



**RFI**  
TECHNOLOGY SOLUTIONS

# User's Manual

## Advanced Power Monitor

APM1317 APM3852

APM7487 APM8796

Base Line 2.84

Australian Standard Patent No. 2011218778

Australian Patent Application No. 2016250327

U.S. Patent No. 8,983,415

U.S. Patent Application No. 15/343,133



## Company Overview

RFI has been serving the needs of the wireless communications market for over 35 years. First founded as a manufacturer of antenna systems, RFI has grown to be a key player in the development, manufacturing and distribution of wireless technology and energy products. Through our extensive network of resellers, systems integrators and retail outlets, RFI is a key supplier to both industry and Government.

Our research and manufacturing facilities have talented people, sophisticated test equipment, state of the art software with class leading manufacturing systems and techniques. Additionally, we have in place a quality management program which is certified to ISO9001, environmental management system certification to ISO14001 and occupational health and safety standard AS4801 giving you complete confidence in everything we do.

RFI's products are truly innovative and as a result we are active around the globe taking our Australian designed and manufactured products to key markets in Asia Pacific, the Americas and EMEA regions via offices 'In-region' in addition to exporting directly to in excess of 50 countries.

One of RFI's key principals is to remain totally customer focused as we recognise our future depends on the success of our customers. We know that to be chosen as your supplier we must add value to your business and to achieve this we will work hard to deliver the best product when and where you need it and back this up with the very best technical support available.

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### **Disclaimer**

Product part numbering in photographs and drawings is accurate at the time of printing. Part number labels on RFI products supersede part numbers given within this manual. Information is subject to change without notice.

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**Note:**

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions;

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

The user is cautioned that changes and/or modifications not approved by the responsible party could void the user's authority to operate the equipment.

**Note:**

This equipment has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at their own expense.

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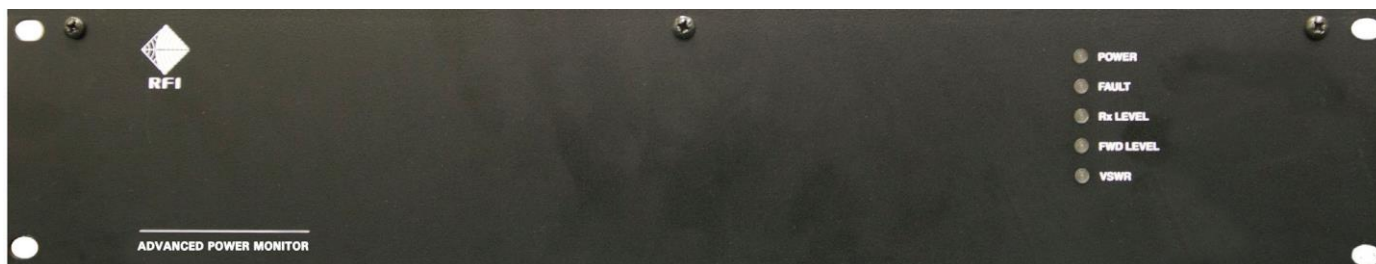
Region	USA	EMEA	ASIA PACIFIC
Sales email	webmaster@rfi.com.au	sales@rfiamea.com	webmaster@rfi.com.au
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## Advanced Power Monitors

### **APMxxxx Series**

Front View



### **APMxxxxK1 Series**

Rear View



### **APMxxxxK2 Series**

Rear View



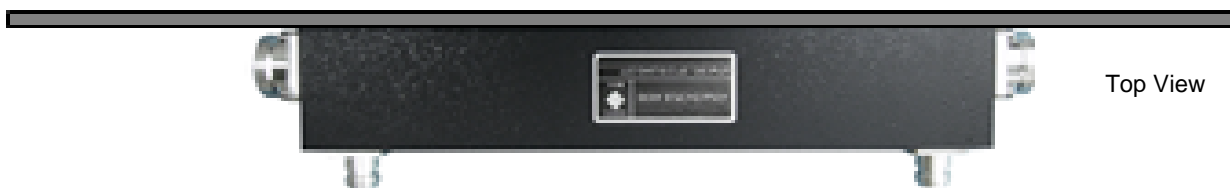
## Antenna Line Couplers

### ***SP1318-2440-DFF1RU (132-174MHz)***

Front View



Top View



### ***SP3855-4440-DFF1RU (380-520MHz)***

Front View



Top View



### ***SP7496-4440-DFF1RU (746-960MHz)***

Front View



Top View



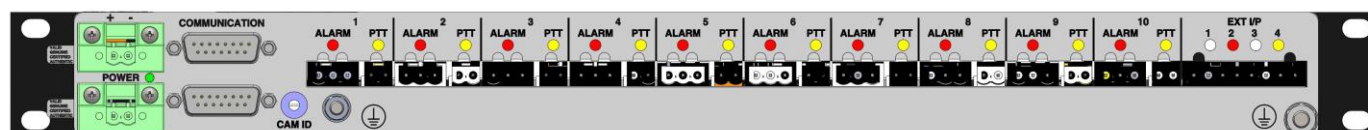


## Optional Modules

### CAM0000 Series



#### Channel Alarm Module (CAM) Front Panel Layout

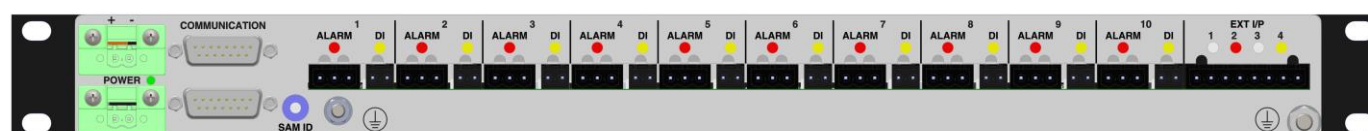


#### Channel Alarm Module (CAM) Rear Panel Layout

### SAM0000 Series

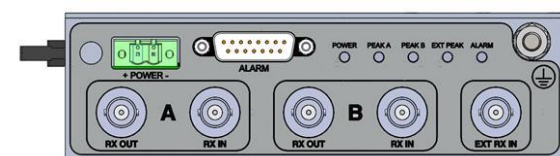


#### Site Alarm Module (SAM) Front Panel Layout



#### Site Alarm Module (SAM) Rear Panel Layout

### RSM0000 Series



#### Receive Systems Module (RSM) Rear Panel Layout

## **1. General Description**

The Advanced Power Monitor (APM) is used to measure and monitor channel-specific Tx Forward and Reflected power and Combiner Insertion losses between transmitter combiners their associated antenna(s) for up to 80 channels. Rx Channel and other frequency monitoring is also available for up to 80 channels. The capability to perform a series of Tx-to-Rx system isolation (loop back), Rx sub-system passband gain response, and Transmitter isolation (Tx carrier rejection) tests is also provided.

Four pairs of Tx Forward (FWD) and Tx Reverse (RFL) coaxial connector inputs fed from non-intrusive in-line directional couplers give the APM the capability of monitoring the output of up to four (or more) separate transmitter combiner/antenna systems.

A Receive coaxial connector input port fed from either the receiver multicoupler system and/or an external "off-air" antenna gives the APM the capability of monitoring receiver system signal levels, or the propagation of transmitter channels located on other sites.

In addition to measuring and monitoring transmitter forward and reflected power in analogue and digital radio communication systems, the APM can also be configured to monitor and measure insertion loss in the network transmitter combiner(s).

For each combiner/antenna system being monitored, a 4-port Antenna Line Coupler (ALC) is inserted after the transmitter combiner on the antenna feeder cable. These couplers have a low insertion loss (<0.2dB) and each is capable of handling up to 750Watts of RF power. The excellent PIM (<-150dBc) and PIP ratings of the coupler are maintained using 7/16 DIN (F) connectors on the input "From Combiner" and output "To Antenna" ports, with N (F) termination connectors used on the "FWD" and "RFL" coupling ports.

The APM and the ALC unit(s) are intended for mounting into 19" rack mount equipment cabinets or open frames, but they can be mounted in alternate configurations if required. As standard, the APM is supplied with one ALC for connection to the first combiner/antenna system - with additional ALCs available separately for applications requiring more than one combiner/antenna system to be monitored.

RFI can also supply PIM-rated 7/16 DIN right-angle adapters if required to assist in rack cabinet layout and installation of the coupler(s) if required.

The APM communicates via an Ethernet port mounted on the rear of the unit. This facilitates configuration and monitoring using a Graphical User Interface (GUI) via an integral web server. Access to the GUI is protected by a User Name and Password that is progressively checked for security strength.

The (up to) 80 individual Tx and Rx frequencies configured in the APM are divided across four GUI pages, each able to display up to 20 channels each. This allows the user to view a large number of channels on a standard monitor screen size without the excessive use of scrolling. It should be noted that each group of 20 Tx channels is not 'physically' assigned to a specific pair of FWD and RFL ports, despite the GUI presenting them as four sets of 20 channels each (although it may be considered this way if this assists in conveniently thinking of the channels and how they may be affiliated to the combiner/antenna that they are connected to). As Tx channels are not physically assigned to a specific pair of FWD and RFL ports, one frequency cannot be measured separately on multiple couplers (i.e. as may be desired if the multiple legs of a Distributed Antenna System were to be monitored using multiple couplers connected to one APM), and therefore each individual frequency can only be measured "once" across all ports of the APM.

All transmitter frequencies, channel bandwidths (12.5KHz and 25KHz), alarm level thresholds, and other relevant parameters are user-programmable via the GUI.

A DB15 rear-mounted connector provides four (4) separate dry relay contact alarm reporting outputs which may be individually user-assigned on an ad-hoc basis, to specific monitored channels, alarm groups (Network IDs), or to the system alarms in the APM, CAM(s), SAM(s) or RSM. This capability allows specific channels' alarm conditions to be accessible via discrete alarm outputs – allowing faulty equipment to be individually identified, reported, and action to be initiated as required, or used to control basic alarm event actions such as antenna change-over (ACO) or main/standby base station switching, etc. SNMP Traps, SNMP GET requests, SMTP (Email) and Manager Message UDP/TCP/IP data packets are also available for alarm and status reporting. LED's on the front panel of the APM provide visual indication of system alarms.

APM monitoring is also supported by the Genesis Software GenWatch™ APM Applet, or by the C² Systems SitePortal® monitoring software.

The APM is available in models that cover two DC input voltage ranges, 9-36V and 36-60V, and AC mains voltage models are available using either a 90-264VAC plugpack-style 12VDC, or a 90-264VAC plugpack-style 48VDC PSU.

### Channel Alarm Modules (CAMs) and Site Alarm Modules (SAMs)

If desired, optional Channel Alarm Modules (CAMs) or Site Alarm Modules (SAMs) may be added to the APM at any time. CAMs/SAMs are connected using a daisy chained cabling approach using two cables - "DC power" and "Comms".

The CAM is no longer manufactured and the SAM is a direct (and enhanced) replacement. Any mixture of up to ten (10) Channel Alarm Modules (CAMs) or Site Alarm Modules (SAMs) may be added to a single APM unit.

When connected, CAMs and SAMs are automatically recognised by an APM, and menu selections for them will then automatically appear in the APM GUI. Each CAM/SAM has an "ID address" which is easily set via the rotary switch on the rear of each CAM/SAM unit. Each CAM/SAM connected to an APM should have a different ID address selected to prevent address contention in the APM GUI.

Each CAM/SAM provides ten (10) separate alarm output relays which may be individually user-assigned, on an ad-hoc basis, to specific monitored channels alarms in the APM. This capability allows specific channels' alarm conditions to be accessible via discrete alarm outputs – allowing faulty equipment to be individually identified, reported, and action to be initiated as required. SNMP, SMTP (Email) and Manager Message UDP data packets are also available for alarm and status reporting.

A logic input on each of the CAM's/SAM's channels allows additional monitoring functionality – such as monitoring base station Tx PTT or RX UNSQ lines – to enable the determination of "conditional" repeater RF output failure states. Various equipment operational configurations can be monitored using these logic inputs – such as hot/standby conditions (and the change-over actioned), using this functionality.

In addition to the ten (10) separate alarm channels, each CAM also has four (4) user-programmable and configurable general-purpose logic inputs that may be used for monitoring external equipment – such as site or cabinet door opening, generator fuel level low, UPS, solar, or other alarm conditions. This functionality has been further enhanced in the SAM, with Input #1 being able to be configured to measure temperature, an analogue voltage range, or a digital logic input level – and inputs #2, #3, and #4 being able to be configured to measure an analogue voltage range, or a digital logic input level respectively.

The CAM and the SAM modules provide enhanced monitoring functionality for the APM, allowing a range of PTT, temperature, voltages and digital inputs to be monitored as part of Antenna Change-Over (ACO), base station hot/standby, equipment and site monitoring, and auxiliary control capabilities.

### Receive Systems Module (RSM)

An optional Receive Systems Module (RSM) may be fitted to an APM to support networks using two receive antennas, such as systems using dual diversity or redundant Rx antennas.

The RSM may be added to an APM at any time – providing a network technology upgrade path if required.

The RSM also improves the APM's receive sensitivity capability and provides an enhanced ability to monitor frequencies in other applications – such as off-air monitoring of adjacent network sites' coverage propagation or the monitoring of a Distributed Antenna System (DAS).

The RSM adds two receiver paths (RA, RB) and a third 'External' antenna (RE) that are configurable in the APM GUI, on a per-channel basis. Rx level measurements for all three receive paths are available in the Status, System Isolation Tests and Service Mode pages of the APM GUI. The RSM also features a unique "RF Peak Level Detector" capability that can measure high levels of RF, even of very short burst duration, that may be overloading the network's base station receivers and degrading network performance. Alarm thresholds can be configured for these received signal level peaks so that alarms can be actioned when they occur, and these events are measured, logged and may be viewed in the APM GUI to assist fault-finding activities.

### Hardware Versions

There are several hardware variants of the APM. These can be identified by the communications ports on the rear of the unit. The earlier "K1" variant has one USB and one TCPIP port. The limited memory capacity of the K1 may restrict its compatibility with future firmware features. Where this occurs, the webserver GUI and/or CLI interface may not display incompatible features to prevent uncertainty in unit capabilities. The K1 unit's memory capacity may also limit the available storage space for data such as alarm history and log files.

The later variant of APM is identified as the "K2". The K2 has deleted the USB port and substituted a second TCPIP port in its place. The memory capacity of K2 units is significantly increased to support more extensive alarm history and log file storage capability. Communications with the APM via a USB interface is still possible utilising a (user-supplied) USB-to-TCPIP adapter.

## 2. Application Diagram

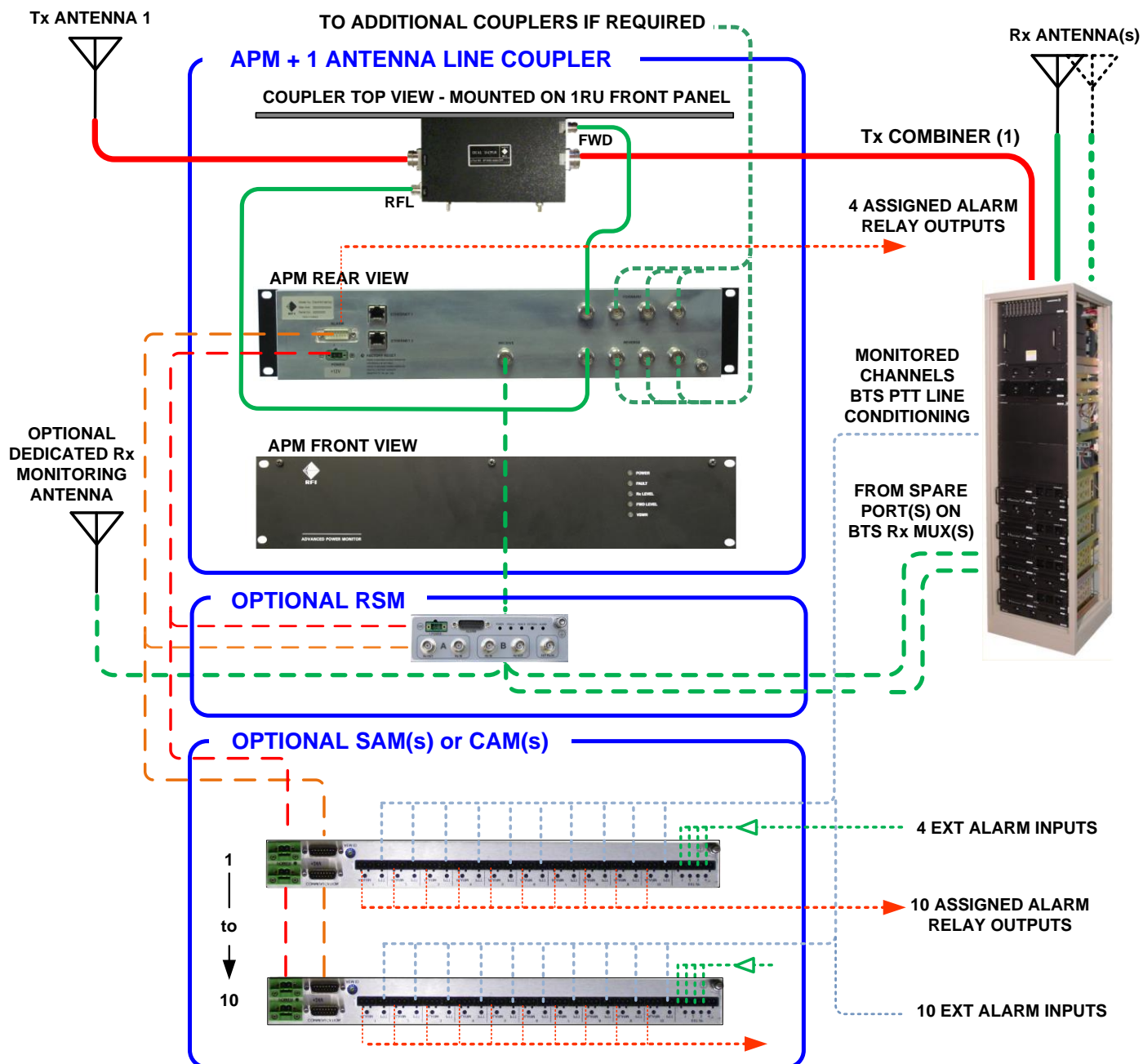


Diagram1

### 3. APM - Electrical and Mechanical Specifications

APM Model Number	APMxxxx Series
Frequency range (Tx power and Rx level monitoring)	APM1317 132-174MHz APM3852 380-520MHz APM7487 746-870MHz APM8796 870-960MHz
Maximum number of monitored channels	Tx = 80 Rx = 80 System Isolation Tests = 20
Maximum number of Tx networks (Tx ant's)	4 (can be externally expanded)
Maximum number of Rx networks (Rx ant's)	1 (can be externally expanded)
Frequency channel step size	1.25kHz
Channel measurement bandwidths	12.5, and 25kHz
Max spurious or IM products level	-30dBm
Measurable Rx input power level	-50dBm to -110dBm (the RSM module can enhance APM readings to better than -125dBm)
Measurable Tx input power level	-30dBm to +20dBm (i.e. +10dBm to +60dBm into 40dB coupler)
Conducted emissions	Complies with CISPR22 Part B & FCC Part 15 (15.207)
Radiated emissions	Complies with CISPR22 Part B & FCC Part 15 (15.209)
RF Termination connectors	All N (F) on rear
Communication interface ports "K1" hardware variant "K2" hardware variant	1 x USB Type B, 1 x TCP/IP RJ45 Ethernet port on rear 2 x TCP/IP RJ45 Ethernet ports on rear
Internal alarm relay contacts output connector	1 x DB15 (M) on rear
Visual alarm notification	Front panel LED's
Configurable alarms	Summary Fault / Tx FWD min. power Tx FWD max. power / Tx Combiner I.L. max. VSWR max. / Rx RSSI min. level / RSSI max. level Tx-to-Rx Antenna Isolation min. & max. Rx System Gain Loss min. & max. Tx Carrier Rejection min. & max. (optional CAM/SAM module alarms)
Alarm Outputs	Summary Alarms – APM Relay Outputs Detailed Alarms – APM or CAM/SAM Module Relay Outputs SMTP Email (up to 4 Addresses) SNMPv2c (Northbound Traps or Southbound GET) or via Genesis Software GenWatch™ APM Applet or via C² Systems SitePortal® monitoring software
Alarm Contact Type	Dry Relay N.O. / Common / N.C.
Alarm Relay Contact Ratings	50VDC @ 1A
Power supply options	9-36VDC, 36-60VDC, or 90-264VAC
Power consumption	10W (typical)
DC power connector	1 x Polarized 2-pin Phoenix-style connector on rear
Mounting	2RU 19" rack mounting
Dimensions	W 19 x H 3.5 x D 1.6in / W 483 x H 89 x D 40mm (incl. connectors)
Weight	< 4.4lbs / 2kgs
Operational temperature range	-22°F to 140°F / -30°C to +60°C

Table 1

## 4. Coupler - Electrical and Mechanical Specifications

Coupler Model Number	SPxxxx-2440-DFF1RU / SPxxxx-4440-DFF1RU
Frequency range	SP1318-2440-DFF1RU 130-180MHz SP3855-4440-DFF1RU 380-550MHz SP7496-4440-DFF1RU 746-960MHz
Insertion Loss	< 0.2dB
Input and Output Port Return Loss	> 20dB
Coupling Loss	40dB (+/- 0.7)
Maximum input power	750W
Maximum PIP	16kW (+72dBm)
PIM 3rd OIP (2 x 43dBm carriers)	Better than -150dBc
Connectors – “To ANT” & “From COMBINER” ports	2 x 7/16 DIN (F)
Connectors – “FWD” and “RFL” coupling ports	2 x N (F)
Mounting	1RU 19" rack mounting
Dimensions	W 19 x H 1.75 x D 3" / W 483 x H 45 x D 77mm (inc connectors)
Weight	SP1318-2440-DFF1RU < 4.4lbs / 2kgs SP3855-4440-DFF1RU < 2.2lbs / 1kg SP7496-4440-DFF1RU < 2.2lbs / 1kg
Operational temperature range	-22°F to 140°F / -30°C to +60°C

Table 2

## 5. CAM/SAM/RSM - Electrical and Mechanical Specifications

CAM Model Number	CAM0000
Alarm Outputs	10
Alarm Contact Type	Dry Relay N.O. / Common / N.C.
Alarm Relay Contact Ratings	50VDC @ 1A
Alarm Inputs	10 (configurable - one per alarm output) 4 (configurable – general purpose)
Alarm Input Logic	“0” = <2.5V DC “1” = >2.5V DC
Visual alarm notification	Front and Rear panel mounted LEDs
Power Supply options	9-36VDC or 36-60VDC
Power Consumption	10W (max)
Connectors	(Note: All connectors on rear) 1 x Polarized 8-pin Phoenix connector 10 x Polarized 3-pin Phoenix connectors 10 x Polarized 2-pin Phoenix connectors 1 x Polarized 2-pin Phoenix connector 1 x DB15 (M)
External Alarm Inputs	
Channel Alarms Outputs	
Channel Alarms Inputs	
Power Supply	
Comms Interface to/from APM	
Mounting	1RU 19" rack mounting
Dimensions	W 19 x H 1.75 x D 3" / W 483 x H 45 x D 77mm
Weight	< 2.2lbs / 1kg
Operational temperature range	-22°F to 140°F / -30°C to +60°C

Table 3



SAM Model Number	SAM0000 / SAM0000-48
Alarm Outputs	10
Alarm Contact Type	Dry Relay N.O. / Common / N.C.
Alarm Relay Contact Ratings	50VDC @ 1A
Alarm Inputs	10 (configurable) digital (general purpose/one per alarm output) 4 (configurable) temperature/analogue/digital (general purpose)
Alarm Input Logic	temperature RFI temperature sensor analogue -60V DC to +60V DC analogue -60V DC to +5V DC digital "0" = <2.5V DC "1" = >2.5V DC
Temperature Sensor (optional)	SAM0000-TS (ordered separately)
I/O Connector Kit (optional)	SAM0000-CK (ordered separately)
Visual alarm notification	Front and Rear panel mounted LEDs
Power Supply options	9-36VDC (SAM0000) or 36-60VDC (SAM0000-48)
Power Consumption	10W (max)
Connectors	(Note: All connectors on rear) 1 x Polarized 8-pin Phoenix connector 10 x Polarized 3-pin Phoenix connectors 10 x Polarized 2-pin Phoenix connectors 1 x Polarized 2-pin Phoenix connector 1 x DB15 (M)
Mounting	1RU 19" rack mounting
Dimensions	W 19 x H 1.75 x D 3" / W 483 x H 45 x D 77mm
Weight	< 2.2lbs / 1kg
Operational temperature range	-22°F to 140°F / -30°C to +60°C

Table 4

RSM Model Number	RSM0000 / RSM0000-48
Frequency Range	132-960MHz
Maximum RF Input Level (no damage)	0dBm
Isolation between RF Inputs	>55dB
Peak Detector Response Time	≥ 3mS
Peak Detector Alarm Threshold (GUI selectable per port)	-35 to -55dBm
Peak Detector Warning Threshold (GUI selectable per port)	-40 to -65dBm
Visual alarm notification	Rear panel mounted LEDs
Power Supply options	9-36VDC (RSM0000) or 36-60VDC (RSM0000-48)
Power Consumption	10W (max)
Connectors	Connection to APM RF In and RF Out Power Supply Comms Interface to/from APM N (Male) BNC (Female) 1 x Polarized 2-pin Phoenix connector 1 x DB15 (M)
Mounting	On rear of APM (mounting bracket supplied)
Dimensions	Mounts on rear of APM
Weight	< 2.64lbs / 1.2kg
Operational temperature range	-22°F to 140°F / -30°C to +60°C

Table 5

## 6. Ordering Information

Ordering Information		
Motorola ECAT	RFI	
Model Number	Model Number	Description
DSAPM1317	APM1317	Advanced Power Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
DSAPM131748	APM1317-48	Advanced Power Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
DSAPM1317AC	APM1317-AC	Advanced Power Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
DSAPM131748AC	APM1317-48AC	Advanced Power Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
DSAPM3852	APM3852	Advanced Power Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
DSAPM385248	APM3852-48	Advanced Power Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
DSAPM3852AC	APM3852-AC	Advanced Power Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
DSAPM385248AC	APM3852-48AC	Advanced Power Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
DSAPM7487	APM7487	Advanced Power Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
DSAPM748748	APM7487-48	Advanced Power Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
DSAPM7487AC	APM7487-AC	Advanced Power Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
DSAPM748748AC	APM7487-48AC	Advanced Power Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
DSAPM8796	APM8796	Advanced Power Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
DSAPM879648	APM8796-48	Advanced Power Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
DSAPM8796AC	APM8796-AC	Advanced Power Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
DSAPM879648AC	APM8796-48AC	Advanced Power Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
Additional Couplers		Description
DSSP13182440DFF1RU	SP1318-2440-DFF1RU	Directional Coupler 130-180MHz 40dB 4-Port 19in Rack Mount 1RU Input /Output Ports DIN (F) Coupling Ports N (F)
DSSP38554440DFF1RU	SP3855-4440-DFF1RU	Dual Directional Coupler 380-550MHz 40dB 4-Port 19in Rack Mount 1RU Input /Output Ports DIN (F) Coupling Ports N (F)
DSSP74964440DFF1RU	SP7496-4440-DFF1RU	Dual Directional Coupler 746-960MHz 40dB 4-Port 19in Rack Mount 1RU Input /Output Ports DIN (F) Coupling Ports N (F)

Table 6

Ordering Information		
Channel Alarm Module		Description
DSCAM0000	CAM0000	Channel Alarm Module 9-36V DC (Obsolete – use DSSAM0000)
DSCAM000048	CAM0000-48	Channel Alarm Module 36-60V DC (Obsolete – use DSSAM000048)
Site Alarm Module		Description
DSSAM0000	SAM0000	Site Alarm Module 9-36V DC
DSSAM000048	SAM0000-48	Site Alarm Module 36-60V DC
DSSAM0000TS	SAM0000-TS	Site Alarm Module Temperature Sensor
DSSAM0000CK	SAM0000-CK	Site Alarm Module Connector Kit (matching connectors for all CAM/SAM I/O connectors)
Receive Systems Module		Description
DSRSM0000	RSM0000	Receive Systems Module 9-36VDC
DSRSM000048	RSM0000-48	Receive Systems Module 36-60VDC
Accessories		
DSAPM0000USAC	APM0000USAC	Plugpack 90-264VAC 12VDC c/w 6ft/1.8m USA IEC Power Cable
DSAPM0048USAC	APM0048USAC	Plugpack 90-264VAC 48VDC c/w 6ft/1.8m USA IEC Power Cable

Table 6

## **7. Unpacking**

The APM is packed into a custom designed cardboard insert, box container and sleeve together with a single Coupler and AC to DC power pack if the AC option has been ordered. Optional CAM, SAM, and RSM modules are similarly packaged.

Packed with the APM and Coupler will be the Factory Test Sheet (FTS) and Quick Start Guide (QSG). Packed with the RSM is a Quick Start Guide (QSG) which overviews its mounting onto an APM. The User's Manual will have been loaded onto either a CD or USB memory stick packed together with the QSG. It is recommended to retain the Factory Test Sheet for future reference.

An Ethernet jumper cable is included in the packaging, provided for your convenience to connect and configure the APM via an onboard Graphical User Interface (GUI) from the browser located on your laptop/notebook.

Although the packing box has been designed to provide a significant amount of protection, it is important to report any visible damage to the carrier immediately. It is the customers' responsibility in the event of product damage, to lodge a damage claim with the carrier within a short period of time after receipt of the package. The time window for lodging the claim should be ascertained from the specific carrier as this may vary between carriers (typically 1 to 5 days).

Please dispose of the packing material responsibly.

## **8. Firmware License Agreement**

This statement must be read in its entirety prior to the loading or use of the Firmware provided by RFI.

### ***Introduction.***

*By loading any product related Firmware you agree without reserve with all the conditions as detailed in this RFI Firmware License Agreement.*

*The term "Firmware" for the sake of this statement includes all software or firmware upgrades, either as a new installation, revision, patches or upgrades. Any reference to software, for the purposes of this license agreement, will therefore be included in the term Firmware.*

*RFI refers to the Australian registered company RF Industries Pty Ltd.*

*The copyright of all Firmware relating to this product remains the property in whole of RFI and is therefore protected by the respective international copyright or trademark laws.*

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## 9. Installation

**WARNING:** Power should not be applied to electrical equipment during Installation, and cabling connection/disconnection activities.

Apply power only when all installation and cabling activities have been completed.

The APM, (optional) CAM/SAMs, and Coupler(s) are designed to be mounted into a standard EIA 19" rack frame using industry standard 19" rack fasteners. The (optional) RSM module is mounted onto the rear of the APM using the supplied mounting bracket. The Application Diagram (Diagram 1) illustrates the APM/CAM/SAM/RSM/Coupler connectivity.

The system should be installed into a dry, vibration and corrosive free environment avoiding areas of high heat or humidity and direct sunlight.

The Coupler 1RU panel/s may be mounted either above or below the APM. However consideration should be given to the requirement for the low loss cables from the Tx combiners to be routed via the Coupler panel to the antenna. This may influence the mounting position of the Coupler panel in the respective 19" rack frame.

No RF coaxial interconnect cables are provided with the APM. This is because the optimal length for these cables may vary for each installation. These cables should be made up on site once the APM and respective coupler units have been mounted into the 19" rack frame.

Typically 50 Ohm double-shielded or solid jacket coaxial cables terminated with N (M) connectors terminated on each end are used to connect the "FWD" and "RFL" ports of the Coupler to the nominated input ports of the APM. Although there is no specific restriction on the length of these cables between the Coupler and the APM, it is recommended to keep the cable losses below 3dB, which in effect adds to the coupling loss. This loss can be calibrated out, however the end result of high cabling losses in these cables will be to marginally reduce the effective lower level measurement dynamic range of the APM. Lower loss coaxial cables should be used to reduce this effect when using longer cable runs exceeding a calculated coaxial line loss of 3dB.

The input "From Combiner" and output "To Antenna" ports of the Coupler are 7/16DIN (F) and will require low Inter-Modulation (IM) 7/16DIN (M) cable connectors to terminate onto the Coupler. The use of correct cable cutting and connector preparation tools to terminate the 7/16DIN (M) connectors is strongly recommended to reduce the possibility of Passive Inter-Modulation (PIM) products. The 7/16DIN connectors should always be correctly torqued to the manufacturers recommended values.

**Note:** Final torqueing of the termination connectors onto the Coupler should be done after the calibration procedure as described under the *Calibration – Tx Port 1* section of this document is completed.

To protect the transmitter combiner and transmitters from any possible damage, ensure that each transmitter coupled to the respective transmitter combiner is powered down prior to disconnection and reconnection onto the respective coupler units.

Although it is not necessary to terminate the unused Tx FWD, Tx RFL and Rx ports on the APM with a 50 Ohm low power resistive termination load, it is often considered good RF engineering practice to terminate any spare or unused port.

For DC power supply, a cable from the DC source should be terminated into the supplied 2-pin plug, observing the correct polarity, and then plugged into the polarized 2-pin Phoenix (F) socket on the rear of the APM. For AC Mains versions, an AC-to-DC plug pack is provided with a terminated 2-Pin plug already terminated onto the end of the plug pack's DC cable. This should be fitted into the power socket on the rear of the APM.

M5 and M6 earth studs are located on the rear of the APM, (optional) CAM/SAM(s) and RSM, and Coupler(s) for earthing the units to a suitable earthing point within the 19" rack cabinet or rack frame.



## **10. Operation**

When the power source to the APM has been switched on, check that the green “Power” LED light on the front panel is illuminated. Any other illuminated LEDs will be reflecting the current state of the various alarms - based on the current programmed configuration.

If one or more optional Channel Alarm Modules (CAMs) and/or Site Alarm Modules (SAMs) and Receive Systems Module (RSM) are fitted, the green “Power” LED light on their panel is illuminated. This LED will “pulse” at regular intervals to indicate comms activity between them and the host APM. Any other illuminated LEDs will be reflecting the current state of the various inputs/outputs and alarm states - based on the current programmed configuration.

A CD or USB memory stick is provided with the APM and contains copies of the QSG (Quick Start Guide) and APM User's Manual and other supporting information and files.

In addition to using the integral Web Browser GUI, the APM (and any connected CAM/SAM/RSMs) can also be communicated with via a CLI (Command Line Interface) using plain text format via a Telnet IP session. For information on the CLI format please contact the RFI Technical Support team.

## **10.1 Ethernet Connection, Set-up, and Reset**

### **Web Browser GUI (Graphical User Interface)**

The APM utilizes an on board web server to provide web browser access to the GUI. This can be accessed connecting to the APM via a short Ethernet cable jumper from a laptop/notebook directly to the APM or remotely via a TCP/IP network.

A standard Ethernet CAT5e jumper cable terminated with RJ45 connectors at either end is provided for convenience in the packing box with the APM. Plug one end of this Ethernet jumper cable into the APM and the other end into your computer Ethernet socket.

The following web browsers are compatible with the APM GUI;

- Internet Explorer 8
- Firefox V3.6
- Chrome V9
- Safari V5.

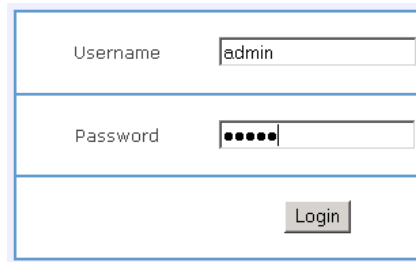
**NOTE:** There are documented issues with Internet Explorer™ Version 10.  
This may impact the presentation of some GUI features.  
The use of an alternate web browser is recommended.

### **IP Address**

Initiate your web browser and type in the address field the following default address;

http://192.168.1.200 (APM factory default address).

Connectivity to the APM is successful when the following “Log In” page appears.



Should the web browser be unable to open this session, it may be necessary to set the IP address of your computer to an address in the same IP range (i.e. 192.168.1.180).

This is done for example in Windows XP™ in the following manner;

1. Select “Start” from status menu
2. Single click – “Control Panel”
3. Double click – “Network Connections”
4. Double click - “Local Area Connection”
5. In Local Area Connections Status box, single click the “Properties” button.
6. When the Local Area Connection Properties box opens, select only the “Internet Protocol (TCP/IP)” choice.
7. Click “Properties” button.
8. Click “Use the following IP address.
9. Enter next to *IP address* 192.168.1.180
10. Enter next to *Subnet mask* 255.255.255.0
11. Enter next to *Default gateway* 192.168.1.254
12. Click “OK” to initiate changes.

This is done for example in Windows 7™ in the following manner;

1. Select "Start" from status menu
2. Single click – "Control Panel"
3. Single click – " Network and Sharing Center"
4. Single click - "Change Adapter Settings" on the left hand side menu
5. Single Click – "Local Area Connection" box
6. Single Click – "Change Settings of this Connection"
6. When the Local Area Connection Properties box opens, select only the "Internet Protocol 4 (TCP/IPv4)" choice.
7. Click "Properties" button.
8. Click "Use the following IP address".
9. Enter next to *IP address* 192.168.1.180
10. Enter next to *Subnet mask* 255.255.255.0
11. Enter next to *Default gateway* 192.168.1.254
12. Click "OK" to initiate changes.

Should you still be unable to successfully connect to the APM via the default IP address then the IP address may have already been changed. If there is no possibility of recovering the changed IP address, then it will be necessary to reset the APM to the factory default settings.

#### **Reset Factory Default Ethernet Addresses and Access.**

To reset the APM back to the Factory Default settings will mean a complete reset of all RF configuration settings and alarm threshold parameters as well as the IP address parameters. To do this, simply switch the APM off by removing the DC power cable connector. Press the factory reset button on the rear of the APM, reconnect the DC power while continuing to hold the reset button down until the green power LED light flashes, the Factory reset has started and the reset button may be released. Wait for the APM to complete its default re-configuration and to restart.

**NOTE:** This will cause the IP address, subnet and gateway addresses and all other configuration data to be reset back to factory default address.

#### Factory Default settings

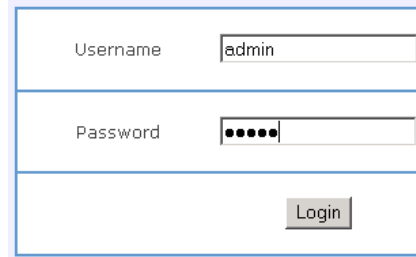
**DHCP** - Disabled  
**IP Address** - 192.168.1.200  
**Subnet Mask** - 255.255.255.0  
**Gateway** - 192.168.1.254  
**Level 1 User Name:** user  
**Level 1 Password:** user  
**Level 2 User Name:** admin  
**Level 2 Password:** admin  
**Level 3 User Name:** master  
**Level 3 Password:** master

#### **Reset RF Default settings.**

To reset the APM back to the RF Default settings will mean a complete reset of all RF configuration settings and alarm threshold parameters. The above Factory Default Ethernet and Access settings will remain unchanged.

Should you wish to only reset the RF configuration settings, simply press the factory reset button (without disrupting power) until the green power LED light flashes, the RF reset has started and the reset button may be released.

## **10.2 Log In Page**



The screenshot shows a login form with two input fields. The first field is labeled 'Username' and contains the text 'admin'. The second field is labeled 'Password' and contains six dots, indicating a masked password. Below these fields is a button labeled 'Login'.

The default User Name is “master” and Password is “master”. This default user name and password provides complete and unrestricted access to the APM (Level 3).

Once logged in, this can be changed via the User Management screen under the Maintenance menu tab.

### **User Name and Password Levels**

Level 1: User name and password access via the web browser GUI interface displays only status screens.

Level 2: User name and password access via the web browser GUI interface facilitates status, configure and maintenance screens. The ‘unit-specific’ sensitive fields (such as Communications Settings, SMTP Alarm email account passwords, etc ) are hidden to prevent accidental modification or disclosure to unauthorised persons.

Level 3: User name and password access via the web browser GUI interface facilitates status, configure and maintenance screens. The ‘unit-specific’ sensitive fields (such as Communications Settings, SMTP Alarm email account passwords, etc) are all displayed and available for editing.


Once the correct User Name and Password is entered the GUI will open to the first page of the GUI.

### **GUI Page Headers**

The first page that appears in the GUI is the “System Overview” page.

This page is headed with the name of the product and the model reference. The “Customer Name” and “Site Name” will display either the factory default fields (as “Not Defined”) or the names allocated to each under the “Configuration – User Data” menu item which allows the user to define the customer name, respective site name, and the names allocated to the respective Tx Ports (Groups) 1 to 4.

### 10.3 System Overview



- [Overview](#)
- [Status](#)
- [History](#)
- [Service Mode](#)
- [Configuration](#)
- [Calibration](#)
- [Maintenance](#)
- [About](#)
- [Logout](#)

[Help](#)

## Advanced Power Monitor

**Model - DSAPM3852K2**

### System Overview

Customer Name -

Demo

Site Name -

Chase Tower

Group	Tx Antenna Reference	Channel Count	Alarm Status
<b><u>Isolation Tests</u></b>			
<b><u>Rx Channels 1-20</u></b>		16	OK
<b><u>Rx Channels 21-40</u></b>		20	FAIL
<b><u>Rx Channels 41-60</u></b>		20	OK
<b><u>Rx Channels 61-80</u></b>		20	OK
<b><u>Tx Port 1</u></b>			
	LTR-TRBO TX1	5	OK
<b><u>Tx Port 2</u></b>			
	LTR-TRBO TX2	5	OK
<b><u>Tx Port 3</u></b>			
	CONV TX3 -NA	0	OK
<b><u>Tx Port 4</u></b>			
	RFI Test	3	OK
<b><u>System</u></b>			FAIL

[Refresh](#)

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This page displays an overview of the current unit status.

The overall summary alarm status is displayed, for each Port and for the System, with each line representing the current alarm status on its respective Status page in the GUI menu. Clicking on any Group item will navigate you to that item's Status page so that the detail of the alarms can be viewed. The following items are displayed:

#### Group:

The group of parameters relevant to each title.

#### Tx Antenna Reference:

The user-defined description for the Port.

#### Channel Count:

The number of channels that have been configured for the Port.

#### Alarm Status:

The "Fail" or "OK" summary status for the Group.

Clicking the title of a "Group" will navigate to the nominated port's details page.

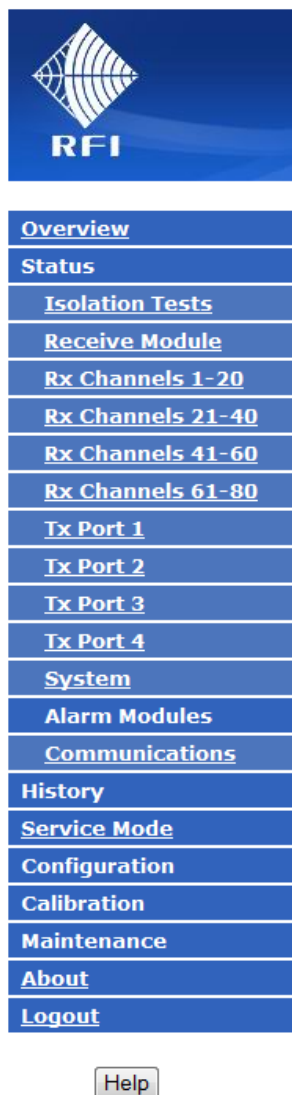
#### Refresh:

Click this button to manually trigger a page refresh.

## **10.4 Status Menu**

The “Status” menu allows all of the APMs measurement parameters to be viewed.


Selecting each indented topic under “Status” will display that item as a separate display page.



**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.



## 10.5 Status – System Isolation Tests



- Overview
- Status
- Isolation Tests
- Rx Channels 1-20
- Rx Channels 21-40
- Rx Channels 41-60
- Rx Channels 61-80
- Tx Port 1
- Tx Port 2
- Tx Port 3
- Tx Port 4
- System
- Communications
- History
- Service Mode
- Configuration
- Calibration
- Maintenance
- About
- Logout

[Help](#)

### Status - System Isolation Tests

Customer Name - Demo  
Site Name - Chase Tower

#### Settings

Setting	Value
Automatic System Isolation Tests	Enabled
Automatic Test Schedule	Every Hour, starting at 02:00
Next Scheduled Test	Tue Jul 14 00:00:00 2015

#### Parameters Used

Item	Value
Internal Test Signal Level	- 15.0 dBm
Tx Reverse Coupling Loss (Nominal)	41.5 dB
Tx Feeder Loss (Nominal)	0.5 dB
Rx Subsystem Gain(Loss)	0.0 dB
Rx Post Gain(Loss)	+10.0 dB

#### Test Results

Frequency	Ant Iso	Rx System	Tx Rejection	Measured
Rx 402.50000 MHz	20.1 dB			- 79.5 dBm
Rx 398.00000 MHz		- 13.4 dB		- 92.2 dBm
Rx 398.75000 MHz		- 2.1 dB		- 80.9 dBm
Rx 400.00000 MHz		- 1.3 dB		- 80.1 dBm
Rx 402.50000 MHz		- 0.6 dB		- 79.4 dBm
Rx 405.00000 MHz		- 0.7 dB		- 79.5 dBm
Rx 406.00000 MHz		- 5.3 dB		- 84.1 dBm
Rx 406.25000 MHz		- 13.4 dB		- 92.2 dBm
Tx 462.15000 MHz - Port 1	53.1 dB	> 102.7 dB	> 156.3 dB	< -110.0 dBm
Tx 454.11250 MHz - Port 1	53.1 dB	100.3 dB	153.9 dB	-107.1 dBm
Tx 454.31250 MHz - Port 1	53.1 dB	102.4 dB	156.0 dB	-110.0 dBm
Tx 454.62500 MHz - Port 1	53.1 dB	101.0 dB	154.6 dB	-109.4 dBm
Tx 463.22500 MHz - Port 1	53.1 dB	> 104.2 dB	> 157.8 dB	< -110.0 dBm
Tx 461.17500 MHz - Port 2	53.1 dB	102.9 dB	156.5 dB	-108.3 dBm
Tx 454.05000 MHz - Port 2	53.1 dB	97.3 dB	150.9 dB	-103.3 dBm
Tx 451.88750 MHz - Port 2	53.1 dB	101.4 dB	155.0 dB	-107.0 dBm
Tx 454.25000 MHz - Port 2	53.1 dB	97.7 dB	151.3 dB	-104.9 dBm
Tx 454.53750 MHz - Port 2	53.1 dB	> 102.5 dB	> 156.1 dB	< -110.0 dBm

[Test Now](#)

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The “Status – Isolation Tests” page reports the current status of the System Isolation Tests settings.

### Settings:

#### Automatic System Isolation Tests:

Indicates if the Automatic System Isolation Tests function is currently enabled/disabled in the APM. If ‘enabled’, the System Isolation Tests are performed automatically, based on the Automatic Test Schedule. If ‘disabled’, the System Isolation Tests can still be performed manually, by clicking the ‘Test Now’ button.

#### Automatic Test Schedule:

The configured schedule when the System Isolation Tests will be performed if enabled. The schedule may be configured based on a range of time/interval/repetition parameters.

## Next Scheduled Test:

The next scheduled date/time that the Automatic Test Schedule will be performed.

## Parameters Used:

The known RF site parameters that are used in performing the System Isolation Tests. These parameters are collated from data fields on the various APM GUI configuration screens,

## Test Results:

The displayed results of the System Isolation Tests. These are as follows;

### Tx-Rx Antenna Isolation Iso (Ant Iso):

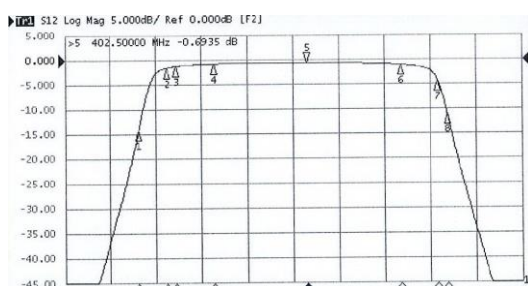
The first line of the Test Results table displays the calculated Tx-Rx Antenna Isolation value, and is measured using the APM's internal signal generator operating on the displayed Rx Frequency. The value measured and displayed represents the minimum isolation value between any of the monitored Tx and Rx antennas. In multiple Tx antenna systems, this value represents the sum of all Tx-Rx isolations seen in parallel, and in multiple Tx antenna installations this value usually represents the worse-case Tx-Rx antenna isolation path at the site. This test's measured Rx Level is provided in the right hand column for information.

**Note:** The isolation that can exist between antennas, particularly in dual/triple/quad stacked models, can vary significantly by frequency, and may be higher than the 'typical' or 'minimum' value stated in the antennas' published specifications. Therefore, it is recommended to measure the achieved antenna isolation on a site during the commissioning of the site (or the initial installation of the APM), and to apply alarm values in the APM configuration screen that are appropriately set either side of the measured antenna isolation at the proposed test frequency. The *Test Now* function may be useable to perform this initial measurement if the achieved isolation value is within the measurement range of the APM.

### Rx System Performance (Rx System):

The next lines of the Test Results table display the calculated Rx System performance values, and is measured using the APM's internal signal generator operating on the programmed Rx Frequencies. Typically, nominated Rx frequencies at the bottom, middle and top of the Receiver System preselector (or TTA) passband will suffice in providing an overall Rx System Performance indication. Additional frequencies may be configured for this test if more thorough results are desired.

The Antenna Isolation value used for all Rx frequencies in this test is the above Tx-Rx Antenna Isolation value. The values calculated represent the Rx Subsystem Gain/Loss value, and the displayed values should align similarly with the Rx Subsystem Gain/Loss value displayed in the Parameters Used table. In the example shown, the preselector passband is 400-405MHz. The preselector passband response roll-off can be seen in the frequency measurements either side of this passband. This test's measured Rx Levels (Measured) are provided for information.



These Rx System Performance measurements show the Rx system's gain and selectivity response. Additional frequencies could be configured into this test to show the selectivity response values further outside the passband if desired.

### Tx Rejection (Tx Rejection):

The next lines of the Test Results table display the calculated receiver subsystem's Tx Rejection performance values, and is measured using the monitored Transmitter's outputs on the displayed Tx Frequencies.

Typically, nominated Tx frequencies at the bottom and top of the Transmitter frequencies monitored on the site (or multiple bottom and top frequencies if multiple Tx sub-bands are APM-monitored Tx combiners) will suffice in providing an overall Tx Rejection performance indication. Additional frequencies may be configured for this test if more thorough results are desired.

The Antenna Isolation value used for all Tx frequencies in this test is a calibrated value measured for each Tx Antenna and recorded in the *Configuration – Isolation Tests* GUI page. The values calculated represent the overall rejection of the Tx carriers, as seen at the Rx Subsystem, and include all Tx combiner, Tx Feeder, Tx-Rx Antenna Isolation, Receiver (or TTA) Preselector selectivity, and Rx Subsystem Gain/Loss components. This test's calculated Receiver (or TTA) Preselector Tx carrier frequency rejection (Rx System) and the measured level of the Tx frequencies at the APM Rx port (Measured) are provided for information.

## Measured:

The Rx RSSI value measured by the APM during this test.


**Test Now:**

The "Test Now" button can be selected at any time to manually initiate a System Isolation Tests measurement.

All of the measurement fields may take time to populate subject to when the Tx frequencies configured in the test next transmit. The 'Test Now' button will display

**Note:** During a System Isolation Test, results that have not yet been measured (i.e. because the nominated Tx frequency has not yet keyed) will be highlighted by a shaded background colour. As each test is able to be completed, and a result recorded, that measurement's value will change to having a solid background colour. It may take some time for all tests to be completed and a measurement result recorded – depending on channel activity at the time of the test. The background behind a measurement value is highlighted in colour to indicate its current status, as follows; Green denotes 'no alarm', a Pale Green background denotes a measurement of a previous 'no alarm' value is yet to be completed, Red denotes 'alarm', a Pale Red background denotes a measurement of a previous 'alarm' value is yet to be completed, a Pale Yellow background denotes the Ant Iso value is a calculated average (i.e. the value for the specific port has not been calibrated, and White denotes a measurement result is not available.

**Note:** The Rx System performance values that can be measured in the System Isolation Tests are a function of the overall test configuration. If the resulting measurement is beyond the APM's measurement sensitivity, '???' will be displayed in lieu of a value.



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### Status - System Isolation Tests

**Customer Name -** APM3852  
**Site Name -** Bayswater

**Settings**

Setting	Value
Automatic System Isolation Tests	Enabled
Automatic Test Schedule	Every Hour, starting at 19:30
Next Scheduled Test	Wed Mar 2 11:30:00 2016

**Parameters Used**

Item	Value
Internal Test Signal Level	- 15.0 dBm
Tx Reverse Coupling Loss (Nominal)	39.2 dB
Tx Feeder Loss (Nominal)	3.0 dB

	RA	RB	RE
Rx Subsystem Gain(Loss)	0.0 dB	0.0 dB	0.0 dB
Rx Post Gain(Loss)	0.0 dB	0.0 dB	0.0 dB

**Test Results**


Frequency	Ant Iso (dB)			Rx System (dB)			Tx Rejection (dB)			Measured (dBm)		
	RA	RB	RE	RA	RB	RE	RA	RB	RE	RA	RB	RE
Rx 421.00000 MHz	61.6	62.3	44.6							-118.8	-119.5	-101.8
Rx 418.00000 MHz				-0.7	-0.2	-0.2				-119.5	-119.7	-102.0
Rx 419.00000 MHz				-0.3	-0.7	+0.5				-119.1	-120.2	-101.3
Rx 420.00000 MHz				+1.1	-0.3	-0.6				-117.7	-119.8	-102.4
Rx 420.50000 MHz				+0.1	-0.2	+0.2				-118.7	-119.7	-101.6
Rx 421.00000 MHz				0.0	0.0	0.0				-118.8	-119.5	-101.8
Rx 421.50000 MHz				-0.3	0.0	+0.1				-119.1	-119.5	-101.7
Rx 422.00000 MHz				-0.5	-0.3	---				-119.3	-119.8	---
Rx 423.00000 MHz				-0.2	-0.9	---				-119.0	-120.4	---
Tx 420.06250 MHz - Port 1	61.7	61.7	61.7	67.1	66.4	80.0	131.8	131.1	144.7	-85.9	-85.2	-98.8
Tx 500.06250 MHz - Port 2	61.7	61.7	61.7	67.3	67.8	95.3	132.0	132.5	160.0	-85.0	-85.5	-113.0

[Test Now](#)

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When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (RxA, RxB and RxE) are visible in the *Status – System Isolation Tests* page.

## 10.6 Status – Receive Systems Module



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### Status - Receive Systems Module

**Customer Name -** APM3852  
**Site Name -** Bayswater

**Settings**

Setting	Value
Model	DSM0000
Firmware Version	1.0
Hardware Model No.	0
Hardware Revision	0
Module Serial Number	0001
RxA to Rx-Output Gain	0 dB
RxB to Rx-Output Gain	0 dB
Antenna (RxE) to Rx-Output Gain	0 dB
RxA-IN to RxA-OUT On/Off	ON
RxB-IN to RxB-OUT On/Off	ON

**Status**

Item	Status
Alarm Status	OK
RxA Peak Level	- 60.3 dBm
RxA Current Level	< - 65.0 dBm
RxB Peak Level	< - 65.0 dBm
RxB Current Level	< - 65.0 dBm
Antenna (RxE) Peak Level	- 59.6 dBm
Antenna (RxE) Current Level	- 60.9 dBm
Power Supply	OK

[Reset Peak Levels](#)
[Refresh](#)

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**Note:** The “Receive Systems Module” menu item appears only if an (optional) Receive Systems Module (RSM) is installed.

The Receive Systems Module “Status” page reports the current status of the RSM

### Settings:

#### Model:

Displays the type of Receive Systems Module.

#### Firmware Version:

Displays the Alarm Module’s Firmware Version.

#### Hardware Model No.:

Displays the Receive Systems Module’s Hardware Revision Number.

**Hardware Revision:**

Displays the Receive Systems Module's Hardware Revision.

**Module Serial Number:**

Displays the Receive Systems Module's Module Serial Number.

**RxA to Rx-Output Gain:**

Displays the configured gain in the signal path from the RxA Input to the Rx Output to the APM.

**RxB to Rx-Output Gain:**

Displays the configured gain in the signal path from the RxB Input to the Rx Output to the APM.

**Antenna RxE to Rx-Output Gain:**

Displays the configured gain in the signal path from the RxE Input to the Rx Output to the APM.

**RxA IN to RxA OUT On/Off:**

Displays the configured state of this RF path. "ON" is a nett gain of 0dB, "OFF" is a maximum attenuation in this path (>25dB).

**RxB IN to RxB OUT On/Off:**

Displays the configured state of this RF path. "ON" is a nett gain of 0dB, "OFF" is a maximum attenuation in this path (>25dB).

**Status:****Alarm Status:**

Indicates the current status of the RSM's alarms.

**RxA Peak Level:**

Displays the highest level signal measured on the RxA input. See *Reset Peak Levels* (below)

**RxA Current Level:**

Displays the last signal measured on the RxA input.

**RxB Peak Level:**

Displays the highest level signal measured on the RxB input. See *Reset Peak Levels* (below)

**RxB Current Level:**

Displays the last signal measured on the RxB input.

**Antenna (RxE) Peak Level:**

Displays the highest level signal measured on the RxE input. See *Reset Peak Levels* (below)

**Antenna (RxE) Current Level:**

Displays the last signal measured on the RxE input.

**Power Supply:**

Displays the current alarm state of the RSM's power supply.

**Reset Peak Levels:**

Click this button to reset the stored Peak Level value


**Refresh:**

Click this button to manually trigger a page refresh.

**Note:** The background behind a measurement value is highlighted in colour to indicate its current status. Green denotes 'no alarm', Yellow denotes 'warning', and Red denotes 'alarm'.



## 10.7 Status - Rx Channels 1-20



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### Status - Rx Channels 1-20

**Customer Name -** Smith County

**Site Name -** Mt Black

Auto Refresh ☐

[Refresh](#)

Chan No.	Channel ID	NW ID	ON	Freq	Act	Last recorded Power above threshold
Rx-1	LTR 1	1	Yes	467.15000 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-2	TRBO 1	0	Yes	459.11250 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-3	TRBO 2	0	Yes	459.31250 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-4	TRBO 3	0	Yes	459.62500 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-5	LTR 7	1	Yes	468.22500 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-6	LTR 9	1	Yes	459.53750 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-7	LTR 10	1	Yes	459.62500 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-8	LTR 18	1	Yes	467.15000 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-9	LTR 19	1	Yes	459.88750 MHz	<span style="color: green;">●</span>	<-110 dBm
Rx-10	LTR 20	1	Yes	468.22500 MHz	<span style="color: green;">●</span>	<-110 dBm

[Refresh](#)

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The “Status - Rx Channels” pages report the current status of Rx channels. To prevent display clutter, Rx channels are displayed with up to 20 channels shown per page.

### Chan No:

Indicates the configured sequential channel number.

### Channel ID:

The user configured description for the channel.

### NW ID:

Allows channels to be affiliated with a network (i.e. “1” is Police Network, “2” is Fire Network), to an antenna system (“1” is Tx Antenna #1, “2” is Tx Antenna #2), or to another label (i.e. “1” is 24x7 Maintenance, “2” is Normal Hours Maintenance) and this label will appear in Alarm Messages to allow faster determination of response priority and or actions.

**Note:** The NW ID column is only displayed if this feature is enabled in the “Configuration – User Data” screen.

### ON:

The configured channel scanning On/Off status. If this is “OFF”, the measurements for this channel will not be performed. This field may be used if channels have been disabled or temporarily removed from the site.

### Freq:

The configured frequency of the channel.

## Act:

An “active” indicator that shows the status of the *Last recorded power above threshold* value being display.

The three states that may appear are;

1. The indicator symbol is displayed but is dull – the value shown was not measured in the last measurement cycle.
2. The indicator symbol is displayed and is lit – the value shown was measured in the last measurement cycle.
3. The indicator symbol is not displayed – the channel is currently disabled and is not being measured.

## Power:

The result of the last valid received signal power level measurement in dBm. This will only be updated if the Rx power is above the programmed minimum threshold level.


## Auto Refresh:

Check this box to enable continuously repeated measurement and status updates. Updates will refresh every 5 seconds. Uncheck this box to cease continuously repeated updates.

## Refresh:

Click this button to manually trigger one measurement and status update cycle.

**Note:** The background behind a measurement value is highlighted in colour to indicate its current status. Green denotes ‘no alarm’, and Red denotes ‘alarm’.



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### Status - Rx Channels 1-20

Customer Name - **APM3852**  
Site Name - **Bayswater**

Auto Refresh ☐ [Refresh](#)


Chan No.	Channel ID	RA	RB	RE	Freq	Last recorded Power above threshold		
						RA	RB	RE
Rx-1	FC CH1 420	Yes	Yes	Yes	420.06250 MHz	- 84.2 dBm	- 85.0 dBm	<-125 dBm
Rx-2	FC CH2 420	Yes	Yes	No	420.26250 MHz	- 83.4 dBm	- 83.6 dBm	
Rx-3	FC CH3 420	Yes	Yes	No	420.36250 MHz	<-125 dBm	<-125 dBm	
Rx-4	FC CH4 420	Yes	Yes	No	420.56250 MHz	- 82.0 dBm	- 85.4 dBm	
Rx-5	FC CH5 420	Yes	Yes	No	420.66250 MHz	- 83.4 dBm	- 82.5 dBm	
Rx-6	FC CH6 420	Yes	No	No	421.28750 MHz	- 82.1 dBm		
Rx-7	FC CH7 420	Yes	No	No	421.36250 MHz	- 81.5 dBm		
Rx-8	FC CH8 420	Yes	No	No	421.58750 MHz	- 82.1 dBm		
Rx-9	Building DAS	No	No	Yes	468.10000 MHz			<-125 dBm

[Refresh](#)

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When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (RxA, RxB and RE) are visible in the *Status – Rx Channels* pages.

## 10.8 Status – Tx Port 1



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### Status - Tx Port 1

Customer Name - **Smith County**

Site Name - **Mt Black**

Tx Antenna Reference - **LTR-TRBO TX1**

Auto Refresh ☐

[Refresh](#)

Chan No.	Channel ID	NW ID	ON	Freq	Last recorded activity above threshold			
					Act	Power	Ins Loss	VSWR
Tx1-1	LTR 18	1	Yes	462.15000 MHz	<span style="color: green;">●</span> 66.07 W	+48.2 dBm	1.8 dB	1.02:1
Tx1-2	LTR 7	1	Yes	454.11250 MHz	<span style="color: green;">●</span> 56.23 W	+47.5 dBm	2.0 dB	1.02:1
Tx1-3	TRBO 3	0	Yes	454.31250 MHz	<span style="color: green;">●</span> 50.12 W	+47.0 dBm	2.5 dB	1.02:1
Tx1-4	LTR 10	1	Yes	454.62500 MHz	<span style="color: green;">●</span> 46.77 W	+46.7 dBm	3.3 dB	1.02:1
Tx1-5	LTR 20	1	Yes	463.22500 MHz	<span style="color: green;">●</span> 74.13 W	+48.7 dBm	0.8 dB	1.02:1

[Refresh](#)

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The Tx Port “Status” page reports the current status of all Tx channels allocated to the selected Tx Port.

**Note:** The Status - Tx Port screens have been optimised for accuracy. The Service Mode page has been optimised for fast screen refresh rate to assist tuning and other maintenance activities. As such, for some modulation types, the Power values displayed on the Status – Tx Port pages may vary slightly from those displayed on the Service Mode screen. For highest accuracy, use the Status - Tx Ports screens for determining actual Power values.

### Chan No:

Indicates the Tx Group followed by the configured sequential channel number within the Group i.e. Tx1-3 is the 3rd monitored channel within Tx Group 1.

### Channel ID:

The user configured description for the channel.

### NW ID:

Allows channels to be affiliated with a network (i.e. “1” is Police Network, “2” is Fire Network), to an antenna system (“1” is Tx Antenna #1, “2” is Tx Antenna #2), or to another label (i.e. “1” is 24x7 Maintenance, “2” is Normal Hours Maintenance) and this label will appear in Alarm Messages to allow faster determination of response priority and or actions.

**Note:** The NW ID column is only displayed if this feature is enabled in the *Configuration – User Data* screen.

**ON:**

The configured channel scanning On/Off status. If this is "OFF", the measurements for this channel will not be performed. This field may be used if channels have been disabled or temporarily removed from the site.

**Freq:**

The configured frequency of the channel.

**Act:**

An "active" indicator that shows the status of the *Last recorded power above threshold* value being display.

The three states that may appear are;

1. The indicator symbol is displayed but is dull – the value shown was not measured in the last measurement cycle.
2. The indicator symbol is displayed and is lit – the value shown was measured in the last measurement cycle.
3. The indicator symbol is not displayed – the channel is currently disabled and is not being measured.

**Power:**

The result of the last valid signal power level measurement in Watts and dBm. This will only be updated if the Tx power is above the programmed minimum threshold level.

**Ins Loss:**

The last measured Combiner Insertion Loss value. This value is the difference between the current Power level (as above) and the stored BTx Power level.

**VSWR:**

This is the VSWR recorded when the last valid power level measurement occurred.

**Auto Refresh:**


Check this box to enable continuously repeated measurement and status updates. Updates will refresh every 5 seconds. Uncheck this box to cease continuously repeated updates.

**Refresh:**

Click this button to manually trigger one measurement and status update cycle.

**Note:** The field behind an alarm is highlighted in colour to indicate its current status. White denotes 'no alarm', and Red denotes 'alarm'.

## 10.9 Status – System



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### Status - System

**Customer Name -** APM3852  
**Site Name -** Bayswater

#### Settings

Setting	Value
Model	DSAPM3852K2
Unit ID	0
Firmware Version	2.7 RC5
GUI Version	2.7 RC6
Hardware Revision	2
Unit Serial Number	11060159
SD-Card IDs & Serial Number	0x02, "TM", Serial 0x14bbc170
Date (dd/mm/yy), Time (hh:mm:ss)	14/4/2016, 9:20:40

#### Alarm Summary

Alarm	Status
Fault Summary	FAIL
Isolation Tests	OK
Rx Power	OK
Tx Power	FAIL
Tx VSWR	FAIL
VCO	OK
SD-Card	OK
Internal Supply Rails	OK
Receive Module	OK

Alarm Modules	1	2	3	4	5	6	7	8	9	10
Ext & DI Summary	OK	OK	-	-	-	-	-	-	-	-

#### Alarm Relays

Relay	Alarm Source	Status
Relay 1	Summary Alarm	Active
Relay 2	Rx Power	Inactive
Relay 3	Tx Power	Active
Relay 4	Tx VSWR	Active

Refresh

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This "System Status" page reports the current system settings and alarm summary.

**Note:** The "Receive Systems Module" and "Alarm Modules" menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

**Model:**

The model designator of this unit.

**Unit ID:**

This field reports the unique ID number that has been assigned by the Remote Manager application (If being used). If the unit is not managed through the Manager application, this will normally be 0.

**Firmware version:**

The version of the firmware.

**GUI version:**

The version of the Graphical User Interface.

**Hardware Revision:**

The hardware revision status of the unit. Future hardware revision levels may add additional capabilities.

**Unit Serial Number:**

The serial number of this unit.

**SD-Card IDs and Serial Number:**

The internal SD storage card's brand/type identification and serial numbers.

**Date, Time:**

The date and time as maintained by the on-board real time clock. Refreshing the page will update this information.

**Alarm Summary:**

Fault Summary:

This is the overall system alarm summary status. It will be active if any of the alarms below it are active.

Isolation Tests:

This alarm will activate if any of the System Isolation Tests values are outside the min. or max. threshold levels.

Rx Power:

This alarm will activate if any of the Rx channels are detecting a received signal level outside the programmed min/max threshold levels.

Tx Power:

This alarm will activate if any of the Tx channels are detecting a forward power level outside the programmed min/max threshold levels.

Tx VSWR:

This alarm will activate if any of the Tx channels is detecting a VSWR level above its configured max VSWR level.

**VCO:**

If any of the unit's VCOs is experiencing lock failures, this alarm will activate.

**SD-Card:**

A regular write/read test is performed on the SD-Card. If this test fails to complete successfully, this alarm will activate.

**Internal Supply Rails:**

If any of the unit's internal supply rail voltages goes out of limits, this alarm will activate.

**Receive Systems Module:**

If a RSM is connected to the APM and any of it has an alarm state present, this alarm will activate.

**Alarm Modules:**

If any CAM or SAM units are connected to the APM and any of their External Inputs has an alarm state present, this alarm will activate.

**Note:** This Receive Systems Module and Alarm Modules lines appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM unit may be fitted to each APM as required.

**Network IDs:**

If any Network ID has a channel with an alarm state active assigned to it, this alarm will activate.

**Alarm Relays:****Relay 1:**

Displays the Alarm Source currently allocated to this relay output, and its status.

**Relay 2:**

Displays the Alarm Source currently allocated to this relay output, and its status.

**Relay 3:**

Displays the Alarm Source currently allocated to this relay output, and its status.

**Relay 4:**

Displays the Alarm Source currently allocated to this relay output, and its status.

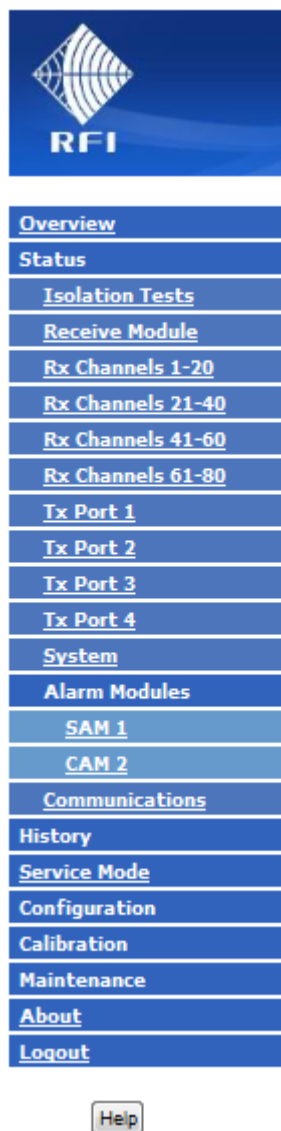
**Refresh:**

Reloads the page, updating the status information.

**Note:** The field behind an alarm is highlighted in colour to indicate its current status. Green denotes 'no alarm', and Red denotes 'alarm'.




## **10.10 Status – Alarm Modules - Menu**



**Note:** The “Receive Systems Module” and “Alarm Modules” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

## 10.11 Status – Alarm Modules - SAM



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### Status - Site Alarm Monitor, Module 1

**Customer Name -** Police  
**Site Name -** Mt Shaddock

Model	Serial Number	Firmware Version	Hardware Revision
SAM	13058071	2.0	1

External Alarm Input	Input ID	Input Value	Status
Ext1-1	Temperature	30.5 °C	OK
Ext1-2	Battery Bank #1	12.23 V	OK
Ext1-3	Door Entry	High	OK
Ext1-4	Movement Sensor	High	OK

Digital Input	Input ID	Function	Status
DI1-1	Base Station #1	PTT	Inactive
DI1-2	Base Station #2	Not in use	
DI1-3	Link #1	Not in use	
DI1-4	Link #2	Not in use	
DI1-5	Mains Power	Not in use	
DI1-6	Hot/Standby	Not in use	
DI1-7	Not defined	Not in use	
DI1-8	Not defined	Not in use	
DI1-9	Not defined	Not in use	
DI1-10	Not defined	Not in use	

Alarm Output	Port	Channel	Status
SAM1-1	Tx Port 1 - Main Tx	Tx1-5, Fire TAC	Inactive
SAM1-2	Alarm not in use		Inactive
SAM1-3	Alarm not in use		Inactive
SAM1-4	Alarm not in use		Inactive
SAM1-5	Alarm not in use		Inactive
SAM1-6	Alarm not in use		Inactive
SAM1-7	Alarm not in use		Inactive
SAM1-8	Alarm not in use		Inactive
SAM1-9	Alarm not in use		Inactive
SAM1-10	Alarm not in use		Inactive

Refresh

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This page reports the status of the selected Site Alarm Module (SAM) if fitted.

**Model:**

Displays the type of Alarm Module.

**Serial Number:**

Displays the Alarm Module's Serial Number.

**Firmware Version:**

Displays the Alarm Module's Firmware Version.

**Hardware Revision:**

Displays the Alarm Module's Hardware Revision.

**External Alarm Input:**

Displays the four (4) configurable external temperature/analogue/digital inputs.

**Input ID:**

The name assigned for the respective External Input.

**Status:**

Indicates the current status of the four (4) External Alarm Inputs.

**Digital Input:**

Displays the ten (10) configurable digital inputs.

**Input ID:**

A label for the respective Digital Input.

**Function:**

Indicates the selected input mode for each of the ten (10) Digital Inputs.

**Status:**

Indicates the current status of the four (4) External Alarm Inputs.

**Alarm Output:**

Displays the ten (10) configurable relay outputs.

**Port:**

Displays the Tx Port that the Alarm Output is currently associated to.

**Channel:**

Displays the Tx Channel that the Alarm Output is currently associated to.

**Status:**

Indicates the current status of the ten (10) Alarm Outputs.


**Refresh:**

Reloads the page, updating the status information.

**Note:** The field behind an alarm is highlighted in colour to indicate its current status. Green denotes 'no alarm', and Red denotes 'alarm'.

**Note:** The "*Status – Alarm Modules*" menu item under the Status menu appears only if one or more (optional) Channel Alarm Modules (CAM) or Site Alarm Modules (SAM) are installed. Up to ten (10) CAM/SAM units may be fitted to each APM as required.

## 10.12 Status – Alarm Modules - CAM



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- [Isolation Tests](#)
- [Rx Channels 1-20](#)
- [Rx Channels 21-40](#)
- [Rx Channels 41-60](#)
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- [Tx Port 1](#)
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### Status - Channel Alarm Module 7

**Customer Name -** Police  
**Site Name -** Mt Shaddock

Model	Serial Number	Firmware Version	Hardware Revision
CAM	12039132	1.0	0

External Alarm Input	Input ID	Status
Ext7-1	Door Alarm	OK
Ext7-2	Gen. Low Fuel	FAIL
Ext7-3	Mains Fail	OK
Ext7-4	Not defined	Not in use

Digital Input	Input ID	Function	Status
DI7-1	Police Rptr PTT	PTT	Inactive
DI7-2	Vot Shelf Alarm	General Purpose	OK
DI7-3	Not defined	Not in use	
DI7-4	Not defined	Not in use	
DI7-5	Not defined	Not in use	
DI7-6	Not defined	Not in use	
DI7-7	Not defined	Not in use	
DI7-8	Not defined	Not in use	
DI7-9	Not defined	Not in use	
DI7-10	Not defined	Not in use	

Alarm Output	Port	Channel	Status
CAM7-1	Tx Port 1 - Main Tx	Tx1-1, Police OPS	Inactive
CAM7-2	Alarm not in use		Inactive
CAM7-3	Alarm not in use		Inactive
CAM7-4	Alarm not in use		Inactive
CAM7-5	Alarm not in use		Inactive
CAM7-6	Alarm not in use		Inactive
CAM7-7	Alarm not in use		Inactive
CAM7-8	Alarm not in use		Inactive
CAM7-9	Alarm not in use		Inactive
CAM7-10	Alarm not in use		Inactive

[Refresh](#)

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This page reports the status of the selected Channel Alarm Module (CAM) if fitted.

**Model:**

Displays the type of Alarm Module.

**Serial Number:**

Displays the Alarm Module's Serial Number.

**Firmware Version:**

Displays the Alarm Module's Firmware Version.

**Hardware Revision:**

Displays the Alarm Module's Hardware Revision.

**External Alarm Input:**

Displays the four (4) configurable external digital inputs.

**Input ID:**

The name assigned for the respective External Input.

**Status:**

Indicates the current status of the four (4) External Alarm Inputs.

**Digital Input:**

Displays the ten (10) configurable digital inputs.

**Input ID:**

A label for the respective Digital Input.

**Function:**

Indicates the selected input mode for each of the ten (10) Digital Inputs.

**Status:**

Indicates the current status of the four (4) External Alarm Inputs.

**Alarm Output:**

Displays the ten (10) configurable relay outputs.

**Port:**

Displays the Tx Port that the Alarm Output is currently associated to.

**Channel:**

Displays the Tx Channel that the Alarm Output is currently associated to.

**Status:**

Indicates the current status of the ten (10) Alarm Outputs.

**Refresh:**


Reloads the page, updating the status information.

**Note:** The field behind an alarm is highlighted in colour to indicate its current status. Green denotes 'no alarm', and Red denotes 'alarm'.

**Note:** The "*Status – Alarm Modules*" menu item under the Status menu appears only if one or more (optional) Channel Alarm Modules (CAM) or Site Alarm Modules (SAM) are installed. Up to ten (10) CAM/SAM units may be fitted to each APM as required.



## 10.13 Status – Communications



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- [History](#)
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- [Configuration](#)
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[Help](#)

### Status - Communications

**Customer Name -** NWRL  
**Site Name -** CSH

**Ethernet**

Setting	Stored Value	Currently In Use
MAC Address	00:50:C2:97:E2:D1	
DHCP	Disabled	Disabled
IP Address	192.168.1.202	192.168.1.202
Subnet Mask	255.255.255.0	255.255.255.0
Gateway	192.168.1.1	192.168.1.1
Port 23 Command Line Interface	Enabled	

**Email**

Setting	Stored Value
Summary system status messages	Enabled
Detailed channel status messages	Enabled
SMTP Server IP Address	209.173.141.248
SMTP Server Listening Port	25
From Email Address	noreply@localhost
Destination Email Address(es)	scott.alford@rfi.com.au bart.voskulen@rfi.com.au

**SNMP**

Setting	Stored Value						
Send Alarm Notifications (Traps)	Enabled						
SNMP GET Requests (Port 161)	Enabled						
	<table border="1" style="width: 100%;"> <thead> <tr> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td>SNMP Manager IP Address</td> <td>123.243.234.21</td> </tr> <tr> <td>SNMP Manager Listening Port</td> <td>9125</td> </tr> </tbody> </table>	Primary	Secondary	SNMP Manager IP Address	123.243.234.21	SNMP Manager Listening Port	9125
Primary	Secondary						
SNMP Manager IP Address	123.243.234.21						
SNMP Manager Listening Port	9125						

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This page reports the current Communications settings.

### Ethernet

#### **MAC Address:**

The physical MAC address of the unit.

#### **DHCP:**

If the stored value is enabled, the unit will attempt to get its IP Address, Subnet Mask and Gateway settings from a DHCP server. If a DHCP server cannot be found, the stored settings will be used and the Currently In Use status will show as disabled.

If disabled, the stored values will be used unconditionally.

#### **IP Address:**

The Stored and Currently In Use IP address values.

**Subnet Mask:**

The Stored and Currently In Use network Subnet Mask addresses.

**Gateway:**

The Stored and Currently In Use network Gateway addresses.

**Port 23 Command Line Interface:**

Indicates if Port 23 is enabled or disabled for Command Line Interface use.

**Email****Summary system status messages:**

Indicates if *System summary status messages* will be sent via email.

**Detailed channel status messages:**

Indicates if *Detailed channel status messages* will be sent by email.

**SMTP Server IP Address:**

The IP address that email messages will be sent to.

**SMTP Server Listening Port:**

The port number used by the SMTP server.

**From Email Address:**

The email address that this unit will appear as in email messages.

**Destination Email Address(es):**

The email address(es) that this unit will send email messages to. (up to 4 addresses may be used)

**SNMP****Send Alarm Notifications (Traps):**

Indicates if sending SNMP Traps are enabled or disabled.

**SNMP GET Requests (Port 161):**

Indicates if Port 161 is enabled or disabled for SNMP GET requests.

**SNMP Manager IP Address:**

The IP address that SNMP northbound Alarm Traps will be sent to. Both a Primary and Secondary address may be used if required for redundant SNMP server configurations.

**SNMP Manager Listening Port:**

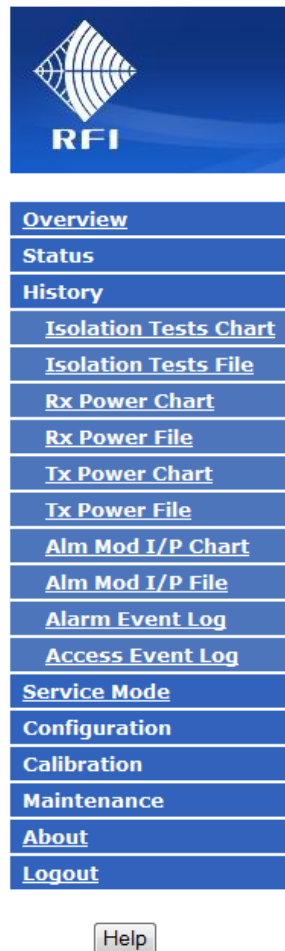
The port number used by the SNMP Manager. Both a Primary and Secondary address may be used if required for redundant SNMP server configurations.

**Note:** SNMP MIB files for the APM are available from RFI.

## **10.14 History Menu**

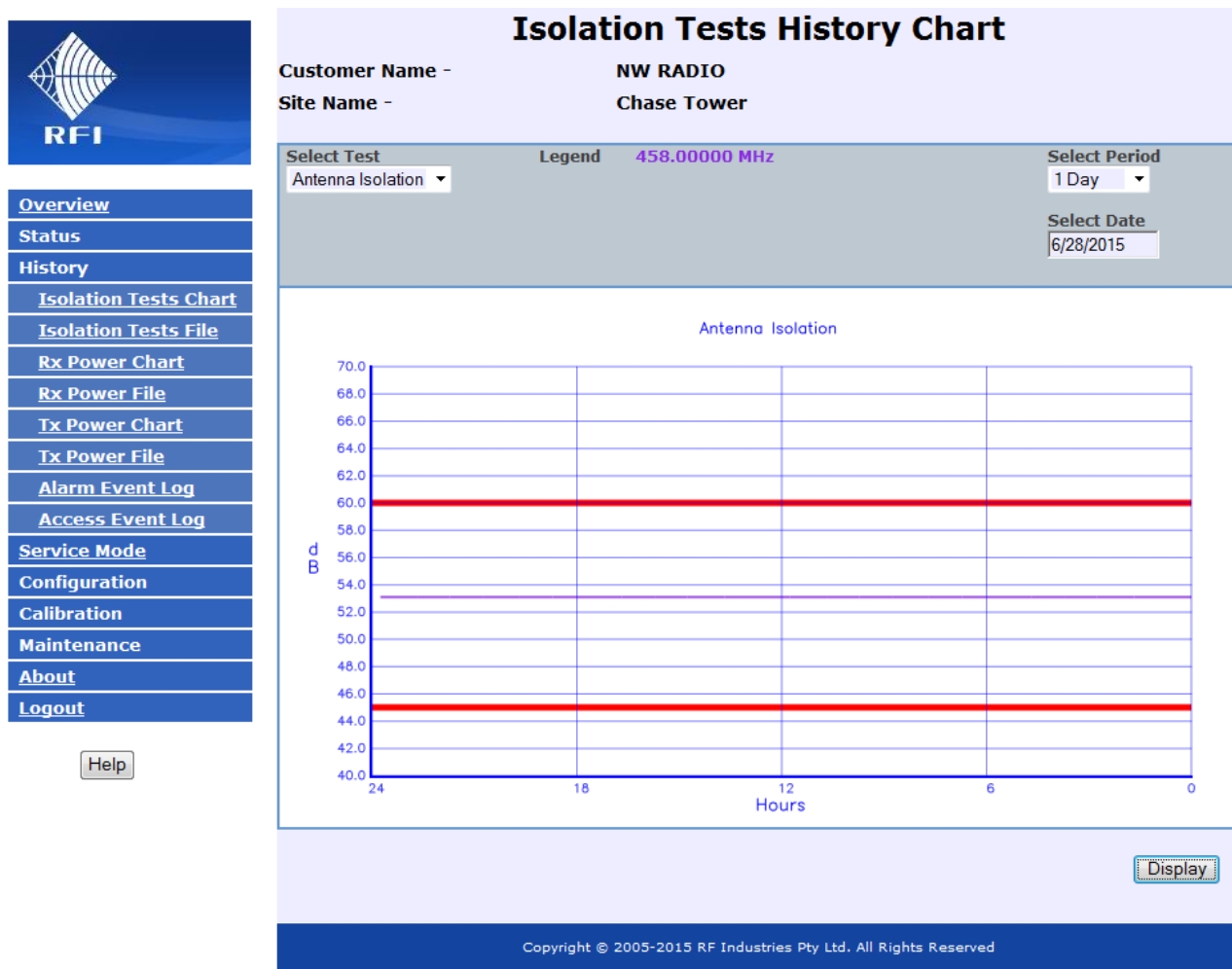
The “History” menu allows the APMs logged data to be viewed.

Selecting each indented topic under “History” will display that item as a separate display page.



**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

## 10.15 History – Isolation Tests



**Example of Antenna Isolation Chart**

This page displays the logged Isolation Tests values.

### Select Test:

Select the Isolation Tests which you desire to display. Available selections are *Antenna Isolation*, *Rx Gain* and *Tx Rejection*.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Display:

Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

**Note:** The red lines on the displayed graph represent the alarm max/min threshold values currently configured for this test.

**NOTE:** There are documented issues with Internet Explorer™ Version 10. This may impact the presentation of some GUI features. The use of an alternate web browser is recommended.

[Overview](#)[Status](#)[History](#)[Isolation Tests Chart](#)[Isolation Tests File](#)[Rx Power Chart](#)[Rx Power File](#)[Tx Power Chart](#)[Tx Power File](#)[Alm Mod I/P Chart](#)[Alm Mod I/P File](#)[Alarm Event Log](#)[Access Event Log](#)[Service Mode](#)[Configuration](#)[Calibration](#)[Maintenance](#)[About](#)[Logout](#)[Help](#)

## Isolation Tests History Chart

Customer Name -

APM3852

Site Name -

Bayswater

Select Test

Antenna Isolation ▾

Legend

RA - 421.00000 MHz [1]

RB - 421.00000 MHz [2]

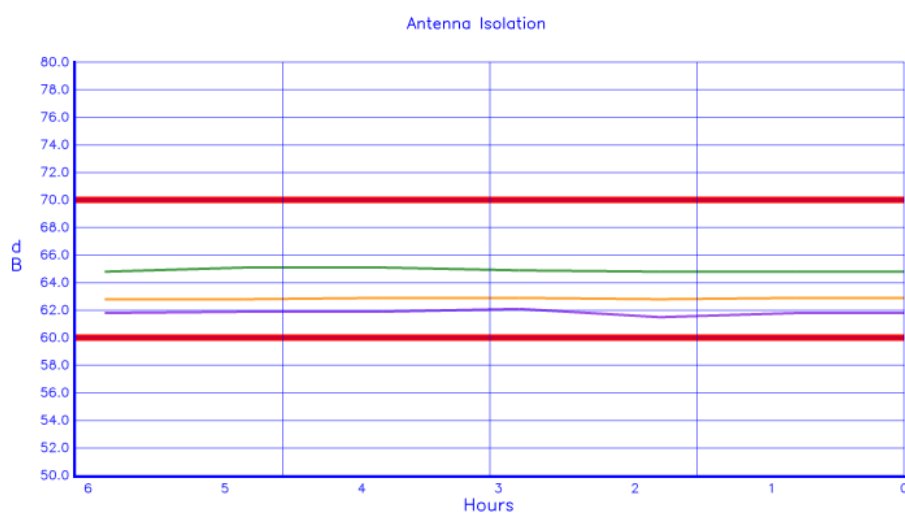
RE - 421.00000 MHz [3]

Select Period

6 Hours ▾

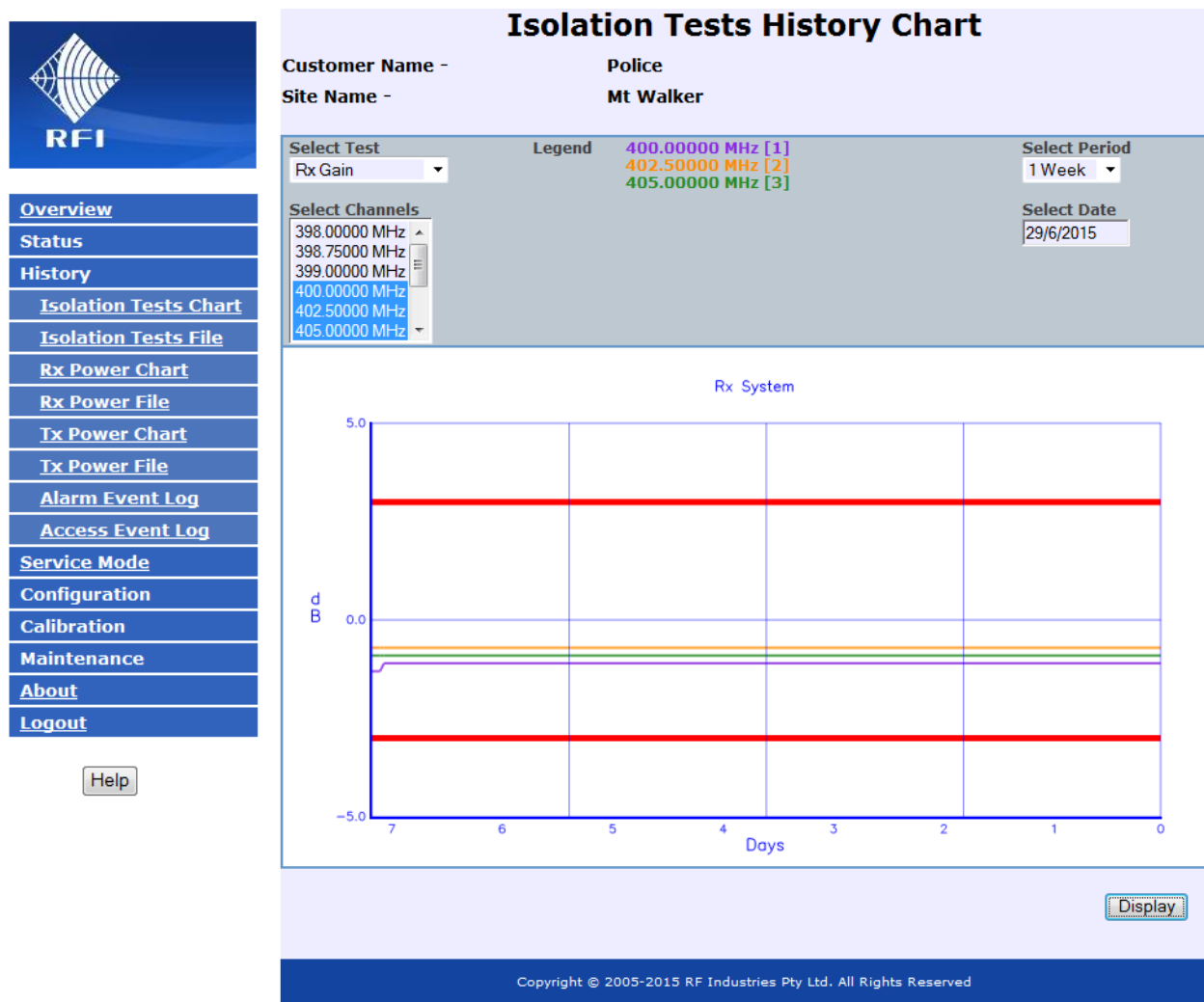
Select Date

3/3/2016

[Display](#)

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When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (RxA, RxB and RE) are visible in the *Isolation Tests History Chart – Antenna Isolation* page.



Example of Rx Gain Chart

This page displays the logged Rx Gain values.

#### Select Test:

Select the Isolation Tests which you desire to display. Available selections are *Antenna Isolation*, *Rx Gain* and *Tx Rejection*.

#### Select Channels:

Select the test frequencies that you wish to display. Up to five (5) frequencies can be displayed at one time and each selected frequency will be displayed using a different coloured line. To select the frequencies to be displayed, click on a frequency from the drop down list and, holding down the "Ctrl" key on your computer keyboard, click additional frequencies in the list as desired. Selected frequencies will be highlighted when selected.

#### Select Period / Select Date:

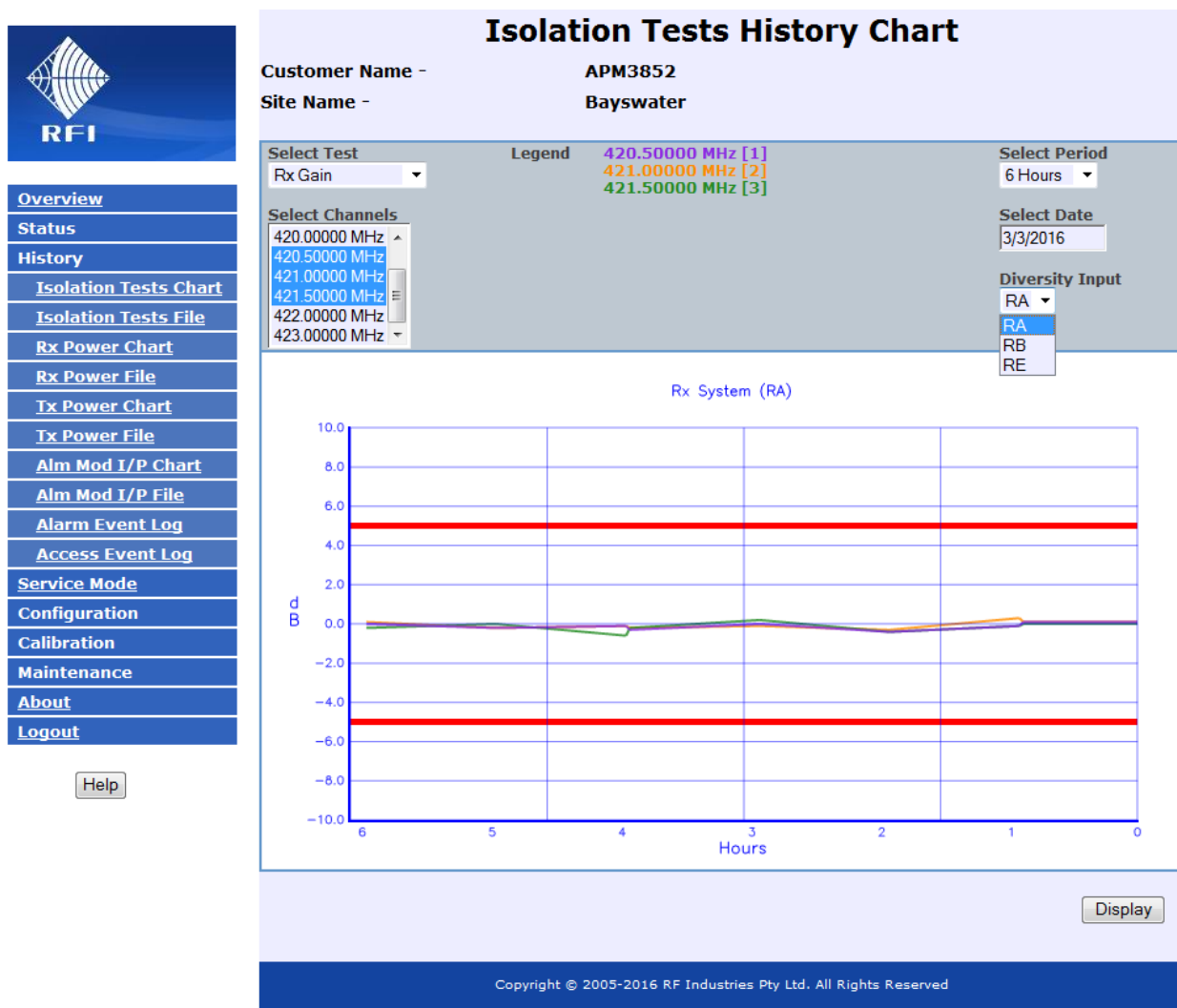
Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

#### Display:

Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

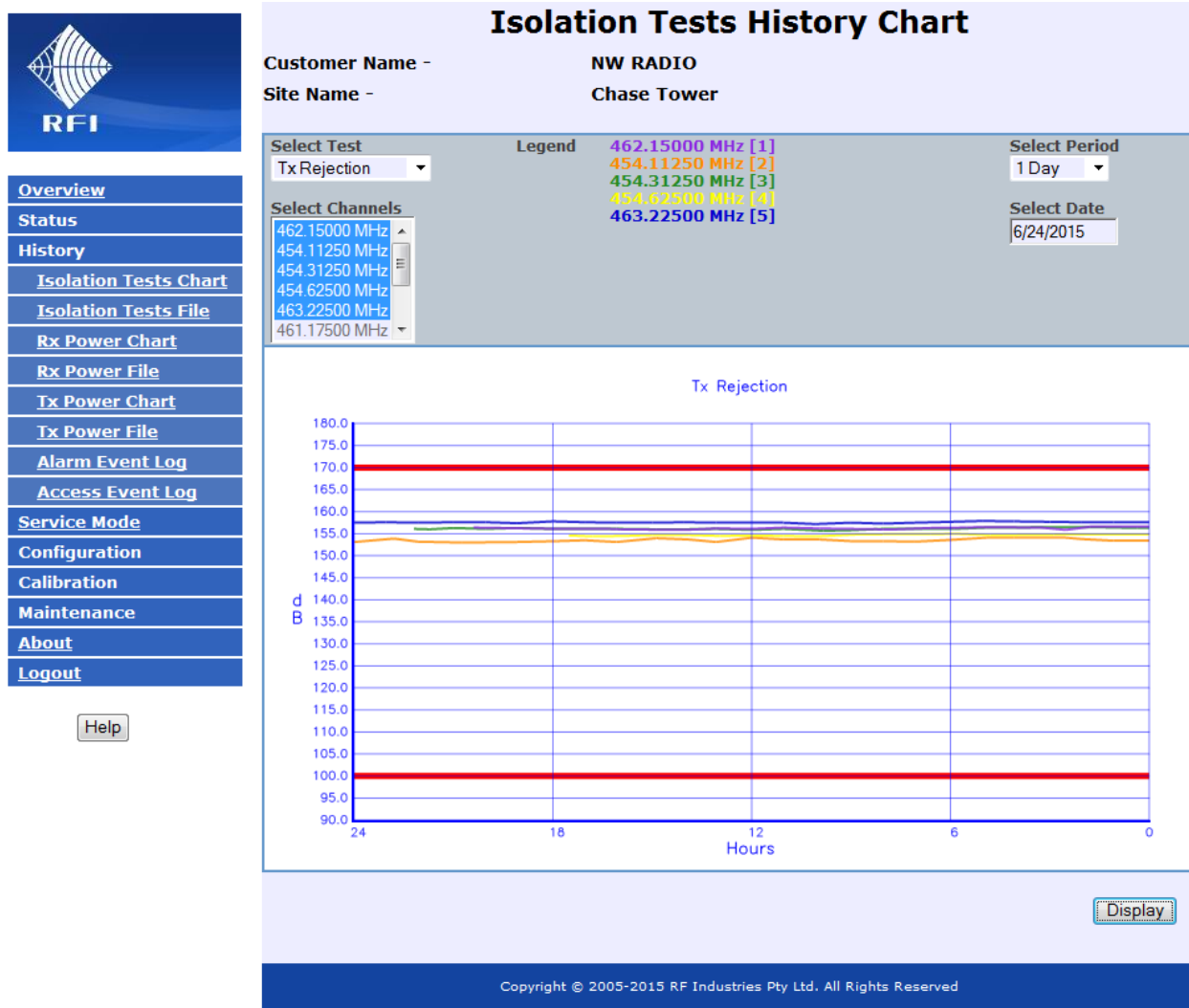
**Note:** The red lines on the displayed graph represent the alarm max/min values currently configured for this test.

**NOTE:** There are documented issues with Internet Explorer™ Version 10. This may impact the presentation of some GUI features. The use of an alternate web browser is recommended.



When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (Rx A, Rx B and Rx E) may be selected in the *Isolation Tests History Chart – Rx Gain* page.





**Example of Tx Rejection Chart**

This page displays the logged Tx Rejection values.

#### Select Test:

Select the Isolation Tests which you desire to display. Available selections are *Antenna Isolation*, *Rx Gain* and *Tx Rejection*.

#### Select Channels:

Select the test frequencies that you wish to display. Up to five (5) frequencies can be displayed at one time and each selected frequency will be displayed using a different coloured line. To select the frequencies to be displayed, click on a frequency from the drop down list and, holding down the "Ctrl" key on your computer keyboard, click additional frequencies in the list as desired. Selected frequencies will be highlighted when selected.

#### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

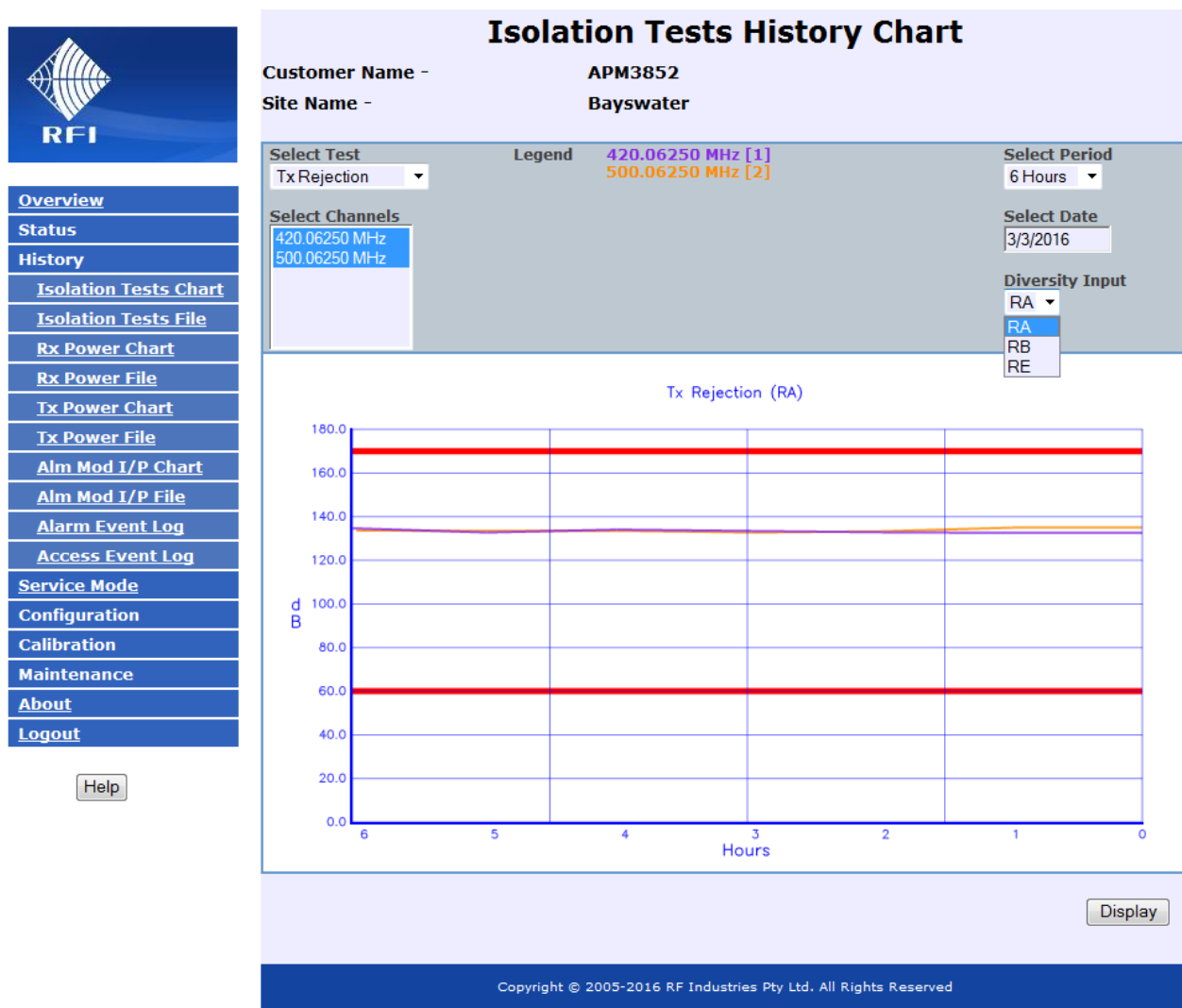
#### Display:

Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

**Note:** The red lines on the displayed graph represent the alarm max/min values currently configured for this test


**Note:** The displayed lines may commence in from the left hand side of the graph. This indicates when the associated transmitter first keyed in the selected Period.

**NOTE:** There are documented issues with Internet Explorer™ Version 10.  
This may impact the presentation of some GUI features.  
The use of an alternate web browser is recommended.



**Note:** When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (Rx A, Rx B and RE) may be selected in the *Isolation Tests History Chart – Tx Rejection* page.

## 10.16 History – Isolation Tests File



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- Isolation Tests File
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- Rx Power File
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- Tx Power File
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### Isolation Tests History File

Customer Name - NW RADIO

Site Name - Chase Tower

Select Period

1 Day

Select Date

7/1/2015

Download

View

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Help

This page allows logged test data to be downloaded, saved or displayed. Data is provided in a CSV file format for ease of import and manipulation.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Download:

Use this button to open a “File Download” or “Save As” dialog for saving the CSV data file.

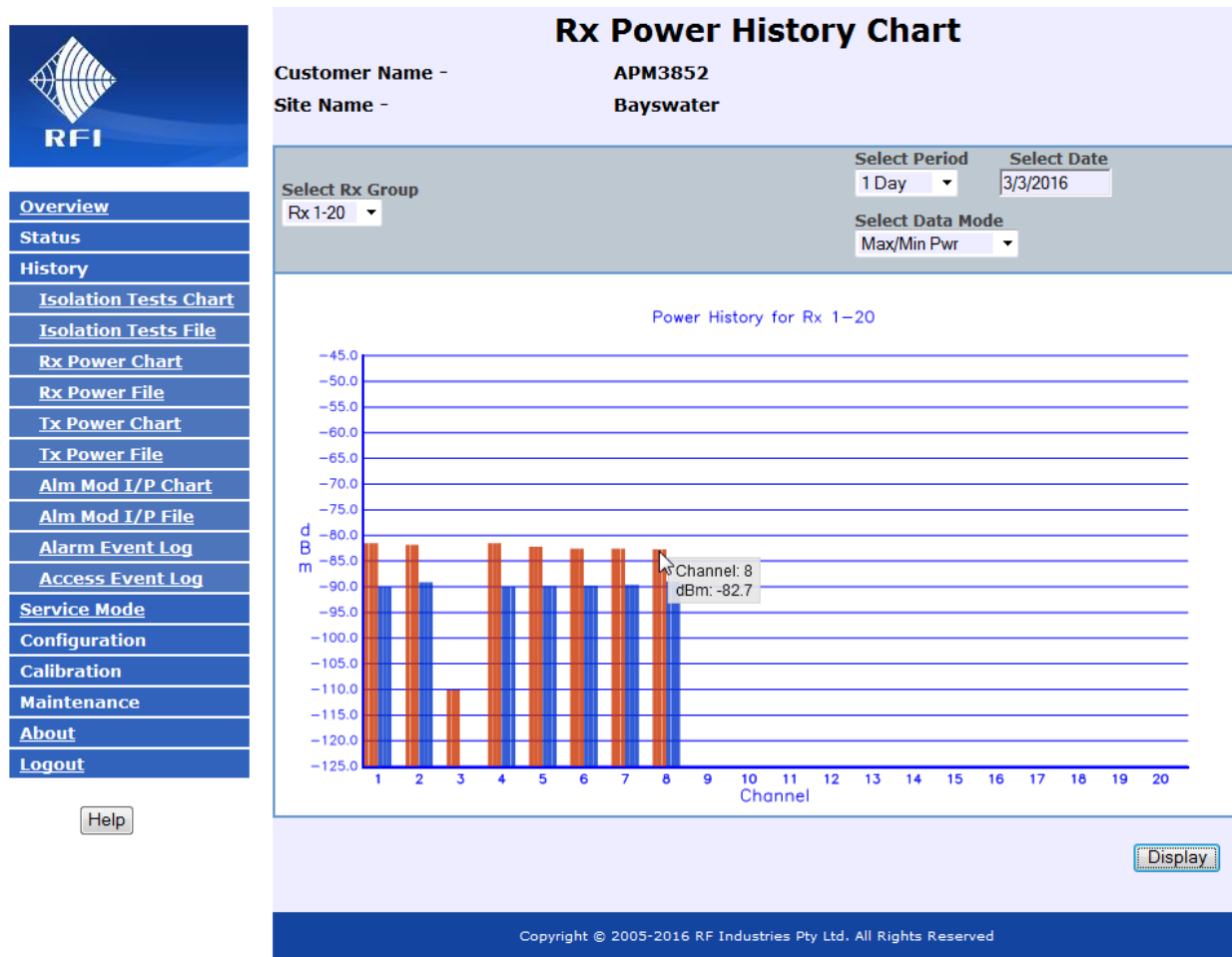
### View:

Use this button to open the CSV data file for viewing. .

```

Date,Time,Type,Reference,Value,Status
7/01/15, 21:03:43, Tx Rejection, 454.250000, 151.3, REJECT=OK
7/01/15, 21:03:08, Tx Rejection, 454.112500, 153.7, REJECT=OK
7/01/15, 21:00:25, Tx Rejection, 454.537500, > 156.2, REJECT=OK
7/01/15, 21:00:25, Tx Rejection, 451.887500, 154.6, REJECT=OK
7/01/15, 21:00:25, Tx Rejection, 463.225000, > 157.8, REJECT=OK
7/01/15, 21:00:25, Rx System, 458.000000, Inderminate, GAIN=OK
7/01/15, 21:00:25, Rx System, 459.600000, Inderminate, GAIN=OK
7/01/15, 21:00:25, Rx System, 459.000000, Inderminate, GAIN=OK
7/01/15, 21:00:25, Rx System, 468.800000, Inderminate, GAIN=OK
7/01/15, 21:00:25, Rx System, 467.100000, Inderminate, GAIN=OK
7/01/15, 21:00:25, Ant Isolation, 458.000000, > 53.0, ISOL=OK
7/01/15, 20:21:56, Tx Rejection, 454.625000, 154.6, REJECT=OK
7/01/15, 20:14:14, Tx Rejection, 454.537500, > 156.2, REJECT=OK
7/01/15, 20:12:34, Tx Rejection, 454.312500, > 154.6, REJECT=OK
7/01/15, 20:10:20, Tx Rejection, 454.050000, 150.1, REJECT=OK
  
```

### 10.17 History – Rx Power Chart



This page displays the logged Rx Power values for all channels.

#### Select Rx Group:

Select the Port which you desire to display.

#### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

**NOTE:** This History Chart screen may not display correctly due to documented issues with Internet Explorer™ Version 10. The use of an alternate web browser is recommended.

**Select Data Mode:**

Select the data set that you wish to display for the selected Rx Group's channels.

Four display modes are available:

- **Max/Min Pwr**
- **Utilisation**
- **Max Pwr (1 chan)**
- **Min Pwr (1 chan)**

Since the graph is only able to display approximately 200 data points, each point will normally represent multiple captured level samples. The selection of the Data Mode controls how the multiple samples are combined to present the plotted data value.

In Max/Min mode, only the maximum and minimum sampled values are used, irrespective of when or how often they occurred in the selected period. If no value reading (above programmed threshold) has been recorded during the period represented by a data point then no data will be displayed on the graph.

In Utilisation mode, the displayed data is created from all measurements recorded above the threshold value. If this threshold value is set too low, all measurements (including site noise) may register a recorded value. As a result, a 100% Utilisation can be displayed on this graph.

All captured level samples are included in the associated data file, in CSV format, which may be downloaded and processed independently (i.e. using other software) if desired.

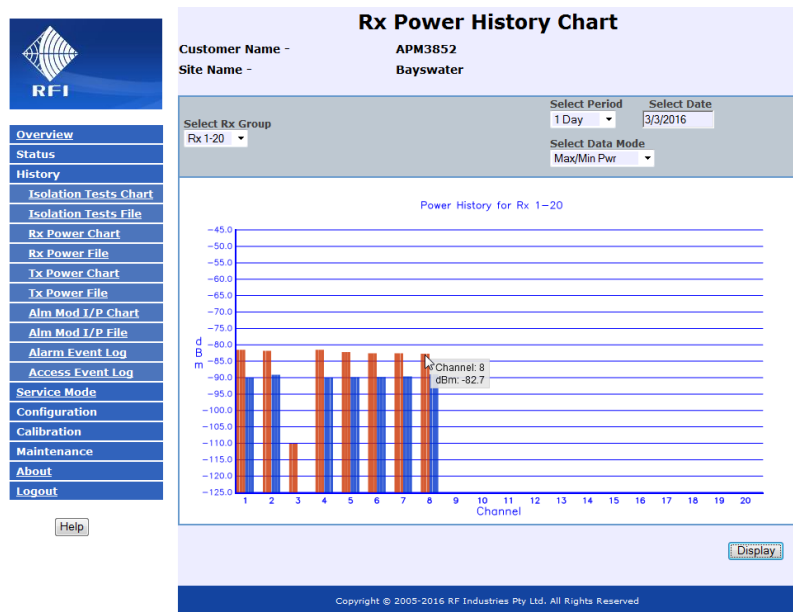
**Note:** During calculations, the processing of all of the recorded data to create the graph may result in delays to the display of the data. If a significant amount of data has been logged, displaying periods back in time may also result in delays while this data is retrieved from memory, processed, and then sent to the viewer's computer.

**Display:**

Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

**Note:** Only channels that have a frequency configured, and which have been enabled will be displayed.

## Examples of Data Mode displays:

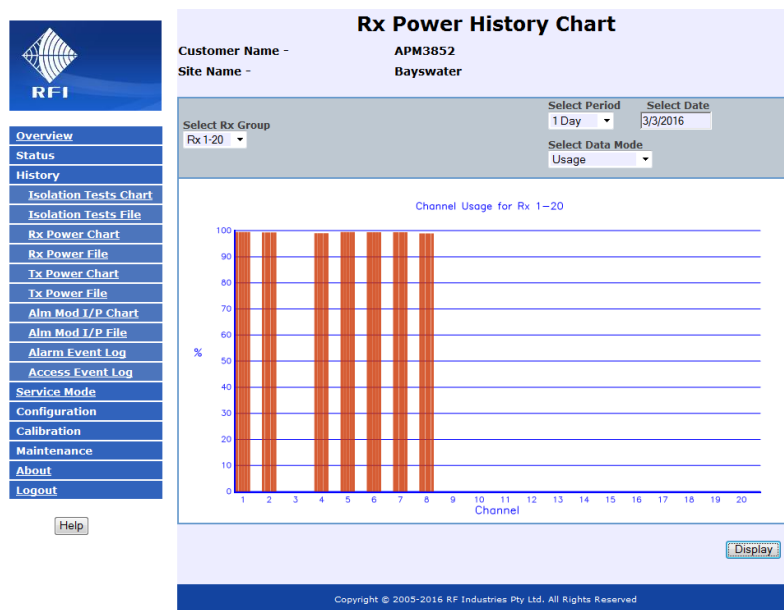


“Max/Min Pwr” Data Mode selected

**Note:** When a Receive Systems Module (RSM) is fitted to the APM, the measured values represent the highest and lowest of any of the for the three receive signal paths (RxA, RxB and RE) for each channel.

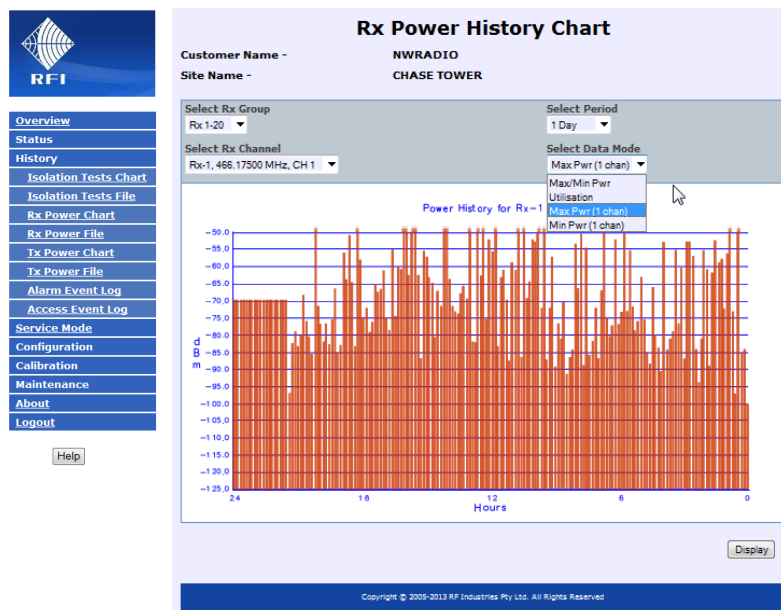
“Usage” Data Mode selected

**Note:** When a Receive Systems Module (RSM) is fitted to the APM, the measured values represent any presence of the for the three receive signal paths (RxA, RxB and RxE) for each channel.



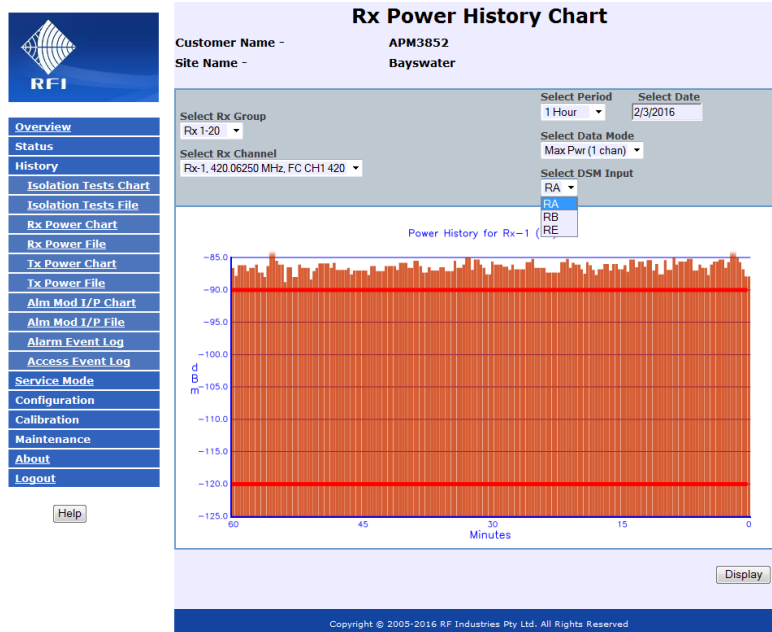
**Note:** Hovering the mouse cursor over the upper portion of a displayed bar in the above two charts will return the actual displayed value (refer example above).

**NOTE:** This History Chart screen may not display correctly due to documented issues with Internet Explorer™ Version 10. The use of an alternate web browser is recommended.




“Max Pwr (1 Chan)” Data Mode selected

**Note:** When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (Rx A, Rx B and Rx E) are selectable.





## 10.18 History – Rx Power File



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### Rx Power History File

Customer Name - Demo

Site Name - Chase Tower

Select Rx Group

Rx 1-20 ▼

Select Period

1 Day ▼

Select Date

7/1/2015

Select Rx Channel

Rx-1, 467.53750 MHz, CHASE FB ▼

[Download](#)
[View](#)

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[Help](#)

This page allows logged data to be downloaded, saved or displayed for a nominated channel. Data is provided in a CSV file format for ease of import and manipulation.

### Select Rx Group:

Select the Group on which the desired Rx Channel is located.

### Select Rx Channel:

Select the Rx Channel that is desired to be viewed.

Note that only channels that have a frequency configured, and which have been enabled will be selectable.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Download:

Use this button to open a "File Download" or "Save As" dialog for saving the CSV data file.

### View:

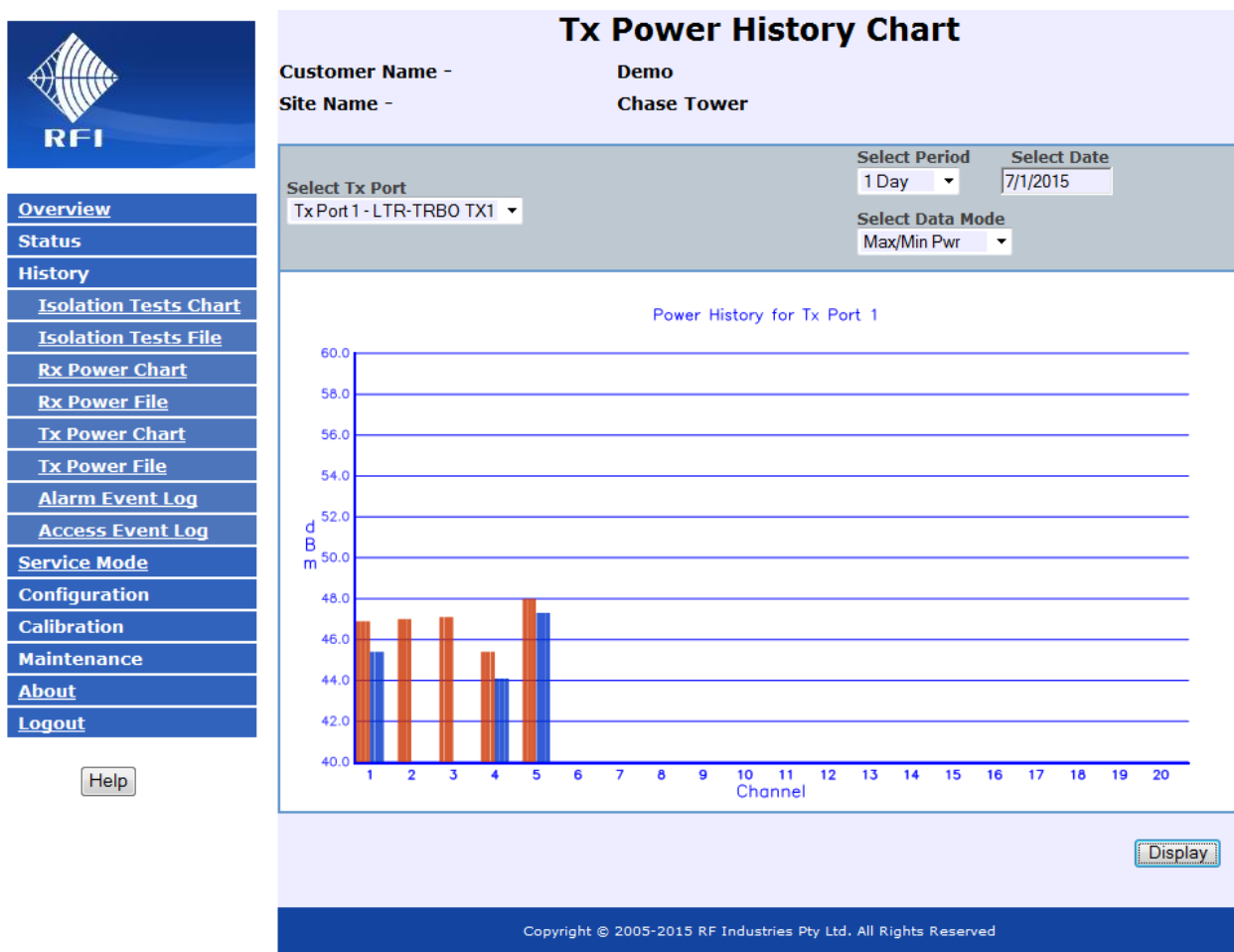
Use this button to open the CSV data file for viewing.

```

Date,Time,Port,Channel,Type,dBm,VSWR,On/Off
3/07/15, 12:24:45, Rx, 1, PWR, <-110,, OFF
3/07/15, 6:24:47, Rx, 1, PWR, <-110,, OFF
3/07/15, 0:24:32, Rx, 1, PWR, <-110,, OFF
2/07/15, 18:24:40, Rx, 1, PWR, <-110,, OFF
2/07/15, 17:28:33, Rx, 1, PWR, <-110,, OFF
2/07/15, 15:33:21, Rx, 1, PWR, <-110,, OFF
  
```

### Example of CSV data

## 10.19 History – Tx Power Chart



This page displays the logged Tx Power values for a nominated channel.

### Select Tx Port:

Select the Port which you desire to display.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Select Data Mode:

Select the data set that you wish to display for the selected Tx Port's channels.

Note that only channels that have a frequency configured and which have been enabled will be selectable.

**NOTE:** There are documented issues with Internet Explorer™ Version 10. This may impact the presentation of some GUI features. The use of an alternate web browser is recommended.

**Select Data Mode:**

Select the display parameter against which logged data will be displayed.

Seven display modes are available:

- **Max/Min Pwr**
- **Max/Min VSWR**
- **Usage**
- **Max Pwr (1 Chan)**
- **Min Pwr (1 Chan)**
- **Max VSWR (1 Chan)**
- **Min VSWR (1 Chan)**

Since the graph is only able to display approximately 200 data points, each of those points may represent multiple captured level samples. The selection of the Data Mode controls how the multiple samples are combined to present the plotted data value.

In *Max/Min* mode, only the maximum and minimum sampled values are used, irrespective of when or how often they occurred in the selected period. If no value reading (above programmed threshold) has been recorded during the period represented by a data point then a “minimum value” will be displayed on the graph.

In *Usage* mode, the measured occurrence of channel activity (above programmed threshold) during the selected period is displayed as a percentage. Depending on the number of channels being monitored in each measurement cycle, and the random sporadic nature of channel activity, this display may have some inaccuracy. Practically, it may be used to conveniently indicate “general” channel (and network) loading, and allows activity to be correlated against specific time/day by viewing the logged data that has been recorded. This capability is useful for identifying co-incidental channel(s) activity during periods of interference – a likely indicator of intermodulation (IM) occurrence.

In *Maximum (1 channel)* mode, only the stored sample with the maximum value during the selected period is used, and;

In *Minimum (1 channel)* mode only the sample with the minimum value is used. If no value reading (above programmed threshold) has been recorded during the period represented by a data point then a “minimum value” will be displayed on the graph.

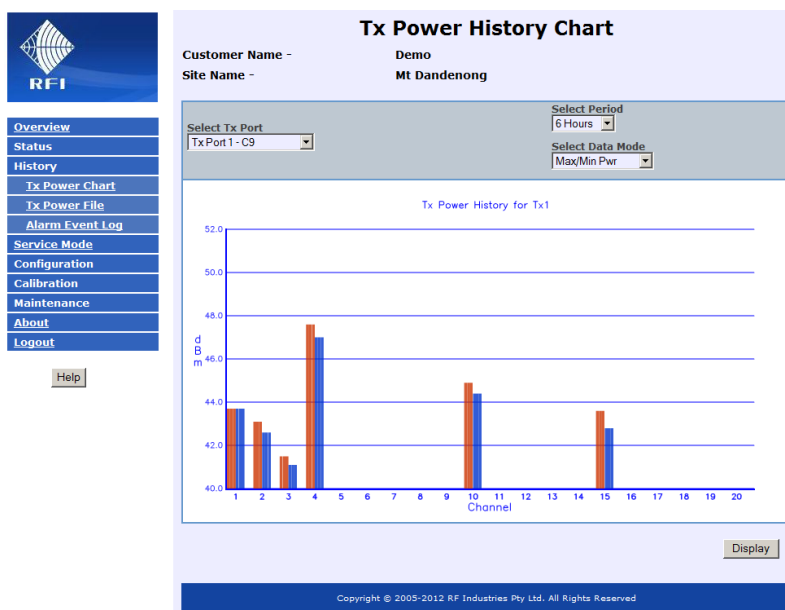
All captured level samples are included in the History File, in CSV format, which may be processed independently (i.e. using other software) if desired.

**Note:** During averaging calculations, the processing of all of the data to create the graph may result in delays to the display of the data. If a significant amount of data has been logged, displaying periods back in time may also result in delays while this data is retrieved and then processed.

**Display:**

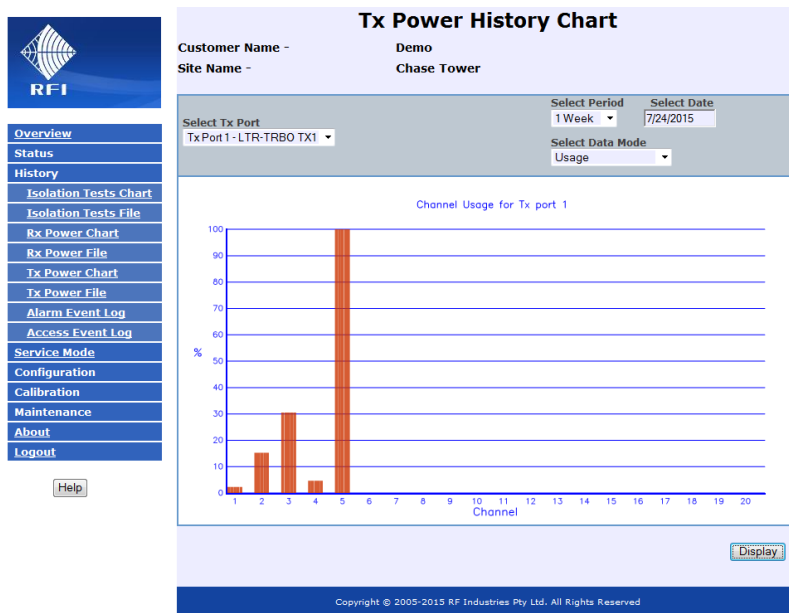
This will refresh the display using the selected settings. Some delay may be experienced while data collates.

## Examples of Data Mode displays:



“Max/Min Pwr” Data Mode selected

“Usage” Data Mode Selected



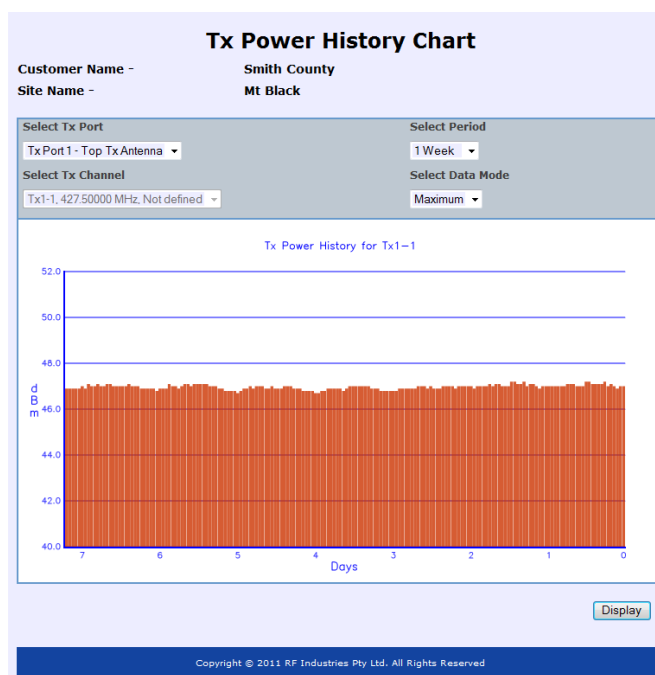
**Note:** Hovering the mouse cursor over the upper portion of a displayed bar in the above two charts will return the actual displayed value (refer example above).

“Maximum Pwr 1 Chan”  
Data Mode selected



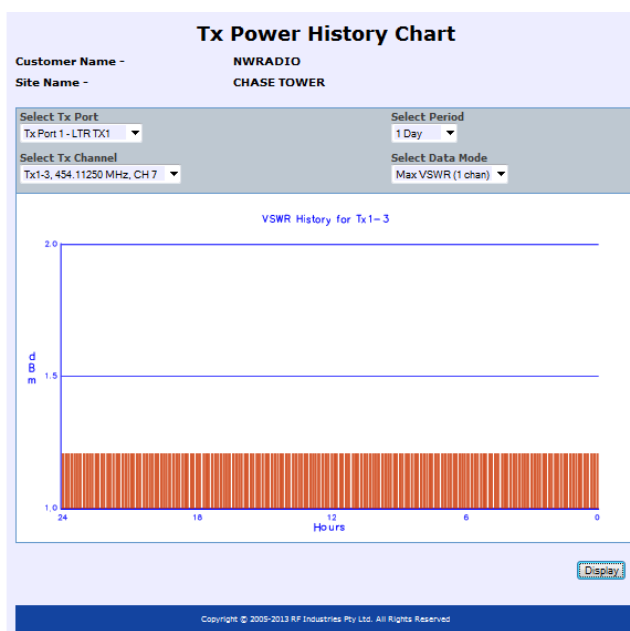
- Overview
- Status
- History
- Tx Power Chart
- Tx Power File
- Service Mode
- Configuration
- Calibration
- Maintenance
- About
- Logout

Help



- Overview
- Status
- History
- Rx Power Chart
- Rx Power File
- Tx Power Chart
- Tx Power File
- Alarm Event Log
- Service Mode
- Configuration
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Help




“Max VSWR 1 Chan” Data Mode selected

**Note:** In a K1 hardware model, approx. 2.5Mb of data storage is available for all log files' data. Depending on the number of Alarm Events recorded, the period of history that can be stored can vary significantly. The available data storage area operates as a FIFO (first-in-first-out) buffer. That is, once full, the oldest stored alarm event is removed to make room for the newest measurement.

In a K2 hardware model, approx. 4Gb of data storage is available for all log files' data. This data area also operates as a FIFO buffer.

## 10.20 History – Tx Power File



- Overview
- Status
- History
- Isolation Tests Chart
- Isolation Tests File
- Rx Power Chart
- Rx Power File
- Tx Power Chart
- Tx Power File
- Alarm Event Log
- Access Event Log
- Service Mode
- Configuration
- Calibration
- Maintenance
- About
- Logout

### Tx Power History File

Customer Name - Demo  
Site Name - Chase Tower

Select Tx Port  
 Tx Port 1 - LTR-TRBO TX1

Select Tx Channel  
 Tx1-1, 462.15000 MHz, NXDN 18

Select Period  
 1 Day

Select Date  
 7/1/2015

[Download](#)
[View](#)

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[Help](#)

This page allows logged data to be downloaded, saved or displayed for a nominated channel. Data is provided in a CSV file format for ease of import and manipulation.

### Select Tx Port:

Select the Port on which the desired Tx Channel is located.

### Select Tx Channel:

Select the Rx Channel that is desired to be viewed.

Note that only channels that have a frequency configured and which have been enabled will be selectable.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Download:

Use this button to open a "File Download" or "Save As" dialog for saving the CSV data file.

### View:

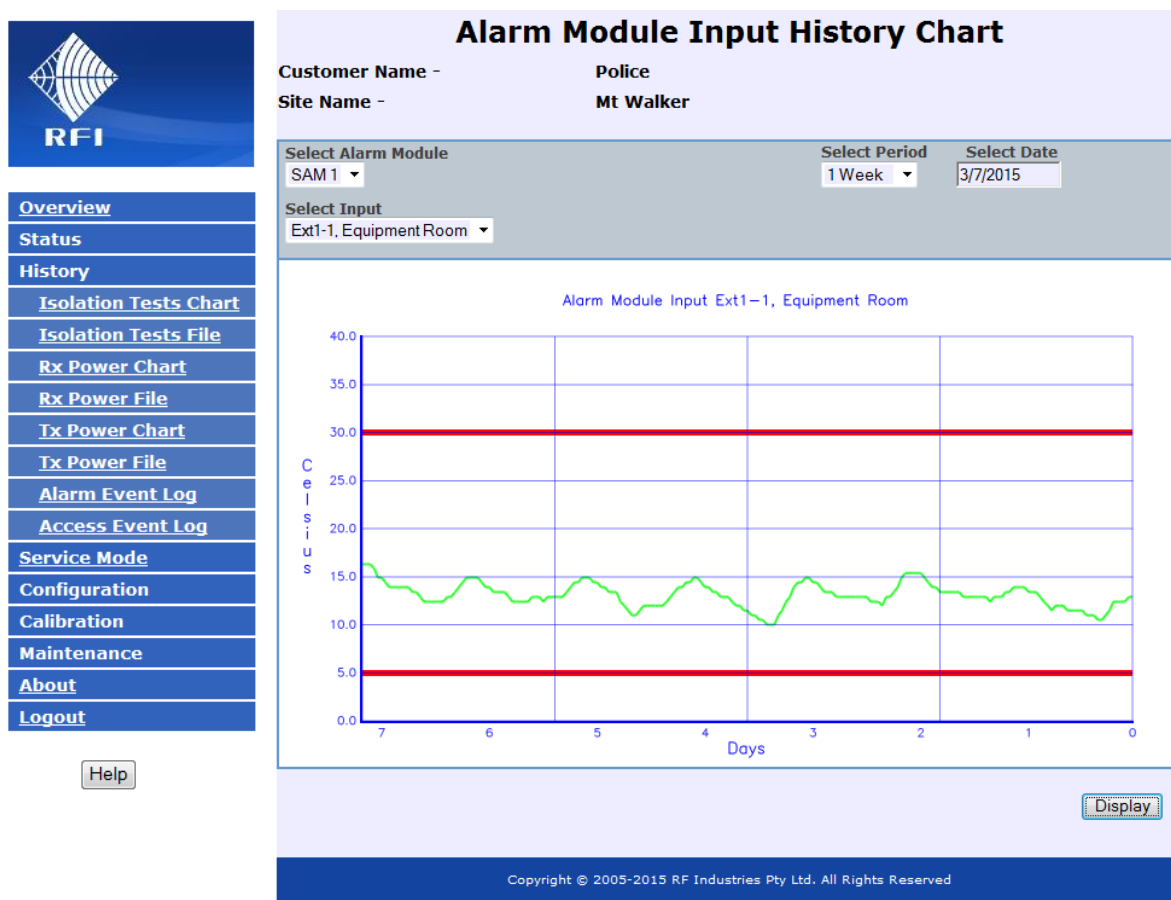
Use this button to open the CSV data file for viewing.

```

Date,Time,Port,Channel,Type,dBm,VSWR,On/Off
7/02/15, 20:06:05, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 19:48:31, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 19:47:57, Tx1, 1, PWR, +46.5,, ON
7/02/15, 19:04:14, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 19:03:38, Tx1, 1, PWR, +46.0,, ON
7/02/15, 17:54:30, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 17:53:57, Tx1, 1, PWR, +45.5,, ON
7/02/15, 17:29:11, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 17:28:38, Tx1, 1, PWR, +46.9,, ON
7/02/15, 17:27:29, Tx1, 1, PWR, +46.4,, ON
7/02/15, 16:59:07, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 16:58:34, Tx1, 1, PWR, +46.4,, ON
7/02/15, 16:32:57, Tx1, 1, PWR, <- 8,, OFF
7/02/15, 16:32:22, Tx1, 1, PWR, +46.3,, ON
  
```

### Example of CSV data

## 10.21 History – Alm Mod I/P Chart



This page displays the logged Alarm Module Input values for a nominated Alarm Module and Input.

### Select Alarm Module:

Select the Alarm Module from which you desire to display.

### Select Input:

Select the Alarm Input that you desire to display.

### Select Period / Select Date:

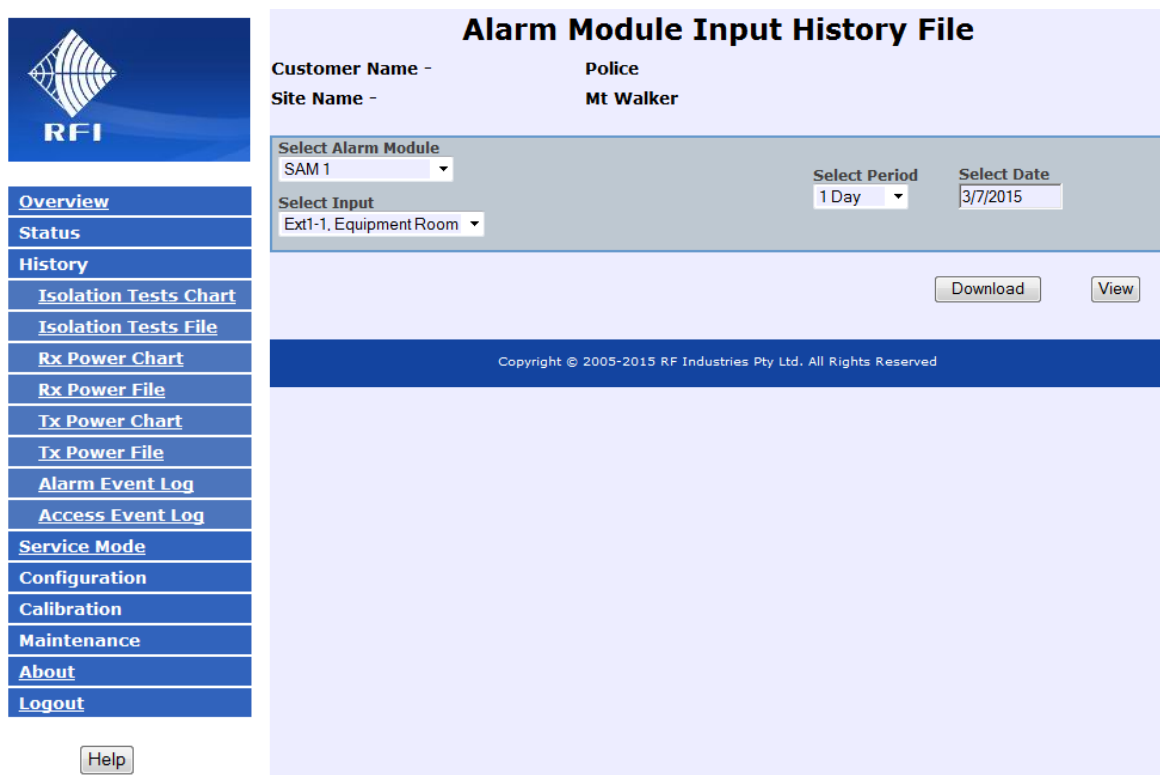
Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Display:

This will refresh the display using the selected settings. Some delay may be experienced while data collates.

**NOTE:** This History Chart screen may not display correctly due to documented issues with Internet Explorer™ Version 10. The use of an alternate web browser is recommended.

## 10.22 History – Alm Mod I/P File



**Alarm Module Input History File**

Customer Name - Police  
Site Name - Mt Walker

Select Alarm Module: SAM 1  
Select Input: Ext1-1, Equipment Room  
Select Period: 1 Day  
Select Date: 3/7/2015

Download View

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This page allows logged data to be downloaded, saved or displayed for a nominated channel. Data is provided in a CSV file format for ease of import and manipulation.

### Select Alarm Module:

Select the Alarm Module from which you desire to display.

### Select Input:

Select the Alarm Input that you desire to display.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Download:

Use this button to open a "File Download" or "Save As" dialog for saving the CSV data file.

### View:

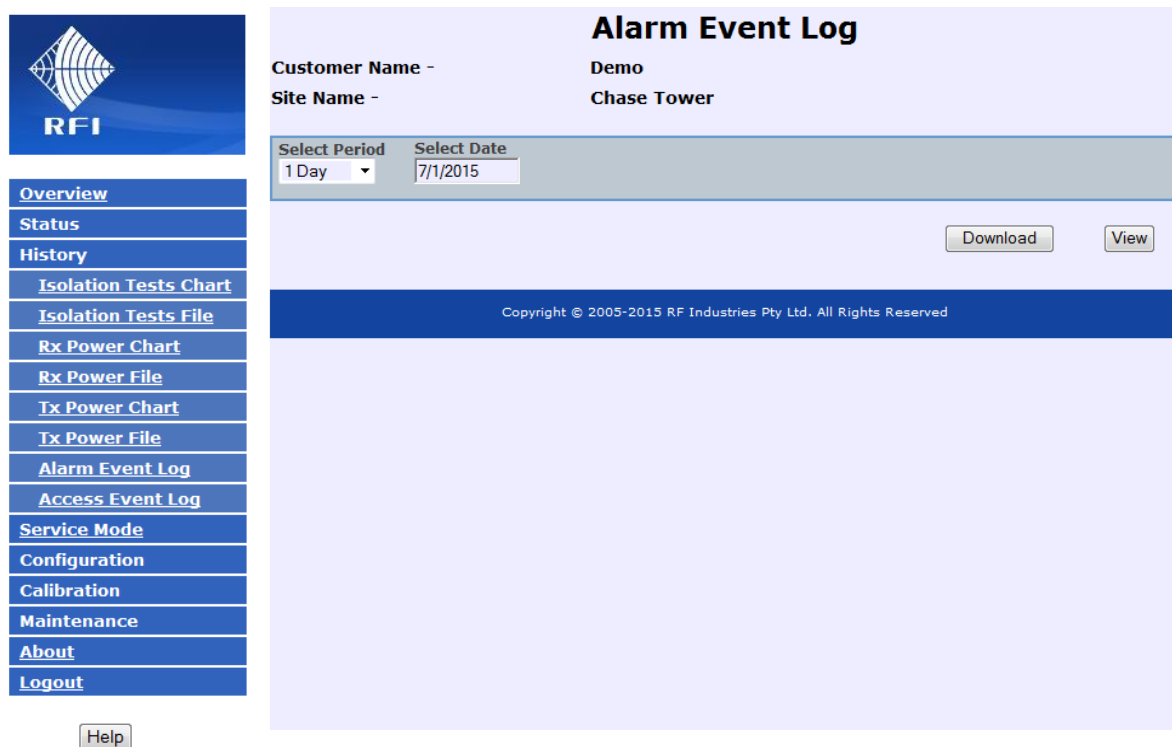
Use this button to open the CSV data file for viewing.

```
Date,Time,Type,Reference,Value,Units
3/07/15, 14:30:16, SAM IP VALUE, Ext1-1, 12.9, C
3/07/15, 14:30:06, SAM IP VALUE, Ext1-1, 13.4, C
3/07/15, 14:29:48, SAM IP VALUE, Ext1-1, 13.4, C
3/07/15, 14:29:38, SAM IP VALUE, Ext1-1, 12.9, C
3/07/15, 14:25:48, SAM IP VALUE, Ext1-1, 12.9, C
3/07/15, 14:25:38, SAM IP VALUE, Ext1-1, 13.4, C
```

**Example Alarm Module Input History log opened in "View"**



### 10.23 History – Alarm Event Log



**Alarm Event Log**

Customer Name - Demo  
Site Name - Chase Tower

Select Period: 1 Day  
Select Date: 7/1/2015

[Download](#) [View](#)

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[Help](#)

This page allows logged data to be downloaded, saved or displayed for a alarms in the current Alarm Event Log. Data is provided in a CSV file format for ease of import and manipulation.

#### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

#### Download:

Use this button to open a “File Download” or “Save As” dialog for saving the CSV data file.

#### View:

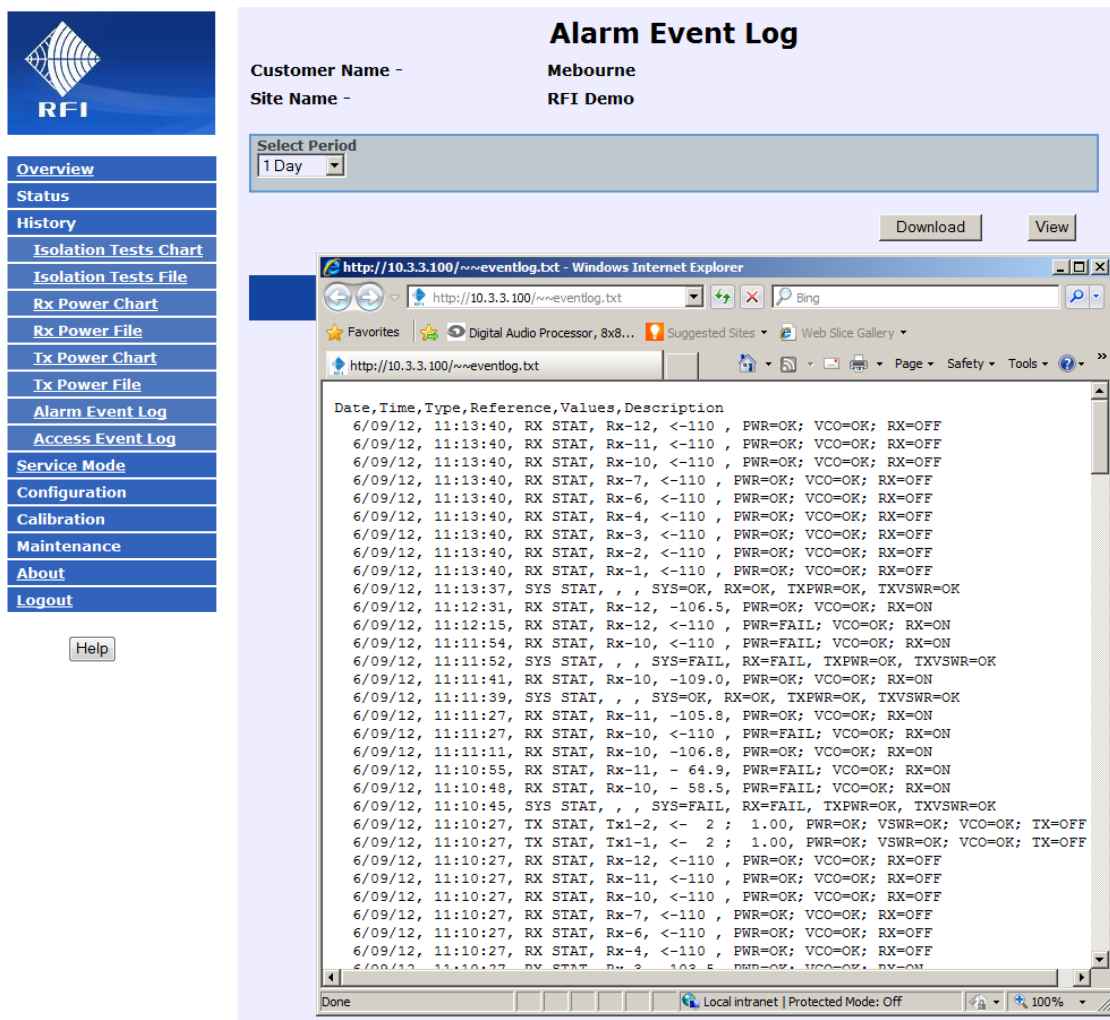
Opens a new window in which the data records will be displayed.

Due to the potential size of some data logs, using View is not recommended for displaying a large amount of data.

**View:**

Opens a new window in which the data records will be displayed.

Due to the potential size of some data logs, using View is not recommended for displaying data for a lengthy selected Period.

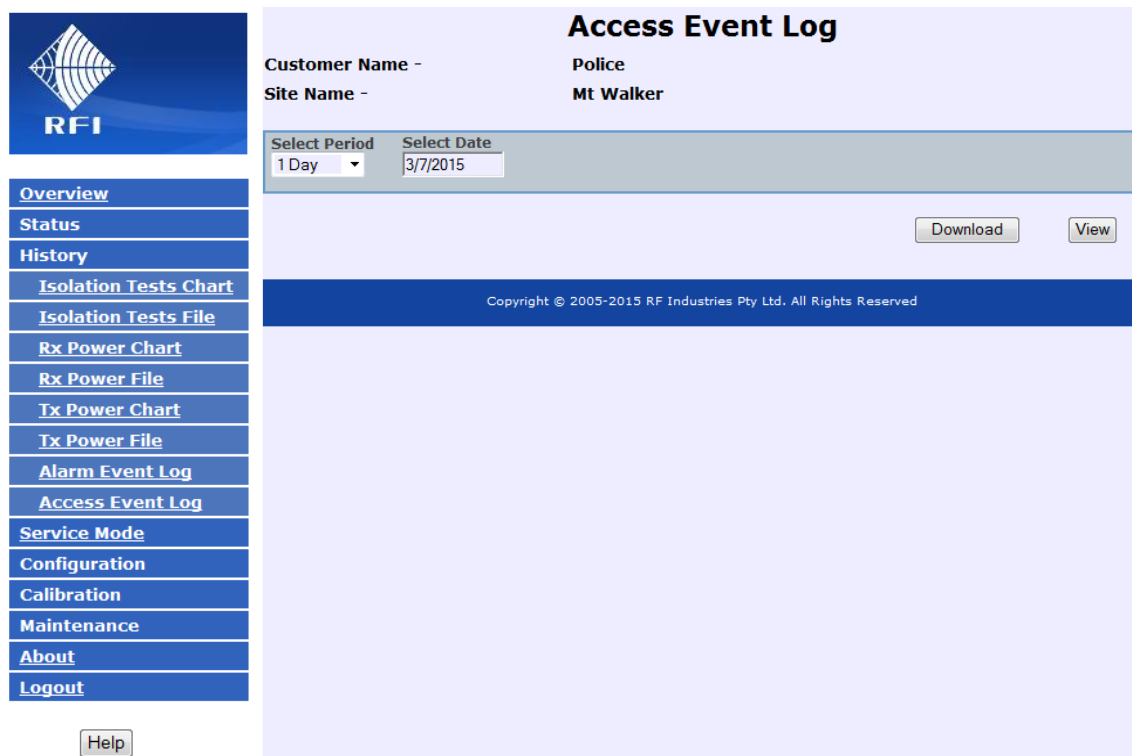


**Example Alarm Event log opened in “View”**

**Note:** In a K1 hardware model, approx. 2.5Mb of data storage is available for all log files' data. Depending on the number of Alarm Events recorded, the period of history that can be stored can vary significantly. The available data storage area operates as a FIFO (first-in-first-out) buffer. That is, once full, the oldest stored alarm event is removed to make room for the newest measurement.

In a K2 hardware model, approx. 4Gb of data storage is available for all log files' data. This data area also operates as a FIFO buffer.

## 10.24 History – Access Event Log



**Access Event Log**

Customer Name - Police  
Site Name - Mt Walker

Select Period: 1 Day  
Select Date: 3/7/2015

Download View

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This page allows logged data to be downloaded, saved or displayed for a alarms in the current Access Event Log. Data is provided in a CSV file format for ease of import and manipulation.

### Select Period / Select Date:

Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

### Download:

Use this button to open a “File Download” or “Save As” dialog for saving the CSV data file.

### View:


Opens a new window in which the data records will be displayed.

Due to the potential size of some data logs, using View is not recommended for displaying a large amount of data.

```
Date,Time,Type,SourceIP,Event,Value
3/07/15, 13:45:56, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
3/07/15, 10:39:06, ACCESS EVENT, 125.254.22.196, TIMEOUT, Level=3
3/07/15, 9:23:29, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
2/07/15, 22:20:08, ACCESS EVENT, 125.254.22.196, TIMEOUT, Level=3
2/07/15, 18:25:39, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
2/07/15, 18:18:44, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
2/07/15, 14:15:15, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
2/07/15, 14:06:05, ACCESS EVENT, 125.254.22.196, TIMEOUT, Level=3
2/07/15, 12:40:36, ACCESS EVENT, 125.254.22.196, LOGIN, Level=3
```

**Example Access Event log opened in “View”**

## 10.25 Service Mode



- Overview
- Status
- History
- Service Mode**
- Configuration
- Calibration
- Maintenance
- About
- Logout

Help

### Service Mode

Customer Name -

Site Name -

NW RADIO

Chase Tower

☒ Monitor Tx Channel  
 Select Tx Port  
 Tx Port2 - LTR-TRB0 TX2  
 Select Tx Channel  
 Tx2-2, 454.05000 MHz, TRB0 1

☒ Monitor Rx  
 Select Rx Group  
 Rx 1-20  
 Select Rx Channel  
 Rx-1, 466.17500 MHz, LTR 1

☒ Channel ☐ Frequency

Tx Fwd Pwr

64.57 W

☐ dBm  
☒ Watts

---

BTx Pwr

107.15 W

☐ dBm  
☒ Watts

---

VSWR

1.02:1

☒ Ant VSWR  
☐ Ant RL (dB)  
☐ RevPwr (dBm)  
☐ RevPwr (Watts)

---

Combiner I.L.

2.2 dB

---

Rx Level

-90.9 dBm

☒ dBm  
☐ µV

Stop

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The Service Mode page presents a real time Tx Power and Rx Level Meter. The current Tx Power, Tx VSWR, Combiner Insertion Loss and Rx Level for the selected Tx and Rx channels are continuously updated once the Start/Stop button has been activated.

The increased font size of the values displayed on this page assist viewing them from a distance.

**Note:** The Service Mode screen is only visible from the Administrator login level, it is not visible from the User login level.

**Note:** The Service Mode screen has been optimised for a fast screen refresh rate to assist tuning and other maintenance activities. As such, for some modulation types, the Tx Fwd Pwr, BTx Pwr and Rx Level values displayed on this page may vary slightly from those displayed on the Status screens. For highest accuracy, use the Status screens for determining actual Tx Fwd Power, BTx Pwr, and Rx Level values.

**Monitor Tx Channel:**

Selects if a Tx frequency will be measured and displayed during each measurement cycle.

**Select Tx Port:**

Select the Port on which the desired Tx Channel is located.

**Select Tx Channel:**

Select the Tx Channel that is desired to be monitored.

**Note:** Only channels that have a frequency configured, and which have been “enabled”, will be selectable.

**Monitor Rx Channel:**

Selects if a Rx frequency will be measured and displayed during each measurement cycle.

**Channel:**

Select the Rx Channel that is desired to be monitored.

**Note:** Only channels that have a frequency configured, and which have been “enabled”, will be selectable.

**Frequency:**

Select or Enter the Rx Frequency that is desired to be monitored.

**Note:** The frequency may be entered by selecting the field and typing in a value, which may be changed by using the up/down keys on your keyboard, or by selecting the drop down arrow next to the field and scrolling through and selecting the desired frequency values.

**Select Rx Group:**

Select the Group in which the desired Rx Channel is located.

**Select Rx Channel:**

Select the Rx Channel that is desired to be monitored.

**Note:** Only channels that have a frequency configured and which have been “enabled”, will be selectable.

**Displayed Values:**

The units of measurement and display for the various values may be changed by clicking on the desired selections.

**Start/Stop:**

This starts or stops the continuously updating measurements.

The Power and Insertion Loss measurements assume that the Port Coupling losses and the Channel BTx Power have been previously calibrated (refer elsewhere in this manual).

**Note:** When Service Mode is running, the unit will not be monitoring or measuring any other programmed channels. Clicking the Stop button, navigating to another page within the site, or closing the browser window/tab will restore the unit's normal operation.

**Note:** The Service Mode screen is only visible from the Master and Administrator login levels, it is not visible from the User login level.


[Help](#)

### Service Mode

Customer Name - **APM3852**  
 Site Name - **Bayswater**

☒ Monitor Tx Channel  
 Select Tx Port  
 Tx Port 1 - Tx 420  
 Select Tx Channel  
 Tx1-1, 420.06250 MHz, FC CH1 420

☒ Monitor Rx  
 Select Rx Group  
 Rx 1-20  
 Select Rx Channel  
 Rx-1, 420.06250 MHz, FC CH1 420

Channel ☒ Frequency ☐  
 Diversity Inputs  
☒ RA  
☒ RB  
☒ RE

<b>Tx Fwd Pwr</b>	<b>74.13 W</b>	<input type="radio"/> dBm <input checked="" type="radio"/> Watts
<b>BTx Pwr</b>	<b>123.03 W</b>	<input type="radio"/> dBm <input checked="" type="radio"/> Watts
<b>VSWR</b>	<b>1.27:1</b>	<input checked="" type="radio"/> Ant VSWR <input type="radio"/> Ant RL (dB) <input type="radio"/> RevPwr (dBm) <input type="radio"/> RevPwr (Watts)
<b>Combiner I.L.</b>	<b>2.2 dB</b>	
<b>RxA Level</b>	<b>10.70 <math>\mu</math>V</b>	
<b>RxB Level</b>	<b>11.08 <math>\mu</math>V</b>	<input type="radio"/> dBm <input checked="" type="radio"/> $\mu$ V
<b>RxE Level</b>	<b>0.04 <math>\mu</math>V</b>	

[Start](#)

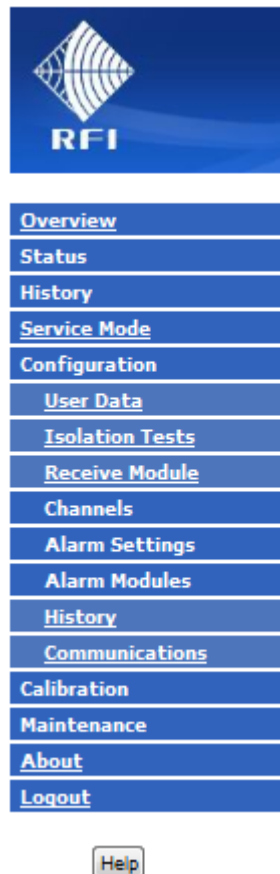
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When a Receive Systems Module (RSM) is fitted to the APM, the measured values for the three receive signal paths (RxA, RxB and RxE) are selectable and may be viewed in the *Service Mode* page.

## **10.26 Configuration Menu**

The “Configuration” menu allows all of the APMs configurable parameters to be programmed.

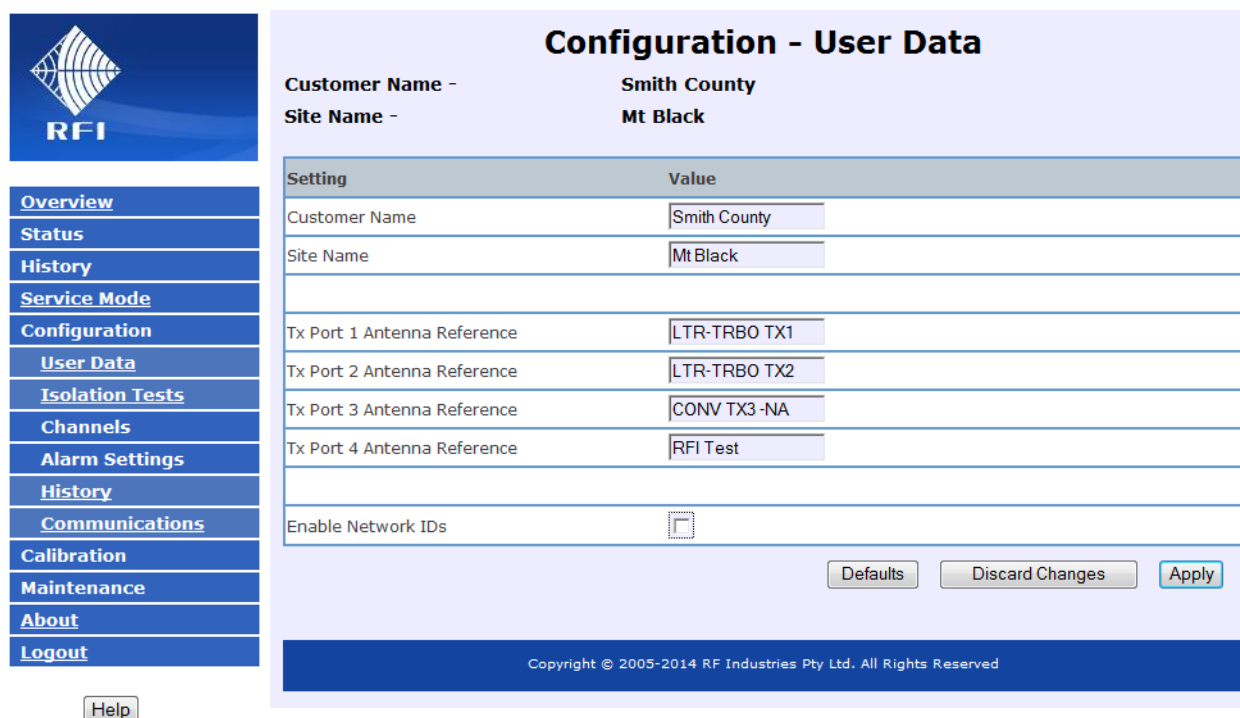
Selecting each indented topic under “Configuration” will display that item as a separate display page.



**Note:** The viewing and functionality of *Configuration* menu items may be limited by the Login level used to access the APM.

**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

## 10.27 Configuration – User Data



**Configuration - User Data**

Customer Name - **Smith County**  
 Site Name - **Mt Black**

Setting	Value
Customer Name	Smith County
Site Name	Mt Black
Tx Port 1 Antenna Reference	LTR-TRB0 TX1
Tx Port 2 Antenna Reference	LTR-TRB0 TX2
Tx Port 3 Antenna Reference	CONV TX3 -NA
Tx Port 4 Antenna Reference	RFI Test
Enable Network IDs	<input type="checkbox"/>

Defaults Discard Changes Apply

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On this page you can enter descriptive texts for Customer Name, Site Name and each of the Ports

### Customer Name:

The name of the network or the customer equipment being monitored by the APM.

### Site Name:

The name of the site on which the network or the customer equipment is located.

### Tx Port Antenna References:

The names or other unique identifier for each of the Tx Antennas being monitored by the APM.

### Enable Network IDs:

Select if Network IDs are to be used in the APM Status and Configuration screens.

### Defaults:

Clicking this sets all of the descriptions to "Not Defined".

### Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the Configure/User Data menu item again to re-display the current configuration.

### Apply:

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.



## Enable Network IDs

If Network IDs are desired to be used, then this item should be selected. When selected, an additional field will appear;

The eight Network IDs allow monitored channels to be nominated as being affiliated together in the *Channels – Status* screens.

The inclusion of the Network IDs 'label' allows channels to be conveniently 'bundled' into their respective groupings.

For example, if channels from one network are randomly distributed on shared combiners, the Network ID text label may use the network's name i.e. ID #1 = "Police", ID #2 = "Fire Dept", etc.

Alternatively, the Network ID could be used to identify different maintenance service levels i.e. ID #1 = B.H. Maintenance, ID #2 = 24x7 Maintenance, etc.

The Networks ID could also be used to identify which antenna is used for the network channels. i.e. ID #1 = TxAnt1, ID #2 = TxAnt2, etc.

**Configuration - User Data**

Customer Name -

NW Radio

Site Name -

Chase Tower

Setting	Value
Customer Name	NW Radio
Site Name	Chase Tower
Tx Port 1 Antenna Reference	LTR-TRBO TX1
Tx Port 2 Antenna Reference	LTR-TRBO TX2
Tx Port 3 Antenna Reference	CONV TX3-NA
Tx Port 4 Antenna Reference	RFI Test
Enable Network IDs	<input checked="" type="checkbox"/>

**Network IDs**

Network Number	Description
Network - 0	Trbo
Network - 1	LTR
Network - 2	
Network - 3	BH Maint Only
Network - 4	24x7 Maint
Network - 5	
Network - 6	Tx Ant#1
Network - 7	Tx Ant#2

**Configuration - Tx Port 1 Channels**

Customer Name -

NW Radio

Site Name -

Chase Tower

Tx Antenna Reference -

LTR-TRBO TX1

Chan No.	Channel ID	NW ID	ON	Frequency	Modulation	Threshold Pwr
Tx1-1	LTR 18	1	<input checked="" type="checkbox"/>	462.15000 MHz	MOTOTRBO	-5.0 dBm
Tx1-2	LTR 7	1 - LTR	<input type="checkbox"/>	54.11250 MHz	FM12.5	-5.0 dBm
Tx1-3	TRBO 3	2 - 3 - BH Maint Only	<input type="checkbox"/>	54.31250 MHz	MOTOTRBO	-5.0 dBm
Tx1-4	LTR 10	4 - 24x7 Maint	<input type="checkbox"/>	54.62500 MHz	FM12.5	-5.0 dBm
Tx1-5	LTR 20	6 - Tx Ant#1	<input type="checkbox"/>	53.22500 MHz	FM12.5	-5.0 dBm
		7 - Tx Ant#2	<input type="checkbox"/>			

The eight Network IDs allow monitored Channels to be nominated as being affiliated together in the *Configuration – Tx Port* screens.

The Network ID affiliations are then displayed in the *Status – Tx Ports* screens.

The Network ID text is included in SMTP (email) and SNMP messages, and the Network ID number (only) is included in Manager Messages status Messages.

3/13/14, 3:52:49,

Customer=Mobile Comms

Site=Mt Morgan

Tx Port 2 - LTR-TRBO TX2, Chan 2 - TRBO 1 (Network 4 - DMR Rentals), PWR=FAIL( +48.6), VSWR=OK( 1.00)

**Example SMTP (Email) Alarm showing Network ID label ('Network 4 - DMR Rentals')**

The Networks ID label allows additional descriptive information about a channel to be communicated in an alarm message, allowing appropriate response activities to be actioned.


## Status - Tx Port 1

Demo  
Mt Dandenong  
Main Tx

Auto Refresh ☐

Chan No.	Channel ID	NW ID	ON	Freq	Last recorded activity above threshold		
					Act	Power	VSWR
Tx1-1	Radio	1	Yes	473.50000 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-2	S'wide	1	Yes	470.20000 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-3	Radio	2	Yes	493.32500 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-4	AA Radio	3	Yes	490.70000 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-5	Satcomm 1	2	Yes	470.92500 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-6	Apt A	1	Yes	487.57500 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-10	TNT	2	Yes	492.25000 MHz	0.00 W	< -9 dBm	1.00:1
Tx1-15	Radio	1	Yes	488.15000 MHz	0.00 W	< -9 dBm	1.00:1

## 10.28 Configuration – Isolation Tests



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- [Alarm Modules](#)
- [History](#)
- [Communications](#)
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[Help](#)

### Configuration - System Isolation Tests

Customer Name -
Demo

Site Name -
Chase Tower

Defaults
Discard Changes
Apply

#### Common Settings

Automatic System Isolation Tests ☒ Enabled

Automatic Test Schedule Every Hour, starting at 02:00  

[Edit](#)

#### Antenna Isolation

Setting	Value
Test Frequency	458.00000 MHz

#### Rx System Gain(Loss)

Setting	ON	Value
Test Frequency 1	<input checked="" type="checkbox"/>	467.10000 MHz
Test Frequency 2	<input checked="" type="checkbox"/>	468.80000 MHz
Test Frequency 3	<input checked="" type="checkbox"/>	459.00000 MHz
Test Frequency 4	<input checked="" type="checkbox"/>	459.60000 MHz
Test Frequency 5	<input checked="" type="checkbox"/>	458.00000 MHz
Test Frequency 6	<input type="checkbox"/>	OFF MHz

#### Tx Rejection

Setting	ON	Value
Test Channel 1	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-1, 462.15000 MHz, NXDN 18
Test Channel 2	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-2, 454.11250 MHz, LTR 7
Test Channel 3	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-3, 454.31250 MHz, TRBO 3
Test Channel 4	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-4, 454.62500 MHz, LTR 10
Test Channel 5	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-5, 463.22500 MHz, NXDN 20
Test Channel 6	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-1, 461.17500 MHz, NXDN 1
Test Channel 7	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-2, 454.05000 MHz, TRBO 1
Test Channel 8	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-3, 451.88750 MHz, NXDN 19
Test Channel 9	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-4, 454.25000 MHz, TRBO 2
Test Channel 10	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-5, 454.53750 MHz, NXDN 9
Test Channel 11	<input type="checkbox"/>	<a href="#">Select</a>

Defaults
Discard Changes
Apply

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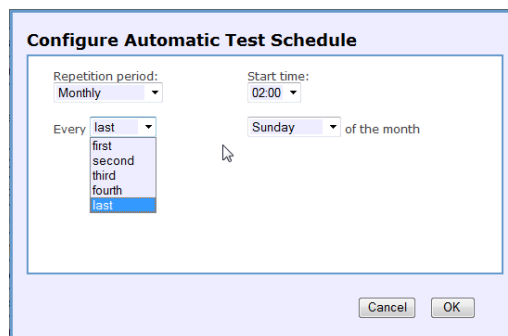
The System Isolation Tests “Configuration” page allows this test's parameters to be entered.

### Automatic System Isolation Tests:

This determines whether the System Isolation Tests will be performed automatically.

### Automatic Test Schedule:

This determines when the *System Isolation Tests* will be performed when *Automatic System Isolation Tests* is selected. Clicking *Edit* selects a calendar menu that allows a wide range of minute/hour/day/week/month selections to be chosen, enabling specific times to be allocated for the System Isolation Tests.



The dialog box titled "Configure Automatic Test Schedule" contains the following fields:

- Repetition period:** A dropdown menu with "Monthly" selected.
- Start time:** A dropdown menu with "02:00" selected.
- Every:** A dropdown menu with "last" selected, and a sub-menu open showing options: "first", "second", "third", "fourth", and "last".
- of the month:** A dropdown menu with "Sunday" selected.

At the bottom right are "Cancel" and "OK" buttons.

### Antenna Isolation Test:

#### Test Frequency:

The frequency upon which the Antenna Isolation Test will be performed.

**Note:** Depending on local licensing and regulatory requirements this frequency will normally be one of the sites existing Base Station receive frequencies.

### Rx Subsystem Gain(Loss):

#### Test Frequency(s):

The frequency(s) upon which the Rx Subsystem Gain/Loss Test will be performed.

**Note:** Depending on local licensing and regulatory requirements this frequency will normally be one of the sites existing Base Station receive frequencies.

### Tx Rejection:

#### Test Frequency(s):

The frequency(s) upon which the Tx Rejection Test will be performed.

**Note:** The frequencies selected for this test must be Tx frequencies that are selected in the *Configuration – Tx Ports* screens.

### Defaults:

Clicking this resets all data fields to the factory defaults.

### Discard Changes:

Click this button to restore the values to those current saved. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the *Configure - Isolation Tests* menu item again to re-display the current configuration.

### Apply:

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.



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## Configuration - System Isolation Tests

Customer Name - APM3852  
 Site Name - Bayswater

### Common Settings

[Defaults](#)

[Discard Changes](#)

[Apply](#)

Automatic System Isolation Tests ☒ Enabled

Automatic Test Schedule Every Hour, starting at 19:30

[Edit](#)

### Antenna Isolation

Setting	RA	RB	RE	Frequency
Test Frequency	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	421.00000 MHz

### Rx System Gain(Loss)

Setting	RA	RB	RE	Frequency
Test Frequency 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	418.00000 MHz
Test Frequency 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	419.00000 MHz
Test Frequency 3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	420.00000 MHz
Test Frequency 4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	420.50000 MHz
Test Frequency 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	421.00000 MHz
Test Frequency 6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	421.50000 MHz
Test Frequency 7	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	422.00000 MHz
Test Frequency 8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	423.00000 MHz
Test Frequency 9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OFF MHz

### Tx Rejection

Setting	RA	RB	RE	Channel
Test Channel 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx1-1, 420.06250 MHz, FC CH1 420
Test Channel 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<a href="#">Select</a> Tx2-1, 500.06250 MHz, FC CH1 500
Test Channel 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Select</a>

[Defaults](#)


[Discard Changes](#)

[Apply](#)

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When a Receive Systems Module (RSM) is fitted to the APM, the three receive signal paths (RxA, RxB and RxE) are selectable in the *Configuration – System Isolation Tests Chart* page.

## 10.29 Configuration – Receive Systems Module



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### Configuration - Receive Systems Module

Customer Name - **APM3852**  
 Site Name - **Bayswater**

Setting	Value
RxA-IN to Rx-OUT Gain	<input type="text" value="0"/> dB
RxB-IN to Rx-OUT Gain	<input type="text" value="0"/> dB
Antenna (Rx) to Rx-OUT Gain	<input type="text" value="0"/> dB
RxA-IN to RxA-OUT	<input checked="" type="checkbox"/> Enabled
RxB-IN to RxB-OUT	<input checked="" type="checkbox"/> Enabled

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The Receive Systems Module “Configuration” page allows this module’s parameters to be entered.

### RxA-IN to Rx-OUT Gain:

Sets the configured gain in the signal path from the RxA Input to the Rx Output to the APM.

### RxB-IN to Rx-OUT Gain:

Sets the configured gain in the signal path from the RxB Input to the Rx Output to the APM.

### Antenna Rx to Rx-OUT Gain:

Sets the configured gain in the signal path from the Rx Input to the Rx Output to the APM.

### RxA-IN to RxA OUT On/Off:

Sets the configured state of this RF path. Checked is a net gain of 0dB, unchecked is a maximum attenuation in this path (>25dB).

### RxB IN to RxB OUT On/Off:

Sets the configured state of this RF path. Checked is a net gain of 0dB, unchecked is a maximum attenuation in this path (>25dB).

**Defaults:**

Clicking this resets all data fields to the factory defaults. The default settings are;

RxA-IN to Rx-Out Gain	15dB
RxB-IN to Rx-Out Gain	15dB
External Antenna RxE-IN to Rx-Out Gain	15dB
RxA-IN to RxA-OUT	Checked
RxB-IN to RxB-OUT	Checked

**Discard Changes:**

Click this button to restore the values to those current saved. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the *Configure - Receive Systems Module* menu item again to re-display the current configuration.

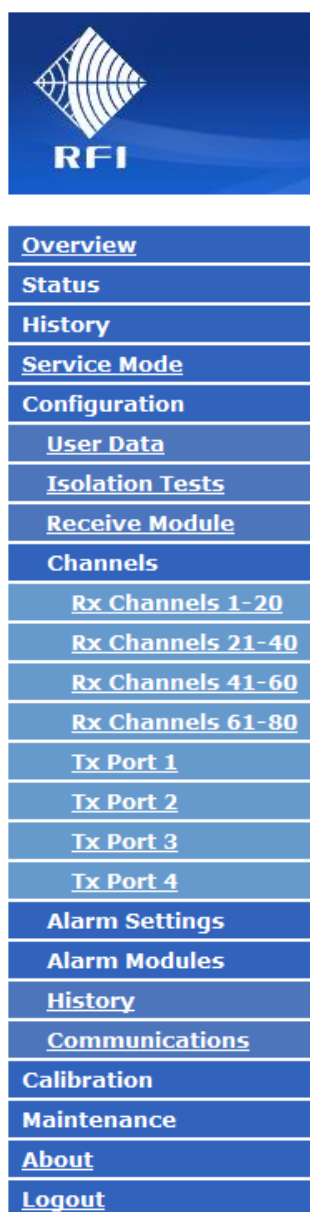
**Save:**

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

### **10.30 Configuration – Channels - Menu**

The “Configuration - Channels” menu allows all of the APMs channel specific parameters to be programmed.

Selecting each indented topic under “Configure - Channels” will display that item as a separate display page.




Help

**Note:** The viewing and functionality of *Configuration* menu items may be limited by the Login level used to access the APM.

**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

### 10.31 Configuration – Rx Channels 1-20



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## Configuration - Rx 1-20, Channels

Customer Name - **Smith County**  
 Site Name - **Mt Black**

Chan No.	Channel ID	NW ID	ON	Frequency	Modulation	Threshold Pwr
<input type="checkbox"/> Rx-1	LTR 1	1	<input checked="" type="checkbox"/>	467.15000 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-2	TRBO 1	0	<input checked="" type="checkbox"/>	459.11250 MHz	MOTOTRBO	-110.0 dBm
<input type="checkbox"/> Rx-3	TRBO 2	0	<input checked="" type="checkbox"/>	459.31250 MHz	MOTOTRBO	-110.0 dBm
<input type="checkbox"/> Rx-4	TRBO 3	0	<input checked="" type="checkbox"/>	459.62500 MHz	MOTOTRBO	-110.0 dBm
<input type="checkbox"/> Rx-5	LTR 7	1	<input checked="" type="checkbox"/>	468.22500 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-6	LTR 9	1	<input checked="" type="checkbox"/>	459.53750 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-7	LTR 10	1	<input checked="" type="checkbox"/>	459.62500 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-8	LTR 18	1	<input checked="" type="checkbox"/>	467.15000 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-9	LTR 19	1	<input checked="" type="checkbox"/>	459.88750 MHz	FM12.5	-110.0 dBm
<input type="checkbox"/> Rx-10	LTR 20	1	<input checked="" type="checkbox"/>	468.22500 MHz	FM25	-110.0 dBm

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Each of the Rx channels (Groups), displayed 20 per page, is configurable as illustrated in this Rx Channel page.

#### Chan No:

The system channel designator.

#### Channel ID:

A description for the channel. Up to 16 characters may be entered.

#### NW ID:

Allows channels to be affiliated with a network (i.e. "1" is Police Network, "2" is Fire Network), to an antenna system ("1" is Tx Antenna #1, "2" is Tx Antenna #2), or to another label (i.e. "1" is 24x7 Maintenance, "2" is Normal Hours Maintenance) and this label will appear in Alarm Messages to allow faster determination of response priority and or actions.

**Note:** The NW ID column is only displayed if this feature is enabled in the *Configuration – User Data* screen.

#### ON:

This controls the scanning of the channel. If checked, the channel is included in the measurement cycle, otherwise it is not included. This allows the channel to remain configured, but to be removed from the measurement cycle if desired (i.e. if the channel has been disabled or temporarily removed).



### Frequency:

The center frequency for the channel. The frequency must be a multiple of 0.00125 MHz. Channel frequency steps of 5KHz, 6.25KHz, 7.5KHz, 10KHz, 12.5KHz, 15KHz, 20KHz, 25KHz and 30KHz are supported.

### Modulation:

Selects the modulation type to be measured.

**Note:** The channel measurement bandwidth is also selected in this field. Some modulation selections default the channel measurement bandwidth (i.e. "TETRA" defaults to a 25KHz setting), but if multiple selections are available, then this is easily identified by the modulation label (i.e. "FM12.5" is 12.5KHz, and "FM25" is 25KHz).

### Threshold Pwr:

The minimum forward power level for which channel measurements and alarm status will be updated. If the detected power level is below this value the signal will be considered as not present.

### Add Row:

When the configuration page is loaded, only configured channels are displayed. To configure a new channel, click the Add Row button to display the next available un-configured channel. Up to 20 channels may be configured for each Tx port.

### Remove Selected Rows:

Clicking this button will return the selected rows to their default settings and remove them from the display. Rows are selected by clicking the checkbox at the left of the row. Clicking the checkbox in the title bar will select all the rows. Note that the first row is always displayed.

**Note:** For any text field, the allowable limits for that field (Model dependent) are displayed when the cursor is hovered over it.

### Defaults:

Clicking this button reduces the display to only the first channel and enters the factory default values for the Channel configuration settings. To only restore specific channels to defaults, select them, and then use the Remove Selected Rows button followed by the Add Row button. The default settings are;

<b>Channel ID</b>	"Not Defined"
<b>ON</b>	Not selected
<b>Frequency</b>	OFF
<b>BW</b>	25 kHz
<b>Threshold Pwr</b>	-120 dBm

### Discard Changes:

Click this button to restore the values to those current saved. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the Configure/User Data menu item again to re-display the current configuration.

### Apply:

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.



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## Configuration - Rx 1-20, Channels

Customer Name - **APM3852**  
 Site Name - **Bayswater**

[Defaults](#)
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[Apply](#)


<input type="checkbox"/>	Chan No.	Channel ID	RA	RB	RE	Frequency	Modulation	Threshold Pwr
<input type="checkbox"/>	Rx-1	FC CH1 420	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	420.06250 MHz	P25P1	-90.0 dBm
<input type="checkbox"/>	Rx-2	FC CH2 420	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	420.26250 MHz	P25P1	-90.0 dBm
<input type="checkbox"/>	Rx-3	FC CH3 420	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	420.36250 MHz	P25P1	-90.0 dBm
<input type="checkbox"/>	Rx-4	FC CH4 420	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	420.56250 MHz	P25P1	-90.0 dBm
<input type="checkbox"/>	Rx-5	FC CH5 420	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	420.66250 MHz	P25P1	-90.0 dBm
<input type="checkbox"/>	Rx-6	FC CH6 420	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	421.28750 MHz	DMR	-90.0 dBm
<input type="checkbox"/>	Rx-7	FC CH7 420	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	421.36250 MHz	DMR	-90.0 dBm
<input type="checkbox"/>	Rx-8	FC CH8 420	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	421.58750 MHz	DMR	-90.0 dBm
<input type="checkbox"/>	Rx-9	Building DAS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	468.10000 MHz	P25P1	-120.0 dBm

[Remove Selected Rows](#)
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When a Receive Systems Module (RSM) is fitted to the APM, the three receive signal paths (RxA, RxB and RxE) are selectable in the *Configuration – Rx Channels* pages.

### 10.32 Configuration – Tx Port 1 Channels



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## Configuration - Tx Port 1 Channels

Customer Name - **Smith County**  
Site Name - **Mt Black**  
Tx Antenna Reference - **LTR-TRBO TX1**

<input type="checkbox"/> Chan No.	Channel ID	NW ID	ON	Frequency	Modulation	Threshold Pwr
<input type="checkbox"/> Tx1-1	LTR 18	1	<input checked="" type="checkbox"/>	462.15000 MHz	MOTOTRBO	- 5.0 dBm
<input type="checkbox"/> Tx1-2	LTR 7	1	<input checked="" type="checkbox"/>	454.11250 MHz	FM12.5	- 5.0 dBm
<input type="checkbox"/> Tx1-3	TRBO 3	0	<input checked="" type="checkbox"/>	454.31250 MHz	MOTOTRBO	- 5.0 dBm
<input type="checkbox"/> Tx1-4	LTR 10	1	<input checked="" type="checkbox"/>	454.62500 MHz	FM12.5	- 5.0 dBm
<input type="checkbox"/> Tx1-5	LTR 20	1	<input checked="" type="checkbox"/>	463.22500 MHz	FM12.5	- 5.0 dBm

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Each of the Tx port channels (Groups), 1 through to 4 is configurable as illustrated in this Tx Port 1 Channel page.

#### Chan No:

The system channel designator.

#### Channel ID:

A description for the channel. Up to 16 characters may be entered.

#### NW ID:

Allows channels to be affiliated with a network (i.e. "1" is Police Network, "2" is Fire Network), to an antenna system ("1" is Tx Antenna #1, "2" is Tx Antenna #2), or to another label (i.e. "1" is 24x7 Maintenance, "2" is Normal Hours Maintenance) and this label will appear in Alarm Messages to allow faster determination of response priority and or actions.

**Note:** The NW ID column is only displayed if this feature is enabled in the *Configuration – User Data* screen.

#### ON:

This controls the scanning of the channel. If checked, scanning is enabled, otherwise it is not included in the scanning cycle. This allows the channel to remain configured, but to be temporarily removed from the scanning cycle.

#### Frequency:

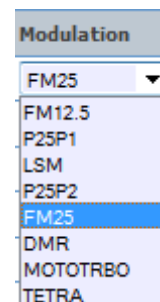
The center frequency for the channel. The frequency must be a multiple of 0.00125 MHz.

Channel frequency steps of 5KHz, 6.25KHz, 7.5KHz, 10KHz, 12.5KHz, 15KHz, 20KHz, 25KHz and 30KHz are supported.

**Modulation:**

Selects the modulation type to be measured.

**Note:** The channel measurement bandwidth is also selected in this field. Some modulation selections default the channel measurement bandwidth (i.e. "TETRA" defaults to a 25KHz setting), but if multiple selections are available, then this is easily identified by the modulation label (i.e. "FM12.5" is 12.5KHz, and "FM25" is 25KHz).



A dropdown menu titled "Modulation" with a list of options: FM25, FM12.5, P25P1, LSM, P25P2, FM25 (highlighted), DMR, MOTOTRBO, and TETRA.

**Threshold Pwr:**

The minimum forward power level for which channel measurements and alarm status will be updated. If the detected power level is below this value the signal will be considered as not present and a new measurement not performed.

**Note:** The default value for this field is "35dBm" which caters for most applications. Alternate values to suit special applications should be entered against specific channels as required, but a value of +10dBm (or higher) is recommended.

**Add Row:**

When the configuration page is loaded, only configured channels are displayed. To configure a new channel, click the Add Row button to display the next available un-configured channel. Up to 20 channels may be configured for each Tx port.

**Note:** If more than 20 channels are required to be configured as sampled by one Antenna Line Coupler (ALC), enter the additional channels into Tx Port 2 (and/or Tx Port 3 and/or Tx Port 4) channel list(s). In the *Calibration – Tx Ports* pages, enter the same Forward and Reverse Coupling values into the respective ports' calibration pages as has been calibrated on the *Calibration - Tx Port 1* page. For example, 37 channels could be monitored in one Tx combiner, via one ALC, by entering the first 20 frequencies against Tx Port 1, and the remaining 17 frequencies against Tx Port 2. The Forward and Reverse Coupling values determined in the *Calibration - Tx Port 1* page should be copied and applied to the *Calibration - Tx Port 2* page.

**Remove Selected Rows:**

Clicking this button will return the selected rows to their default settings and remove them from the display. Rows are selected by clicking the checkbox at the left of the row. Clicking the checkbox in the title bar will select all the rows. Note that the first row is always displayed.

**Note:** For any text field, the allowable limits for that field (Model dependent) are displayed when the cursor is hovered over it.

**Defaults:**

Clicking this button reduces the display to only the first channel and enters the factory default values for the Channel configuration settings. To only restore specific channels to defaults, select them, and then use the Remove Selected Rows button followed by the Add Row button. The default settings are;

Channel ID	"Not Defined"
ON	Not selected
Frequency	OFF
BW	25 kHz
Threshold Pwr	35 dBm

**Discard Changes:**

Click this button to restore the values to those present when the page was last re-displayed.

Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Channels/Tx Port menu item again to re-display the current configuration.

**Apply:**

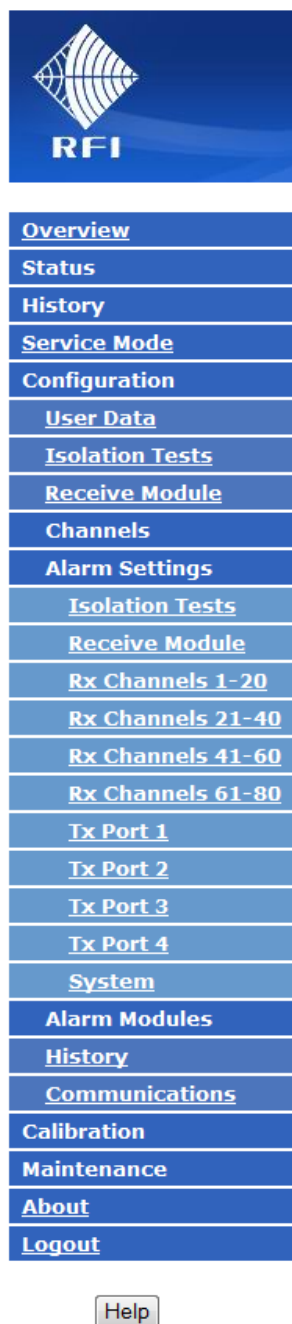
This will attempt to save and activate the values entered. If any out-of-range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

### **10.33 Configuration – Alarms Settings Menu**

The “Configuration - Alarms” menu allows all of the APMs alarm parameters to be programmed.


Selecting each indented topic under “Alarm Settings” will display that item as a separate display page.



**Note:** The viewing and functionality of *Configuration* menu items may be limited by the Login level used to access the APM.

**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.

### 10.34 Configuration – Alarm Settings – Isolation Tests



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## Configuration - System Isolation Test Alarms

Customer Name - Police  
Site Name - Mt Walker

System Information	Value
Tx Reverse Coupling Loss (Nominal)	40.7 dB
Tx Feeder Loss (Nominal)	3.0 dB
Rx Subsystem Gain(Loss)	- 0.7 dB
Rx Post Gain(Loss)	0.0 dB
Alarm Output	---

Setting	Min	Max
Antenna Isolation	20.0 dB	24.0 dB
System Rx Gain(Loss)	- 20.0 dB	+ 3.0 dB
Tx Rejection	60.0 dB	120.0 dB

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The "Configuration – System Isolation Test Alarms" page allows this test's parameters to be entered.

#### Tx Reverse Coupling Loss:

The value of coupling loss that has been entered in the Tx Port Calibration page. This value is used in the calculation of the System Isolation Tests values.

#### Tx Feeder Loss:

The value of Tx Antenna Feeder loss that has been entered in the Tx Port Calibration page. This value is used in the calculation of the System Isolation Tests values.

**Rx Subsystem Gain(Loss):**

The value of Rx Subsystem Gain/Loss that has been entered in the Rx Port Calibration page. This value is used in the calculation of the System Isolation Tests values.

**Rx Post Gain(Loss):**

The value of Rx Subsystem Post Gain/Loss that has been entered in the Rx Port Calibration page. This value is used in the calculation of the System Isolation Tests values.

**Alarm Output:**

If the Antenna Isolation alarm status is assigned as the source for an Alarm Module Alarm Output, or for one of the System Alarm relays, this displays the associated alarm output. For example;

“1-4” indicates Alarm Module 1, Alarm Output 4  
“S-2” indicates System Alarm relay 2

**Antenna Isolation (Alarm Level):**

The Antenna Isolation values below or above which an alarm will be generated when the System Isolation Tests are performed.

**System Rx Gain/Loss (Alarm Level):**

The Rx System Rx Gain/Loss values below or above which an alarm will be generated when the System Isolation tests are performed.

**Tx Rejection (Alarm Level):**

The Tx Rejection values below or above which an alarm will be generated when the System Isolation tests are performed.

**Defaults:**

Clicking this resets all data fields to the factory defaults.


**Discard Changes:**

Click this button to restore the values to those current saved. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the Configure/User Data menu item again to re-display the current configuration.

**Apply:**

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

### 10.35 Configuration – Alarm Settings – Receive Systems Module



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## Configuration - Receive Systems Module Alarms

Customer Name - **APM3852**  
 Site Name - **Bayswater**

Setting	Warning	Alarm
RxA Peak Level	- 50.0 dBm	- 35.0 dBm
RxB Peak Level	- 50.0 dBm	- 35.0 dBm
Antenna (Rx) Peak Level	- 55.0 dBm	- 35.0 dBm

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Each of the Rx input alarms is configurable as illustrated in this *Configuration – Alarm Settings - Receive Systems Module Alarms* page.

#### Setting:

Each of the three Rx inputs are listed for configuration.

#### Warning:

The alarm threshold level that will indicated a Yellow 'Warning' colour behind the displayed measured value for this Rx input.

#### Alarm:

The alarm threshold level that will indicated a Red 'Alarm' colour behind the displayed measured value for this Rx input.



**Defaults:**

Clicking this resets all data fields to the factory defaults. The default settings are;

Setting	Warning	Alarm
RxA Peak Level	-50dBm	-35dBm
RxB Peak Level	-50dBm	-35dBm
Antenna RxE Peak Level	-50dBm	-35dBm


**Discard Changes:**

Click this button to restore the values to those current saved. Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the Configure/User Data menu item again to re-display the current configuration.

**Apply:**

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

### 10.36 Configuration – Alarm Settings – Rx Channels



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- Isolation Tests
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- Rx Channels 21-40
- Rx Channels 41-60
- Rx Channels 61-80
- Tx Port 1
- Tx Port 2
- Tx Port 3
- Tx Port 4
- System
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## Configuration - Rx 1-20, Alarms

Customer Name - **Smith County**  
 Site Name - **Mt Black**

Chan No.	Channel ID	Frequency	Min Pwr	Max Pwr	Alm O/P
Rx-1	LTR 1	467.15000 MHz	-120.0 dBm	-55.0 dBm	---
Rx-2	TRBO 1	459.11250 MHz	-120.0 dBm	-55.0 dBm	---
Rx-3	TRBO 2	459.31250 MHz	-120.0 dBm	-55.0 dBm	---
Rx-4	TRBO 3	459.62500 MHz	-120.0 dBm	-55.0 dBm	---
Rx-5	LTR 7	468.22500 MHz	-120.0 dBm	-55.0 dBm	---
Rx-6	LTR 9	459.53750 MHz	-120.0 dBm	-55.0 dBm	---
Rx-7	LTR 10	459.62500 MHz	-120.0 dBm	-55.0 dBm	---
Rx-8	LTR 18	467.15000 MHz	-120.0 dBm	-55.0 dBm	---
Rx-9	LTR 19	459.88750 MHz	-120.0 dBm	-55.0 dBm	---
Rx-10	LTR 20	468.22500 MHz	-120.0 dBm	-75.0 dBm	---

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Each of the Rx channel alarms is configurable as illustrated in this *Configuration – Alarm Settings – Rx Channels* page.

#### Min Pwr and Max Pwr:

Sets the power level limits for alarming of the monitored Rx channels. A signal detected outside these limits will result in an alarm.

**Note:** Setting the Min Pwr to -120dBm will disable low level alarms. However, setting Min Pwr between -120dBm and the APMs minimum sensitivity measurement level (-110dBm) may result in unpredictable alarm behavior for Rx levels within this range. These values are different if an (optional) RSM module is fitted.

**Note:** For any text field, the allowable limits for that field (field dependent) are displayed when the cursor is hovered over it. Alarms will only be raised for signals where the Received Power level exceeds the Threshold Power set on the Channel Configuration pages.

**ALM O/P:**

The Alarm Output that this channel's Min. Pwr or Max. Pwr alarm has been assigned to.

**Note:** This is configured in the Configuration – Alarm Settings – System or Configuration – Alarm Modules screens as required.

**Defaults:**

Clicking this button enters the factory default values for the Channel alarm settings, which are;

<b>Min Power</b>	-110dBm
<b>Max Pwr</b>	-75dBm

**Discard Changes:**

Click this button to restore the values to those present when the page was last displayed.


**Note:** If invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant *Configuration/Alarms/Rx Channels* menu item again to re-display the current configuration.

**Apply:**

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever any configuration changes are applied, the alarm status for affected channels is re-initialised.

### 10.37 Configuration – Alarm Settings - Tx Port 1



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- Alarm Settings
- Antenna Isolation
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- Rx Channels 21-40
- Rx Channels 41-60
- Rx Channels 61-80
- Tx Port 1**
- Tx Port 2
- Tx Port 3
- Tx Port 4
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## Configuration - Tx Port 1 Alarms

Customer Name - **Smith County**  
 Site Name - **Mt Black**  
 Tx Antenna Reference - **LTR-TRBO TX1**

Chan No.	Channel ID	Frequency	Min Pwr	Max Pwr	Max I.L.	Max VSWR	Alm O/P
Tx1-1	LTR 18	462.15000 MHz	+42.0 dBm	+55.0 dBm	4.0 dB	1.50 :1	---
Tx1-2	LTR 7	454.11250 MHz	+42.0 dBm	+55.0 dBm	4.0 dB	1.50 :1	---
Tx1-3	TRBO 3	454.31250 MHz	+42.0 dBm	+55.0 dBm	4.0 dB	1.50 :1	---
Tx1-4	LTR 10	454.62500 MHz	+42.0 dBm	+55.0 dBm	4.0 dB	1.50 :1	---
Tx1-5	LTR 20	463.22500 MHz	+42.0 dBm	+55.0 dBm	4.0 dB	1.50 :1	---

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Each of the Tx port (Groups) channel alarms, 1 through to 4 is configurable as illustrated in this Tx Port 1 Alarms page.

#### Min & Max Power:

Sets the power level limits for alarming of the monitored Tx channels. A signal detected outside these limits will result in an alarm.

#### Max Insertion Loss:

Sets the Maximum allowable Combiner Insertion Loss calculated using the Forward Power level and the stored BTx Power level.

#### Max VSWR:

Sets the VSWR alarm limit.

#### ALM O/P:

The Alarm Output that this channel's Min. Pwr or Max. Pwr alarm has been assigned to.

**Note:** This is configured in the Configuration – Alarm Settings – System or Configuration – Alarm Modules screens as required.

**Note:** For any text field, the allowable limits for that field (Model dependent) are displayed when the cursor is hovered over it.

**Note:** Alarms will only be raised for signals where the Forward Power level exceeds the Threshold Power set on the Channel Configuration pages.

**Defaults:**

Clicking this button enters the factory default values for the Channel alarm settings, which are:

Min Power	+42 dBm
Max Power	+49 dBm
Max Ins Loss	1.0 dB
Max VSWR	1.50:1

**Discard Changes:**

Click this button to restore the values to those present when the page was last re-displayed.


Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

**Apply:**

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

### 10.38 Configuration – Alarm Settings – System



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- Rx Channels 41-60
- Rx Channels 61-80
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## Configuration - System Alarms

Customer Name - **APM3852**  
 Site Name - **Bayswater**

Setting	Value
VCO alarms	<input checked="" type="checkbox"/> Enabled
Tx Power alarms	<input checked="" type="checkbox"/> Enabled
Tx VSWR alarms	<input checked="" type="checkbox"/> Enabled
Rx Power alarms	<input type="checkbox"/> Enabled
Alarm Module Input alarms	<input checked="" type="checkbox"/> Enabled
Tx alarm delay	<input type="text" value="15"/> Seconds
Rx alarm delay	<input type="text" value="15"/> Seconds
Alarm Module Input alarm delay	<input type="text" value="15"/> Seconds

### Alarm Output Mapping

Relay	Alarm Source	
Relay 1	Summary Alarm, Normal, N/O	<input type="button" value="Edit"/>
Relay 2	Rx Power, Normal, N/O	<input type="button" value="Edit"/>
Relay 3	Tx Power, Normal, N/O	<input type="button" value="Edit"/>
Relay 4	Tx VSWR, Normal, N/O	<input type="button" value="Edit"/>

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These settings allow various alarm categories to be disabled. Note that disabling an alarm category only suppresses activation of the relevant alarm relays. For example if Tx Power alarms are disabled, the Tx Power alarm relay, and the Summary alarm relay will not activate when the Tx Forward power level is outside the configured limits. However, the alarm status LEDs will continue to operate normally, and the user interface will still display the relevant alarms.

#### VCO alarms:

When selected, a VCO alarm is raised when either of the APM unit's VCOs fail to frequency lock.

#### Tx Power alarms:

When selected, this alarm occurs when the Forward Power level for a Tx channel is outside the configured Min & Max power alarm limits or when the Combiner Insertion Loss exceeds the configured alarm limit.

#### Tx VSWR alarms:

When selected, this alarm occurs when the VSWR for a Tx channel is greater than the configured limit.

### Rx Power alarms:

When selected, this alarm occurs when the level for a Rx channel is outside the configured Min & Max level alarm limits.

### Alarm Module Input alarms:

When selected, this alarm occurs when any Alarm Module Input is outside the configured Min & Max alarm limits.

### Tx alarm delay:

This setting defines the length of time (in seconds) for which the alarm must be continuously present or restored before the change in alarm status is recognized.

### Rx alarm delay:

This setting defines the length of time (in seconds) for which the alarm must be continuously present or restored before the change in alarm status is recognized.

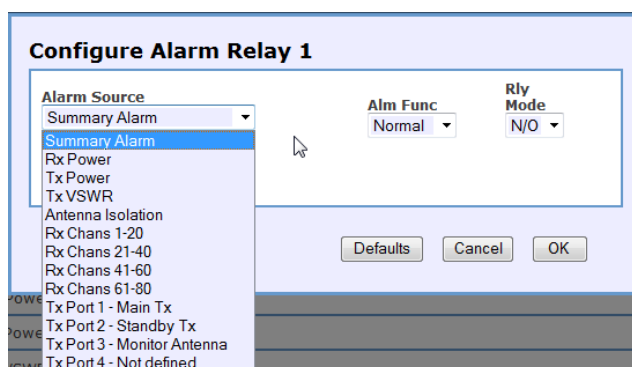
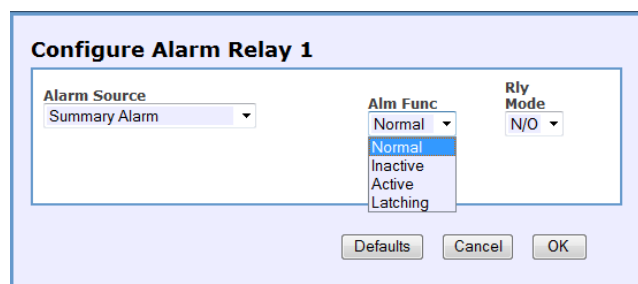
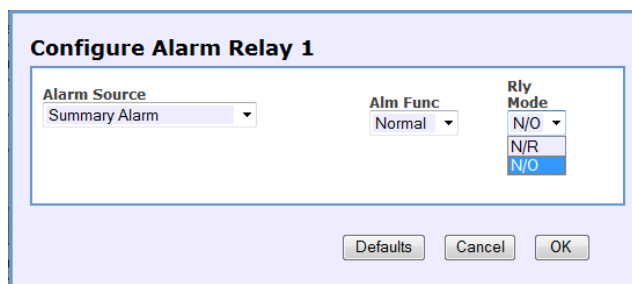
### Alarm Module Input alarm delay:

This setting defines the length of time (in seconds) for which the alarm must be continuously present or restored before the change in alarm status is recognized.

### Alarm Output Mapping

These selections allow the four relays available on the APM's rear panel DB15 connect to be mapped to a choice selectable from the System's Summary, Antenna Isolation, Rx Channel or Tx Channel alarms.

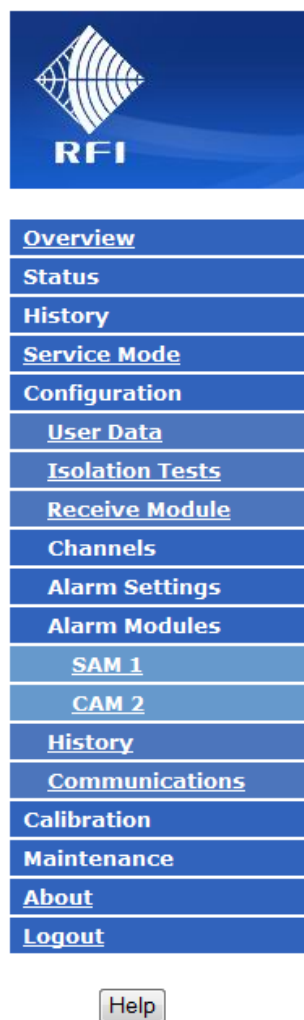
For each alarm selected and assigned, the relay can be configured for Normal, Inactive, Active or Latching actions, with either a Normally Operated or Normally Released state selectable.

### Defaults:

This will enable all alarm categories. The Tx alarm, Rx alarm and Alarm Module Inputs alarms delays will be set to 15 Seconds, and the four relay outputs will be set to the respective System Summary selections.


### 10.39 Configuration – Alarm Modules - Menu



**Note:** The “*Receive Systems Module*” and “*Alarm Modules*” menu items appear only if one or more (optional) Channel Alarm Module (CAM), Site Alarm Module (SAM) or Receive Systems Module (RSM) is installed. Up to ten (10) CAM/SAM units and one (1) RSM may be fitted to each APM as required.



### 10.40 Configuration – Alarm Modules – Channel Alarm Module



**RFI**

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- CAM 7**
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## Configuration - Channel Alarm Module 7

Customer Name - **Mebourne**  
 Site Name - **RFI Demo**

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext7 - 1	Not defined	<input type="checkbox"/>	5V Digital ▼	Active Low ▼
Ext7 - 2	Not defined	<input type="checkbox"/>	5V Digital ▼	Active Low ▼
Ext7 - 3	Not defined	<input type="checkbox"/>	5V Digital ▼	Active Low ▼
Ext7 - 4	Not defined	<input type="checkbox"/>	5V Digital ▼	Active Low ▼

Digital Input	Input ID	Enabled	Function	Criteria
D17 - 1	Police Rptr PTT	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 2	Vot Shelf Alarm	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 3	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 4	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 5	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 6	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 7	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 8	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 9	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼
D17 - 10	Not defined	<input type="checkbox"/>	Not in use ▼	Active Low ▼

Alarm Output	Port	Channel	Alarm Configuration
CAM7 - 1	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 2	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 3	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 4	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 5	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 6	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 7	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 8	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 9	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>
CAM7 - 10	Alarm not in use ▼	Alarm not in use ▼	<input type="button" value="Configure Alarm Detail"/>

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Each of the (optional) Channel Alarm Module (CAM) units fitted to the APM is configurable as illustrated in this Channel Alarm Module page.

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext4-1	Site Door	<input checked="" type="checkbox"/>	5V Digital ▾	Active Low ▾
Ext4-2	Fuel Tank Low	<input checked="" type="checkbox"/>	5V Digital ▾	Active High ▾
Ext4-3	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
Ext4-4	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾

### External Alarm Input:

Displays the four (4) configurable external digital inputs.

### Input ID:

Enter a description for the External Alarm input signals. Up to 16 characters may be entered.

### Enabled:

If the input is Enabled, an alarm condition will result in a System Fault summary alarm, together with an indication on the System Status page. Its status will also be displayed on the associated CAM Status page.

### Mode:

5V Digital ▾

Not in use

5V Digital

Select the input mode for the external input.

### Criteria:

Select the input state (LOW or HIGH) that signals an alarm condition for each External Input.

Digital Input	Input ID	Enabled	Function	Criteria
DI4-1	Police Base PTT	<input checked="" type="checkbox"/>	CAM4-1 PTT ▾	Active Low ▾
DI4-2	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI4-3	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI4-4	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI4-5	Microwave Alarm	<input checked="" type="checkbox"/>	General Purpose ▾	Active Low ▾
DI4-6	Solar Low Volts	<input checked="" type="checkbox"/>	General Purpose ▾	Active Low ▾
DI4-7	Mains Fail	<input checked="" type="checkbox"/>	General Purpose ▾	Active Low ▾
DI4-8	Batt. Low Volts	<input checked="" type="checkbox"/>	General Purpose ▾	Active Low ▾
DI4-9	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI4-10	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾

## Digital Input:

Displays the ten (10) configurable digital inputs.

## Input ID:

Enter a description for the digital alarm signal. Up to 16 characters may be entered.

## Enabled:

Selects if this input is enabled.

## Function:

Select the input mode for each of the Digital Inputs.

A "CAMX-X PTT" selection affiliates the digital input as a base station Tx PTT or RX UNSQ or other control line function as a monitoring line for the base station assigned to that CAM Alarm Relay Output (see below). A "General Purpose" selection identifies the Digital Input as an independent digital input for monitoring external equipment, etc

When the Function input is enabled, it is used instead of the Threshold Power Level (configured on the Tx Port Channel Configuration page) to determine if the alarmed parameter should be measured. If used with the transmitter's PTT line, even if the transmitter produces no RF output, but the PTT line activation is present, an alarm condition can be determined. If the Threshold Power Level value was used instead, no RF level would be detected above the threshold level, so no measurements (or resulting alarm states) would occur.

Other conditional alarming functionality for Receiver, Voting Shelf or other system equipment can be created using this Function input selection.

## Criteria:

Select the input state (LOW or HIGH) that signals an alarm condition.

Alarm Output	Alarm Source	Input/Channel	Alarm Configuration	Expand All
CAM4-1	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-2	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-3	Ext Alm Inputs 1-4	Alarm not in use	Configure Alarm Detail	
CAM4-4	Digital Inputs 1-10	Alarm not in use	Configure Alarm Detail	
CAM4-5	Antenna Isolation	Alarm not in use	Configure Alarm Detail	
CAM4-6	Rx Chans 1-20	Alarm not in use	Configure Alarm Detail	
CAM4-7	Rx Chans 21-40	Alarm not in use	Configure Alarm Detail	
CAM4-8	Rx Chans 41-60	Alarm not in use	Configure Alarm Detail	
CAM4-9	Rx Chans 61-80	Alarm not in use	Configure Alarm Detail	
CAM4-10	Tx Port 1 - Main Tx 1	Alarm not in use	Configure Alarm Detail	
	Tx Port 2 - Standby Tx	Alarm not in use	Configure Alarm Detail	
	Tx Port 3 - Not defined	Alarm not in use	Configure Alarm Detail	
	Tx Port 4 - Not defined	Alarm not in use	Configure Alarm Detail	
	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-9	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-10	Alarm not in use	Alarm not in use	Configure Alarm Detail	

## Alarm Output:

These 10 rows configure the individual channel alarm outputs and PTT input settings. Selecting the *Configure Alarm Detail* button on each row expands its display (refer above example). Selecting the *Collapse* button minimises the row display.

## Alarm Source:

Either select the source of the alarm for each channel, or select "Alarm not in use" to disable the alarm.

## Input/Channel:

Having selected the source, select the desired input/channel to be assigned to the SAM alarm.

## Alarm Configuration:

### Alarm Func:

The following options are available:

Normal – The alarm relay is controlled by the channel alarm status.

Inactive – The alarm relay is forced to the “no alarm” state for testing.

Active – The alarm relay is forced to its “alarm” state for testing.

Latching – The alarm relay is “latched” by an instance of the alarm state, and remains in this position until unlatched by manually selecting the adjacent *Clr* box.

**Note:** When an alarm is current, the border of the *Configure Alarm Detail* button will be red, and when the Channel is expanded, the *Alm Func* box will also be red (refer above example).

### Rly Mode:

The Relay Mode may be either Normally Released (N/R), i.e. it “operates” when an alarm is present, or Normally Operated (N/O), i.e. it “releases” when an alarm is present.

### Specific Alarm Types:

If a Tx Channel is selected as the alarm source, either Tx Power or VSWR (or both) alarm conditions on the affiliated APM Tx channel will initiate an alarm output condition on this CAM channel. Other selections will appear for other alarm source selections.

Alarm Output	Port	Channel	Alarm Configuration	Expand All
CAM4-1	Alarm not in use	Alarm not in use	<div> <div>Alm Func</div> <div>Normal</div> </div> <div> <div>Rly Mode</div> <div>N/R</div> </div> <div> <div>Specific alarm types:</div> <div> <input checked="" type="checkbox"/> Tx Pwr           <input checked="" type="checkbox"/> VSWR         </div> </div> <div>Collapse</div>	
CAM4-2	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-3	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-4	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-5	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-6	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-7	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-8	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-9	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM4-10	Alarm not in use	Alarm not in use	Configure Alarm Detail	

## Defaults:

Clicking this button restores the factory default values which are:

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext7-1	Not Defined	<input type="checkbox"/>	Not in use	Active Low
Ext7-2	Not Defined	<input type="checkbox"/>	Not in use	Active Low
Ext7-3	Not Defined	<input type="checkbox"/>	Not in use	Active Low
Ext7-4	Not Defined	<input type="checkbox"/>	Not in use	Active Low

Digital Input	Input ID	Enabled	Function	Criteria
DI7-1	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-2	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-3	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-4	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-5	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-6	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-7	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-8	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-9	Not Defined	<input type="checkbox"/>	Not in use	Active Low
DI7-10	Not Defined	<input type="checkbox"/>	Not in use	Active Low

Alarm Output	Alarm Source	Input/Channel	Alarm Configuration	Expand All
CAM7-1	Alarm not in use	Alarm not in use	<div> <div>Alm Func</div> <div>Normal</div> </div> <div> <div>Rly Mode</div> <div>N/R</div> </div> <div>Collapse</div>	
CAM7-2	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-3	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-4	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-5	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-6	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-7	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-8	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-9	Alarm not in use	Alarm not in use	Configure Alarm Detail	
CAM7-10	Alarm not in use	Alarm not in use	Configure Alarm Detail	

Clicking *Apply* then saves these values into the APM, or *Discard Changes* restores these values to their previous settings.

## Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed.


Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

## Apply:

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

## 10.41 Configuration – Alarm Modules – Site Alarm Module



**Configuration - Site Alarm Monitor, Module 1**

Customer Name -                      Comm Site  
 Site Name -                              Mt Smith

External Alarm Input	Input ID	Enabled	Mode	Criteria		
Ext1-1	Room Temperature	<input checked="" type="checkbox"/>	Temperature	Min -10.1	Max 50.0	°F
Ext1-2	Battery Bank	<input checked="" type="checkbox"/>	+5V to -60V	Min -50.0	Max -45.0	Volts
Ext1-3	Solar Array	<input checked="" type="checkbox"/>	+60V to -60V	Min 2.0	Max 20.0	Volts
Ext1-4	Door Alarm	<input checked="" type="checkbox"/>	5V Digital	Active High		

Digital Input	Input ID	Enabled	Function	Criteria
DI1-1	Police Rptr PTT	<input checked="" type="checkbox"/>	SAM1-1 PTT	Active Low
DI1-2	Generator Alarm	<input checked="" type="checkbox"/>	General Purpose	Active High
DI1-3	Fuel Low Alarm	<input checked="" type="checkbox"/>	General Purpose	Active Low
DI1-4	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-5	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-6	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-7	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-8	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-9	Not defined	<input type="checkbox"/>	Not in use	Active Low
DI1-10	Not defined	<input type="checkbox"/>	Not in use	Active Low

Alarm Output	Port	Channel	Alarm Configuration
SAM1-1	Tx Port 1 - Tx Antenna #1	Tx1-1, 153.21250 MHz, Police	<input type="button" value="Configure Alarm Detail"/>
SAM1-2	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-3	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-4	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-5	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-6	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-7	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-8	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-9	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>
SAM1-10	Alarm not in use	Alarm not in use	<input type="button" value="Configure Alarm Detail"/>

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Each of the (optional) Site Alarm Module (SAM) units fitted to the APM is configurable as illustrated in this “Configuration - Site Alarm Module” page.

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext1-1	Room Temperature	<input checked="" type="checkbox"/>	Temperature ▾	Min -10.1 Max 50.0 °F
Ext1-2	Battery Bank	<input checked="" type="checkbox"/>	+5V to -60V ▾	Min -50.0 Max -45.0 Volts
Ext1-3	Solar Array	<input checked="" type="checkbox"/>	+60V to -60V ▾	Min 2.0 Max 20.0 Volts
Ext1-4	Door Alarm	<input checked="" type="checkbox"/>	5V Digital ▾	Active High ▾

### External Alarm Input:

Displays the four (4) configurable external temperature/analogue/digital inputs.

#### Input ID:

Enter a description for the External Alarm input signals. Up to 16 characters may be entered.

#### Enabled:

If the input is Enabled, an alarm condition will result in a System Fault summary alarm, together with an indication on the System Status page. Its status will also be displayed on the associated SAM Status page.

#### Mode:

Select the input mode for the external input. Ext1 may select from temperature/analogue/digital, and Ext2, Ext3 and Ext 4 may be selected from analogue/digital

Temperature ▾

Not in use

5V Digital

Temperature

0V to +5V

+5V to -60V ▾

Not in use

5V Digital

+60V to -60V

+5V to -60V

#### Criteria:

Set the alarm threshold limits or input state (LOW or HIGH) that signals an alarm condition for each External Input.

Digital Input	Input ID	Enabled	Function	Criteria
DI1-1	Police #1 PTT	<input checked="" type="checkbox"/>	SAM1-1 PTT ▾	Active Low ▾
DI1-2	Door Entry	<input checked="" type="checkbox"/>	General Purpose ▾	Active Low ▾
DI1-3	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-4	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-5	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-6	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-7	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-8	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-9	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾
DI1-10	Not defined	<input type="checkbox"/>	Not in use ▾	Active Low ▾

### Digital Input:

Displays the ten (10) configurable digital inputs.

#### Input ID:

Enter a description for the digital alarm signal. Up to 16 characters may be entered.

### Enabled:

Selects if this input is enabled.

### Function:

Select the input mode for each of the Digital Inputs.

A "SAMX-X PTT" selection affiliates the digital input as a base station Tx PTT or RX UNSQ or other control line function as a monitoring line for the base station assigned to that SAM Alarm Relay Output (see below). A "General Purpose" selection identifies the Digital Input as an independent digital input for monitoring external equipment, etc

When the Function input is enabled, it is used instead of the Threshold Power Level (configured on the Tx Port Channel Configuration page) to determine if the alarmed parameter should be measured. If used with the transmitter's PTT line, even if the transmitter produces no RF output, but the PTT line activation is present, an alarm condition can be determined. If the Threshold Power Level value was used instead, no RF level would be detected above the threshold level, so no measurements (or resulting alarm states) would occur.

Other conditional alarming functionality for Receiver, Voting Shelf or other system equipment can be created using this Function input selection.

### Criteria:

Select the input state (LOW or HIGH) that signals an alarm condition.

Alarm Output	Alarm Source	Input/Channel	Alarm Configuration	Expand All
SAM1-1	Tx Port 1 - Main Tx	Tx1-1, 473.50000 MHz, Radi	<div> <div>Alm Func</div> <div>Normal</div> </div> <div> <div>Rly Mode</div> <div>N/R</div> </div> <div> <div>Specific alarm types:</div> <div> <input checked="" type="checkbox"/> Tx Pwr           <input checked="" type="checkbox"/> Ins Loss           <input checked="" type="checkbox"/> VSWR         </div> </div>	
SAM1-2	Antenna Isolation	Alarm not in use	Configure Alarm Detail	
SAM1-3	Rx Chans 1-20	Alarm not in use	Configure Alarm Detail	
SAM1-4	Rx Chans 21-40	Alarm not in use	Configure Alarm Detail	
SAM1-5	Rx Chans 41-60	Alarm not in use	Configure Alarm Detail	
SAM1-6	Rx Chans 61-80	Alarm not in use	Configure Alarm Detail	
SAM1-7	Tx Port 1 - Main Tx	Alarm not in use	Configure Alarm Detail	
SAM1-8	Tx Port 2 - Standby Tx	Alarm not in use	Configure Alarm Detail	
SAM1-9	Tx Port 3 - Monitor Antenna	Alarm not in use	Configure Alarm Detail	
SAM1-10	Tx Port 4 - Not defined	Alarm not in use	Configure Alarm Detail	

### Alarm Output:

These 10 rows configure the individual channel alarm outputs and PTT input settings. Selecting the *Configure Alarm Detail* button on each row expands its display (refer above example). Selecting the *Collapse* button minimises the row display.

### Alarm Source:

Either select the source of the alarm for each channel, or select "Alarm not in use" to disable the alarm.

### Input/Channel:

Having selected the source, select the desired input/channel to be assigned to the SAM alarm.



## Alarm Configuration:

### Alarm Func:

The following options are available:

Normal – The alarm relay is controlled by the channel alarm status.

Inactive – The alarm relay is forced to the “no alarm” state for testing.

Active – The alarm relay is forced to its “alarm” state for testing.

Latching – The alarm relay is “latched” by an instance of the alarm state, and remains in this position until unlatched by manually selecting the adjacent *Clr* box.

**Note:** When an alarm is current, the border of the *Configure Alarm Detail* button will be red, and when the Channel is expanded, the *Alm Func* box will also be red (refer above example).

### Rly Mode:

The Relay Mode may be either Normally Released (N/R), i.e. it “operates” when an alarm is present, or Normally Operated (N/O), i.e. it “releases” when an alarm is present.

### I/P Func:

This selects the channel specific input function. An application for this feature is to use it with a PTT signal from the transmitter. The following options are available;

Disabled – The input is not used.

PTT Low – An active LOW or “0” input signal is required. (A LOW is defined as <2.5vdc)

PTT High – An active HIGH or “1” input signal is required. (A HIGH is defined as >2.5vdc)

When the I/P Func input is enabled, it is used instead of the Threshold Power Level (configured on the Tx Port Channel Configuration page) to determine if the alarmed parameter should be measured. If used with the transmitter's PTT line, even if the transmitter produces no RF output, but the PTT line activation is present, an alarm condition can be determined. If the Threshold Power Level value was used instead, no RF level would be detected above the threshold level, so no measurements (or resulting alarm states) would occur.

### Specific Alarm Types:

When selected, either Tx Power, Tx I.L. or VSWR (or any combination thereof) alarm conditions on the affiliated APM Tx channel will initiate an alarm output condition on this CAM channel.

### Defaults:

Clicking this button restores the factory default values which are:

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext1-1	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
Ext1-2	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
Ext1-3	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
Ext1-4	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>

Digital Input	Input ID	Enabled	Function	Criteria
DI1-1	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-2	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-3	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-4	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-5	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-6	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-7	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-8	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-9	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>
DI1-10	<input type="text" value="Not Defined"/>	<input type="checkbox"/>	<input type="text" value="Not in use"/>	<input type="text" value="Active Low"/>

Alarm Output	Alarm Source	Input/Channel	Alarm Configuration	Expand All
SAM1-1	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div> <div>Alm Func</div> <div><input type="text" value="Normal"/></div> </div> <div> <div>Rly Mode</div> <div><input type="text" value="N/R"/></div> </div> <div>Collapse</div>	
SAM1-2	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-3	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-4	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-5	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-6	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-7	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-8	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-9	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	
SAM1-10	<input type="text" value="Alarm not in use"/>	<input type="text" value="Alarm not in use"/>	<div>Configure Alarm Detail</div>	

Clicking *Apply* then saves these values into the APM, or *Discard Changes* restores these values to their previous settings.

#### Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed.


Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

#### Apply:

This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

## 10.42 Configuration – History



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### Configuration - History

Customer Name - **APM3852**  
Site Name - **Bayswater**

Setting	Value
Recover 'Last Recorded' Status values after power loss	<input checked="" type="checkbox"/> Enabled
Rx Power Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
Tx Power Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
VSWR Level Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
Alarm Module Input Level Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
Logging Interval	10 Sec ▾
Rx Power Logging Resolution	0.5 dB ▾
Tx Power Logging Resolution	0.5 dB ▾
VSWR Level Logging Resolution	10 % ▾
Alarm Module Analogue Input Voltage Logging Resolution	5 % ▾ (Of full range)

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This page determines if measurements are logged into the APM's data memory and the period at which these values are logged.

### Recover “Last Recorded” Status values after power loss:

This Enables or Disables whether “last recorded values” are restored after a power outage, or whether values remain at their power on defaults until a valid measurement is made for each field.

### Rx Power Logging:

This setting Enables or Disables the Rx power level logging. Disabling the logging at any time will not affect any data already captured.

### Tx Power Logging:

This setting Enables or Disables the Tx power level logging. Disabling the logging at any time will not affect any data already captured.

### VSWR Level Logging:

This setting Enables or Disables the VSWR power level logging. Disabling the logging at any time will not affect any data already captured.

### Alarm Module Input Level Logging:

This setting Enables or Disables the Alarm Module input level logging. Disabling the logging at any time will not affect any data already captured.

### Logging Interval:

This sets the interval between the logging snapshots. For example, if set to “10 sec”, a snapshot of all the current levels is taken and saved every 10 seconds.

### Use Interval:

After each of the *RX Power Logging*, *Tx Power Logging* and *VSWR Level Logging* fields there is a *Use Interval* selection box. If selected, each of the Logging activities will use the displayed *Logging Interval* value between log entries. If not selected, logging of the respective data will occur for every measurement cycle.

### Rx Power Logging Resolution:

If the difference between the current Rx level and the last level logged is less than this value, a new record will not be written to the history data files. Higher values will make it less likely that a new data record will be required. This may greatly increase the total period of time for which data can be stored in the available data memory space.

### Tx Power Logging Resolution:

If the difference between the current Tx power level and the last level logged is less than this value, a new record will not be written to the history data files. Higher values will make it less likely that a new data record will be required. This may greatly increase the total period of time for which data can be stored in the available data memory space.

### VSWR Logging Resolution:

If the difference between the current VSWR value and the last level logged is less than this value, a new record will not be written to the history data files. Higher values will make it less likely that a new data record will be required. This may greatly increase the total period of time for which data can be stored in the available data memory space.

### Alarm Module Analogue Input Voltage Resolution:

If the difference between the current analogue input voltage level and the last level logged is less than this value, a new record will not be written to the history data files. Higher values will make it less likely that a new data record will be required. This may greatly increase the total period of time for which data can be stored in the available data memory space.

### Defaults:

Clicking this button selects the factory default values which are:

Setting	Value
Recover 'Last Recorded' Status values after power loss	<input checked="" type="checkbox"/> Enabled
Rx Power Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
Tx Power Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
VSWR Level Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
CAM Input Level Logging	<input checked="" type="checkbox"/> Enabled <input checked="" type="checkbox"/> Use Interval
Logging Interval	10 Sec ▾
Rx Power Logging Resolution	0.5 dB ▾
Tx Power Logging Resolution	0.5 dB ▾
VSWR Level Logging Resolution	10 % ▾
CAM Analogue Input Voltage Logging Resolution	2 % ▾ (Of full range)

Clicking *Apply* then saves these values into the APM, or *Discard Changes* restores these values to their previous settings.


### Discard Channels:

Click this button to restore the values to those present when the page was last re-displayed.

### Apply:

This will apply the values entered.

### 10.43 Configuration – Communications



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## Configuration - Communications

**Customer Name -** NWRL  
**Site Name -** CSH

**Ethernet**

Setting	Value
DHCP	<input type="checkbox"/> Enabled
IP Address	192.168.1.202
Subnet Mask	255.255.255.0
Gateway	192.168.1.1

**NOTE:** After saving new values for any of the **above** settings, the system must be restarted to activate them. The Restart option is under the Maintenance menu.

Port 23 Command Line Interface ☒ Enabled

**Email**

Setting	Value	
Messages to send	<input checked="" type="checkbox"/> Summary system status <input checked="" type="checkbox"/> Detailed status	<a href="#">Test Email</a>
SMTP Server Address	209.173.141.091	
SMTP Server Listening Port	25	
SMTP Server Login Username	rfiASMalarms	
SMTP Server Login Password	..... <input type="checkbox"/> Reveal	
From Email Address	noreply@localhost	
Destination Email Addresses	<input type="text"/> <input type="text"/> <input type="text"/>	

**SNMP**

Setting	Value	
Send Alarm Notifications (Traps)	<input checked="" type="checkbox"/> Enabled	<a href="#">Test SNMP</a>
SNMP GET Requests (Port 161)	<input checked="" type="checkbox"/> Enabled	
SNMP Community String	public	
	<b>Primary</b>	<b>Secondary</b>
SNMP Manager IP Address	123.243.234.21	220.245.149.200
SNMP Manager Listening Port	9125	162

[Defaults](#)
[Discard Changes](#)
[Apply](#)

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Each of the Communications parameters configurable in the APM is configurable as illustrated in this Configuration page.

## **Ethernet**

### **DHCP:**

If enabled, the unit will attempt to get its IP Address, Subnet Mask and Gateway settings from a DHCP server. If no DHCP server is found, the configured settings will be used. If not enabled, the configured settings will always be used.

### **IP Address:**

The IP address for this unit.

### **Subnet Mask:**

The network address mask to be used.

### **Gateway:**

The address of the network gateway to be used.

### **Port 23 Command Line Interface:**

Selects if Port 23 is enabled or disabled for Command Line Interface use. The default setting is 'disabled' for optimum security.

## **Email**

### **Summary system status messages:**

Selects if *System summary status messages* are to be sent via email.

### **Detailed channel status messages:**

Selects if *Detailed channel status messages* are to be sent by email.

### **SMTP Server IP Address:**

Sets the IP address that email messages will be sent to. This must be the IP address of the email server that will send the email. DNS look-up is not supported, so the email server name (i.e. "smtp.live.com") is not a valid entry.

### **SMTP Server Listening Port:**

Sets the port number used by the SMTP server. Commonly this will be Port 25, 2525 or 587. The IP connection to the APM must support access to the required IP Port. Email service providers can provide their email server Listening Port address if it is not already known.

### **SMTP Server Login Username:**

When the email service being used to handle emails required login authentication, enter the account Username in this field. The entry should be the same as would otherwise be used if logging into that email service directly (i.e. "scott@gmail.com" for Gmail™ or "rfiAPMalarms" for Jango™).

### **SMTP Server Login Password:**

When the email service being used to handle emails required login authentication, enter the account Password in this field. The entry should be the same as would otherwise be used if logging into that email service directly (i.e. "scott123!" for Gmail™ or "rfiAPMalarms" for Jango™). Ticking the *Reveal* box will display the password entered.

### **From Email Address:**

Sets the email address that this unit will appear as in email messages. This must be a name in a valid email address format (i.e. xxxx@yyyyy.com etc).

### **Destination Email Address(es):**

Sets the email address(es) that this unit will send email messages to. (up to 4 addresses may be used)

**Note:** Access to certain email addresses may be restricted by the SMTP Server being used. Emails to outside email addresses are generally not allowed by organisations' own email servers. At this time, this SMTP Email Alarms feature does not support the SSH authentication or encryption requirements that some email servers may require.

## **SNMP**

### **Send Alarm Notifications (Traps):**

Selects if sending SNMP Traps are enabled or disabled.

### **SNMP GET Requests (Port 161):**

Selects if Port 161 is enabled or disabled for SNMP GET requests. The default setting is 'disabled' for optimum security.

### **SNMP Community String:**

Sets the SNMP Community String value used for both Alarm Notifications (Traps) and GET Requests. The default value is 'public'.

### **SNMP Manager IP Address:**

Selects the IP address that SNMP notifications (Traps) will be sent to. Both a Primary and Secondary address may be used if required for redundant SNMP server configurations.

### **SNMP Manager Listening Port:**

Selects the port number used by the SNMP Manager. Both a Primary and Secondary address may be used if required for redundant SNMP server configurations.

**Note:** SNMP MIB files for the APM are available from RFI.

## **Defaults:**

Clicking this button enters the factory default values for the Communications settings, which are:

DHCP	Disabled
IP Address	192.168.1.200
Subnet Mask	255.255.255.0
Gateway	192.168.1.254

## **Discard Changes:**

Click this button to restore the values to those present when the page was last re-displayed.

Note that if invalid values are being displayed after a Save attempt, these values may not match the current repeater configuration. In this case, just select the Configure/Communications menu item again to re-display the current configuration.

## **Save:**

This will attempt to save the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

**Note:** Unlike the other configuration pages, this will not Activate (or "apply") the Ethernet settings if they have been changed. Ethernet changes can only be activated by restarting the APM unit, either by cycling the power, or through the Maintenance/Restart menu item.

### **10.44 Calibration Menu**

The “Calibration” menu allows the APMs associated system components’ (couplers, feeders) values to be programmed.

Selecting each indented topic under “Calibration” will display that item as a separate display page.




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### 10.45 Calibration – System Isolation Tests



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## Calibration - System Isolation Tests

Customer Name - Police  
Site Name - Mt Walker

**Antenna Isolation for Each Tx Port (Used for Tx Rejection measurements only)**

Port	Isolation	
Tx Port 1 - Tx #1	51.4 dB	Test & Capture
Tx Port 2 -	51.4 dB	Test & Capture
Tx Port 3 -	51.4 dB	Test & Capture
Tx Port 4 -	51.4 dB	Test & Capture

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This page is used for (optionally) calibrating the individual Tx Port to Rx Port Antenna Isolation values.

As each Tx Port is normally connected to a different antenna system, the antenna isolation between that Tx antenna and the Rx antenna is likely to be different than that between the other Tx antennas and that same Rx port, and different to the average value measured in the Antenna Isolation Test.

If desired, this page allows the different values for each Tx Antenna to Rx Antenna isolation to be set up for each port. This calibrated value will then be used in determining the Tx Rejection value for configured channels on each specific port in the System Isolation Tests' Tx Rejection Tests.

If the calibration isolation value is left blank, the system measured Antenna Isolation Test value will be used for the Tx Rejection Tests measurements for the Tx port.

#### Calibration Process:

Disconnect all of the connected Tx Reverse ports' coaxial cables. Re-connect the cables, with only one connected at a time, and click the associated Test & Capture button. Clicking this button immediately initiates a new Antenna Isolation Test measurement, and loads the result into the Isolation field associated with that port.

Complete this process, having only one Tx Reverse ports' coaxial cable connected each time, until all used Tx Ports have been calibrated.

Re-connect all Tx Reverse ports' coaxial cables.

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## Calibration - System Isolation Tests

Customer Name - APM3852  
Site Name - Bayswater

Antenna Isolation for Each Tx Port (Used for Tx Rejection measurements only)

Port	Isolation			
	RA	RB	RE	
Tx Port 1 - Tx 420	61.7 dB	61.7 dB	61.7 dB	<a href="#">Test &amp; Capture</a>
Tx Port 2 - Tx 500	61.7 dB	61.7 dB	61.7 dB	<a href="#">Test &amp; Capture</a>
Tx Port 3 -	61.7 dB	61.7 dB	61.7 dB	<a href="#">Test &amp; Capture</a>
Tx Port 4 -	61.7 dB	61.7 dB	61.7 dB	<a href="#">Test &amp; Capture</a>


[Defaults](#)[Discard Changes](#)[Apply](#)

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When a Receive Systems Module (RSM) is fitted to the APM, the three receive signal paths (RxA, RxB and RxE) are configurable in the *Calibration – System Isolation Tests* page.

The Calibration process outlined on the previous page may also be used for these settings, with the separate Tx-Rx isolations to the multiple RSM inputs able to be measured and recorded.

## 10.46 Calibration – Rx Port



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### Calibration - Rx Port

Customer Name - Demo  
Site Name - Chase Tower

Setting	Value
Rx Subsystem Gain(Loss)	<input type="text" value="0.0"/> dB
Rx Post Gain(Loss)	<input type="text" value="+10.0"/> dB

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### Rx Subsystem Gain (Loss):

This field previously appeared under *Configuration – Antenna Isolation* in earlier firmware versions.

The combined value of the receive antenna coaxial cable feeder insertion loss, TTA or Receiver Multicoupler gain (or loss) and an separate preselector or post-filter.

The value of the nett gain (or loss) of the Receiver subsystem should be entered here. This value represents the sum of the insertion losses of the various elements of the receiver subsystem and the gain of its amplifier elements (if any).

Examples of this may be;

Receiver Feeder loss	-3.0 dB
Receiver Preselector loss	-1.0 dB
Receiver Multicoupler gain	+7.0 dB
<hr/>	
Rx Subsystem Nett Gain	+3.0 dB

or;

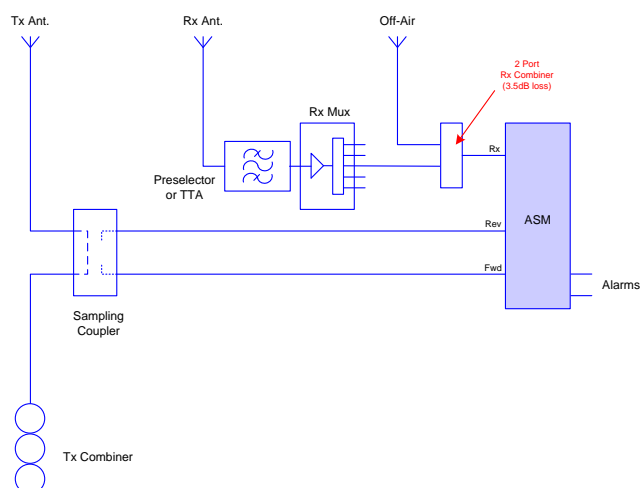
TTA Preselector loss	-1.0 dB
TTA Amplifier gain	+20.0 dB
Receiver Feeder loss	-3.0 dB
Receiver Multicoupler Divider loss	-10.0 dB
<hr/>	
Rx Subsystem Nett Gain	+6.0 dB

The Rx Subsystem loss considers all of the Rx subsystem components that determine the Rx signal level as seen by the base station receivers on the site.

## Rx Post Gain (Loss):

The value of any splitter/coupler loss that may be added into the system when multiple receiver paths are being combined for monitoring by an APM.

Example: a two port receiver combiner may add 3.5dB of additional loss into the APM receiver monitoring configuration (shown above as "-3.5").



**Example Installation – Rx Post Gain (Loss) shown**

The Rx Post Gain(Loss) value considers the additional loss/gain in the Rx subsystem that is seen by the APM – compared to that seen by the base station receivers on the site.

## Defaults:

Clicking this button enters the factory default values for the Rx Port page, which are:

Rx System Gain(Loss)	0dB
Rx Post Gain (Loss)	0dB

## Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed.

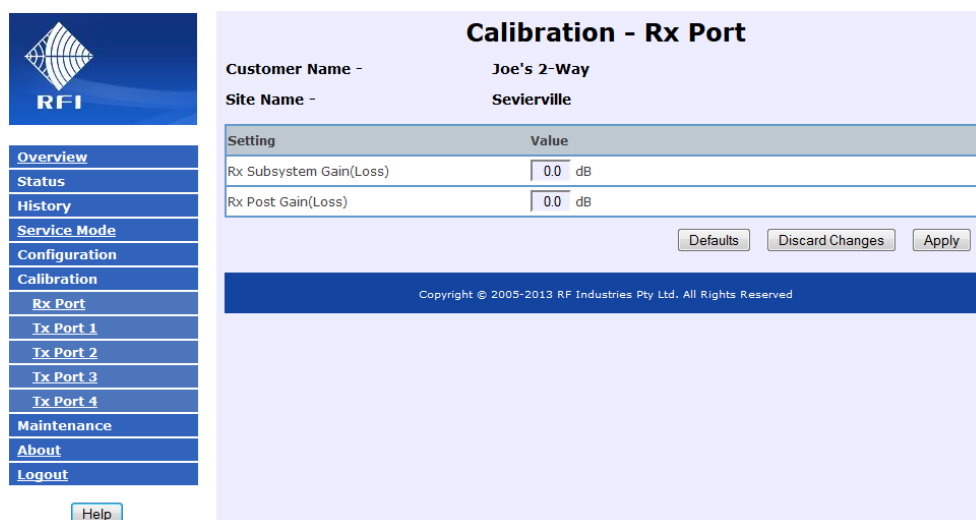
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current repeater configuration. In this case, just select the Configure/Rx Port menu item again to re-display the current configuration.

## Apply:

This will attempt to apply the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

## RX PORT CALIBRATION

The following will calibrate the APM Rx levels read from an output port of the receive multicoupler.



**RFI**

**Calibration - Rx Port**

Customer Name - Joe's 2-Way  
Site Name - Sevierville

Setting	Value
Rx Subsystem Gain(Loss)	0.0 dB
Rx Post Gain(Loss)	0.0 dB

Defaults Discard Changes Apply

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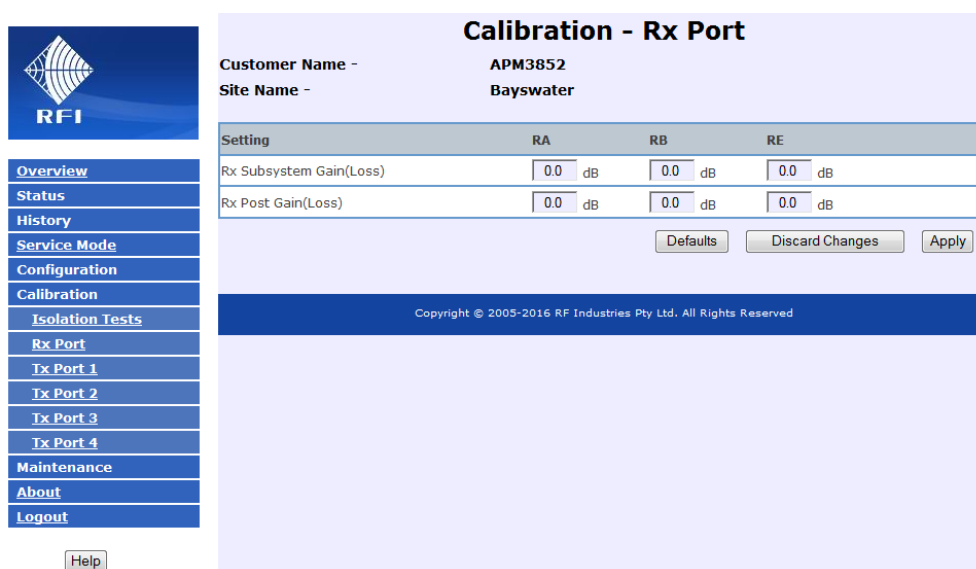
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For TTA / RX multicoupler systems, enter the system Reserve Gain in the “RX Subsystem Gain (Loss)” field. For non-TTA systems, enter the net of the RX feedline loss and any multicoupler gain. Gain is entered as a positive number, loss as a negative number.

The “RX Post Gain (Loss)” field is for any gain or loss in line with the APM RX input which is not present in the path to the base receiver(s). Click on the “Help” button shown for further explanations. The objective here is to ensure that the APM is displaying the receive level present at the input of any site receivers.

When a Receive Systems Module (RSM) is fitted to the APM, the three receive signal paths (RxA, RxB and RxE) are configurable in the *Calibration – Rx Port* page.



**RFI**

**Calibration - Rx Port**

Customer Name - APM3852  
Site Name - Bayswater

Setting	RA	RB	RE
Rx Subsystem Gain(Loss)	0.0 dB	0.0 dB	0.0 dB
Rx Post Gain(Loss)	0.0 dB	0.0 dB	0.0 dB


Defaults Discard Changes Apply

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## 10.47 Calibration – Tx Port 1



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### Calibration - Tx Port 1

Customer Name - Demo  
 Site Name - Chase Tower  
 Tx Antenna Reference - LTR-TRBO TX1

Tx Port 1 Losses	
Forward Coupling	<input type="text" value="41.5"/> dB
Reverse Coupling	<input type="text" value="41.5"/> dB
Antenna Feeder	<input type="text" value="0.5"/> dB
VSWR Calibration	<input checked="" type="checkbox"/> Enabled <input type="button" value="Calibrate..."/>

Chan No.	Channel ID	Frequency	Reported Pwr		BTx Pwr	Capture BTx Pwr
			Fwd	Rev		
Tx1-1	NXDN 18	462.15000 MHz	<- 8 dBm	<- 8 dBm	<input type="text" value="+50.0"/> dBm	<input type="button" value="Capture"/>
Tx1-2	LTR 7	454.11250 MHz	+46.5 dBm	+20.9 dBm	<input type="text" value="+49.5"/> dBm	<input type="button" value="Capture"/>
Tx1-3	TRBO 3	454.31250 MHz	<- 8 dBm	<- 8 dBm	<input type="text" value="+44.5"/> dBm	<input type="button" value="Capture"/>
Tx1-4	LTR 10	454.62500 MHz	<- 8 dBm	<- 8 dBm	<input type="text" value="+44.7"/> dBm	<input type="button" value="Capture"/>
Tx1-5	NXDN 20	463.22500 MHz	+47.5 dBm	+25.0 dBm	<input type="text" value="+49.5"/> dBm	<input type="button" value="Capture"/>

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This page is used for calibrating the Coupler coupling loss settings and the Channel BTx Power levels.

**Note:** Only channels that have a frequency programmed, and which have been enabled will be displayed.

### Tx Port Losses:

#### Forward Coupling:

The combined value of the Coupler forward coupling loss and the connecting cable insertion loss for this Tx Port. This value is used to calculate the reported power level for channels on this Port.

#### Reverse Coupling:

The combined value of the Coupler forward coupling loss and the connecting cable insertion loss for this Tx Port. This value is used to calculate the reflected power level for channels on this port and contributes to the reported VSWR figure.

#### Antenna Feeder:

The loss of the Antenna Feeder cable for this Port. This value is used to compensate the calculated Fwd and Rev Power levels so that the reported VSWR figure represents the VSWR value as seen at the Antenna. The value entered in this field should represent the insertion loss in one direction of the feeder only (i.e. from the Coupler "to" the antenna).

#### Reported Pwr:

The result of the last valid signal power level measurement in dBm. This will only be updated if the Tx power is above the programmed threshold level.

### BTx Pwr:

This is the Base Tx Output Power that will be used to calculate Combiner Insertion Loss. It should indicate the Power Level expected at the input of the Combiner.

You can either manually enter a value (if known) or use the Capture button to copy the current Reported Pwr value to this field.

### Capture BTx Pwr:

Copies the Reported Pwr value to the BTx Pwr field.

### Refresh:

Click this button to update the Reported Pwr status information with the most recent measurements.

### Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed.

Note that if invalid values are being displayed after an Apply attempt, these values may not match the current saved settings. In this case, just click on the relevant "Calibration/Tx Port" menu item to re-display the current settings.

### Apply:

This will attempt save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background. If successfully saved, the Reported Pwr values are adjusted to current values.

**Note:** Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

## RECOMMENDED CALIBRATION PROCEDURE

Calibration of the APM allows system parameters such as coupling values, interconnecting cable losses and system feeder losses to be programmed into the APM for optimum measurement accuracy.

Motorola has approved three methods of APM calibration;

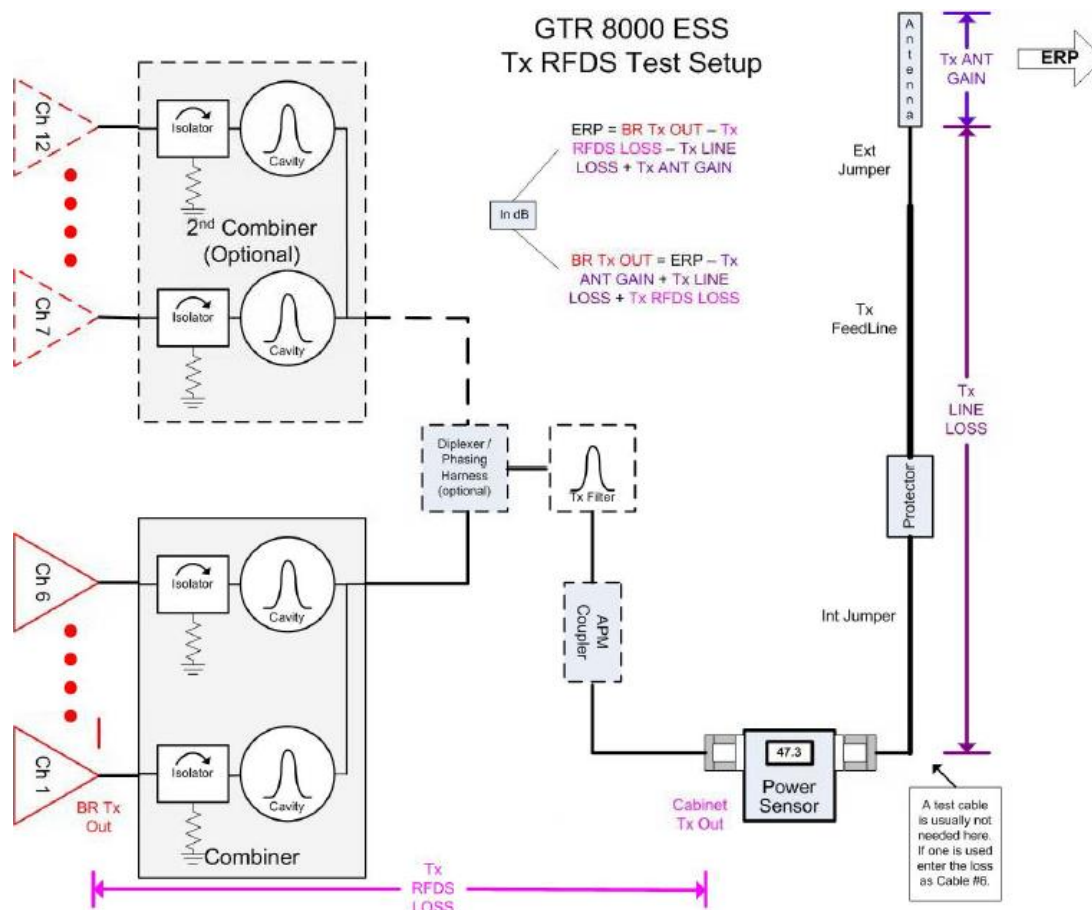
- Option 1 (preferred method) – utilizes high accuracy digital power meter as a reference.
- Option 2 (alternate to Option 1) - also utilizes high accuracy digital power measurement.
- Option 3 – utilizes a Service Monitor for APM calibration.

The first two options require an accurate power measurement device capable of measuring digital signals. The third option requires a Service Monitor capable of generating a 0dBm RF output signal utilizing the modulation scheme of the system being optimized. Test equipment requirements for each option are;

TEST EQUIPMENT REQUIREMENTS			
OPTION	EQUIPMENT TYPE	VENDOR AND MODEL # (or equivalent)	COMMENTS
1, 2	Digital Power Meter	R&S NRT-Z14	
1, 2, 3	50Ω Termination	-	Capable of handling base station TX power
3	Service Monitor	-	Capable of generating system modulation @ 0 dBm
3	RF Cable for Svc Monitor	-	With known insertion loss

For Motorola systems, there are two reference points for power measurement:

1. The TX output port of each repeater: "BR Tx Out", and
2. The TX output of the cabinet / rack: "Cabinet Tx Out"



**NOTE:** With this alignment procedure, the APM GUI's display of "Combiner I.L." actually will reflect the total "Tx RFDS LOSS" shown in the above drawing.



Selecting each indented topic under the “Calibration” screen in the GUI will display that item as a separate page.

The following discusses the calibration of the APM “TX Port 1” and its associated hybrid coupler. The procedure for TX Ports 2, 3 and 4 is identical.

**Calibration - Tx Port 1**

Customer Name - Joe's 2-Way  
Site Name - Sevierville  
Tx Antenna Reference - Combiner 1

Refresh Discard Changes Apply

---

**Tx Port 1 Losses**

Forward Coupling	0.0 dB
Reverse Coupling	0.0 dB
Antenna Feeder	0.0 dB
VSWR Calibration	<input type="checkbox"/> Enabled <span>Calibrate...</span>

---

Chan No.	Channel ID	Frequency	Reported Pwr		BTx Pwr	Capture BTx Pwr
			Fwd	Rev		
Tx1-1	Chan 1	851.01250 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>
Tx1-2	Chan 2	852.01250 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>
Tx1-3	Chan 3	853.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>
Tx1-4	Chan 4	854.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>
Tx1-5	Chan 5	855.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>
Tx1-6	Chan 6	856.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<span>Capture</span>


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The above screen shot contains all the necessary fields for the calibration process.

## CALIBRATION PROCEDURES

The only difference between Options 1 and 2 are the way in which the BTx power levels are entered into the APM. These steps will be performed first and then the remainder of the calibration procedure will apply to both options. Option 3 will be listed following the Option 1 / 2 procedure.

### BTx POWER LEVEL SETTING:

#### OPTION 1 (Preferred)

1. Measure the output power, in dBm, of each repeater at the repeater TX connector using the Rohde & Schwarz (or equivalent) power sensor. The output of the sensor should connect to the cable which connects the repeater under test to the combiner input.
2. On the APM GUI, enter the measured power into the “BTx Pwr” field and then click the “Apply” button at the top right section of the screen.
3. Repeat Step 2 for each repeater associated with the APM TX Port being calibrated.

**OPTION 2 (Assumes all repeaters are set at the same power level. If not, use Option 1 procedure)**

1. Measure the output power, in dBm, of a repeater in the middle of the frequency range used by the system. Make the measurement at the repeater TX connector using the Rohde & Schwarz (or equivalent) power sensor. The output of the sensor should connect to the cable which connects the repeater under test to the combiner input.
2. On the APM GUI, enter this measured power into the "BTx Pwr" field for each of the repeater channels in the system associated with the TX Port being calibrated.
3. Click on the "Apply" button at the top right section of the screen.

**The following procedures apply to both Option 1 and Option 2:**

**FORWARD COUPLING:**

1. Preset the "Forward Coupling" and "Reverse Coupling" values on the screen to "40.0" dB.
2. Preset the "Antenna Feeder" to "0.0" dB
3. Connect the Rohde & Schwarz (or equivalent) power meter to the "Cabinet TX Out" port (see drawing on Page 2) and terminate the output of the sensor into the site antenna network. Key a repeater, near the center of the frequency range of the system, and note the forward power (in dBm).
4. Adjust the "Forward Coupling" value as needed until the "Reported Pwr – Fwd" matches the power measured in Step 3.  
**NOTE: You must click on "Apply" after each change in the coupling value for the new value to take effect.** Click the "Refresh" button several times to ensure a stable power reading on the APM.
5. Set the "Reverse Coupling" value to the same as the "Forward Coupling" value and click "Apply"

**COUPLER TYPES (LEGACY or CURRENT)**

Confirm that the coupler, for UHF and 700/800 MHz, is the latest model. The latest models will have the "FWD" and "REV" Type N connectors at either end of the coupler, next to the DIN connectors. For reference, here are photos of both types of couplers:



**"Legacy" Bi-Directional Coupler (VHF shown, legacy UHF/700/800/900 MHz models are similar in appearance but shorter)**



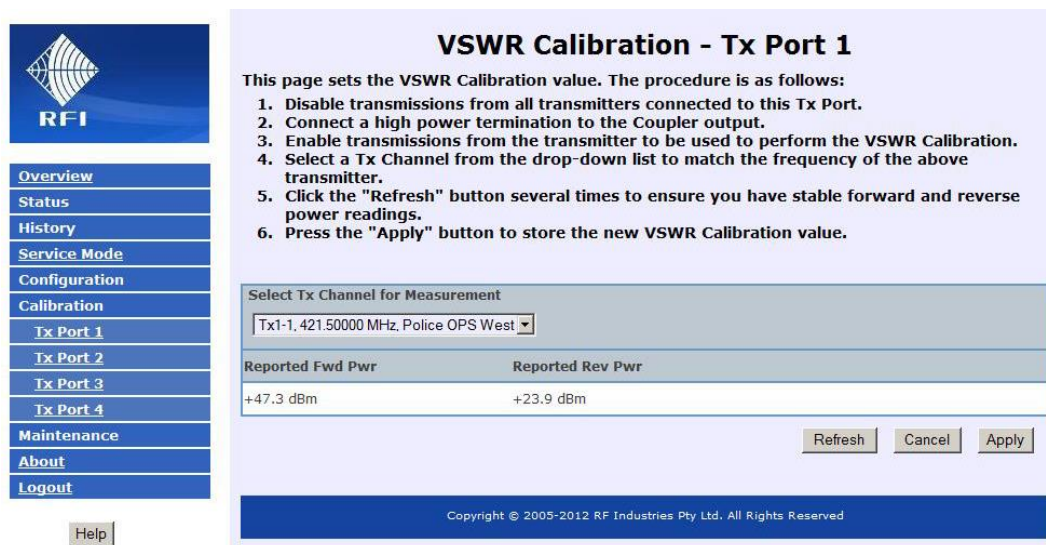
**"Current" Dual-Directional Coupler (used for UHF, 700/800/900 MHz only)**

**Note:** If your couplers are VHF, legacy UHF or legacy 700/800 MHz, perform the *VSWR Calibration* described on the following pages, otherwise proceed to the Calibration Confirmation section

## VSWR CALIBRATION:

1. On the Calibration Screen, check the "Enabled" box next to "VSWR Calibration"
2. Click "Apply"
3. Click on the "Calibrate" button

The following screen will appear:



**VSWR Calibration - Tx Port 1**

This page sets the VSWR Calibration value. The procedure is as follows:

1. Disable transmissions from all transmitters connected to this Tx Port.
2. Connect a high power termination to the Coupler output.
3. Enable transmissions from the transmitter to be used to perform the VSWR Calibration.
4. Select a Tx Channel from the drop-down list to match the frequency of the above transmitter.
5. Click the "Refresh" button several times to ensure you have stable forward and reverse power readings.
6. Press the "Apply" button to store the new VSWR Calibration value.

Select Tx Channel for Measurement  
Tx1-1, 421.50000 MHz, Police OPS West

Reported Fwd Pwr	Reported Rev Pwr
+47.3 dBm	+23.9 dBm

Refresh Cancel Apply

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Follow the calibration steps listed on the screen.

**Note:** You can connect the termination to the "Cabinet TX Out" port rather than directly to the APM coupler as mentioned in Step 2 as described on the screen.

## REVERSE COUPLING: *(Perform these steps regardless of coupler type)*

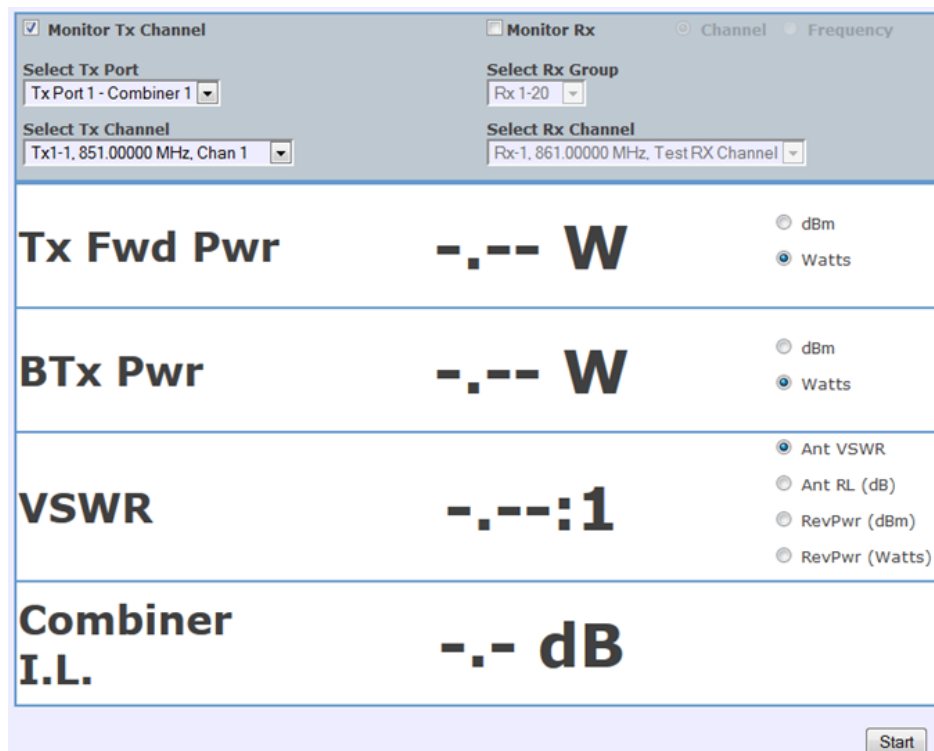
1. Connect the antenna system to the output of the Rohde & Schwarz sensor (the input of the sensor should still be connected to the "Cabinet TX Out" connector. The objective here is to measure some reflected power rather than using the 50Ω termination which would provide minimal reflected power.
2. Key a repeater near the center frequency of the system frequencies and measure the value of the reflected power, in dBm.
3. Adjust the Reverse Coupling value until the APM "Reported Pwr – Rev" matches that read on the R&S meter.

**Note:** You *must* click on "Apply" after each change in the coupling value for the new value to take effect. Click the "Refresh" button several times to ensure a stable power reading on the APM.

## CALIBRATION CONFIRMATION

1. With the antenna system connected, and the R&S sensor still in-line, select "Service Mode" on the APM GUI menu (screen shot on the next page).
2. At the top left of the GUI screen, select the appropriate TX Port and Channel from the drop down menus.
3. At the lower portion of the screen, click on "Start". This will "lock" the APM onto the selected channel and begin sampling the forward and reflected power levels.
4. Key the repeater and compare the forward and reflected power readings with those measured by the R&S meter. The readings should correlate closely. If so, the calibration has been confirmed.
5. De-key the station and click "Stop" at the bottom of the APM screen.
6. From the GUI menu, click on "Calibration" and select the appropriate TX Port.
7. Enter the antenna feeder loss in the upper portion of the screen, below the coupler loss values and then click "Apply".
8. The APM will now display SWR at the antenna rather than at the "Cabinet Tx Out" port.

**Note:** In the future, if the SWR at the "Cabinet Tx Out" port needs to be measured, simply change the feedline loss to 0.0 dB, click "Apply" and then make the measurement. Before leaving the site, return the feedline loss to the previous value and click "Apply" again.



The screenshot displays the APM GUI interface. At the top, there are two main sections: "Monitor Tx Channel" (checked) and "Monitor Rx" (unchecked). Under "Monitor Tx Channel", there are dropdown menus for "Select Tx Port" (Tx Port 1 - Combiner 1) and "Select Tx Channel" (Tx1-1, 851.00000 MHz, Chan 1). Under "Monitor Rx", there are dropdown menus for "Select Rx Group" (Rx 1-20) and "Select Rx Channel" (Rx-1, 851.00000 MHz, Test RX Channel). Below these are four large display areas for measurements: "Tx Fwd Pwr" (displaying -.-- W), "BTx Pwr" (displaying -.-- W), "VSWR" (displaying -.--:1), and "Combiner I.L." (displaying .- dB). Each measurement area has radio buttons for units: dBm and Watts for power, and Ant VSWR, Ant RL (dB), RevPwr (dBm), and RevPwr (Watts) for VSWR. A "Start" button is located at the bottom right of the screen.

### OPTION 3 (if Option1 or 2 is not available)

1. Connect the service monitor to the "Combiner" port of the APM hybrid coupler and the 50Ω termination to the "Antenna" port of the coupler.
2. Set the generator to the correct modulation type for the channel being measured and adjust its output level for 0 dBm.
3. Enter 40.0 dB into both the Forward Coupling and Reverse Coupling fields on the GUI.
4. Enter 0 dB into the Antenna Feeder field.
5. Enter the signal level (generator setting minus cable loss) into the BTx Power field. For this example, that is 0dBm – 0.6 dB = -0.6 dBm. This is the level present at the "Combiner" port of the hybrid coupler.

**Note:** Do not press the "CAPTURE" button to the right of the BTx Power level field.

6. The GUI should appear as follows:

**Calibration - Tx Port 1**

**Customer Name -** Joe's 2-Way  
**Site Name -** Sevierville  
**Tx Antenna Reference -** Combiner 1

Tx Port 1 Losses	
Forward Coupling	40.0 dB
Reverse Coupling	40.0 dB
Antenna Feeder	0.0 dB
VSWR Calibration	<input type="checkbox"/> Enabled <input type="button" value="Calibrate..."/>

Chan No.	Channel ID	Frequency	Reported Pwr		BTx Pwr	Capture BTx Pwr
			Fwd	Rev		
Tx1-1	Chan 1	851.01250 MHz	<- 50 dBm	<- 50 dBm	-0.6 dBm	<input type="button" value="Capture"/>
Tx1-2	Chan 2	852.01250 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<input type="button" value="Capture"/>
Tx1-3	Chan 3	853.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<input type="button" value="Capture"/>
Tx1-4	Chan 4	854.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<input type="button" value="Capture"/>
Tx1-5	Chan 5	855.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<input type="button" value="Capture"/>
Tx1-6	Chan 6	856.02500 MHz	<- 50 dBm	<- 50 dBm	0.0 dBm	<input type="button" value="Capture"/>

7. Click the "Apply" button toward the upper right of the screen.
8. Look at the "Reported Pwr - Fwd" field for the channel being used for calibration.
9. "BTx Pwr" field. Click the "Apply" button each time a change is made to "Forward Coupling" value.
10. At this point, disregard the reading in the "Reported Pwr - Rev" field.
11. Once the "Reported Pwr - Fwd" and "BTx Power" fields match, click the "Refresh" button a few times to confirm a stable reading and then click the "Apply" button and make no further changes to the "Forward Coupling" value.

## REVERSE COUPLING

1. Keep the generator settings and test cable the same.
2. Move the generator cable to the "Antenna" port of the hybrid coupler and the 50 $\Omega$  termination to the "Combiner" port of the coupler.
3. Click the "Refresh" button and note the power level shown in the "Reported Pwr - Rev" field.
4. Adjust the "Reverse Coupling" value up or down until the displayed "Rev" power reading matches that in the "BTx Pwr" field. Click the "Apply" button each time a change is made to the "Reverse Coupling" value.
5. At this point, disregard the reading in the "Reported Pwr - Fwd" field.
6. Once the "Reported Pwr - Rev" and "BTx Pwr" fields match, click the "Refresh" button a few times to confirm a stable reading and then click the "Apply" button and make no further changes to the "Reverse Coupling" field.

## BTx POWER SETTING

In order to allow an accurate calculation of Combiner Insertion Loss, the value of transmit power applied to the combiner input from each transmitter (in dBm) needs to be entered into the "BTx Power" field. There are two procedures which can be used:

- Motorola Preferred
- Optional

With the "Preferred" procedure, the actual base station input power to the combiner is measured and stored within the APM for each station. With the "Optional" procedure, one station's input power to the combiner is measured and stored. The remaining stations power levels are then simply entered into the APM GUI and saved. In either case, a final check is to verify the combiner insertion loss for each channel. If the optional procedure has been used, any channel exhibiting incorrect combiner loss (factory spec  $\pm 1$  dB), the TX power into that channel must be measured and saved into the APM using the preferred procedure before beginning any combiner troubleshooting or retuning.

### PREFERRED METHOD:

The APM may be used to measure and store the power for each channel. This is achieved by performing the following procedure:

1. Connect a known good 50 $\Omega$  load to the "Antenna" port of the APM hybrid coupler.
2. Connect the cable from each station, one at a time, to the "Combiner" port of the APM coupler.
3. Key the base station.
4. Click on the "Refresh" button at the top of the Calibration screen until a stable value is shown in the "BTx Pwr" field of the associated channel.
5. Click the "Capture BTx Pwr" button associated with the channel being measured.
6. Click the "Apply" button after each capture.
7. Repeat for each base station.

The APM will retain the measured power level until such time as it is changed either manually or by a repeating of the above procedure at a later date.

## OPTIONAL METHOD:

If the BTx power level is accurately known, simply enter it for each channel and then click the “Apply” button to save all values. The combiner insertion loss is calculated by subtracting the measured forward power at the APM coupler from the value assigned in the “BTx Pwr” field. A table of watts vs dBm is shown below for reference:

TX POWER (WATTS)	TX POWER (dBm)	TX POWER (WATTS)	TX POWER (dBm)	TX POWER (WATTS)	TX POWER (dBm)
10	40.0	40	46.0	70	48.5
15	41.8	45	46.5	75	48.8
20	43.0	50	47.0	80	49.0
25	44.0	55	47.4	85	49.3
30	44.8	60	47.8	90	49.5
35	45.4	65	48.1	95	49.8
				100	50.0

## VSWR CALIBRATION:

Confirm that the coupler, for UHF and 700/800 MHz, is the latest model. The latest models will have the “FWD” and “REV” Type N connectors at either end of the coupler, next to the DIN connectors. For reference, here are photos of both types of couplers:

For reference, the following photos show the physical difference between the two types of couplers:



“Legacy” Bi-Directional Coupler (VHF shown, legacy UHF/700/800/900 MHz models are similar in appearance but shorter)



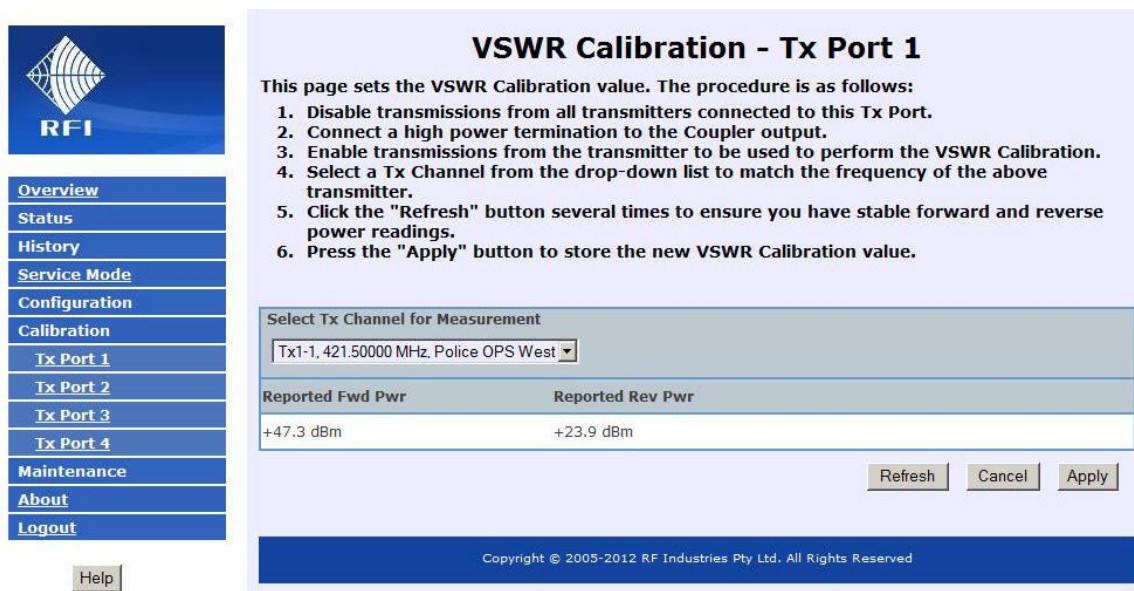
Current Dual-Directional Coupler (UHF, 700/800/900 MHz only)

The legacy couplers are readily identifiable as they have the “FWD” and “REV” ports (Type N connectors) along the bottom edge. The bi-directional couplers have those ports on the ends of the coupler along with the 7/16 DIN connectors.

**Note:** If your couplers are VHF, legacy UHF or legacy 700/800 MHz, perform the *VSWR Calibration* described on the following pages, otherwise proceed to the Calibration Confirmation section



To perform the VSWR Calibration, select a channel in the middle of the frequency range and then check the “Enabled” box on the Calibration screen. Click the “Calibrate” button to the right of the box and the following screen will be displayed:



**VSWR Calibration - Tx Port 1**

This page sets the VSWR Calibration value. The procedure is as follows:

1. Disable transmissions from all transmitters connected to this Tx Port.
2. Connect a high power termination to the Coupler output.
3. Enable transmissions from the transmitter to be used to perform the VSWR Calibration.
4. Select a Tx Channel from the drop-down list to match the frequency of the above transmitter.
5. Click the "Refresh" button several times to ensure you have stable forward and reverse power readings.
6. Press the "Apply" button to store the new VSWR Calibration value.

Select Tx Channel for Measurement  
Tx1-1, 421.50000 MHz, Police OPS West

Reported Fwd Pwr	Reported Rev Pwr
+47.3 dBm	+23.9 dBm

Refresh Cancel Apply

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Follow the procedure shown on this screen to complete the VSWR Calibration.

## VERIFICATION

Now that the calibration has been completed, a quick check will verify performance.

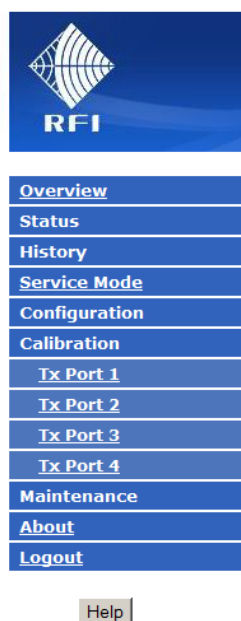
1. Connect the 50Ω termination to the “Antenna” port on the APM coupler
2. Connect the combiner output to the “Combiner” port on the APM coupler
3. In the GUI menu, select “Service Mode” (screen shot below)
4. In the “Service Mode”, select the TX Port and Channel to be tested.



<input checked="" type="checkbox"/> <b>Monitor Tx Channel</b>		<input type="checkbox"/> <b>Monitor Rx</b>		<input checked="" type="radio"/> Channel	<input type="radio"/> Frequency
Select Tx Port Tx Port 1 - Combiner 1		Select Rx Group Rx 1-20			
Select Tx Channel Tx1-1, 851.00000 MHz, Chan 1		Select Rx Channel Rx-1, 861.00000 MHz, Test RX Channel			
<b>Tx Fwd Pwr</b>	<b>-.-- W</b>	<input type="radio"/> dBm <input checked="" type="radio"/> Watts			
<b>BTx Pwr</b>	<b>-.-- W</b>	<input type="radio"/> dBm <input checked="" type="radio"/> Watts			
<b>VSWR</b>	<b>-.--:1</b>	<input checked="" type="radio"/> Ant VSWR <input type="radio"/> Ant RL (dB) <input type="radio"/> RevPwr (dBm) <input type="radio"/> RevPwr (Watts)			
<b>Combiner I.L.</b>	<b>-. dB</b>				
<input type="button" value="Start"/>					

5. Key the base station and note the Forward power and VSWR. The VSWR should be low with the load attached.
6. De-Key the station and connect the antenna system.
7. Repeat Step 5 noting that the VSWR may be a bit higher with the antenna attached.
8. Return to the "Calibration" menu, enter the Feed Line loss into the "Antenna Feeder" field and then click "Apply". The APM will now display the VSWR calculated at the antenna rather than the base of the feedline. If you prefer the APM to measure the VSWR at the bottom of the feed line (output port of the coupler), leave the feed line loss at 0 dB.
9. Repeat the above verification for a channel within each of the active "TX Ports"

## 10.48 VSWR Calibration



### VSWR Calibration - Tx Port 1

This page sets the VSWR Calibration value. The procedure is as follows:

1. Disable transmissions from all transmitters connected to this Tx Port.
2. Connect a high power termination to the Coupler output.
3. Enable transmissions from the transmitter to be used to perform the VSWR Calibration.
4. Select a Tx Channel from the drop-down list to match the frequency of the above transmitter.
5. Click the "Refresh" button several times to ensure you have stable forward and reverse power readings.
6. Press the "Apply" button to store the new VSWR Calibration value.

Select Tx Channel for Measurement	
Tx1-1, 421.50000 MHz, Police OPS West	

Reported Fwd Pwr	Reported Rev Pwr
+47.3 dBm	+23.9 dBm

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This page is used to set up the VSWR Calibration algorithm for VHF, UHF and 700/800/900MHz systems utilising "legacy" model bi-directional couplers.

The APM is equipped with an algorithm to improve the "at the antenna" VSWR measurement for installations utilising these "legacy" model couplers. This algorithm compensates for some of the feeder system frequency and phase variables present during VSWR measurement and is not required, and should not be used, for site installations using "current" model dual-directional couplers. For site installations using "current" model couplers, the VSWR Calibration *Enabled* box should remain unchecked, and the *Tx Port VSWR Calibration* process need not be performed.

### Reported Fwd Pwr & Reported Rev Pwr:

The result of the last signal power level measurements in dBm.

To update to the latest measurements, click the Refresh button.

### Cancel:

Exits the VSWR Calibration page without saving any changes and returns to the Tx Port Calibration page.

### Apply:

This applies the VSWR Calibration algorithm. Use the Enable setting on the Tx Port Calibration page to control usage of the algorithm in VSWR calculations.

### TX PORT VSWR CALIBRATION:

To perform the VSWR Calibration, complete the *RECOMMENDED CALIBRATION PROCEDURE* in the previous section of this manual.


### **10.49 Maintenance Menu**

The “Maintenance” menu allows all of the APMs interface and system-wide formatting parameters to be viewed.

Selecting each indented topic under “Maintenance” will display that item as a separate display page.



## 10.50 Maintenance – Access Management



- Overview
- Status
- History
- Service Mode
- Configuration
- Calibration
- Maintenance
- Access Management**
- Date & Time
- Manager Interface
- Configuration Files
- Test Alarms
- Firmware Update
- Restart
- About
- Logout

### Maintenance - Access Management

Customer Name - Demo  
Site Name - Chase Tower

Access level	UserName	Password	Confirm Password	Password Strength
View Status only	user	....	....	
View Status and Modify Settings	admin	.....	.....	
View Status and Modify all Settings	master	.....	.....	

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This page is used for managing access to the APM. There are two levels of access available to users of the system:

### View Status only:

These are the User Name and Password to be used by users that may only view Status pages. Users logged in with these credentials will not be able to view or change any Configuration settings.

### View Status and Modify Settings:

The User Name and Password to be used by users that are to have access to the Configuration, Calibration and Maintenance settings as well as the Status pages. The modification of some fields have been restricted under this access level to prevent inadvertent changing of critical values that can render the APM inaccessible, and the prevent exposure of sensitive Communications passwords, etc.

Configuration screens not accessible under this access level include;

- Communications Configuration
- Manager Interface Maintenance
- Configuration Files Maintenance – View and Download options

### View Status and all Modify Settings:

The User Name and Password to be used by users that are to have access to the Configuration, Calibration and Maintenance settings as well as the Status pages.

**Note:** User Names and Passwords may contain up to 16 characters each. Passwords are case sensitive, but User Names are not. Passwords are strength tested, as they are entered, to assist appropriate security integrity is maintained. Passwords should meet a Password Strength value of at least 50 to be acceptable.

Access level	UserName	Password	Confirm Password	Password Strength
View Status only	user	••••	••••	
View Status and Modify Settings	admin	•••••	•••••	
View Status and Modify <b>all</b> Settings	master	••••••	••••••	(14) very weak

### Tips for strong passwords:

Make your password 8 characters or more in length.  
 Use mixed case letters (upper and lower case).  
 Make more than one digit a number.  
 Use special characters (!, @, #, \$, %, ^, &, \*, ?, \_ , ~).

### Discard Changes:


Click this button to restore the values to those present when the page was last redisplayed.

Note that if invalid values are being displayed after an Apply attempt, these values may not match the current unit configuration. In this case, just click on the Maintenance/User Management menu item to re-display the current configuration.

### Apply:

This will save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

## 10.51 Maintenance – Date & Time



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### Maintenance - Date & Time

Customer Name - Demo  
Site Name - Chase Tower

Setting	Value
Date Format	<input checked="" type="radio"/> mm/dd/yy <input type="radio"/> dd/mm/yy
Date (mm/dd/yy)	7 / 24 / 15
Time (hh:mm:ss)	1 : 02 : 52
Use an Internet Time Server (NTP)	<input checked="" type="checkbox"/> <span style="float: right;">Test</span>
NTP Servers	129.6.15.28 0.0.0.0
STD Local Offset from UTC	-6:00
Adjust for Daylight Saving (DST)	<input checked="" type="checkbox"/>
DST Start Date & Time	3/10/2013 02:00
DST Stop Date & Time	11/3/2013 02:00
DST Offset (minutes)	60

Discard Changes
Apply

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The internally maintained real time clock Date and Time values may be adjusted using these fields.

### Date Format:

Two styles of date format can be selected to cater for international format preferences.

### Date:

Enter the current date in the displayed mm/dd/yy or dd/mm/yy format.

### Time:

Enter the current time in the displayed hh:mm:ss format.

### Use an Internet Time Server (NTP)

If selected this feature allows a primary and secondary NTP server address to be nominated for automatic updating of the APM date and time. NTP time is displayed as UTC time.

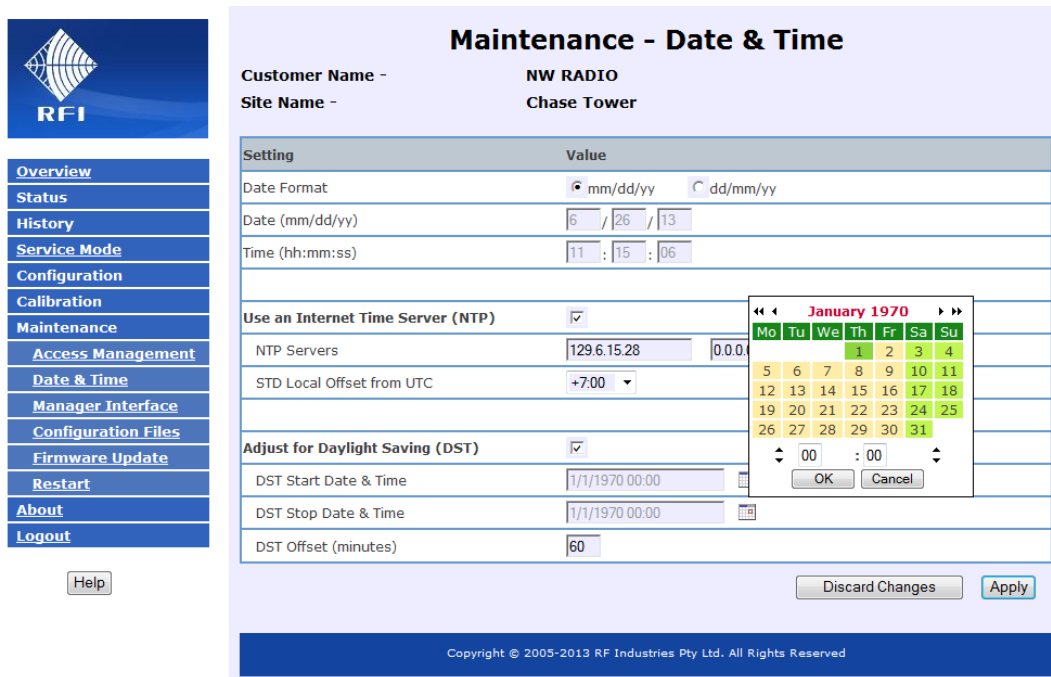
Pressing the Test button confirms connectivity to the nominated primary server. To confirm connectivity to the secondary server, place its address in the primary address field.

A STD Local Offset should be selected to offset local time from the UTC time obtained from the nominated NTP server(s).

## Adjust for Daylight Saving (DST)

If selected this feature allows a nominated Daylight Saving Time correction to be applied to the NTP server(s) time.

Select the relevant date and times for the start and finish of daylight saving time at the APM location, and the associated DST offset (in minutes) to be applied during the nominated DST period.



**Maintenance - Date & Time**

Customer Name - NW RADIO  
Site Name - Chase Tower

Setting	Value
Date Format	<input checked="" type="radio"/> mm/dd/yy <input type="radio"/> dd/mm/yy
Date (mm/dd/yy)	6 / 26 / 13
Time (hh:mm:ss)	11 : 15 : 06
Use an Internet Time Server (NTP)	<input checked="" type="checkbox"/>
NTP Servers	129.6.15.28 0.0.0.0
STD Local Offset from UTC	+7:00
Adjust for Daylight Saving (DST)	<input checked="" type="checkbox"/>
DST Start Date & Time	1/1/1970 00:00
DST Stop Date & Time	1/1/1970 00:00
DST Offset (minutes)	60

Calendar pop-up: January 1970. Days of the week: Mo, Tu, We, Th, Fr, Sa, Su. Dates 1 through 31 are shown. Time selection: 00 : 00. Buttons: OK, Cancel.

Buttons: Discard Changes, Apply

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**Note:** A convenient calendar is available next to the DST Start and Stop fields to allow dates to be selected directly.


### Discard Changes:

Click this button to restore the values to those present when the page was last re-displayed.

### Apply:

This will save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

## 10.52 Maintenance – Manager Interface



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### Maintenance - Manager Interface

Customer Name - Demo  
Site Name - Chase Tower

Setting	Value										
Auto Status Packets	<input checked="" type="checkbox"/> Enabled										
Auto Traffic Packets	<input checked="" type="checkbox"/> Enabled										
Max Traffic Period	5										
<b>Manager</b>	<table border="1"> <thead> <tr> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td>Manager Address</td> <td>208.10.92.62</td> </tr> <tr> <td>Manager TCP Port</td> <td>9123</td> </tr> <tr> <td>Manager UDP Port</td> <td>9127</td> </tr> <tr> <td>Manager Use TCP for Status Packets</td> <td><input type="checkbox"/> Enabled</td> </tr> </tbody> </table>	Primary	Secondary	Manager Address	208.10.92.62	Manager TCP Port	9123	Manager UDP Port	9127	Manager Use TCP for Status Packets	<input type="checkbox"/> Enabled
Primary	Secondary										
Manager Address	208.10.92.62										
Manager TCP Port	9123										
Manager UDP Port	9127										
Manager Use TCP for Status Packets	<input type="checkbox"/> Enabled										

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The configuration and status of multiple Advanced Power Monitor units may be remotely managed by a PC based Manager application. Normally the Manager application will control the settings on this page, but, using this page it is possible to manually configure (or override) these settings.

### Auto Status Packets:

This controls the automatic sending of Status Change packets to the Manager application. If enabled, any change in alarm status results in a Status Change packet. This setting will be ignored if the Manager Address is set to "0.0.0.0".

### Auto Traffic Packets:

This controls the automatic sending of Tx Traffic data packets to the Manager application. If enabled, any change in detected Tx carrier presence results in a Traffic packet. In addition, if any Tx carrier remains ON or OFF for "Max Traffic Period" seconds, a STILL-ON or STILL-OFF Traffic packet is sent. This setting will be ignored if the Manager Address is set to "0.0.0.0".

### Max Traffic Period:

This controls the automatic sending of the STILL-ON and STILL-OFF traffic data packets as detailed above.

### Manager Address:

The IP address for the Manager application. If a Manager application is not being used this should be 0.0.0.0.



**Manager TCP Port:**

The port number for TCP communications to the Manager application. Both a primary and a secondary address is provided if Manager Messages are desired to be sent to two applications/destinations.

**Manager UDP Port:**

The port number for UDP communications to the Manager application. Both a primary and a secondary address is provided if Manager Messages are desired to be sent to two applications/destinations.

**Manager Use TCP for Status Packets:**

The default communications protocol for Status change and Traffic data packets is UDP. If TCP is required for Status packets, this setting should be enabled.

**Note:** This option should only be activated if essential for networking reasons. The UDP protocol is strongly preferred, as the protocol and processing overheads are significantly lower and packets can be sent at a higher rate. Note also that Traffic data packets will always use UDP protocol.

**Defaults:**

Clicking this button enters the factory default values for the Communications settings, which are:

Auto Status Packets	Disabled
Auto Traffic Packets	Disabled
Max Traffic Period	60
Manager Address	0.0.0.0
Manager TCP Port	9123
Manager UDP Port	9124
Manager Use TCP for Status Packets	Disabled

**Discard Changes:**


Click this button to restore the values to those present when the page was last re-displayed.

Note that if invalid values are being displayed after a Save attempt, these values may not match the current unit configuration. In this case, just select the Maintenance/Manager Interface menu item again to re-display the current configuration.

**Apply:**

This will save the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

### 10.53 Maintenance – Configuration Files



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## Maintenance - Configuration Files

Customer Name - Demo  
Site Name - Chase Tower

**Upload a new Configuration file**

Note that the filename must have a .CFG extension.

**Manage existing Configuration files**

<div style="background-color: #e0e0ff; padding: 2px;">07021743.CFG</div> <div style="background-color: #e0e0ff; padding: 2px;">4501NEW.CFG</div>	<input type="button" value="View"/> <input type="button" value="Download"/> <input type="button" value="Apply"/> <input type="button" value="Delete"/>
--	---

**Save current Configuration to file**

Enter a name for the new Configuration file, then click **Save**:

Note that the filename will have a .CFG extension.

.CFG

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Configurations for the APM may be stored in a list within the APM and loaded or saved to a nominated computer drive if desired.

**Note:** Due to memory architecture limitations, this feature is not available in “K1” models of the APM, but configuration files can be saved into a “K1” model using the Telnet Command Line Interface (CLI). Refer the end of this section for details.

**Note:** Access to this screen, and the field accessible on it, may vary based on the Login level used for accessing the APM.

## Upload a new Configuration file:

Click "Browse" to locate the desired APM Configuration file from a chosen drive/directory location. Once the desired drive/directory/name has been selected from the popup box, click "Send" to upload the nominated Configuration file to the list of existing Configuration files.

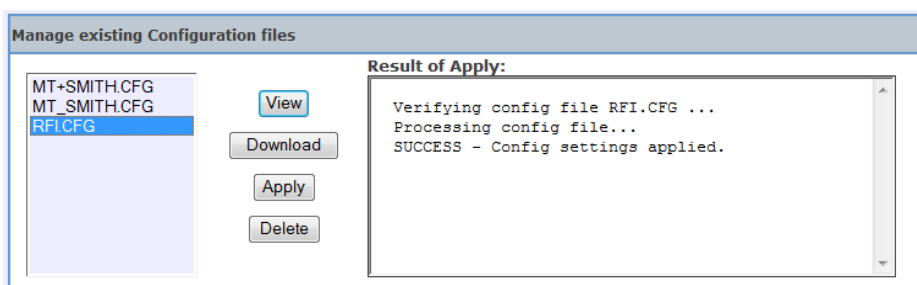
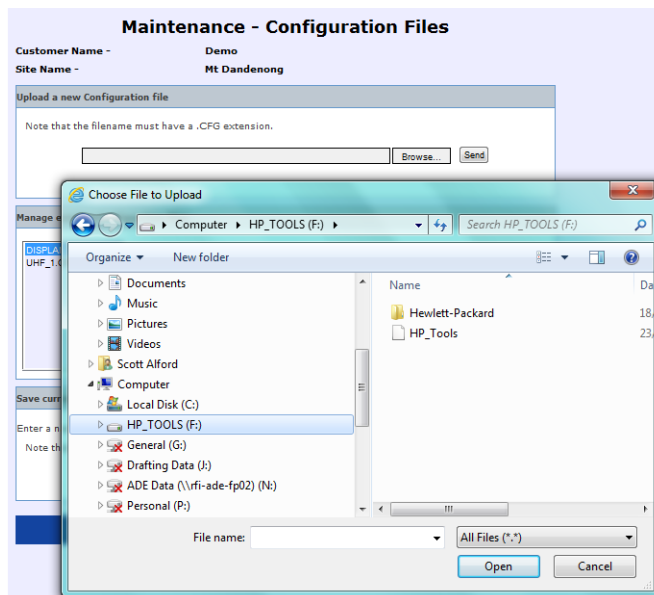
**Note:** This Configuration file must be highlighted in the Configuration list and the "Apply" button clicked to activate this uploaded Configuration in the APM.

## Manage existing Configuration files:

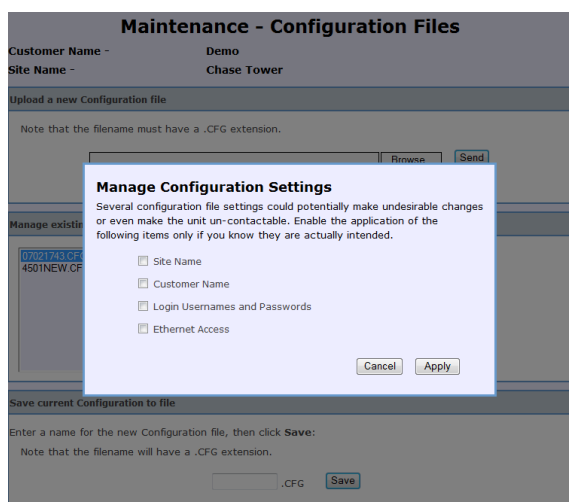
**VIEW:** To view the text contents of highlighted Configuration in the web browser.

**DOWNLOAD:** To save the highlighted Configuration file to a nominated computer drive/directory.

**APPLY:** Activates the highlighted Configuration in the APM.



A progress and completion message will appear in a "Results of Apply" text box (refer above example).



When the *Apply* button is clicked, the screen at left will appear. Select any of the site-specific fields from the configuration of the site that you do want to have applied to the APM, and then click *Apply*.

Follow the prompts and the selected configuration file, with the selected site-specific data fields' contents, will be applied into the APM. In this manner, one common configuration file can be applied to multiple APMs, with the site-specific data fields not used from the configuration file contents, but then edited individually.

This new feature can save significant programming configuration time across an APM fleet.

DELETE: To delete the highlighted Configuration file from the list.

**Save current configuration to file:**

Enter a file name and click “Save” to save the current APM configuration to the list of stored APM configurations.

**Note:** The stored APM configurations list is capable of holding many different Configurations. For practical management, it is recommended to limit the number of Configurations kept in this list to less than 10.

**Configuration files and “K1” hardware variants of the APM:**

Due to memory architecture limitations, this feature is not available in “K1” models of the APM, but configuration files can be saved from a “K1” model using the Telnet Command Line Interface (CLI).

Saving a Configuration File

The process for this is as follows;

Use a terminal emulation program (such as TeraTerm™, etc) that supports Telnet and Xmodem. The APM uses its IP address and the standard Telnet port number of 23 for its CLI.

Connect the Telnet session to the APM unit, activate the terminal emulator's *logging* function, then use the following sequence of commands;


```
LOGIN ADMIN ADMIN <Enter>
CONFIG SAVE TERMINAL <Enter>
```

When the transfer has completed, de-activate the terminal emulator's *logging* function, and edit the captured data file to remove any unwanted lines at the start and end of the file.

**Note:** The commands may be entered in upper or lower case, but the parameter “TERMINAL” in the above listed commands must be in upper case.

The file that has been created should be saved with a “\*.cfg” file extension, and is in the standard APM configuration file format.

## 10.54 Maintenance – Test Alarms



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### Maintenance - Test Alarms

Customer Name -
Demo

Site Name -
Chase Tower

Alarm	Status	
System Alarm Relay 1 (Summary Alarm)	Inactive	<a href="#">Test</a>
System Alarm Relay 2 (Rx Power)	Inactive	<a href="#">Test</a>
System Alarm Relay 3 (Tx Power)	Inactive	<a href="#">Test</a>
System Alarm Relay 4 (Tx VSWR)	Inactive	<a href="#">Test</a>
Email status message	Idle	<a href="#">Test</a>
SNMP status trap	Idle	<a href="#">Test</a>

[Refresh](#)

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The internally generated alarms can be simulated and tested using these fields.

### Alarm:

The available alarms that can be simulated and tested.

### Status:

If there is no alarm state present on an Alarm Relay, then its Status will display 'Inactive', and its background colour will be green. If there is an alarm state present on an Alarm Relay, then its Status will display 'active', and its background colour will be red.

Email and SNMP Alarms will display 'Idle' if no corresponding communications message is in progress and its background colour will be green. If a communications message is in progress, its Status will display 'Sending' and its background colour will be yellow.

### Test:

Clicking the *Test* button forces the corresponding Relay and Alarm LED status to change for a period of several seconds.

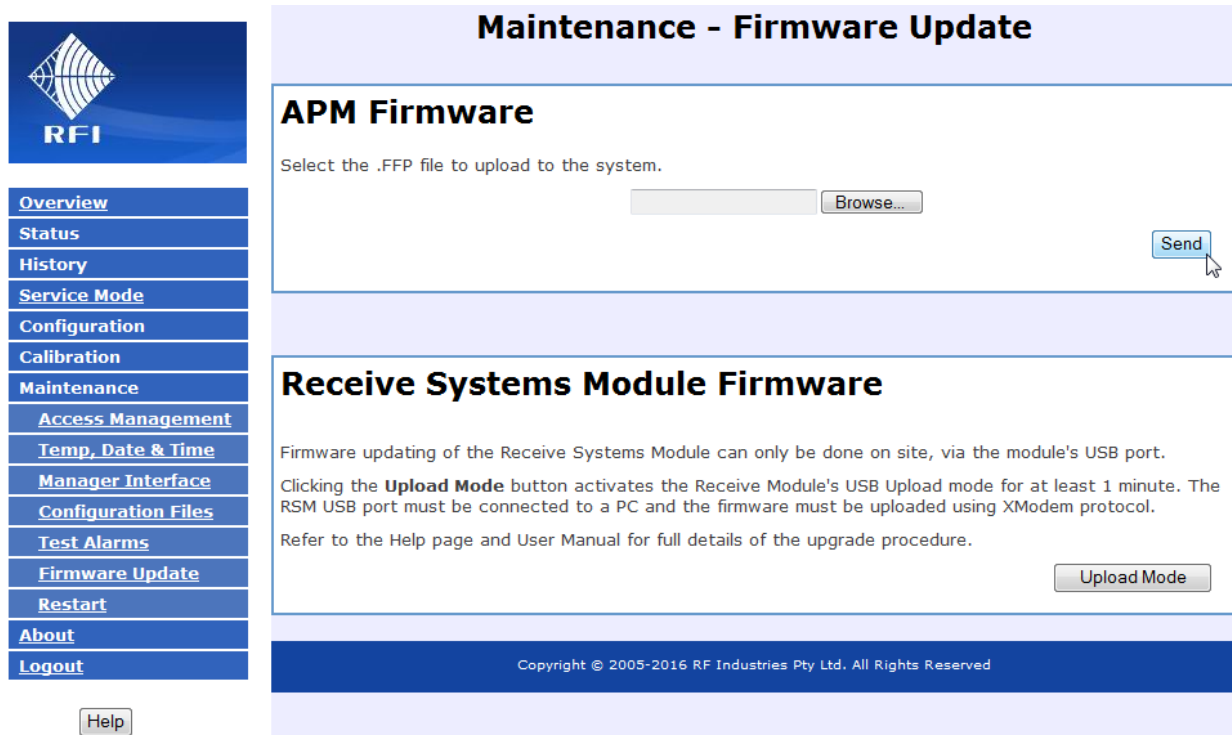
The *Test* will also generate a History Alarm Event Log entry and, if configured and enabled, relevant Email, SNMP and Manager Message Status messages. These will be identified as being *Test* messages. The *Test* message or Log entry will indicate status changes for the default Alarm Relay mapping, regardless of the actual alarm source mapping.

When the Email and SNMP *Test* button is clicked, the APM will attempt to send the relevant Test message. Unlike on the Communications Configuration page, these two tests are not checked to see if the feature is configured and enabled. That is, if the Email and SNMP function has not been configured and enabled on the Communications Configuration page, no *Test* alarm message will be sent, despite what the *Test Status* indicates.

### Refresh:

Reloads the page, updating the status information.

## 10.55 Maintenance – Firmware Update



**Note:** Please read all Service Bulletins published from the release of the firmware currently operating in your APM prior to commencing an upgrade to its firmware. Upgrades may require a transition through an intermediate firmware version on the way to reaching the desired upgrade version - or may have other implications for your APM.

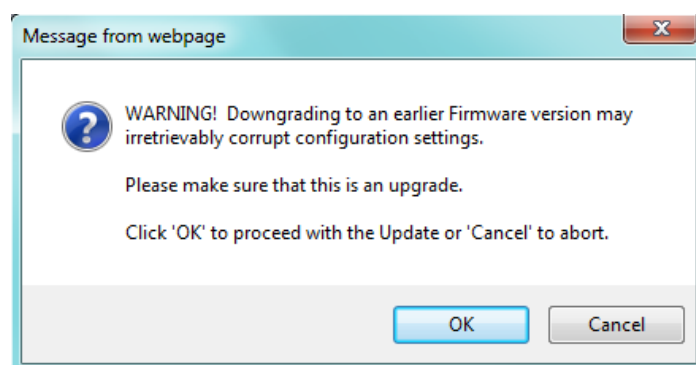
The required intermediate firmware version transitions for the APM are;

- Firmware below version 2.0 must transition through version 2.0 or 2.05 prior to attempting an update to 2.1 or above.
- Firmware below 2.60 must transition through version 2.60 prior to attempting an update to 2.7 or above.

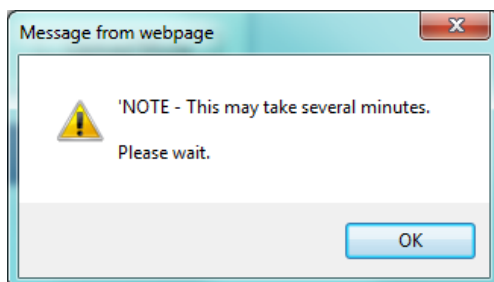
APM firmware upgrades are normally supplied using a “FFP” file extension (Firmware & File system Package).

Enter or Browse the file path of the system firmware update file, then click the *Send* button.

A message box will appear to remind the user to ensure they are uploading a later revision of firmware into the unit.



Click **OK** to proceed.



A message box will appear to remind the user that, depending on the speed of the connection, it can take several minutes for the file upload to complete and be confirmed.

Click **OK** to start the update file download process.

At the completion of a successful file upload the following screen will appear.



After waiting for about a minute, re-display the System Status page to confirm that the update completed successfully. If the update process is interrupted or unsuccessful for any reason, the unit will restart with the previous firmware.

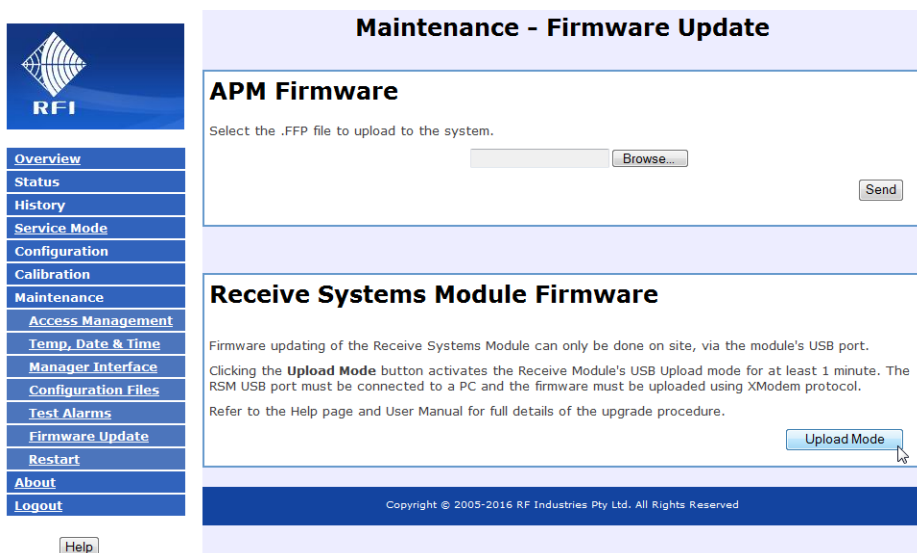
**Note:** You may need to clear your browser's cache to view changed pages. If you happen to get a connection timeout message, do not click the retry button. Instead, wait for a minute or so and then re-display the System Status page to confirm that the update actually completed satisfactorily.

**Note:** Firmware upgrades can impact existing APM configurations. Please read Service Bulletins prior to initiating a firmware upgrade so that impacts are understood prior to any upgrade activity.

**WARNING:** Do not attempt to revert to an older version of firmware as this could corrupt the APM and render it inoperable and the unit's return to the factory may be necessary.

RSM firmware upgrades can only be completed locally via the RSM's micro USB port. The process for upgrading the RSM firmware is as follows;

1. Connect a laptop USB port to the RSM micro USB socket.
2. The laptop must have the CP2104 USB to UART driver installed. The correct Windows driver is included on the RFI provided USB memory stick. Also, Windows 7 or later can automatically install the correct driver from the Internet. The driver software can also be downloaded from the Silicon Labs website - look for the CP210x VCP drivers.
3. Start a Serial communications program and connect it to the virtual COM port installed by the USB driver. Examples of suitable programs that implement the required XModem file transfer protocol are HyperTerminal and ShamCom.
4. Make sure the Communications parameters are set to 115200 baud, 8 data bits, no parity, 1 stop bit and no flow control.
5. Tapping the <Enter> key should result in a "login>" prompt being returned.
6. You are now ready to activate RSM Upload Mode from the APM GUI Firmware Update page.



7. When Upload Mode has been activated, the Terminal will display the uploading instructions. You have around 3 minutes within which to initiate the upload.
8. When the upload completes, the RSM unit will restart and return to the "login>" prompt.
9. Verify that the RSM now has the updated firmware version by displaying the APSM GUI Status page for the Receive Systems Module.



### **10.56 Maintenance - Restart**



Clicking on this selection will initiate an APM system “Restart”.

**Note:** The unit will normally only need to be restarted to activate new Communications settings. If restarted, an APM may take several minutes to reboot and re-initialise itself before it becomes available for a “Log in” and a new session.

## 10.57 About – Advanced Power Monitor



### Overview

### Status

### History

### Service Mode

### Configuration

### Calibration

### Maintenance

### About

### Logout

[Help](#)

## Advanced Power Monitor

The Advanced Power Monitor (APM) monitors channel specific forward and reflected transmitted power for up to 80 Tx channels through four separate transmitter combining systems. Using the high coupling port directivity of an external four port coupler, a wide dynamic range of forward to reflected power (VSWR) can be measured. Up to 80 Rx channels can also be monitored. All frequencies and alarm level thresholds are user definable on a per-channel basis.

Status, History, Service Mode, Configuration, Calibration, Alarms, Communication Setup and Maintenance interfaces are managed via the Web GUI interface which is accessed through one of the Ethernet ports. A command line based interface (CLI) is also available via a TCP/IP Telnet session.

Alarms are communicated using N/O or N/C contact relays interfaced via the DB15 male connector at the rear of the unit, via SMTP (Email), SNMP or Manager Message data packets. LEDs on the front panel of the unit display DC power presence, an aggregated Summary fault, Rx level, Forward Tx power and VSWR threshold failures.

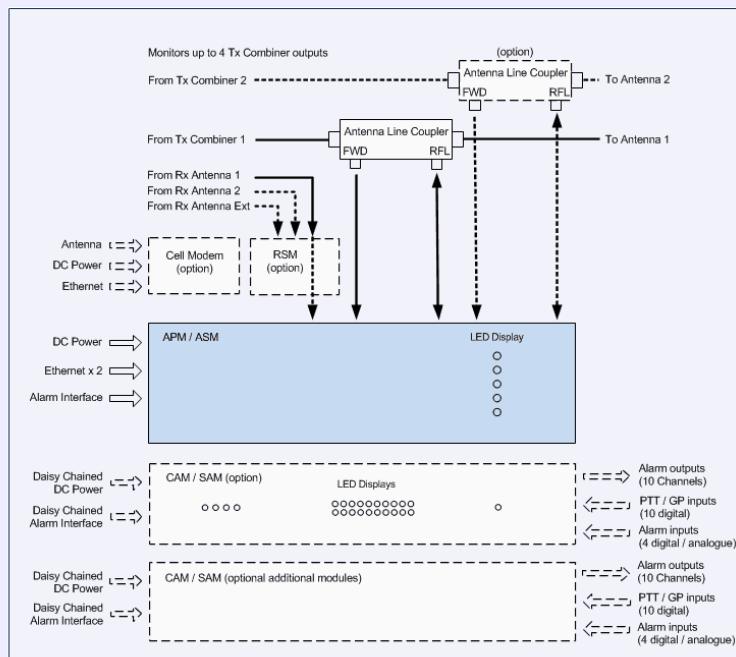
Optional Channel Alarm Module (CAM) and Site Alarm Monitor (SAM) modules are available. These modules provide ten (10) digital logic inputs that can be used to monitor and correlate the base station's current Tx status, or any of these inputs may be configured as general purpose digital alarm inputs for monitoring of other equipment alarms at the site. Four (4) additional digital logic inputs are also provided for use on the CAM, and on the SAM these additional inputs may be configured for a combination of digital input, temperature and analogue voltage level monitoring. Ten (10) dry relay outputs are also provided that may be user-assigned to any of the RF alarms configured in the APM - or any of the digital input, temperature or voltage alarms configured in the CAM/SAM module. Any combination of up to ten (10) CAM and SAM modules may be connected to a single APM.

An optional Receive Systems Module (RSM) may also be fitted to the APM to support networks using two receive antennas in applications including dual diversity, redundant or hot/standby Rx antennas. A third antenna port is also provided to allow the monitoring of frequencies outside the restrictions of the Rx systems' preselector passbands (off-air monitoring of other sites' transmitters, the coverage of a DAS, etc.). The RSM features a unique "RF Peak Level Detector" capability that can measure high levels of RF across a wide range of frequencies, even of very short burst duration, that may overload the network's base station receivers, degrading network performance. The specific Rx paths monitored per-channel, their measured levels, the peak level detectors and the alarm thresholds associated with these parameters are all managed via the APM Web GUI.

Any combination of up to ten (10) CAM and SAM modules and one (1) RSM may be connected to a single APM.

The Advanced Power Monitor is designed and built in Australia by RFI. Please refer to the User Manual for detailed installation and operational Instructions.

The block diagram below provides an overview of the system interfaces.



For further information or help with this product contact your nearest RFI sales Office or through the following:

### Region

Sales email  
Tech Support  
Telephone International  
Telephone Local  
Fax International  
Web

### USA

webmaster@rfi.com.au  
support@rfi.com.au  
+1 (330) 486 0706  
330 486 0706  
+1 (330) 486 0705  
rfiamerica.com

### EMEA

sales@rfi.com.au  
support@rfi.com.au  
+44 1869 255 772  
01869 255 772  
-  
rfiemea.com

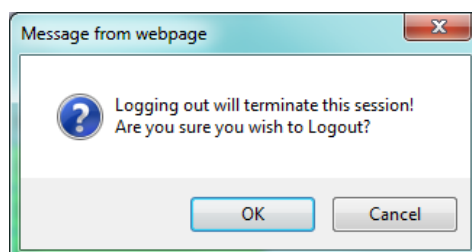
### ASIA PACIFIC

webmaster@rfi.com.au  
support@rfi.com.au  
+61 7 3621 9400  
1300 000 RF  
+61 2 9630 0844  
rfi.com.au

This site is best viewed with Internet Explorer 8, Firefox Version 3.6, Chrome Version 9 or Safari Version 5.

### **10.58 Logout**

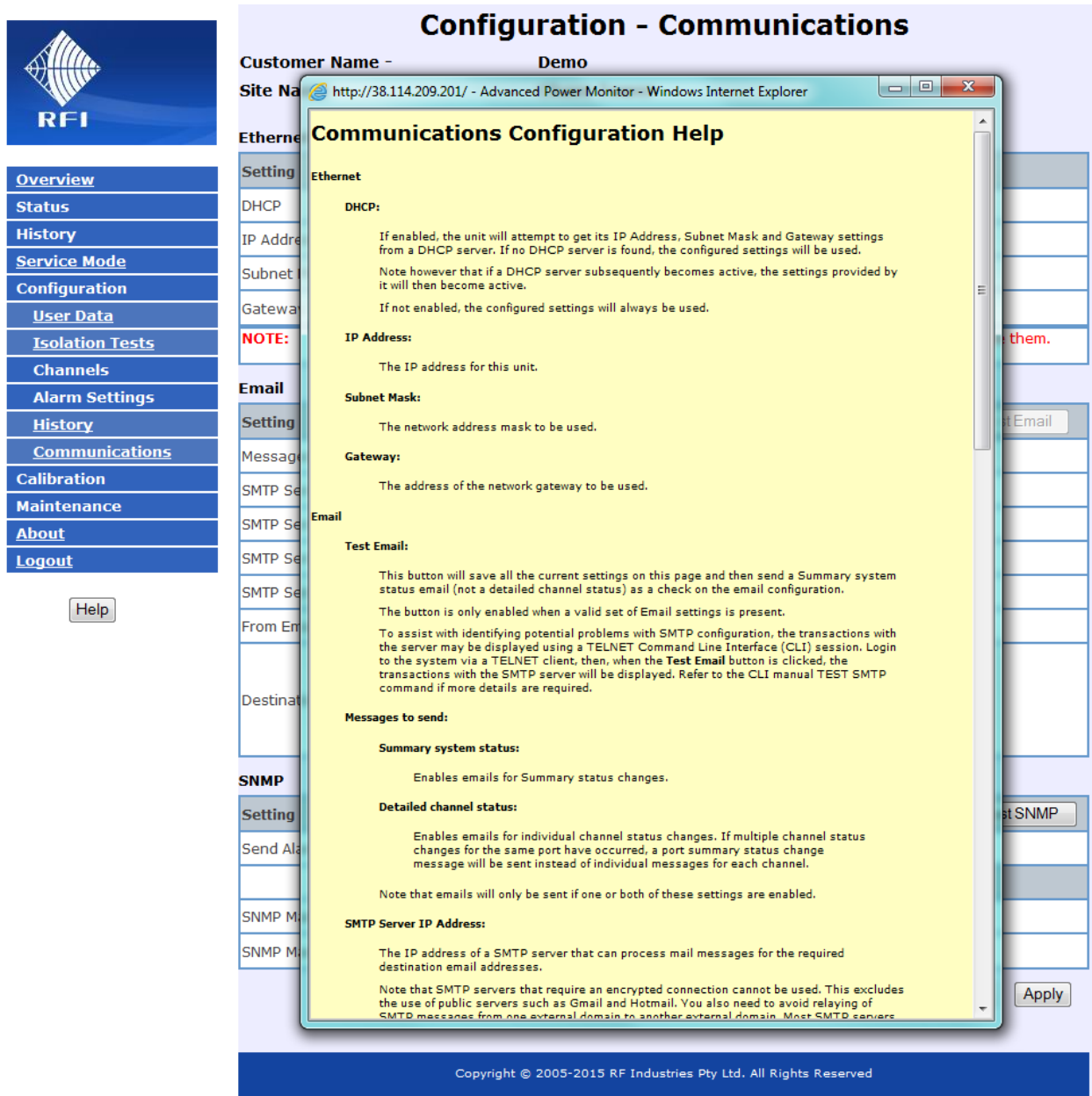
Clicking on this selection will present the “Log out” message box.



If “OK” is selected, the user will be logged out of the current webserver session and the original “Log in” screen will be presented, ready for a new session.....

Username	<input type="text" value="admin"/>
Password	<input type="password" value="•••••"/>
<input type="button" value="Login"/>	

## 10.59 HELP Screens



The screenshot displays the 'Configuration - Communications' screen in the APM GUI. A help window titled 'Communications Configuration Help' is overlaid on the main configuration page. The help window provides detailed information about the various settings available on the page.

**Configuration - Communications**

Customer Name - Demo

Site Name http://38.114.209.201/ - Advanced Power Monitor - Windows Internet Explorer

**Ethernet**

**Setting**

DHCP

IP Address

Subnet

Gateway

**NOTE:**

**IP Address:**

The IP address for this unit.

**Subnet Mask:**

The network address mask to be used.

**Gateway:**

The address of the network gateway to be used.

**Email**

**Setting**

Message

SMTP Se

SMTP Se

SMTP Se

From Em

Destinat

**SNMP**

**Setting**

Send Al

SNMP M

SNMP M

**Communications Configuration Help**

**Ethernet**

**DHCP:**

If enabled, the unit will attempt to get its IP Address, Subnet Mask and Gateway settings from a DHCP server. If no DHCP server is found, the configured settings will be used.

Note however that if a DHCP server subsequently becomes active, the settings provided by it will then become active.

If not enabled, the configured settings will always be used.

**IP Address:**

The IP address for this unit.

**Subnet Mask:**

The network address mask to be used.

**Gateway:**

The address of the network gateway to be used.

**Email**

**Test Email:**

This button will save all the current settings on this page and then send a Summary system status email (not a detailed channel status) as a check on the email configuration.

The button is only enabled when a valid set of Email settings is present.

To assist with identifying potential problems with SMTP configuration, the transactions with the server may be displayed using a TELNET Command Line Interface (CLI) session. Login to the system via a TELNET client, then, when the **Test Email** button is clicked, the transactions with the SMTP server will be displayed. Refer to the CLI manual TEST SMTP command if more details are required.

**Messages to send:**

**Summary system status:**

Enables emails for Summary status changes.

**Detailed channel status:**

Enables emails for individual channel status changes. If multiple channel status changes for the same port have occurred, a port summary status change message will be sent instead of individual messages for each channel.

Note that emails will only be sent if one or both of these settings are enabled.

**SMTP Server IP Address:**

The IP address of a SMTP server that can process mail messages for the required destination email addresses.

Note that SMTP servers that require an encrypted connection cannot be used. This excludes the use of public servers such as Gmail and Hotmail. You also need to avoid relaying of SMTP messages from one external domain to another external domain. Most SMTP servers

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A comprehensive set of Help screens are available throughout the APM GUI. On any page, click the Help button to display the available information.

## 11. SNMP

This section overviews the SNMP V2c northbound Trap and southbound GET functionality supported by the APM products using baseline 2.8 (and above) firmware. SNMP Community String value configuration and supporting SNMP Managers that require non 'null' returned values is available in baseline 2.8.3 (and above) firmware.

The Advanced Power Monitor (APM) SNMP Interface is defined by the following MIB files:

RF-INDUSTRIES-MIB.txt  
RFI-AXM-ALARM-MIB.txt

The RFI-AXM-ALARM-MIB file provides details of the various objects (OIDs) within every trap that is sent whenever an alarm status change occurs. Updated MIB files are available for download.

The axmAlarmType object (1.3.6.1.4.1.32327.2.2.2.1.2.3) defines 11 different types of traps.

Every trap includes the following objects:

### Trap Objects

#### axmAlarmCustName

OID 1.3.6.1.4.1.32327.2.2.2.1.2.1

Syntax Text String

Description Provides the Customer Name string as configured on the User Data Configuration page.

#### axmAlarmSiteName

OID 1.3.6.1.4.1.32327.2.2.2.1.2.2

Syntax Text String

Description Provides the Site Name string as configured on the User Data Configuration page.

#### axmAlarmType

OID 1.3.6.1.4.1.32327.2.2.2.1.2.3

Syntax Integer 0..5

Description Identifies the type of alarm that this trap relates to. The data for some of the other objects will depend on the alarm type.

The possible Types (and integer values) are:

<b>Restart (0)</b>	The unit has just been restarted.
<b>SystemStatus (1)</b>	The summary alarm status has changed.
<b>ChannelStatus (2)</b>	An individual channel alarm status has changed.
<b>CamStatus (3)</b>	An Alarm Module input alarm status has changed.
<b>AccessEvent (4)</b>	Three or more consecutive login attempts have failed, resulting in a lockout state.
<b>IsolTestStatus (5)</b>	A change in Isolation test alarm status.

## axmAlarmStatusBits

OID 1.3.6.1.4.1.32327.2.2.2.1.2.4

Syntax Integer 0..65535 (i.e. 16 bits)

Description This is an integer value representing the status bits relevant to the alarm type.  
The various sets of status bits are detailed as follows;

### ReStart

These bits will generally be the same as the System Status Bits, but because the system has only just restarted they will likely not be fully up to date representing the true system status. They should therefore be ignored.

### SystemStatus

#### **System Status Bits**

The system summary status bits are:

- 0x0001 Lock detect fail for Receive synthesisers.
- 0x0002 Lock detect fail for Transmit synthesisers.
- 0x0004 One or more Tx Power level fails are present.
- 0x0008 One or more Tx VSWR fails are present.
- 0x0010 Rx Power level fail is present.
- 0x0020 System hardware alarms summary. (See Hardware Alarm Bits)
- 0x0040 Antenna Isolation test fail is present.
- 0x0080 One or more CAM/SAM External or General Purpose DI alarms are present.
- 0x0100 Rx Summary alarm.
- 0x0200 Tx Power summary alarm.
- 0x0400 Tx VSWR summary alarm.
- 0x0800 Not in use.
- 0x1000 Not in use.
- 0x2000 Receive Systems Module alarm.
- 0x4000 Alarm relay is active. As masked by Alarm Config.
- 0x8000 Summary alarm LED is active.

#### **Hardware Alarm Bits**

- 0x01 Internal 5V rail is out of limit.
- 0x02 Internal temperature exceeds 80 degrees.
- 0x04 Internal hardware failure – I2C EEPROM.
- 0x08 Internal hardware failure – SFLASH.
- 0x10 Internal hardware failure – SD-Card.

**Note:** These are not presented separately, but any Hardware Alarm Bit(s) will set the 0x0020 bit of the (above) System Status Bits.

### Channel Status

**Note:** Decoded from the following tables and is based on determining a RX or Tx message from the contents of the rest of the SNMP trap message.

#### **Rx Status Bits**

- 0x0001 Rx power level fail summary.
- 0x0002 Rx Antenna isolation loss fail summary.
- 0x0004 RxA level out of range (Rx-0 only).
- 0x0008 VCO lock fail.
- 0x0010 RxB level out of range (Rx-0 only).
- 0x0020 Any Rx signal still ON/OFF.
- 0x0040 RxE level out of range (Rx-0 only).
- 0x0080 RxA signal present.
- 0x0100 RxB signal present.
- 0x0200 RxE signal present.
- 0x0400 RxA enabled.
- 0x0800 RxB enabled.
- 0x1000 RxE enabled.
- 0x2000 RSM Present.

**Tx Status Bits**

0x01 Tx power level fail.  
0x02 Internal Use only.  
0x04 VSWR fail.  
0x08 VCO lock fail.  
0x10 Tx signal present.  
0x20 Tx signal still ON/OFF.  
0x40 Internal use.  
0x80 Rx signal present.

**CamStatus****Alarm Module Status Bits**

0x0000 Alarm not active.  
0x0001 Alarm active.

**Note:** Each trap refers to only one alarm input, as detailed by the axmAlarmSourceNumber and axmAlarmItemNumber objects

**AccessEvent****Access Event Bits**

0x0000 (Always)

**Note:** This trap is only sent when the number of sequential log attempts is  $\geq 3$ .

**IsolationTestStatus****Isolation Test Status Bits**

0x0001 Not used.  
0x0002 Rx Gain or Tx Rejection fail.  
0x0004 Rx A level out of range. (Not used by SNMP)  
0x0008 VCO lock fail (Rx Gain only). (Not used by SNMP)  
0x0010 Rx B level out of range. (Not used by SNMP)  
0x0020 Not used.  
0x0040 Rx E level out of range. (Not used by SNMP)  
0x0080 Not used.  
0x0100 Not used.  
0x0200 Not used.  
0x0400 Rx A enabled. (Not used by SNMP)  
0x0800 Rx B enabled. (Not used by SNMP)  
0x1000 Rx E enabled. (Not used by SNMP)  
0x2000 RSM Present. (Not used by SNMP)

**Note:** The axmAlarmSourceNumber is one of 21, 22 or 23 (as detailed in the Syntax Integer declaration for the axmAlarmSourceNumber object).

**Note:** The use of the IsolationTestStatus bits varies between SNMP and Manager Messages. Only bit 0x0002 is used for SNMP. In SNMP, bit 0x0002 will be set whenever there is either an Isolation, Rx gain, or Tx reject alarm. The text of the next OID describes the fault, and the values measured.

## axmAlarmDescription

OID 1.3.6.1.4.1.32327.2.2.2.1.2.5

Syntax Text String

Description This is a brief textual description of the alarm status. The included detail depends on the alarm type. The following are examples:

**Restart:** System Restart  
**SystemStatus:** SYS=FAIL, RX=OK, TXPWR=OK, TXVSWR=FAIL  
 If a CAM or SAM is present an "ALMMOD=" status is added.  
 If a Receive Systems Module is present a "RSM=" status is also added.  
**ChannelStatus:** For a Rx channel: - PWR=OK(-97.5), VCO=OK, RX=ON  
 For a Rx Channel with Receive Systems Module:  
 - PWR=OK(A=-97.5,B=-95.3,E=-101.2), VCO=OK, RX=ON  
 For a Tx channel: - PWR=OK(39.5), Internal Use only, VSWR=OK(1.52),VCO=OK, TX=ON  
**CamStatus:** SAM Input, DI1-6 - Test IP-6, STATUS=FAIL  
**AccessEvent:** System Access Lockout Alert, Source=10.3.5.119, Count=3  
**IsolTestStatus:** For Antenna Isolation:  
 - Ant Isolation,STATUS=OK(A=82.0,B=83.1,E=78.7 dB,900.000000 MHz)  
 For Rx System:  
 - Rx System,STATUS=OK(A=-0.1,B=-0.4,E=-1.3 dB,870.000000 MHz)  
 For Tx Rejection:  
 - Tx Rejection,STATUS=OK(A=95.1,B=97.8,E=91.4 dB,915.000000 MHz)  
 Note that 'A', 'B' and 'E' values are only included if a Receive Systems Module is in use.

## axmAlarmState

OID 1.3.6.1.4.1.32327.2.2.2.1.2.6

Syntax Integer

Description The alarm status for this trap. A value of 1 represents OK, a value of 2 is FAIL.

## axmAlarmDateTime

OID 1.3.6.1.4.1.32327.2.2.2.1.2.7

Syntax Date and Time

Description The time stamp for when this trap was sent.

## axmAlarmSourceNumber

OID 1.3.6.1.4.1.32327.2.2.2.1.2.8

Syntax Integer

Description This identifies the source of the alarm event. This object, although included with every trap, is only relevant for the following alarm types:

**ChannelStatus:**  
 0 – RxPort      1 – TxPort-1      2 – TxPort-2      3 – TxPort-3      4 – TxPort-4  
**CamStatus:**  
 Possible values are::  
 11 – Alarm Module 1      12 – Alarm Module 2      13 – Alarm Module 3      14 – Alarm Module 4  
 15 – Alarm Module 5      16 – Alarm Module 6      17 – Alarm Module 7      18 – Alarm Module 8  
 19 – Alarm Module 9      20 – Alarm Module 10  
**IsolTestStatus:**  
 21 – Antenna Isolation      22 – Rx System      23 – Tx Rejection



## axmAlarmSourceText

OID 1.3.6.1.4.1.32327.2.2.2.1.2.9

Syntax Text String

Description The textual description for the axmAlarmSourceNumber.. This object, although included with every trap, is only relevant for the following alarm types:

### ChannelStatus:

The port reference string as configured on the User Data Configuration page.

Examples are:

Rx Port

Tx Antenna 1

### CamStatus:

The Alarm Module description.

Examples are:

SAM-1

CAM-3

### IsolTestStatus:

The Isolation Test description.

Examples are:

Ant Isolation

Rx System

Tx Rejection

## axmAlarmItemNumber

OID 1.3.6.1.4.1.32327.2.2.2.1.2.10

Syntax Integer

Description This identifies the specific item number within the above alarm source. This object, although included with every trap, is only relevant for the following alarm types:

### ChannelStatus:

Possible values are 1 to 80 for the Rx Port, and 1 to 20 for Tx Ports.

### CamStatus:

The Alarm Module input number.

Possible values are 1 to 4 for External Inputs 1 to 4, or 11 to 20 for Digital Inputs 1 to 10

**Note:** The axmAlarmItemNumber object is not valid for an Isolation alarm type and will always be 0.

## axmAlarmItemText

OID 1.3.6.1.4.1.32327.2.2.2.1.2.11

Syntax Text String

Description The textual description for the specific item. This object, although included with every trap, is only relevant for the following alarm types:

### ChannelStatus:

The channel ID string as configured on the Channel Configuration page.

Examples are:

Ambulance 1

Fire Service 3

### CamStatus:

The Alarm Module Input ID string as configured on the Alarm Module Configuration page.

Examples are:

Temperature

Door Open

### IsolTestStatus:

The frequency that the specific Isolation Test was performed on.

For example:

960.000000 MHz

## SNMP GET Requests

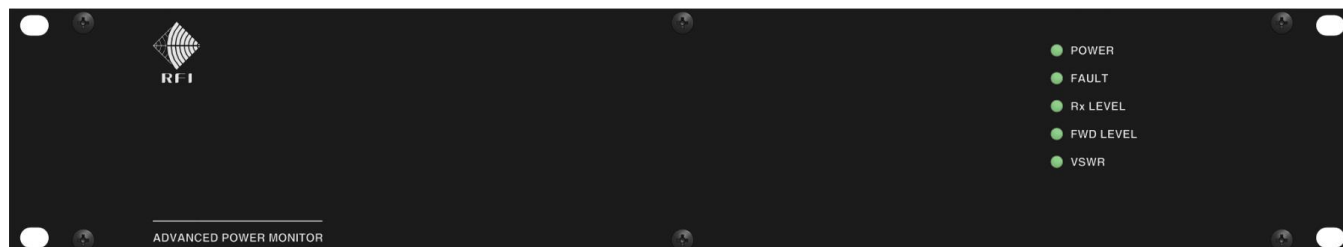
Any SNMP GET requests on the objects defined in the MIB and described above will return the current parameter value of the associated object (OID) sent with the GET.

An example of the response to GET commands sent to the APM is as follows;

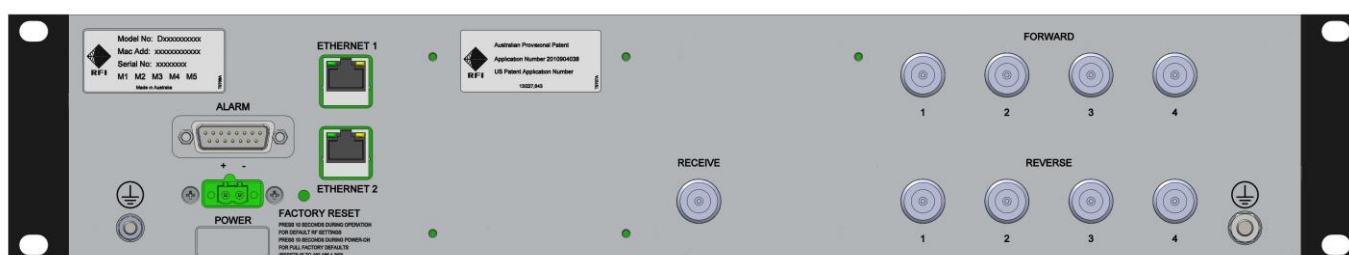
<b>axmAlarmCustName.0</b>	Not defined
<b>axmAlarmSiteName.0</b>	Not defined
<b>axmAlarmType.0</b>	SystemStatus(1)
<b>axmAlarmStatusBits.0</b>	49488
<b>axmAlarmDescription.0</b>	SYS=FAIL, RX=FAIL, TXPWR=OK, TXVSWR=OK, ALMMOD=OK
<b>axmAlarmState.0</b>	fail(2)
<b>axmAlarmDateTime.0</b>	2016-3-3,15:18:26.0
<b>axmAlarmSourceNumber.0</b>	RxPort(0)
<b>axmAlarmSourceText.0</b>	
<b>axmAlarmItemNumber.0</b>	0
<b>axmAlarmItemText.0</b>	

## 12. Connectors

### APM Front and Rear Panel Layouts:



Advanced Power Monitor (APM) Front Panel Layout

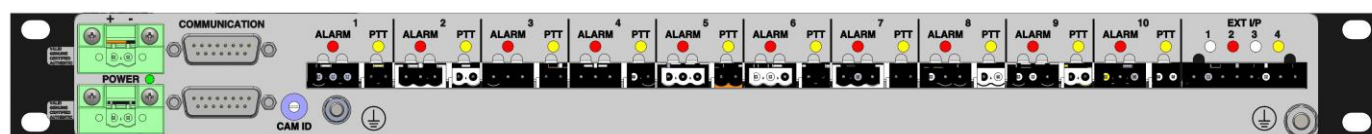


Advanced Power Monitor (APM) Rear Panel Layout

## CAM Front and Rear Panel Layouts:



Channel Alarm Module (CAM) Front Panel Layout

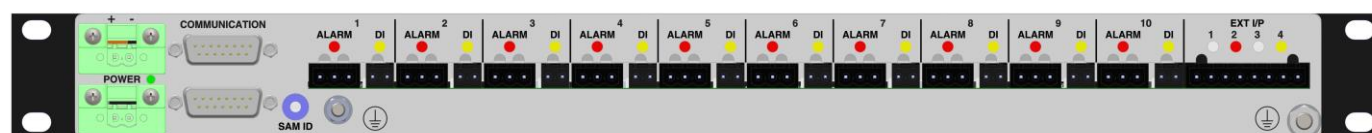


Channel Alarm Module (CAM) Rear Panel Layout

## SAM Front and Rear Panel Layouts:

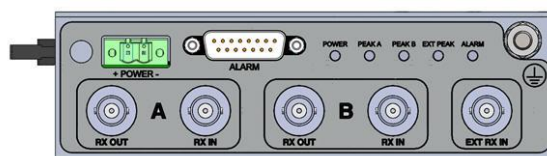


Site Alarm Module (SAM) Front Panel Layout



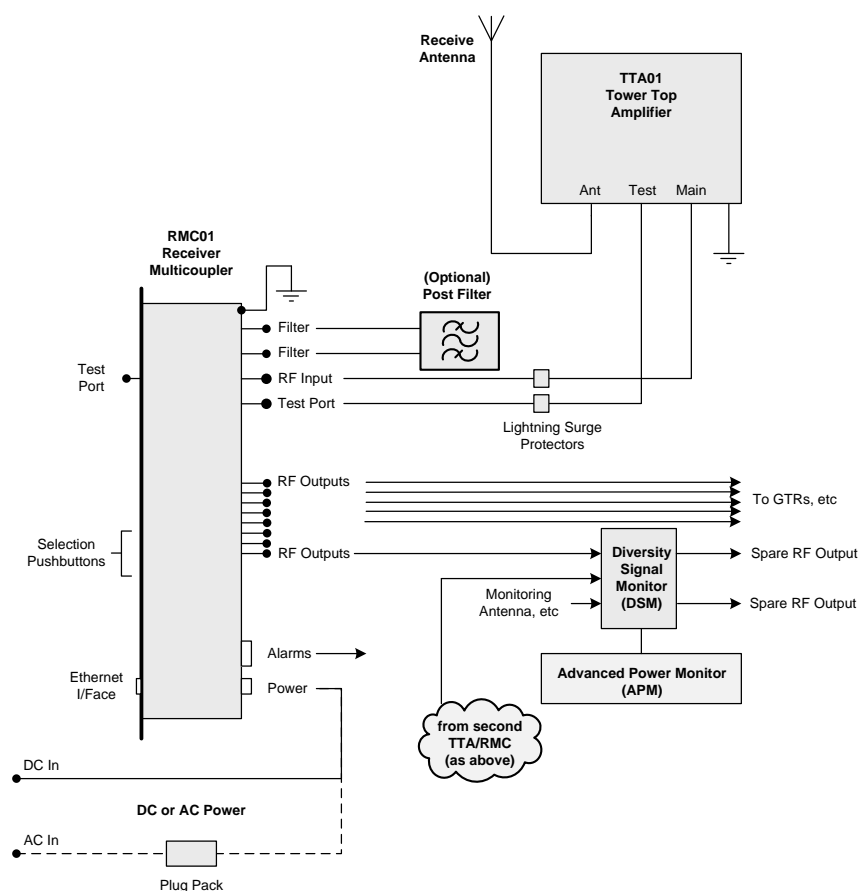
Site Alarm Module (SAM) Rear Panel Layout

## RSM Rear Panel Layout:

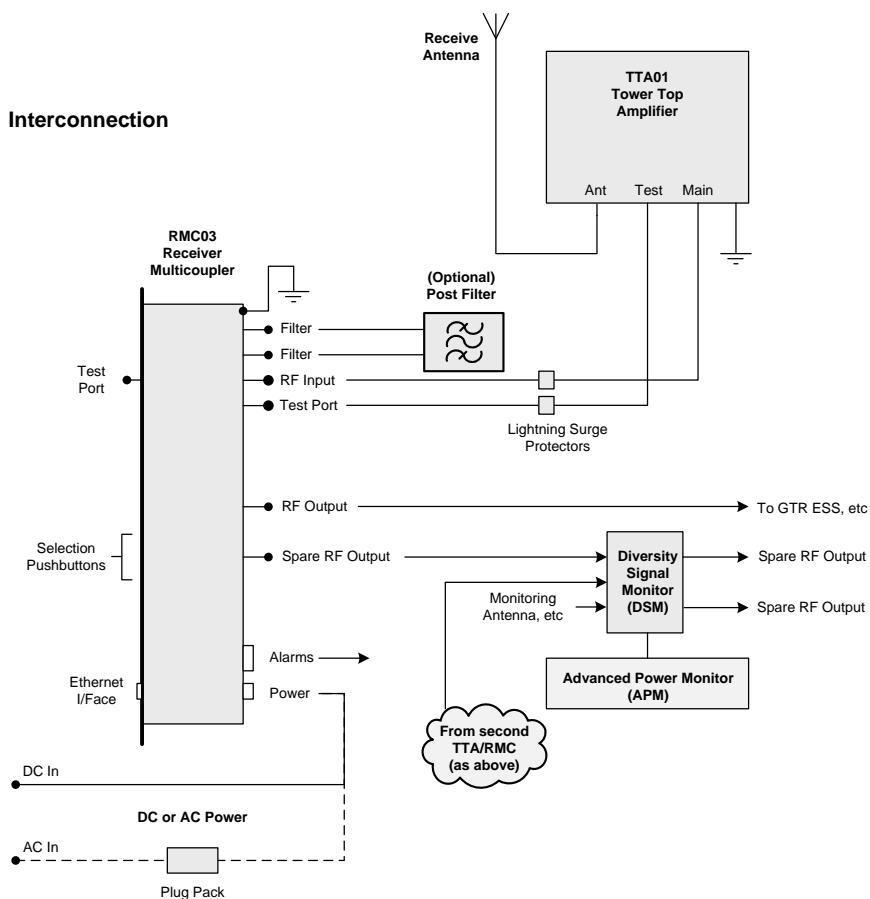


Receive Systems Module (RSM) Rear Panel Layout

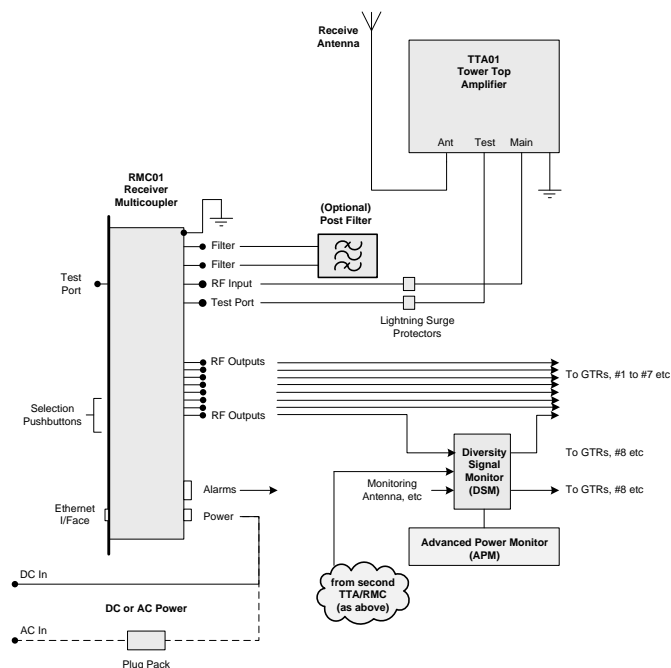
## RSM – Receiver System Interconnection:



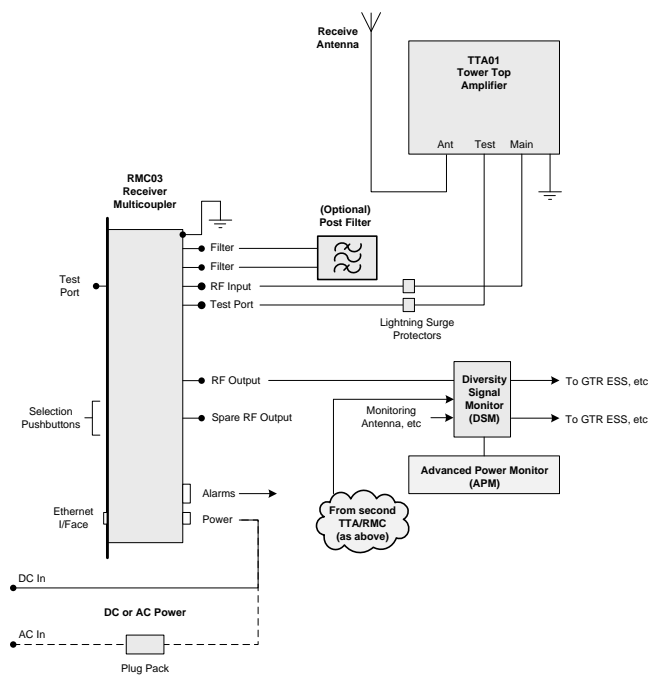
Recommended RMC01/TTA01 Interconnection



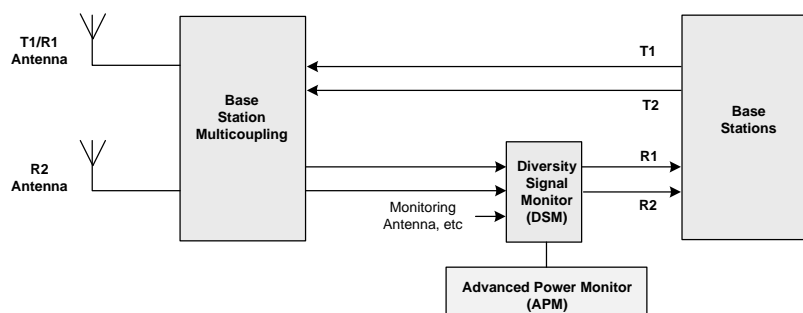
Recommended RMC03/TTA01 Interconnection



Alternate RMC01/TTA01 Interconnection



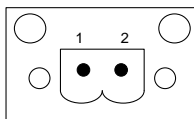
Alternate RMC03/TTA01 Interconnection



Recommended T1/R2 Interconnection

### APM/CAM/SAM/RSM DC Power connector (Phoenix 2-pin) pin-out:

The pin numbers on the polarized Phoenix 2-pin connector on the rear of the APM (and optional CAM) are illustrated below.



Pinout of DC Connector

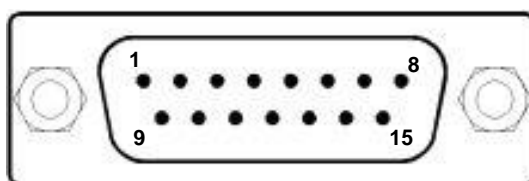
#### Pin Function Table:

Pin	Function
1	DC Power Input +ve
2	DC Power Input -ve

### APM Alarm/Comms connector (Sub D DB-15) pin-out:

The pin numbers on the DB15 (M) at the rear of the APM are illustrated below.

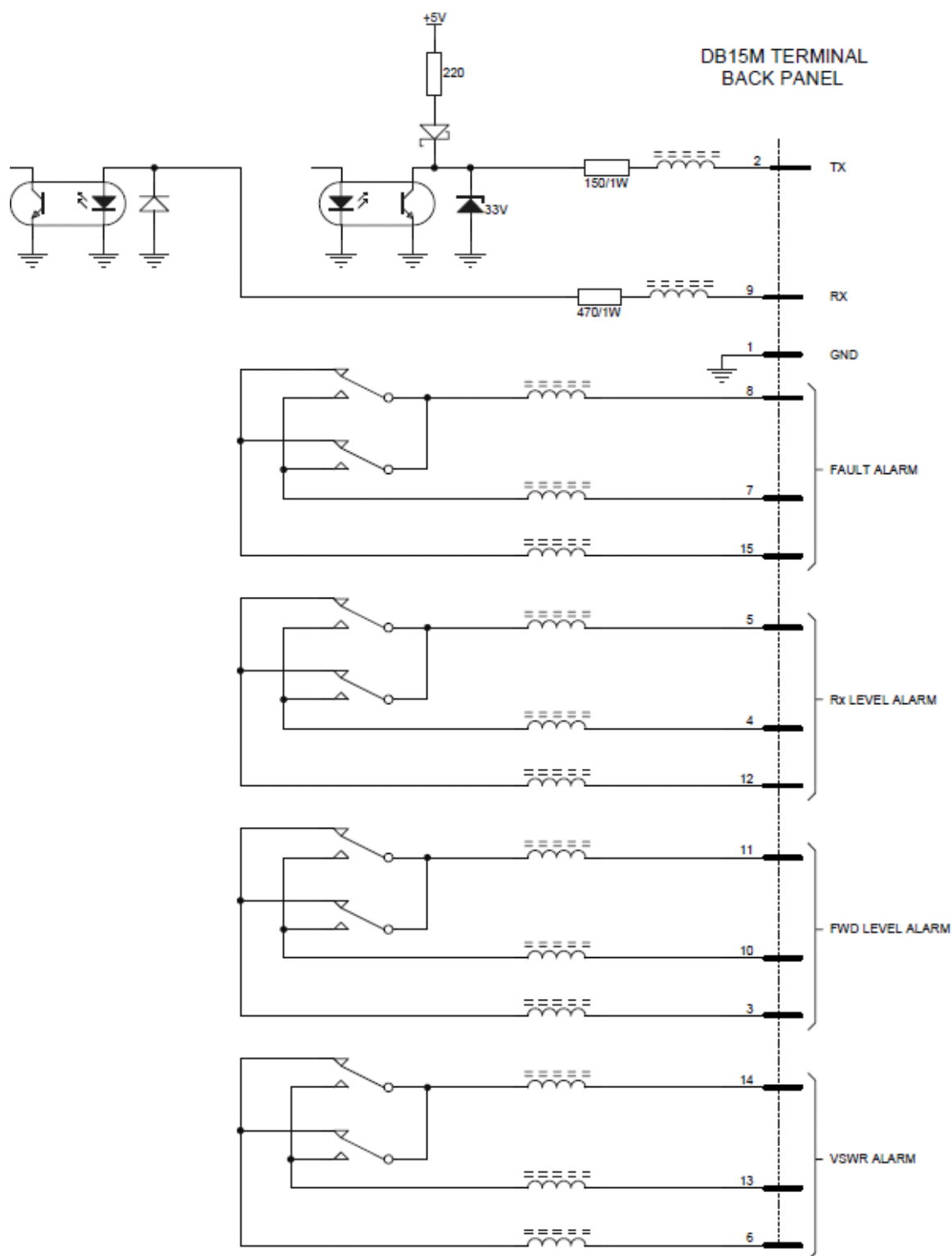
An electrical schematic of the alarm pin-outs to the D-Sub DB15 (M) connector located at the rear of the APM is illustrated on the next page.



Pinout of DB15 Connector

#### Pin Function Table:

Pin	Function
1	Communications Buss - GND
2	Communications Buss – Tx
3	APM Alarm Relay #3 – Closed when an alarm is present
4	APM Alarm Relay #2 – Open when an alarm is present
5	APM Alarm Relay #2 – Common
6	APM Alarm Relay #4 – Closed when alarm is present
7	APM Alarm Relay #1 – Open when an alarm is present
8	APM Alarm Relay #1 – Common
9	Communications Buss – Rx
10	APM Alarm Relay #3 – Open when an alarm is present
11	APM Alarm Relay #3 – Common
12	APM Alarm Relay #2 – Closed when an alarm is present
13	APM Alarm Relay #4 – Open when an alarm is present
14	APM Alarm Relay #4 – Common
15	APM Alarm Relay #1 – Closed when an alarm is present

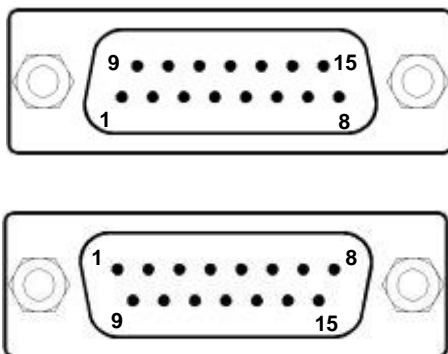
**APM Alarm/Comms connector (Sub D DB-15) pin-out Electrical Schematic:**


**Note:** The APM alarm relay outputs may be assigned to individual channel, Network ID group, or summary alarms (summary alarm names shown in above diagram)



### CAM/SAM Comms connectors (Sub D DB-15) pin-out:

The pin numbers on the DB15 (M) connector at the rear of the (optional) CAM/SAM/RSM are illustrated below.

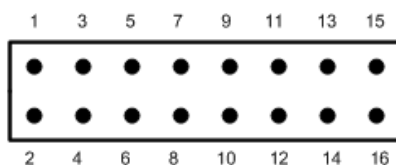


Pinout of DB15 Connectors

#### Pin Function Table:

Pin	Function
1	Communications Buss - GND
2	Communications Buss – Rx
3	Connected through to same pin number on other connector
4	Connected through to same pin number on other connector
5	Connected through to same pin number on other connector
6	Connected through to same pin number on other connector
7	Connected through to same pin number on other connector
8	Connected through to same pin number on other connector
9	Communications Buss – Tx
10	Connected through to same pin number on other connector
11	Connected through to same pin number on other connector
12	Connected through to same pin number on other connector
13	Connected through to same pin number on other connector
14	Connected through to same pin number on other connector
15	Connected through to same pin number on other connector

### RSM Comms connector (IDC-16) pin-out:



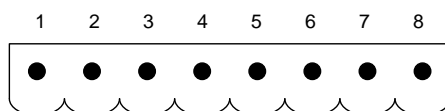
#### Pin Function Table:

Pin	Function
1	Communications Buss - GND
2	Communications Buss – Rx
3	Connected through to same pin number on DB15
4	Connected through to same pin number on DB15
5	Connected through to same pin number on DB15
6	Connected through to same pin number on DB15
7	Connected through to same pin number on DB15
8	Connected through to same pin number on DB15
9	Communications Buss – Tx
10	Connected through to same pin number on DB15
11	Connected through to same pin number on DB15
12	Connected through to same pin number on DB15
13	Connected through to same pin number on DB15
14	Connected through to same pin number on DB15
15	Connected through to same pin number on DB15
16	Not connected

### CAM/SAM External Inputs connector (Phoenix 8-pin) pin-out:

The pin numbers on the Phoenix 8-pin connector on the rear of the (optional) CAM/SAM are illustrated below.

To assist in logic level interfacing, an electrical schematic of the External Alarm Inputs pin-outs 8-pin polarized Phoenix connector located on the rear of the CAM/SAM is illustrated on the next page.



Pinout of External I/Ps Connector

### Pin Function Table:

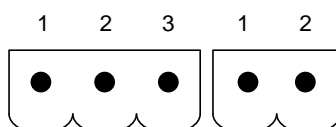
Pin	CAM Function	SAM Function
1	External Alarm Input #1	Temperature / Digital / 0 to +5VDC
2	Ground	Ground
3	External Alarm Input #2	Digital / +5VDC to -60VDC / +60VDC to -60VDC
4	Ground	Ground
5	External Alarm Input #3	Digital / +5VDC to -60VDC / +60VDC to -60VDC
6	Ground	Ground
7	External Alarm Input #4	Digital / +5VDC to -60VDC / +60VDC to -60VDC
8	Ground	Ground

**Note:** When used as Digital Inputs, the External Inputs of the CAM/SAM are logic "0" = <+2.5VDC, "1" = >+2.5VDC, with a maximum DC input voltage of +60VDC

### CAM/SAM Alarm Output and Digital Input connectors (Phoenix 2-pin & 3-pin) pin-outs:

The pin numbers on the Phoenix 3-pin and 2-pin connectors on the rear of the (optional) CAM/SAM are illustrated below.

To assist in logic level interfacing, electrical schematics of the Alarm Output and the PTT Input polarized Phoenix connectors located on the rear of the CAM/SAM are illustrated on the next page.



Alarm Outputs PTT Inputs

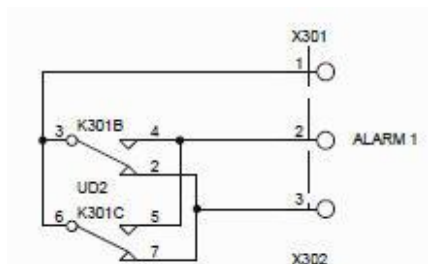
**Note:** Only one (1) channel of ten (10) is shown

### Pin Function Table:

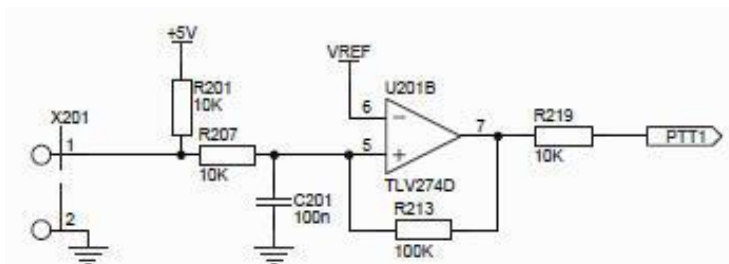
Pin	Function
1	Alarm Output Relay Common
2	Normally Open
3	Normally Closed
1	Digital Input
2	Ground

**Note:** The ten (10) PTT/Digital Inputs of the CAM/SAM are logic "0" = <+2.5VDC "1" = >+2.5VDC, with a maximum DC input voltage of +5VDC.

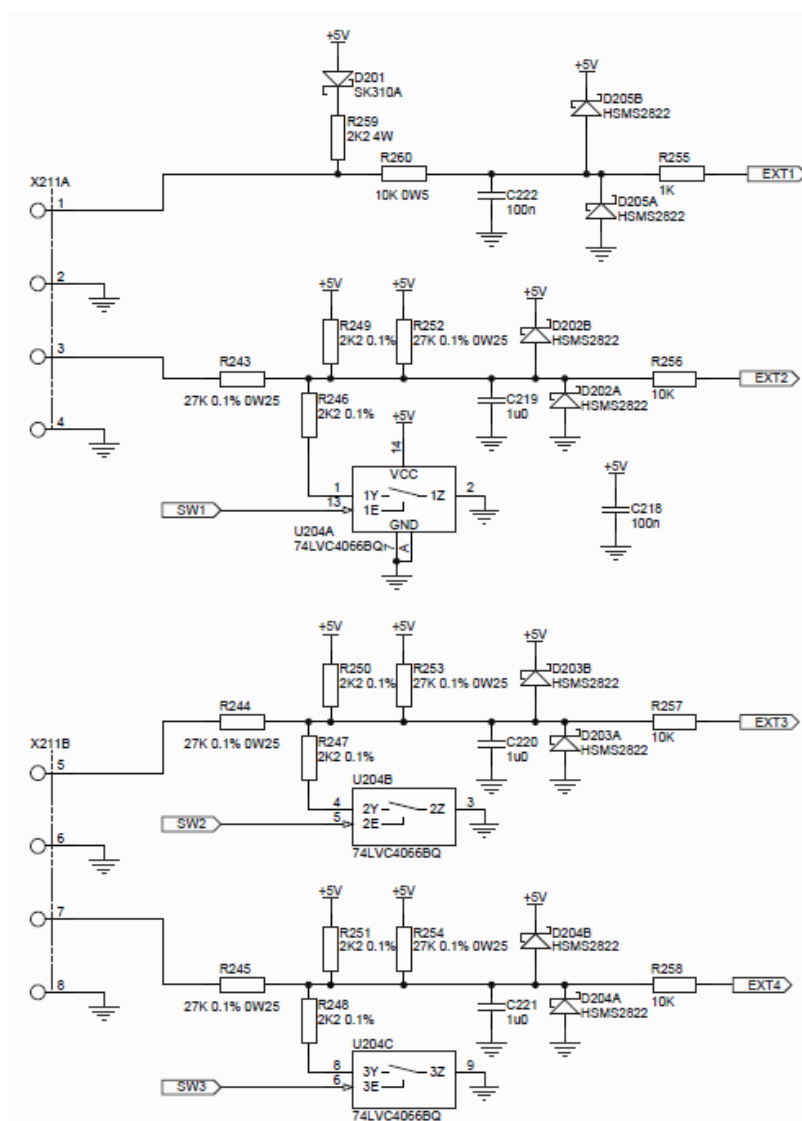
### CAM/SAM Inputs and Outputs polarised Phoenix connectors' electrical schematics:



CAM/SAM Alarm Outputs



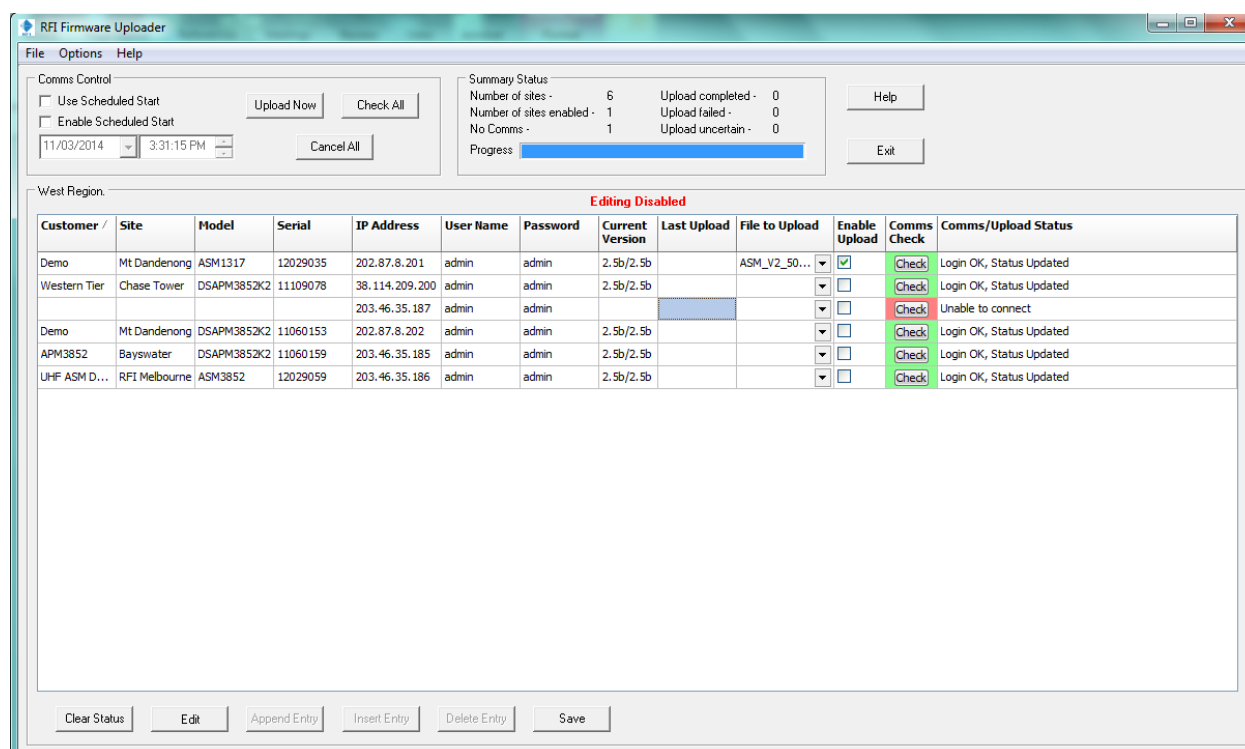
CAM External and CAM/SAM PTT Inputs



## 13. Maintenance, Inspection and Repair Advice

No special maintenance program is required for the APM, (optional) CAM/SAM/RSMs, or frequency banded Couplers.

Firmware upgrades may periodically be made available and may be uploaded into the APM if desired using the *Firmware Upgrade* feature within the GUI. Automated firmware upgrades (and communications connectivity checks) to a fleet of APMs can be managed using the RFI Uploader software package.



Example RFI Uploader software screen

Checking that the 7/16DIN (M) RF connectors on the feeder cables from the combiner and to the antenna are correctly torqued (as per manufacturers recommendations) onto the corresponding Coupler termination connectors is considered good practice. Checking all N Male termination connectors on the RF coaxial connectors on both the APM and Coupler/s is also recommended.

All other DB15 and/or Phoenix connectors must be firmly located and pushed into their corresponding mating sockets, with fastening screws tightened securely.

Neither the APM, optional CAM/SAM/RSMs, or the Coupler(s), are considered field repairable. Should it be considered that any unit may be faulty through diagnosis, it should be replaced or returned to RFI for repair.

## **14. Frequently Asked Questions (FAQ)**

**Q** – Does the APM really evaluate each frequency individually?

**A** – **Yes.** Each frequency is broken down individually and the Tx Forward Power, Tx VSWR, Combiner Insertion Loss, and Rx Level is displayed per-channel.

**Q** – Does the VSWR monitor function ignore nearby (12.5 KHz) off-frequency RF energy entering backwards from other transmitting antennas (i.e. horizontally mounted antennas)

**A** – **Yes.** The VSWR, like the Tx Forward Power, is measured in a channelised bandwidth. The high directivity of the APM directional coupler prevents Tx Forward Power from creating a Tx VSWR measurement error also.

**Q** – What is the minimum channel spacing to maintain true channelisation?

**A** – The APM can discern and measure 12.5KHz channel separation between Tx channels.

**Q** – Channel bandwidth is established per channel during setup, and these could be mixed bandwidths (i.e. 25KHz Analogue, APCOP25 Phase1, TETRA, DMR, etc.) in a single combiner. Can these each be measured individually?

**A** – **Yes.** Modulations and selected channel bandwidths can be mixed within a combiner with no issue as modulation type is programmed by channel in the GUI. Channel bandwidth is automatically selected by the modulation type chosen – except FM where several channel bandwidths are available.

**Q** – Are alarms logged for future reporting and analysis?

**A** – **Yes.** In firmware revision 1.92 and above, alarm events are stored in an Alarm Event Log which can be viewed and downloaded as desired.

**Q** – Can alarms be sent to remote devices?

**A** – **Yes.** Alarm events can be sent via SMTP (Email), SNMP (Northbound) traps, APM relay outputs, or (optional) SAM/CAM relay outputs to remote devices for monitoring. SNMP GET# Summary Alarms can also be polled if desired.

**Q** – How is the VSWR calibrated to the antenna?

**A** – The APM accepts the cable loss of the tx feeder network and uses this to calculate the measured VSWR to the top of the Tx antenna.

**Q** – Will calibration take into account different lengths, types, and losses of the cable?

**A** – **Yes.** The coupling loss, cable loss, and any variable losses will be compensated out during calibration.

**Q** – What is the minimum Tx forward power levels that can be monitored?

**A** – The APM will measure down to -10dBm and up to +60dBm without any changes.

**Q** – Can a PC file be created and/or saved of the APMs configuration?

**A** – **Yes.** A configuration file containing all of the APM's parameters relevant to a site may be prepared beforehand and easily uploaded to an APM (locally or remotely via Ethernet port), simplifying the deployment activities carried at a network site. This file is in easily editable text format for ease of use. In addition, multiple configuration files can be stored within the APM and activated when desired to cater for network re-frequencing transitions, different network operating configurations, or to back up APM configurations for site records, later use, or convenient programming in the event of an APM unit being exchanged.

**Q** – Can the APM monitor the site's Base Rx frequencies?

**A** – **Yes.** Rx Monitoring and Tx-Rx Antenna Isolation testing can be performed and results displayed.

**Q** – Can the APM measure VHF 5KHz, 7.5KHz, 15KHz, 20KHz and 30KHz offset frequencies?

**A** – **Yes**. The APM can measure, monitor and alarm any channel frequency step multiple of 1.25KHz.

**Q** – Can the APM measure Tx-Rx Antenna Isolation, Rx Subsystem Gain/Ripple and Tx Carrier Rejection?

**A** – **Yes**. The APM can measure, monitor and alarm these three System Tests for up to 20 frequencies.

**Q** – Can the APM support SNMP alarm reporting and monitoring?

**A** – **Yes**. The APM can report alarms via SNMP v2c northbound alarm traps, and can be polled by a southbound GET# command. The GET# command will respond with a summary Alarm Status message.

**Q** – Can the APM support Diversity Rx, Dual Rx Antennas, and Redundant Rx Antenna systems?

**A** – **Yes**. The Receive Systems Module (RSM) may be added to the APM at any time to provide Rx signal path monitoring for two receiver systems (i.e. dual diversity or redundant Rx antennas). The RSM also provides a third Rx signal path that may be used for off-air monitoring of adjacent network sites' coverage, a co-sited Distributed Antenna System (DAS), or other signals that may be outside the Rx system(s) passbands. The RSM also improves the APM's receiver sensitivity capability, facilitating the monitoring of lower level Rx signals.

## **15. Supporting Information**

For additional support information on the APM series products including;

[APM Marketing Sheet](#)  
[APM Design Guide](#)  
[APM Antenna & Systems Monitoring Application Note](#)  
[APM User Manual](#)  
[APM Service Bulletins](#)  
[APM Firmware File \(\\*.FFP\)](#)  
[APM SNMP MIB Files](#)  
[CAM Marketing Sheet](#)  
[SAM Marketing Sheet](#)  
[SAM Temperature Sensor Marketing Sheet](#)  
[RSM Marketing Sheet](#)

please visit the RFI website at:

<http://rfi-motorola.com/AdvancedPowerMonitors.aspx>

Test Drive the APM GUI by visiting: <http://203.46.35.185>

Level 1: Username:	user
Password:	user
Level 2: Username:	admin
Password:	admin
Level 3: Username:	master
Password:	master

Please note that this unit is not connected to a “live” network and may be test driven and programmed without impact. This unit may be off-line periodically for maintenance purposes or Internet connectivity outage. If you cannot connect to this unit please contact your nearest RFI Sales office so we can ensure it is available for your test drive.

### **Contact Information**

If you would like more information on the APM product and its applications, please contact your nearest RFI Sales Office.

For more information on RFI products, please visit us at <http://www.rfiwireless.com.au/>

## **16. User Notes:**





**RFI**  
TECHNOLOGY SOLUTIONS

## **Australian Support**

Phone: 1300 000 RFI (734)  
Email: [enquiry@rfi.com.au](mailto:enquiry@rfi.com.au)

## **International Support**

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