WESROC® RMS Satellite Repeater
MT-9100R-SAT
User Manual

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Wesroc® RMS Satellite Repeater Overview

Wesroc® RMS For Remote Sites

The Wesroc® RMS Satellite Repeater is used for communication of Wesroc RMS remote telemetry system data to the Wesroc RMS Host System. Specifically, the preferred use is in locations where conventional communication networks are not available or are not reasonably accessible.

The Wesroc® RMS Remote Telemetry System

The Wesroc® Satellite Repeater operates by receiving Wesroc® RMS telemetry packets. These packets are conditionally accepted based on whether the Satellite Repeater has been initialized to them. If so, the original telemetry packet is sent through the Globalstar® simplex data network, where it is then delivered through the internet to the Wesroc® host server. Data inquiries and reporting from the Wesroc® host server function normally just as if the data were delivered by Wesroc® RMS Base Units through the Public Switched Telephone Network.

AC or Solar Power

The Wesroc® Satellite Repeater operates on an AC power adapter or with an optional solar powered battery backup system. The Satellite Repeater comes with a 25 foot cord and an external power supply. When installing the Satellite Repeater, it must be installed outside with a clear view of the sky. The Satellite Repeater must be able to receive Global Positioning System signals and also transmit data to the Low Earth Orbiting Globalstar® satellite constellation. This requires the open view of the sky.

Satellite Repeater Location

Simply place the Satellite Repeater in an outdoor location that is within range of the Wesroc® RMS transmitters which it must provide service for. The Satellite Repeater must then be initialized to these Wesroc® RMS transmitters. Once the Satellite Repeater knows which transmitter(s) to listen to, scheduled reporting times must be programmed for each transmitter.

Compatibility

The Satellite Repeater is fully compatible with all Wesroc® RMS telemetry devices including standard repeaters (MT-9100R).

Wesroc® RMS Satellite Repeater Operation

General

The Wesroc® RMS Satellite Repeater is designed to work in conjunction with all other Wesroc® RMS transmitters. The Wesroc® RMS Base Unit is used for regular communications to the Wesroc® Host Server over the Public Switched Telephone Network. There are plenty of potential remote monitoring sites where access to the PSTN does not exist, or is cost prohibitive. There exist cellular solutions for communication, but they are costly and are still limited to areas where access to cellular carriers is available. The Satellite Repeater was created to solve the problem of remote monitoring in locations where conventional communication is unavailable.

The Satellite Repeater operates by receiving data packets from Wesroc® RMS transmitters. These could include Gas Meters, Thermometers, Level Sensors, etc… It is also intended to be forward compatible with Wesroc® application sensors which are not yet conceived. The data is then sent through the Globalstar Simplex data network. This network consists of Low Earth Orbiting Satellites (or LEOS) which repeat the data signals. These repeated signals are then received by Globalstar®'s ground segment stations. Globalstar® recognizes the Electronic Serial Number of the Satellite Repeater and associates the received packets with Independent Technologies. The data is then sent via the internet to the Wesroc® RMS SatComm server which processes and presents the data to the Wesroc® RMS Host Computer system where it is made accessible to the Host Administrators.

The use of the Globalstar® Simplex data network is a for-fee service. Independent Technologies is charged for the setup and operation of the Satellite Repeater. Independent Technologies then charges it's customers appropriately for the use of the Wesroc® RMS data provided through this system.

Wesroc® RMS Satellite Repeater Location

The satellite repeater must receive Global Position System signals to acquire time and date. GPS information also is required for proper Globalstar® simplex channel selection based on it's proximity to Radio Astronomy Sites. The satellite repeater must also transmit the signal used by the Globalstar® simplex data network. These two requirements necessitate that the satellite repeater be placed in a location that has a clear, unobstructed, view of the sky. Typical locations include pole mounting, mounting the satellite repeater at the point of a roof, etc… The satellite repeater comes with a 25 foot power cord. This allows for the AC power source to be located inside of a building or structure, or properly protected area.

Wesroc® RMS Satellite Repeater Power

The power source for the satellite repeater may be either AC power, or solar power. The power consumption required for satellite communication makes primary batteries prohibitive. By using external power, reliability of the system is assured while removing the requirement that batteries be periodically replaced.

It is expected that once a Wesroc® RMS satellite repeater is properly installed in the field using AC power, periodic service will not be required. For solar powered satellite repeaters, it is recommended that the lead acid battery be replaced every five years.

Wesroc® RMS Transmitters

The Wesroc® RMS Satellite Repeater is designed to manage to up to sixteen total Wesroc® RMS transmitters. These transmitters can be mixed and matched in any fashion. They need not be all the same type of transmitter.

The Wesroc RMS system uses a proprietary packet data protocol. This protocol uses a strict format which includes a preamble, a packet header, payload, and proprietary Cyclic Redundancy Code for error checking. For this reason, the Wesroc RMS satellite repeater will reject all radio signals that are received in it's occupied ISM band except for properly formatted data packets from Wesroc® RMS transmitters. There is no risk of erroneously receiving signals that may be incorrectly interpreted as Wesroc® RMS packets.

Scheduled Reporting

The satellite repeater may be configured for scheduled reporting of data for each transmitter which is initialized to it. It is expected that multiple transmissions from initialized transmitters will be received by the Satellite Repeater for each transmission through the Globalstar® simplex data network. The purpose of scheduled reporting is to make sure that data in the Wesroc Host Computer is reasonably kept up to date for routine data. But at the same time, the cost of operation is kept to minimum by not sending Globalstar simplex data packets for each and every transmission from a Wesroc® RMS transmitter. It will be up to the end customer to decided how often they wish to have updates from specific transmitters and weigh that against the per-packet costs.

Each Satellite Repeater is limited by Globalstar® to no more than one transmission every 30 minutes. This is an important limit to understand. If a particular satellite repeater has, say, eight transmitters initialized to it. And the satellite repeater is configured so that all eight transmitters are scheduled to report at 3:00AM. It will require four hours for all eight transmitters to be reported, so the last transmitter will report in between 6:30AM and 7:00AM.

Alarm Based Reporting

For transmitters with applications that the satellite repeater understands (i.e. can interpret data, apply limits, apply algorithms, etc…), alarm based reporting can be applied. For example, an alarm can be set for a temperature transmitter. If a Wesroc® RMS packet is received from a temperature transmitter, then the satellite repeater can apply limits to the reported temperature. If the reported temperature goes above or below a preset limit, then a Globalstar simplex data packet would be sent. Alarm events are reported when they happen with no time of day restrictions.

Wesroc® RMS applications which the satellite repeater does not understand can only be reported through the Globalstar® network using scheduled reporting. Again, with it's proprietary packet format, the satellite repeater will only receive data packets from Wesroc® RMS transmitters.

Initialization Mode (or INIT mode)

In order to "associate" Wesroc RMS transmitters with the Satellite Repeater, the Satellite Repeater must be "initialized" to these transmitters. While the Satellite Repeater is in "INIT" mode, any init-mode packets that are received from transmitters will cause the Satellite Repeater to link, or attach, to that transmitter. This is so that during normal operation, the Satellite Repeater knows which Wesroc® transmitters to pay attention to and which Wesroc® transmitters to ignore. It also allows the Satellite Repeater to respond differently from one transmitter to the next. For instance you may want daily reports from a water flow sensor, but only weekly reports from a tank level sensor. Reporting is configured separately for each transmitter.

The satellite repeater is placed in initialization mode by setting the initialization mode timer to a non-zero value. (see satellite repeater configuration section of this document). The initialization mode timer indicates time in minutes. When the value of the initialization mode timer is set, it automatically begins to count down to zero. While it is non-zero, the satellite repeater is in initialization mode. A practical value for the initialization mode timer is 30 minutes.

While the satellite repeater is in initialization mode, initialization is accomplished by placing the appropriate Wesroc® RMS transmitter in initialization mode. This forces the transmitter to send "init-mode" packets. The satellite repeater recognizes the init-mode packet and initializes or links to that transmitter. Once initialization has taken place, both the satellite repeater and the transmitter may be taken out of initialization mode. Initialization mode is confirmed by verifying that the transmitters' serial number and application appear in the initialized transmitter configuration screen of the Wesroc® Portable Diagnostic Unit.

Wesroc® Portable Diagnostic Unit Field Control Module

In order to configure a Satellite Repeater in the field, the installer must have a Wesroc® Portable Diagnostic Unit (PN: MT9100-PDU). The portable diagnostic unit is for receiving and displaying status and configuration information transmitted by the Satellite Repeater (along with any other Wesroc® RMS devices that are present). The PDU also transmits configuration information to the Satellite Repeater. To power up the PDU, press the PWR button. The logo screen will then be displayed.

Logo Screen

To view Wesroc® RMS transmitters, press the right button from the logo screen. When power is applied to the Satellite Repeater it will transmit status information. The transmitter list screen shows which transmitters have been heard from. The Serial Number of the device, the type of device, the Time Since Last Transmission and the Received Signal Strength are shown. The transmitter screen will look something like this:

Transmitter List Screen

To look at the detailed information that is sent from the Satellite Repeater, push the up and down arrows until the selection arrow is pointed at the entry for the Satellite Repeater. Then press the right button.

PDU Satellite Repeater Detail Screens

The PDU displays five unique informational status screens for the Satellite Repeater. Once the first screen has been displayed by pressing the right button from the transmitter list screen, subsequent screens may be accessed by pressing the up or down buttons. Each press of the up or down button shows the previous or next screen respectively.

Satellite Repeater Identification Screen

Screen 1 shows general information about the Satellite Repeater:

1. Satellite Repeater Electronic Serial Number (ESN). This ESN is the same as the ESN of the Axonn® STX-2 module. It is also the ESN by which Globalstar® associates Satellite Repeaters with Independent Technologies.
2. Application Code .(10 for Satellite Repeater).
3. Hardware Type. (Will increase upon hardware changes).
4. Firmware Version. (Will increase upon software changes).
5. System Status Bits.
6. Frequency error of transmission between SatRep and PDU in kHz. Normally this value should be less than +-10kHz.
7. DC Voltage Supplied to SatRep in milliVolts. This is mostly of concern when the Satellite Repeater is used with solar power. The Satellite Repeater will cease normal operations if this value drops below 10.6VDC.

To view the next screen, press the down button.

Satellite Repeater Status Screen

Screen 2 shows more general information about the Satellite Repeater:

1. Number of transmitters initialized to the Satellite Repeater. The maximum number of transmitters supported by one Satellite Repeater is sixteen.
2. Number of minutes remaining for Init Mode. This is used for verifying that the Satellite Repeater is still in initialization mode during a system installation. See detailed description of initialization mode in operation section of this document.
3. Cold Boots. (Total times power has been removed from and applied to the satellite repeater). This is a useful diagnostic if unusual operation is occurring due to frequent power failures. This number will not increase after 65535 cold boots.
4. Up Time. Number of minutes the Satellite Repeater has operated since the last cold boot. This is also a useful indicator of the reliability of the power source.
5. Total number of packets sent to Globalstar network. This is in place as a potential reconciliation tool in case there is a discrepancy between received reports and expected reports from a given Satellite Repeater.

To view the next screen, press the down button.

Satellite Repeater Local Time and Date Screen

Screen three shows local time information. This information is derived from Universal Coordinated Time as obtained by the Global Positioning System receiver. This information will not be valid until the Satellite Repeater's GPS receiver has obtained a good position fix. Screen three shows:

1. Local Time in Hours:Minutes:Seconds format (24 hour). The time that is displayed in quite accurate. However, it will be the time of day at the time of the transmission from the Satellite Repeater to the PDU. For example, if the Satellite Repeater does not send a packet for 10 minutes, the time will be 10 minutes old.
2. Local Date in Month/Day/Year format.
3. Local Day of the Week.
4. Local Time Zone.
5. Whether Daylight Savings Time is Enabled.
6. If Enabled, whether Daylight Savings Time is active.

To view the next screen, press the down button.

Satellite Repeater GPS Detail Screen

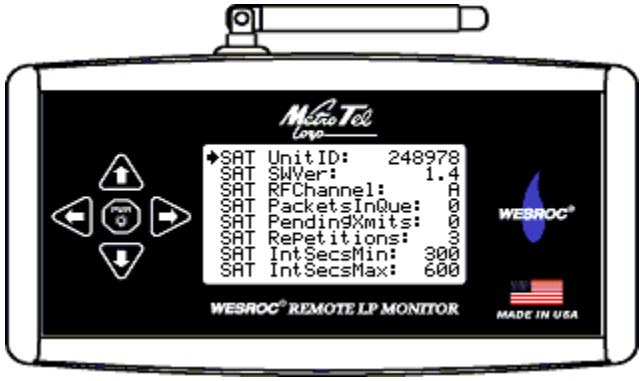
Screen four displays current location information as received from the GPS receiver in the Satellite Repeater. The Satellite Repeater will not transmit any Satellite packets to the Globalstar® Simplex Data Network until it has obtained a good location fix. The reason for this is that the Satellite Repeater must know where it is so that it can determine the proper Globalstar® simplex channel to transmit on for the purpose of respecting Radio Astronomy Sites and to adhere to Globalstar®'s overall frequency plan.

Screen four shows:

1. Current Location Latitude in Degrees and Decimal Minutes (North or South).
2. Current Location Longitude in Degrees and Decimal Minutes (East or West).
3. Whether GPS has a good fix. The location information is not valid until this field shows "Good" otherwise it will show "Bad" until it has received a good location fix.
4. Number of satellites being tracked. The GPS receiver is based on the Sirf-III chipset. It is capable of tracking 20 satellites at any given time. The number shown is the number of GPS satellites current being tracked.
5. The greatest Signal to Noise Ratio of the tracked satellites. Under good conditions with a clear view of the sky, it is appropriate to expect a maximum signal to noise ratio of 35 to 40.

To view the next screen, press the down button.

Satellite Repeater Axonn STX-2 Status Screen



Screen five shows information about the Axonn® STX-2 Globalstar® Satellite Transmitter module.

1. Electronic Serial Number.
2. Software Version.
3. Current RF Channel (A,B,C or D). This will be determined by the current location of the Satellite Repeater. The Satellite Repeater is intended for operation in North America only. For most locations, the Channel used will be “A”. If the Satellite Repeater is installed in a location that is within 100 miles of a known Radio Astronomy Site, the channel will be “C”.
4. Total packets waiting for transmission. Since the transmission of a single satellite packet may take up to 30 minutes, it is possible that scheduled satellite transmissions and alarm events will transpire that will have to be “Cued” for transmission when the current transmission is complete. This indicates the total number of transmissions waiting to be transmitted to the Globalstar® network.
5. Pending Transmissions for Current Packet. This shows the remaining satellite transmissions for the whole packet that is currently being sent. Each native packet sent to the Globalstar® network has 9 bytes of payload. Each of these native packets is sent to the Globalstar network 3 times. A typical Wesroc® packet is 36 bytes. This means that the STX-2 will transmit 12 times in order to complete the transmission of one Wesroc® packet.
6. Packet Repetitions. (Always 3).
7. Packet Repetition Minimum Interval in Seconds (Always 300).
8. Packet Repetition Maximum Interval in Seconds (Always 600).

Pressing the down button again cycles back to the first screen and starts over. Pressing the up button moves through the screens in the opposite direction.

Satellite Repeater Configuration Screen

The Satellite Repeater detail screens, thus far, have been informative only. Meaning that the data in the detail screens can be viewed, but not edited. In order to change the configuration of the Wesroc® Satellite Repeater, the Satellite Repeater Configuration Screen must be used. From the Satellite Repeater Detail screen, a press of the right button displays the Satellite Repeater configuration screen. This is the screen from which the configuration parameters of the Wesroc® Satellite Repeater are set and or modified. Unlike the detail screens, the configuration screen pointer moves through each item one line at a time instead of one page at a time.

Time Zone Configuration Screen:

To adjust the time zone setting, from the Satellite Repeater Configuration Screen, move the cursor to “Time Zone” and press the right key. The following is the Time Zone modification screen.

Then press the up button to adjust the time zone hour up one hour. Or press the down button to adjust the time zone one hour down. When the desired time zone is showing, from the right-most digit, press the right button. The view moves back to the configuration screen and the new time zone setting is then sent to the

Satellite Repeater. The value that is displayed in the configuration screen is always the value that is sent back from the Satellite Repeater. This ensures that the value that is shown is the actual value. If, for some reason, the configuration packet does not make it to the satellite repeater, the value shown in the configuration screen will not change from its original setting. The Time Zone setting is the number of hours the current location is from UTC or Universal Coordinated Time (Greenwich, England). This can be set from –12 hours to +12 hours. The following is a list of common time zones for North America:

- Atlantic Time Zone is -5 Hours.
- Central Time Zone is -6 Hours.
- Mountain Time Zone is -7 Hours.
- Pacific Time Zone is -8 Hours.
- Alaska Time Zone is -9 Hours.
- Hawaii Time Zone is -10 Hours.

Accurate time information is received from the GPS signals. These time signals are always sent as UTC. The time zone setting allows the Satellite Repeater to properly establish local time. Local time (along with the Daylight Savings Time Setting) is then used for calendar based scheduling of reports and other time reporting functions.

Daylight Savings Time Configuration Function:

Depending on the region, daylight savings time is sometimes not used. Daylight savings time is enabled and disabled by pressing the right button in the Satellite Repeater Configuration Screen when the cursor is on “DST”. Each time the right button is pressed, the setting for DST is “toggled” from enabled to disabled and vice versa. Again, the actual value that is displayed is always the value that is actually sent back to the PDU from the Satellite Repeater. This ensures that the value shown is the value that is actually set.

Satellite Repetitions = 3

Globalstar has determined that in order to ensure the transmission of a packet through their simplex data system, that every native packet must be transmitted a total of three times. This ensures that with the high rate of change of the Globalstar satellite constellation that at least one satellite will simultaneously be in view of the Satellite Repeater and a Globalstar ground segment station during a transmission. This value has been determined to be three. Do not change it.

Sat Interval Seconds Minimum = 300

The repeated transmissions are sent at random intervals. This is to reduce the possibility of simultaneous transmission overlap from other transmitters using the Globalstar Simplex Data System. Globalstar has established the optimum setting for the minimum time between the repeated transmissions to be five minutes. Five minutes is 300 seconds. Do not change this value.

Sat Interval Seconds Maximum = 600

The other boundary of the random interval described above is the maximum time between the repeated transmissions. Globalstar has determined that the proper time for this value is ten minutes or 600 seconds. Don't change this value either.

Initialization Mode Minutes Function

The following is a description of viewing and configuring initialization mode minutes. For a detailed description of Initialization mode, please see the Operation section of this document.

This shows the number of minutes remaining before the Satellite Repeater expires from initialization mode. This configuration parameter may also be set to the number of minutes required by the installer. To do this, from the Satellite Repeater Configuration Screen, place the cursor on "InitModeMins:" and press

the right button. Move the cursor left or right to the decade to modify: 1's, 10's, 100's etc… A press of the up button adds that many minutes to that column (1,2,3,4 or 10,20,30,40 etc…). When the desired number is entered, from the right most digit (1's), press the right button. The screen goes back to the configuration screen and the requested initialization mode minutes are sent to the Satellite Repeater. The value shown in the configuration screen is the value sent by (and understood by) the Satellite Repeater. This is to ensure that the value was received.

Once initialization mode minutes are set, they begin an automatic countdown in the Satellite Repeater. Once this timer reaches zero, the countdown stops and the Satellite Repeater exits from initialization mode.

Transmitters Initialized:

This shows the total number of transmitters that have been initialized to the Satellite Repeater. This is helpful in indicating that a successful initialization has taken place. Presently, the Satellite Repeater can be initialized to up to sixteen transmitters. This entry is not editable.

Configure Transmitter Function

This is the entry function to the Transmitter Configuration Screen. This screen is used for the configuration of parameters related to specific transmitters. Each transmitter is configurable independently. To enter the transmitter configuration screen, move the cursor to this entry and press the right button.

Initialized Transmitter Configuration Screen

Initialized Transmitter Indicator

Initd Xmtr 1 of 2.

This entry indicates which transmitter the configuration screen is showing information about. Only one set of transmitter configuration information items is shown at any given time. In the example, information is shown about the first of two transmitters. To look at a different transmitter, move the cursor to this entry and press the right button. This sends a request to the Satellite Repeater to show the next transmitter in the list. If the operation is successful, this line will show "Initd Xmtr 2 of 2". And the configuration information shown will be that for the second transmitter.

The Satellite Repeater can handle up to sixteen transmitters. The transmitter in entry #1 has a special purpose. It is permanently attached to the Satellite Repeater itself. So setting the scheduled reporting for entry #1 will set the scheduled reporting of the Satellite Repeater status packet. This packet includes useful information like the GPS location of the Satellite Repeater, self-diagnostic information, external power condition, etc…

Transmitter Configuration Information can be set for each of the Satellite Repeater's sixteen initialized transmitters independently. For example, the satellite repeater itself can send scheduled informational packets only on the first of the month. Where the satellite repeater can have a gas meter transmitter initialized to it that can be configured to send packets one per day, or once per week. Again, all configuration information for each initialized transmitter is independent of the other initialized transmitters.

Delete Initialized Transmitter Function

Delete Init: →.

This entry is used to delete the initialization for the current transmitter. It is important that the Satellite Repeater only be initialized to transmitters which it is intended to listen to. If a transmitter is incorrectly initialized to the Satellite Repeater, select the transmitter to be deleted using the "Initd Xmtr" function discussed above. Then move the cursor to the "Delete Init" function and press the right button. This sends the request to the Satellite Repeater. The Satellite Repeater will then reply, refreshing the information in the configuration screen. Entry #1 cannot be deleted, as it is permanently attached to the Satellite Repeater itself.

Transmitter Serial Number Indicator

Xmtr SN:

The Serial Number of the selected initialized Wesroc® transmitter is shown here. This serial number will correspond to the serial number printed on the transmitter itself. This number also corresponds to the serial number that is shown on the PDU for packets received directly from the transmitter. This serial number is obtained from information sent by the transmitter during the initialization process. This, along with the application code, allows the Satellite Repeater to uniquely identify the transmitter.

Normally, there is rarely any need to modify the serial number. However, it is possible. The occasion for modifying the serial number would be if a transmitter is replaced at a particular installation. The serial number of the transmitter being replaced can be changed to the serial number of the new transmitter. If this method is used, be sure to verify that both the serial number and the application code (see next entry below) are set correctly, otherwise the new transmitter will be ignored. This is not the preferred method of transmitter replacement as it requires exact accuracy in order for the transmitter to be recognized. The preferred method of transmitter replacement is to delete the initialization for the transmitter being replaced. Then initialize the Satellite Repeater to the new transmitter. (See discussion on transmitter initialization).

Transmitter Application Indicator

Xmtr App: SatRep

The Transmitter Application indicates the Application that the particular transmitter is serving. Common applications include "Therm" for thermometer, "GasMtr" for gas meters, "Tank" for liquid level measurements, etc… New applications are being added regularly.

This configuration parameter may also be edited for the reasons mentioned above in the serial number discussion. To edit the application code, move the cursor to the "Xmtr App" function and press the right button. Once the code is modified to the desired code, press the right button from the 1's digit column. The new application code is then sent to the Satellite Repeater.

Transmitter Received Signal Strength Indicator

Xmtr RSSI: 78

The transmitter Receive Signal Strength Indicator as shown in the transmitter configuration screen displays the strength of the transmitter signal as received by the Satellite Repeater. This is an important indicator of how reliable the communication between the Wesroc® RMS transmitter and the Satellite Repeater will be. The recommended absolute minimum signal strength is 30. The higher the RSSI, the more reliably the system will operate. As the RSSI decreases, the margin of the signal strength decreases. While the system can operate with RSSI's below 30, there exists virtually no signal margin. In these conditions the transmitter signal may not be received at all if there are any signal degradations (a truck parked in the just the right location, a distance interfering signal, rain, snow cover, etc…). With adequate signal margin, the system will be much more resilient to changing operation conditions.

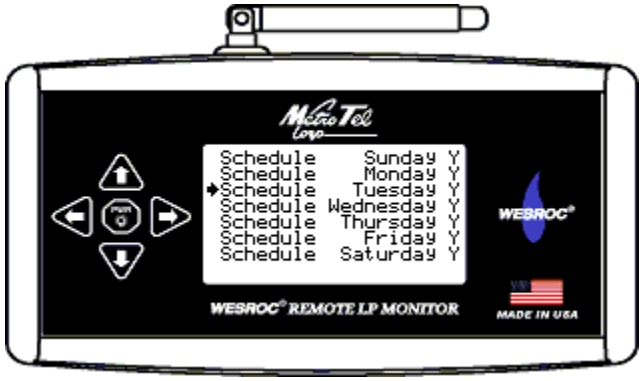
Day of the Week Scheduled Reporting

Weekly Rpt: SMTWTFS

The Weekly Reporting configuration parameter is used for setting which day(s) of the week scheduled reporting is to occur. This line shows the current setting for the day of the week reporting by using a letter code for each day of the week starting with Sunday. A line showing "SMTWTFS" indicates that the Satellite Repeater will schedule reports for each day of the week for this transmitter. As another typical example "-M-W-F-" shows that reports will be scheduled only for Monday, Wednesday, and Friday.

To change the day of the week scheduled reporting, move the cursor to the "Weekly Rpt" line and press the right button. The following screen will be displayed:

Day of the Week Scheduled Reporting Configuration Screen



To change the scheduled reporting status for a day of the week, move the cursor up and down to reach the day of the week to be changed. Then press the right button. This toggles (Yes to No to Yes to No, etc…) the reporting status for the selected day. The change request is not actually sent to the satellite repeater until all day of the week changes are made and the PDU is returned to the transmitter configuration screen. This is performed by pressing the left button from the day of the week scheduled reporting configuration screen. This sends a request to the Satellite Repeater to set the weekly scheduled reporting to the selected days for the current transmitter. The status itself is not changed until the Satellite Repeater receives the change request, makes the change, then sends the updated parameters back to the PDU. This ensures that the status shown in the transmitter configuration screen is the actual current configuration of the Satellite Repeater.

Day of the Month Scheduled Reporting

Monthly Rpt: None

Monthly reporting configures the Satellite Repeater to schedule reports on the days of the month selected for the current transmitter. For instance it may be preferred to send a report only on the first of the month, instead of weekly. In this case, all of the day of the week reporting should be turned off. Then the first day of the month should be set in monthly reporting.

Note: Weekly report and monthly reporting functions use an “OR” condition. If a particular day meets either the day of the week reporting OR the day of the month reporting, then a report is scheduled for that day.

The “Monthly Rpt:” line indicates how many days are currently set for day of the month reporting. If no days are set, then this line will show “None”. To change the monthly reporting for the current transmitter, move cursor to this line and press the right button. The following screen will be displayed.

Day of the Month Scheduled Reporting Configuration Screen

To change the status for the current day of the month, move the cursor to the day to be changed and press the right button. This toggles the report request for the selected day of the month. The display of the PDU shows eight lines at any given time. The first screen will show days of the month 1st through 8th. To change days of the month beyond the 8th, continue to move the cursor down. Each down button press will shift the day of the month entries up one. Editing the reporting status of the days of the month is the same for every day (i.e. 1st, 2nd, 3rd, etc...)
The actual change request is not sent to the satellite repeater until all desired changes are made to the day of the month reporting. Once the left button is pressed to return to the transmitter configuration screen, then the change request is sent to the satellite repeater. The Satellite Repeater will implement the change and reply with updated information. The values shown in the transmitter configuration screen will only be what the actual current setting is.

Daily Report Interval Function

DailyRptInterval 24

The Daily Report Interval function is used to set the number of hours between scheduled reports for any given day that reporting is to occur for the current transmitter. Unlike the OR function used with weekly reporting and monthly reporting. The scheduled reports per day is an AND function. What this means is that if the daily report interval for the current transmitter is set to zero. Then no scheduled reports for this transmitter will ever be sent. Similarly, if the daily report interval is set to 4 hours (or anything greater than zero), but no days of the week or days of the month are set, then again, no scheduled reporting for this transmitter will take place. Both a day setting (weekly or monthly) and a non-zero daily report interval setting must be in place for scheduled reporting to occur. If The daily report interval is set to 24, then only one report per day will be sent for days that meet the weekly or monthly scheduled reporting requirement.

First Daily Report Hour Function

First Report Hour: 1

The First Report Hour setting is used to set the hour of the day for the first report for any given day that meets the weekly or monthly scheduled reporting requirement. This is useful in circumstances where a given transmitter scheduled report is desired at the beginning of a workday. For instance, the first report hour can be set to 7. In this case the scheduled report will take place at about 7AM, in time for that business days' operation.

Once the first report has occurred, then the daily report interval timing is applied for the next report to occur that day. For example, if the first report hour were set to 7, and the daily report interval were set to 6. Then for a day that meets the weekly or monthly scheduling requirements, the first report would be sent at about 7AM, the next report that day would be sent at 1PM. Then another report at 7PM. The next six-hour interval would put the next report at 1AM the next day, so no more reports would occur on this day. The next day, the scheduled reporting rules, which may be the same or different, are applied for that day.

Wesroc® RMS Satellite Repeater Specifications

Mechanical
- Size: 7.50” x 5.25” x 2.75”
- Weight: 16 oz.

Electrical
- Voltage: 9VDC to 28VDC (Tip Positive)
- Current: 300mA Maximum

Global Positioning System
- Frequency: 1.57542 GHz LHCP
- Type: Sirf-III 20 channel parallel receiver

Globalstar Simplex Data System
- Frequency: 1.61125 GHz to 1.61875 GHz RHCP
- Power: +18dBm (63mW)

Wesroc® RMS ISM RF System
- Frequency: 911.980 MHz to 920.980 MHz VP
- Power: +8dBm (6.3mW)

Warranty Information

MetroTel Corporation of Minnesota, Inc. (MetroTel) warrants the MT-9100R-SAT WESROC® RMS Satellite Repeater against defects in materials or workmanship for a period of one year from date of shipment to original purchaser. All units deemed defective under this warranty will be replaced or repaired at MetroTel's option. No other warranty is expressed or implied, nor will responsibility for operation of this device be assumed by MetroTel.

Radio Frequency Exposure Warning

To ensure that exposure to hazardous radio frequency radiation is prevented, this equipment must not be installed in a location where humans will be routinely within 20 centimeters of it.

To ensure that FCC requirements are met regarding radio frequency exposure, Wesroc RMS Satellite Repeaters are not to be placed in operation where they will be collocated with other Wesroc® RMS Satellite Repeaters. Collocation is considered to be where one operating Wesroc® RMS Satellite Repeater is within 20 centimeters of another operating Wesroc® RMS Satellite Repeater.

Radio Interference

This equipment (FCC ID number RWB-MT9100R-SAT and IC number 115A-MT9100R-SAT) has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The Wesroc® RMS Satellite Repeater contains no user serviceable parts. Any changes or modifications to the Wesroc® RMS Satellite Repeater that are not expressly approved by MetroTel could void authorization to use the Wesroc® RMS Satellite Repeater.