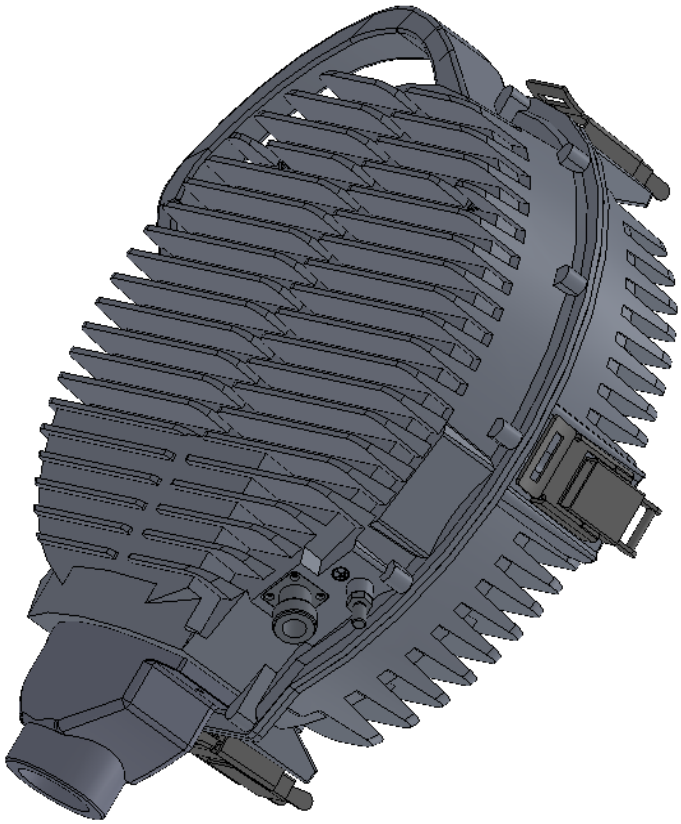
StrataLink® 24

24 GHz All-Outdoor 750 Mbps FDD Point to Point License-Free Microwave System
Model: SL-24



Quick Start Guide

Notice

Trademarks

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Information to User

Any changes or modifications of equipment not expressly approved by the manufacturer could void the user's authority to operate the equipment and the warranty for such equipment.

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Introduction

Thank you for purchasing the StrataLink 24 unlicensed point to point microwave system. This guide is designed to assist with basic installation and configuration of the system. For advanced settings, refer to the User Manual and application notes.

System Components

The basic link consists of the following items:

2 each SL-24 Radio
2 each Dish Antenna
2 each PoE
2 each Power Supply

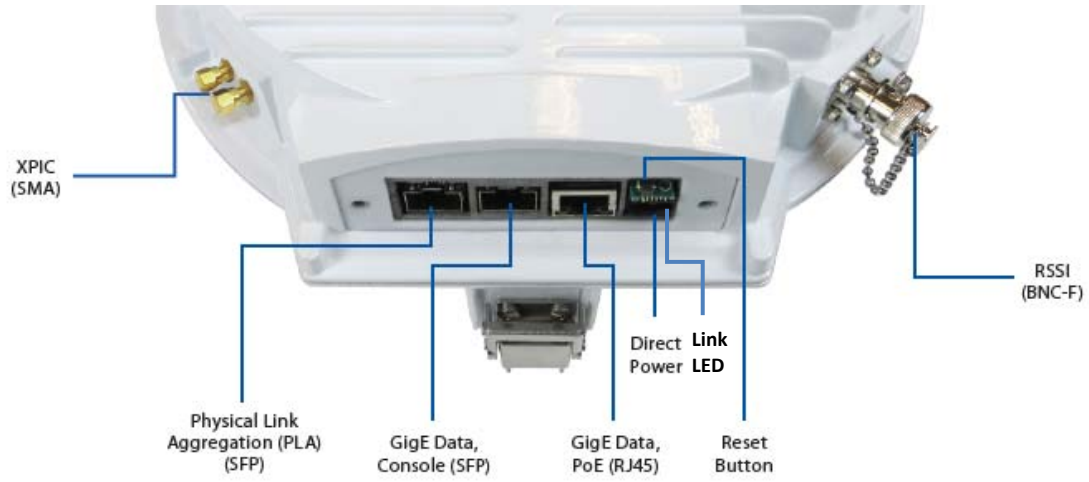
Additional items may be needed depending on the link configuration. A List of the most common part numbers used for the system is given in Table 1.

Part Number	Description
TLSL-24	StrataLink® 24 US/IC system, 24.05-24.25 GHz
TLSL-24-E	StrataLink® 24 ETSI system, 24.05-24.3 GHz
SL-24	StrataLink® 24 All Outdoor Unit, US/IC 24.05-24.25 GHz
SL-24-E	StrataLink® 24 All Outdoor Unit, ETSI 24.05 -24.3 GHz
PSUPPLY-WM-48-L	-48 Volt Universal Wall Mount power supply
POE-GIGE-48	PoE injector/Surge Suppressor for ApexPlus/StrataLink Family
CBLDAT-RSSI	BNC-M to Banana plug cable for RSSI voltage measurement
CBLDAT-XPIC-3	XPIC Coaxial Cable set (2x3 'cables) with heat shrink
SL-KEY-300	Software Key to Allow Throughputs up to 300 Mbps
SL-KEY-400	Software Key to Allow Throughputs up to 400 Mbps
SL-KEY-MAX	Software Key to Allow Throughputs up to MAX (750 Mbps)
SFP-Console	Serial Console SFP Module with DB9 Serial interface
SFP-GigE-C	SFP 10/100/1000BaseT Copper RJ45
SFP-GigE-S	SFP Fiber Single Mode Module
SFP-GigE-M	SFP Fiber Multi Mode
AD24G-1-U2	Antenna, 34 dBi 1 ft/ 30cm, Freq:24.05-24.25GHz
AD24G-1-T2	Antenna, 36 dBi 1 ft/ 30cm, Freq:24.05-24.25GHz
AD24G-2-U2	Antenna, 40 dBi 2 ft/ 60cm, Freq:24.05-24.25GHz
AD24G-2-T2	Antenna, 41 dBi 2 ft/ 60cm, Freq:24.05-24.25GHz
AD24G-3-T2	Antenna, 44.5 dBi 3 ft/ 90cm, Freq:24.05-24.25GHz

Table 1: StrataLink® 24 Part Numbers

Radio Unit Overview

Below is a picture showing the main interfaces of the SL-24 after removing the port cover (loosen the two captive screws)



Interface Panel

GigE Data (RJ45) - Interface for Traffic and Management. Autonegotiate 10/100/1000 BaseT. This port also supports PoE operation using the **PoE-Gige-48** Power injector. This is the default traffic and management port

GigE Data (SFP) - Interface for Traffic and Management. Autonegotiate 10/100/1000 BaseT. With the optional **SFP-Console** module this port can be directly connected to a PC Serial port.

PLA Port (SFP) – Physical Link Aggregation (PLA) to connect to a second radio link running in parallel with the main radio link.

Direct Power – Terminal Block for applying direct -48 VDC power to the unit.

BNC – Output of DC voltage proportional to the RSSI level. The chart below gives the voltage vs RSL.

The BNC Voltage = 0.1 +0.04 x (90+RSL) Volts, where RSL = -90 to -20 dBm

RSL(dBm)	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20
BNC Voltage (V)	0.10	0.30	0.50	0.70	0.90	1.10	1.30	1.50	1.70	1.90	2.10	2.30	2.50	2.70	2.90

Reset Button – The Reset button operates as follows:

1) Hold for more than 2 seconds, but less than 6 seconds:

a. The IP address will be reset to default to allow access in the event of a forgotten password or IP address.

b. The CLI management passwords will be reset to default

c. The Web interface passwords will be reset to default.

d. The SNMP read/write/trap community strings will be set to defaults.

e. The CLI prompt will be reset.

2) Hold for more than 6 seconds: The unit will reset the system configuration to the factory default, but **NOT** reset the items in (1) above. The unit **WILL REBOOT** automatically.

Link LED – LED is solid on when linked with the far end unit, and Flashing when not linked. LED will be solid at system power up for approximately two minutes.

XPIC – Input/Output coaxial connection to second radio – required only when using XPIC operation – **CBLDAT-XPIC-3** kit required. When XPIC is not used ensure that the caps remain installed.

Radio Management

There are three ways to manage the StrataLink System:

1) In-band management without a VLAN using RJ45 or SFP. Only traffic coming into the radio from RJ45 or SFP or the RF with the Radio MAC address will be forwarded to the CPU. **This is the default configuration.**

2) In- band management **with** a VLAN using RJ45 or SFP. Only traffic coming into the radio from RJ45 or SFP or the RF with a matching VLAN ID and the Radio MAC address will be forwarded to the CPU. QoS will be applied to incoming packets based on the VLAN tag Priority field bits to allow prioritization of management traffic over user traffic. The VLAN tagging option must be enabled and the VLAN ID set

3) Out- of- Band Management (OBM). The system will pass management traffic coming into the OBM port to the CPU and not forward any traffic across the link from this port. Disable IBM to enable OBM on the SFP Port. If the SFP is desired for Data and the RJ45 port for OBM, select the GE2(SFP) port for Data after disabling IBM.

Using the web interface is the easiest way to set up the system. A visit to a single web page on each radio is all that is required to get up and running.

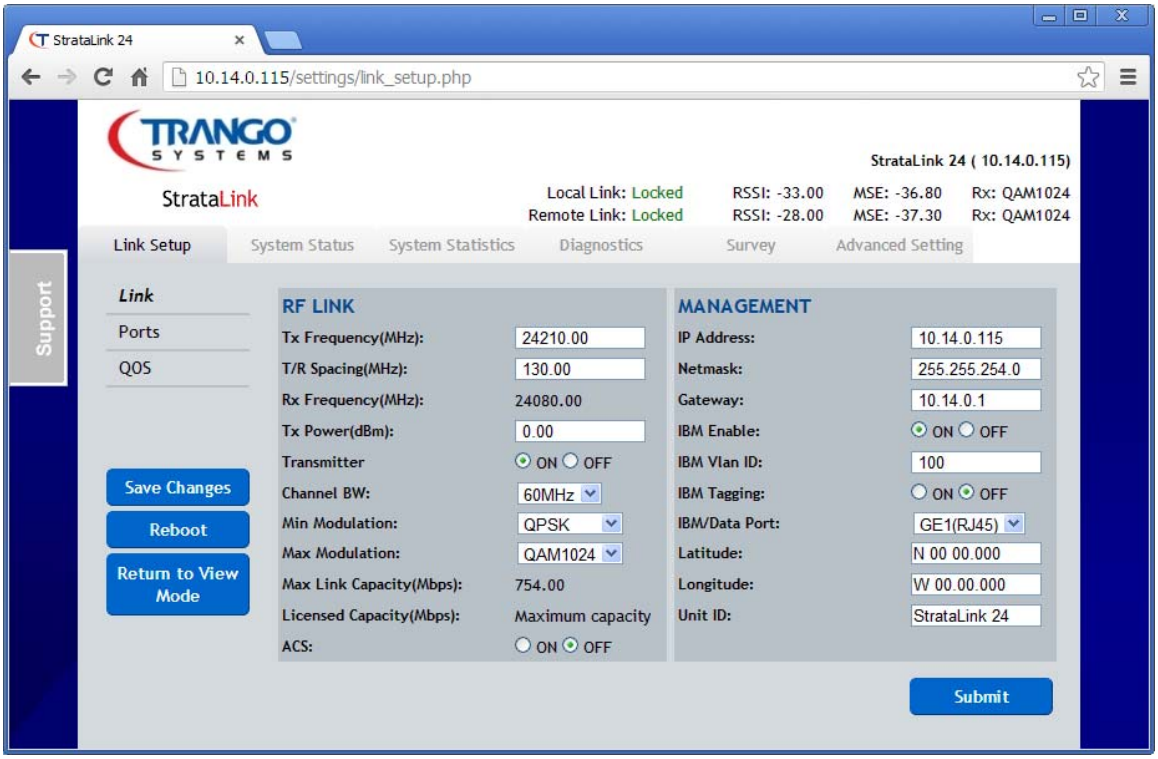
Management of the radio may be done via the following interfaces:

1) Web Browser
2) Telnet
3) SSH
4) Console port

The radio has two levels of access, View and Config. View allows only viewing of the various parameters while config allows changing them. The default login and passwords for each level are:

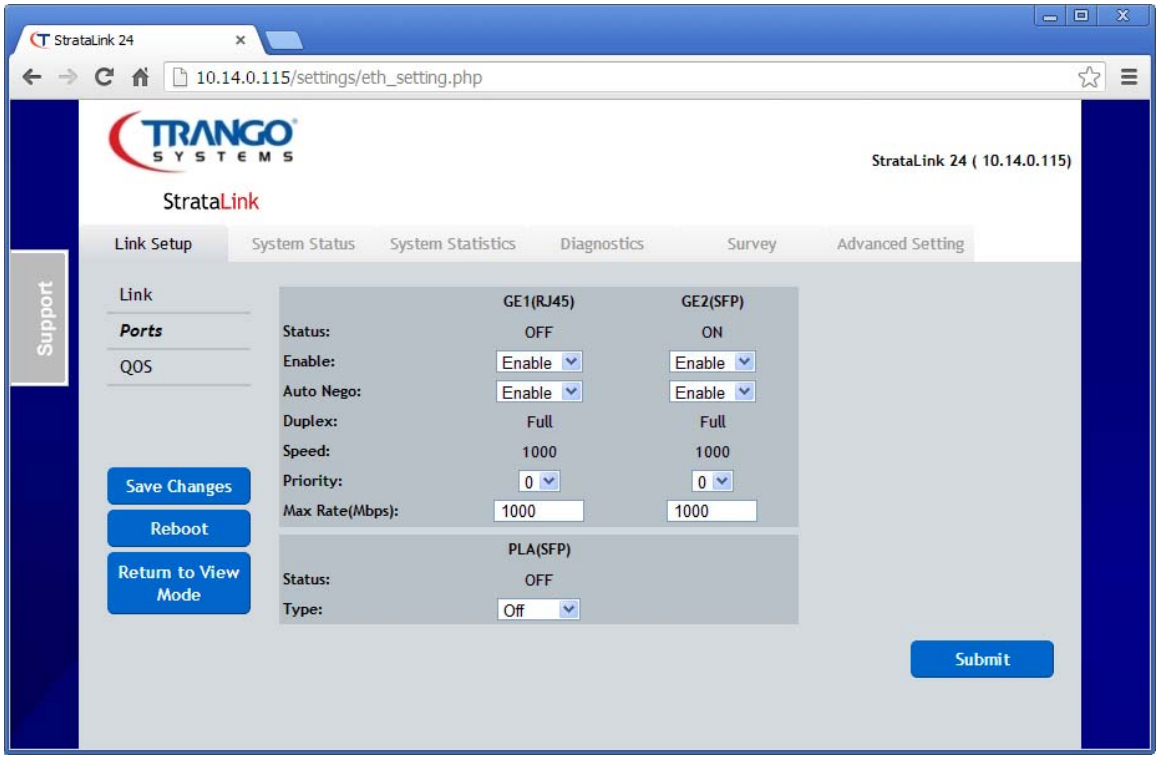
View Level	Login:	***admin***
	Password:	***trango***
Config Level	Login:	***config***
	Password:	***trango***

When purchased as a link, one radio will be programmed with the IP address **192.168.100.100** and the other will be **192.168.100.101** to avoid conflicts when the radios are turned on and link. After logging into the config level and selecting the Link Setup Page, the IP address, Netmask, and Gateway should be changed as appropriate. Press the “Save Changes” button to the left to save the IP address. When properly linked the display should show the locked indications at the top of each page



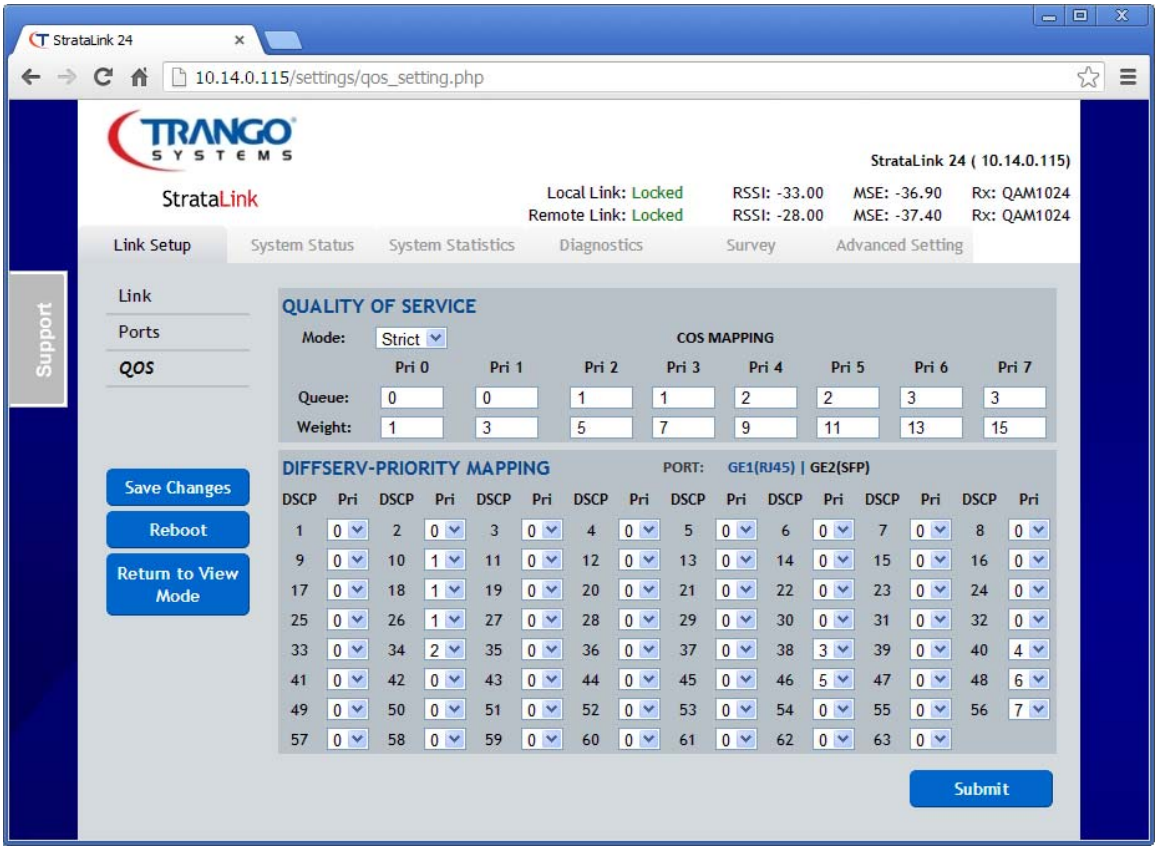
Link setup - Link Page

The Link Setup – Ports Page shows the current configuration for the RJ45, SFP, and PLA ports. The defaults are set for autonegotiate. The SFP ports only support Gigabit operation and require an SFP module (copper or fiber) available from Trango.



Link setup – Ports page

The Link Setup QoS page displays the current settings for the QoS. Changes can be made to reflect the prioritization of user traffic across the link, or to change the QoS Mode from strict to Weighted Round Robin (WRR). Default values are shown below.



Link setup- QoS Page

Installation

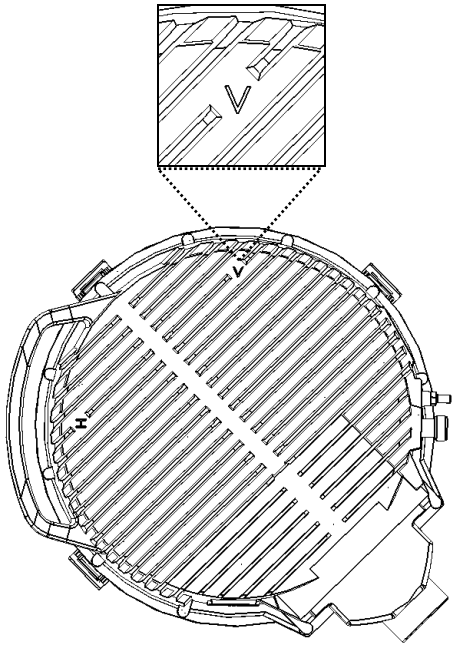
The StrataLink 24 comes preconfigured to link up as soon as power is applied. To install and operate the StrataLink follow these steps:

BENCH:

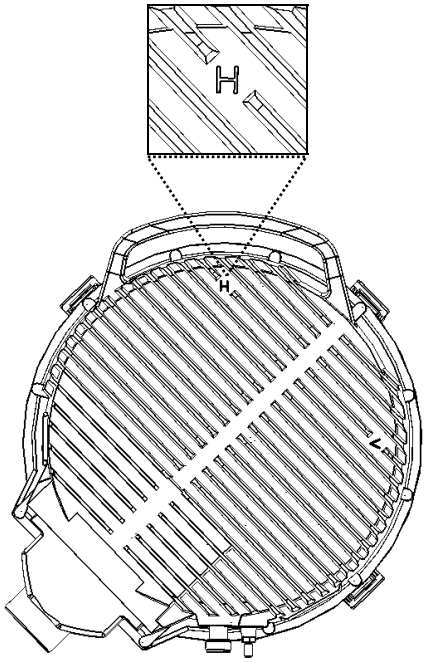
1) Apply power using the PoE or with direct power (-48VDC)
2) Log into each unit using a browser or telnet with the default IP addresses of 192.168.100.100/192.168.100.101 with the following user/passwords
    a. View node user: **admin** password: **trango**
    b. Config node: user: **config** password: **trango**
3) Units should link if waveguide ports are oriented toward each other.
4) Adjust the transmit power as appropriate. **For FCC Compliance, it is the responsibility of the installer to set the transmitter power at or below -3 dBm to meet the field strength limits of FCC Part 15.249.**
5) Save changes.
6) Change the IP address to the desired IP address and submit. Radio connection will be lost until new IP address is used.

FIELD:

1) Install the antennas onto the mounting pole at each end of the link and visually align them toward each other.
2) Latch one StrataLink 24 unit to the back of the antenna with "**V"** indicator at the top - This unit will be transmitting Vertical Polarization and receiving Horizontal Polarization.



3) Latch the other StrataLink 24 unit to the far end antenna with the **"H"** indicator at the top – This unit will be transmitting Horizontal Polarization and receiving Vertical Polarization.



4) Power up the radios using PoE or with direct power (-48VDC)
5) Align the radios using the BNC RSSI output to obtain the expected RSL.
6) Link LED should light up solid green on both ends.
7) Start passing Data!

Antenna Connection

The StrataLink24 utilizes a slip fit connection that makes installation simple. The unit is designed to mount to a Trango circular waveguide antenna which may be 1, 2, or 3 foot diameter.

Power Supply

Trango can provide power supplies for rack mount and desktop applications. The PSUPPLY-WM-48 and PSUPPLY-WM-48-L are wall mount power supplies with 2.3 and 1.66 Amp capacities, respectively and are only recommended for a single StrataLink 24 unit. The PSUPPLY-1U-48 is a rack mount power supply with 6.5 Amp capacity that can support multiple co-located StrataLink24 units. The power supply should be kept in a weatherproof, temperature controlled environment within the operating temp of 0 to 40 deg C.

Direct Power Option

The StrataLink24 can be direct powered using a -48 Volt DC source with a terminal block connection at the unit. The length of the cable varies on the gauge of the wire being used, but in general longer distances can be achieved than using the PoE option since the voltage drop is less. As long as the minimum voltage of -43 Volts DC is maintained at the StrataLink 24 unit, the system will operate normally. This option is also preferred for applications using fiber for the data.

Power Over Ethernet (PoE) Option

When utilized with a PoE-GigE-48 PoE injector, the StrataLink 24 can be powered over the same Cat5e/Cat6 Shielded Twisted Pair (STP) that is used for the Main data/management connection. Surge suppression and provision for redundant power supplies are provided with a single PoE-GigE-48 device.

Features

The StrataLink 24 basic features are briefly described here. For more information on advanced features and a full command line interface listing, please reference the individual Application Notes and Full User Manual available online at www.trangosys.com.

Traffic Capacity

With QAM1024 modulation in a 60 MHz channel, the link can support capacities up to 750 Mbps full duplex or 1.5 Gbps Mbps aggregate, including the Multilayer Header compression. Header compression is always active unless disabled by the user.

No restrictions are put on the channel size or modulation levels that can be set by the user, however the capacity is restricted based on the license key installed.

The base model comes with **200** Mbps full duplex license and there are upgrade keys available that can open the entire 750 Mbps capacity:

SL-Key-300:

Description: Unlocks throughput capacity from 200 up to 300 Mbps Full Duplex payload (300 Mbps each direction) – Covers one link – (2 license keys provided)

SL-Key-400:

Description: Unlocks throughput capacity from 200 up to 400 Mbps Full Duplex payload (400 Mbps each direction) – Covers one link – (2 license keys provided)

SL-Key-MAX:

Description: Unlocks throughput capacity up to Maximum capacity Full Duplex payload (Approx. 750 Mbps each direction) – Covers one link – (2 license keys provided)

Multilayer Header Compression

When dynamic multilayer header compression is enabled, up to 750 Mbps capacity (IPv4) can be achieved without the dependency on traffic payload. Up to 2048 headers are stored in a database and the Ethernet header is replaced with a 2 or 4 byte tag. The tag is re-mapped to the correct Ethernet header on the far end of the link. Statistics are available to show the effectiveness of the Header Compression Engines. There are two engines used for compressing the streams, one primarily for L2 portion of the header , and another for the L3-L4 portions of the header.

A higher percentage indicates better compression effectiveness . For a single stream of IPV4 with UDP the percentage can be as high as 60%.

Custom channel size and T/R spacing

The 24 GHz unlicensed spectrum is typically very clear due to the narrow antenna beamwidths required. However, if collocated systems on the same path are required, operation of each link on a non overlapping frequency pair may be advised. The StrataLink 24 allows custom TX and RX center frequency to help with co-location.

The system can support user selectable channel sizes of 10, 14, 20, 25, 30, 40, 50, or 60 MHz.

Recommended settings for each channel size are shown in Appendix 1

Advanced Adaptive Coding and Modulation (AACM)

Adaptive coding and modulation provides error-free hitless changing of the modulation level for a fixed channel width to allow the link to be maintained during heavy weather related fading conditions. Instead of the link dropping and no traffic passing, the link will be maintained with a lower capacity until the fading condition is removed, at which time the link will return to the normal modulation level.

The transitions between modulation levels are controlled by pre-set MSE thresholds and each transition is made without dropping packets since both ends of the link coordinate the transition automatically. The available modulation levels are 1024 QAM, 512 QAM, 256 QAM, 128 QAM, 64 QAM, 32 QAM, 16 QAM, 8PSK, and QPSK.

The user can set both a maximum and minimum modulation level which the radio will operate within. Both sides of the link should have the same min and max modulation levels for proper operation. Typically it is best to always use QPSK as the minimum modulation level to maintain the link during deep fading.

Adaptive Channel Size (ACS)

In addition to the AACM, up to an additional 10 dB of system gain can be obtained by enabling the adaptive channel size feature.

ACS will set the channel to the smaller, highly coded 10 MHz bandwidth to preserve the link during extreme fading conditions. In the case of a 60 MHz channel downshifting from 1024 QAM to QPSK, the profile will be set to 10 MHz channel size if the MSE goes below a user set downshift threshold. This 10 MHz profile is a highly coded profile that can operate with very low SNR. The system gain is increased by up to 10 dB to preserve communication across the channel for as long as possible. The switch is not hitless and there will be a 1-2 second break in traffic during the downshift. When the MSE improves above a user set upshift threshold, both ends of the link will reset to the user set ACM profile.

GPS Coordinates

Allows entering/saving the GPS Coordinates manually to assist in plotting the endpoints of each link on third party management software link SNMP managers and Google Earth/Maps. The coordinates must be entered by the user manually.

Site Survey (Spectrum Analyzer Function)

This feature allows the user to check the spectrum utilization for the entire 24.05 to 24.25 GHz band. The result displays the peak and average power over a time interval using the 10 MHz bandwidth. The measurements are stepped at the 10 MHz spacing

The user may specify the time spent for the survey in minutes. The transmitter is disabled while the test is running so the link will be broken during the test. After the test the link will resume and the results will be displayed.

Link Management

The StrataLink24 can be managed through the following methods:

Graphical User Interface (GUI):

Web Browser: Remote access via in band and out of band methods with view/configuration level access (single user + password).

The StrataLink24 is compatible with any standard web browser such as Chrome, Firefox, Safari and Internet Explorer. Chrome is the recommended browser.

The basic setup web page allows the following items to be:

Set and saved

- Transmit Frequency
- Channel Bandwidth and Modulation Range
- Transmit Power for each ACM profile
- Target RSSI
- Turn Opmode On and set default to ON
- IP address, IBM on/off and subnet
- Status snapshot
- Config Save

Viewed

- Link Name, coordinates, and Network time
- Local and Remote RSSI, BER, MSE, link status
- Transmit Freq Range allowed
- Max TX power allowed
- Current capacity based on profile and utilization

- Model and Software version
- Link to Trango Support Page

Additional Web pages provide advanced setup of the various features and provide detailed monitoring and troubleshooting

Command Line Interfaces

SSH – Encrypted remote access via in band and out of band methods with separate view and configuration level access (password protected)

Telnet – Remote access via in band and out of band methods with separate view and configuration level access (password protected)

Console – Local Access using a serial cable for bench configuration with separate view and configuration level access (password protected).

SNMP – Remote control and monitoring via in-band and out-of band methods using any third party Network Management Software (NMS).

Standard MIB II System Level and Enterprise MIB Blocks are supported with monitoring for all major link health and traffic related metrics.

Firmware Update

Remote update of the system firmware is available via TFTP or FTP. The TFTP daemon must be enabled if TFTP is used to update the system.

bootimage upgrade – upgrades the flash memory with the new software following TFTP or FTP of new firmware into the system. A system reboot is required after performing this command to load the new firmware

bootimage toggle – Returns the firmware to the previous version as shown in the *version* command. A system reboot is required after performing this command to load the previous firmware

Appendix A

Product Specifications

Dimensions and Weight

Parameter	Specification
Size	10.5 x 10.5 x 4.1 in
Weight	<10 lbs

Environmental

Parameter	Specification
Operating Temperature Range	-40 deg C to +65 deg C - Functional -40 deg C to +55 deg C - Spec Compliant
Storage Temperature	-40 deg C to +75 deg C
Humidity	100% Condensing

Emissions

Parameter	Specification
FCC Conducted Emissions	FCC 15.107 (a) Class “B”
FCC Radiated Emissions	FCC 15.109 (a) Class “A”

Wireless Compliance

Parameter	Specification
FCC	CFR47 Part 15.249 (24 GHz Point to Point Device) CFR47 Part 15 Class A unintentional radiator
Canada	RSS 210 (Annex 12)

Wireless Parameters

Parameter	Specification
Frequency Range	24.05 to 24.25 GHz (FCC and IC models)
Channel Sizes Supported	10 , 14, 20, 25, 30, 40, 50, 60 MHz
Modulation Levels	QAM1024, QAM512, QAM256, QAM128, QAM64, QAM32, QAM16, 8PSK, QPSK
Transmit RF power output	FCC: Approx +33 dBm EIRP Industry Canada: Conducted 0 dBm for all antenna sizes
Transmitter Power Accuracy	+/- 2 dB
Transmitter Frequency Accuracy	+/- 7 ppm
Transmitter Center Frequency Synthesizer step size	1 MHz
Transmitter Output Power (Muted)	< -50 dBm
Adaptive Modulation Type	Error Free, Hitless through each transition

Radio Sensitivity

Channel Width (MHz)	Symbol Rate (Msps)	Receive Sensitivity In dBm								
		QPSK	8PSK	QAM 16	QAM 32	QAM 64	QAM 128	QAM 256	QAM 512	QAM 1024
10	7.5	-94.0	-89.0	-86.0	-82.0	-79.6	-76.5	-73.5	-70.1	NA
14	12.2	-90.5	-87.3	-84.3	-80.3	-77.9	-74.8	-71.8	-68.4	-64.9
20	16	-89.0	-85.8	-82.8	-78.8	-76.4	-73.3	-70.3	-66.9	-63.4
25	20.8	-88.1	-85.1	-82.0	-78	-75.4	-72.3	-69.3	-65.9	-62.4
30	26	-87.3	-84.1	-81.1	-77.1	-74.7	-71.6	-68.6	-65.2	-61.7
40	34.83	-86.0	-82.8	-79.8	-75.8	-73.4	-70.3	-67.3	-63.9	-60.4
50	42	-85.1	-81.8	-78.9	-74.9	-72.5	-69.4	-66.4	-63.0	-59.5
60	52	-84.0	-80.3	-78.3	-74.3	-71.9	-68.8	-65.8	-62.4	-58.9

Power

Parameter	Specification
Input Voltage Range (Direct)	-40 to -72 VDC
Input Voltage Range (PoE)	-43 to -50 VDC (At PoE-GigE-48 Power input)
Power Consumption	<45Watts

User Interfaces

Description	Specification
Ethernet Traffic Ports and/or In Band Management (IBM)	ETH1: RJ45 - 10/100/1000BaseT ETH2: SFP - 1000BaseT for SFP Module: SFP-GigE- C (1000BaseT) SFP-GigE-S (1000BaseLX Single Mode Fiber) SFP-GigE-M (1000BaseLX Multimode Fiber)
PLA Port	ETH3: SFP - 1000BaseT for SFP Module
Direct Power	2 Position Latching screw terminal Block
RSSI Alignment	BNC-Female (CBLDAT-RSSI recommended)
Reset IP/Config	Momentary Push Button
Antenna	Slip-Fit Circular Waveguide

Ethernet Parameters

Parameter	Specification
Packet Size	64-9600 Bytes , IPV4, IPV6
Max Capacity	L1: 900 Mbps L2: 750 Mbps
Data Latency	< 300 uS for 64 byte packets, Max capacity (per RFC2544 store and forward)
QoS	802.1p Port Prioritization VLAN Priority for tagged packets: 4 Classes of Service
RSTP	Rapid Port Shutdown both ends of link within 50 mSec of link drop

MAX Ethernet Capacity by channel size

BW(MHz)	QPSK	8PSK	16 QAM	32 QAM	64 QAM	128 QAM	256 QAM	512 QAM	1024 QAM
10	23	35	46	57	71	82	92	105	NA
14	34	52	69	85	103	120	136	154	174
20	48	72	97	120	148	171	194	220	249
25	60	92	123	152	185	216	246	280	317
30	72	109	146	182	219	257	296	336	380
40	97	147	197	245	296	347	394	448	507
50	120	181	242	300	367	427	490	556	627
60	144	217	290	361	441	514	602	664	754

Max Channel Bandwidth & Capacity including Header Compression

(68 Byte IPV4 UDP packets with One VLAN tag)

Appendix B

StrataLink 24 Recommended Operating Frequencies

10 MHz Channels

Min Center Freq: 24055 MHz

Max Center Freq: 24245 MHz

T/R Spacing: 100 MHz

Low Center Freq	High Center Freq
24055	24155
24065	24165
24075	24175
24085	24185
24095	24195
24105	24205
24115	24215
24125	24225
24135	24235
24145	24245

14 MHz Channels

Min Center Freq: 24058MHz

Max Center Freq: 24241 MHz

T/R Spacing: 99 MHz

Low Center Freq	High Center Freq
24058	24157
24072	24171
24086	24185
24100	24199
24114	24213
24128	24227
24142	24241

20 MHz Channels

Min Center Freq: 24060 MHz

Max Center Freq: 24240 MHz

T/R Spacing: 100 MHz

Low Center Freq	High Center Freq
24060	24160
24080	24180
24100	24200
24120	24220
24140	24240

25 MHz Channels

Min Center Freq: 24054 MHz

Max Center Freq: 24237 MHz

T/R Spacing: 98 MHz

Low Center Freq	High Center Freq
24064	24162
24089	24187
24114	24212
24139	24237

30 MHz Channels

Min Center Freq: 24066 MHz

Max Center Freq: 24234 MHz

T/R Spacing: 98 MHz

Low Center Freq	High Center Freq
24066	24164
24096	24194
24126	24234

40 MHz Channels

Min Center Freq: 24071 MHz

Max Center Freq: 24229 MHz

T/R Spacing: 100 MHz

Low Center Freq	High Center Freq
24071	24171
24129	24229

50 MHz Channels

Min Center Freq: 24075 MHz

Max Center Freq: 24225 MHz

T/R Spacing: 100 MHz

Low Center Freq	High Center Freq
24075	24175
24125	24225

60 MHz Channels

Min Center Freq: 24081 MHz

Max Center Freq: 24215 MHz

T/R Spacing: 120 MHz

Low Center Freq	High Center Freq
24081	24215

COMPLIANCE

FCC

FCC ID: NCY-SL24

The StrataLink 24 System is used for point-to-point operation only, and requires professional installation due to FCC limits on radiated output power.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference,

(2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in any particular installation. Operation of this equipment in a residential area is likely to cause harmful interference in which case the use will be required to correct the interference at his own expense.

WARNING:
Intentional or unintentional changes or modifications must not be made unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty. To comply with RF exposure requirements, the following antenna installation and device operating configurations must be satisfied. The antenna for this unit must be fixed and mounted on outdoor permanent structures with a separation distance of at least two meters from all persons. Furthermore, it must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada

IC: 2945A-SL24

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Les changements ou modifications non approuvés expressément par la partie responsable de la conformité pourrait annuler l'autorité de l'utilisateur à faire fonctionner l'équipement.

RF Exposure Warning

The antennas used for this transmitter must be installed to provide a separation distance of at least 2 meters from all persons and must not be located or operating in conjunction with any other antenna or transmitter except as listed for this products certification..

This device has been designed to operate with the following antennas:

Trango Systems: AD24G-1-T2: 1 foot diameter – 36.1 dBi Dish
Trango Systems: AD24G-1-U2: 1 foot diameter – 34 dBi Dish
Trango Systems: AD24G-2-T2: 2foot diameter – 41 dBi Dish
Trango Systems: AD24G-2-U2: 2 foot diameter – 40 dBi Dish
Trango Systems: AD24G-3-T2: 3 foot diameter – 44.5 dBi Dish