Lock)	N/A
.1.3.6.1.4.1.5454.1.70.3.2.16.2	rf2InDataPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.16.3	rf2InDropPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.16.4	rf2InPortRate	Counter32	RO	N/A	
.1.3.6.1.4.1.5454.1.70.3.2.16.5	rf2InPortUtil	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.17.1	rf2OutDataPackets	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.17.2	rf2OutDataOctet	Counter32	RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.3.2.17.3	rf2OutPortRate	Counter32	RO	N/A	
.1.3.6.1.4.1.5454.1.70.3.2.17.4	rf2OutPortUtil	Counter32	RO	N/A	N/A
				N/A	N/A

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.4.1.1.1	gigeEth1AutoNegotiate	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.1.1.2	gigeEth1Duplex	Integer	RW	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.1.1.3	gigeEth1Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.1.1.4	gigeEth1MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.1.1.5	gigeEth1PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.1.1.6	gigeEth1Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.1.1.7	gigeEth1Speed	Integer	RW	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.1.1.8	gigeEth1Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.1.2.1	gigeEth1InOctets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.2	gigeEth1InUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.3	gigeEth1InNUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.4	gigeEth1InTotalPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.5	gigeEth1OutOctets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.6	gigeEth1OutUcastPackets	Counter32	RO	0-4294967296	

.1.3.6.1.4.1.5454.1.70.4.1.2.7	gigeEth1OutNUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.8	gigeEth1OutTotalPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.9	gigeEth1CRCErrors	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.1.2.10	gigeEth1CollisionErrors	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.1.1	gigeEth2AutoNegotiate	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.2.1.2	gigeEth2Duplex	Integer	RW	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.2.1.3	gigeEth2Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.2.1.4	gigeEth2MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.2.1.5	gigeEth2PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.2.1.6	gigeEth2Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.2.1.7	gigeEth2Speed	Integer	RW	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.2.1.8	gigeEth2Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.2.2.1	gigeEth2InOctets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.2	gigeEth2InUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.3	gigeEth2InNUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.4	gigeEth2InTotalPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.5	gigeEth2OutOctets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.6	gigeEth2OutUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.7	gigeEth2OutNUcastPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.8	gigeEth2OutTotalPackets	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.9	gigeEth2CRCErrors	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.2.2.10	gigeEth2CollisionErrors	Counter32	RO	0-4294967296	
.1.3.6.1.4.1.5454.1.70.4.3.1.1	gigeEth3AutoNegotiate	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.3.1.2	gigeEth3Duplex	Integer	RW	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.3.1.3	gigeEth3Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.3.1.4	gigeEth3MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.3.1.5	gigeEth3PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.3.1.6	gigeEth3Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.3.1.7	gigeEth3Speed	Integer	RW	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.3.1.8	gigeEth3Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.1	gigeEth3InOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.2	gigeEth3InUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.3	gigeEth3InNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.4	gigeEth3InTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.5	gigeEth3OutOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.6	gigeEth3OutUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.7	gigeEth3OutNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.8	gigeEth3OutTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.9	gigeEth3CRCErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.3.2.10	gigeEth3CollisionErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.1.1	gigeEth4AutoNegotiate	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.4.1.2	gigeEth4Duplex	Integer	RW	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.4.1.3	gigeEth4Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.4.1.4	gigeEth4MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.4.1.5	gigeEth4PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.4.1.6	gigeEth4Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.4.1.7	gigeEth4Speed	Integer	RW	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.4.1.8	gigeEth4Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.1	gigeEth4InOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.2	gigeEth4InUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.3	gigeEth4InNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.4	gigeEth4InTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.5	gigeEth4OutOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.6	gigeEth4OutUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.7	gigeEth4OutNUcastPackets	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.4.4.2.8	gigeEth4OutTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.9	gigeEth4CRCErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.4.2.10	gigeEth4CollisionErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.1.1	gigeEth5AutoNegotiate	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.5.1.2	gigeEth5Duplex	Integer	RO	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.5.1.3	gigeEth5Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.5.1.4	gigeEth5MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.5.1.5	gigeEth5PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.5.1.6	gigeEth5Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.5.1.7	gigeEth5Speed	Integer	RO	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.5.1.8	gigeEth5Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.1	gigeEth5InOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.2	gigeEth5InUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.3	gigeEth5InNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.4	gigeEth5InTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.5	gigeEth5OutOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.6	gigeEth5OutUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.7	gigeEth5OutNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.8	gigeEth5OutTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.9	gigeEth5CRCErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.5.2.10	gigeEth5CollisionErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.1.1	gigeEth6AutoNegotiate	Integer	RO	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.6.1.2	gigeEth6Duplex	Integer	RO	0(Half), 1(Full)	1(Full)
.1.3.6.1.4.1.5454.1.70.4.6.1.3	gigeEth6Enable	Integer	RW	0(Off), 1(On)	1(On)
.1.3.6.1.4.1.5454.1.70.4.6.1.4	gigeEth6MaxRate	Integer	RW	0-1000	1000
.1.3.6.1.4.1.5454.1.70.4.6.1.5	gigeEth6PauseFrame	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.4.6.1.6	gigeEth6Priority	Integer	RW	0-7	0
.1.3.6.1.4.1.5454.1.70.4.6.1.7	gigeEth6Speed	Integer	RO	0, 100, 1000	1000
.1.3.6.1.4.1.5454.1.70.4.6.1.8	gigeEth6Status	Integer	RO	0(Off), 1(On)	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.1	gigeEth6InOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.2	gigeEth6InUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.3	gigeEth6InNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.4	gigeEth6InTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.5	gigeEth6OutOctets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.6	gigeEth6OutUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.7	gigeEth6OutNUcastPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.8	gigeEth6OutTotalPackets	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.9	gigeEth6CRCErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.6.2.10	gigeEth6CollisionErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.4.7.1	gigeEthPriority0COSQueue	Integer	RW	0-3	0
.1.3.6.1.4.1.5454.1.70.4.7.2	gigeEthPriority1COSQueue	Integer	RW	0-3	0
.1.3.6.1.4.1.5454.1.70.4.7.3	gigeEthPriority2COSQueue	Integer	RW	0-3	1
.1.3.6.1.4.1.5454.1.70.4.7.4	gigeEthPriority3COSQueue	Integer	RW	0-3	1
.1.3.6.1.4.1.5454.1.70.4.7.5	gigeEthPriority4COSQueue	Integer	RW	0-3	2
.1.3.6.1.4.1.5454.1.70.4.7.6	gigeEthPriority5COSQueue	Integer	RW	0-3	2
.1.3.6.1.4.1.5454.1.70.4.7.7	gigeEthPriority6COSQueue	Integer	RW	0-3	3
.1.3.6.1.4.1.5454.1.70.4.7.8	gigeEthPriority7COSQueue	Integer	RW	0-3	3

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.5.1.1.1	stm1Port1Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.5.1.1.2	stm1Port1Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.5.1.2.1	stm1Port1CounterB1	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.2.2	stm1Port1CounterB2	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.5.1.2.3	stm1Port1CounterREI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.1	stm1Port1AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.2	stm1Port1AlarmOOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.3	stm1Port1AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.4	stm1Port1AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.5	stm1Port1AlarmRDI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.6	stm1Port1AlarmTIM	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.1.3.7	stm1Port1AlarmREI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.1.1	stm1Port2Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.5.2.1.2	stm1Port2Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.5.2.2.1	stm1Port2CounterB1	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.2.2	stm1Port2CounterB2	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.2.3	stm1Port2CounterREI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.1	stm1Port2AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.2	stm1Port2AlarmOOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.3	stm1Port2AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.4	stm1Port2AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.5	stm1Port2AlarmRDI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.6	stm1Port2AlarmTIM	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.5.2.3.7	stm1Port2AlarmREI	Counter32	RO	0-4294967296	N/A

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.6.1.1.1	tdmPort1Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.1.1.2	tdmPort1CableConfig	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.1.1.3	tdmPort1Status	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.1.2.1	tdmPort1CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.2.2	tdmPort1CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.2.3	tdmPort1CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.2.4	tdmPort1CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.2.5	tdmPort1CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.1	tdmPort1AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.2	tdmPort1AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.3	tdmPort1AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.4	tdmPort1AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.5	tdmPort1AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.6	tdmPort1AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.7	tdmPort1AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.1.3.8	tdmPort1AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.1.1	tdmPort2Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.2.1.2	tdmPort2Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.2.1.3	tdmPort2CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.2.2.1	tdmPort2CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.2.2	tdmPort2CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.2.3	tdmPort2CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.2.4	tdmPort2CounterFEBErrors	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.2.2.5	tdmPort2CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.1	tdmPort2AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.2	tdmPort2AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.3	tdmPort2AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.4	tdmPort2AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.5	tdmPort2AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.6	tdmPort2AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.7	tdmPort2AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.2.3.8	tdmPort2AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.1.1	tdmPort3Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.3.1.2	tdmPort3Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.3.1.3	tdmPort3CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.3.2.1	tdmPort3CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.2.2	tdmPort3CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.2.3	tdmPort3CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.2.4	tdmPort3CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.2.5	tdmPort3CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.1	tdmPort3AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.2	tdmPort3AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.3	tdmPort3AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.4	tdmPort3AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.5	tdmPort3AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.6	tdmPort3AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.7	tdmPort3AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.3.3.8	tdmPort3AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.1.1	tdmPort4Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.4.1.2	tdmPort4Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.4.1.3	tdmPort4CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.4.2.1	tdmPort4CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.2.2	tdmPort4CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.2.3	tdmPort4CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.2.4	tdmPort4CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.2.5	tdmPort4CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.1	tdmPort4AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.2	tdmPort4AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.3	tdmPort4AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.4	tdmPort4AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.5	tdmPort4AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.6	tdmPort4AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.7	tdmPort4AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.4.3.8	tdmPort4AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.1.1	tdmPort5Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.5.1.2	tdmPort5Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.5.1.3	tdmPort5CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.5.2.1	tdmPort5CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.2.2	tdmPort5CounterExCrcErrors	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.5.2.3	tdmPort5CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.2.4	tdmPort5CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.2.5	tdmPort5CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.1	tdmPort5AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.2	tdmPort5AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.3	tdmPort5AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.4	tdmPort5AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.5	tdmPort5AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.6	tdmPort5AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.7	tdmPort5AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.5.3.8	tdmPort5AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.1.1	tdmPort6Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.6.1.2	tdmPort6Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.6.1.3	tdmPort6CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.6.2.1	tdmPort6CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.2.2	tdmPort6CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.2.3	tdmPort6CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.2.4	tdmPort6CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.2.5	tdmPort6CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.1	tdmPort6AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.2	tdmPort6AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.3	tdmPort6AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.4	tdmPort6AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.5	tdmPort6AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.6	tdmPort6AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.7	tdmPort6AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.6.3.8	tdmPort6AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.1.1	tdmPort7Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.7.1.2	tdmPort7Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.7.1.3	tdmPort7CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.7.2.1	tdmPort7CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.2.2	tdmPort7CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.2.3	tdmPort7CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.2.4	tdmPort7CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.2.5	tdmPort7CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.1	tdmPort7AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.2	tdmPort7AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.3	tdmPort7AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.4	tdmPort7AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.5	tdmPort7AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.6	tdmPort7AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.7	tdmPort7AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.7.3.8	tdmPort7AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.1.1	tdmPort8Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.8.1.2	tdmPort8Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.8.1.3	tdmPort8CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)

.1.3.6.1.4.1.5454.1.70.6.8.2.1	tdmPort8CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.2.2	tdmPort8CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.2.3	tdmPort8CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.2.4	tdmPort8CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.2.5	tdmPort8CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.1	tdmPort8AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.2	tdmPort8AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.3	tdmPort8AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.4	tdmPort8AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.5	tdmPort8AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.6	tdmPort8AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.7	tdmPort8AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.8.3.8	tdmPort8AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.1.1	tdmPort9Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.9.1.2	tdmPort9Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.9.1.3	tdmPort9CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.9.2.1	tdmPort9CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.2.2	tdmPort9CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.2.3	tdmPort9CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.2.4	tdmPort9CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.2.5	tdmPort9CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.1	tdmPort9AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.2	tdmPort9AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.3	tdmPort9AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.4	tdmPort9AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.5	tdmPort9AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.6	tdmPort9AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.7	tdmPort9AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.9.3.8	tdmPort9AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.1.1	tdmPort10Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.10.1.2	tdmPort10Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.10.1.3	tdmPort10CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.10.2.1	tdmPort10CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.2.2	tdmPort10CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.2.3	tdmPort10CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.2.4	tdmPort10CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.2.5	tdmPort10CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.1	tdmPort10AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.2	tdmPort10AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.3	tdmPort10AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.4	tdmPort10AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.5	tdmPort10AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.6	tdmPort10AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.7	tdmPort10AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.10.3.8	tdmPort10AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.1.1	tdmPort11Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.11.1.2	tdmPort11Status	Integer	RO	0(Off), 1(On)	0(Off)

.1.3.6.1.4.1.5454.1.70.6.11.1.3	tdmPort11CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.11.2.1	tdmPort11CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.2.2	tdmPort11CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.2.3	tdmPort11CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.2.4	tdmPort11CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.2.5	tdmPort11CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.1	tdmPort11AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.2	tdmPort11AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.3	tdmPort11AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.4	tdmPort11AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.5	tdmPort11AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.6	tdmPort11AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.7	tdmPort11AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.11.3.8	tdmPort11AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.1.1	tdmPort12Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.12.1.2	tdmPort12Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.12.1.3	tdmPort12CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.12.2.1	tdmPort12CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.2.2	tdmPort12CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.2.3	tdmPort12CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.2.4	tdmPort12CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.2.5	tdmPort12CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.1	tdmPort12AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.2	tdmPort12AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.3	tdmPort12AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.4	tdmPort12AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.5	tdmPort12AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.6	tdmPort12AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.7	tdmPort12AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.12.3.8	tdmPort12AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.1.1	tdmPort13Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.13.1.2	tdmPort13Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.13.1.3	tdmPort13CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.13.2.1	tdmPort13CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.2.2	tdmPort13CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.2.3	tdmPort13CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.2.4	tdmPort13CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.2.5	tdmPort13CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.1	tdmPort13AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.2	tdmPort13AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.3	tdmPort13AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.4	tdmPort13AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.5	tdmPort13AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.6	tdmPort13AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.7	tdmPort13AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.13.3.8	tdmPort13AlarmLSMFA	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.14.1.1	tdmPort14Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.14.1.2	tdmPort14Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.14.1.3	tdmPort14CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.14.2.1	tdmPort14CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.2.2	tdmPort14CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.2.3	tdmPort14CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.2.4	tdmPort14CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.2.5	tdmPort14CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.1	tdmPort14AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.2	tdmPort14AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.3	tdmPort14AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.4	tdmPort14AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.5	tdmPort14AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.6	tdmPort14AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.7	tdmPort14AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.14.3.8	tdmPort14AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.1.1	tdmPort15Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.15.1.2	tdmPort15Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.15.1.3	tdmPort15CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.15.2.1	tdmPort15CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.2.2	tdmPort15CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.2.3	tdmPort15CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.2.4	tdmPort15CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.2.5	tdmPort15CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.1	tdmPort15AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.2	tdmPort15AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.3	tdmPort15AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.4	tdmPort15AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.5	tdmPort15AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.6	tdmPort15AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.7	tdmPort15AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.15.3.8	tdmPort15AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.1.1	tdmPort16Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.16.1.2	tdmPort16Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.16.1.3	tdmPort16CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.16.2.1	tdmPort16CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.2.2	tdmPort16CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.2.3	tdmPort16CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.2.4	tdmPort16CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.2.5	tdmPort16CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.1	tdmPort16AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.2	tdmPort16AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.3	tdmPort16AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.4	tdmPort16AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.5	tdmPort16AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.6	tdmPort16AlarmRMA	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.16.3.7	tdmPort16AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.16.3.8	tdmPort16AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.1.1	tdmPort17Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.17.1.2	tdmPort17Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.17.1.3	tdmPort17CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.17.2.1	tdmPort17CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.2.2	tdmPort17CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.2.3	tdmPort17CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.2.4	tdmPort17CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.2.5	tdmPort17CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.1	tdmPort17AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.2	tdmPort17AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.3	tdmPort17AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.4	tdmPort17AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.5	tdmPort17AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.6	tdmPort17AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.7	tdmPort17AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.17.3.8	tdmPort17AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.1.1	tdmPort18Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.18.1.2	tdmPort18Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.18.1.3	tdmPort18CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.18.2.1	tdmPort18CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.2.2	tdmPort18CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.2.3	tdmPort18CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.2.4	tdmPort18CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.2.5	tdmPort18CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.1	tdmPort18AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.2	tdmPort18AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.3	tdmPort18AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.4	tdmPort18AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.5	tdmPort18AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.6	tdmPort18AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.7	tdmPort18AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.18.3.8	tdmPort18AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.1.1	tdmPort19Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.19.1.2	tdmPort19Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.19.1.3	tdmPort19CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.19.2.1	tdmPort19CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.2.2	tdmPort19CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.2.3	tdmPort19CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.2.4	tdmPort19CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.2.5	tdmPort19CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.1	tdmPort19AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.2	tdmPort19AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.3	tdmPort19AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.4	tdmPort19AlarmTS16AIS	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.19.3.5	tdmPort19AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.6	tdmPort19AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.7	tdmPort19AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.19.3.8	tdmPort19AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.1.1	tdmPort20Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.20.1.2	tdmPort20Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.20.1.3	tdmPort20CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.20.2.1	tdmPort20CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.2.2	tdmPort20CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.2.3	tdmPort20CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.2.4	tdmPort20CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.2.5	tdmPort20CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.1	tdmPort20AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.2	tdmPort20AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.3	tdmPort20AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.4	tdmPort20AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.5	tdmPort20AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.6	tdmPort20AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.7	tdmPort20AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.20.3.8	tdmPort20AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.1.1	tdmPort21Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.21.1.2	tdmPort21Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.21.1.3	tdmPort21CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.21.2.1	tdmPort21CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.2.2	tdmPort21CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.2.3	tdmPort21CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.2.4	tdmPort21CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.2.5	tdmPort21CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.1	tdmPort21AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.2	tdmPort21AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.3	tdmPort21AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.4	tdmPort21AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.5	tdmPort21AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.6	tdmPort21AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.7	tdmPort21AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.21.3.8	tdmPort21AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.1.1	tdmPort22Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.22.1.2	tdmPort22Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.22.1.3	tdmPort22CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.22.2.1	tdmPort22CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.2.2	tdmPort22CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.2.3	tdmPort22CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.2.4	tdmPort22CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.2.5	tdmPort22CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.1	tdmPort22AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.2	tdmPort22AlarmLOF	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.22.3.3	tdmPort22AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.4	tdmPort22AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.5	tdmPort22AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.6	tdmPort22AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.7	tdmPort22AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.22.3.8	tdmPort22AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.1.1	tdmPort23Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.23.1.2	tdmPort23Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.23.1.3	tdmPort23CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.23.2.1	tdmPort23CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.2.2	tdmPort23CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.2.3	tdmPort23CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.2.4	tdmPort23CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.2.5	tdmPort23CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.1	tdmPort23AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.2	tdmPort23AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.3	tdmPort23AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.4	tdmPort23AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.5	tdmPort23AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.6	tdmPort23AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.7	tdmPort23AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.23.3.8	tdmPort23AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.1.1	tdmPort24Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.24.1.2	tdmPort24Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.24.1.3	tdmPort24CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.24.2.1	tdmPort24CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.2.2	tdmPort24CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.2.3	tdmPort24CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.2.4	tdmPort24CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.2.5	tdmPort24CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.1	tdmPort24AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.2	tdmPort24AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.3	tdmPort24AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.4	tdmPort24AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.5	tdmPort24AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.6	tdmPort24AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.7	tdmPort24AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.24.3.8	tdmPort24AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.1.1	tdmPort25Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.25.1.2	tdmPort25Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.25.1.3	tdmPort25CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.25.2.1	tdmPort25CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.2.2	tdmPort25CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.2.3	tdmPort25CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.2.4	tdmPort25CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.2.5	tdmPort25CounterLCViolations	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.25.3.1	tdmPort25AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.2	tdmPort25AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.3	tdmPort25AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.4	tdmPort25AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.5	tdmPort25AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.6	tdmPort25AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.7	tdmPort25AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.25.3.8	tdmPort25AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.1.1	tdmPort26Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.26.1.2	tdmPort26Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.26.1.3	tdmPort26CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.26.2.1	tdmPort26CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.2.2	tdmPort26CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.2.3	tdmPort26CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.2.4	tdmPort26CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.2.5	tdmPort26CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.1	tdmPort26AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.2	tdmPort26AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.3	tdmPort26AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.4	tdmPort26AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.5	tdmPort26AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.6	tdmPort26AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.7	tdmPort26AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.26.3.8	tdmPort26AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.1.1	tdmPort27Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.27.1.2	tdmPort27Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.27.1.3	tdmPort27CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.27.2.1	tdmPort27CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.2.2	tdmPort27CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.2.3	tdmPort27CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.2.4	tdmPort27CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.2.5	tdmPort27CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.1	tdmPort27AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.2	tdmPort27AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.3	tdmPort27AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.4	tdmPort27AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.5	tdmPort27AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.6	tdmPort27AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.7	tdmPort27AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.27.3.8	tdmPort27AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.1.1	tdmPort28Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.28.1.2	tdmPort28Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.28.1.3	tdmPort28CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.28.2.1	tdmPort28CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.2.2	tdmPort28CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.2.3	tdmPort28CounterFBAErrors	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.28.2.4	tdmPort28CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.2.5	tdmPort28CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.1	tdmPort28AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.2	tdmPort28AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.3	tdmPort28AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.4	tdmPort28AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.5	tdmPort28AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.6	tdmPort28AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.7	tdmPort28AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.28.3.8	tdmPort28AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.1.1	tdmPort29Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.29.1.2	tdmPort29Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.29.1.3	tdmPort29CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.29.2.1	tdmPort29CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.2.2	tdmPort29CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.2.3	tdmPort29CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.2.4	tdmPort29CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.2.5	tdmPort29CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.1	tdmPort29AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.2	tdmPort29AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.3	tdmPort29AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.4	tdmPort29AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.5	tdmPort29AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.6	tdmPort29AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.7	tdmPort29AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.29.3.8	tdmPort29AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.1.1	tdmPort30Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.30.1.2	tdmPort30Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.30.1.3	tdmPort30CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.30.2.1	tdmPort30CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.2.2	tdmPort30CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.2.3	tdmPort30CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.2.4	tdmPort30CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.2.5	tdmPort30CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.1	tdmPort30AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.2	tdmPort30AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.3	tdmPort30AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.4	tdmPort30AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.5	tdmPort30AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.6	tdmPort30AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.7	tdmPort30AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.30.3.8	tdmPort30AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.1.1	tdmPort31Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.31.1.2	tdmPort31Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.31.1.3	tdmPort31CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.31.2.1	tdmPort31CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A

.1.3.6.1.4.1.5454.1.70.6.31.2.2	tdmPort31CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.2.3	tdmPort31CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.2.4	tdmPort31CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.2.5	tdmPort31CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.1	tdmPort31AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.2	tdmPort31AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.3	tdmPort31AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.4	tdmPort31AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.5	tdmPort31AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.6	tdmPort31AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.7	tdmPort31AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.31.3.8	tdmPort31AlarmLSMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.1.1	tdmPort32Enable	Integer	RW	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.32.1.2	tdmPort32Status	Integer	RO	0(Off), 1(On)	0(Off)
.1.3.6.1.4.1.5454.1.70.6.32.1.3	tdmPort32CableConfig	Integer	RW	0(0-133), 1(133-266), 2(255-399), 3(399-533), 4(533-655)	0(0-133)
.1.3.6.1.4.1.5454.1.70.6.32.2.1	tdmPort32CounterCrcBlockErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.2.2	tdmPort32CounterExCrcErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.2.3	tdmPort32CounterFBAErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.2.4	tdmPort32CounterFEBErrors	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.2.5	tdmPort32CounterLCViolations	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.1	tdmPort32AlarmLOS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.2	tdmPort32AlarmLOF	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.3	tdmPort32AlarmAIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.4	tdmPort32AlarmTS16AIS	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.5	tdmPort32AlarmRAI	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.6	tdmPort32AlarmRMA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.7	tdmPort32AlarmLCMFA	Counter32	RO	0-4294967296	N/A
.1.3.6.1.4.1.5454.1.70.6.32.3.8	tdmPort32AlarmLSMFA	Counter32	RO	0-4294967296	N/A

Object ID	Name		Access	Range Limit	Default Value
.1.3.6.1.4.1.5454.1.70.7.1	trapStartUp		RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.7.2	trapReboot		RO	N/A	N/A
.1.3.6.1.4.1.5454.1.70.7.3	trapRPSPortStatus		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.4	trapProtectionModeSwitch		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.1	trapEth1StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.2	trapEth2StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.3	trapEth3StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.4	trapEth4StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.5	trapEth5StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.5.6	trapEth6StatusUpdate		RO	0(OFF), 1(ON)	N/A
.1.3.6.1.4.1.5454.1.70.7.6.1	trapRadio1LinkLock		RO	0(NORMAL), 1(LOCKED)	N/A
.1.3.6.1.4.1.5454.1.70.7.6.2	trapRadio2LinkLock		RO	0(NORMAL), 1(LOCKED)	N/A
.1.3.6.1.4.1.5454.1.70.7.7.1	trapIDUTempMinThreshold		RO	Current IDU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.7.2	trapIDUTempMaxThreshold		RO	Current IDU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.8.1	trapRadio1MSEMinThreshold		RO	Current MSE value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.2	trapRadio1MSEMaxThreshold		RO	Current MSE value	N/A

.1.3.6.1.4.1.5454.1.70.7.8.3	trapRadio1BERMinThreshold		RO	Current BER value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.4	trapRadio1BERMaxThreshold		RO	Current BER value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.5	trapRadio1FERMinThreshold		RO	Current FER value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.6	trapRadio1FERMaxThreshold		RO	Current FER value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.7	trapRadio1RSSIMinThreshold		RO	Current RSSI value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.8	trapRadio1RSSIMaxThreshold		RO	Current RSSI value	N/A
.1.3.6.1.4.1.5454.1.70.7.8.9	trapRadio1ODUTempMinThreshold		RO	Current ODU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.8.10	trapRadio1ODUTempMaxThreshold		RO	Current ODU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.8.11	trapRadio1InPortUtilMinThreshold		RO	Current In port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.8.12	trapRadio1InPortUtilMaxThreshold		RO	Current In port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.8.13	trapRadio1OutPortUtilMinThreshold		RO	Current Out port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.8.14	trapRadio1OutPortUtilMaxThreshold		RO	Current Out port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.9.1	trapRadio2MSEMinThreshold		RO	Current MSE value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.2	trapRadio2MSEMaxThreshold		RO	Current MSE value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.3	trapRadio2BERMinThreshold		RO	Current BER value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.4	trapRadio2BERMaxThreshold		RO	Current BER value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.5	trapRadio2FERMinThreshold		RO	Current FER value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.6	trapRadio2FERMaxThreshold		RO	Current FER value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.7	trapRadio2RSSIMinThreshold		RO	Current RSSI value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.8	trapRadio2RSSIMaxThreshold		RO	Current RSSI value	N/A
.1.3.6.1.4.1.5454.1.70.7.9.9	trapRadio2ODUTempMinThreshold		RO	Current ODU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.9.10	trapRadio2ODUTempMaxThreshold		RO	Current ODU Temp	N/A
.1.3.6.1.4.1.5454.1.70.7.9.11	trapRadio2InPortUtilMinThreshold		RO	Current In port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.9.12	trapRadio2InPortUtilMaxThreshold		RO	Current In port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.9.13	trapRadio2OutPortUtilMinThreshold		RO	Current Out port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.9.14	trapRadio2OutPortUtilMaxThreshold		RO	Current Out port untilization	N/A
.1.3.6.1.4.1.5454.1.70.7.10.1	trapVoltage1.25Status		RO	Current voltage value	N/A
.1.3.6.1.4.1.5454.1.70.7.10.2	trapVoltage2.5Status		RO	Current voltage value	N/A

.1.3.6.1.4.1.5454.1.70.7.10.3	trapVoltage3.3Status		RO	Current voltage value	N/A
.1.3.6.1.4.1.5454.1.70.7.10.4	trapVoltage5Status		RO	Current voltage value	N/A
.1.3.6.1.4.1.5454.1.70.7.10.5	trapVoltage12Status		RO	Current voltage value	N/A

Appendix E - Part Numbers

Part #	Description
Giga PRO-IDU-1	TrangoLINK™ Giga PRO Indoor Unit , 100Mbps Full Duplex, 1U rack mount (All Frequency Versions)
P-SUPPLY-1U-48	48 VDC, 1U rack mount power supply, Rev A, 6#, 22x6x6
SFP-STM1/OC3	SFP Fiber Module for STM-1/OC3 for GigaPro
SFP-GigE-M	SFP Multi Mode Fiber Module for GigE for GigaPro/Apex/Plus
SFP-GigE-S	SFP Single Mode Fiber Module for GigE for GigaPro/Apex/Plus
PP16-PDH	16 Port T1/E1 Patch Panel w/ cables for GigaPro
PP32-PDH	32 Port T1/E1 Patch Panel w/ cables for GigaPro
CBLDAT-TDM-50	T1/E1 8 Port Breakout cable for GigaPro-IDU-1, 24 AWG,50 Ft
CBLDAT-TDM-100	T1/E1 8 Port Breakout cable for GigaPro-IDU-1, 24 AWG,100 Ft
CBLDAT-EW-ETH	East/West Ethernet Relay Cable Kit for data ports, 3"
CBLDAT-EW-PDH	East/West T1/E1 Relay Cable Kit for T1/E1, 16 ports
CBLDAT-EW-SMF	East/West STM/OC3 Single mode crossover fiber cable, 3 "
GIGAPRO-KEY-1	SW License Key, 1 IDU Enable 200 Mbps per enabled modem
GIGAPRO-KEY-2	SW License Key, 1 IDU Enable Max Capacity per enabled modem
GIGAPRO-KEY-M2	SW License Key, 1 IDU, Enable Second Modem
GIGAPRO-KEY-PDH	SW License Key, 1 IDU, Enable 16x T1/E1 per enabled modem
GIGAPRO-KEY-SDH	SW License Key, 1 IDU, Enable 1x STM-1/OC3 per enabled modem
CBLDAT-N400-50	LMR400 cable with N-Male connections, 50 Foot, 4# 15x15x5
CBLDAT-N400-100	LMR400 cable with N-Male connections, 100 Foot, 10# 18x18x4
CBLDAT-N400-150	LMR400 cable with N-Male connections, 150 Foot, 13# 18x18x4
CBLDAT-N400-250	LMR400 cable with N-Male connections, 250 Foot, 15# 18x18x4
CBLDAT-N400-300	LMR400 cable with N-Male connections, 300 Foot
CBLDAT-N400-1K	LMR400 cable with N-Male connections, 1000 Foot
LP-GRD	Lightning Protection Kit, for 8 CBLDAT-N400 Series
LP-GRD-1	Lightning Protection Kit for Single CBLDAT-N400 Series
LP-LMRSP-1	LMR Gas Tube Surge Protector (GT-NFM-AL) N Female to N-Male
LP-LMRSP-2	LMR Gas Tube Surge Protector (GT-NFF-AL) N Female to N-Female
GIGA-MOUNT-ODU	MOUNTING PLATE, SP ODU, Rev 1
HP-MOUNT- WR137	MOUNTING PLATE with WGA Adapter for Rect WG, HP6 ODU
HP-MOUNT- WR112	MOUNTING PLATE with WGA Adapter for Rect WG, HP7/8 ODU
HP-MOUNT- WR90	MOUNTING PLATE with WGA Adapter for Rect WG, HP11 ODU
HP-MOUNT- WR75	MOUNTING PLATE with WGA Adapter for Rect WG, HP13 ODU
HP-MOUNT- WR62	MOUNTING PLATE with WGA Adapter for Rect WG, HP15 ODU
HP-MOUNT- WR42	MOUNTING PLATE with WGA Adapter for Rect WG, HP18 ODU
HP-MOUNT- WR421	MOUNTING PLATE with WGA Adapter for Rect WG, HP23 ODU
HP-MOUNT- WR422	MOUNTING PLATE with WGA Adapter for Rect WG, HP26 ODU
HP-MOUNT- WR28	MOUNTING PLATE with WGA Adapter for Rect WG, HP28 ODU
HP-MOUNT- WR281	MOUNTING PLATE with WGA Adapter for Rect WG, HP32 ODU

GigaPro Supported Outdoor Units (ODUs)

Part Number	Description	Freq Min	Freq Max
ODUs- 6 GHZ			
High Power ODUs			
HP-06-0240-1A	HP ODU 6, ETSI TR240, 1A - Low Band	5,925.00	6,025.00
HP-06-0240-1B	HP ODU 6, ETSI TR240, 1B - Low Band	6,175.00	6,275.00
HP-06-0240-2A	HP ODU 6, ETSI TR240, 2A - Low Band	6,000.00	6,100.00
HP-06-0240-2B	HP ODU 6, ETSI TR240, 2B - Low Band	6,250.00	6,350.00
HP-06-0240-3A	HP ODU 6, ETSI TR240, 3A - Low Band	6,075.00	6,175.00
HP-06-0240-3B	HP ODU 6, ETSI TR240, 3B - Low Band	6,325.00	6,425.00
HP-06-0252-1A	HP ODU 6, ANSI/ETSI TR252, 1A - Low Band	5,925.00	6,025.00
HP-06-0252-1B	HP ODU 6, ANSI/ETSI TR252, 1B - Low Band	6,175.00	6,275.00
HP-06-0252-2A	HP ODU 6, ANSI/ETSI TR252, 2A - Low Band	6,000.00	6,100.00
HP-06-0252-2B	HP ODU 6, ANSI/ETSI TR252, 2B - Low Band	6,250.00	6,350.00
HP-06-0252-3A	HP ODU 6, ANSI/ETSI TR252, 3A - Low Band	6,075.00	6,175.00
HP-06-0252-3B	HP ODU 6, ANSI/ETSI TR252, 3B - Low Band	6,325.00	6,425.00
HP-06-0340-1A	HP ODU 6, ETSI TR340, 1A - High Band	6,430.00	6,540.00
HP-06-0340-1B	HP ODU 6, ETSI TR340, 1B - High Band	6,770.00	6,880.00
HP-06-0340-2A	HP ODU 6, ETSI TR340, 2A - High Band	6,520.00	6,630.00
HP-06-0340-2B	HP ODU 6, ETSI TR340, 2B - High Band	6,860.00	6,970.00
HP-06-0340-3A	HP ODU 6, ETSI TR340, 3A - High Band	6,600.00	6,710.00
HP-06-0340-3B	HP ODU 6, ETSI TR340, 3B - High Band	6,940.00	7,050.00
HP-06-0340-4A	HP ODU 6, ETSI TR340, 4A - High Band	6,670.00	6,780.00
HP-06-0340-4B	HP ODU 6, ETSI TR340, 4B - High Band	7,010.00	7,120.00
ODUs - 7 GHZ			
High Power ODUs			
HP-07-0154-1A	HP ODU 7, ETSI TR154, 1A	7,428.00	7,484.00
HP-07-0154-1B	HP ODU 7, ETSI TR154, 1B	7,582.00	7,638.00
HP-07-0154-2A	HP ODU 7, ETSI TR154, 2A	7,470.00	7,526.00
HP-07-0154-2B	HP ODU 7, ETSI TR154, 2B	7,624.00	7,680.00
HP-07-0154-3A	HP ODU 7, ETSI TR154, 3A	7,512.00	7,568.00
HP-07-0154-3B	HP ODU 7, ETSI TR154, 3B	7,666.00	7,722.00
HP-07-0160-1A	HP ODU 7, ETSI TR160, 1A	7,433.50	7,496.50
HP-07-0160-1B	HP ODU 7, ETSI TR160, 1B	7,593.50	7,656.50
HP-07-0160-2A	HP ODU 7, ETSI TR160, 2A	7,478.50	7,541.50
HP-07-0160-2B	HP ODU 7, ETSI TR160, 2B	7,638.50	7,701.50
HP-07-0160-3A	HP ODU 7, ETSI TR160, 3A	7,526.00	7,589.00
HP-07-0160-3B	HP ODU 7, ETSI TR160, 3B	7,686.00	7,749.00

HP-07-0161-1A	HP ODU 7, ETSI TR161, 1A	7,114.00	7,177.00
HP-07-0161-1B	HP ODU 7, ETSI TR161, 1B	7,275.00	7,338.00
HP-07-0161-2A	HP ODU 7, ETSI TR161, 2A	7,149.00	7,212.00
HP-07-0161-2B	HP ODU 7, ETSI TR161, 2B	7,310.00	7,373.00
HP-07-0161-3A	HP ODU 7, ETSI TR161, 3A	7,184.00	7,247.00
HP-07-0161-3B	HP ODU 7, ETSI TR161, 3B	7,345.00	7,408.00
HP-07-0161-4A	HP ODU 7, ETSI TR161, 4A	7,219.00	7,282.00
HP-07-0161-4B	HP ODU 7, ETSI TR161, 4B	7,380.00	7,443.00
HP-07-0161-5A	HP ODU 7, ETSI TR161, 5A	7,239.00	7,302.00
HP-07-0161-5B	HP ODU 7, ETSI TR161, 5B	7,400.00	7,463.00
HP-07-0161-6A	HP ODU 7, ETSI TR161, 6A	7,274.00	7,337.00
HP-07-0161-6B	HP ODU 7, ETSI TR161, 6B	7,435.00	7,498.00
HP-07-0161-7A	HP ODU 7, ETSI TR161, 7A	7,309.00	7,372.00
HP-07-0161-7B	HP ODU 7, ETSI TR161, 7B	7,470.00	7,533.00
HP-07-0161-8A	HP ODU 7, ETSI TR161, 8A	7,344.00	7,407.00
HP-07-0161-8B	HP ODU 7, ETSI TR161, 8B	7,505.00	7,568.00
HP-07-0161-9A	HP ODU 7, ETSI TR161, 9A	7,414.00	7,477.00
HP-07-0161-9B	HP ODU 7, ETSI TR161, 9B	7,575.00	7,638.00
HP-07-0161-10A	HP ODU 7, ETSI TR161, 10A	7,449.00	7,512.00
HP-07-0161-10B	HP ODU 7, ETSI TR161, 10B	7,610.00	7,673.00
HP-07-0161-21A	HP ODU 7, ETSI TR161, 21A	7,484.00	7,547.00
HP-07-0161-21B	HP ODU 7, ETSI TR161, 21B	7,645.00	7,708.00
HP-07-0161-22A	HP ODU 7, ETSI TR161, 22A	7,519.00	7,582.00
HP-07-0161-22B	HP ODU 7, ETSI TR161, 22B	7,680.00	7,743.00
HP-07-0161-23A	HP ODU 7, ETSI TR161, 23A	7,539.00	7,602.00
HP-07-0161-23B	HP ODU 7, ETSI TR161, 23B	7,700.00	7,763.00
HP-07-0161-24A	HP ODU 7, ETSI TR161, 24A	7,574.00	7,637.00
HP-07-0161-24B	HP ODU 7, ETSI TR161, 24B	7,735.00	7,798.00
HP-07-0161-25A	HP ODU 7, ETSI TR161, 25A	7,609.00	7,672.00
HP-07-0161-25B	HP ODU 7, ETSI TR161, 25B	7,770.00	7,833.00
HP-07-0161-26A	HP ODU 7, ETSI TR161, 26A	7,644.00	7,707.00
HP-07-0161-26B	HP ODU 7, ETSI TR161, 26B	7,805.00	7,868.00

HP-07-0168-1A	HP ODU 7, ETSI TR168, 1A	7,443.00	7,499.00
HP-07-0168-1B	HP ODU 7, ETSI TR168, 1B	7,611.00	7,667.00
HP-07-0168-2A	HP ODU 7, ETSI TR168, 2A	7,485.00	7,541.00
HP-07-0168-2B	HP ODU 7, ETSI TR168, 2B	7,653.00	7,709.00
HP-07-0168-3A	HP ODU 7, ETSI TR168, 3A	7,527.00	7,583.00
HP-07-0168-3B	HP ODU 7, ETSI TR168, 3B	7,695.00	7,751.00

7 GHz (cont'd)

HP-07-0196-1A	HP ODU 7, ETSI TR196, 1A	7,093.00	7,149.00
HP-07-0196-1B	HP ODU 7, ETSI TR196, 1B	7,289.00	7,345.00
HP-07-0196-2A	HP ODU 7, ETSI TR196, 2A	7,121.00	7,177.00
HP-07-0196-2B	HP ODU 7, ETSI TR196, 2B	7,317.00	7,373.00
HP-07-0196-3A	HP ODU 7, ETSI TR196, 3A	7,149.00	7,205.00
HP-07-0196-3B	HP ODU 7, ETSI TR196, 3B	7,345.00	7,401.00
HP-07-0196-4A	HP ODU 7, ETSI TR196, 4A	7,177.00	7,233.00
HP-07-0196-4B	HP ODU 7, ETSI TR196, 4B	7,373.00	7,429.00
HP-07-0196-5A	HP ODU 7, ETSI TR196, 5A	7,205.00	7,261.00
HP-07-0196-5B	HP ODU 7, ETSI TR196, 5B	7,401.00	7,457.00

HP-07-0245-1A	HP ODU 7, ETSI TR245, 1A	7,400.00	7,484.00
HP-07-0245-1B	HP ODU 7, ETSI TR245, 1B	7,645.00	7,729.00
HP-07-0245-2A	HP ODU 7, ETSI TR245, 2A	7,484.00	7,568.00
HP-07-0245-2B	HP ODU 7, ETSI TR245, 2B	7,729.00	7,813.00
HP-07-0245-3A	HP ODU 7, ETSI TR245, 3A	7,568.00	7,652.00
HP-07-0245-3B	HP ODU 7, ETSI TR245, 3B	7,813.00	7,897.00

ODUs - 8 GHZ
High Power ODUs

HP-08-0119-1A	HP ODU 8, ETSI TR119, 1A	8,279.00	8,307.00
HP-08-0119-1B	HP ODU 8, ETSI TR119, 1B	8,398.00	8,426.00
HP-08-0119-2A	HP ODU 8, ETSI TR119, 2A	8,293.00	8,321.00
HP-08-0119-2B	HP ODU 8, ETSI TR119, 2B	8,412.00	8,440.00
HP-08-0119-3A	HP ODU 8, ETSI TR119, 3A	8,307.00	8,335.00
HP-08-0119-3B	HP ODU 8, ETSI TR119, 3B	8,426.00	8,454.00
HP-08-0119-4A	HP ODU 8, ETSI TR119, 4A	8,321.00	8,349.00
HP-08-0119-4B	HP ODU 8, ETSI TR119, 4B	8,440.00	8,468.00
HP-08-0119-5A	HP ODU 8, ETSI TR119, 5A	8,335.00	8,363.00
HP-08-0119-5B	HP ODU 8, ETSI TR119, 5B	8,454.00	8,482.00
HP-08-0119-6A	HP ODU 8, ETSI TR119, 6A	8,349.00	8,377.00
HP-08-0119-6B	HP ODU 8, ETSI TR119, 6B	8,468.00	8,496.00

HP-08-0151-1A	HP ODU 8, ETSI TR151, 1A	8,203.00	8,271.00
HP-08-0151-1B	HP ODU 8, ETSI TR151, 1B	8,355.00	8,423.00
HP-08-0151-2A	HP ODU 8, ETSI TR151, 2A	8,240.00	8,308.00
HP-08-0151-2B	HP ODU 8, ETSI TR151, 2B	8,392.00	8,460.00
HP-08-0151-3A	HP ODU 8, ETSI TR151, 3A	8,277.00	8,345.00
HP-08-0151-3B	HP ODU 8, ETSI TR151, 3B	8,429.00	8,497.00

8 GHz (cont'd)

HP-08-0208-1A	HP ODU 8, ETSI TR208, 1A	8,043.00	8,113.00
HP-08-0208-1B	HP ODU 8, ETSI TR208, 1B	8,251.00	8,321.00
HP-08-0208-2A	HP ODU 8, ETSI TR208, 2A	8,099.00	8,169.00
HP-08-0208-2B	HP ODU 8, ETSI TR208, 2B	8,307.00	8,377.00
HP-08-0208-3A	HP ODU 8, ETSI TR208, 3A	8,155.00	8,225.00
HP-08-0208-3B	HP ODU 8, ETSI TR208, 3B	8,363.00	8,433.00
HP-08-0208-4A	HP ODU 8, ETSI TR208, 4A	8,211.00	8,281.00
HP-08-0208-4B	HP ODU 8, ETSI TR208, 4B	8,419.00	8,489.00

HP-08-0266-1A	HP ODU 8, ETSI TR266, 1A	7,905.00	8,024.00
HP-08-0266-1B	HP ODU 8, ETSI TR266, 1B	8,171.00	8,290.00
HP-08-0266-2A	HP ODU 8, ETSI TR266, 2A	8,017.00	8,136.00
HP-08-0266-2B	HP ODU 8, ETSI TR266, 2B	8,283.00	8,402.00

HP-08-0311-1A	HP ODU 8, ETSI TR311, 1A	7,731.00	7,867.00
HP-08-0311-1B	HP ODU 8, ETSI TR311, 1B	8,042.00	8,178.00
HP-08-0311-2A	HP ODU 8, ETSI TR311, 2A	7,835.00	7,971.00
HP-08-0311-2B	HP ODU 8, ETSI TR311, 2B	8,146.00	8,282.00
HP-08-0311-3A	HP ODU 8, ETSI TR311, 3A	7,717.00	7,867.00
HP-08-0311-3B	HP ODU 8, ETSI TR311, 3B	8,028.00	8,178.00

ODUs -11 GHZ

Standard Power ODUs

Giga11-ODU-1A	SP ODU 11, ANSI TR490, 1A	10,715.00	10,945.00
Giga11-ODU-1B	SP ODU 11, ANSI TR490, 1B	11,205.00	11,435.00
Giga11-ODU-2A	SP ODU 11, ANSI TR490, 2A	10,950.00	11,195.00
Giga11-ODU-2B	SP ODU 11, ANSI TR490, 2B	11,440.00	11,685.00
Giga11E-ODU-1A	SP ODU 11, ETSI TR490, 1A	10,715.00	10,945.00
Giga11E-ODU-1B	SP ODU 11, ETSI TR490, 1B	11,205.00	11,435.00
Giga11E-ODU-2A	SP ODU 11, ETSI TR490, 2A	10,950.00	11,195.00
Giga11E-ODU-2B	SP ODU 11, ETSI TR490, 2B	11,440.00	11,685.00

High Power ODUs 15% more

HP-11-0490-1A	HP ODU 11, ANSI/ETSI TR490, 1A	10,675.00	10,855.00
HP-11-0490-1B	HP ODU 11, ANSI/ETSI TR490, 1B	11,165.00	11,345.00
HP-11-0490-2A	HP ODU 11, ANSI/ETSI TR490, 2A	10,795.00	10,975.00
HP-11-0490-2B	HP ODU 11, ANSI/ETSI TR490, 2B	11,285.00	11,465.00
HP-11-0490-3A	HP ODU 11, ANSI/ETSI TR490, 3A	10,915.00	11,095.00
HP-11-0490-3B	HP ODU 11, ANSI/ETSI TR490, 3B	11,405.00	11,585.00
HP-11-0490-4A	HP ODU 11, ANSI/ETSI TR490, 4A	11,035.00	11,215.00
HP-11-0490-4B	HP ODU 11, ANSI/ETSI TR490, 4B	11,525.00	11,705.00
HP-11-0490-5A	HP ODU 11, ANSI/ETSI TR490, 5A	10,700.00	10,890.00
HP-11-0490-5B	HP ODU 11, ANSI/ETSI TR490, 5B	11,200.00	11,390.00
HP-11-0490-6A	HP ODU 11, ANSI/ETSI TR490, 6A	10,855.00	11,045.00
HP-11-0490-6B	HP ODU 11, ANSI/ETSI TR490, 6B	11,355.00	11,545.00
HP-11-0490-7A	HP ODU 11, ANSI/ETSI TR490, 7A	11,010.00	11,200.00
HP-11-0490-7B	HP ODU 11, ANSI/ETSI TR490, 7B	11,510.00	11,700.00

HP-11-0530-1A	HP ODU 11, ETSI TR530, 1A	10,675.00	10,855.00
HP-11-0530-1B	HP ODU 11, ETSI TR530, 1B	11,205.00	11,385.00
HP-11-0530-2A	HP ODU 11, ETSI TR530, 2A	10,795.00	10,975.00
HP-11-0530-2B	HP ODU 11, ETSI TR530, 2B	11,325.00	11,505.00
HP-11-0530-3A	HP ODU 11, ETSI TR530, 3A	10,915.00	11,135.00
HP-11-0530-3B	HP ODU 11, ETSI TR530, 3B	11,445.00	11,665.00
HP-11-0530-4A	HP ODU 11, ETSI TR530, 4A	11,035.00	11,215.00
HP-11-0530-4B	HP ODU 11, ETSI TR530, 4B	11,565.00	11,745.00

ODUs – 13 GHZ

High Power ODUs

HP-13-0266-1A	HP ODU 13, ETSI TR266, 1A	12,751.00	12,814.00
HP-13-0266-1B	HP ODU 13, ETSI TR266, 1B	13,017.00	13,080.00
HP-13-0266-2A	HP ODU 13, ETSI TR266, 2A	12,807.00	12,870.00
HP-13-0266-2B	HP ODU 13, ETSI TR266, 2B	13,073.00	13,136.00
HP-13-0266-3A	HP ODU 13, ETSI TR266, 3A	12,863.00	12,926.00
HP-13-0266-3B	HP ODU 13, ETSI TR266, 3B	13,129.00	13,192.00
HP-13-0266-4A	HP ODU 13, ETSI TR266, 4A	12,919.00	12,982.00
HP-13-0266-4B	HP ODU 13, ETSI TR266, 4B	13,185.00	13,248.00

ODUs – 15 GHZ

Standard Power ODUs

Giga15E-ODU-1A	SP ODU 15, ETSI TR728, 1A	14,515.00	14,613.00
Giga15E-ODU-1B	SP ODU 15, ETSI TR728, 1B	15,243.00	15,341.00
Giga15E-ODU-2A	SP ODU 15, ETSI TR644, 2A	14,515.00	14,683.00
Giga15E-ODU-2B	SP ODU 15, ETSI TR644, 2B	15,159.00	15,327.00

High Power ODUs

HP-15-0315-1A	HP ODU 15, ETSI TR315, 1A	14,627.00	14,746.00
HP-15-0315-1B	HP ODU 15, ETSI TR315, 1B	14,942.00	15,061.00
HP-15-0315-2A	HP ODU 15, ETSI TR315, 2A	14,725.00	14,844.00
HP-15-0315-2B	HP ODU 15, ETSI TR315, 2B	15,040.00	15,159.00
HP-15-0315-3A	HP ODU 15, ETSI TR315, 3A	14,823.00	14,942.00
HP-15-0315-3B	HP ODU 15, ETSI TR315, 3B	15,138.00	15,257.00

HP-15-0420-4A	HP ODU 15, ETSI TR420, 4A	14,501.00	14,613.00
HP-15-0420-4B	HP ODU 15, ETSI TR420, 4B	14,921.00	15,033.00
HP-15-0420-5A	HP ODU 15, ETSI TR420, 5A	14,606.00	14,725.00
HP-15-0420-5B	HP ODU 15, ETSI TR420, 5B	15,026.00	15,145.00
HP-15-0420-6A	HP ODU 15, ETSI TR420, 6A	14,718.00	14,837.00
HP-15-0420-6B	HP ODU 15, ETSI TR420, 6B	15,138.00	15,257.00
HP-15-0420-7A	HP ODU 15, ETSI TR420, 7A	14,816.00	14,928.00
HP-15-0420-7B	HP ODU 15, ETSI TR420, 7B	15,236.00	15,348.00

HP-15-0490-4A	HP ODU 15, ETSI TR490, 4A	14,403.00	14,522.00
HP-15-0490-4B	HP ODU 15, ETSI TR490, 4B	14,893.00	15,012.00
HP-15-0490-5A	HP ODU 15, ETSI TR490, 5A	14,515.00	14,634.00
HP-15-0490-5B	HP ODU 15, ETSI TR490, 5B	15,005.00	15,124.00
HP-15-0490-6A	HP ODU 15, ETSI TR490, 6A	14,627.00	14,746.00
HP-15-0490-6B	HP ODU 15, ETSI TR490, 6B	15,117.00	15,236.00
HP-15-0490-7A	HP ODU 15, ETSI TR490, 7A	14,739.00	14,858.00
HP-15-0490-7B	HP ODU 15, ETSI TR490, 7B	15,229.00	15,348.00

HP-15-0475-1A	HP ODU 15, ETSI TR475, 1A	14,500.00	14,668.00
HP-15-0475-1B	HP ODU 15, ETSI TR475, 1B	14,975.00	15,143.00
HP-15-0475-2A	HP ODU 15, ETSI TR475, 2A	14,660.00	14,828.00
HP-15-0475-2B	HP ODU 15, ETSI TR475, 2B	15,135.00	15,303.00
HP-15-0475-3A	HP ODU 15, ETSI TR475, 3A	14,783.00	14,883.00
HP-15-0475-3B	HP ODU 15, ETSI TR475, 3B	15,258.00	15,358.00

HP-15-0640-1A	HP ODU 15, ETSI TR640, 1A	14,500.00	14,610.00
HP-15-0640-1B	HP ODU 15, ETSI TR640, 1B	15,140.00	15,250.00
HP-15-0640-2A	HP ODU 15, ETSI TR640, 2A	14,605.00	14,715.00
HP-15-0640-2B	HP ODU 15, ETSI TR640, 2B	15,245.00	15,355.00

HP-15-0644-1A	HP ODU 15, ETSI TR644, 1A	14,400.00	14,512.00
HP-15-0644-1B	HP ODU 15, ETSI TR644, 1B	15,044.00	15,156.00
HP-15-0644-2A	HP ODU 15, ETSI TR644, 2A	14,498.00	14,610.00
HP-15-0644-2B	HP ODU 15, ETSI TR644, 2B	15,142.00	15,254.00
HP-15-0644-3A	HP ODU 15, ETSI TR644, 3A	14,596.00	14,708.00
HP-15-0644-3B	HP ODU 15, ETSI TR644, 3B	15,240.00	15,352.00

15 GHz (cont'd)

HP-15-0728-1A	HP ODU 15, ETSI TR728, 1A	14,500.00	14,615.00
HP-15-0728-1B	HP ODU 15, ETSI TR728, 1B	15,228.00	15,343.00
HP-15-0728-2A	HP ODU 15, ETSI TR728, 2A	14,500.00	14,625.00
HP-15-0728-2B	HP ODU 15, ETSI TR728, 2B	15,228.00	15,353.00

ODUs – 18 GHZ

Standard Power ODUs

Giga18-ODU-1A	SP ODU 18, ANSI TR1560, 2B	17,705.00	18,135.00
Giga18-ODU-1B	SP ODU 18, ANSI TR1560, 2B	19,265.00	19,695.00
Giga18E-ODU-1A	SP ODU 18, ETSI TR1010, 1A	17,727.50	18,167.50
Giga18E-ODU-1B	SP ODU 18, ETSI TR1010, 1B	18,737.50	19,177.50
Giga18E-ODU-2A	SP ODU 18, ETSI TR1010, 2A	18,195.00	18,662.50
Giga18E-ODU-2B	SP ODU 18, ETSI TR1010, 2B	19,205.00	19,672.50

High Power ODUs

HP-18-1010-1A	HP ODU 18, ETSI TR1010, 1A	17,685.00	17,985.00
HP-18-1010-1B	HP ODU 18, ETSI TR1010, 1B	18,695.00	18,995.00
HP-18-1010-2A	HP ODU 18, ETSI TR1010, 2A	17,930.00	18,230.00
HP-18-1010-2B	HP ODU 18, ETSI TR1010, 2B	18,940.00	19,240.00
HP-18-1010-3A	HP ODU 18, ETSI TR1010, 3A	18,180.00	18,480.00
HP-18-1010-3B	HP ODU 18, ETSI TR1010, 3B	19,190.00	19,490.00
HP-18-1010-4A	HP ODU 18, ETSI TR1010, 4A	18,400.00	18,700.00
HP-18-1010-4B	HP ODU 18, ETSI TR1010, 4B	19,410.00	19,710.00

HP-18-1092-1A	HP ODU 18, ETSI TR1092, 1A	17,700.00	18,060.00
HP-18-1092-1B	HP ODU 18, ETSI TR1092, 1B	18,805.00	19,165.00
HP-18-1092-2A	HP ODU 18, ETSI TR1092, 2A	17,975.00	18,335.00
HP-18-1092-2B	HP ODU 18, ETSI TR1092, 2B	19,080.00	19,440.00
HP-18-1092-3A	HP ODU 18, ETSI TR1092, 3A	18,235.00	18,595.00
HP-18-1092-3B	HP ODU 18, ETSI TR1092, 3B	19,340.00	19,700.00

HP-18-1560-1A	HP ODU 18, ANSI TR1560, 1A	17,700.00	18,000.00
HP-18-1560-1B	HP ODU 18, ANSI TR1560, 1B	19,260.00	19,560.00
HP-18-1560-2A	HP ODU 18, ANSI TR1560, 2A	17,840.00	18,140.00
HP-18-1560-2B	HP ODU 18, ANSI TR1560, 2B	19,400.00	19,700.00
HP-18-1560-3A	HP ODU 18, ANSI TR1560, 3A	17,700.00	18,140.00
HP-18-1560-3B	HP ODU 18, ANSI TR1560, 3B	19,260.00	19,700.00

ODUs - 23 GHZ

Standard Power ODUs

Giga23-ODU-2A	SP ODU 23, ANSI TR1200, 2A	21,805.00	22,395.00
Giga23-ODU-2B	SP ODU 23, ANSI TR1200, 2B	23,005.00	23,595.00
Giga23E-ODU-2A	SP ODU 23, ETSI TR1008, 2A	22,022.00	22,358.00
Giga23E-ODU-2B	SP ODU 23, ETSI TR1008, 2B	23,030.00	23,366.00

High Power ODUs

HP-23-1008-1A	HP ODU 23, ETSI TR1008, 1A	21,994.00	22,330.00
HP-23-1008-1B	HP ODU 23, ETSI TR1008, 1B	23,002.00	23,338.00
HP-23-1008-2A	HP ODU 23, ETSI TR1008, 2A	22,274.00	22,610.00
HP-23-1008-2B	HP ODU 23, ETSI TR1008, 2B	23,282.00	23,618.00

HP-23-1200-1A	HP ODU 23, ANSI TR1200, 1A	21,200.00	21,530.00
HP-23-1200-1B	HP ODU 23, ANSI TR1200, 1B	22,400.00	22,730.00
HP-23-1200-2A	HP ODU 23, ANSI TR1200, 2A	21,490.00	21,820.00
HP-23-1200-2B	HP ODU 23, ANSI TR1200, 2B	22,690.00	23,020.00
HP-23-1200-3A	HP ODU 23, ANSI TR1200, 3A	21,780.00	22,110.00
HP-23-1200-3B	HP ODU 23, ANSI TR1200, 3B	22,980.00	23,310.00
HP-23-1200-4A	HP ODU 23, ANSI TR1200, 4A	22,070.00	22,400.00
HP-23-1200-4B	HP ODU 23, ANSI TR1200, 4B	23,270.00	23,600.00
HP-23-1200-5A	HP ODU 23, ANSI TR1200, 5A	21,200.00	21,600.00
HP-23-1200-5B	HP ODU 23, ANSI TR1200, 5B	22,400.00	22,800.00
HP-23-1200-6A	HP ODU 23, ANSI TR1200, 6A	21,600.00	22,000.00
HP-23-1200-6B	HP ODU 23, ANSI TR1200, 6B	22,800.00	23,200.00
HP-23-1200-7A	HP ODU 23, ANSI TR1200, 7A	22,000.00	22,400.00
HP-23-1200-7B	HP ODU 23, ANSI TR1200, 7B	23,200.00	23,600.00

HP-23-1232-1A	HP ODU 23, ETSI TR1232, 1A	21,200.00	21,500.00
HP-23-1232-1B	HP ODU 23, ETSI TR1232, 1B	22,432.00	22,732.00
HP-23-1232-2A	HP ODU 23, ETSI TR1232, 2A	21,472.00	21,786.00
HP-23-1232-2B	HP ODU 23, ETSI TR1232, 2B	22,704.00	23,018.00
HP-23-1232-3A	HP ODU 23, ETSI TR1232, 3A	21,779.00	22,093.00
HP-23-1232-3B	HP ODU 23, ETSI TR1232, 3B	23,011.00	23,325.00
HP-23-1232-4A	HP ODU 23, ETSI TR1232, 4A	22,086.00	22,386.00
HP-23-1232-4B	HP ODU 23, ETSI TR1232, 4B	23,318.00	23,618.00

ODUs – 26 GHZ

High Power ODUs

HP-26-0800-1A	HP ODU 26, ETSI TR800, 1A	24,250.00	24,450.00
HP-26-0800-1B	HP ODU 26, ETSI TR800, 1B	25,050.00	25,250.00

HP-26-1008-1A	HP ODU 26, ETSI TR1008, 1A	24,549.00	24,885.00
HP-26-1008-1B	HP ODU 26, ETSI TR1008, 1B	25,557.00	25,893.00
HP-26-1008-2A	HP ODU 26, ETSI TR1008, 2A	24,829.00	25,165.00
HP-26-1008-2B	HP ODU 26, ETSI TR1008, 2B	25,837.00	26,173.00
HP-26-1008-3A	HP ODU 26, ETSI TR1008, 3A	25,109.00	25,445.00
HP-26-1008-3B	HP ODU 26, ETSI TR1008, 3B	26,117.00	26,453.00

ODUs – 28 GHZ

High Power ODUs

HP-28-1008-1A	HP ODU 28, ETSI TR1008, 1A	27,250.00	28,025.00
HP-28-1008-1B	HP ODU 28, ETSI TR1008, 1B	28,528.00	29,033.00
HP-28-1008-2A	HP ODU 28, ETSI TR1008, 2A	27,968.00	28,473.00
HP-28-1008-2B	HP ODU 28, ETSI TR1008, 2B	28,976.00	29,481.00

ODUs – 32 GHZ

High Power ODUs

HP-32-0812-1A	HP ODU 32, ETSI TR812, 1A	31,815.00	32,207.00
HP-32-0812-1B	HP ODU 32, ETSI TR812, 1B	32,627.00	33,019.00
HP-32-0812-2A	HP ODU 32, ETSI TR812, 2A	32,179.00	32,571.00
HP-32-0812-2B	HP ODU 32, ETSI TR812, 2B	32,991.00	33,383.00

ODUs – 38 GHZ

High Power ODUs

HP-38-0700-1A	HP ODU 38, ANSI/ETSI TR700, 1A	38,595.00	38,805.00
HP-38-0700-1B	HP ODU 38, ANSI/ETSI TR700, 1B	39,295.00	39,505.00
HP-38-0700-2A	HP ODU 38, ANSI/ETSI TR700, 2A	38,795.00	39,005.00
HP-38-0700-2B	HP ODU 38, ANSI/ETSI TR700, 2B	39,495.00	39,705.00
HP-38-0700-3A	HP ODU 38, ANSI/ETSI TR700, 3A	38,995.00	39,205.00
HP-38-0700-3B	HP ODU 38, ANSI/ETSI TR700, 3B	39,695.00	39,905.00
HP-38-0700-4A	HP ODU 38, ANSI/ETSI TR700, 4A	39,195.00	39,405.00
HP-38-0700-4B	HP ODU 38, ANSI/ETSI TR700, 4B	39,895.00	40,105.00

HP-38-1260-1A	HP ODU 38, ANSI/ETSI TR1260, 1A	37,044.00	37,632.00
HP-38-1260-1B	HP ODU 38, ANSI/ETSI TR1260, 1B	38,304.00	38,892.00
HP-38-1260-2A	HP ODU 38, ANSI/ETSI TR1260, 2A	37,604.00	38,192.00
HP-38-1260-2B	HP ODU 38, ANSI/ETSI TR1260, 2B	38,864.00	39,452.00

Appendix F – Link Install and Commissioning Logs

Site Installation Log (per end)

Site Information	
Customer:	
Site Name:	
Site Address:	
Site Coordinate:	
Radio Model:	
Radio Serial #	
Site Access notes:	

ANTENNA

Antenna model	
Antenna size	
Height above Ground Level	
Does it meet Fresnel zone requirement?	Yes No
Antenna Mount is properly secure?	Yes No
Is the Antenna properly secure?	Yes No
Is the Mount Properly grounded?	Yes No
Is the Antenna Properly grounded?	Yes No
Is the Antenna side strut installed?	Yes No
Is the Antenna weather proof?	Yes No
Was the O-Ring installed properly?	Yes No

OUTDOOR UNIT (ODU)

Model of ODU (SP or HP):	
Direct or Remote ODU Mount	Direct Remote
Are all four latches properly closed?	Yes No
Is the transition installed with correct orientation?	Yes No
What is the antenna polarization?	H V
Is the ODU LED ON (SP only)?	Yes No
Is the LED functioning properly?	Yes No
Does the ODU look damaged?	Yes No
Is the Gore membrane cap damaged?	Yes No

INDOOR UNIT (IDU)

Is it properly mounted on the rack?	Yes No
Does it have sufficient space between other devices on the rack for proper ventilation?	Yes No
Is it properly grounded to the rack?	Yes No
Are all cables properly labeled and secure?	Yes No

Is the fan working?	Yes No
Is the fan running?	Yes No
Is the Ferrite correctly installed?	Yes No
Is the rack properly secure to the floor?	Yes No
Is the rack properly grounded?	Yes No

Power Supply

Type of power Supply:	
Redundant power to the IDU?	Yes No
Measure input voltage at IDU	(-VDC)
Properly grounded to the rack?	Yes No
Is the DC connector secure via the fasten screws on the IDU?	Yes No
For redundant power, is the + ground on both power supplies connected to the center pin of the DC connector in the IDU?	Yes No
Are the leads properly terminated to the power supply's terminal block	Yes No

IF Cable

Cable type:	
Cable Length:	
Proper connection to the IDU?	
Proper connection to the ODU?	
Proper weather proofing at all necessary Points?	Yes No Remarks:
Point of entry properly weather proof?	Yes No
Point of entry properly grounded?	Yes No
Is there a drip loop at the ODU?	Yes No
Is cable properly secure?	Yes No
Are there any damages to the cable, bends, kinks, etc.?	Yes No Remarks:
Grounding straps install per specs?	Yes No
How many inline surge arresters installed?	

Other Notes:

Site install perform by:

Name:	Date:
Title:	Contact Number:
Company:	Signature:

Site installation approved by:

Name:	Date:
Title:	Contact Number:
Company:	Signature:

Link Commissioning Log

Equipment

Site A Name_____

- IDU1 Model _____ SN_____ Firmware _____
- IDU1 Mac Address: _____
- IDU2 Model _____ SN_____ Firmware _____
- IDU2 Mac Address: _____
- Power supplies model IDU1_____ IDU2_____
- IF Cable Type IDU1 _____ IF Cable length _____ ft
- IF Cable Type IDU2_____ IF Cable length _____ ft
- Combiner Model _____ SN _____
- Antenna 1 Model_____ SN _____
- Antenna 2 Model_____ SN _____

Site B Name_____

- IDU3 Model _____ SN_____ Firmware _____
- IDU3 Mac Address: _____
- IDU4 Model _____ SN_____ Firmware _____
- IDU4 Mac Address: _____
- Power supplies model IDU3_____ IDU4_____
- IF Cable Type IDU3_____ IF Cable length _____ ft
- IF Cable Type IDU4_____ IF Cable length _____ ft
- Combiner Model _____ SN _____
- Antenna 3 Model_____ SN _____
- Antenna 4 Model_____ SN _____

Link Configuration

Sysconfig: 1+0____1+1 HSB___ 1+1 SD____ 1+1 FD____ 2+0____ 2+2 _____ 4+0 ____

Site A **Site B**

Distance: _____miles

ODU 1 TX Freq _____ GHz _____ GHz
ODU2 TX Power _____ dBm _____ dBm
ODU 3 TX Freq _____ GHz _____ GHz
ODU 4 TX Power _____ dBm _____ dBm

Speed/Mod _____ _____
ACM ON _____ _____
ATPC ON _____ _____
Expected RSSI :_____ dBm _____ dBm
Current RSSI: _____ dBm _____ dBm
Current MSE: _____ _____
Lock Status: _____
Speed: _____
Grounding every 75 ft on IF cable ? _____
Ferrites on -48 VDC input to IDUs? _____
IF Cable attenuation values _____, _____, _____ dB
IF Cable attenuation values _____, _____, _____ dB
IF Cable attenuation values _____, _____, _____ dB
IF Cable attenuation values _____, _____, _____ dB

Record Link Test Results (10 cycles):

Lock:
RSSI:
MSE:
BER:

Notes

NOTE: The system information file for each IDU as well as the diagnostic file should be downloaded and added to the Link Commissioning document. This can serve as reference for comparison from the data been manual recorded on this document.

Link Install performed by:

Name:	Date:
Title:	Contact Number:
Company:	Signature:

Link Commissioned by:

Name:	Date:
Title:	Contact Number:
Company:	Signature:

Appendix G – Declaration of Conformity

We, Trango Systems, Inc.,

Tel +1 858 391-0010
Fax +1 858 391-0020

Hereby declare that the product(s) listed below,

Product Name: TrangoLINK GigaPRO Indoor Unit,100Mbps Full Duplex,1U rack mount
Model No: GIGA PRO-IDU-1

Product Name: Standard Power Outdoor Unit, 6-23GHz
Model No: GIGAXX-ODU-ZZ

Product Name: High Power Outdoor Unit 6-38 GHz
Model No: HP-XX-YYYY-ZZ

Where:
XX = the Frequency Band in GHz
YYYY= the T/R Spacing
ZZ= the Sub-band

To which this declaration relates, are in conformity with the following standards and/or other normative documents:

EN 302 217-2-2 (2007-04)
EN 302 217-2-1 (2005-08)
EN 301 489-17 v1.2.1 (2002-08)
EN 60950-1/IEC 60950-1:2001 First Edition
EN 50385: 2002

We hereby declare that all essential radio test suites have been carried out and that the above named products are in conformity with all the essential requirements of Directive 1999/5/EC.

The conformity assessment procedure referred to in Article 10(5) and detailed in Annex IV of Directive 1999/5/EC has been followed with the involvement of the following Notified Body using the CB Scheme:

CE

Glossary - Acronyms

AGC	Automatic Gain Control
ATPC	Automatic Transmit Power Control
BER	Bit Error Rate
BPF	Band Pass Filter
Cat5	Category 5 Cable
CoS	Class of Service
dB	Decibel
E1	European-Carrier 1
FCC	Federal Communication Commission
FEC	Forward Error Correction
FPGA	Field Programmable Gate-Array
FTP	File Transfer Protocol
GigE	Giga PRObit Ethernet
HTTP	HyperText Transfer Protocol
HTTPD	HyperText Transfer Protocol Daemon
HTTPS	HyperText Transfer Protocol Secure
IDU	Indoor Unit
IF	Intermediate Frequency
LB	Loopback
LED	Light-emitting Diode
LIU	Line Interface Unit
MSE	Mean Square Error
ODU	Outdoor Unit
Opmode	Operation Mode

OS	Operating System
PIC	A Series of microcontrollers a product of the Microchip Technology
QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
RJ-45	Registered Jack - 45
RS-232	Recommended Standard 232
RSSI	Receive Signal Strength Indicator
Rx	Receive
SNMP	Simple Network Management Protocol
SSH	Secure Shell
Sysinfo	System Information
T1 T	1.544 Mbps telephony carrier 1
TDM	Time-Division Multiplexing
T/I	Threshold to Interference
TFTP	Trivial File Transfer Protocol
TFTPD	Trivial File Transfer Protocol Daemon
Tx	Transmit
VLAN	Virtual Local Area Network
WISP	Wireless Internet Service Provider