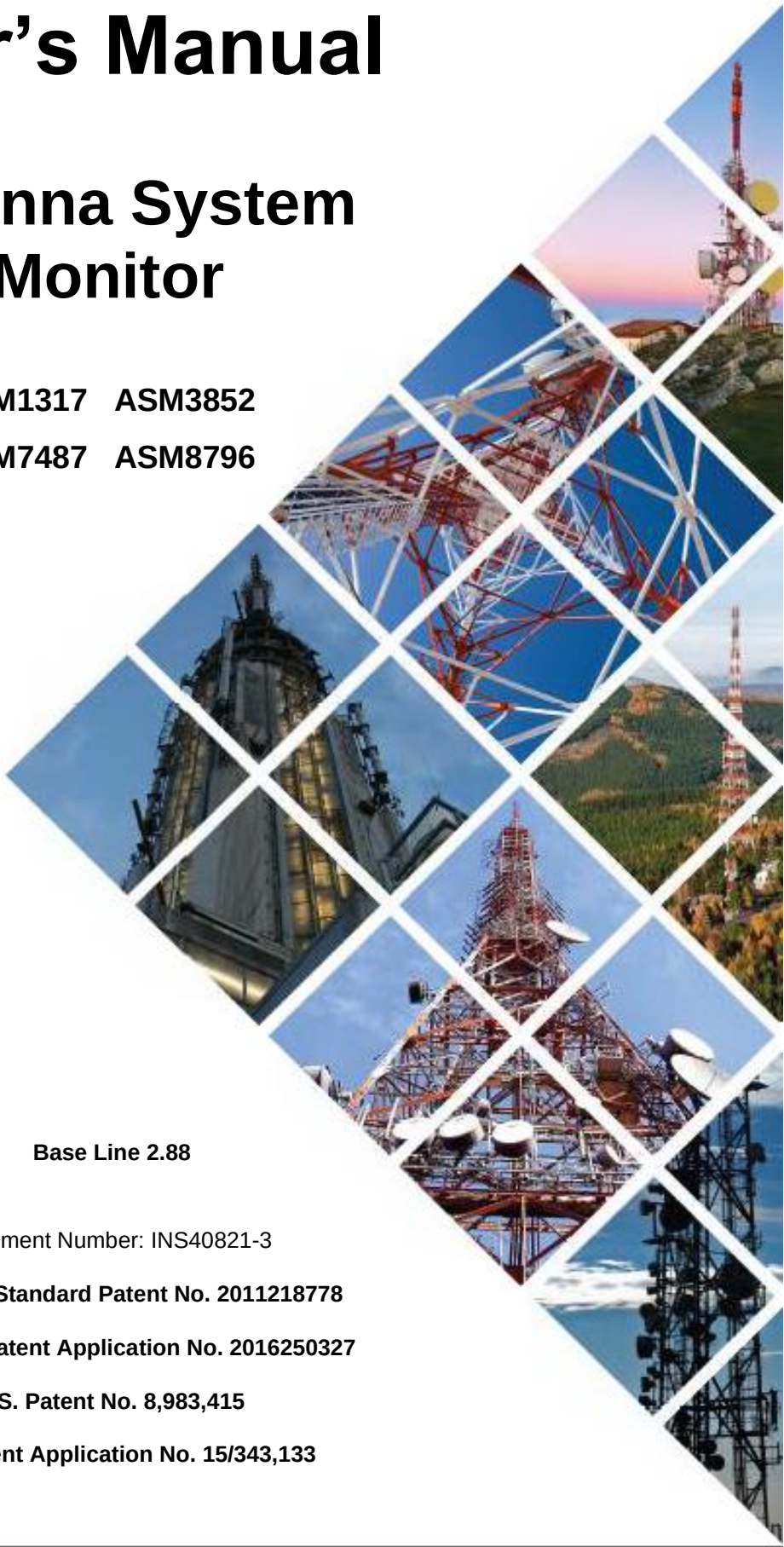
RFI
TECHNOLOGY SOLUTIONS

User's Manual

Antenna System Monitor

ASM1317 ASM3852

ASM7487 ASM8796



Base Line 2.88

Document Number: INS40821-3

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.

Document Number INS40821-3
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First Printing: 1st March 2011

Version Number	Version Date
1	1ST March 2011
1.2	2nd May 2011
1.4	4th July 2011
1.4c	9th November 2011
1.6	28th December 2011
1.7	04th January 2012
1.8	20th February 2012
1.9	15th April 2012
1.9a	30th May 2012
1.95	12th July 2012
2.0	29th August 2012
2.05	25th September 2012
2.10	05th May 2013
2.20	11th October 2013
2.30	8th January 2014
2.40	24th January 2014
2.50	14th March 2014
2.50b	22nd April 2014
2.50c	17th September 2014
2.50d	09th December 2014
2.50e	11th March 2015
2.60	15th July 2015
2.62	19th January 2016
2.70	15th March 2016
2.80	30th January 2017
2.81	27th April 2017
2.82	03rd July 2017
2.83	14th September 2017
2.83	14th March 2019
2.84	20th April 2019
2.85	17th February 2021
2.86	03rd June 2021
2.88	28th June 2023

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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For further information or help with this product contact your nearest RFI sales office or through the following;

Region	USA	EMEA	ASIA PACIFIC
Sales email	webmaster@rfi.com.au	sales@rfiemea.com	webmaster@rfi.com.au
Tech Support	support@rfi.com.au	support@rfi.com.au	support@rfi.com.au
Telephone Intl	+1 (330) 486 0706	+44 1869 255 772	+61 7 3621 9400
Telephone local	330 486 0706	01869 255 772	1300 000 RFI
Fax Intl	+ 1 (330) 486 0705	-	+61 2 9630 0844
Web	rfiamericas.com	rfiemea.com	rfi.com.au

Antenna System Monitors

ASMxxxx Series

Front View

ASMxxxxK1 Series

Rear View

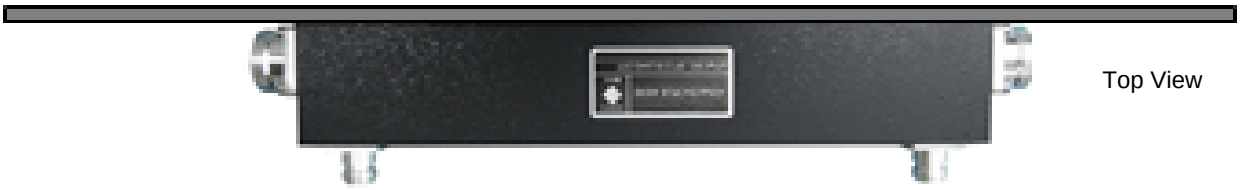
ASMxxxxK2 Series

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)

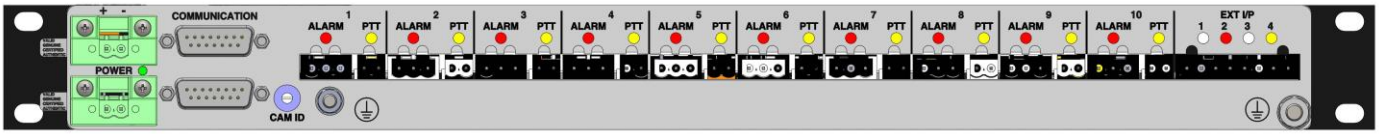
Front View

Top View

Optional Modules

CAM0000 Series

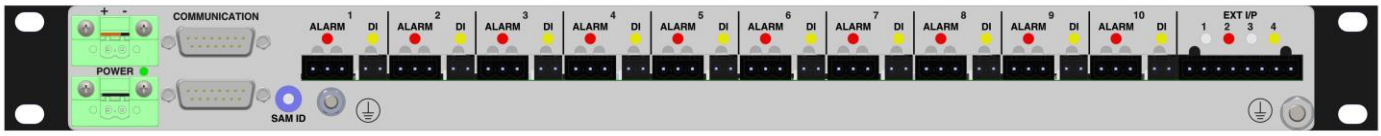
Channel Alarm Module (CAM) Front Panel Layout



Channel Alarm Module (CAM) Rear Panel Layout

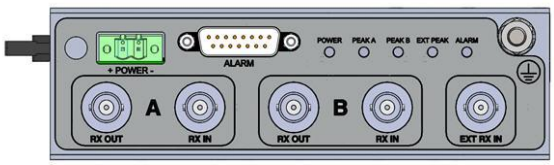
SAM0000 Series

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 Antenna System Monitor (ASM) is used to measure and monitor channel-specific Tx Forward and Reflected power between transmitter combiners their associated antenna(s) for up to 80 channels. Rx Channel and or 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 ASM 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 ASM the capability of monitoring receiver system signal levels, or the propagation of transmitter channels located on other sites.

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 ASM 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 ASM 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 ASM 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 ASM 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 ASM), and therefore each individual frequency can only be measured "once" across all ports of the ASM.

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 ASM, 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/TCPIP data packets are also available for alarm and status reporting. LED's on the front panel of the ASM provide visual indication of system alarms.

ASM status and alarm monitoring is also supported by the Motorola UEM, Genesis Software GenWatch™ ASM Applet, or by the C² Systems SitePortal® monitoring software.

The ASM 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 ASM 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 ASM unit.

When connected, CAMs and SAMs are automatically recognised by an ASM, and menu selections for them will then automatically appear in the ASM 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 ASM should have a different ID address selected to prevent address contention in the ASM 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 ASM. 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 ASM, 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 ASM to support networks using two receive antennas, such as systems using dual diversity or redundant Rx antennas.

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

The RSM also improves the ASM'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 ASM GUI, on a per-channel basis. Rx level measurements for all three receive paths are available in the Status, System Isolation Tests and Channel Diagnostics pages of the ASM 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 ASM GUI to assist fault-finding activities.

Hardware Versions

There are several hardware variants of the ASM. 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 ASM 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 ASM via a USB interface is still possible utilising a (user-supplied) USB-to-TCPIP adapter.

2. Application Diagram

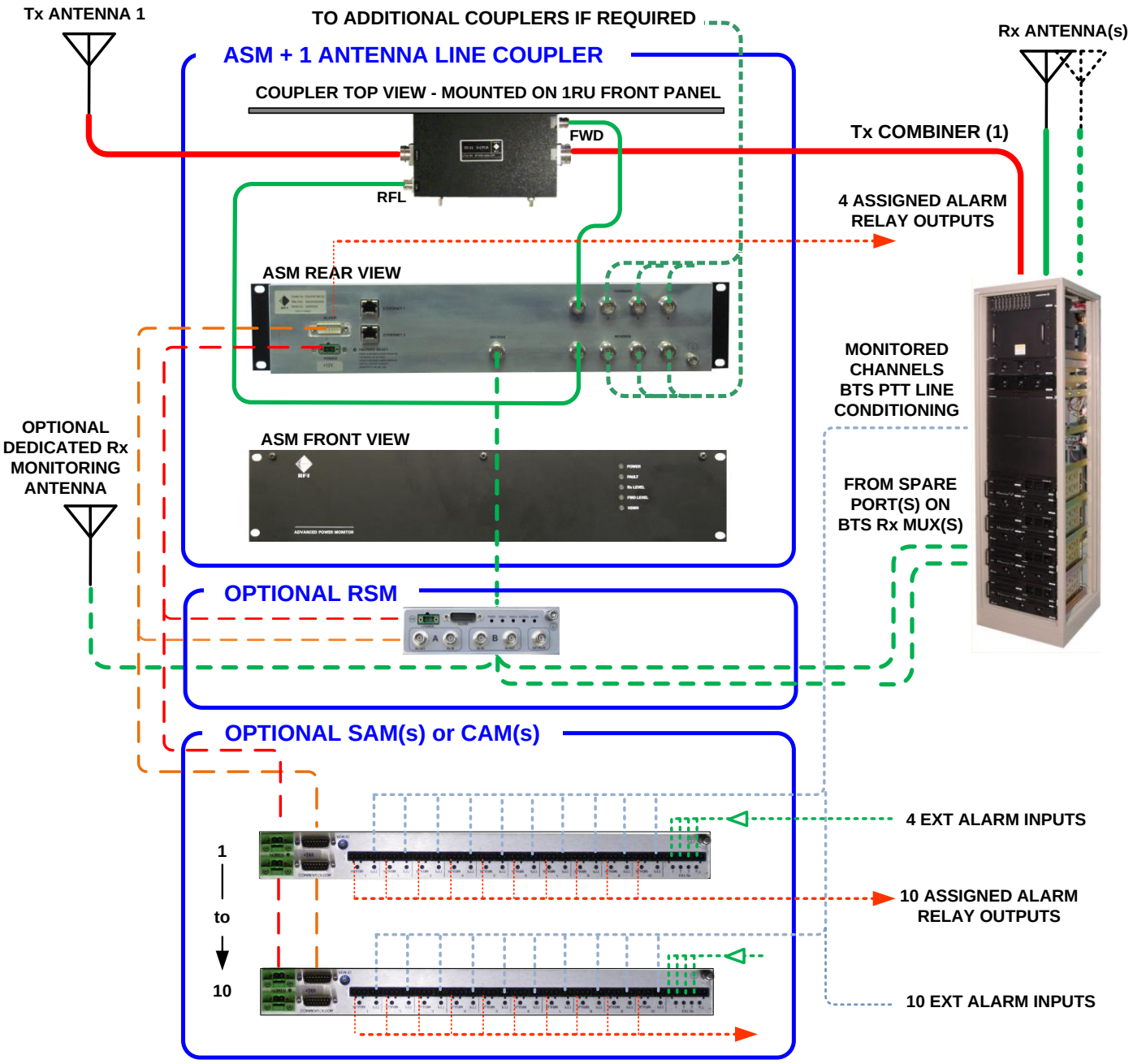


Diagram1

3. ASM - Electrical and Mechanical Specifications

ASM Model Number	ASMxxxx Series
Frequency range (Tx power and Rx level monitoring)	ASM1317 132-174MHz ASM3852 380-520MHz ASM7487 746-870MHz ASM8796 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 ASM readings to better than -125dBm)
Measurable Tx input power level	-30dBm to +20dBm (minimum range) (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 TCPIP 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 – ASM Relay Outputs Detailed or Group Alarms – ASM or CAM/SAM Module Relay Outputs SMTP Email (up to 4 Addresses) SNMPv2c (Northbound Traps or Southbound GET) or via Genesis Software GenWatch™ ASM Applet or via C² Systems SitePortal® monitoring software or via the Motorola Unified Event Manager (UEM)
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 External Alarm Inputs Channel Alarms Outputs Channel Alarms Inputs Power Supply Comms Interface to/from ASM	(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 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)
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 External Alarm Inputs Channel Alarms Outputs Channel Alarms Inputs Power Supply Comms Interface to/from ASM	(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 ASM RF In and RF Out Power Supply Comms Interface to/from ASM	 N (Male) BNC (Female) 1 x Polarized 2-pin Phoenix connector 1 x DB15 (M)
Mounting	On rear of ASM (mounting bracket supplied)
Dimensions	Mounts on rear of ASM
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	
Model Number	**Description**
ASM1317	Antenna System Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
ASM1317-48	Antenna System Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
ASM1317-AC	Antenna System Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
ASM1317-48AC	Antenna System Monitor 132-174MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
ASM3852	Antenna System Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
ASM3852-48	Antenna System Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
ASM3852-AC	Antenna System Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
ASM3852-48AC	Antenna System Monitor 380-520MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
ASM7487	Antenna System Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
ASM7487-48	Antenna System Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
ASM7487-AC	Antenna System Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
ASM7487-48AC	Antenna System Monitor 746-870MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
ASM8796	Antenna System Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC
ASM8796-48	Antenna System Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC
ASM8796-AC	Antenna System Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36VDC to 90-264V AC (external)
ASM8796-48AC	Antenna System Monitor 870-960MHz 80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60VDC to 90-264V AC (external)
Additional Couplers	**Description**
SP1318-2440-DFF1RU	Directional Coupler 130-180MHz 40dB 4-Port 19in Rack Mount 1RU Input /Output Ports DIN (F) Coupling Ports N (F)
SP3855-4440-DFF1RU	Dual Directional Coupler 380-550MHz 40dB 4-Port 19in Rack Mount 1RU Input /Output Ports DIN (F) Coupling Ports N (F)
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**
CAM0000	Channel Alarm Module 9-36V DC (Obsolete – use SAM0000)
CAM0000-48	Channel Alarm Module 36-60V DC (Obsolete – use SAM0000-48)
Site Alarm Module	**Description**
SAM0000	Site Alarm Module 9-36V DC
SAM0000-48	Site Alarm Module 36-60V DC
SAM0000-TS	Site Alarm Module Temperature Sensor
SAM0000-CK	Site Alarm Module Connector Kit (matching connectors for all CAM/SAM I/O connectors)
Receive Systems Module	**Description**
RSM0000	Receive Systems Module 9-36VDC
RSM0000-48	Receive Systems Module 36-60VDC
Accessories	
ASM0000AU-AC	Plugpack 90-264VAC 12VDC c/w 6ft/1.8m Australian IEC Power Cable
ASM0000UK-AC	Plugpack 90-264VAC 12VDC c/w 6ft/1.8m UK IEC Power Cable
ASM0000US-AC	Plugpack 90-264VAC 12VDC c/w 6ft/1.8m USA IEC Power Cable
ASM0048AU-AC	Plugpack 90-264VAC 48VDC c/w 6ft/1.8m Australian IEC Power Cable
ASM0048UK-AC	Plugpack 90-264VAC 48VDC c/w 6ft/1.8m UK IEC Power Cable
ASM0048US-AC	Plugpack 90-264VAC 48VDC c/w 6ft/1.8m USA IEC Power Cable

Table 6

7. Unpacking

The ASM 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 ASM 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 ASM. The User's Manual and other supporting information and files are available for downloading from the RFI website at www.rfi.com.au. 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 ASM 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.

You agree that by using and or downloading any of the ASM product specific Firmware, that you have fully understood and agree to comply and be bound by the all of the conditional requirements as detailed in this Firmware License Agreement and accept the disclaimer thereof.

RFI reserves the right to update and change, from time to time, any attribute, function, feature and in the main any content of the Firmware and any documentation attributed and referenced to the Firmware underwritten by this Firmware License Agreement without notice to existing users.

The use of this Firmware is non-exclusive and non-sub licensable, nor does it give the user the right to re-sell, lease, loan, distribute, or transfer the Firmware nor the rights thereof.

This Firmware License Agreement grants or implies no right, title, or interest in any intellectual property owned or licensed by RFI.

Support and Firmware Updates.

RFI may elect to provide you with customer support and/or Firmware upgrades, enhancements, or modifications for the RFI Firmware at its sole discretion, and may terminate such support at any time without notice to the user. RFI may change, suspend, or discontinue any aspect of the Firmware at any time, including the availability of any Firmware feature, database, or content.

From time to time RFI may provide notice through the RFI web site of any available updates or Firmware revision downloads.

Fees.

RFI reserves the right to charge fees for upgrades or revisions of the applicable Firmware download.

Disclaimer.

Use of any Firmware enabling operation of the ASM or providing support for the ASM is at the user's discretion and risk. RFI will not be held responsible or liable for any damage or loss that results from the downloading and or use of the Firmware or incompatibilities or other problems experienced as a result of any combination of operating system(s), firmware, or software the user may use.

RFI will not be held responsible or liable for any inaccuracies, completeness or inadequacy regarding the Firmware as the basis of the provision of the Firmware is on a "fit-for-purpose, best effort" approach.

RFI will not be liable to the user for claims and liabilities of any kind arising out of or in any way related to the use of the Firmware by the user or any third party.

The failure of RFI to exercise or enforce any right or provision of this Firmware License Agreement shall not constitute a waiver of such right or provision.

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 ASM, (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 ASM using the supplied mounting bracket. The Application Diagram (Diagram 1) illustrates the ASM/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 ASM. 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 ASM. This is because the optimal length for these cables may vary for each installation. These cables should be made up on site once the ASM 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 ASM. Although there is no specific restriction on the length of these cables between the Coupler and the ASM, 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 ASM. 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 ASM 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 ASM. 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 ASM.

M5 and M6 earth studs are located on the rear of the ASM, (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 ASM 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 ASM. Any other illuminated LEDs will be reflecting the current state of the various inputs/outputs and alarm states - based on the current programmed configuration.

The ASM User's Manual and other supporting information and files are available for downloading from the RFI website at www.rfi.com.au.

In addition to using the integral Web Browser GUI, the ASM (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 ASM utilizes an on board web server to provide web browser access to the GUI. This can be accessed connecting to the ASM via a short Ethernet cable jumper from a laptop/notebook directly to the ASM 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 ASM. Plug one end of this Ethernet jumper cable into the ASM and the other end into your computer Ethernet socket.

The following web browsers are compatible with the ASM GUI;

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

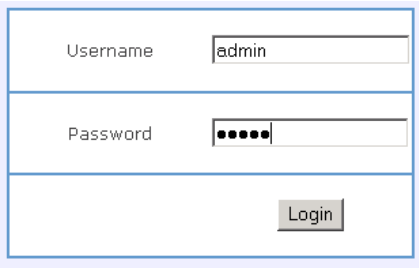
NOTE: There are documented issues with Internet Explorer™ Version 10.
This may impact the presentation of some GUI features.
The use of an alternate web browser is recommended.

IP Address

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

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

Connectivity to the ASM 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 ASM 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 ASM to the factory default settings.

Reset Factory Default Ethernet Addresses and Access.

To reset the ASM 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 ASM off by removing the DC power cable connector. Press the factory reset button on the rear of the ASM, 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 ASM 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

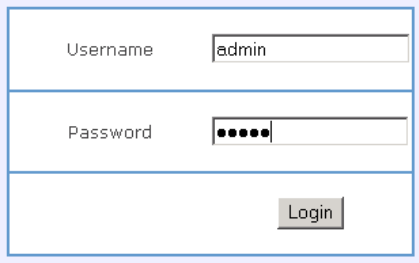
DHCP - Disabled
IP Address - 192.168.1.200
Subnet Mask - 255.255.255.0
Gateway - 192.168.1.254
Level 1 User Name: user
Level 1 Password: user
Level 2 User Name: admin
Level 2 Password: admin
Level 3 User Name: master
Level 3 Password: master

Reset RF Default settings.

To reset the ASM 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 default User Name is "master" and Password is "master". This default user name and password provides complete and unrestricted access to the ASM (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.

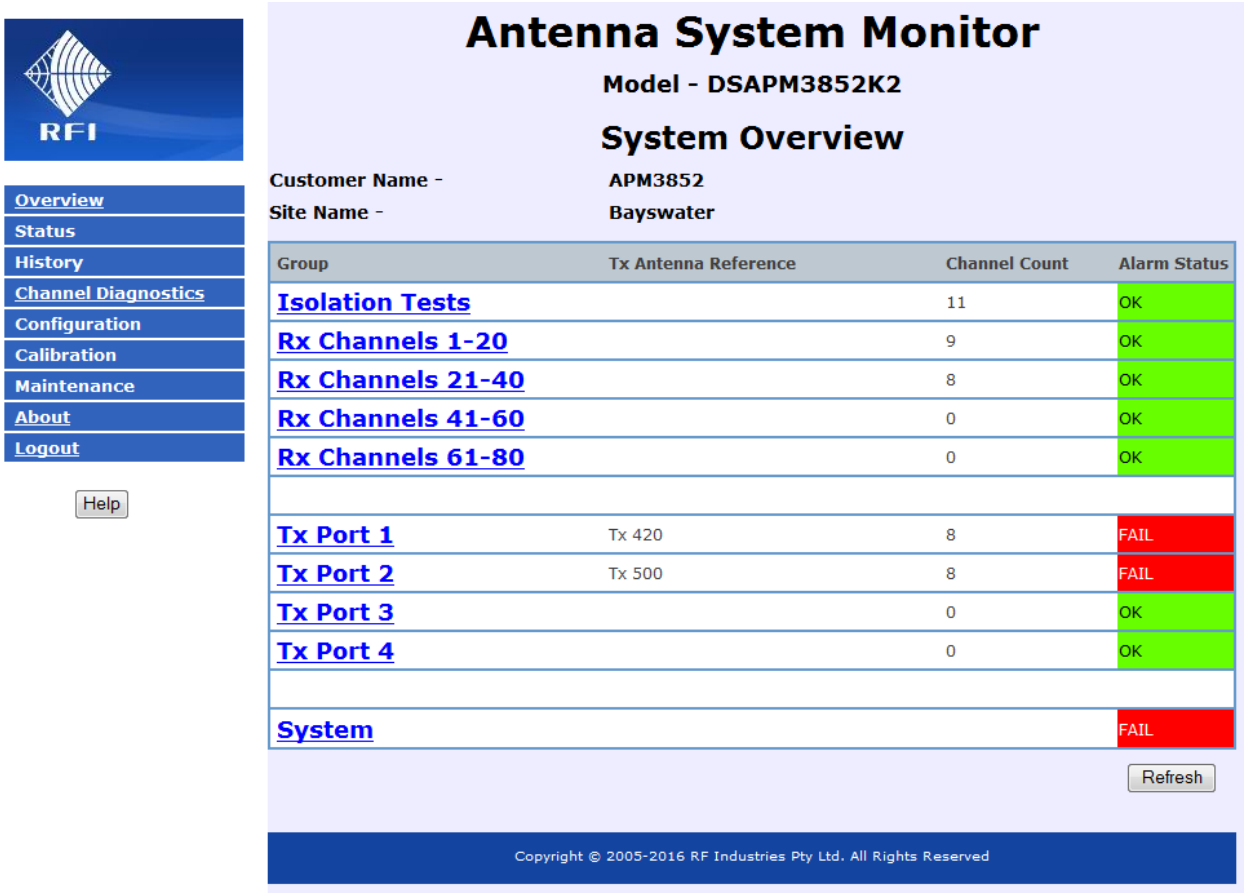
Once the correct User Name and Password is entered the GUI will open to the first page of the GUI.

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



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.

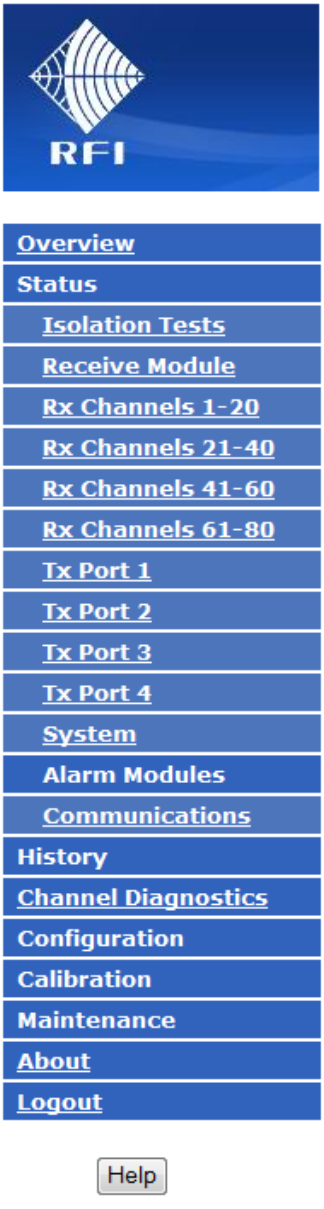
Refresh:

Click this button to manually trigger a page refresh.

10.4 Status Menu

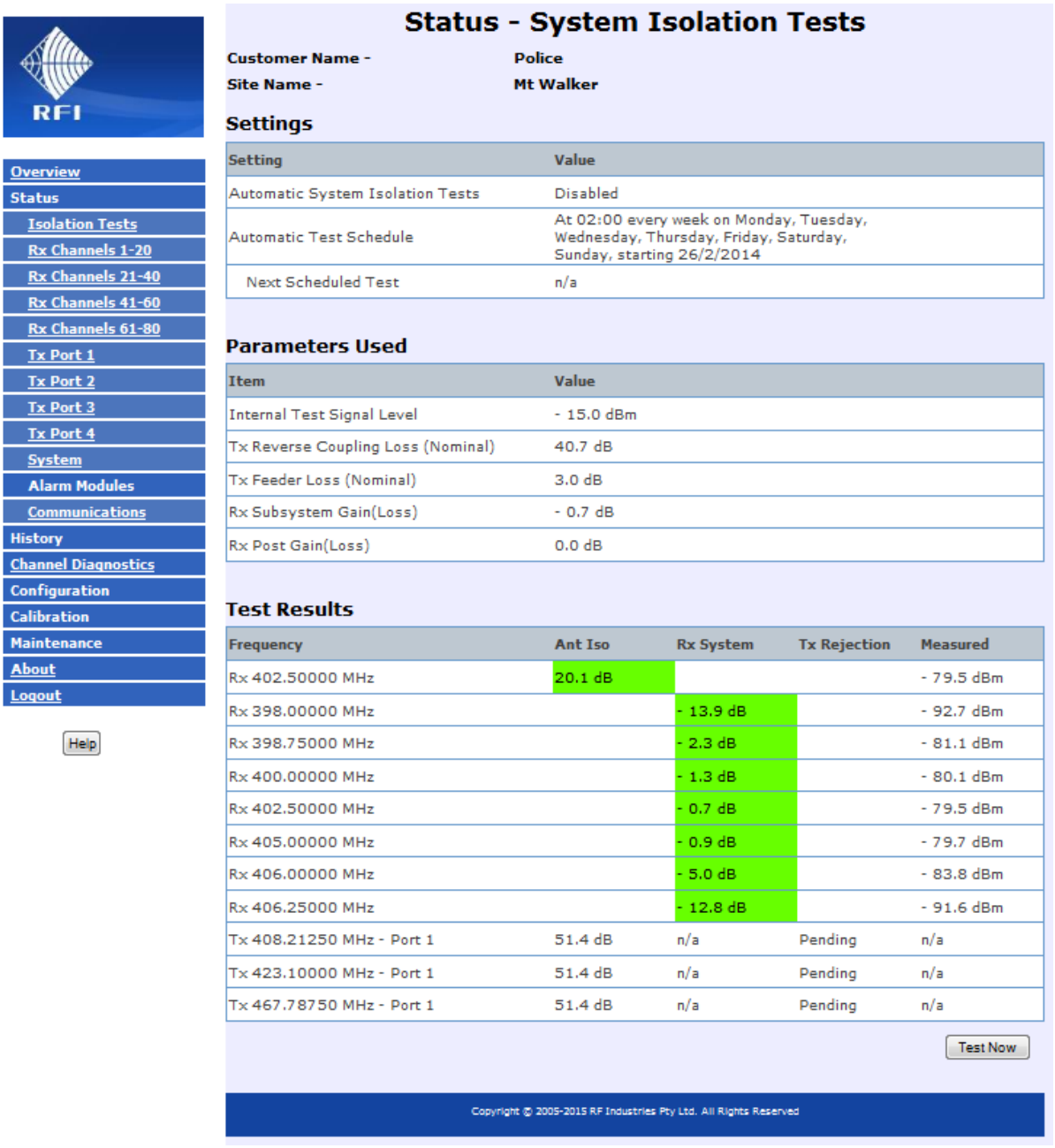
The "Status" menu allows all of the ASMs measurement parameters to be viewed.

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 ASM as required.

10.5 Status – System Isolation Tests



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 ASM. 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 ASM GUI configuration screens,

Test Results:

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

Tx-Rx Antenna Isolation Iso (Ant Iso):

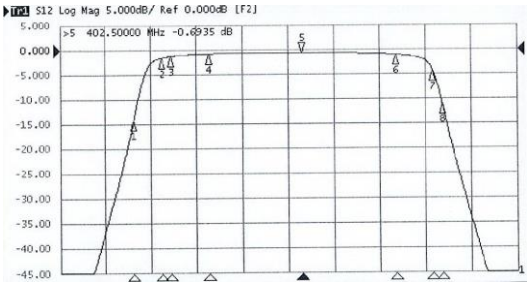
The first line of the Test Results table displays the calculated Tx-Rx Antenna Isolation value, and is measured using the ASM's internal signal generator operating on the displayed Rx Frequency. The value measured and displayed represents the minimum isolation value between any of the monitored Tx and 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 ASM), and to apply alarm values in the ASM configuration screen that are appropriately set either side of the emasured 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 ASM.

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 ASM'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 ASM-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 ASM Rx port (Measured) are provided for information.

Measured:

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

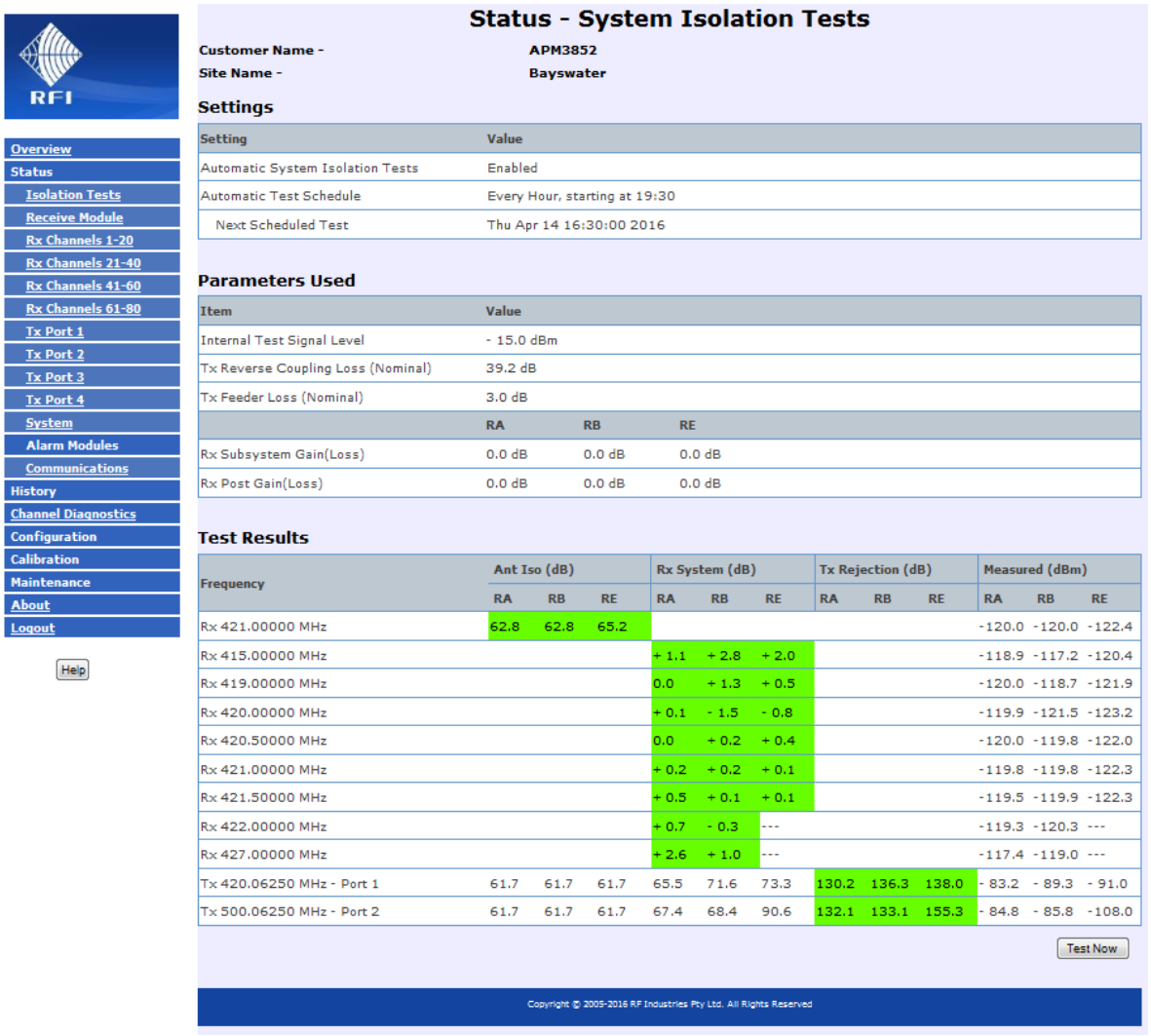
Test Now:

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

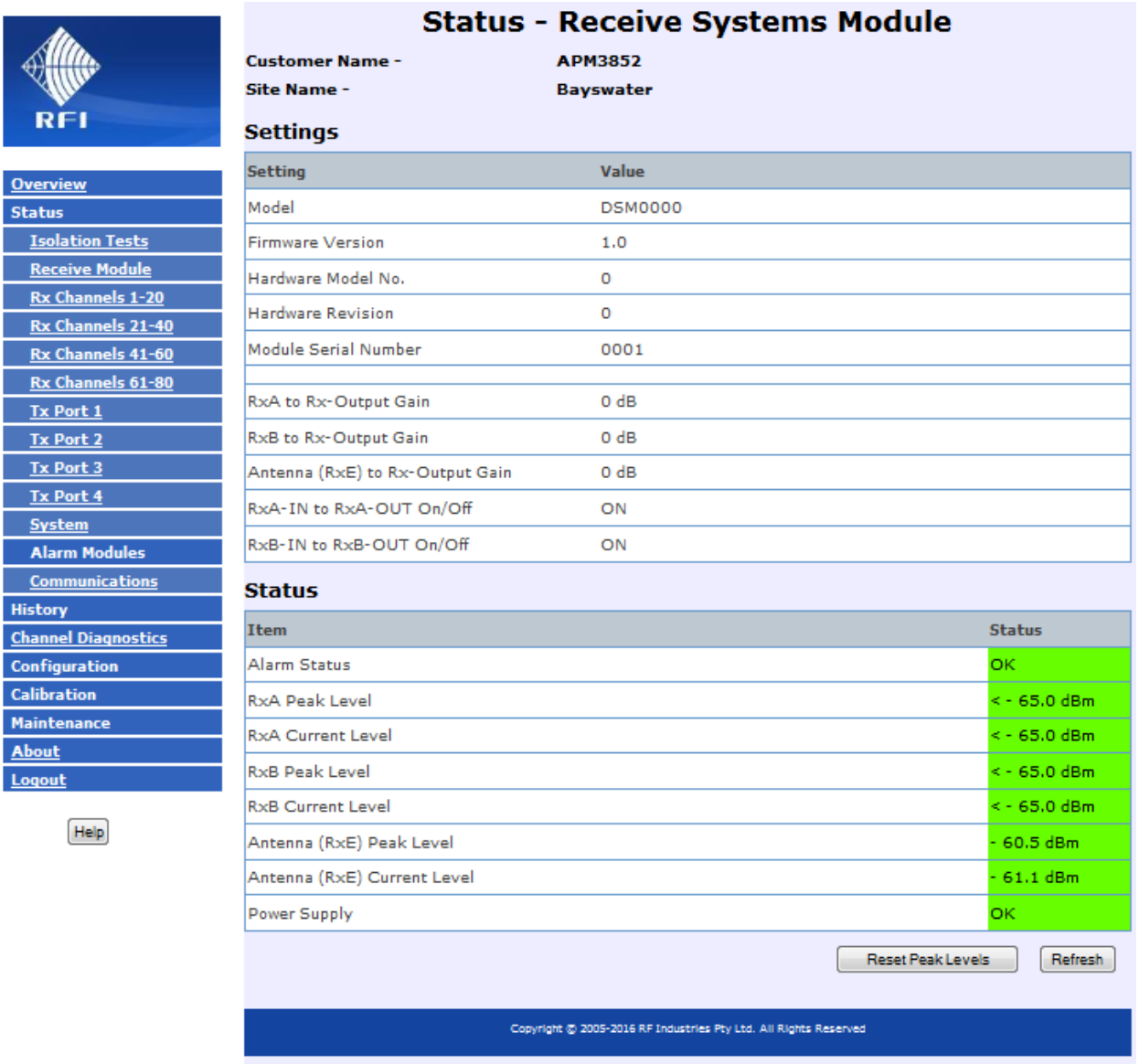
Note: During a System Isolation Test, results that have not yet been measured (i.e. because the nominated Tx frequency has not yet keyed) will be highlighted by a shaded background colour. As each test is able to be completed, and a result recorded, that measurement's value will change to having a solid 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 ASM's measurement sensitivity, '???' will be displayed in lieu of a value.



When a Receive Systems Module (RSM) is fitted to the ASM, 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



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 ASM.

RxB to Rx-Output Gain:

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

Antenna RxE to Rx-Output Gain:

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

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:

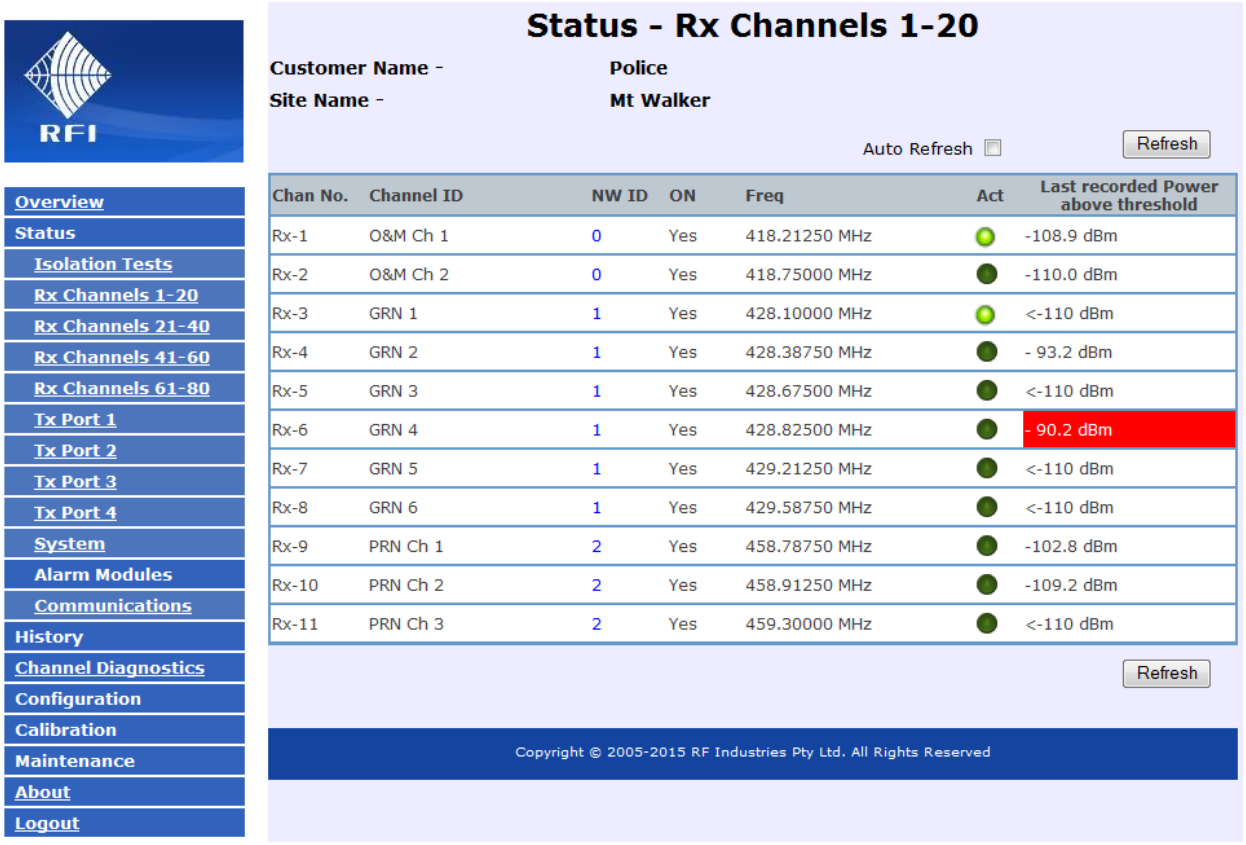
Click this button to reset the stored Peak Level value

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



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.

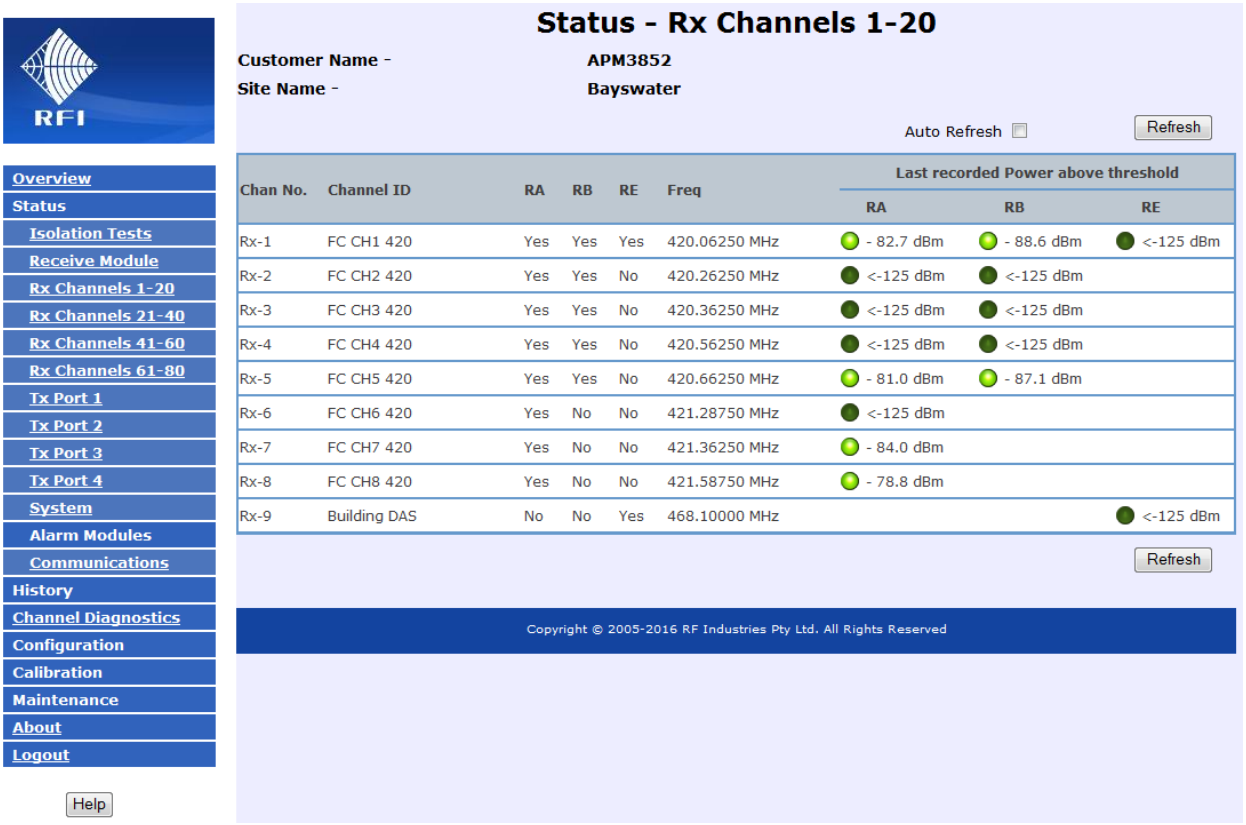
Auto Refresh:

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:

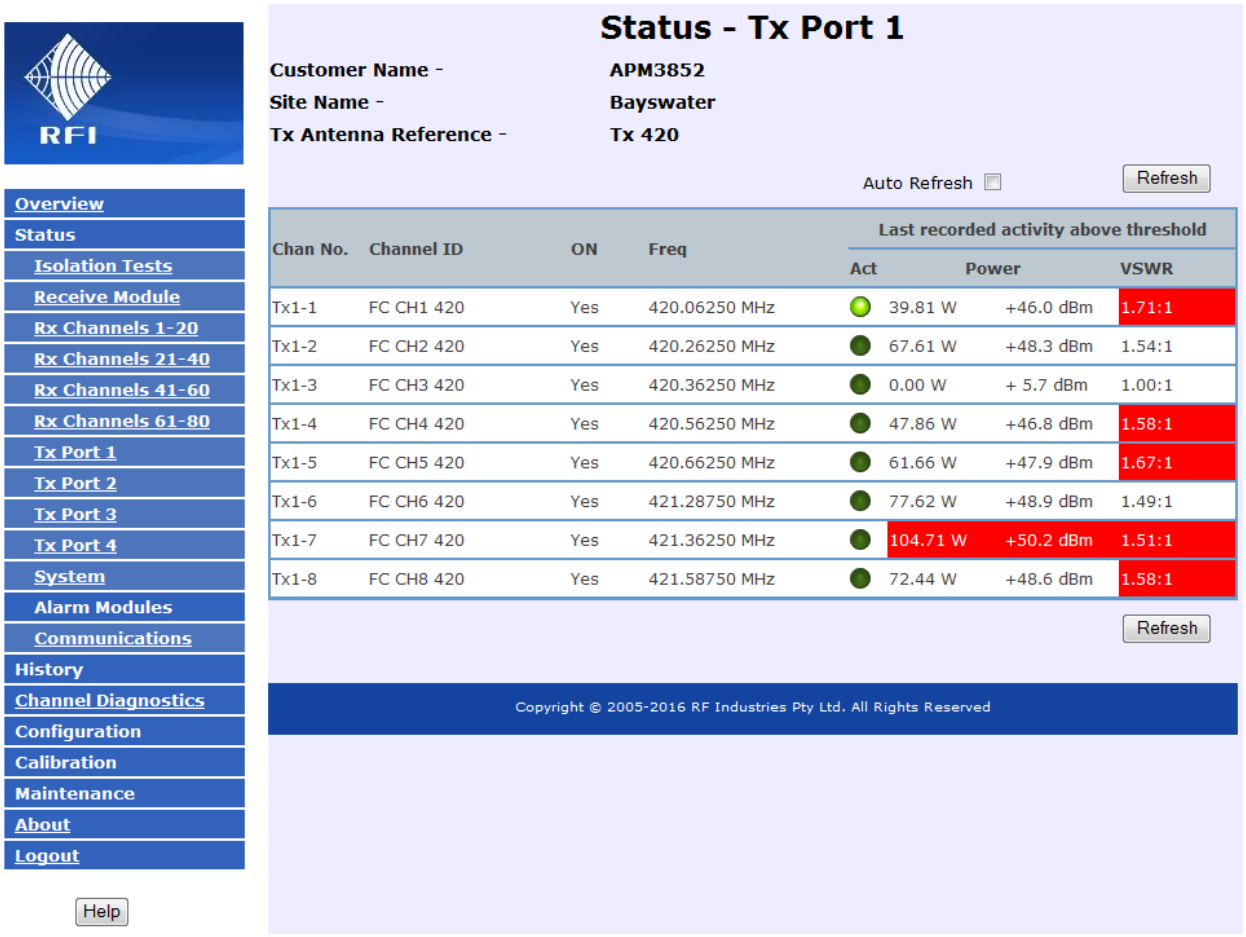
Click this button to manually trigger one measurement and status update cycle.

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



When a Receive Systems Module (RSM) is fitted to the ASM, 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



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 Channel Diagnostics 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 Channel Diagnostics 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:

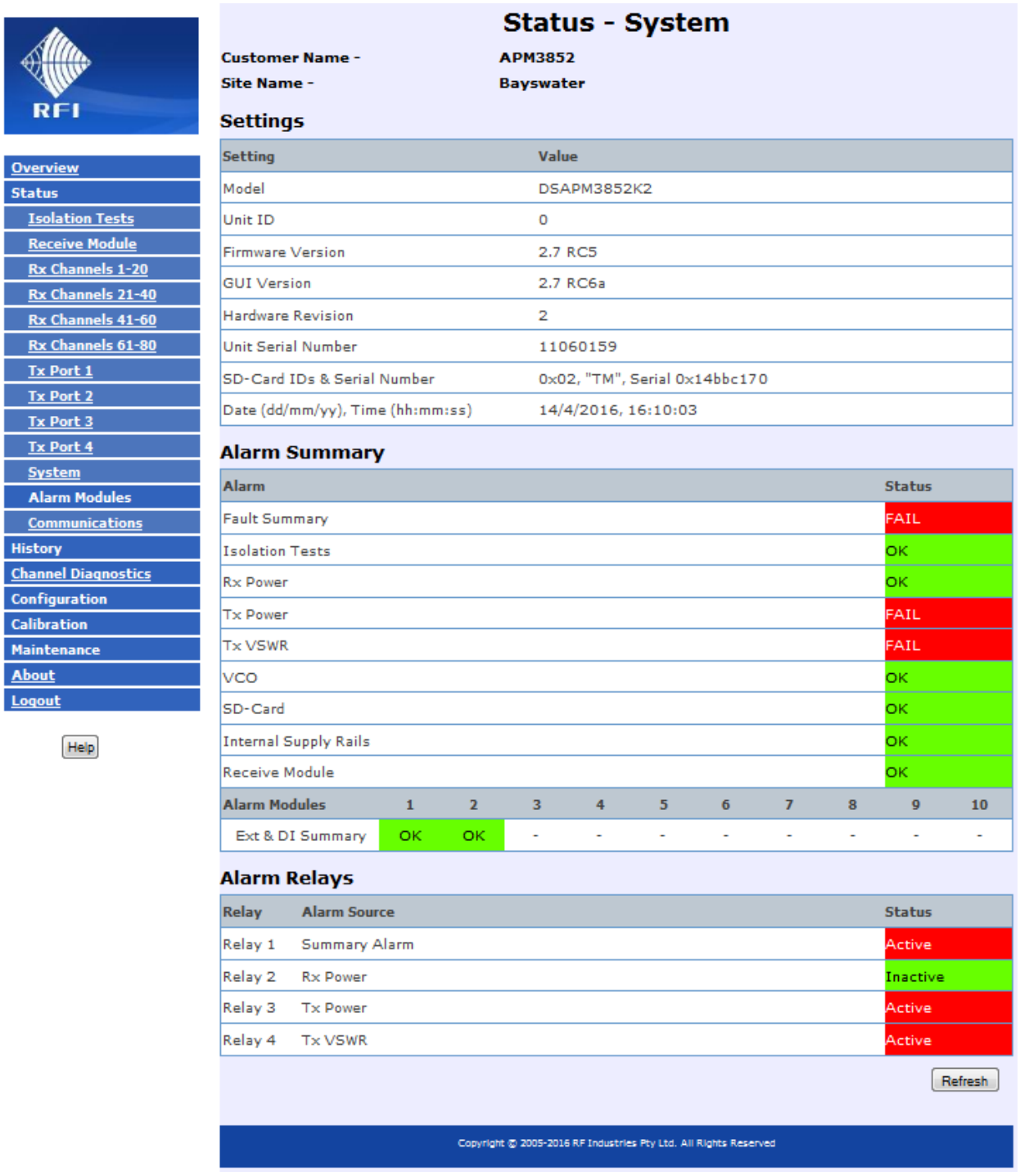
Check this box to enable continuously repeated measurement and status updates. Updates will refresh every 5 seconds. Uncheck this box to cease continuously repeated updates.

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



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 ASM 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 ASM 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 ASM 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 ASM 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:

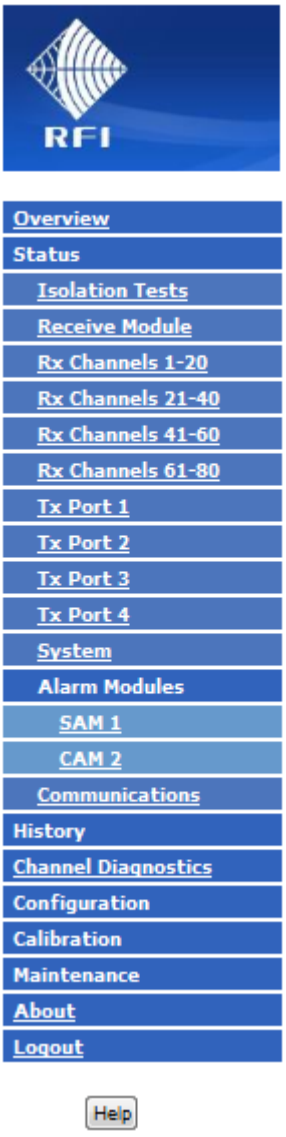
Displays the Alarm Source currently allocated to this relay output, and its status.

Refresh:

Reloads the page, updating the status information.

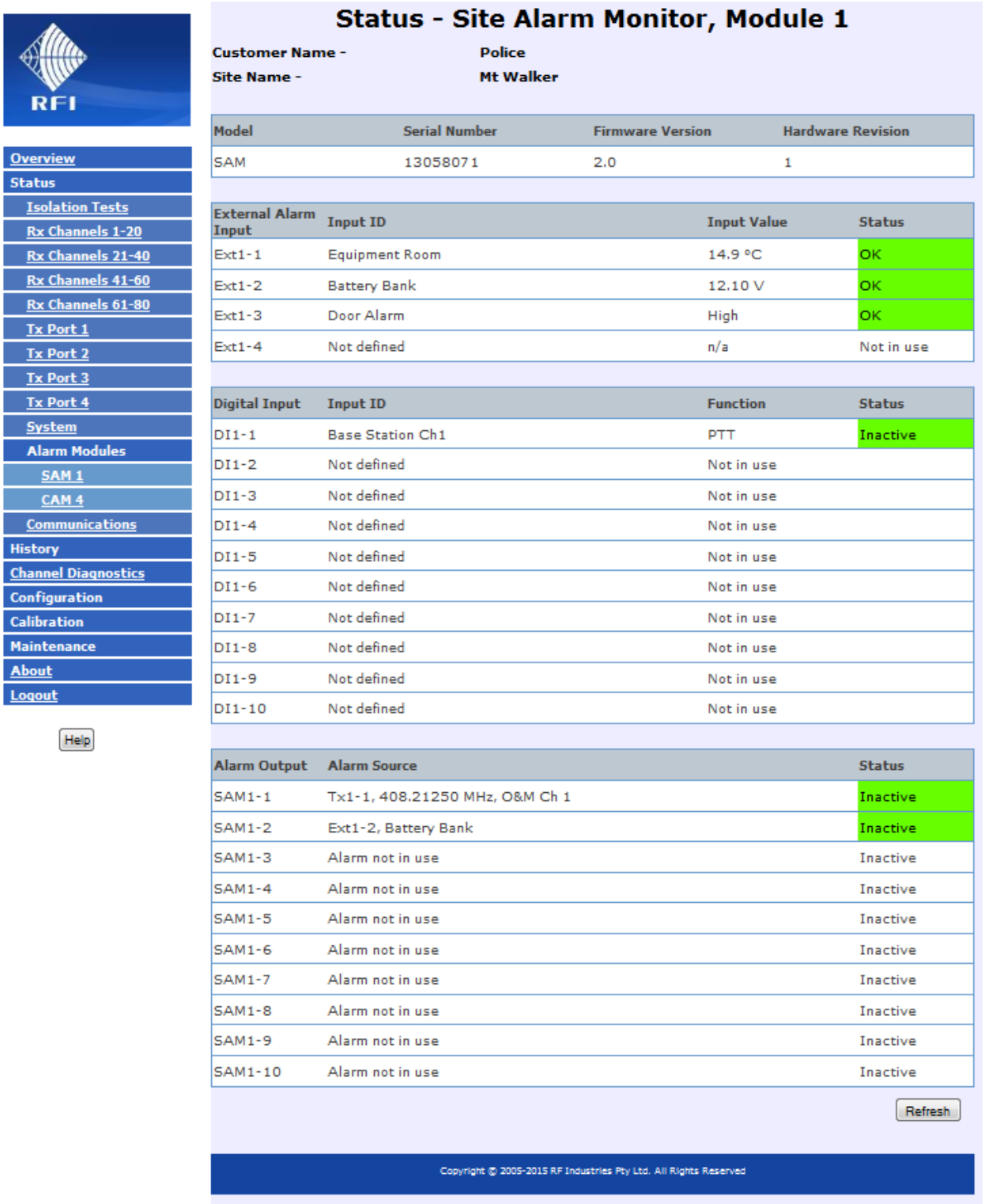
Note: The field behind an alarm is highlighted in colour to indicate its current status.
Green denotes 'no alarm', and Red denotes 'alarm'.

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 ASM as required.

10.11 Status – Alarm Modules - SAM



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.

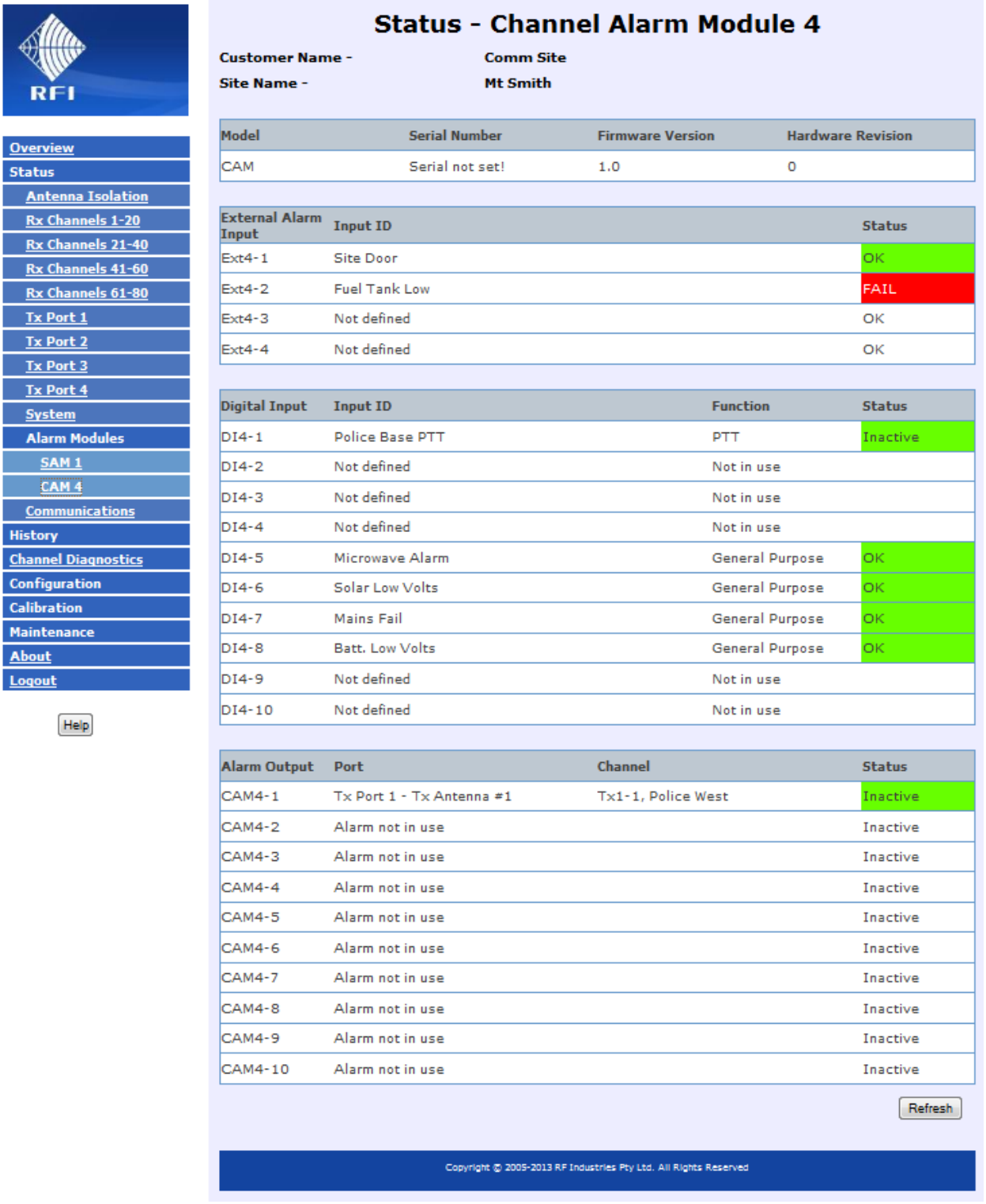
Refresh:

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 ASM as required.

10.12 Status – Alarm Modules - CAM



RFI

- Overview
- Status
  - Antenna Isolation
  - 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
  - Alarm Modules
    - SAM 1
    - CAM 4
  - Communications
- History
- Channel Diagnostics
- Configuration
- Calibration
- Maintenance
- About
- Logout

Help

Status - Channel Alarm Module 4

Customer Name - **Comm Site**

Site Name - **Mt Smith**

Model	Serial Number	Firmware Version	Hardware Revision
CAM	Serial not set!	1.0	0

External Alarm Input	Input ID	Status
Ext4-1	Site Door	OK
Ext4-2	Fuel Tank Low	FAIL
Ext4-3	Not defined	OK
Ext4-4	Not defined	OK

Digital Input	Input ID	Function	Status
DI4-1	Police Base PTT	PTT	Inactive
DI4-2	Not defined	Not in use	
DI4-3	Not defined	Not in use	
DI4-4	Not defined	Not in use	
DI4-5	Microwave Alarm	General Purpose	OK
DI4-6	Solar Low Volts	General Purpose	OK
DI4-7	Mains Fail	General Purpose	OK
DI4-8	Batt. Low Volts	General Purpose	OK
DI4-9	Not defined	Not in use	
DI4-10	Not defined	Not in use	

Alarm Output	Port	Channel	Status
CAM4-1	Tx Port 1 - Tx Antenna #1	Tx1-1, Police West	Inactive
CAM4-2	Alarm not in use		Inactive
CAM4-3	Alarm not in use		Inactive
CAM4-4	Alarm not in use		Inactive
CAM4-5	Alarm not in use		Inactive
CAM4-6	Alarm not in use		Inactive
CAM4-7	Alarm not in use		Inactive
CAM4-8	Alarm not in use		Inactive
CAM4-9	Alarm not in use		Inactive
CAM4-10	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.

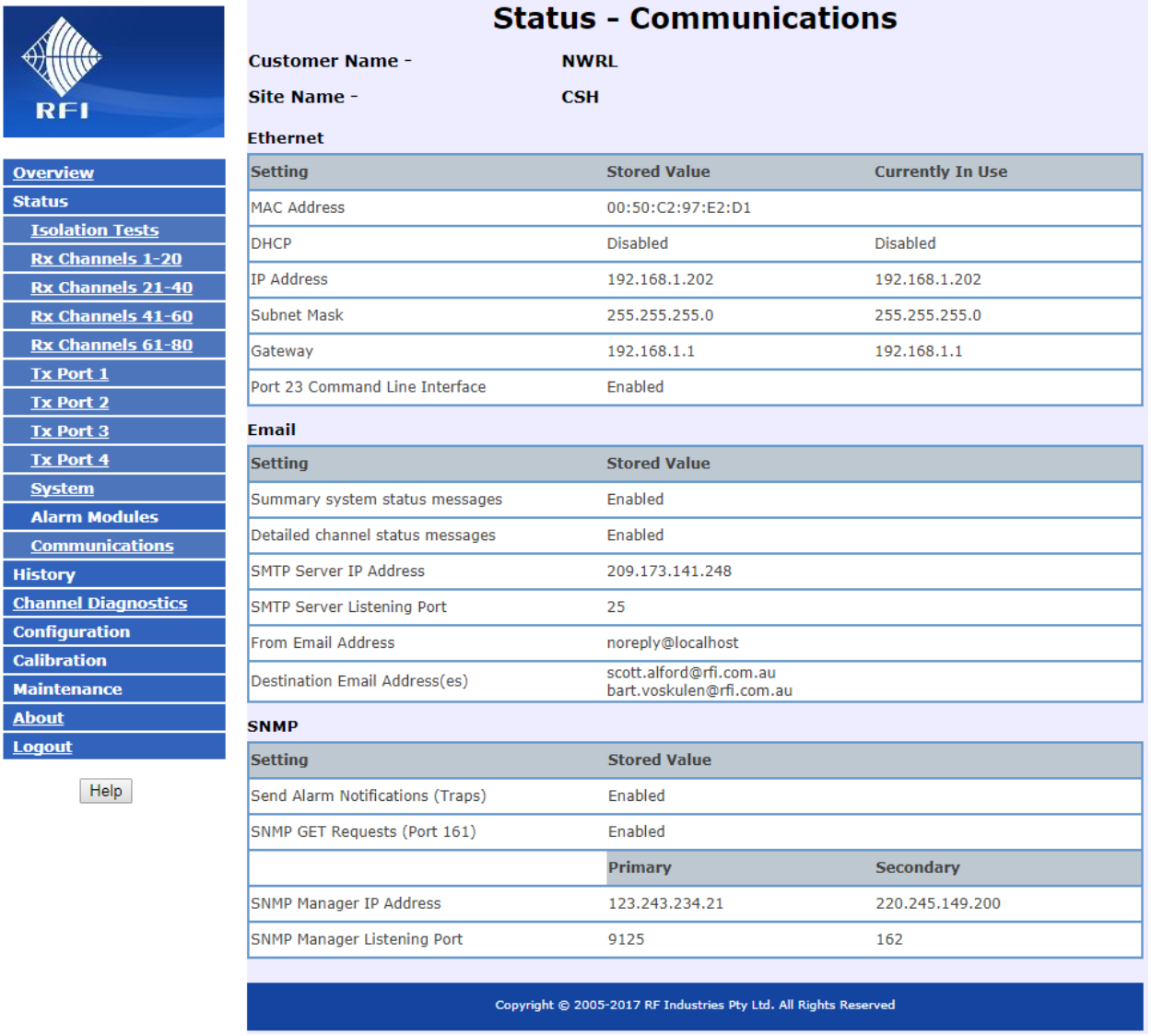
Refresh:

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 ASM as required.

10.13 Status – Communications



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:

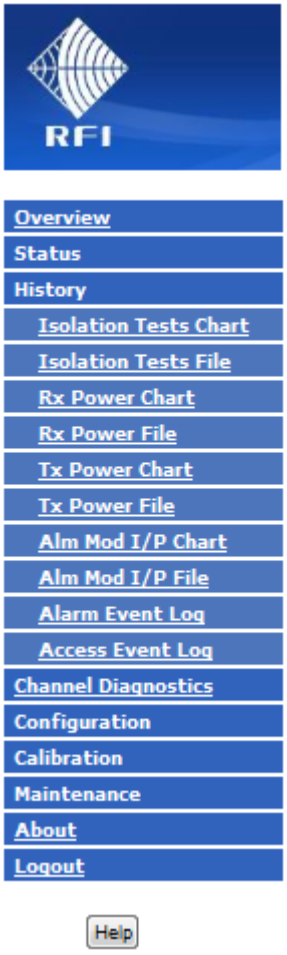
The port number used by the SNMP Manager. Both a Primary and Secondary address may be used if required for redundant SNMP server configurations.

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

10.14 History Menu

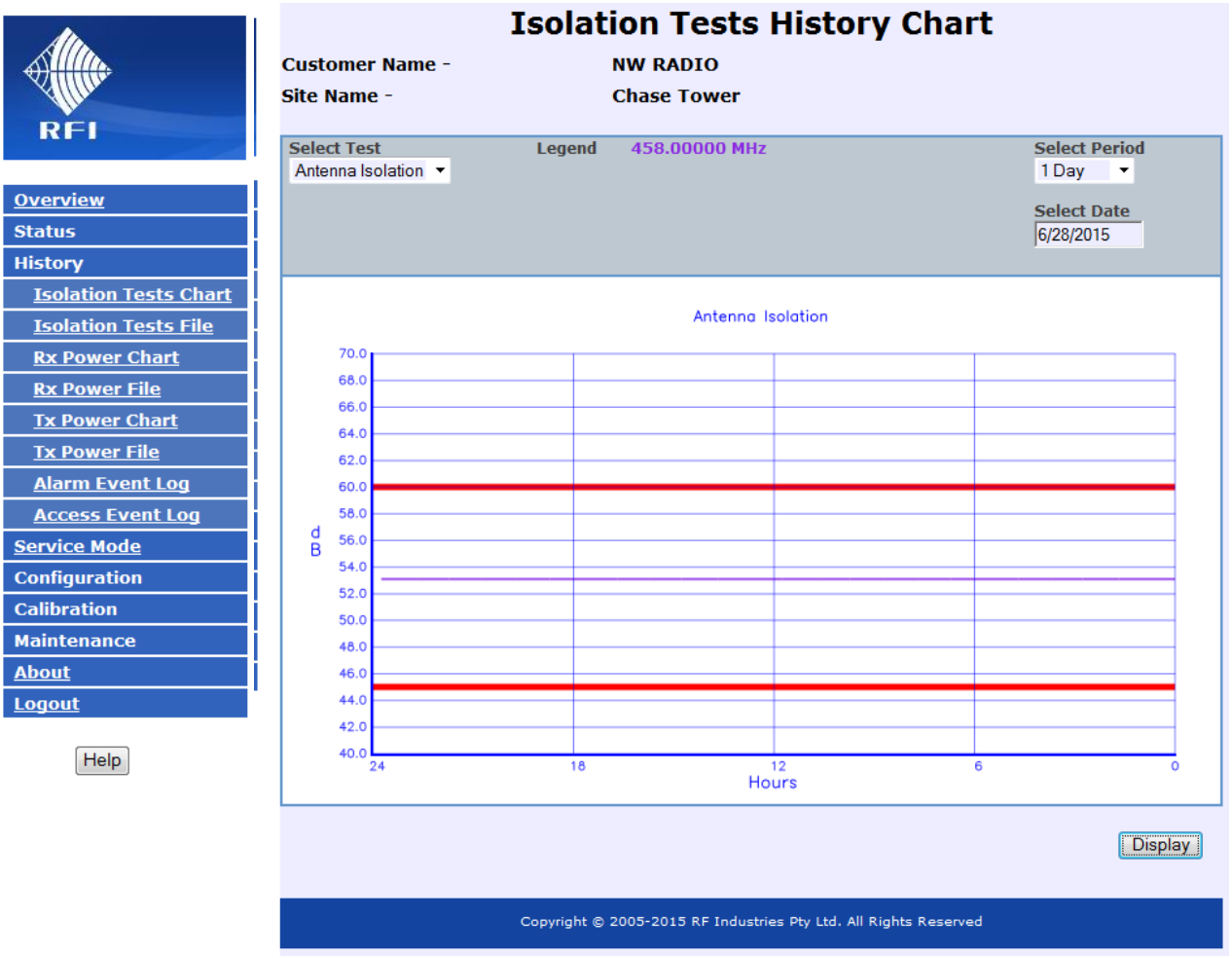
The "History" menu allows the ASMs logged data to be viewed.

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 ASM 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:

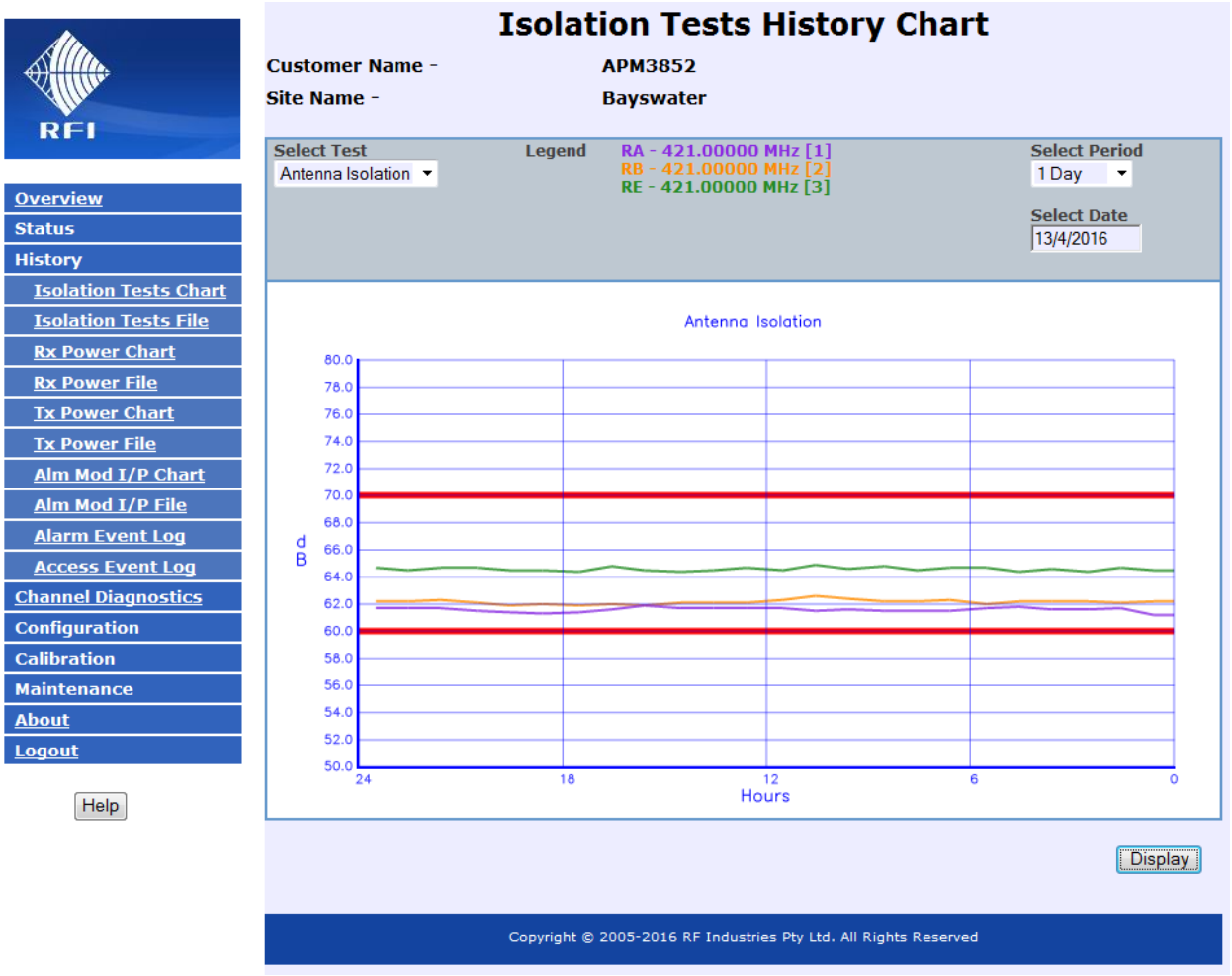
Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

Display:

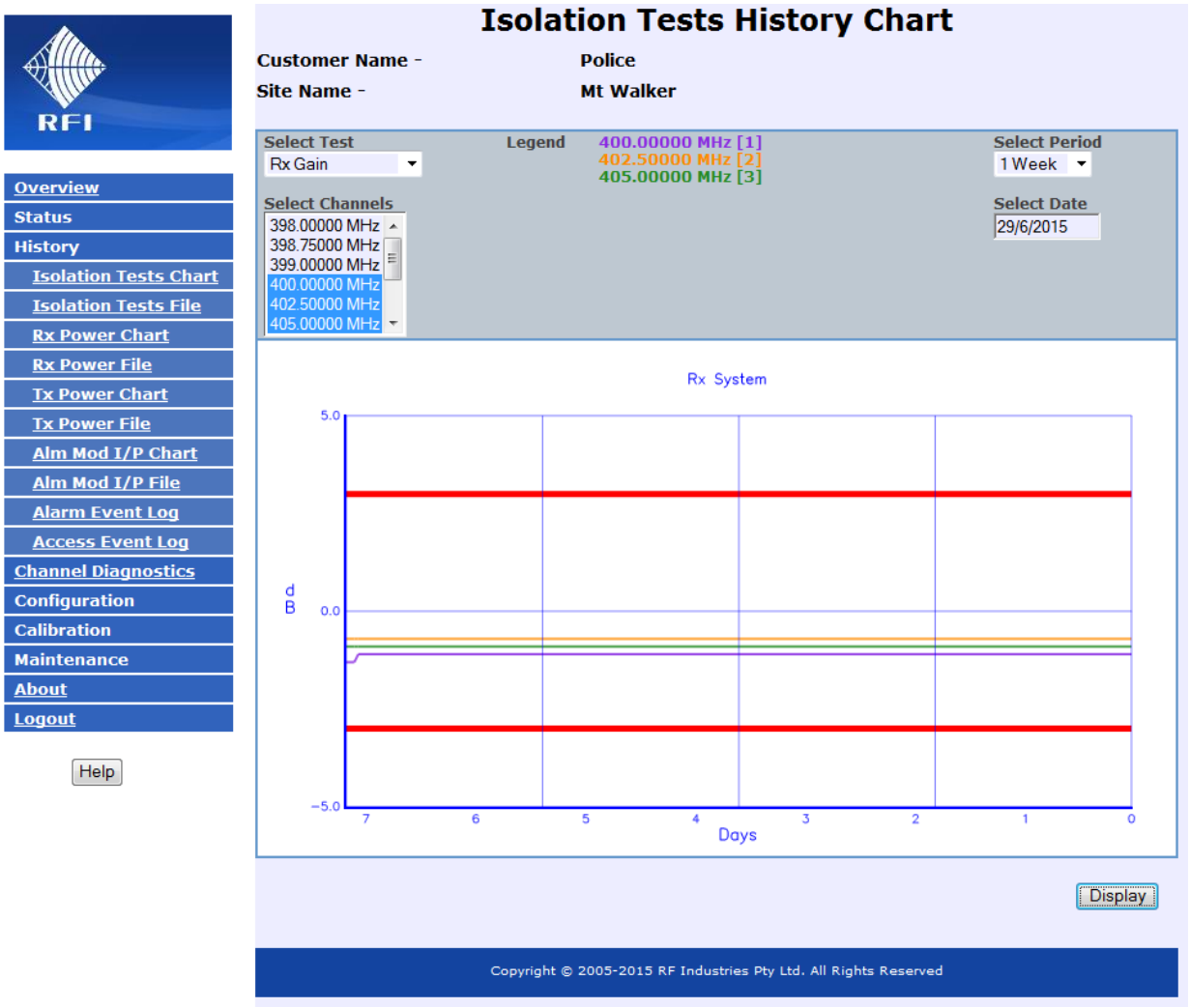
Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

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.



When a Receive Systems Module (RSM) is fitted to the ASM, 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 selected 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:

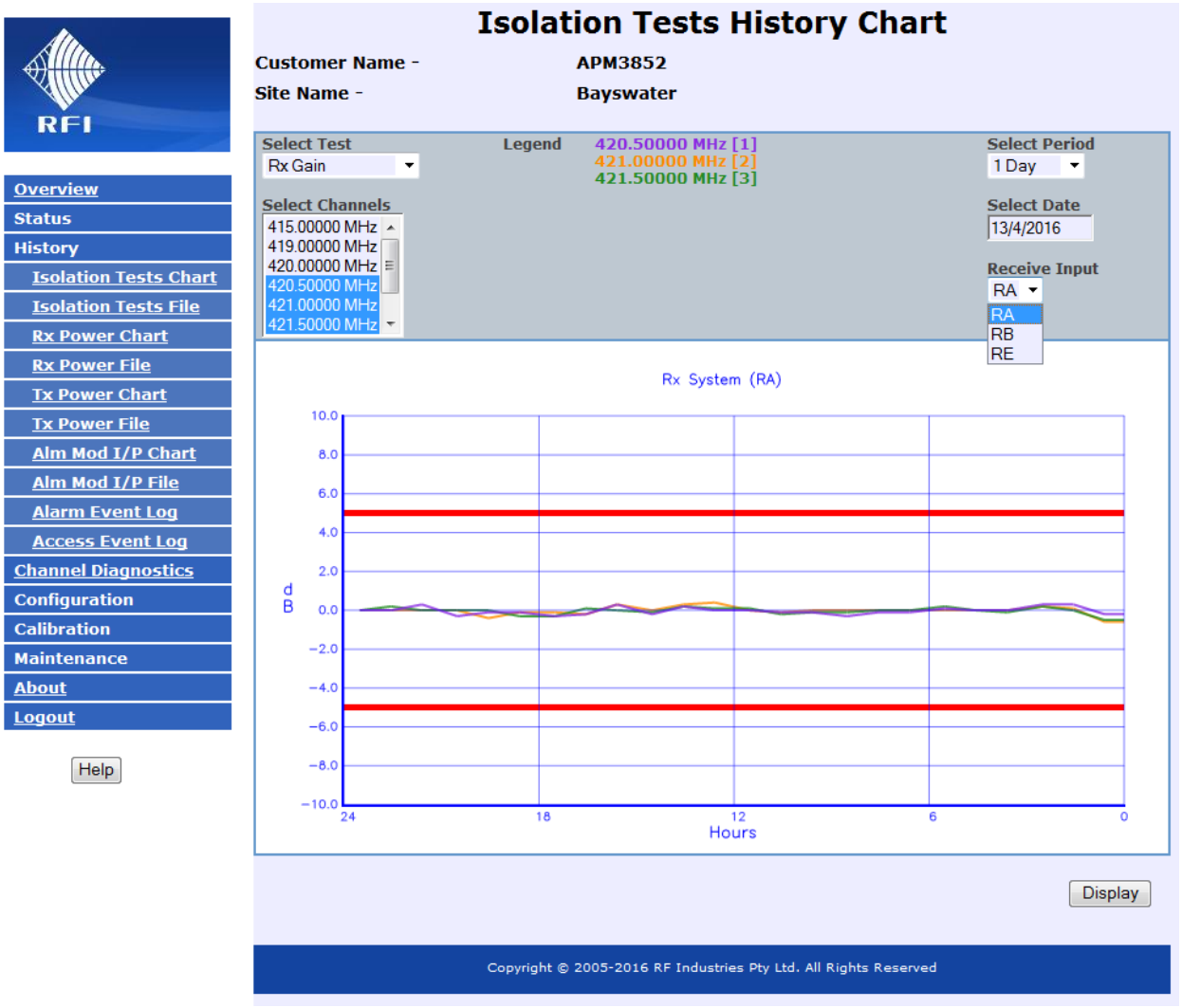
Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

Display:

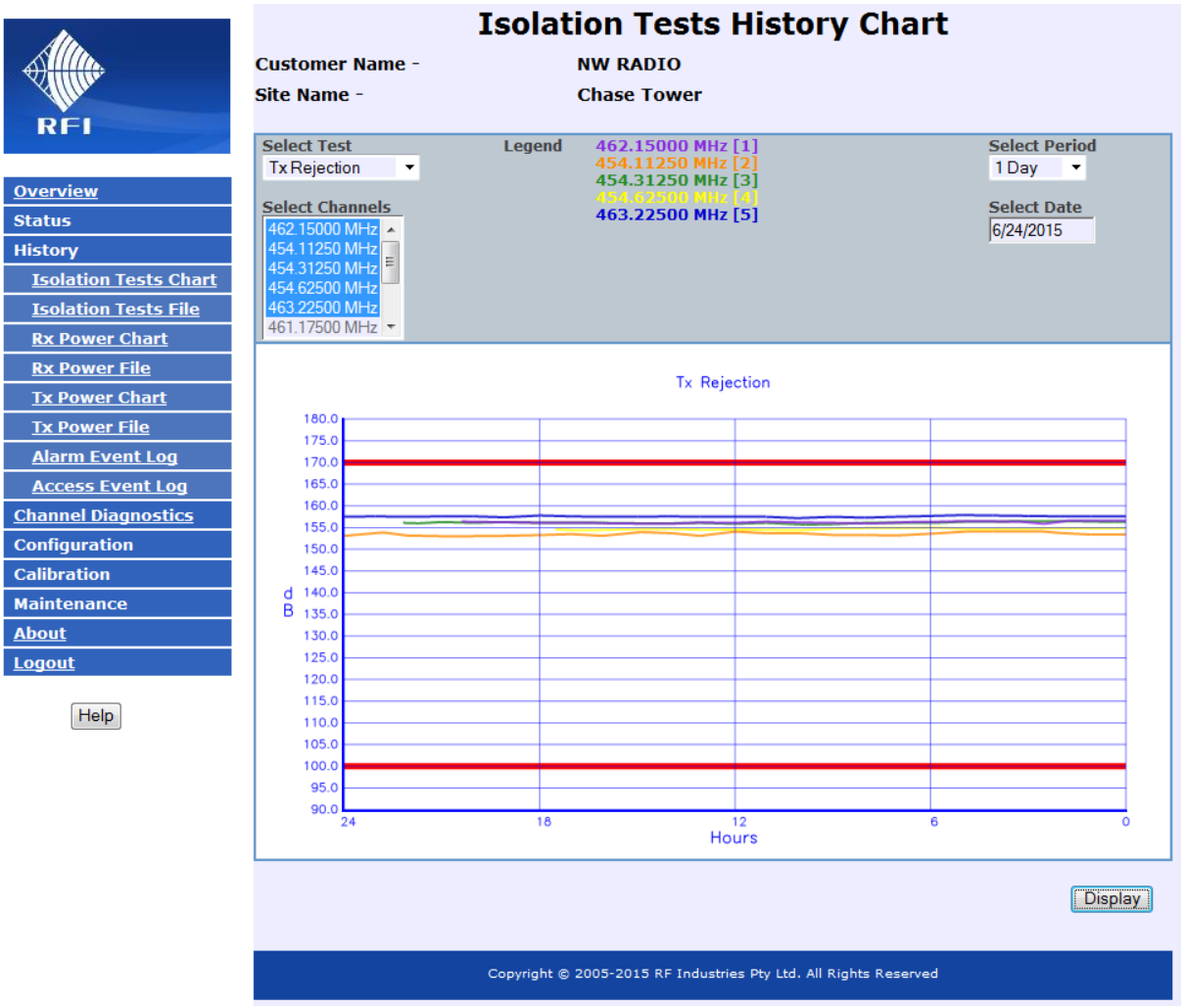
Clicking the Display button starts the collation of data that meets the selected criteria. Once the data is processed and the updated chart created, the screen will refresh. This may take a period of time depending on the number of data values that have been stored that meet the selected criteria.

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 ASM, the measured values for the three receive signal paths (RxA, RxB and RE) 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 selected 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.

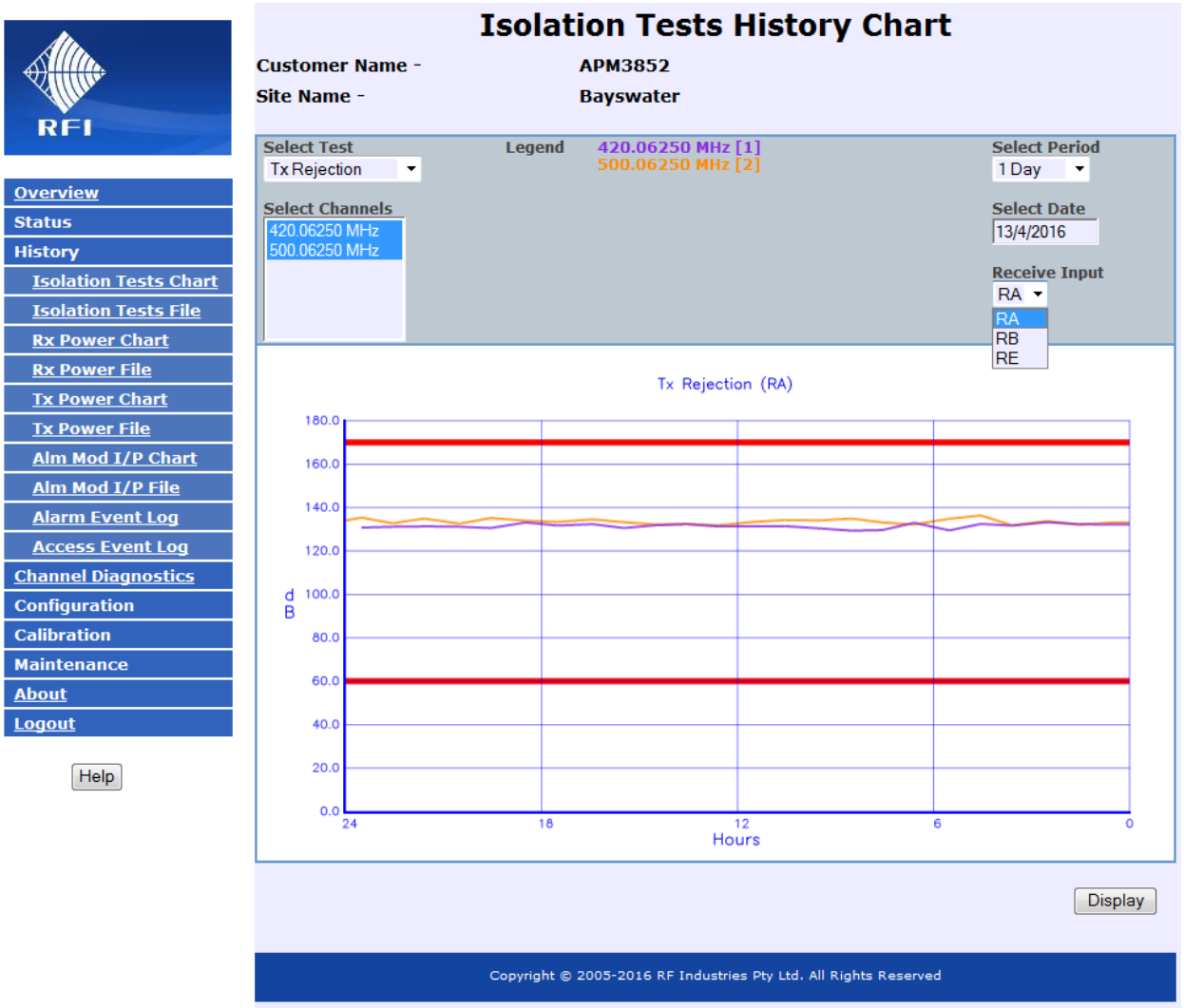
Display:

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

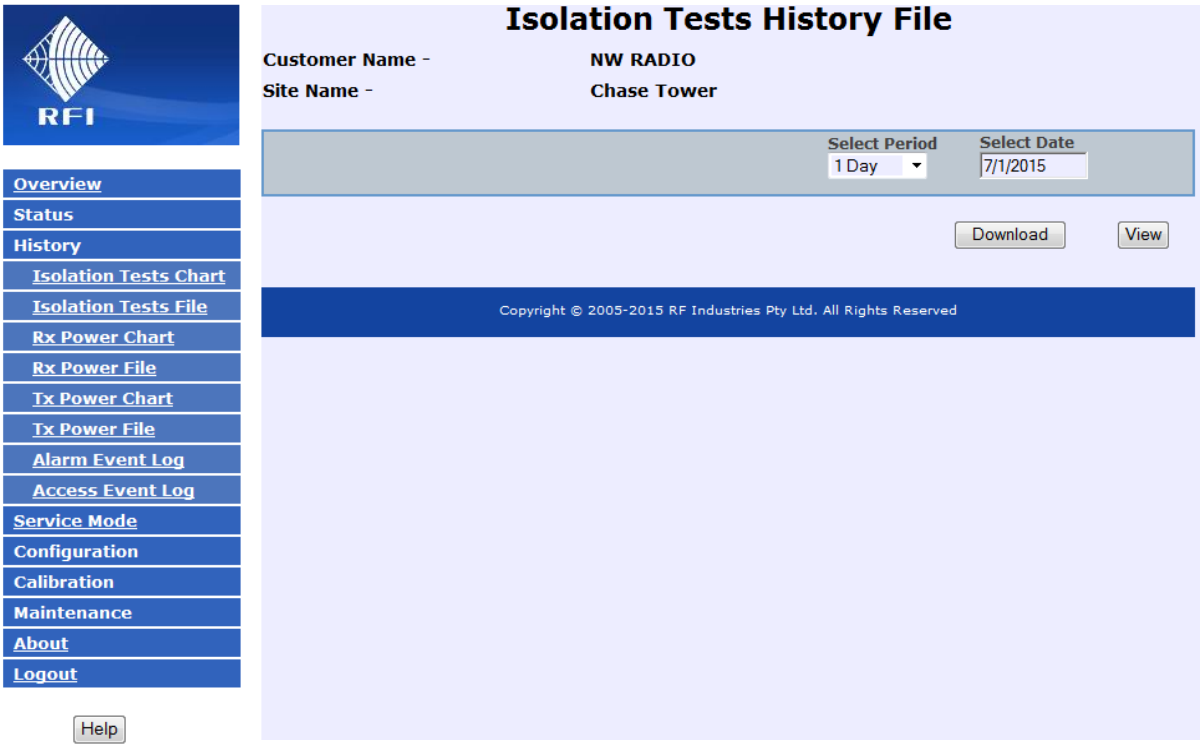
Note: The displayed lines may commence in from the left hand side of the graph. This indicates when the associated transmitter first keyed in the selected Period.

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 ASM, the measured values for the three receive signal paths (RxA, RxB and RE) may be selected in the *Isolation Tests History Chart – Tx Rejection* page.

10.16 History – Isolation Tests File



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:

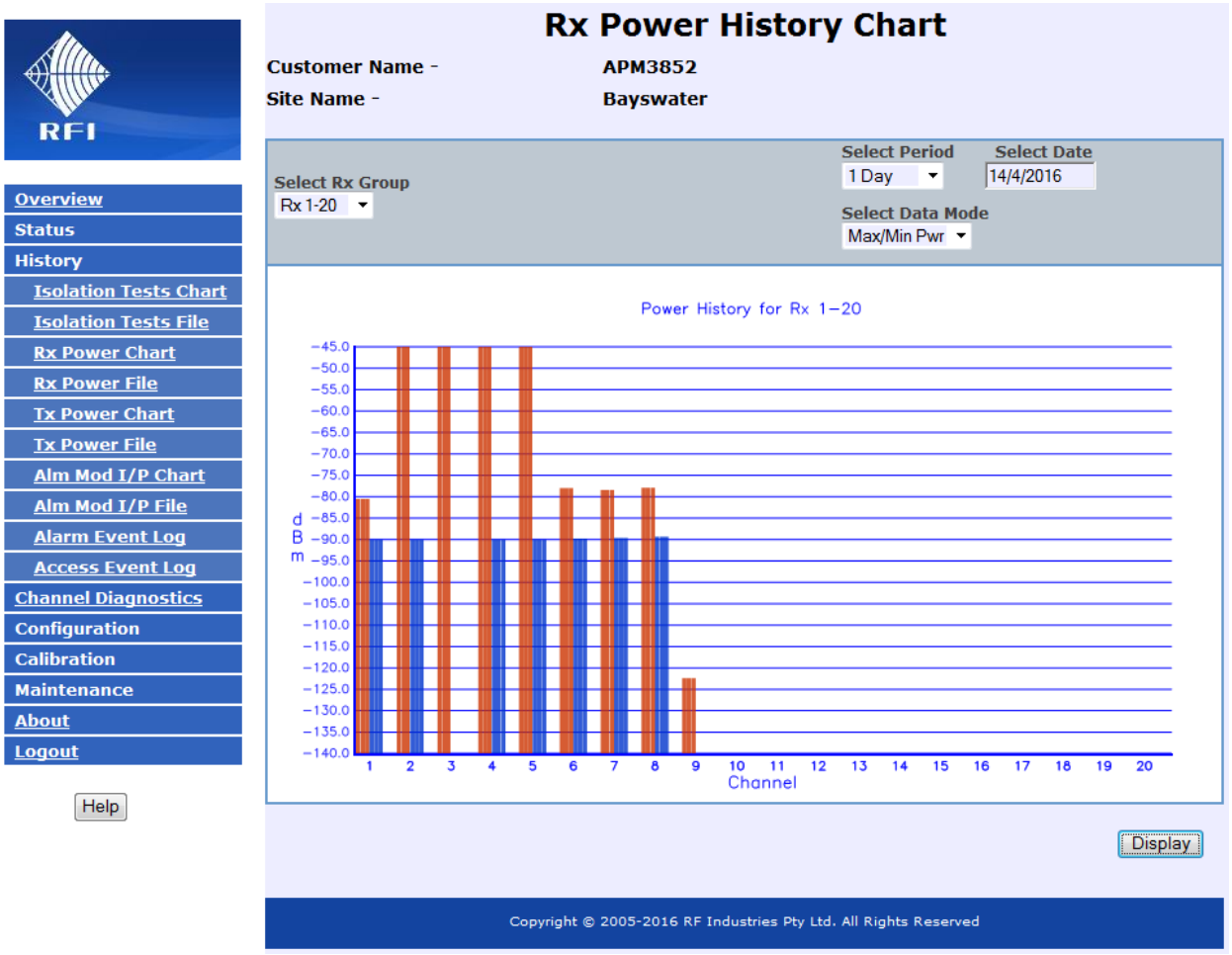
Use this button to open a "File Download" or "Save As" dialog for saving the CSV data file.

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.

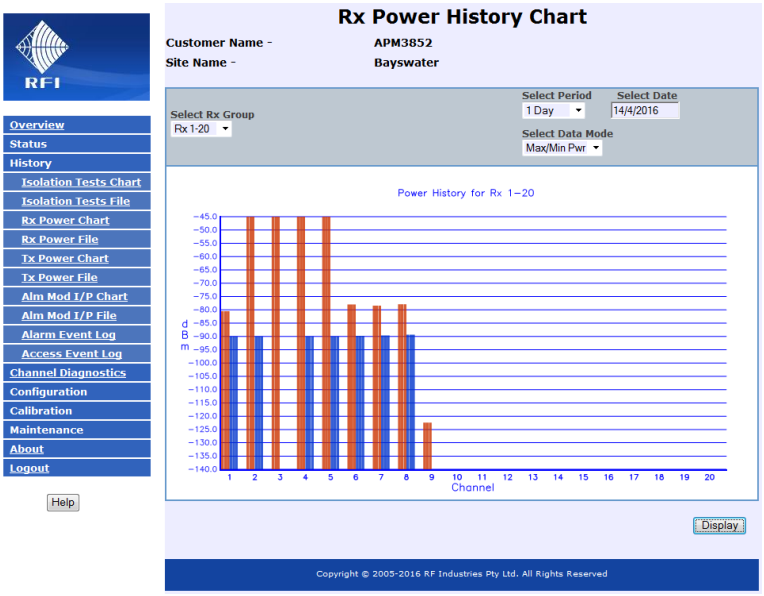
Note: During calculations, the processing of all of the recorded data to create the graph may result in delays to the display of the data. If a significant amount of data has been logged, displaying periods back in time may also result in delays while this data is retrieved from memory, processed, and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

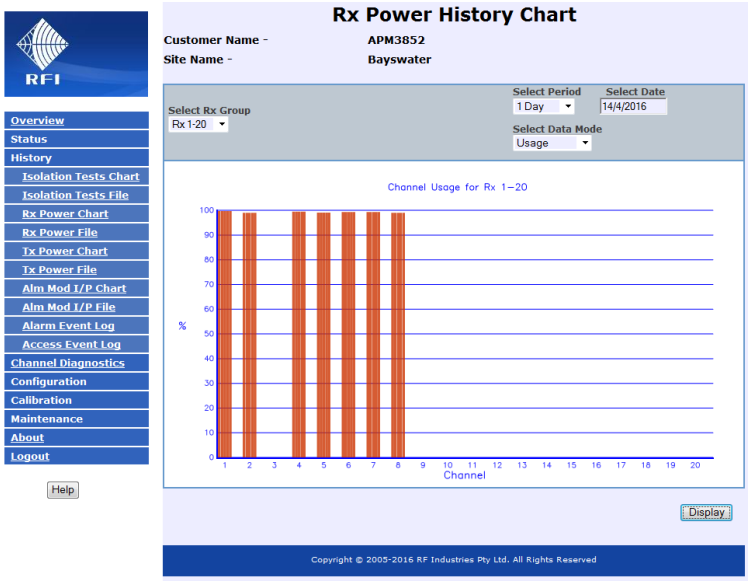


"Max/Min Pwr" Data Mode selected

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

"Usage" Data Mode selected

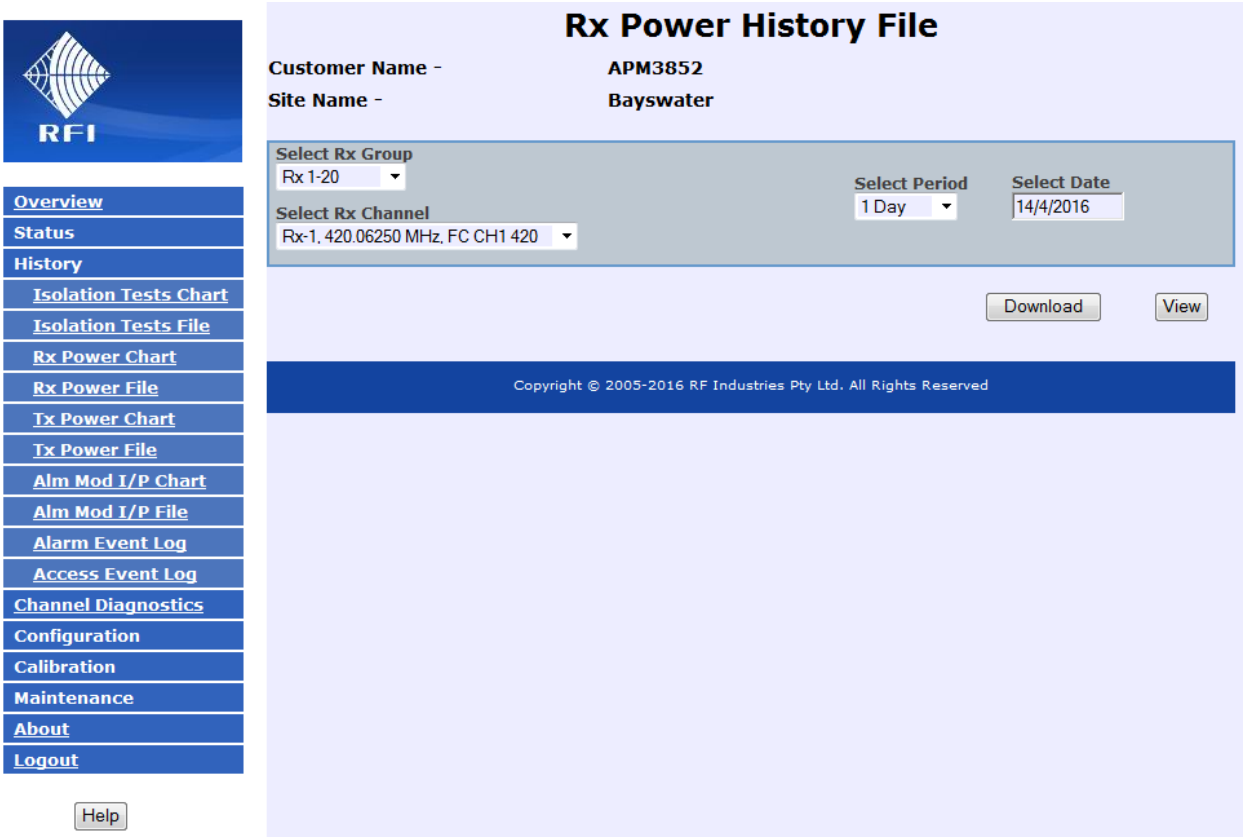
Note: When a Receive Systems Module (RSM) is fitted to the ASM, the measured values represent any presence of the three receive signal paths (RxA, RxB and RxE) for each channel.



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.

10.18 History – Rx Power File



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.

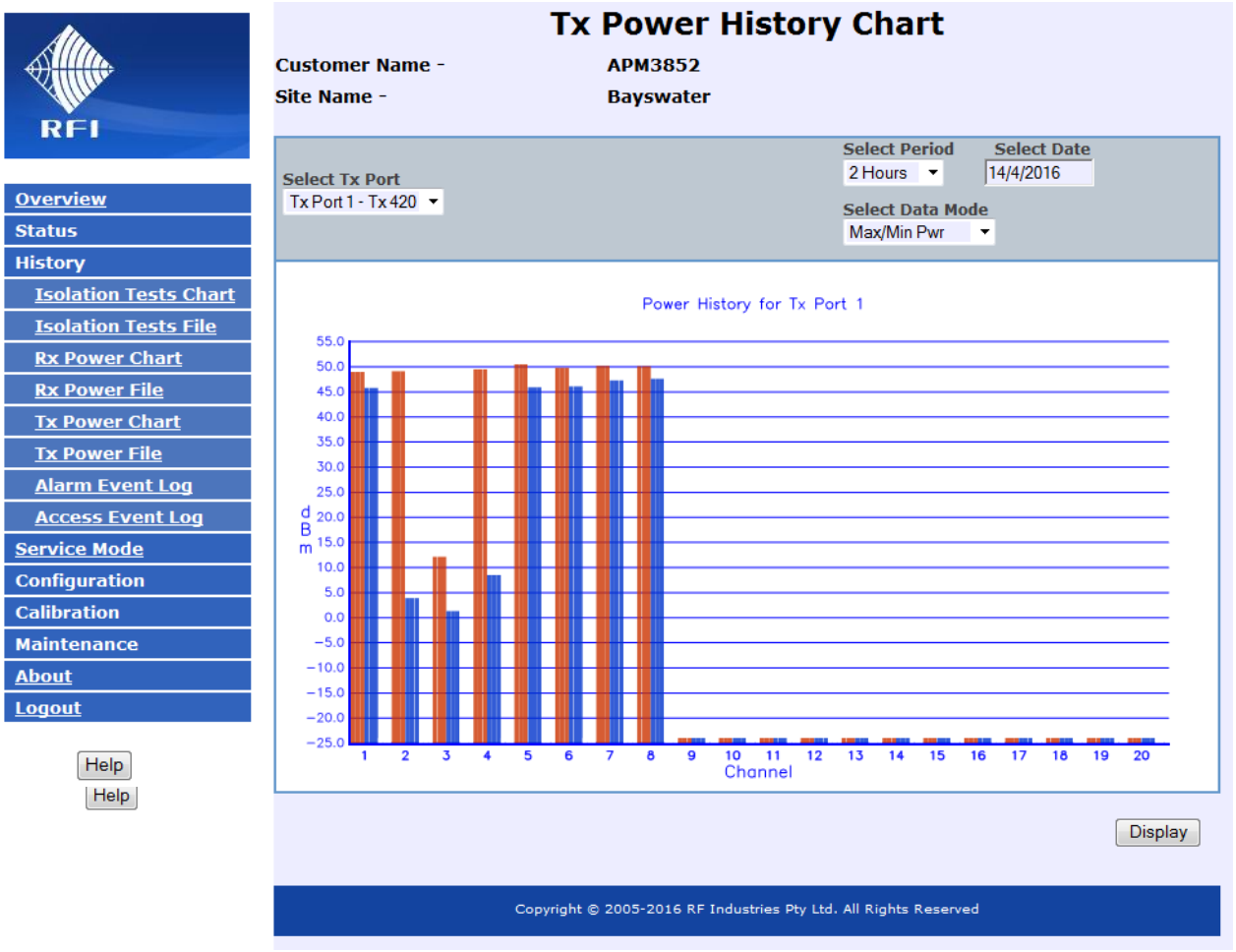
View:

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**

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 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.

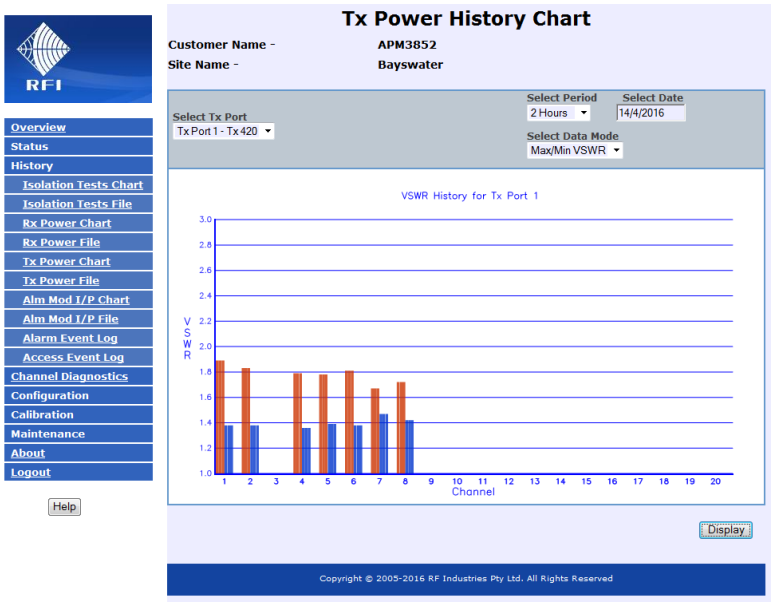
All captured level samples are included in the History File, in CSV format, which may be processed independently (i.e. using other software) if desired.

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 retrieve and then processed.

Display:

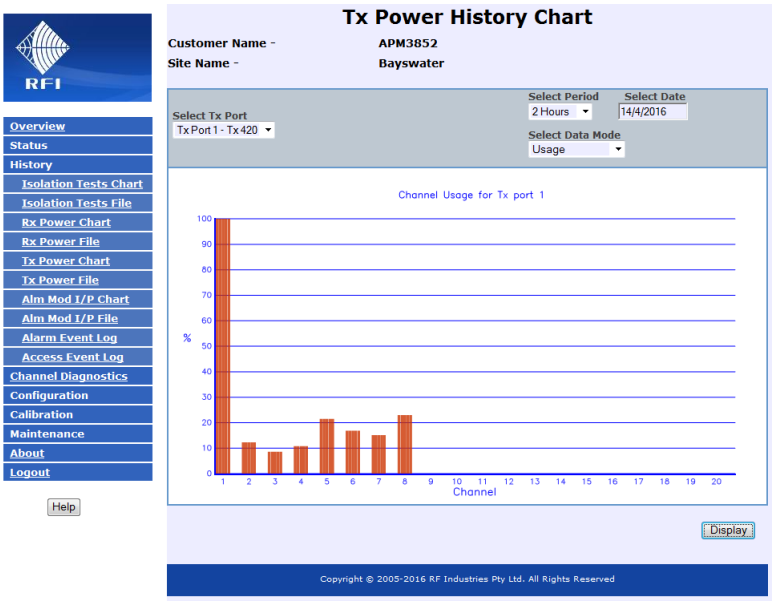
This will refresh the display using the selected settings. Some delay may be experienced while data collates.

Examples of Data Mode displays:



"Max/Min VSWR" Data Mode selected

"Usage" Data Mode Selected

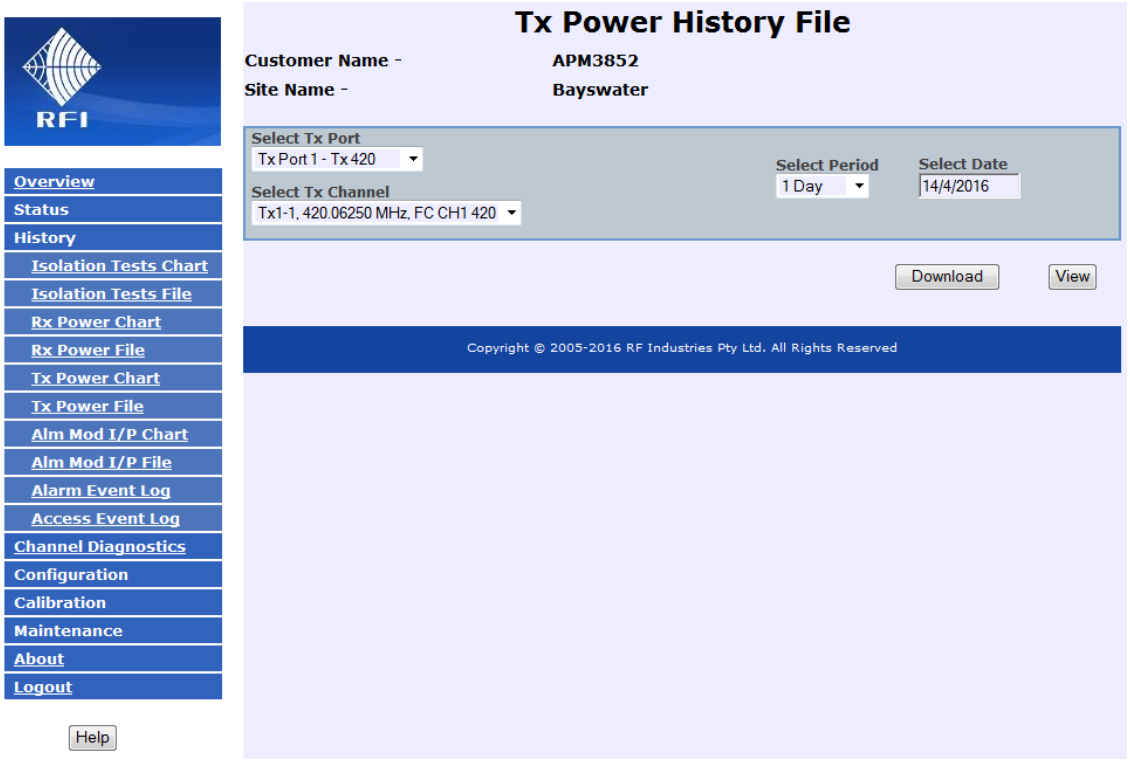


Note: Hovering the mouse cursor over the upper portion of a displayed bar in the above two charts will return the actual displayed value (refer example above).

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



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.

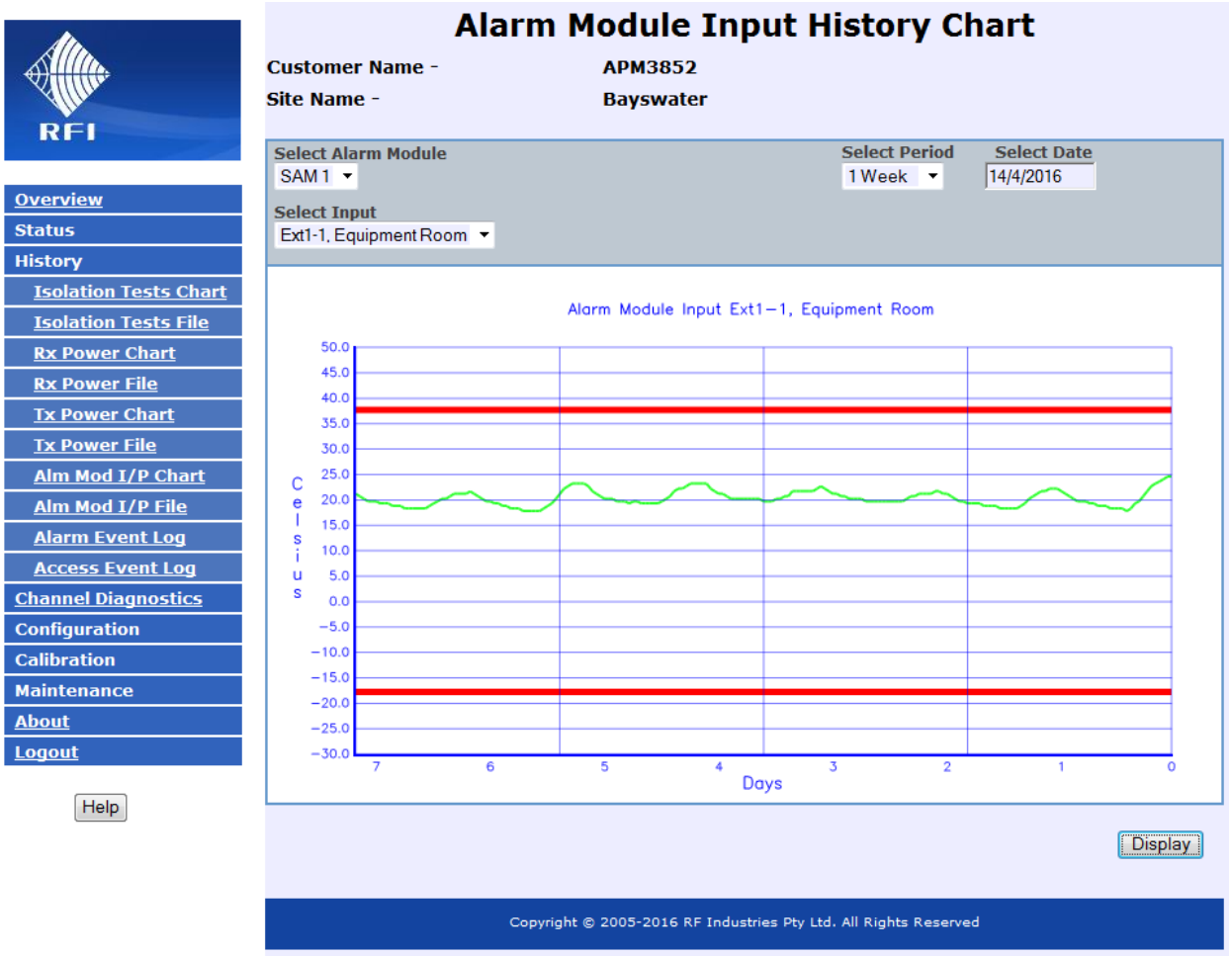
View:

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:

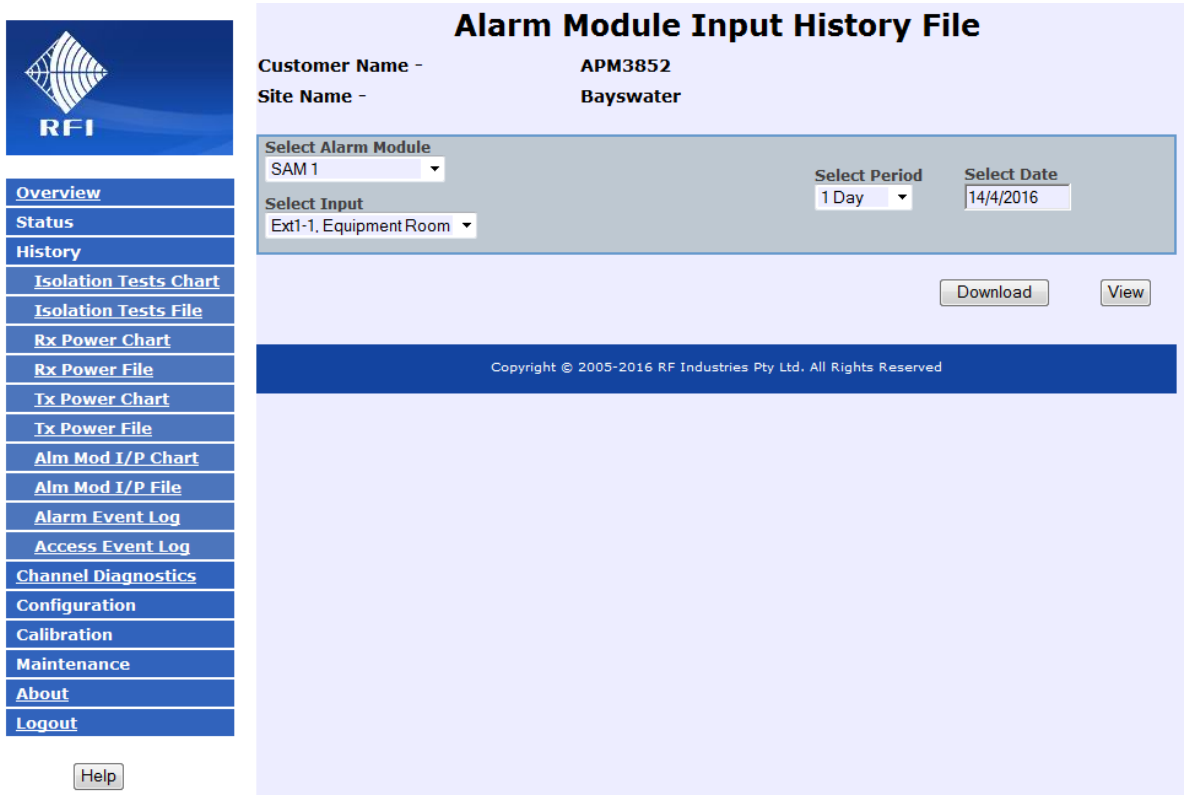
Select the past period (working back from the Select Date) for which logged data will be displayed. When the Select Date field is selected, a calendar will appear allowing a past date to be nominated as the starting day for the Period to apply up until.

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



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.

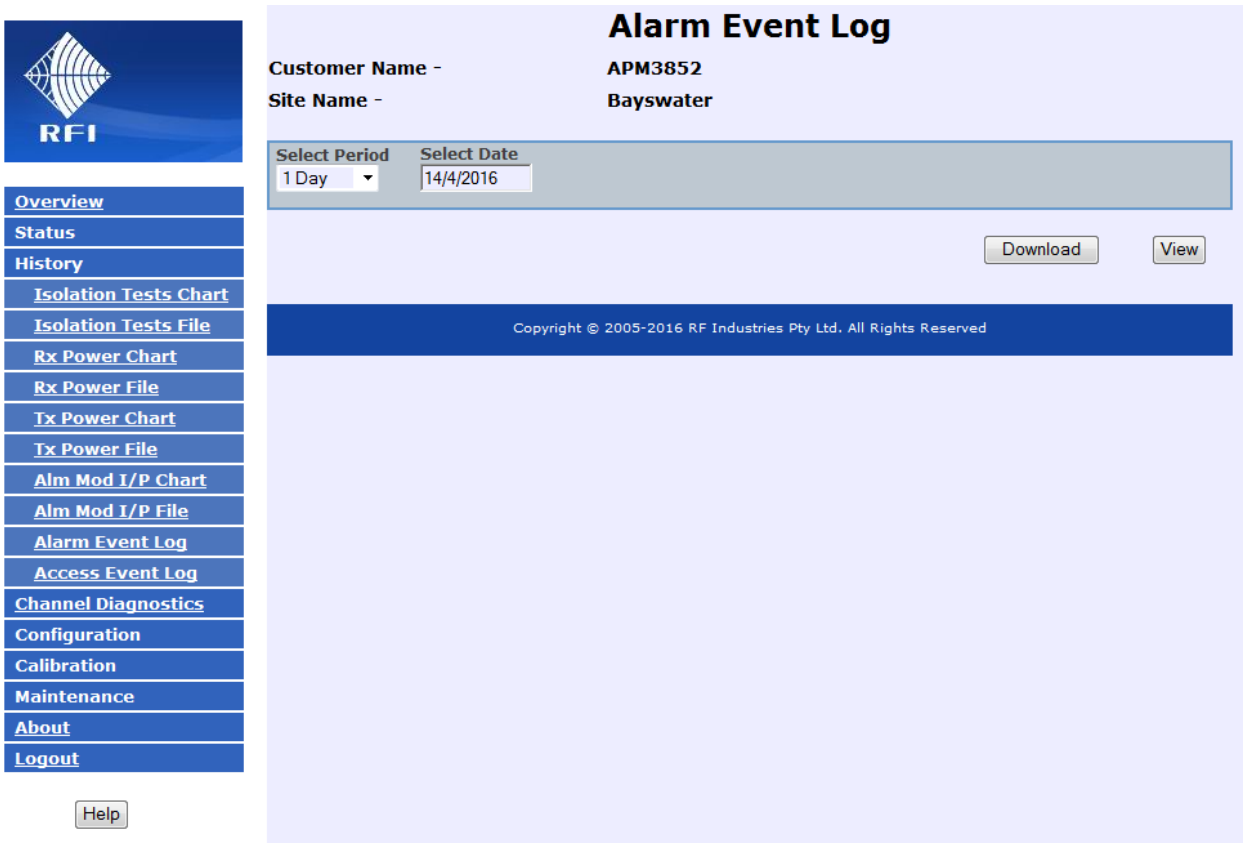
View:

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



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.

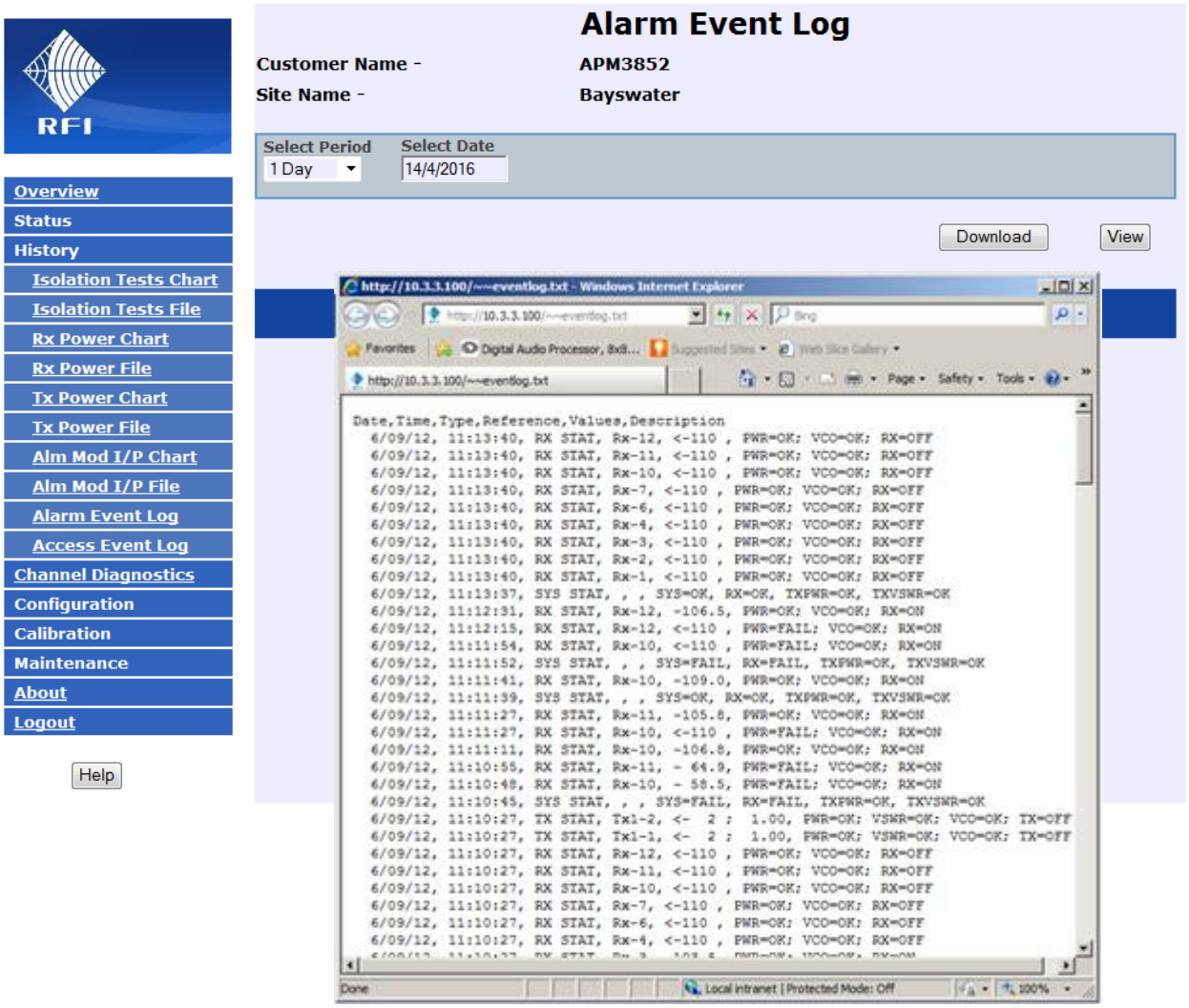
Download:

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.

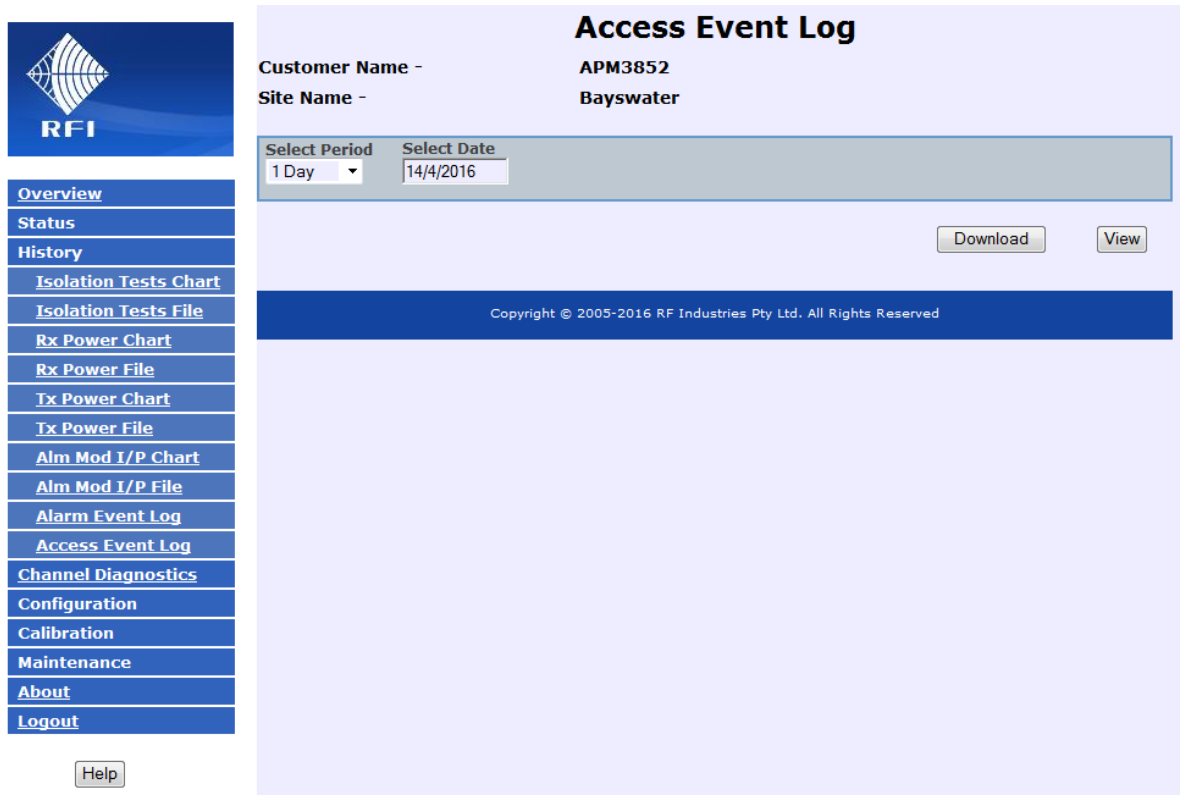
Due to the potential size of some data logs, using View is not recommended for displaying data for a lengthy selected Period.

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



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:

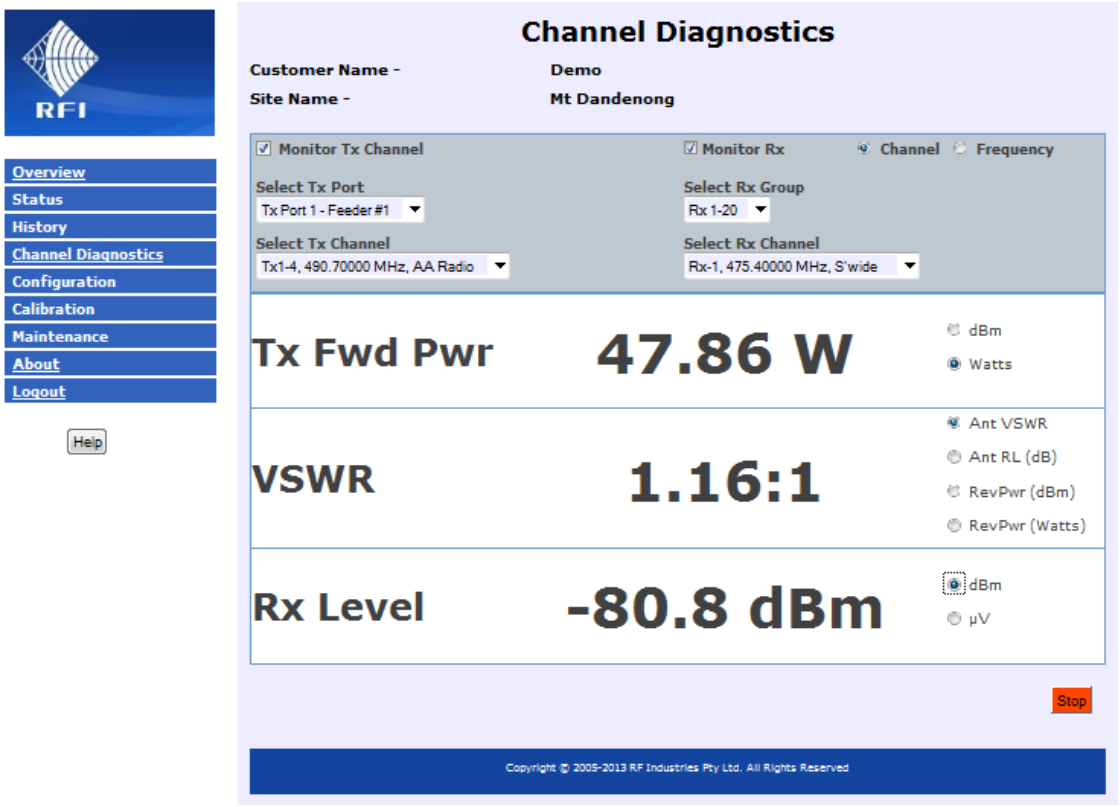
Opens a new window in which the data records will be displayed.

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 Channel Diagnostics



The Channel Diagnostics page presents a real time Tx Power and Rx Level Meter. The current Tx Power, Tx VSWR 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 Channel Diagnostics screen is only visible from the Administrator login level, it is not visible from the User login level.

Note: The Channel Diagnostics 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.

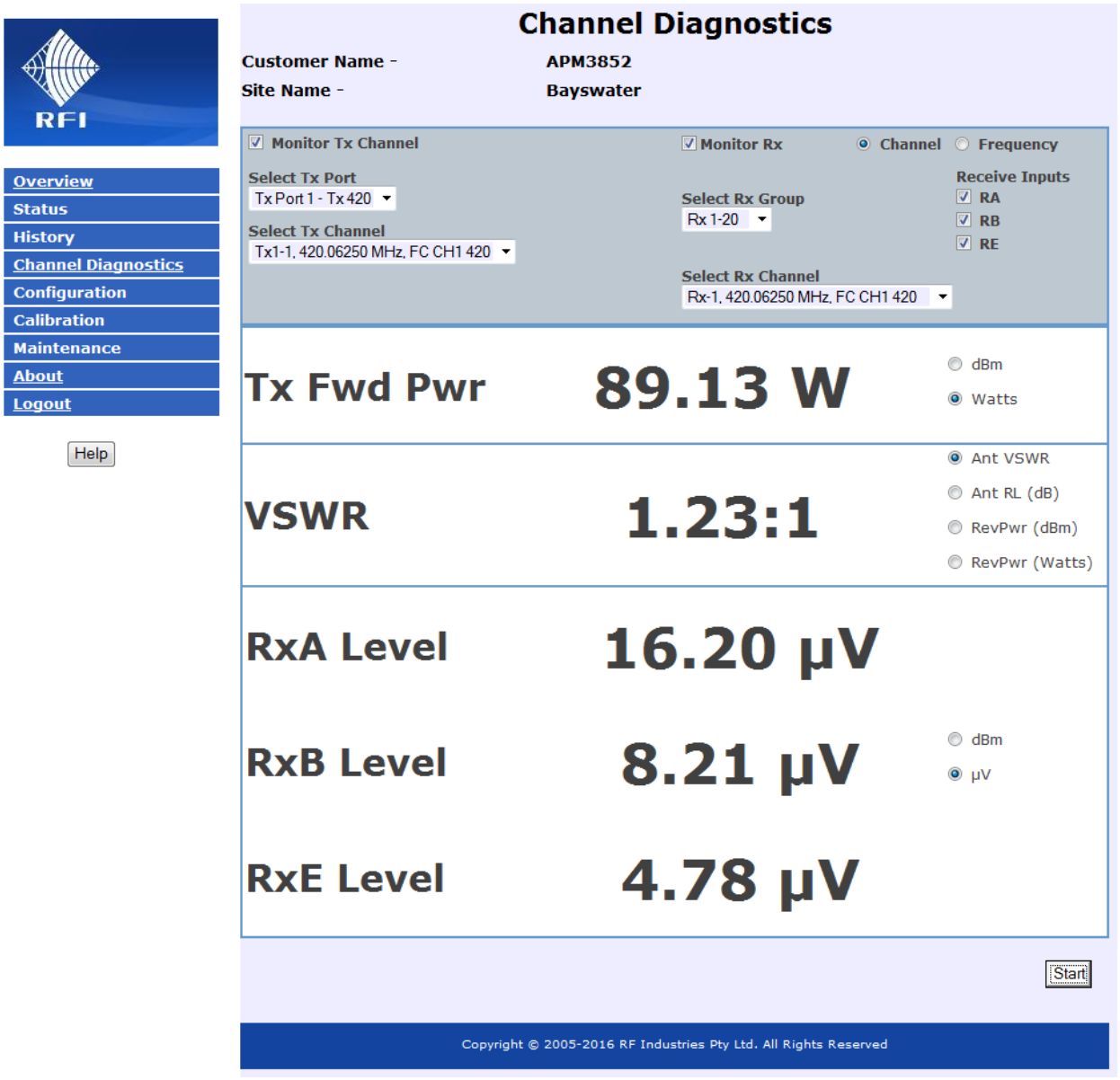
Start/Stop:

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 Channel Diagnostics 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 Channel Diagnostics screen is only visible from the Master and Administrator login levels, it is not visible from the User login level.

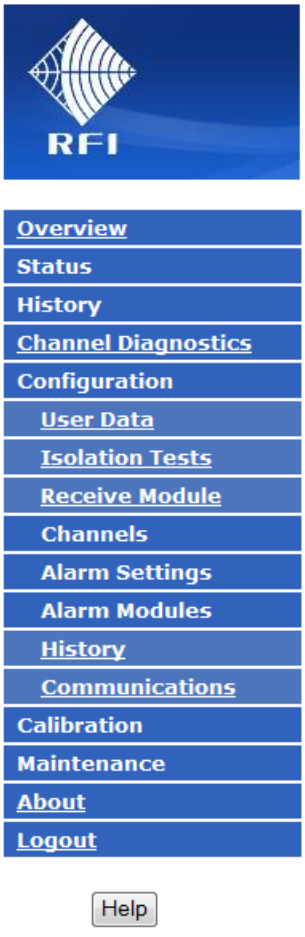


When a Receive Systems Module (RSM) is fitted to the ASM, the measured values for the three receive signal paths (RxA, RxB and RxE) are selectable and may be viewed in the *Channel Diagnostics* page.

10.26 Configuration Menu

The "Configuration" menu allows all of the ASMs configurable parameters to be programmed.

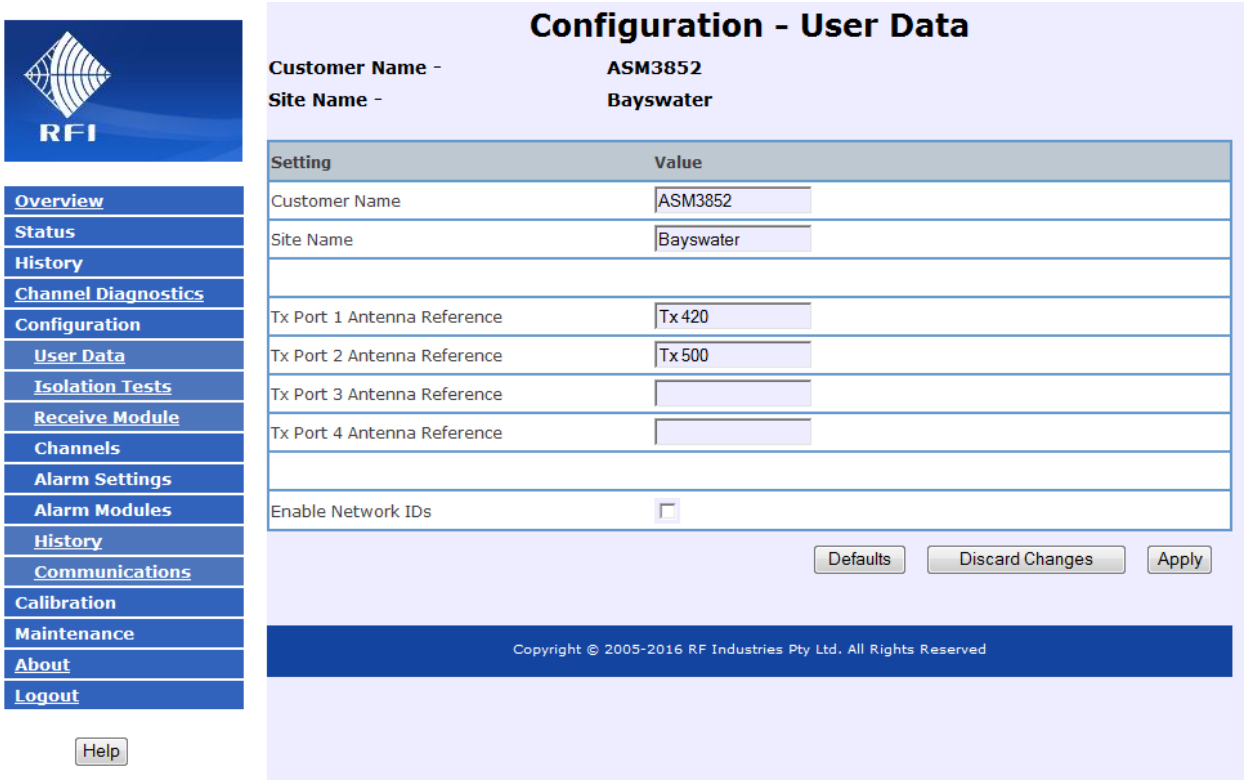
Selecting each indented topic under "Configuration" will display that item as a separate display page.



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

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 ASM as required.

10.27 Configuration – User Data



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 ASM.

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 ASM.

Enable Network IDs:

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

Defaults:

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

Discard Changes:

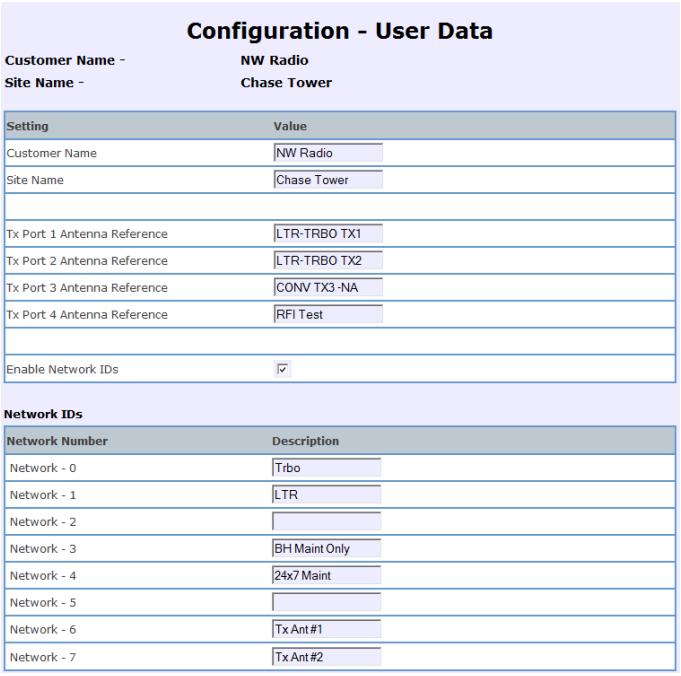
Click this button to restore the values to those present when the page was last re-displayed.
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the Configure/User Data menu item again to re-display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



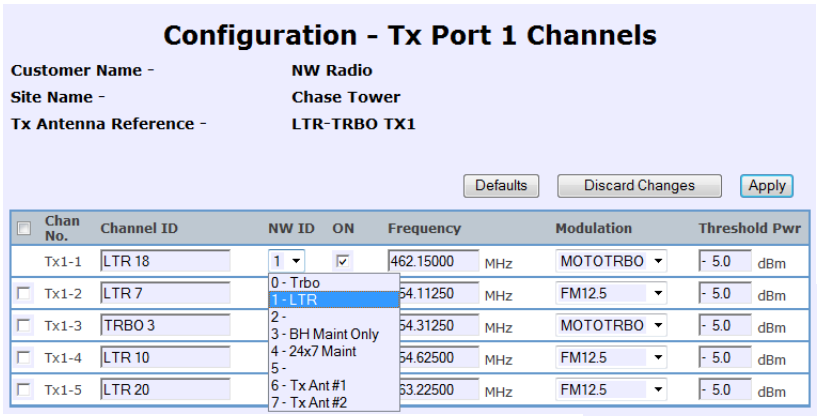
The eight Network IDs allow monitored channels to be nominated as being affiliated together in the *Channels – Status* screens.

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.

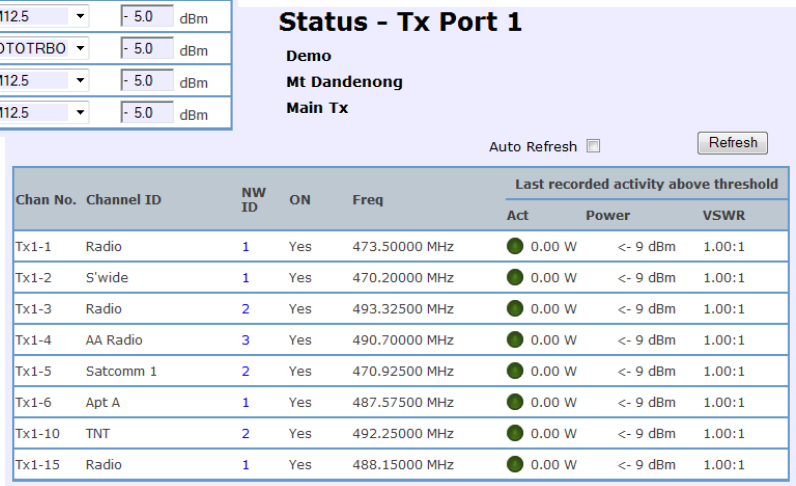
The Networks ID could also be used to identify which antenna is used for the network channels. i.e. ID #1 = TxAnt1, ID #2 = TxAnt2, etc.



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.

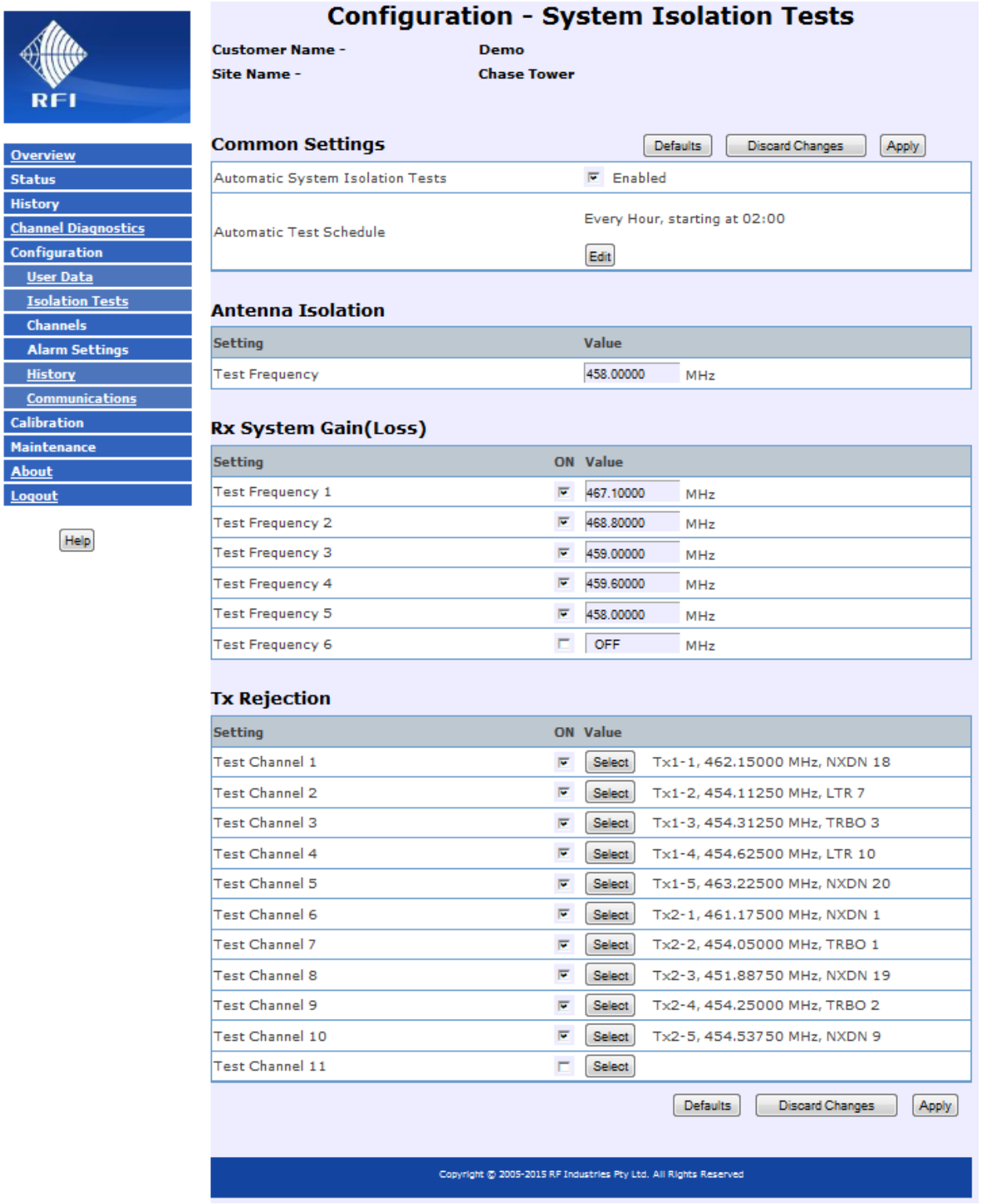


3/13/14, 3:52:49,
Customer=Mobile Comms
Site=Mt Morgan
Tx Port 2 - LTR-TRBO TX2, Chan 2 - TRBO 1 (Network 4 - DMR Rentals), PWR=FAIL(+48.6), VSWR=OK(1.00)

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.

10.28 Configuration – Isolation Tests



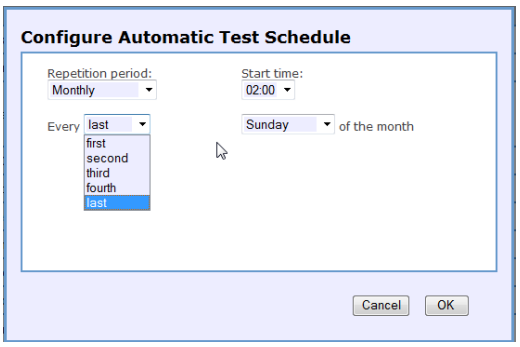
The System Isolation Tests "Configuration" page allows this test's parameters to be entered.

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.



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.

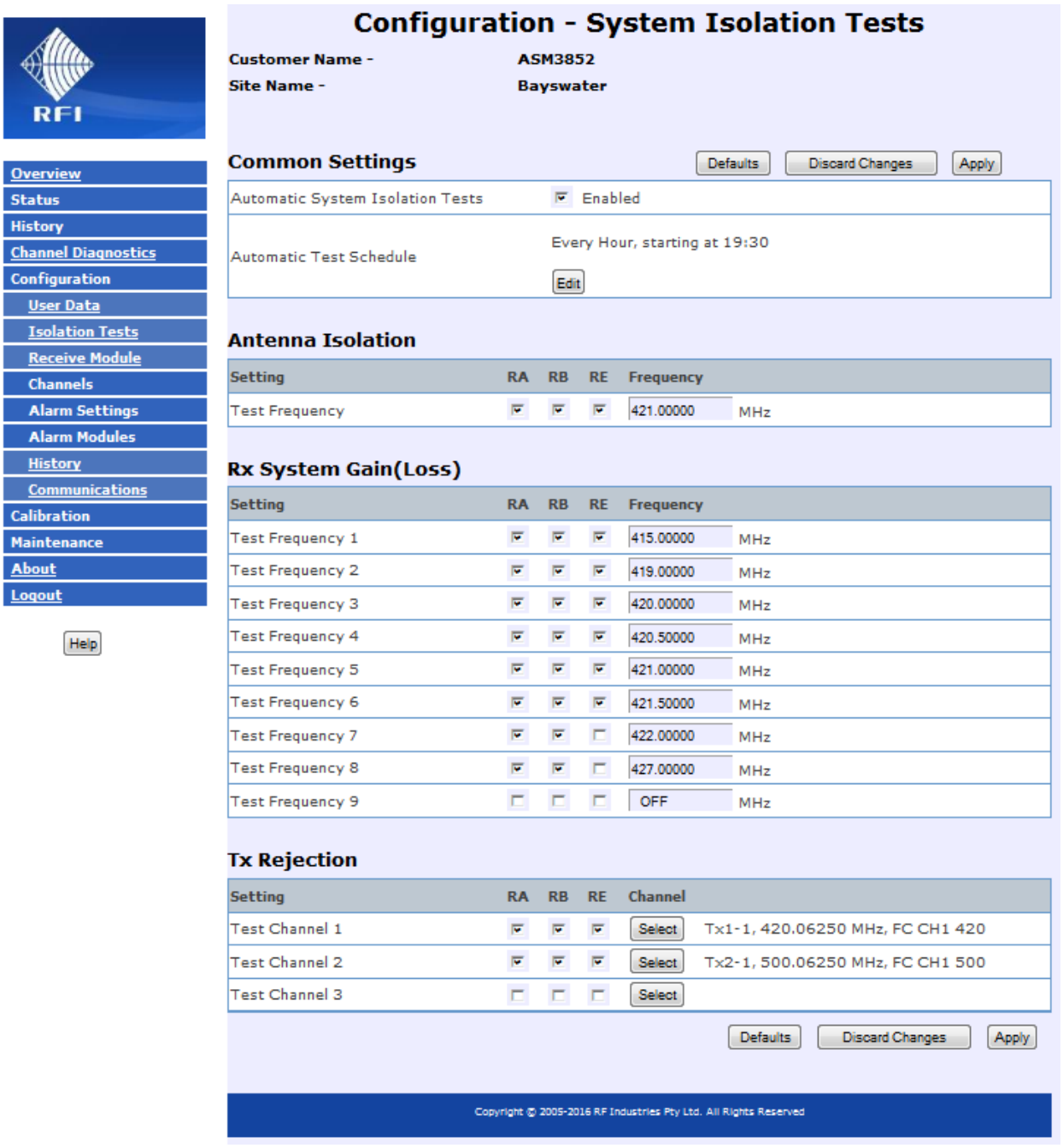
Discard Changes:

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:

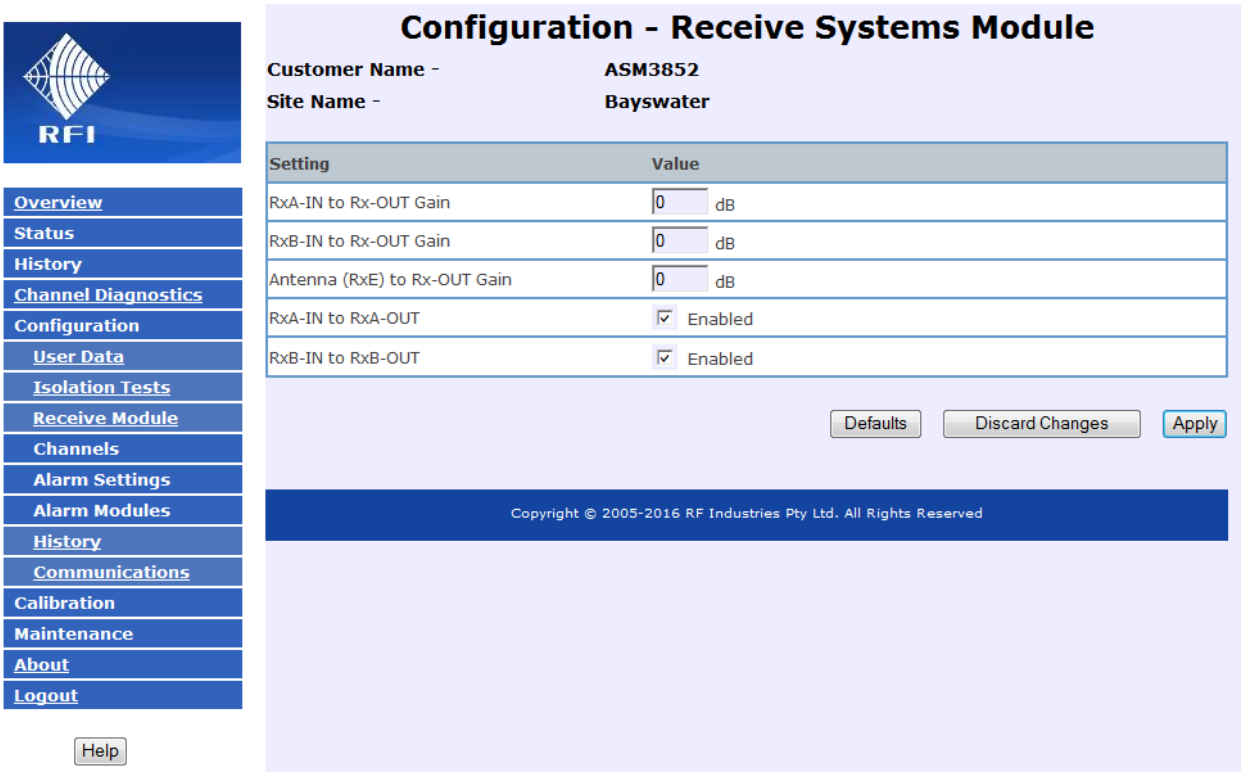
This will attempt to save and activate the values entered. If any out-of-range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

NOTE: Antenna Isolation values outside the measurement range of this test may also be measured as a Rx Channels measurement. The Rx Frequency can be measured as one of the systems own Tx frequencies, and the Max/Min Alarm Levels set to measure a change in received level (which includes the antenna isolation value). A reduction in Tx Output Power or Antenna Isolation can generate an alarm if the measure Rx level is outside the alarm Max/Min values. As Tx Power is also alarmed, in can be deduced whether an alarm is being generated by a reduction in Tx Output Power or Antenna Isolation value, and fault rectification actioned accordingly.



When a Receive Systems Module (RSM) is fitted to the ASM, 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



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 ASM.

RxB-IN to Rx-OUT Gain:

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

Antenna RxE to Rx-OUT Gain:

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

RxA-IN to RxA OUT On/Off:

Sets the configured state of this RF path. Checked is a nett 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 nett 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.

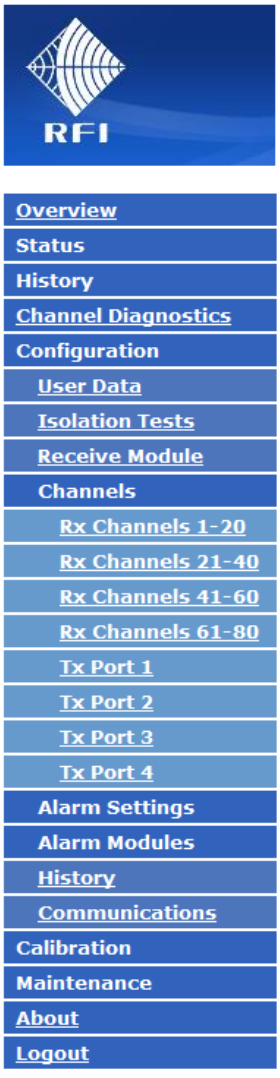
Save:

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 ASMs channel specific parameters to be programmed.

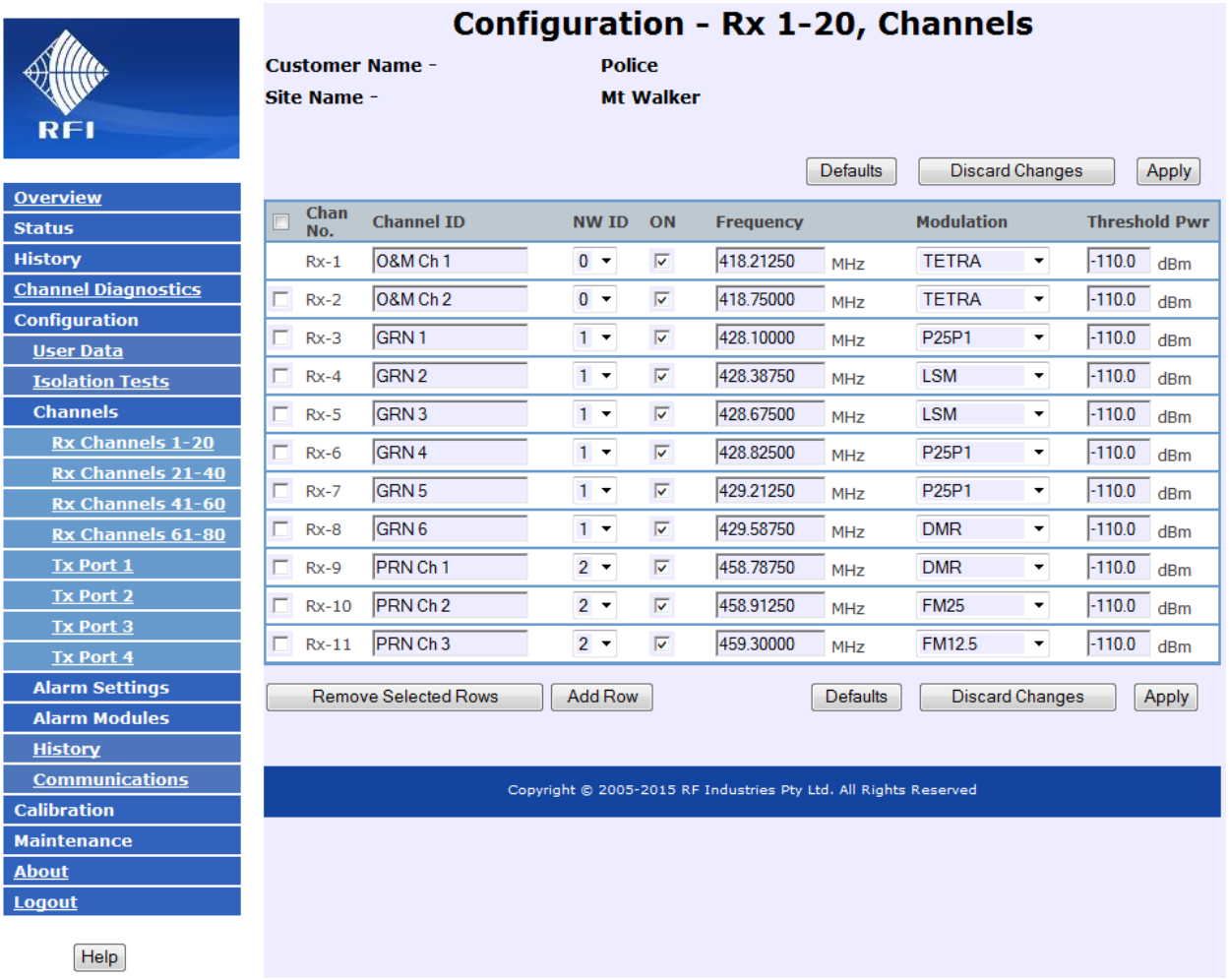
Selecting each indented topic under "Configure - Channels" will display that item as a separate display page.



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

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 ASM as required.

10.31 Configuration – Rx Channels 1-20



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;

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

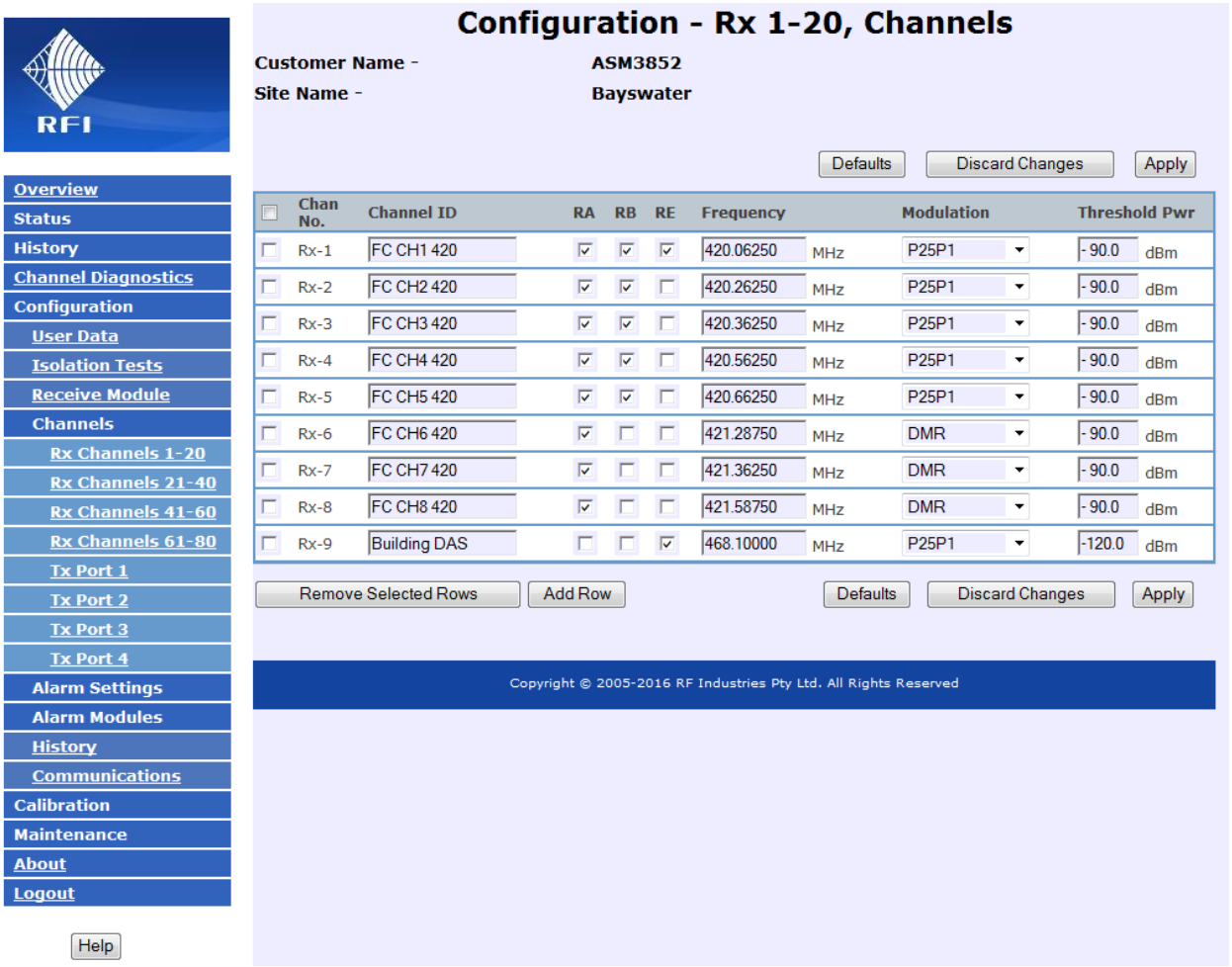
Discard Changes:

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:

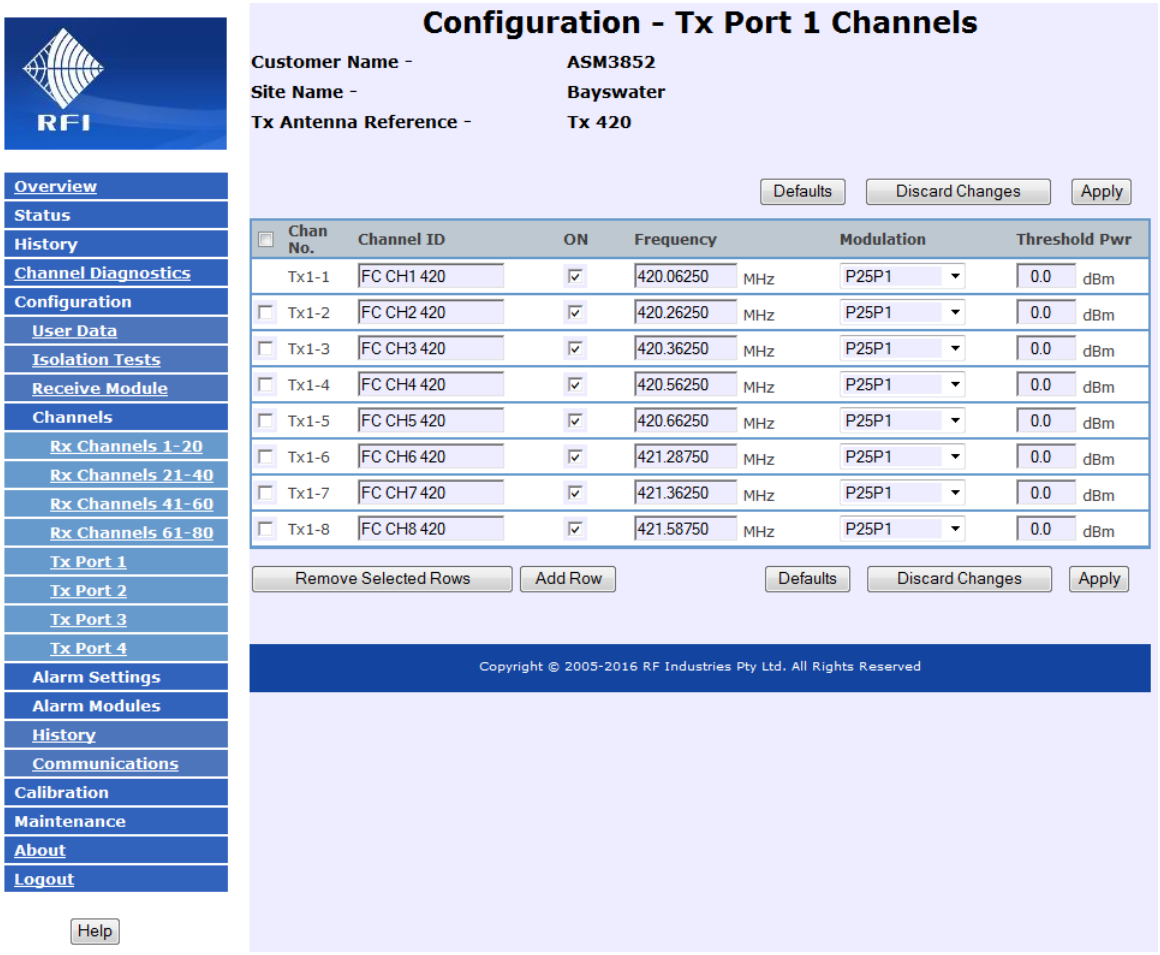
This will attempt to save and activate the values entered. If any out of range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

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



When a Receive Systems Module (RSM) is fitted to the ASM, the three receive signal paths (RxA, RxB and RxE) are selectable in the *Configuration – Rx Channels* pages.

10.32 Configuration – Tx Port 1 Channels



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.

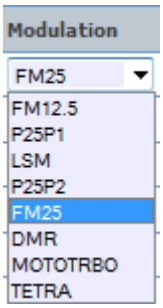
Note: The NW ID column is only displayed if this feature is enabled in the *Configuration – User Data* screen.

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).

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:

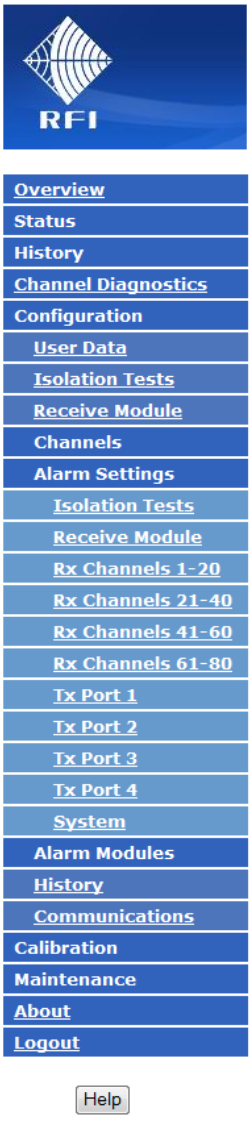
This will attempt to save and activate the values entered. If any out-of-range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

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 ASMs alarm parameters to be programmed.

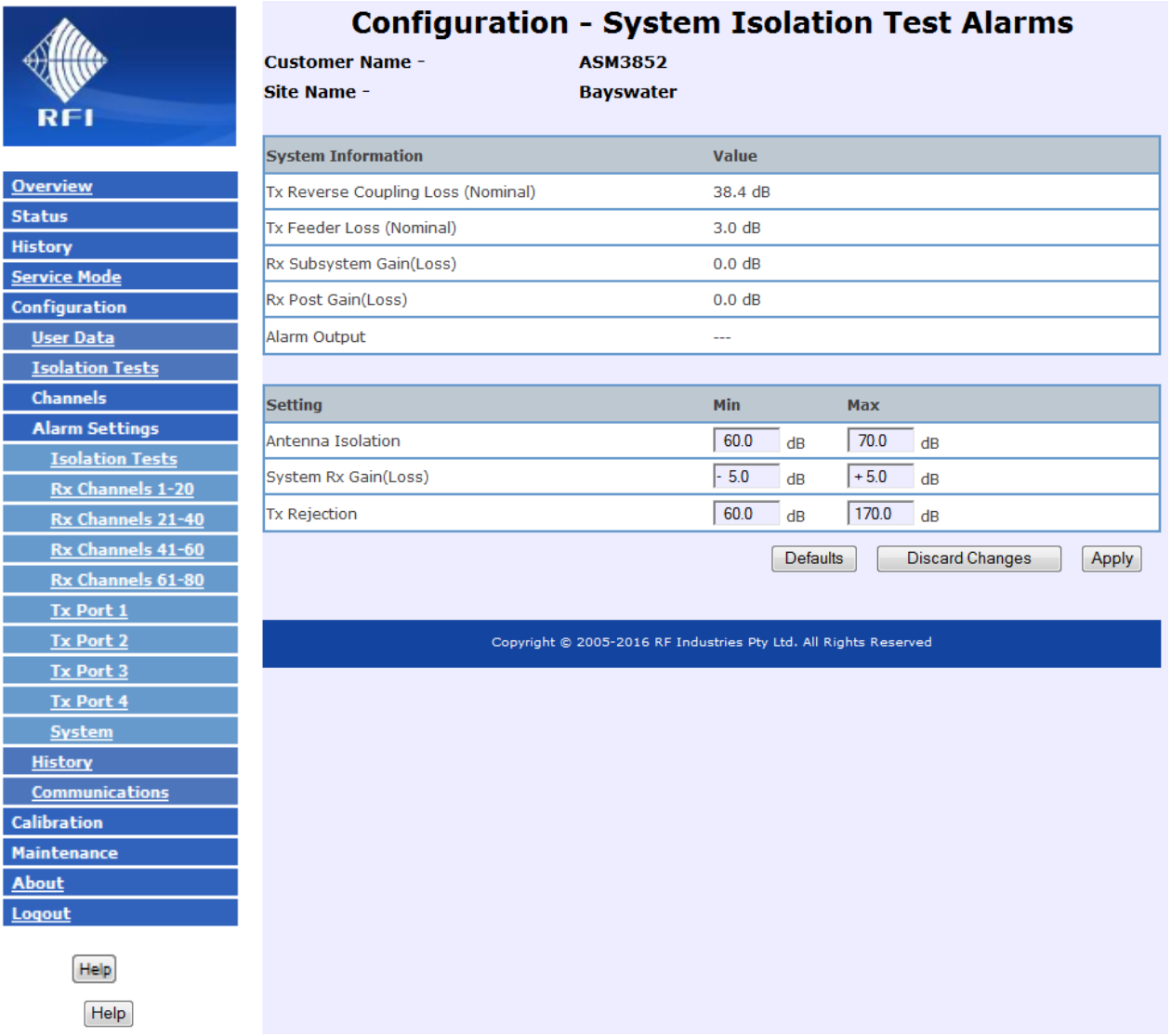
Selecting each indented topic under "Alarm Settings" will display that item as a separate display page.



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

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 ASM as required.

10.34 Configuration – Alarm Settings – Isolation Tests



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.

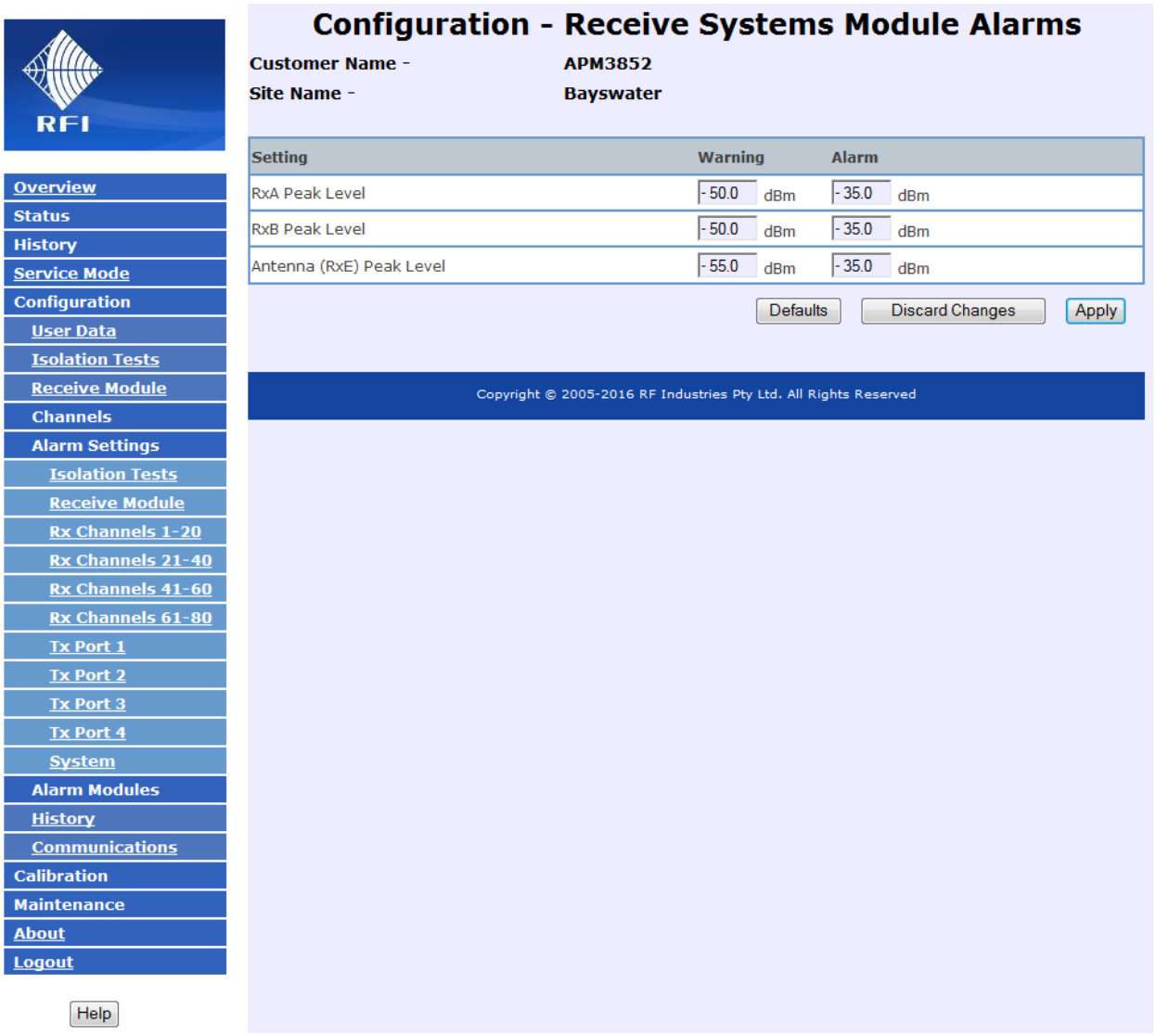
Discard Changes:

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



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

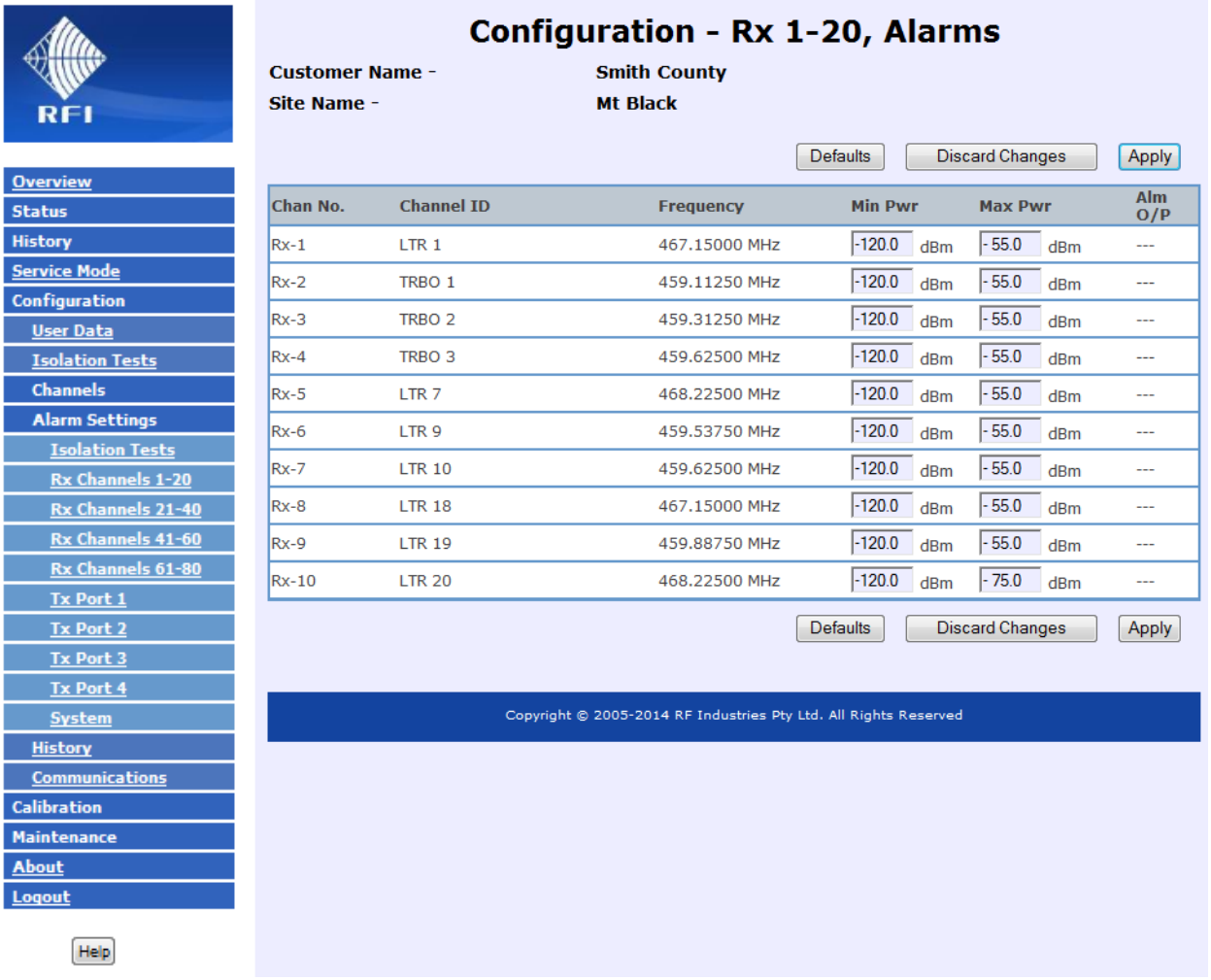
Discard Changes:

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



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 ASMs 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;

Min Power	-110dBm
Max Pwr	-75dBm

Discard Changes:

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

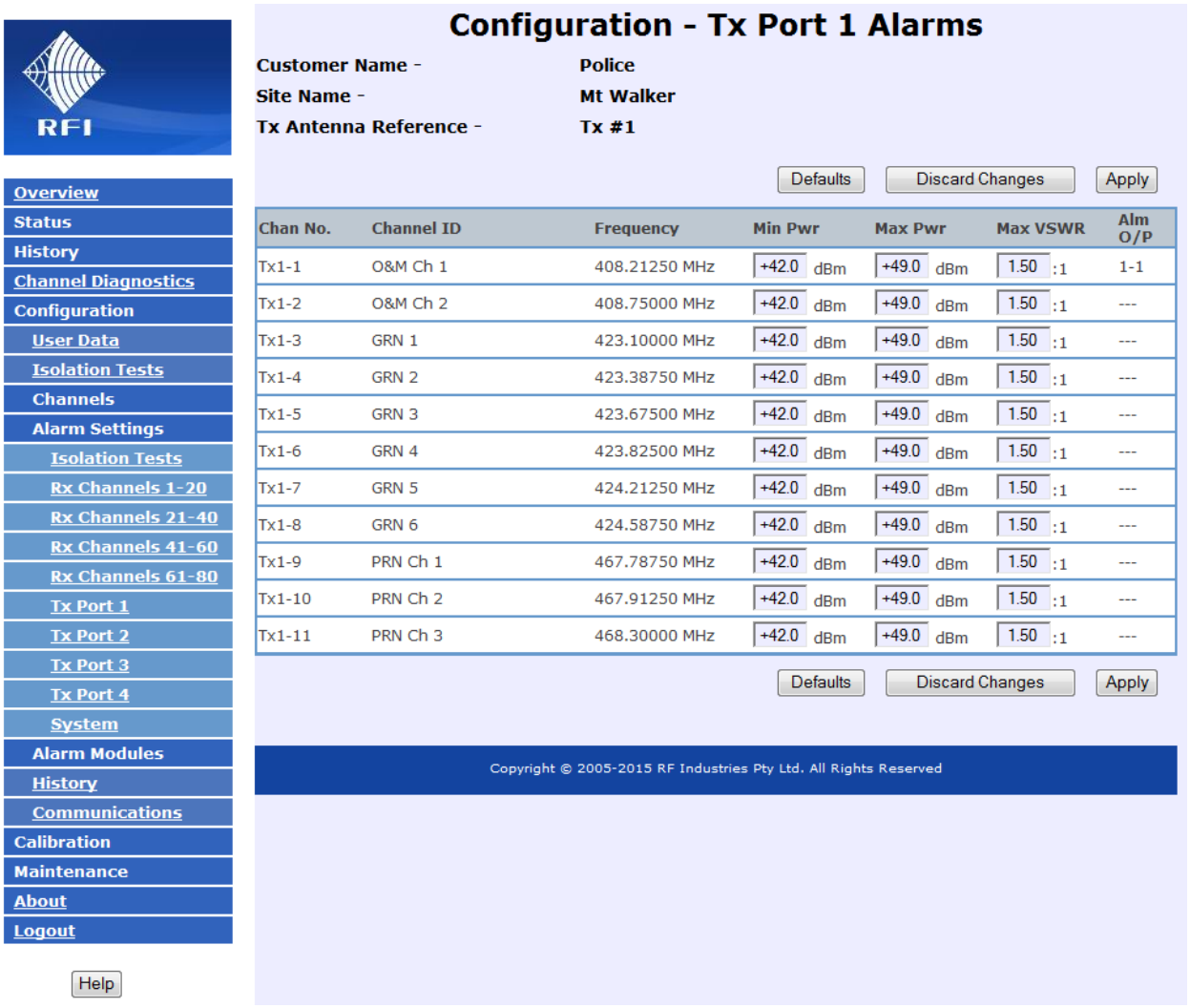
Note: If invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant *Configuration/Alarms/Rx Channels* menu item again to re-display the current configuration.

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



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 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.

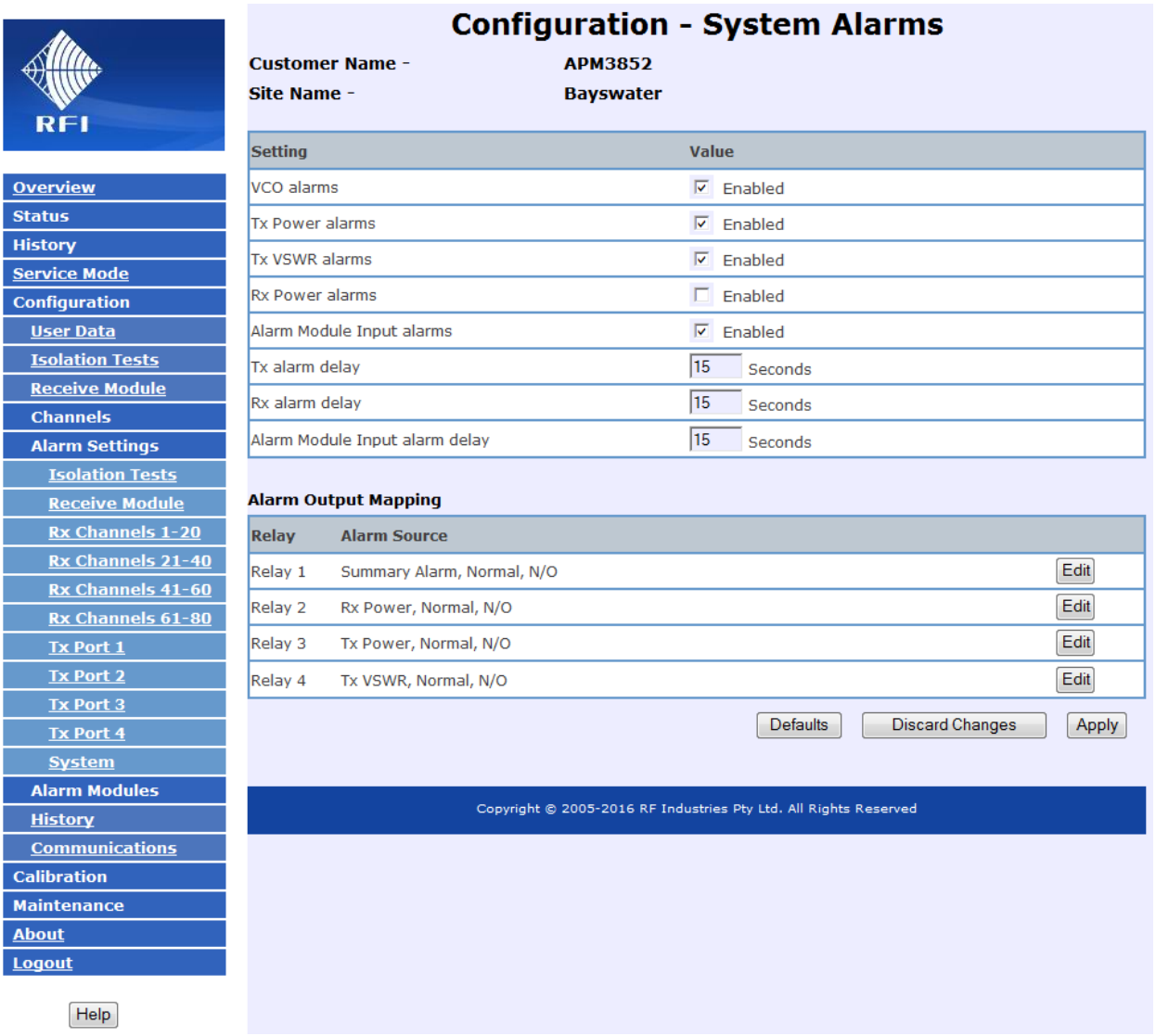
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

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



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 ASM 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.

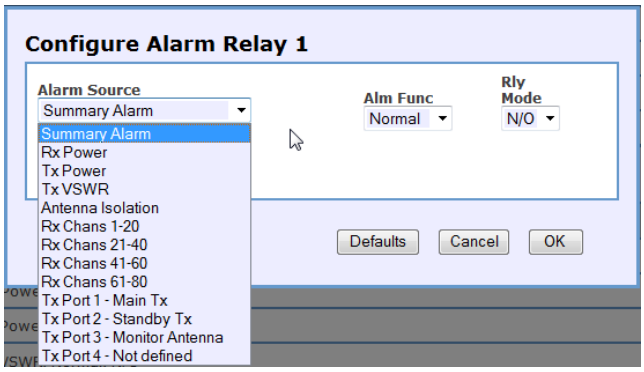
Alarm Module Input alarm delay:

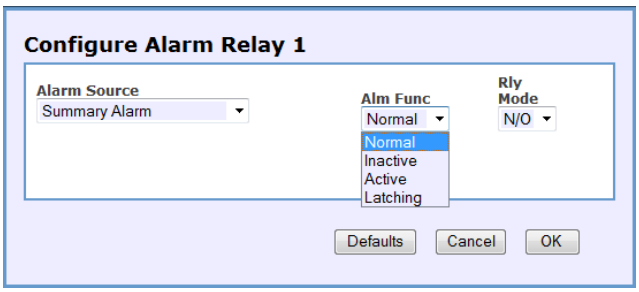
This setting defines the length of time (in seconds) for which the alarm must be continuously present or restored before the change in alarm status is recognized.

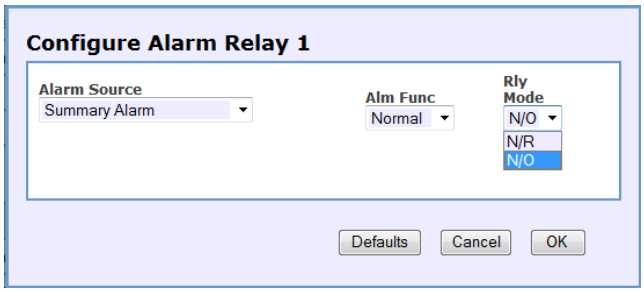
Alarm Output Mapping

These selections allow the four relays available on the ASM'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.



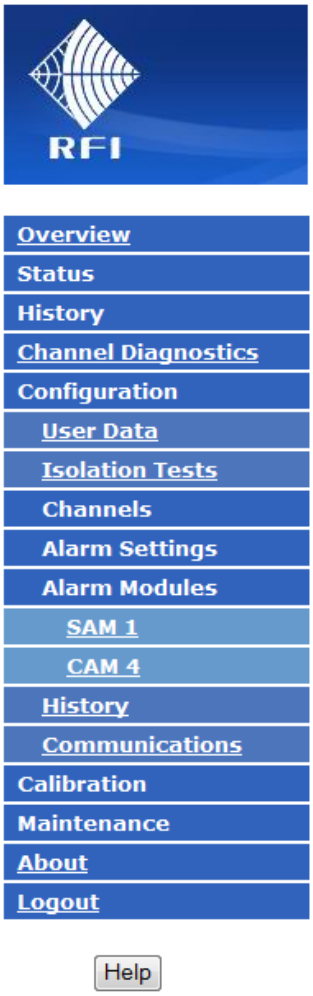




Defaults:

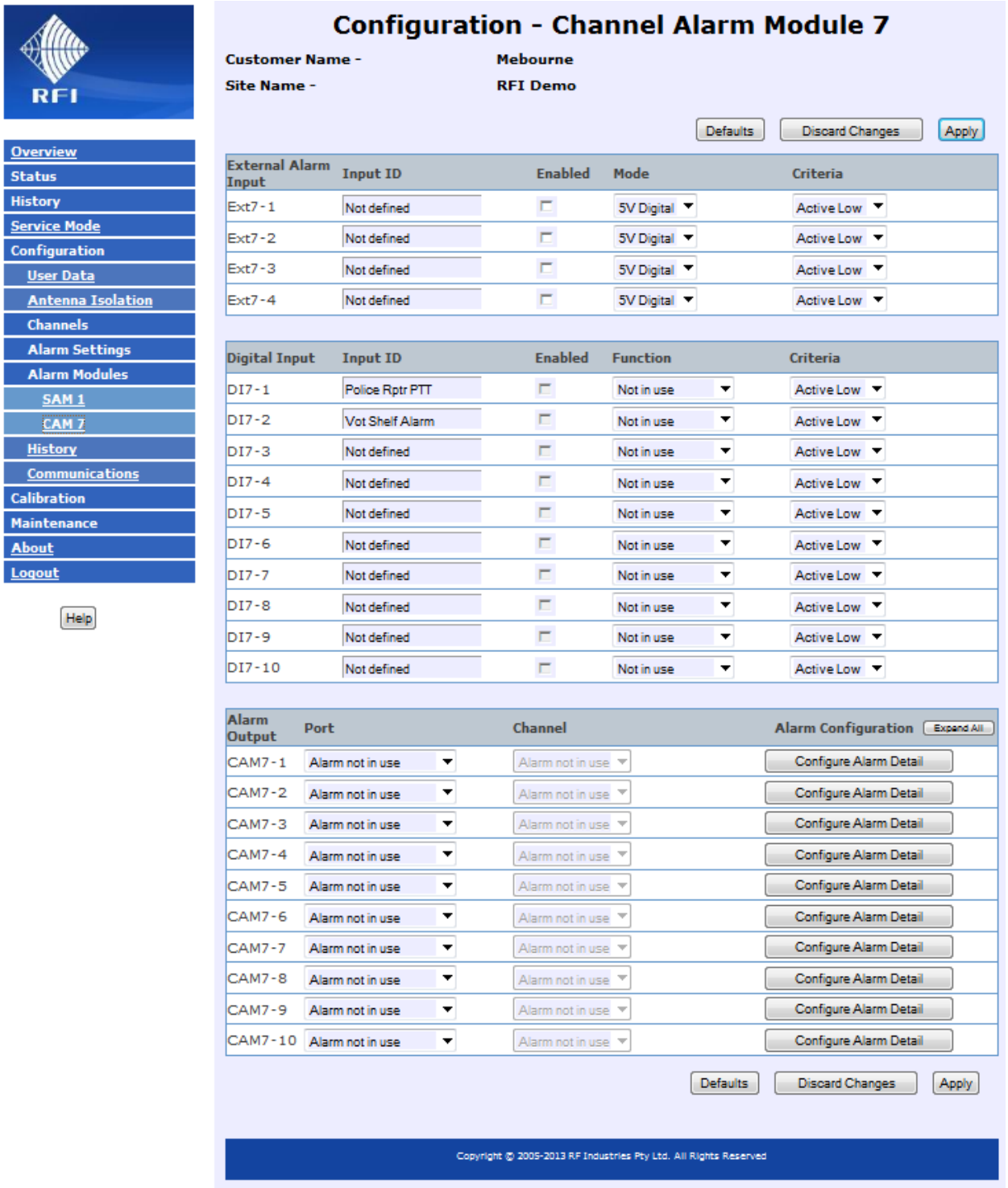
This will enable all alarm categories. The Tx alarm, Rx alarm and Alarm Module Inputs alarms delays will be set to 15 Seconds, and the four relay outputs will be set to the respective System Summary selections.

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 ASM as required.

10.40 Configuration – Alarm Modules – Channel Alarm Module



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

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext4-1	Site Door	☑	5V Digital	Active Low
Ext4-2	Fuel Tank Low	☑	5V Digital	Active High
Ext4-3	Not defined	☐	Not in use	Active Low
Ext4-4	Not defined	☐	Not in use	Active Low

External Alarm Input:

Displays the four (4) configurable external digital inputs.

Input ID:

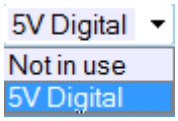
Enter a description for the External Alarm input signals. Up to 16 characters may be entered.

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:

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	☑	CAM4-1 PTT	Active Low
DI4-2	Not defined	☐	Not in use	Active Low
DI4-3	Not defined	☐	Not in use	Active Low
DI4-4	Not defined	☐	Not in use	Active Low
DI4-5	Microwave Alarm	☑	General Purpose	Active Low
DI4-6	Solar Low Volts	☑	General Purpose	Active Low
DI4-7	Mains Fail	☑	General Purpose	Active Low
DI4-8	Batt. Low Volts	☑	General Purpose	Active Low
DI4-9	Not defined	☐	Not in use	Active Low
DI4-10	Not defined	☐	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:

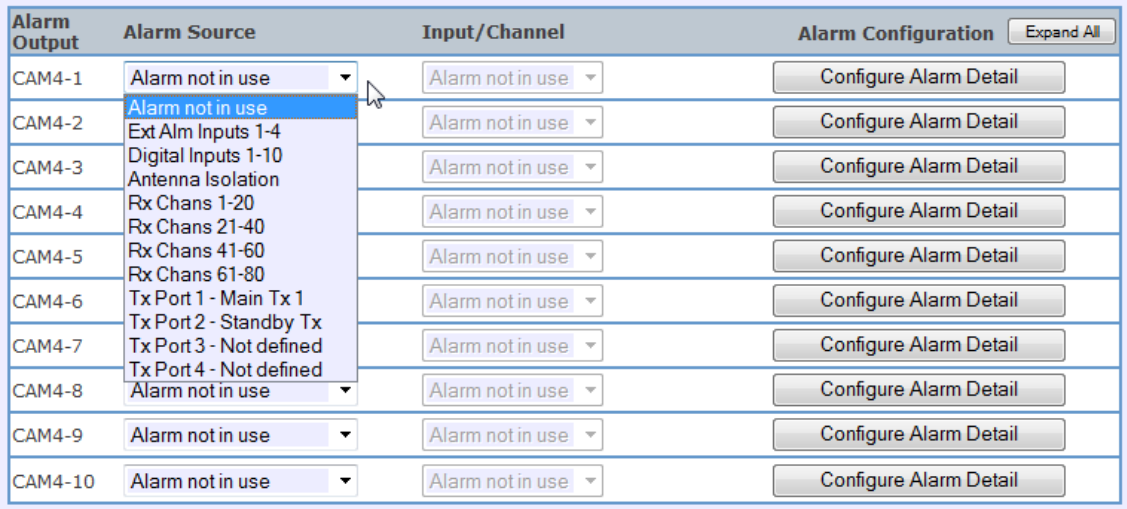
Select the input mode for each of the Digital Inputs.
A "CAMX-X PTT" selection affiliates the digital input as a base station Tx PTT or RX UNSQ or other control line function as a monitoring line for the base station assigned to that CAM Alarm Relay Output (see below). A "General Purpose" selection identifies 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:

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.

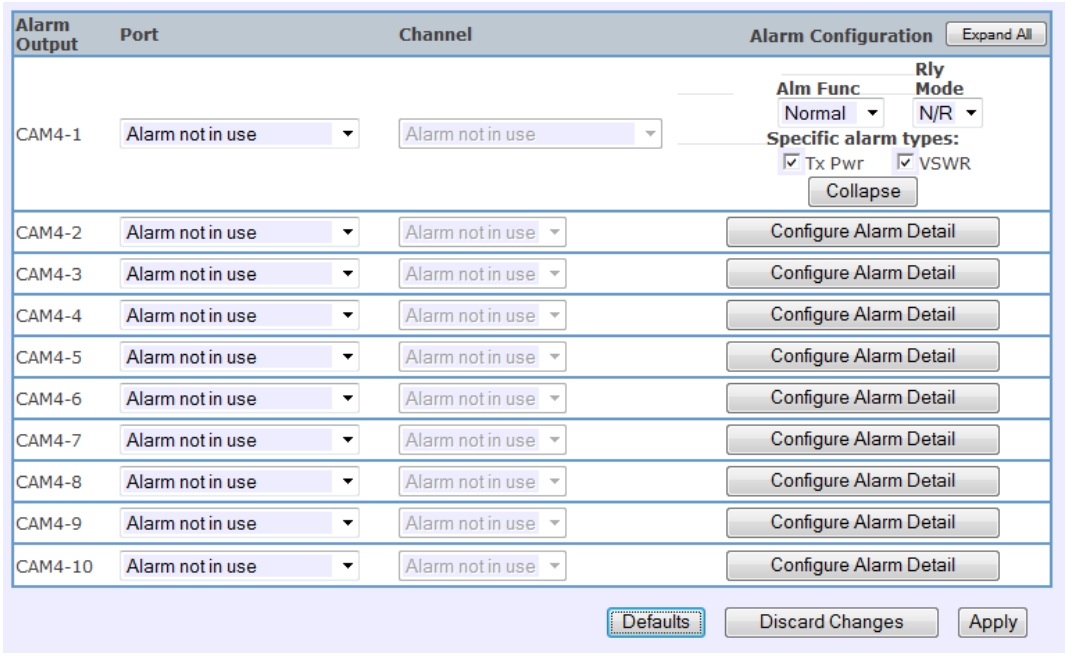
Note: When an alarm is current, the border of the *Configure Alarm Detail* button will be red, and when the Channel is expanded, the *Alm Func* box will also be red (refer above example).

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.

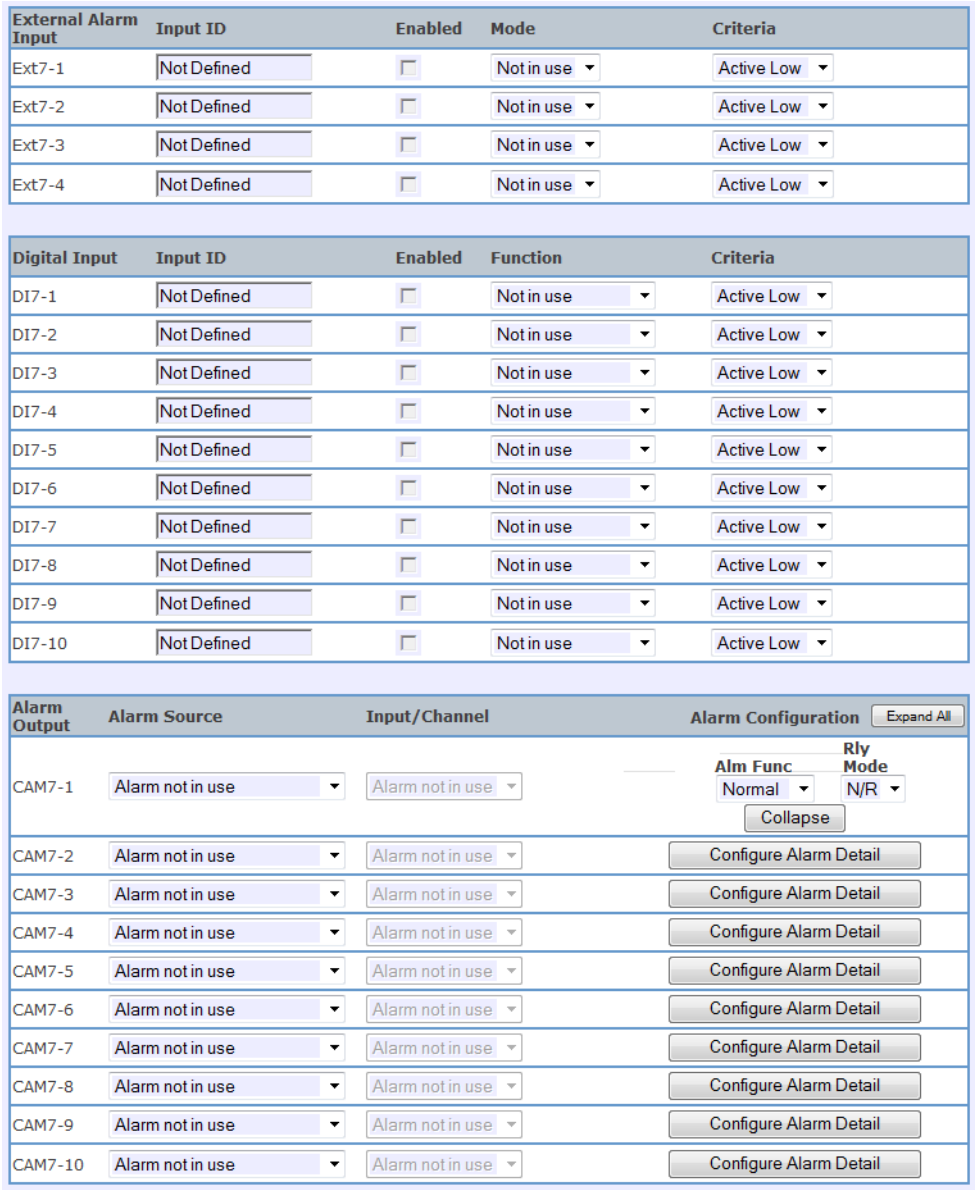
Specific Alarm Types:

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



Defaults:

Clicking this button restores the factory default values which are:



External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext7-1	Not Defined	☐	Not in use	Active Low
Ext7-2	Not Defined	☐	Not in use	Active Low
Ext7-3	Not Defined	☐	Not in use	Active Low
Ext7-4	Not Defined	☐	Not in use	Active Low

Digital Input	Input ID	Enabled	Function	Criteria
DI7-1	Not Defined	☐	Not in use	Active Low
DI7-2	Not Defined	☐	Not in use	Active Low
DI7-3	Not Defined	☐	Not in use	Active Low
DI7-4	Not Defined	☐	Not in use	Active Low
DI7-5	Not Defined	☐	Not in use	Active Low
DI7-6	Not Defined	☐	Not in use	Active Low
DI7-7	Not Defined	☐	Not in use	Active Low
DI7-8	Not Defined	☐	Not in use	Active Low
DI7-9	Not Defined	☐	Not in use	Active Low
DI7-10	Not Defined	☐	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	Alm Func: Normal; Rly Mode: N/R; Collapse
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 ASM, 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.

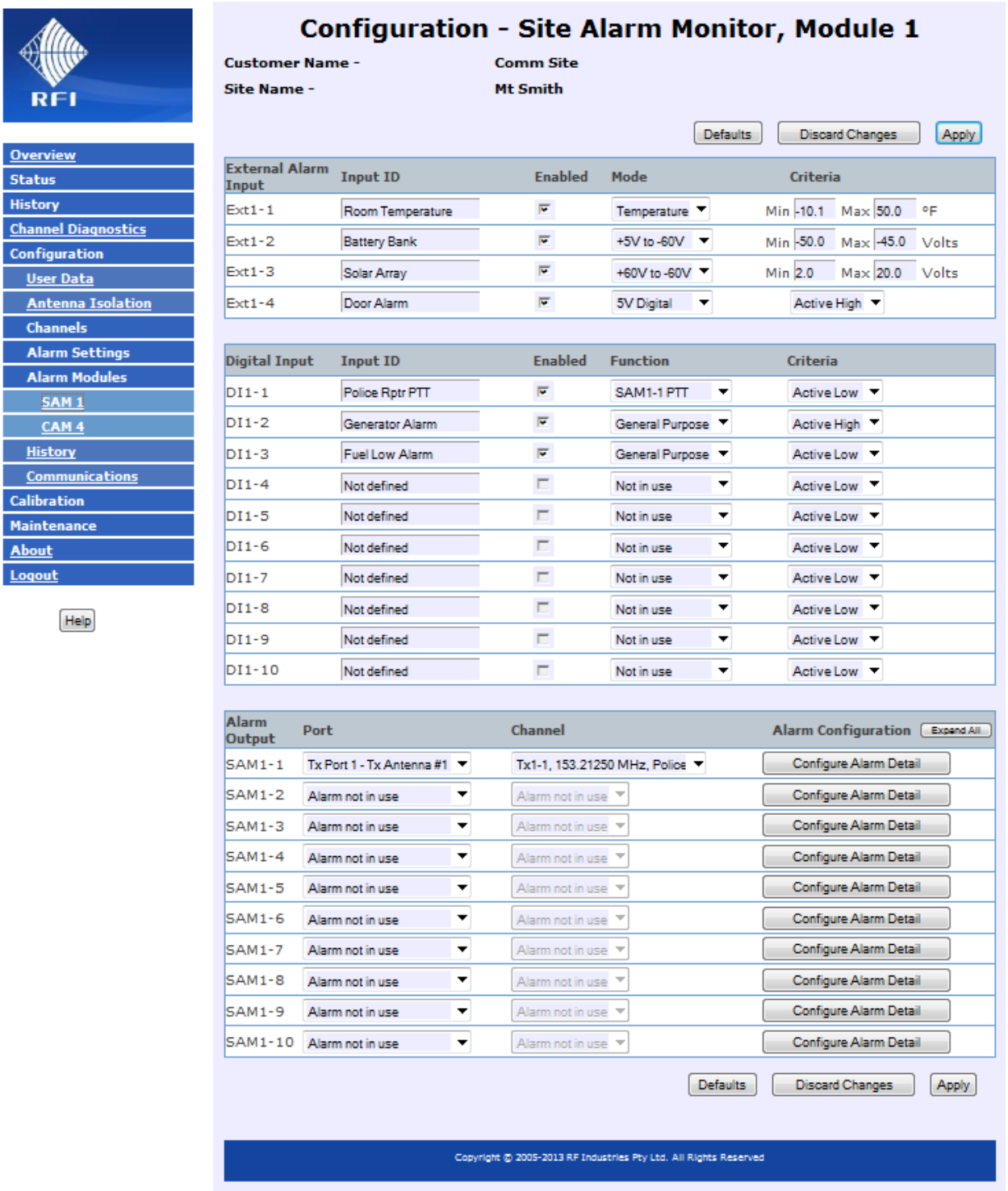
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

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



Each of the (optional) Site Alarm Module (SAM) units fitted to the ASM is configurable as illustrated in this "*Configuration - Site Alarm Module*" page.

External Alarm Input	Input ID	Enabled	Mode	Criteria
Ext1-1	Room Temperature	☑	Temperature	Min -10.1 Max 50.0 °F
Ext1-2	Battery Bank	☑	+5V to -60V	Min -50.0 Max -45.0 Volts
Ext1-3	Solar Array	☑	+60V to -60V	Min 2.0 Max 20.0 Volts
Ext1-4	Door Alarm	☑	5V Digital	Active High

External Alarm Input:

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

Input ID:

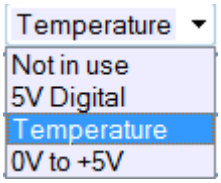
Enter a description for the External Alarm input signals. Up to 16 characters may be entered.

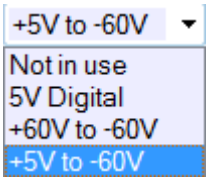
Enabled:

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





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	☑	SAM1-1 PTT	Active Low
DI1-2	Door Entry	☑	General Purpose	Active Low
DI1-3	Not defined	☐	Not in use	Active Low
DI1-4	Not defined	☐	Not in use	Active Low
DI1-5	Not defined	☐	Not in use	Active Low
DI1-6	Not defined	☐	Not in use	Active Low
DI1-7	Not defined	☐	Not in use	Active Low
DI1-8	Not defined	☐	Not in use	Active Low
DI1-9	Not defined	☐	Not in use	Active Low
DI1-10	Not defined	☐	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:

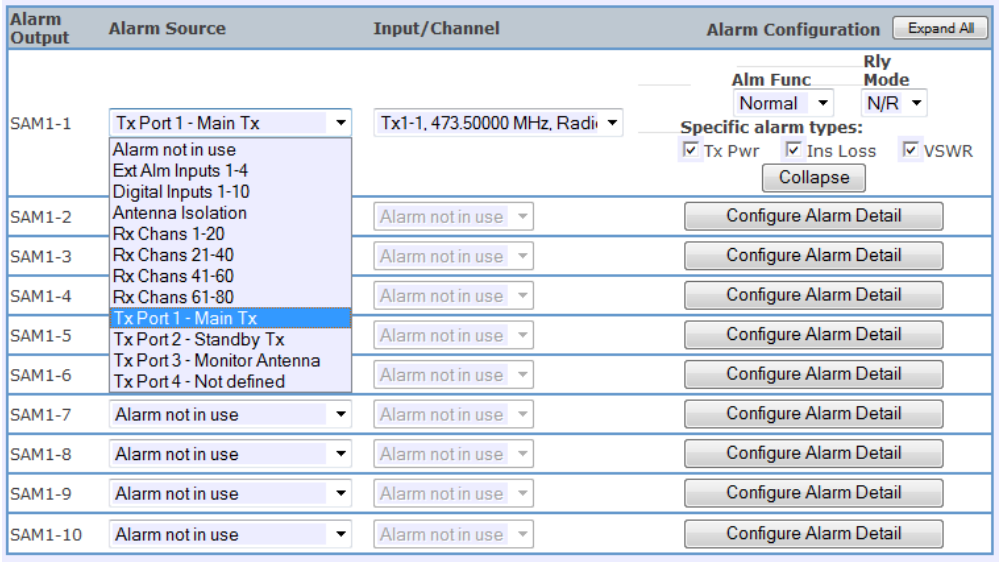
Select the input mode for each of the Digital Inputs.
A "SAMX-X PTT" selection affiliates the digital input as a base station Tx PTT or RX UNSQ or other control line function as a monitoring line for the base station assigned to that SAM Alarm Relay Output (see below). A "General Purpose" selection identifies 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:

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)

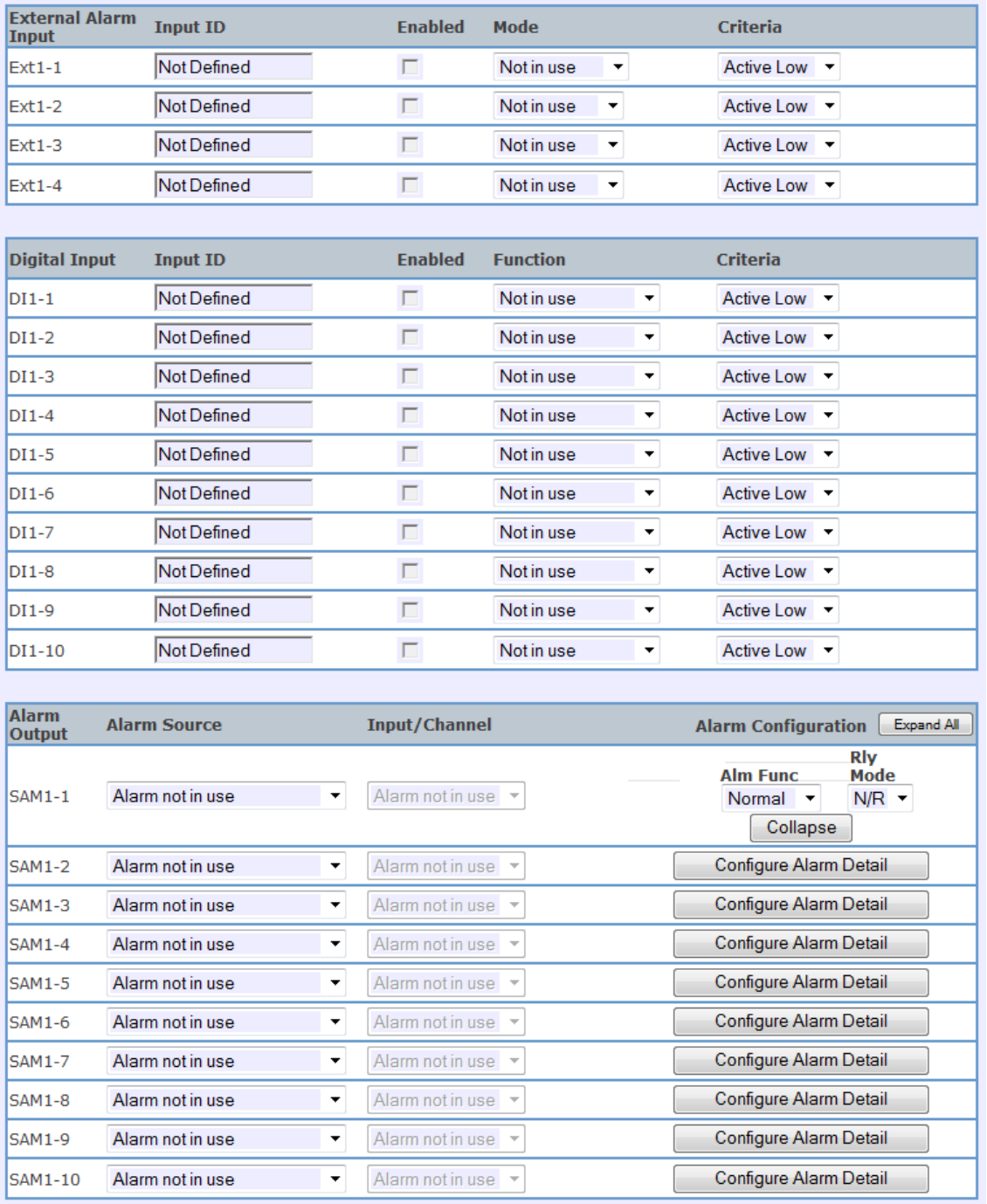
When the I/P Func input is enabled, it is used instead of the Threshold Power Level (configured on the Tx Port Channel Configuration page) to determine if the alarmed parameter should be measured. If used with the transmitter's PTT line, even if the transmitter produces no RF output, but the PTT line 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 ASM 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	Not Defined	☐	Not in use	Active Low
Ext1-2	Not Defined	☐	Not in use	Active Low
Ext1-3	Not Defined	☐	Not in use	Active Low
Ext1-4	Not Defined	☐	Not in use	Active Low

Digital Input	Input ID	Enabled	Function	Criteria
DI1-1	Not Defined	☐	Not in use	Active Low
DI1-2	Not Defined	☐	Not in use	Active Low
DI1-3	Not Defined	☐	Not in use	Active Low
DI1-4	Not Defined	☐	Not in use	Active Low
DI1-5	Not Defined	☐	Not in use	Active Low
DI1-6	Not Defined	☐	Not in use	Active Low
DI1-7	Not Defined	☐	Not in use	Active Low
DI1-8	Not Defined	☐	Not in use	Active Low
DI1-9	Not Defined	☐	Not in use	Active Low
DI1-10	Not Defined	☐	Not in use	Active Low

Alarm Output	Alarm Source	Input/Channel	Alarm Configuration (Expand All)
SAM1-1	Alarm not in use	Alarm not in use	Alm Func: Normal; Rly Mode: N/R; Collapse
SAM1-2	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-3	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-4	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-5	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-6	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-7	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-8	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-9	Alarm not in use	Alarm not in use	Configure Alarm Detail
SAM1-10	Alarm not in use	Alarm not in use	Configure Alarm Detail

Clicking *Apply* then saves these values into the ASM, 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.

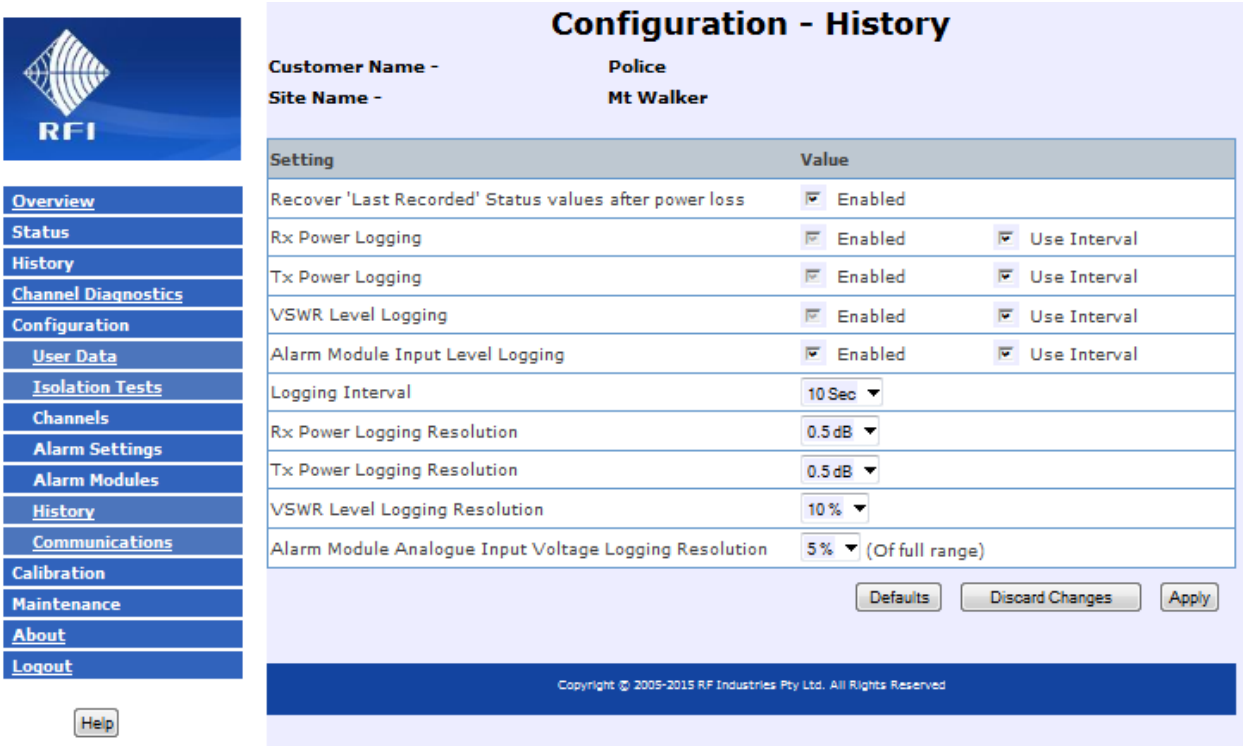
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current system configuration. In this case, just select the relevant Configuration/Alarms/Tx Port menu item again to re-display the current configuration.

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



This page determines if measurements are logged into the ASM'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	☑ Enabled
Rx Power Logging	☑ Enabled ☑ Use Interval
Tx Power Logging	☑ Enabled ☑ Use Interval
VSWR Level Logging	☑ Enabled ☑ Use Interval
CAM Input Level Logging	☑ Enabled ☑ 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 ASM, or *Discard Changes* restores these values to their previous settings.

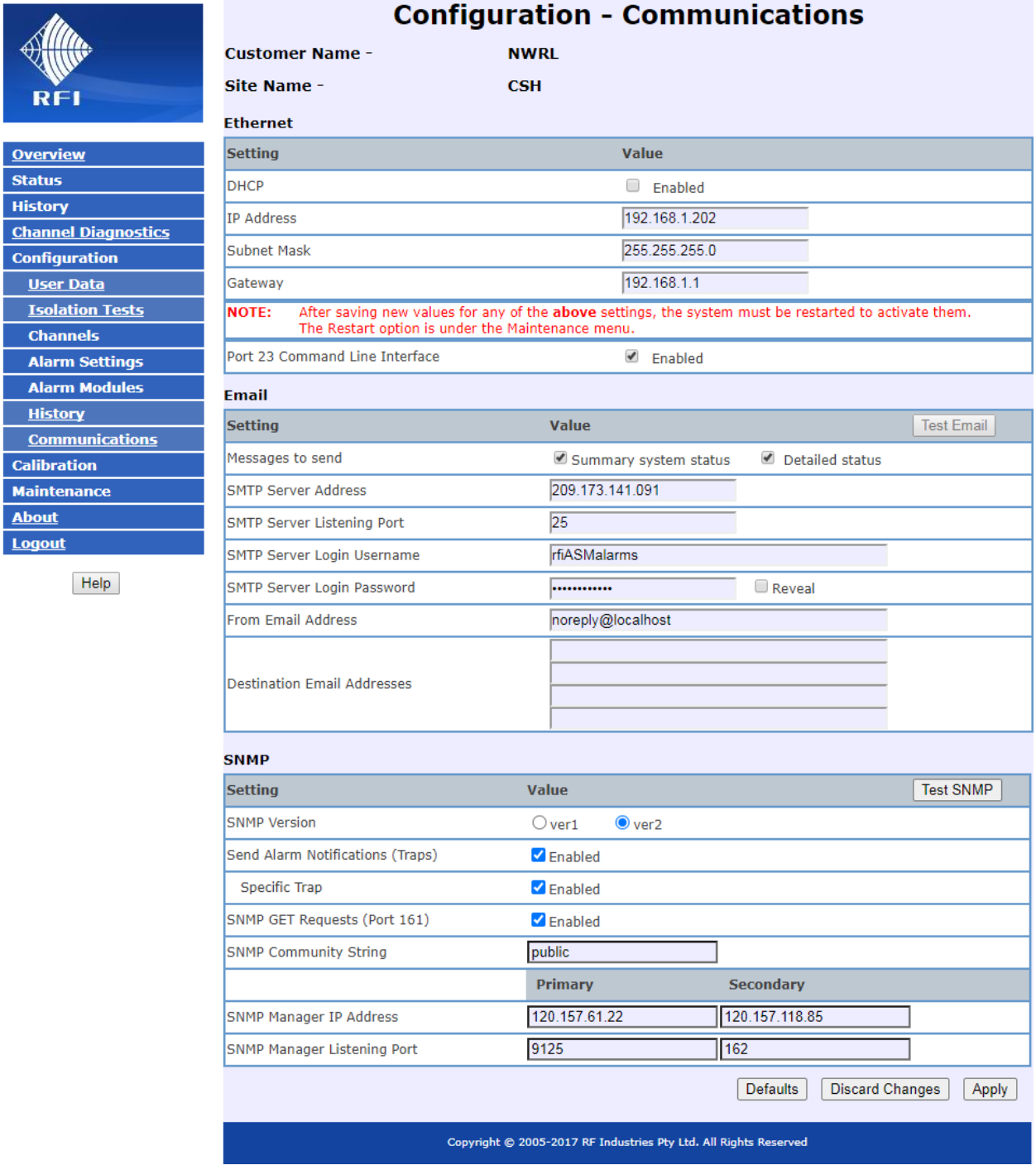
Discard Channels:

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



Each of the Communications parameters configurable in the ASM 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 ASM 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 "rfiASMalarms" 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 "rfiASMalarms" 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

SNMP Version

Selects if SNMP v1 or v2c format will be used.

Send Alarm Notifications (Traps):

Selects if sending SNMP Traps are enabled or disabled.

Specific Trap

Selects if the table OIDs will be used

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 ASM 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:

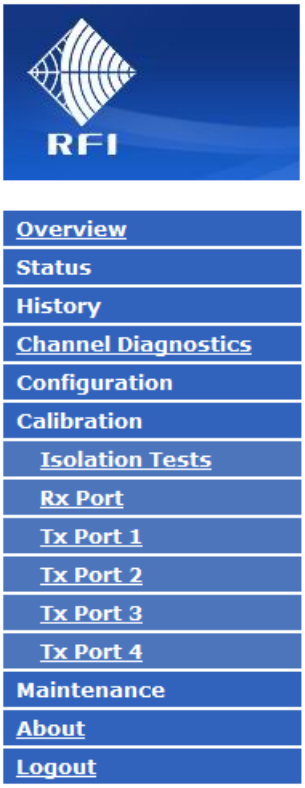
This will attempt to save the values entered. If any out-of-range values are present, nothing will be saved and the problem settings will be highlighted with a red background.

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 ASM unit, either by cycling the power, or through the Maintenance/Restart menu item.

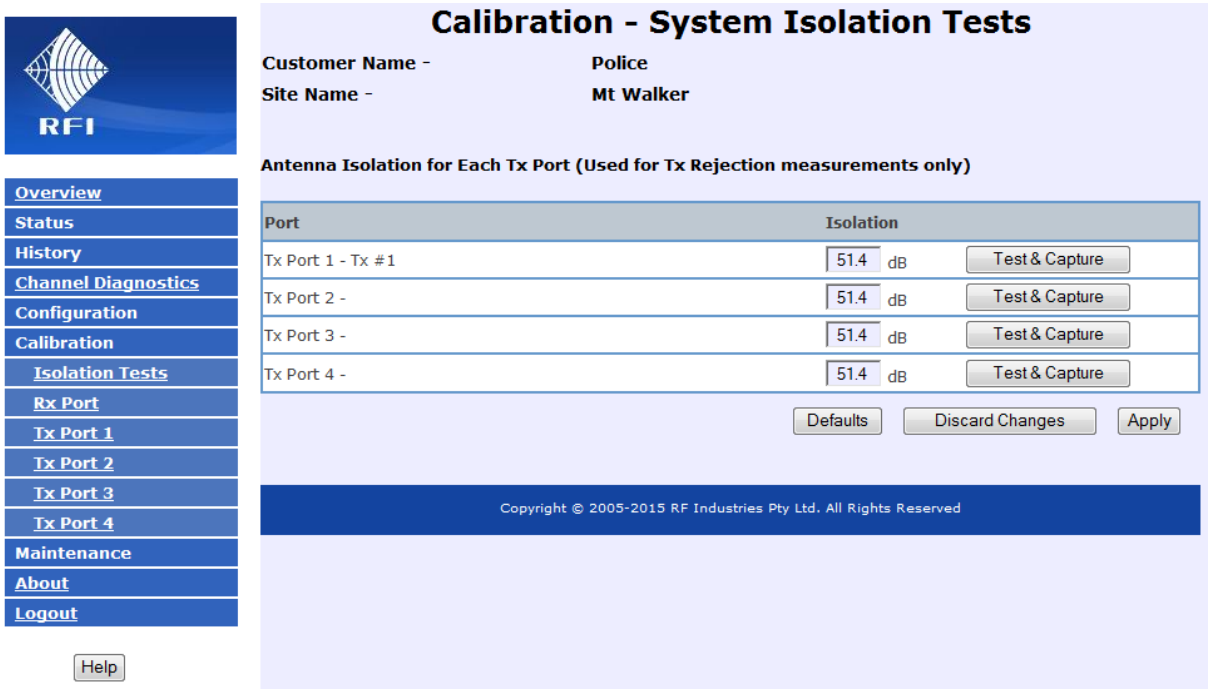
10.44 Calibration Menu

The "Calibration" menu allows the ASMs associated system components' (couplers, feeders) values to be programmed.

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



10.45 Calibration – System Isolation Tests



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.

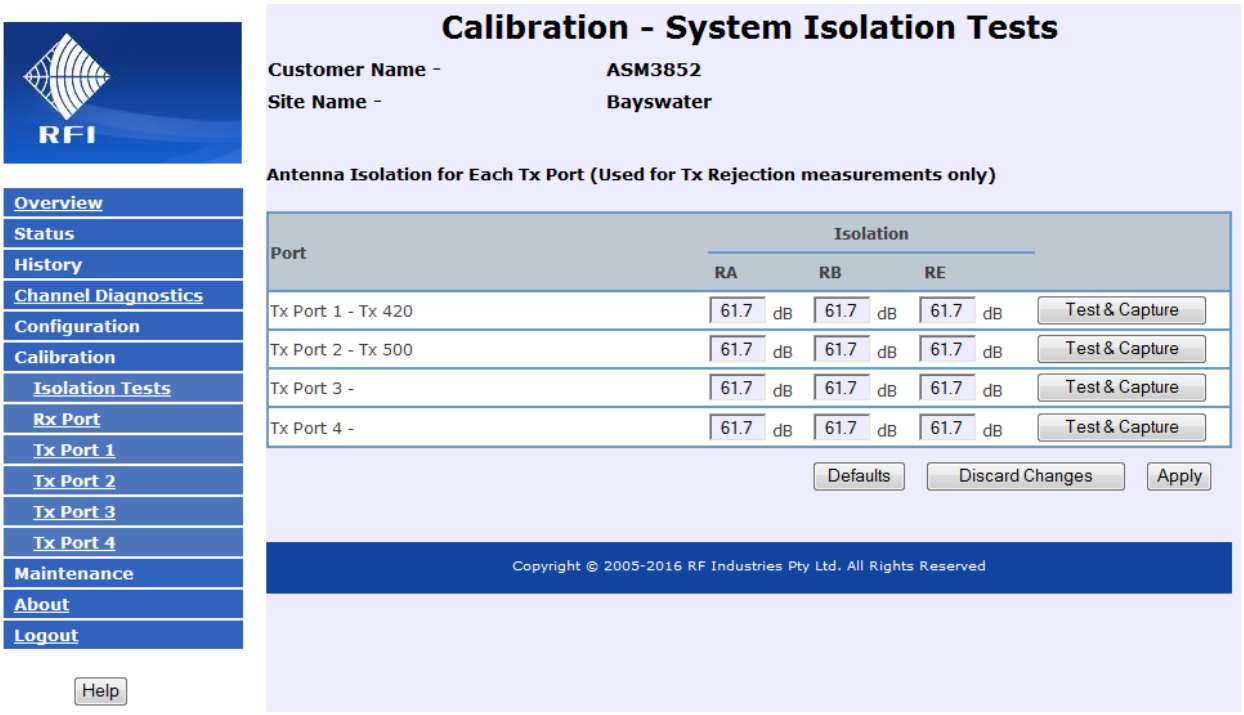
If the calibration isolation value is left blank, the system measured Antenna Isolation Test value will be used for the Tx Rejection Tests measurements for the Tx port.

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.

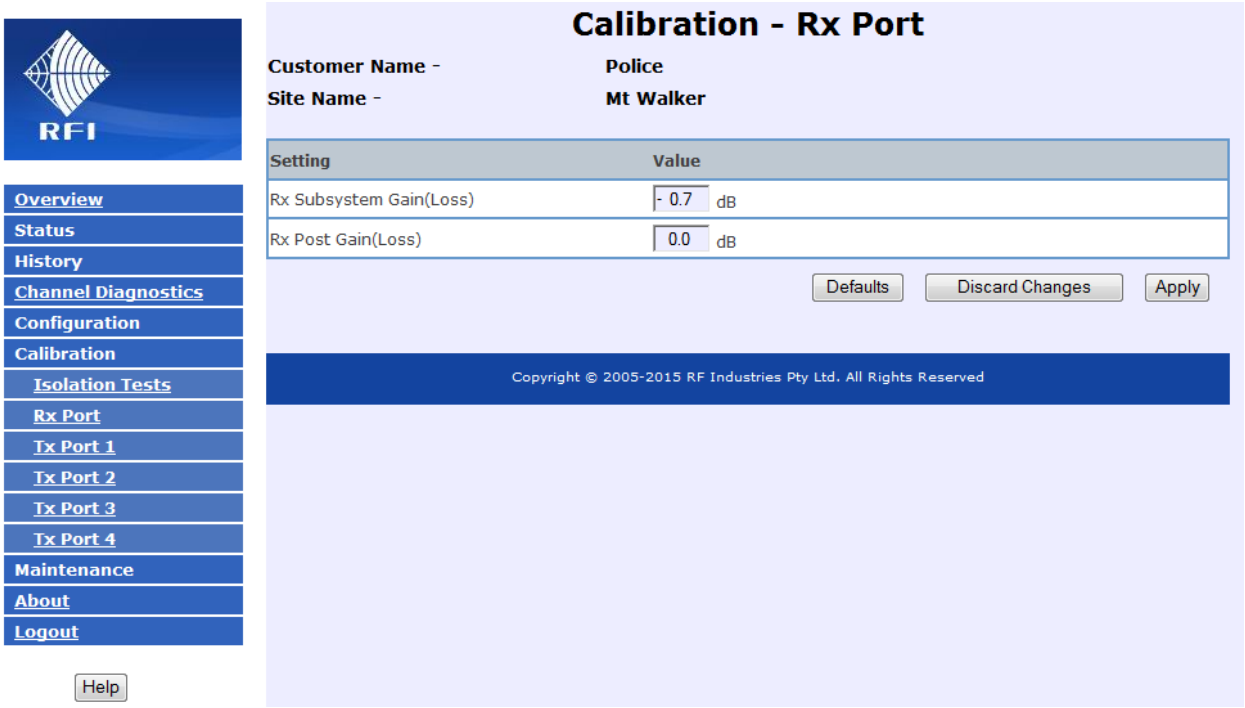
Re-connect all Tx Reverse ports' coaxial cables.



When a Receive Systems Module (RSM) is fitted to the ASM, 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



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
Rx Subsystem Nett Gain	+3.0 dB

or;

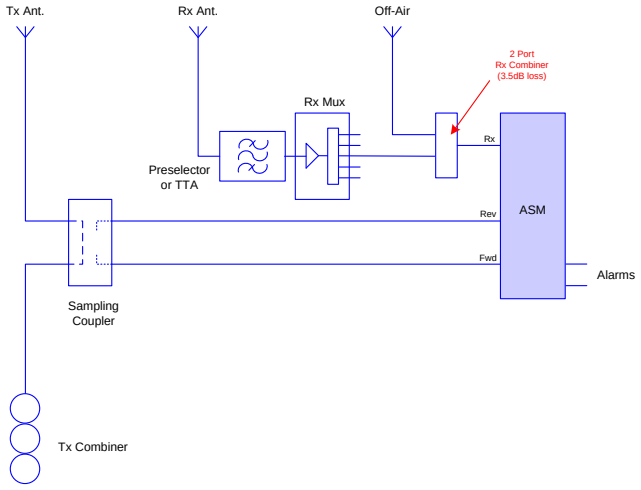
TTA Preselector loss	-1.0 dB
TTA Amplifier gain	+20.0 dB
Receiver Feeder loss	-3.0 dB
Receiver Multicoupler Divider loss	-10.0 dB
Rx Subsystem Nett Gain	+6.0 dB

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 ASM.

Example: a two port receiver combiner may add 3.5dB of additional loss into the ASM 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 ASM – 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.

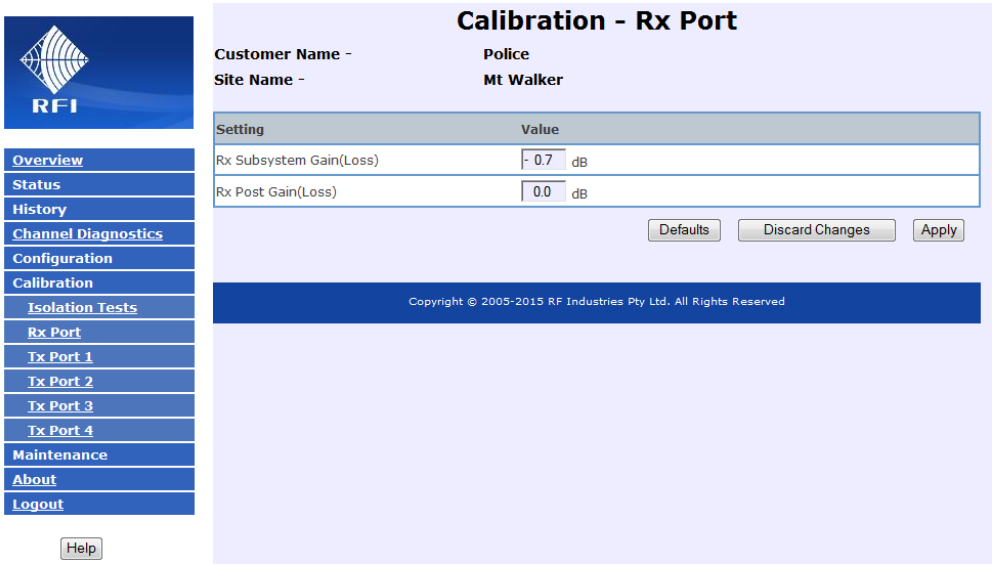
Note that if invalid values are being displayed after an Apply attempt, these values may not match the current repeater configuration. In this case, just select the Configure/Rx Port menu item again to re-display the current configuration.

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

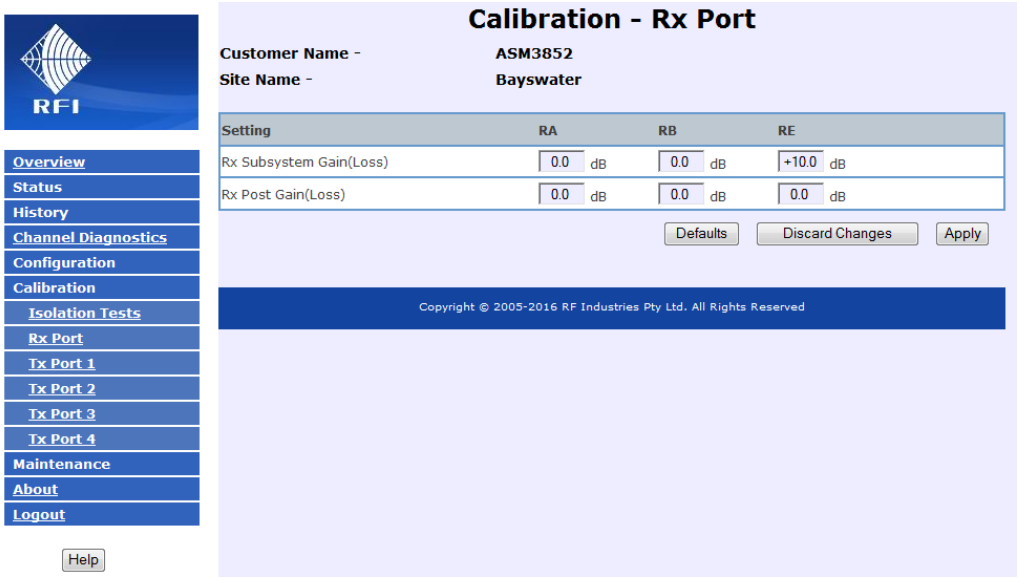
The following will calibrate the ASM Rx levels read from an output port of the receive multicoupler.



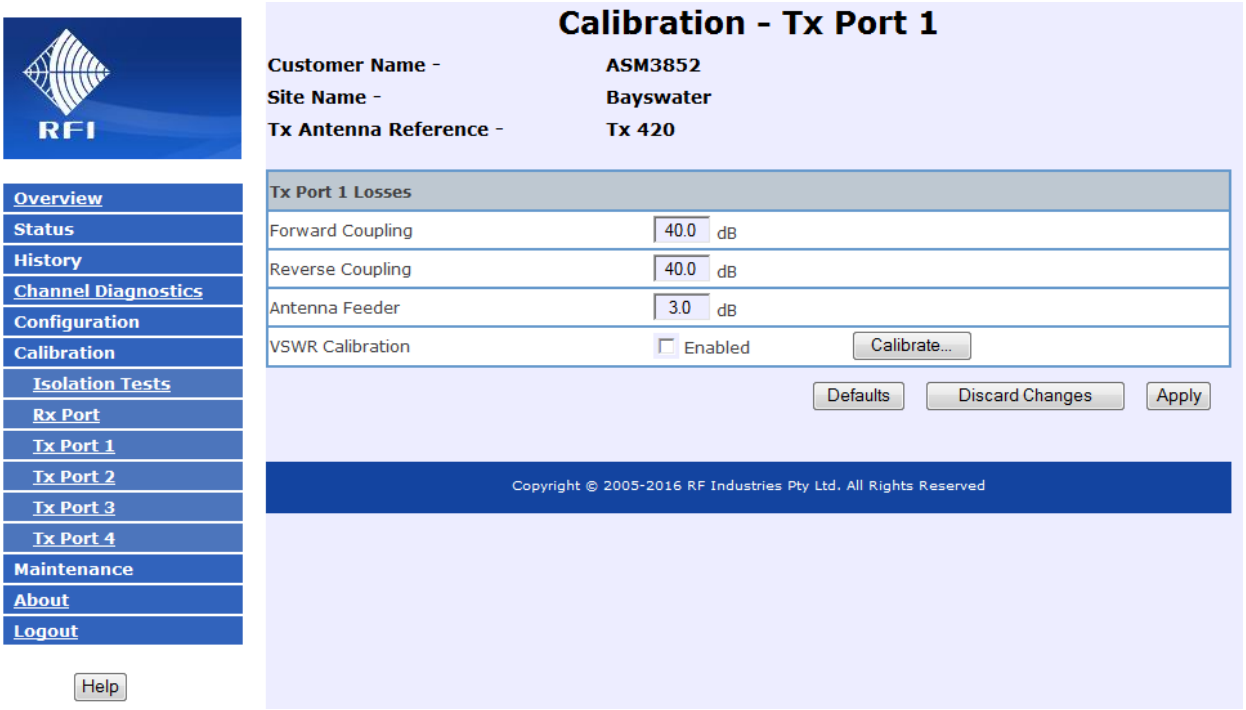
For TTA / RX multicoupler systems, enter the system Reserve Gain in the "RX Subsystem Gain (Loss)" field. For non-TTA systems, enter the net of the RX feedline loss and any multicoupler gain. Gain is entered as a positive number, loss as a negative number.

The "RX Post Gain (Loss)" field is for any gain or loss in line with the ASM 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 ASM is displaying the receive level present at the input of any site receivers.

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



10.47 Calibration – Tx Port 1



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:

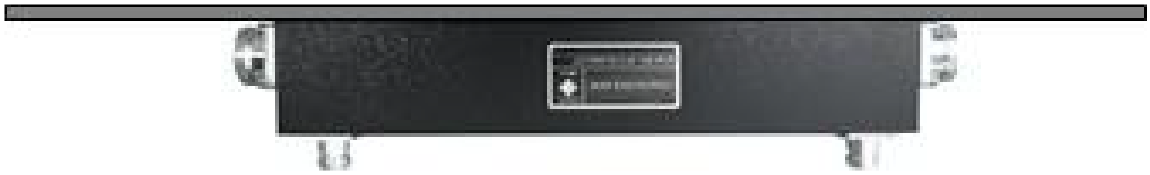
The loss of the Antenna Feeder cable for this Port. This value is used to compensate the calculated Fwd and Rev Power levels so that the reported VSWR figure represents the VSWR value as seen at the Antenna. The value entered in this field should represent the insertion loss in one direction of the feeder only (i.e. from the Coupler "to" the antenna).

VSWR Calibration:

Note: The "VSWR Calibration" does not need to be carried out when using SP3855-4440-DFF1RU and SP7496-4440-DFF1RU Dual Directional Couplers. The *Enabled* checkbox should be left un-ticked when using these model couplers and the process outlined in the *Tx Port VSWR CALIBRATION* section of this manual should be ignored.

An enhanced VSWR calculation algorithm may be used to improve the accuracy of the reported Antenna VSWR figures when significant Antenna feeder losses are present. The enhanced algorithm is only applicable to "legacy" model couplers and used in VSWR calculations if the Enabled checkbox is ticked.

For reference, the following photos show the physical difference between the two types of couplers:



"Legacy" model Bi-Directional Coupler (VHF model shown)

"Current" model Dual-Directional Coupler (700/800/900MHz model shown)

The "legacy" model couplers are readily identifiable as they have the "FWD" and "REV" sampling ports (Type N connectors) on a separate housing face to the 7/16 DIN connectors.

The "current" model dual-directional couplers have those ports on the ends of the coupler alongside and on the same housing faces as the 7/16 DIN connectors.

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.

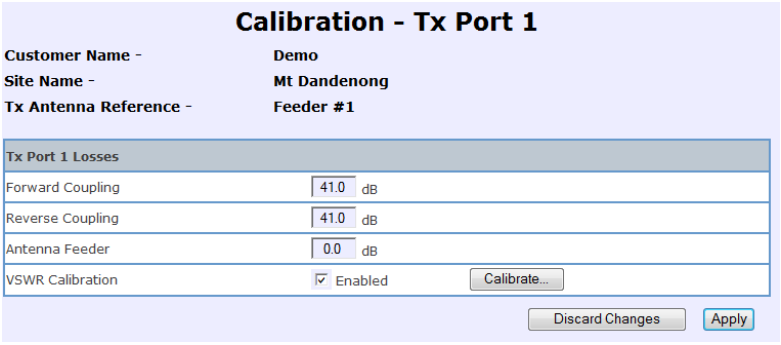
Note: Whenever programming changes are applied, the alarm status for affected channels is re-initialized.

RECOMMENDED CALIBRATION PROCEDURE

Calibration of the ASM allows system parameters such as coupling values, interconnecting cable losses and system feeder losses to be programmed into the ASM for optimum measurement accuracy.

Selecting each indented topic under the "Calibration" screen in the GUI will display that item as a separate page.

The following calibration procedure is for "Tx Port 1" and its associated coupler. The procedure for Tx Ports 2, 3 and 4 and their associated couplers is identical.



The screen at left contains all the necessary fields for the calibration process.

To complete the calibration process the required Test Equipment includes;

- Service Monitor capable of providing a 0dBm signal output using the same modulation type used by the system, and as selected in the *Configuration – Channels* GUI screens.
- An accurate 50ohm load capable of handling the base station transmitter power.
- A 50ohm cable, of known insertion loss, to connect between the Service Monitor and the ASM coupler.

Note: For the purpose of this calibration procedure description, the insertion loss of this 50ohm cable is assumed at "0.6dB". Adjust this value to accurately represent the cable actually being used.

Note: For the purpose of this calibration procedure description, the insertion loss of the Antenna Feeder cable is assumed at "0.0dB". Adjust this value to accurately represent the actual loss of the antenna feeder installed on site.

FORWARD COUPLING

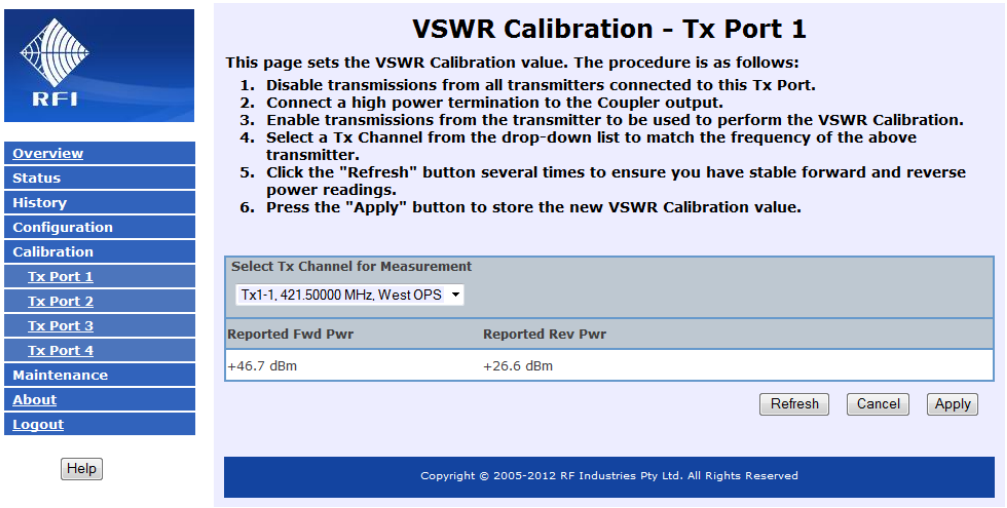
1. Connect the Service Monitor to the "*From Combiner*" port of the ASM coupler using the 50ohm cable, and the 50Ω termination to the "*To Antenna*" port of the coupler.
2. Set the Service Monitor signal generator to the correct frequency and modulation type for the channel being measured and adjust its output level for 0dBm.
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. Click the "*Apply*" button toward the upper right of the screen.
6. Go to the *Status – Tx Port 1* GUI screen and confirm that the displayed value for the channel is correct (i.e. 0dBm).
7. If it is not displaying correctly, return to the *Calibration – Tx Port 1* GUI screen and adjust the *Forward Coupling* value to correct the reading.
8. Click the "*Apply*" button toward the upper right of the screen.
9. Repeat steps 6 to 8 until the *Status – Tx Port 1* displayed value is correct for the test frequency.

REVERSE COUPLING

1. Do not change the Service Monitor signal generator settings and test cable used.
2. Move the Service Monitor signal generator cable to the "*To Antenna*" port of the coupler and the 50Ω termination to the "*From Combiner*" port of the coupler.
3. Go to the *Status – Tx Port 1* GUI screen and confirm that the displayed value for the channel is correct (i.e. 0dBm).
4. If it is not displaying correctly, return to the *Calibration – Tx Port 1* GUI screen and adjust the *Reverse Coupling* value to correct the reading.
5. Click the "*Apply*" button toward the upper right of the screen.
6. Repeat steps 3 to 5 until the *Status – Tx Port 1* displayed value is correct for the test frequency.

NOTE: Restore the connection of the cabling to/from the coupler for normal operation.

TX PORT VSWR CALIBRATION



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 ASM 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 this *Tx Port VSWR Calibration* process need not be performed.

Cancel:

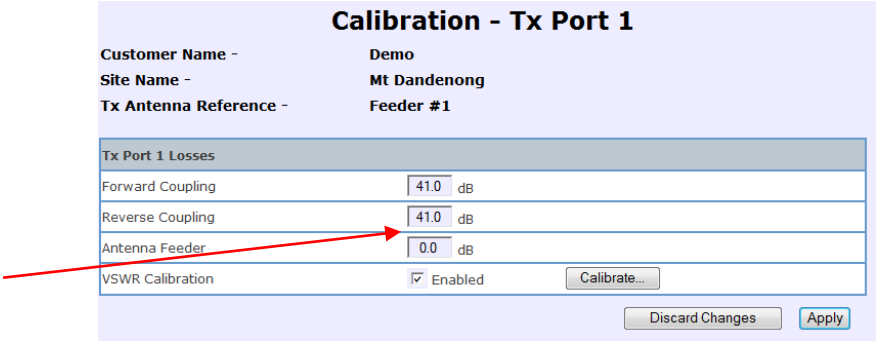
Exits the VSWR Calibration page without saving any changes and returns to the Tx Port Calibration page.

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.

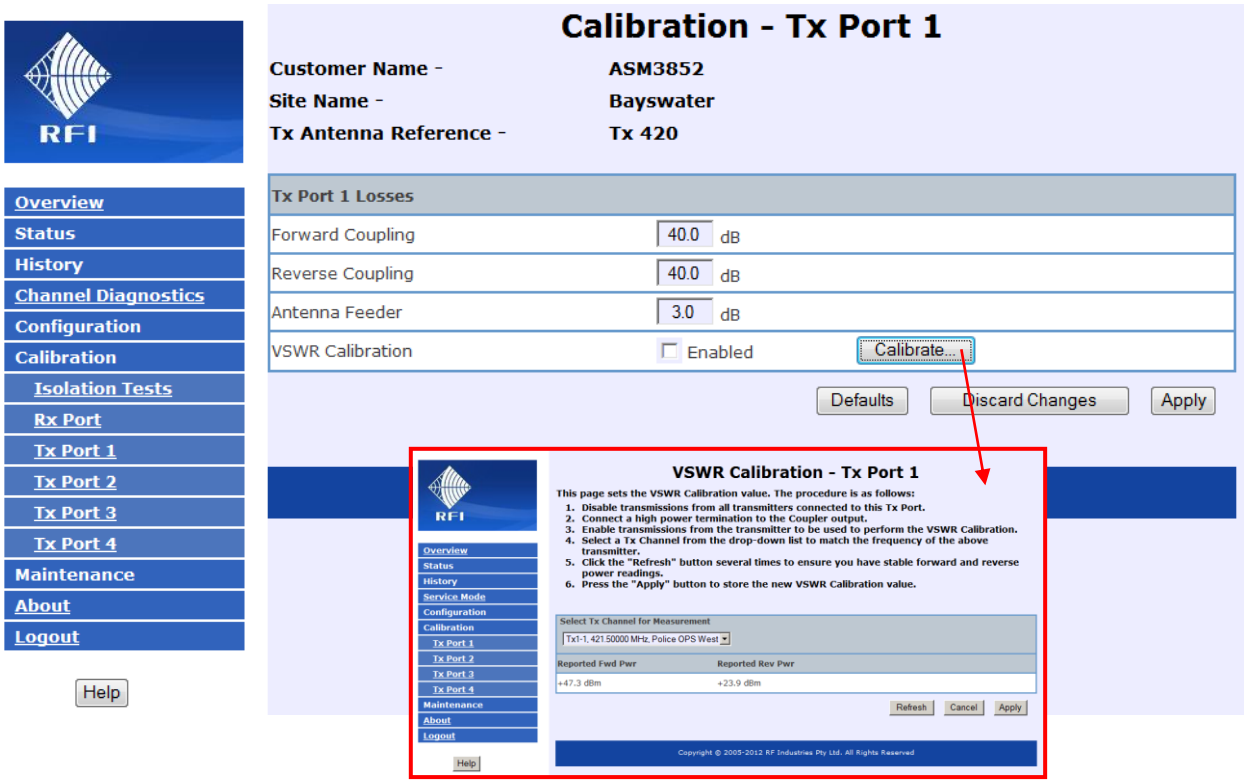
TX PORT VSWR CALIBRATION

To perform the VSWR Calibration, complete the *Calibration – Tx Port* process first, then select a channel in the middle of the frequency range and then check the "Enabled" box on the *Calibration – Tx Port* screen.



Then select the "Calibrate" button and the screen in the following section of this manual will appear after a prompt.

10.48 VSWR Calibration



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 ASM 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:

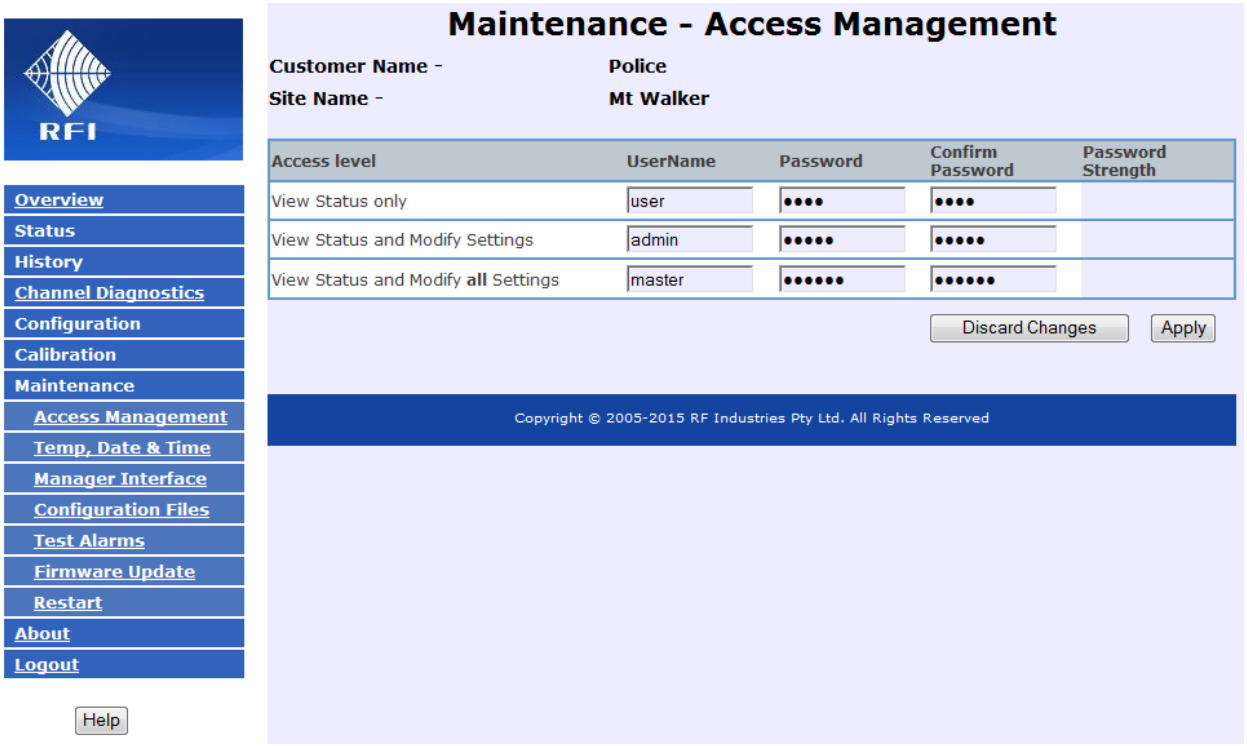
To perform the VSWR Calibration, complete the *RECOMMENDED CALIBRATION PROCEDURE in the* previous section of this manual.

10.49 Maintenance Menu

The "Maintenance" menu allows all of the ASMs 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



This page is used for managing access to the ASM. 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 ASM 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 **all** 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:

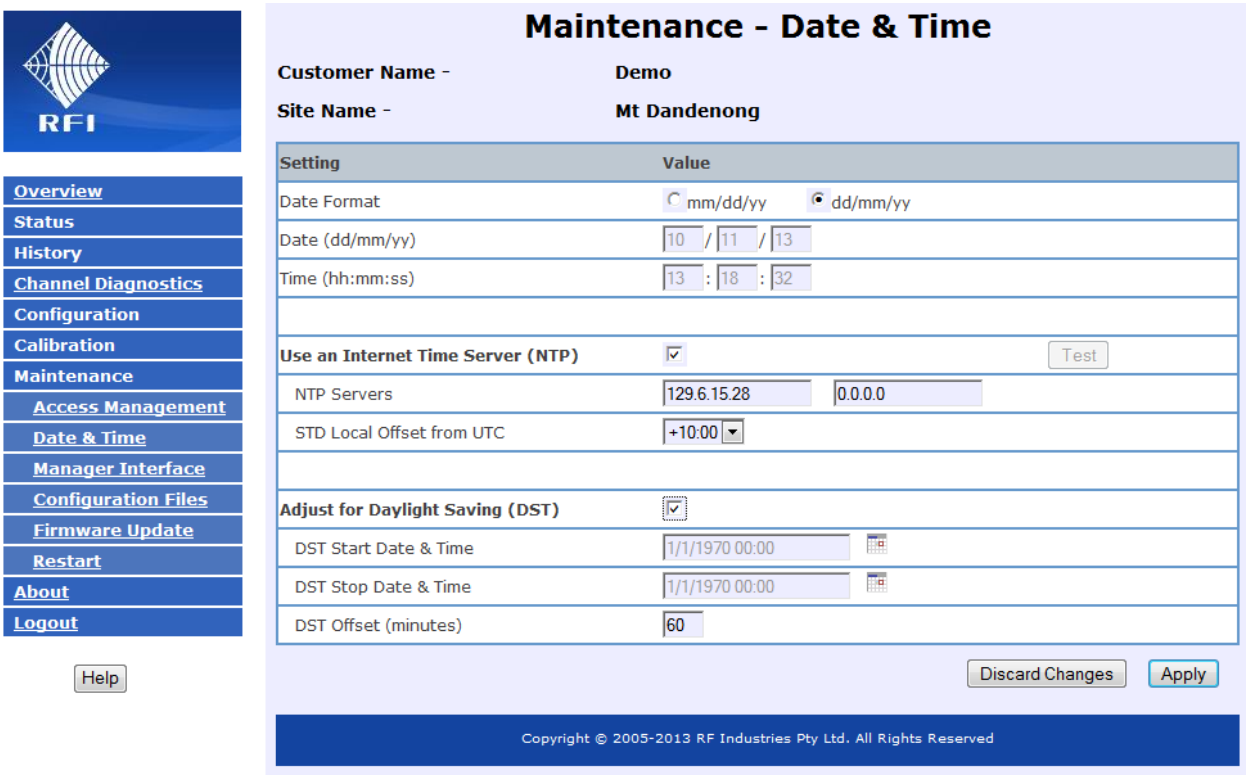
Click this button to restore the values to those present when the page was last redisplayed.

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



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 ASM date and time. NTP time is displayed as UTC time.

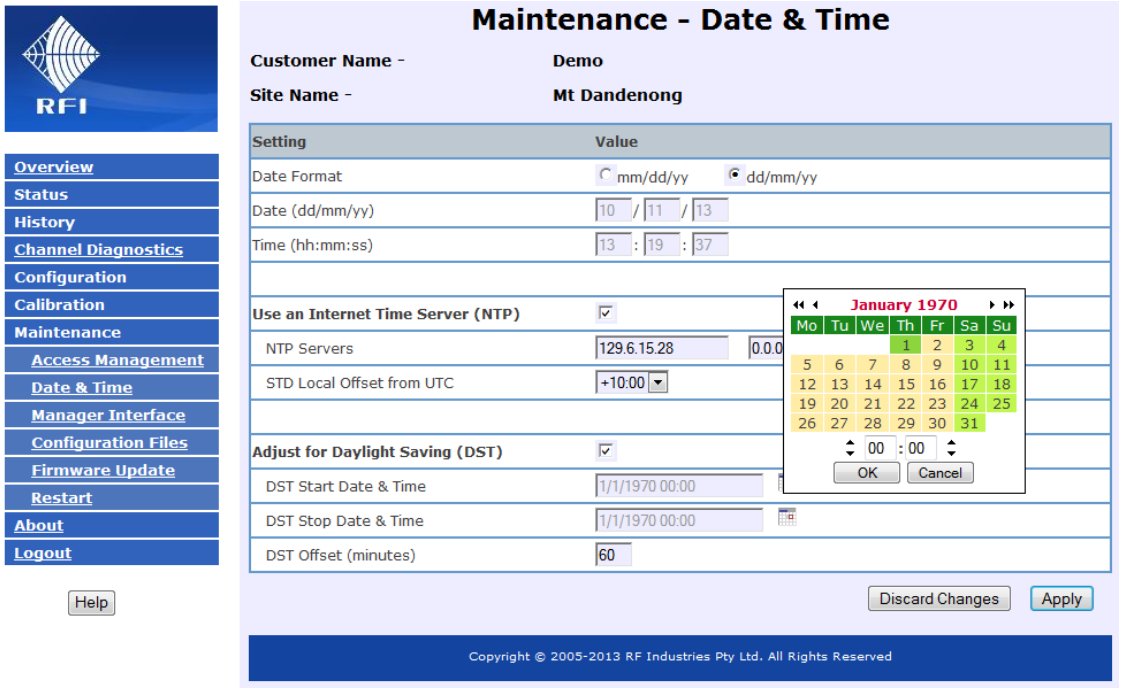
Pressing the Test button confirms connectivity to the nominated primary server. To confirm connectivity to the secondary server, place its address in the primary address field.

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 ASM location, and the associated DST offset (in minutes) to be applied during the nominated DST period.



Note: A convenient calendar is available next to the DST Start and Stop fields to allow dates to be selected directly.

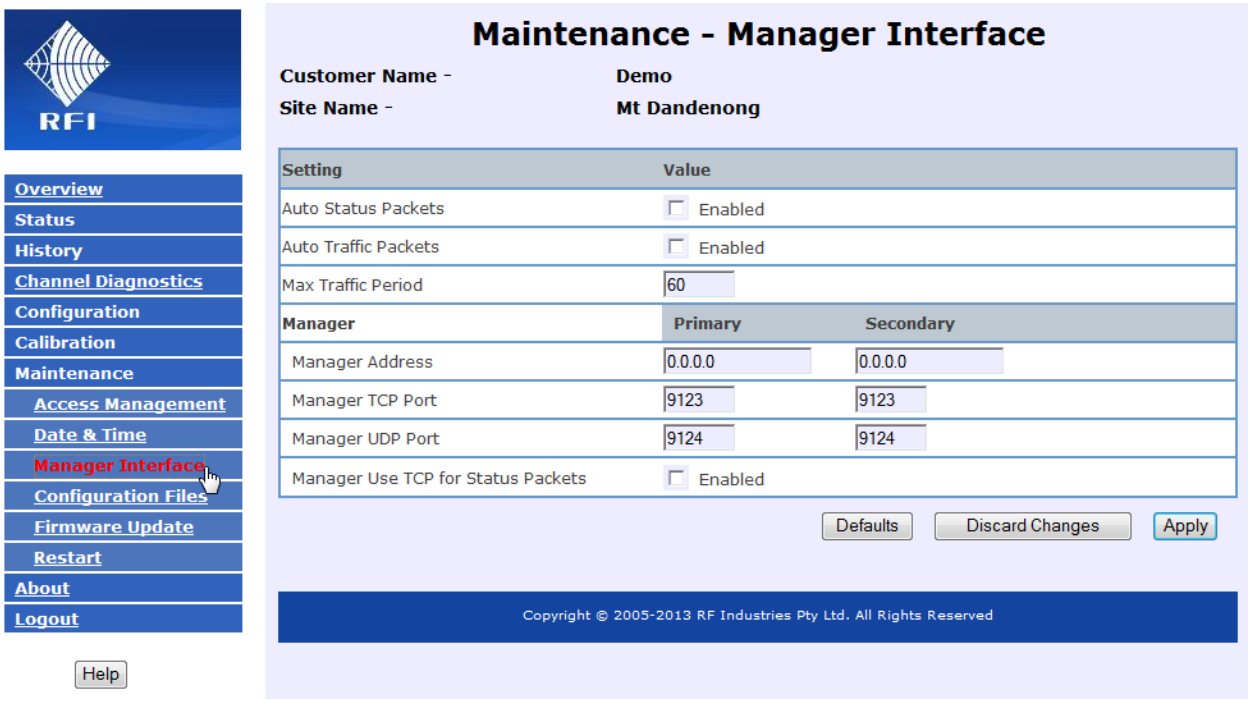
Discard Changes:

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



The configuration and status of multiple Antenna System 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

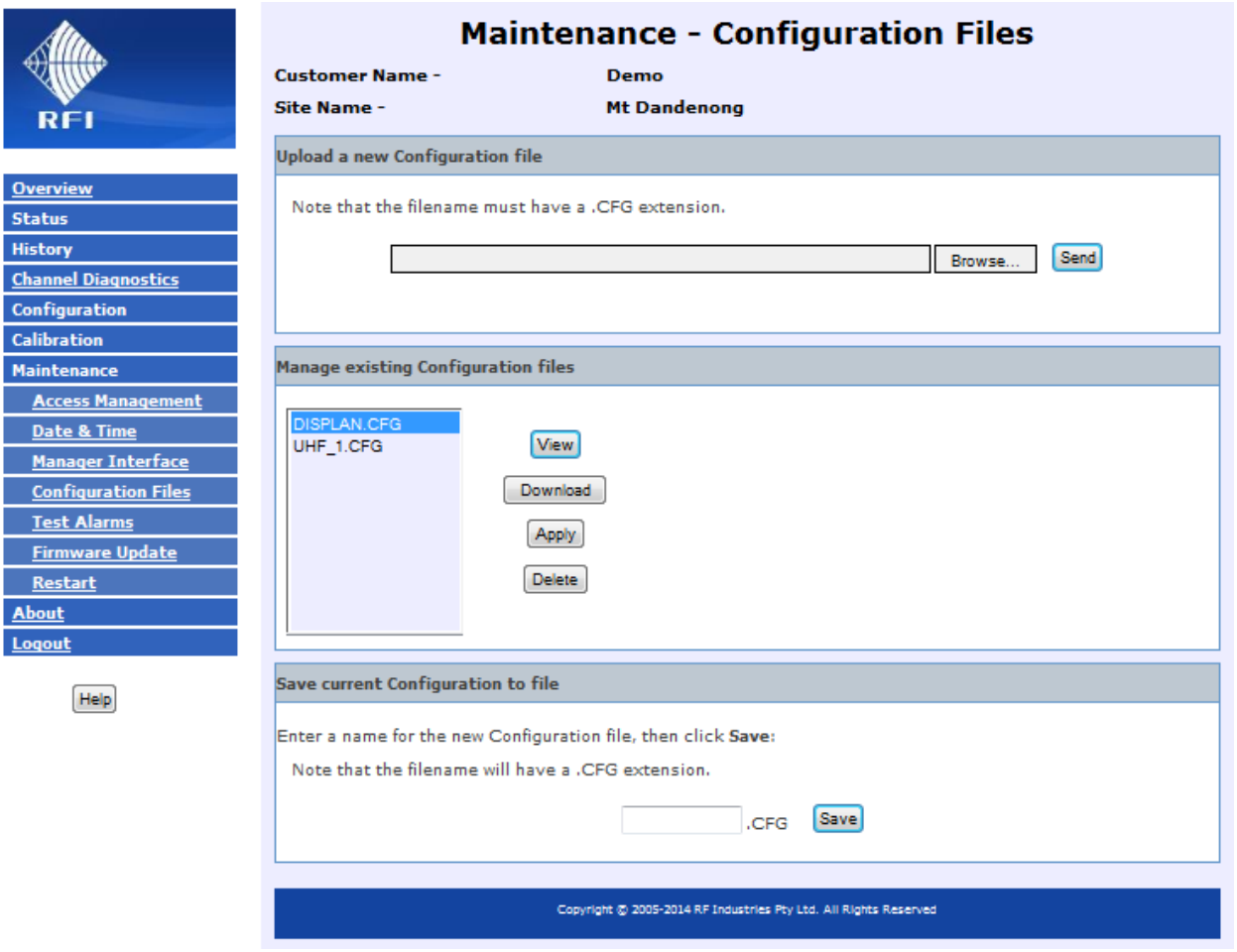
Discard Changes:

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



Configurations for the ASM may be stored in a list within the ASM and loaded or saved to a nominated computer drive if desired.

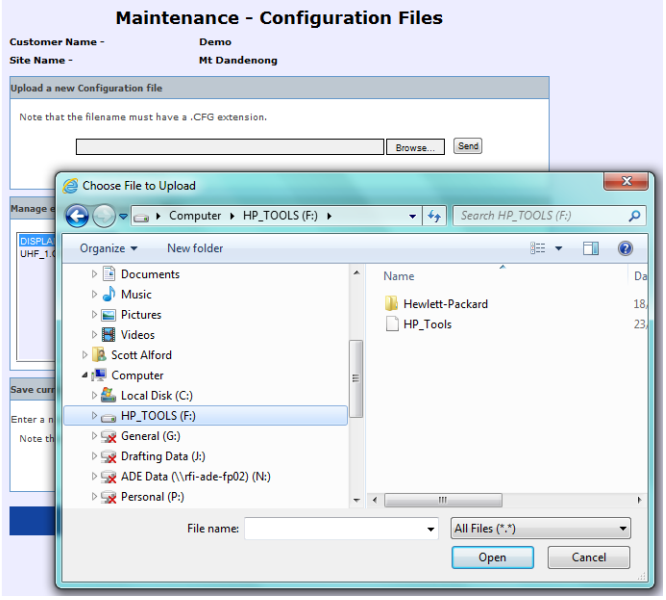
Note: Due to memory architecture limitations, this feature is not available in "K1" models of the ASM, but configuration files can be saved from a "K1" model using the Telnet Command Line Interface (CLI). Refer the end of this section for details.

Note: Access to this screen, and the field accessible on it, may vary based on the Login level used for accessing the ASM.

Upload a new Configuration file:

Click "Browse" to locate the desired ASM 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 ASM.

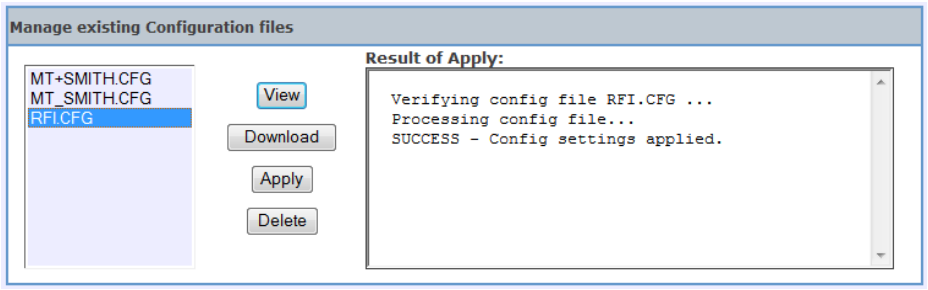


Manage existing Configuration files:

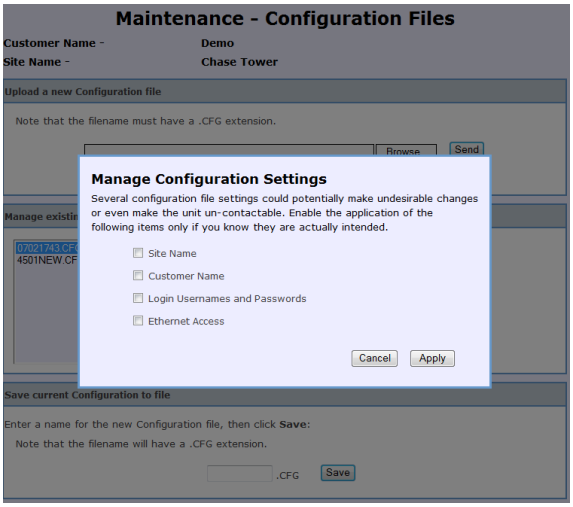
VIEW: To view the text contents of highlighted Configuration in the web browser.

DOWNLOAD: To save the highlighted Configuration file to a nominated computer drive/directory.

APPLY: Activates the highlighted Configuration in the ASM.



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 file that you do want to have applied to the ASM, 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 ASM. In this manner, one common configuration file can be applied to multiple ASMs, 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 ASM 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 ASM configuration to the list of stored ASM configurations.

Note: The stored ASM 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 ASM:

Due to memory architecture limitations, this feature is not available in "K1" models of the ASM, but configuration files can be saved into 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 ASM uses its IP address and the standard Telnet port number of 23 for its CLI.

Connect the Telnet session to the ASM unit, activate the terminal emulator's *logging* function, then use the following sequence of commands;

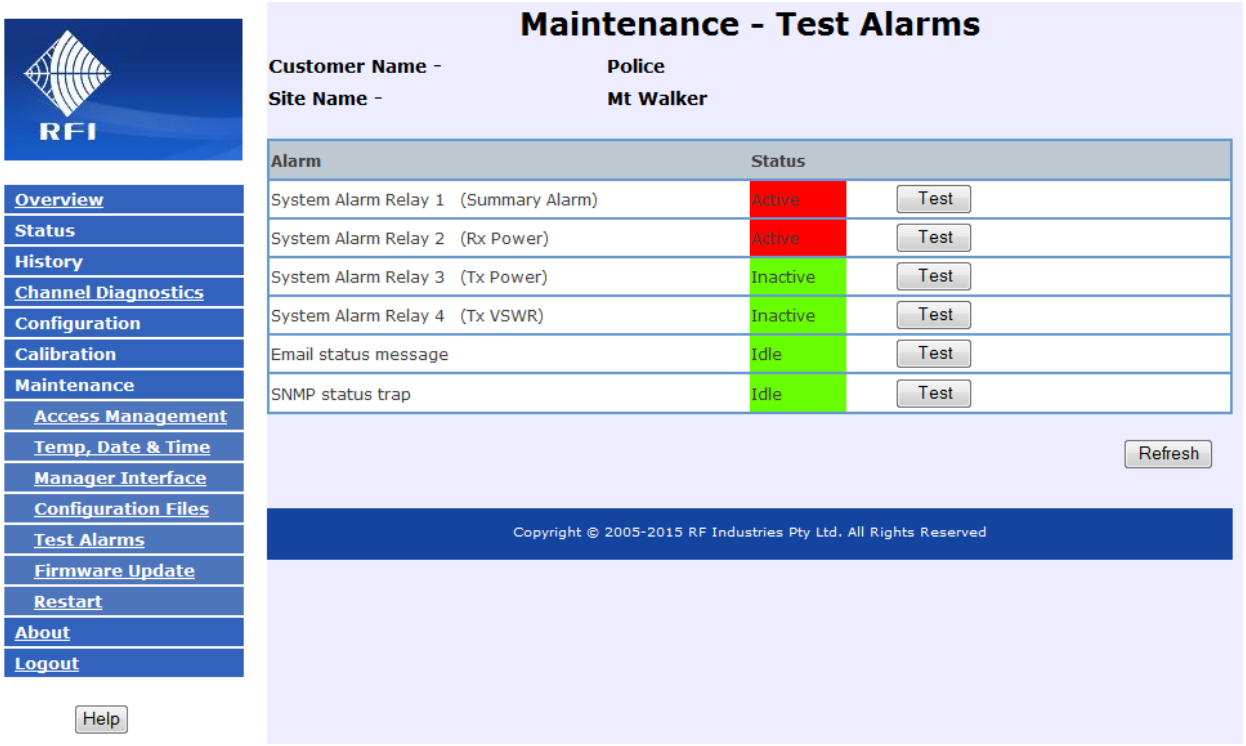
LOGIN ADMIN ADMIN <Enter>
CONFIG SAVE TERMINAL <Enter>

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 ASM configuration file format.

10.54 Maintenance – Test Alarms



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.

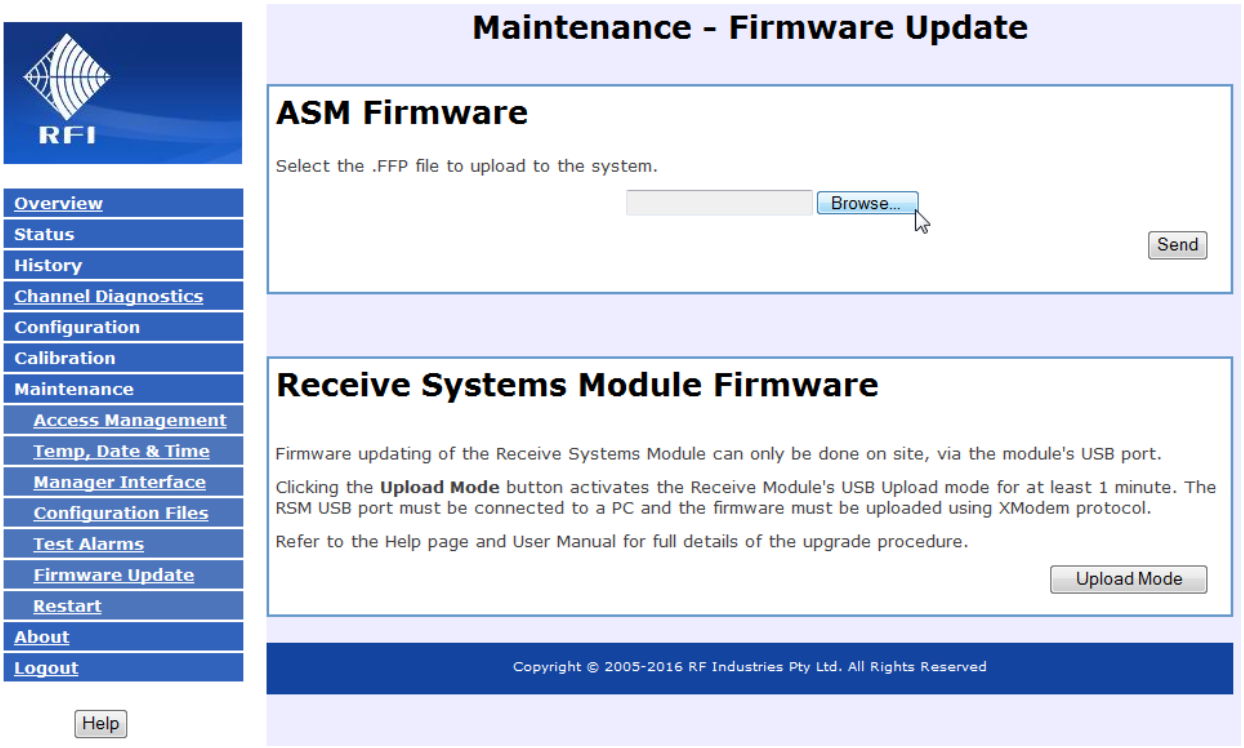
The *Test* will also generate a History Alarm Event Log entry and, if configured and enabled, relevant Email, SNMP and Manager Message Status messages. These will be identified as being *Test* messages. The *Test* message or Log entry will indicate status changes for the default Alarm Relay mapping, regardless of the actual alarm source mapping.

When the Email and SNMP *Test* button is clicked, the ASM 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 ASM 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 ASM.

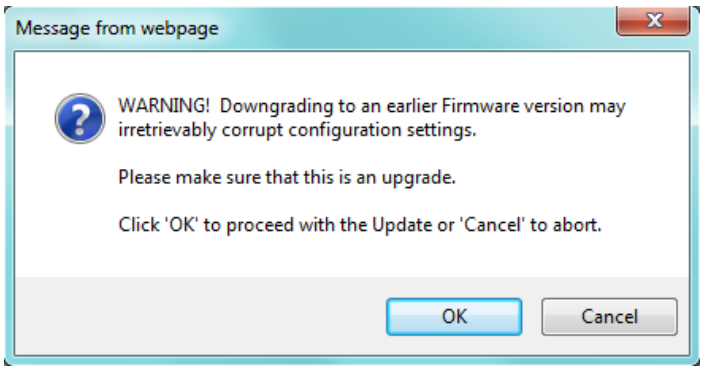
The required intermediate firmware version transitions for the ASM are;

- 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.

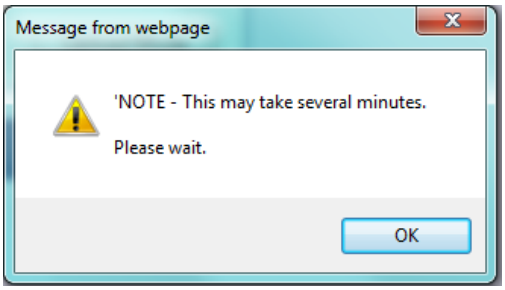
ASM firmware upgrades are normally supplied using a "FFP" file extension (Firmware & File system Package).

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.



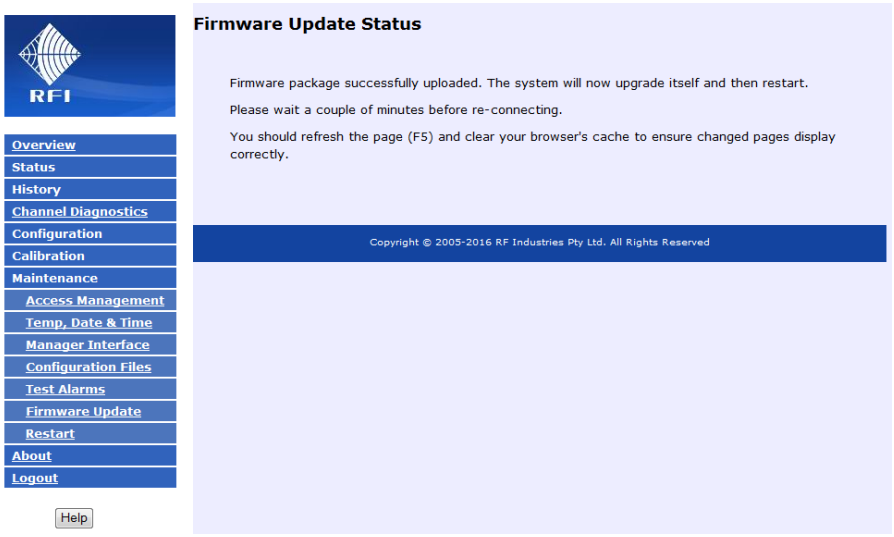
Click *OK* to proceed.



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.

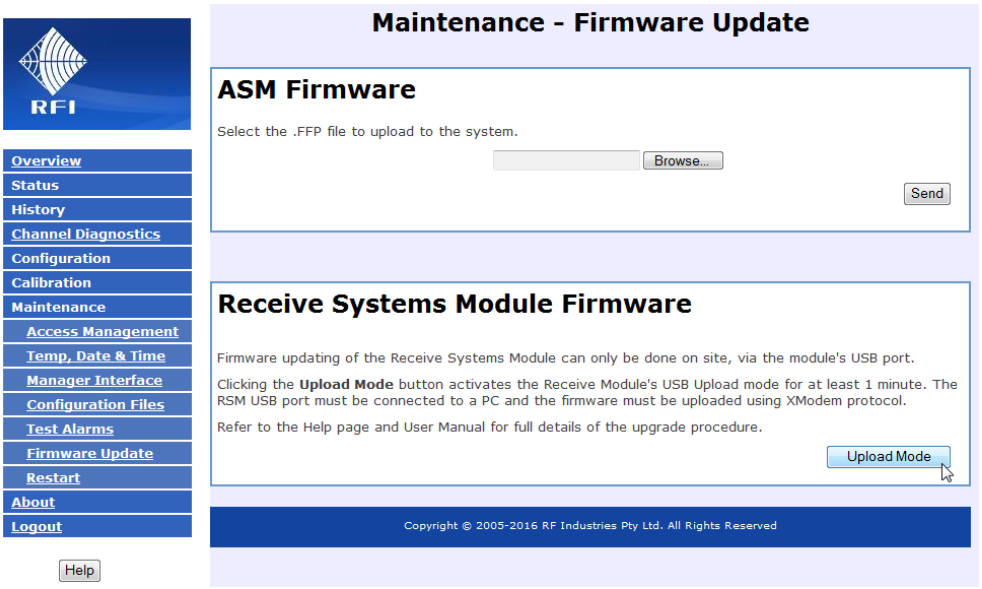
Note: You may need to clear your browser's cache to view changed pages. If you happen to get a connection timeout message, do not click the retry button**.** Instead, wait for a minute or so and then re-display the System Status page to confirm that the update actually completed satisfactorily.

Note: Firmware upgrades can impact existing ASM 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 ASM and render it inoperable and the unit's return to the factory may be necessary.

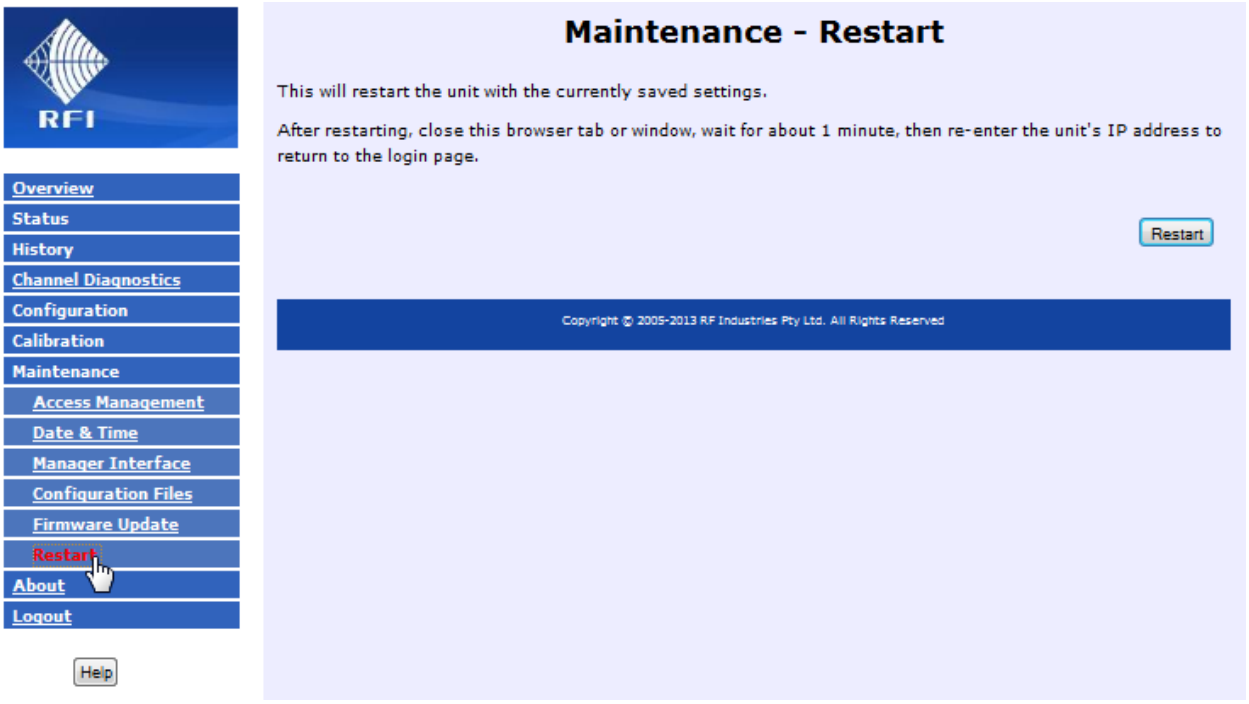
RSM firmware upgrades can only be completed locally via the RSM's micro USB port. The process for upgrading the RSM firmware is as follows;

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 ASM 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.

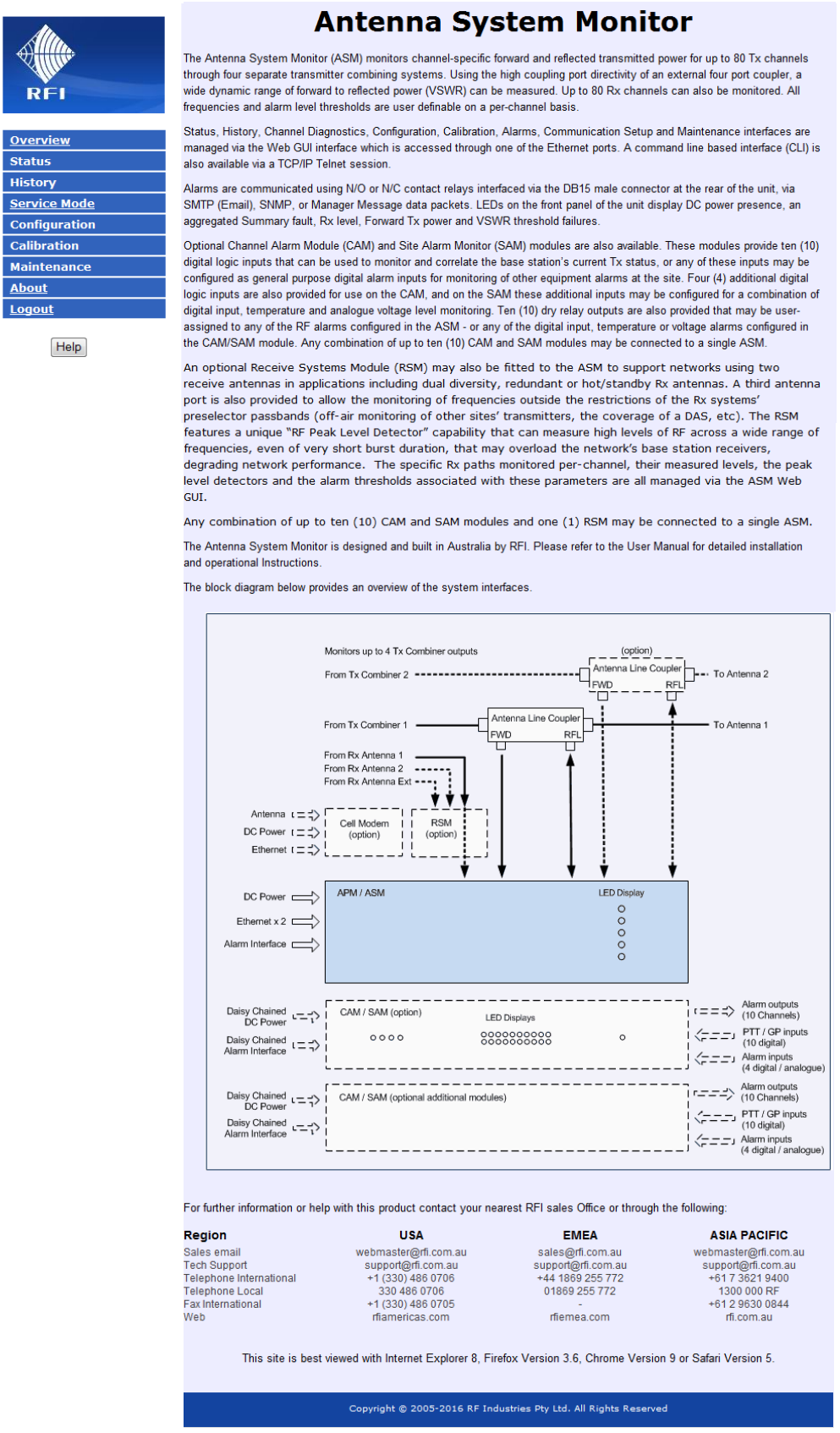
10.56 Maintenance - Restart



Clicking on this selection will initiate an ASM system "Restart".

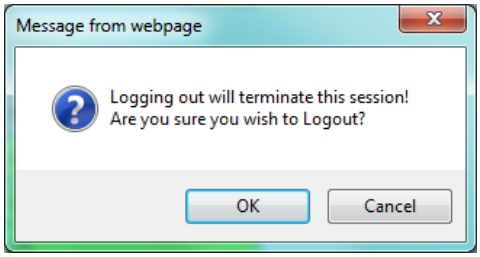
Note: The unit will normally only need to be restarted to activate new Communications settings. If restarted, an ASM may take several minutes to reboot and re-initialise itself before it becomes available for a "Log in" and a new session.

10.57 About – Antenna System Monitor

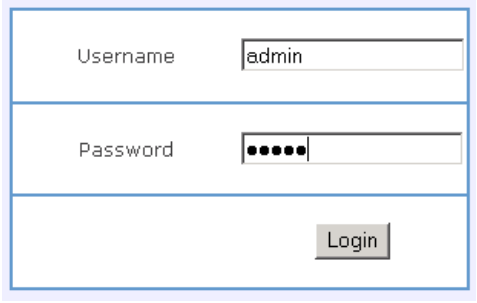


10.58 Logout

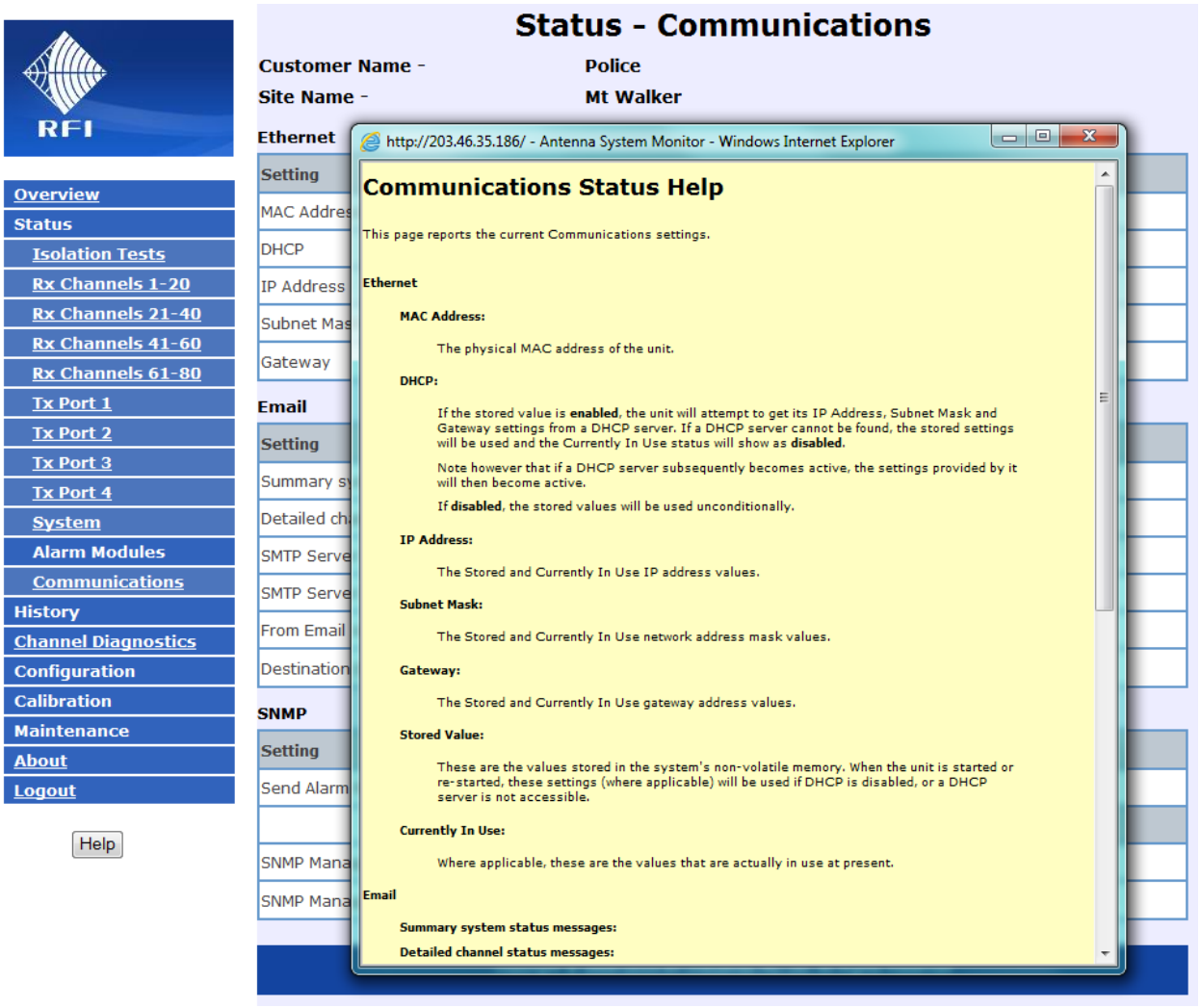
Clicking on this selection will present the "Log out" message box.



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…..



10.59 HELP Screens



A comprehensive set of Help screens are available throughout the ASM GUI. On any page, click the Help button to display the available information.

11. SNMP

This section overviews the SNMP V1 and V2c scalar and table OID-based northbound Trap and southbound GET request functionality supported by the ASM products using baseline 2.85 (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.

Scalar OID traps described in the Scalar OID Trap Objects section of this document are sent when the 'Specific Trap' checkbox is unticked in the Configuration-Communications GUI page.

Table OID traps described in the Table OID GET Requests and Trap Objects section of this document are enabled when the 'Specific Trap' checkbox is ticked in the Configuration-Communications GUI page.

The Antenna System Monitor (ASM) 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.

Scalar OID Trap Objects

The axmAlarmEntry object (1.3.6.1.4.1.32327.2.2.2.1.2) defines a trap and each trap includes the following 11 different 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:

Restart (0)	The unit has just been restarted.
SystemStatus (1)	The summary alarm status has changed.
ChannelStatus (2)	An individual channel alarm status has changed.
CamStatus (3)	An Alarm Module input alarm status has changed.
AccessEvent (4)	Three or more consecutive login attempts have failed, resulting in a lockout state.
IsolTestStatus (5)	A change in Isolation test alarm status.

axmAlarmStatusBits

OID 1.3.6.1.4.1.32327.2.2.2.1.2.4

Syntax Integer 0/1 (1 bit) or 0..255 (8 bits) or 0..65535 (i.e. 16 bits)

System Status – 16 bits
Channel Rx Status – 16 bits
Channel Tx Status – 8 bits
CAM/SAM Status – 1 bit
Isolation Test Status – 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 be up to date representing the true system status. They should therefore be ignored.

SystemStatus

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 below.
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
Internal 5V rail is out of limit.
Internal hardware failure – SD-Card.

Note: These are no presented separately, but any Hardware Alarm Bit(s) set will set the 0x0020 bit of the (above) System Status Bits

ChannelStatus

Note: Decoded from the following tables 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
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
0x0 Alarm not active.
0x1 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 login attempts is ≥ 3.

IsolationTestStatus

Isolation Test Status Bits
0x0001 Not used.
0x0002 (Antenna Isolation), Rx Gain or Tx Rejection fail. See Note below
0x0004 RxA Level out of range (Not used by SNMP).
0x0008 VCO Lock Fail (Not used by SNMP).
0x0010 RxB Level out of range (Not used by SNMP).
0x0020 Not used.
0x0040 RxE Level out of range (Not used by SNMP).
0x0080 Not used.
0x0100 Not used.
0x0200 Not used.
0x0400 RxA Enabled (Not used by SNMP).
0x0800 RxB Enabled (Not used by SNMP).
0x1000 RxE 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 Antenna Isolation, Rx Gain, or Tx Rejection 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), ILOSS=OK(1.5), 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, or 1 to 20 for Tx Ports.
CamStatus:
The Alarm Module input number.
Possible values are 1 to 4 for External Inputs, or 11 to 20 for Digital Inputs 1 to 10

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

Scalar OID GET Requests

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 ASM is as follows;

axmAlarmCustName.0	Not defined
axmAlarmSiteName.0	Not defined
axmAlarmType.0	SystemStatus(1)
axmAlarmStatusBits.0	49488
axmAlarmDescription.0	SYS=FAIL, RX=FAIL, TXPWR=OK, TXVSWR=OK, ALMMOD=OK
axmAlarmState.0	fail(2)
axmAlarmDateTime.0	2016-3-3,15:18:26.0
axmAlarmSourceNumber.0	RxPort(0)
axmAlarmSourceText.0	
axmAlarmItemNumber.0	0
axmAlarmItemText.0	

Table OID GET Requests and Trap Objects

The MIB file defines a group of OIDs which belong to a particular table OID. Any SNMP GET request to a table OID will be a multi OID request and the ASM will return the current parameter values for all the associated OIDs in that table.

The Alarm Status node (1.3.6.1.4.1.32327.2.2.2.1.3) has the following five table OID's. The first four OIDs have nine different objects, and the last OID has four different objects.

- Tx channel status (1.3.6.1.4.1.32327.2.2.2.1.3.1.1)
- Rx channel status (1.3.6.1.4.1.32327.2.2.2.1.3.2.1)
- Isolation test status (1.3.6.1.4.1.32327.2.2.2.1.3.3.1)
- CAM and SAM alarm status (1.3.6.1.4.1.32327.2.2.2.1.3.4.1)
- System status (1.3.6.1.4.1.32327.2.2.2.1.3.5.1)

Tx channel status table entry OID objects (1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1**)**

Object name	OID	Syntax	Description
statusTxChannelIndex	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.1	Integer(1..80)	A unique value for each Tx channel (instance/row)
channelPort	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.2	Integer(1..4)	Information about the port number
channelNumber	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.3	Integer(1..20)	Information about the channel number in a specific port
channelForwardPwr	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.4	Integer(-2048..2047)	Information about Tx forward power level. This is in 1/10th of dBm
channelInsertionLoss	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.5	Integer (0..4095)	Information about Tx combiner insertion loss. This is in 1/10ths of a dB
channelVswr	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.6	Integer (100..9999)	Information about Antenna VSWR. This is in 1/100ths units.
channelStatus	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.7	Integer (0..255)	Value representing the Tx channel status bits
channelState	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.8	Integer (1..4)	State of the channel
channelDescription	1.3.6.1.4.1.32327.2.2.2.1.3.1.1.1.9	Text String	Textual description of Tx channel status bits

Channel states
1 OK
2 Fail
3 Disabled / Not configured
4 Invalid Tx channel index

Tx Channel Status Bits
0x01 Tx power level failed.
0x02 Internal Use only.
0x04 VSWR failed.
0x08 VCO lock failed.
0x10 Tx signal present.
0x20 Tx signal still ON/OFF.
0x40 Internal use.
0x80 Rx signal present.

An example of the Tx channel status table is;

SNMP Table - .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiAxMProduct.axmAlarmMIB.statusAlarmEntry.statusTxChannelNode.statusTxChannelTable

s...	channelPort	channelNumber	channelForwardPwr	channelInsertionLoss	channelVswr	channelStatus	channelState	channelDescription
1	TxPort1(1)	1	-334	563	1	33	fail(2)	PWR=FAIL(<- 10); ILOSS=OK(56.3); VSWR=OK(1.00); VCO=OK; TX=OFF
2	TxPort1(1)	2	-118	0	1	32	okay(1)	PWR=OK(<- 10); ILOSS=OK(0.0); VSWR=OK(1.00); VCO=OK; TX=OFF
3	TxPort1(1)	3	2047	2047	2047	0	disabled(3)	
4	TxPort1(1)	4	2047	2047	2047	0	disabled(3)	
5	TxPort1(1)	5	2047	2047	2047	0	disabled(3)	
6	TxPort1(1)	6	2047	2047	2047	0	disabled(3)	

Note: The levels will be reported as +2047 if the respective input is not enabled

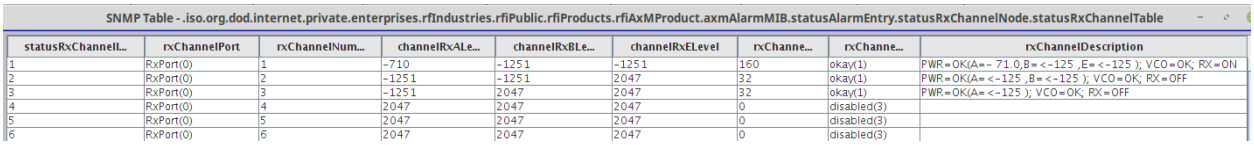
Rx channel status table entry OID objects (1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1**)**

Object name	OID	Syntax	Description
statusRxChannelIndex	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.1	Integer (1..80)	A unique value for each Rx channel (instance/row)
rxChannelPort	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.2	Integer(0)	Information about the port number
rxChannelNumber	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.3	Integer(1..80)	Information about the Rx channel number in a specific port
channelRxALevel	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.4	Integer(-2048..2047)	Information about Rx (or RSM-RxA) power level. This is in 1/10ths of a dBm
channelRxBLevel	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.5	Integer(-2048..2047)	Information about RSM-RxE power level. This is in 1/10ths of a dBm
channelRxELevel	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.6	Integer(-2048..2047)	Information about RSM-RxE power level. This is in 1/10ths of a dBm
rxChannelStatus	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.7	Integer(0..65535)	Information about Rx channel status bits
rxChannelState	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.8	Integer(1..4)	An integer representing state of the Rx channel
rxChannelDescription	1.3.6.1.4.1.32327.2.2.2.1.3.2.1.1.9	Text String	Description of Rx channel status bits

Channel states
1 OK
2 Fail
3 Disable/Not configured
4 Invalid Rx channel index

Rx Channel Status Bits
0x0001 Rx power level failure summary.
0x0002 Rx Antenna isolation loss fail summary.
0x0004 RxA level out of range (Rx-0 only).
0x0008 VCO lock failed.
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.

An example of Rx channel status table is;


SNMP Table - .iso.org.dod.internet.private.enterprises.rfiIndustries.rfiPublic.rfiProducts.rfiAxMProduct.axmAlarmMIB.statusAlarmEntry.statusRxChannelNode.statusRxChannelTable

statusRxChannelI...	rxChannelPort	rxChannelNum...	channelRxALe...	channelRxBLe...	channelRxELevel	rxChanne...	rxChanne...	rxChannelDescription
1	RxPort(0)	1	-710	-1251	-1251	160	okay(1)	PWR=OK(A=- 71.0,B=<-125 ,E=<-125); VCO=OK; RX=ON
2	RxPort(0)	2	-1251	-1251	2047	32	okay(1)	PWR=OK(A=<-125 ,B=<-125); VCO=OK; RX=OFF
3	RxPort(0)	3	-1251	2047	2047	32	okay(1)	PWR=OK(A=<-125); VCO=OK; RX=OFF
4	RxPort(0)	4	2047	2047	2047	0	disabled(3)	
5	RxPort(0)	5	2047	2047	2047	0	disabled(3)	
6	RxPort(0)	6	2047	2047	2047	0	disabled(3)	

Note: The levels will be reported as +2047 if the respective input is not enabled

Isolation test status table entry objects (1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1**)**

Object name	OID	Syntax	Description
isolChannelIndex	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.1	Integer(0..40)	A unique value for each isolation test channel (instance/row)
isolTestSource	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.2	Text string	Textual representation of test source
isolTestFreq	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.3	Text string	Textual representation of test frequency
isolTestResultA	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.4	Integer(-2048..2047)	Measurement results of antenna Isolation A/ RxA Gain/ TxA rejection levels. This is in 1/10ths of a dB
isolTestResultB	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.5	Integer(-2048..2047)	Measurement results of antenna Isolation B/ RxB Gain/ TxB rejection levels. This is in 1/10ths of a dB
isolTestResultE	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.6	Integer(-2048..2047)	Measurement results of antenna Isolation E/ RxE Gain/ TxE rejection levels. This is in 1/10ths of a dB
isolTestStatus	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.7	Integer(0..65535)	Information about isolation test status bits
isolTestState	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.8	Integer(1..4)	State of isolation test channel
isolTestDescription	1.3.6.1.4.1.32327.2.2.2.1.3.3.1.1.9	Text string	Textual description of isolation test status bits

Isolation Channel Index

0 Antenna Isolation,
1 - 20 Rx System Gain channels (1 - 20)
21 - 40 Tx Rejection channels (1 - 20)

Isolation test channel states

1 OK
2 Fail
3 Disable/Not configured
4 Invalid index

Isolation Test Status Bits

0x0001 Not used.
0x0002 Rx Gain or Tx Rejection fail.
0x0004 RxA level out of range. (Not used by SNMP)
0x0008 VCO lock fail (Rx Gain only). (Not used by SNMP)
0x0010 RxB level out of range. (Not used by SNMP)
0x0020 Not used.
0x0040 RxE level out of range. (Not used by SNMP)
0x0080 Not used.
0x0100 Not used.
0x0200 Not used.
0x0400 RxA enabled. (Not used by SNMP)
0x0800 RxB enabled. (Not used by SNMP)
0x1000 RxE enabled. (Not used by SNMP)
0x2000 RSM Present. (Not used by SNMP)

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 Antenna Isolation, Rx Gain, or Tx Rejection alarm.

An example of isolation test status table is;

SNMP Table - .iso.org.dod.internet.private.enterprises.rfiIndustries.rfiPublic.rfiProducts.rfiAxMProduct.axmAlarmMIB.statusAlarmEntry.statusIsolationChannelNode.statusIsolationChannelTable

isolChannelIndex	isolTestSource	isolTestFreq	isolTestResultA	isolTestResultB	isolTestResultE	isolTestStatus	isolTestState	isolTestDescription
0	AntIsolation	480.000000 MHz	591	591	593	32	okay(1)	Ant Isolation,STATUS=OK(A=59.1,B=59.1,E=59.3 dB,480.000000 MHz)
1	RxSystem-1	480.000000 MHz	4	2	3	0	okay(1)	Rx System,STATUS=OK(A=0.4,B=0.2,E=0.3 dB,480.000000 MHz)
2	RxSystem-2	481.000000 MHz	1	2	2047	0	okay(1)	Rx System,STATUS=OK(A=0.1,B=0.2 dB,481.000000 MHz)
3	RxSystem-3	482.000000 MHz	3	2047	2047	0	okay(1)	Rx System,STATUS=OK(A=0.3 dB,482.000000 MHz)
4	RxSystem-4	483.000000 MHz	0	6	4	0	okay(1)	Rx System,STATUS=OK(A=0.0,B=0.6,E=0.4 dB,483.000000 MHz)
5	RxSystem-5	484.000000 MHz	-4	4	2047	0	okay(1)	Rx System,STATUS=OK(A=-0.4,B=0.4 dB,484.000000 MHz)
6	RxSystem-6	485.000000 MHz	-6	2047	2047	0	okay(1)	Rx System,STATUS=OK(A=-0.6 dB,485.000000 MHz)
7	RxSystem-7	486.000000 MHz	-11	4	-1	0	okay(1)	Rx System,STATUS=OK(A=-1.1,B=0.4,E=-0.1 dB,486.000000 MHz)
8	RxSystem-8	487.000000 MHz	-17	1	2047	0	okay(1)	Rx System,STATUS=OK(A=-1.7,B=0.1 dB,487.000000 MHz)
9	RxSystem-9	488.000000 MHz	-21	2047	2047	0	okay(1)	Rx System,STATUS=OK(A=-2.1 dB,488.000000 MHz)
10	RxSystem-10	480.500000 MHz	0	1	2	0	okay(1)	Rx System,STATUS=OK(A=0.0,B=0.1,E=0.2 dB,480.500000 MHz)
11	RxSystem-11		2047	2047	2047	0	disabled(3)	
12	RxSystem-12		2047	2047	2047	0	disabled(3)	
13	RxSystem-13		2047	2047	2047	0	disabled(3)	
14	RxSystem-14		2047	2047	2047	0	disabled(3)	
15	RxSystem-15		2047	2047	2047	0	disabled(3)	
16	RxSystem-16		2047	2047	2047	0	disabled(3)	
17	RxSystem-17		2047	2047	2047	0	disabled(3)	
18	RxSystem-18		2047	2047	2047	0	disabled(3)	
19	RxSystem-19		2047	2047	2047	0	disabled(3)	
20	RxSystem-20	494.000000 MHz	-17	-9	-15	0	okay(1)	Rx System,STATUS=OK(A=-1.7,B=-0.9,E=-1.5 dB,494.000000 MHz)
21	TxRejection-1	410.000000 MHz	-1	-1	-1	0	okay(1)	Tx Rejection,STATUS=OK(A=-0.1,B=-0.1,E=-0.1 dB,410.000000 MHz)
22	TxRejection-2	411.000000 MHz	893	1466	2047	2	fail(2)	Tx Rejection,STATUS=FAIL(A=89.3,B=> 146.6 dB,411.000000 MHz)
23	TxRejection-3	410.000000 MHz	-1	2047	2047	0	okay(1)	Tx Rejection,STATUS=OK(A=-0.1 dB,410.000000 MHz)
24	TxRejection-4		2047	2047	2047	0	disabled(3)	
25	TxRejection-5		2047	2047	2047	0	disabled(3)	
26	TxRejection-6		2047	2047	2047	0	disabled(3)	
27	TxRejection-7		2047	2047	2047	0	disabled(3)	
28	TxRejection-8		2047	2047	2047	0	disabled(3)	
29	TxRejection-9		2047	2047	2047	0	disabled(3)	
30	TxRejection-10	440.000000 MHz	-1	2047	2047	0	okay(1)	Tx Rejection,STATUS=OK(A=-0.1 dB,440.000000 MHz)
31	TxRejection-11		2047	2047	2047	0	disabled(3)	
32	TxRejection-12		2047	2047	2047	0	disabled(3)	
33	TxRejection-13		2047	2047	2047	0	disabled(3)	
34	TxRejection-14		2047	2047	2047	0	disabled(3)	
35	TxRejection-15		2047	2047	2047	0	disabled(3)	
36	TxRejection-16		2047	2047	2047	0	disabled(3)	
37	TxRejection-17		2047	2047	2047	0	disabled(3)	
38	TxRejection-18		2047	2047	2047	0	disabled(3)	
39	TxRejection-19		2047	2047	2047	0	disabled(3)	
40	TxRejection-20	440.000000 MHz	-1	-1	-1	0	okay(1)	Tx Rejection,STATUS=OK(A=-0.1,B=-0.1,E=-0.1 dB,440.000000 MHz)

Note: The levels will be reported as +2047 if the respective input is not enabled

CAM and SAM status table entry objects (1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1**)**

Object name	OID	Syntax	Description
moduleIndex	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.1	Integer(1..10)	A unique value representing CAM/SAM module ID
moduleInfo	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.2	Integer(0..4)	Module information bits
EXT-1	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.3	Integer(-32768..32767)	External analog input voltage measurement in mV or Module Temperature in 1/10ths of a degree Fahrenheit
EXT-2	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.4	Integer(-32768..32767)	External analog voltage measurement in 10 mV units
EXT-3	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.5	Integer(-32768..32767)	External analog voltage measurement in 10 mV units
EXT-4	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.6	Integer(-32768..32767)	External analog input voltage measurement in 10 mV units
moduleStatus	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.7	Integer(0..65535)	Represents external and digital input alarm status bits. See below
moduleState	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.8	Integer(1..4)	Represents state of alarm module. See below
moduleDescription	1.3.6.1.4.1.32327.2.2.2.1.3.4.1.1.9	Text string	Textual description of the module status and module Information

CAM/SAM module states
1 OK
2 Fail
3 Disabled / Not configured
4 Invalid module Id

Module Information Bits
0x1 Alarm module is present.
0x2 Alarm module is SAM.
0x4 Ext-1 value is degrees Celsius.
0x8 Spare.

Module Status Bits
0x0001 Ext-1 input alarm active.
0x0002 Ext-2 input alarm active.
0x0004 Ext-3 input alarm active.
0x0008 Ext-4 input alarm active.
0x0010 DI-1 input alarm active.
0x0020 DI-2 input alarm active.
0x0040 DI-3 input alarm active.
0x0080 DI-4 input alarm active.
0x0100 DI-5 input alarm active.
0x0200 DI-6 input alarm active.
0x0400 DI-7 input alarm active.
0x0800 DI-8 input alarm active.
0x1000 DI-9 input alarm active.
0x2000 DI-10 input alarm active.

An example of CAM/SAM status table is;

SNMP Table - .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiAxMProduct.axmAlarmMIB.statusAlarmEntry.statusCamSamNode.statusCamSamTable

moduleIndex	moduleInfo	eXT-1	eXT-2	eXT-3	eXT-4	moduleStatus	moduleState	moduleDescription
almMod1(1)	1	0	0	0	0	8117	fail(2)	CAM Input; DI(1,2,4,5,6,7,8,9)-FAIL ; EXT(1,3)-FAIL
almMod2(2)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod3(3)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod4(4)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod5(5)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod6(6)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod7(7)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod8(8)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT
almMod9(9)	3	4974	491	491	491	16123	fail(2)	SAM Input; DI(1,2,3,4,6,7,8,9,10)-FAIL ; EXT(1,2,4)-FAIL
almMod10(10)	0	32767	32767	32767	32767	0	disabled(3)	MODULE: NOT PRESENT

Note: The levels will be reported as +32767 if the respective input is not enabled.
Analog values are applicable only for SAM module.

System status table entry objects (1.3.6.1.4.1.32327.2.2.2.1.3.5.1.1**)**

Object name	OID	Syntax	Description
systemIndex	1.3.6.1.4.1.32327.2.2.2.1.3.5.1.1.1	Integer(0..1)	0 - System summary alarm status 1 - System login/access failure attempt status
systemStatus	1.3.6.1.4.1.32327.2.2.2.1.3.5.1.1.2	Integer(0..65535)	System summary status bits
systemState	1.3.6.1.4.1.32327.2.2.2.1.3.5.1.1.3	Integer(1,2,4)	State corresponding to "System summary alarm status" or "System login/access status"
systemDescription	1.3.6.1.4.1.32327.2.2.2.1.3.5.1.1.4	Text string	Textual description of the status

System states:
1 OK
2 Fail
4 Invalid index

System summary alarm status
System Status Bits
0x0001 Lock detect fail for Receive synthesisers.
0x0002 Lock detect failed for Transmit synthesisers.
0x0004 One or more Tx Power level failures are present.
0x0008 One or more Tx VSWR fails are present.
0x0010 Rx Power level failure is present.
0x0020 System hardware alarms summary. (See Hardware Alarm Bits)
0x0040 Antenna Isolation test failure present.
0x0080 One or more CAM/SAM External or General Purpose Digital Input 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 Alarms
Internal 5V rail is out of limit.
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.

System login/access status

Note: System status not applicable

An example of system status table is;

SNMP Table - .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiAxMProduct.axmAlarmMIB.statusAlarmEntry.statusSystemNode.statusSystemTable

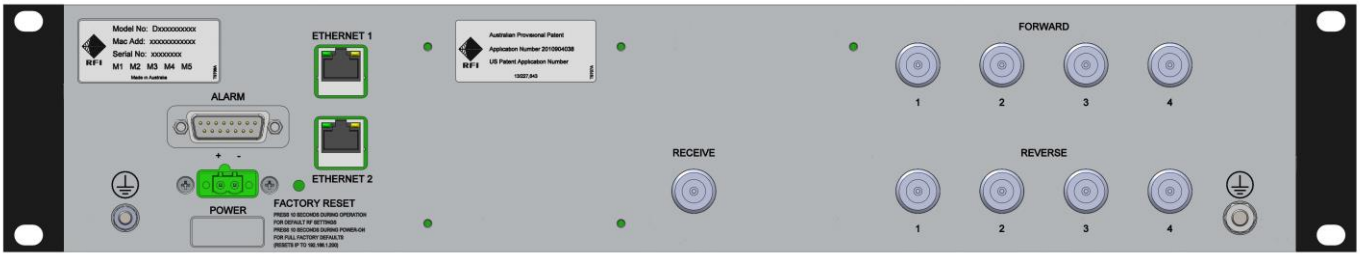
systemIndex	systemStatus	systemState	systemDescription
SystemStatus(0)	58712	fail(2)	SYS=FAIL, RX=FAIL, TXPWR=OK, TXVSWR=FAIL, RSM=FAIL
SystemAccess(1)	0	fail(2)	System Access Lockout Alert, Source=192.168.1.110; 192.168.1.10

The SNMP features of the ASM support monitoring by the Motorola Unified Event Manager (UEM). An example of an ASM being monitored by the UEM is shown here;

12. Connectors

ASM Front and Rear Panel Layouts:

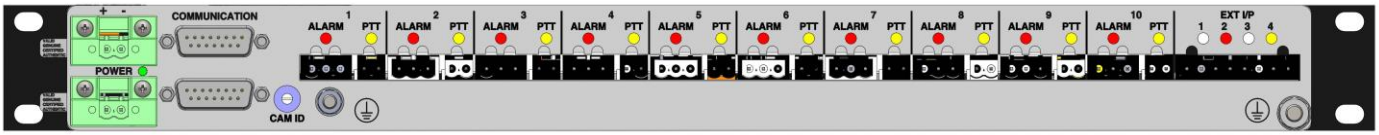
Antenna System Monitor (ASM) Front Panel Layout



Antenna System Monitor (ASM) Rear Panel Layout

CAM Front and Rear Panel Layouts:

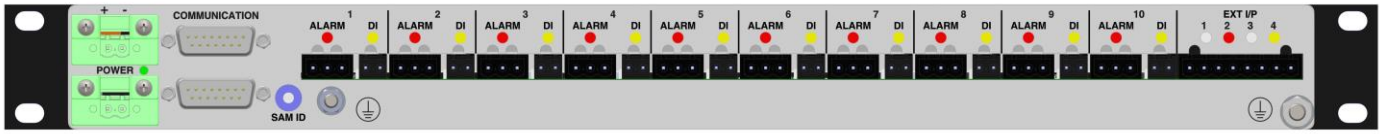
Channel Alarm Module (CAM) Front Panel Layout



Channel Alarm Module (CAM) Rear Panel Layout

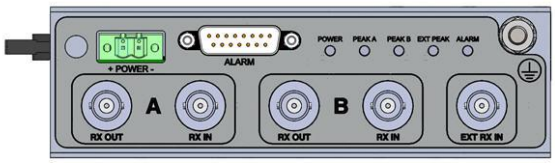
SAM Front and Rear Panel Layouts:

Site Alarm Module (SAM) Front Panel Layout



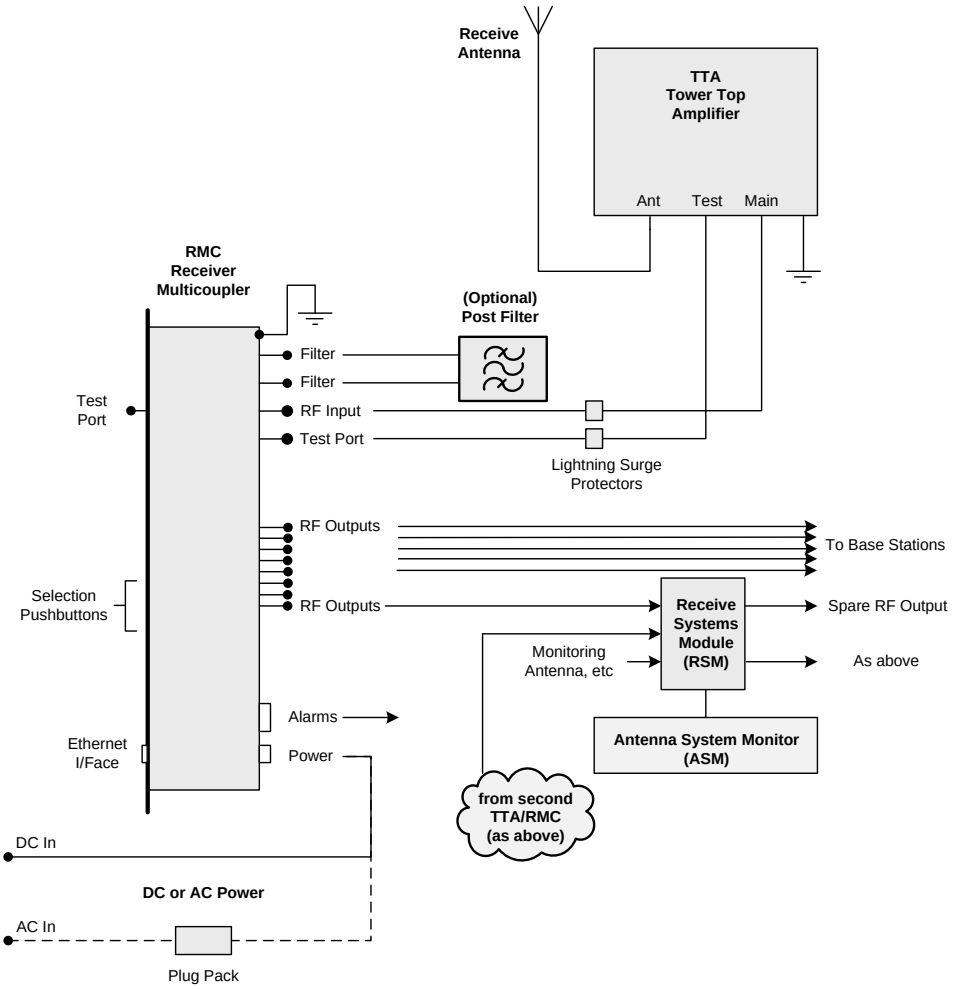
Site Alarm Module (SAM) Rear Panel Layout

RSM Rear Panel Layout:

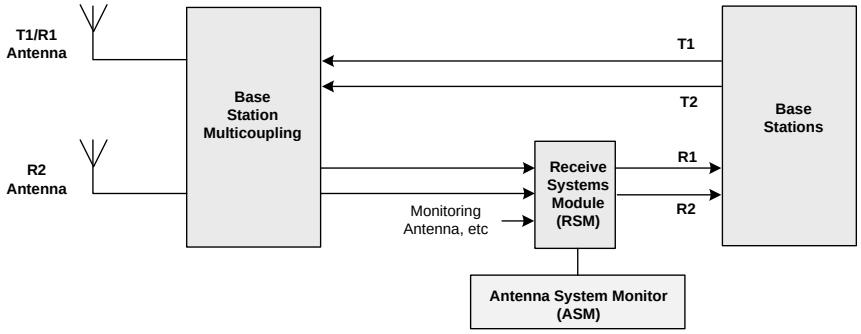


Receive Systems Module (RSM) Rear Panel Layout

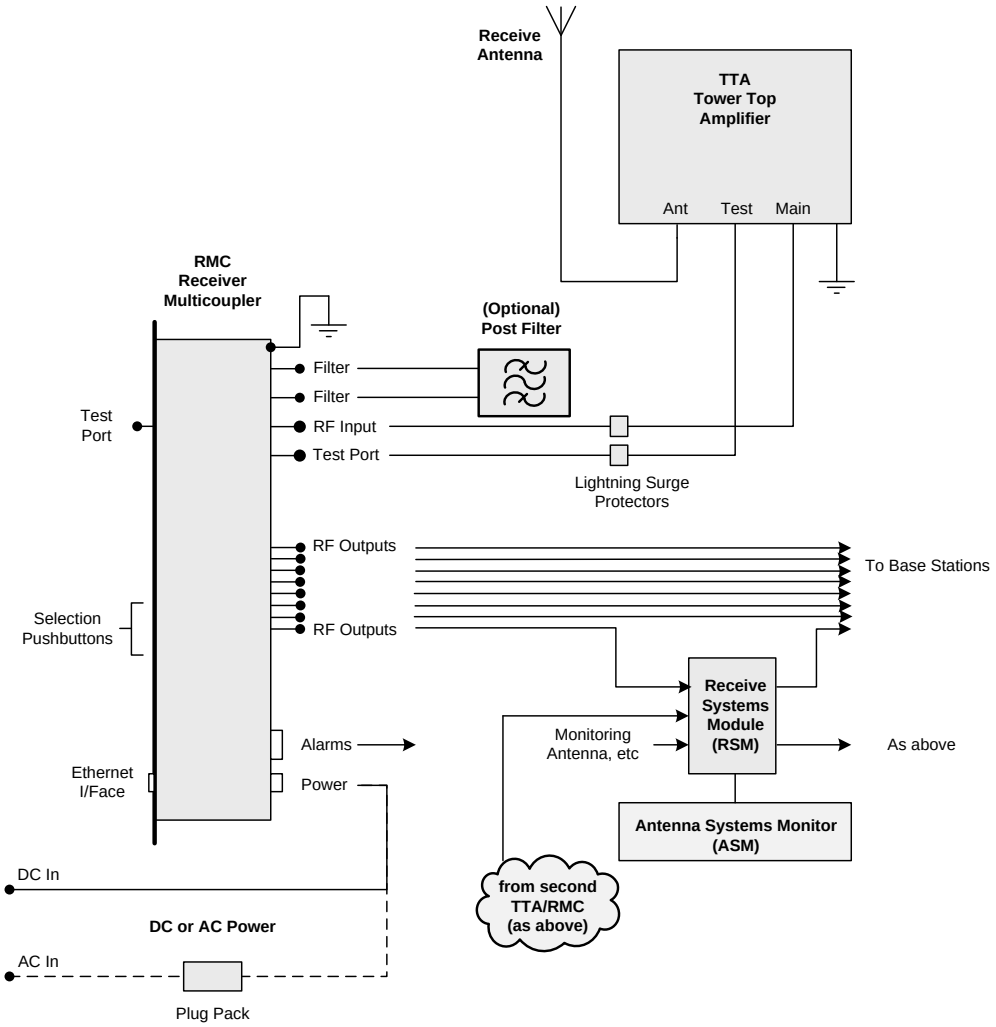
RSM – Example Receiver System Interconnection:



Recommended Receiver Multicoupler / Tower Top Amplifier Interconnection



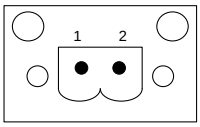
Recommended T1 / R2 Interconnection



Alternate Receiver Multicoupler / Tower Top Amplifier Interconnection

ASM/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 ASM (and optional CAM) are illustrated below.



Pinout of DC Connector

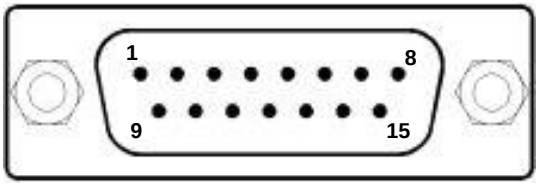
Pin Function Table:

Pin	Function
1	DC Power Input +ve
2	DC Power Input -ve

ASM Alarm/Comms connector (Sub D DB-15) pin-out:

The pin numbers on the DB15 (M) at the rear of the ASM are illustrated below.

An electrical schematic of the alarm pin-outs to the D-Sub DB15 (M) connector located at the rear of the ASM is illustrated on the next page.

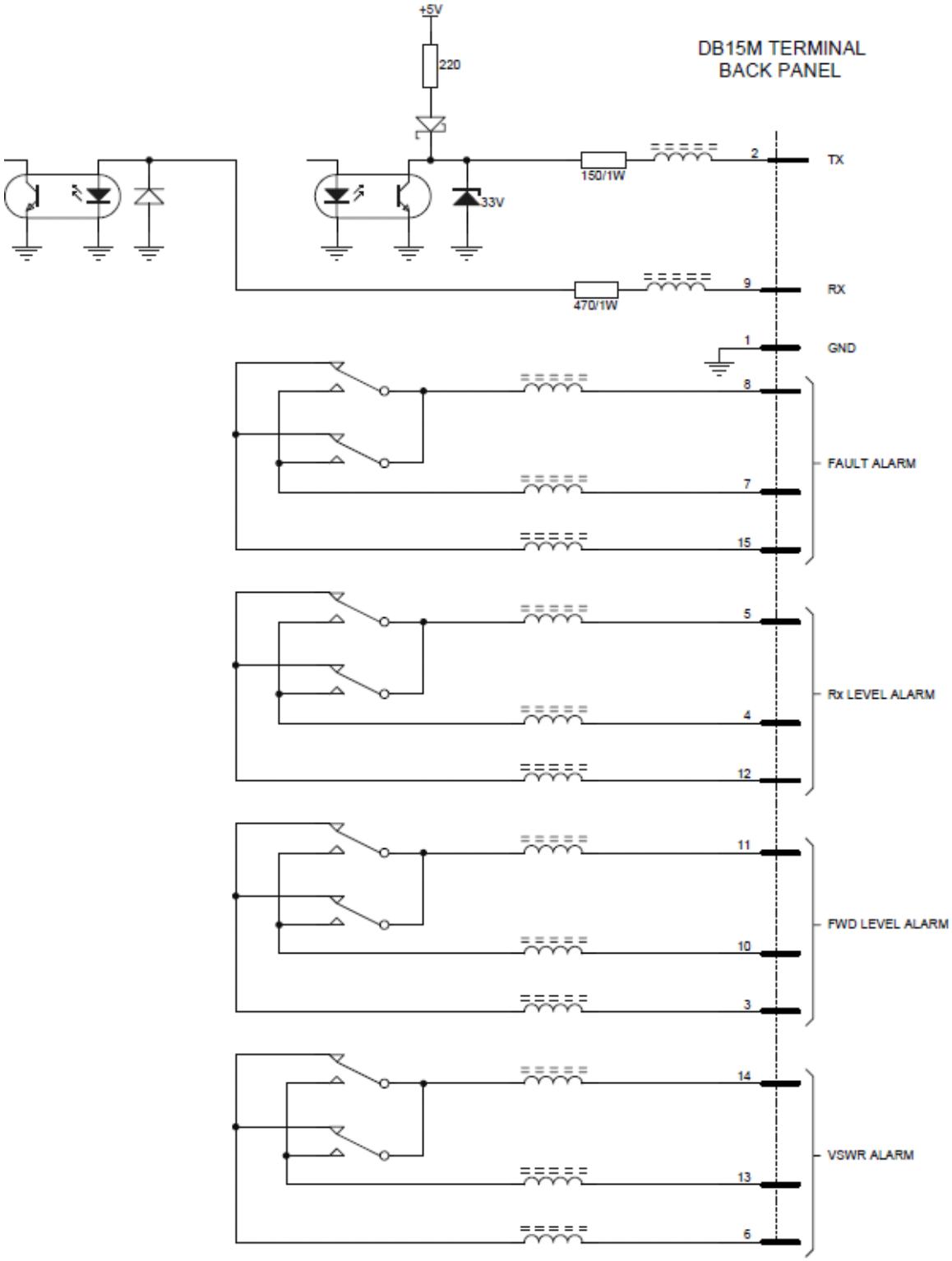


Pinout of DB15 Connector

Pin Function Table:

Pin	Function
1	Communications Buss - GND
2	Communications Buss – Tx
3	ASM Alarm Relay #3 – Closed when an alarm is present
4	ASM Alarm Relay #2 – Open when an alarm is present
5	ASM Alarm Relay #2 – Common
6	ASM Alarm Relay #4 – Closed when alarm is present
7	ASM Alarm Relay #1 – Open when an alarm is present
8	ASM Alarm Relay #1 – Common
9	Communications Buss – Rx
10	ASM Alarm Relay #3 – Open when an alarm is present
11	ASM Alarm Relay #3 – Common
12	ASM Alarm Relay #2 – Closed when an alarm is present
13	ASM Alarm Relay #4 – Open when an alarm is present
14	ASM Alarm Relay #4 – Common
15	ASM Alarm Relay #1 – Closed when an alarm is present

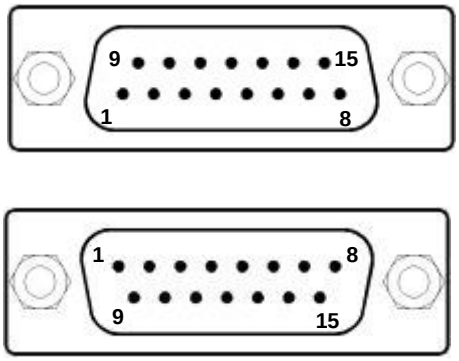
ASM Alarm/Comms connector (Sub D DB-15) pin-out Electrical Schematic:



Note: The ASM 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.

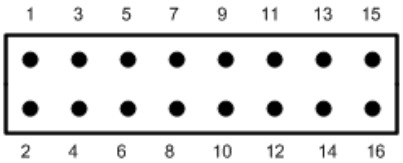


Pinout of DB15 Connectors

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:



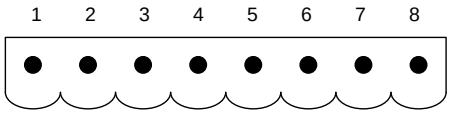
Pin Function Table:

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:

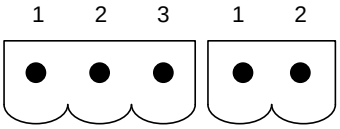
Pin	CAM Function	SAM Function
1	External Alarm Input #1	Temperature / Digital / 0 to +5VDC
2	Ground	Ground
3	External Alarm Input #2	Digital / +5VDC to -60VDC / +60VDC to -60VDC
4	Ground	Ground
5	External Alarm Input #3	Digital / +5VDC to -60VDC / +60VDC to -60VDC
6	Ground	Ground
7	External Alarm Input #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**

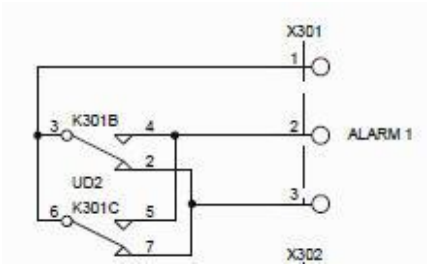
Note: Only one (1) channel of ten (10) is shown

Pin Function Table:

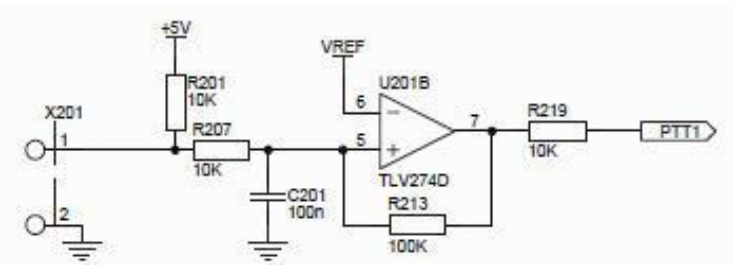
Pin	Function
1	Alarm Output Relay Common
2	Normally Open
3	Normally Closed
1	Digital Input
2	Ground

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.

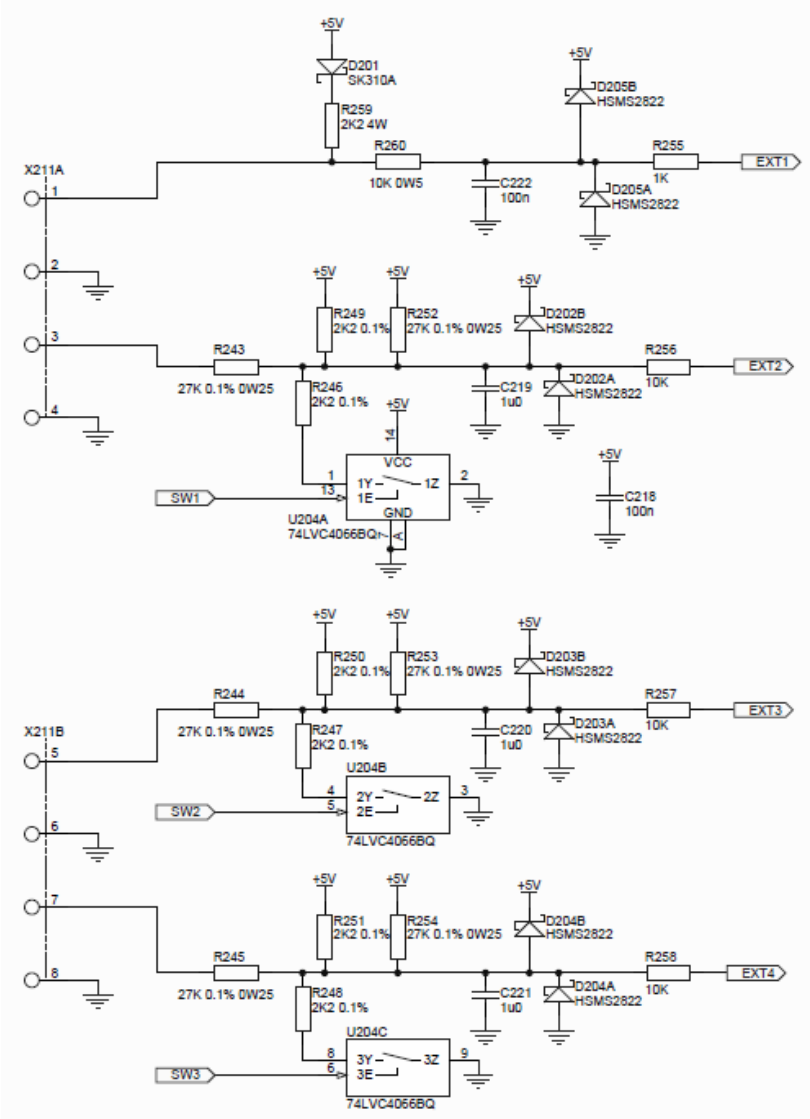
CAM/SAM Inputs and Outputs polarised Phoenix connectors' electrical schematics:



CAM/SAM Alarm Outputs



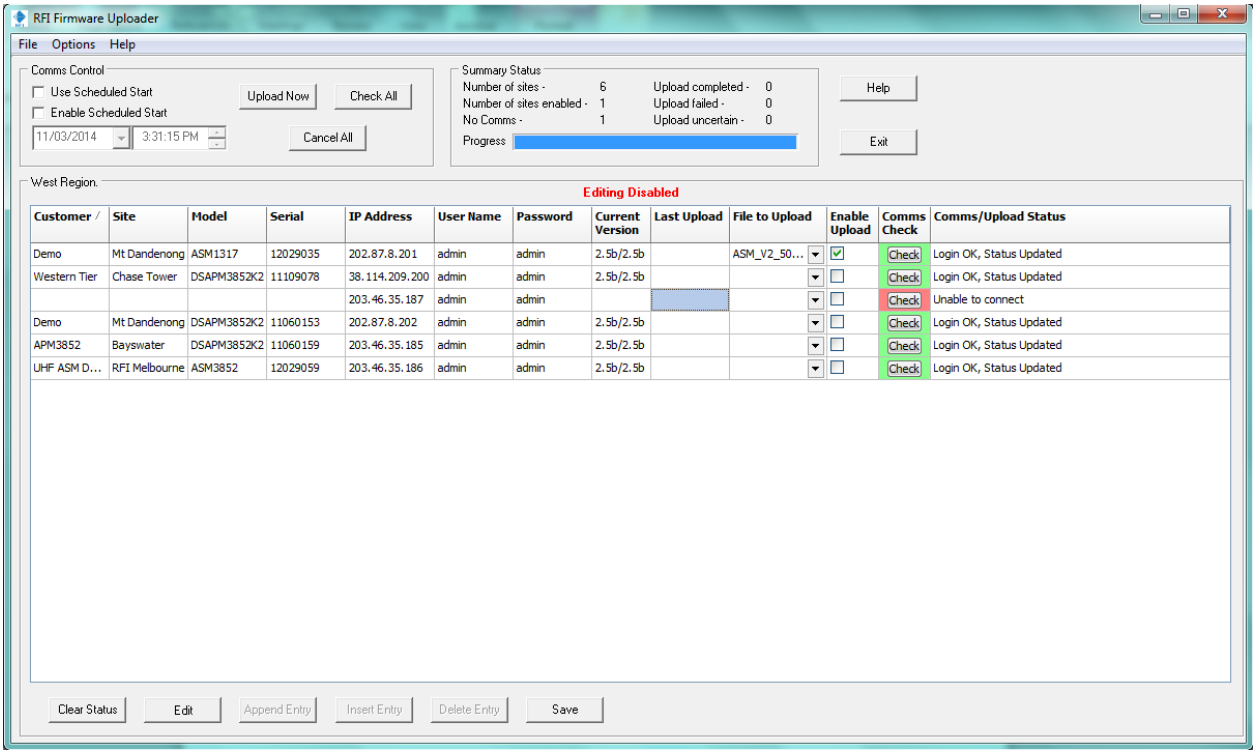
CAM External and CAM/SAM PTT Inputs



13. Maintenance, Inspection and Repair Advice

No special maintenance program is required for the ASM, (optional) CAM/SAM/RSMs, or frequency banded Couplers.

Firmware upgrades may periodically be made available and may be uploaded into the ASM if desired using the *Firmware Upgrade* feature within the GUI. Automated firmware upgrades (and communications connectivity checks) to a fleet of ASMs 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 ASM 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 ASM, 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 ASM really evaluate each frequency individually?
A – Yes. Each frequency is broken down individually and the Tx Forward Power, Tx VSWR 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 ASM 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 ASM 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, ASM 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 ASM 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 the monitored?
A – The ASM will measure down to -10 dBm and up to +60 dBm without any changes.

Q – Can a PC file be created and/or saved of the ASMs configuration?
A – Yes. A configuration file containing all of the ASM's parameters relevant to a site may be prepared beforehand and easily uploaded to an ASM (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 ASM and activated when desired to cater for network re-frequencying transitions, different network operating configurations, or to back up ASM configurations for site records, later use, or convenient programming in the event of an ASM unit being exchanged.

Q – Can the ASM 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 ASM measure VHF 5KHz, 7.5KHz, 15KHz, 20KHz and 30KHz offset frequencies?
A – Yes. The ASM can measure, monitor and alarm any channel frequency step multiple of 1.25KHz.

Q – Can the ASM measure Tx-Rx Antenna Isolation, Rx Subsystem Gain/Ripple and Tx Carrier Rejection?
A – Yes. The ASM can measure, monitor and alarm these three System Tests for up to 20 frequencies.

Q – Can the ASM support SNMP alarm reporting and monitoring?
A – Yes. The ASM can report alarms via SNMP v1 and v2c northbound alarm traps, and can be polled by southbound GET commands. The GET command will respond with the associated OID's current parameter value.

Q – Can the ASM support the Motorola UEM?
A – Yes. The ASM can report alarms to the Motorola UEM via SNMP v1 northbound alarm traps, and can be polled by southbound GET commands.

Q – Can the ASM support Diversity Rx, Dual Rx Antennas, and Redundant Rx Antenna systems?
A – Yes. The Receive Systems Module (RSM) may be added to the ASM 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 ASM's receiver sensitivity capability, facilitating the monitoring of lower-level Rx signals.

15. Supporting Information

For additional support information on the ASM series products including;

ASM Product Brief
ASM Antenna & Systems Monitoring Application Note
ASM User Manual
ASM Service Bulletins
ASM Firmware File (*.FFP)
ASM SNMP MIB Files
CAM Product Brief
SAM Product Brief
RSM Product Brief
SAM Temperature Sensor Product Brief

please visit the RFI website at:

http://www.rfiwireless.com.au/multicoupling-monitoring/monitoring.html

Test Drive the ASM GUI by visiting: **http://203.46.35.186**

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 ASM 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

International Support

APAC
Phone: +617 3621 9400
Email: export@rfi.com.au

RFI EMEA (UK)
Phone: +44 (0) 1869 255 772
Email: sales@rfiemea.com

RFI Americas
Phone: +1 330 486 0706
Email: export@rfi.com.au

www.rfi.com.au