User’s Manual

ASM1317
ASM3852
ASM7487
ASM8796

Antenna System Monitor

Base Line 2.0

Document Number: INS40821-3
Australian Patent Application No. 20112218778
U.S. Patent Application No. 13/227,643
Company Overview

RFI has been serving the needs of the wireless communications market for over 30 years. First founded as a manufacturer of antenna systems, RFI has grown to be a key player in the development, manufacturing and distribution of wireless technology and energy products. Through our extensive network of resellers, systems integrators and retail outlets, RFI is a key supplier to both industry and Government.

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

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

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

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

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

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

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

Note:

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

<table>
<thead>
<tr>
<th>Region</th>
<th>USA</th>
<th>EMEA</th>
<th>ASIA PACIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales email</td>
<td><a href="mailto:webmaster@rfi.com.au">webmaster@rfi.com.au</a></td>
<td><a href="mailto:sales@rfiemea.com">sales@rfiemea.com</a></td>
<td><a href="mailto:webmaster@rfi.com.au">webmaster@rfi.com.au</a></td>
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<tr>
<td>Tech Support</td>
<td><a href="mailto:support@rfi.com.au">support@rfi.com.au</a></td>
<td><a href="mailto:support@rfi.com.au">support@rfi.com.au</a></td>
<td><a href="mailto:support@rfi.com.au">support@rfi.com.au</a></td>
</tr>
<tr>
<td>Telephone Intl</td>
<td>+1 (330) 486 0706</td>
<td>+44 1869 255 772</td>
<td>+61 7 3621 9400</td>
</tr>
<tr>
<td>Telephone local</td>
<td>330 486 0706</td>
<td>01869 255 772</td>
<td>1300 000 RFI</td>
</tr>
<tr>
<td>Fax Intl</td>
<td>+1 (330) 486 0705</td>
<td>-</td>
<td>+61 2 9630 0844</td>
</tr>
<tr>
<td>Web</td>
<td>rfiamericas.com</td>
<td>rfiemea.com</td>
<td>rfi.com.au</td>
</tr>
</tbody>
</table>
ASMxxxx Series

Front View

Rear View

ASMxxxxK1 Series

ASMxxxxK2 Series
**SP13182440DFF (132-174MHz)**

Front View

Top View

**SP38554440DFF (380-520MHz)**

Front View

Top View
ASMxxxx Series User’s Manual

SP74964440DFF (746-960MHz)

Front View

Top View

CAM0000 Series

Front View

Rear View
1. General Description

The Antenna System Monitor (ASM) is used to measure and monitor channel-specific forward and reflected power between multiple transmitter combiners and an antenna for up to 80 channels. Rx Channel and/or adjacent site Tx Channel monitoring is also available for up to 80 channels, and the capability to perform a full Tx-to-Rx system isolation (loop back) test is also provided.

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

A Receive coaxial 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, transmitter-to-receiver system isolation, or the propagation of transmitter channels located on other sites.

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

For each combiner/antenna system being monitored, a 4-port coupler 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.

Designed for rack mounting, the ASM and the coupler units are intended for mounting into 19” rack mount equipment cabinets or open frames. As standard, the ASM is supplied with one coupler for connection to the first combiner/antenna system - with additional couplers 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).

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.

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

A DB15 rear mounted connector provides summary alarm reporting outputs that can be hardwired into most alarm reporting facilities. LED’s on the front panel of the ASM allow visual confirmation of the hardwired alarm outputs.

The ASM models cover two DC voltage input power ranges, 9-36V and 36-60V. The AC mains voltage model uses a 100-240VAC to 12V DC power pack.
If desired, optional Channel Alarm Modules (CAMs) may be added to the ASM at any time. CAMs are connected using a daisy chained cabling approach using two cables - “DC power” and “Comms”.

Up to ten (10) Channel Alarm Modules (CAMs) may be added to a single ASM unit.

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

Each CAM 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.

A logic input on each of the CAM’s channels allows additional monitoring functionality – such as monitoring base station PTT 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.
2. Application Diagram
### 3. ASM - Electrical and Mechanical Specifications

<table>
<thead>
<tr>
<th>ASM Model Number</th>
<th>ASMxxxx Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>ASM1317 132-174MHz</td>
</tr>
<tr>
<td>(Tx power and Rx level monitoring)</td>
<td>ASM3852 380-520MHz</td>
</tr>
<tr>
<td></td>
<td>ASM7487 746-870MHz</td>
</tr>
<tr>
<td></td>
<td>ASM8796 870-960MHz</td>
</tr>
<tr>
<td>Maximum number of monitored channels</td>
<td>Tx = 80</td>
</tr>
<tr>
<td></td>
<td>Rx = 80</td>
</tr>
<tr>
<td>Maximum number of Tx networks (Tx ant's)</td>
<td>4 (can be extended)</td>
</tr>
<tr>
<td>Maximum number of Rx networks (Rx ant's)</td>
<td>1 (can be extended)</td>
</tr>
<tr>
<td>Frequency channel step size</td>
<td>6.25kHz</td>
</tr>
<tr>
<td>Channel measurement bandwidths</td>
<td>12.5, and 25kHz</td>
</tr>
<tr>
<td>Max spurious or IM products level</td>
<td>-30dBm</td>
</tr>
<tr>
<td>Measurable Tx input power level</td>
<td>-50dBm to +20dBm (i.e. -10dBm to +60dBm into 40dB coupler)</td>
</tr>
<tr>
<td>Conducted emissions</td>
<td>Complies with FCC Part 15 (15.207)</td>
</tr>
<tr>
<td>Radiated emissions</td>
<td>Complies with FCC Part 15 (15.209)</td>
</tr>
<tr>
<td>RF Termination connectors</td>
<td>All N (F) on rear</td>
</tr>
<tr>
<td>Communication interface ports</td>
<td>2 x TCP/IP Ethernet port (RJ45) on rear</td>
</tr>
<tr>
<td>Internal alarm relay contacts output connector</td>
<td>1 x DB15 (M) on rear</td>
</tr>
<tr>
<td>Visual alarm notification</td>
<td>Front panel LED’s</td>
</tr>
<tr>
<td>Configurable alarms</td>
<td>Summary Fault / Tx FWD min. power / Tx FWD max. power / VSWR max. / Rx RSSI / Tx-to-Rx System Isolation min.</td>
</tr>
<tr>
<td>Alarm Outputs</td>
<td>Summary Alarms – ASM Relay Outputs</td>
</tr>
<tr>
<td></td>
<td>Detailed Alarms – CAM Module Relay Outputs (optional)</td>
</tr>
<tr>
<td></td>
<td>Email (up to 4 Addresses)</td>
</tr>
<tr>
<td></td>
<td>SNMPv2c (Northbound Traps)</td>
</tr>
<tr>
<td>Power supply options</td>
<td>9-36VDC, 36-60VDC, or 100-240VAC</td>
</tr>
<tr>
<td>DC power connector</td>
<td>1 x Polarized 2-pin Phoenix connector on rear</td>
</tr>
<tr>
<td>Mounting</td>
<td>2RU 19” rack mounting</td>
</tr>
<tr>
<td>Dimensions</td>
<td>W 19 x H 3.5 x D 1.6in</td>
</tr>
<tr>
<td></td>
<td>(W 483 x H 89 x D 40mm)</td>
</tr>
<tr>
<td></td>
<td>(incl connectors)</td>
</tr>
<tr>
<td>Weight</td>
<td>&lt; 4.4lbs / 2kgs</td>
</tr>
<tr>
<td>Operational temperature range</td>
<td>-30°C to +60°C / -22°F to 140°F</td>
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Table 1
4. Coupler - Electrical and Mechanical Specifications

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

5. CAM - Electrical and Mechanical Specifications

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

Table 3
## 6. Ordering Information

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
</tr>
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</table>
| ASM1317      | Antenna System Monitor 132-174MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36V DC |
| ASM1317-48   | Antenna System Monitor 132-174MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60V DC |
| ASM1317-AC   | Antenna System Monitor 132-174MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 100-240V AC (external) |
| ASM3852      | Antenna System Monitor 380-520MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36V DC |
| ASM3852-48   | Antenna System Monitor 380-520MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60V DC |
| ASM3852-AC   | Antenna System Monitor 380-520MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 100-240V AC (external) |
| ASM7487      | Antenna System Monitor 746-870MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36V DC |
| ASM7487-48   | Antenna System Monitor 746-870MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60V DC |
| ASM7487-AC   | Antenna System Monitor 746-870MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 100-240V AC (external) |
| ASM8796      | Antenna System Monitor 870-960MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 9-36V DC |
| ASM8796-48   | Antenna System Monitor 870-960MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 36-60V DC |
| ASM8796-AC   | Antenna System Monitor 870-960MHz  
80 Ch / 4 Tx Fwd / 4 Tx Rfl / 1 Rx Port / 100-240V AC (external) |

### Additional Couplers

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
</table>
| SP1318-2440-DFF | Directional Coupler 130-180MHz  
40dB 4-Port 19in Rack Mount 1RU  
Input /Output Ports DIN (F)  
Coupling Ports N (F) |
| SP3855-4440-DFF | Dual Directional Coupler 380-550MHz  
40dB 4-Port 19in Rack Mount 1RU  
Input /Output Ports DIN (F)  
Coupling Ports N (F) |
| SP7496-4440-DFF | Dual Directional Coupler 746-960MHz  
40dB 4-Port 19in Rack Mount 1RU  
Input /Output Ports DIN (F)  
Coupling Ports N (F) |

### Channel Alarm Module

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM0000</td>
</tr>
<tr>
<td>CAM0000-48</td>
</tr>
</tbody>
</table>

Table 4
7. Unpacking

The ASM (and optional CAM) is packed into a custom designed cardboard insert, box container and sleeve together with a single banded Coupler and AC to DC power pack if the AC option has been ordered.

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

An Ethernet jumper cable is included in the packaging, provided for your convenience to connect and configure the 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

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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

The ASM, (optional) CAMs, and Coupler are designed to be mounted into a standard EIA 19” rack frame using industry standard 19” rack fasteners. The Application Diagram (Diagram 1) illustrates the ASM/CAM/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 Section 10.27 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.

A M6 earth stud is located on the rear of the ASM, (optional) CAMs, and Coupler 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) are fitted, the green “Power” LED light on their front 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 - based on the current programmed configuration.

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

In addition to using the integral Web Browser GUI, the ASM (and any connected CAMs) can also be communicated with via the 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**

**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.

**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.

![Login Page](image-url)
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”
7. When the Local Area Connection Properties box opens, select only the “Internet Protocol 4 (TCP/IPv4)” choice.
8. Click “Properties” button.
9. Click “Use the following IP address”.
10. Enter next to IP address 192.168.1.180
11. Enter next to Subnet mask 255.255.255.0
12. 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 to factory default Ethernet addressing.

To reset the ASM back to the Factory Default settings will mean a complete reset of all RF 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 for up to 30 seconds. When the green power LED light starts flashing, the reset button may be released.

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

Should you wish to only reset the RF configurations simply press the factory reset button for 10 seconds without disconnecting the power source.

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
### 10.2 Log In Page

The default User Name is “admin” and Password is “admin”. This default user name and password provides complete and unrestricted access to the ASM (level 2). 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.

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 unit status.

For the System, the overall summary alarm status is displayed, for each Port, 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.

The “Refresh” button reloads the page, updating the status information.

Clicking the title of a “Group” will navigate to the nominated port’s details page.
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 “Channel Alarm Modules” menu item appears only if one or more (optional) Channel Alarm Module (CAM) is installed. Up to ten (10) CAM units may be fitted to each ASM as required.
10.5 Status - Antenna Isolation

The Antenna Isolation “Status” page reports the current status of the Antenna Isolation settings.

**Automatic Isolation Test:**

Indicates if the Antenna Isolation Test function is currently enabled/disabled in the ASM.

**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.

**Automatic Test Repetition Period:**

The regularity that the Antenna Isolation Test will be performed.

*Note:* This period is repeated from the time and day that this parameter was configured and saved into the ASM unit.

**Calculated Tx-Rx Isolation:**

The calculated Tx-Rx antenna isolation value based on various parameters configured into the ASM (i.e. Coupler coupling values, Tx Feeder Loss, Rx System Gain, etc).
Test Now:

The “Test Now” button can be selected at any time to manually initiate a measurement.

Note: The maximum isolation value that can be measured will be a function of the test frequency’s level, coupler and receiver system values, and the ASM unit’s Rx Level sensitivity.
10.6 Status - Rx Channels 1-20

The Rx Port “Status” page reports the current status of all Rx channels. To prevent display clutter, Rx channels are displayed with 20 per page.

**Chan No:**

Indicates the configured sequential channel number.

**Channel ID:**

The user configured description for the channel.

**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.

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.

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.

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.
10.7 Status – Tx Port 1

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

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.

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 displayed.

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.

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.
10.8 Status – System

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

**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.

**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.

**Date, Time:**

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

**Fault Summary:**

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

**Tx Power:**

This alarm will activate if any of the Tx channels are detecting a forward power level outside its programmed Min/Max threshold levels, or if a Combiner Insertion Loss value is above the programmed alarm limit.

**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.

**Internal Supply Rails:**

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

**CAM External Alarms:**

If any CAM units' External Inputs has an alarm state present, this alarm will activate.

**Note:** This line appears only if one or more (optional) Channel Alarm Module (CAM) is installed.

Up to ten (10) CAM units may be fitted to each ASM as required.

**Refresh:**

Reloads the page, updating the status information.
10.9 Status – Channel Alarm Modules - Menu

Note: The “Channel Alarm Modules” menu item under the Status menu appears only if one or more (optional) Channel Alarm Module (CAM) is installed. Up to ten (10) CAM units may be fitted to each ASM as required.
10.10 Status – Channel Alarm Modules Module 1

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

**External Alarm Input No:**

Indicates the status of the four (4) configurable external digital inputs.

**Alarm No:**

Indicates the status of the ten (10) assigned relay outputs.

**Refresh:**

Reloads the page, updating the status information.

**Note:** The “Channel Alarm Modules” menu item under the Status menu appears only if one or more (optional) Channel Alarm Module (CAM) is installed. Up to ten (10) CAM units may be fitted to each ASM as required.
10.11 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 address mask values.

Gateway:
The Stored and Currently In Use gateway address values.

Stored Value:
These are the values stored in the system's non-volatile memory. When the unit is started or re-started, these settings (where applicable) will be used if DHCP is disabled, or a DHCP server is not accessible.

Currently In Use:
Where applicable, these are the values that are actually in use at present.

Email
Summary system status messages:
Displays if System summary status messages are enabled or disabled.

Detailed channel status messages:
Displays if Detailed channel status messages are enabled or disabled.

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):**
Displays if sending SNMP Traps are enabled or disabled.

**SNMP Manager IP Address:**
The IP address that SNMP notifications (Traps) will be sent to.

**SNMP Manager Listening Port:**
The port number used by the SNMP Manager
10.12 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.
**10.13 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 the past period (working back from the current date and time) for which logged data will be displayed.

**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.
**Select Data Mode:**

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

Two display modes are available:

- **Max/Min Pwr**
- **Utilisation**

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 a “minimum value” will be displayed on the graph.

In Utilisation 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.

All captured level samples are included in the History 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.
Example of Utilisation Chart

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

**Display:**

This will refresh the display using the selected settings. Some delay may be experienced while data collates.
10.14 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 Tx Channel that is desired to be monitored. Note that only channels that have a frequency configured, and which have been enabled will be selectable.

**Select Period:**

Select the past period (working back from the current date and time) for which logged data will be displayed.

**Download:**

Use this button to open a “File Download” or “Save As” dialog for saving the CSV data file.
10.15 History – Alarm Event Log

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

Select Period:
Select the past period (working back from the current date and time) for which logged data will be displayed.

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 a large amount of data.

**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.
**10.16 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 Configuration menu and screens are only visible from the Administrator login level, and are not visible from the User login level.

**Note:** The “Channel Alarm Modules” menu item appears only if one or more (optional) Channel Alarm Module (CAM) is installed. Up to ten (10) CAM units may be fitted to each ASM as required.
10.17 Configuration – User Data

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

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.
10.18 Configuration – Antenna Isolation

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

**Automatic Isolation Test:**

This determines whether the Antenna Isolation Test will be performed.

**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.

**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 Antenna Isolation value.

**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 Antenna Isolation value.
Rx Subsystem Gain:

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;

<table>
<thead>
<tr>
<th>Component</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiver Feeder loss</td>
<td>-3.0 dB</td>
</tr>
<tr>
<td>Receiver Preselector loss</td>
<td>-1.0 dB</td>
</tr>
<tr>
<td>Receiver Multicoupler gain</td>
<td>+7.0 dB</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Rx Subsystem Nett Gain</td>
<td>+3.0 dB</td>
</tr>
</tbody>
</table>

or;

<table>
<thead>
<tr>
<th>Component</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTA Preselector loss</td>
<td>-1.0 dB</td>
</tr>
<tr>
<td>TTA Amplifier gain</td>
<td>+20.0 dB</td>
</tr>
<tr>
<td>Receiver Feeder loss</td>
<td>-3.0 dB</td>
</tr>
<tr>
<td>Receiver Multicoupler Div.</td>
<td>-10.0 dB</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Rx Subsystem Nett Gain</td>
<td>+6.0 dB</td>
</tr>
</tbody>
</table>

Minimum Isolation Loss (Alarm Level):

The Antenna Isolation value below which an alarm will be generated when the Antenna Isolation measurement is carried out.

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.

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.
**10.19 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.
10.20 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.

**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 0.00625 MHz.

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:

<table>
<thead>
<tr>
<th>Channel ID</th>
<th>&quot;Not Defined&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Not selected</td>
</tr>
<tr>
<td>Frequency</td>
<td>OFF</td>
</tr>
<tr>
<td>BW</td>
<td>25 kHz</td>
</tr>
<tr>
<td>Threshold Pwr</td>
<td>-120 dBm</td>
</tr>
</tbody>
</table>
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.
10.21 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.

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 0.00625 MHz.
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.

NOTES:

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;

<table>
<thead>
<tr>
<th>Channel ID</th>
<th>&quot;Not Defined&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Not selected</td>
</tr>
<tr>
<td>Frequency</td>
<td>OFF</td>
</tr>
<tr>
<td>BW</td>
<td>25 kHz</td>
</tr>
<tr>
<td>Threshold Pwr</td>
<td>-5 dBm</td>
</tr>
</tbody>
</table>
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.
10.22 Configuration – Alarms 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.
10.23 Configuration – Alarms - Antenna Isolation

The Antenna Isolation “Alarms” page is the same as the “Configuration” page. Only the Minimum Isolation Loss (Alarm Level) field is an alarm feature data entry field.

Minimum Isolation Loss (Alarm Level):

The Antenna Isolation value below which an alarm will be generated when the Antenna Isolation measurement is carried out.

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.

Note: In addition the other fields on this page may be changed if desired. Refer to the “Configuration - Antenna Isolation” page in Section 10.18 of this manual for further details.
10.24 Configuration – Alarms – Rx Channels

Each of the Rx channel alarms is configurable as illustrated in this Rx Channels 1-20 Alarms 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 that 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.

**Note:** For any text field, the allowable limits for that filed (model 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.
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: 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/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.
10.25 Configuration – Alarms -Tx Port 1 Alarms

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

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.
10.26 Configuration – Alarms – System Alarms

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:**

A VCO alarm is raised when either of the ASM unit’s VCOs fail to frequency lock.

**Tx Power:**

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:**

This alarm occurs when the VSWR for a Tx channel is greater than the configured limit.
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.

Defaults:

This will enable all alarm categories. The Tx alarm delay will be set to 15 Seconds.
10.27 Configuration – Channel Alarm Module - Menu

**Note:** The “Channel Alarm Modules” menu item appears only if one or more (optional) Channel Alarm Module (CAM) is installed. Up to ten (10) CAM units may be fitted to each ASM as required.
10.28 Configuration – Channel Alarm Module 1

Each of the (optional) Channel Alarm Module (CAM) units fitted to the ASM is configurable as illustrated in this Channel Alarm Module 1 page.

**Input ID:**

Enter a description for the external alarm signal. 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.
**Alarm State:**

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

**Alarm No:**

These 10 rows configure the individual channel alarm outputs and PTT input settings.

**Port:**

Either select the Tx Port for the desired channel, or select “Alarm not in use” to disable the alarm.

**Channel:**

Having selected the Port, select the channel to be assigned to the CAM alarm.

**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.

**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.

**Note:** The Tx Threshold Power Level is used at all times to determine when to update the Combiner Insertion Loss measurement. The Insertion Loss measurement (on the Tx Port Status Page) will only be updated if the Tx power level measurement exceeds the programmed Threshold Power Level value.
Defaults:
Clicking this button restores the factory default values which are:

**External Alarms**
- **Input ID**  
  "Not defined"
- **Enabled**  
  Not enabled
- **Alarm State**  
  Active Low

**Channel Alarms**
- **Port**  
  "Alarm not in use"
- **Channel**  
  "Alarm not in use"
- **Alm Func**  
  Normal
- **Rly Mode**  
  "N/R" (normally released)
- **I/P Func**  
  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 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.
10.29 Configuration – Communications

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.

**Email**

**Summary system status messages:**
Selects if *System summary status messages* are enabled or disabled.

**Detailed channel status messages:**
Selects if *Detailed channel status messages* are enabled or disabled.

**SMTP Server IP Address:**
Sets the IP address that email messages will be sent to.

**SMTP Server Listening Port:**
Sets the port number used by the SMTP server

**From Email Address:**
Sets the email address that this unit will appear as in email messages.

**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 often not allowed by organisations’ own email servers. At this time, this Email Alarms feature does not support authentication or encryption requirements that some servers may require.
SNMP

Send Alarm Notifications (Traps):
Selects if sending SNMP Traps are enabled or disabled.

SNMP Manager IP Address:
Selects the IP address that SNMP notifications (Traps) will be sent to.

SNMP Manager Listening Port:
Selects the port number used by the SNMP Manager

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:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP</td>
<td>Disabled</td>
</tr>
<tr>
<td>IP Address</td>
<td>192.168.1.200</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Gateway</td>
<td>192.168.1.254</td>
</tr>
</tbody>
</table>

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.
10.30 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.
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).
Recommended procedure for calibrating the Forward Coupling and Reverse Coupling values:

1) **Calibrating the Forward Coupling.** With the Coupler connected to the ASM via the FWD and REV coupling ports, inject a known RF signal level (i.e. +0dBm) on one of the monitored Tx frequencies into the input “From combiner” 7/16DIN (F) port of the Coupler, with the “To Antenna” 7/16 DIN (F) port terminated into a known good resistive termination load of >=20dB return loss. For optimum accuracy of calibration, add in an estimation of the additional loss of the coaxial interconnect cable between the RF Source output and the Coupler, accounting for and compensating for this loss by adjusting the output reference level of the signal source accordingly. (i.e. if the interconnect cable is estimated at 0.3dB, adjust the RF signal source to +0.3dB output level so that the Coupler input level is 0dBm).

2) From the GUI main menu navigate to the required “Calibration” screen via the relevant Tx Port network that contains the required transmitter frequency or frequencies (preferably the frequency closest to the center of the Coupler band).

3) With the signal source providing a known “on frequency” RF signal level, enter in the Forward Coupling field an initial figure of “40dB”. Press either the top or bottom “Refresh” button to update the measured value, keeping in mind that you may need to very slightly adjust this entered value displayed level in the relevant Tx channel’s “BTx Pwr” field equals the Coupler’s input level (from step 1. above). Repeat this process by changing the entered Forward Coupling value and refreshing the screen until the values are equal.

   **Calibration Validation.** The “Reported Power” against each configured channel in the second table on this screen can be used as a further calibration reference. The Reported Pwr should equal the BTx Pwr value after the “Apply” button has been activated. If not, adjust the Forward Coupling level until the BTx power equals the Reported Power Level.

4) **Calibrating the Reverse Coupling** is the same procedure as detailed in steps 1 through to 3 however, the input from the signal source is reversed and injected into the “To Antenna” port of the coupler with the “From Combiner” port terminated into the termination load.

   The same start (40dB) value entered for Forward Power should be used as the start value in the Reverse Coupling.

   **Note:** Once the Forward Coupling and Reverse Coupling values in steps 3 and 4 have been finalized, do not change them from this point forward.

   When the Reverse Coupling procedure has been completed, restore the coupler back to its normal configuration with the “From Combiner”, “To Antenna”, “FWD” and “RFL” ports all connected correctly to the combiner, antenna and ASM forward and reverse ports.

5) **Storing Calibration Values** - Once all transmitters have been connected and their respective “Capture” buttons clicked, press the “Apply” button on the Calibration page to save both the Forward and Reverse Coupling values - and the reference Transmitter Output Powers for all channels.

   **Note:** The “Apply” button must be selected prior to leaving the Calibration page for the collected calibration values to be stored into the ASM.
**Enhanced VSWR Calculation:**

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 used in the VSWR calculations if the Enabled checkbox is ticked.

Click the Calibrate button to open a new page to allow the unit to calibrate the algorithm.

**Reported Pwr:**

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

**BTx Pwr:**

This is the Base Tx Output Power that will be used to calculate Combiner Insertion Loss. It should indicate the Power Level expected at the input of the Combiner.

You can either manually enter a value (if known) or use the Capture button to copy the current Reported Pwr value to this field.

**Capture BTx Pwr:**

Copies the Reported Pwr value to the BTx Pwr field.

**Refresh:**

Click this button to update the Reported Pwr status information with the most recent measurements.

**Discard Changes:**

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

Note that if invalid values are being displayed after an Apply attempt, these values may not match the current saved settings. In this case, just click on the relevant “Calibration/Tx Port” menu item to re-display the current settings.

**Apply:**

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

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

This page is used to set up the VSWR Calibration algorithm that compensates for some of the feeder system variables present during VSWR measurement.

Caution:

Before starting the VSWR Calibration process, ensure the ASM is installed and connected as described in the User's Manual and that all transmitters connected to the coupler being calibrated are disabled. The high power termination must have an appropriate power rating and should have a known of 1.1:1 (or better). Use a high quality cable to connect the load to the coupler and keep the length as short as practical.

When choosing a transmitter for the VSWR Calibration process, use a transmitter frequency near the center of your operating frequency range.

Note: If the Forward or Reverse Power readings are out of range, the "Apply" button will be greyed out.

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 new VSWR Calibration algorithm. Use the Enable setting on the Tx Port Calibration page to control usage of the algorithm in VSWR calculations.
10.33 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.
10.34 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.

**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 must meet a Password Strength value of at least 50 to be accepted.
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 redisplay 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.
### 10.35 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.

#### 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.
10.36 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.

Manager UDP Port:

The port number for UDP communications to the Manager application.

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.

Save:

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.
10.37 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.

**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).

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.
10.38 Maintenance – Firmware Update

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 to start the update file download process. Depending on the speed of the connection, it can take several minutes for the file upload to complete and be confirmed.

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.
10.39 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 up to one minute to reboot and re-initialise itself before it becomes available for a “Log in” and a new session.
### 10.40 About – Antenna System Monitor

**Antenna System Monitor**

The Antenna System Monitor (ASM) monitors channel specific forward and reflected transmitted power for up to 80 channels through four separate transmitter combining systems. Using the high coupling port directivity of an external four port coupler, a wide dynamic range of forward to reflected power (VSWR) can be measured. All frequencies and level thresholds are software definable.

Status, Configuration, Calibration, Alarms, Communication Setup and Maintenance interfaces are managed via the Web GUI interface which is accessed through one of the Ethernet ports. A command line based interface is also available via a TCP/IP Telnet session.

Alarms are communicated using N/O or N/IC contact relays interfaced via the DB15 female connector at the rear of the unit. LEDs on the front panel of the unit display DC power presence, an aggregated Summary fault, Rx level, Forward Tx power and VSWR threshold failures.

An optional Channel Alarm Module (CAM) is available for ASM users. The CAM provides dry relay alarm contacts for up to ten (10) user-defined channels being monitored by the ASM. Four (4) External Alarm digital inputs are also provided to allow the monitoring of other equipment at a site. Up to ten (10) individual OAM units may be cascaded onto a single AGM.

The Antenna System Monitor is designed and built in Australia by RFI. Please refer to the User Manual for detailed installation and operational instructions.

The block diagram below provides an overview of the system interfaces.

---

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

<table>
<thead>
<tr>
<th>Region</th>
<th>USA</th>
<th>EMEA</th>
<th>ASIA PACIFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales email</td>
<td><a href="mailto:webmaster@rfi.com.au">webmaster@rfi.com.au</a></td>
<td><a href="mailto:sales@rfi.com.au">sales@rfi.com.au</a></td>
<td><a href="mailto:webmaster@rfi.com.au">webmaster@rfi.com.au</a></td>
</tr>
<tr>
<td>Tech Support</td>
<td><a href="mailto:support@rfi.com.au">support@rfi.com.au</a></td>
<td><a href="mailto:support@rfi.com.au">support@rfi.com.au</a></td>
<td>+61 7 9621 9400</td>
</tr>
<tr>
<td>Telephone</td>
<td>+1 (330) 485 0705</td>
<td>+44 1889 750 772</td>
<td>1300 200 R F</td>
</tr>
<tr>
<td>Fax International</td>
<td>+1 (220) 485 0706</td>
<td>01800 235 772</td>
<td>+61 2 9590 0844</td>
</tr>
</tbody>
</table>

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This site is best viewed with Internet Explorer 8, Firefox Version 3.0, Chrome Version 9 or Safari Version 5.

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10.41 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.....
11. Connectors

ASM (and optional CAM) DC Power connector (Pheonix 2-pin) pin-out:

The pin numbers on the polarized Pheonix 2-pin connector on the rear of the ASM (and optional CAM) are illustrated below.

![Diagram of ASM connector](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC Power Input +ve</td>
</tr>
<tr>
<td>2</td>
<td>DC Power Input -ve</td>
</tr>
</tbody>
</table>
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.

Pin Function Table:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communications Buss - GND</td>
</tr>
<tr>
<td>2</td>
<td>Communications Buss – Tx</td>
</tr>
<tr>
<td>3</td>
<td>FWD Level – Closed when an alarm is present</td>
</tr>
<tr>
<td>4</td>
<td>Rx Level – Open when an alarm is present</td>
</tr>
<tr>
<td>5</td>
<td>Rx Level – Common</td>
</tr>
<tr>
<td>6</td>
<td>VSWR – Closed when alarm is present</td>
</tr>
<tr>
<td>7</td>
<td>Fault – Open when an alarm is present</td>
</tr>
<tr>
<td>8</td>
<td>Fault – Common</td>
</tr>
<tr>
<td>9</td>
<td>Communications Buss – Rx</td>
</tr>
<tr>
<td>10</td>
<td>FWD Level – Open when an alarm is present</td>
</tr>
<tr>
<td>11</td>
<td>FWD Level – Common</td>
</tr>
<tr>
<td>12</td>
<td>Rx Level – Closed when an alarm is present</td>
</tr>
<tr>
<td>13</td>
<td>VSWR – Open when an alarm is present</td>
</tr>
<tr>
<td>14</td>
<td>VSWR – Common</td>
</tr>
<tr>
<td>15</td>
<td>Fault – Closed when an alarm is present</td>
</tr>
</tbody>
</table>
ASM Alarm/Comms connector (Sub D DB-15) pin-out Electrical Schematic:
CAM Comms connector (Sub D DB-15) pin-out:

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

Pin Function Table:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Communications Buss - GND</td>
</tr>
<tr>
<td>2</td>
<td>Communications Buss – Rx</td>
</tr>
<tr>
<td>3</td>
<td>Not connected</td>
</tr>
<tr>
<td>4</td>
<td>Not connected</td>
</tr>
<tr>
<td>5</td>
<td>Not connected</td>
</tr>
<tr>
<td>6</td>
<td>Not connected</td>
</tr>
<tr>
<td>7</td>
<td>Not connected</td>
</tr>
<tr>
<td>8</td>
<td>Not connected</td>
</tr>
<tr>
<td>9</td>
<td>Communications Buss – Tx</td>
</tr>
<tr>
<td>10</td>
<td>Not connected</td>
</tr>
<tr>
<td>11</td>
<td>Not connected</td>
</tr>
<tr>
<td>12</td>
<td>Not connected</td>
</tr>
<tr>
<td>13</td>
<td>Not connected</td>
</tr>
<tr>
<td>14</td>
<td>Not connected</td>
</tr>
<tr>
<td>15</td>
<td>Not connected</td>
</tr>
</tbody>
</table>
CAM External Inputs connector (Phoenix 8-pin) pin-out:

The pin numbers on the Phoenix 8-pin connector on the rear of the (optional) CAM 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 is illustrated on the next page.

Pin Function Table:

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>External Alarm Input #1</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>External Alarm Input #2</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
<tr>
<td>5</td>
<td>External Alarm Input #3</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>External Alarm Input #4</td>
</tr>
<tr>
<td>8</td>
<td>Ground</td>
</tr>
</tbody>
</table>
CAM External Alarm Inputs polarized Phoenix connector Electrical Schematic:

External Alarm Inputs
CAM Alarm Output and PTT Input connectors (Pheonix 2-pin & 3-pin) pin-outs:

The pin numbers on the Pheonix 3-pin and 2-pin connectors on the rear of the (optional) CAM are illustrated below.

To assist in logic level interfacing, electrical schematics of the Alarm Output and the PTT Input polarized Pheonix connectors located on the rear of the CAM are illustrated on the next page.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alarm Output Relay Common</td>
</tr>
<tr>
<td>2</td>
<td>Normally Open</td>
</tr>
<tr>
<td>3</td>
<td>Normally Closed</td>
</tr>
<tr>
<td>1</td>
<td>PTT Input</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**Note:** Only one (1) channel of ten (10) is shown
CAM PTT Inputs and Alarm Outputs polarized Phoenix connectors Electrical Schematics:

Alarm Outputs

PTT Inputs
12. Maintenance, Inspection and Repair Advice

No special maintenance program is required for the ASM, (optional) CAMS, or frequency banded Couplers.

Firmware upgrades may periodically be made available and may be uploaded into the ASM (or optional CAMs) if desired.

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, or the Coupler(s) are considered field repairable. Should it be considered that any unit may be faulty through diagnosis, they should be replaced - or returned to RFI for repair.
User Notes:
11. Maintenance

No special maintenance program is required for the ASM or frequency banded Couplers. Firmware upgrades may periodically be made available and will require uploading into the ASM.

Physically 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. All N Male termination connectors on the RF coaxial connectors on both the ASM and Coupler/s must also be tightened.

The 2-pin Phoenix DC connector socket must be firmly located and pushed into the corresponding power plug on the ASM.

Neither the ASM nor the Coupler/s are considered field repairable and should it be considered that either unit may be faulty through diagnosis, they will have to be returned to RFI.

Notes: