Mobile WiMAX RF Manual
33dBm

Sprint

Together with NEXTEL

2008. 12

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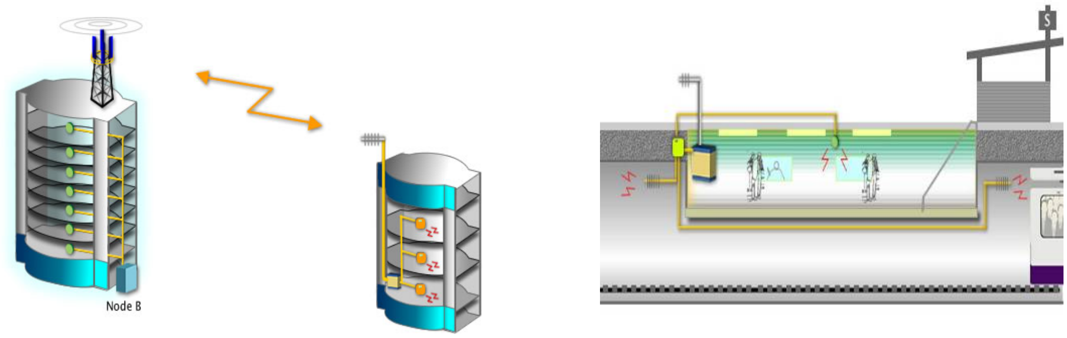
1 System Outline

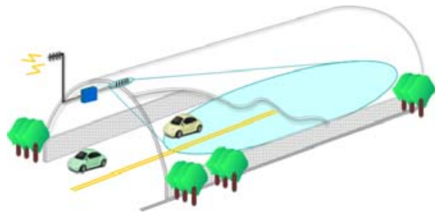
Mobile WiMAX operates at 2.5GHz frequency band and it offers wireless internet service at medium to low velocity movement without connection being cutoff. Mobile WiMAX guarantees mobility and due to inexpensive wireless internet access, it has become a necessary technology. Generally wireless infrastructures for radio waves are not serviceable in locations such as in-buildings, islands, mountain areas and shadow zones. To solve this problem, a repeater system is utilized. This mobile internet RF repeater system is an OFDMA mobile internet system that allows services in in-buildings such as offices, underground parking areas, shopping malls, sub-station locations and small scale areas. This system can provide coverage to shadow zones where radio waves can’t penetrate. Some of these locations may be underground or indoor areas with dense traffic.

<Shadow Zones>

- Underground: subway, underground shopping mall, underground passage, underground car park, etc.
- Terrestrial: inside large building, tunnel, dense city centers, etc



<In-Building Application> <Subway Application>



<Tunnel Application>

[Figure 1] MOBILE WIMAX System Outline

2 System Configuration

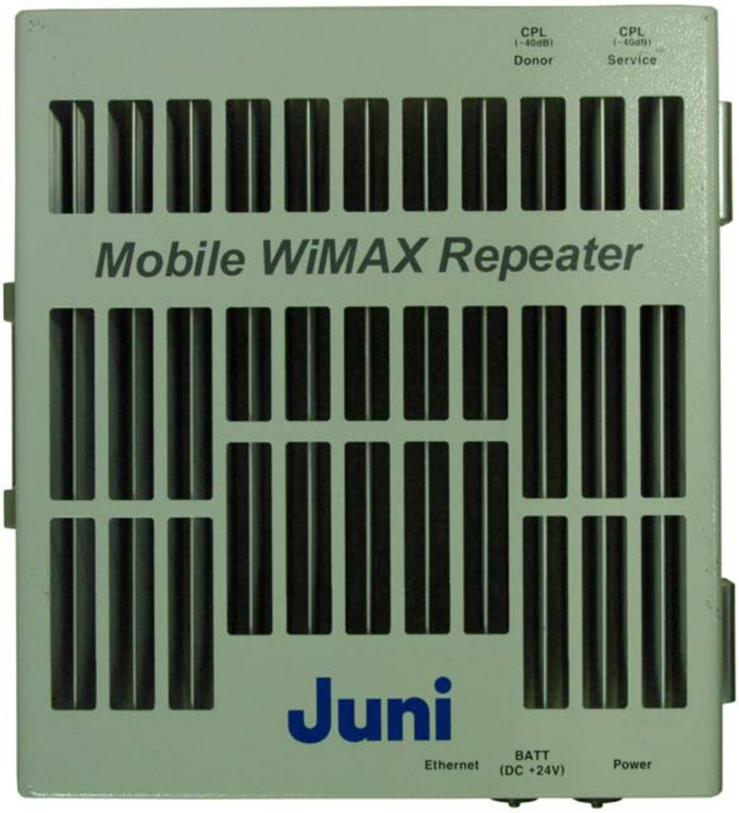
2.1 Mobile WiMAX

This mobile WiMAX system was developed so that signals could be retransmitted to shadow zones and thus provide service to these areas. Setup for this unit has become very common in indoor areas such as underground shadow zones.

Donor antenna and service antenna ports for the repeaters are configured to N-females while monitoring ports for repeaters are configured to SMA female.

In order for operator’s to easily understand the repeaters operational status, Ethernet port is used so that units can be monitored and allow repairs to be easily made.

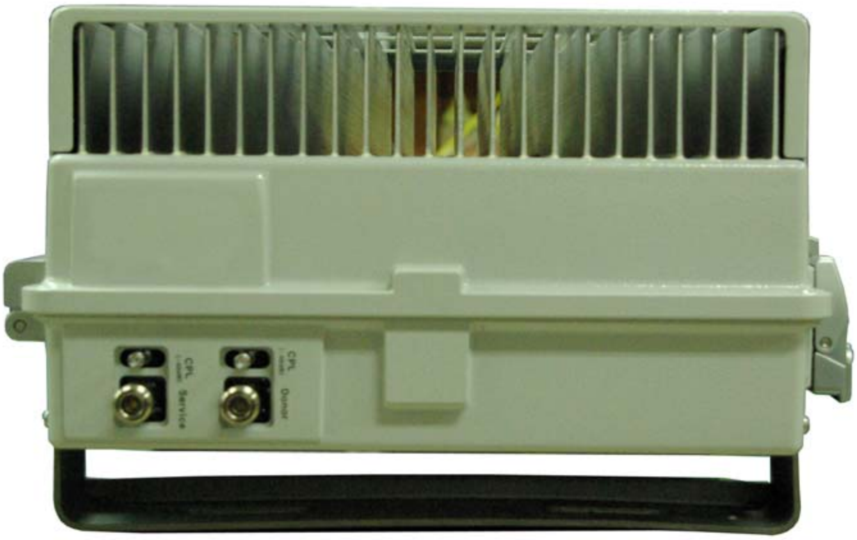
For 33dBm repeater: Maximum value of 33dBm/Total can be emitted for forward and reverse direction.


CPL
(-40dB)
Donor
CPL
(-40dB)
Service
Mobile WiMAX Repeater
Juni
Ethernet
BATT
(DC +24V)
Power

[Figure 2] Frontal view of Mobile WiMAX System

2.1.1 Base Station Direction (Donor ANT)

Connect the antenna cables to the donor antenna port which is located on the top section of the repeater. The donor antenna is installed outside on the building so that it will be able to receive signals from base station.



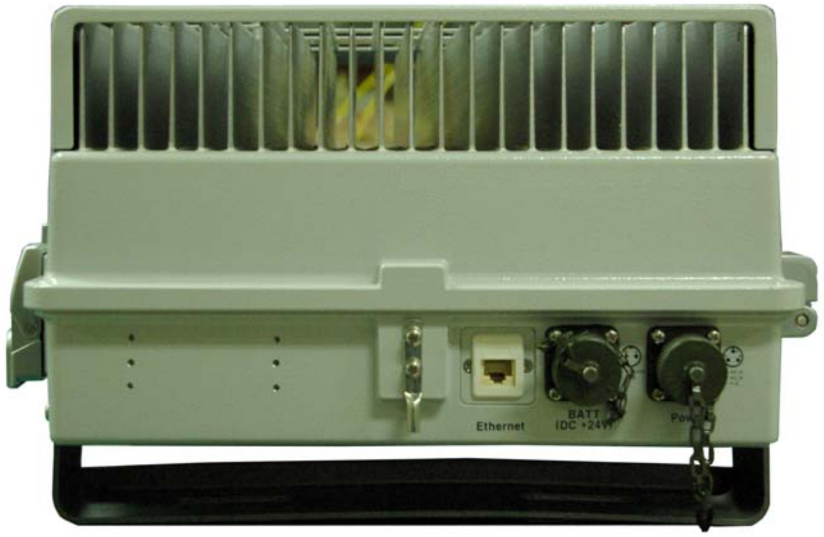
[Figure 3] Top view of MOBILE WIMAX System

2.1.2 Service Direction (Service ANT)

The service antenna port which is located at the top section of the repeater is connected to the service antenna cable. These antennas that are connected to the repeaters are able to provide service to the Shadow Zone and allow for a satisfactory smooth signal. So, in order to match site characteristics with an installation location, an antenna type has to be determined and connected.

2.1.3 UL CPL (Up Link Coupling)

Up link coupling is for operators to analyze the status of an Up Link path. It is a port for measuring UL signal waveform and strength.



[Figure 4] Bottom view of MOBILE WIMAX System

2.1.4 DL CPL (Down Link Coupling)

Down link coupling is for operators to analyze the status of a Down Link path. It is a port for measuring DL signal waveform and strength.

2.1.5 GUI

Communication is made between repeaters and the PC operation program via an RJ-45. The GUI confirms that the conditions of the repeater and status settings are made on the ports.

2.1.6 AC Power

Repeater’s operational power supply is connected via an AC cable.

2.1.7 DC Battery

When the AC power supply is cutoff, DC +24V battery is implemented as the back up power source. (Option)

3 System Figures and Specifications

3.1 MOBILE WIMAX System Specifications

3.1.1 System Figures

Section	Features (33dBm Repeater)	Notes
Duplexing	TDD	
Frequency	2,496 ~ 2,690MHz	
Output (Repeaters Final Range)	33dBm/Total (FWD) 33dBm/Total (RVS)	

[Table 1] System Figures

3.1.2 Features and Functions

Items		Specifications (33dBm Repeater)	Notes
RF Connector Type(IN/OUT)		N-Type	Female
Power Connector Type		Waterproof type	
Enclosure	Size(W x H x D)	386mm *334mm *153mm	
	Mass	Less than 25Kg	
	Structure	Wall Mount Type Heat Sink Cooling (Natural Dissipation)	

[Table 2] Features and Functions

3.1.3 Environment Figures

Items	Specifications	Notes
Operational Temperature and Humidity Range	−10 ~ +50℃, 5% ~ 95%	
Power Consumption	Less than 300W	

[Table 3] Environment Specification

3.2 System Specification

3.2.1 System Specification

Section		Figures	Notes
Frequency		2496 ~ 2690MHz	
System delay		5.0usec	For each FA, Maximum Value
FA delay drift		35 nsec	
Frequency Stability		±0.02ppm	
Switching time		Within 2.5usec Max	
Switching time adjustment range		Within TTG, RTG Section	1usec step
Switching time adjustment accuracy		Within ± 1us	
Pass band Ripple		Within ± 1.5dB	
System Gain	Down Link	80dB	
	Up Link	80dB	
Gain Control Step Size		0.5dB	
Gain Control accuracy		Within ± 1dB	
Input VSWR		Less than 1.4	
EVM		3%	Source Comparison
Forward input range		-50 ~ -20dBm/Total	
Noise Figure		5dB	
Path isolation		More than 120dB Min.	
Reverse operating input range		-50dBm	
Pass Band 3dB BW		FA 10MHz Band : Within 11MHz	Each FA
Pass Band 50dB BW		FA 10MHz Band : Within 13MHz	Each FA
Occupied Frequency Bandwidth		FA 10MHz Band : Within 10MHz	Each FA

Down Link Spurious Emission Mask	FA edge±1MHz More than	Less than -40dBc	100KHz
	FA edge±3.5MHz More than	Less than -45dBc	100KHz
Out of Band Spurious Emission Mask	Under 30MHz~1GHz	Less than -13dBm	100KHz
	1GHz~12.75GHz	Less than -13dBm	1MHz
Up Link Stop band Rejection	FA edge±1MHz More than	Less than -40dBc	100KHz
	FA edge±3.5MHz More than	Less than -45dBc	100KHz
Reverse Out of Band Spurious Emission	Under 30MHz~1GHz	Less than -13dBm	100KHz
	1GHz~12.75GHz	Less than -13dBm	1MHz

LED	RF Power	Occurrence of Over Power Red	
	VSWR	Alarm Occurrence Red	
	RSSI	Alarm Occurrence Red	
	Over Temp.	Alarm Occurrence Red	
	Undercurrent	Alarm Occurrence Red	

Shutdown	DL Input Level	-14dBm/Total ±2dB	
	UL Output Level	35dBm/Total ±2dB	

[Table 4] System Specification

3.3 Main Component Specification

3.3.1 Switch Module Specification

Parameter	Specification	Remark
Frequency	2496MHz ~ 2690MHz	BW=194 MHz
Insertion Loss	1.5dB max. (Diode 5)	HPA → Service @TTL High Link → LNA @TTL High HPA → Link @TTL Low Service → LNA @TTL Low
VSWR	1.4 max.	RF ON Application, All port
Isolation	120 dB min.	HPA → Service @TTL Low Link → LNA @TTL Low HPA → Link @TTL High Service → LNA @TTL High
Switching Time	2.5 ㎲ max.	90% Application.

[Table 5] Switch Module Specification

3.3.2 UDC (Up/Down Converter) Specification

Parameters		Specifications	Remark
Frequency1		2518.5MHz	BW33MHz
Frequency2		2535MHz	BW33MHz
Frequency3		2551.5MHz	BW33MHz
Frequency4		2640.5MHz	BW33MHz
Frequency5		2657MHz	BW33MHz
Frequency6		2673.5MHz	BW33MHz
Operational Band Width		30MHz	
System delay		4.7usec	
Frequency Stability		±0.02ppm	
Passband Ripple		Within ± 1 dB	-40℃~55℃
System Gain	Down Link	27dB(@LNA17dB)	-40℃~55℃
	Up Link	27dB(@LNA17dB)	-40℃~55℃
Temp ATT		min=8dB(Normal Temperature)	@ All path
Rate of Change for Temperature		±3dB(No temp ATT)	-40℃~55℃
Gain Control Step Size		0.5dB	
Gain Control accuracy		Within 0.7dB	
Input VSWR		Less than 1.4	
EVM		2%	Source Comparison (DL64QAM/UL16QAM)
Tx/Rx input range		-17 ~ -47dBm/FA	Including LNA
Tx/Rx Output		-5dBm	

Noise Figure	5dB		Max (Including LNA)
	12dB		Min (Including LNA)
OOBE	edge±1.5 ~ 2.5MHz	-53dBm/100kHz	-40℃~55℃
	edge±2.5 ~ 4.5MHz	-53dBm/MHz	-40℃~55℃
	More than edge±4.5MHz	-82dBm/MHz	-40℃~55℃
ALC	30dB		
Occupied Frequency Bandwidth	Within 30MHz		3FA
Reverse Out of Band Spurious Emission	Less than 30MHz~1GHz	Less than -13dBm	100KHz
	1GHz~12GHz	Less than -13dBm	1MHz
Temperature For All Conditions	-40℃~55℃		

[Table 6] UDC Specification

3.3.3 BPF Module Specification

3.3.3.1 Electrical Specifications

Donor

Parameters	specifications	Notes
	BPF	
Frequency Range	2502~2690MHz	
Center Frequency	2596MHz	
Bandwidth	188MHz	
Insertion Loss (Max.)	1.2 dB (Normal Temperature : 1.0 dB)	
Return Loss(Min.)	18 dB	
Pass Band Ripple (Max.)	0.8 dB	
Attenuation(Min.)	2486MHz@20 dBc	
	2700MHz@30 dBc	
Coupling Vale	40±2.0dB(Out Port) 824~894MHz@30dB±2.0dB(In Port)	
Operating Temp	-30 ~ +60 ℃	
In/ Out Impedance	50 Ω	

Service

Parameters	specifications	Notes
	BPF	
Frequency Range	2502~2690MHz	
Center Frequency	2596MHz	
Bandwidth	188MHz	
Insertion Loss (Max.)	1.2 dB (Normal Temperature : 1.0 dB)	
Return Loss(Min.)	18 dB	
Pass Band Ripple (Max.)	0.8 dB	
Attenuation(Min.)	2486MHz@20 dBc	
	2700MHz@30 dBc	
Coupling Vale	40±1.5dB(Out Port)	
Operating Temp	-30 ~ +60 ℃	
In/ Out Impedance	50 Ω	

[Table 7] BPF Specification

3.3.4 HPA Specification

Parameters	Specifications for 30dBm Repeater		Remark
Frequency Range	2490~2690MHz		
Output Power	36dBm		
Gain	40dB ±1dB (min)		
Gain Flatness	1.0dB (peak to peak)		
Input/Output VSWR	1.3 :1 (max) to 50Ω		
ACP	@ Output Power OFDM 3FA 36dBm	≤ −20dBm @ Offset Freq(20MHz), RBW(1MHz)	
		≤ −20dBm @ Offset Freq(23MHz), RBW(1MHz)	
DC Input Voltage	+28V DC		
DC Input Current	Typ. 1.2mA, MAX 1.5A (@Vdc= +28V, @OFDM 3FA)		
Power Detect	4V@33dBm, (100mV/1dB), Detect range : 3dBm ~ 33dBm		
Enable (On/Off)	Enable : Close /Disable : Open		
Over Power Alarm	TTL High @ 36dBm		
Operating Temperature	−10 ~ +60℃		
Dimension	170 x 140 x 25		
RF Connectors	SMA Female		
Pin Description (15PinD−SUB Male)	Pin1, 2, 9, 10 : +28V Pin3 : HPA Fail Alarm (Shutdown) Pin4 : Over Temp Alarm (Shutdown) Pin5 : Over Power Alarm Pin6 : Over VSWR Alarm Pin7 : Out Power Det Pin8 : Enable / Disable Pin11, 12 : NC Pin13, 14, 15 : GND		

[Table 8] HPA Electrical Specification

3.3.5 SDM (Sync Detector Module) Specification

3.3.5.1 Electrical Characteristic

Parameter	Specification			Units	Remark
	min	normal	max		
Input Frequency	2400		2700	MHz	
Input Power w/o Damage			0	dBm	*Note 1
Normal Input Power	-70		-20	dBm	*Note 2
Synch Detection Level	-70		-20	dBm	
Ratio Detection Level	-70		-20	dBm	
VSWR			2:1		
Local Leakage			-80	dBm	*Note 3
Supply Voltage	4.75	5.5	6	V	
Consumption Current	0.3	0.45	1	A	5[V] Range

FA Index	Description
0 ~ 775	(Current Frequency) = 2496 MHz + (FA Index * 0.25 MHz)

[Table 9] SDM Electrical Characteristic

3.3.5.2 Environment Specifications

Parameter	Specification	Remark
Operating Temp.	-40~80℃	Humidity 0~90%
Storage Temp.	-40~90℃	-

[Table 10] SDM Environment Specification

3.3.5.3 Mechanical Characteristic

Parameter	Specification	Remark
Size	110×75×1.6	W×H×D (mm)
Weight	TBD	
Interface connector	2.54 pitch 2x13	

[Table 11] SDM Mechanical Characteristic

3.3.6 CONTORLLER SPECIFICATION

3.3.6.1 Application Range

Mobile WiMAX repeater’ s control board is applied.

3.3.6.2 Main Characteristic

Items	Details	
CPU Board Specification	Circuit Version	HUEX1101
	PCB Version	HUEX1101-1
	Exterior Size	200mm * 110mm
	Thickness, Layer	1.6T, 4 Layer
Main Component	CPU	ATmega128 16 MHz
	Data Memory	K6X4008C1F-GF70 (4Mbit) Internal 4kByte EEPROM
	Program Memory	Internal 1Mbit Flash
Electrical Characteristic	Operation Voltage(Vcc)	+7V → VCC
	Power Stability Element	MIC29150-5.0BU
Operational OS		uC/OS-II
Temperature Characteristic	-30 ~ 80 ℃	

[Table 12] Controller Characteristic

3.3.6.3 Mechanical Characteristic

Item	Specification
CPU B’ D	FR4 4Layer t=1.6 Size=270mm*240mm

[Table 13] Controller Mechanical Characteristic

3.3.7 PSU Specification

3.3.7.1 GENERAL CHARACTERISTIC

	Items	Specification	
Input	Input Voltage and Range	110 ~ 124 or 208 ~ 240VAC (Switch Selection)	
	Frequency	55 ~ 65Hz	
	Constant	Single Phase	
Output	Rated Voltage and Load Current	+27VDC/5A, +5.5VDC/1.5A, +7VDC/4A,-27VDC/0.1A	
	Voltage Fluctuation Limit	Rated Output Voltage ± Within 2% (Line/Load Regulation)	
	Ripple/Spike	Ripple, Spike inclusion, Output Voltage less than 1% of 10V which is within 100mV	
	Excess Voltage (Sudden Load Change)	Peak Value	Less than 1V
		Recovery Time	Less than 35msec
	Efficiency	More than 75%	
	Hold-up Time	Maintain more than 20msec	
	Over Voltage Protection	Output level of 110 ~140% Shutdown Protection	
	Over Current Protection	Maximum output current is between 110~140% for current limit. Auto return Sub-power for over current protection follows the elements characteristic.	
	Arrival Time Rating	For voltage rating, the arrival time is within 100 msecond. OVER&UNDER SHOOT voltage rating is within 90 ~ 110%	
	Time Drift	After 30 minutes of operation, when output voltage is measured, value should be within ± 0.25%	

	Over-Heating Protection	When PSU’ s Base Plate exceeds 100 °C, system shuts down
	BATT. Terminal Voltage	+21V ±0.5V

[Table 14] Power Source Specification

3.3.7.2 Output Characteristic

Rated Output		Io		Ripple & Noise
Vo	Tolerance	Min	Max	
+27V	±2%	0.1A	4A	2000mV
+5.5V	±2%	0.1A	1.5A	100mV
+7V	±2%	0.1A	4A	120mV
-27V	±2%	0.01A	0.1A	200mV

[Table 15] Power Source Output Characteristic

3.3.7.3 Environment Characteristic

Specification Items	Specification	Remarks
Operating Temperature and Humidity	-30°C/10%~70°C/90%	
Storage Temperature and Humidity	-30°C/10%~70°C/90%	
Output Voltage Change	0.05%/°C	
Cooling Mode	Conduction Cooling Mode	
High Temperature Test Condition (Full load)	For 72 hours at 70°C	

COLD START	Storing the unit at -30°C for 10 hours and then turning it on	

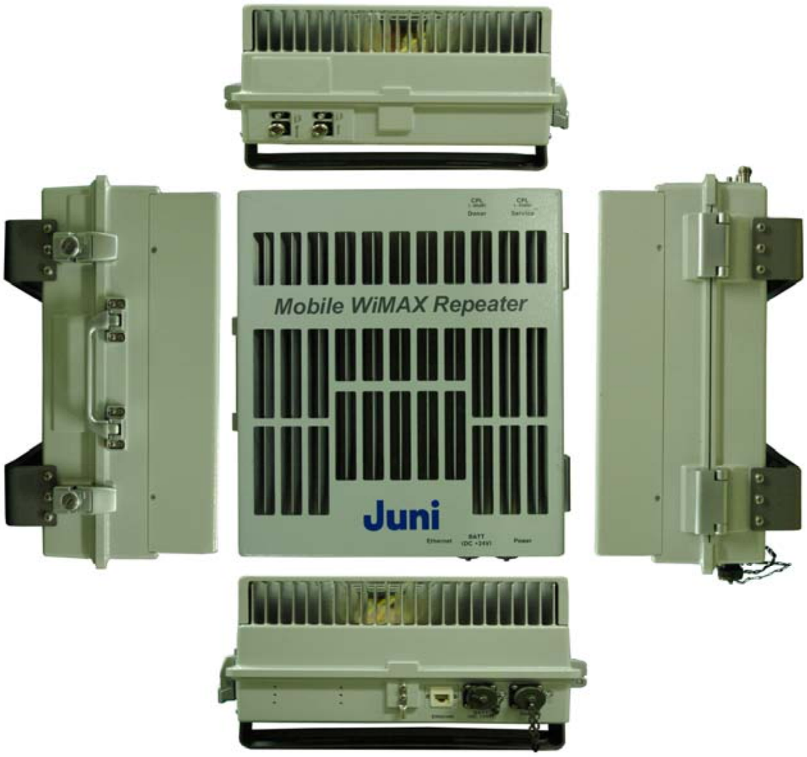
[Table 16] Power Source Environment Characteristic

4 System Structure and Function

4.1 Repeater Structure and Explanation

4.1.1 Repeater External Appearance

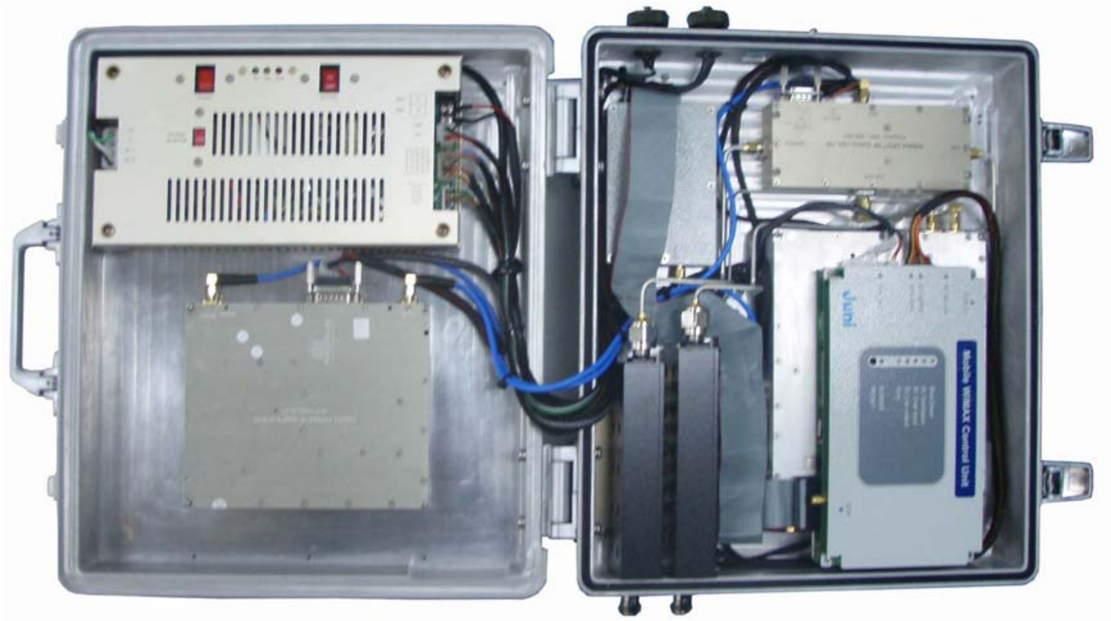
Repeater’s enclosure prevents dust and other pollutant particles from entering and is designed for wall mount positioning. Heat-sink is placed to dissipate heat.


CPL
Donor
CPL
Service
Mobile WiMAX Repeater
Juni
Ethernet
BATT (DC +24V)
Power

[Figure 5] Mobile WiMAX RF Repeater Structure

4.1.2 REPEATER INTERIOR

Structure of the unit is simplified so that maintenance will be easily handled; therefore the number of modules is minimized. Inside the repeater enclosure, there are 6 modules that are laid out. These modules are Switch, PSU, HPA, BPF, UDC and Controller.



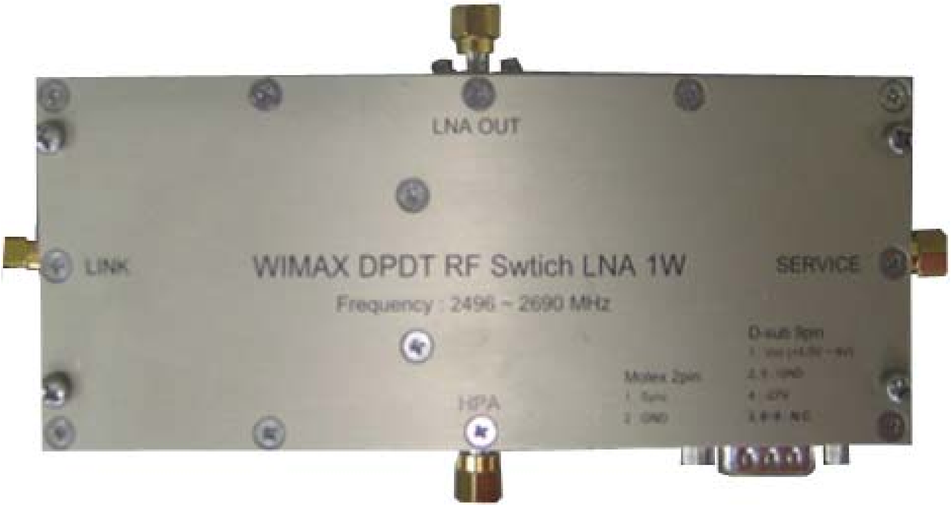
[Figure 6] Mobile WiMAX Repeater’s Interior

4.2 Explanation of Internal Configuration

4.2.1 Switch Module

WIMAX DPDT (Double Pole Double Throw) RF Switch LNA is applied to the WIMAX RF repeater.

High Isolation values are used for Down Link and Up Link segregation (More than 120dB). With low insertion loss, Noise Figure value and HPA output loss can be lowered. When TTL sync is high, downlink path is set and when TTL sync is low, Up Link path is set.


LNA OUT
LINK
WIMAX DPDT RF Swtich LNA 1W
Frequency : 2496 ~ 2690 MHz
SERVICE
D-sub 9pin
Molex 2pin
1. Sync
2. GND
HPA

[Figure 7] Switch Module Feature

4.2.1.1 HPA

HPA is the input signal port for RF signals which travel out the Link and Service port.

4.2.1.2 LNA

Signals make their way into Link and Service ports, whereby weak signals are amplified and exit out of LNA OUT. Signals are then delivered to up/down converter’s input port.

4.2.1.3 Service

Service port connects directly to BPF. Based on a switching mechanism, high amplified signals enter into the HPA and exit its way out of the service port. The signal then gets filtered by BPF and travels toward the service antenna. When the switch module is in a different state, weak signals from the service antenna pass through the BPF and into the service port. These signals exit the LNA out port to be amplified.

4.2.1.4 Link

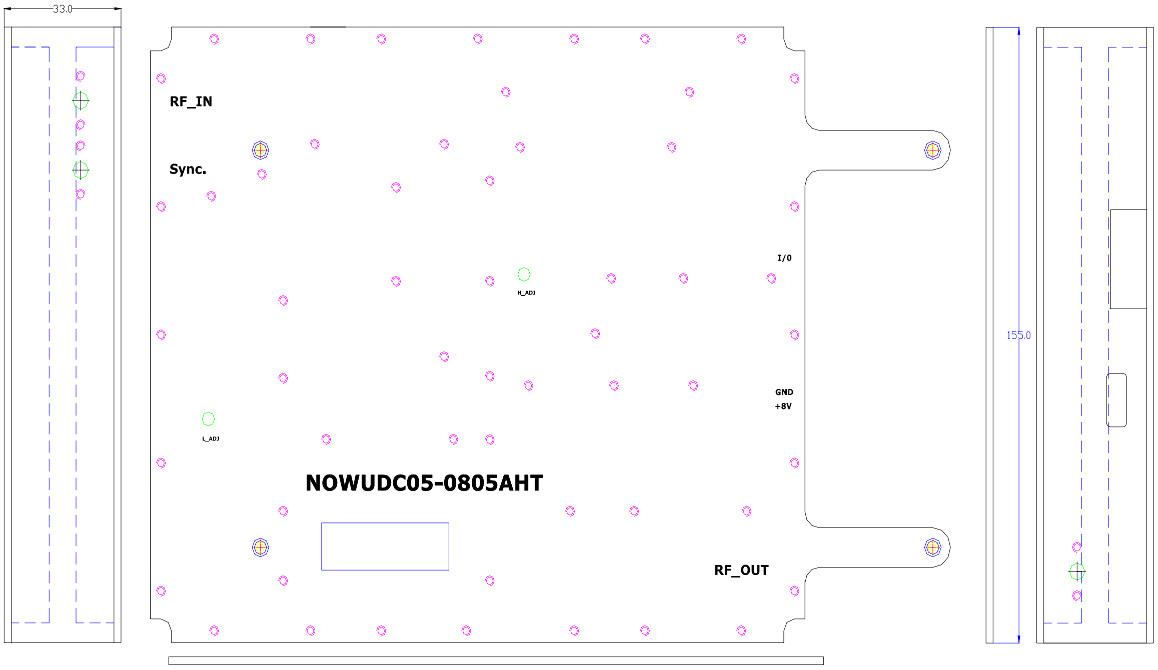
The Link port connects directly to BPF. Based on a switching mechanism, high amplified signals enter into the HPA and exit its way out of the Link port. The signal then gets filtered by BPF and travels toward the donor antenna. When the switch module is in a different state, weak signals from the donor antenna pass through the BPF and into the Link port. These signals exit the LNA out port to be amplified.

4.2.2 UDC Module

4.2.2.1 RF Module

Mobile WiMAX signal is received at the LNA (Switch Module). The signal is down converted and passed through a SAW filter. Once any unwanted signals have been removed, it is up converted, amplified and then sent to the HPA (Switch module).

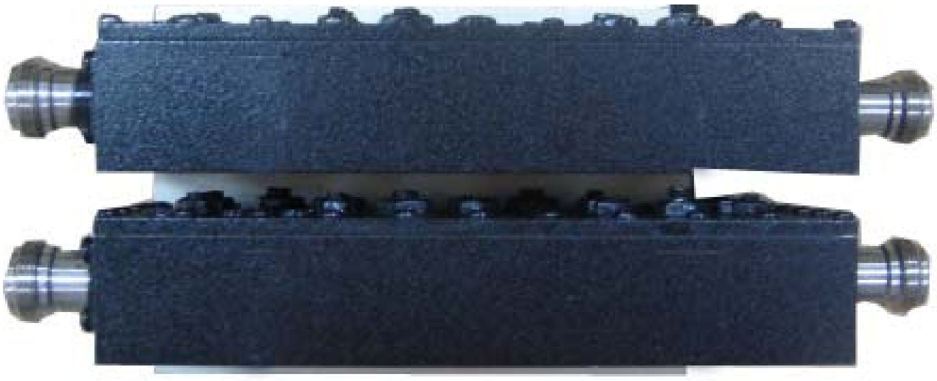
Digital variable attenuators are built into the repeater so full gain control can be performed for forward and reverse direction (As it handles duplex transmission).


33.0
RF_IN
Sync.
I/O
H_ADJ
GND
+8V
L_ADJ
NOWUDC05-0805AHT
RF_OUT
155.0

[Figure 8] UDC Module Feature

4.2.3 BPF Module

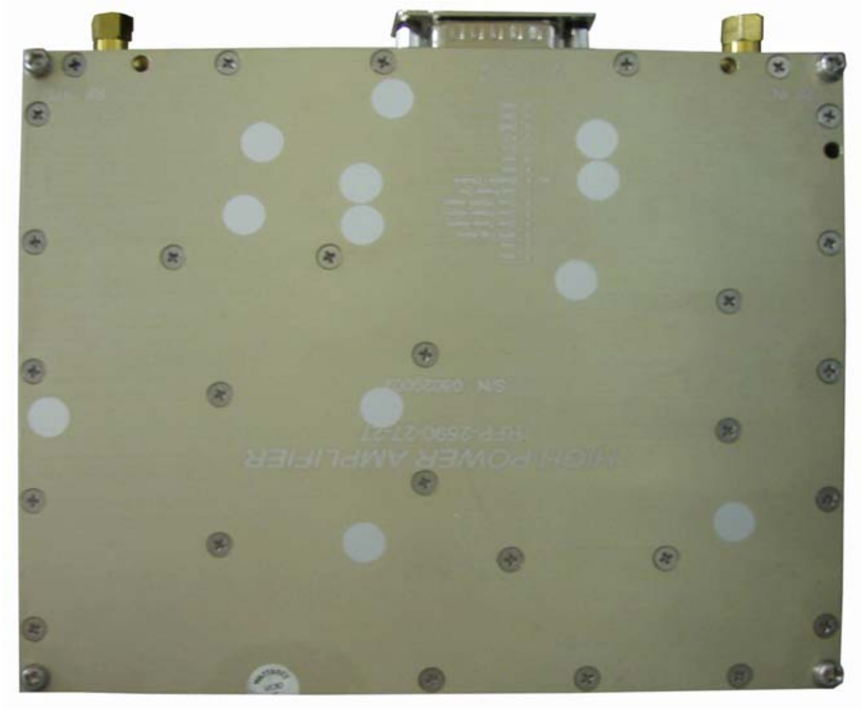
These modules receive Mobile WiMAX signals from antennas outside. Only BRS-Band’s are passed and signals are delivered to the switch module. These modules also receive output signals from the switch module of the HPA port and forward them to the antennas.



[Figure 9] BPF Module Feature

4.2.4 HPA MODULE

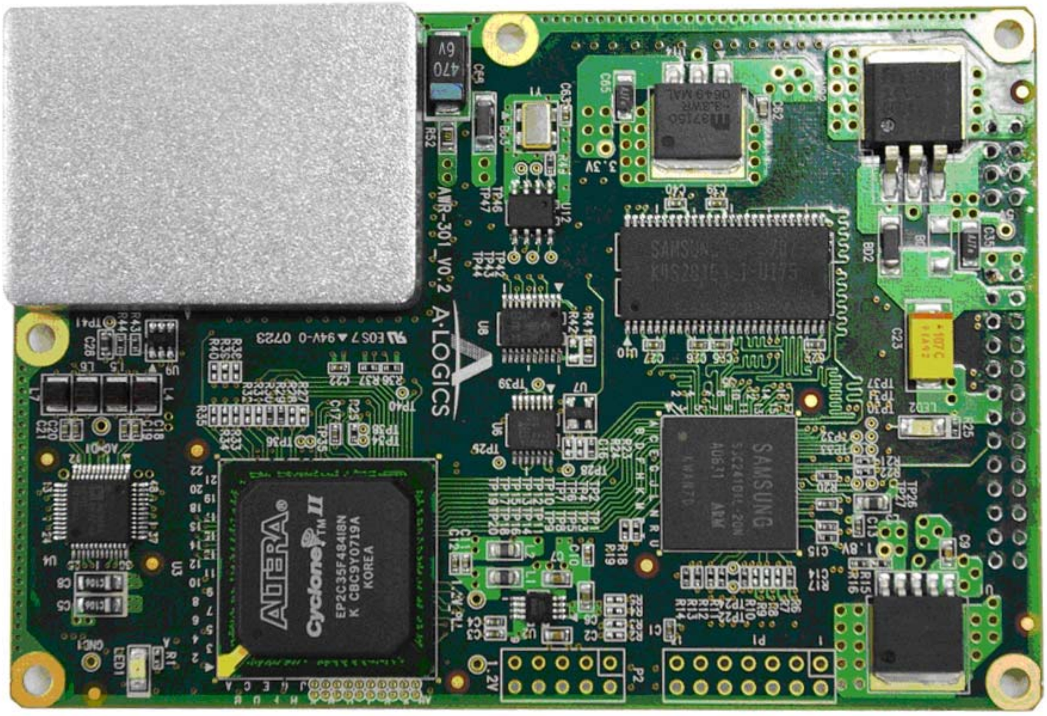
HPA module receives filtered and amplified mobile WiMAX signals from UDC module. These signals are then amplified to serviceable capacity and sent to the switch module.



[Figure 10] HPA Module Feature

4.2.5 SDM

TDD switching signal and repeater oscillation sensing functions are provided. In order to allow for TDD switching signal, synchronization detection and rate detection functions are set up. Also, oscillation sensing function is built in.



[Figure 11] SDM Feature

Characteristics of the functions that were implemented above are shown below.

Sync Detection
Cell search
Function: Searches for 114 Mobile WiMAX preambles and to detect Mobile WiMAX signals.

Preamble Detection
Function: For Cell search, tracking quality from detected preambles.

FA search
When cell search is unsuccessful in searching for a designated FA, FA is changed and cell search is executed again.

TDD Switch

Generation of 8 switching signal function

Rate Detection
FFT
Mobile WiMAX use, 1024 FFT function

Channel Estimation/Compensation
Reconstruction of Fading signal function

Frequency Offset Estimation/Compensation
AWR providing BB signals for RF frequency offset compensation function

Forward Error Correction
Convolution Code Decoder

Convolution Turbo Code Decoder

Minute Oscillation
Feedback Path detection

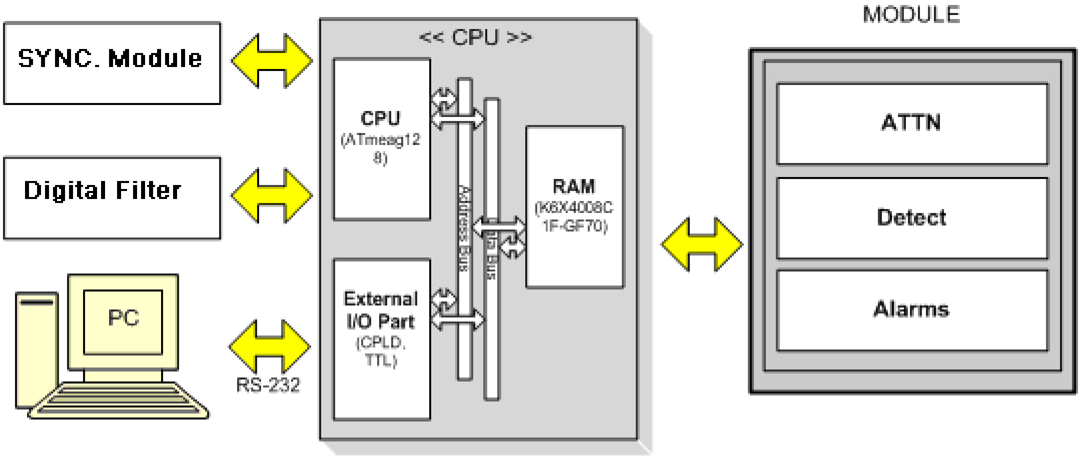
Additional Function
AGC
In order to improve AWR performance, AGC is provided for AWR’ s input signal.

RSSI
Providing Preamble’ s RSSI

4.2.6 Controller Module

Main NMS board includes the Mobile WiMAX repeater's CPU. For each sector, monitoring and control functions are performed.

4.2.6.1 Block Diagram


SYNC. Module
Digital Filter
PC
RS-232
<< CPU >>
CPU
(ATmeag128)
External
I/O Part
(CPLD, TTL)
Address Bus
ta Bus
RAM
(K6X4008C1F-GF70)
MODULE
ATTN
Detect
Alarms

[Figure 12] Controller Block Diagram

4.2.6.2 CPU(Atmel ATmega128)

AVR mega series One-chip type CPU
Operating Frequency: 16 MHz
1Mbit Program Memory (Flash) built in
4kByte internal SRAM and 4kByte EEPROM built in for data back up use
2 Serial Port (UART) built in

4.2.6.3 PC and Communication Function

By utilizing PC's application programs, repeaters can monitor and control activities at the controller. PC will require a connection of 38400bps on a RJ-45 cable for communication.

4.2.6.4 Digital Module and Communication Function

Digital Module's status of monitoring and control can be performed.

4.2.6.5 Data Back Up Function

At the PC and notebook's key, controlled values are saved in the controller. Therefore when the repeater is powered off or reset, these set values will be maintained.

4.2.6.6 Attn Control Function

ATTN can be controlled.
All Attn setting ranges are 0~30 dB.

4.2.6.7 Power/Temperature Detect Function

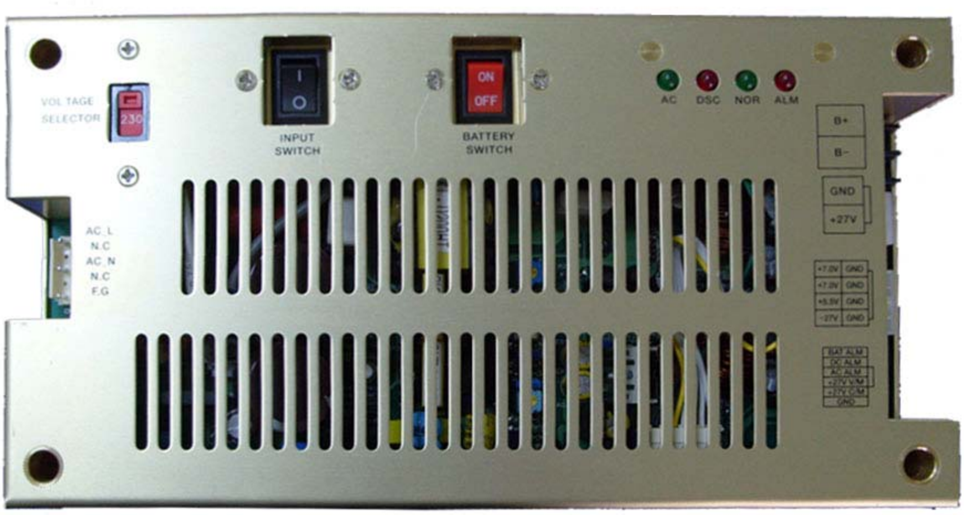
For each module, analog inputs of power and temperature are converted to digital output. It is displayed in the PC and set values are executed for characteristic functions.

4.2.6.8 Alarm Check Function

For each module, output of all status information are collected and displayed in the PC. Afterwards, relevant functions can be performed.

4.2.7 PSU

In order to provide stable DC power from an AC power input, this power supply unit is utilized. AC 110 ~ 125 / 208 ~ 240Vac input (Switch is used) power is received and converted to SMPS (Switch Mode Power Supply) of +27V, +7V, +5.5V, -27V outputs.


VOLTAGE SELECTOR
230
INPUT SWITCH
ON
OFF
BATTERY SWITCH
AC
DSC
NOR
ALM
B+
B-
GND
+27V
AC_L
N.C
AC_N
N.C
F.G
+7.2V
GND
+7.2V
GND
+5.5V
GND
-27V
GND
BAT ALM
DC ALM
AC ALM
+27V V/M
+27V C/M
GND

[Figure 13] PSU Feature

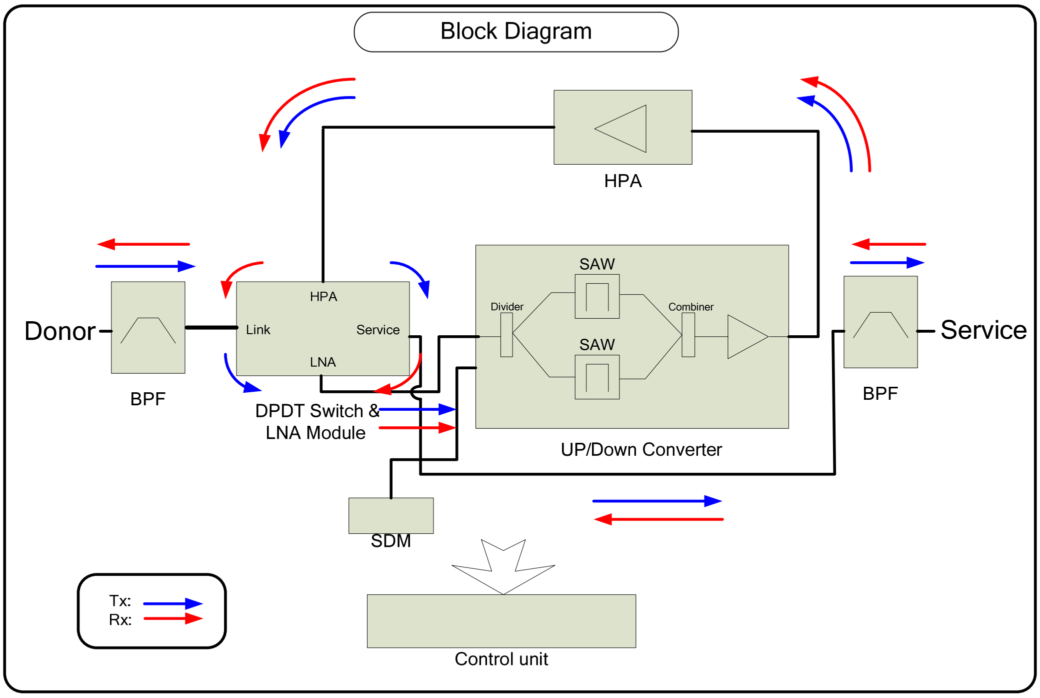
Main power supply unit' s cooling method is by conduction cooling. The unit has been designed to meet all safety standards for dielectric structure; including dielectric potential and dielectric resistance characteristics. The power supply unit has been designed with a PWM switching for high efficiency and the switching frequency operates at 67 KHz ± 10 KHz. For all electrical characteristic testing, rated input, output conditions and components should be connected.

5 Signal Block Diagram and Signal Flow

5.1 System Block Diagram

In order to minimize the size of the device, we have implemented a design that is single pass and bi-directional serviceability.

A single pass repeater is small, simple and reduces the cost of the system. It also generates less heat and is light weight thus installation and maintenance becomes easy to handle. Single pass, bi-directional repeater' s block diagram is shown below along with other components that have been implemented such BPF , RF Switch (DPDT), LNA, Converter and HPA Module.


Block Diagram
HPA
Donor
BPF
HPA
Link
Service
LNA
DPDT Switch &
LNA Module
SAW
Divider
Combiner
SAW
UP/Down Converter
BPF
Service
SDM
Tx:
Rx:
Control unit

[Figure 14] MOBILE WIMAX Repeater Block

5.1.1 Forward Direction Block Explanation

Signals from BTS are received via the repeater' s donor antenna. These signals are then filtered through the BPF (Band Pass Filter) and enter into the DPDT RF switch as inputs.

Within the DPDT switch, down link and up link paths are switched alternately. In a down link switching state, signals are sent to LNA where low noise amplifications are applied and sent to the Up/Down Converter. At the converter, only the relevant bands are passed through the SAW filter and forwarded to the HPA. HPA amplifies these signals to high output and passes it through to the DPDT switch and BPF. The signals finally radiate out the service antenna.

5.1.2 Reverse Direction Block Explanation

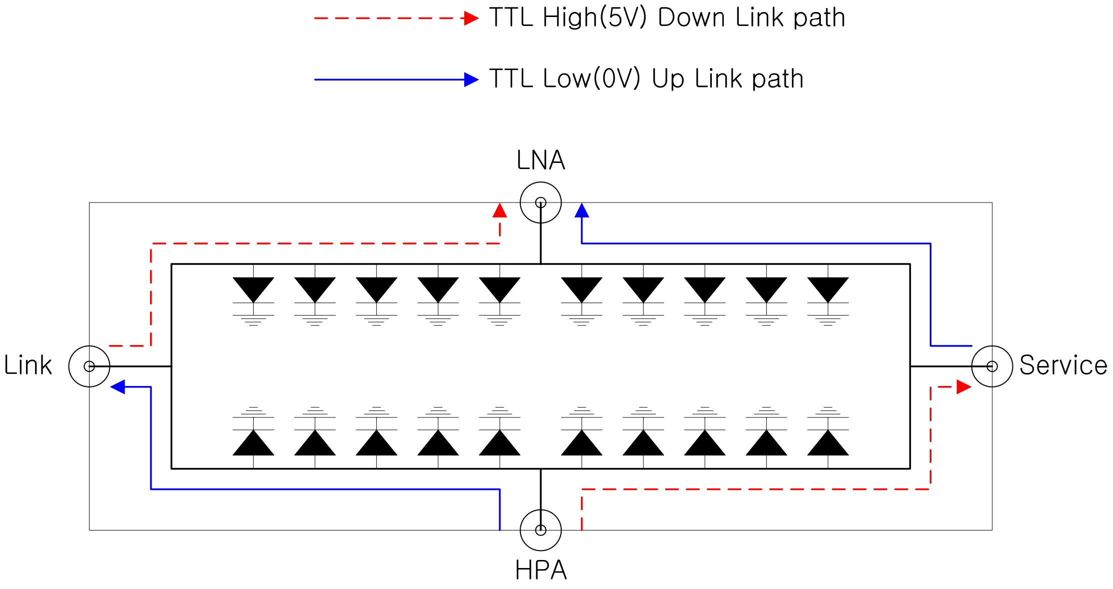
Signals from PSS (Portable Subscriber Station) are received via repeater’s service antenna. These signals are then filtered through the BPF (Band Pass Filter) and enter into the DPDT RF switch as inputs. Within the DPDT switch, down link and up link paths are switched alternately. In an up link switching state, signals are sent to LNA where low noise amplifications are applied and sent to the Up/Down Converter. At the converter, only the relevant bands are passed through the SAW filter and forwarded to HPA. HPA amplifies these signals to high output and passes it through to the DPDT switch and BPF. The signals finally radiate out the donor antenna.

5.2 UNIT MODULE BLOCK DIAGRAM

5.2.1 SWITCH MODULE BLOCK DIAGRAM

5.2.1.1 Like the figure below, switch module implements RF Switch (DPDT) and LNA into one module.

5.2.1.2 For Mobile WiMAX and TDD based systems, at a set given time, system will have to operate at one path and change moments later. Due to this characteristic for up link and down link signals, this module was developed specifically for this type of operation.

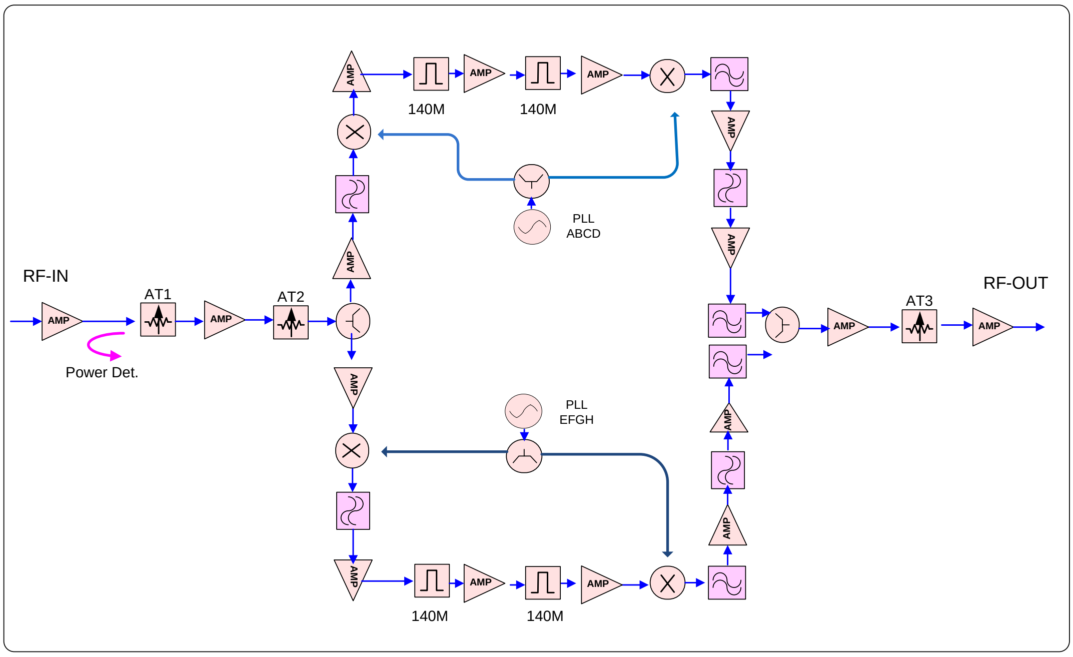

TTL High(5V) Down Link path
TTL Low(0V) Up Link path
LNA
Link
Service
HPA

[Figure 15] Switch Module Block

5.2.2 UDC BLOCK DIAGRAM

5.2.2.1 RF MODULE

Like the figure below, the UDC (Up/Down Converter) module is configured to all of the repeater' s functions such as gain control from attenuators, up and down conversion of frequency from PLL and mixer, filters that remove unwanted bands and amplified signals from amplifiers. UDC manages the role of filtering and amplifying received signals via LNA. Signals are sufficiently amplified by HPA so that it can be emitted out towards the BTS or PSS.

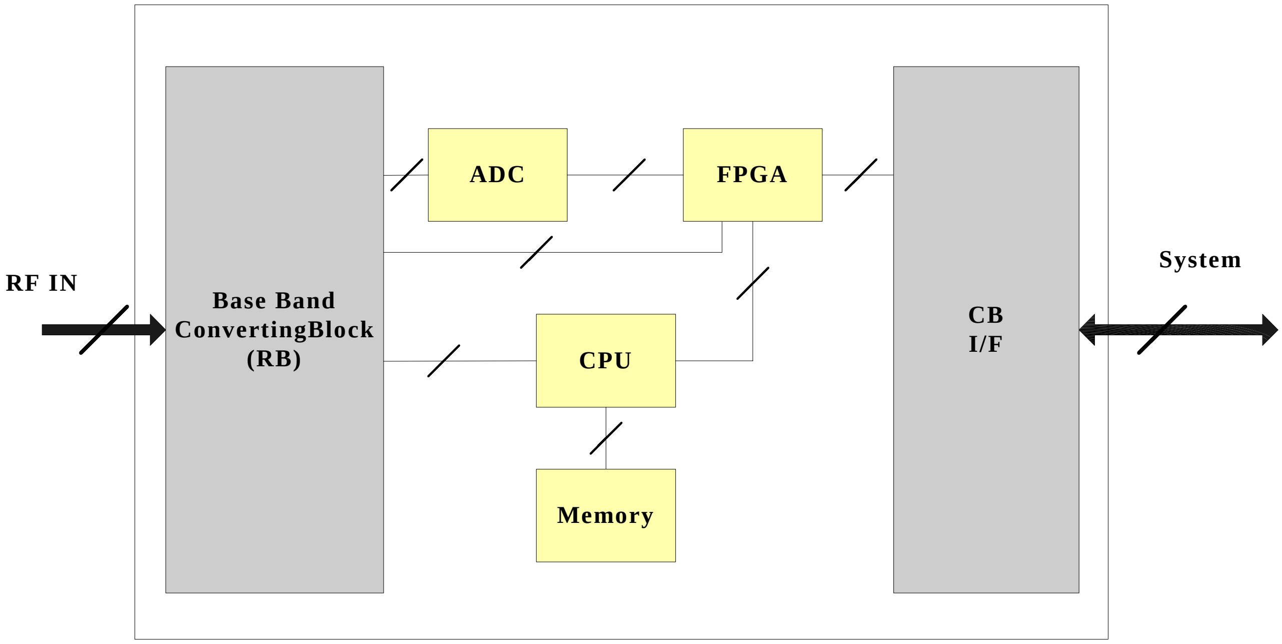

RF-IN
AT1
AT2
AMP
Power Det.
140M
140M
PLL
ABCD
PLL
EFGH
AT3
RF-OUT

[Figure 16] UDC Block

5.2.3 SDM & CTRL BLOCK DIAGRAM

From the BTS, SDM (Sync. Detector Module) & CTRL (Control) modules receives signals and extracts TTG and RTG. Signals that control the DPDT switching is sent as IHS and system determines the direction of operation. Repeater determines the operation status and control features are performed in order for it to function smoothly.

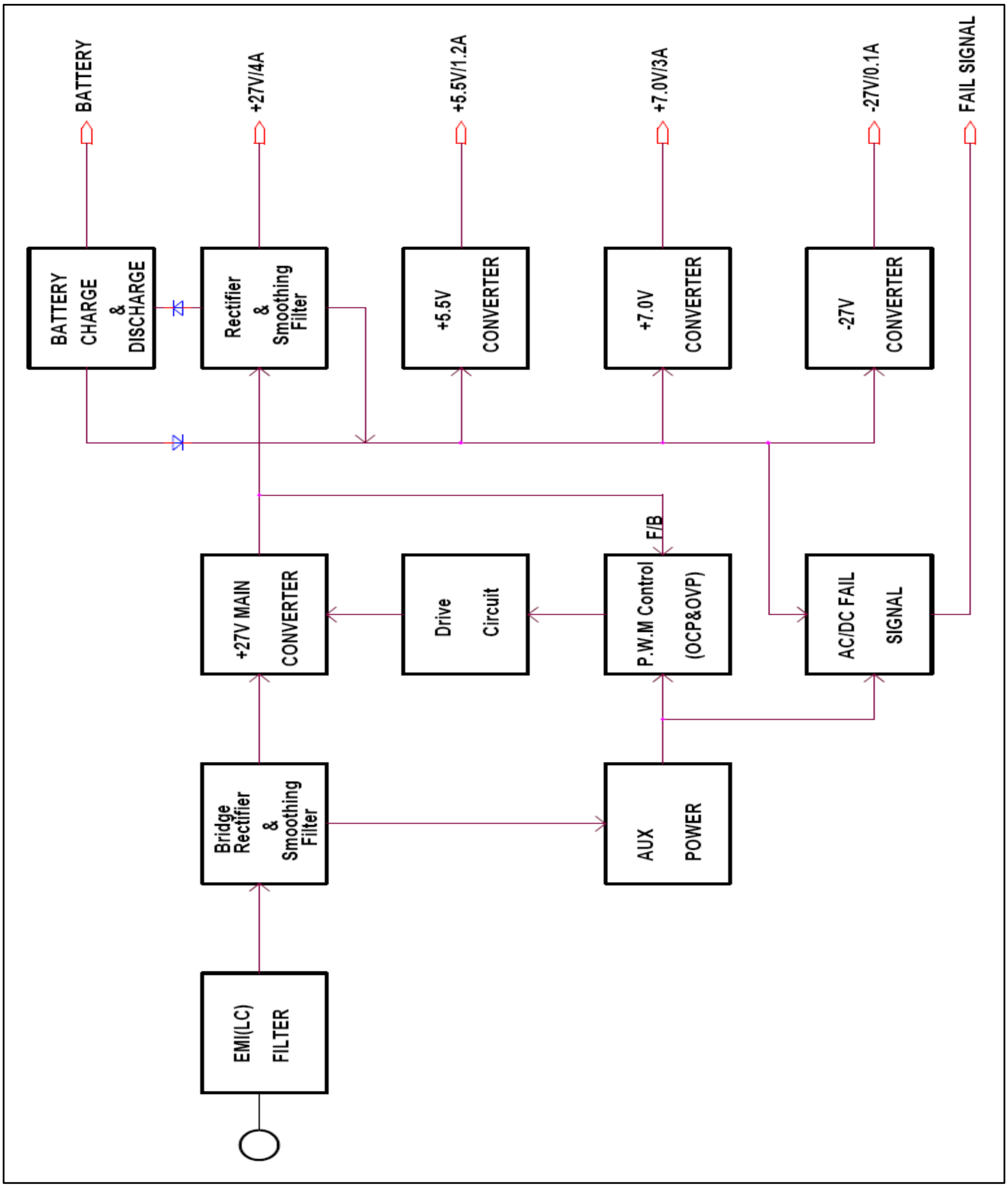
Via the GUI, status of the repeater can be determined on the PC. The repeater's status can also be sent via host's NMS.


RF IN
Base Band
ConvertingBlock
(RB)
ADC
FPGA
CPU
Memory
CB
I/F
System

[Figure 17] SDM Block

5.2.4 PSU BLOCK DIAGRAM

Repeaters running power for the power supply unit is AC 110 ~ 125 / 208 ~ 240Vac input (Switch used). Power is converted to DC and supplied to each component.


BATTERY
+27V/4A
+5.5V/1.2A
+7.0V/3A
-27V/0.1A
FAIL SIGNAL
BATTERY CHARGE & DISCHARGE
Rectifier & Smoothing Filter
+5.5V CONVERTER
+7.0V CONVERTER
-27V CONVERTER
F/B
+27V MAIN CONVERTER
Drive Circuit
P.W.M Control (OCP&OVP)
AC/DC FAIL SIGNAL
Bridge Rectifier & Smoothing Filter
AUX POWER
EMI(LC) FILTER

[Figure 18] PSU Block

6 Additional Function

6.1 ASD (AUTO SHUTDOWN) Function

6.1.1 Aim of ASD Functions

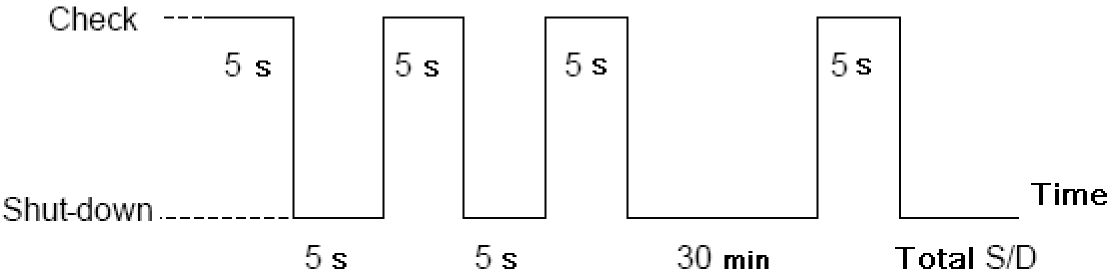
In order to protect the repeaters setup and networks stability, output must be suppressed. This is done by activating the automatic shutdown function when down link input is high, up link output is high or when oscillation occurs. Shutdown function operates by following the algorithms shown in the figure below.

6.1.2 ASD Management Procedure

For Automatic Shutdown, when DL Input is high, value is shown as -14dBm/Total and when UL Output is high, +36dBm/3FA is the value. ASD algorithm is performed like the figure below.

Section		Specification	Remark
Detection Level	Down Link Input	-14dBm/Total	
	Up Link Output	36dBm/Total	

[Table 17] ASD Function Operation Condition



[Figure 19] DL Over Input and UL Over Output Shutdown Algorithm

If the above oscillations recheck process confirms that there are no oscillations, then all records of previous steps are deleted and normal servicing is initiated. However, if oscillation is detected, oscillation check step starts from the beginning and recommences oscillation re-check process.

6.2 ALC Function

6.2.1 AIM of ALC FUNCTION

6.2.1.1 In order to protect DL’s over input, ALC (Automatic Level Control) function is implemented. ALC’s operational range input signal and DL’s normal input range is -47dBm/Total ~ -17dBm/Total.

6.2.2 Management Procedure

6.2.2.1 ALC’s maximum set point is -17dBm/Total and its minimum set point is -47dBm/Total. When a signal coming into the system is higher than ALC’s set point, the repeater’s ASD function is initiated.

Section	Specification	Remarks
ALC Set Level	-47dBm/Total~ -17dBm/Total	
ASD Operation Level	ALC Set Level +3dBm	

[Table 18] Function and Operation Level

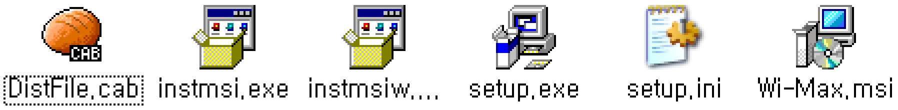
PC Application Program

1 PC Application Program

The icons and folder names displayed in the manual can differ with that of the User’s PC.

1.1 Program Installation

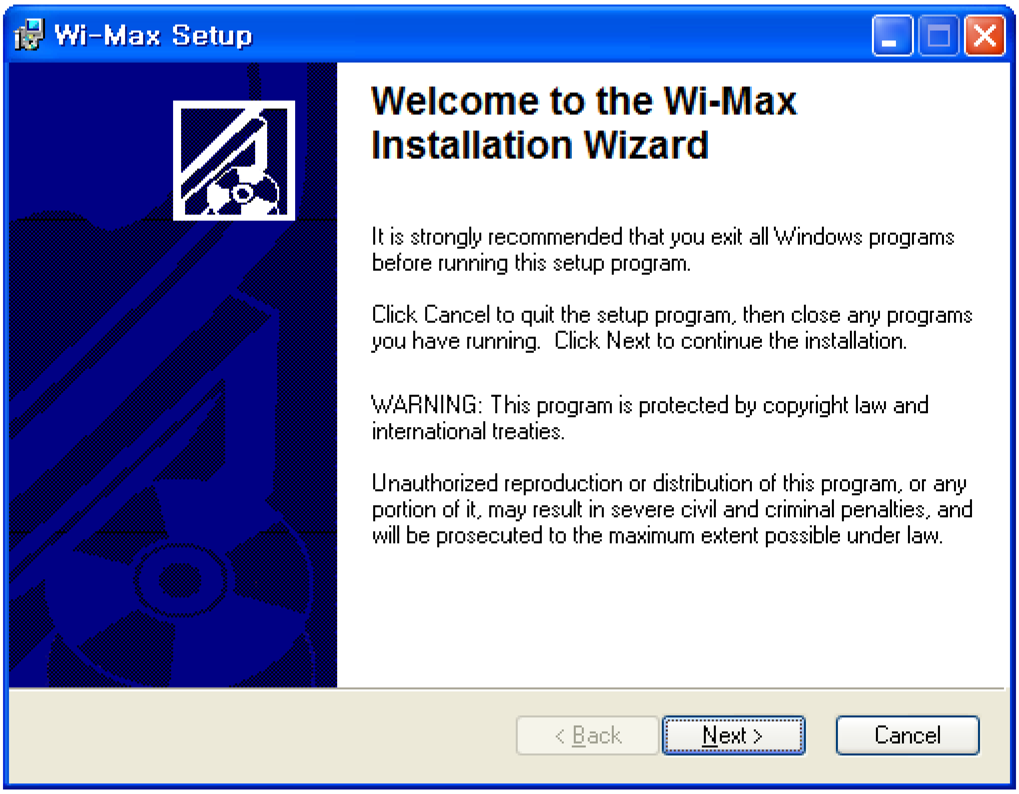
When accessing the installation program, the following files will be present.



<Figure 1-1>

Double click the Setup.exe file to begin installation.

A window screen similar to one shown below will appear. The user is able to cancel and exit the installation process by clicking the [Cancel] button or continue with the installation by clicking the [Next] button.



Welcome to the Wi-Max Installation Wizard

It is strongly recommended that you exit all Windows programs before running this setup program.

Click Cancel to quit the setup program, then close any programs you have running. Click Next to continue the installation.

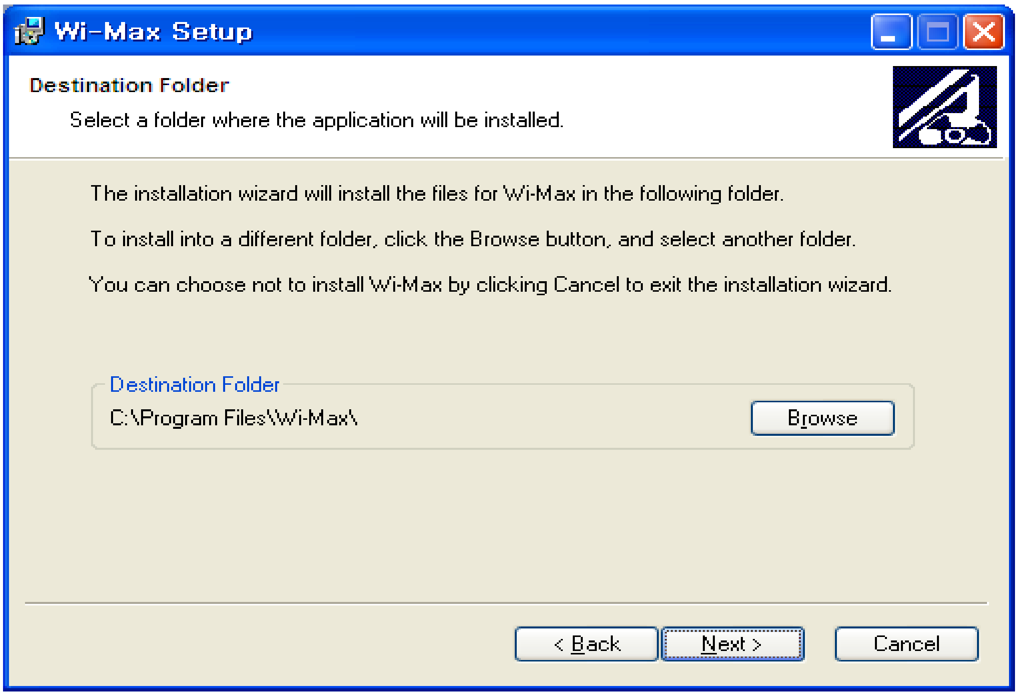
WARNING: This program is protected by copyright law and international treaties.

Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

<Figure 1-2> Install Start

The user must select the folder in which the program will be saved under.

The standard folder in which the software is saved under is C:₩Program Files₩Wi-Max. However, if the user decides to customize the location of the program, it can be done by clicking the [Browse] button.



Wi-Max Setup

Destination Folder

Select a folder where the application will be installed.

The installation wizard will install the files for Wi-Max in the following folder.

To install into a different folder, click the Browse button, and select another folder.

You can choose not to install Wi-Max by clicking Cancel to exit the installation wizard.

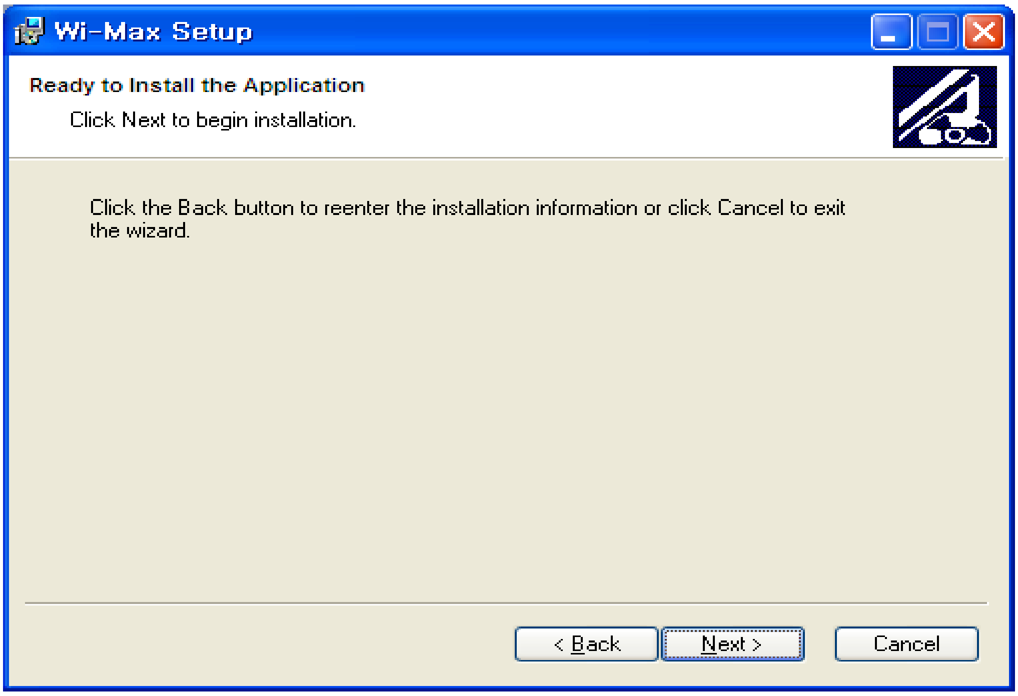
Destination Folder

C:\Program Files\Wi-Max\

<Figure 1-3> Installation Folder Selection

Click the [Next] button once the destination has been selected.

This will prompt a new window indicating installation process is ready.



Ready to Install the Application

Click Next to begin installation.

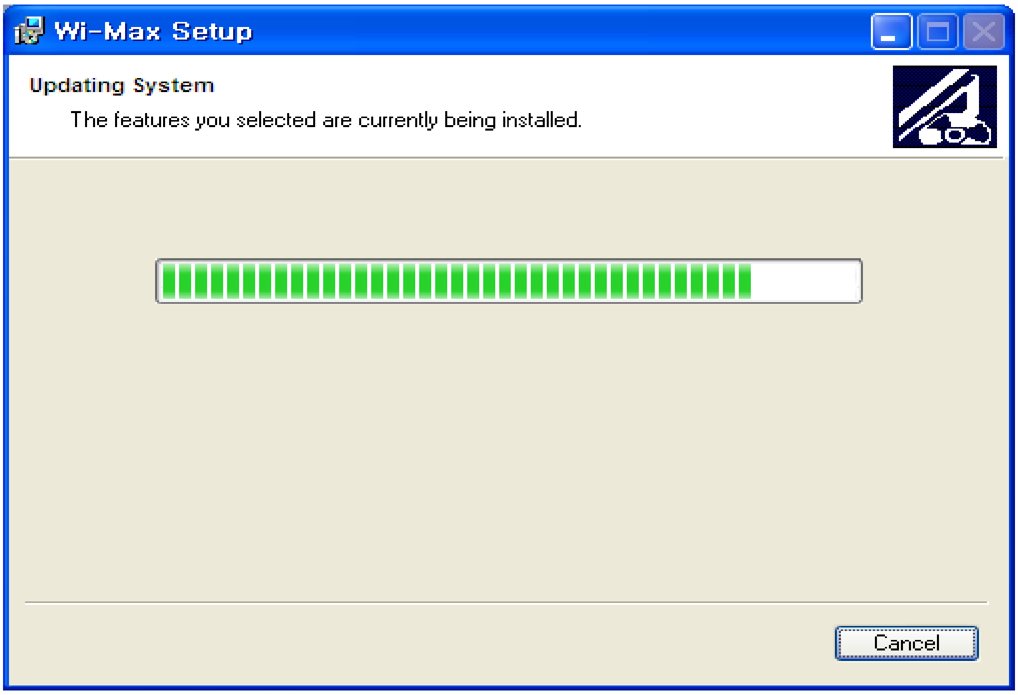
Click the Back button to reenter the installation information or click Cancel to exit the wizard.

<Figure 1-4> Ready to Install Window

The [Back] button will allow the user to re-enter the section where he or she selects the destination of the software. If the user decides to continue with the installation process, this can be done by clicking the [Next] button. During the installation process, a window screen like the one shown in Figure 1-5 will automatically appear indicating the status of the installation.

Once the program has been completely installed, a window screen like the one shown in Figure 1-6 will automatically appear indicating the installation has been successfully completed.

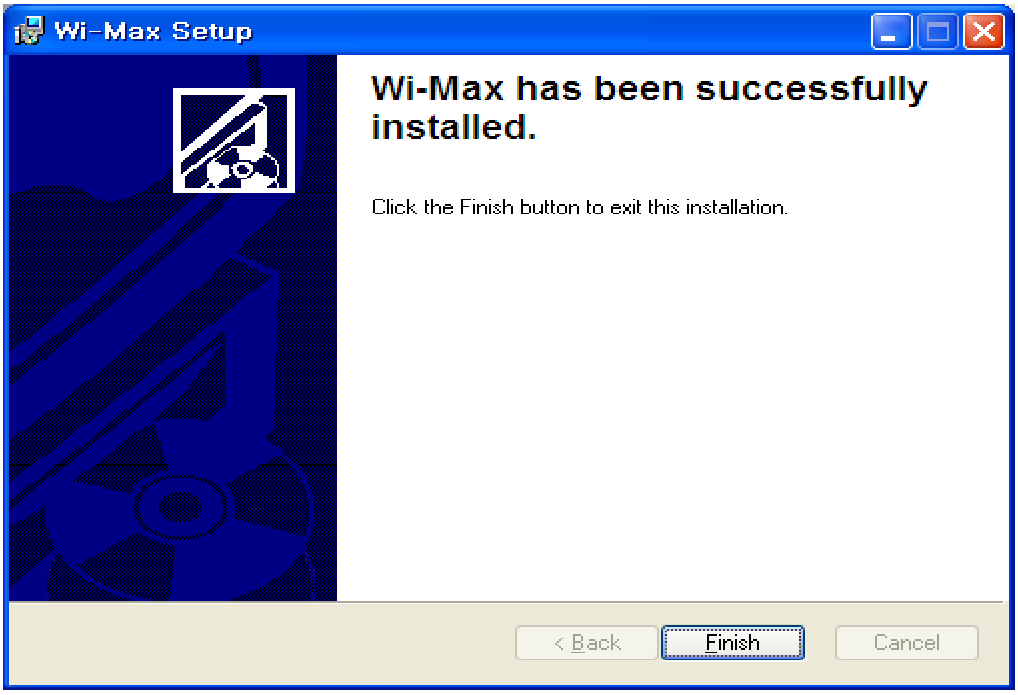
The user can exit the Installation Wizard by clicking the [Finish] button.


Wi-Max Setup
Cancel

Updating System

The features you selected are currently being installed.

<Figure1-5> Installation Status Window


Wi-Max Setup
< Back
Finish
Cancel

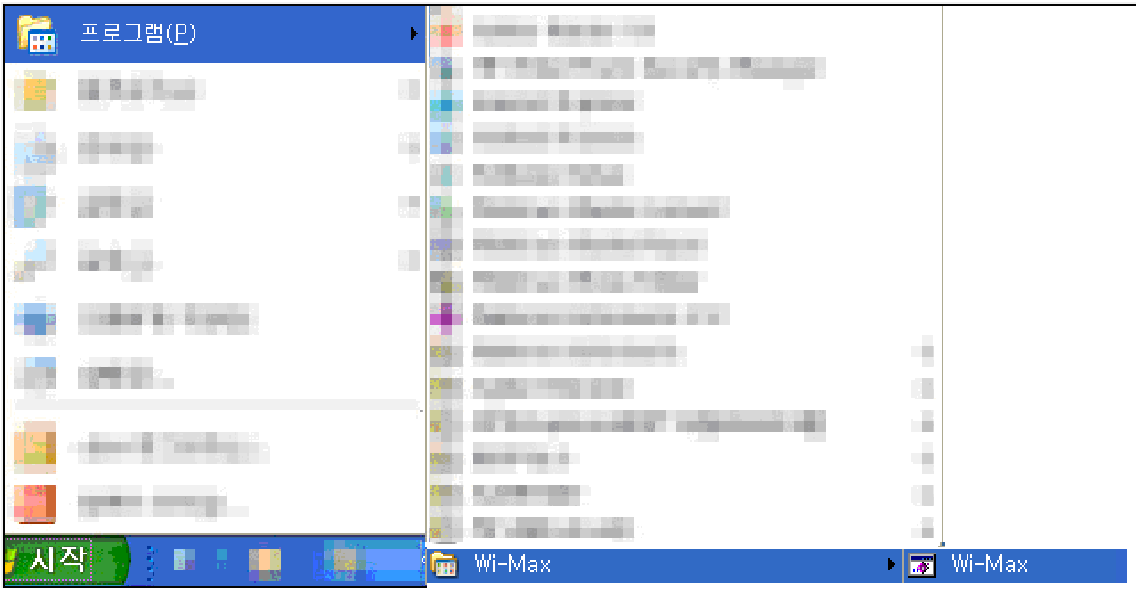
Wi-Max has been successfully installed.

Click the Finish button to exit this installation.

<Figure 1-6> Successful Installation Window

1.2 Program Start

Once the program has been successfully installed, the user may access the program by clicking the [Start] ->Program->WiMAX button at the bottom right corner of the main window screen



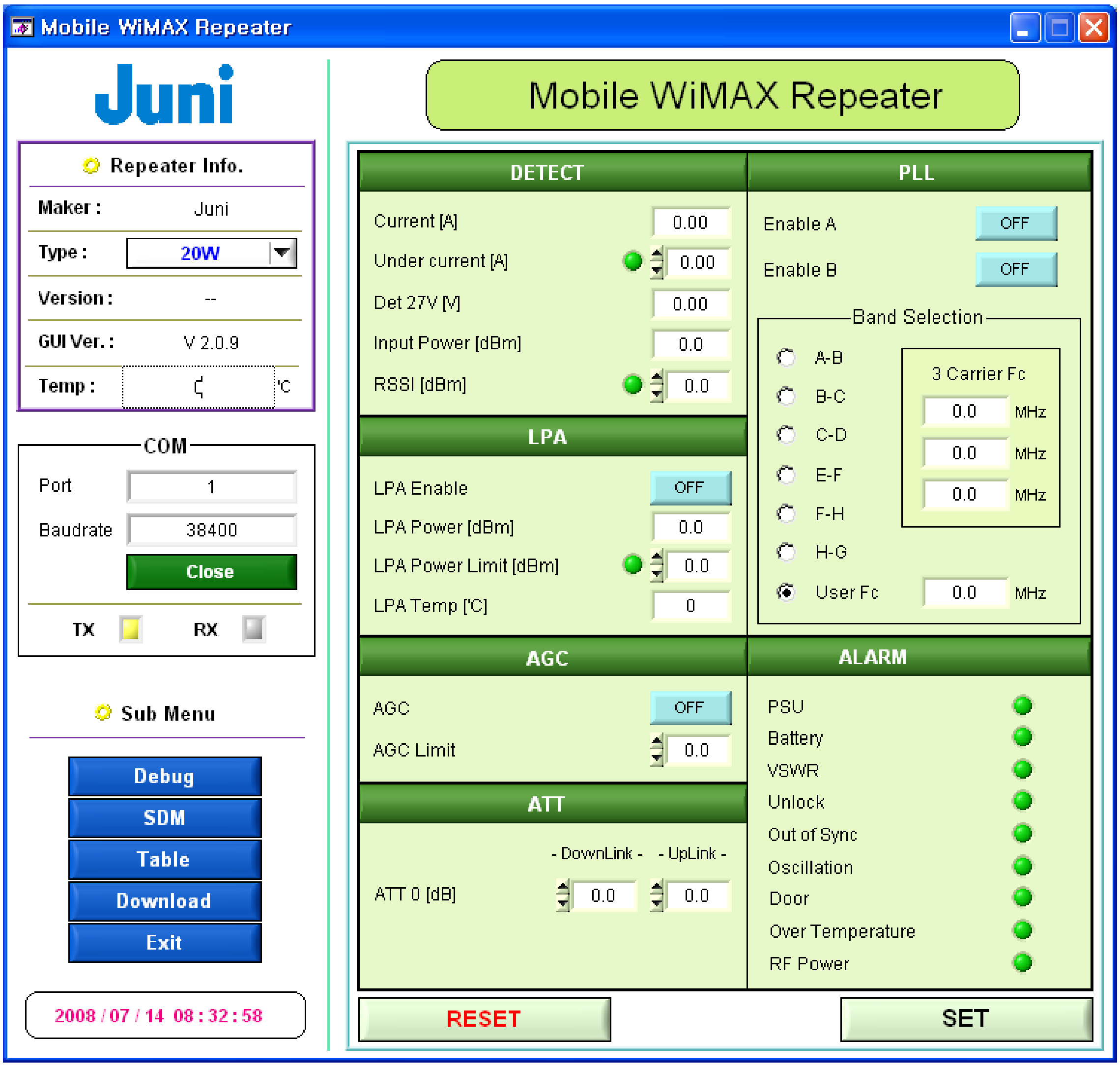
<Figure 2-1> Program Start

1.3 Status Monitoring and Control

Connect the serial port to the PC and open the software. The baud rate should be set at 38400bps. If the user wants to change the com port, it can be done by first pressing the [Port Close], then changing it to the desired port and then clicking the [Port Open] button. The connection can be verified by checking the TXD / RXD LED on the left of the screen. A blinking TXD / RXD LED indicate a successful connection.

1.3.1 Status Monitoring

The PC will automatically update the system values every 1 second.


Mobile WiMAX Repeater
Juni
Mobile WiMAX Repeater
Repeater Info.
COM
Close
TX
RX
Sub Menu
Debug
SDM
Table
Download
Exit
DETECT
PLL
LPA
AGC
ATT
ALARM
Band Selection
3 Carrier Fc
RESET
SET

Maker : Juni
Type : 20W
Version : --
GUI Ver. : V 2.0.9
Temp : 'C

Port 1
Baudrate 38400

2008 / 07 / 14 08 : 32 : 58

Current [A] 0.00
Under current [A] 0.00
Det 27V [V] 0.00
Input Power [dBm] 0.0
RSSI [dBm] 0.0

LPA Enable OFF
LPA Power [dBm] 0.0
LPA Power Limit [dBm] 0.0
LPA Temp ['C] 0

AGC OFF
AGC Limit 0.0

- DownLink - - UpLink -
ATT 0 [dB] 0.0 0.0

Enable A OFF
Enable B OFF

○ A-B
○ B-C
○ C-D
○ E-F
○ F-H
○ H-G
● User Fc 0.0 MHz

3 Carrier Fc
0.0 MHz
0.0 MHz
0.0 MHz

PSU ●
Battery ●
VSWR ●
Unlock ●
Out of Sync ●
Oscillation ●
Door ●
Over Temperature ●
RF Power ●

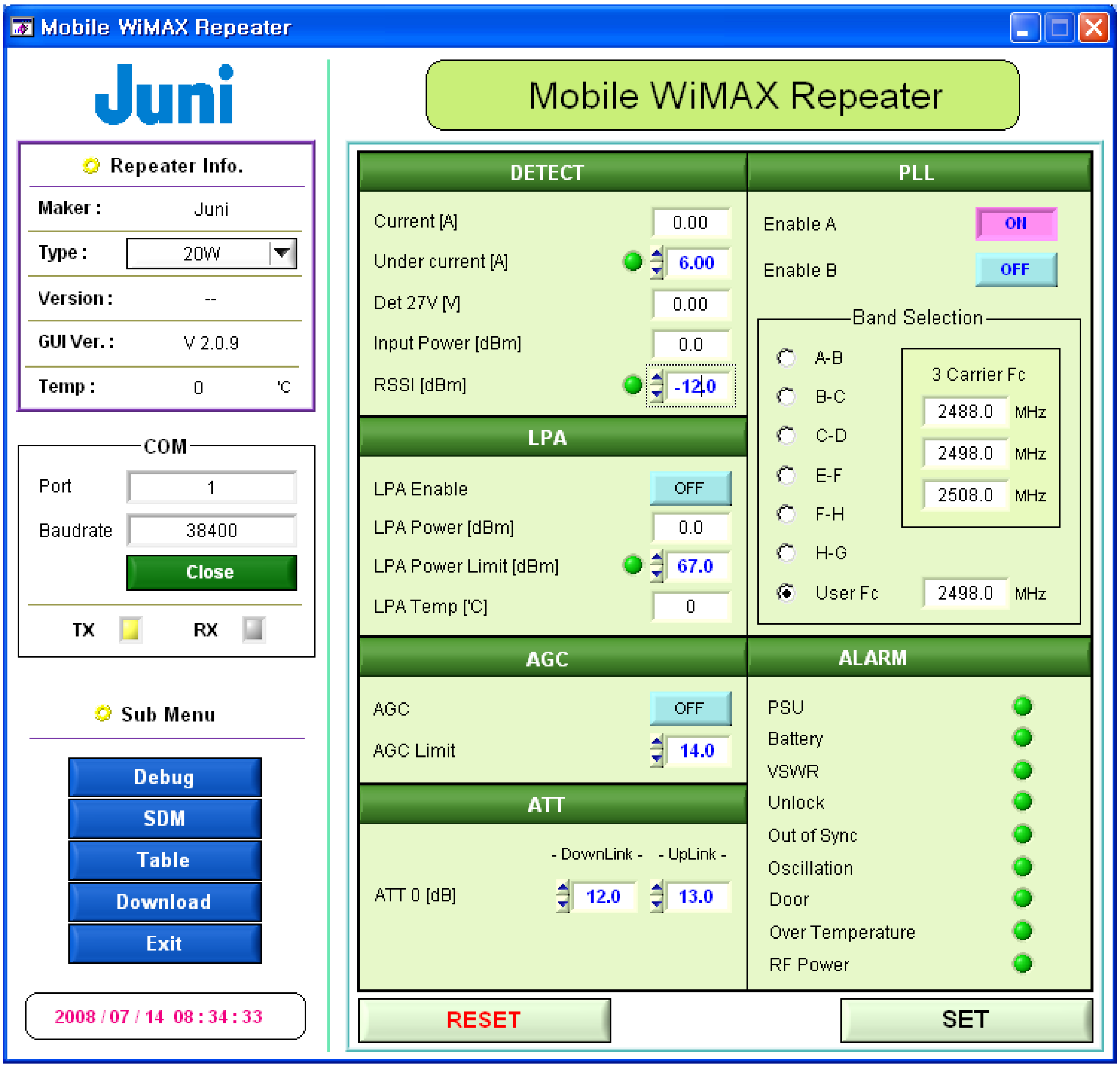
<Figure 3-1> Status Monitoring Window

The function of each button is explained below

Port Open / Close	Opening and closing current set port
Debug	Accessing the communication information Window
SDM	Accessing SDM Window
Table	Accessing the Table Window
Download	Accessing the Download Window
Exit	Exiting the Program
Reset	System Reboot
Set	Change settings

1.3.2 .Status Control and Setting

When changing the setting of the system through the software, the text of the changed items will change to a blue color. By pressing the [Set] button, all values that correspond to an item with blue text will be modified.



Mobile WiMAX Repeater
Juni
Mobile WiMAX Repeater
Close
TX
RX
Sub Menu
Debug
SDM
Table
Download
Exit
RESET
SET

Repeater Info.
Maker : Juni
Type : 20W
Version : --
GUI Ver. : V 2.0.9
Temp : 0 'C

COM
Port 1
Baudrate 38400

2008 / 07 / 14 08 : 34 : 33

DETECT
Current [A] 0.00
Under current [A] 6.00
Det 27V [V] 0.00
Input Power [dBm] 0.0
RSSI [dBm] -12.0

PLL
Enable A ON
Enable B OFF
Band Selection
○ A-B
○ B-C
○ C-D
○ E-F
○ F-H
○ H-G
● User Fc 2498.0 MHz
3 Carrier Fc
2488.0 MHz
2498.0 MHz
2508.0 MHz

LPA
LPA Enable OFF
LPA Power [dBm] 0.0
LPA Power Limit [dBm] 67.0
LPA Temp ['C] 0

AGC
AGC OFF
AGC Limit 14.0

ATT
- DownLink - - UpLink -
ATT 0 [dB] 12.0 13.0

ALARM
PSU ●
Battery ●
VSWR ●
Unlock ●
Out of Sync ●
Oscillation ●
Door ●
Over Temperature ●
RF Power ●

<Figure 3-2> Status Control and Setting Window

1.3.3 Status Monitoring and Control Items

The following table lists the various items of the repeater system that can be monitored and changed.

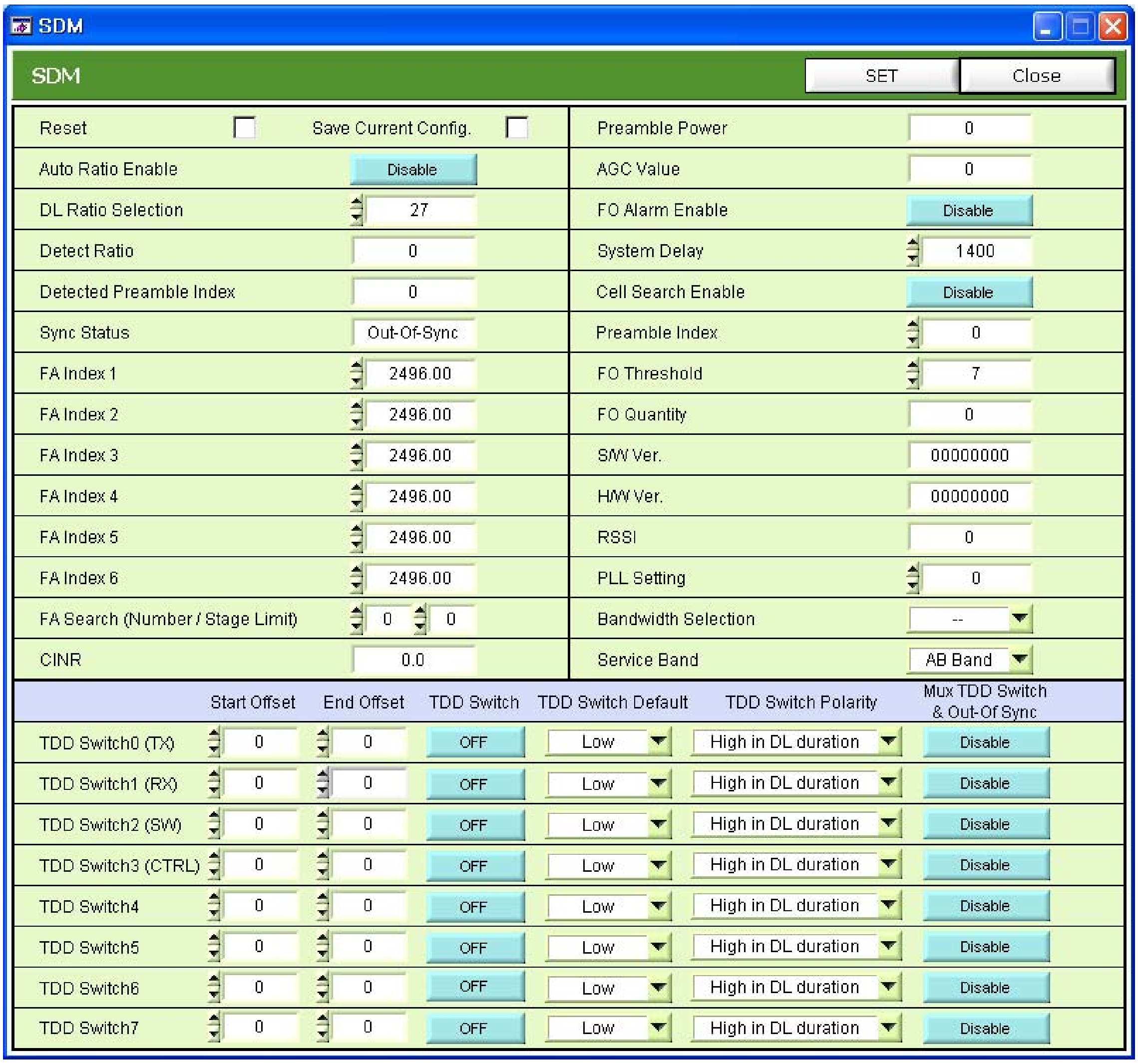
Item		Monitoring/Control	Notes
Repeater Info.	Maker	Monitoring	
	Type	Monitoring/Control	
	Version	Monitoring	
	Temp	Monitoring	[‘ C]
DETECT	Current	Monitoring	[A]
	Under Current	Monitoring/Control	[A]
	Det 27V	Monitoring	[V]
	Input Power	Monitoring	[dBm]
	RSSI	Monitoring/Control	Alarm: Red, Normal: Green [dBm]
LPA	LPA Enable	Monitoring/Control	ON / OFF
	LPA Power	Monitoring	[dBm]
	LPA Power Limit	Monitoring/Control	[dBm]
	LPA Temp	Monitoring	[‘ C]
PLL	Enable A	Monitoring/Control	ON / OFF
	Enable B	Monitoring/Control	ON / OFF
	Band Selection	Monitoring/Control	[MHz]
AGC	AGC ON/OFF	Monitoring/Control	ON / OFF
	AGC Limit	Monitoring/Control	
ATT	Down Link	Monitoring/Control	[dB]
	Up Link	Monitoring/Control	[dB]
ALARM	PSU	Monitoring	Alarm: Red, Normal: Green
	Battery	Monitoring	Alarm: Red, Normal: Green
	VSWR	Monitoring	Alarm: Red, Normal: Green

	Unlock	Monitoring	Alarm: Red, Normal: Green
	Out of Sync	Monitoring	Alarm: Red, Normal: Green
	Oscillation	Monitoring	Alarm: Red, Normal: Green
	Door	Monitoring	Alarm: Red, Normal: Green
	Ocer Temperature	Monitoring	Alarm: Red, Normal: Green
	RF Power	Monitoring	Alarm: Red, Normal: Green

1.3.4 SDM Status Monitoring

By clicking the [SDM] button on the Status/Control window, the user can access the SDM Data Monitoring window.

The PC will automatically update the system values every 1 second.



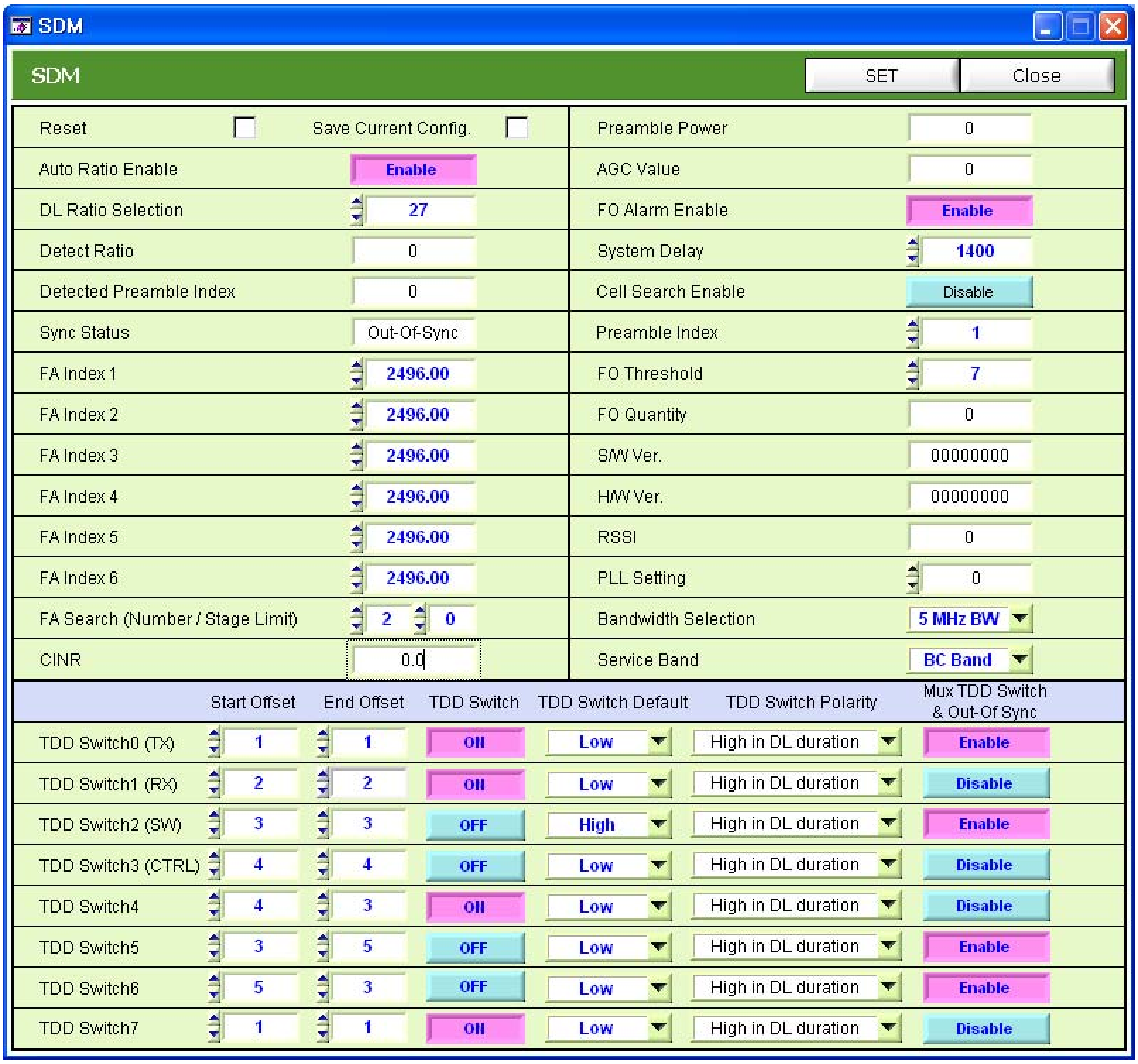
Reset ☐	Save Current Config. ☐	Preamble Power	0
Auto Ratio Enable	Disable	AGC Value	0
DL Ratio Selection	27	FO Alarm Enable	Disable
Detect Ratio	0	System Delay	1400
Detected Preamble Index	0	Cell Search Enable	Disable
Sync Status	Out-Of-Sync	Preamble Index	0
FA Index 1	2496.00	FO Threshold	7
FA Index 2	2496.00	FO Quantity	0
FA Index 3	2496.00	S/W Ver.	00000000
FA Index 4	2496.00	H/W Ver.	00000000
FA Index 5	2496.00	RSSI	0
FA Index 6	2496.00	PLL Setting	0
FA Search (Number / Stage Limit)	0 0	Bandwidth Selection	--
CINR	0.0	Service Band	AB Band

	Start Offset	End Offset	TDD Switch	TDD Switch Default	TDD Switch Polarity	Mux TDD Switch & Out-Of Sync
TDD Switch0 (TX)	0	0	OFF	Low	High in DL duration	Disable
TDD Switch1 (RX)	0	0	OFF	Low	High in DL duration	Disable
TDD Switch2 (SW)	0	0	OFF	Low	High in DL duration	Disable
TDD Switch3 (CTRL)	0	0	OFF	Low	High in DL duration	Disable
TDD Switch4	0	0	OFF	Low	High in DL duration	Disable
TDD Switch5	0	0	OFF	Low	High in DL duration	Disable
TDD Switch6	0	0	OFF	Low	High in DL duration	Disable
TDD Switch7	0	0	OFF	Low	High in DL duration	Disable

<Figure 3-3> SDM Status Monitoring and Control Window

1.3.5 SDM Control Settings

When changing the settings of the system through the software, the text of the changed items will change to a blue color. By pressing the [Set] button, all values that correspond to an item with a blue text will be modified.



Reset ☐	Save Current Config. ☐	Preamble Power	0
Auto Ratio Enable	Enable	AGC Value	0
DL Ratio Selection	27	FO Alarm Enable	Enable
Detect Ratio	0	System Delay	1400
Detected Preamble Index	0	Cell Search Enable	Disable
Sync Status	Out-Of-Sync	Preamble Index	1
FA Index 1	2496.00	FO Threshold	7
FA Index 2	2496.00	FO Quantity	0
FA Index 3	2496.00	S/W Ver.	00000000
FA Index 4	2496.00	H/W Ver.	00000000
FA Index 5	2496.00	RSSI	0
FA Index 6	2496.00	PLL Setting	0
FA Search (Number / Stage Limit)	2 0	Bandwidth Selection	5 MHz BW
CINR	0.0	Service Band	BC Band

	Start Offset	End Offset	TDD Switch	TDD Switch Default	TDD Switch Polarity	Mux TDD Switch & Out-Of Sync
TDD Switch0 (TX)	1	1	ON	Low	High in DL duration	Enable
TDD Switch1 (RX)	2	2	ON	Low	High in DL duration	Disable
TDD Switch2 (SW)	3	3	OFF	High	High in DL duration	Enable
TDD Switch3 (CTRL)	4	4	OFF	Low	High in DL duration	Disable
TDD Switch4	4	3	ON	Low	High in DL duration	Disable
TDD Switch5	3	5	OFF	Low	High in DL duration	Enable
TDD Switch6	5	3	OFF	Low	High in DL duration	Enable
TDD Switch7	1	1	ON	Low	High in DL duration	Disable

<Figure 3-4> SDM Status Control Window

1.3.6 SDM Status Monitoring and Control Items

The following table lists the various SDM status items that can be monitored and changed.

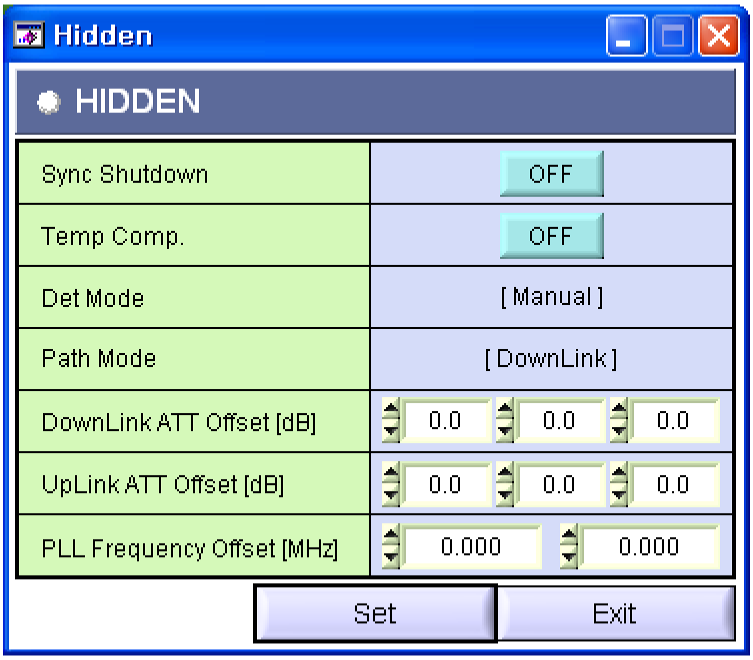
Item	Monitoring/Control	Notes
Reset	Monitoring/Control	
Auto Ratio Enable	Monitoring/Control	Enable / Disable
DL Ratio Selection	Monitoring/Control	
Detect Ratio	Monitoring	
Detected Preamble Index	Monitoring/Control	Enable / Disable
Sync Status	Monitoring	
FA Index 1	Monitoring/Control	[MHz]
FA Index 2	Monitoring/Control	[MHz]
FA Index 3	Monitoring/Control	[MHz]
FA Index 4	Monitoring/Control	[MHz]
FA Index 5	Monitoring/Control	[MHz]
FA Index 6	Monitoring/Control	[MHz]
FA Search	Monitoring/Control	Number / Stage Limit
CINR	Monitoring	
Preamble Power	Monitoring	[dBm]
AGC Value	Monitoring	
FO Alarm Enable	Monitoring/Control	Enable / Disable
System Delay	Monitoring/Control	
Cell Search Enable	Monitoring/Control	Enable / Disable
Preamble Index	Monitoring/Control	
FO Threshold	Monitoring/Control	
FO Quantity	Monitoring	
S/W Ver.	Monitoring/Control	
H/W Ver.	Monitoring/Control	

RSSI		Monitoring	
PLL Setting		Monitoring/Control	
Bandwidth Selection		Monitoring/Control	
Service Band		Monitoring/Control	
Start Offset	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	
	TDD Switch7	Monitoring/Control	
End Offset	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	
	TDD Switch7	Monitoring/Control	
TDD Switch	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	

	TDD Switch7	Monitoring/Control	
TDD Switch Default	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	
	TDD Switch7	Monitoring/Control	
TDD Switch Polarity	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	
	TDD Switch7	Monitoring/Control	
Mux TDD Switch & Out-Of Sync	TDD Switch0 (TX)	Monitoring/Control	
	TDD Switch1 (RX)	Monitoring/Control	
	TDD Switch2 (SW)	Monitoring/Control	
	TDD Switch3 (CTRL)	Monitoring/Control	
	TDD Switch4	Monitoring/Control	
	TDD Switch5	Monitoring/Control	
	TDD Switch6	Monitoring/Control	
	TDD Switch7	Monitoring/Control	

1.3.7 Hidden Status Control Settings

The user is able to access the Hidden Data Status Control and Settings section by pressing the [F8] key when he/she enters the Status Control and Settings window. Automatic polling will occur every 1 sec between the system and the PC as the status values are displayed.

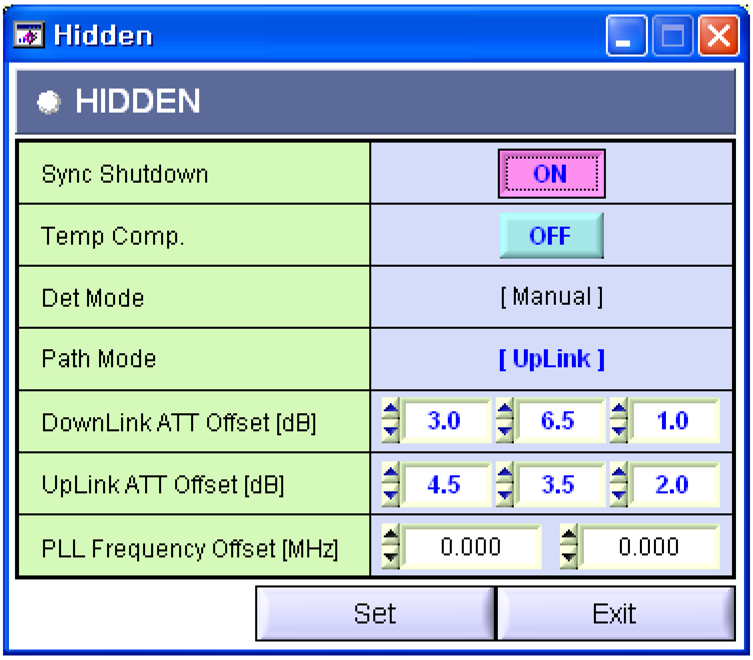


Sync Shutdown	OFF
Temp Comp.	OFF
Det Mode	[Manual]
Path Mode	[DownLink]
DownLink ATT Offset [dB]	0.0 0.0 0.0
UpLink ATT Offset [dB]	0.0 0.0 0.0
PLL Frequency Offset [MHz]	0.000 0.000

<Figure 3-5> Hidden Status Control Window

1.3.8 Hidden Status Setup

When changing the setting of the system through the software, the text of the changed items will change to a blue color. By pressing the [Set] button, all values that correspond to an item with a blue text will be modified.



Sync Shutdown: ON
Temp Comp.: OFF
Det Mode: [Manual]
Path Mode: [UpLink]
DownLink ATT Offset [dB]: 3.0 6.5 1.0
UpLink ATT Offset [dB]: 4.5 3.5 2.0
PLL Frequency Offset [MHz]: 0.000 0.000

<Figure 3-6> Hidden Status Control Window

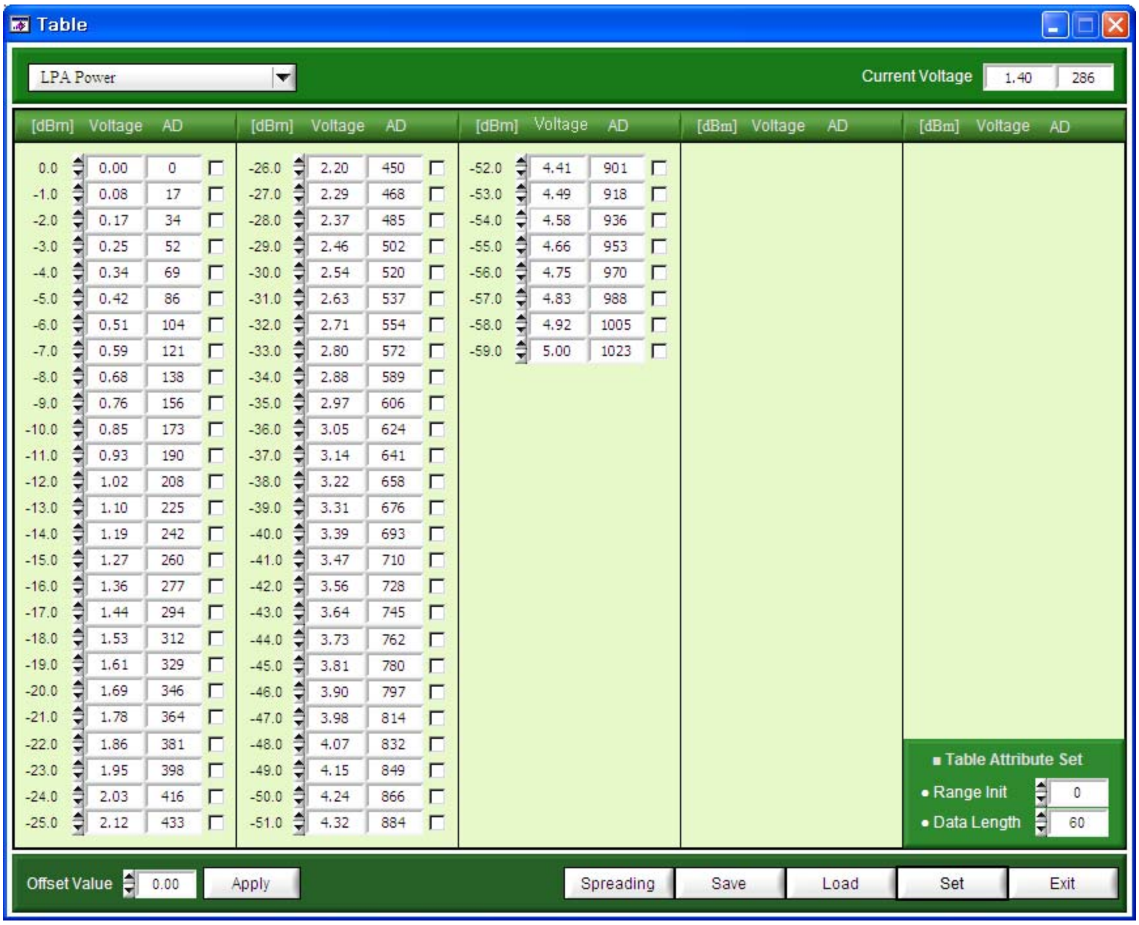
1.3.9 Hidden Status Monitoring/Control Items

The following table lists the various Hidden status items that can be monitored and changed.

Item	Monitoring/Control	Notes
Sync Shutdown	Monitoring/Control	ON / OFF
Temp Comp.	Monitoring/Control	ON / OFF
Det Mode	Monitoring/Control	Auto / Manual
Path Mode	Monitoring/Control	Down Link / Up Link
Down Link ATT Offset	Monitoring/Control	[dB]
	Monitoring/Control	[dB]
	Monitoring/Control	[dB]
Up Link ATT Offset	Monitoring/Control	[dB]
	Monitoring/Control	[dB]
	Monitoring/Control	[dB]

1.4 Table

By clicking the [Table] button on the Status Monitoring/Control window, the user is able to access the System Detect Table as shown below. The user is able to monitor and control these values.



Current Voltage 1.40 286

[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD	[dBm]	Voltage	AD
0.0	0.00	0	☐	-26.0	2.20	450	☐	-52.0	4.41	901	☐						
-1.0	0.08	17	☐	-27.0	2.29	468	☐	-53.0	4.49	918	☐						
-2.0	0.17	34	☐	-28.0	2.37	485	☐	-54.0	4.58	936	☐						
-3.0	0.25	52	☐	-29.0	2.46	502	☐	-55.0	4.66	953	☐						
-4.0	0.34	69	☐	-30.0	2.54	520	☐	-56.0	4.75	970	☐						
-5.0	0.42	86	☐	-31.0	2.63	537	☐	-57.0	4.83	988	☐						
-6.0	0.51	104	☐	-32.0	2.71	554	☐	-58.0	4.92	1005	☐						
-7.0	0.59	121	☐	-33.0	2.80	572	☐	-59.0	5.00	1023	☐						
-8.0	0.68	138	☐	-34.0	2.88	589	☐										
-9.0	0.76	156	☐	-35.0	2.97	606	☐										
-10.0	0.85	173	☐	-36.0	3.05	624	☐										
-11.0	0.93	190	☐	-37.0	3.14	641	☐										
-12.0	1.02	208	☐	-38.0	3.22	658	☐										
-13.0	1.10	225	☐	-39.0	3.31	676	☐										
-14.0	1.19	242	☐	-40.0	3.39	693	☐										
-15.0	1.27	260	☐	-41.0	3.47	710	☐										
-16.0	1.36	277	☐	-42.0	3.56	728	☐										
-17.0	1.44	294	☐	-43.0	3.64	745	☐										
-18.0	1.53	312	☐	-44.0	3.73	762	☐										
-19.0	1.61	329	☐	-45.0	3.81	780	☐										
-20.0	1.69	346	☐	-46.0	3.90	797	☐										
-21.0	1.78	364	☐	-47.0	3.98	814	☐										
-22.0	1.86	381	☐	-48.0	4.07	832	☐										
-23.0	1.95	398	☐	-49.0	4.15	849	☐										
-24.0	2.03	416	☐	-50.0	4.24	866	☐										
-25.0	2.12	433	☐	-51.0	4.32	884	☐										

- Range Init 0
- Data Length 60

Offset Value 0.00

<Figure 4-1> LPA Power Table

3.1.4.1 Table Selection

The user is able to access the table for the following items:

LPA Power

LPA Temp

Input Detect

Current Monitor

Det 27V Monitor

ATTN 0

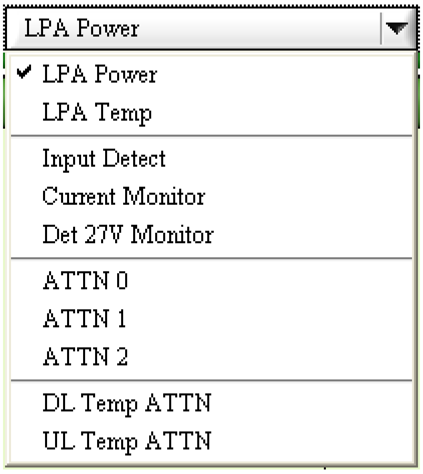
ATTN 1

ATTN 2

DL Temp ATTN

UL Temp ATTN

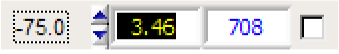
The user is able to access the table of the different items by using the combination box and selecting the desired item.


LPA Power
✓ LPA Power
LPA Temp
Input Detect
Current Monitor
Det 27V Monitor
ATTN 0
ATTN 1
ATTN 2
DL Temp ATTN
UL Temp ATTN

<Figure 4-2> Table Selection

1.4.1 Table Value Input

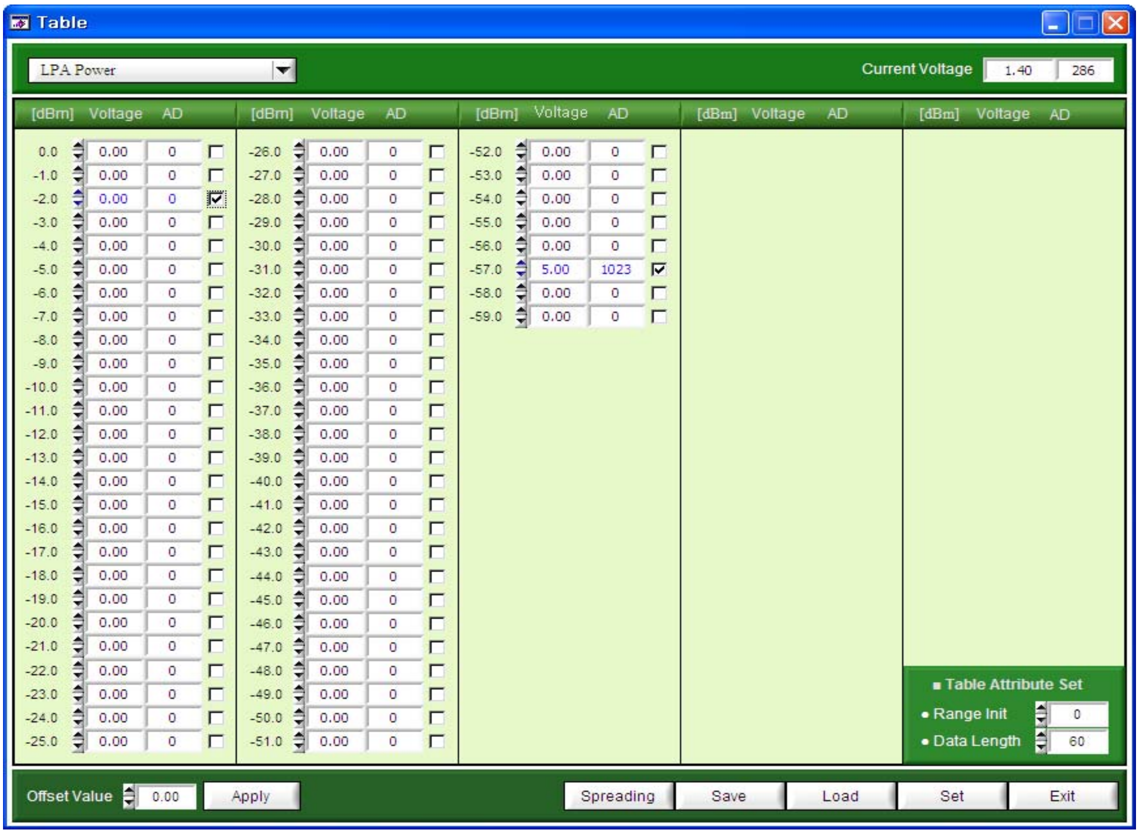
The user is able to change the data value by using the cursor provided or by registering a new value.



<Figure 4-3> Table Value Input

When the voltage value is changed by the user as shown above, the AD value will automatically change accordingly.

The user may change several values within a range simultaneously by using the [Spreading] function. As shown in the figures below, first check the box with the beginning and end range values. Once this has been done, press the [Spreading] button. This will automatically set values for all within that range as shown in figure 4-5



LPA Power

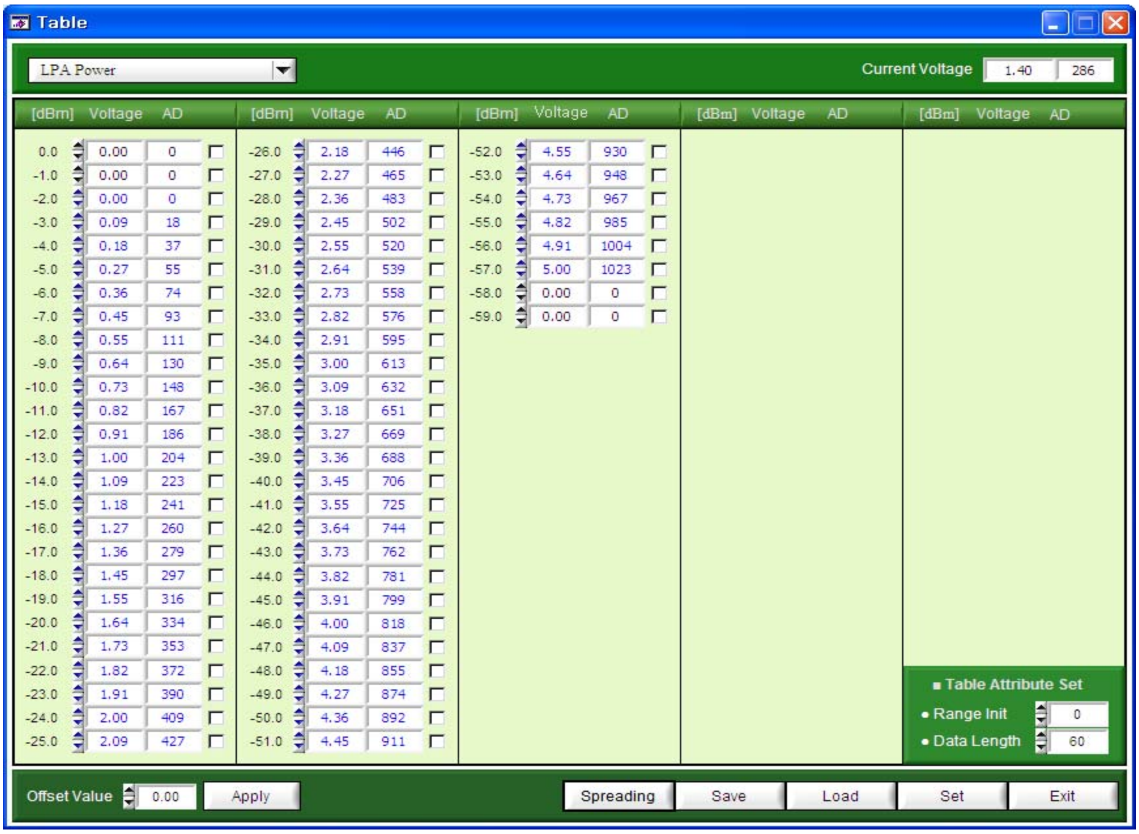
Current Voltage 1.40 286

[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD	[dBm]	Voltage	AD
0.0	0.00	0	☐	-26.0	0.00	0	☐	-52.0	0.00	0	☐						
-1.0	0.00	0	☐	-27.0	0.00	0	☐	-53.0	0.00	0	☐						
-2.0	0.00	0	☑	-28.0	0.00	0	☐	-54.0	0.00	0	☐						
-3.0	0.00	0	☐	-29.0	0.00	0	☐	-55.0	0.00	0	☐						
-4.0	0.00	0	☐	-30.0	0.00	0	☐	-56.0	0.00	0	☐						
-5.0	0.00	0	☐	-31.0	0.00	0	☐	-57.0	5.00	1023	☑						
-6.0	0.00	0	☐	-32.0	0.00	0	☐	-58.0	0.00	0	☐						
-7.0	0.00	0	☐	-33.0	0.00	0	☐	-59.0	0.00	0	☐						
-8.0	0.00	0	☐	-34.0	0.00	0	☐										
-9.0	0.00	0	☐	-35.0	0.00	0	☐										
-10.0	0.00	0	☐	-36.0	0.00	0	☐										
-11.0	0.00	0	☐	-37.0	0.00	0	☐										
-12.0	0.00	0	☐	-38.0	0.00	0	☐										
-13.0	0.00	0	☐	-39.0	0.00	0	☐										
-14.0	0.00	0	☐	-40.0	0.00	0	☐										
-15.0	0.00	0	☐	-41.0	0.00	0	☐										
-16.0	0.00	0	☐	-42.0	0.00	0	☐										
-17.0	0.00	0	☐	-43.0	0.00	0	☐										
-18.0	0.00	0	☐	-44.0	0.00	0	☐										
-19.0	0.00	0	☐	-45.0	0.00	0	☐										
-20.0	0.00	0	☐	-46.0	0.00	0	☐										
-21.0	0.00	0	☐	-47.0	0.00	0	☐										
-22.0	0.00	0	☐	-48.0	0.00	0	☐										
-23.0	0.00	0	☐	-49.0	0.00	0	☐										
-24.0	0.00	0	☐	-50.0	0.00	0	☐										
-25.0	0.00	0	☐	-51.0	0.00	0	☐										

■ Table Attribute Set
- Range Init 0
- Data Length 60

Offset Value 0.00

<Figure 4-4> First Phase of Spreading



LPA Power

Current Voltage 1.40 286

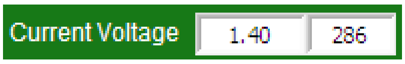
[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD		[dBm]	Voltage	AD	[dBm]	Voltage	AD
0.0	0.00	0	☐	-26.0	2.18	446	☐	-52.0	4.55	930	☐						
-1.0	0.00	0	☐	-27.0	2.27	465	☐	-53.0	4.64	948	☐						
-2.0	0.00	0	☐	-28.0	2.36	483	☐	-54.0	4.73	967	☐						
-3.0	0.09	18	☐	-29.0	2.45	502	☐	-55.0	4.82	985	☐						
-4.0	0.18	37	☐	-30.0	2.55	520	☐	-56.0	4.91	1004	☐						
-5.0	0.27	55	☐	-31.0	2.64	539	☐	-57.0	5.00	1023	☐						
-6.0	0.36	74	☐	-32.0	2.73	558	☐	-58.0	0.00	0	☐						
-7.0	0.45	93	☐	-33.0	2.82	576	☐	-59.0	0.00	0	☐						
-8.0	0.55	111	☐	-34.0	2.91	595	☐										
-9.0	0.64	130	☐	-35.0	3.00	613	☐										
-10.0	0.73	148	☐	-36.0	3.09	632	☐										
-11.0	0.82	167	☐	-37.0	3.18	651	☐										
-12.0	0.91	186	☐	-38.0	3.27	669	☐										
-13.0	1.00	204	☐	-39.0	3.36	688	☐										
-14.0	1.09	223	☐	-40.0	3.45	706	☐										
-15.0	1.18	241	☐	-41.0	3.55	725	☐										
-16.0	1.27	260	☐	-42.0	3.64	744	☐										
-17.0	1.36	279	☐	-43.0	3.73	762	☐										
-18.0	1.45	297	☐	-44.0	3.82	781	☐										
-19.0	1.55	316	☐	-45.0	3.91	799	☐										
-20.0	1.64	334	☐	-46.0	4.00	818	☐										
-21.0	1.73	353	☐	-47.0	4.09	837	☐										
-22.0	1.82	372	☐	-48.0	4.18	855	☐										
-23.0	1.91	390	☐	-49.0	4.27	874	☐										
-24.0	2.00	409	☐	-50.0	4.36	892	☐										
-25.0	2.09	427	☐	-51.0	4.45	911	☐										

- Table Attribute Set
- Range Init 0
- Data Length 60

Offset Value 0.00

<Figure 4-5> Spreading Result

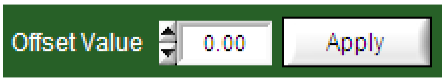
When entering the Detect Table, the current voltage reading is displayed on the left corner. This value can be automatically applied to the value boxes by right clicking the box where the user is able to change the values.



Current Voltage 1.40 286

<Figure 4-6> Current Voltage Reading

The Offset value located at the bottom left corner can be adjusted by the user. NOTE* The Offset Value will apply to all values in the table.

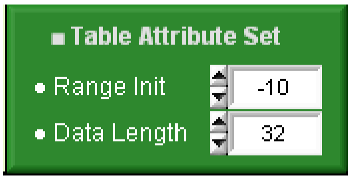


Offset Value 0.00

<Figure 4-7> Table Offset

1.4.2 Table Attribute Setting

The Offset Value located at the bottom left corner can be adjusted by the user. NOTE* The Offset Value will apply to all values in the table.



Range Init: -10
Data Length: 32

<Figure 4-8> Table Attribute

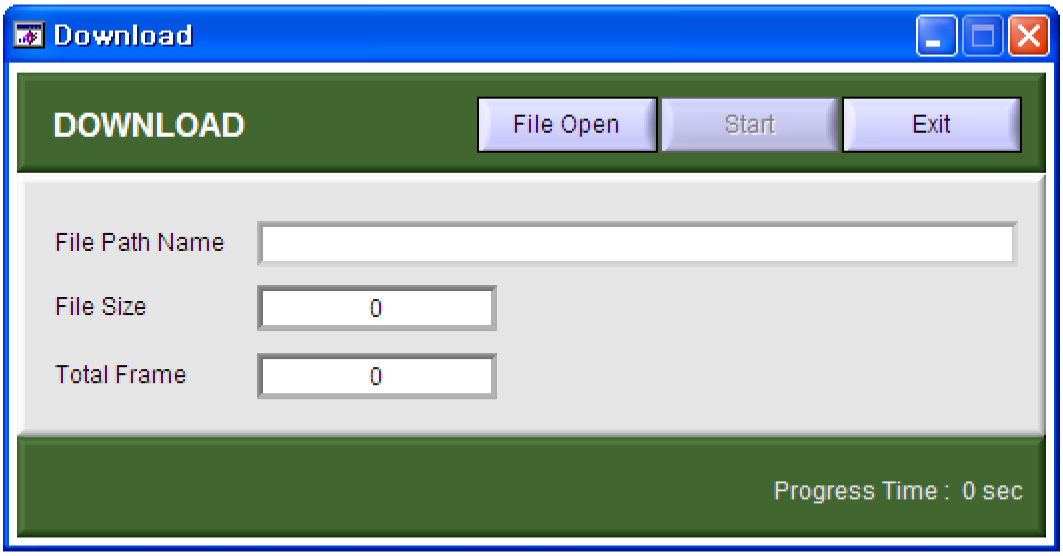
Explanations of other function buttons are listed below.

Save	Saving the currently updated values into the PC.
Load	Loading an already saved set range of values.
Set	To apply the changes made by the user.
Exit	Exiting the table

1.5 DOWNLOAD

1.5.1 Download Preparation

By clicking the Download button on the Status/Monitoring screen, the user is able to F/W Download files into the system. By clicking the Download button the user will be directed to a download window as seen below.



File Path Name

File Size 0

Total Frame 0

Progress Time : 0 sec

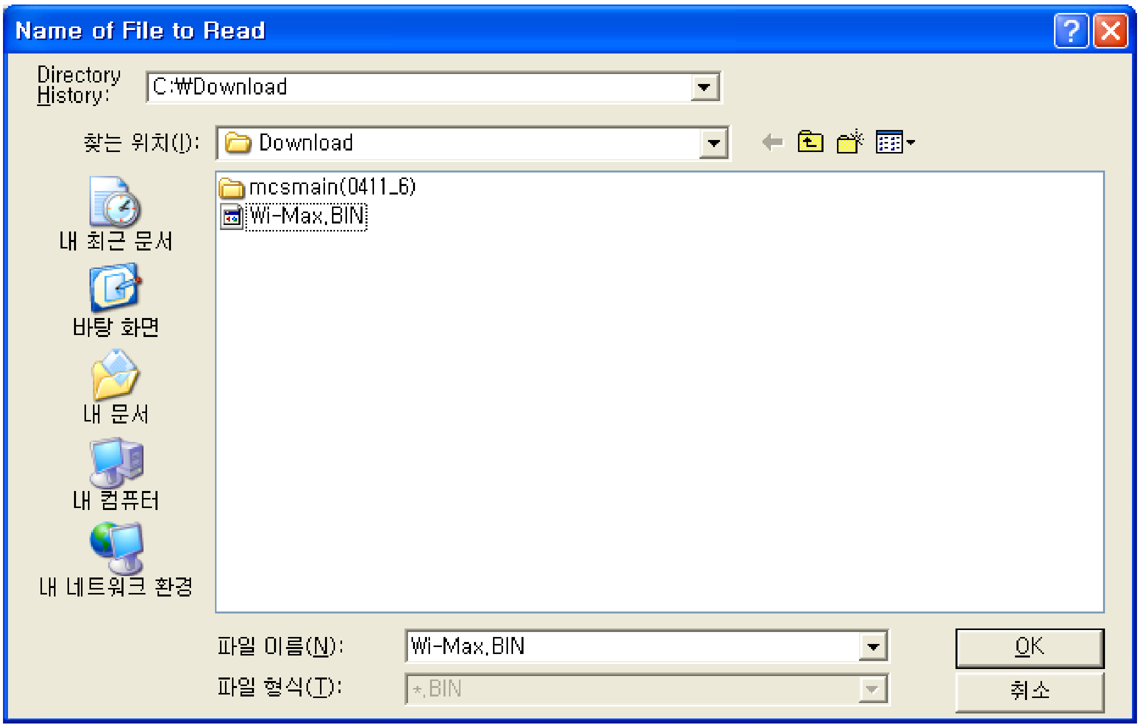
<Figure 5-1> Download Ready Window

Here, [File Open] button is clicked.

If user wants to exit, click the [Exit] button.

1.5.2 File Open

Click the [File Open] button to access the file search window shown below.



Name of File to Read
?
X
내 최근 문서
바탕 화면
내 문서
내 컴퓨터
내 네트워크 환경
mcsmain(0411_6)
Wi-Max.BIN
OK
취소

Directory History: C:₩Download

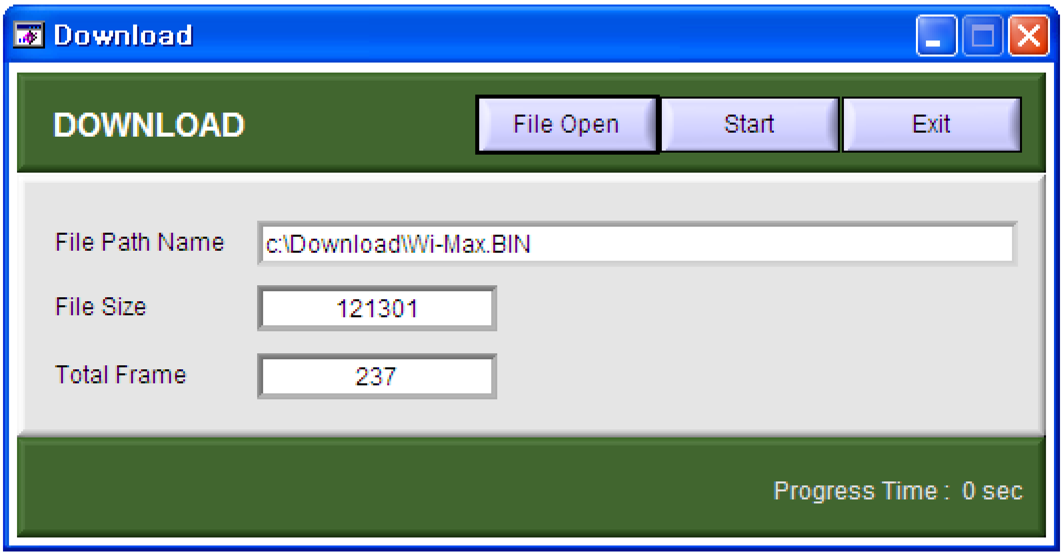
찾는 위치(I): Download

파일 이름(N): Wi-Max.BIN

파일 형식(T): *.BIN

<Figure 5-2> File Open

The user has the option of typing the exact file name in the entry box or clicking and selecting the " .bin" file from the main screen. Once the user selects the file and clicks the [OK] button, the window will indicate the file name; file size and total frame of the selected file.



File Path Name: c:\Download\Wi-Max.BIN

File Size: 121301

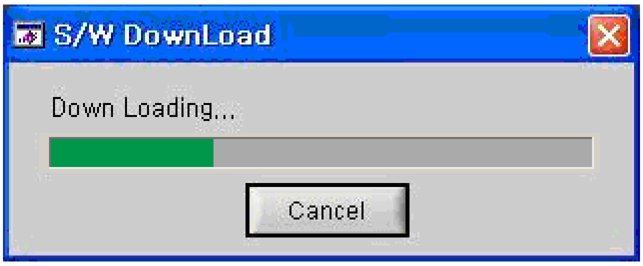
Total Frame: 237

Progress Time : 0 sec

<Figure 5-3> Preparation for Download

1.5.3 Download Start

Once the user presses the [Start] button as shown in the figure <Figure 5-3> above, the download process will begin. This will be followed by a progress bar indicating the status of download as shown below.

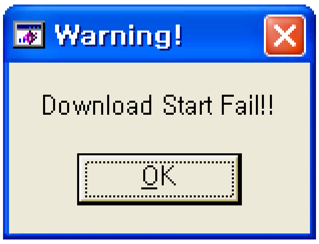


Down Loading...

<Figure 5-4> Download Progress Window

If the user presses the [Cancel] button, the download will immediately terminate.

If the download process is not successfully completed, a window notifying a failure will appear.

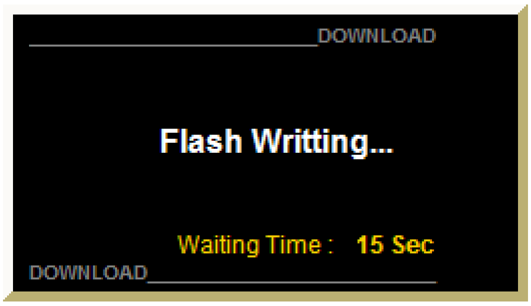


Download Start Fail!!

<Figure 5-5> Window Notifying a Failed Download Attempt

1.5.4 Download Complete

Once download the is complete, a flashing screen will appear during the initialization period. Completion is notified to the user by a window indicating that download has been completed.

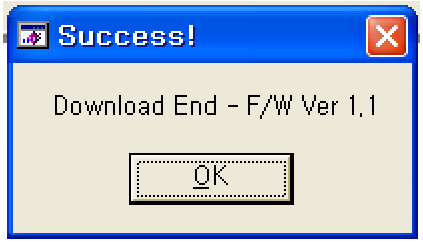


Flash Writting...

Waiting Time : 15 Sec

[Figure 5-6] Flash Write

Once all downloading has been completed, a small confirmation will pop up as shown below.



Success!

Download End - F/W Ver 1.1

[Figure 5-7] Download Complete

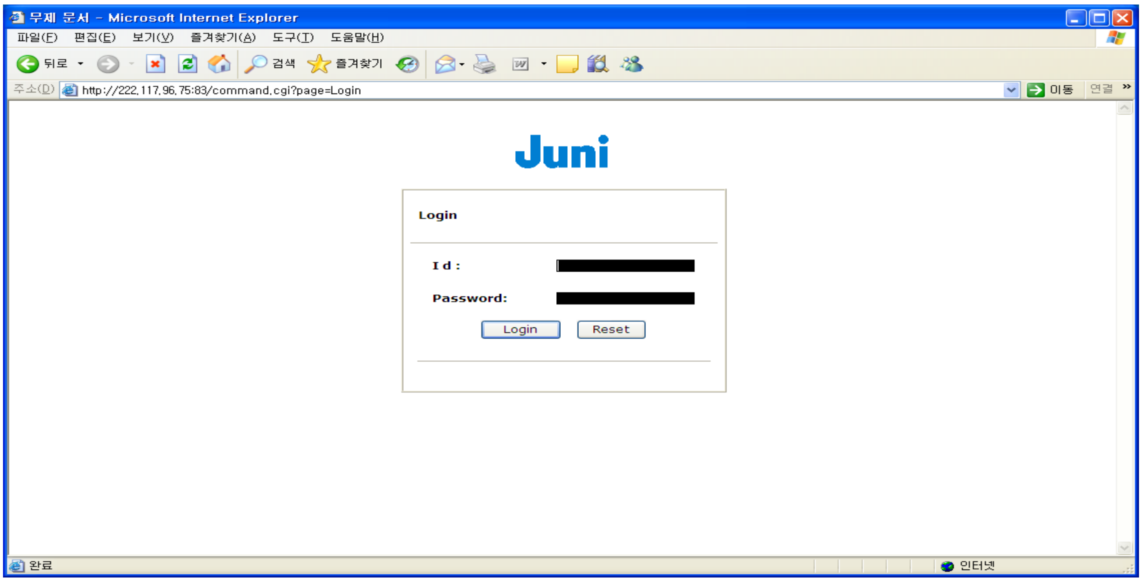
2 WEB GUI

2.1 Program Start

2.1.1 Web Site Link

Open an Internet Explorer window or an available web browser. Enter an appropriate IP and port address in the URL column.

If the correct link has been entered, a Login display like the one below will be shown.



무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Login
Reset
완료
인터넷

http://222.117.96.75:83/command.cgi?page=Login

Login

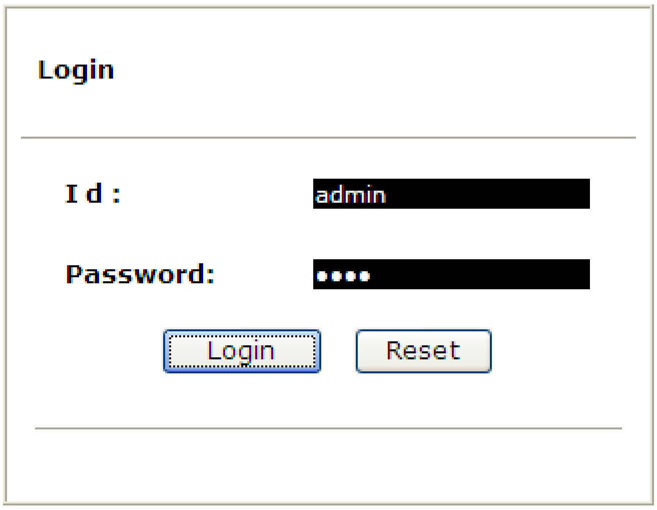
Id : [redacted]

Password: [redacted]

<Figure 10-1> Initial Login Page

2.1.2 Login

After a specified User ID and relevant account password has been entered, click on the [Login] button.



Login

Id : admin

Password: ●●●●

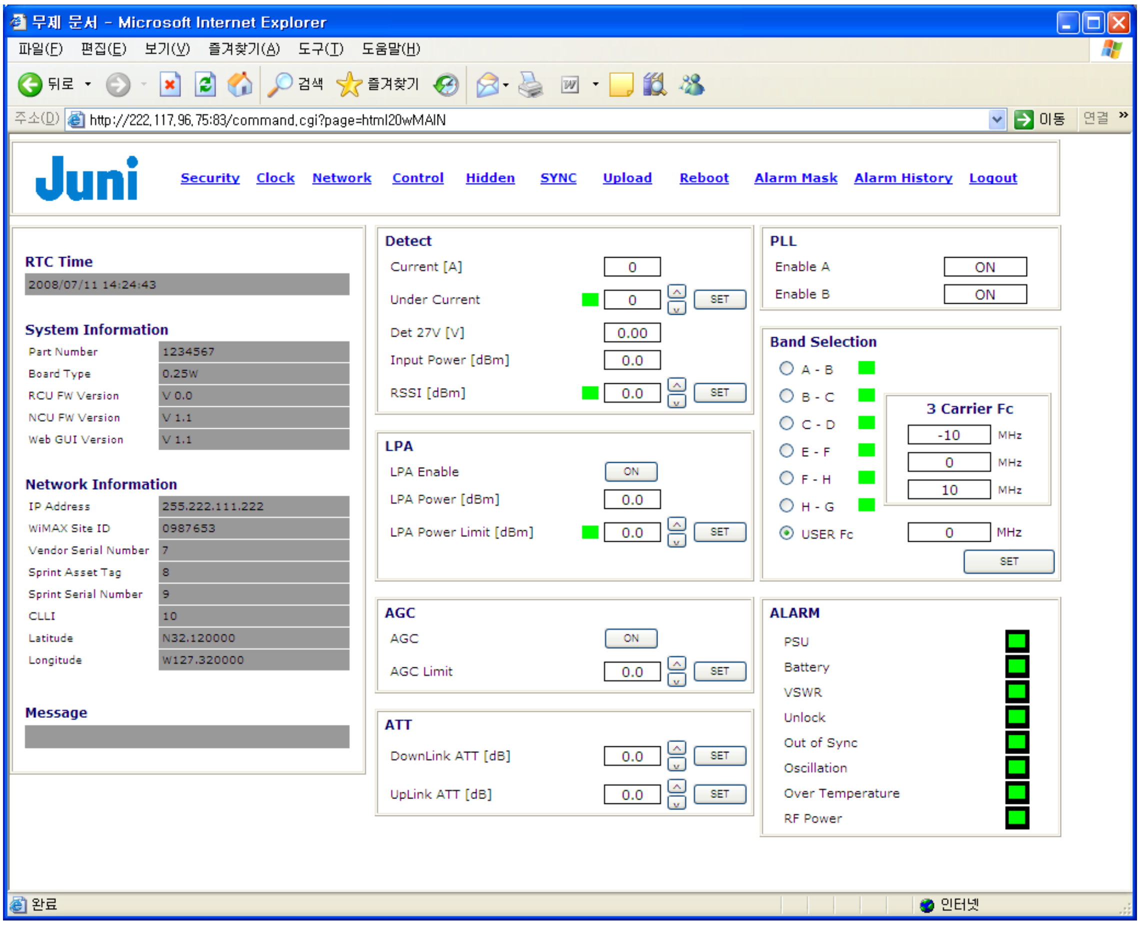
Login
Reset

<Figure 10-2> Login

2.2 Basic Display Configuration

2.2.1 Initial Display

After Login has been successful, a display like the one below is shown. Initial display will be a ‘ Control’ display.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
SET
완료
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time
2008/07/11 14:24:43

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Detect

Current [A]		0
Under Current	🟩	0
Det 27V [V]		0.00
Input Power [dBm]		0.0
RSSI [dBm]	🟩	0.0

LPA

LPA Enable		ON
LPA Power [dBm]		0.0
LPA Power Limit [dBm]	🟩	0.0

AGC

AGC	ON
AGC Limit	0.0

ATT

DownLink ATT [dB]	0.0
UpLink ATT [dB]	0.0

PLL

Enable A	ON
Enable B	ON

Band Selection

- ○ A - B 🟩
- ○ B - C 🟩
- ○ C - D 🟩
- ○ E - F 🟩
- ○ F - H 🟩
- ○ H - G 🟩
- ● USER Fc 0 MHz

3 Carrier Fc
-10 MHz
0 MHz
10 MHz

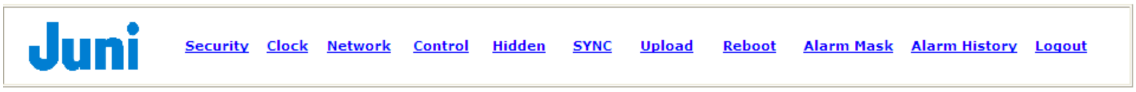
ALARM

PSU	🟩
Battery	🟩
VSWR	🟩
Unlock	🟩
Out of Sync	🟩
Oscillation	🟩
Over Temperature	🟩
RF Power	🟩

<Figure 10-3> Initial Display

2.2.2 Menu

Near the top of the web page, there are some menu items. When clicked, it will display the relevant function web page.


Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout

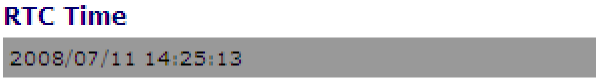
<Figure 10-4> Menu

Below are the menu functions and explanations:

- Security : Account Password Change.
- Clock : System Clock change.
- Network : Network and miscellaneous information setting.
- Control : System status monitoring and control.
- Hidden : System hidden items status monitoring and control.
- SYNC : SYNC system status monitoring and control.
- Upload : Repeater firmware Update.
- Reboot : System Reboot.
- Alarm History : Monitoring occurrence of alarm at present conditions.
- Alarm Mask : Alarm mask status monitoring and control.
- Logout : Logout for current user and returning to login display page.

2.2.3 Date/Time Information

On the top left section of the web page, below the main menu items, the system’ s set clock is displayed.



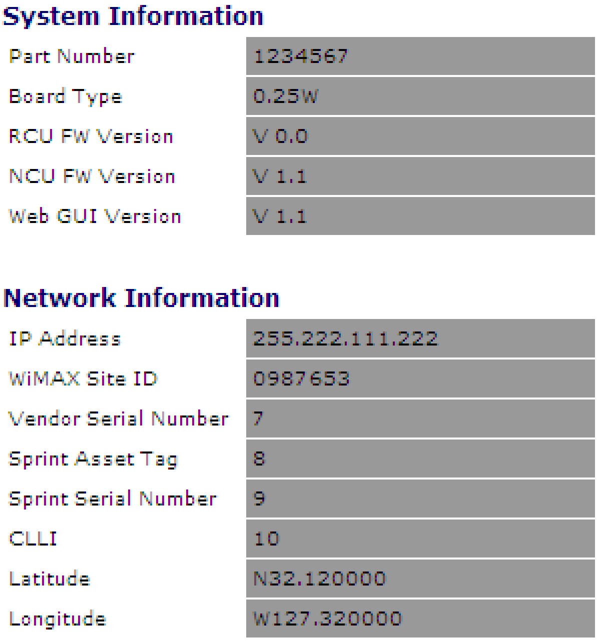
RTC Time

2008/07/11 14:25:13

<Figure 10-5> Date/Time Information

2.2.4 Network/System Information

Below the Date/Time Information section, System and Network Information are displayed.



System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

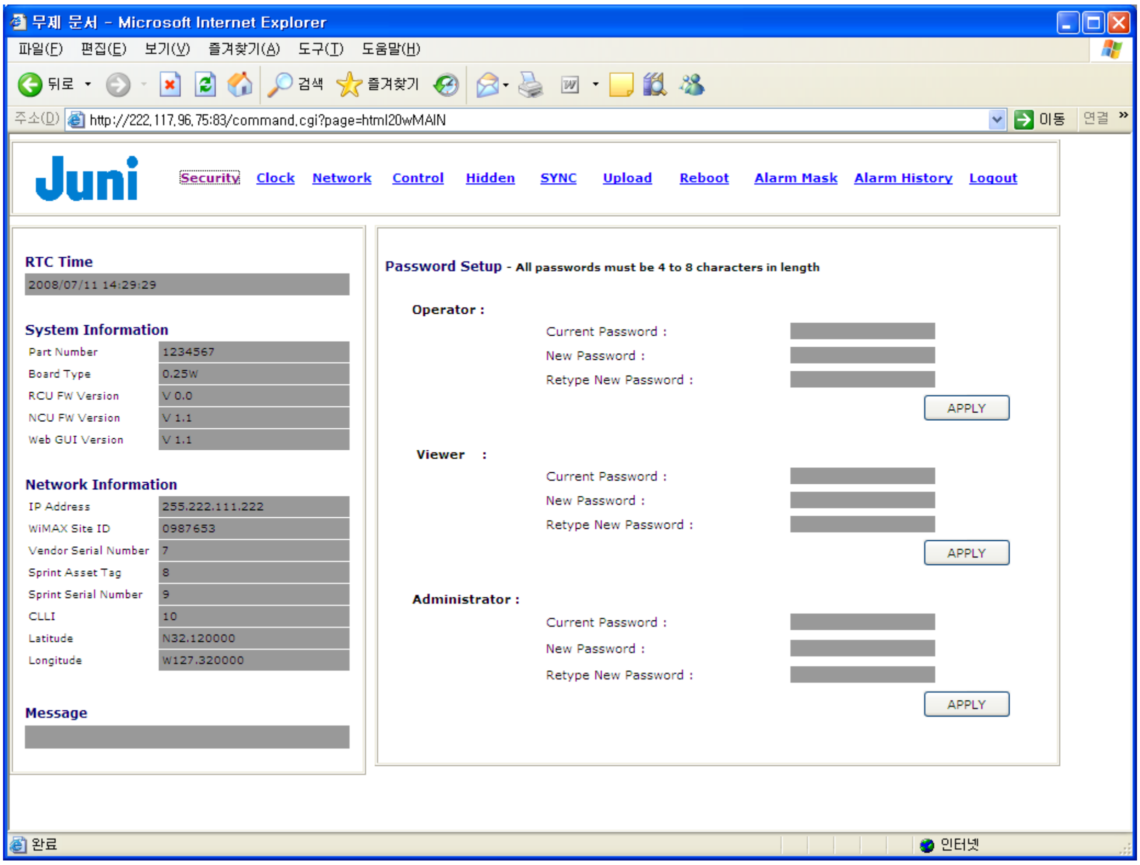
IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

<Figure 10-6> Network/System Information

2.3 Security (Password Setup)

Security is used for changing a user’s Password. All Passwords must be set with 4~8 characters.

When changing a user’s Password, the user account must be selected. Also, once Current Password, New Password and Retyping of the New Password has been inserted, [APPLY] button is clicked.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
Password Setup - All passwords must be 4 to 8 characters in length
Operator :
Current Password :
New Password :
Retype New Password :
APPLY
Viewer :
Current Password :
New Password :
Retype New Password :
APPLY
Administrator :
Current Password :
New Password :
Retype New Password :
APPLY
완료
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 14:29:29

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

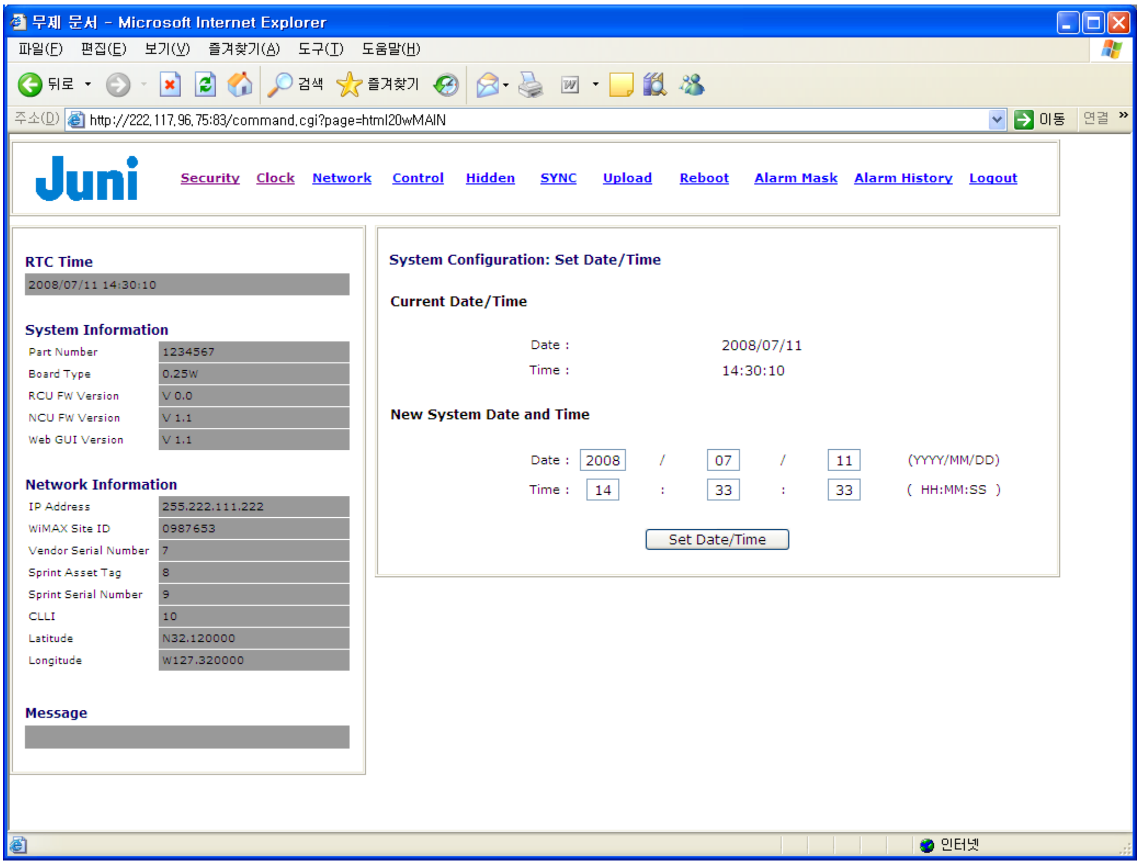
IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

<Figure 10-7> Security (Password Setup)

2.4 Clock

Clock menu displays and sets system’ s time. The changed clock values can be viewed on the ‘ RTC Time’ section located below ‘ Juni’ logo left of the page. When changing Date/Time, the desired inputs are added and [Set Date/Time] button is clicked.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
Set Date/Time
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 14:30:10

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

System Configuration: Set Date/Time

Current Date/Time

Date : 2008/07/11
Time : 14:30:10

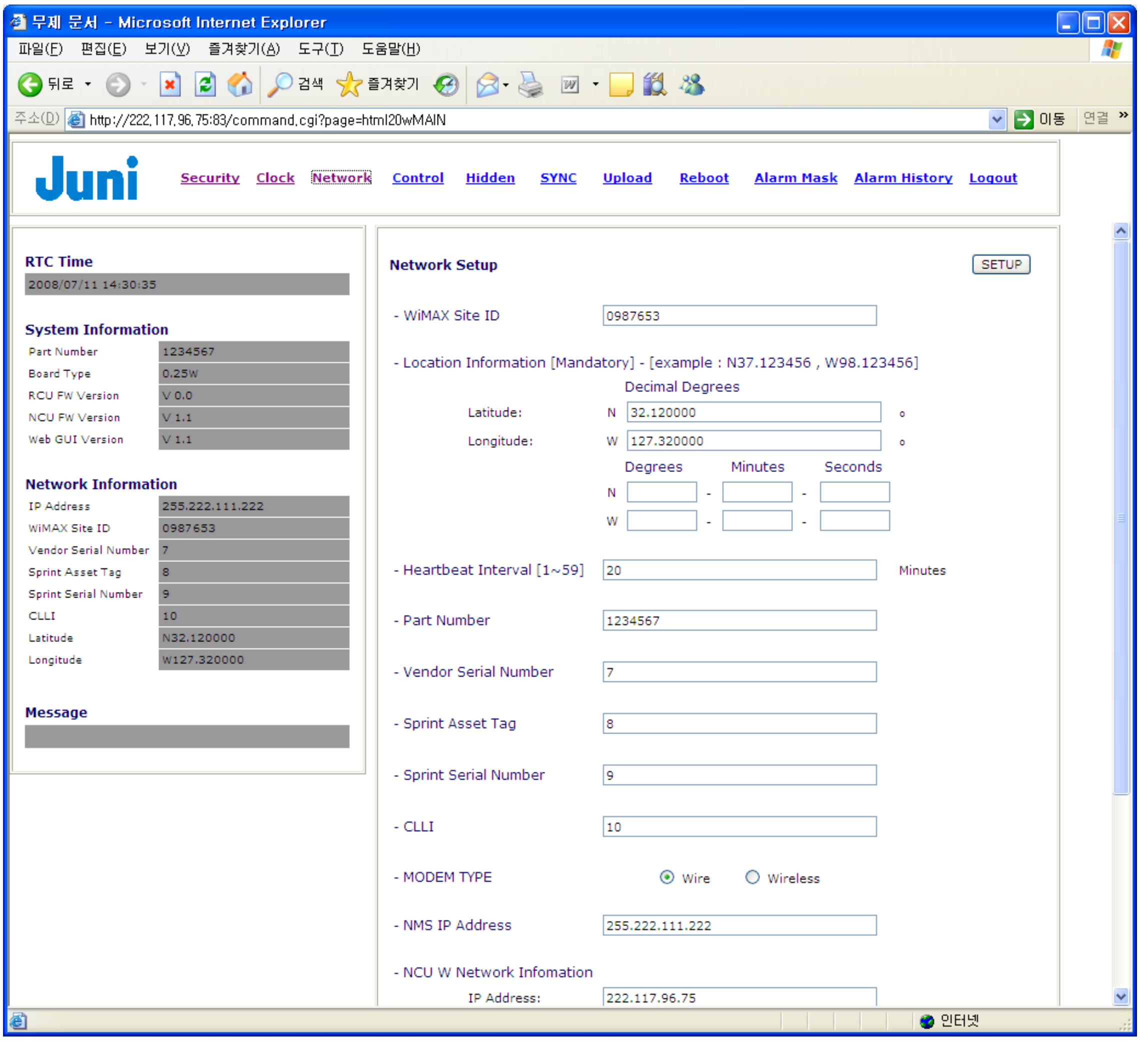
New System Date and Time

Date : 2008 / 07 / 11 (YYYY/MM/DD)
Time : 14 : 33 : 33 (HH:MM:SS)

<Figure 10-8> Clock

2.5 Network

Network menu monitors and controls network information. When there are items in the network setup that needs to be changed, information is added and changed in the ‘ Network Setup’ section. After all relevant information has been added, [SETUP] button which is located at the top and bottom of the page, is clicked.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
SETUP
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 14:30:35

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

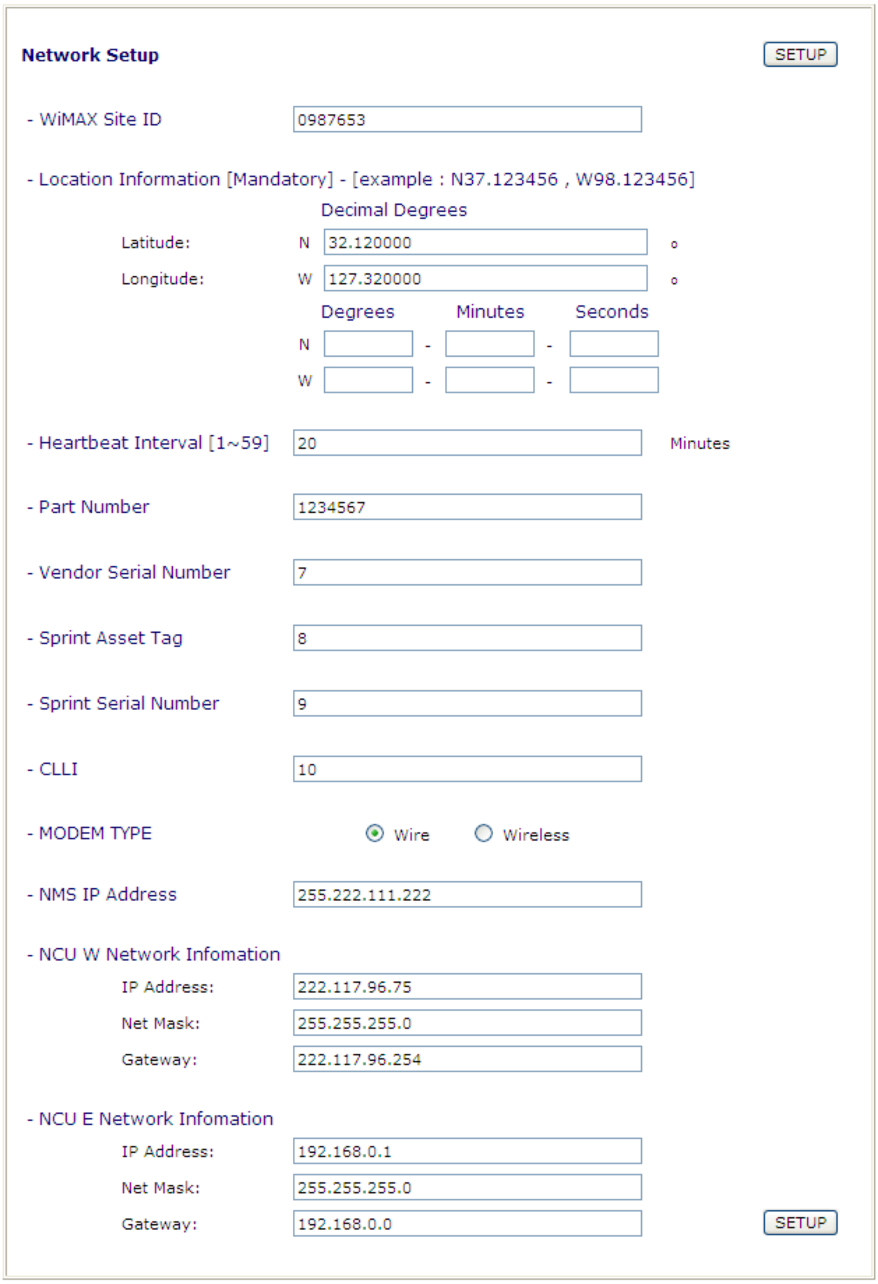
IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Network Setup

- WiMAX Site ID: 0987653
- Location Information [Mandatory] - [example : N37.123456 , W98.123456]
  - Decimal Degrees
  - Latitude: N 32.120000 °
  - Longitude: W 127.320000 °
  - Degrees - Minutes - Seconds
  - N ☐ - ☐ - ☐
  - W ☐ - ☐ - ☐
- Heartbeat Interval [1~59]: 20 Minutes
- Part Number: 1234567
- Vendor Serial Number: 7
- Sprint Asset Tag: 8
- Sprint Serial Number: 9
- CLLI: 10
- MODEM TYPE: ● Wire ○ Wireless
- NMS IP Address: 255.222.111.222
- NCU W Network Infomation
  - IP Address: 222.117.96.75

<Figure 10-9> Network



Network Setup

- WiMAX Site ID: 0987653
- Location Information [Mandatory] - [example : N37.123456 , W98.123456]

Decimal Degrees
Latitude: N 32.120000 °
Longitude: W 127.320000 °

Degrees - Minutes - Seconds
N ☐ - ☐ - ☐
W ☐ - ☐ - ☐

- Heartbeat Interval [1~59]: 20 Minutes
- Part Number: 1234567
- Vendor Serial Number: 7
- Sprint Asset Tag: 8
- Sprint Serial Number: 9
- CLLI: 10
- MODEM TYPE: ● Wire ○ Wireless
- NMS IP Address: 255.222.111.222
- NCU W Network Infomation
  - IP Address: 222.117.96.75
  - Net Mask: 255.255.255.0
  - Gateway: 222.117.96.254
- NCU E Network Infomation
  - IP Address: 192.168.0.1
  - Net Mask: 255.255.255.0
  - Gateway: 192.168.0.0

<Figure 10-10> Network Setup

Following shows items that can be monitored or controlled in the Network Setup page:

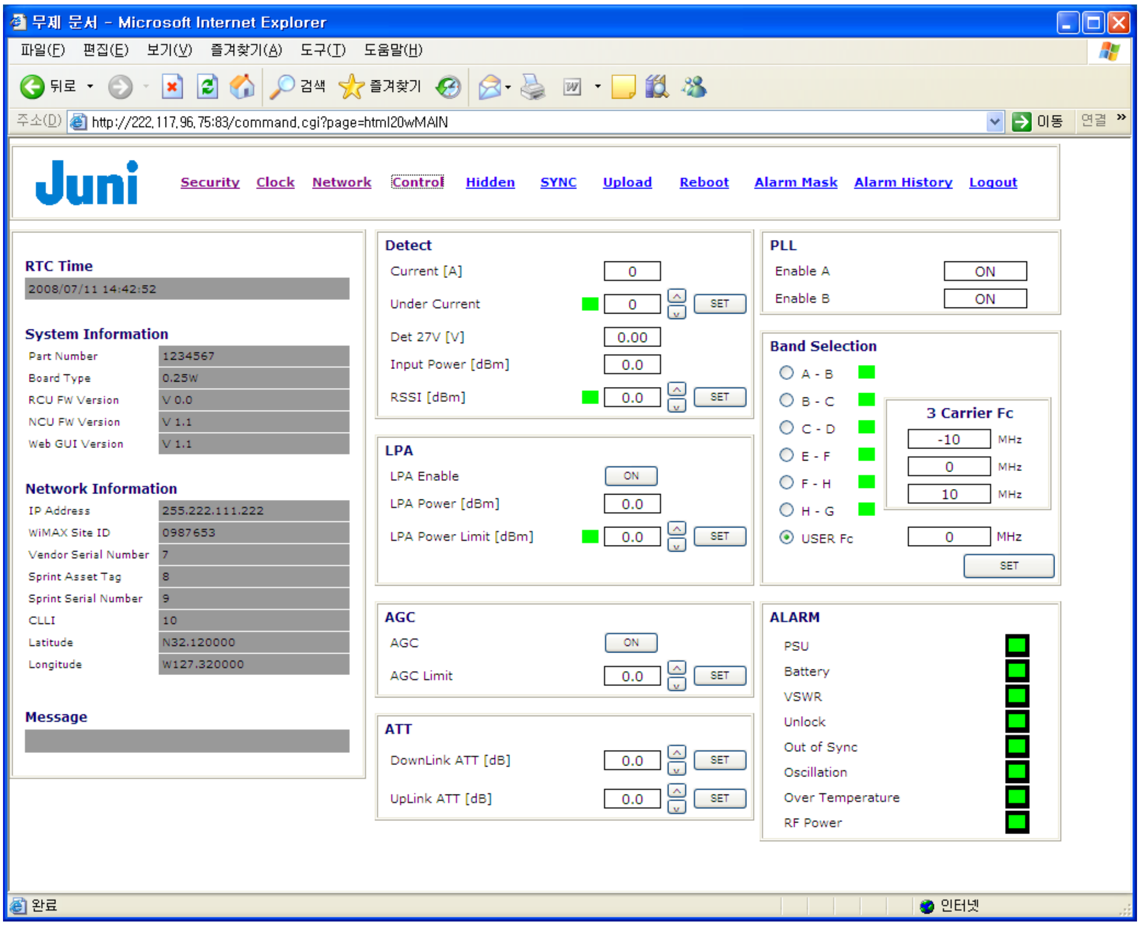
Item		Notes
Cascade Code		
Location Information	Latitude	
	Longitude	
Heartbeat Interval		[minutes]
Part Number		
Vendor Serial Number		
Sprint Asset Tag		
Sprint Serial Number		
CLLI		
MODEM TYPE		
NMS IP Address		
NCU W Network Information	IP Address	
	Net Mask	
	Gate Way	
NCU E Network Information	IP Address	
	Net Mask	
	Gate Way	

2.6 Control

System status can be monitored or controlled in the ‘ Control’ menu. Roughly for every 15 seconds, data is sent, received and updated on this page.

When a user wants to control or change a setting, the moment a control item is clicked or a value is changed, communication with the repeater is momentarily halted. The repeater would then wait for a control command.

When values have been added or changed within the item’ s appropriate range, [Set] button is clicked. This will forward a control command to the repeater. In situations where [SET] button is not clicked, after 10 seconds, system recommences communication.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
SET
완료
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time
2008/07/11 14:42:52

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Detect

Current [A]		0
Under Current	🟩	0
Det 27V [V]		0.00
Input Power [dBm]		0.0
RSSI [dBm]	🟩	0.0

LPA

LPA Enable		ON
LPA Power [dBm]		0.0
LPA Power Limit [dBm]	🟩	0.0

AGC

AGC	ON
AGC Limit	0.0

ATT

DownLink ATT [dB]	0.0
UpLink ATT [dB]	0.0

PLL

Enable A	ON
Enable B	ON

Band Selection

○ A - B 🟩
○ B - C 🟩
○ C - D 🟩
○ E - F 🟩
○ F - H 🟩
○ H - G 🟩
● USER Fc 0 MHz

3 Carrier Fc
-10 MHz
0 MHz
10 MHz

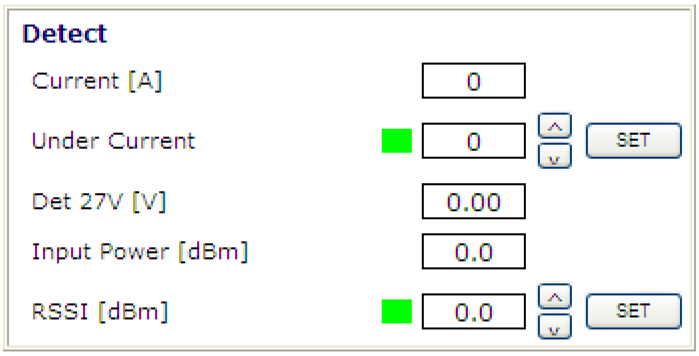
ALARM

PSU	🟩
Battery	🟩
VSWR	🟩
Unlock	🟩
Out of Sync	🟩
Oscillation	🟩
Over Temperature	🟩
RF Power	🟩

<Figure 10-11> Control

2.6.1 Detect

Monitoring and Control for Detect Status.


Detect
Current [A]
0
Under Current
0
SET
Det 27V [V]
0.00
Input Power [dBm]
0.0
RSSI [dBm]
0.0
SET

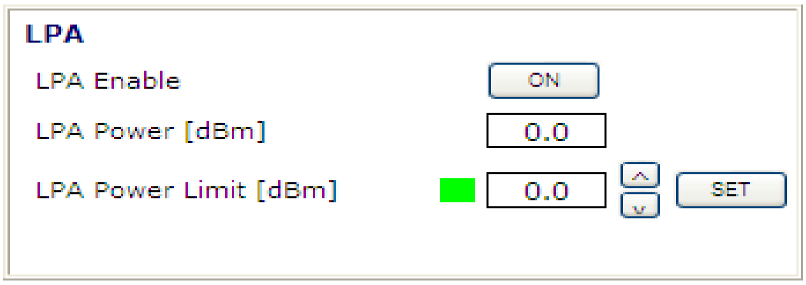
<Figure 10-12> Detect

Below are items that are included in the Detect section for monitoring and control.

Item	Unit	Notes
Current	[A]	Monitoring
Under Current	[A] [Green: Normal, Red: Alarm]	Monitoring/Control Monitoring
Det 27V	[V]	Monitoring
Input Power	[dBm]	Monitoring
RSSI	[dBm] [Green: Normal, Red: Alarm]	Monitoring/Control Monitoring

2.6.2 LPA

Monitoring and Control for LPA Status.



LPA

LPA Enable: ON

LPA Power [dBm]: 0.0

LPA Power Limit [dBm]: 🟩 0.0

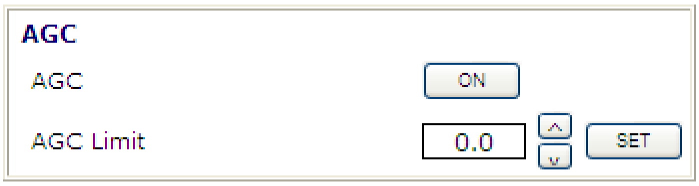
<Figure 10-13> LPA

Below are items that are included in the LPA section for monitoring and control.

Item	Unit	Notes
LPA Enable	[ON / OFF]	Monitoring/Control
LPA Power	[dBm]	Monitoring/Control
LPA Power Limit	[dBm] [Green: Normal, Red: Alarm]	Monitoring/Control Monitoring

2.6.3 AGC

Monitoring and control for AGC Status.



AGC

AGC: ON

AGC Limit: 0.0

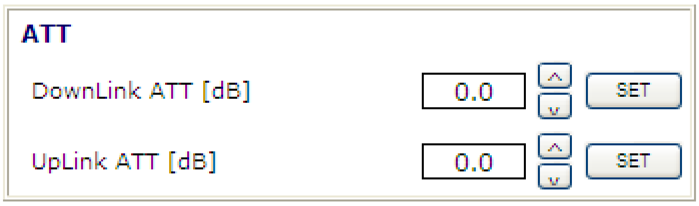
<Figure 10-14> AGC

Below are items that are included in the AGC section for monitoring and control.

Item	Unit	Notes
AGC	[ON / OFF]	Monitoring/Control
AGC Limit		Monitoring/Control

2.6.4 ATT

Monitoring and control for ATT status.



ATT

DownLink ATT [dB] 0.0

UpLink ATT [dB] 0.0

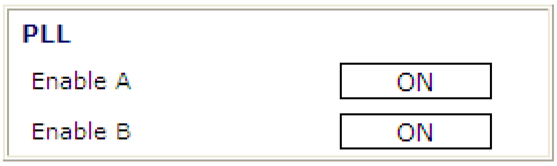
<Figure 10-15> ATT

Below are items that are included in the ATT section for monitoring and control.

Item	Unite	Notes
Down Link ATT	[dB]	Monitoring/Control
Up Link ATT	[dB]	Monitoring/Control

2.6.5 PLL

Monitoring for PLL status.



PLL

Enable A ON

Enable B ON

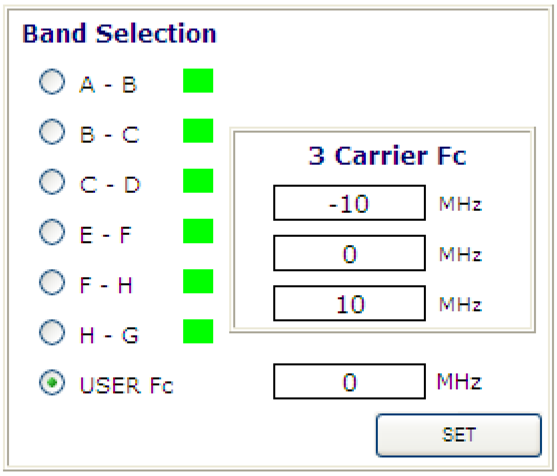
<Figure 10-16> PLL

Below are items that are included in the PLL section for monitoring and control.

Item	Unit	Notes
Enable A	[ON / OFF]	Monitoring
Enable B	[ON / OFF]	Monitoring

2.6.6 Band Selection

Desired Band can be selected or frequencies can be typed in.



Band Selection

○ A - B 🟩

○ B - C 🟩

○ C - D 🟩

○ E - F 🟩

○ F - H 🟩

○ H - G 🟩

● USER Fc 0 MHz

3 Carrier Fc

-10 MHz

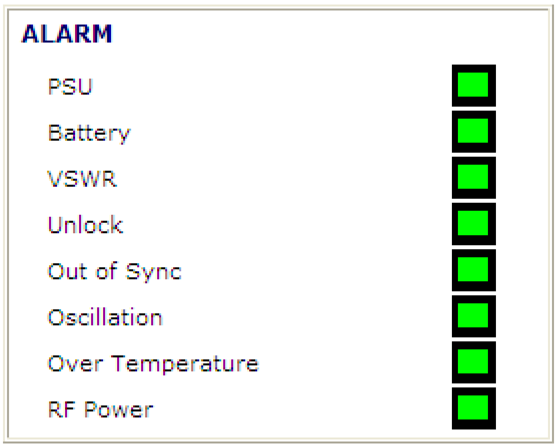
0 MHz

10 MHz

<Figure 10-17> Band Selection

2.6.7 ALARM

Display for ALARM status.



ALARM

PSU	🟩
Battery	🟩
VSWR	🟩
Unlock	🟩
Out of Sync	🟩
Oscillation	🟩
Over Temperature	🟩
RF Power	🟩

<Figure 10-18> ALARM

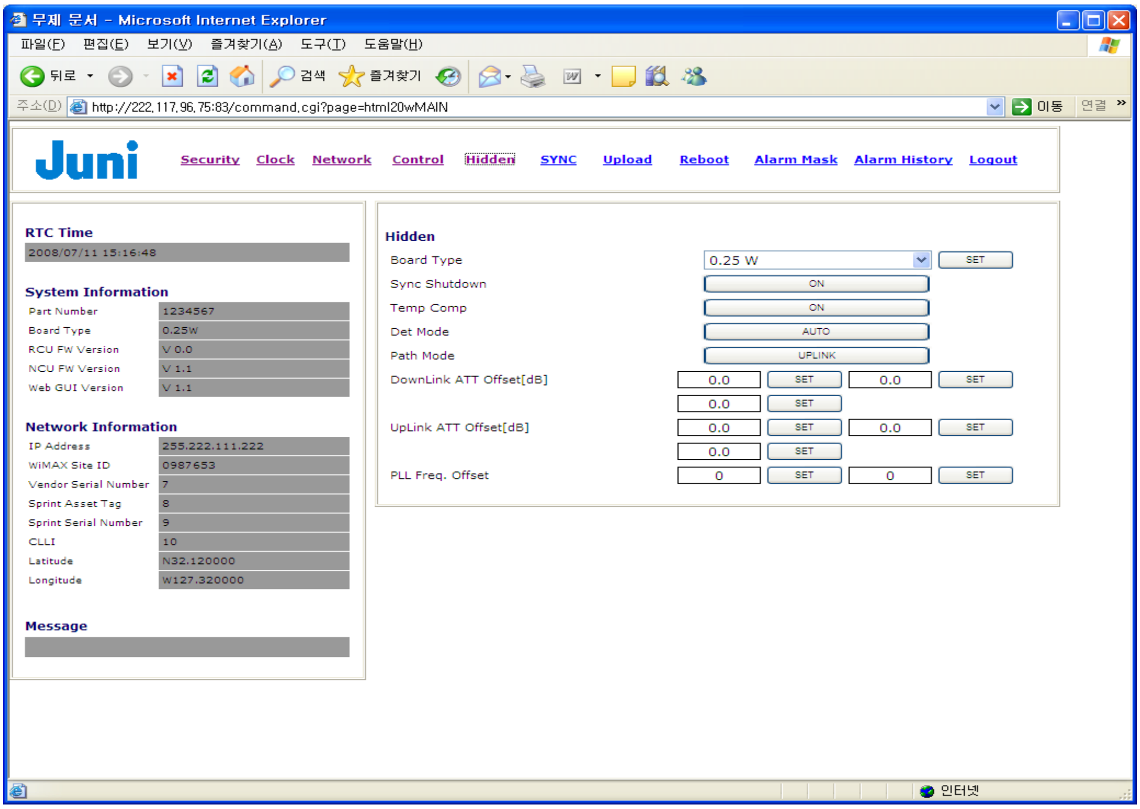
Below are items that are included in the Alarm section for monitoring and control.

Item	Unite	Notes
PSU	[Green: Normal, Red: Alarm]	Monitoring
Battery	[Green: Normal, Red: Alarm]	Monitoring
VSWR	[Green: Normal, Red: Alarm]	Monitoring
Unlock	[Green: Normal, Red: Alarm]	Monitoring
Out of Sync	[Green: Normal, Red: Alarm]	Monitoring
Oscillation	[Green: Normal, Red: Alarm]	Monitoring
Over Temperature	[Green: Normal, Red: Alarm]	Monitoring
RF Power	[Green: Normal, Red: Alarm]	Monitoring

2.7 Hidden

For the system’ s hidden items, status can be monitored or controlled in the ‘ Hidden’ menu. Roughly for every 15 seconds, data is sent, received and updated on this page. When a user wants to control or change a setting, the moment a control item is clicked or a value is changed, communication with the repeater is momentarily halted. The repeater would then wait for a control command.

When the values have been added or changed within the item’ s appropriate range, [Set] button is clicked. This will forward a control command to the repeater. In situations where [SET] button is not clicked, after 10 seconds, system recommences communication.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
SET
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 15:16:48

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Hidden

Board Type	0.25 W			SET
Sync Shutdown	ON			
Temp Comp	ON			
Det Mode	AUTO			
Path Mode	UPLINK			
DownLink ATT Offset[dB]	0.0	SET	0.0	SET
	0.0	SET		
UpLink ATT Offset[dB]	0.0	SET	0.0	SET
	0.0	SET		
PLL Freq. Offset	0	SET	0	SET

<Figure 10-19> Hidden

Below are items that are included in the Hidden page for monitoring and control.

Item	Unit	Notes
Board Type		Monitoring/Control

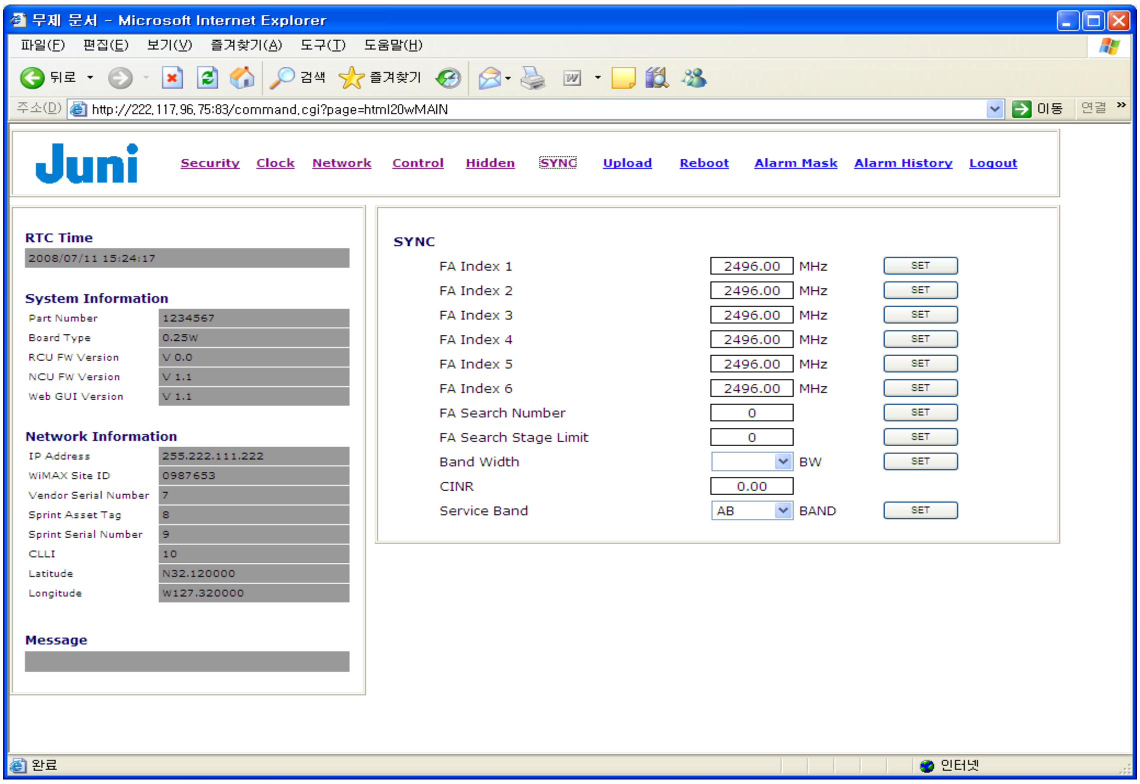
Sync Shutdown	[ON / OFF]	Monitoring/Control
Temp Comp	[ON / OFF]	Monitoring/Control
Det Mode	[AUTO / MANUAL]	Monitoring/Control
Path Mode	[DOWNLINK / UPLIINK]	Monitoring/Control
Down Link ATT Offset	[dB]	Monitoring/Control
Up Link ATT Offset	[dB]	Monitoring/Control
PLL Freq. Offset		Monitoring/Control

2.8 SYNC

For the system’ s SYNC, status can be monitored or controlled in the ‘ SYNC’ menu. When the page is first displayed, status data is shown.

When a user wants to control or change a setting, the moment a control item is clicked or a value is changed, communication with the repeater is momentarily halted. The repeater would then wait for a control command.

When values have been added or changed within the item’ s appropriate range, [Set] button is clicked. This will forward a control command to the repeater.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
SET
완료
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 15:24:17

System Information

Part Number: 1234567
Board Type: 0.25W
RCU FW Version: V 0.0
NCU FW Version: V 1.1
Web GUI Version: V 1.1

Network Information

IP Address: 255.222.111.222
WiMAX Site ID: 0987653
Vendor Serial Number: 7
Sprint Asset Tag: 8
Sprint Serial Number: 9
CLLI: 10
Latitude: N32.120000
Longitude: W127.320000

Message

SYNC

FA Index 1: 2496.00 MHz
FA Index 2: 2496.00 MHz
FA Index 3: 2496.00 MHz
FA Index 4: 2496.00 MHz
FA Index 5: 2496.00 MHz
FA Index 6: 2496.00 MHz
FA Search Number: 0
FA Search Stage Limit: 0
Band Width: BW
CINR: 0.00
Service Band: AB BAND

<Figure 10-20> Hidden

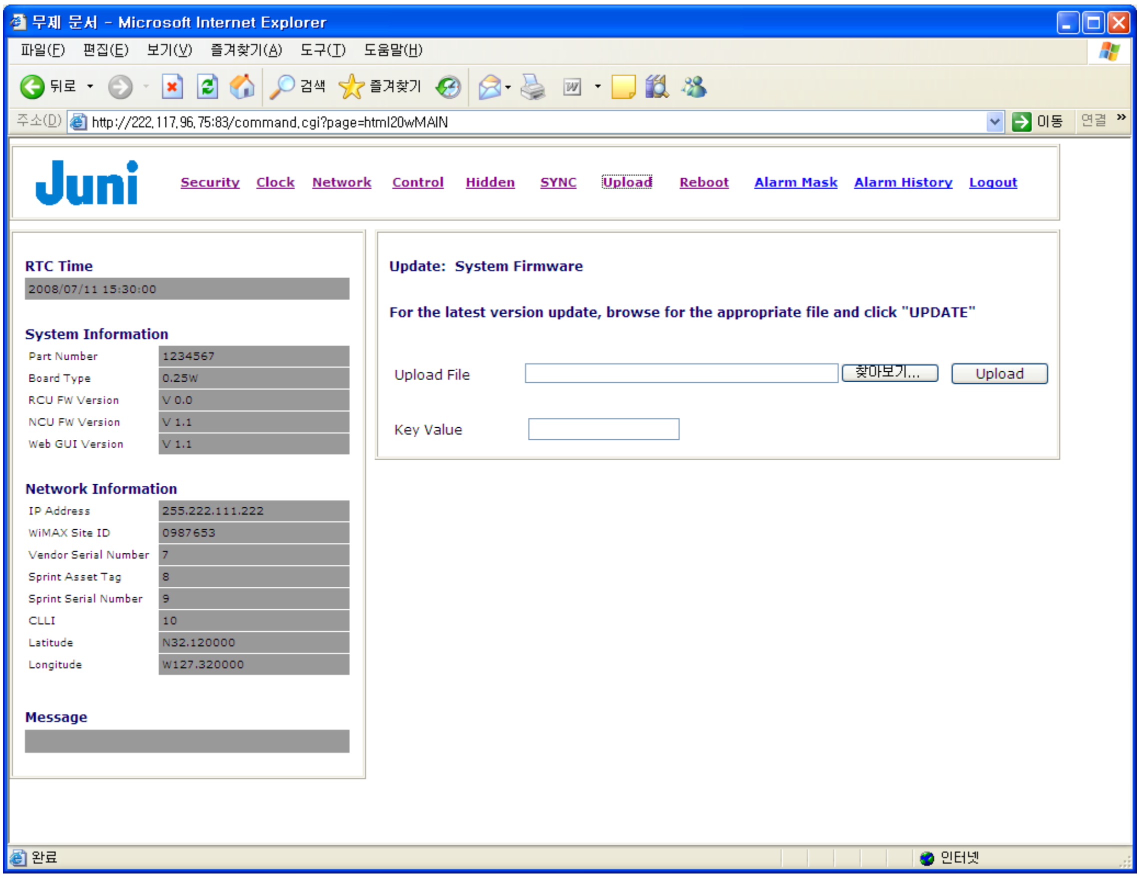
Below are items that are included in the SYNC page for monitoring and control.

Item	Unit	Notes
FA Index 1	[MHz]	Monitoring/Control
FA Index 2	[MHz]	Monitoring/Control
FA Index 3	[MHz]	Monitoring/Control

FA Index 4	[MHz]	Monitoring/Control
FA Index 5	[MHz]	Monitoring/Control
FA Index 6	[MHz]	Monitoring/Control
FA Search Number		Monitoring/Control
FA Search Stage Limit		Monitoring/Control
Band Width	[BW]	Monitoring/Control
CINR		Monitoring
Service Band	[BAND]	Monitoring/Control

2.9 Upload

If the [Upload] link is clicked, a page will open whereby system F/W update can be executed.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
http://222.117.96.75:83/command.cgi?page=html20wMAIN
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
찾아보기...
Upload
완료
인터넷

RTC Time

2008/07/11 15:30:00

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Update: System Firmware

For the latest version update, browse for the appropriate file and click "UPDATE"

Upload File

Key Value

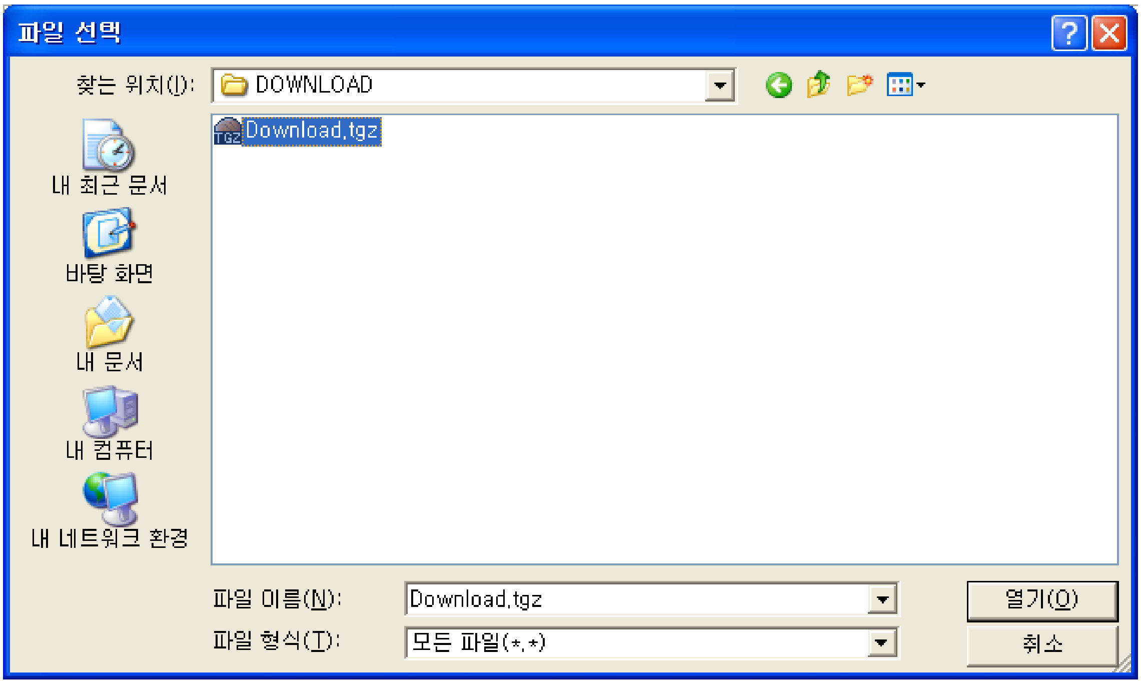
<Figure 10-21> Upload

Definitions of each item are available below.

찾아보기 (Search) : a window will open so that a file can be selected for Upload.
Upload : Selected file will upload onto the system.
Upload File Name : Selected File path
Key value : Selected File’ s error check key value

2.9.1 File Selection

When the [찾아보기] button in <Figure 10-21> is clicked, a window like the one below appears. Here, desired system upload files can be selected. These uploadable file’s extension is ‘.tgz’.


파일 선택
?
Download.tgz
내 최근 문서
바탕 화면
내 문서
내 컴퓨터
내 네트워크 환경
열기(O)
취소

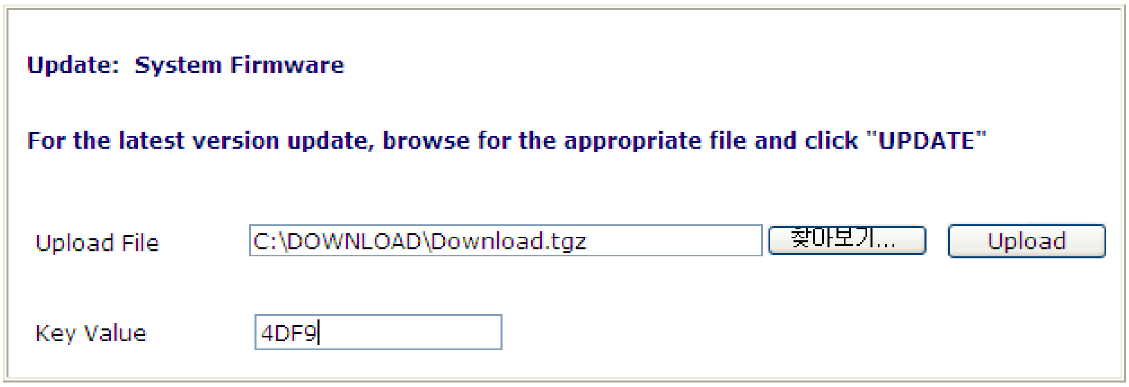
찾는 위치(I): DOWNLOAD

파일 이름(N): Download.tgz

파일 형식(T): 모든 파일(*.*)

<Figure 10-22> Upload File Selection

2.9.2 File Information



Update: System Firmware

For the latest version update, browse for the appropriate file and click "UPDATE"

Upload File: C:\DOWNLOAD\Download.tgz

Key Value: 4DF9

찾아보기...
Upload

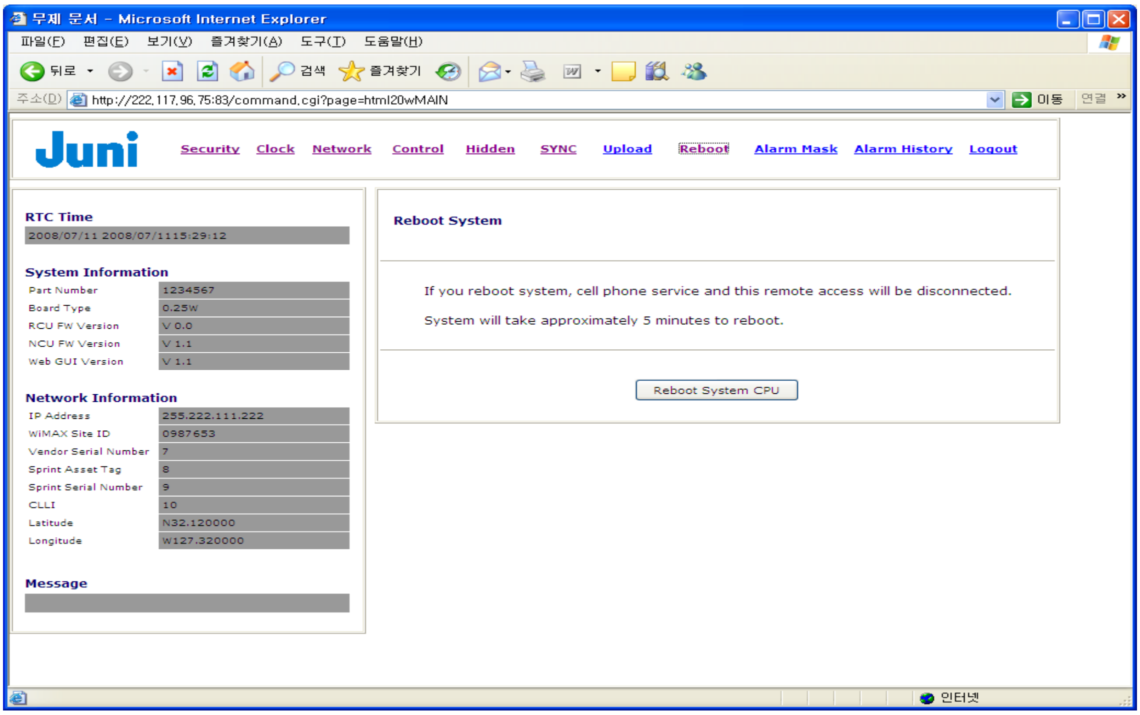
<Figure 10-23> Upload File Information

Each supplied upload files are allocated with 4 distinguishing key values. These key values and the upload files are checked. If they are not correct, upload action is denied.

When the [Upload] button is clicked, system upload is initiated. Once the upload is complete, the system will reboot.

2.10 Reboot

When [Reboot] link in the main menu is clicked, a page will be displayed whereby the system can reboot. Within this page, if [Reboot System CPU] button is clicked, system will reboot.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
Reboot System CPU
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time

2008/07/11 2008/07/1115:29:12

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Reboot System

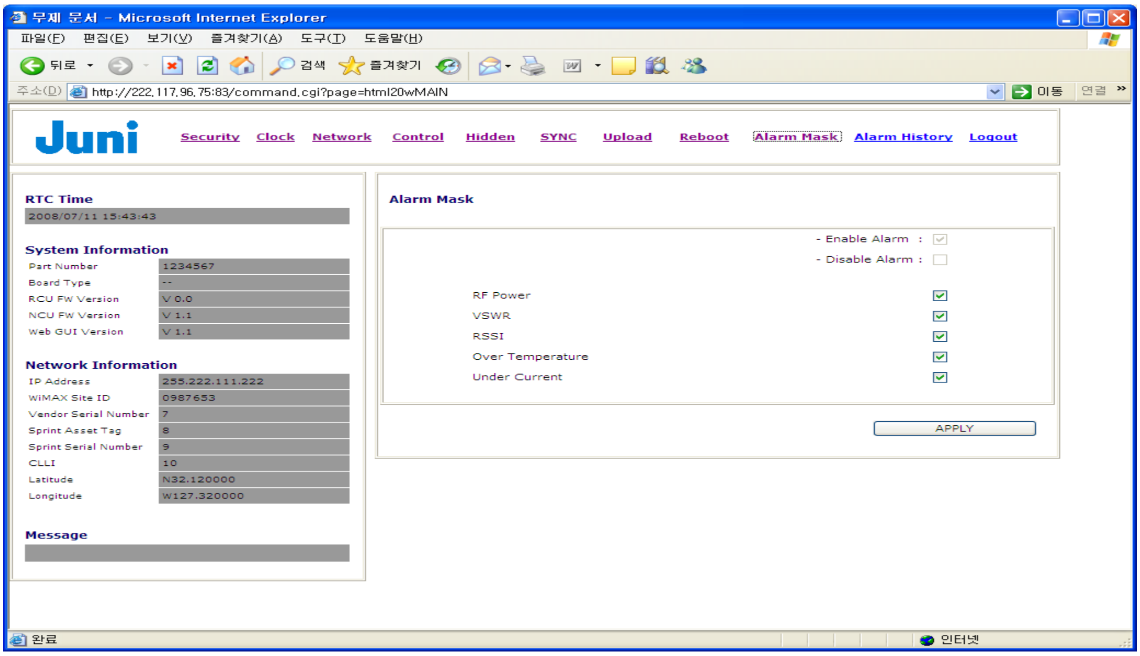
If you reboot system, cell phone service and this remote access will be disconnected.

System will take approximately 5 minutes to reboot.

<Figure 10-24> Reboot

2.11 Alarm Mask

In the main menu, when [Alarm Mask] link is clicked, ‘ Alarm Mask’ page is displayed.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
APPLY
완료
인터넷

http://222.117.96.75:83/command.cgi?page=html20wMAIN

RTC Time
2008/07/11 15:43:43

System Information

Part Number	1234567
Board Type	--
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

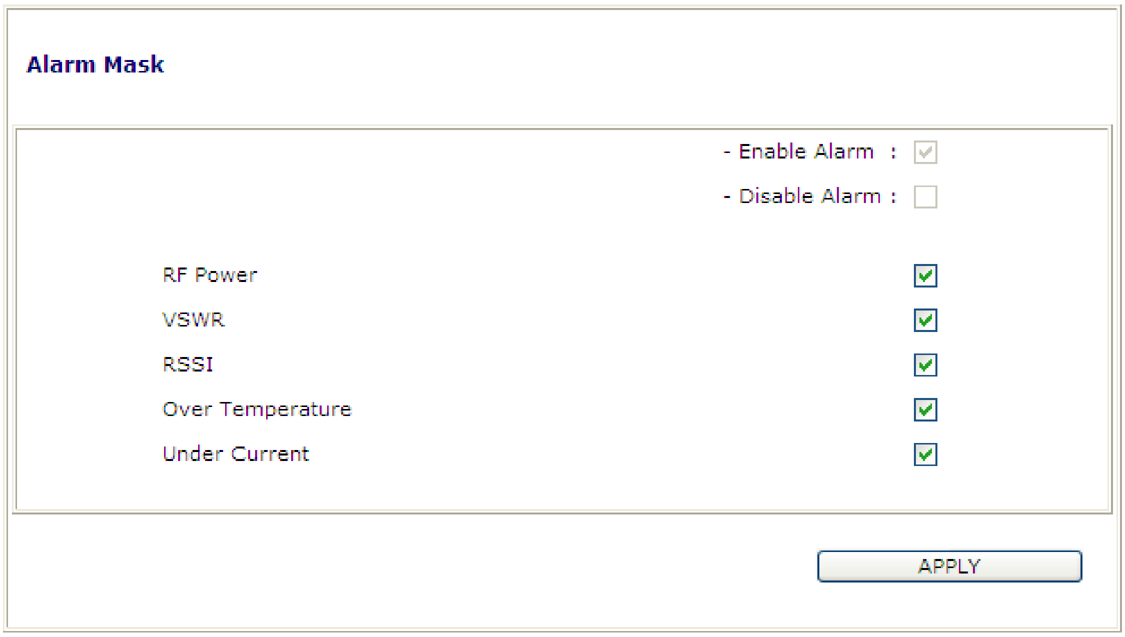
Alarm Mask

- Enable Alarm : ☑
- Disable Alarm : ☐

RF Power ☑
VSWR ☑
RSSI ☑
Over Temperature ☑
Under Current ☑

<Figure 10-25> Alarm Mask

Once the desired alarms for masking are checked, click on the apply button.



Alarm Mask

- Enable Alarm : ☑
- Disable Alarm : ☐

RF Power ☑
VSWR ☑
RSSI ☑
Over Temperature ☑
Under Current ☑

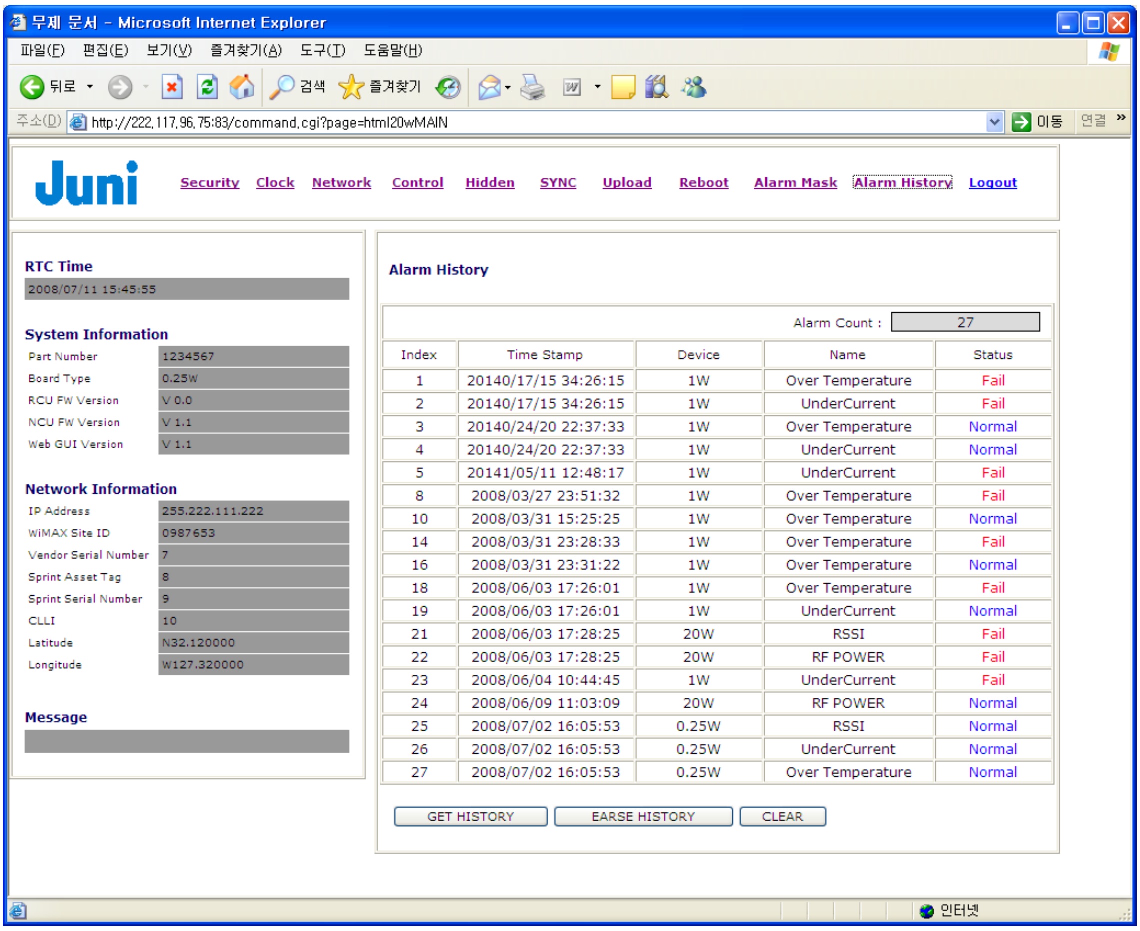
<Figure 10-26> Alarm Mask Setup

Below are items that are included in Alarm Mask section for monitoring and control.

Item	Notes
RF Power	
VSWR	
RSSI	
Over Temperature	
Under Current	

2.12 Alarm History

In the main menu, when [Alarm History] link is clicked, ‘ Alarm History’ page is displayed. Any alarms that occur during the operation of the repeater will be logged in this page.


무제 문서 - Microsoft Internet Explorer
파일(F) 편집(E) 보기(V) 즐겨찾기(A) 도구(T) 도움말(H)
뒤로
검색
즐겨찾기
주소(D)
http://222.117.96.75:83/command.cgi?page=html20wMAIN
이동
연결
Juni
Security
Clock
Network
Control
Hidden
SYNC
Upload
Reboot
Alarm Mask
Alarm History
Logout
GET HISTORY
EARSE HISTORY
CLEAR
인터넷

RTC Time

2008/07/11 15:45:55

System Information

Part Number	1234567
Board Type	0.25W
RCU FW Version	V 0.0
NCU FW Version	V 1.1
Web GUI Version	V 1.1

Network Information

IP Address	255.222.111.222
WiMAX Site ID	0987653
Vendor Serial Number	7
Sprint Asset Tag	8
Sprint Serial Number	9
CLLI	10
Latitude	N32.120000
Longitude	W127.320000

Message

Alarm History

Alarm Count : 27

Index	Time Stamp	Device	Name	Status
1	20140/17/15 34:26:15	1W	Over Temperature	Fail
2	20140/17/15 34:26:15	1W	UnderCurrent	Fail
3	20140/24/20 22:37:33	1W	Over Temperature	Normal
4	20140/24/20 22:37:33	1W	UnderCurrent	Normal
5	20141/05/11 12:48:17	1W	UnderCurrent	Fail
8	2008/03/27 23:51:32	1W	Over Temperature	Fail
10	2008/03/31 15:25:25	1W	Over Temperature	Normal
14	2008/03/31 23:28:33	1W	Over Temperature	Fail
16	2008/03/31 23:31:22	1W	Over Temperature	Normal
18	2008/06/03 17:26:01	1W	Over Temperature	Fail
19	2008/06/03 17:26:01	1W	UnderCurrent	Normal
21	2008/06/03 17:28:25	20W	RSSI	Fail
22	2008/06/03 17:28:25	20W	RF POWER	Fail
23	2008/06/04 10:44:45	1W	UnderCurrent	Fail
24	2008/06/09 11:03:09	20W	RF POWER	Normal
25	2008/07/02 16:05:53	0.25W	RSSI	Normal
26	2008/07/02 16:05:53	0.25W	UnderCurrent	Normal
27	2008/07/02 16:05:53	0.25W	Over Temperature	Normal

<Figure 10-27> Alarm History

Functions and explanations of each button are provided below.

GET HISTORY : Alarm histories that are saved in the system are displayed.
EARSE HISTORY : Alarm histories that have been saved in the system are deleted.
CLEAR : Initialization of List.