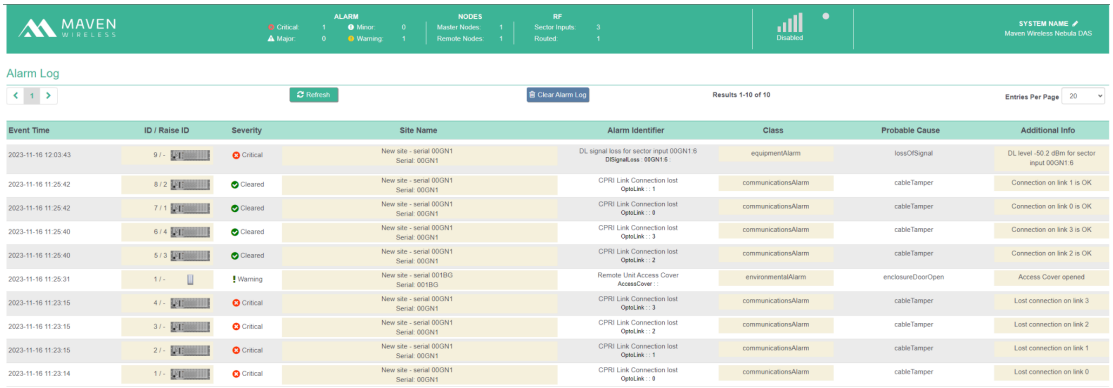


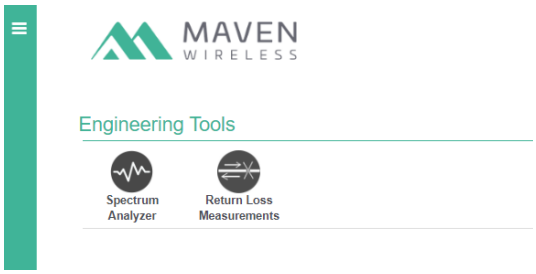
Field	Description
Event Time	This indicates at what time alarm happened
ID / Raise ID	This is a unique event ID of the alarm throughout the system. If this is an alarm clear (Severity is Cleared), the Raise ID is the ID of the alarm that is cleared.
Severity	X.733 Alarm Severity level, one of: Critical Major Minor Warning
Site Name	Name of the site where alarm was detected
Alarm Identifier	Description of the alarm source, plus the unique alarm identifier in the particular node
Class	X.733 Alarm Class, one of communicationsAlarm qualityOfServiceAlarm processingErrorAlarm equipmentAlarm environmentalAlarm integrityViolation operationalViolation physicalViolation securityServiceOrMechanismViolation timeDomainViolation other
Probable Cause	A hint of what the reason for the alarm might be, as defined by X.733. Such as lossOfSignal degradedSignal enclosureDoorOpen powerProblem Refer ITU Recommendation X.733 for full list.
Additional Info	Additional information about this particular alarM, such as current levels or status when the alarm was triggered.

Clear Alarm Log

Clear Alarm Log By clicking this, all non active alarms will be cleared from all the nodes in the DAS installation.

Engineering Tools

This menu allows you to check Spectrum Analyzer and Return loss Measurement status.

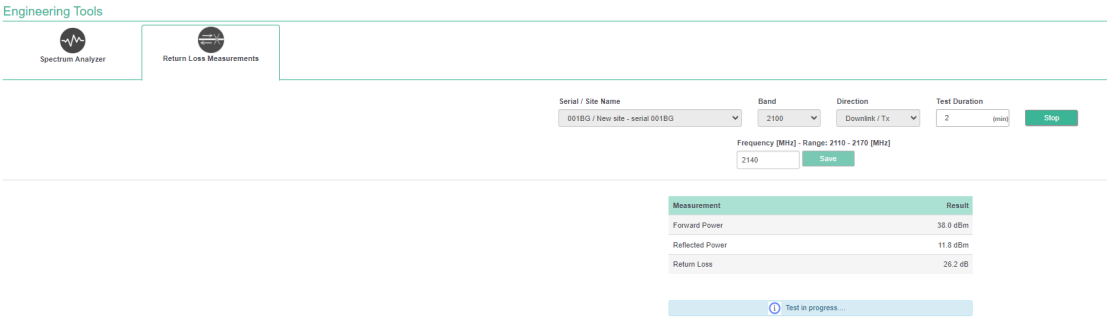


Spectrum Analyzer

Click on Spectrum Analyzer , Select band, port , Signal direction. Click Submit for measurement.

Return loss measurements.

Select band, test duration and click on Start for measurements.



Slot configurations per Orion type

Article	Description	Modem?	Fans	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8
MRN00001	All cellular bands 600 and up except C-band. Supporting bandwidths of 75-100 MHz per slot depending on revision.	No	1	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz
MRN00002	2 x UHF bands in slots 1 and 3, slots 2 and 4 unused. Slots 5-8 cellular bands max 75 MHz bandwidth.	No	1	UHF 380-470 MHz	UNUSED	UHF 380-470 MHz	UNUSED	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz
MRN00004	Same as MRN00001 with modem	Yes	1	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz
MRN00005	Same as MRN00002 with modem	Yes	1	UHF 380-470 MHz	UNUSED	UHF 380-470 MHz	UNUSED	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz
MRN00006	Slot 1 UHF 380-470 MHz, Slot 2 FM broadcast 87,5-108 MHz, Slot 3 VHF 136-174 MHz, Slot 4 DAB 174-240 MHz, Slots 5-8 cellular 600-2700 max 75 MHz BW.	Yes	1	UHF 380-470 MHz	FM 87,5-108 MHz	VHF 136-174 MHz	DAB 174-240 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz
MRN00007	Slot 1 UHF, Slot 2 FM, Slot 3 UHF, Slot 4 FM, Slots 5-8 DAB or Cellular	No	1	UHF 380-470 MHz	FM 87,5-108 MHz	UHF 380-470 MHz	FM 87,5-108 MHz	DAB / IF Cellular BW 75 MHz	DAB / IF Cellular BW 75 MHz	DAB / IF Cellular BW 75 MHz	DAB / IF Cellular BW 75 MHz
MRN00008	Same as MRN00001 with dual fans	No	2	IF BW 75MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz	IF BW 75 MHz
MRN00009	Same as MRN00002 with dual fans	No	2	UHF 380-470 MHz	UNUSED	UHF 380-470 MHz	UNUSED	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz	IF Cellular BW 75 MHz

Leaky Feeder Monitoring System

System for detecting distance to fault on leaky feeders.

Introduction

For many DAS deployments, there is a need to monitor not only the active system part but also the passive elements composing the radiating system, especially the leaky feeders in tunnels. For critical communications, it can be of high importance to be able to detect and localize any failure in the radiating cable to ensure continuity of service.

Maven Wireless has developed a product performing cable monitoring, failure detection and estimation of the location of the failure in the cable.

Leaky Feeder Monitoring Description

The LFM module is part of the Remote Unit itself. The LFM module gives two ports with two distinctly different signals allowing you to monitor up to 4 radiating cables in a tunnel segment. The LFM module output ports are accessible from the bottom of the remote unit. 4.3/10 female connectors constitute the interface.

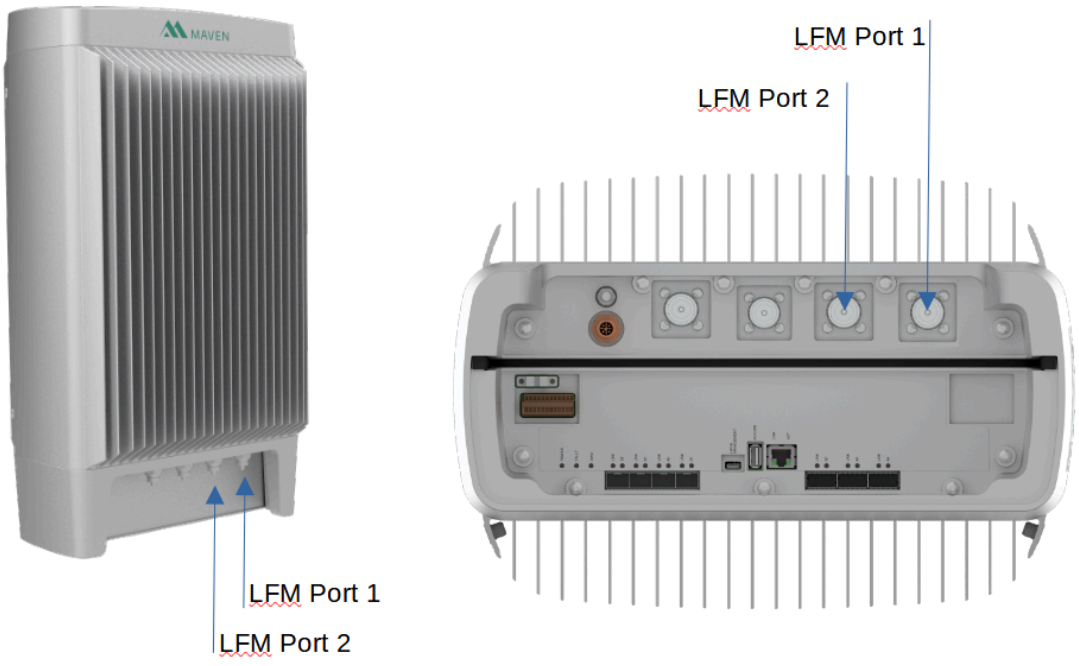


Figure 1 : Leaky Feeder Monitoring RF ports on Remote Unit

The LFM feature can be used when a portion of a leaky feeder is fed with signal on both sides. On each remote site, the signal is injected to the radiating cable in both directions through a 10 dB coupler (allowing the 350 MHz signal to pass through into the leaky feeder system).

This signal is detected and measured by the next remote unit and the system can evaluate the cable and react to a presence of failure. If a failure is detected, an alarm is generated and an estimation of the location of the failure is given.

The figures below illustrate connection from the LFM module(s) to the leaky feeder under monitoring for single and dual tube tunnels :

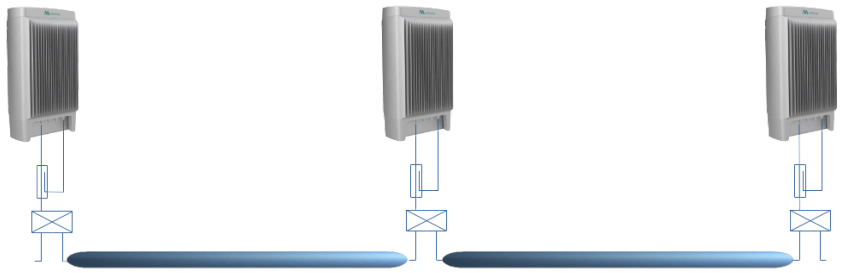


Figure 2 : Leaky Feeder Monitoring Architecture - 1 tube tunnel

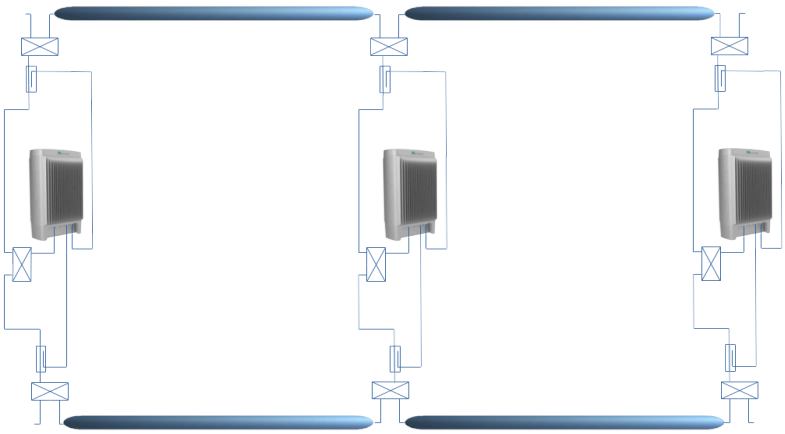


Figure 3 : Leaky Feeder Monitoring Architecture - 2 tubes tunnel

Prerequisites for using the system

The LFM option needs to be ordered as an option with the remote unit. The frequency used is fixed in the system, it is therefore imperative to check that the radiating cables employed do not have a “stop band” or unusable frequencies in the needed frequency range.
No stop band must be present in the frequencies between 345–355 MHz or the monitoring system may not work as intended. The stop bands can be found in the cable manufacturer’s data sheet for the radiating cables used in the project.

LFM Module Characteristics

Carrier frequency: 350 MHz

Carrier bandwidth: 10 MHz

Output power: -7 dBm ± 1dB

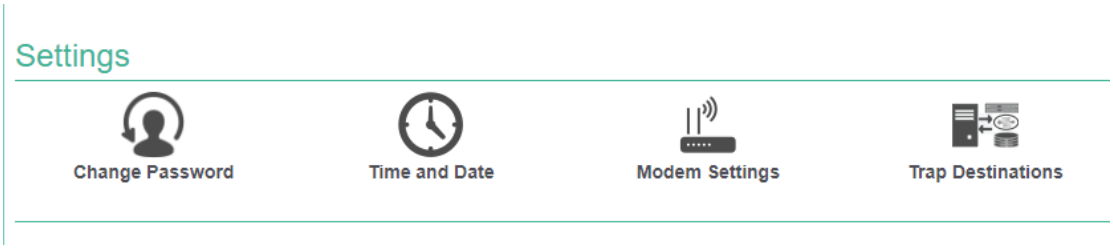
Spectral density of carrier: < -26 dBm / 100 kHz*
(*) after 10 dB coupler < -36 dBm / 100 kHz. This is chosen so that other radio communications are not disturbed by unwanted noise in the spectrum. The -36 dBm requirement fulfils the requirements for spurious emissions for frequencies below 1 GHz.

Dynamic range

A coupler of minimum 10 dB must be used for the LFM module to conform to specifications. This introduces a loss of 20 dB (one coupler at each end) above the loss on the cable as well as typical split loss.
The total link budget is about 63 dB. Including 2 x 10 dB couplers it gives us a dynamic range of 43 dB. Including 2 x 2-way splitters gives another 6 dB loss that means we can tolerate a maximum of 37 dB of longitudinal loss on the cable.

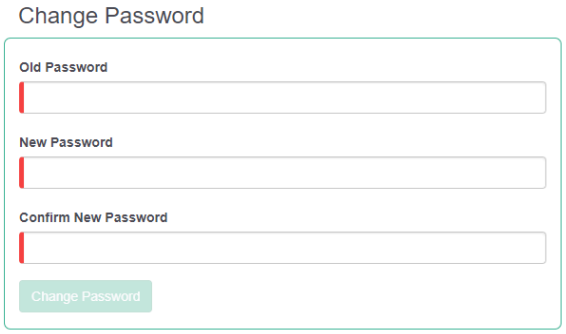
Settings

This menu option allows to configure password, time/date and optionally the modem should the DAS have a node with a modem installed.



Change Password

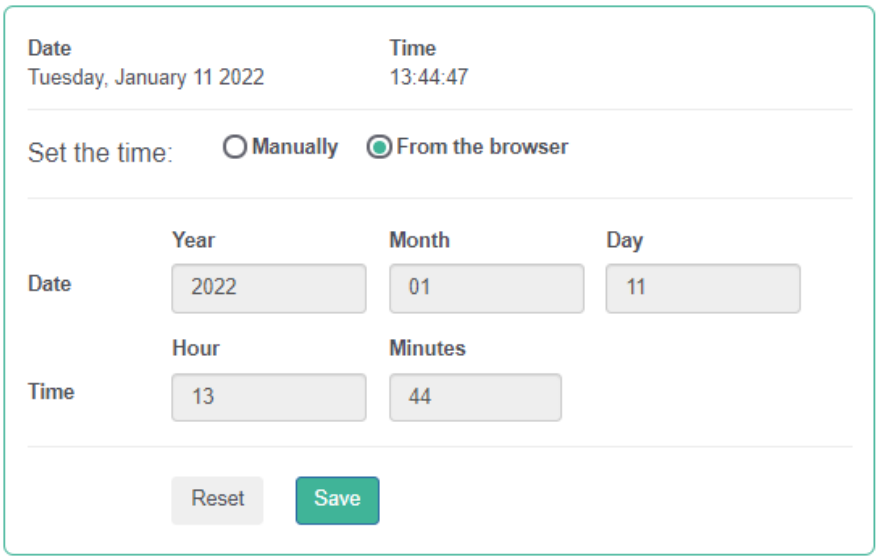
This allows the user to change the web login for all units in the DAS installation.



Configure Time and Date

Click 

to change Time and Date in the DAS system



By selecting Manually current time can be filled in the different fields.
If choosing From the browser option the current browser time will be filled in to the fields.

Click 

to set the configured time in all the nodes of the DAS installation.

Configure Modem

The Cirrus can be equipped with a built in 4G-modem to provide remote access over the mobile network, in which case the 

icon is visible.

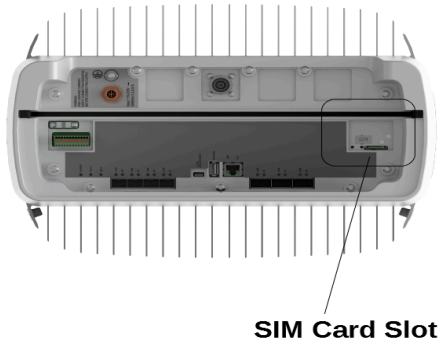
The modem is connected to the BTS antenna via a 15 dB coupler ensuring the modem receives good signal strength at all times.
Once the modem is enabled, the unit will initialize the modem and register to the network according to the settings. Should a failure initializing occur, the unit will continuously try to register to the network until successful, including power cycling the modem.

It is also possible to configure a server IP address, and should the unit fail to ping the server IP, the modem will be power cycled and re-registered onto the network to ensure modem comes back online regardless of error encountered.

Modem initialisation log and advanced registration data is available to further troubleshoot the modem in case a problem occurs.

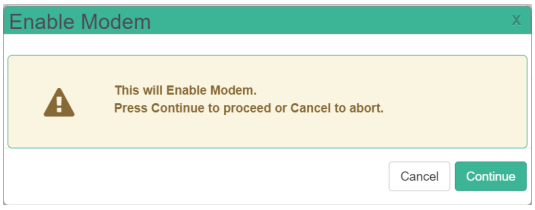
Modem Configurations Procedure

1. Insert SIM card in the SIM slot - SIM-card type is MicroSIM.

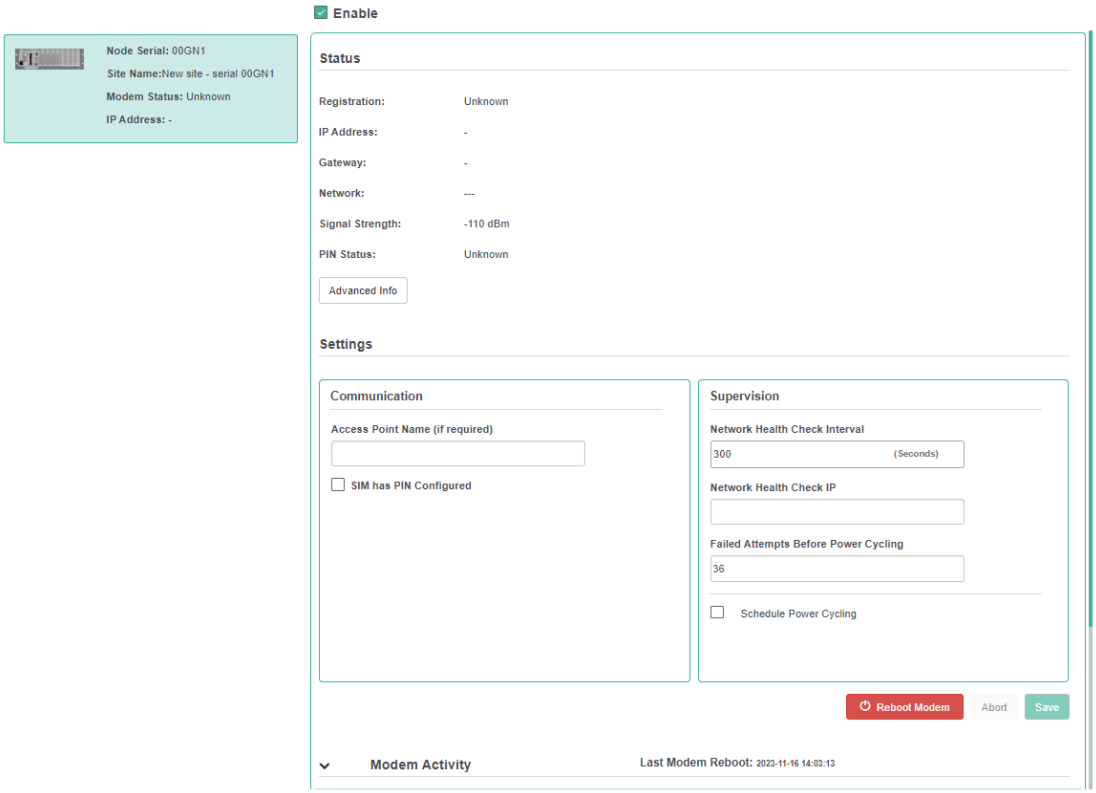


2. Click 

If modem is not yet enabled, clicking the icon will prompt to enable the modem

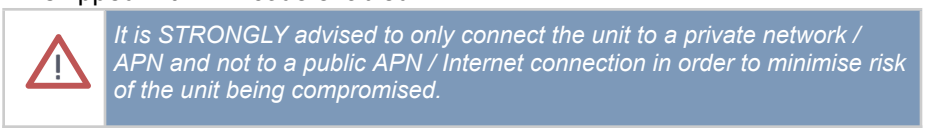


3. Click Continue to set up the configuration. This brings up the Modem Settings dialog



4. **Status Section** - this displays runtime parameters for the modem connection, such as Registration status, IP addresses and signal strength.
Settings - this is where the various modem parameters are configured

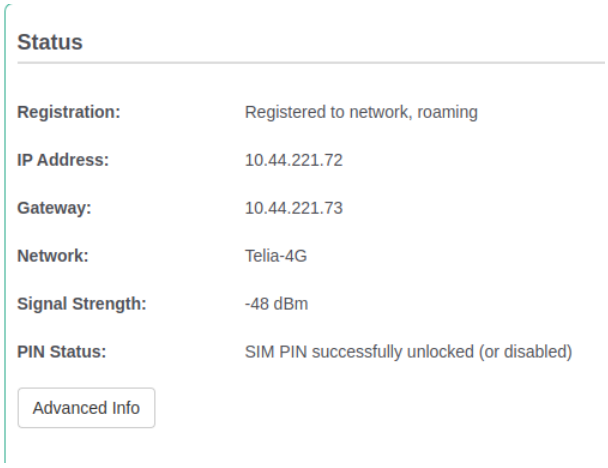
5. Depending on SIM configuration, the modem might register automatically, or there might be network specific parameters to configure.
   Access Point Name - the APN allows for the unit to connect to a specific network.
   SIM has PIN Configured - this is where the SIM card PIN code is configured should it be shipped with PIN code enabled.



6. In order to ensure that the unit is always accessible, the Supervision section allows to configure parameters ensuring unit always have a network connection:
   Network Health Check IP - if this field is configured, the unit will on configurable intervals try to ping the configured IP address.
   Network Health Check Interval - this is how often to ping the configured IP address.
   Failed Attempts Before Power Cycling - this indicates how many consecutive pings should fail before the unit will power cycle the modem.
   Scheduled Power Cycling - if this is checked, the unit will at this time of the day power cycle the modem and re-register on the network.
7. Once all parameters are configured, click 

to initiate a modem initialisation with the new parameters.

8. Wait for the modem to register, this normally takes less than 60 seconds.
   The modem screen should be displaying the received IP address and various runtime parameters.

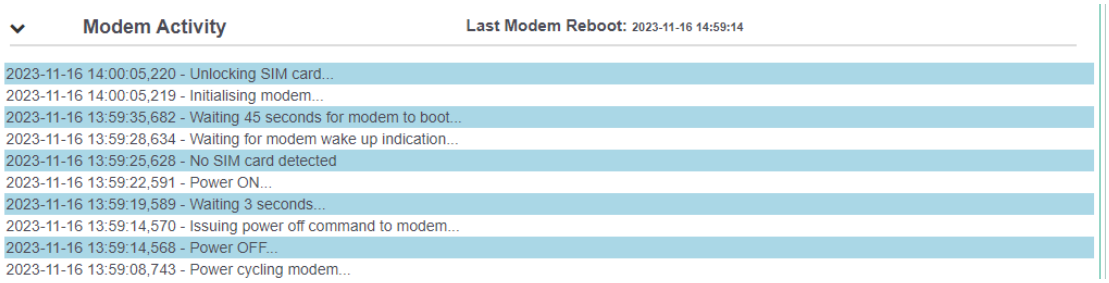


   The Advanced Info gives detailed information about the current cell info - please contact Maven Support should this data needs to be decoded.

9. Modem configuration done.

Basic Modem Troubleshooting

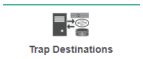
The Modem Activity log in the bottom of the screen gives a clear indication of any potential reason why the modem does not register properly to the network



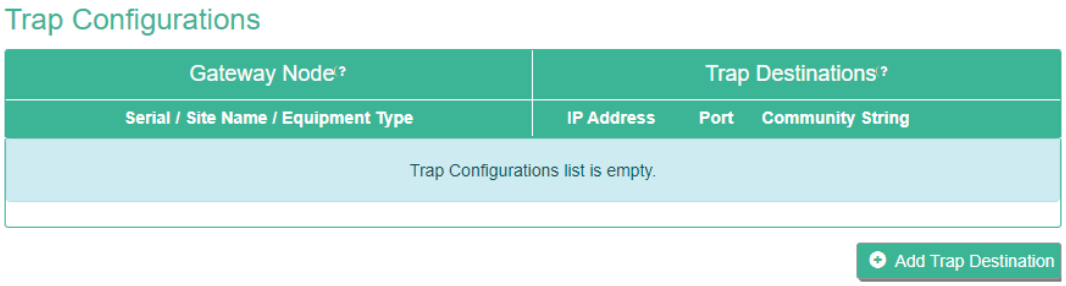
Common errors:

- **Wrong PIN code** - the log should indicate if there is a failure unlocking the SIM card. Reconfiguring the PIN code will cause the unit to retry unlocking.
- **Too low signal strength** - if the SIM card is successfully unlocked, but it is not registering to the network it might be because of too low signal strength. The modem normally needs around -105 dBm received signal level to register to the network. Check the antenna placement and ensure that there is a serving cell in the unit.
- **Wrong APN** - if the modem manages to register to the network but does not succeed in getting an IP address, the Access Point Name might be wrong. Double check and update correspondingly.

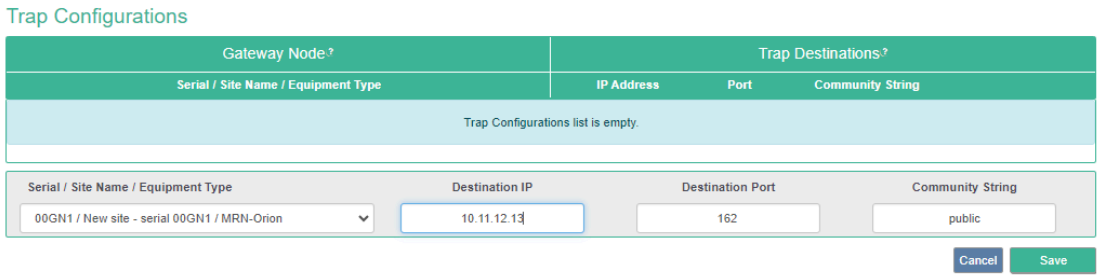
Configure Trap Destinations (SNMP settings)

Click Trap configurations 

to change SNMP settings in the DAS system



Click on Add Trap Destination select Serial / Site name / Equipment Type, Destination IP, Destination Port, Community String.



Click Save to set the configured time in all the nodes of the DAS installation.

Maintenance

Orion Master Unit

The Orion only requires periodic maintenance to keep the unit clean and the cooling airways clear.

- The outside of the unit can be cleaned (when the equipment is powered down) using a damp cloth with water or mild domestic cleaning fluids as required.
- Dust should be removed from air inlet holes at front and side using a vacuum cleaner.
- The fan should be removed and the blades cleaned by wiping them with a damp cloth.
- Observe the condition of the internal heatsink on the digital board (visible through the fan aperture when this has been removed). If the fins are blocked by significant amounts of dust contact Maven Wireless Support for advice.

Apart from periodic cleaning or the updating of Radio Module and PSU Configurations as required, the unit has no user serviceable parts. In all cases of suspected malfunction contact Maven Wireless Support.

Stratus, Cirrus and Cumulus units

The remote unit is designed to not require any maintenance. The unit has no user serviceable parts. In all cases of suspected malfunction contact Maven Wireless Support.

However, if the unit is installed in a very dusty area which over time might decrease the air flow around the unit and hence decreasing cooling it is recommended to perform periodic cleaning of the unit.

- Dust should be swept from the heatsink fins using a long bristled brush.
- The outside of the unit can be cleaned using a damp cloth with water or mild domestic cleaning fluids as required.