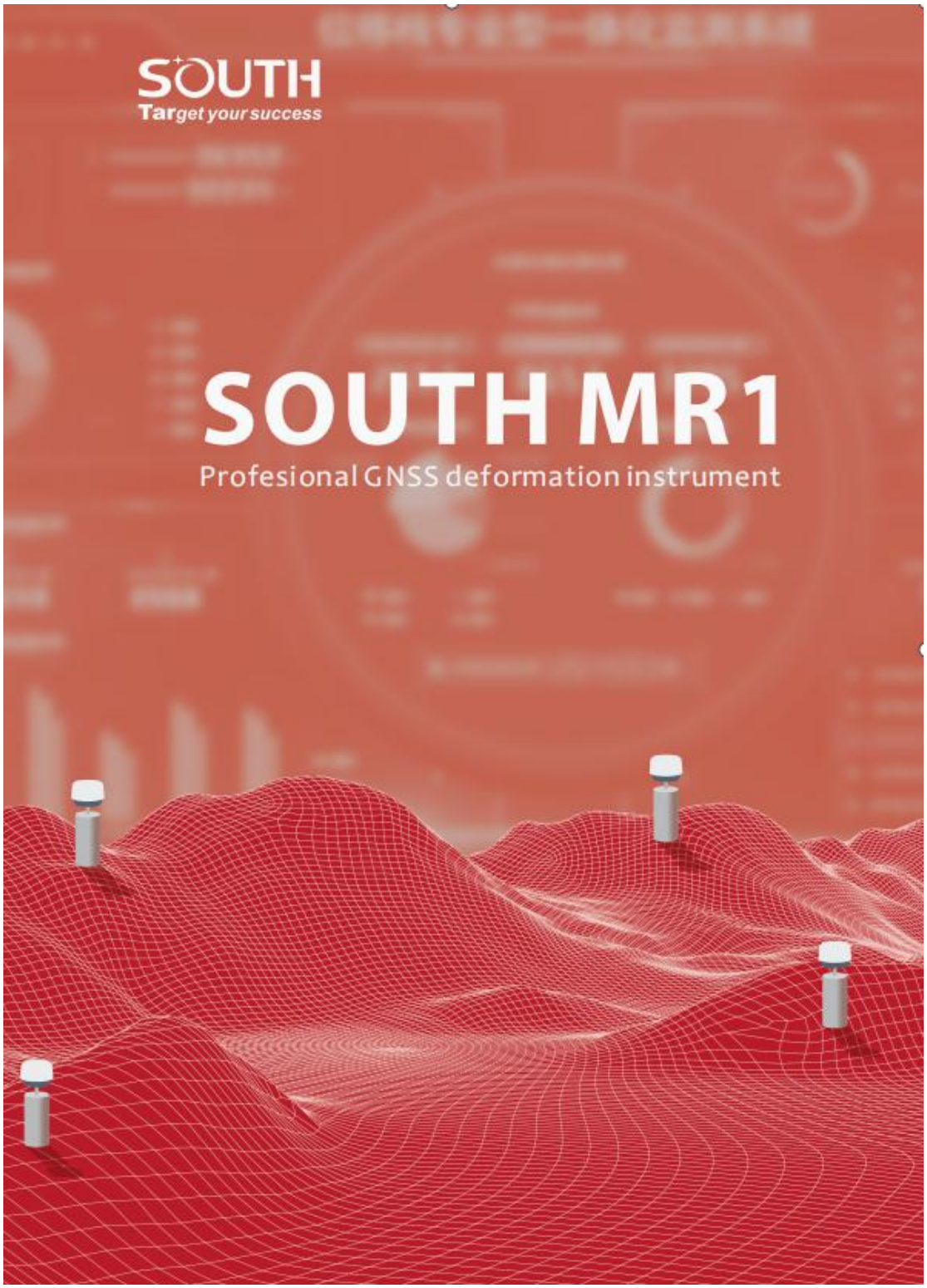


SOUTH Surveying & Mapping Technology CO., LTD

Contents

SOUTH MR1 Profesional GNSS deformation instrument Product Manual

1. product description

Reading this chapter, you can master the system composition and functions of the Monitoring receiver MR1 in detail.

1.1 Product model

Monitoring receiver MR1 GNSS receiver.

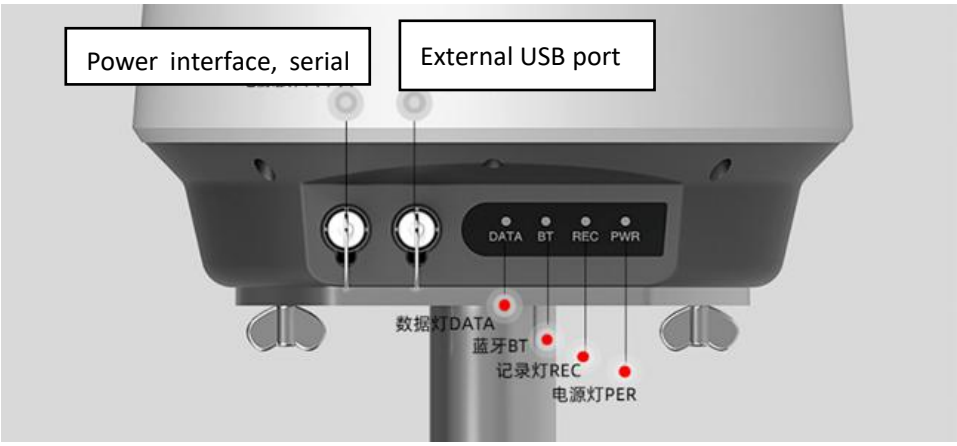
1.2 Product application scenarios

This product is suitable for surface displacement and deformation monitoring in multiple scenarios, such as surface displacement and deformation monitoring of geological disaster deformation bodies in the land and soil industry, surface displacement and deformation monitoring of reservoir dams in the water conservancy industry, slope displacement and deformation monitoring in the transportation industry, and mines Displacement and deformation monitoring of mining slopes, dumps, tailings reservoirs, dams, etc., and house deformation monitoring, etc.

1.3 Appearance of displacement stack product

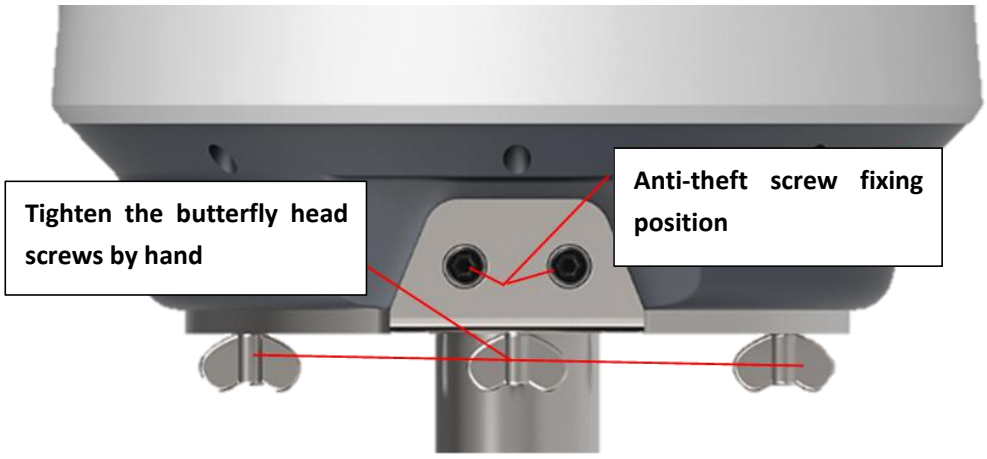
The overall appearance of the displacement stack is "trapezoidal cylinder", the top cover part is white injection molding, the surface is matte, the base is aluminum alloy die-casting, and the surface is dark gray powder sprayed. The front and rear panels are made inwardly flat, one side is the line interface and indicator position, the other side is the installation fixed surface, the bottom panel is equipped with function buttons and SIM card slot, which is simple to operate and convenient to use. The details are as follows:
positive

The front panel provides LCD display and interface functions, including DATA data light, BT light, REC recording light, PWR power light 4 indicators, a power interface \ serial port, and an external USB interface.



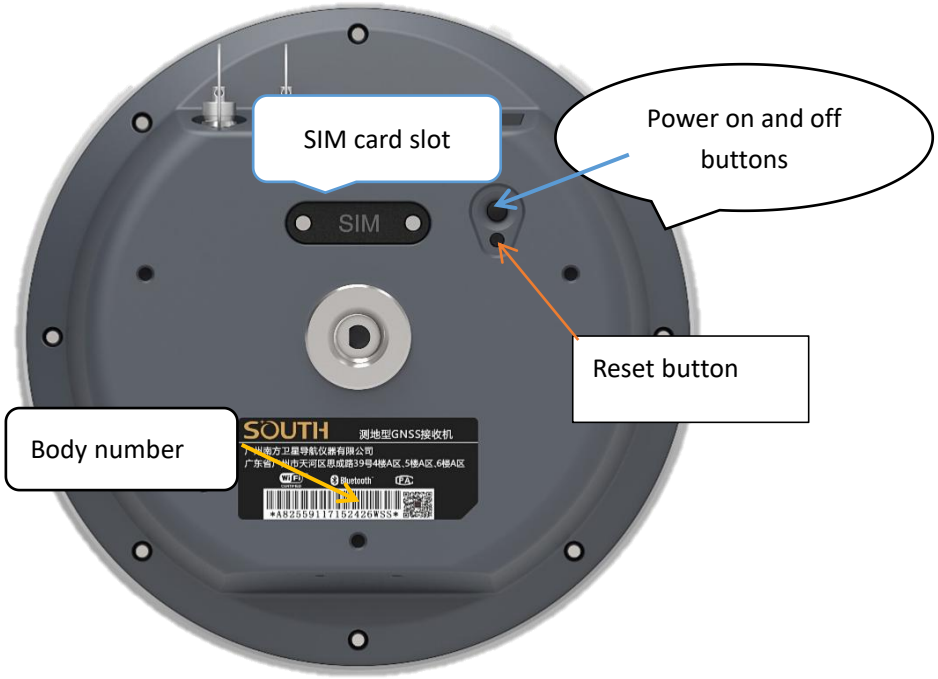
back

The back is the mounting surface. The location of the host is fixed by an anti-theft screw to achieve a physical anti-theft function.



bottom

There is a SIM card slot and two buttons at the bottom of the host. The buttons are the switch button and the reset button.



1.4 Interface indicator and button introduction

There are two buttons at the bottom of the host, one. .
The specific information is shown in the following table:

project	position	Features	Role and status
Front panel (Indicator light)	DATA	Data light	In network mode, the data light flashes quickly when dialing, and after the dialing is successful, the data light flashes every second, which means that the differential data is received stably.
	BT	Bluetooth light	After the host connects to the handheld device via Bluetooth, the Bluetooth light keeps on.
	REC	Recording light	Flashes regularly according to the sampling interval set by the system.

		Power light	The red light is always on under normal working conditions, and the power light flashes when the voltage is undervoltage.
Front panel (interface)		Power interface\serial port	---
		External USB interface	---

2.Wireless network connection

Use a PC to connect to the host's WIFI network, the network name is SOUTH_**** (**** is the last four digits of the fuselage number), and there is no initial password. Open the browser and enter http://10.1.1.1 in the address bar to open the Web Server login interface.

Log in to Web Server

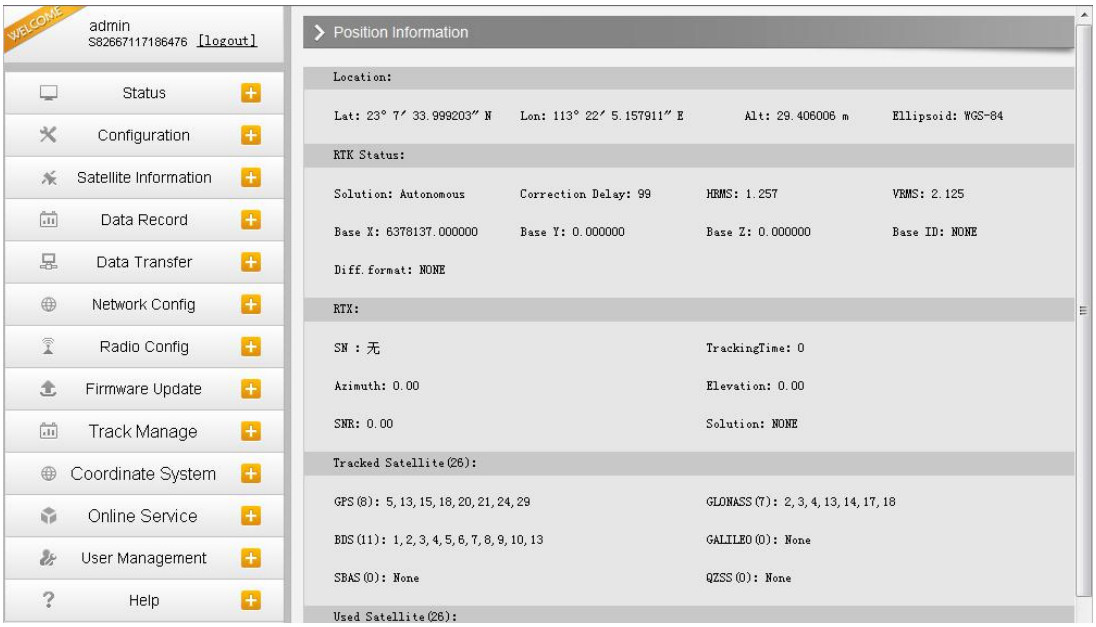
Enter the MR1 Web Server system login page, as shown in Figure 3-8, enter the user name and password shown in Table 3-2 on the login page, and click "User Login" to enter the home page of the MR1 Web Server system.

account type	username	password	Authority
general user	admin	admin	View host status, configure host Parameters, download data records, liters Level firmware, change the encryption card, etc.

Note: Chromium browser is recommended for MR1 Web Server system operation!!

3.Web UI main interface

After login the Web UI management of MR1by WIFI or USB connection, the main interface appears with displaying configuration items and positioning. As shown at following figures.



In the Web UI home page, the configuration items are listed at left side. And the positioning information including coordinates information and satellites are displayed at right side.

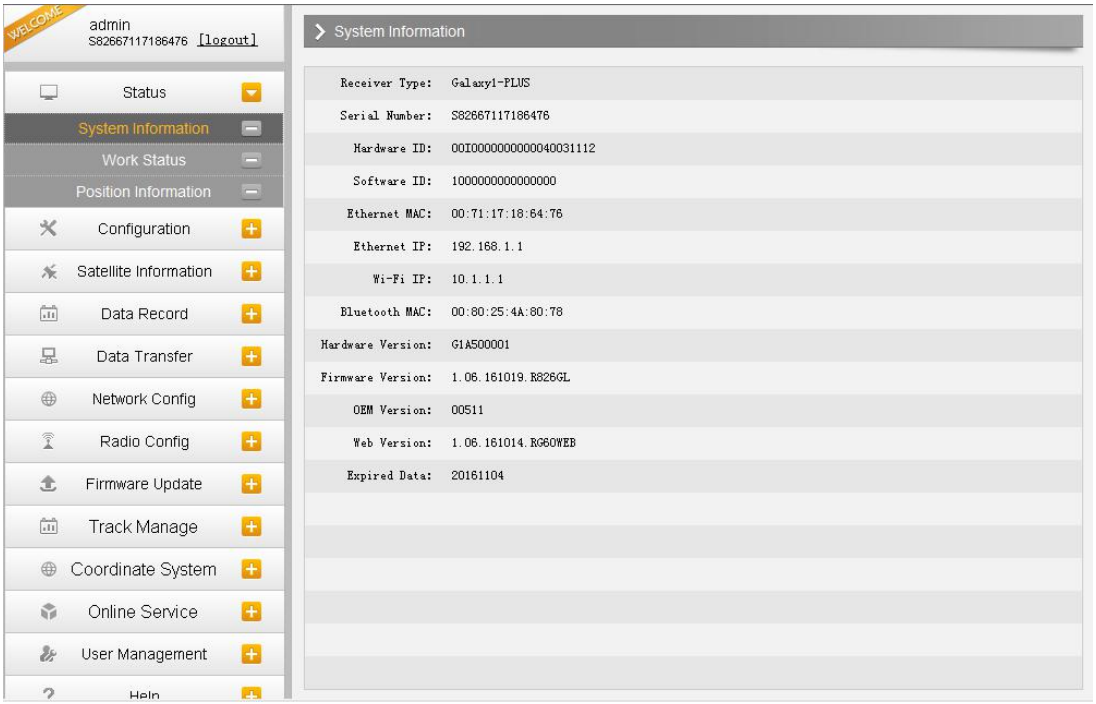
Ref	Component	Description
	**Status**	Positioning information, satellite tracking and the others will be displayed in this page
	**Configuration**	It contains registration for receiver, base configuration, antenna configuration, satellite configuration, receiver configuration and system configuration.
	**Satellite Information**	Display and control the satellites are used or not
	**Data Record**	Configure the parameters for static mode and raw data download
	**Data Transfer**	Contains NTRIP configuration, TCP/IP configuration and data transferring with PC
	**Network Config.**	Contains network parameters configuration, WIFI configuration and the other functions
	**Radio Config.**	Configure the parameters and frequency for radio modem
	**Firmware Update**	It is used to upgrade the firmware for receiver and each modem
	**Track Manage**	Record track file while doing measurement
	**Coordinate System**	Setup a local coordinate system for MR1
	**Online Service**	Upload data onto a server in real-time
	**User Management**	Add and manage the Web UI users
	**Help**	Offers solutions

3.1 Status

System Information, Work Status and Position Information are listed under Status menu.

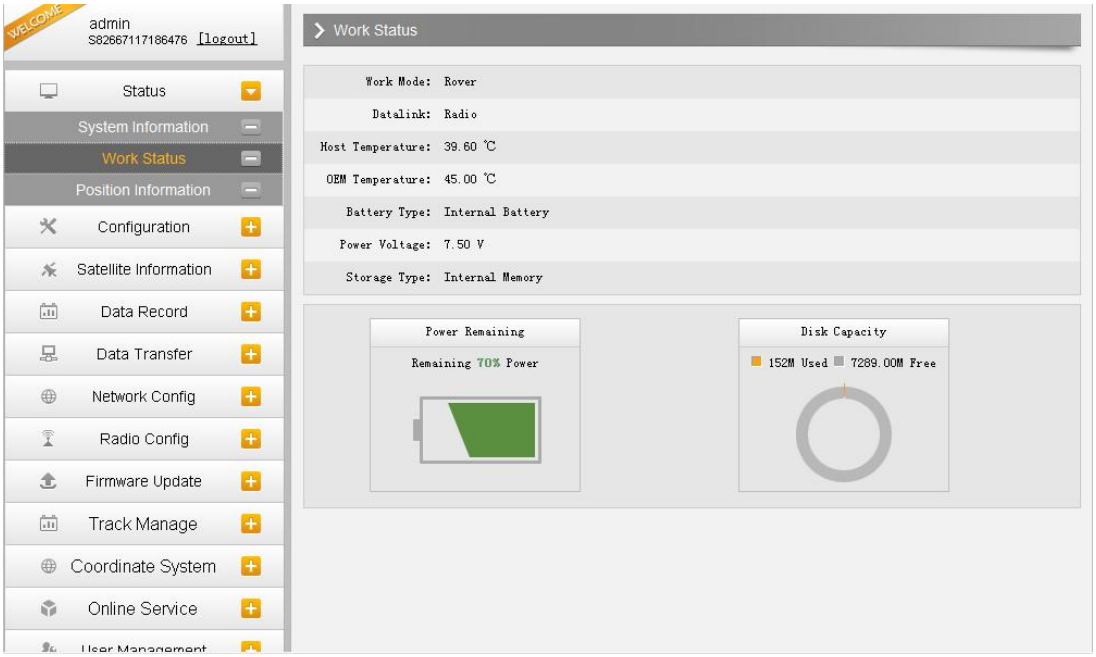
System Information

In this page, all the information of MR1is displayed such as serial number, hardware ID, MAC address, firmware version and so on.



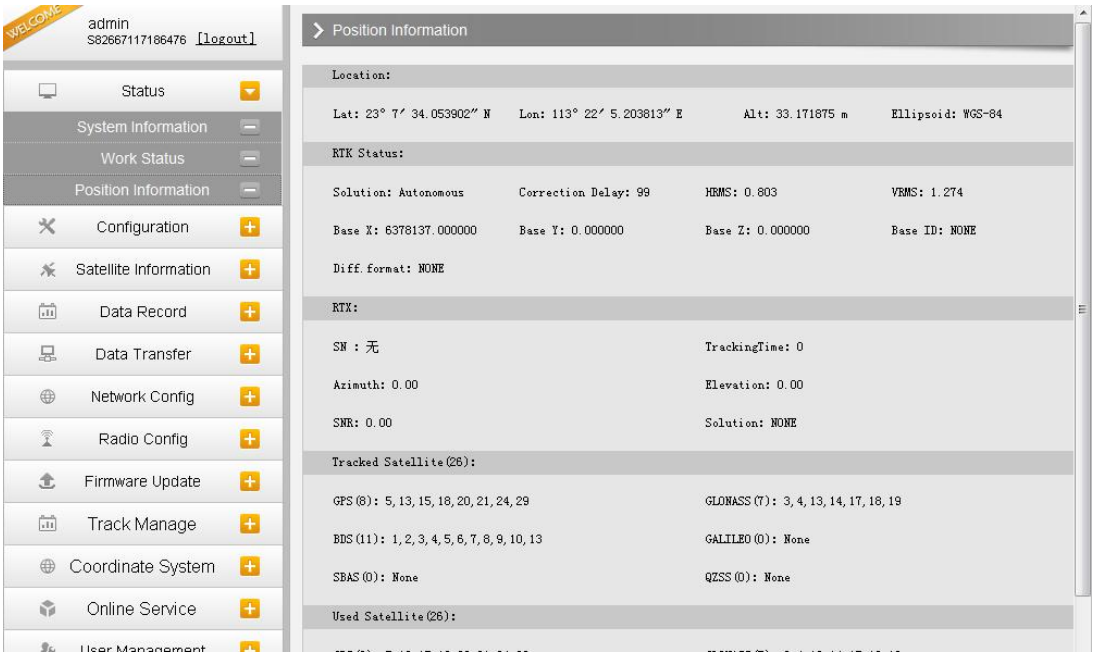
Work Status

The physical state of MR1such as working mode, datalink, host temperature, remaining power and the free memory is obtained from this page



Position Information

In this page, users can be clear at a glance on current position information and satellite information

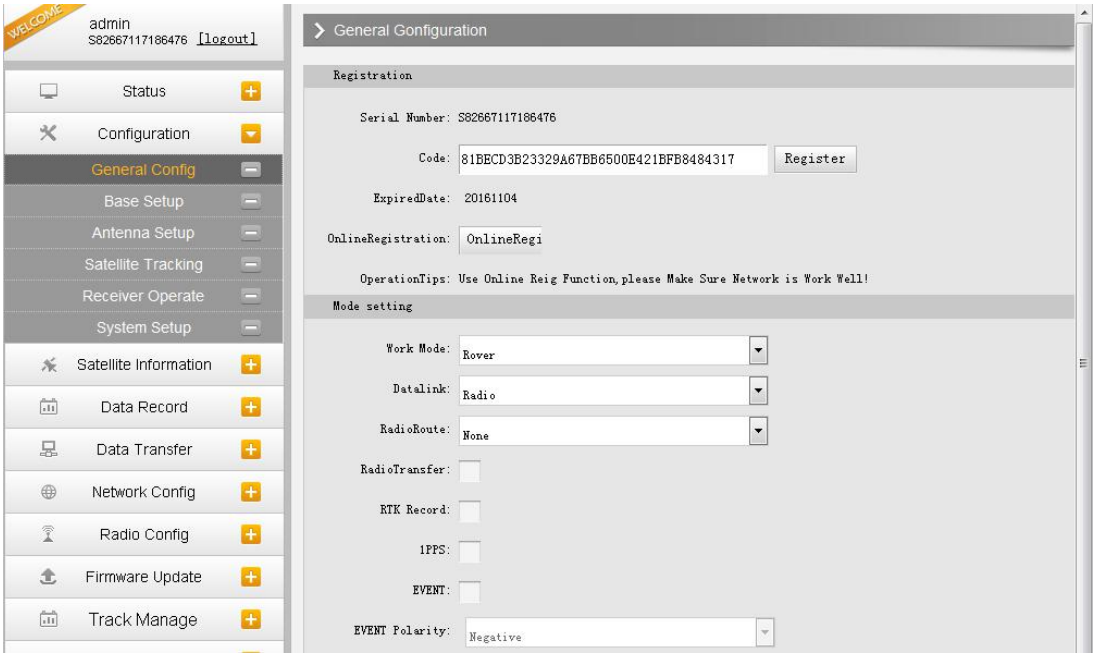


3.2 Configuration

General Config, Base Setup, Antenna Setup, Satellite Tracking, Receiver Operate and Default Language are contained under Configuration menu. Users are able to configure all kinds of parameters for MR1under Configuration menu, and all the settings are immediate effect after saving.

General Config

The registration for receiver working mode setting can be completed in this general configuration page.

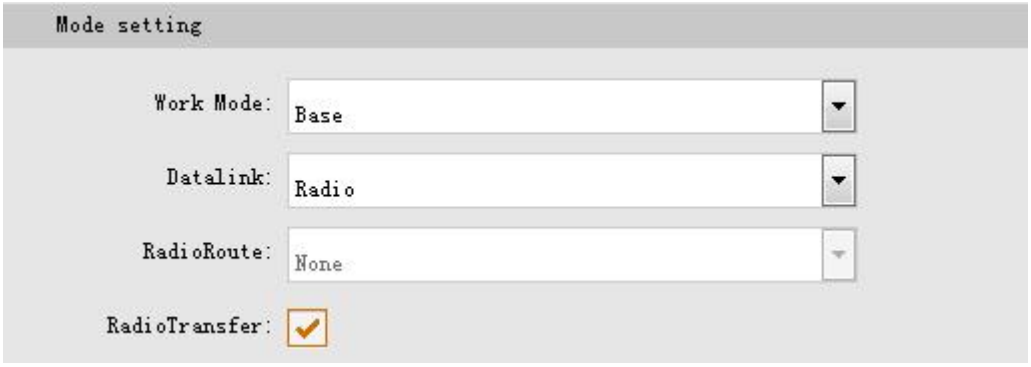


If the code of MR1 has expired or is going to be run out, please provide the serial number of your MR1 for us to apply for another available code, then input the code into the blank or register the receiver online.

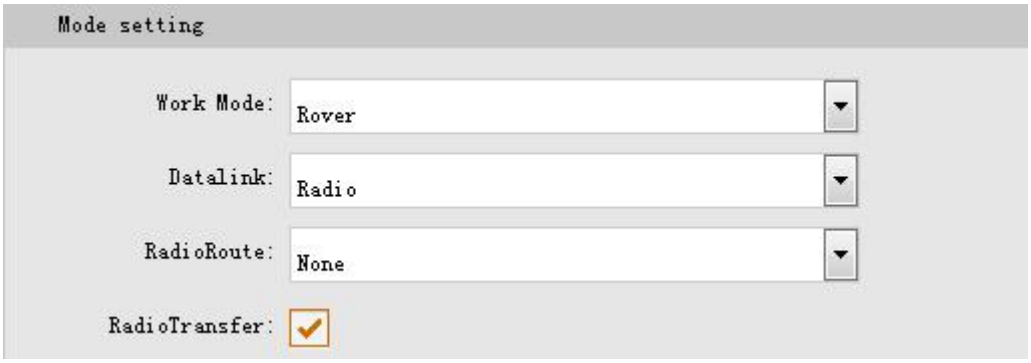
MR1 allows users to setup the working mode and datalink from this Web UI that only need the mobile phone or tablet PC is able to connect the WIFI hotspot of MR1.

Operation:

1, check the box of “Radio Transfer” on “General Config” dialog for Base station.



2, open the same function for Rover in critical status (when the Rover is close to working distance of Base internal UHF).



3, configure the datalink of the other rovers into internal UHF mode, then make sure the channel, protocol and frequency point are same as “Repeater” rover.

Note: please take in mind that the “Repeater” rover should keep away from Base

station to avoid signal interference.

RTK Record: This is used to enable raw data recording in base mode or rover mode for post-processing

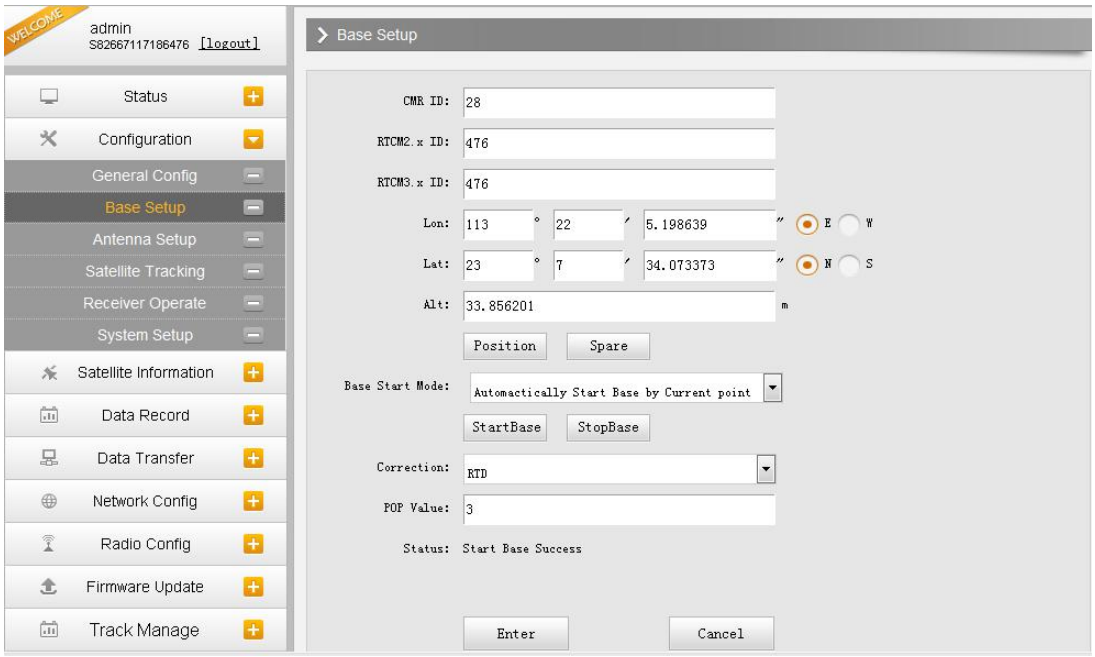
1 PPS: This option is for the 1 pulse per second output

EVENT: This option is for the EVENT marker input

EVENT Polarity: EVENT input method.

Base Setup

When MR1 works as a base, the basic configuration for base can be setup in this page. Users can input the correct coordinates or capture a current position for the base. Also users can define what kind of correction format is transmitted.



CMR ID/RTCM2.X ID/RTCM3.X ID: Users can specify the ID for transmitting correction.

Position: Click this button to capture the coordinates for current position

Spare: This is used to the repeat station

Base Start Mode: Here contains 3 methods to start the Base, manually start base, automatically start base by fixed point, automatically start base by current point.

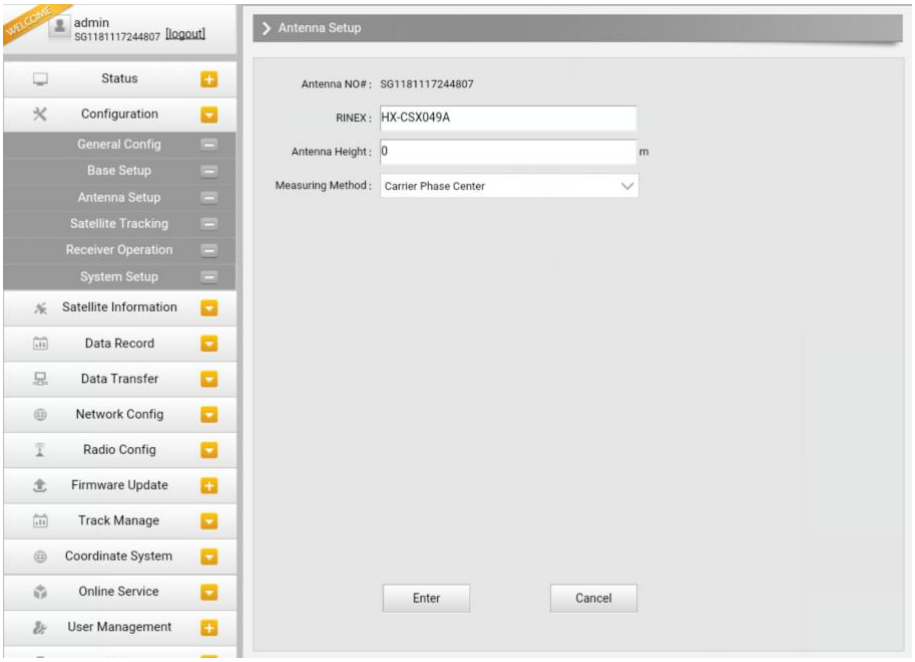
Correction: Here contains the global general used correction formats including RTD,RTCM23, RTCM30, RTCM32, CMR and SCMRx

POP Value: This value is setup for the PDOP limitation.

Status: Here will display the status for base in real-time.

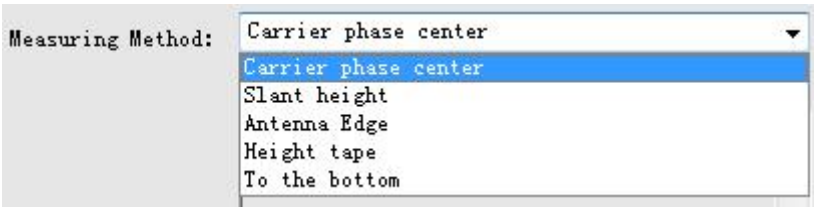
Antenna Setup

The antenna parameters are configured in this page including the antenna height, measuring method.



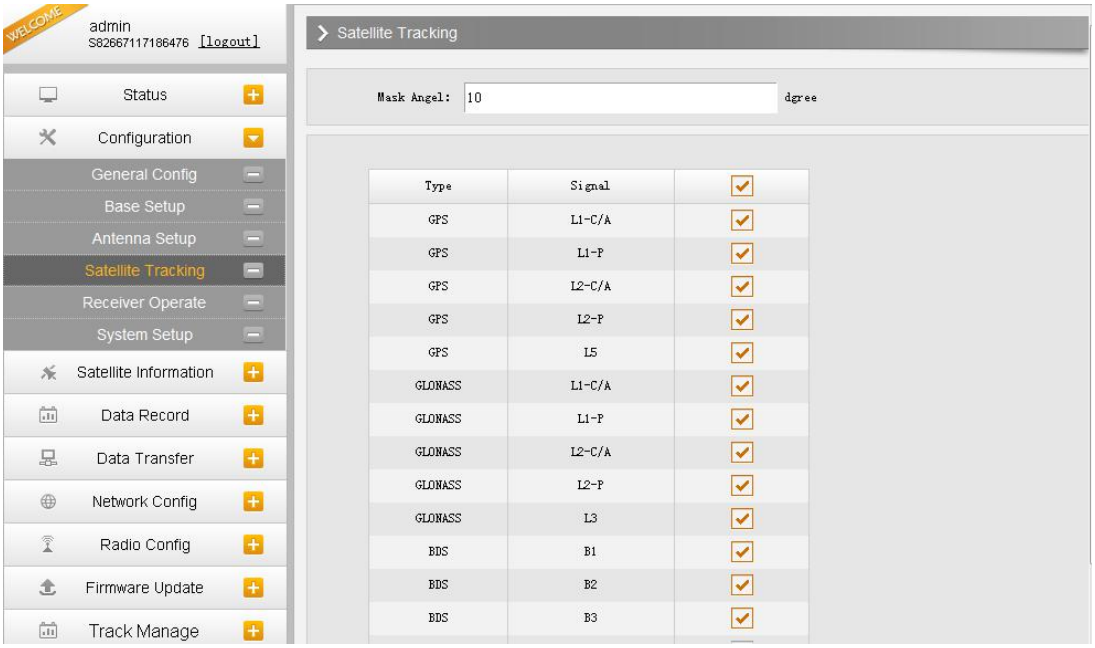
Antenna Height: This is the value for height of antenna while surveying.

Measuring Method: Here provides several methods for measuring the antenna height such as carrier phase center, slant height, antenna edge, height plate and to the bottom.



Satellite Tracking

In this page, users can define the mask angle for satellite tracking, and check on the box of corresponding band from the constellation that to use this band or not



Receiver Operate

The page provides all kinds of operations to control the receiver such as self-check operation, clean epochs, factory reset, reboot and power off.

Self-check: Users can also do the self-check from this configuration page, click on the Check all button to check all the modems or click on the check button corresponding to the modem to check one by one.

Clean EPH: Click this button to clear the remaining epochs to let recever track the satellites better.

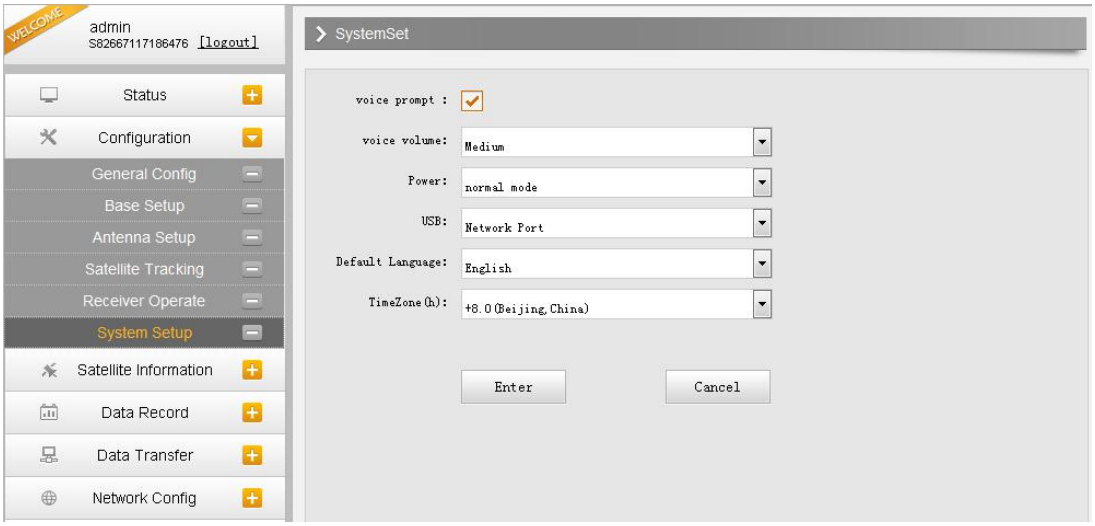
Factory Default: Click this button to bring the receiver back to factory default setting.

Reboot: Click this button to restart the receiver.

Power Off: Click this button to power off the receiver.

System Setup

This page is used to control Voice prompt, volume of voice, power saving, USB mode and the default language for receiver.



Voice Prompt: Check on this box to turn on the voice guide for MR1, uncheck it to turn off the voice guide.

V**oice Volume:** Define the voice volume for MR1's speaker.

Power: Configure the receiver to use the power saving mode or not.

USB: This is used to configure MR1what kind of USB mode output from 7-pin port when connect the receiver with computer via USB cable. USB and network port for optional.

Default Language: Configure the default language for MR1which associates with voice guide.

Note: This is not the language setup for web UI, the Web UI only supports Chinese and English.

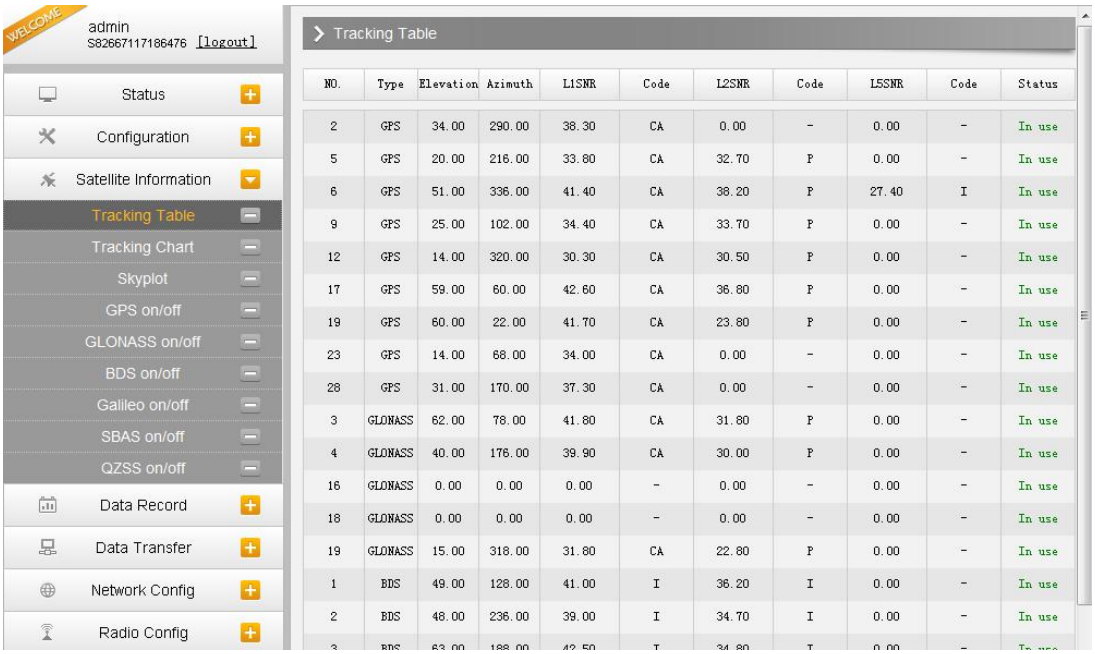
Time Zone(h): Use this to setup the corresponding time zone for your country or area.

3.3 Satellite Information

The "Satellite Information" provides all kinds of tables, graph and the skyplot to view the information of tracking satellites. And it is allowed to configure to use which satellite in constellation on/off page by checking on the corresponding box.

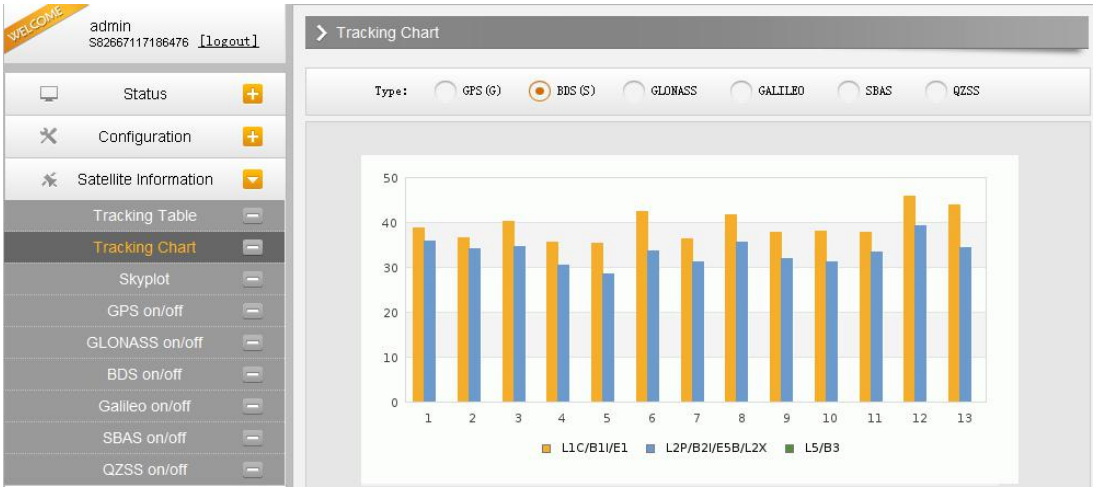
Tacking Table

Here is the table to list all current used satellites and the other information for these satellites.



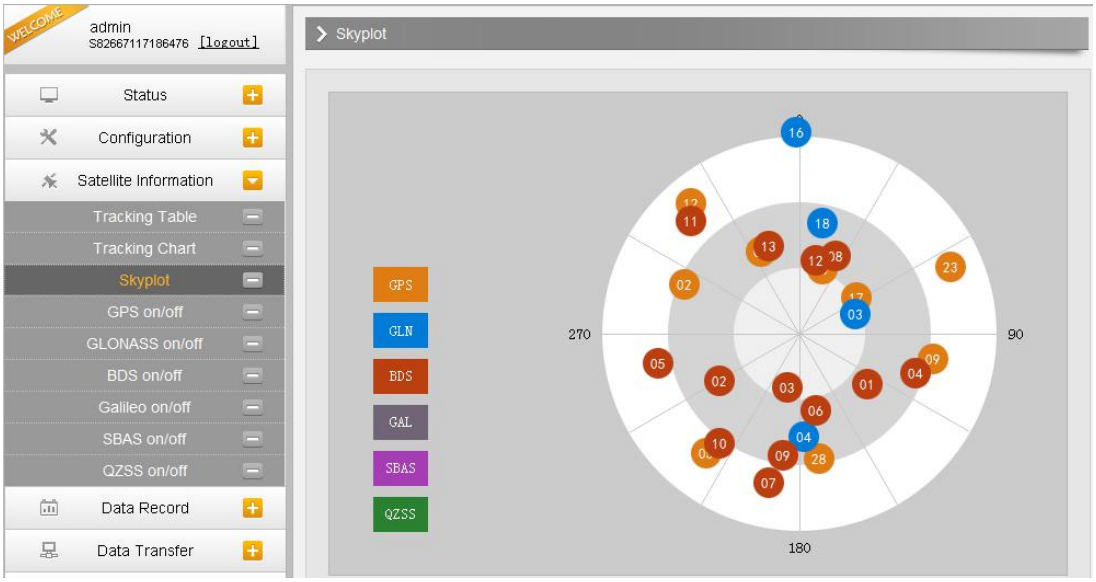
Tracking Chart

In this page, the histogram will indicate the signals from those used satellites, and allow to check each constellation separately.



Skyplot

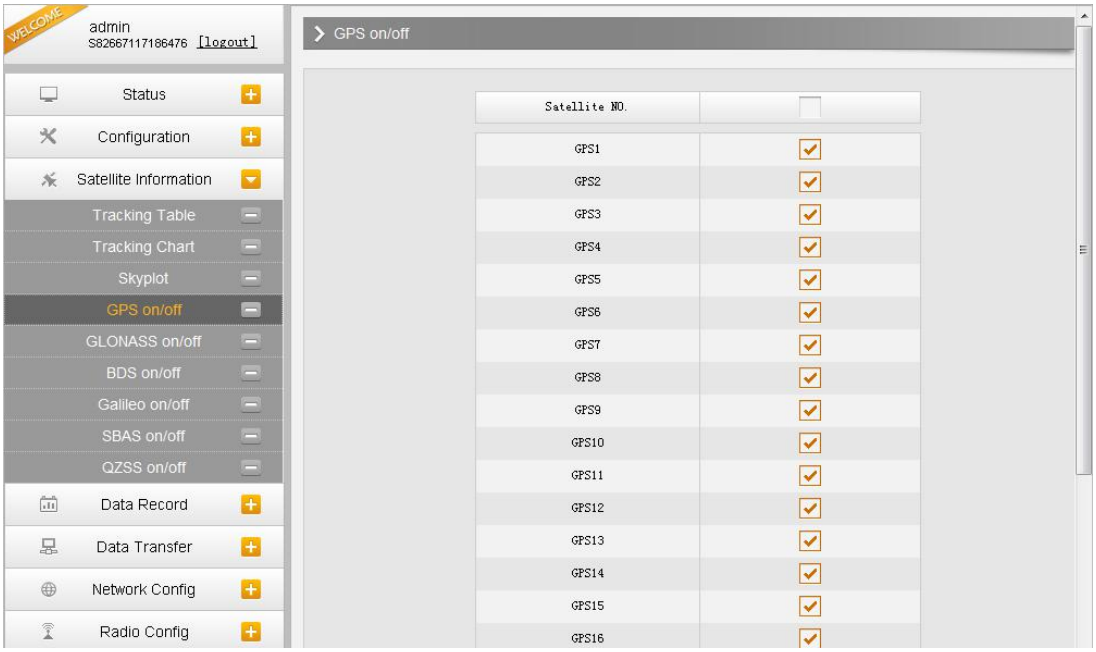
In this page, all the tracking satellites are shown on the sky plot, this let users intuitively view and know where the current position of satellite is.



GPS on/off

For all the running GNSS constellations or the augmentation system, MR1allows to configure to use which satellite or not.

In GNSS on/off page, all the running satellites are listed, and unselect the box corresponding to the satellite to not use it.

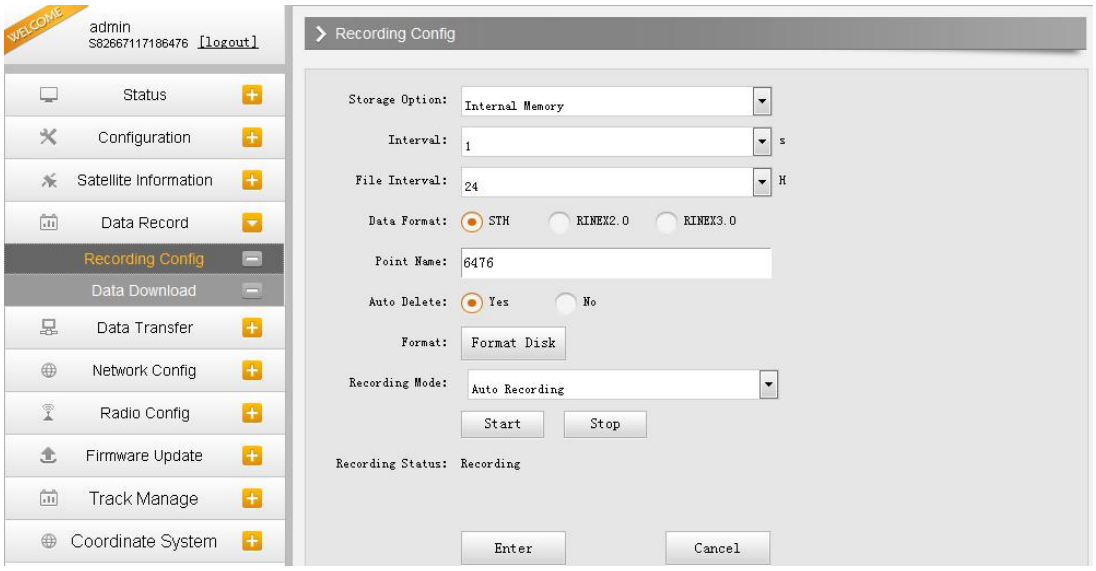


3.4 Data Record

The “Data Record” performance is mainly used to configure all the parameters for receiver in static mode. Much more operations can be done on MR1such as storage path, interval, data format and data files download.

Recording Config

The page provides more practical operations for raw data storage.



Storage Option: Here are the options to be selected for where the raw data will be stored, internal memory or external memory.

Interval: This is the sampling interval for data storage, 50Hz(0.02s) sampling interval now is available for MR1.

File Interval: This is used to defined the data storage time for the static file.

Data Format: Here are 3 options to selected for MR1to store what kind of format data, STH, Rinex2.0 and Rinex3.0.

Point Name: A point name is required, the last 4 digits of SN is default setting for the point name.

Auto Delete: This is used to configured MR1to delete the previous data files automatically if the memory is full.

Format: Click this button to format the internal memory for MR1.

Recording Mode: Here are 2 options to configure MR1to record raw data automatically or not if it achieves the sampling conditions.

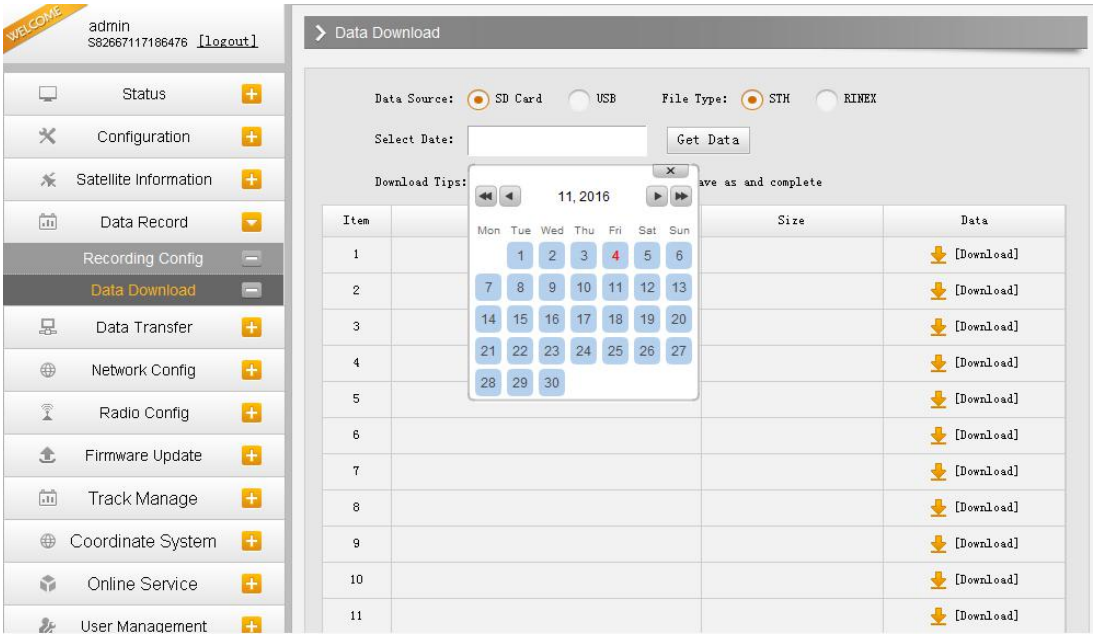
Start/Stop: Click these buttons to start recording or strop recording the raw data.

Recording Status: Here shows the status of static data storage.

Data Download

This page provides the data files to download

Choose the storage where the static data recorded, and file type, then click on the blank of “Select Date” to choose what date the data was recorded and click “Get Data” button, all the files recorded in the date you choose will show in the table, tap download button to download the data files.

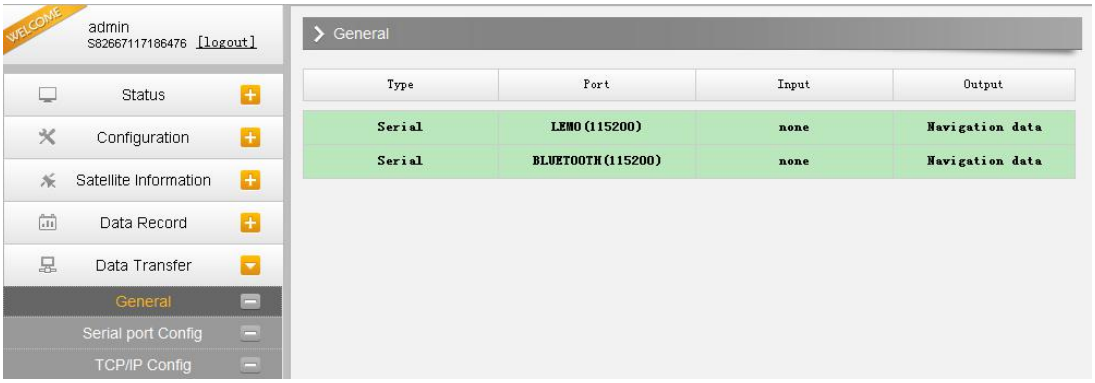


3.5 Data Transfer

This performance contains General, Serial Port Config, TCP/IP Config, NTRIP Config and Data Flow Config. The “Data Transfer” allows to configure the output mode for raw observation data and differential data, as well as to the NTRIP performance configuration.

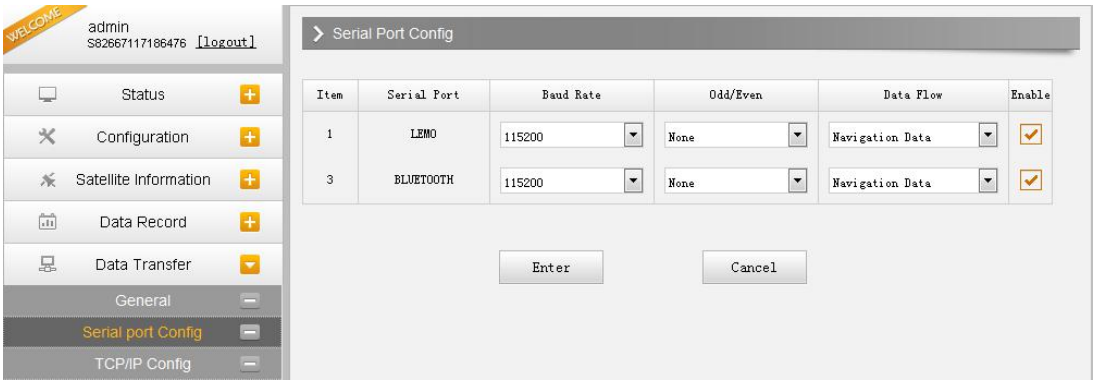
General

This page shows the service condition and the output contents of the ports, if the port item display in green, that means the port is being used, and the port is not used while the item display in red.



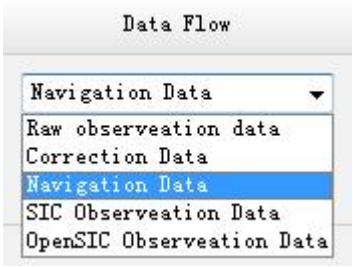
Serial port Config

This page is allowed to configure the baud rate, odd-even check and the data flow for serial port (5-pin port) and Bluetooth.

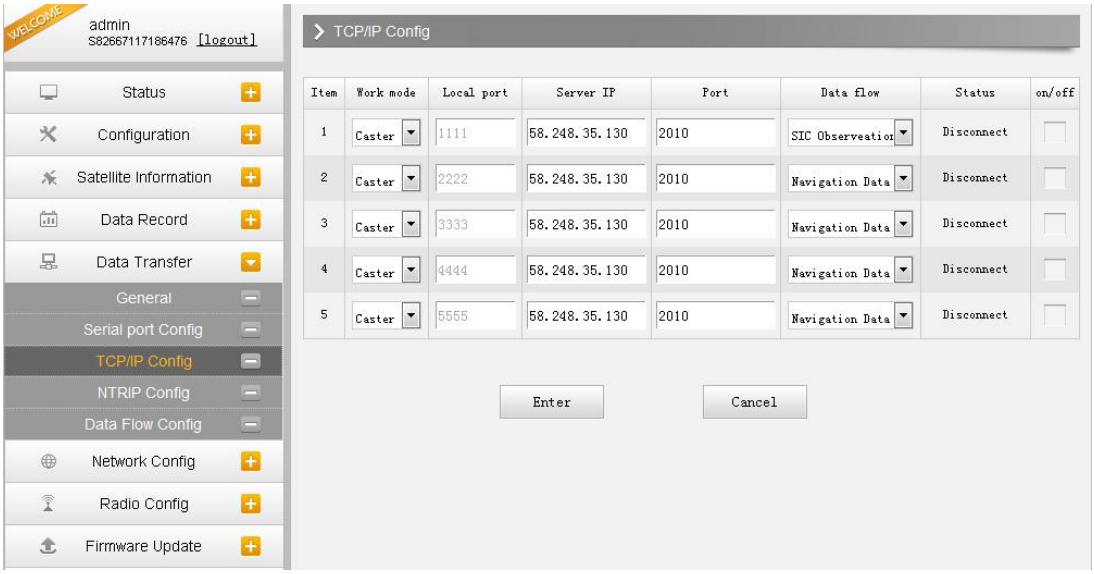


CAUTION: do not change the default value in this page for each item, if you want to change the settings, please contact with SOUTH technician for further support.

In the drop down list of data flow, there shows 4 items for selection.
Raw observation data: This is the raw observation data straight from OEM board.
Correction Data: This is the correction data straight from OEM board.
Navigation Data: This is the navigation data output from receiver such as NMEA-0183, GSV, AVR, RMC and so on. It is configured in Data Flow Config page.
SIC Observation Data: This is the user-defined format observation data from SOUTH.
OpenSIC Observation Data: This is the open version of SOUTH user-defined format observation data for secondary development.



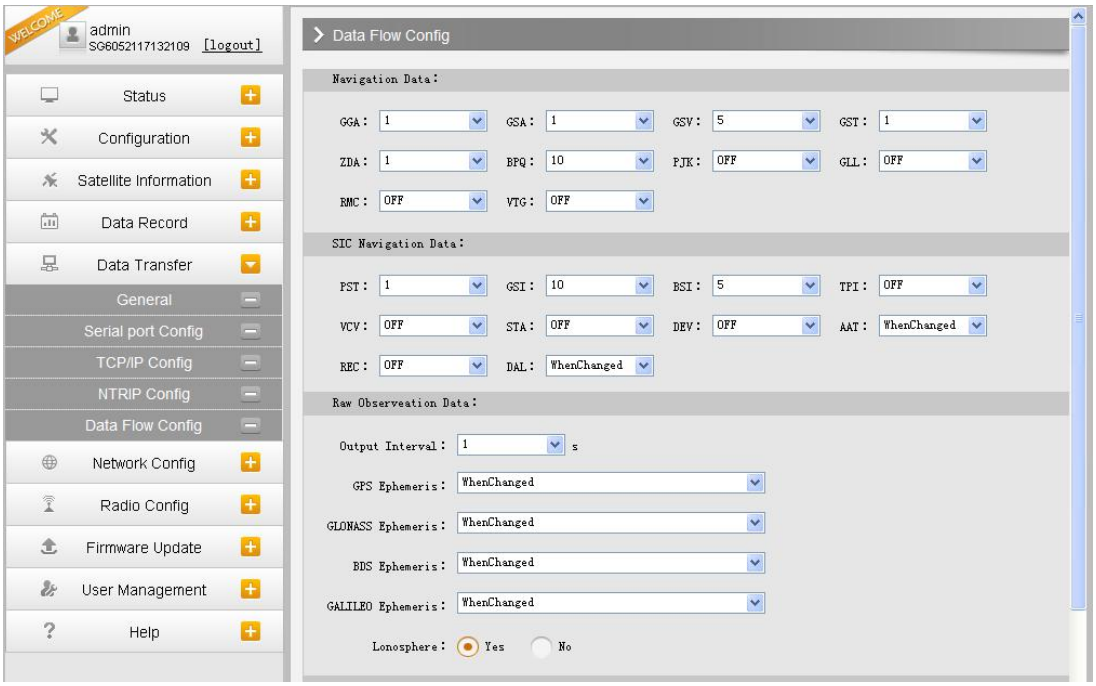
TCP/IP Config
This is used to configured the raw data or navigation data to be uploaded or transferred to a server. And there are Caster and Server working mode for this performance.
Caster: If this working mode is selected, MR1will be a client to upload the data to a specify server if it connects to the internet by WIFI or GPRS connection with SIM card inserted. Input the specified IP and port for server, and the data format what is uploaded. Then users are able to see the uploaded data on server.
Server: MR1will upload the data onto internet by the static WIFI if server is selected, then users are able to obtain its dynamic data by accessing to MR1through the IP from receiver.



Data Flow Config

In this page, users can optionally to configure the content and the update rate of data flow that to output or not to output what kind of data format.

Click on the dropdown list for each data format to define the update rate



3.6 Network Config

The “Network Config” is able to configure the ways and the contents for internet access of MR1. GSM/GPRS Config, CSD Config, WIFI Config, Bluetooth Config, Port

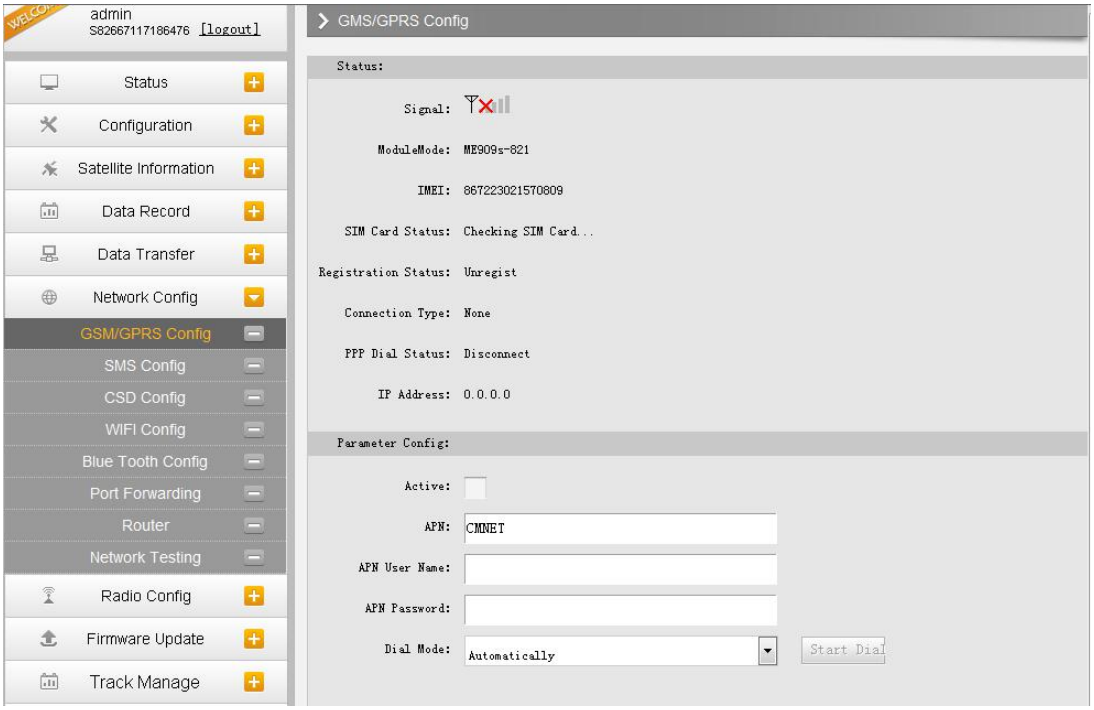
Forwarding, Router and Network Testing are under the list of Network Config.

GSM/GPRS Config

In this page, all the information of receiver under GPRS mode will be displayed including the hardware information and dialing status.

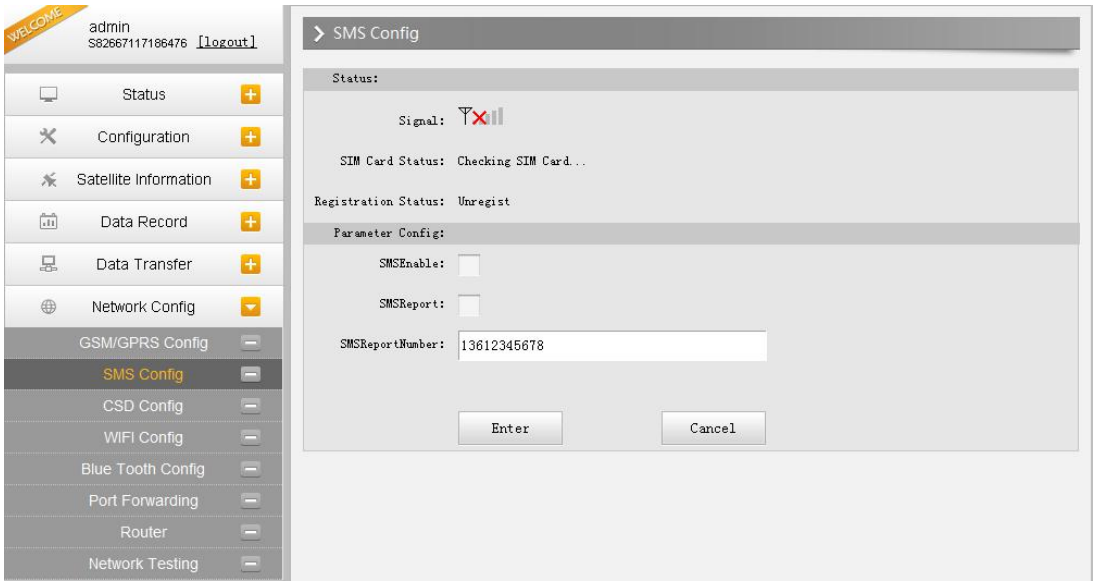
Status: The dialing status and hardware information are displayed in this field that users can intuitively to view the signal of network, module model and the IMEI number of the module.

Parameter Config: The parameters of SIM card are input in this field including APN, assigned username and password, dial mode.



MSM Config

On this configuration dialog, input a phone number into the blank, MR1will send text message onto the phone which number is written.



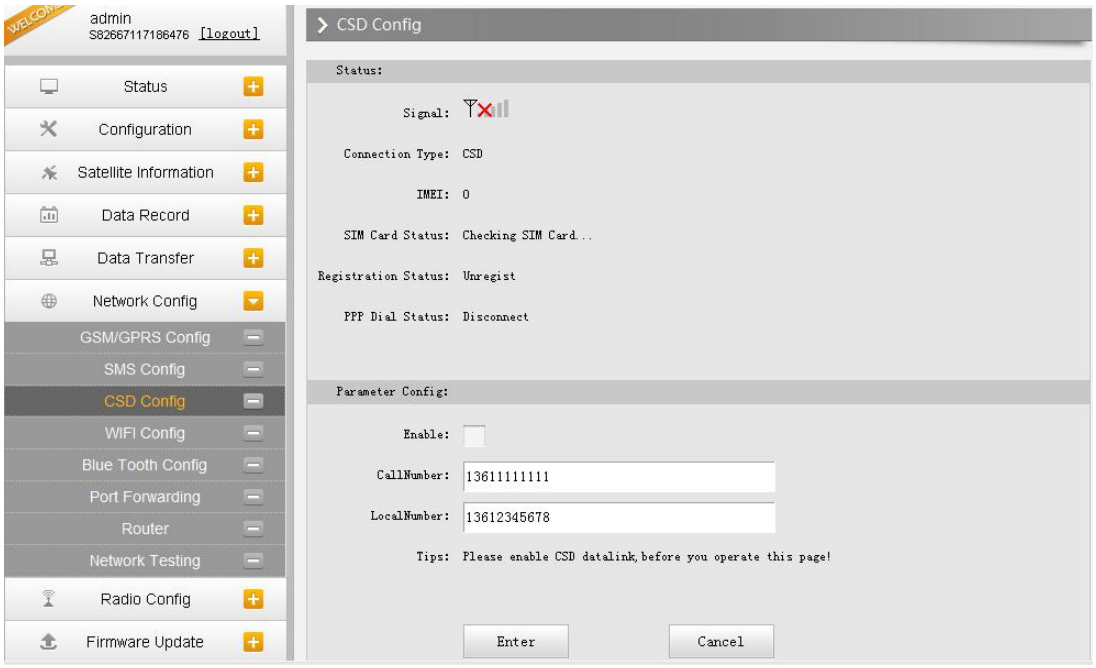
CSD Config

CSD is the meaning of direct dial between Base and Rover with SIM card inserted (the CSD function should be activated on local SIM card), this function is mainly used in the area where there is very poor internet signal coverage.

Status: This field displays the dialing status when CSD is used on MR1.

Parameter Config: To enable the CSD function with checking the box of Enable option in this field, then input the phone number for Rover and Base in CallNumber and LocalNumber.

Tips: please choose CSD as datalink for receiver in General Config.



WIFI Config

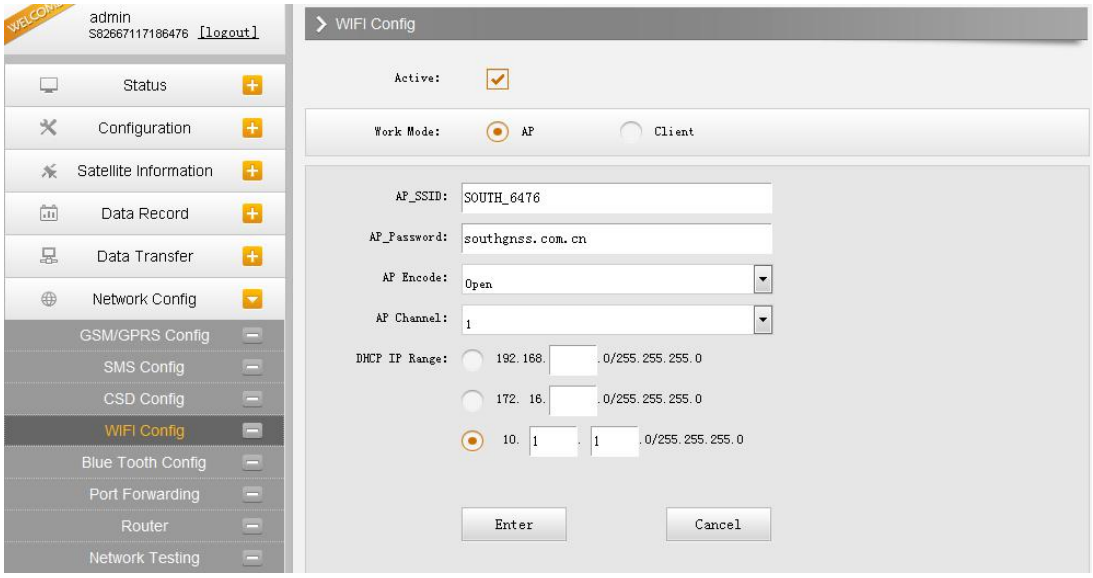
This is mainly used on the WIFI configuration for MR1, there are AP mode and Client mode for optional.

AP:

This is used to enable the WIFI hotspot for MR1to broadcast for mobile terminals such as smartphone or tablet to connect and access the Web UI.

Check the box of AP in Work Mode to enable the WIFI hotspot for MR1, and define the SSID, password, encryption method and broadcasting channel for WIFI connection.

DHCP IP Range: This is allowed to user-defined the IP for Web UI login.



Client:

This option enables MR1to search and connect the other WIFI hotspot which connects to the internet, the receiver is able to download and use the mountpoint from reference station.

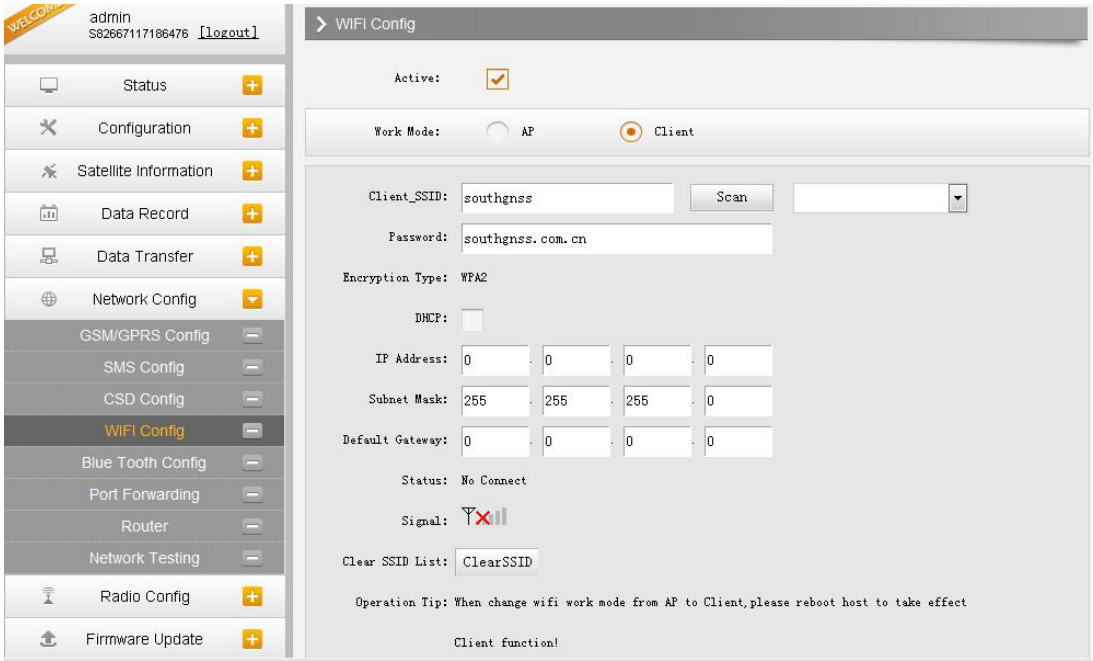
Client_SSID: This is the WIFI hot spot which MR1is going to connect

Scan: Click this button to search the surrounding available WIFI hot spot.

Password: This is the password which the WIFI hot spot requires.

IP fields: If MR1successfully connects to the WIFI, there will be an LAN IP address generated by MR1.

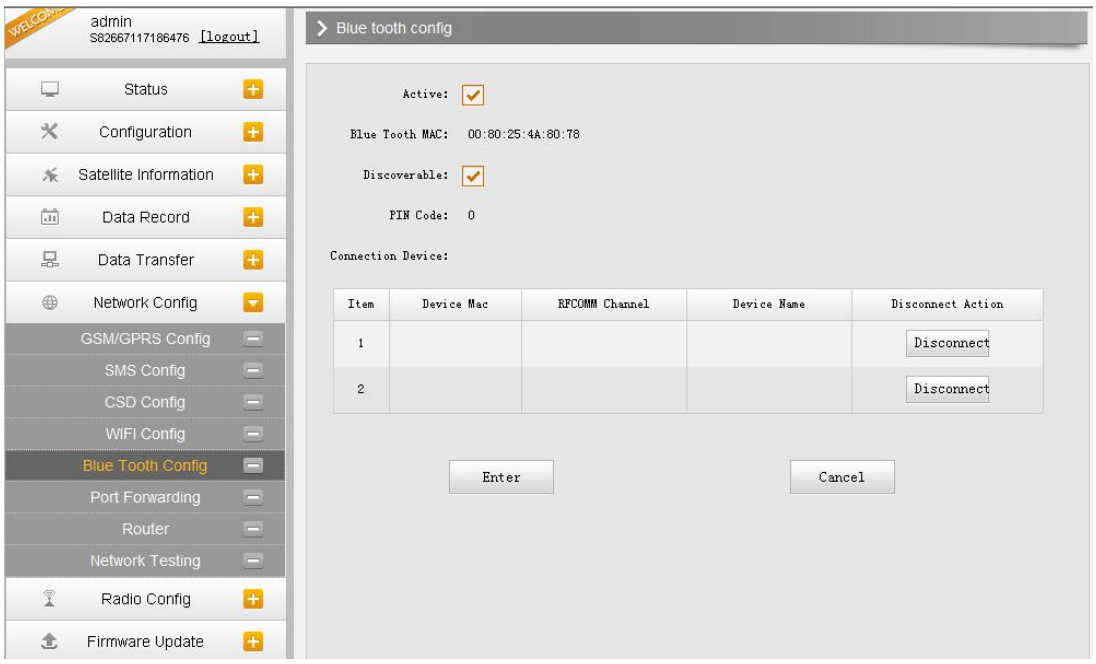
ClearSSID: Click this button to clear the SSID list.



Bluetooth Config

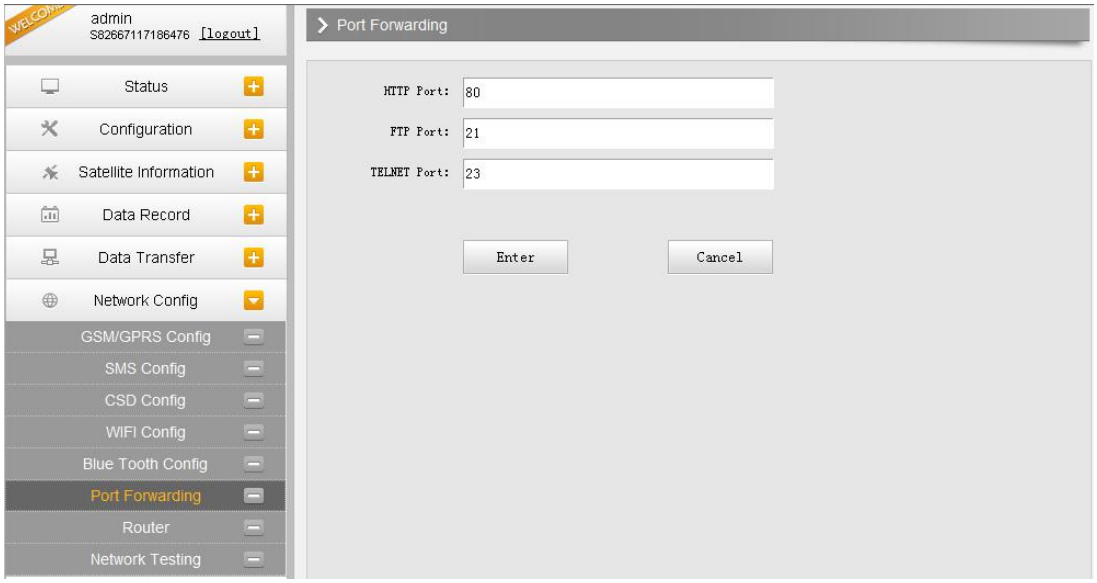
In this page, users can view the information and connection status of Bluetooth, such

the MAC of Bluetooth, discoverable or not, the PIN code, and the connection devices in following table.



Port Forwarding

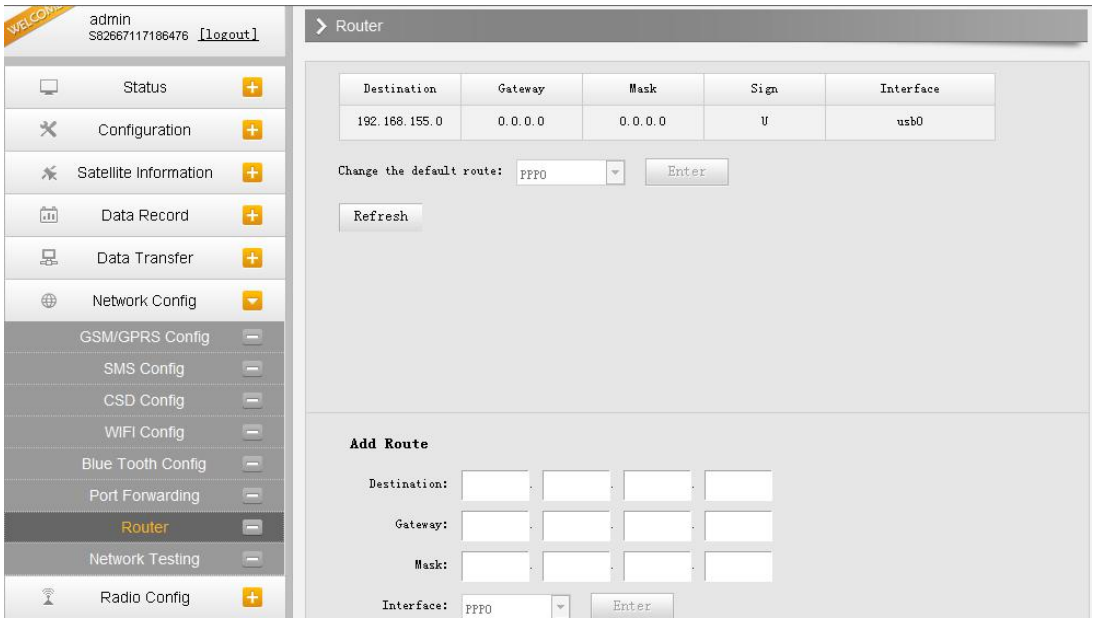
This page is mainly used to view and configure the internet transmission port for MR1, customize and debug receiver.



NOTE: Usually we will keep the default setting in this page, if you would like to modify it, please contact with SOUTH technician for more supports.

Router

This is mainly used to view and configure the parameters for router, only under the condition of customize and debug receiver.



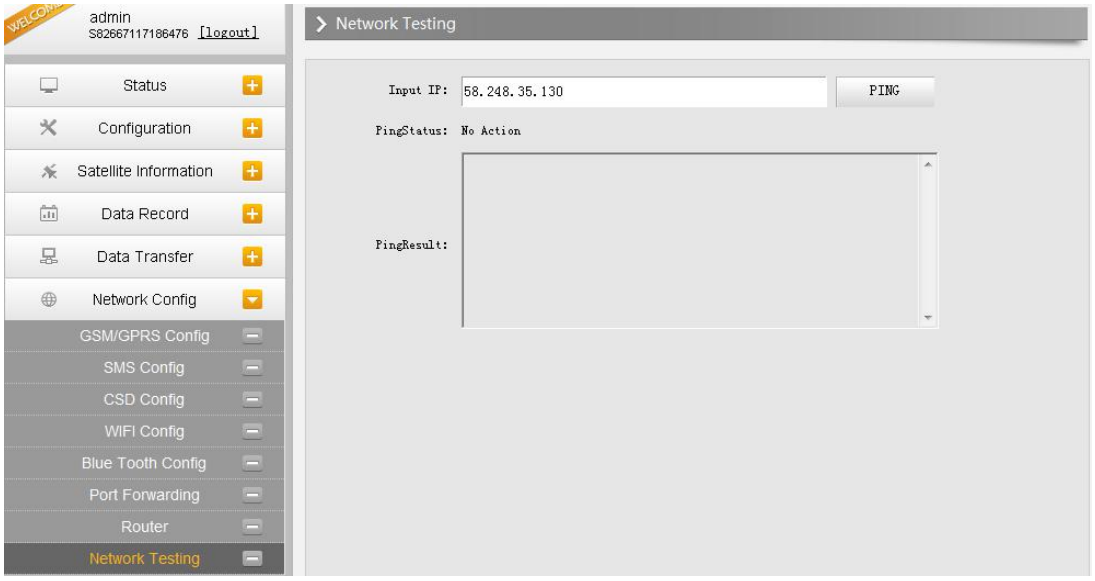
NOTE: Usually we will keep the default setting in this page, if you would like to modify it, please contact with SOUTH technician for more supports.

Network Testing

This function is mainly used to test network status for MR1after logging on the internet.

How to do:

Input the IP address which MR1already connected, then click PING button, the testing information will be displayed in the following window.

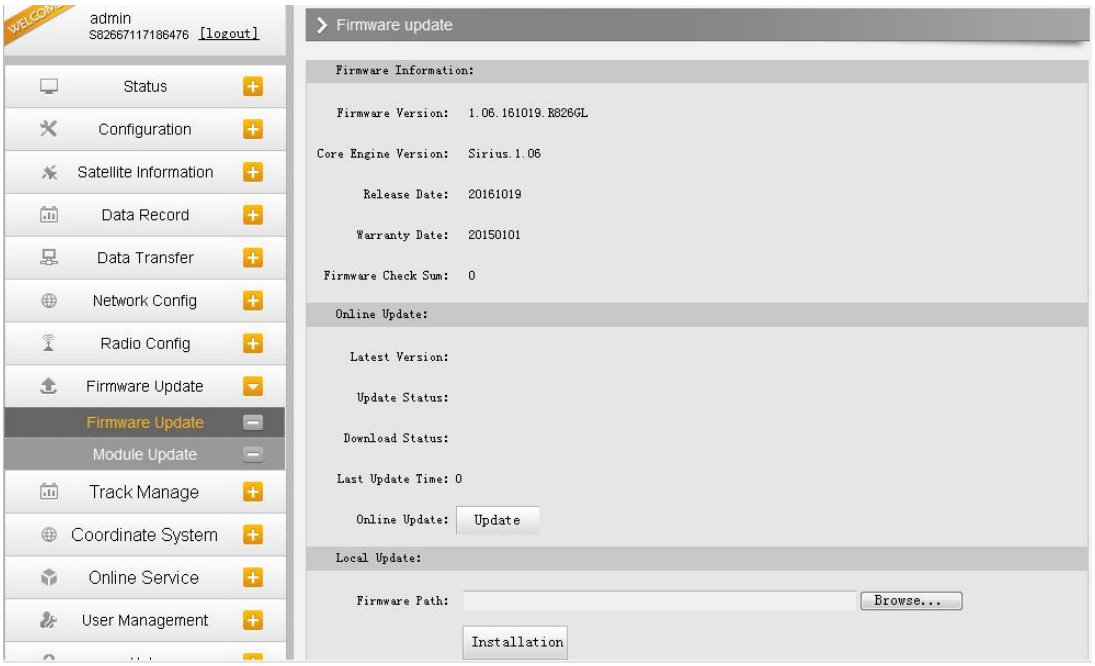


3.7 Firmware Update

Update the latest firmware for receiver or for corresponding modems can be done in “Firmware Update”.

Firmware Update

This page displays all the information of the firmware which current installed on MR1, and allows to update the latest version firmware for receiver. To get latest version firmware please contact with SOUTH technician.

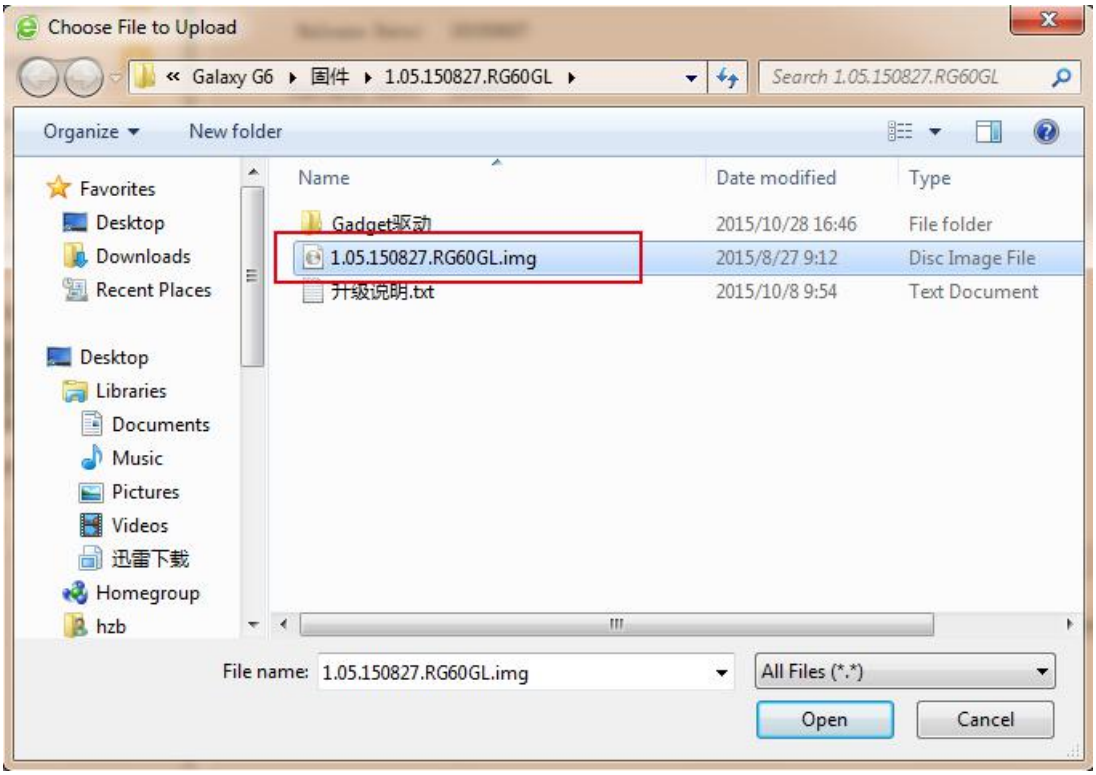


Online Update: MR1supports to update the firmware online anytime if there is something update or optimized.

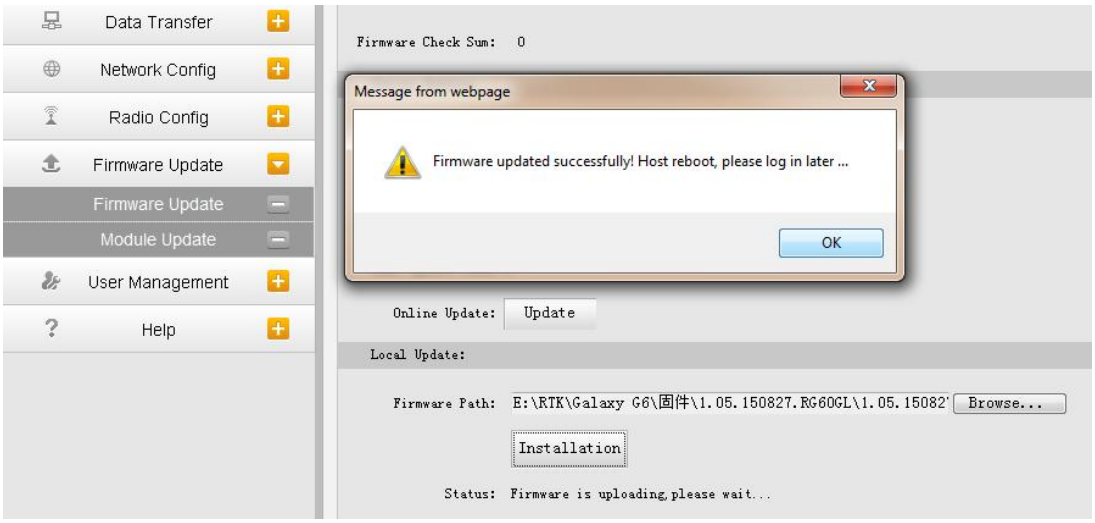
Local Update: Update the latest firmware by using a firmware file.

How to upgrade the firmware with Local Update

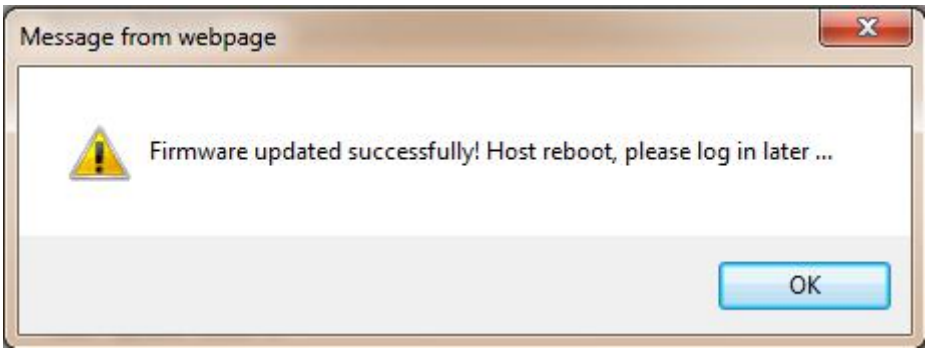
a) Click on “Browse” button to load firmware file (Please take in mind that the firmware is ended with .img as the extension name).



b) And then click “Installation” button to start upgrading.



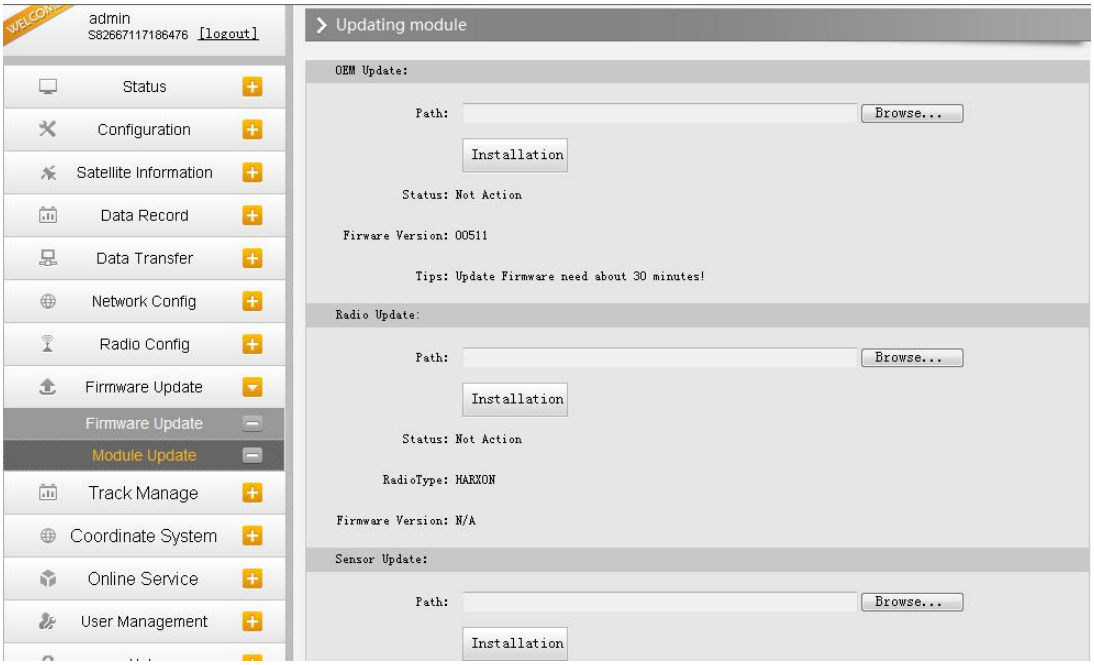
c) After the firmware is completed upgrading, a dialog will appear saying “Firmware updated successfully! Host reboot, please log in later…”, then the receiver will restart automatically.



SPECIAL REMIND: MR1doesn't support to update the firmware with the help of INstar program any more, in the future, update the firmware for MR1shall be done through the Web UI.

Module Update

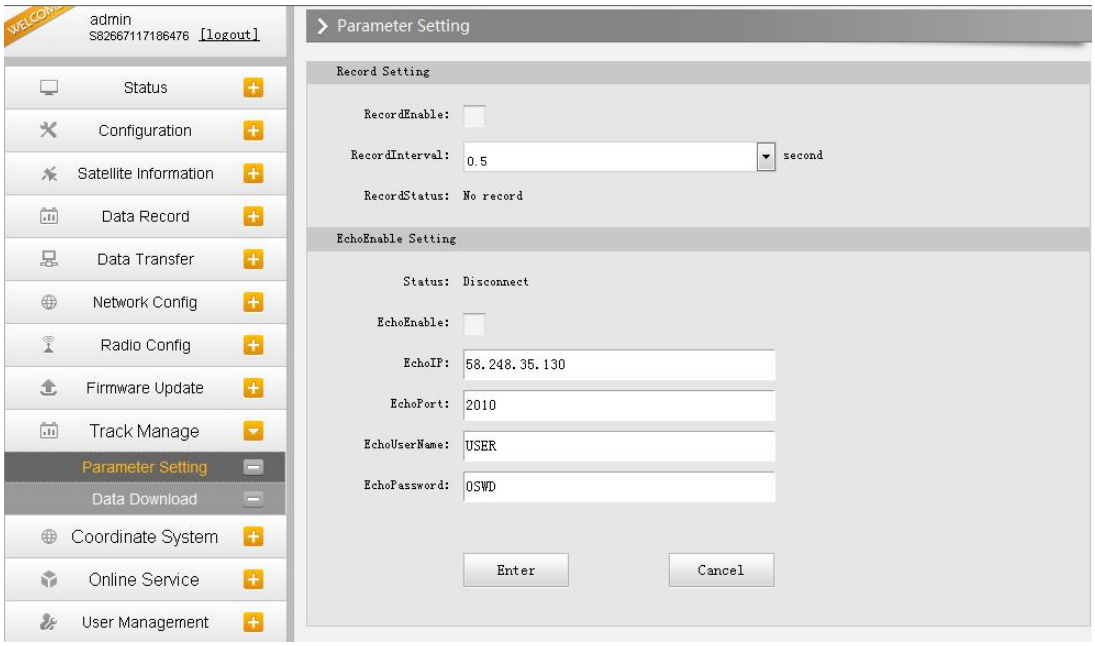
This page is used to update the firmware for corresponding modem such as OEM board, radio module and sensor.



3.8 Track Manage

MR1now supports to record the track while doing measurement, and upload the data onto the server.

Parameter Setting

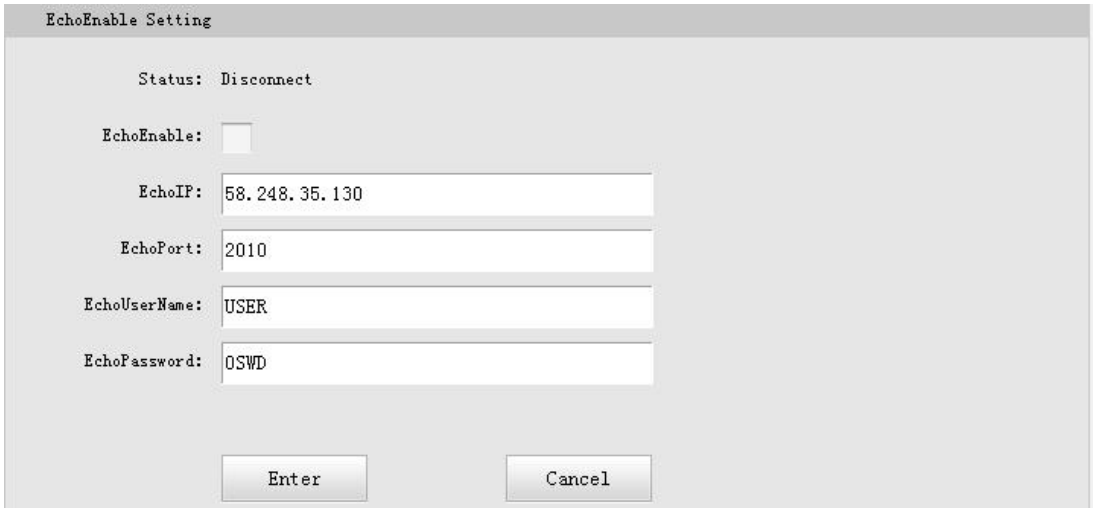


Record Setting

Check on the box of “RecordEnable” to activate track recording function, and choose a proper recording interval in dropdown list of “RecordInterval”.

EchoEnable Setting

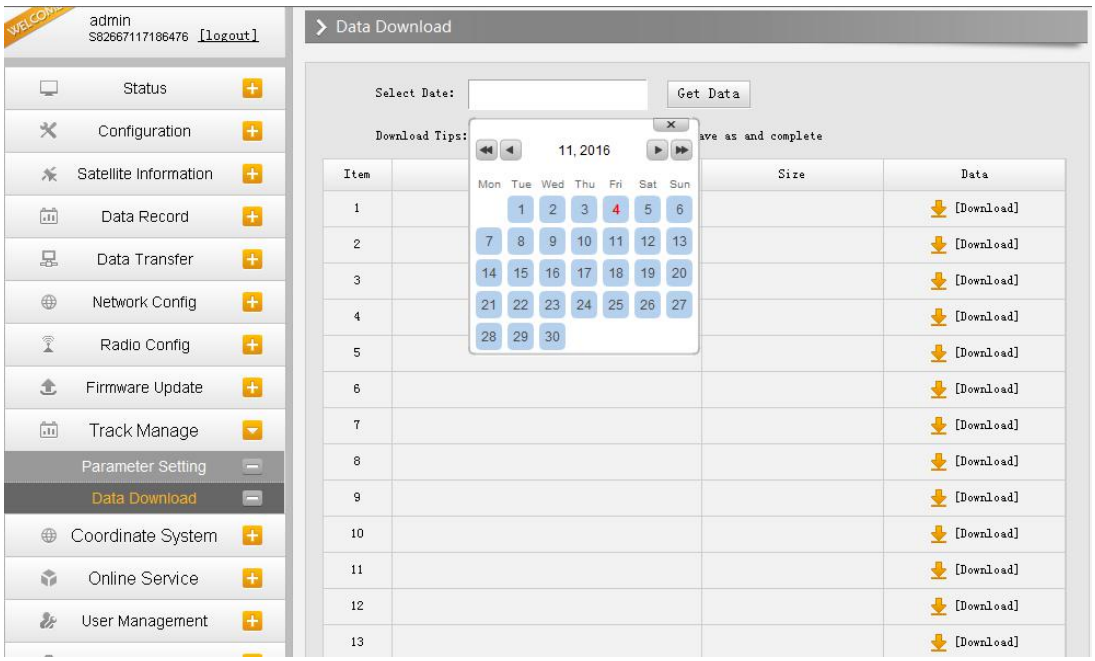
This configuration dialog is used to upload the recording data to a server in real-time.



Data Download

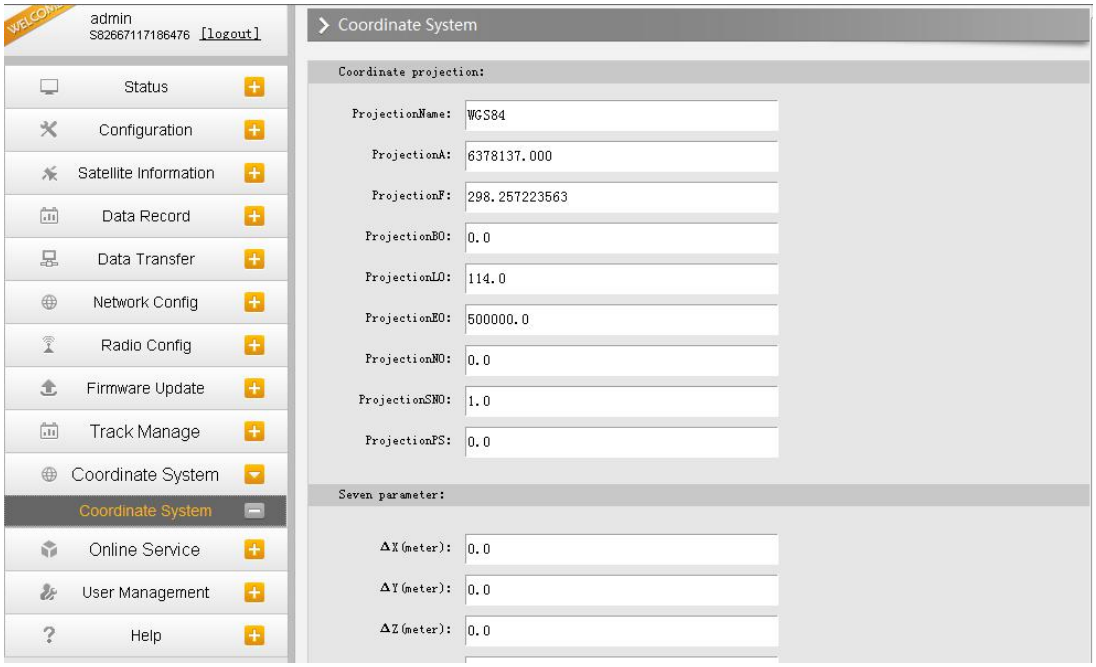
On this page, users can download the track data file from receiver. Choose the

recording date and click “Get Data” to load all the data files recorded at that day, then choose the files and click download button.



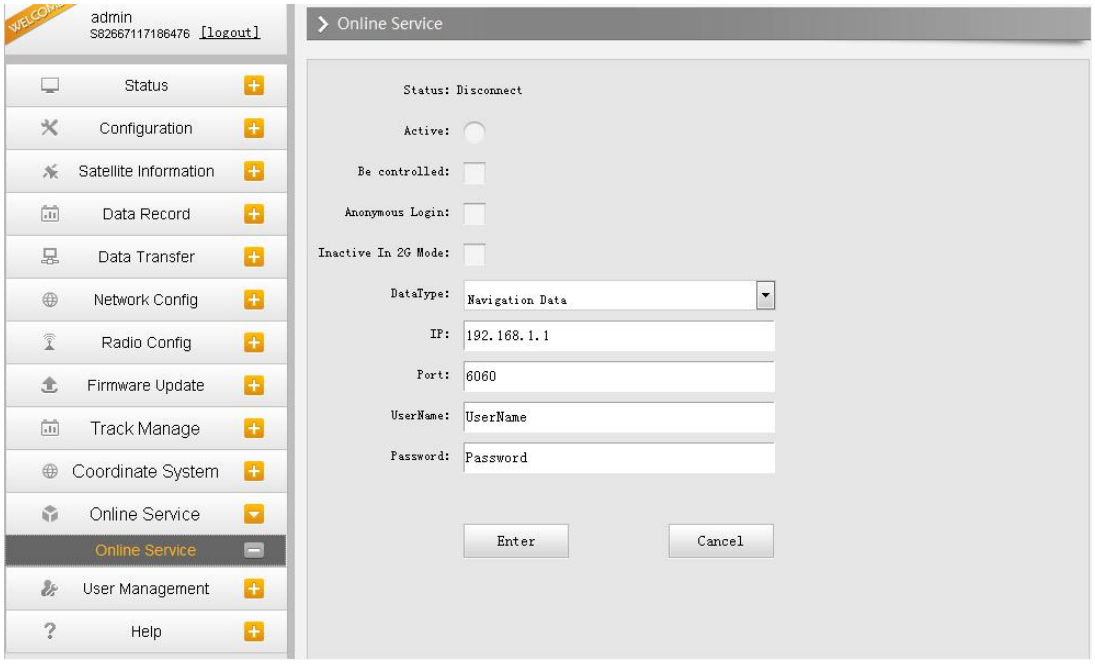
3.9 Coordinate System(reserve)

MR1allows users to setup the local coordinate system on internal web UI management. The instrument would output the local coordinates according to this coordinate system.



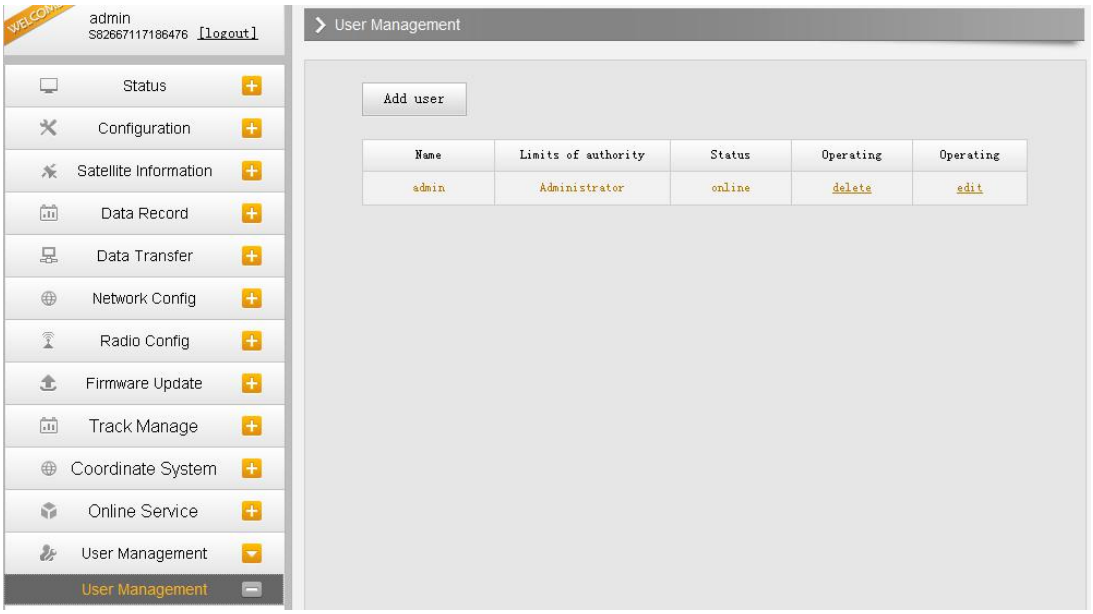
3.10 Online Service(reserve)

This function is to upload the data onto a server real-time, including Navigation data, raw observation data, correction data, SIC observation data and open SIC observation data.



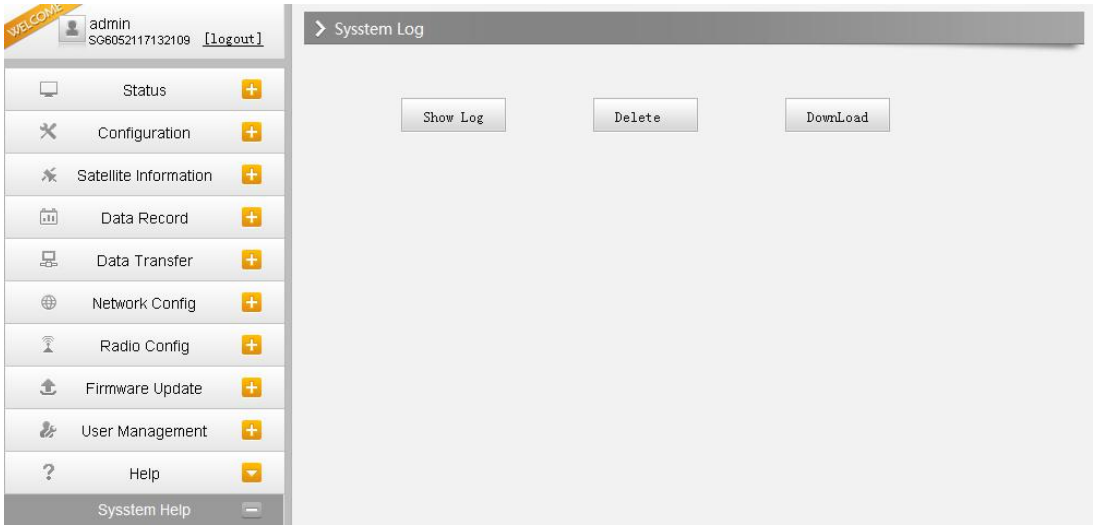
3.11 User Management

This page is used to manage the authority of login Web UI for users, including the username, password and add users.

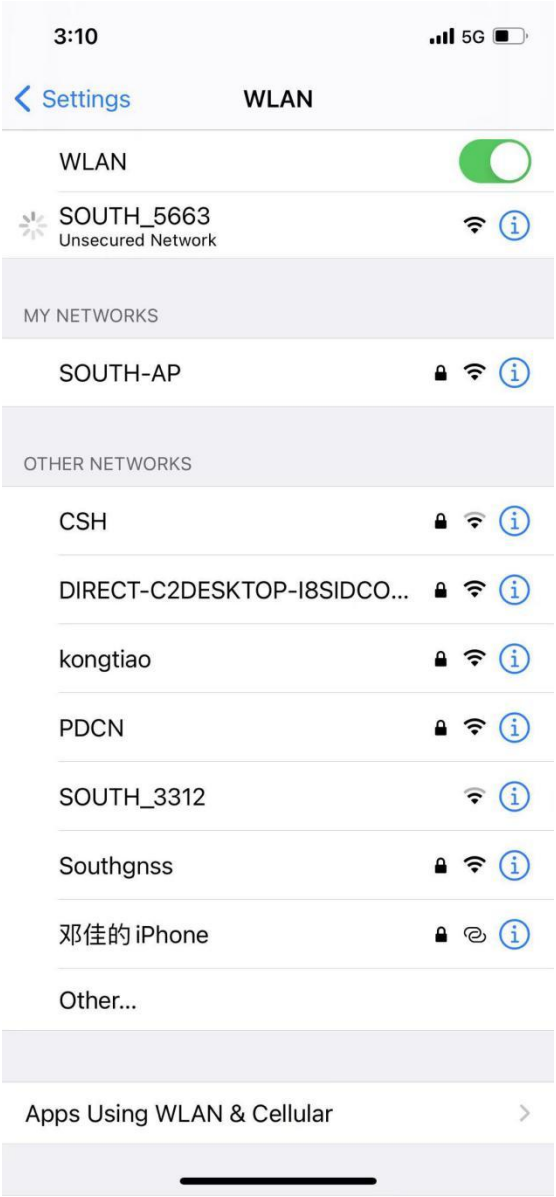


3.12 Help

In this page, users can get help and check the log book of receiver (the log book can help to backtrack the working status of receiver).
NOTE: Only the administrator can modify any parameters for receiver and manage users, and the ordinary users only have the right to view the relative parameters.



Method of connecting host web UI with WIAN mode：



Search for the WL AN of the host's body number in the wireless network

The mobile terminal user enters the URL 10.1.1.1 PC terminal enters 192.168.155.155

Username and password are both （admin）

This will enter the web UI.