



GX4000 Series

E-band Impulse Radio System

User Guide

T101-2293-01

Issue 1.01

2013 July

FUJITSU LIMITED

Issue History

Issue Number	Issue Date	History
1.01	27 th July, 2013	First issue

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1. GX4000 System Description

1.1 Introduction

This section describes the system description of BroadOne GX4000 series E-band Radio System. The main areas covered are:

- System Overview
- Mechanical Configuration
- General Specification
- Power requirement

1.2 System Overview

Fujitsu BroadOne GX4000 series E-band Radio System is complete All-In-One ODU radio employing impulse radio technology. The capacity is Multi Gigabit throughput using 70/80 GHz spectrum.

The system requires Line-of-Sight environment for radio transmission path.

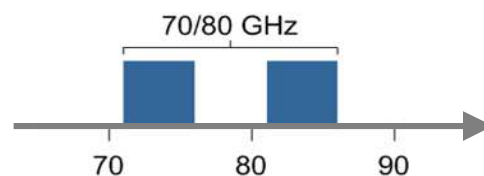


Figure 1.2-1 Frequency Band Allocation

Fujitsu BroadOne GX4000 series E-band Radio System is more cost-effectively, rapidly and flexibly deployable access method than optical fibre for one-mile-transmission and alternative connectivity for access at certain areas where environmental impact or legal implication is not suitable for optical fibre.

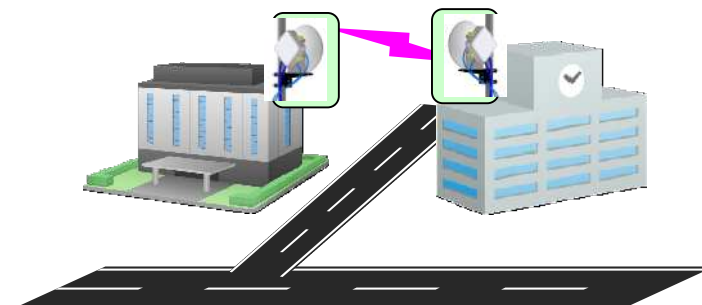


Figure 1.2-2 Alternative high rate access for optical fibre

Types of Signal Interfaces

The models are available as following.

- **GE Model**

Gigabit-Ethernet model

The user data rate is 3.0 Gbps capacity

Connect with other Ethernet based network equipment
(Router/Switch/etc.)

- **CPRI model**

The throughput, depends on CPRI interface implementation of the base station product is 2.4576 Gbps

Connect with BBU/RRH

Types of Signal Interfaces

The types of signal interface are available as following.

- 10G Ethernet interface (10GBASE-LR)
- n x Gb Ethernet (1000BASE-LX) using optional Baseband Conversion Module
- CPRI (Common Public Radio Interface) (*1) interface for mobile communication system

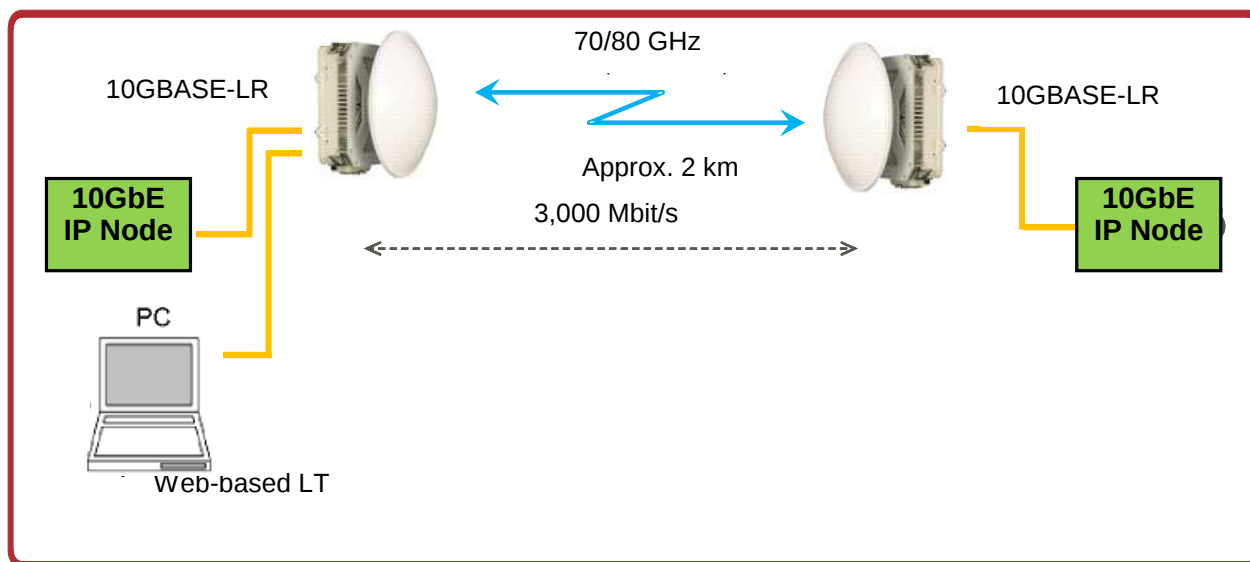


Figure 1.2-3 10GbEthernet Interface Configuration

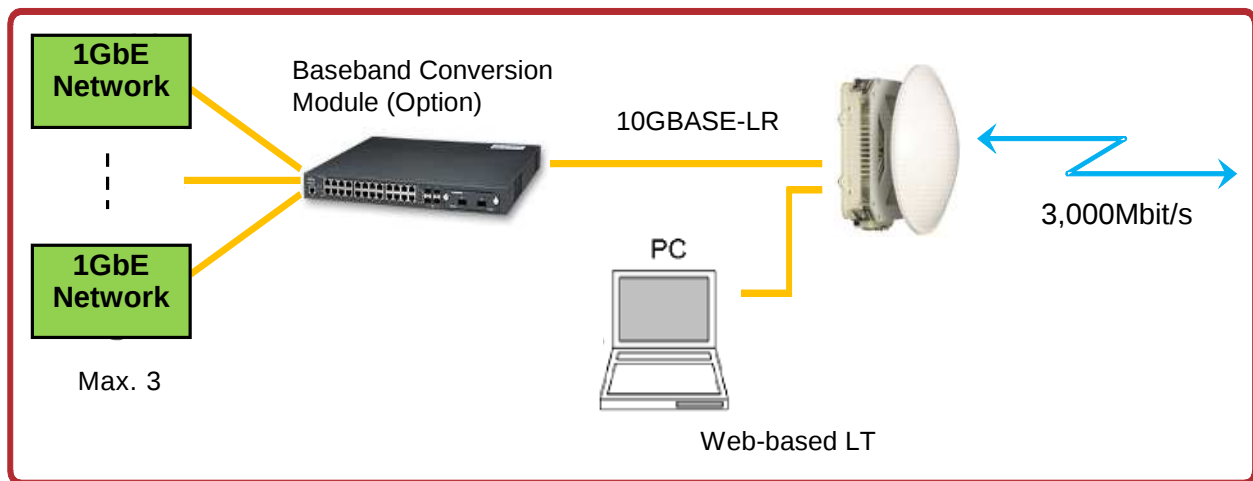


Figure 1.2-4 n x GbEthernet Interface Configuration

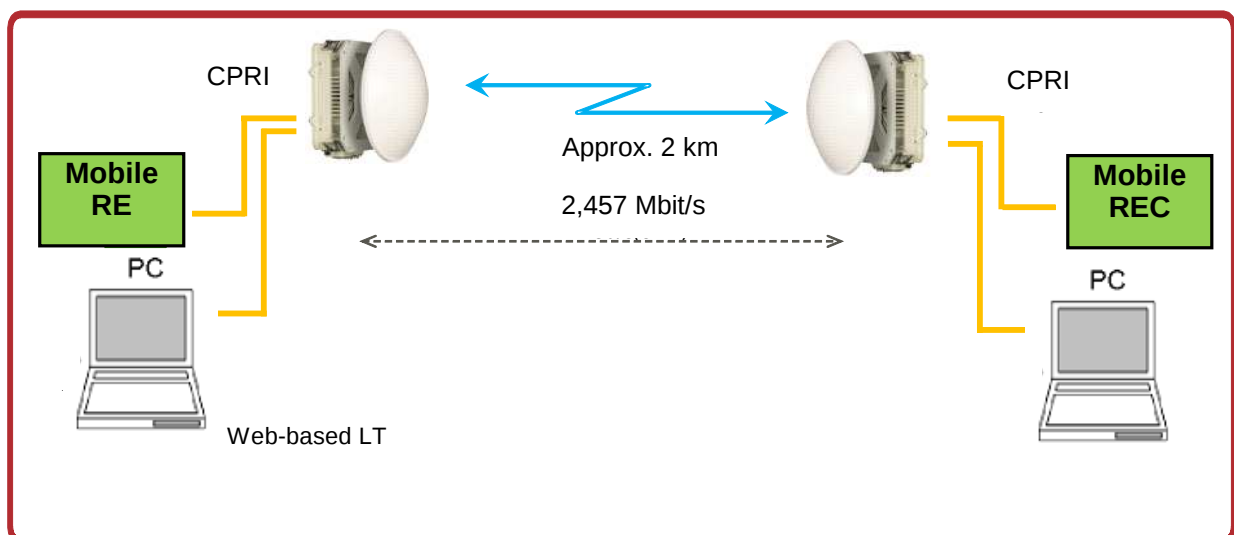


Figure 1.2-5 CPRI Interface Configuration

Note-1*:

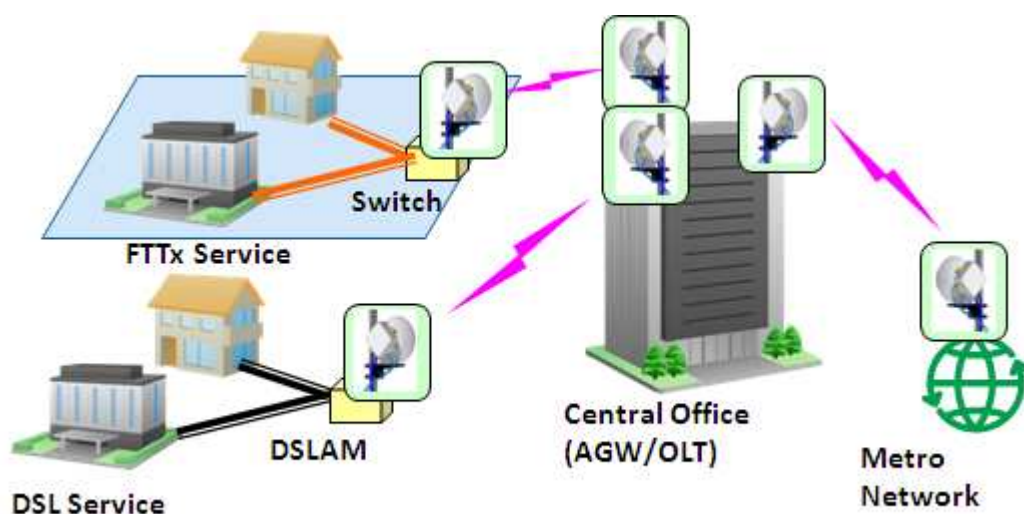
The **Common Public Radio Interface** (CPRI) is the successful industry cooperation defining the publicly available specification for the key internal interface of radio base stations between the Radio Equipment Control (REC) and the Radio Equipment (RE). The Parties cooperating to define the CPRI Specification are now encompassing Ericsson, Huawei, NEC, Nokia Siemens Networks and Alcatel-Lucent. Nortel contributed as member of the CPRI cooperation to CPRI Specification versions 1.4, 2.1, 3.0 4.0 and 4.1 and left the cooperation in December 2009

Features & Performance

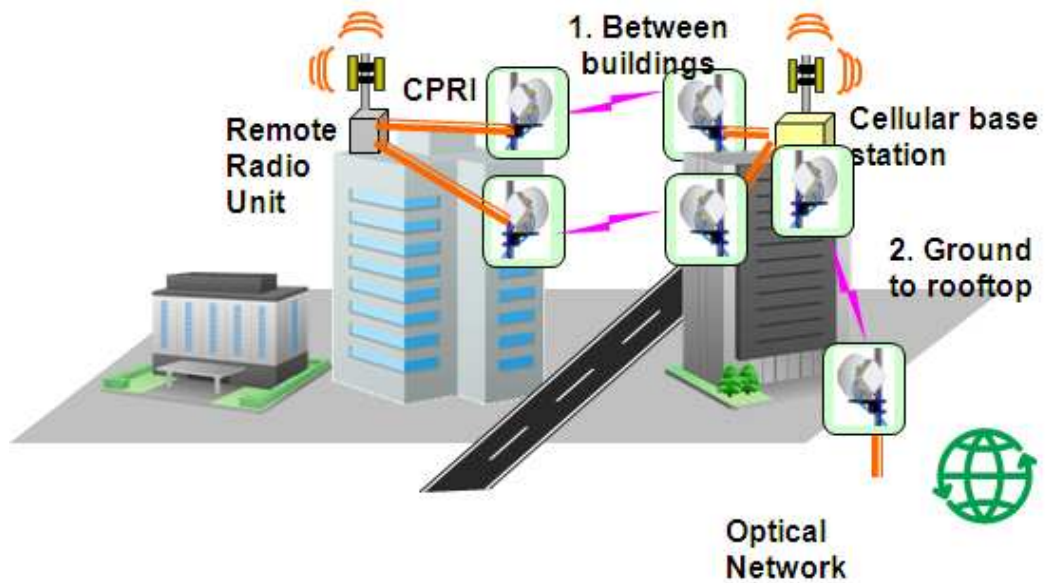
- Wireless Innovation based on Impulse Radio
- 71-76/81-86 GHz (4,500MHz bandwidth)
- FDD (Frequency Division Duplex)
- 1+0 point-to-point radio
- Lightweight, small size zero-footprint ODU design
< 4.0 liter and < 4.7 kg
- High power amplifier using GaAs Field Effect Transistor (GaAs FET)
- Low power consumption (< 30W / 1+0)
- Three types of baseband interfaces available
 - 10Gb Ethernet: IEEE802.2ae 10GBASE-LR (XFP)
 - N x Gb Ethernet: IEEE822.3z 1000BASE-LX using optional Baseband Conversion Module
 - CPRI: 2.4 Gbit/s (SFP)
- LC connector on fibre interface (Main signal)
- Low latency for multimedia application
- Transmit Power Control (ATPC/MTPC)
- Reed Solomon error correction
- Web-based LT (local terminal) and EMS compatible SNMP (RJ-45)
- 1-foot or 2-foot parabolic antenna

Sample Application

- Backhaul in Fixed Broadband Networks
 - Fibre Extension
 - Local Area Network Extension
 - Metropolitan Area Networks (MAN)

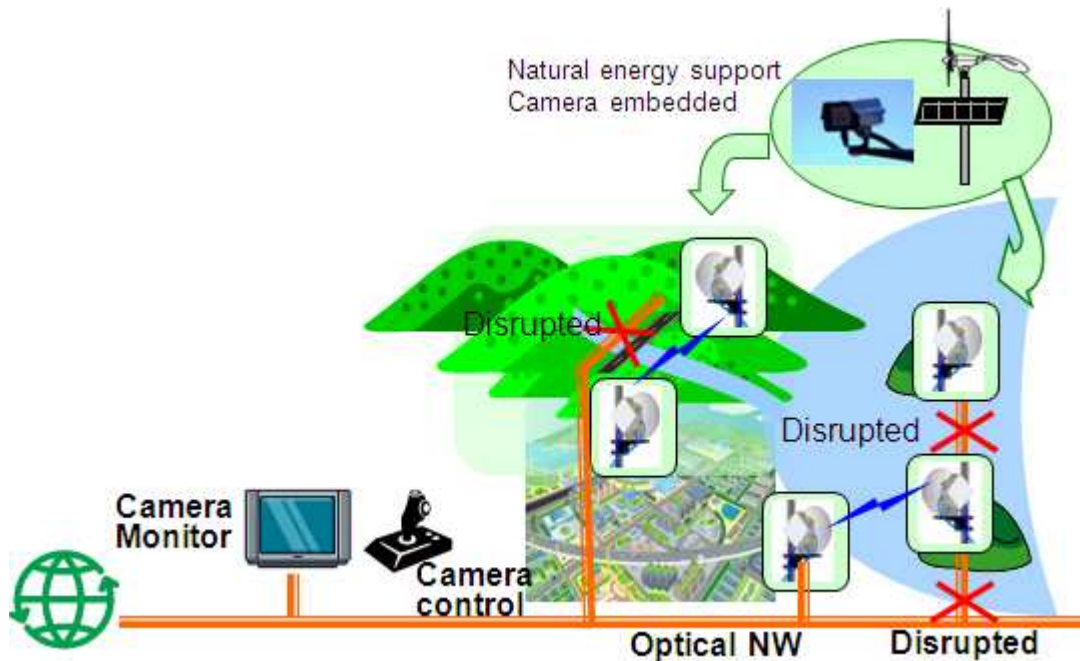


- Backhaul in Mobile Broadband Networks (3G/LTE/etc.)
- Fronthaul in Future Mobile Networks (CPRI Transport)



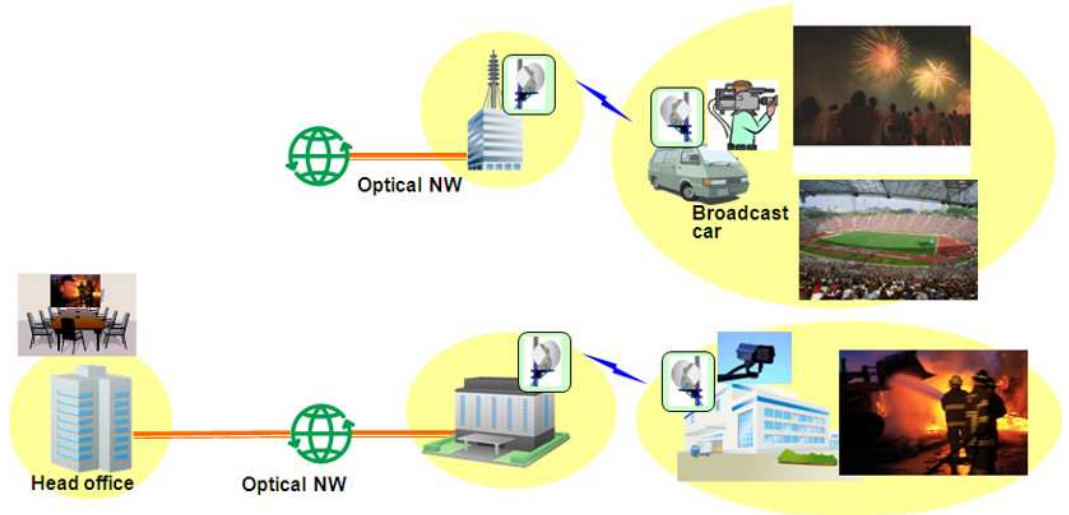
- Portable Networks for Disaster Recovery

Quickly re-connection high speed transmission when optical infrastructure was disrupted, especially across river, lake, mountainous areas, islands, etc.

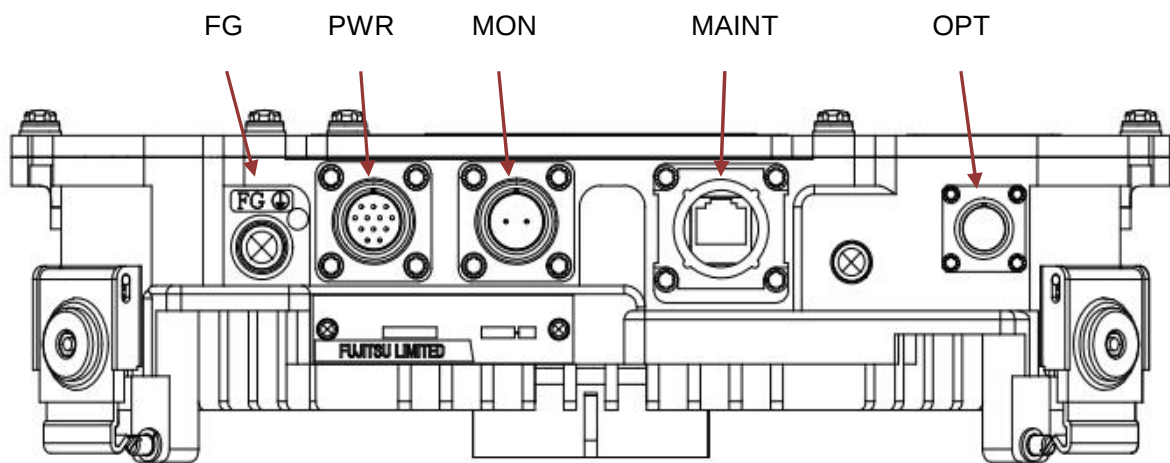
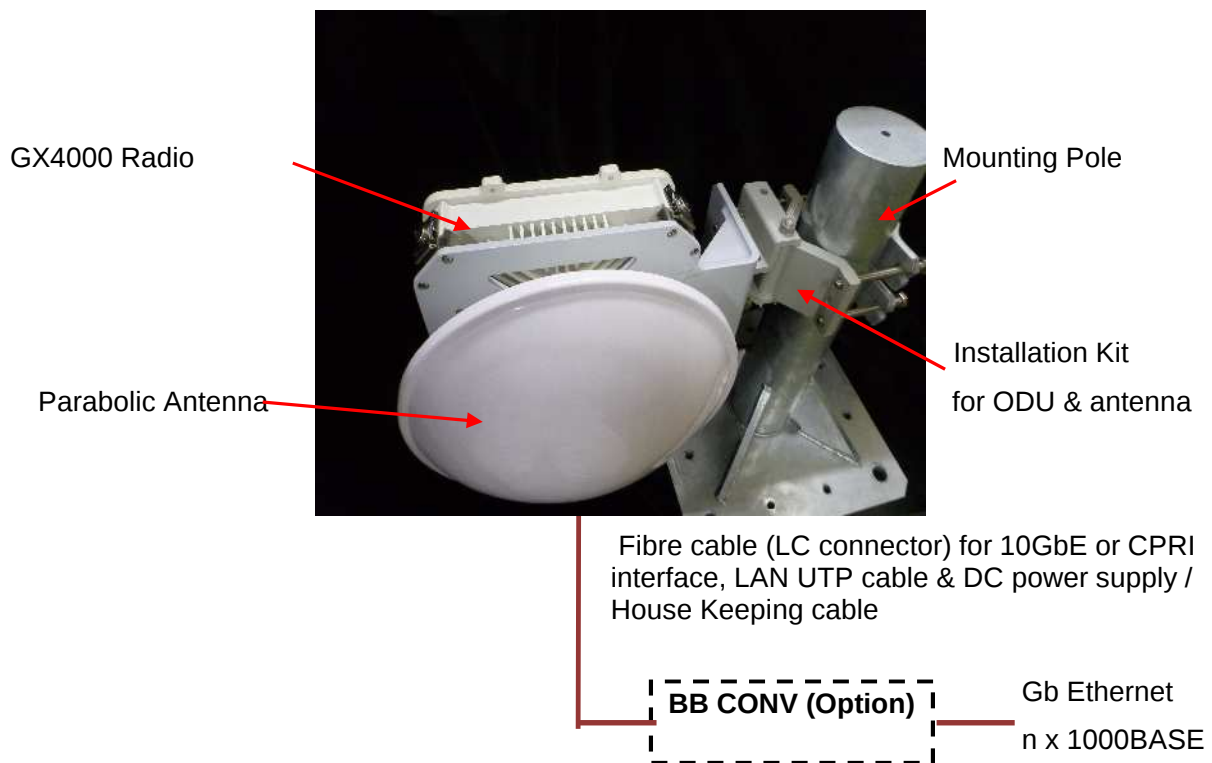


- Portable Networks for HDTV Transport

Flexible and establish high capacity transmission between field sites and centre in order to transmit uncompressed HDTV thanks to low latency feature.



1.3 Mechanical Configuration



Port/Connector of GX4000 Radio

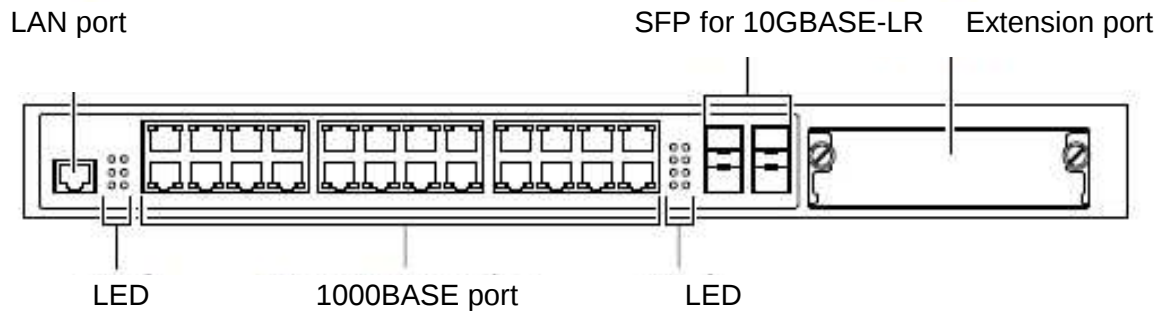
FG: Frame Grand connector

PWR; -48Vdc power/House Keeping connector

MON; AGC Monitor Port (For Antenna alignment)

MAINT; Local Maintenance connector (LAN, RJ-45)

OPT; Optical fiber connector (LC duplex)



Connector of Baseband Conversion Module (Option)

Radio Side Interface; 10GBASE-LR (SFP) Port

Line Side Interface; 1000BASE-LX Port

1.4 General Specifications

System Specification

Table 1.4-1 System Specification

Item	Description
RF Band used	70/80 GHz band (E-Band) in accordance with ETSI EN302 217-3 V1.3.1 (2009-07) Annex UC 70 GHz band: 71,0 to 76.0 MHz 80 GHz band: 81,0 to 86.0 MHz
Occupied Bandwidth	4,500 MHz
Transmission Capacity	<u>Digital Transfer rate:</u> Ethernet interface: 3,000 Mbit/s CPRI interface: 2,457.6 Mbit/s <u>Total digital transfer rate:</u> 70 GHz band: 3,266.786 Mbit/s 80 GHz band: 3,274.286 Mbit/s
System Configuration	1+0, Terminal configuration Block diagram of GX4000 Radio is shown in Figure 1.4-1.
TX Power Output	0 to +10 dBm measured at Point C7 (antenna port) in accordance with ETSI EN302 217-1 V1.2.1 (2007-06)
TX Output Control	ATPC/MTPC
Received RF Input	Minimum RSL: -52 dBm typical at BER of 10^{-6} Maximum RSL: -25 dBm typical at BER of 10^{-6} AGC range: -54 to -25 dBm measured at Point C (antenna port) in accordance with ETSI EN302 217-1 V1.2.1 (2007-06)
Modulation	ON-OFF Keying ("Impulse Radio" method)
Error Correction	Reed Solomon (255/239) with Bit Interleave function
Route ID	0 to 15, pre-settable
Baseband Interface	(1) 10GBASE-LR or (2) n x 1000BASE-LX using optional Baseband Conversion Module or (3) CPRI REC (Radio Equipment Controller) or (4).CPRI RE (Radio Equipment)
Fiber interface type	LC connector
DC Power Supply	DC -48 Vdc (-40.5 to -57 Vdc) for GX4000 Radio AC 100/240 V +/- 15% for Baseband Conversion Module
Power Consumption	< 30 W (Typical) for GX4000 Radio < 80 W (Typical) for Baseband Conversion Module
Dimension	250 x 250 x 64 mm excluding connectors and screws for GX4000 Radio 441 x 388 x 44 mm for Baseband Conversion Module
Weight	GX4000 Radio: < 4.7 kg Optional Baseband Converter without 19-inch rack kit: < 5.5 kg 1-foot antenna with mounting material: < 8 kg 2-foot antenna with mounting material: < 11 kg Installation kit to mounting pole: < 3.5 kg

Transmitter of GX4000 Radio Equipment

Table 1.4-2 Transmitter Part

Item	Description
RF Output Power	0 to +10 dBm measured at antenna port RF output power tolerance: -3.0 / +1.0 dB
RF Output Power when set TX OFF	< -40 dBm
CW/MOD Selection	None
RF Band used and RF equivalent center frequency	70/80 GHz band (E-Band) in accordance with ETSI EN302 217-3 V1.3.1 (2009-07) Annex UC 70 GHz band: 71,125 to 75,625 MHz (f ₀ = 73,503 GHz) 80 GHz band: 81,125 to 85,625 MHz (f ₀ = 83,494 GHz)
Output Power Density Mask	In accordance with ETSI EN 302 217-3 V1.3.1 (2009-07) Annex-UC measured at antenna port as shown in Figure 1.4-2a.
Emission Outside the 71-76 GHz & 81-86 GHz Range	(1) Output power spectral density, at antenna port, falling outside of the 71-76 GHz band edge or below the lower band edge of 81-86 GHz band should be limited to a maximum of -55 dBW/MHz. (2) For the band 86-92 GHz is allocated to Passive Services and, in particular to Earth Extension Satellite Services, for their protection, unwanted emission power density at the antenna port is in accordance with Figure 1.4-2b.
TX Spurious Emission - External	In accordance with ETSI EN301 390 V1.2.1 (2003-11) For the interference into other systems operation for the fundamental frequency range of 13 GHz to 150 GHz band, spurious emission allowable is shown in Figure 1.4-2c. (a) < -50 dBm in the frequency range of 30 MHz to 21.2 GHz (b) < -30 dBm in the frequency range of 21.2 GHz to 2nd harmonic Spurious emission is defined as any emission at frequencies which are outside the nominal carrier frequency by more than +/- 250% of the aggregated channel separation (4,500 MHz of 70/80 GHz band).
ATPC	Automatic transmit power control (ATPC) is available as standard. Power control level: 0 to +10 dBm, continuous Initiation threshold: Normal RSL +/- 5 dB Restoration threshold; Normal RSL +/- 3 dB Response time: 10 dB/100 msec Control initiator: Pre-settable Received signal Level (RSL) Pre-settable RSL: -30 dBm or -40 dBm
MTPC	Manual transmit power control (MTPC) is available as standard. Power control level: 0 to 20 dB, 0.5-dB step Control: Manual
Symbol Rate	70 GHz (Lower band): 3,266.786 Mbit/s 80 GHz (Upper band): 3,274.286 Mbit/s
RF Output VSWR	Less than 1.5 measured at antenna port

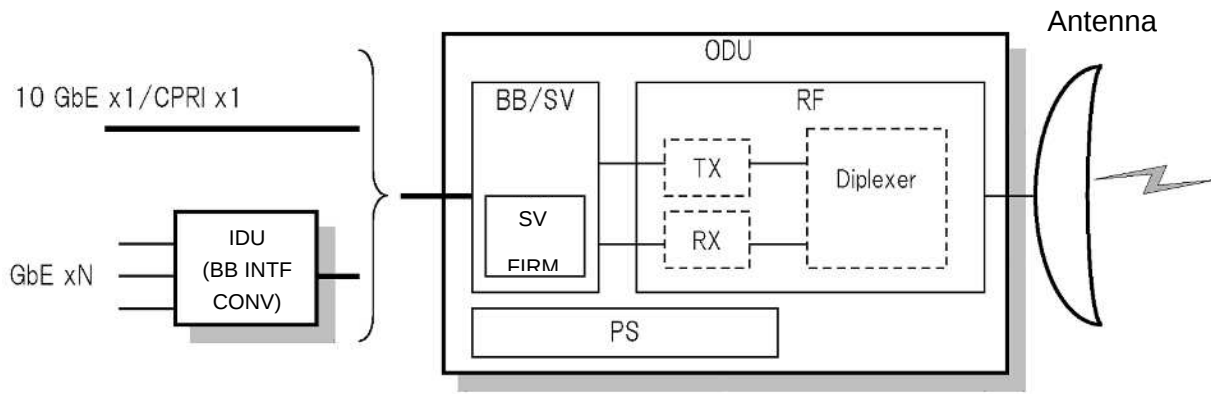


Figure 1.4-1 Schematic Block Diagram of GX4000 Radio

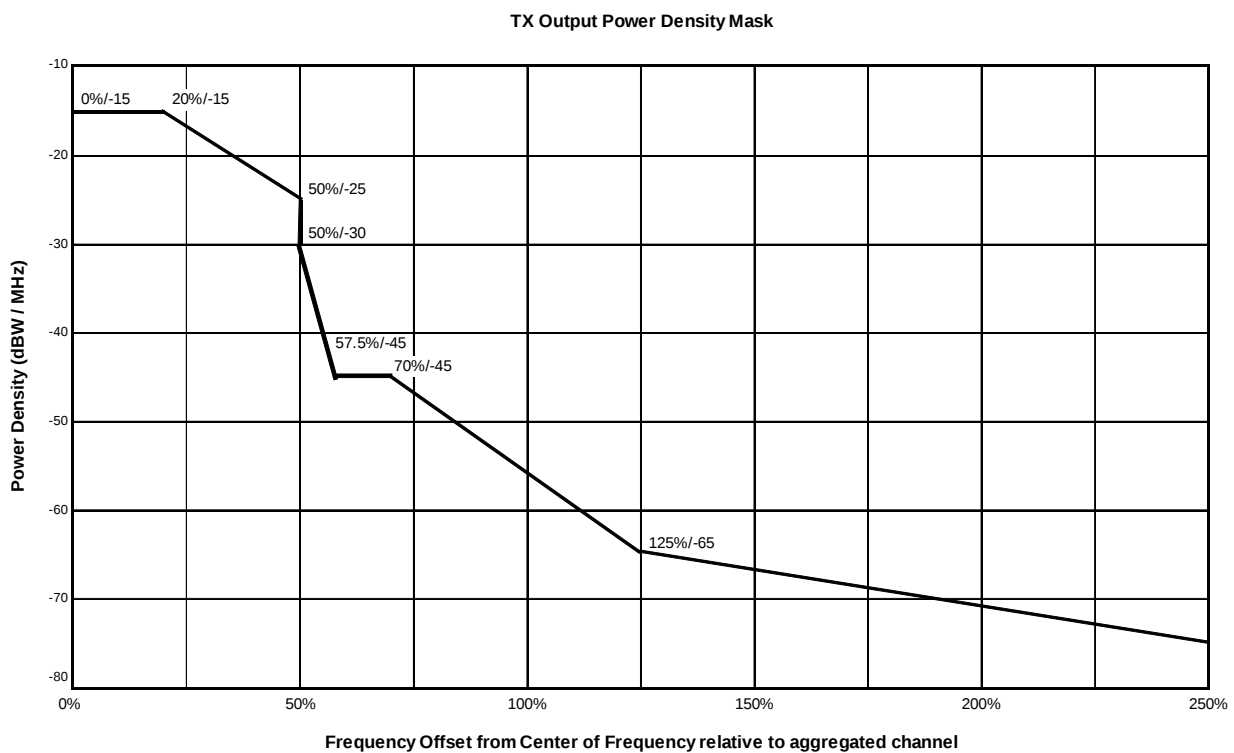


Figure 1.4-2a Output Power Density Mask

(In accordance with ETSI EN 302 217-3 V1.3.1 (2009-07) Annex UC)

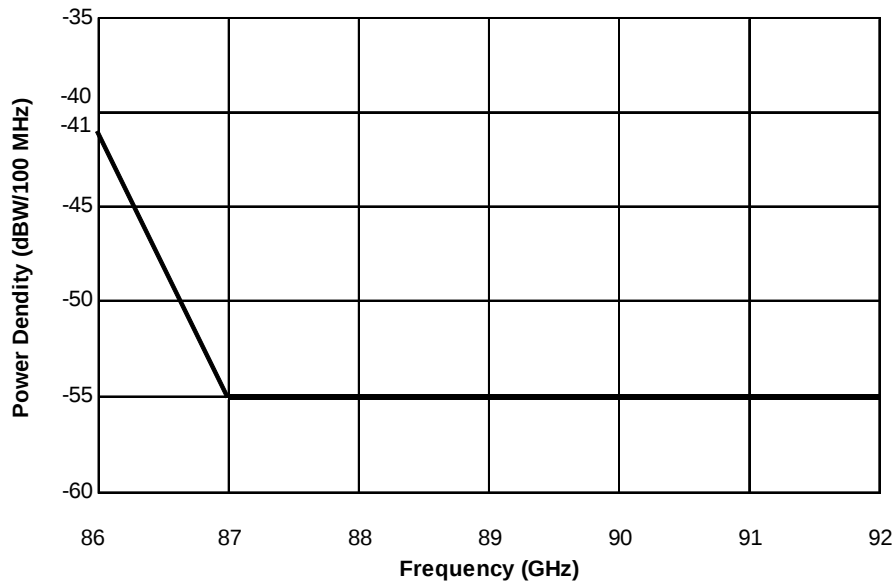
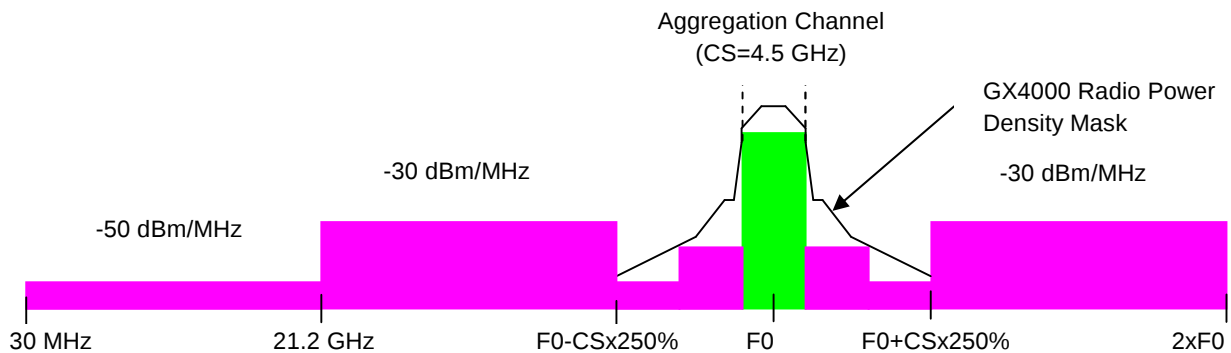


Figure 1.4-2b Unwanted Emission Power Density at the Antenna port
(In accordance with ETSI EN 302 217-3 V1.3.1 (2009-07) Annex UC)



Parameter	Description	Remarks
CS	Aggregation channel spacing	4.5 GHz
F0	Equivalent RF center frequency	73.503 GHz (lower) 83.494 GHz (upper)
F0-CSx2.5	Edge of output power density mask	62.253 GHz (lower) 72.244 GHz (upper)
F0+CSx2.5	Edge of output power density mask	84.753 GHz (lower) 94.744 GHz (upper)
2 x F0	Second harmonic	147.0054 GHz (lower) 166.9886 GHz (upper)

TX spurious specification according to EN301 390 V1.2.1 (2003-11)

Spurious Range	Frequency Range	Specification
External	30 MHz to 21.2 GHz	<-50 dBm
	21.2 GHz to 2 nd Harmonic	<-30 dBm

Figure 1.4-2c Spurious Emission - External at the Antenna port
(In accordance with ETSI EN 301 390-3 V1.2.1 (2003-11))

Receiver of GX4000 Radio Equipment

Table 1.4-3 Receiver Part

Item	Description
Noise Figure	11.5 dB typical 12 dB guaranteed Noise figure is measured at Point C (antenna port) in accordance with ETSI EN302 217-1 (2007-06) & at maximum gain of RF AMP.
RX RF Band	70/80 GHz band (E-Band) in accordance with ETSI EN302 217-3 V1.3.1 (2009-07) Annex UC 70 GHz band: 71,125 to 75,625 MHz 80 GHz band: 81,125 to 85,625 MHz
RX Spurious Emission	<-10 dBm / MHz for out band emission frequency range <-13 dBm / MHz for spurious emission frequency range
Normal Received Power	-52 to -25 dBm at Point C and BER of 10^{-6}
AGC Dynamic Range	-54 to -25 dBm
Allowable TX-RX Interference Level	<-79 dBm when RSL is -52 dBm
RF Interference	In accordance with Table 1.4-3
RX Input VSWR	Less than 1.5 measured at antenna port
Alarm Function	(1) RX Block Failure (2) RSL Abnormal
Monitoring	(1) Analogue monitor for antenna orientation (2) RSL monitor on WebLT (3) Inner temperature monitoring (-33 to +85 degree)

Table 1.4-4 RF Interference Sensitivity

	Co-CH Interference		First Adjacent CH Interference		CW	Remarks
	1 dB deg.	3 dB deg.	1 dB deg.	3 dB deg.		
C/I	23	19	0	-4	-30	

Note: CW: $> f_0 \pm 250\%$

Overall Performance of GX4000 Radio Equipment

Table 1.4-5 BER Performance Overall

Item	Description
Upfade BER	BER = 10^{-6} at RSL of -25 dBm typical BER = 10^{-6} at BER of -28 dBm guaranteed measured at antenna RF input port
Downfade BER	BER = 10^{-3} at RSL of -53.5 dBm typical BER = 10^{-3} at RSL of -51.5 dBm guaranteed BER = 10^{-6} at RSL of -53.0 dBm typical BER = 10^{-6} at RSL of -50.5 dBm guaranteed measured at antenna RF input port
Residual BER	BER < 10^{-12} /hop/day at normal receiving condition (Typical) BER < 10^{-11} /hop/day at normal receiving condition (Guaranteed)

Ethernet 10GbE Optical Interface

Table 1.4-6 10GBASE-LR Optical Interface

SFP Used	10G Gigabit Ethernet optical transceiver
Specification	IEEE802.3ae full duplex
Transmission Speed	10.3125 Gbit/s
Transmission Capacity	3,000 Mbit/s
Optical Fiber used	1.31 μ m single mode fiber
Optical Fiber Wavelength	1.260 to 1.355 nm
Output Level (average)	-8.2 to +0.5 dBm on XFP
Input Level (average)	-12.6 to +0.5 dBm on XFP
Typical Reach	10 km (maximum)
Coding Method	64B/66B
Networking	Tag VLAN, Port VLAN
Synchronization	SyncE, not supported IEEE1588
1-hop, One-way Latency	<69 μ sec for 64 bytes frame <77 μ sec for 1518 bytes frame in accordance with RFC2544
Connector used	LC duplex

CPRI Optical Interface

Table 1.4-7 CPRI Optical Interface

Specification	CPRI specification V5.0 (2011-09-21)
Line Bit Rate	CPRI line bit rate option 3: 2457.6 Mbit/s (4 x 614.4 Mbit/s)
Optical Fiber used	1.31 μ m zero dispersal type single mode fiber (SM) 1.55 μ m dispersal shift type single mode fiber (DSM)
Operation Wavelength	Up-stream (REC ← RE): 1.275 to 1.355 nm Down-stream (REC → RE): 1.480 to 1.500 nm
Output Level (average)	-6 to 0 dBm on XFP
Input Level (average)	-19 to 0 dBm on XFP
Typical Reach	20 km (maximum)
Coding Method	8B/10B
Synchronization	Slave Synchronization
1-hop, One-way Latency	<47 μ sec
Connector used	LC duplex

Maintenance Interface

Table 1.4-8 Maintenance Interface for Ether

Item	GX4000 Radio Ether	GX4000 Radio CPRI
Local Maintenance	Web server, Supervision/Log management/Configuration setting/ User administration/File management	
EMS Access	SNMP V2c (MIB II and Private MIB)	
Connector	RJ-45	
No. of CH	1	
Transmission	10BASE-T and 100BASE-TX	
Cable	Category 5 UTP (Unshielded Twisted Pair)	
Transmission length	<100 m	
Transmission Mode	Auto-negotiation (10M full/100M full)	
MDI/MDI-X	Auto MDI-X	
Remote Contact Line	In-band (V-LAN) both Line and Radio sides	Not applicable for Line side RFCOH for Radio side
Housekeeping Item	Supervision x3 and Control x1	
Time Setting	Auto setting by NTP version 4 (Client) or manual setting	Manual setting by local maintenance application

Base Band Conversion Module (Option)

Table 1.4-9a Base Band Conversion (BB CONV) Module

Line Side Interface	1000BASE-LX
Radio Side Interface	10GBASE-LR
Power Supply	100 to 240 Vac, 50/60 Hz
Power Consumption	< 80 W (all ports are in operation)
Dimension	441 x 388 x 44 mm
Weight	<5.5 kg excluding mounting materials
Mounting	19 inch rack mounting

Table 1.4-9b 1000BASE-LX Optical Interface

SFP Used	1.25 Gigabit Ethernet optical transceiver
Specification	IEEE802.3z full duplex
Optical Fiber Used	62.5/50 μ m multi-mode, 10 μ m single-mode
Operation wavelength	1.270 – 1.355 nm
Mean Launched Power	Maximum: -3 dBm , Minimum: -11.5 dBm
Average Received Power	-19 to -3 dBm
Maximum Reach	500 m (MM), 10 km (SM)
Coding Method	8B/10B
Networking	Tag VLAN, Port VLAN, QoS (IEEE802.1p (CoS) ToS (IP preceding), DSCP & ACL (IPv4, IPv6)
Latency	<4 μ sec for 64 bytes frame according to RFC2544
Connector Used	LC duplex

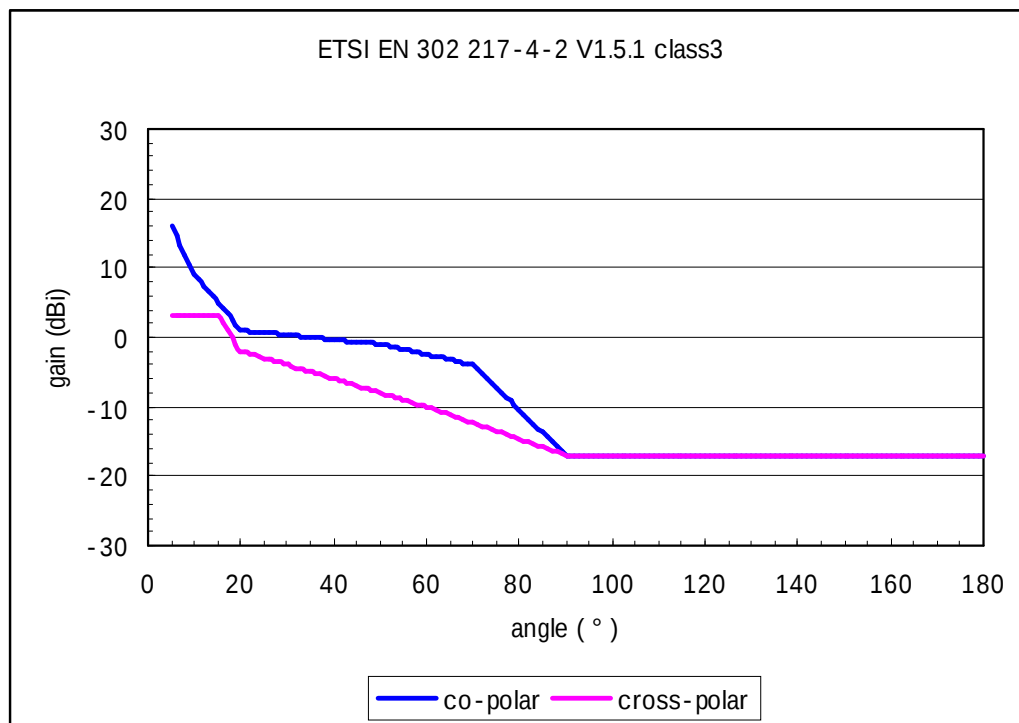
Table 1.4-9c 10GBASE-LR Optical Interface

XFP Used	10G Gigabit Ethernet optical transceiver
Specification	IEEE802.3ae full duplex
Transmission Speed	10.3125 Gbit/s
Optical Fiber used	1.31 μ m single mode fiber
Optical Fiber Wavelength	1.260 to 1.355 nm
Output Level (average)	-8.2 to +0.5 dBm
Input Level (average)	-12.6 to +0.5 dBm
Typical Reach	10 km (maximum)
Coding Method	64B/66B
Networking	Tag VLAN, Port VLAN, QoS (IEEE802.1p (CoS) ToS (IP preceding), DSCP & ACL (IPv4, IPv6)
One-way Latency	<4 μ sec for 64 bytes frame according to RFC2544
Connector Used	LC duplex

Parabolic Antenna

Table 1.4-10 Parabolic Antenna

	1-foot antenna	2-foot antenna
RF	71.0 to 76 GHz & 81.0 to 86.0 GHz	
Antenna Gain	43 dB (typical)	48 dB (typical)
Half Beam Width	0.9 degree	0.5 degree
VSWR	<1.5 (50-ohm)	<1.5 (50-ohm)
XPD (minimum)	>27 dB	>27 dB
F/B Discrimination	>60 dB	>66 dB
Antenna Diameter	30 cm	60 cm
Side Lobe Suppression	ETSI EN302 217-4-2 V1.5.1 class 3	
Weight with installation material	<8 kg	<11 kg



	Gain (dBi)								
Angle	5	10	15	20	50	60	70	90	180
Co-pol.	16	9	4	1	-1	-3	-4	-17	-17
X-pol.	3	3	3	-2	-7	-10	-14	-17	-17

Figure 1.4-3 ETSI EN302 217-4-2 V1.5.1 Class 3

1.5 Power Requirements

Power Supply Interface Requirement

Power Supply Interface Requirement for ODU

Table 1.5-1 shows the power supply interface requirement in accordance with ETSI EN300 132-2 V2.2.2 (2007-10) below;

Table 1.5-1 Power Supply Requirement at Interface “A”

Item	Specification
(1) Nominal voltage	-48 Vdc with positive grounded <u>Note*</u> : The voltage of interface “A” will be complemented by a 24 cell lead-acid battery.
(2) Normal service voltage range	-40.5 Vdc to -57.0 Vdc
(3) Abnormal service voltage range	(a) Abnormal service voltage under steady-state condition GX4000 Radio will not suffer any damage when subjected to the following voltage ranges; 0.0 to -40.5 Vdc and -57 to -60 Vdc
	(b) Recovery from steady state abnormal voltage Following the restoration to the normal voltage range, GX4000 Radio will automatically restore service and resume operation according to its specification. And the abnormal voltage shall not lead to the disconnection of the power supply by causing circuit breakers & so on.
	(c) Voltage Transients caused by power distribution system GX4000 Radio will not be damaged under the test model in accordance with EN61000-4-5.
	(d) Recovery from voltage transients GX4000 Radio will continue to function within its operational specification without requiring manual intervention.
(4) Voltage change due to the regulation of the power supply	For the single rate of the voltage at interface “A” with an amplitude of $6V \pm 10\%$ for both the fall and rise time of the voltage and a change rate within the range 3 V/ms to 7 V/ms, GX4000 Radio shall operate according to the specification and no loss of data or false alarm shall occur.

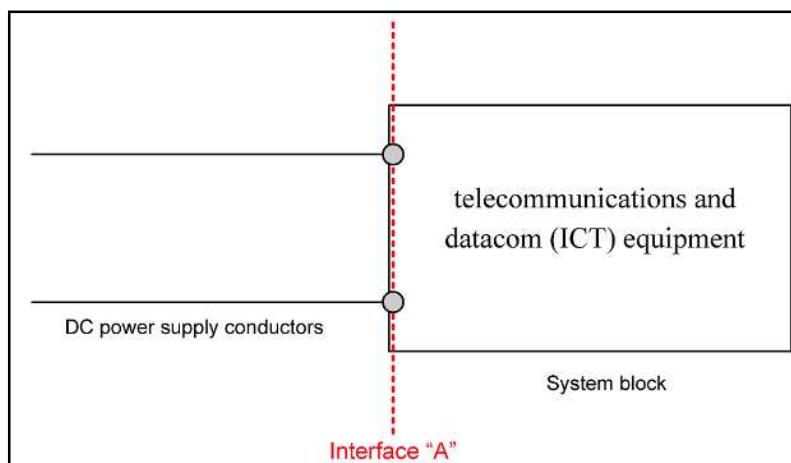


Table 1.5-1 Power Supply Requirement at Interface “A” (Cont’d)

Item	Specification
(5) Supply protection	The supply at interface “A” shall be protected by circuit breaker or other such devices. Circuit breaker is installed outside GX4000 Radio.
(6) Maximum current drain following abnormal service	Maximum current drain at any voltage in the normal and abnormal voltage range at interface “A” lasting for longer than 1 second shall not exceed 1.5 times the maximum continuous current drain at normal working voltage of -48 Vdc.
(7) Inrush current	In accordance with Figure 3, ETSI EN300 132-2 V2.2.1 (2007-05)
(8) Immunity to narrowband noise	In accordance with Table 1 and Figure 5, ETSI EN300 132-2 V2.2.1 (2007-05)
(9) Emissions of narrowband noise	In accordance with Table 2 and Figure 7, ETSI EN300 132-2 V2.2.1 (2007-05)

- I_i inrush current (magnitude of instantaneous value);
- I_m maximum continuous input current for a fully-equipped equipment under test connected to interface “A”, at nominal voltage.

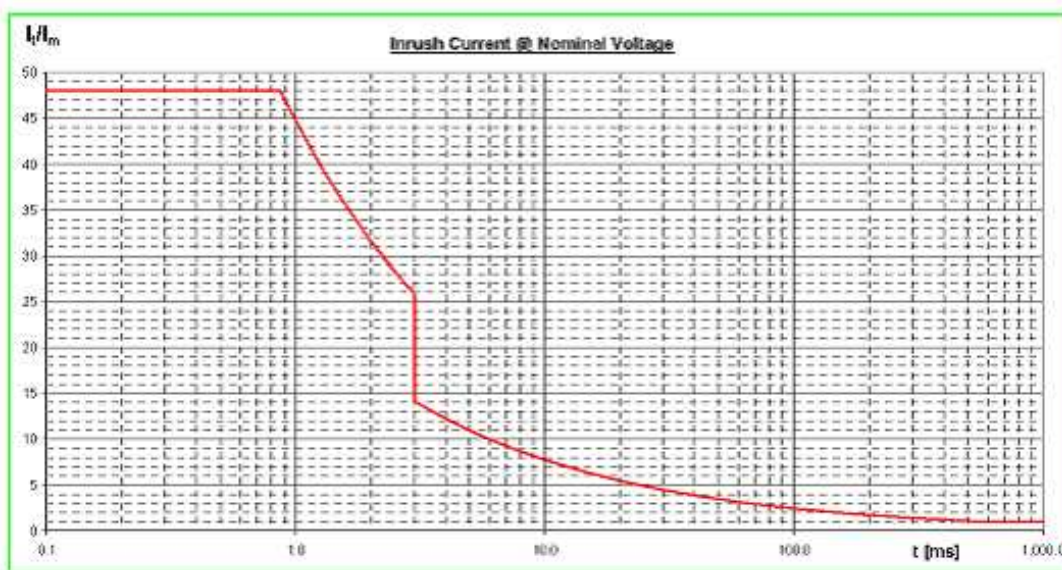


Figure 3: Maximum inrush current characteristics for telecommunications equipment at nominal voltage and maximum load

Inrush Current Specification

Table 1

Frequency range	Resolution bandwidth
25 Hz to 10 kHz	10 Hz

Table 2

Frequency range	Resolution bandwidth
25 Hz to 10 kHz	10 Hz
> 10 kHz to 20 kHz	200 Hz or 300 Hz

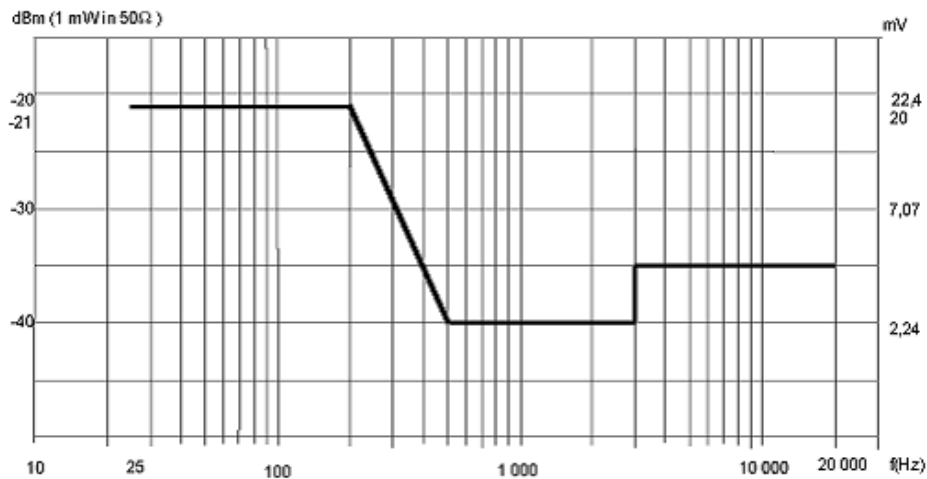


Figure 7: Maximum levels of narrowband noise

Immunity to narrow band Specification

Emission of narrowband noise Specification

Power Consumption

The power consumption is 30W (Typical).

Note-1: Power consumption includes the efficiency of power supply unit.

Note-2: Above is typical value. Guaranteed value is +10% up including environmental conditions and primary power voltage variance within -40.5 to -57 V.

Note-3: Power consumption value for ODU is quoted when set ATPC to ON.

2. GX4000 Quick Start-up Guide

2.1 Installation

This section describes the Quick start-up guide of BroadOne GX4000 series E-band Radio System. The main areas covered are:

- Antenna Fixing Material to Pole
- Installing Antenna to Antenna Fixing Material
(Included Polarization Setting)
- GX4000 Installing to Antenna
- Pre-Alignment
- Cable Connection (Power / Optical / LAN)
- Turn On

Antenna Pole Mounting

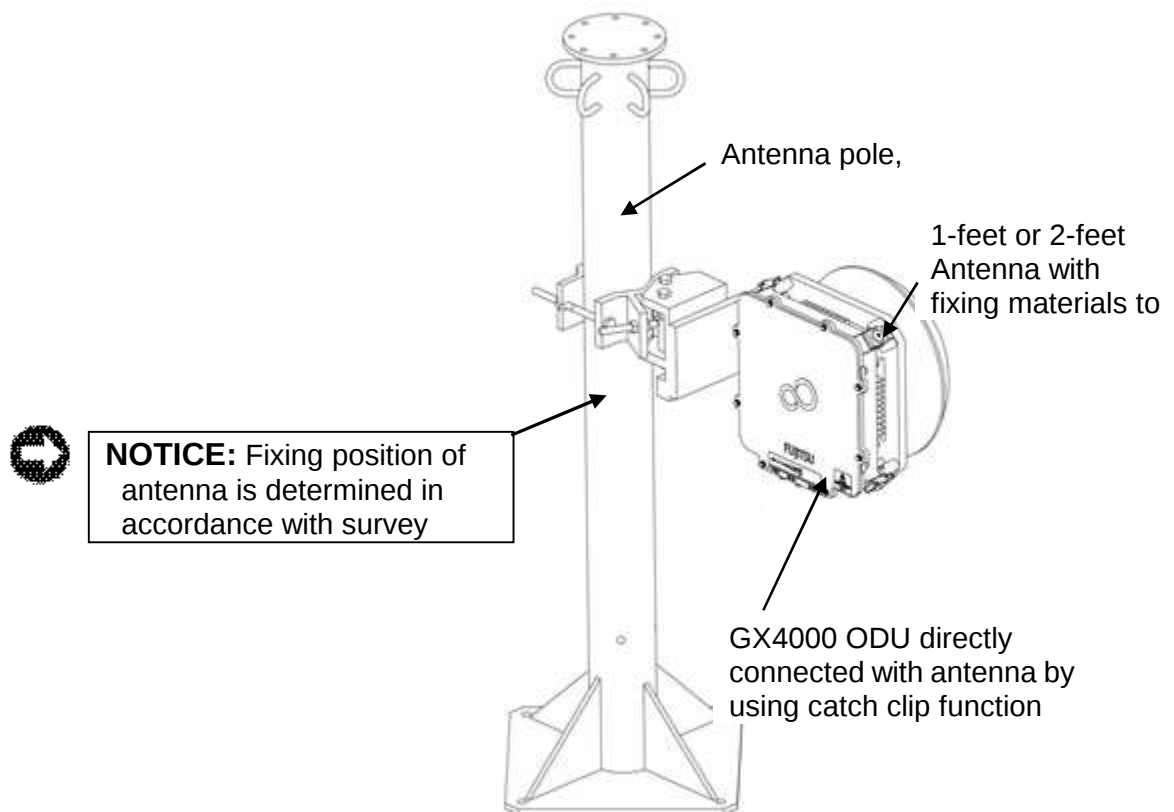
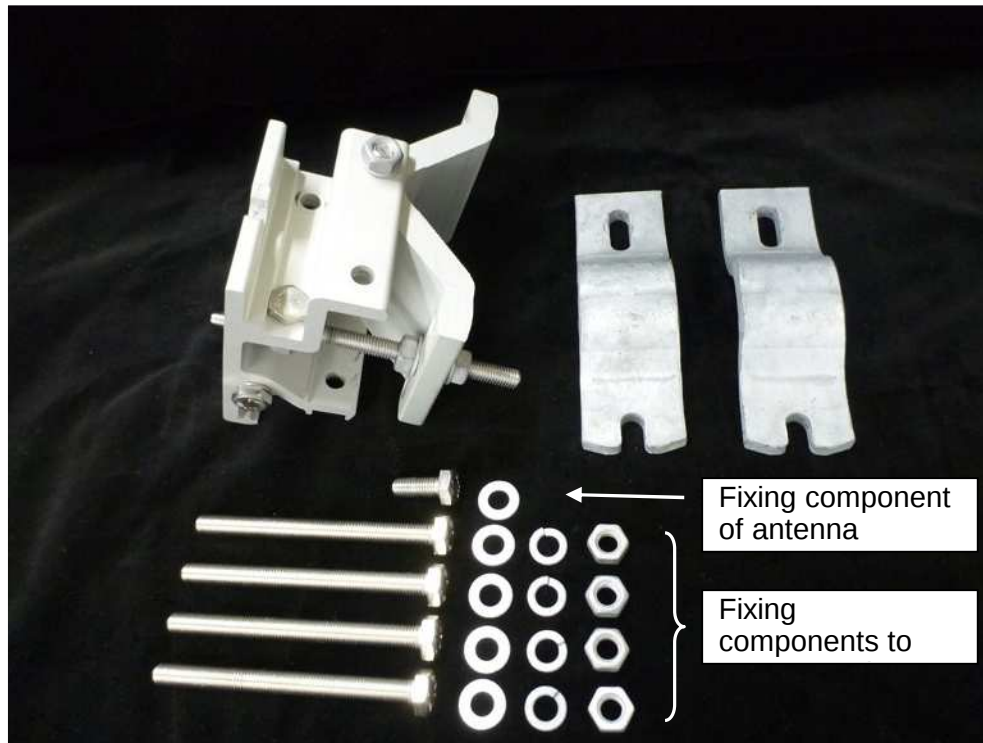
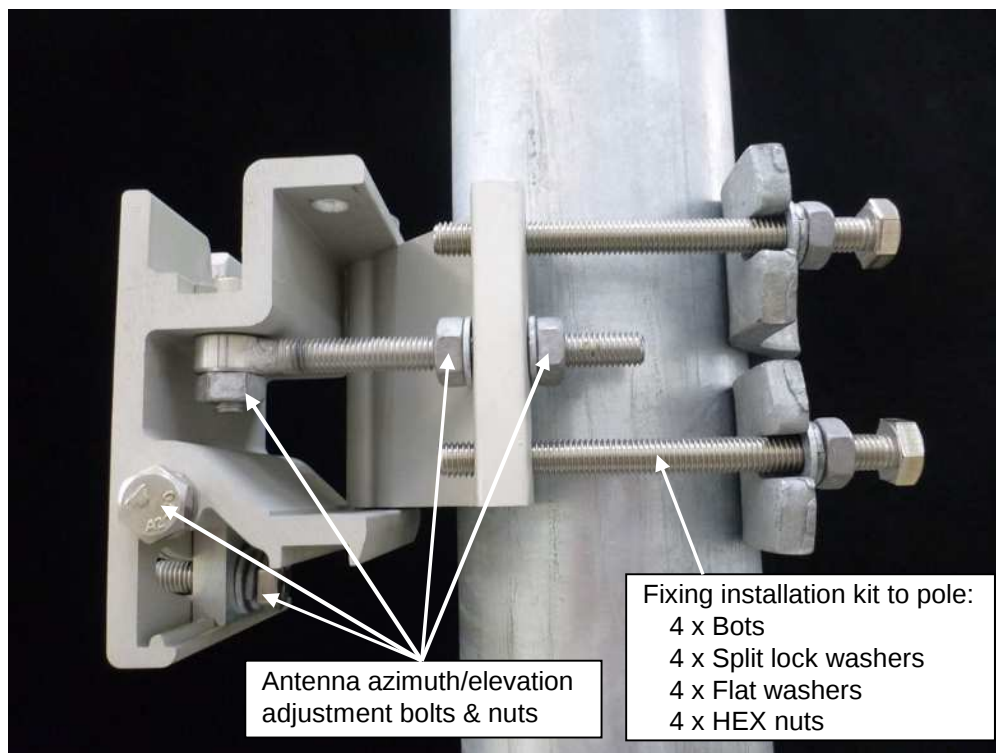


Figure 2.1-1 Image of Antenna Pole Mount

Antenna Fixing Material



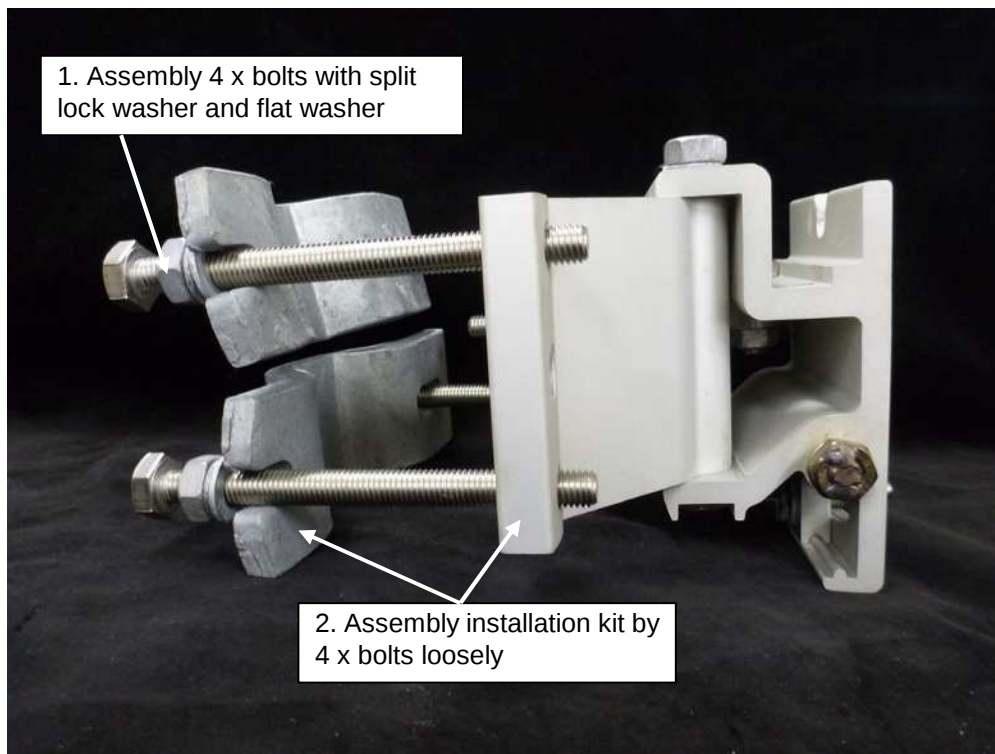
Antenna Fixing Material to Pole



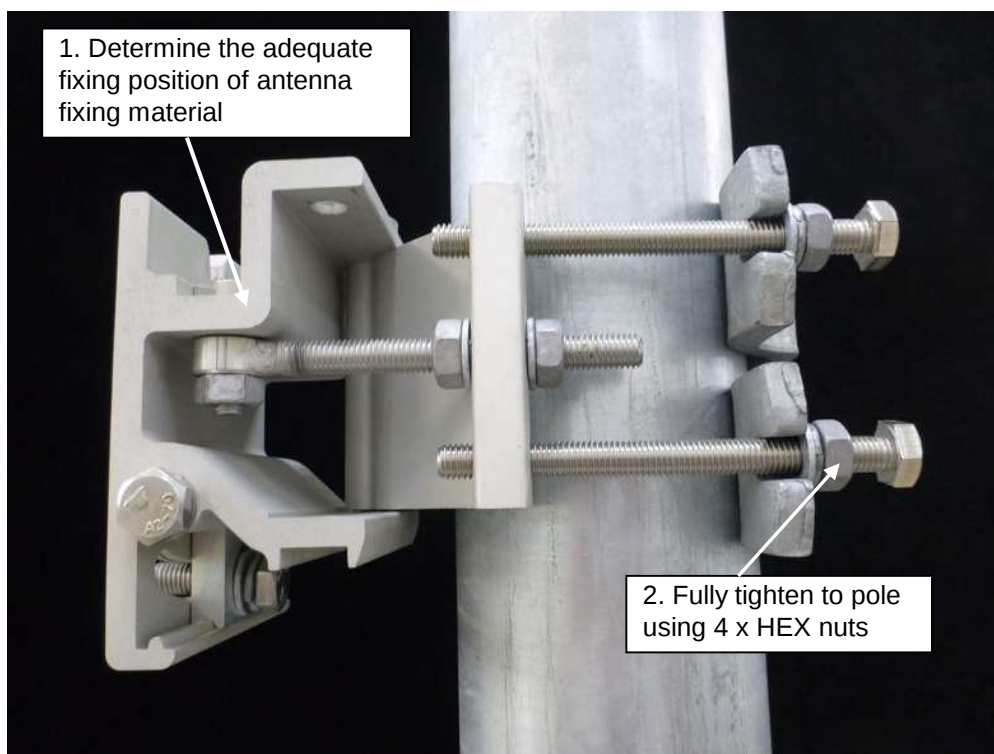
Antenna Fixing Material to Antenna Pole

Antenna Fixing Material to Pole

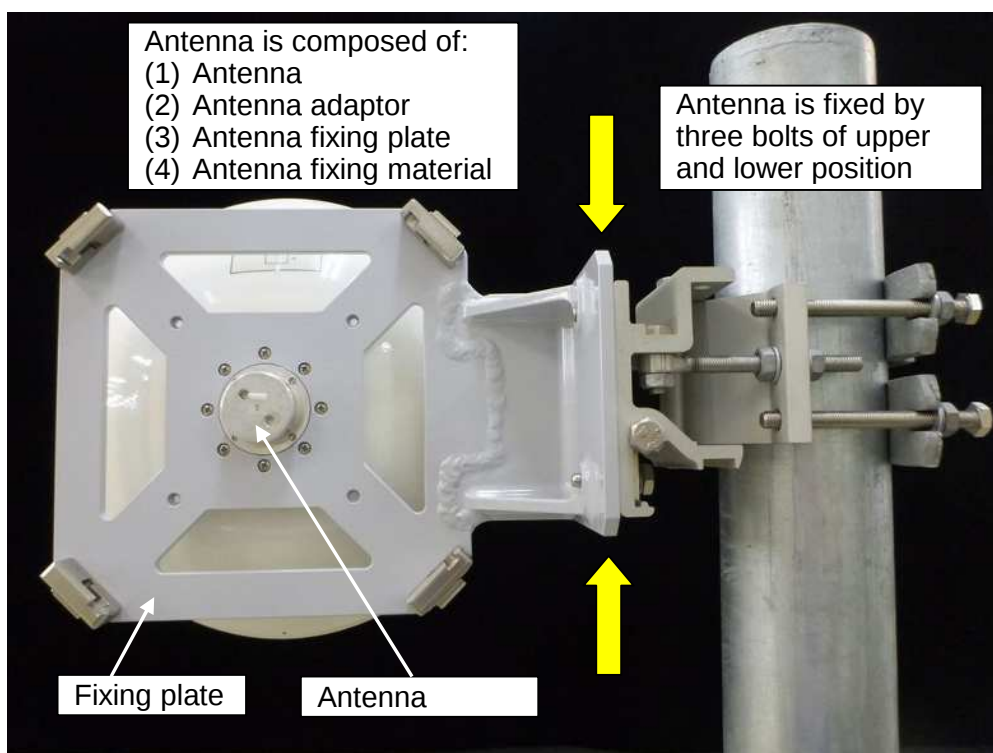
Step-1: Assembly of Antenna Fixing material



Step-2: Antenna fixing material to Pole



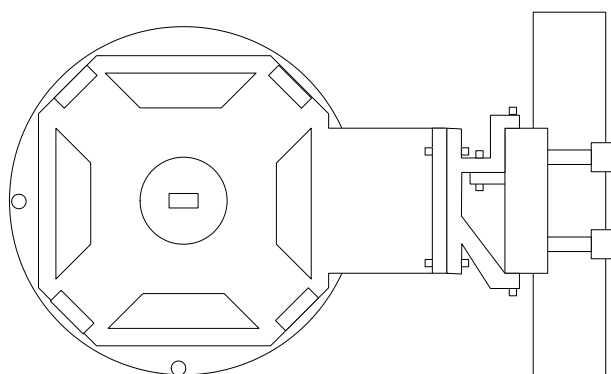
Installing Antenna to Antenna Fixing Material



Step-1: Polarization Setting

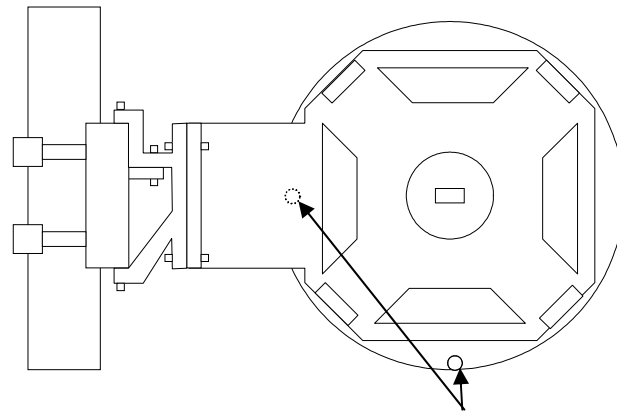
Confirm antenna polarization from antenna waveguide and water-draw hole position below.

NOTICE: Default setting is V-polarization.



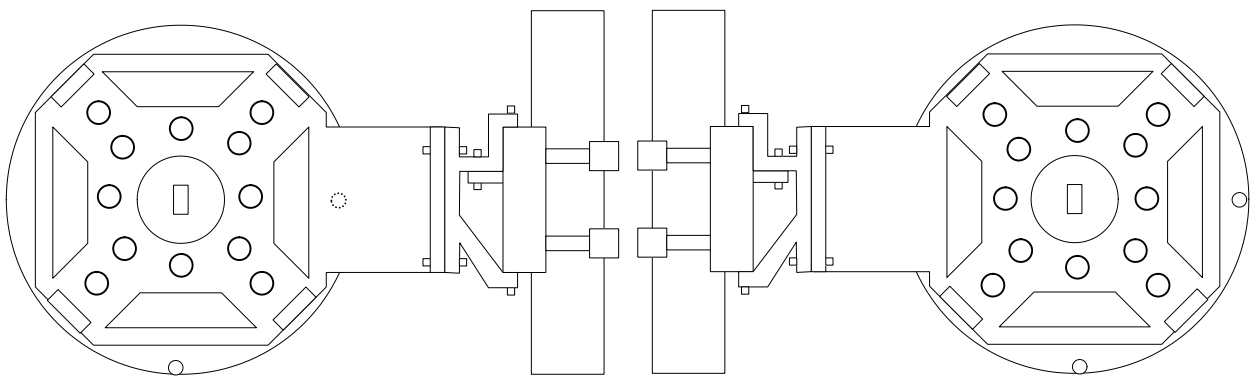
Default antenna polarization is V-pol.

- In case that antenna polarization is H-polarized and V-polarized with right side installation to the pole, antenna should be changed 90 degree by removing 8 x M5 bolts for 1-foot antenna or 12 x M5 bolts for 2-foot antenna and fixed again by adequate torque.



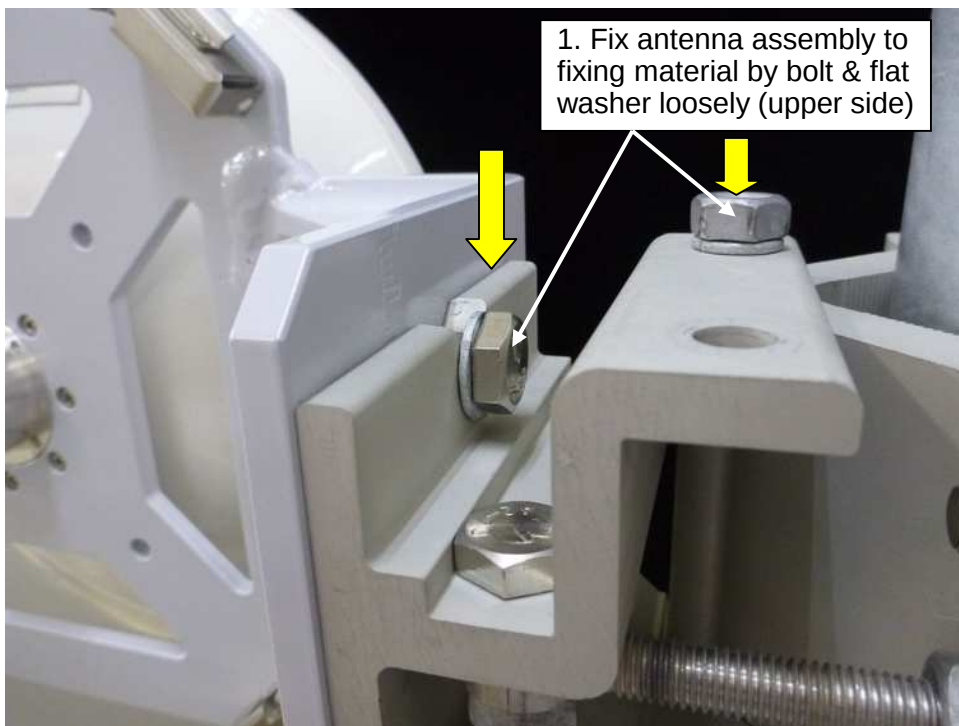
Water-draw hole

Vertical Polarization (Right side to pole)

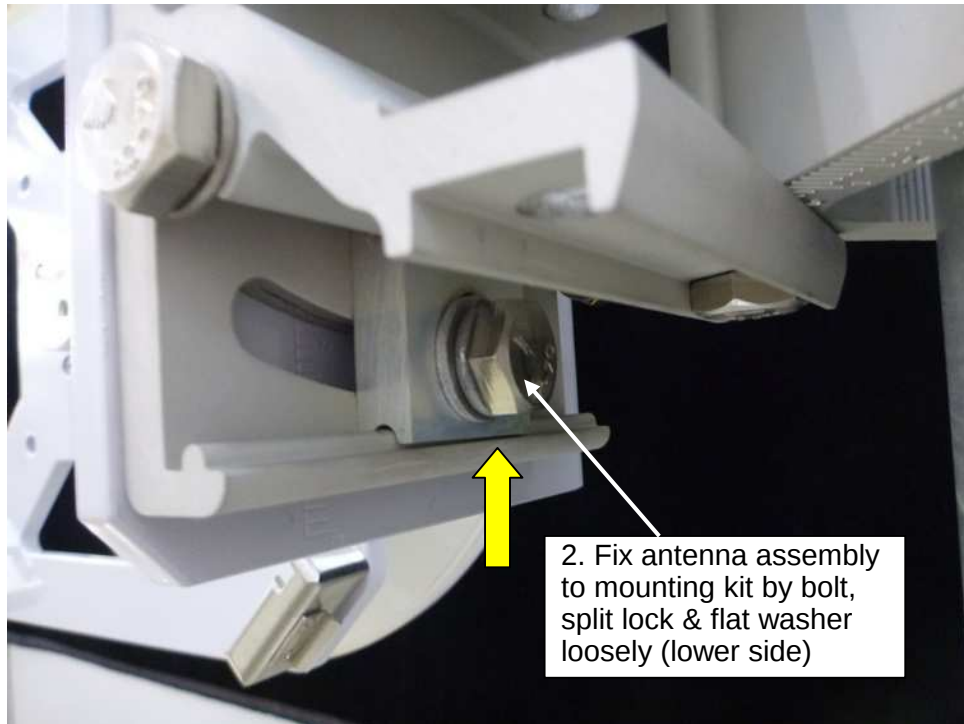


Horizontal Polarization

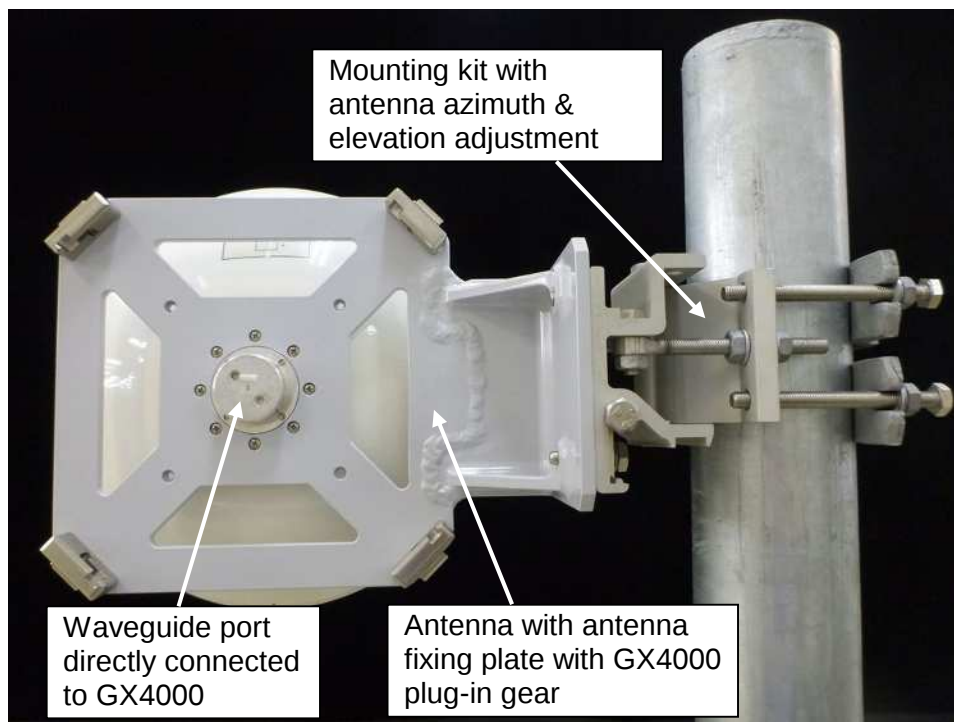
Step-2: Fixing Antenna to Fixing Material



Antenna Assembly to the fixing material (Upper Side)

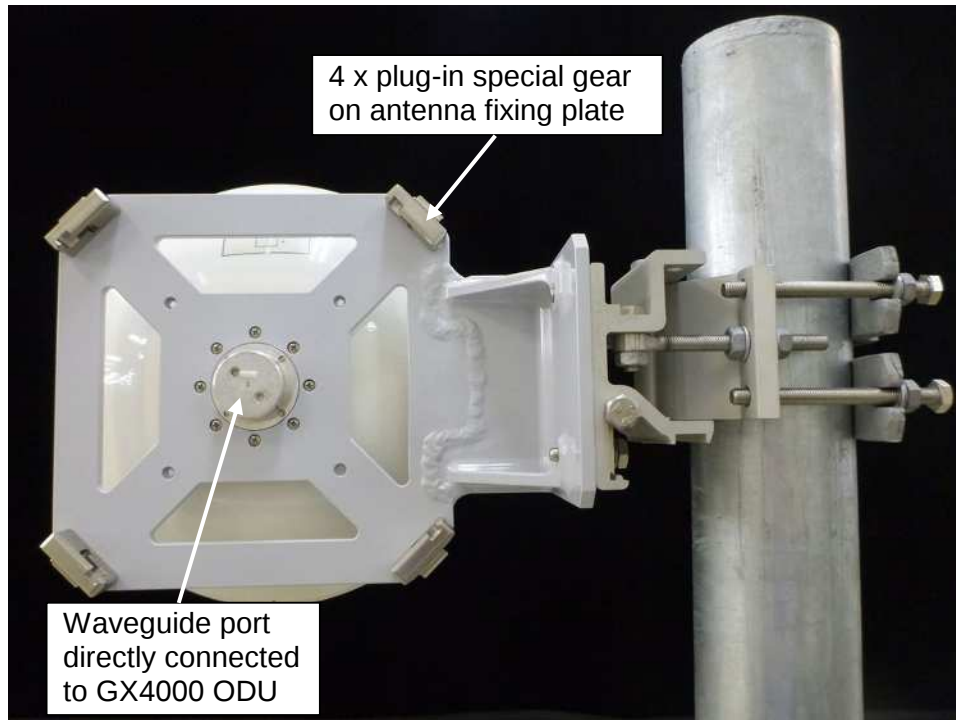


Antenna Assembly to the Fixing Material (Lower Side)



Fixing Antenna Assembly to Fixing Material

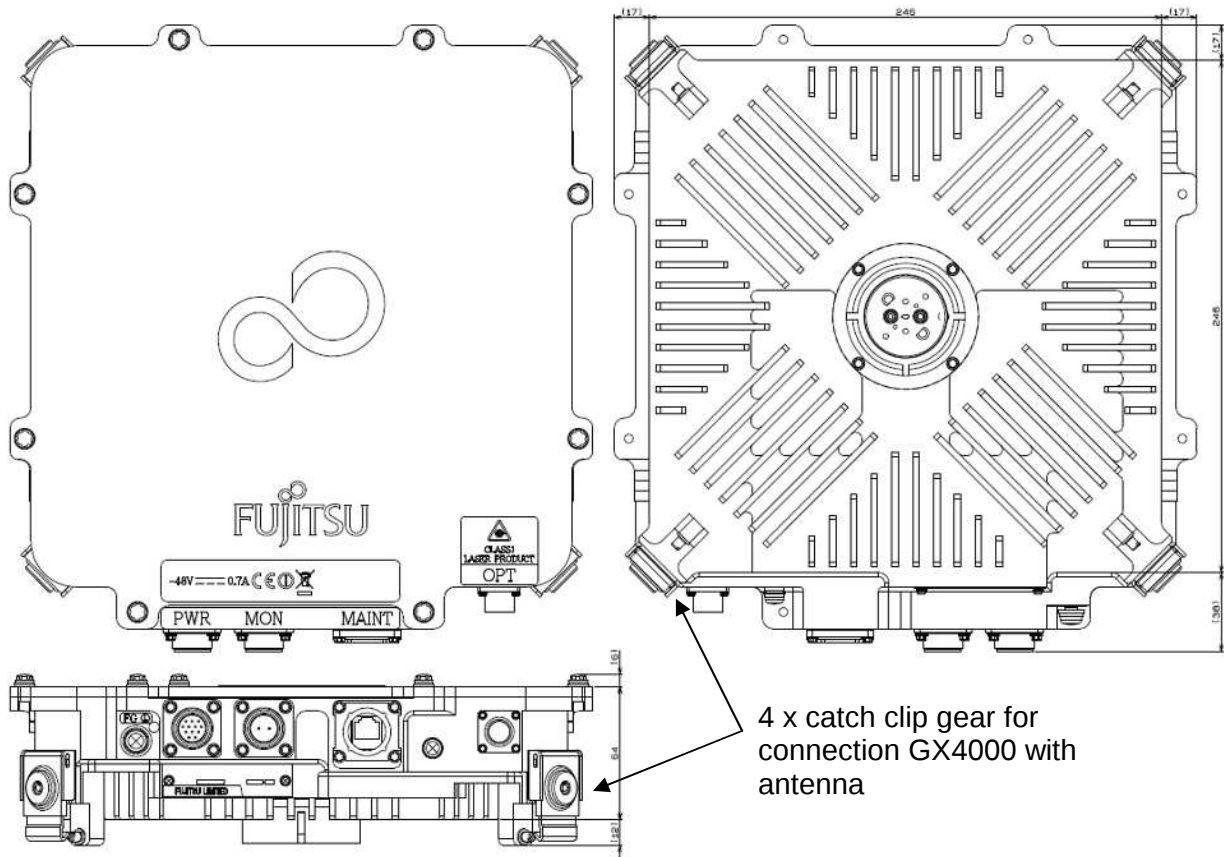
GX4000 Installing to Antenna



Special Gear for ODU Plug-in



Plug-in Special Gear on Antenna Fixing Plate



Catch Clip on ODU

Plug-in GX4000 ODU to Antenna



- Fix tightly 4 x catch clips by installation wrench attached



Pre-Alignment

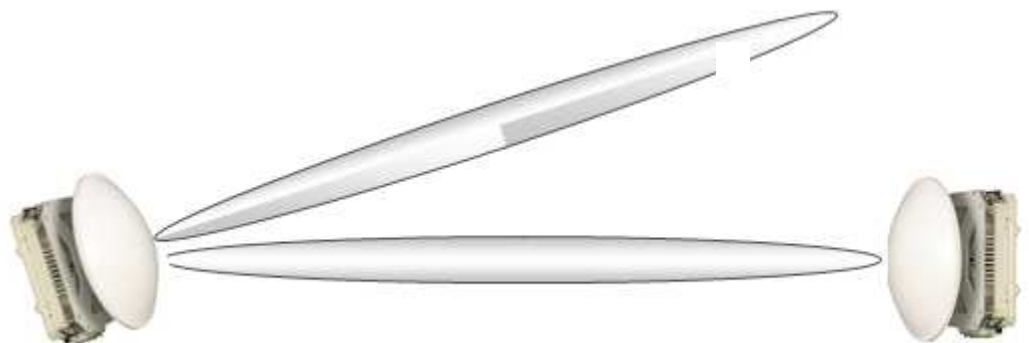
The pre-alignment phase involves settings on the antenna prior to installation and/or turn-on of the radio equipment.

Antenna has three adjustments for alignment:

- Polarization
- Azimuth (left and right)
- Elevation (up and down)

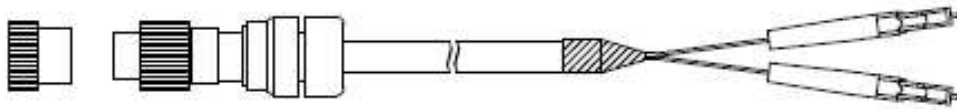


Good Alignment

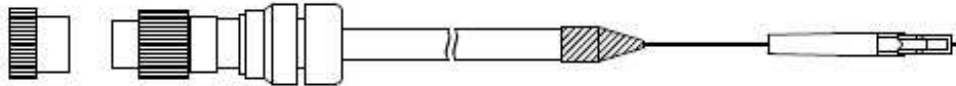


Bad Alignment

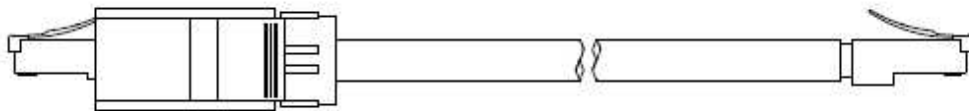
Cable Connection



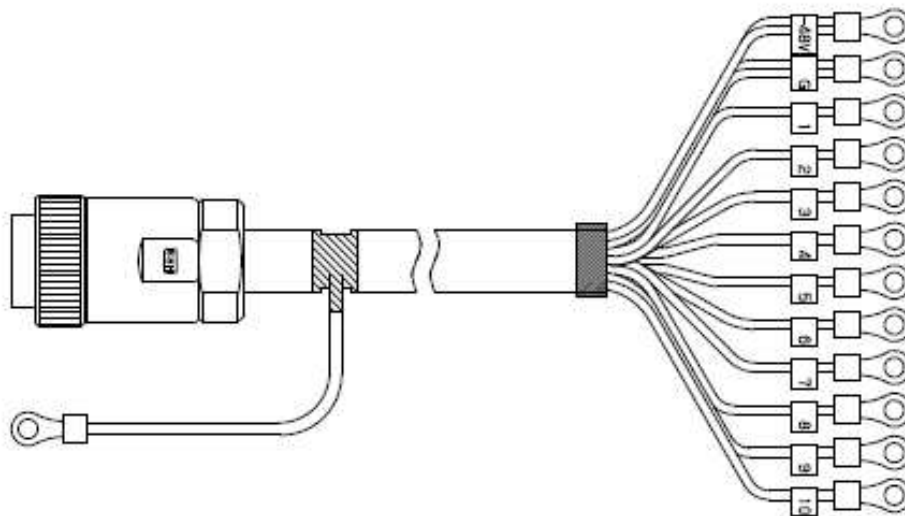
Optical Cable with connector both ends type1 (2-cables)



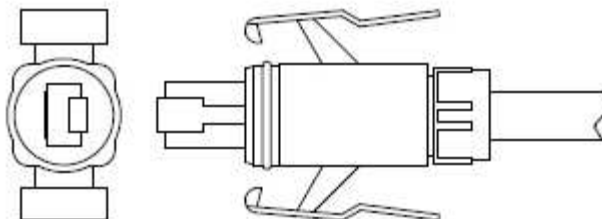
Optical cable with connector both ends type2 (1-cable)



Ether optical Cable with LAN connector both ends



PS/ALM Cable with connector & clamping terminal



LAN Connector without Cable

Cable Connector Location

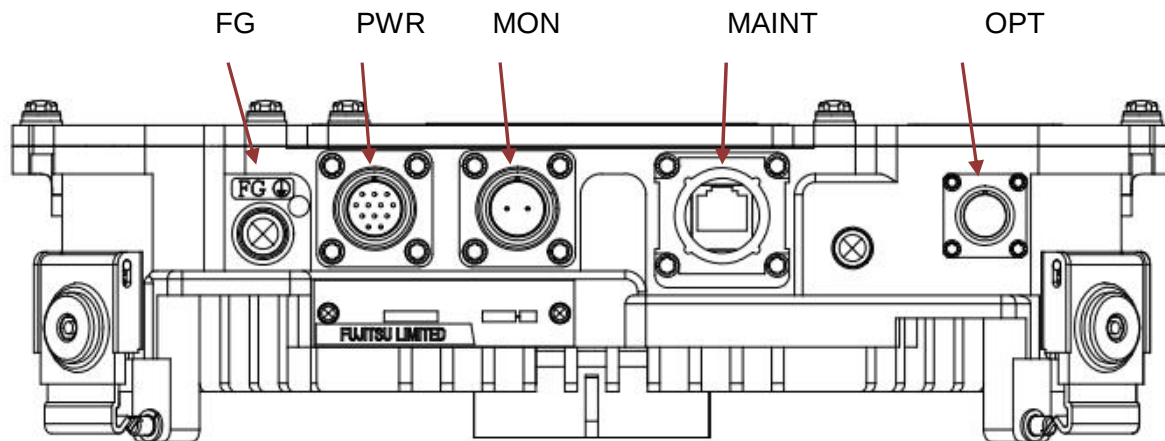


Figure 2.1-2a GX4000 Radio Equipment

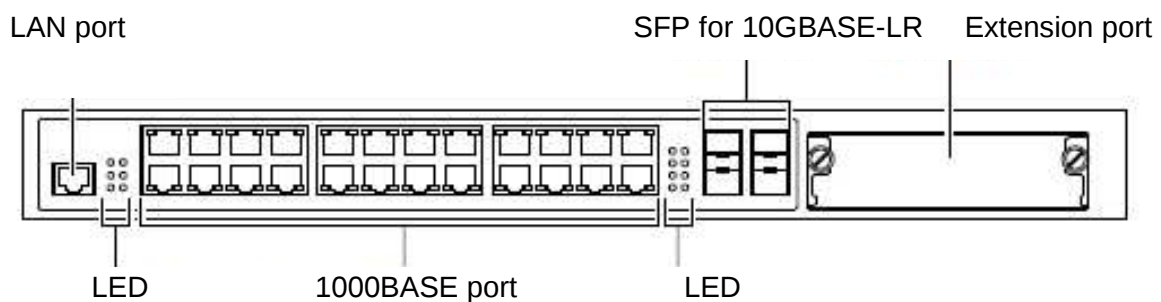


Figure 2.1-2b Baseband Conversion Module

Cable Connector with External Communication Equipment

Cable connection with the external communication equipment is shown in Table 2.1-1 and detailed connection between GX4000 and external communication equipment is shown in Figure 2.1-2.

Table 2.1-1 Cable Connection with External Equipment

Item	Indication	Cable	External Equipment	Remarks
1	OPT	Optical, Ether	IP Node	Customer provision
			BB Converter	XFP port 25/26
		Optical, CPRI	Mobile RE or REC	Customer provision
2	PWR	PS/ALM	Power Supply System	Customer provision
3	MAINT	LAN	PC or IP Network	Customer provision

Pin Assignment of Connector

Table 2.1-2a Pin Assignment of Connector (Optical Cable type1)

Item	GX4000 Side					Ext Equipment Side	
	Signal	Direction	Connector	Pin No.		Label	Connector
1	RX	IN	OMS	1		1	LC
2	TX	OUT		2		-	LC

Table 2.1-2b Pin Assignment of Connector (Optical Cable type2)

Item	GX4000 Side					Ext Equipment Side	
	Signal	Direction	Connector	Pin No.		Label	Connector
1	TX/RX	IN/OUT	OMS	1		-	LC
2	-	-		2		-	-

Table 2.1-2c Pin Assignment of Connector (PS/ALM Cable)

Item	GX4000 Side					Ext Equipment Side	
	Signal	Direction	Connector	Pin No.		Label	Terminal
1	Total ALM P	OUT	RM	1		1	Crimp
2	-48V	IN		2		-48V	Crimp
3	PS ALM P	OUT		3		2	Crimp
4	PS ALM N	OUT		4		3	Crimp
5	CPU ALM P	OUT		5		4	Crimp
6	CPU ALM N	OUT		6		5	Crimp
7	GND	IN		7		G	Crimp
8	Total ALM N	OUT		8		6	Crimp
9	-48V MON	OUT		9		7	Crimp
10	G MON	OUT		10		8	Crimp
11	CPU Reset P	IN		11		9	Crimp
12	CPU Reset N	IN		12		10	Crimp
13	Shielded	-	Crimp	-		-	-

Table 2.1-2d Pin Assignment of Connector (LAN Cable)

Item	GX4000 Side				Ext Equipment Side		
	Signal	Direction	Connector	Pin No.		Label	Connector
1	TD (+)	-	RJ45	1		1	RJ-45
2	TD (-)	-		2		2	
3	RD (+)	-		3		3	
4	-	-		4		4	
5	-	-		5		5	
6	RD (-)	-		6		6	
7	-	-		7		7	
8	-	-		8		8	

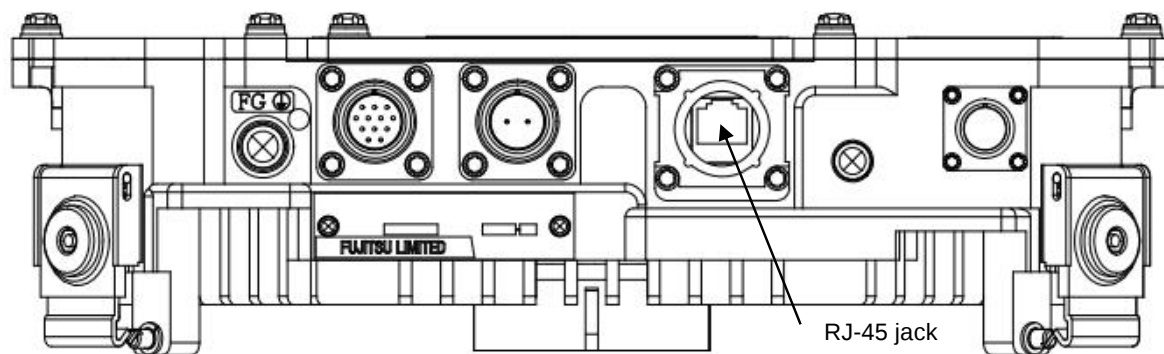
Turn On

- Remove PS/ALM connector on GX4000
- Set circuit breaker switch for GX4000 to ON.
- Confirm the DC power supply voltage on PS/ALM connector;
Voltage between Pin-2 (-) and Pin-7 (GND) is -40.5 to -57.0 V
- Set circuit breaker to OFF.
- Connect PS/ALM connector on GX4000 and set circuit breaker switch for GX4000 to ON

2.2 Commissioning (GE model)

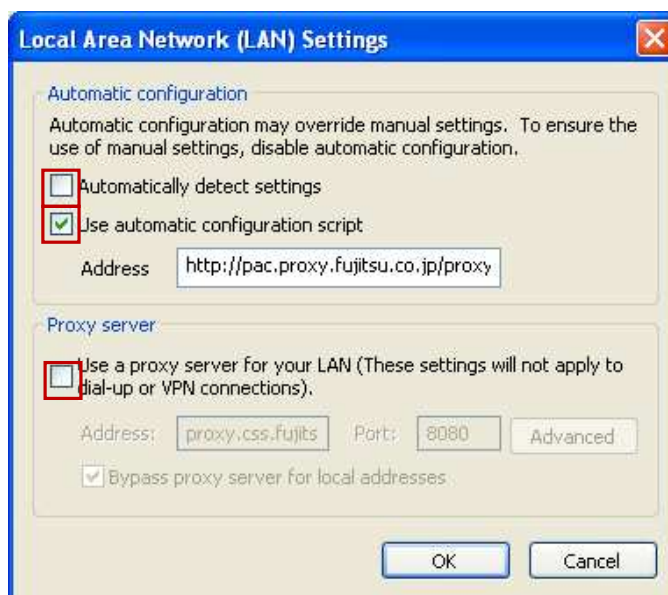
Connecting WebLT to GX4000 RJ-45 Jack

Connect PC with MON connector (RJ-45 jack) on GX4000 by LAN cable.



Web Browser Setting of PC

1. Open Internet Web browser, Tool Bar > Internet Option > Connections
2. Click LAN settings and all checkmarks will undo and click OK.



HTTPS Setting of PC

NOTICE: When you can apply HTTPS (Hypertext Transfer Protocol over Security Layer), minimum key length of Web Server Certificate should be changed to 512. If not, you cannot open WebLT.

In case of Windows 7, key length setting is as follows;

Change of key length:

Execute the following command in the dos prompt screen:

Certutil -setreg chain\minRSAPubKeyBitLength 512

Restoration of key length:

Execute the following command in the dos prompt screen.

Certutil -setreg chain\minRSAPubKeyBitLength 1024

For details, refer to Microsoft Security Advisory URL;

<http://support.microsoft.com/kb/2661254>

Starting Web LT (*1)

After making appropriate cable connection to the NE (LAN jack on ODU), you can start Web LT:

1. Open your web browser.
2. Enter the IP address of the NE as a URL (Uniform Resource Locator) form.

Default IP address of NE: <http://192.0.2.1>

<https://192.0.2.1> (when HTTPS = enable)

3. "Connect to 192.168.0.10" sub menu appears as an example.



User name and Password sub menu

4. Input User ID and Password.

Default User ID: Admin

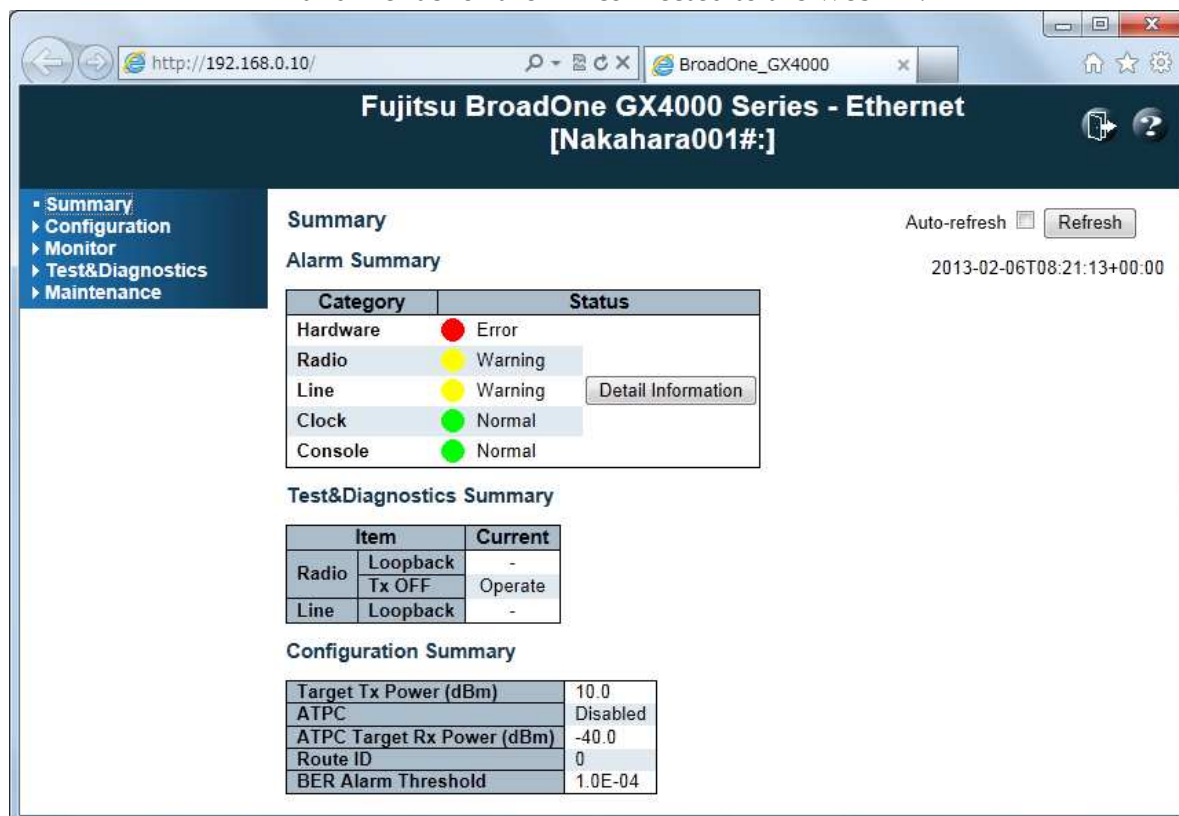
Default Password: null

5. When the Web LT successfully accesses to the NE, Web LT Start screen appears.

NOTE: IP address of NE and User ID/Password will be able to change in the Configuration Menu on WebLT after first login.

Start Screen

The Start Screen displays the NE ID (Network Element Identification) and menus for the NE connected to the Web LT.



Help Icon

You can click Help button to know well about WebLT menu.



Exiting Web LT

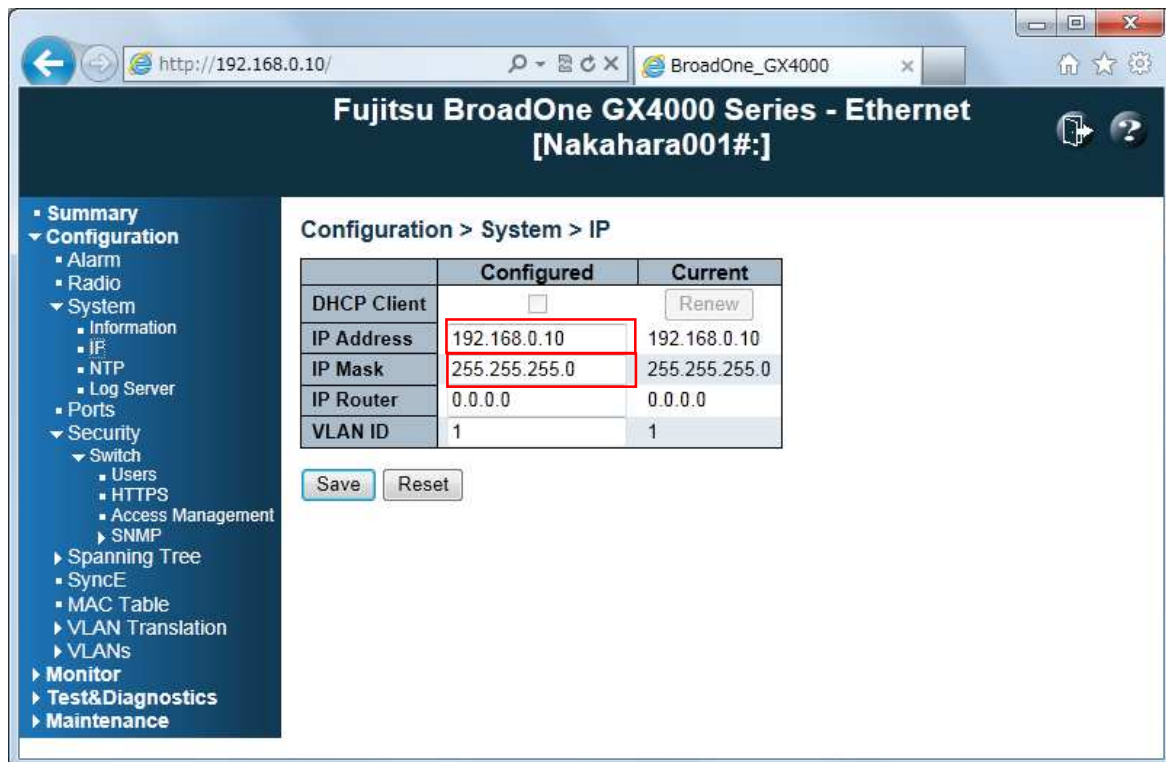
You can exit the Web LT by clicking Logout icon or X. This terminates the session between your PC and the NE.



Exiting WebLT

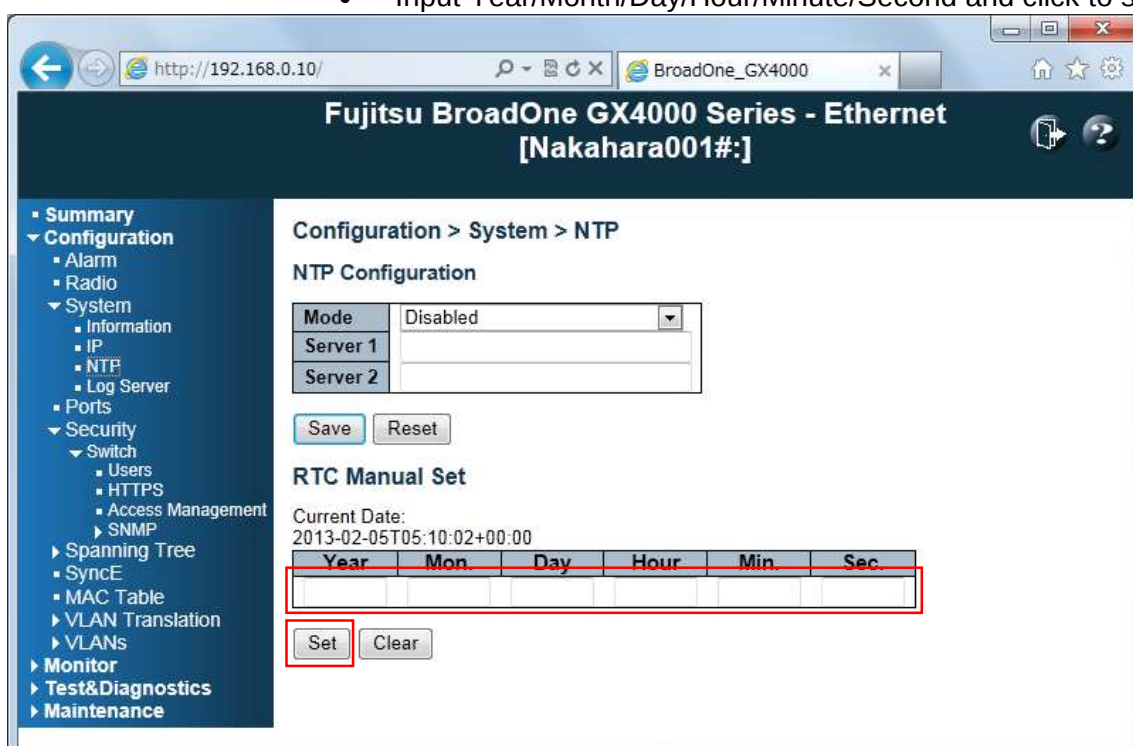
IP Address Setting on WebLT

- Configuration > System > IP
 - Set IP Address and IP Mask
- IP Address: 192.168.0.1 (default)
- IP Mask: 255.255.255.0



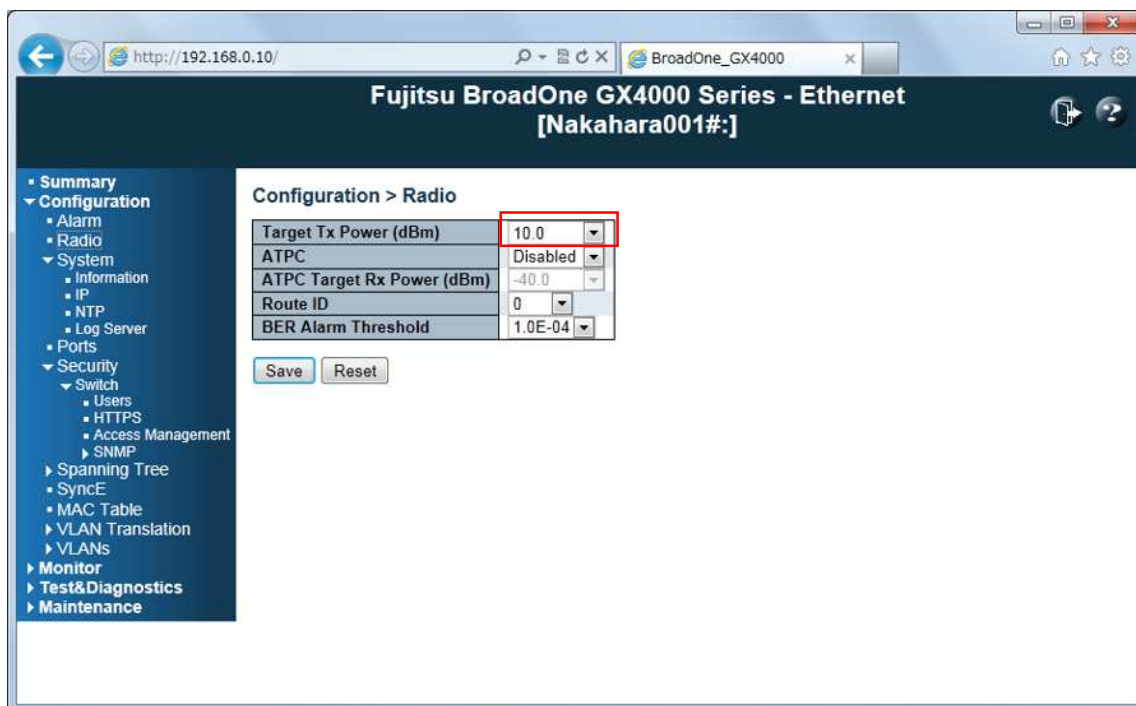
Time Data Setting

- Configuration > System > NTP
- Input Year/Month/Day/Hour/Minute/Second and click to set.



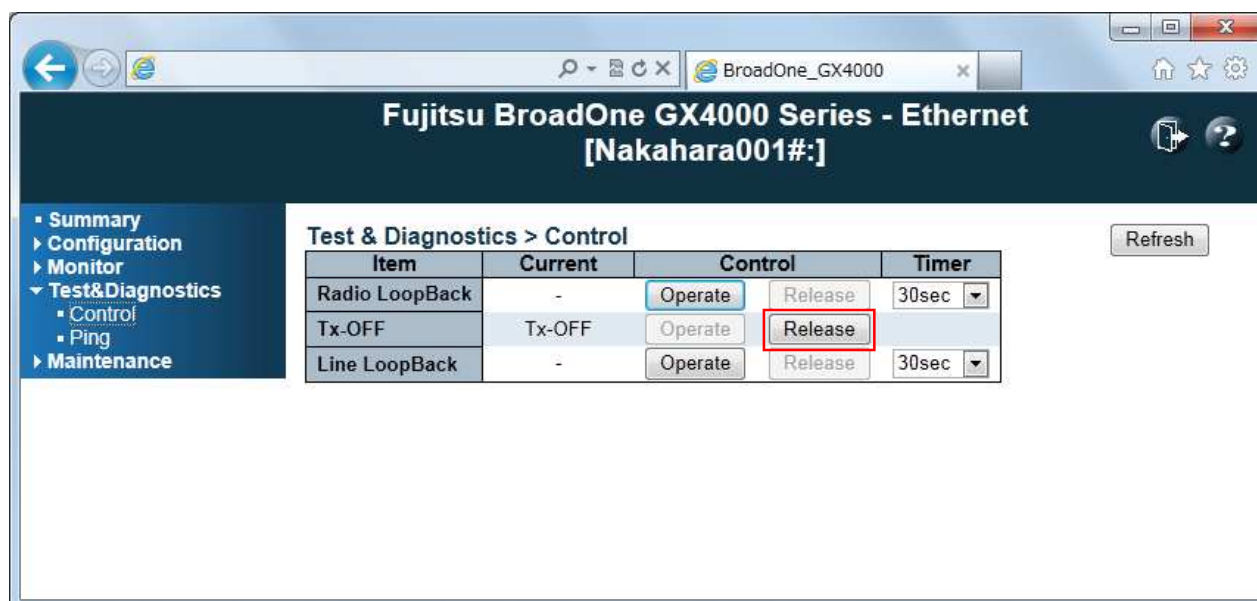
Radio Parameter Setting

- Configuration > Radio
- Set Target Tx Power (dBm) to 10.0 and click to save.



Tx Output Power ON

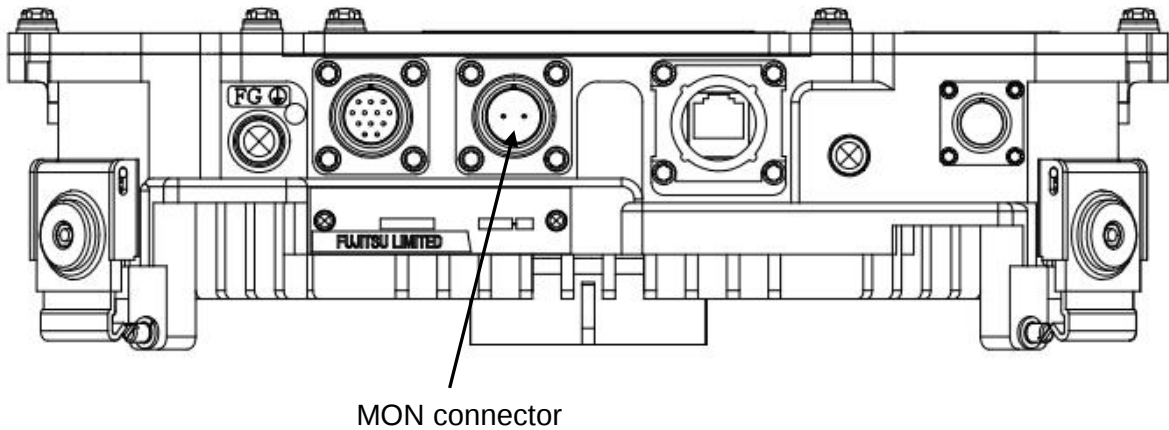
- Test & Diagnostic > Control
- Click Release button and Tx-OFF turned to Tx-ON.
- TX output power is transmitted.



Monitoring RSL on MON Connector

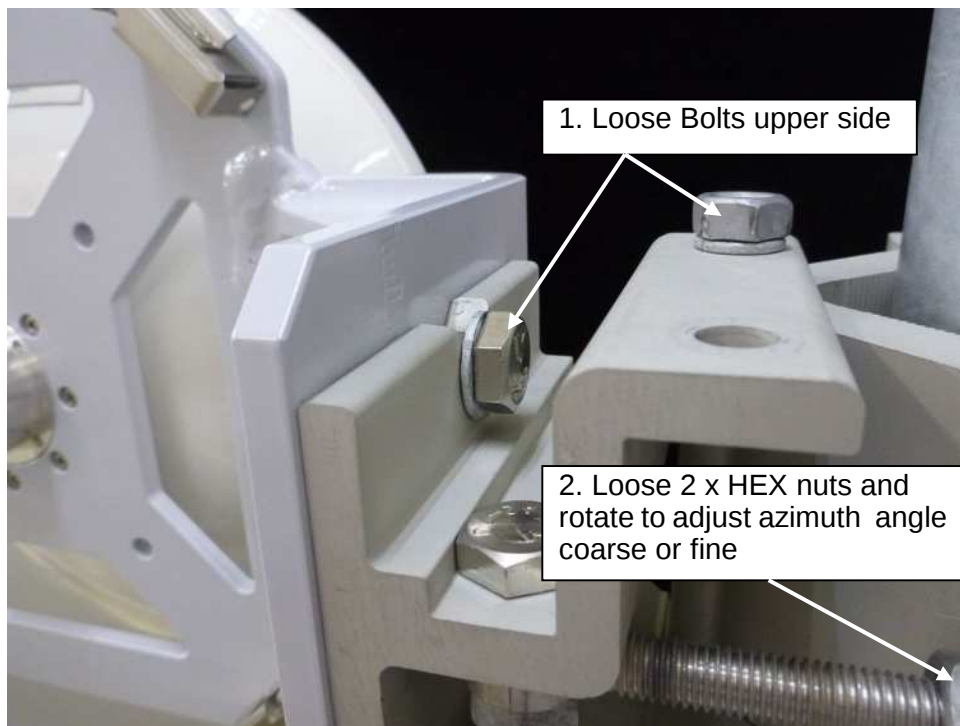
- Connect DC Voltmeter with MON connector

Note: Monitoring DC voltage is 0 to +3.3 V depending on path length.

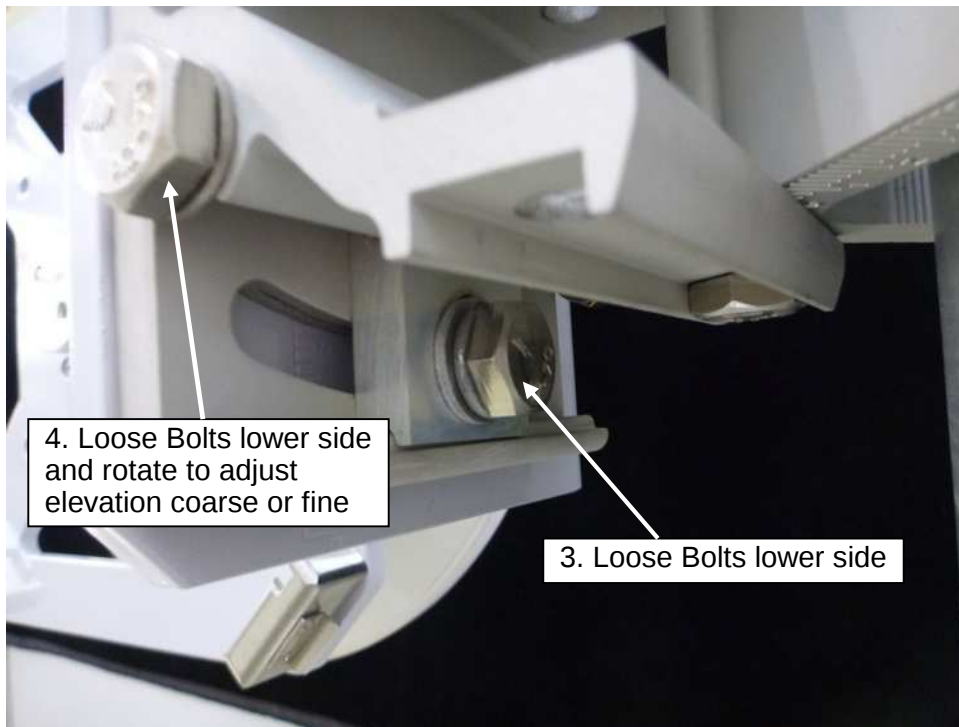


Catching RSL from Far-end Site

- Verify that remote Tx power is operational and remote antenna is fixed.
- Rotate slowly the antenna in the azimuth direction (horizontal) and find the maximum RSL voltage.
- Rotate slowly the antenna in the elevation direction (vertical) until the RSL voltage is peak voltage and record the measured voltage.



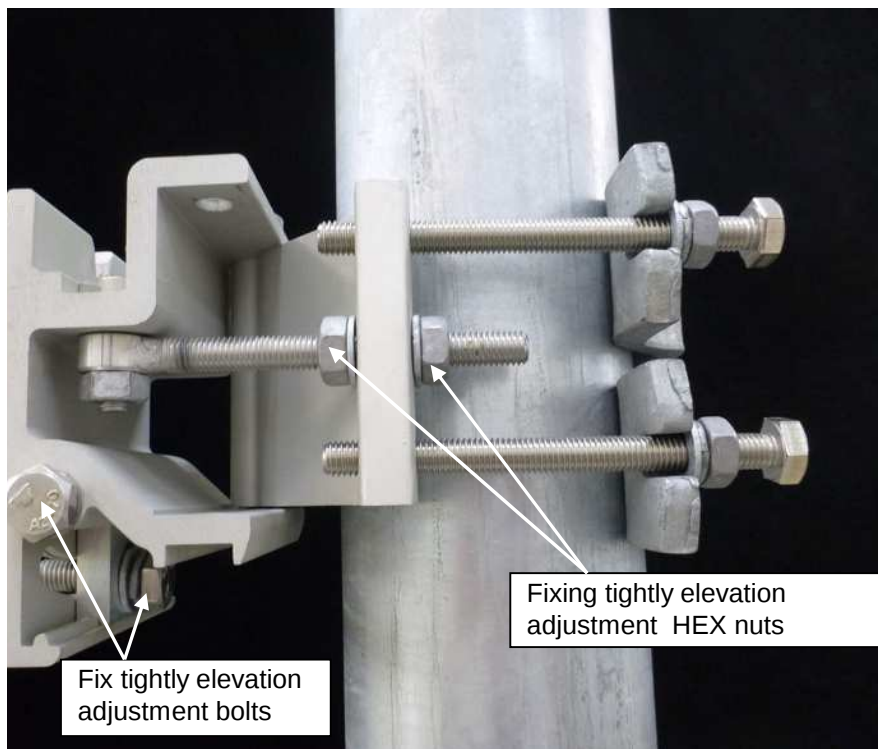
Azimuth Adjustmen

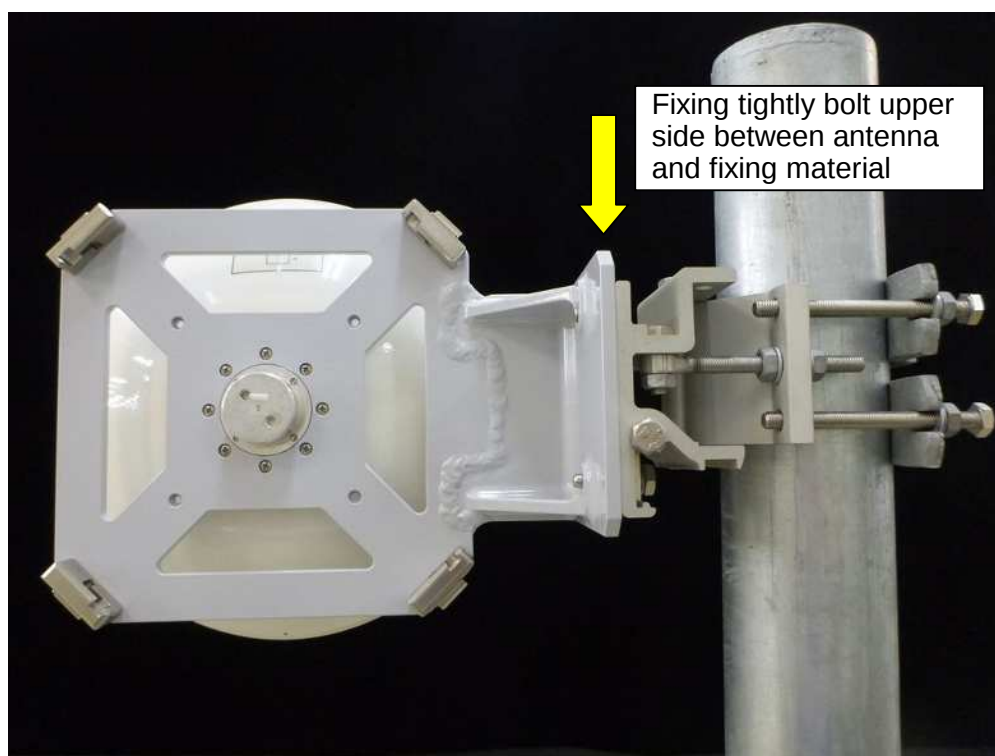


Elevation Adjustment

Final Antenna Fixing

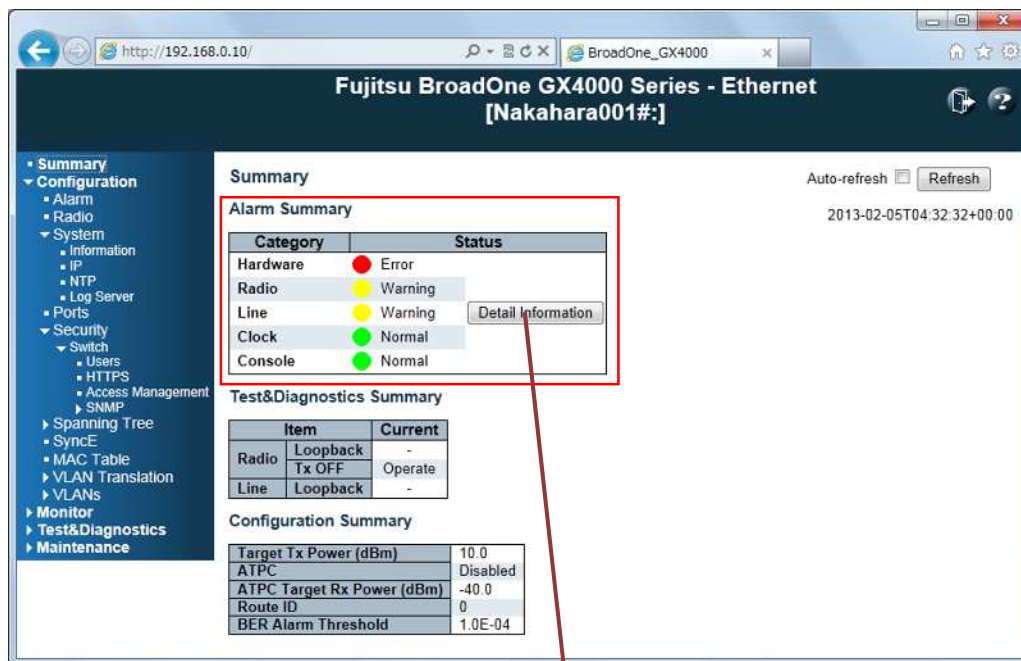
- Fine azimuth and fine elevation adjustment both site A and site B is carried out several times.
- Confirm that measured RSL monitoring voltage is peak.
- Fix the bolts and HEX nuts tightly for final antenna fixing.



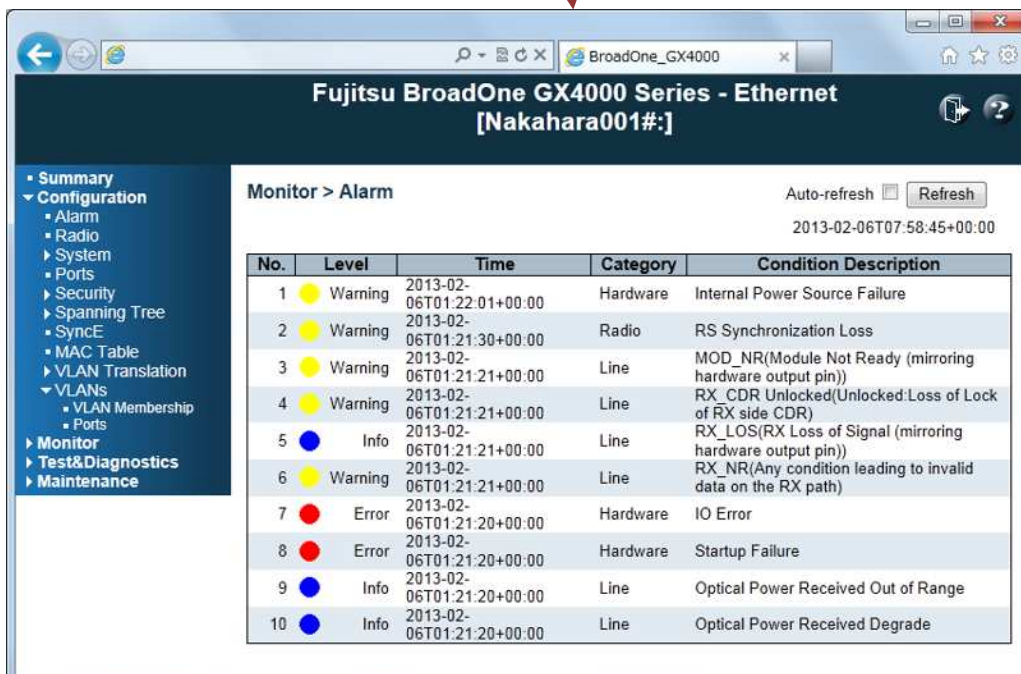


Alarm Summary Indication

- Summary
- Check Alarm Summary and if Error, Warning and Info indication are issued, click Default Information button to indicate alarm description.



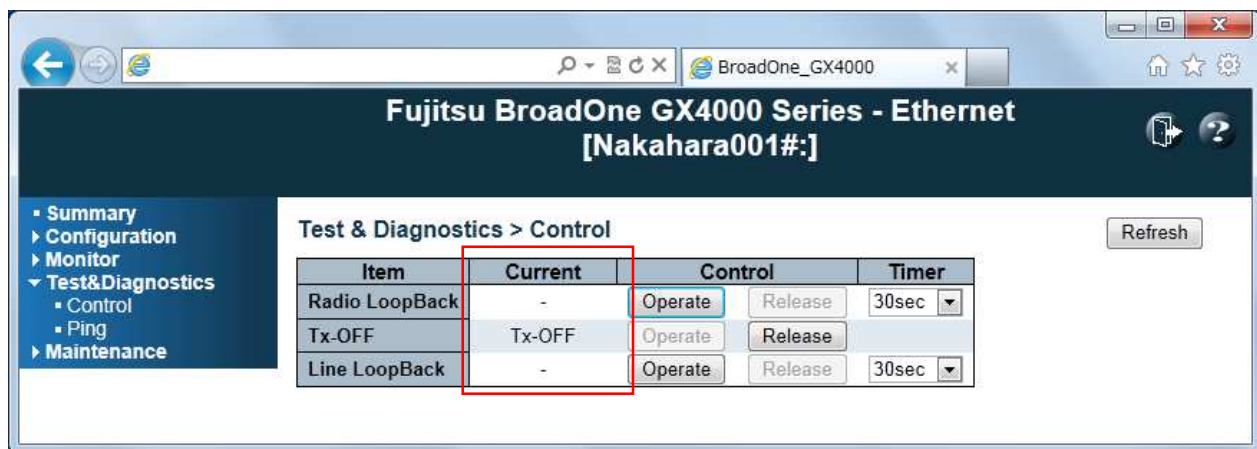
Alarm Summary Menu



Alarm detailed List

Test & Diagnostic Summary Indication

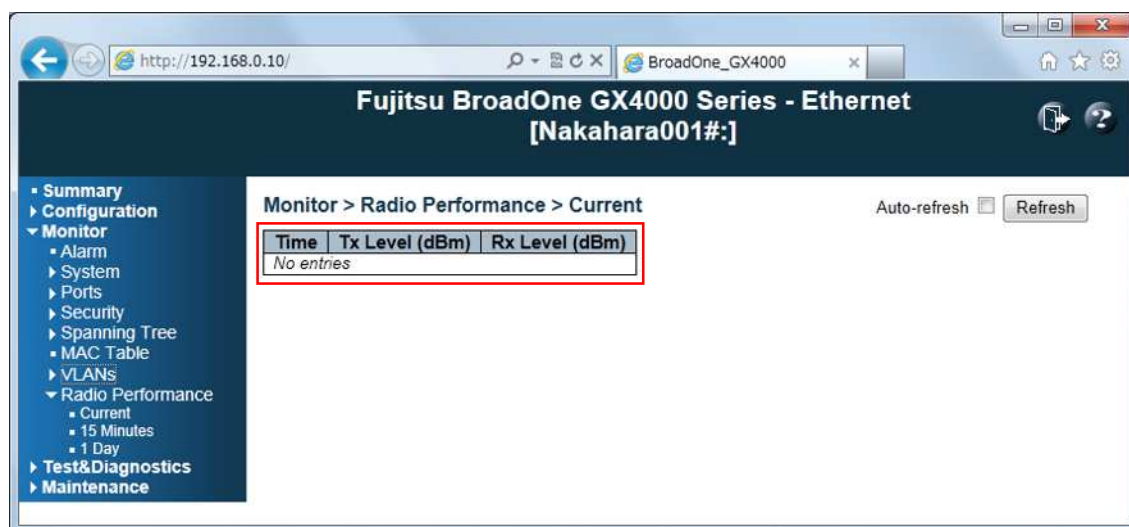
- Test & Diagnostics > Control
- Confirm all current information are “-”.



Confirm that Current of Tx-OFF is “-” and Control of Tx-OFF is “Operate”.

Confirmation of RSL

- Monitor > Radio Performance > Current



Radio Performance Current

- Confirm Current value.

Item	Parameter	Specification
Tx Level (dBm)	TX output power	Setting value +/- 3 dB
Rx Level (dBm)	Received Signal Level	System design value +/- 3 dB

Confirmation of Ether Traffic (Only applicable for GE Model)

- Monitor > Ports > Traffic Overview

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

Monitor > Ports > Traffic Overview

Auto-refresh ☐ Refresh Clear

Port	Packets		Bytes		Errors		Drops		Filtered
	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received
Radio	0	136	0	46146	0	0	0	0	0
Line	0	28	0	9321	0	0	0	0	0
Maintenance	1165	602	292273	115346	0	0	137	0	1164

Ether Traffic Overview

3. GX4000 WebLT Menu

3.1 Overview

The Web LT is a local terminal that is the main human machine interface for operation, maintenance, system setup and tune-up. The Web LT is designed as an embedded web server using HTTP (Hyper Text Transfer Protocol) protocol and HTML (Hyper Text Markup Language) document format on an IP (Internet Protocol) network. An operator can manage the GX4000 NE by accessing with ordinary web browser client software. Table 3.1-1 shows the outline of Web LT major functions.

Table 3.1-1 Web LT Major Functions

Status & Condition	Display alarms and conditions of card and system.
Configuration	Setting of system configurations, optional functions and NE parameters.
Monitor	Display equipment and L2SW monitoring.
Test & Diagnostics	Display radio performance and analogue monitoring.
Maintenance	Display History of conditions, download and upload files

System Requirements

To use the Web LT, the PC hardware and software should meet or exceed the requirements listed in Table 3.1-2.

Table 3.1-2 System Requirements

Client Requirements	HTTP/1.0 or later
	JavaScript™ *1
	Cascade Style Sheet (CSS2)
	Least one working Ethernet port supporting 10/100Base-T 1024x768 or 1280x768 XGA Display recommended
Recommended Browser	Microsoft Internet Explorer *2, *3, Version 8.0 or later
Recommended OS	English version OS

*1 JavaScript is a trademark of Sun Microsystems, Inc., and refers to Sun's Java programming language.

*2 Microsoft Internet Explorer is a trademark of Microsoft Corporation in the United State and/or other countries.

*3 Set Zoom on View menu to 100% and Security of Internet Option on Tools menu to "Reset all zones to default level".

3.2 Menu Tree & Menu Description for GE Model

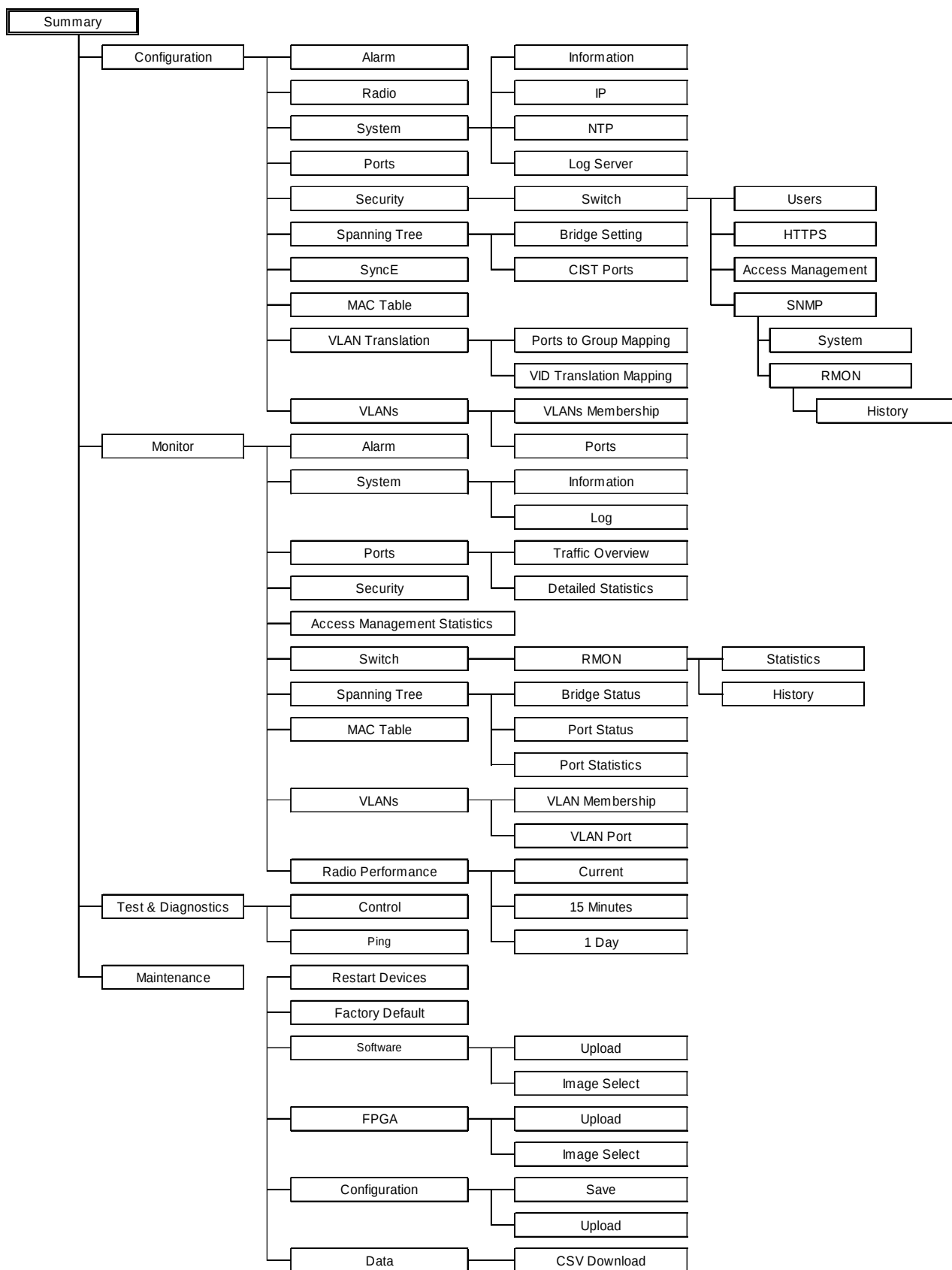


Figure 3.2-1 Menu Tree

Table 3.2-1 Menu Description for GE Model

Menu	Description
Summary	summary of current alarms
Configuration	Provisioning setting
Alarm	Optical pass through/Link shutdown: Enable/Disable
Radio	TX power/ATPC/ATPC RX threshold/Route ID/BER threshold
System	
Information	System information setting
IP	IP address setting
NTP	NTP configuration, RTC manual setting
Log Server	Server mode/Server address/Syslog level
Ports	Current port configuration
Security	
Switch	
Users	User name/User password/Privilege level
HTTPS	Mode/Automatic Redirect: Enable/Disable
Access Management	Mode: Enable/Disable, Add new entry
SNMP	
System	SNMP mode/Version/Community, SNMP trap configuration
RMON	
History	configure RMON History table
Spanning Tree	
Bridge Setting	configure STP system settings
CIST Ports	user to inspect the current <u>STP</u> CIST port configurations
SyncE	SyncE configuration setting
MAC Table	MAC table configuration setting
VLAN Translation	
Ports to Group Mapping	Configuration setting of "Port to Group Mapping"
VID Translation Mapping	Configuration setting of "VID Translation Mapping"
VLANs	
VLANs Membership	Configuration setting of VLANs membership
Ports	Configuration setting of VLAN ports
Monitor	
Alarm	Alarm monitoring item and item description
System	
Information	Current information of system/hardware/time/SW/FPGA
Log	Current information of system log
Ports	Current information of traffic packet
Traffic Overview	overview of general traffic statistics for all switch ports
Detailed Statistics Ratio	detailed traffic statistics for a specific switch port.
Security	
Access Management Statistics	Overview of access management statistics
Switch	
RMON	
Statistics	overview of RMON Statistics entries
History	Overview of RMON History entries
Spanning Tree	
Bridge Status	detailed information on a single <u>STP</u> bridge instance
Port Status	<u>STP</u> CIST port status for physical ports of the switch.
Port Statistics	<u>STP</u> port statistics counters of bridge ports in the switch
MAC Table	Entries in the <u>MAC Table</u>
VLANs	
VLAN Membership	Overview of membership status of VLAN users.
VLAN Port	Overview of VLAN port
Radio Performance	
Current	Current information of Time/Tx level/Rx level
15 Minutes	Historical radio performance data for 15 minutes interval
1 Day	Historical radio performance data for 1 day interval
Test & Diagnostics	
Control	Control of test and diagnosis
Ping	ICMP PING packets to troubleshoot IP connectivity issues.

Table 3.2-1 Menu Description (Cont'd)

Menu	Description
Maintenance	
Restart Devices	Restart Devices, Yes/No
Factory Default	Factory Default, Yes/No
Software	
Upload	Firmware Update
Image Select	Software Image Selection
FPGA	
Upload	FPGA upload
Image Select	FPGA image selection
Configuration	
Save	Configuration Save
Upload	Configuration Upload
Data	
CSV Download	CSV download

3.3 Menu Tree & Menu Description for CPRI Model

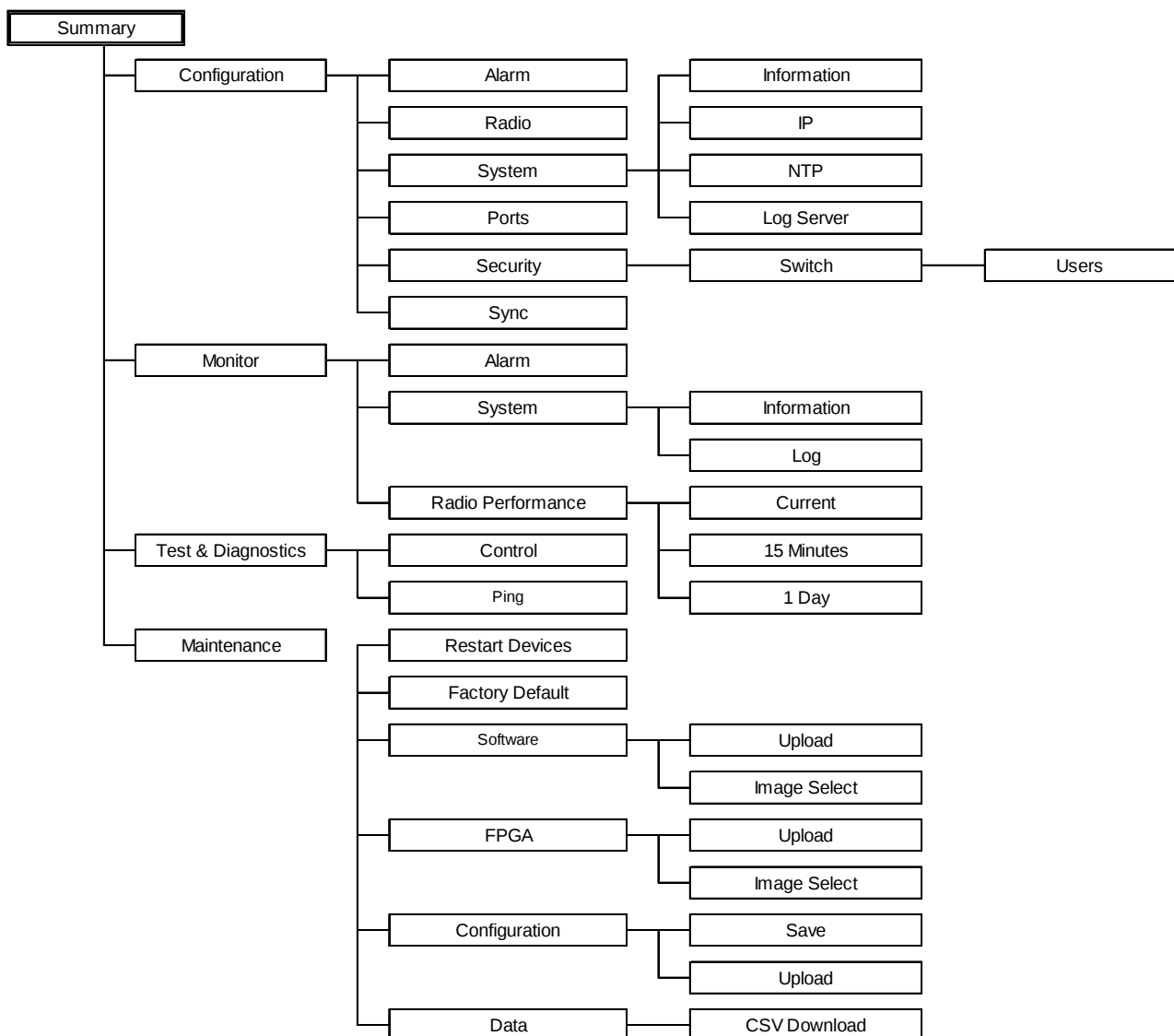


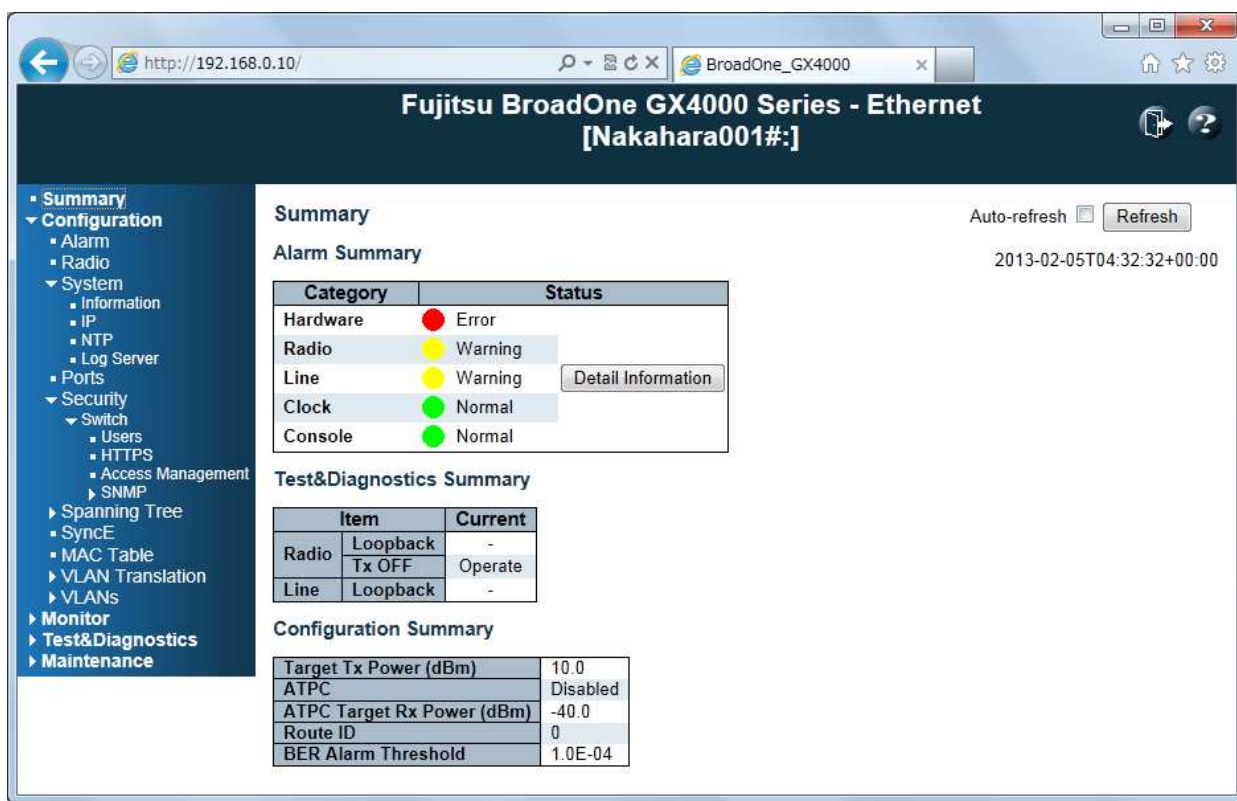
Figure 3.3-1 Menu Tree

Table 3.3-1 Menu Description for CPRI Model

Menu	Description
Summary	summary of current alarms
Configuration	Provisioning setting
Alarm	Optical pass through/Link shutdown: Enable/Disable
Radio	TX power/ATPC/ATPC RX threshold/Route ID/BER threshold
System	
Information	System information setting
IP	IP address setting
NTP	NTP configuration, RTC manual setting
Log Service	Server mode/Server address/Syslog level
Ports	Current port configuration
Security	
Switch	
Users	User name/User password/Privilege level
Sync	Synchronization configuration setting
Monitor	
Alarm	Alarm monitoring item and item description
System	
Information	Current information of system/hardware/time/SW/FPGA
Log	Current information of system log
Radio Performance	
Current	Current information of Time/Tx level/Rx level
15 Minutes	Historical radio performance data for 15 minutes interval
1 Day	Historical radio performance data for 1 day interval
Test & Diagnostics	
Control	Control of test and diagnosis
Ping	ICMP PING packets to troubleshoot IP connectivity issues.
Maintenance	
Restart Devices	Restart Devices, Yes/No
Factory Default	Factory Default, Yes/No
Software	
Upload	Firmware Update
Image Select	Software Image Selection
FPGA	
Upload	FPGA upload
Image Select	FPGA image selection
Configuration	
Save	Configuration Save
Upload	Configuration Upload
Data	
CSV Download	CSV download

3.4 WebLT GUI

Summary



Alarm Summary: This menu shows the summary of current alarms.

- Category : The category of alarms. The displayed categories are;
- Hardware:** Related to the hardware
 - Radio:** Related to the Radio interface
 - Line:** Related to the Line interface
 - Clock:** Related to the clock synchronization
 - Console:** Related to the Console interface
- Status : The status of current alarms are displayed with 3 levels Error, Warning and info.
- Error** (indicated with red icon): High level problem. Equipment can not work correctly, under this condition. Fatal problem happens on internal device or process.
 - Warning** (indicated with yellow icon): Low level problem. Equipment is working. However some problem happens on interface of Radio, Line Clock or Console, otherwise hardware has degradation.
 - Info** (indicated with blue icon): Information except Error and Warning to be informed to the operator.
- If there are no Error, Warning and Info, **Normal** (indicated with green icon) is displayed

Test & Diagnostics Summary: This menu shows the summary of current condition of Test and Diagnostics.

- Radio loopback : Operation of Loopback for RADIO side.
- Radio TX OFF : Operation of shut-off for TX output power.

- Line loopback : Operation of Loopback for LINE side.
- Current : Indicates current condition. The displayed conditions are;
Operate: Operation is active
-: Operation is inactive
Configuration Summary: This menu shows the summary of radio configuration
- Target TX power : Current setting of target value for TX output power.
- ATPC : Current setting of ATPC. The displayed settings are:
Enabled: ATPC is enabled
Disabled: ATPC is disabled
- ATPC target RX power : Current setting of target value for receiving power upon ATPC. If ATPC is disabled, there is no value.
- Route ID : Current setting of root identification number for radio link.
- BER Alarm Threshold : Current setting of BER alarm threshold for radio link
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
- Refresh** : Click to refresh the page
- Detail Information** : Click to open the detailed alarm list as shown in Figure 1a below.

Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]

Monitor > Alarm Auto-refresh ☐ Refresh

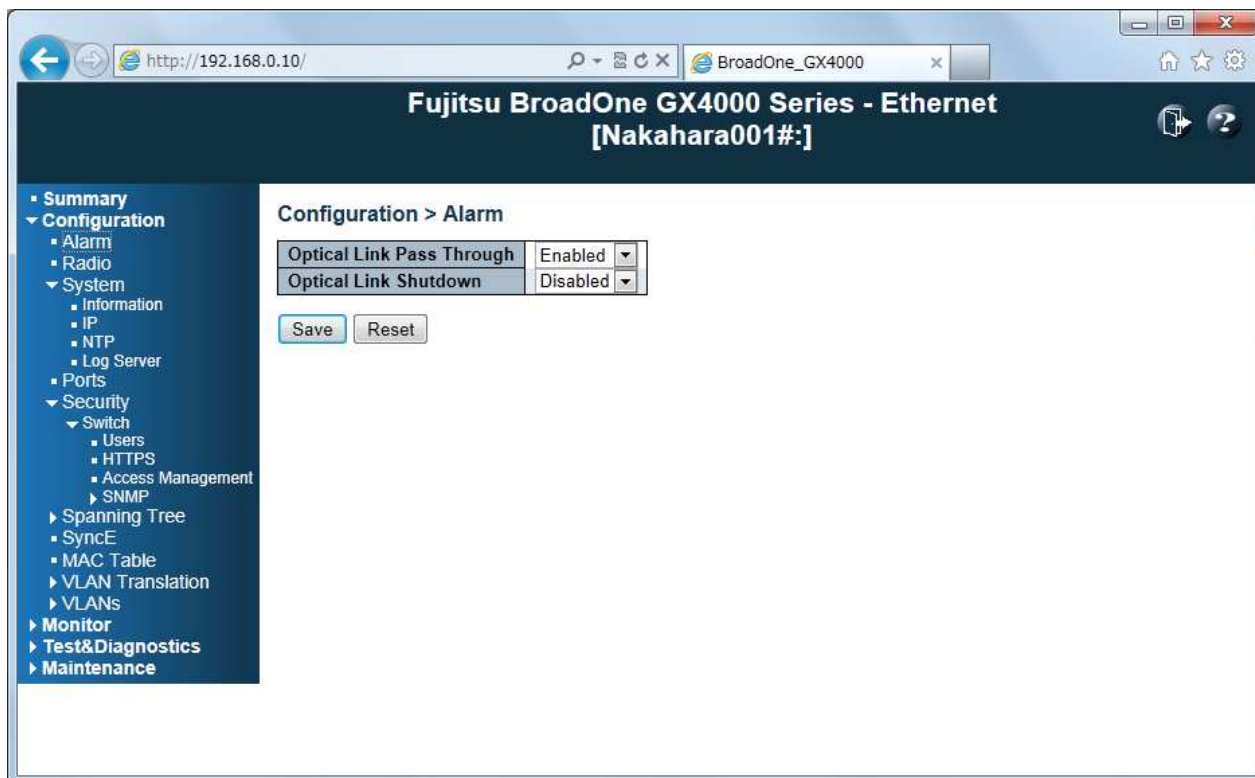
2013-02-06T07:58:45+00:00

No.	Level	Time	Category	Condition Description
1	Warning	2013-02-06T01:22:01+00:00	Hardware	Internal Power Source Failure
2	Warning	2013-02-06T01:21:30+00:00	Radio	RS Synchronization Loss
3	Warning	2013-02-06T01:21:21+00:00	Line	MOD_NR(Module Not Ready (mirroring hardware output pin))
4	Warning	2013-02-06T01:21:21+00:00	Line	RX_CDR Unlocked(Unlocked:Loss of Lock of RX side CDR)
5	Info	2013-02-06T01:21:21+00:00	Line	RX_LOS(RX Loss of Signal (mirroring hardware output pin))
6	Warning	2013-02-06T01:21:21+00:00	Line	RX_NR(Any condition leading to invalid data on the RX path)
7	Error	2013-02-06T01:21:20+00:00	Hardware	IO Error
8	Error	2013-02-06T01:21:20+00:00	Hardware	Startup Failure
9	Info	2013-02-06T01:21:20+00:00	Line	Optical Power Received Out of Range
10	Info	2013-02-06T01:21:20+00:00	Line	Optical Power Received Degrade

Detailed Alarm List Screen

Configuration

Configuration > Alarm



Configuration > Alarm:

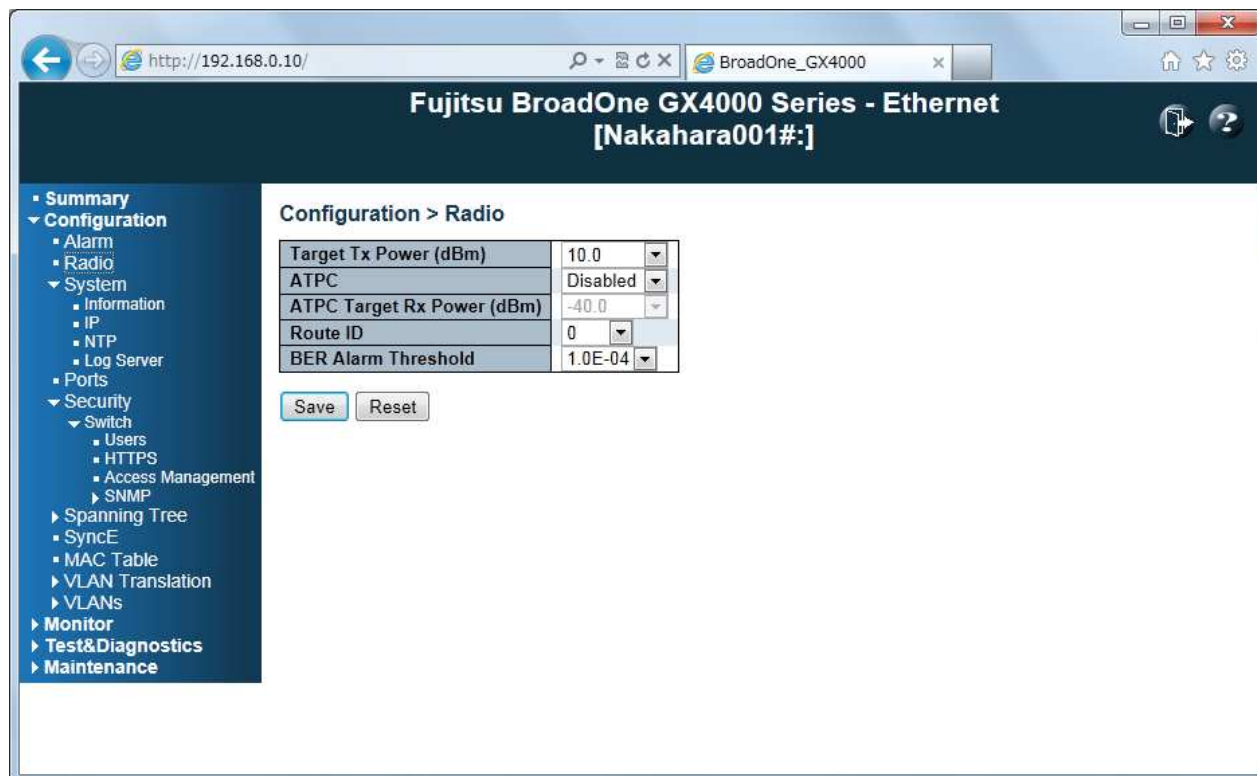
Optical Link Pass Through : The Optical Link Pass Through is the function that carry the condition of own optical link down to opposite side optical link through the radio link. Set the Optical Link Pass Through. Possible settings are:
Enabled: Optical Link Pass Through is enabled
Disabled: Optical Link Pass Through is disabled

Optical Link Shutdown : The Optical Link Shutdown is the function that automatically shuts off the optical output according to the loss of radio link. Set the Optical Link Shutdown. Possible settings are:
Enabled: Optical Link Shutdown is enabled
Disabled: Optical Link Shutdown is disabled

Save Button : Click to save changes

Reset Button : Click to undo any changes made locally and revert to previously saved values

Configuration > Radio



Configuration > Radio:

- Target Tx Power** : The Target Tx Power is the target TX output power of transmitter. Set to **0.0** (0 dBm) to **10.0** (+10 dBm) with **0.5** step. The default value is 10.0 (+10 dBm).
- ATPC** : The Automatic Transmit Power Control is the function that adjust TX output power automatically by detecting far-end receiver signal level (RSL) threshold. Possible settings are:
Enabled: ATPC is enabled
Disabled: ATPC is disabled (default)
- ATPC Target Rx power** : The ATPC Target Rx Power is target value of far-end RSL threshold when ATPC is enabled. Set to **-30.0** (-30 dBm) or **-40.0** (-40 dBm). The default value is -40.0 (-40 dBm). If ATPC is disabled, it cannot activate. Default is -40.
- Route ID** : The Route ID is the function that identifies the number for radio link to detect the interference with undesired radio signals. Same Route ID must be set on both of equipment that connected by a radio link. If there is different Route ID, "RF Route ID Fail" happens. Set to **0** to **15**. The default value is 0
- BER Alarm Threshold** : The BER Alarm Threshold is defined the threshold to initiate "Radio BER Alarm". Set to **1.0E-03**, or **5.0E-04**, or **1.0E-04**, or **5.0E-05**, or **1.0E-05**, or **5.0E-06**, or **1.0E-06**. The default value is 1.0E-04.
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values

Configuration > System**Configuration > System > Information**

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

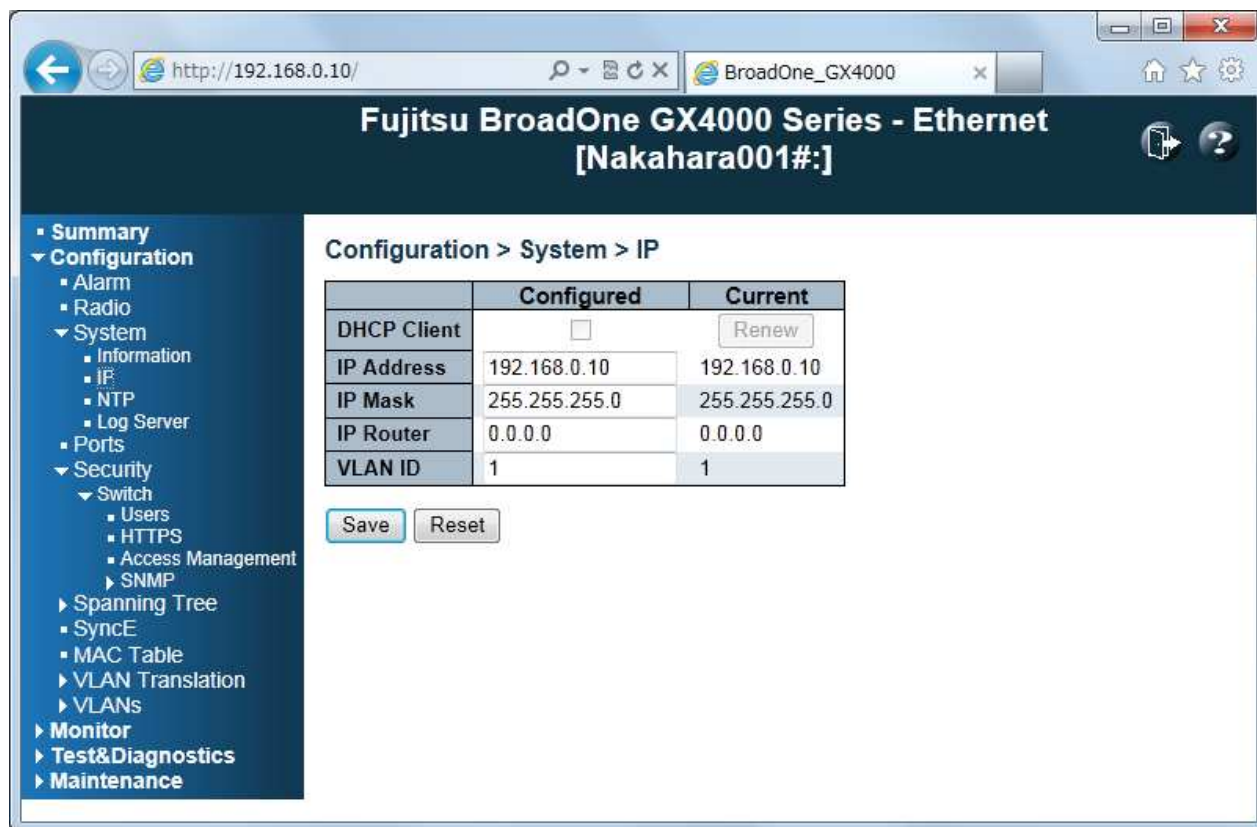
Configuration > System > Information

System Contact	Nakahara:
System Name	Nakahara001-2F
System Location	Nakahara001#:
System Timezone Offset (minutes)	0
Site Code	a1-2:
Equipment Code	b-2:
Local No.	c1-2:
Resource State	d1-2:
Equipment Note	e1-2:

Configuration > System > Information:

- System Contact** : The textual identification of the contact person. The allowed string length is 0 to 255 and the allowed content is the ASCII characters from 32 to 126.
- System Name** : An administratively assigned name for this radio system. Allowable character is a text string drawn from the alphabet (A-Za-z), digits (0-9), minus sign (-). No space characters are permitted as part of a name. The first character must be an alpha character. And the first or last character must not be a minus sign. The allowed string length is 0 to 255.
- System Location** : The physical location of this site (e.g., telephone closet, 3rd floor). The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 32 to 126
- System Timezone offset** : Provide the time zone offset relative to UTC/GMT. The offset is given in minutes east of GMT. The valid range is from -720 to 720 minutes.
- Site Code** : Site code where equipment is set up, max. 9 alphanumeric characters
- Equipment Code** : Equipment code, maximum 5 alphanumeric characters.
- Local Number** : User managed serial number, max. 6 alphanumeric characters
- Resource State** : NE release-build status, max. 6 alphanumeric characters
- Equipment Note** : Equipment note, max. 60 alphanumeric characters
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values

Configuration > System > IP

**Configuration > System > IP:**

Configure the switch-managed [IP](#) information on this page. The **Configured** column is used to view or change the IP configuration. The **Current** column is used to show the active IP configuration.

- DHCP Client : Not supported. "Disable" is always set.
- IP Address : Set the IP address of this switch in [dotted decimal notation](#).
Default is 192.0.2.1
- IP Mask : Set the IP mask of this switch [dotted decimal notation](#).
Default is 255.255.255.0
- IP Router : Set the IP address of the router in [dotted decimal notation](#).
Default is 0.0.0.0
- VLAN ID : Provide the managed [VLAN](#) ID. The allowed range is 1 to 4095.
Default is 1
Note: When functioning, CPRI is not displayed.
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values

Configuration > System > NTP

The screenshot shows a web browser window with the address bar displaying 'http://192.168.0.10/'. The browser tab is labeled 'BroadOne_GX4000'. The main title of the page is 'Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]'. On the left is a navigation menu with the following items: Summary, Configuration (expanded), Alarm, Radio, System (expanded), Information, IP, NTP (selected), Log Server, Ports, Security (expanded), Switch, Users, HTTPS, Access Management, SNMP, Spanning Tree, SyncE, MAC Table, VLAN Translation, VLANs, Monitor, Test&Diagnostics, and Maintenance. The main content area is titled 'Configuration > System > NTP' and 'NTP Configuration'. It contains a 'Mode' dropdown menu set to 'Disabled', and two input fields for 'Server 1' and 'Server 2'. Below these are 'Save' and 'Reset' buttons. The section 'RTC Manual Set' shows the 'Current Date:' as '2013-02-05T05:10:02+00:00' and a table for manual date and time input:

Year	Mon.	Day	Hour	Min.	Sec.

Below the table are 'Set' and 'Clear' buttons.

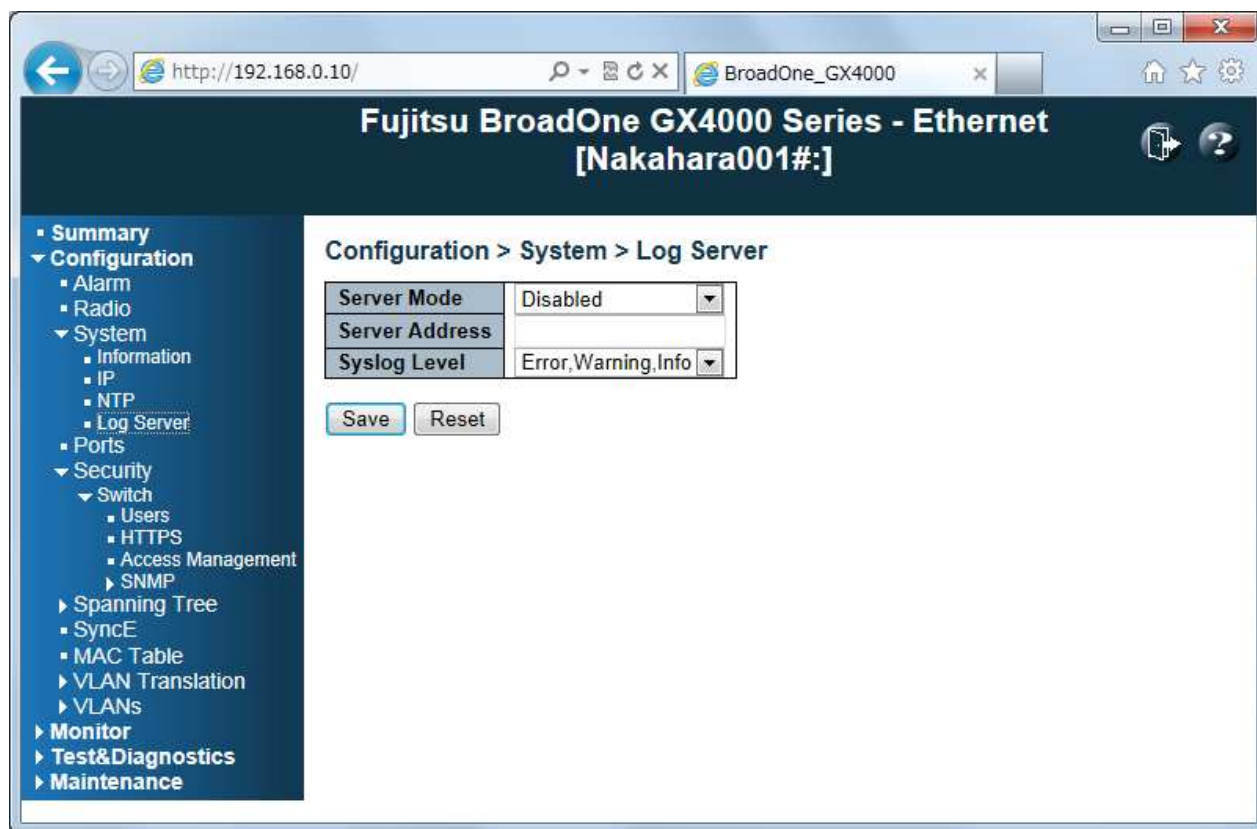
NTP Configuration:

- Mode** : Indicates the NTP mode operation. Possible modes are:
Enabled: Enable NTP mode operation. When NTP mode operation is enabled, the agent forwards NTP messages between the clients and the server when they are not on the same subnet domain.
Disabled: Disable NTP mode operation.
- Server1/2** : Provide the NTP IPv4 address of this switch. Default is null.
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values

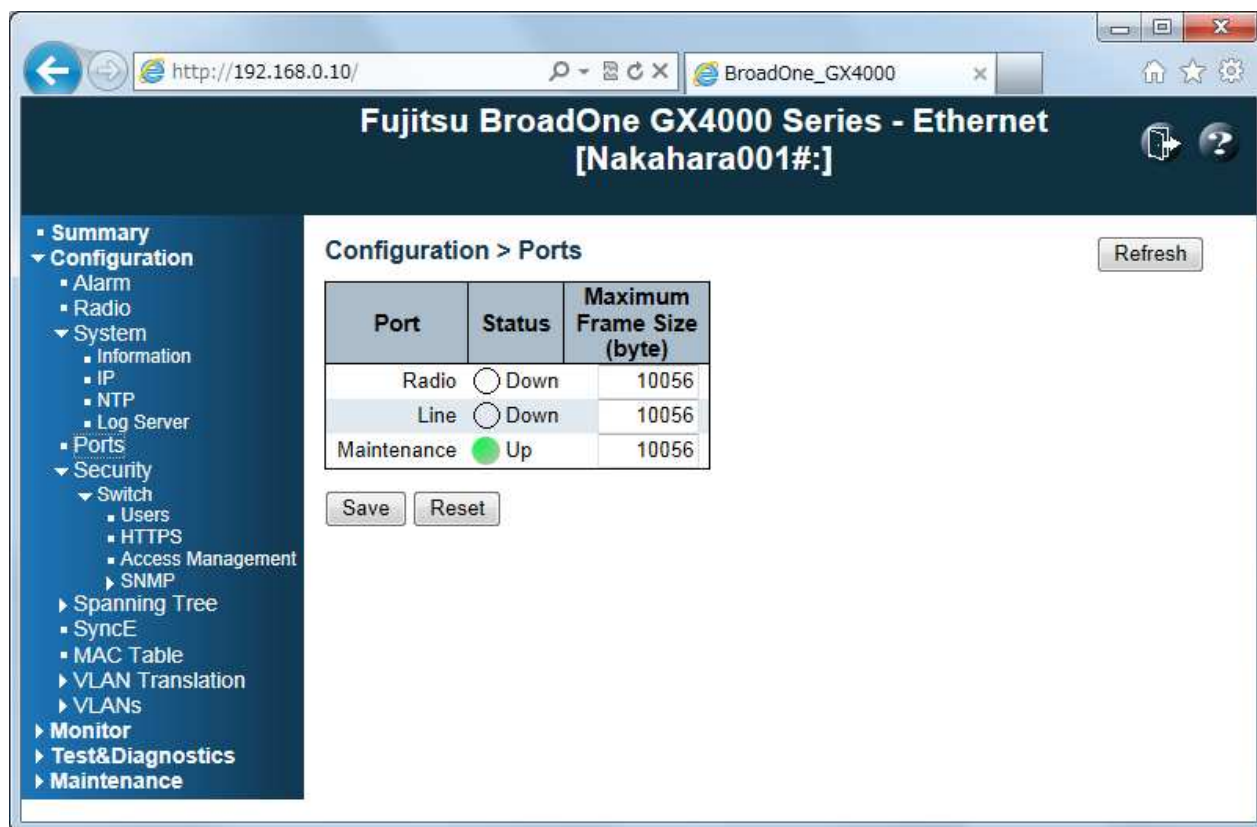
RTC Manual Set:

- Mode** : Set the date and time.
 The input items are:
 Year: Input year. (allowed range: 2012-2037)
 Mon.: Input month. (allowed range: 1-12)
 Day: Input day. (allowed range: 1-31)
 Hour: Input hour. (allowed range: 0-23)
 Min.: Input minute. (allowed range: 0-59)
 Sec.: Input second. (allowed range: 0-59)
- Set** : Input date and time are set
- Clear** : The input items are emptied

Configuration > System > Log Server

**Configuration > System > Log Server:**

- Server Mode** : Indicates the server mode operation. When the mode operation is enabled, the syslog message will send out to syslog server. The syslog protocol is based on UDP communication and received on UDP port 514 and the syslog server will not send acknowledgments back sender since UDP is a connectionless protocol and it does not provide acknowledgments. The syslog packet will always send out even if the syslog server does not exist. Possible modes are:
Enabled: Enable server mode operation.
Disabled: Disable server mode operation. (default)
- Server Address** : Indicates the IPv4 host address of syslog server. If the switch provide DNS feature, it also can be a host name. Default is null.
- Syslog Level** : Indicates what kind of message will send to syslog server. Possible modes are:
Error, Warning, Info: Send information, warnings and errors.
Error, Warning: Send warnings and errors.
Error: Send errors.
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values

Configuration > Port (Only applicable for GE Model)**Configuration > Port:**

This menu displays current port configurations. Ports can also be configured here.

This menu displays current port configurations. Ports can also be configured here.

- Port** : This is the port name for this row
- Status** : The current link state is displayed graphically. Green indicates the link is up and no colour that it is down.
- Maximum Frame Size** : Enter the maximum frame size allowed for the switch port, including FCS.
 Line port maximum frame size: 1518 to 10056, default is 10056
 Radio port maximum frame size: 1518 to 10056, default is 10056
 Maintenance port maximum frame size: 1518 to 10056, default is 10056
- Save Button** : Click to save changes
- Reset Button** : Click to undo any changes made locally and revert to previously saved values.
- Refresh Button** : Click to refresh the page. Any changes made locally will be undone

Configuration > Security

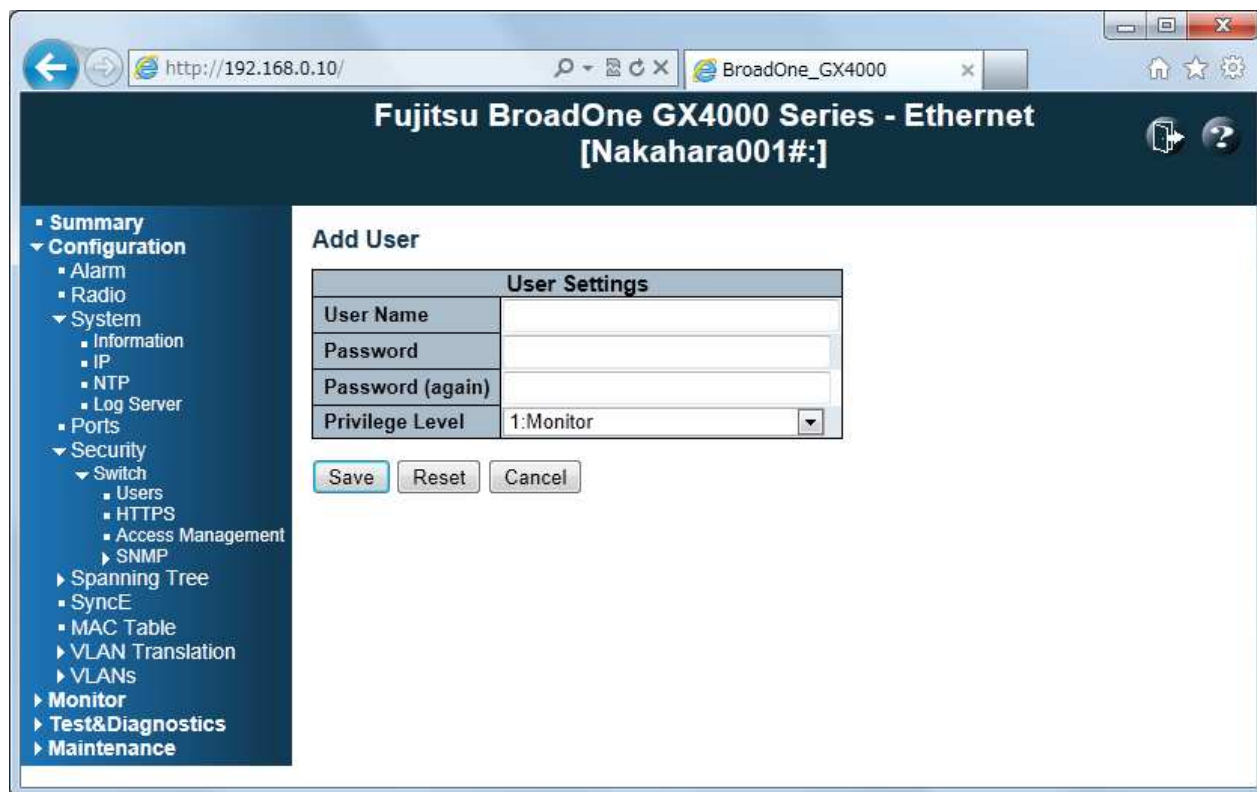
Configuration > Security > Switch > User



Configuration > Security > Switch > User:

This menu provides an overview of the current users. Currently the only way to login as another user on the web server is to close and reopen the browser. The displayed values for each user are:

- User Name : The name identifying the user. This is also a link to [Add/Edit User](#).
- Privilege Level : The privilege level of the user. The allowed range is 1 to 4.
The operation allowed at each privilege level is the following:
 - 1: Monitor
 - 2: Monitor, Test & Diagnostics
 - 3: Monitor, Test & Diagnostics, Maintenance, Configuration
 - 4: Monitor, Test & Diagnostics, Maintenance, Configuration, Telnet
- Add New User : Click to add a new user and Add User frame will appear.



Add User Sub Frame

Add User:

- User Name** : A string identifying the user name that this entry should belong to. The allowed string length is 1 to 32. The valid user name is a combination of letters, numbers and underscores.
- Password** : The password of the user. The allowed string length is 0 to 32.
- Password again** :
- Privilege Level** : The privilege level of the user. The allowed range is 1 to 3. The operation allowed at each privilege level is the following:
 1: Monitor
 2: Monitor, Test & Diagnostics
 3: Monitor, Test & Diagnostics, Maintenance, Configuration
- Save button** : Click to save changes
- Reset button** : Click to undo any changes made locally and revert to previously saved values
- Cancel button** : Click to undo any changes made locally and return to the [Users](#).
- Delete User** : Delete the current user. This button is not available for new configurations (Add new user)

Configuration > Security > Switch > HTTPS (Only applicable for GE Model)

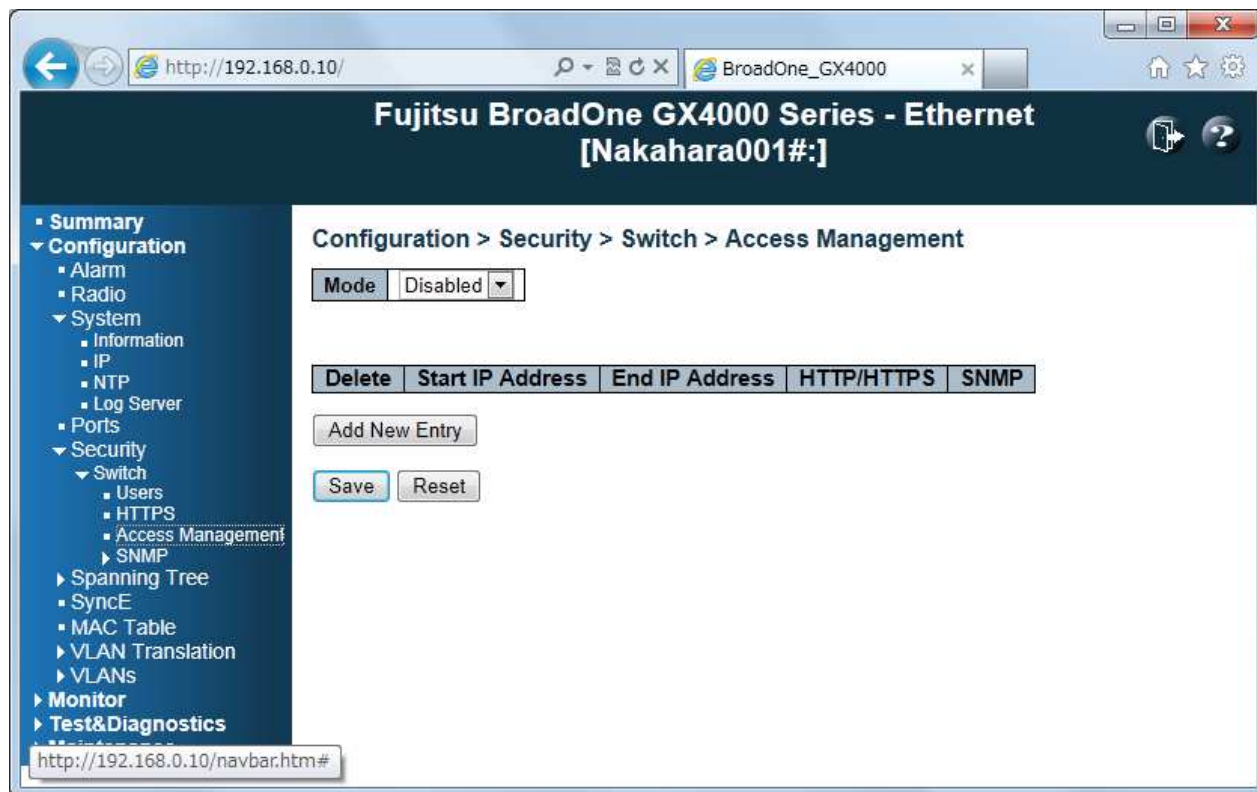


Configuration > Security > Switch > HTTPS:

- | | | |
|--------------------|---|---|
| Mode | : | Indicates the HTTPS mode operation. When the current connection is HTTPS, to apply HTTPS disabled mode operation will automatically redirect web browser to an HTTP connection. Possible modes are:
Enabled: Enable HTTPS mode operation.
Disabled: Disable HTTPS mode operation. |
| Automatic Redirect | : | Indicates the HTTPS redirect mode operation. It only significant if HTTPS mode "Enabled" is selected. Automatically redirects web browser to an HTTPS connection when both HTTPS mode and Automatic Redirect are enabled or redirects web browser to an HTTP connection when both are disabled. Possible modes are:
Enabled: Enable HTTPS redirect mode operation.
Disabled: Disable HTTPS redirect mode operation. |
| Save button | : | Click to save changes |
| Reset button | : | Click to undo any changes made locally and revert to previously saved values |

Configuration > Security > Switch > Access Management

(only applicable for GE Model)

**Access Management:**

The maximum number of entries is **16**. If the application's type match any one of the access management entries, it will allow access to the switch.

- Mode** : Indicates the access management mode operation. Possible modes are:
Enabled: Enable access management mode operation.
Disabled: Disable access management mode operation.
- Delete** : Check to delete the entry. It will be deleted during the next save.
- Start IP Address** : Indicates the start IP address for the access management entry.
- End IP Address** : Indicates the end IP address for the access management entry.
- HTTP/HTTPS** : Indicates that the host can access the switch from HTTP/HTTPS interface if the host IP address matches the IP address range provided in the entry.
- SNMP** : Indicates that the host can access the switch from SNMP interface if the host IP address matches the IP address range provided in the entry.
- Add New Entry** : Click to add a new access management entry.
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values

Configuration > Security > Switch > SNMP (Only applicable for GE Model)

Configuration > Security > Switch > SNMP > System

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

Configuration > Security > Switch > SNMP > System

Mode	Enabled
Version	SNMP v2c
Read Community	public
Write Community	private

SNMP Trap Configuration

Trap Mode	Disabled
Trap Version	SNMP v2c
Trap Community	public
Trap Destination Address	
Trap Authentication Failure	Enabled
Trap Link-up and Link-down	Enabled
Trap Inform Mode	Enabled
Trap Inform Timeout (seconds)	1
Trap Inform Retry Times	5

Save Reset

Configuration > Security > Switch > SNMP > System:

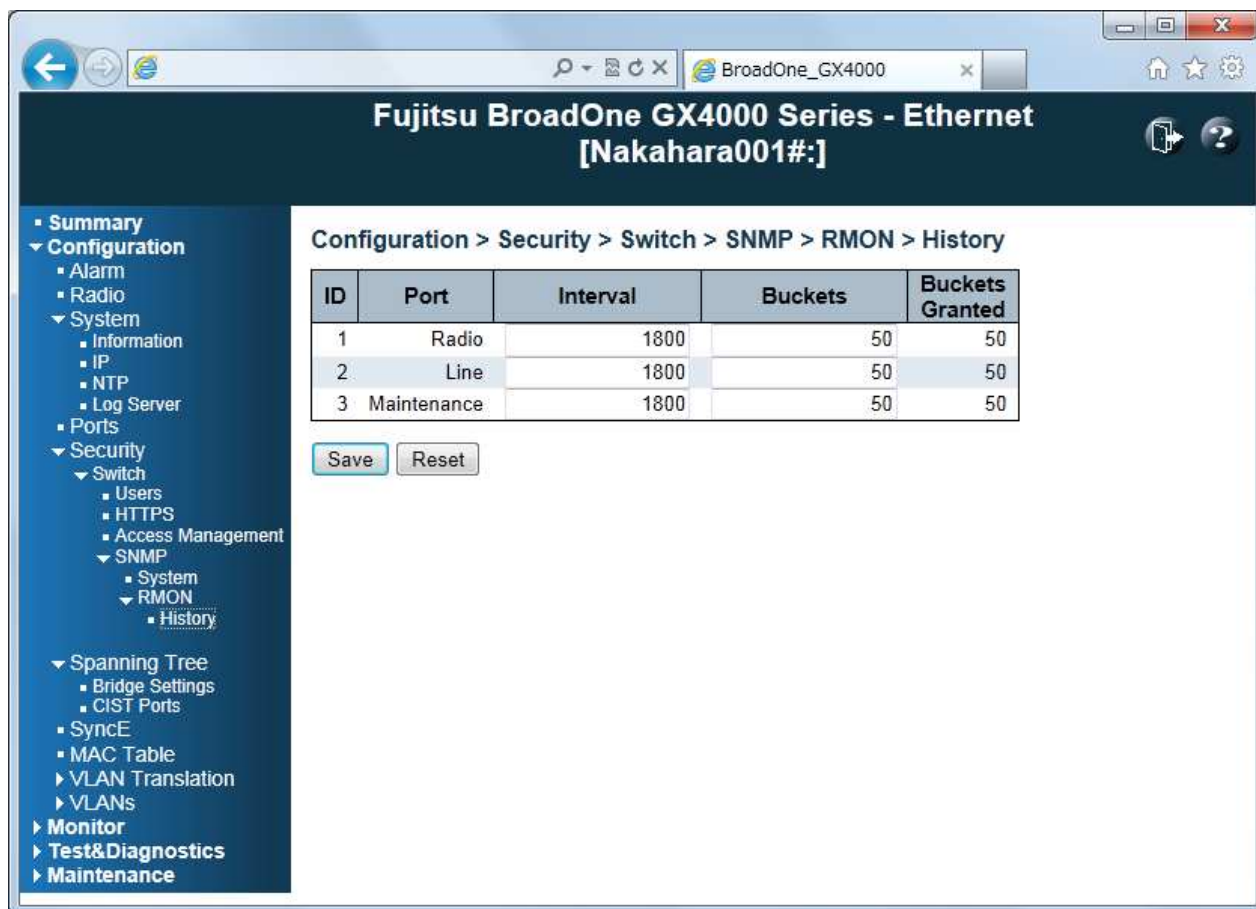
- Mode** : Indicates the SNMP mode operation. Possible modes are:
Enabled: Enable SNMP mode operation.
Disabled: Disable SNMP mode operation.
- Version** : Indicates the SNMP supported version. Possible versions are:
SNMP v2c: Set SNMP supported version 2c.
- Read Community** : Indicates the community read access string to permit access to SNMP agent. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 33 to 126.
 The field is applicable only when SNMP version is SNMPv2c. It provides more flexibility to configure security name than a SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.
- Write Community** : Indicates the community write access string to permit access to SNMP agent. The allowed string length is 0 to 255, and the allowed content is the ASCII characters from 33 to 126.
 The field is applicable only when SNMP version is SNMPv2c. It provides more flexibility to configure security name than a SNMPv2c community string. In addition to community string, a particular range of source addresses can be used to restrict source subnet.

SNMP Trap Configuration:

Trap Mode	:	Indicates the SNMP trap mode operation. Possible modes are: Enabled: Enable SNMP trap mode operation. Disabled: Disable SNMP trap mode operation.
Trap Version	:	Indicates the SNMP trap supported version. Possible versions are: SNMP v2c: Set SNMP trap supported version 2c.
Trap Community	:	Indicates the community access string when sending SNMP trap packet. The allowed string length is 0 to 255, and the allowed content is ASCII characters from 33 to 126.
Trap Destination Address	:	Indicates the SNMP trap destination address. It allows a valid IP address in dotted decimal notation ('x. y. z. w').
Trap Authentication Failure	:	Indicates that the SNMP entity is permitted to generate authentication failure traps. Possible modes are: Enabled: Enable SNMP trap authentication failure. Disabled: Disable SNMP trap authentication failure.
Trap Link-up and Link-down	:	Indicates the SNMP trap link-up and link-down mode operation. Possible modes are: Enabled: Enable SNMP trap link-up and link-down mode operation. Disabled: Disable SNMP trap link-up and link-down mode operation.
Trap Inform Mode	:	Indicates the SNMP trap inform mode operation. Possible modes are: Enabled: Enable SNMP trap inform mode operation. Disabled: Disable SNMP trap inform mode operation.
Trap Inform Timeout (sec)	:	Indicates the SNMP trap inform timeout. The allowed range is 0 to 2147 .
Trap Inform Retry Times	:	Indicates the SNMP trap inform retry times. The allowed range is 0 to 255 .
Save	:	Click to save changes
Reset		Click to undo any changes made locally and revert to previously saved values

Configuration > Security > Switch > SNMP > RMON

Configuration > Security > Switch > SNMP > RMON > History



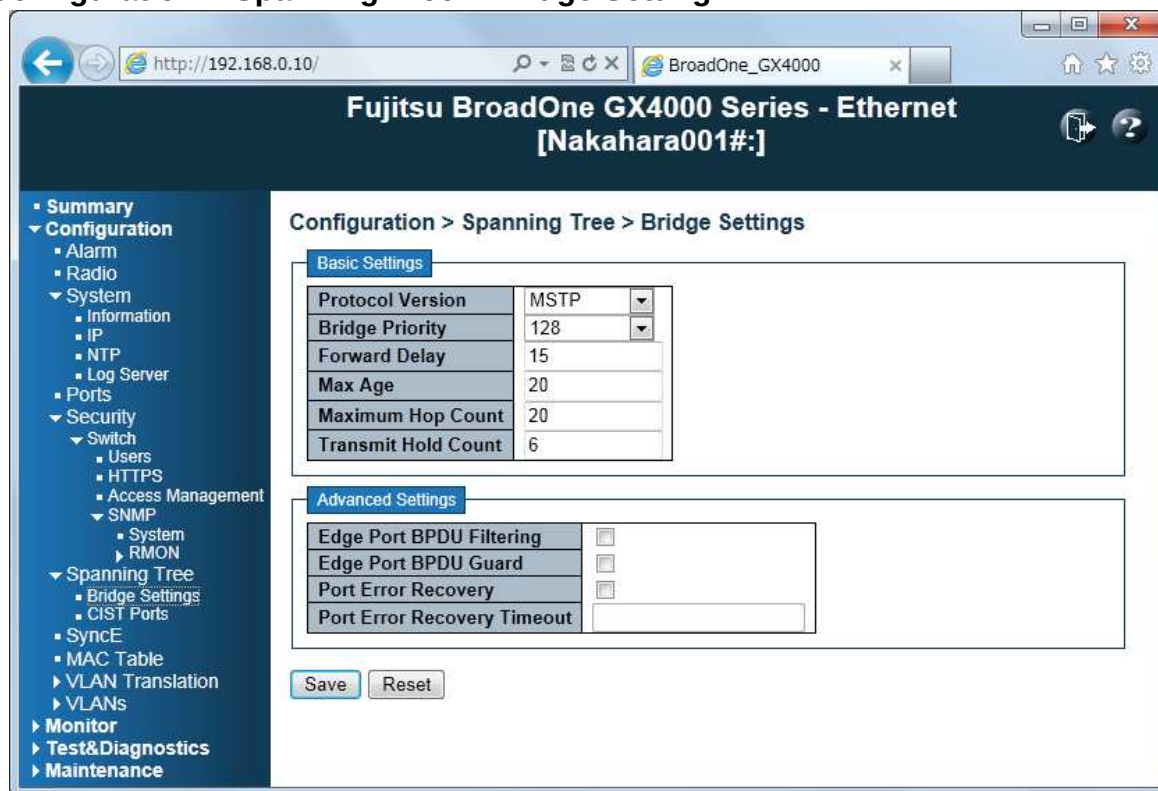
Configuration > Security > Switch > RMON > History:

This menu is to configure RMON History table. The entry index key is **ID**.

- ID** : Indicates the index of the entry. The range is from 1 to 65535
- Port** : Indicates the port name which wants to be monitored
- Interval** : Indicates the interval in seconds for sampling the history statistics data. The range is from 1 to 3600, default value is 1800 seconds.
- Buckets** : Indicates the maximum data entries associated this History control entry stored in RMON. The range is from 1 to 3600, default value is 50.
- Buckets Granted** : The number of data shall be saved in the RMON
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values

Configuration > Spanning Tree (Only applicable for GE Model)

Configuration > Spanning Tree > Bridge Setting



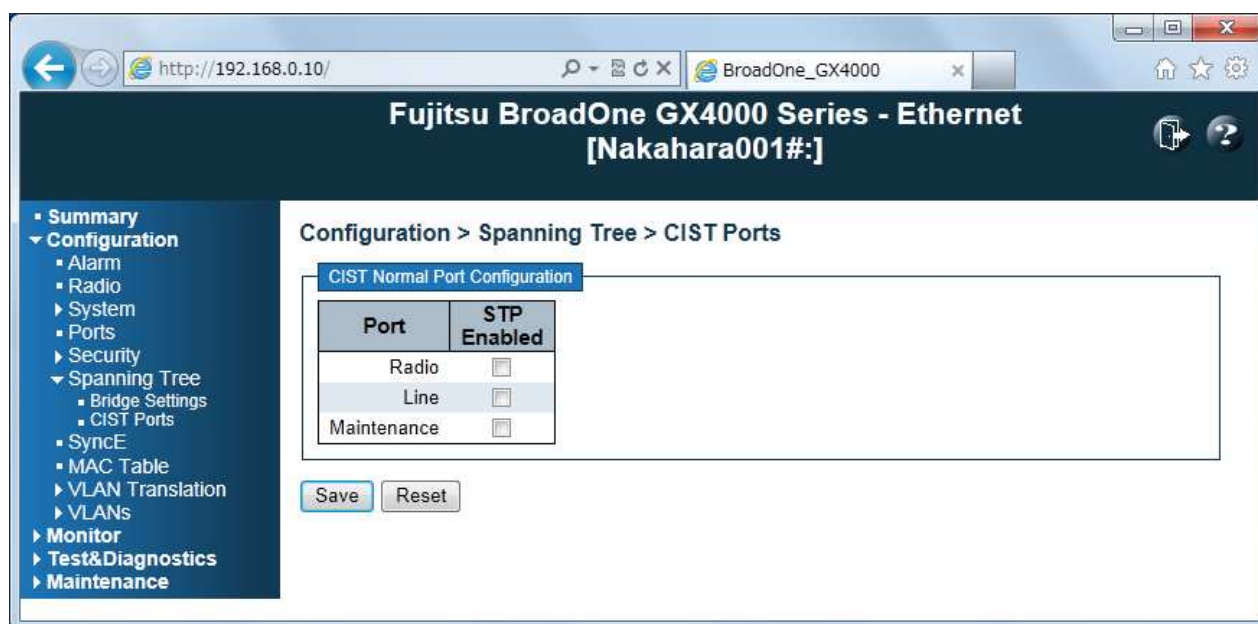
Configuration > Spanning Tree > Bridge Setting: This menu allows you to configure STP system settings. The settings are used by all STP Bridge instances in the Switch

Basic Setting:

- Protocol Version : The [STP](#) protocol version setting. Valid values are STP, RSTP & MSTP. Default is MSTP.
- Bridge Priority : Controls the bridge priority. Lower numeric values have better priority. The bridge priority plus the MSTI instance number, concatenated with the 6-byte MAC address of the switch forms a *Bridge Identifier*.
For **MSTP** operation, this is the priority of the CIST. Otherwise, this is the priority of the STP/RSTP bridge. Default is 128.
- Forward Delay : The delay used by STP Bridges to transit Root and Designated Ports to Forwarding (used in STP compatible mode). Valid values are in the range 4 to 30 seconds. Default is 15.
- Max Age : The maximum age of the information transmitted by the Bridge when it is the Root Bridge. Valid values are in the range 6 to 40 seconds, and Max Age must be $\leq (\text{FwdDelay}-1)*2$. Default is 20.
- Maximum Hop Count : This defines the initial value of remaining Hops for MSTI information generated at the boundary of an MSTI region. It defines how many bridges a root bridge can distribute its BPDU information to. Valid values are in the range 6 to 40 hops. Default is 20.
- Transmit Hold Count : The number of BPDU's a bridge port can send per second. When exceeded, transmission of the next BPDU will be delayed. Valid values are in the range 1 to 10 BPDU's per second. Default is 6.

Advanced Setting:

- Edge Port BPDU Filtering : Control whether a port *explicitly* configured as **Edge** will transmit and receive BPDUs. Default is not clicking.
- Edge Port BPDU Guard : Control whether a port *explicitly* configured as **Edge** will disable itself upon reception of a BPDU. The port will enter the *error-disabled* state, and will be removed from the active topology. Default is not clicking.
- Port Error Recovery : Control whether a port in the *error-disabled* state automatically will be enabled after a certain time. If recovery is not enabled, ports have to be disabled and re-enabled for normal STP operation. The condition is also cleared by a system reboot. Default is not clicking.
- Port Error Recovery Timeout : The time to pass before a port in the *error-disabled* state can be enabled. Valid values are between 30 and 86400 seconds (24 hours). Default is null.
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values

Configuration > Spanning Tree > CIST Ports

Spanning Tree > CIST Ports: This menu allows the user to inspect the current STP CIST port configurations, and possibly change them as well. This menu contains settings for physical and aggregated ports.

- Port : The port name of the logical STP port
- STP Enables : Controls whether STP is enabled on this port
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values

Configuration > SyncE (Only applicable for GE Model)

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Configuration > SyncE Refresh

Note: The configurations on this page are saved in the flash memory, but can not be saved to a XML file which is downloaded by "Maintenance > Configuration > Save".

Clock Source Nomination and State

Clock Source	Nominated	Port	Priority	SSM Overwrite	Hold Off	LOCS	SSM	WTR	Clear WTR
1	☐	Line	-	QL NONE	Disabled	●	●	●	none
2	☐	Radio	-	QL NONE	Disabled	●	●	●	none

Clock Selection Mode and State

Mode	Source	WTR Time	SSM Hold Over	SSM Free Run	State	Clock Source	LOL
Forced Free Run	1	5M	QL NONE	QL NONE	Free Run		●

Save Reset

SyncE Ports

Port	SSM Enable	Tx SSM	Rx SSM
Radio	☐		
Line	☐		

Clock Source Nomination and Status:

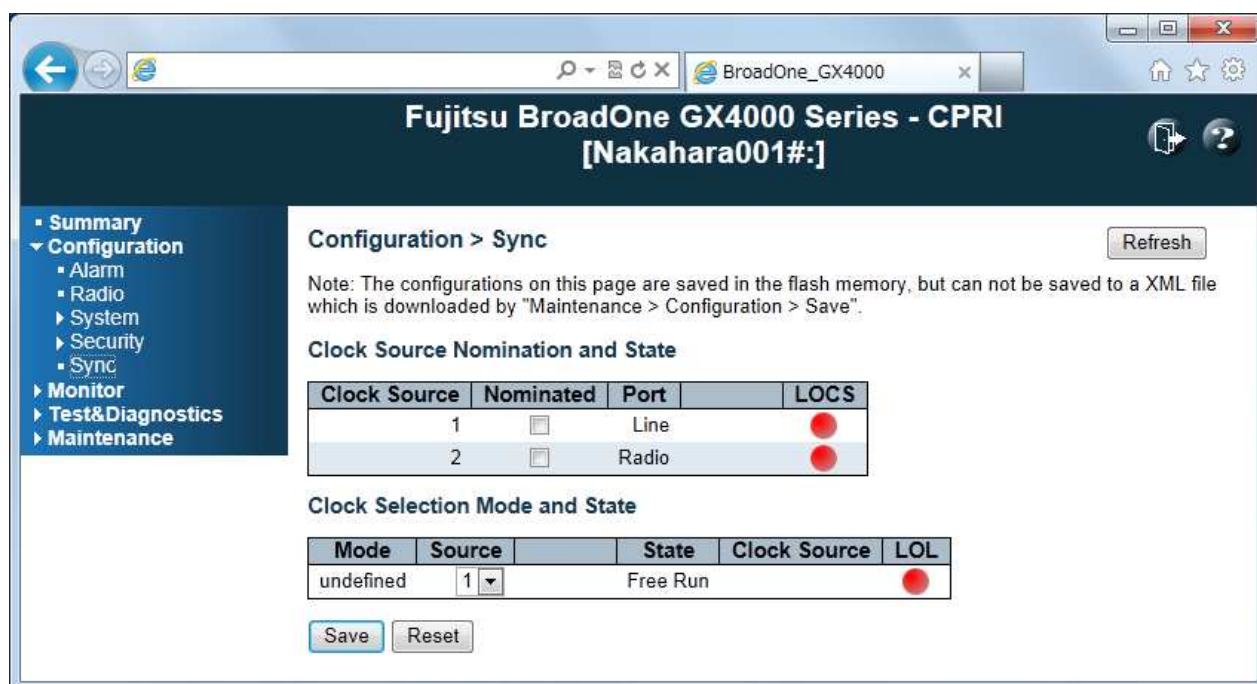
- Clock Source** : This is the instance number of the clock source. This has to be referenced when selecting 'Manual' Mode
- Nominated** : When a clock source is nominated, the clock output from the related [PHY](#) (Port) is enabled against the clock controller. This makes it available as a possible source in the clock selection process.
- Port** : The ports that are possible to select for this clock source, is presented.
- Priority** : The priority for this clock source. Lowest number (0) is the highest priority. If two clock sources have the same priority, the lowest clock source number gets the highest priority in the clock selection process. (Future support)
- SSM Overwrite** : A selectable clock source Quality Level ([QL](#)) to overwrite any QL received in a [SSM](#). If QL is not Received in a SSM (SSM is not enabled on this port), the SSM Overwrite QL is used as if received. The SSM Overwrite can be set to QL_NONE, indicating that the clock source is without any know quality (Lowest compared to clock source with known quality)
- Hold Off** : The Hold Off timer value. Active loss of clock Source will be delayed the selected amount of time. The clock selector will not change clock source if the loss of clock condition is cleared within this time (Future support)
- LOCS** : Signal is lost on this clock source
- SSM** : If SSM is enabled and not received properly. Type of SSM fail will be indicated in the 'Rx SSM' field
- WTR** : Wait To Restore timer is active.
- Clear WTR** : Clears the WTR timer and makes this clock source available to the clock selection process.

Clock Selection Mode and Status

Mode	: The definition of the 'best' clock source is firstly the one with the highest QL and secondly (the ones with equal QL) the highest priority. Clock Selector can be in different modes: Manual: Clock selector will select the clock source stated in Source (see below). If this manually selected clock source is failing, the clock selector will go into holdover state. Force Hold Over: Clock Selector is forced to Free Run State. Force Free Run: Clock Selector is forced to Free Run State. The mode transition from "Force Free Run" to "Force Hold Over" is not allowed (The message of INVALID_PARAMETER is displayed). (Default is Force Free Run.)
Source	: Only relevant if Manual mode is selected (see above). 1: Line and 2: Radio (default is 1.)
WTR Time	: Wait To Restore timer value in minutes. The WTR time is activated on the falling edge of a clock source failure. This means that the clock source is first available for clock selection after WTR Time (can be cleared). Set WTR Time from Disable, 1M to 12M, 1 minute step.
SSM Holdover	: Transmitted SSM QL value when clock selector is in Hold Over State. Set SSM Holdover from QL NONE, QL PRC, QL SSUA, QL SSUB, QL ECC2, QL ECC1, QL DNU and QL INV. (Default is QL NONE.)
SSM Free Run	: This is the transmitted SSM QL value when clock selector is in Hold Over State. Set SSM Free Run from QL NONE, QL PRC, QL SSUA, QL SSUB, QL ECC2, QL ECC1, QL DNU and QL INV. (Default is QL NONE.)
Status	: This is indicating the state of the clock selector. Possible states are: Free Run: There are no external clock sources to lock to (unlocked state). The Clock Selector has never been locked to a clock source long enough to calculate the hold over frequency offset to local oscillator. The frequency of this node is the frequency of the local oscillator. Hold Over: There are no external clock sources to lock to (unlocked state). The Clock Selector has calculated the holdover frequency offset to local oscillator. The frequency of this node is hold to the frequency of the clock source previous locked to. Locked: Clock selector is locked to the clock source indicated (See next).
Clock Source	: The clock source locked to when clock selector is in locked state.
LOL	: Clock selector has raised the Los Of Lock alarm

SyncE Port

Port	: The port number to configure.
SSM Enabled	: Enable and disable of SSM functionality on this port.
TX SSM	: Monitoring of the transmitted SSM QL on this port. Transmitted QL should be the Quality Level of the clock generated by this node. This means the QL of the clock source this node is locked to
RX SSM	: Monitoring of the received SSM QL on this port. If link is down on port, QL_LINK is indicated. If no SSM is received, QL_FAIL is indicated
Refresh	Click to refresh the page
Save	Click to save changes
Reset	Click to undo any changes made locally and revert to previously saved values

Configuration > Sync (Only applicable for CPRI Model)**Clock Source Nomination and Status:**

This menu allows the user

to inspect and configure the current Sync port settings.

- Clock Source : This is the instance number of the clock source. This has to be referenced when selecting 'Manual' Mode
- Nominated : When a clock source is nominated, the clock output from the related [PHY](#) (Port) is enabled against the clock controller. This makes it available as a possible source in the clock selection process.
- Port : The ports that are possible to select for this clock source, is presented.
- LOCS : Signal is lost on this clock source

Clock Selection Mode and Status

- Mode : The definition of the 'best' clock source is firstly the one with the highest [\(QL\)](#) and secondly (the ones with equal QL) the highest priority.

Clock Selector can be in different modes:

Manual: Clock selector will select the clock source stated in Source (see below). If this manually selected clock source is failing, the clock selector will go into holdover state.

- Source : The clock source locked to when clock selector is in locked state
- Clock Source : The clock source locked to when clock selector is in locked state.
- LOL : Clock selector has raised the Los Of Lock alarm.

- Refresh** : Click to refresh the page immediately
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values.

Configuration > MAC Table (Only applicable for GE Model)

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

- Summary
- Configuration
 - Alarm
 - Radio
 - System
 - Ports
 - Security
 - Spanning Tree
 - SyncE
 - MAC Table
 - VLAN Translation
 - VLANs
- Monitor
- Test&Diagnostics
- Maintenance

Configuration > MAC Table

Aging Configuration

Disable Automatic Aging ☐

Aging Time seconds

MAC Table Learning

	Port Members		
	Maintenance	Line	Radio
Auto	☒	☒	☒
Disable	☐	☐	☐
Secure	☐	☐	☐

Static MAC Table Configuration

Delete	VLAN ID	MAC Address	Port Members		
			Maintenance	Line	Radio
Add New Static Entry					

Save Reset

Aging Configuration:

By default, dynamic entries are removed from the MAC table after 300 seconds. This removal is also called aging. Configure aging time by entering a value here in seconds:

- Aging Time : Setting range is 10 to 1000000.
- Disable : Disable automatic aging of dynamic entries by checking. Default is not checking.
- Automatic Aging

MAC Table Learning:

If the learning mode for a given port is grayed out, another module is in control of the mode, so that it cannot be changed by the user. An example of such a module is the MAC-Based Authentication under 802.1X. Each port can do learning based upon the following settings:

- Auto : Learning is done automatically as soon as a frame with unknown SMAC is received. (default)
- Disable : No learning is done
- Secure : Only static MAC entries are learned, all other frames are dropped.
Note: Make sure that the link used for managing the switch is added to the Static Mac Table before changing to secure learning mode, otherwise the management link is lost and can only be restored by using another non-secure port or by connecting to the switch via the serial interface.

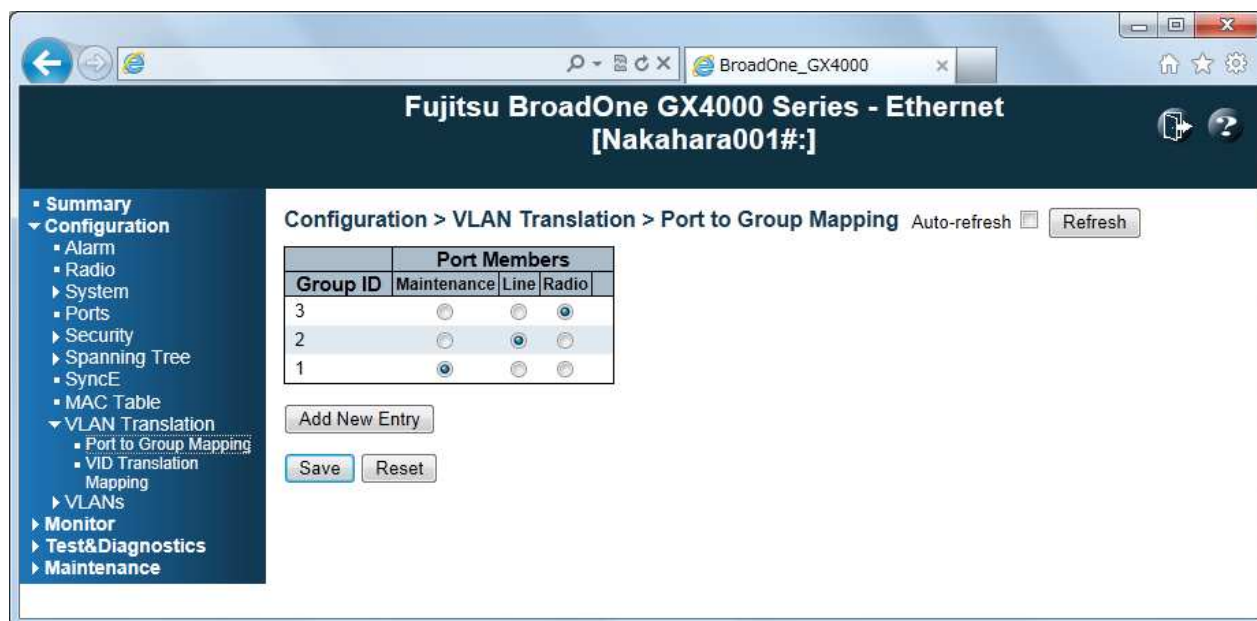
Static MAC Table Configuration:

The static entries in the MAC table are shown in this table. The static MAC table can contain 64 entries. The MAC table is sorted first by [VLAN ID](#) and then by MAC address.

Delete	:	Check to delete the entry. It will be deleted during the next save.
VLAN ID	:	The VLAN ID of the entry.
MAC Address	:	The MAC address of the entry.
Port Member	:	Checkmarks indicate which ports are members of the entry. Check or uncheck as needed to modify the entry.
Adding a New Static Entry		Click to add a new entry to the static MAC table. Specify the VLAN ID, MAC address, and port members for the new entry. Click "Save".
Save	:	Click to save changes
Reset	:	Click to undo any changes made locally and revert to previously saved values

Configuration > VLAN Translation (Only applicable for GE Model)

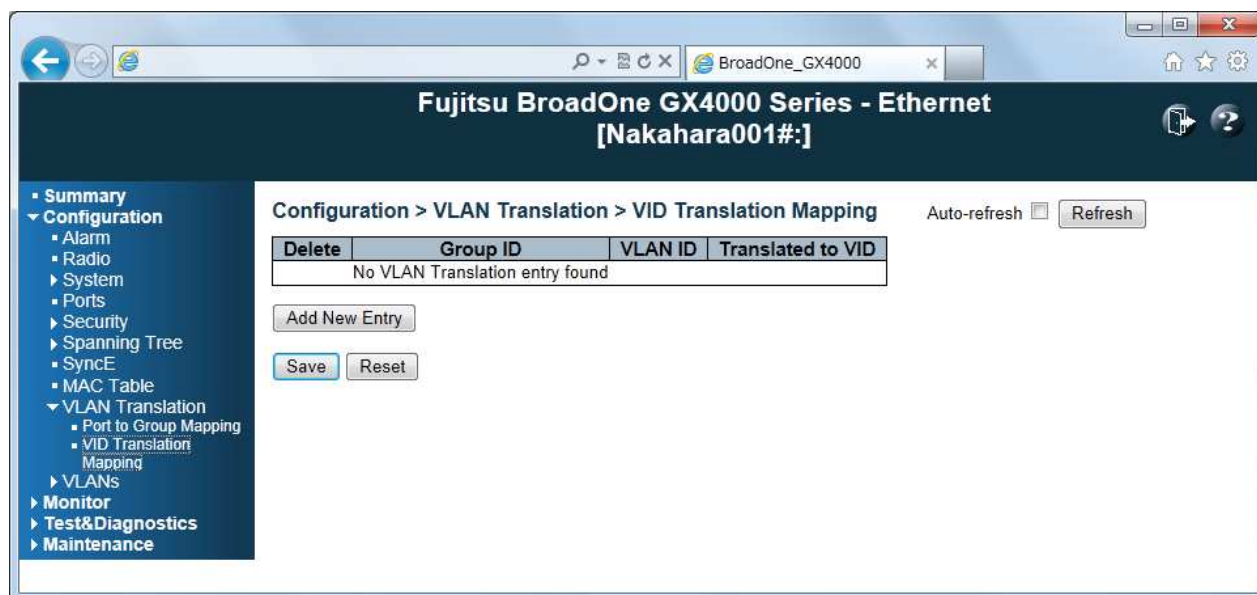
Configuration > VLAN Translation > Port to Group Mapping



Port to Group Mapping:

- Group ID** : A valid Group ID is an integer value from 1 to 29. A set of VLAN Translations are mapped to a group Id. This way a port is mapped to a list of VLAN Translations easily by mapping it to a group. Number of groups in this switch is equal to the number of ports (29) present in this switch. A port can be mapped to any of the groups. Multiple ports can also be mapped to a group with same group Id.
Note: By default, each port is mapped to a group with a group Id equal to the port number. For example, port 1 is mapped to the group with ID=1.
- Port Member** : A row of radio buttons, one radio button for each port is displayed for each Group ID. To include a port in a Group, click the radio button. A port must belong to at least one group.
- Adding a New Entry** : Click **Add New Entry** to add a new entry in Port to Group Mapping Table. An empty row is added to the table with the Group ID and array of radio buttons, one radio button for each port (click corresponding radio button to make port to be member of a particular Group). Legal values for a VLAN ID are **1** through **4095**. The **Delete** button can be used to undo the addition of new entry.
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds

Configuration > VLAN Translation > VID Translation Mapping

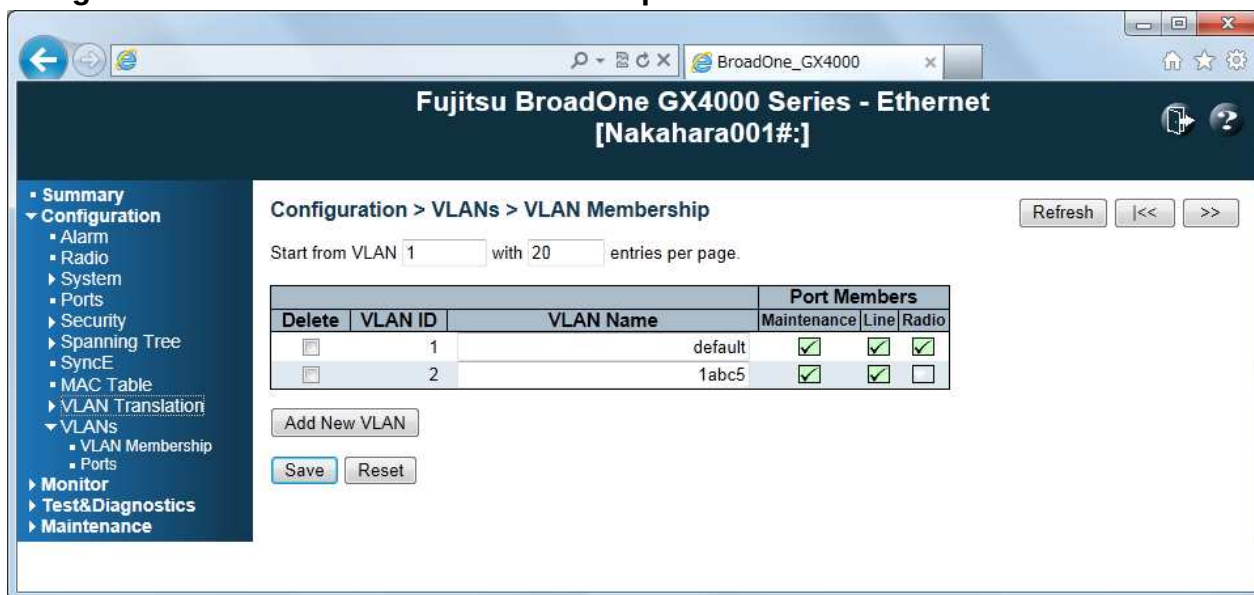


VID Translation Mapping: This menu allows you to map VLAN ID to other VLAN ID for a particular Group ID Globally

- | | | |
|------------------------------------|---|---|
| Delete | : | To delete a VLAN Translation Group database entry, check this box. The entry will be deleted on the switch during the next Save |
| Group ID | : | A valid Group ID is an integer value from 1 to 29. A set of VLAN Translations are mapped to a group Id. This way a port is mapped to a list of VLAN Translations easily by mapping it to a group. Number of groups in a switch is equal to the number of ports present in this switch. A port can be mapped to any of the groups. Multiple ports can also be mapped to a group with same group Id.
<u>Note:</u> By default, each port is mapped to a group with a group Id equal to the port number. For example, port 1 is mapped to the group with ID=1. |
| VLAN ID | : | Indicates the ID to which Group ID will be mapped. A valid VLAN ID ranges from 1-4095. |
| Translated to VID | : | Indicates the VID to which VLAN ID of ingress frames will be changed, if VID in incoming frames is same as configured in VLAN ID field preceded by this field on member ports of a particular group to which this entry belongs. Setting range is 1 to 4095 and default is null. |
| Adding a new VID Translation entry | : | Click Add New Entry to add a new entry in VLAN Translation table. An empty row is added to the table, the Group ID, VLAN ID and Translated to VID fields can be configured as needed. Legal values for a VLAN ID are 1 through 4095 . The Delete button can be used to undo the addition of new entry. |
| Auto-refresh | : | Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds |
| Refresh | : | Click to refresh the page immediately |
| Save | : | Click to save changes |
| Rest | : | Click to undo any changes made locally and revert to previously saved values |

Configuration > VLANs (Only applicable for GE Model)

Configuration > VLANs > VLAN Membership



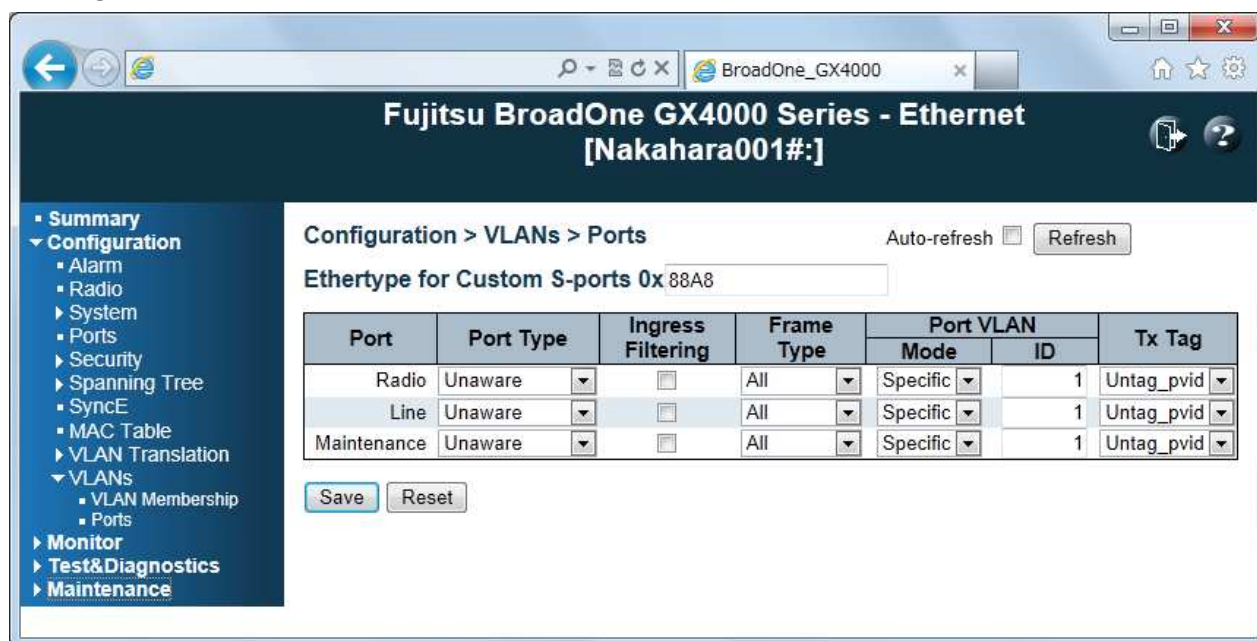
VLANs Membership:

The [VLAN](#) membership configuration for the switch can be monitored and modified here. Up to 4096 VLANs are supported. This page allows for adding and deleting VLANs as well as adding and deleting port members of each VLAN.

- Delete : To delete a VLAN entry, check this box. The entry will be deleted during the next Save
- VLAN ID : Indicates the ID of this particular VLAN
- VLAN Name : Indicates the name of the VLAN. Maximum length of the VLAN Name String is 32 and default is null. VLAN Name can only contain alphabets or numbers. VLAN name should contain at least one alphabet. VLAN name can be edited for the existing VLAN entries or it can be added to the new entries. But maximum number of VLANs which can have Names is 64.
- Port Members : A row of check boxes for each port is displayed for each VLAN ID.
 To include a port in a VLAN, check the box as ☒.
 To include a port in a forbidden port list, check the box as shown ☒.
 To remove or exclude the port from the VLAN, make sure the box is unchecked as shown ☐.
 By default, no ports are members, and for every new VLAN entry all boxes are unchecked.

- Adding a New VLAN** : Click **Add New VLAN** to add a new VLAN ID. An empty row is added to the table, and the VLAN can be configured as needed. Legal values for a VLAN ID are **1** through **4095**.
- The VLAN is enabled when you click on "Save". The **Delete** button can be used to undo the addition of new VLANs.
- Save** : Click to save changes
- Reset** : Click to undo any changes made locally and revert to previously saved values
- Refresh** : Refreshes the displayed table starting from the "VLAN ID" input fields
- I<<** : Updates the table starting from the first entry in the VLAN Table, i.e. the entry with the lowest VLAN ID
- >>** : Updates the table, starting with the entry after the last entry currently displayed

Configuration > VLANs > Port



Configuration > VLANs > Ports: This menu is used for configuring the switch port VLAN

Ethertype for Custom S-port 0x...: This field specifies the ether type used for Custom S-ports. This is a global setting for all the Custom S-ports

- Port : The port name in the same row.
- Port Type : Port can be one of the following types: Unaware, Customer port (C-port), Service port(S-port), Custom Service port(S-custom-port). If Port Type is Unaware, all frames are classified to the Port VLAN ID and tags are not removed. Default is Unaware.

- Ingress Filtering** : Enable ingress filtering on a port by checking the box. This parameter affects VLAN ingress processing. If ingress filtering is enabled and the ingress port is not a member of the classified VLAN of the frame, the frame is discarded. By default, ingress filtering is disabled (no checkmark). Default is no checkmark.
- Frame Type** : Determines whether the port accepts all frames or only tagged/untagged frames. This parameter affects VLAN ingress processing. If the port only accepts tagged frames, untagged frames received on the port are discarded. By default, the field is set to **All**. Default is All.
- Port VLAN Mode** : Configures the Port VLAN Mode. The allowed values are **None** or **Specific**. This parameter affects VLAN ingress and egress processing.
- If **None** is selected, a VLAN tag with the classified VLAN ID is inserted in frames transmitted on the port. This mode is normally used for ports connected to VLAN aware switches.
- If **Specific** (default value) is selected, a Port VLAN ID can be configured (see below). Untagged frames received on the port are classified to the Port VLAN ID. If VLAN awareness is disabled, all frames received on the port are classified to the Port VLAN ID. If the classified VLAN ID of a frame transmitted on the port is different from the Port VLAN ID, a VLAN tag with the classified VLAN ID is inserted in the frame.
- Port VLAN ID** : Configures the VLAN identifier for the port. The allowed values are **1** through **4095**. Default value is 1.
Note: The port must be a member of the same VLAN as the Port VLAN ID.
- Tx Tag** : Determines egress tagging of a port.
Untag_pvid - All VLANs except the configured PVID will be tagged. Tag_all - All VLANs are tagged.
Untag_all - All VLANs are untagged. Default is Untag_pvid.
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
- Save** : Click to save changes
- Rest** : Click to undo any changes made locally and revert to previously saved values

Monitor

Monitor > Alarm

Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]

Monitor > Alarm

Auto-refresh ☐ Refresh

2013-02-05T08:52:59+00:00

No.	Level	Time	Category	Condition Description
1	Warning	2013-02-05T08:16:36+00:00	Hardware	Internal Power Source Failure
2	Warning	2013-02-05T08:16:05+00:00	Radio	RS Synchronization Loss
3	Warning	2013-02-05T08:15:56+00:00	Line	MOD_NR(Module Not Ready (mirroring hardware output pin))
4	Warning	2013-02-05T08:15:56+00:00	Line	RX_CDR Unlocked(Unlocked:Loss of Lock of RX side CDR)
5	Info	2013-02-05T08:15:56+00:00	Line	RX_LOS(RX Loss of Signal (mirroring hardware output pin))
6	Warning	2013-02-05T08:15:56+00:00	Line	RX_NR(Any condition leading to invalid data on the RX path)
7	Error	2013-02-05T08:15:55+00:00	Hardware	IO Error
8	Error	2013-02-05T08:15:55+00:00	Hardware	Startup Failure
9	Info	2013-02-05T08:15:55+00:00	Line	Optical Power Received Out of Range
10	Info	2013-02-05T08:15:55+00:00	Line	Optical Power Received Degrade

Monitor > Alarm:

- No. : The line number of the table.
- Level : The level of the severity of the alarm.
Error (indicated with red icon): High level problem. Equipment can not work correctly, under this condition. Fatal problem happens on internal device or process.
Warning (indicated with yellow icon): Low level problem. Equipment is working. However some problem happens on interface of Radio, Line Clock or Console, otherwise hardware has degradation.
Info (indicated with blue icon): Information except Error and Warning to be informed to the operator.
- Time : The occurrence time of the alarm.
- Category : The category of alarms. The displayed categories are:
Hardware: Related to the hardware.
Radio: Related to the Radio interface.
Line: Related to the Line interface.
Clock: Related to the Line interface.
Console: Related to the Console interface.
- Condition Description : Indicates the description of the alarm.
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
- Refresh Button** : Click to refresh the page

Monitor > System**Monitor > System > Information**

The screenshot shows a web browser window with the address bar displaying `http://192.168.0.10/`. The page title is "Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]". The navigation menu on the left includes: Summary, Configuration, Monitor (selected), Alarm, System, Information (selected), Log, Ports, Security, Spanning Tree, MAC Table, VLANs, Radio Performance, Test&Diagnostics, and Maintenance. The main content area is titled "Monitor > System > Information" and contains a table of system information. The table is organized into sections: System, Hardware, Time, Software, and FPGA.

System	
Contact	Nakahara:
Name	Nakahara001-2F
Location	Nakahara001#:
Site Code	a1-2:
Equipment Code	b-2:
Local No.	c1-2:
Resource State	d1-2:
Equipment Note	e1-2:
Hardware	
MAC Address	5c-9a-d8-36-af-1b
System Name	BroadOne GX4480
System No	TA04010-B936
System Version	020AA
The date of manufacture	20120401
Serial Number	000000012345
CPLD Version	V00L03
Time	
System Date	2013-02-05T08:59:10+00:00
System Uptime	0d 00:43:20
Software	
ACT Version	V01L01C06-01a
STBY Version	V01L51C06-01a
FPGA	
ACT Version	V00L05C00
STBY Version	V00L05C00

Monitor > System > Information:

Contact	:	The system contact configured in Configuration System Information System Contact.
Name	:	The system name configured in Configuration System Information System Name.
Location	:	The system location configured in Configuration System Information System Location
Site Code	:	The site code configured in Configuration System Information Site Code.
Equipment Code	:	The equipment code configured in Configuration System Information Equipment Code.
Local No.	:	The local number configured in Configuration System Information Local No.
Resource State	:	The local number configured in Configuration System Information Resource State.
Equipment Note	:	The equipment note configured in Configuration System Information Equipment Note.
MAC Address	:	The MAC Address of this switch.
System Name	:	It is a name of the system.
System No.	:	It is a chart number of the system.

System Version	:	It is a version of the system.
Date of Manufacture	:	It is date of manufacture
Serial Number	:	It is a serial number of manufacturing
CPLD Version	:	It is a version of CPLD.
System Date	:	The current (GMT) system time and date. The system time is obtained through the Timing server running on the switch, if any.
System Uptime	:	The period of time the device has been operational.
Software ACT Version	:	It is a version of Software on the ACT side.
Software STBY Version	:	It is a version of Software on the STBY side.
FPGA ACT Version	:	It is a version of FPGA on the ACT side.
FPGA STBY Version	:	It is a version of FPGA on the STBY side.
Auto-refresh	:	Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
Refresh Button	:	Click to refresh the page

Monitor > System > Log

Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]

Monitor > System > Log Auto-refresh ☐ Refresh Clear << << >> >>

Level All Category All

The total number of entries is 21 for the given level.

Start from ID 1 with 100 entries per page.

ID	Level	Time	Category	Message
1	Info	2013-02-05T08:15:51+00:00	Software	Switch just made a cold boot.
2	Info	2013-02-05T08:15:53+00:00	Software	Link up on Line
3	Info	2013-02-05T08:15:53+00:00	Software	Link up on Radio
4	Info	2013-02-05T08:15:55+00:00	Line	ALM Occured, Code:0xB300, Optical Power Received Degrade
5	Info	2013-02-05T08:15:55+00:00	Line	ALM Occured, Code:0xB301, Optical Power Received Out of Range
6	Error	2013-02-05T08:15:55+00:00	Hardware	ALM Occured, Code:0x2208, Startup Failure,
7	Error	2013-02-05T08:15:55+00:00	Hardware	ALM Occured, Code:0x2209, Startup Failure,
8	Error	2013-02-05T08:15:55+00:00	Hardware	ALM Occured, Code:0xE000, Startup Failure,
9	Error	2013-02-05T08:15:55+00:00	Hardware	ALM Occured, Code:0xBC03, IO Error
10	Warning	2013-02-05T08:15:56+00:00	Line	ALM Occured, Code:0x8004, XFP RX_NR(Any condition leading to invalid data on the RX path), Line
11	Info	2013-02-05T08:15:56+00:00	Line	ALM Occured, Code:0x8005, XFP RX_LOS(RX Loss of Signal(mirroring hardware output pin)), Line
12	Warning	2013-02-05T08:15:56+00:00	Line	ALM Occured, Code:0x8006, XFP RX_CDR Unlocked (Unlocked:Loss of Lock of RX side CDR), Line
13	Warning	2013-02-05T08:15:56+00:00	Line	ALM Occured, Code:0x8007, XFP MOD_NR(Module Not Ready(mirroring hardware output pin)), Line

Monitor > System > Log:

- ID : The ID (≥ 1) of the system log entry.
- Level : The level of the system log entry. The following level types are supported:
Info: Information level of the system log.
Warning: Warning level of the system log.
Error: Error level of the system log.
All: All levels.
- Time : The time of the system log entry.
- Category : The category of the system log. The following kind of categories are supported:
Software
Hardware
Radio
Line
Clock
Console
All
- Message : The message of the system log entry

- Auto-refresh** : Check the box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
- Refresh** : Update the system log entries, starting from the current entry ID.
- Clear** : Flushes the selected log entries.
- I<<** : Update the system log entries, starting from the first available entry ID.
- <<** : Update the system log entries, starting from the last entry currently displayed.
- >>** : Updates the system log entries, starting from the last entry currently displayed.
- >>I** : Updates the system log entries, starting from the last available entry ID

Monitor > Port (Only applicable for GE Model)

Monitor > Port > Traffic Overview

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

Monitor > Ports > Traffic Overview

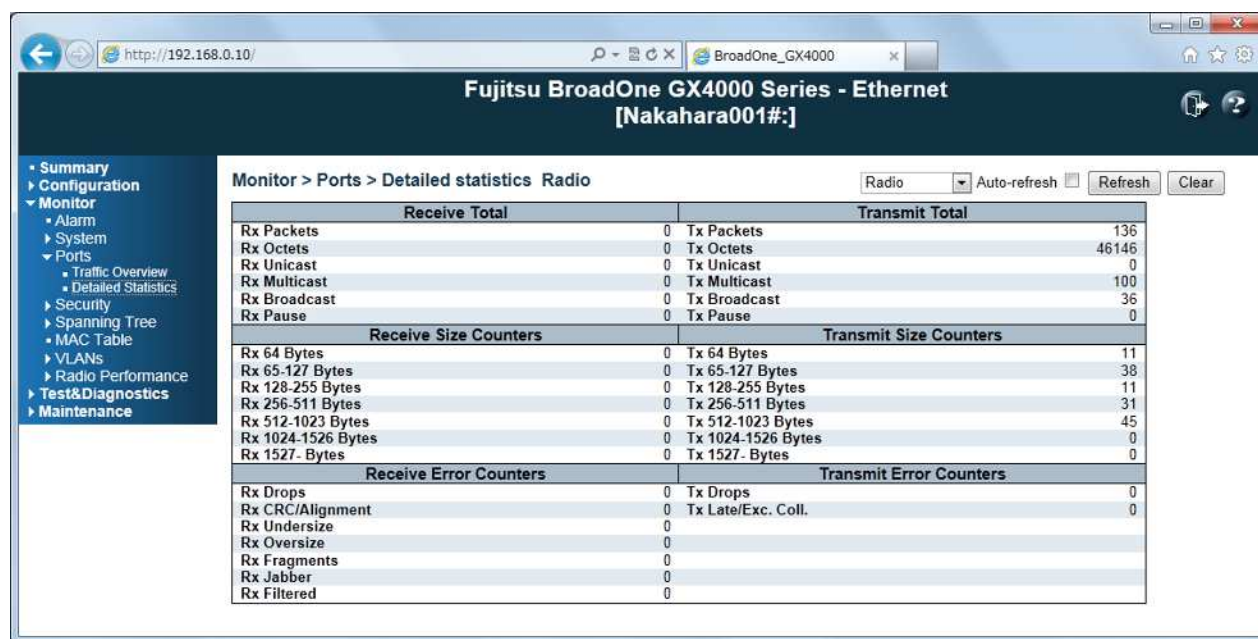
Auto-refresh ☐ Refresh Clear

Port	Packets		Bytes		Errors		Drops		Filtered
	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received	Transmitted	Received
Radio	0	136	0	46146	0	0	0	0	0
Line	0	28	0	9321	0	0	0	0	0
Maintenance	1165	602	292273	115346	0	0	137	0	1164

Monitor > Ports > Traffic Overview: This menu provides an overview of general traffic statistics for all switch ports

- Port** : The port for the settings contained in the same row.
- Packets** : The number of received and transmitted packets per port.
- Bytes** : The number of received and transmitted bytes per port.
- Errors** : The number of frames received in error and the number of incomplete transmissions per port.
- Drops** : The number of frames discarded due to ingress or egress congestion.
- Filtered** : The number of received frames filtered by the forwarding process.
- Refresh** : Click to refresh the page immediately
- Clear** : Clears the counters for all ports
- Auto-refresh** : Check this box to enable an automatic refresh of the page at regular intervals

Monitor > Port > Detailed Statistics Ratio

**Rx and Tx Total:**

This menu provides detailed traffic statistics for a specific switch port. Use the port select box to select which switch port details to display. The displayed counters are the totals for receive and transmit, the size counters for receive and transmit, and the error counters for receive and transmit.

- Rx and Tx Packets : The number of received and transmitted (good and bad) packets.
- RX and Tx Octets : The number of received and transmitted (good and bad) bytes. Includes FCS, but excludes framing bits.
- Rx and Tx Unicast : The number of received and transmitted (good and bad) unicast packets.
- Rx and Tx Multicast : The number of received and transmitted (good and bad) multicast packets.
- Rx and Tx Broadcast : The number of received and transmitted (good and bad) broadcast packets.
- Rx and Tx Pause : A count of the MAC Control frames received or transmitted on this port that have an opcode indicating a PAUSE operation.

Rx Error Counters:

The number of received and transmitted (good and bad) packets split into categories based on their respective frame sizes.

- Rx Drops : The number of frames are dropped due to lack of receive buffers or egress congestion.
- RX CRC/Alignment : The number of frames received with CRC or alignment errors
- RX Undersize : The number of short¹ frames received with valid CRC.
- Rx Oversize : The number of long² frames received with valid CRC.

Rx Error Counters: (Cont'd)

The number of received and transmitted (good and bad) packets split into categories based on their respective frame sizes.

- Rx Fragment : The number of short¹ frame received with invalid CRC.
- Rx Jabber : The number of long² frames received with invalid CRC
- Rx Filtered : The number of received frames filtered by the forwarding process.

¹ Short frames are frames that are smaller than 64 bytes.

² Long frames are frames that are longer than the configured maximum frame length for this port.

Tx Error Counter:

- Tx Drops : The number of frames dropped due to output buffer congestion.
- Tx Late/Exc. Coll. : The number of frames dropped due to excessive or late collisions

Monitor > Security (Only applicable for GE Model)**Monitor > Security > Access Management Statistics**

The screenshot shows the web interface for the Fujitsu BroadOne GX4000 Series - Ethernet. The browser address bar shows 'BroadOne_GX4000'. The page title is 'Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]'. The left sidebar contains a navigation menu with the following items: Summary, Configuration, Monitor (expanded), Alarm, System, Ports, Security (expanded), Access Management Statistics (selected), Switch, Spanning Tree, MAC Table, VLANs, Radio Performance, Test&Diagnostics, and Maintenance. The main content area is titled 'Monitor > Security > Access Management Statistics'. It features a table with the following data:

Interface	Received Packets	Allowed Packets	Discarded Packets
HTTP	0	0	0
HTTPS	0	0	0
SNMP	0	0	0
TELNET	0	0	0
SSH	0	0	0

Below the table, there are controls for 'Auto-refresh' (a checkbox), a 'Refresh' button, and a 'Clear' button.

- Interface : The interface type through which the remote host can access the switch.
- Received Packets : Number of received packets from the interface when access management mode is enabled.
- Allowed Packets : Number of allowed packets from the interface when access management mode is enabled.
- Discarded Packets : Number of discarded packets from the interface when access management mode is enabled.
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
- Refresh** : Click to refresh the page immediately
- Clear** : Clear all statistics

Monitor > Security > Switch > RMON > Statistics

ID	Port	Drop	Octets	Pkts	Broad-cast	Multi-cast	CRC Errors	Under-size	Over-size	Frag.	Jabb.	Coll.	64 Bytes	65 ~ 127	128 ~ 255	256 ~ 511	512 ~ 1023	1024 ~ 1588
1	Radio	0	30133	93	15	78	0	0	0	0	0	0	14	25	4	20	30	0
2	Line	0	252	3	0	3	0	0	0	0	0	0	1	2	0	0	0	0
3	Maintenance	74	188690	603	116	148	4	0	0	0	0	0	34	256	72	144	56	41

This menu provides an overview of RMON Statistics entries. Each page shows up to 99 entries from the Statistics table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the Statistics table. The first displayed will be the one with the lowest ID found in the Statistics table.

The "Start from Control Index" allows the user to select the starting point in the Statistics table. Clicking the **Refresh** button will update the displayed table starting from that or the next closest Statistics table match. The **>>** will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the **<<** button to start over

ID	:	Indicates the index of Statistics entry.
Port	:	The port ID which wants to be monitored.
Drop	:	The total number of events in which packets were dropped by the probe due to lack of resources.
Octets	:	The total number of octets of data (including those in bad packets) received on the network.
Pkts	:	The total number of packets (including bad packets, broadcast packets, and multicast packets) received.
Broad-cast	:	The total number of good packets received that were directed to the broadcast address.
Multi-cast	:	The total number of good packets received that were directed to a multicast address.
CRC Errors	:	The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets.
Under-size	:	The total number of packets received that were less than 64 octets.
Over-size	:	The total number of packets received that were longer than 1518 octets.
Frag.	:	The number of frames which size is less than 64 octets received with invalid CRC
Jabb.	:	The number of frames which size is larger than 64 octets received with invalid CRC
Coll.	:	The best estimate of the total number of collisions on this Ethernet segment.

64	:	The total number of packets (including bad packets) received that were 64 octets in length
65-127	:	The total number of packets (including bad packets) received that were between 65 to 127 octets in length.
128-255	:	The total number of packets (including bad packets) received that were from 128 to 255 octets in length.
256-512	:	The total number of packets (including bad packets) received that were from 256 to 511 octets in length.
513-1023	:	The total number of packets (including bad packets) received that were from 512 to 1023 octets in length
1024-1588	:	The total number of packets (including bad packets) received that were from 1024 to 1588 octets in length.
Auto-refresh	:	Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
Refresh	:	Click to refresh the page immediately
I<<	:	Updates the table starting from the first entry in the Statistics table, i.e. the entry with the lowest ID
>>	:	Updates the table, starting with the entry after the last entry currently displayed

Monitor > Security > Switch > RMON > History

Fujitsu BroadOne GX4000 Series - Ethernet
[Nakahara001#:]

Monitor > Security > Switch > RMON > History

Auto-refresh ☐ Refresh << >>

Start from Control Index 0 and Sample Index 0 with 20 entries per page.

History Index	Sample Index	Sample Start	Drop	Octets	Pkts	Broadcast	Multicast	CRC Errors	Under-size	Over-size	Frag.	Jabb.	Coll.	Utilization
1	1	9954	0	0	0	0	0	0	0	0	0	0	0	0
1	2	1901	0	0	0	0	0	0	0	0	0	0	0	0
1	3	3701	0	0	0	0	0	0	0	0	0	0	0	0
1	4	5501	0	0	0	0	0	0	0	0	0	0	0	0
1	5	7301	0	0	0	0	0	0	0	0	0	0	0	0
1	6	9101	0	0	0	0	0	0	0	0	0	0	0	0
1	7	10901	0	0	0	0	0	0	0	0	0	0	0	0
2	1	9954	0	0	0	0	0	0	0	0	0	0	0	0
2	2	1901	0	0	0	0	0	0	0	0	0	0	0	0
2	3	3701	0	0	0	0	0	0	0	0	0	0	0	0
2	4	5501	0	0	0	0	0	0	0	0	0	0	0	0
2	5	7301	0	0	0	0	0	0	0	0	0	0	0	0
2	6	9101	0	0	0	0	0	0	0	0	0	0	0	0
2	7	10901	0	0	0	0	0	0	0	0	0	0	0	0
3	1	9954	0	290638	1060	278	244	0	0	0	2	0	0	0
3	2	1901	0	41911	124	8	60	0	0	0	0	0	0	0
3	3	3701	0	99038	265	35	230	0	0	0	0	0	0	0
3	4	5501	0	32583	65	5	60	0	0	0	0	0	0	0
3	5	7301	0	32336	64	4	60	0	0	0	0	0	0	0
3	6	9101	0	32583	65	5	60	0	0	0	0	0	0	0

This menu provides an overview of RMON History entries. Each page shows up to 99 entries from the Statistics table, default being 20, selected through the "entries per page" input field. When first visited, the web page will show the first 20 entries from the beginning of the Statistics table. The first displayed will be the one with the lowest ID found in the Statistics table.

The "Start from Control Index" allows the user to select the starting point in the Statistics table. Clicking the **Refresh** button will update the displayed table starting from that or the next closest Statistics table match. The **>>** will use the last entry of the currently displayed entry as a basis for the next lookup. When the end is reached the text "No more entries" is shown in the displayed table. Use the **<<** button to start over

History Index	:	Indicates the index of History control entry.
Sample Index	:	Indicates the index of the data entry associated with the control entry
Sample Start	:	The total number of events in which packets were dropped by the probe due to lack of resources.
Drop	:	The total number of events in which packets were dropped by the probe due to lack of resources
Octets	:	The total number of octets of data (including those in bad packets) received on the network.
Pkts	:	The total number of packets (including bad packets, broadcast packets, and multicast packets) received.
Broadcast	:	The total number of good packets received that were directed to the broadcast address
Multicast	:	The total number of good packets received that were directed to a multicast address
CRCError	:	The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets
Undersize	:	The total number of packets received that were less than 64 octets.

Oversize	:	The total number of packets received that were longer than 1518 octets.
Frag.	:	The number of frames which size is less than 64 octets received with invalid CRC.
Jabb.	:	The number of frames which size is larger than 64 octets received with invalid CRC.
Coll.	:	The best estimate of the total number of collisions on this Ethernet segment.
Utilization	:	The best estimate of the mean physical layer network utilization on this interface during this sampling interval, in hundredths of a percent.
Auto-refresh	:	Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
Refresh	:	Click to refresh the page immediately
I<<	:	Updates the table starting from the first entry in the History table, i.e., the entry with the lowest History Index and Sample Index
>>	:	Updates the table, starting with the entry after the last entry currently displayed

Monitor > Spanning Tree (**Only applicable for GE Model**)

Monitor > Spanning Tree > Bridge Status

The screenshot shows the web interface for the Fujitsu BroadOne GX4000 Series - Ethernet [Nakahara001#:]. The left sidebar contains a navigation menu with the following items: Summary, Configuration, Monitor (selected), Alarm, System, Ports, Security (Access Management, Statistics), Switch (RMON, Statistics, History), Spanning Tree (selected), Bridge Status (selected), Port Status, Port Statistics, MAC Table, VLANs, Radio Performance, Test&Diagnostics, and Maintenance.

The main content area is titled "Monitor > Spanning Tree > Bridge Status". It includes an "Auto-refresh" checkbox and a "Refresh" button. Below this, there are two tables:

STP Bridge Status	
Bridge Instance	CIST
Bridge ID	80:00-5C:9A:D8:36:AF:1B
Root ID	80:00-5C:9A:D8:36:AF:1B
Root Cost	0
Root Port	0
Regional Root	80:00-5C:9A:D8:36:AF:1B
Internal Root Cost	0
Topology Flag	Steady
Topology Change Count	0
Topology Change Last	-

CIST Ports & Aggregations State							
Port	Port ID	Role	State	Path Cost	Edge	Point2Point	Uptime
No ports or aggregations active							

This menu provides detailed information on a single [STP](#) bridge instance, along with port state for all active ports associated.

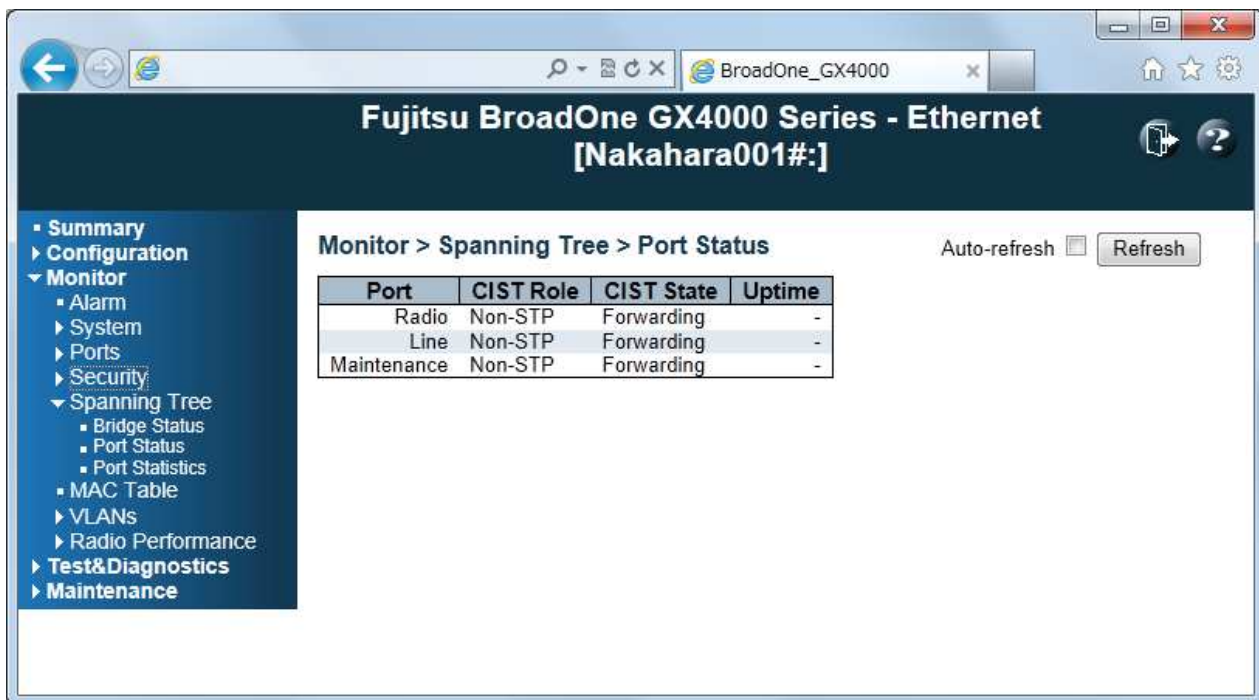
STP Bridge Status:

Bridge Instance	:	The Bridge instance - CIST, MST1, ...
Bridge ID	:	The Bridge ID of this Bridge instance.
Rout ID	:	The Bridge ID of the currently elected root bridge
Root Cost	:	The switch port currently assigned the <i>root</i> port role.
Root Port	:	Root Path Cost. For the Root Bridge this is zero. For all other Bridges, it is the sum of the Port Path Costs on the least cost path to the Root Bridge.
Regional Root	:	The Bridge ID of the currently elected regional root bridge, inside the MSTP region of this bridge. <i>(For the CIST instance only).</i>
Internal Root Cost	:	The Regional Root Path Cost. For the Regional Root Bridge this is zero. For all other CIST instances in the same MSTP region, it is the sum of the Internal Port Path Costs on the least cost path to the Internal Root Bridge. <i>(For the CIST instance only).</i>
Topology Flag	:	The current state of the Topology Change Flag of this Bridge instance.
Topology Change Count	:	The number of times where the topology change flag has been set (during a one-second interval).
Topology Change Last	:	The time passed since the Topology Flag was last set.

CIST Port & Aggregation State

Port	:	The switch port number of the logical STP port.
Port ID	:	The port id as used by the STP protocol. This is the priority part and the logical port index of the bridge port
Role	:	The current STP port role. The port role can be one of the following values: Alternate Port, Backup Port, Root Port and Designated Port.
State	:	The current STP port state. The port state can be one of the following values: Discarding, Learning, Forwarding.
Path Cost	:	The current STP port path cost. This will either be a value computed from the Auto setting, or any explicitly configured value.
Edge	:	The current STP port (operational) Edge Flag. An Edge Port is a switch port to which no Bridges are attached. The flag may be automatically computed or explicitly configured. Each Edge Port transits directly to the Forwarding Port State, since there is no possibility of it participating in a loop.
Point-to-Point	:	The current STP port point-to-point flag. A point-to-point port connects to a non-shared LAN media. The flag may be automatically computed or explicitly configured. The point-to-point properties of a port affect how fast it can transit to STP state.
Uptime	:	The time since the bridge port was last initialized
Auto-refresh	:	Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
Refresh	:	Click to refresh the page immediately

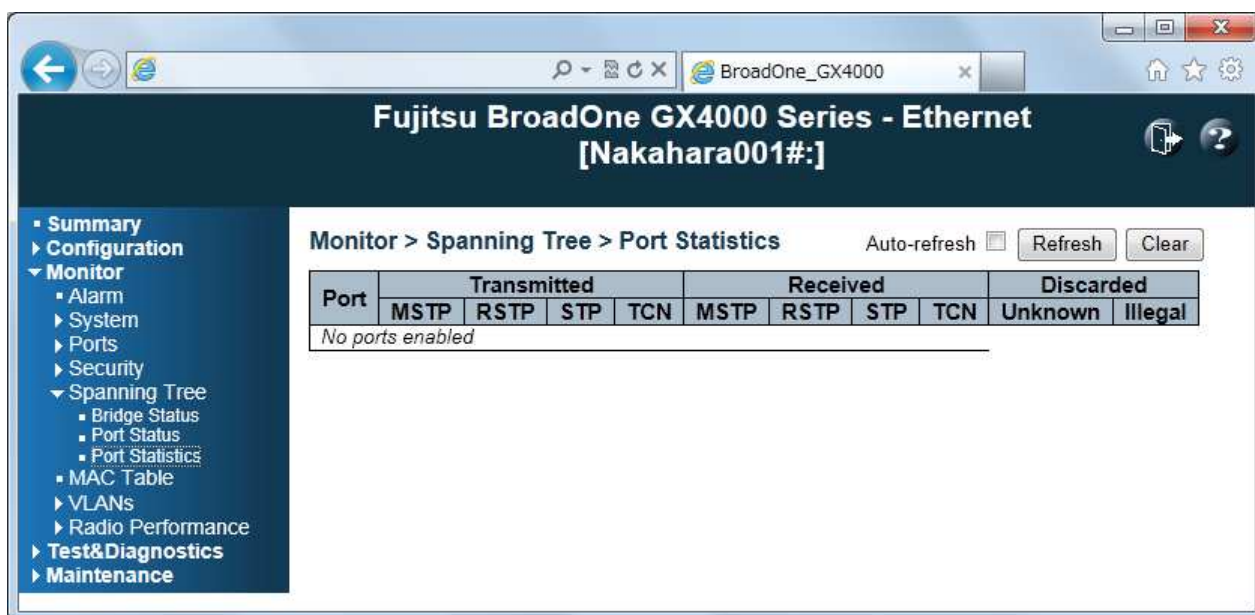
Monitor > Spanning Tree > Port Status



This menu displays the [STP](#) CIST port status for physical ports of the switch.

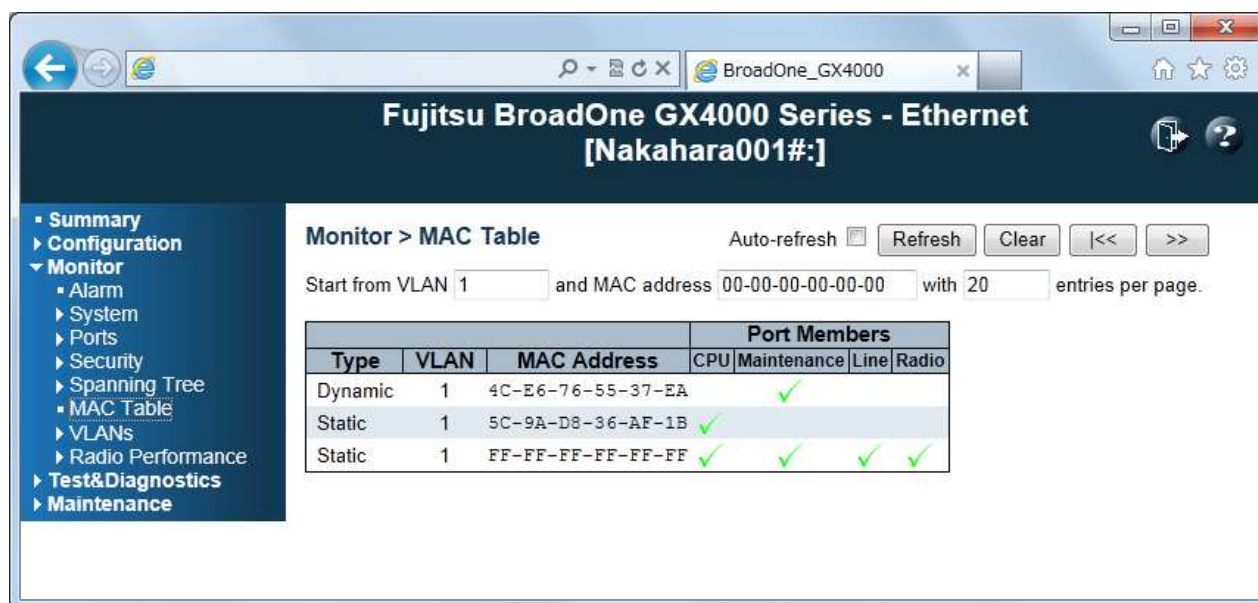
Port	:	The switch port name of the logical STP port
CIST Role	:	The current STP port role of the CIST port. The port role can be one of the following values: Alternate Port , Backup Port , Root Port , Designated Port and Disabled .
CIST State	:	The current STP port state of the CIST port. The port state can be one of the following values: Discarding , Learning and Forwarding .
Uptime	:	The time since the bridge port was last initialized.
Auto-refresh		Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
Refresh		Click to refresh the page immediately

Monitor > Spanning Tree > Port Statistics



This menu displays the [STP](#) port statistics counters of bridge ports in the switch

Port	:	The switch port number of the logical STP port.
MSTP	:	The number of MSTP Configuration BPDU's received/transmitted on the port
RSTP	:	The number of RSTP Configuration BPDU's received/transmitted on the port
STP	:	The number of legacy STP Configuration BPDU's received/transmitted on the port.
TCN	:	The number of (legacy) Topology Change Notification BPDU's received/transmitted on the port.
Discarded Unknown	:	The number of unknown Spanning Tree BPDU's received (and discarded) on the port.
Discarded Illegal	:	The number of illegal Spanning Tree BPDU's received (and discarded) on the port.
Auto-refresh	:	Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds
Refresh	:	Click to refresh the page immediately
Clear	:	Click to reset the counters

Monitor > MAC Table (Only applicable for GE Model)

Entries in the [MAC Table](#) are shown on this page. The MAC Table contains up to 8192 entries, and is sorted first by [VLAN ID](#), then by MAC address

Switch (stack only) : The switch port number of the logical STP port.

Type : The stack unit where the entry is learned

VLAN : The VLAN ID of the entry.

MAC Address : The MAC address of the entry

Port Member : The ports that are members of the entry

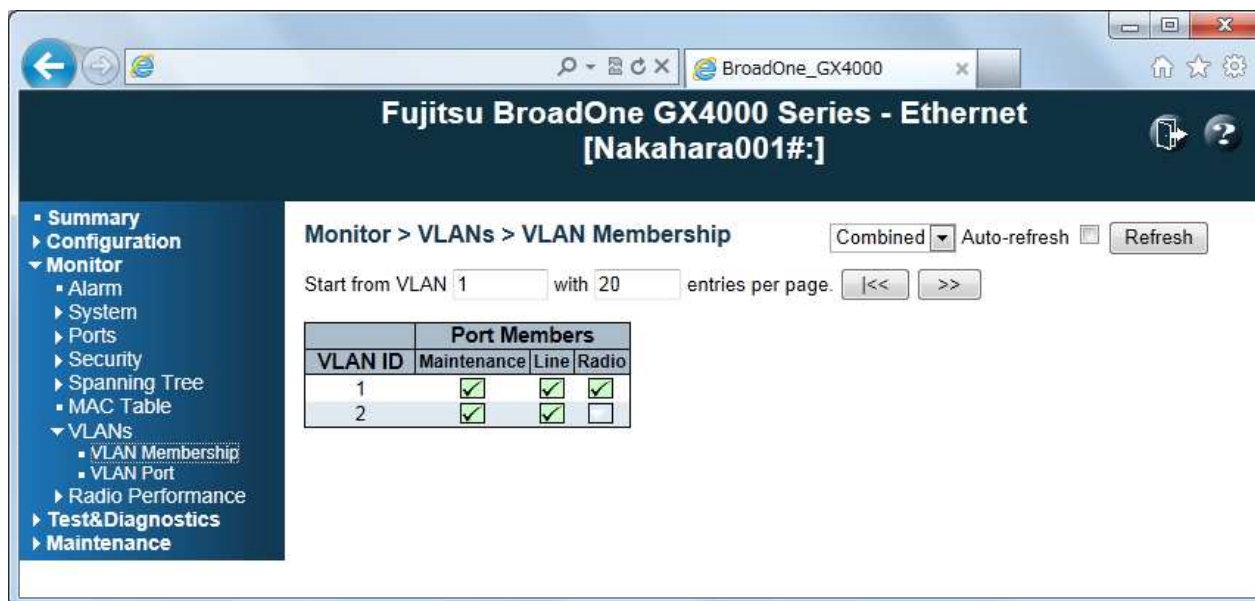
Auto-refresh : Automatic refresh occurs every 3 seconds

Refresh : Refreshes the displayed table starting from the "Start from MAC address" and "VLAN" input fields

Clear : Flushes all dynamic entries

I<< : Updates the table starting from the first entry in the MAC Table, i.e. the entry with the lowest VLAN ID and MAC address

>> : Updates the table, starting with the entry after the last entry currently displayed.

Monitor > VLANs (Only applicable for GE Model)**Monitor > VLANs > VLAN Membership**

This menu provides an overview of membership status of VLAN users.

VLAN User : VLAN User module uses services of the VLAN management functionality to configure VLAN memberships and VLAN port configurations such as PVID and UVID. Currently we support the following VLAN user types:

Web/SNMP: These are referred to as static.

MSTP : The 802.1s Multiple Spanning Tree protocol (MSTP) uses VLANs to create multiple spanning trees in a network, which significantly improves network resource utilization while maintaining a loop-free environment.

Port Membership : A row of check boxes for each port is displayed for each VLAN ID. If a port is included in a VLAN, an image will be displayed. If a port is included in a Forbidden port list, an image will be displayed. If a port is included in a Forbidden port list and dynamic VLAN user register VLAN on same Forbidden port, then conflict port will be displayed as .

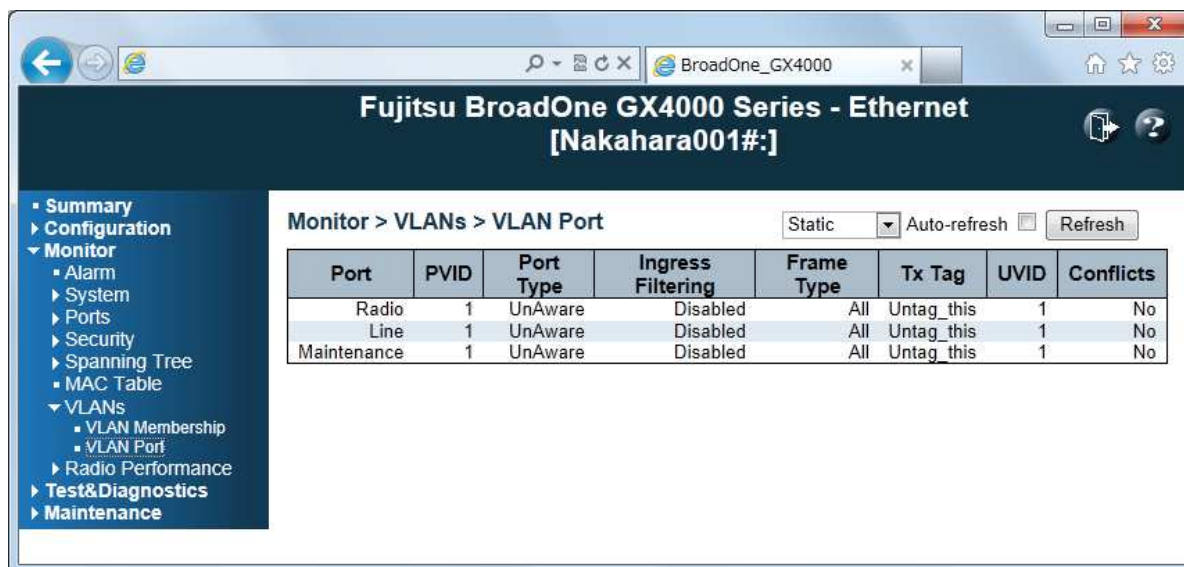
VLAN Membership : The VLAN Membership Status Page shall show the current VLAN port members for all VLANs configured by a selected VLAN User (selection shall be allowed by a Combo Box). When ALL VLAN Users are selected, it shall show this information for all the VLAN Users, and this is by default. VLAN membership allows the frames classified to the VLAN ID to be forwarded on the respective VLAN member ports.

Button : Select VLAN Users from **Static**, **MSTP** and **Combined**.

Auto-refresh : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds

Refresh : Click to refresh the page immediately

Monitor > VLANs > VLAN Port



Port	PVID	Port Type	Ingress Filtering	Frame Type	Tx Tag	UVID	Conflicts
Radio	1	UnAware	Disabled	All	Untag_this	1	No
Line	1	UnAware	Disabled	All	Untag_this	1	No
Maintenance	1	UnAware	Disabled	All	Untag_this	1	No

VLAN User : VLAN User module uses services of the VLAN management functionality to configure VLAN memberships and VLAN port configurations such as PVID and UVID. Currently we support the following VLAN user types:
Web/SNMP : These are referred to as static.

MSTP: The 802.1s Multiple Spanning Tree protocol (MSTP) uses VLANs to create multiple spanning trees in a network, which significantly improves network resource utilization while maintaining a loop-free environment.

Port : The port name in the same row.

PVID : Shows the VLAN identifier for that port. The allowed values are **1** through **4095**. The default value is **1**.

Port Type : Shows the Port Type. Port type can be any of Unaware, C-port, S-port, Custom S-port. If Port Type is Unaware, all frames are classified to the Port VLAN ID and tags are not removed. C-port is Customer Port. S-port is Service port. Custom S-port is S-port with Custom TPID.

Ingress Filtering : Shows the ingress filtering on a port. This parameter affects VLAN ingress processing. If ingress filtering is enabled and the ingress port is not a member of the classified VLAN, the frame is discarded.

Frame Type : Shows whether the port accepts all frames or only tagged frames. This parameter affects VLAN ingress processing. If the port only accepts tagged frames, untagged frames received on that port are discarded.

Tx Tag : Shows egress filtering frame status whether tagged or untagged.

UVID : Shows UVID (untagged VLAN ID). Port's UVID determines the packet's behaviour at the egress side

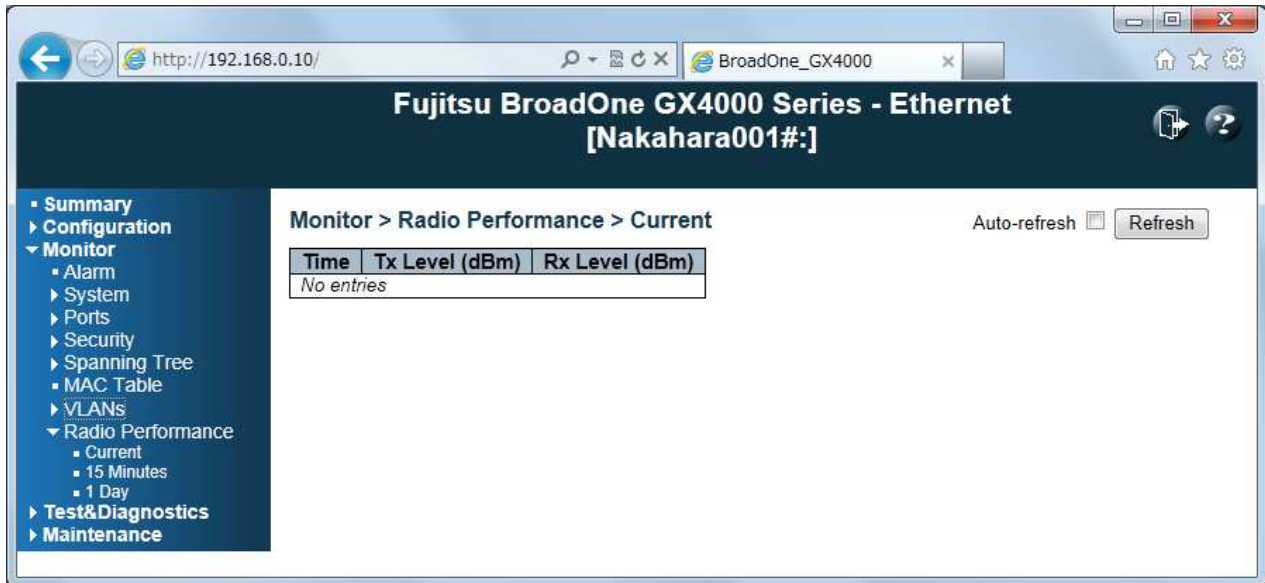
Conflicts : Shows status of Conflicts whether exists or not. When a Volatile VLAN User requests to set VLAN membership or VLAN port configuration, the following conflicts can occur:

Functional Conflicts between features. Conflicts due to hardware limitation. Direct conflict between user modules.

Button : Select VLAN Users from **Static**, **MSTP** and **Combined**.

Auto-refresh : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds

Refresh : Click to refresh the page immediately

Monitor > Radio Performance**Monitor > Radio Performance > Current****Radio Performance > Current:**

Time : The time that measured performance data.

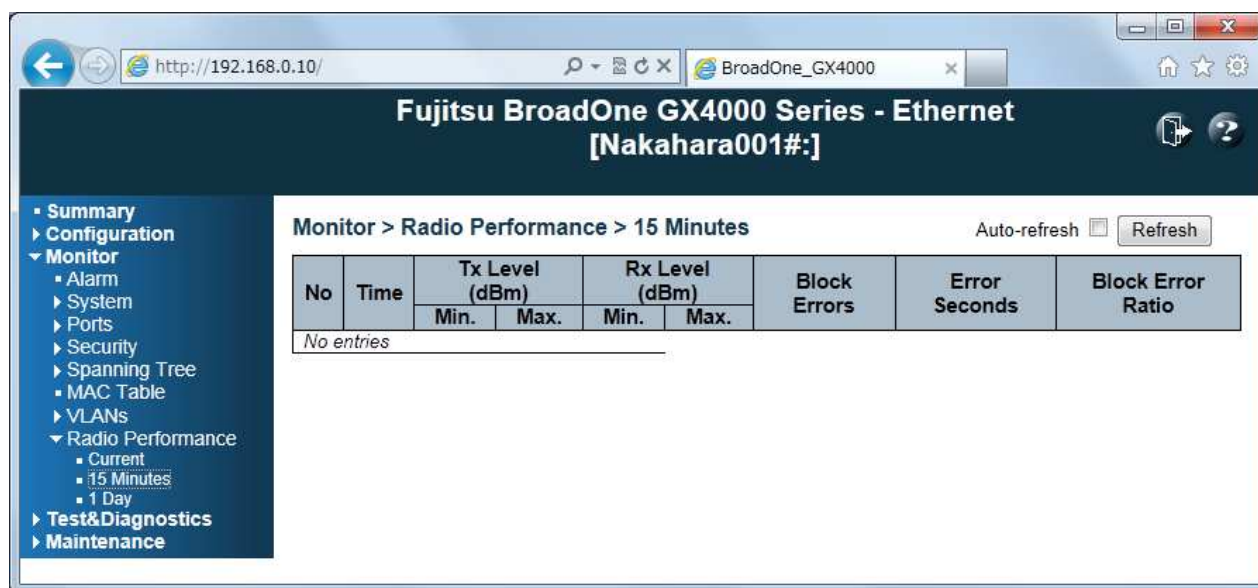
Tx Level (dBm) : The signal level of radio transmitting.

Rx Level (dBm) : The signal level of radio receiving.

Auto-refresh : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.

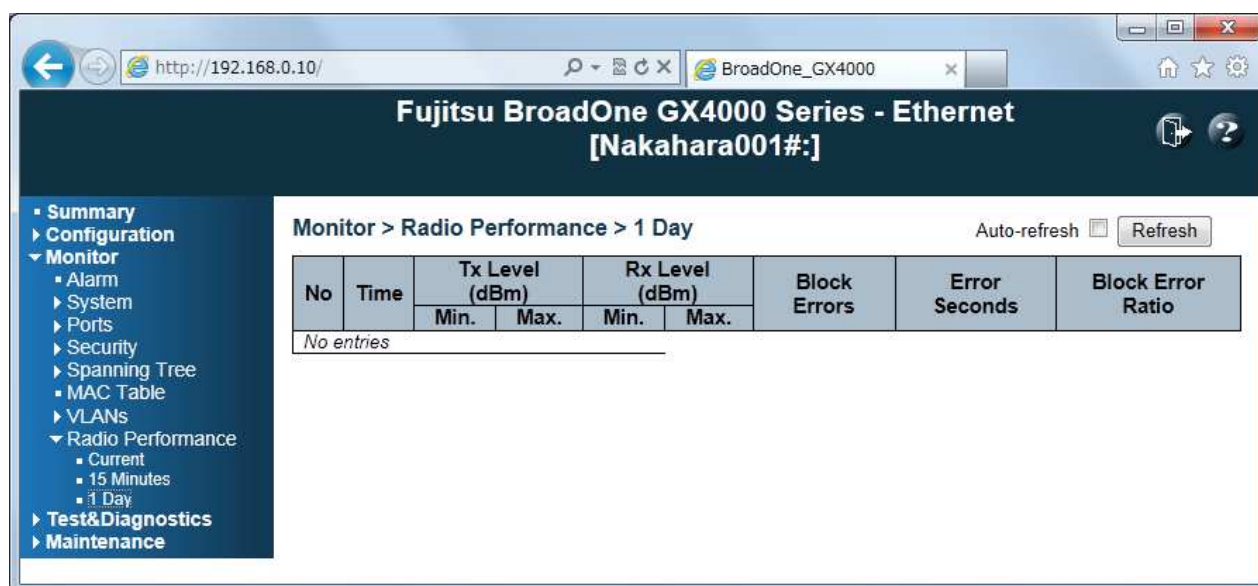
Refresh : Click to refresh the page

Monitor > Radio Performance > 15 Minutes

**Monitor > Radio Performance > 15 Minutes:**

This page provides historical radio performance data measured with 15 minutes window. As maximum, latest 72 hours of historical performance data can be seen.

- Time : The starting time of the 15 minutes window. The minute is fixed with 0, 15 30 and 45 on every hour.
- Tx Level (dBm) Min. : Indicates the minimum signal level of radio transmitting in 15 minutes window.
- TX Level (dBm) Max. : Indicates the maximum signal level of radio transmitting in 15 minutes window.
- Rx Level (dBm) Min. : Indicates the minimum signal level of radio receiving in 15 minutes window.
- Rx Level (dBm) Max. : Indicates the maximum signal level of radio receiving in 15 minutes window.
- Block Errors : Indicates the number of block error in 15 minutes window
- Error Seconds : Indicates the number of the second that have block error in 15 minutes window.
- Block Error Ratio : Indicates the ratio of the number of block error in the total number of block in 15 minutes window.
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
- Refresh** : Click to refresh the page

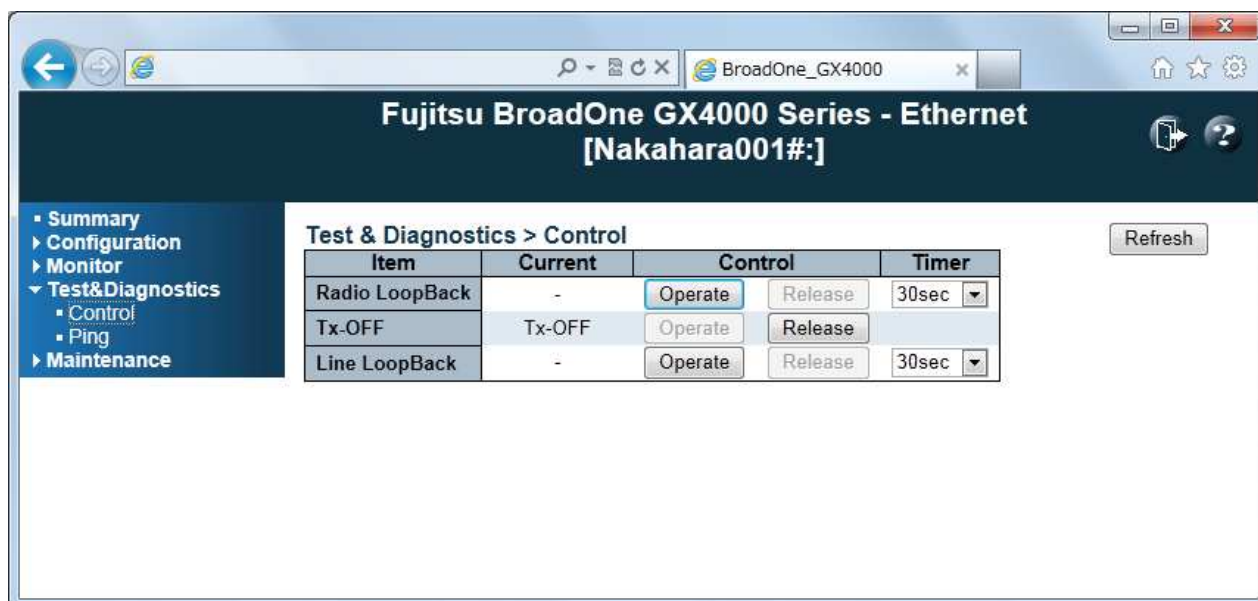
Monitor > Radio Performance > 1 Day**Monitor > Radio Performance > 1 Day:**

This page provides historical radio performance data measured with 1 day window. As maximum, latest 2 days of historical performance data can be seen.

- Time : The starting time of the 1 day window. The time is fixed with 0:00 in every day.
- Tx Level (dBm) Min. : Indicates the minimum signal level of radio transmitting in 1 day window.
- TX Level (dBm) Max. : Indicates the maximum signal level of radio transmitting in 1 day window
- Rx Level (dBm) Min. : Indicates the minimum signal level of radio receiving in 1 day window.
- Rx Level (dBm) Max. : Indicates the maximum signal level of radio receiving in 1 day window.
- Block Errors : Indicates the number of block error in 1 day window
- Error Seconds : Indicates the number of the second that have block error in 1 day window.
- Block Error Ratio : Indicates the ratio of the number of block error on the total number of block in 1 day window.
- Auto-refresh** : Check this box to refresh the page automatically. Automatic refresh occurs every 3 seconds.
- Refresh** : Click to refresh the page

Test & Diagnostics

Test & Diagnostics > Control

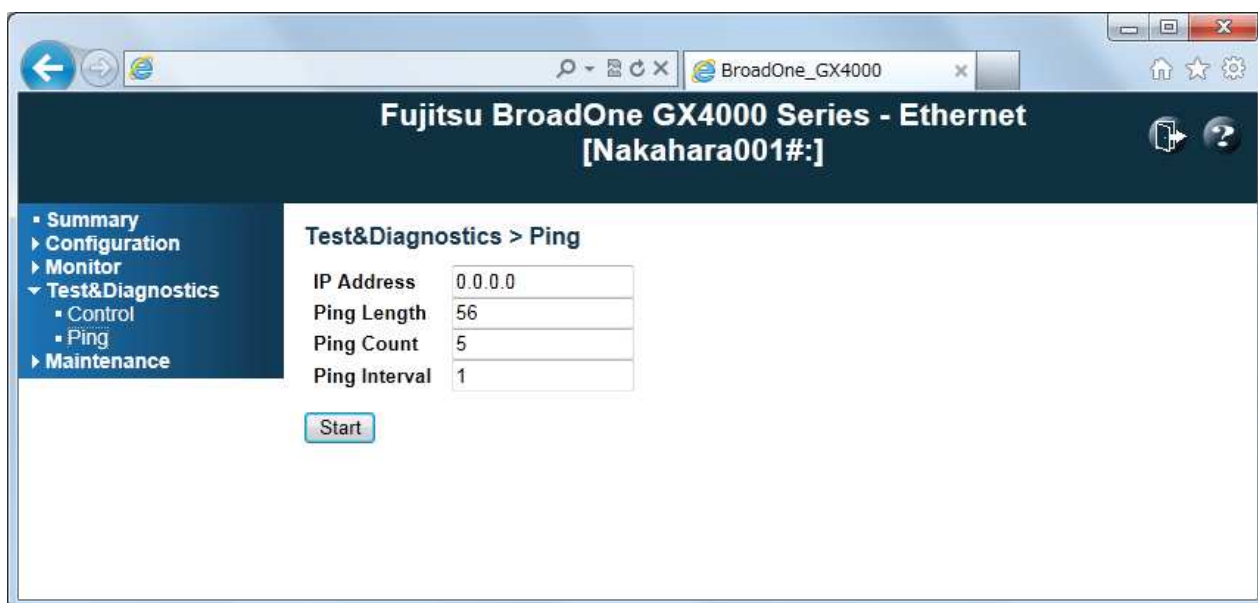


This menu allows you to control of test and diagnosis

- | | | |
|---------|---|---|
| Item | : | Radio LoopBack: Operation of Loopback for Radio side.
Tx-OFF: Operation of shut-off for radio transmitting.
Line LoopBack: Operation of Loopback for Line side. |
| Current | : | Indicates current condition. The displayed conditions are;
Operate: Operation is active.
-: Operation is inactive. |
| Control | : | Operate: Click to operate the item.
Release: Click to release the item |
| Timer | : | Set the remaining time. The Radio LoopBack and the Line LoopBack is released automatically if the time is up.
The allowed range is
10 seconds
20 seconds
30 seconds
1 minute
10 minutes
30 minutes
1 hour
3 hours
12 hours
24 hours
None (Non auto-release)

The default value is 30 seconds. |
| Refresh | : | Click to refresh the page |

Test & Diagnostics > Ping



This menu allows you to issue ICMP PING packets to troubleshoot IP connectivity issues.

After you press , ICMP packets are transmitted, and the sequence number and round trip time are displayed upon reception of a reply. The amount of data received inside of an IP packet of type ICMP ECHO_REPLY will always be 8 bytes more than the requested data space(the ICMP header). The page refreshes automatically until responses to all packets are received, or until a timeout occurs.

PING server 10.10.132.20, 56 bytes of data.

64 bytes from 10.10.132.20: icmp_seq=0, time=0ms

64 bytes from 10.10.132.20: icmp_seq=1, time=0ms

64 bytes from 10.10.132.20: icmp_seq=2, time=0ms

64 bytes from 10.10.132.20: icmp_seq=3, time=0ms

64 bytes from 10.10.132.20: icmp_seq=4, time=0ms

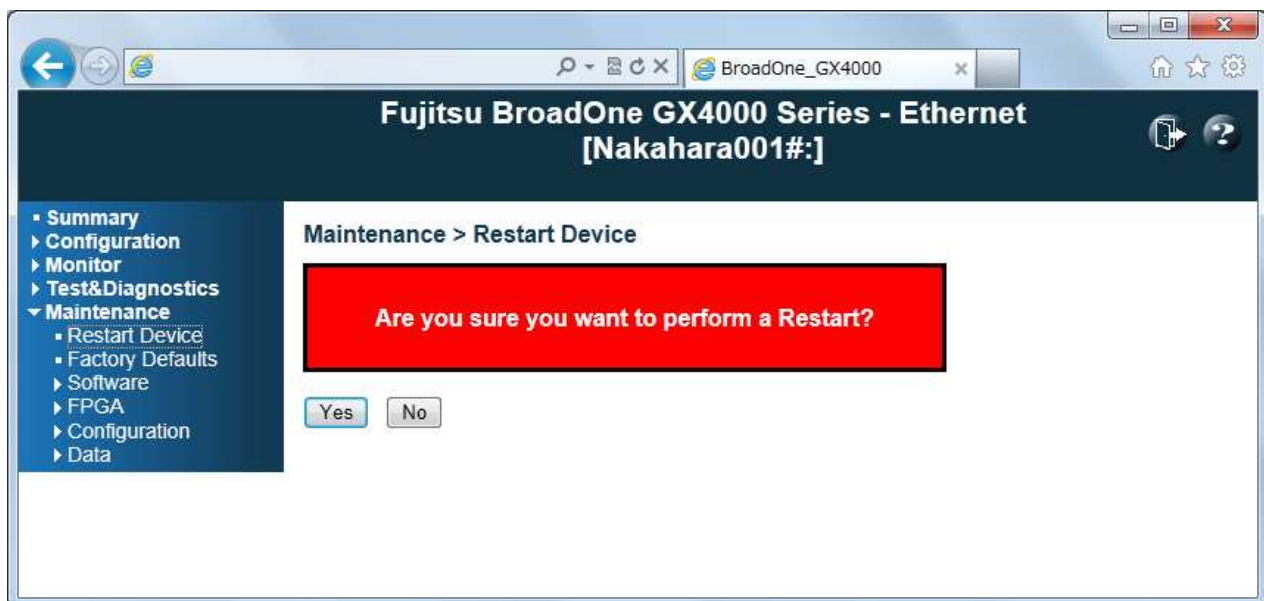
Sent 5 packets, received 5 OK, 0 bad

You can configure the following properties of the issued ICMP packets

- | | | |
|---------------|---|---|
| IP Address | : | The destination IP Address |
| Ping Length | : | The payload size of the ICMP packet. Values range from 2 bytes to 1452 bytes. |
| Ping Count | : | The count of the ICMP packet. Values range from 1 time to 60 times. |
| Ping Interval | : | The interval of the ICMP packet. Values range from 1 second to 30 seconds |
| Start | : | Click to start transmitting ICMP packets |
| New Ping | : | Click to re-start diagnostics with PING |

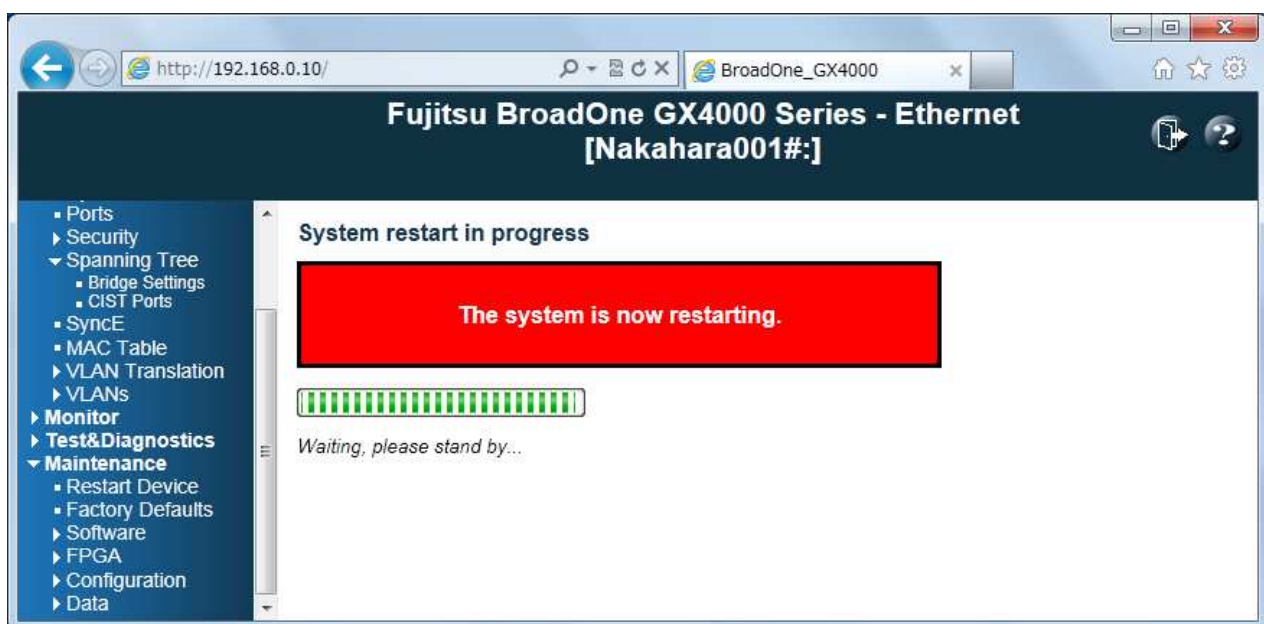
Maintenance

Maintenance > Restart Devices



You can restart the switch on this page. After restart, the switch will boot normally

- Yes** : Click to restart device
- No** : Click to return to the Port State page without restarting



When click Yes, Restarting display will appear.

Maintenance > Factory Defaults

You can reset the configuration of the switch on this page. Only the [IP](#) configuration is retained. The new configuration is available immediately, which means that no restart is necessary

- Yes** : Click to reset the configuration to Factory Defaults
- No** : Click to return to the Port State page without resetting the configuration

Note: Restoring factory default can also be performed by making a physical loopback between port 1 and port 2 within the first minute from switch reboot. In the first minute after boot, 'loopback' packets will be transmitted at port 1. If a 'loopback' packet is received at port 2 the switch will do a restore to default

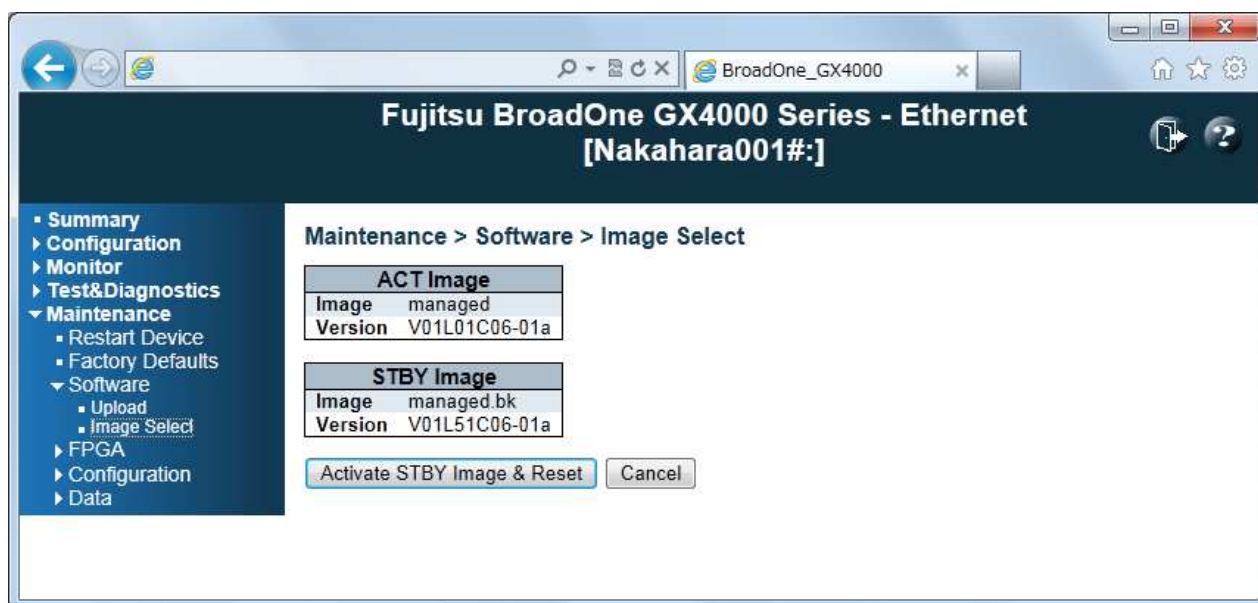
Maintenance > Software**Maintenance > Software > Upload**

This page is used to update the software to the latest version.
The versions of software images are displayed, and the alert message to confirm it is displayed.
Up-loading begins after clicking OK.
The up-loaded image is stored on the STBY side, and after a few minutes, up-loading is completed.

NOTICE: Do not restart or power off the device at this time or the device may fail to function afterwards.

- | | | |
|---------------|---|---|
| Browse | : | Click to the location of software image |
| Upload | : | Click to upload the software image |

Maintenance > Software > Image Select



This page provides information about the ACT software image and the STBY software image in the device, and allows you to select to the STBY software image.

Reset operates when switching.

The web page displays two tables with information about the ACT software image and the STBY software image.

Note: 1. In case the ACT image is alternate image, only the "ACT Image" table is shown. In this case, the "Activate STBY Image & Reset" button is also disabled.

- | | | |
|--|---|--|
| Image | : | The flash index name of the software image. The name of primary image is managed , the alternate image is named managed.bk . |
| Version | : | The version of the software image, and the date where the software was produced. |
| Activate STBY Image & Reset | : | Activate STBY Image & Reset: Click to use the STBY image. This button may be disabled depending on system state. |
| Cancel | : | Cancel activating the STBY image. Navigates away from this page. |

Maintenance > FPGA**Maintenance > FPGA > Upload**

This page is used to update the FPGA data to the latest version.

The versions of FPGA data images is displayed, and the alert message to confirm it is displayed. Up-loading begins after clicking OK.

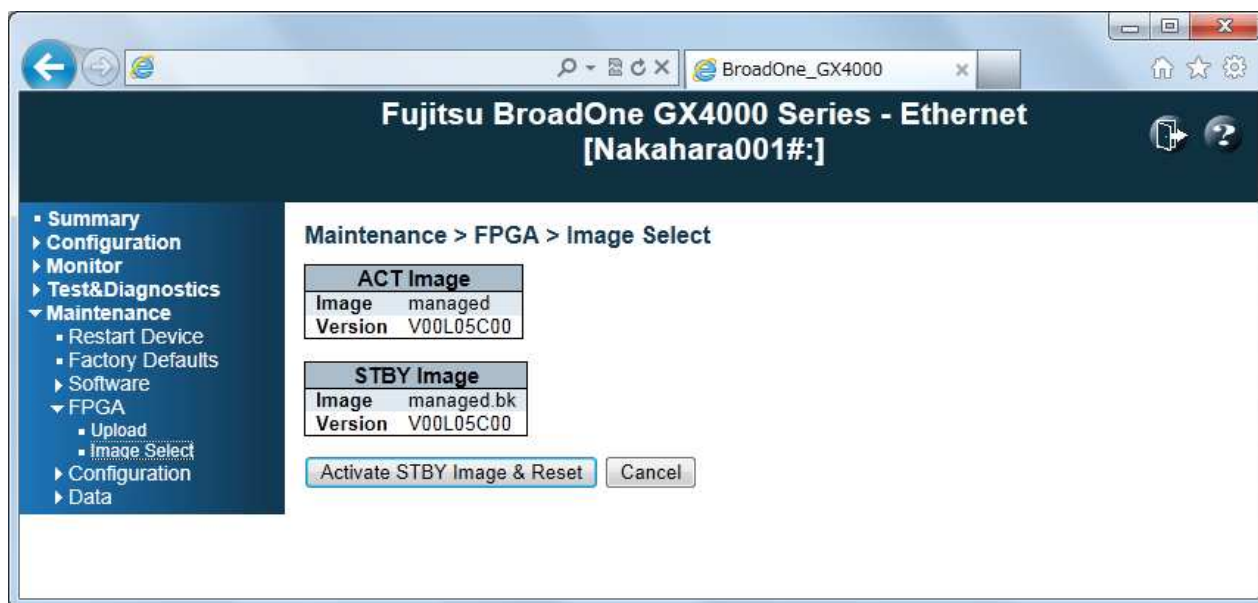
The up-loaded image is stored on the STBY side, and after a few minutes, up-loading is completed.

NOTICE: Do not restart or power off the device at this time or the device may fail to function afterwards.

Browse : Click to the location of FPGA image

Upload : Click to upload the FPGA image

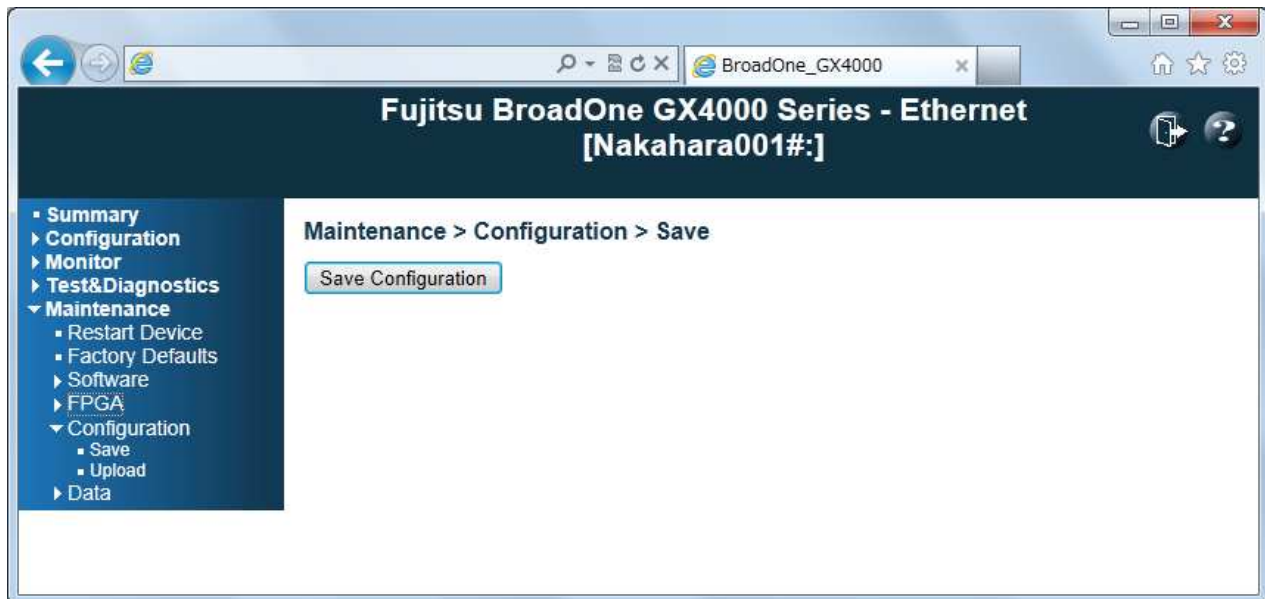
Maintenance > FPGA > Image Select



This page provides information about the ACT FPGA data image and the STBY FPGA data image in the device, and allows you to select to the STBY FPGA data image. Reset operates when switching. The web page displays two tables with information about the ACT FPGA data image and the STBY FPGA data image.

Note: 1. In case the ACT image is alternate image, only the "ACT Image" table is shown. In this case, the "Activate STBY Image & Reset" button is also disabled.

- Image : The flash index name of the FPGA data image. The name of primary image is **managed**, the alternate image is named **managed.bk**.
- Version : The version of the FPGA data image.
- Activate STBY Image & Reset** : Activate STBY Image & Reset: Click to use the STBY image. This button may be disabled depending on system state.
- Cancel** : Cancel activating the STBY image. Navigates away from this page.

Maintenance > Configuration**Maintenance > Configuration > Save**

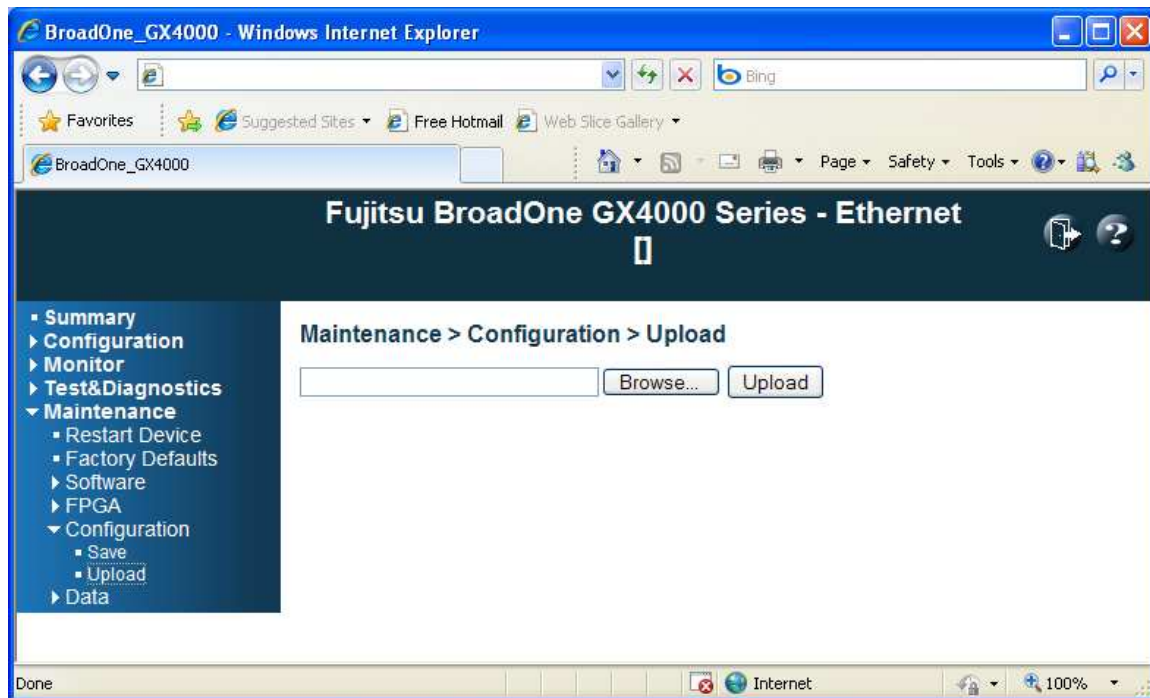
You can save/view the device configuration. The configuration file is XML format. When the Save Configuration button is clicked, the file of the name of config_yyyymmdd_hhmiss.xml is saved.

The example of the file name) config_20120624_160745_.xml

yyyy: year
mm: month
dd: day
hh: hour
mi: minute
ss: second

NOTICE: Do not edit the XML file. The up-loading of the edited XML file is unsupported. The device might malfunction even if up-loading is normally completed

Save Configuration : Click to save the configuration file

Maintenance > Configuration > Upload

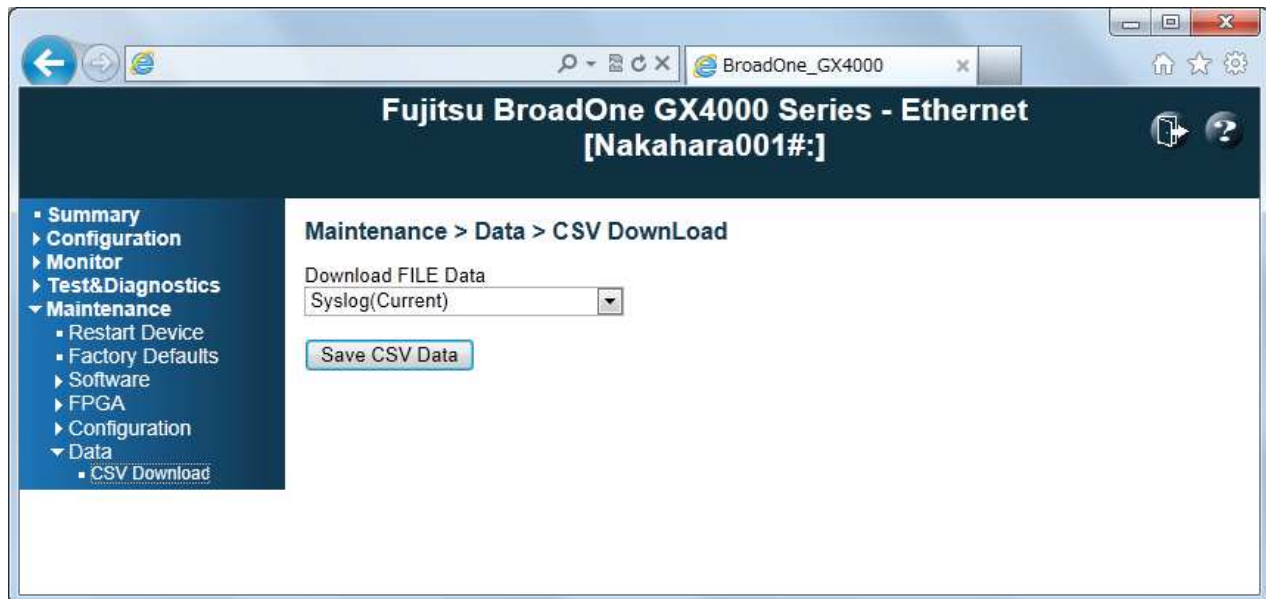
You can upload the device configuration. The configuration file is XML format. When the Upload button is clicked, the file of the configuration is up-loaded.

The example of the file name) config_20120624_160745_.xml

yyyy: year
mm: month
dd: day
hh: hour
mi: minute
ss: second

NOTICE: Do not edit the XML file. The up-loading of the edited XML file is unsupported. The device might malfunction even if up-loading is normally completed

Browse	:	Click to save the configuration file
Upload	:	Click to upload the configuration file

Maintenance > Data**Maintenance > Data > CSV Download**

You can download information selected with Download FILE Data. The data file is CSV file format. When the Save CSV Data button is clicked, the file of the name of kkkk_yyyymmdd_hhmiss.csv is saved.

Download File Data : Syslog: Data of Syslog is downloaded. (Data including the old information is downloaded when there is an old information.)
 Radio Performance Data (15min): Radio Performance Data of 15min is downloaded.
 Radio Performance Data (1Day): Radio Performance Data of 1Day is downloaded.

The example of the file name) syslog_20120624_160745_.xml

kkkk: syslog/15minpm/1daypm

yyyy: year

mm: month

dd: day

hh: hour

mi: minute

ss: second

Save CSV Data

Click to start CSV download