

# **User's Manual**

# Tower Top Amplifier System

**TA8990 Series** 

Base Line 1.71

INS42684-2



#### **Company Overview**

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

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

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

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

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# Acknowledgements

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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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# TA8990-01xx-10-00 Series

Tower Top Amplifier Unit



# TA8990-02xx-20-00 Series

Dual Tower Top Amplifier Units (c/w Dual TTA Mounting Kit)





Receiver Multicoupler Unit – RX6996-3408-44-xxB





Front View

Post Filter Unit - PF8990-1006-31N



Note: For 900MHz applications each RMC is used with a Post Filter

Dual TTA Receiver Multicoupler Units - RX6996-3408-45-xxB



Post Filter Unit - PF8990-1006-31N-2

Rear View



Note: For 900MHz applications each RMC is used with a Post Filter



# **1. General Description**

#### **Overview**

The TA8990 Series are full-featured, high performance systems comprising a Tower Top Amplifier (TTA) and a Receiver Multicoupler/TTA Controller unit (RMC).

Diversity receiver and dual-receiver system requirements can be implemented using RFI's unique TTA Diversity Kit if required.

#### Tower Top Amplifier (TTA)

The TTA unit's milled cavity bandpass preselector and the RMC's Post Filter (PF) provide a 6MHz bandwidth (896-902MHz) with excellent selectivity (>110dB) and rejection (>90dB) of adjacent 894MHz cellular services. Redundant quadrature low-noise amplifiers are included to overcome the system's feeder cable losses. An IP-rated milled aluminium housing provides excellent environmental ratings and the housing's small size also provides installation tower loading efficiency. Lightning surge protection is internally fitted to the TTA.

Each TTA amplifier stage is monitored to provide alarm indications in the event of failure, and to initiate automatic change-over between the redundant amplifier paths. The status of these amplifier alarms, in addition to TTA temperature, TTA power supply voltages, and other operational conditions, are sent to the RMC via the "Main" coaxial feeder cable between the TTA and RMC, using an interface signalling protocol. DC power for the TTA is also sourced from this cable.



#### Figure 1 - TTA Block Diagram

The TTA's operating configuration can be controlled using either the user-friendly front panel switches, or via a local (or remote) IP connection using the integral webserver Graphical User Interface (GUI) of the interconnected RMC.

A Test Port is provided on the TTA unit to facilitate TTA system testing from the ground equipment room. A coupler in the TTA allows a signal to be injected to test the performance of both amplifier RF paths, and a Test function allows measurements to be compared between a termination and the receive antenna to determine the effective sensitivity of the network's receiver system.

A Bypass capability is also included in the TTA Test Mode to allow both RF amplifiers to be bypassed during system testing. This Bypass feature will time out after the user-configurable time period (factory default is 1 minute) to ensure the system is not inadvertently left in this test mode.



RF path switching between the redundant amplifiers allow the RF signal path to be changed automatically using the auto changeover feature, or manually using the RMC front panel switches or via GUI control. Manual changing between amplifier paths may also be actioned for testing purposes, or for equipment life cycle sharing between the two amplifiers' circuitry. If *Auto Bypass* is selected, and if both amplifiers have failed, the TTA will switch itself into Bypass mode and if *Gain Boost* is selected, the RMC gain will increase to maximum – providing the best available system performance until normal operation can be restored. When in this *Auto Bypass* mode of operation, and if *Auto Restore* is selected, the amplifiers' fault state is continually monitored and if either amplifier's fault clears, the TTA will restore itself to normal operation using that amplifier.

#### Receiver Multicoupler (RMC)

The RMC/TTA Controller (a.k.a. "RMC") provides a power supply and signalling interface to the TTA, monitoring of the TTA's operational status and alarms and receive signal distribution to multiple base station receivers. It includes adjustable gain to overcome the distribution cabling losses within the equipment building.

Configuration of the RMC is provided using rear panel rotary switches and configuration of the RMC/TTA Controller is provided using front panel switches. Rear panel LED indicators show the status of power - and the use of the optional post filter (if used). Front panel LED indicators show the status of power, TTA and RMC Fault status, the selected TTA amplifier path, Term and Bypass modes, and whether the RMC is under Switch or LAN configuration control.

In addition, SNMP V2c (northbound Traps and southbound GET) and Form-C relay outputs are provided for interfacing to a site monitoring or alarm management system.

An extensive set of user-configurable features are available including Test Modes, Auto-Gain, Gain-Boost, Auto-Bypass (Fail-Over) and Auto-Revert. These features enhance the TTA system, giving a network a diverse range of operational capabilities, improved performance, and superior fault-tolerance and resiliency.

The RMC has adjustable attenuators for both Input and Distribution (Output) gain settings, adjustable in 1dB increments. Rear panel CONFIG, INPUT GAIN ATTEN, and DIST. GAIN ATTEN switches provide a simple and convenient method of configuring the RMC for both Input gain, and Distribution gain for the number of base stations connected to the TTA system.

The RMC unit distributes signals to 8 base station receivers (9 in Config Mode 2), and it can be easily field expanded to cater for up to 128 base station receivers using additional 8way RMC Expansion Multicoupler which may be ordered separately as required. Default TTA/RMC configurations are capable of 8 (or 9) and 16 outputs, but other output capacities may be easily ordered to suit system requirements.



#### Figure 2 – RMC Block Diagram



A Test Port is provided on the RMC front panel to be used in conjunction with the TTA's Bypass mode to sweep the receive antenna feeder and antenna using a distance-to-fault (DTF) test set.

#### **Diversity Receive and Dual-Receiver Systems**

Diversity receive and dual-receiver requirements systems can be implemented for receiver systems by using two TTA units, a Dual TTA Mounting Kit, and two RMC receiver multicouplers and PF Post Filters.

The Dual TTA Mounting Kit allows two TTA units to be mounted together, maintaining a small and space efficient footprint that greatly minimises installation space requirements, and tower wind and weight loadings.

RFI's unique implementation of this diversity receiver and dual-receiver configuration also provides true full redundancy as the receiver multicoupling subsystem preselector and all active circuitry is fully duplicated - including the (already redundant TTA) quadrature LNAs, the TTA power supply circuitry, the TTA control and configuration circuitry, and the TTA alarm monitoring circuitry. In the equipment room the receiver multicouplers (RMCs) are also duplicated, providing true full redundancy for the TTA equipment room power supply, control and monitoring circuitry – and the RMC LNA, receiver distribution, and associated circuitry.

This innovative architecture approach provides the highest levels of duplication in the RF signal path, fault-tolerance and resiliency, and receiver system availability – while also providing a convenient network migration path.

RFI's TTA/RMC architecture also provides a convenient and future-proof migration path from single receive designs, to the latest diversity receive technologies – minimising spares holdings requirements throughout the network's life, while maximising realisable equipment life-cycles, and a network operator's return-on-investment.

The TTA/RMC system may be configured using the RMC's front and rear panel switches. If desired, an integral webserver Graphical User Interface (GUI) resident in the RMC may also be used to configure the TTA/RMC and to monitor the status of alarms and TTA/RMC operation. This webserver can be accessed locally or remotely via TCP/IP network (or Internet) access.

For software developers, a Command Line Interface (CLI) text-based command set is also available for interfacing to the TTA/RMC using a computer or handheld/obile device and a Telnet communications session if desired. New features can also be easily implemented via firmware upgrades using the GUI or CLI.

These TTA systems are available in 12VDC, 24VDC, 48VDC or 90-264VAC versions to suit different network or site power systems.

Supporting documents including this User Manual, a Quick Start Guide (QSG), an Application Note, Service Bulletins and SNMP MIB files are also available from RFI's website.



# 2. TTA - Electrical and Mechanical Specifications

TTA Model Number	TA8990-0100-10-00
Frequency Band	900MHz
Preselector Included	Yes
Preselector / Post Filter Frequency Range	896-902MHz
Preselector / Post Filter Passband Width	6MHz
Preselector / Post Filter Selectivity (High)	>110dB @ 928MHz
Preselector / Post Filter Selectivity (Low)	>120dB @ 869MHz >90dB @ 894MHz
Type of Amplifier	Quadrature Coupled
Amplifier Switching	Automatic (configurable)
Type of Amplifier Switching	Solid State RF Switch
TTA Gain (input to output of TTA)	25dB +/-1dB
Noise Figure (Amplifier)	<1.5dB (1dB typ.)
Noise Figure (TTA)	<3.5dB typ.
Noise Figure (Complete TTA/Feeder/RMC/PF System)	<4dB (includes TTA, 6dB feeder cable, RMC and PF)
TTA Amplifier IIP3	>+13dBm
Return Loss (All Ports)	>14dB
RF Bypass	Yes (Receiver Multicoupler controlled)
Power Requirements	Power Derived from "Main" port coaxial cable
Operating Temperature Range	-30°C to +60°C / -22°F to 140°F
Operating Temperature Range (with minor performance degradation)	-30°C to +70°C / -22°F to 158°F
Redundancy	Automatic Changeover (configurable)
Fail-Over / Bypass Modes	Yes (Receiver Multicoupler controlled) Gain Boost / Auto-Bypass Fail-Over / Auto-Recover / Bypass
Lightning Protection	20kA IEC 61000-4-5 8/20uS multiple strike 3kA 10/350uS slow pulse multiple strike
Test Port Included	Yes
Isolation (Coupling) of Test Port	30dB +/- 2dB
50ohm Termination Test	Yes (Receiver Multicoupler controlled)
Type of RF Test Switching	Solid State RF Switch
Bypass Test Mode	Yes (Receiver Multicoupler controlled)
Connectors (All Ports)	N-type (female)
Enclosure	NEMA Weather resistant housing



# Diversity Receiver/Dual Receiver TTA (Comprises 2 x TTA and 1 x TA7982-TA8996-DK)

TTA Model Number	TA8990-0200-20-00
Frequency Band	900MHz
Preselector Included	Yes
Preselector / Post Filter Frequency Range	896-902MHz
Preselector / Post Filter Passband Width	6MHz
Preselector / Post Filter Selectivity (High)	>110dB @ 928MHz
Preselector / Post Filter Selectivity (Low)	>120dB @ 869MHz >90dB @ 894MHz
Type of Amplifier	Quadrature Coupled
Amplifier Switching	Automatic (configurable)
Type of Amplifier Switching	Solid State RF Switch
TTA Gain (input to output of TTA)	25dB +/-1dB
Noise Figure (Amplifier)	<1.5dB (1dB typ.)
Noise Figure (TTA)	<3.5dB typ.
Noise Figure (Complete TTA/Feeder/RMC/PF System)	<4dB (includes TTA, 6dB feeder cable, RMC and PF)
TTA Amplifier IIP3	> +13dBm @ 25dB TTA gain
Return Loss (All Ports)	>14dB
RF Bypass	Yes (Receiver Multicoupler controlled)
Power Requirements	Power Derived from "Main" port coaxial cable
Operating Temperature Range	-30°C to +60°C / -22°F to 140°F
Operating Temperature Range (with minor performance degradation)	-30°C to +70°C / -22°F to 158°F
Redundancy	Automatic Changeover (configurable)
Fail-Over / Bypass Modes	Yes (Receiver Multicoupler controlled) Gain Boost / Auto-Bypass Fail-Over / Auto-Recover / Bypass
Lightning Protection	20kA IEC 61000-4-5 8/20uS multiple strike 3kA 10/350uS slow pulse multiple strike
Test Port Included	Yes
Isolation (Coupling) of Test Port	33dB +/- 2dB
50ohm Termination Test	Yes (Receiver Multicoupler controlled)
Type of RF Test Switching	Solid State RF Switch
Bypass Test Mode	Yes (Receiver Multicoupler controlled)
Connectors (All Ports)	N-type (female)
Enclosure	NEMA Weather resistant housing



# 3. RMC - Electrical and Mechanical Specifications

Receiver Multicoupler Model Number	RX6996-3408-44-xxB
Frequency range	698-960MHz
Number of RF Output Ports	8 (expandable to 128)
Expansion Port	Yes
Net Gain or Loss (RMC In to RMC Out)	0 to +4dB (-19 to +11dB available)
Amplifier Type	Quadrature Coupled
Auto-Gain on Amplifier Fail	Yes
Amplifier Noise Figure	4dB max. (<1.9dB typ.)
Amplifier Output 3 <sup>rd</sup> Order Intercept Point (30IP)	>45dB (48dB typ.)
RF Port Return Loss (All Ports)	>14dB
Connectors (to TTA)	N-type (female)
Receiver Connector	BNC-type (female)
Rx-Rx Port Isolation	>20dB
Receive Test Port	Yes
Test Port Input (front of Receiver Multicoupler)	BNC-type (female)
Test Port Output (rear of Receiver Multicoupler)	N-type (female)
Reserve (Input) Gain electronic attenuator	0-15dB in 1dB steps (0.5dB steps in later models)
Distribution Gain electronic attenuator	4dB in 1dB steps (0.5dB steps in later models)
Lightning Protection	Internal SMT surge protection to supplement building entry point protection
Alarms	Form-C contacts (n.o./n.c. 1A 60V) SNMP V2c (Northbound Traps) SNMP V2c (Southbound GET) UDP Manager Messages
Alarm Connector	3pin Phoenix style (locking)
Communications Connector	TCP/IP Ethernet port (RJ45)
Indicators	Front and Rear panel LED's
Power Requirements	12VDC nom. (10VDC to 18VDC floating) 24VDC nom. (18VDC to 36VDC floating) 48VDC nom. (36VDC to 60VDC floating) 90-264VAC 50/60Hz (plug pack on 12VDC model)
DC Current Consumption (including TTA)	2.5A @ 12VDC 1.3A @ 24VDC 650mA @ 48VDC
DC Connector	2pin Phoenix style (locking)
Earthing	M6 stud (on RHS of rear panel) M5 screw (on LHS of rear panel)
Operating Temperature Range	0°C to +50°C / 32°F to 122°F
Mounting	1RU 19inch Rack mount (8way) 2RU 19inch Rack mount (16way)
Dimensions (W x H x D)	19 x 1.75 x 5.9" / 483 x 44.75 x 150mm (8way) 19 x 3.5 x 5.9" / 483 x 89.5 x 150mm (16way)



# Dual RMC (Comprises 2 x RMC units)

Receiver Multicoupler Model Number	RX6996-3408-45-xxB
Frequency range	698-960MHz
Number of RF Output Ports	2 x 8 (expandable to 128)
Expansion Port	Yes
Net Gain or Loss (RMC In to RMC Out)	0 to +4dB (-19 to +11dB available)
Amplifier Type	Quadrature Coupled
Auto-Gain on Amplifier Fail	Yes
Amplifier Noise Figure	4dB max. (<1.9dB typ.)
Amplifier Output 3 <sup>rd</sup> Order Intercept Point (30IP)	>45dB (48dB typ.)
RF Port Return Loss (All Ports)	>14dB
Connectors (to TTA)	N-type (female)
Receiver Connector	BNC-type (female)
Rx-Rx Port Isolation	>20dB
Receive Test Port	Yes
Test Port Input (front of Receiver Multicoupler)	BNC-type (female)
Test Port Output (rear of Receiver Multicoupler)	N-type (female)
Reserve (Input) Gain electronic attenuator	0-15dB in 1dB steps (0.5dB steps in later models)
Distribution Gain electronic attenuator	4dB in 1dB steps (0.5dB steps in later models)
Lightning Protection	Internal SMT surge protection to supplement building entry point protection
Alarms	Form-C contacts (n.o./n.c. 1A 60V) SNMP V2c (Northbound Traps) SNMP V2c (Southbound GET) UDP Manager Messages
Alarm Connector	3pin Phoenix style (locking)
Communications Connector	TCP/IP Ethernet port (RJ45)
Indicators	Front and Rear panel LED's
Power Requirements (varies by model)	12VDC nom. (10VDC to 18VDC floating) 24VDC nom. (18VDC to 36VDC floating) 48VDC nom. (36VDC to 60VDC floating) 90-264VAC 50/60Hz (plug pack on 48VDC model)
DC Current Consumption (including TTAs)	5A @ 12VDC 2.6A @ 24VDC 1.3A @ 48VDC
DC Connector	2pin Phoenix style (locking)
Earthing	M6 stud (on RHS of rear panel) M5 screw (on LHS of rear panel)
Operating Temperature Range	0°C to +50°C / 32°F to 122°F
Mounting	2RU 19inch Rack mount (8way) 4RU 19inch Rack mount (16way)
Dimensions (W x H x D)	19 x 3.5 x 5.9" / 483 x 89.5 x 150mm (2 x 8way) 19 x 7 x 5.9" / 483 x 179 x 150mm (2 x 16way)



# **Expansion Multicoupler - Electrical and Mechanical Specifications**

Receiver Multicoupler Model Number	RX0696-3008-31B
Frequency range	60-960MHz
Number of RF Output Ports	8
RF Port Return Loss (All Ports)	>14dB
Connectors	BNC-type (female)
Rx-Rx Port Isolation	>20dB
Power Requirements	None (Passive)
Operating Temperature Range	0°C to +50°C / 32°F to 122°F
Mounting	1RU 19inch Rack mount
Dimensions (W x H x D)	483 x 44.75 x 150mm / 19 x 1.75 x 5.9"

# Table 5

# Post Filter - Electrical and Mechanical Specifications

Post Filter Model Number	PF8990-1006-31N
Frequency range	896-902MHz
RF Port Return Loss (All Ports)	>14dB
Connectors	N-type (female)
Power Requirements	None (Passive)
Operating Temperature Range	-30°C to +60°C / -22°F to +140°F
Mounting	1RU 19inch Rack mount
Dimensions (W x H x D)	483 x 44.75 x 150mm / 19 x 1.75 x 5.9"

Note: 1 x PF8990-1006-31N-2 = 2 x PF8990-1006-31N Post Filters

#### Table 6

# Mains Power Supply - Electrical and Mechanical Specifications

Plug Pack Power Supply	RXTA0000-3460xx-AC	
Input Voltage	90-264VAC 50/60Hz	
Input Plug	IEC	
Plug Type	RXTA0000-3460AU-AC 1.5m long lead, AU plug RXTA0000-3460US-AC 1.5m long lead, USA plug RXTA0000-3460UK-AC 1.5m long lead, UK plug	
Output Voltage	48VDC @ 1.25A (60W)	
Output Connector	2pin Phoenix style (locking)	
Mounting	Free-standing	
Dimensions (W x H x D)	125 x 31.5 x 50mm / 5 x 1.25 x 2"	

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# 4. Ordering Information

Ordering Information	
RFI Part Number	Description
TA8990-0100-10-00	Tower Top Amplifier, 794-824MHz
RX6996-3408-44-ACB	8 Port Receiver Multicoupler, 698-960MHz, 36-60VDC complete with RXTA0000-3460US-AC 90-264VAC/48VDC Plug Pack Power Supply
RX6996-3408-44-48B	8 Port Receiver Multicoupler, 698-960MHz, 36-60VDC
RX6996-3408-44-12B	8 Port Receiver Multicoupler, 698-960MHz, 10-18VDC
RX6996-3408-44-24B	8 Port Receiver Multicoupler, 698-960MHz, 18-36VDC
PF8990-1006-31N	RMC Post Filter, 896-902MHz, 6MHz BW, N Connectors c/w RG142 cables leads for connection to RMC
RX0696-3008-31B	8 Port Expansion Multicoupler, 60-960MHz, BNC Connectors
TA8990-0200-20-00	2 x Tower Top Amplifiers, 794-824MHz, complete with TA7982-TA8996-DK Dual TTA Mounting Kit
RX6996-3408-65-ACB	2 x 8 Port Receiver Multicouplers, 698-960MHz, 36-60VDC complete with 2 x PF8990-1006-31N Post Filters and 2 x RXTA0000-3460US-AC 90-264VAC/48VDC Plug Pack Power Supplies
RX6996-3408-65-48B	2 x 8 Port Receiver Multicouplers, 698-960MHz, 36-60VDC complete with 2 x PF8990-1006-31N Post Filters
RX6996-3408-65-12B	2 x 8 Port Receiver Multicouplers, 698-960MHz, 10-18VDC complete with 2 x PF8990-1006-31N Post Filters
RX6996-3408-65-24B	2 x 8 Port Receiver Multicouplers, 698-960MHz, 18-36VDC complete with 2 x PF8990-1006-31N Post Filters
PF8990-1006-31N-2	2 x PF8990-1006-31N Post Filters, 896-902MHz, 6MHz BW, N Connectors c/w RG142 cables leads for connection to RMCs
RX0696-3008-31B	8 Port Expansion Multicoupler, 60-960MHz, BNC Connectors (Qty for each RMC required when used in dual TTA systems)
RXT40000-3060411-4C	90-264\/AC 50/60Hz 12\/DC Plug Pack c/w 1 5m IEC cable with AI I plug
RXTA0000-3460AU-AC	90-264VAC 50/60Hz 48VDC Plug Pack c/w 1.5m IEC cable with AU plug
RXTA0000-3060UK-AC	90-264VAC 50/60Hz 12VDC Plug Pack c/w 1.5m IEC cable with UK plug
RXTA0000-3460UK-AC	90-264VAC 50/60Hz 48VDC Plug Pack c/w 1.5m IEC cable with UK plug
RXTA0000-3060US-AC	90-264VAC 50/60Hz 12VDC Plug Pack c/w 1.5m IEC cable with USA plug
RXTA0000-3460US-AC	90-264VAC 50/60Hz 48VDC Plug Pack c/w 1.5m IEC cable with USA plug
TA7982-TA8996-DK	Dual TTA Mounting Kit



# 5. Interconnection Diagrams

The TA8990 series of TTA systems are designed to be mounted into a wide range of configurations. These Interconnection Diagrams (Figures 3 and 4) show examples.









Figure 3b – Typical Configuration (Config Switch position 3, 4 and 5)





Figure 4 – Typical Configuration (Diversity Receive/Dual Receiver)



# 6. TTA System RF Output Capacity Expansion

The TTA system RF output capacity may be easily expanded. Channel capacities from 8 through to 128 channels can be easily catered for, with expansions being easily and conveniently implemented on-site - as required by future network expansion.

To optimize site cabling material and installation effort, 8-way Expansion Multicouplers may be "distributed" around a site equipment room, with one (or more) Expansion Multicouplers installed in each 19inch cabinet, with short interconnect cables then being run between that cabinet's Expansion Multicoupler and the base station receivers colocated in that cabinet.

<u>Note:</u> In 900MHz Diversity Receive/Dual Receiver systems, Expansion Multicouplers (if required) and Post Filters are added to both RMCs.



Figure 5 - Receiver Multicoupler (RMC) configuration for up to 8 (or 9) base station receivers





Figure 6 - Receiver Multicoupler (RMC) configuration for up to 16 base station receivers







Figure 8 - Receiver Multicoupler (RMC) configuration for up to 128 base station receivers (using multiple 8way Expansion Multicouplers for desired capacity)

<u>Note:</u> In Diversity Receive/Dual Receiver systems, a Post Filter and Expansion Multicouplers are added to both RMCs.



# 7. Unpacking

The TTA, RMC and PF units are packed in custom designed cardboard packaging, together with an AC to DC power pack (if the AC option has been ordered).

Packed with the units will be the Factory Test Sheet (FTS) and Quick Start Guide (QSG). The User's Manual will be included on a USB memory stick.

It is recommended to retain the Factory Test Sheet for future reference.

An Ethernet jumper cable is included in the RMC packaging, provided for your convenience to connect and configure the TTA and RMC via the RMC Graphical User Interface (GUI).

Although the packaging has been designed to provide suitable product protection during shipping, 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 all packaging material responsibly.



# 8. Firmware License Agreement

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

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# 9. Assembly of Dual TTA Mounting Kit

This section applies to dual TTA configurations (i.e. Diversity Receiver and Dual-Receiver systems) and overviews the assembly of the two TTA units onto the TTA Diversity Kit

#### Parts List.

ITEM	PART #	DESCRIPTION	QUANTITY
1	ΠA	(Supplied Separately)	2
2	U9459C	Mounting Plate	2
3	U9460C	SIDE SUPPORT	2
4	U9464A	TTA Mounting Bracket	2
5	U9463B	DUAL TTA, HEX SPACER	2
6	SP7496-2403-11	Coupler	1
7	A3399	M5x12 SEM Screw	28
8	A0296	SCREW M5X10 PAN POZ SS (Re-used From TTA)	8
9	A0809	WASHER M5 FLAT SS (Re-used From TTA)	8
10	A0830	WASHER M5 SPRG SS (Re-used From TTA)	8

### Assembly Details.

(ASSUMES ALL COMPONENTS HAVE BEEN REMOVED FROM THEIR PACKING BOXES) NOTE: ONLY NIP UP SCREWS (7) DURING ASSEMBLY TO ALLOW FOR ALIGNMENT OF TTA'S (1) AND SPLITTER (6) AT FINAL ASSEMBLY POINT 7. BEFORE TIGHTENING.

- 1. REMOVE MOUNTING BRACKETS (4) FROM BOTH TTA'S (1) RETAIN EIGHT SCREWS, WASHERS & SPRING WASHERS (8) (0) & TWO BRACKETS (4) DISCARD THE OTHER TWO BRACKETS, SCREWS & WASHERS.
- 2. FIT PLATES (2) TO THE NON TEXT SIDE OF EACH TTA(1), ONE PLATE (2) PER TTA.
  - NOTE: a) FOR ONE TTA USE EIGHT SCREWS & WASHERS (8) (1) TO FIT PLATE (2) REFER DETAIL 'B'.

b) FOR THE OTHER TTA FIT PLATE (2) & TWO BRACKETS (4) USING

- FOUR SCREWS (7) REFER DETAIL 'A'.
- 3. PLACE TTA () WITH ONLY THE FITTED PLATE (2) ON A FLAT SURFACE, WITH PLATE (2) FACING UP, DETAIL 'B'.
- 4. FIT SIDE SUPPORTS (3) TO PLATE (2), WITH SUPPORTS (3) ROUNDED EDGES FACING OUT, USING EIGHT SCREWS (7).
- 5. FIT HEX SPACERS (5) TO PLATE (2) USING TWO SCREWS (7).
- 6. LOWER TTA/BRACKET ASSEMBLY SHOWN IN DETAIL 'A' ONTO SUPPORT ③ & HEX SPACERS ⑤ AND FIX BOTH TOGETHER USING TEN SCREWS ⑦ .
- 7. ATTACH SPLITTER (6) TO TEST PORT OF EACH TTA. SEE DETAILS 'C' & 'D'.
- 8. ALIGN TTA'S AND SPLITTER AND TIGHTEN ALL SCREWS.









# 10. Installation

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

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

# <u>Note:</u> All installation works and practices should be carried out by qualified personnel and in compliance to Recommended industry standards.

#### TTA Installation

The use of appropriate TTA mounting hardware that suits the installation's specific tower or mast installation scenario is important.

The TTA is provided with a general purpose stainless steel mounting bracket that enables the TTA to be installed onto many antenna booms, mounting head frames, poles, masts, tower spaces, or flat surfaces (such as building parapets or walls).

To cater for the variety of installation locations and structures, any required hose clamps, bolts, U-bolts or other hardware items required to complete those installations must be supplied by the customer or their installation contractor.

The TTA must always be installed with the connectors facing downwards to optimize environmental sealing and to prevent water ingress.





Figure 9 – TTA Mechanical Details

After connecting the system coaxial feeder cables to the TTA, it is recommended to wrap connectors tightly with sealing tape. Starting wrapping 2-3 inches away from the connector, wrapping towards the connector, and finish by completely covering the connector body – making sure that the sealing tape overlaps the connector and the round body of the associated TTA's bulkhead connector.

An M8 stud is provided on the TTA to allow an earthing strap to be fitted between the TTA and an appropriate grounding point on the tower (or other mounting structure).

Both flat and lock washers are supplied on this stud to ensure the earthing strap can be secured for optimum connection integrity.

Note: All dimensions in inches.



#### Lightning Protection

Lightning Protection and grounding of the system is important. Lightning suppressors are fitted internally in the TTA, but corresponding lightning protectors must be fitted to the "Main" and "Test" coaxial feeder cables at the equipment building entry point.

<u>Note:</u> The Lightning Surge Protectors used on the coaxial feeder cable between the TTA "Main" port and the RMC RF Input port <u>must</u> be a DC-Pass style that is compatible with AISG signalling.

AISG signalling is widely used in the telecommunications industry, and a choice of protectors are available that meet these requirements.

RFI recommends the Polyphaser 109-0501W-A and 109-0501W-B for use with its TTA systems. For consistency, RFI recommends this style of lightning protector be fitted to both the "Main" and "Test" coaxial feeder cables.

The body of each lightning protector must be connected to the Entry Point Ground Bus (refer Figure 9) with an earthing cable or strap.



109-0501W-A / 109-0501W-B series

#### **RMC** Installation

The RMC is designed to be installed into standard 19inch rack mount frames or cabinet spaces. Install the unit using four screws that match the 19in racking, ensuring nylon washers are used under the head of the screws to protect the RMC front panel.

An M6 stud and M5 screw are located on the rear of the RMC for earthing to the Equipment Rack Ground Bar with an earthing strap or cable. The Equipment Rack Ground Bar should then be tied back to the Entry Point Ground Bus via the Equipment Room master ground Buss (refer Figure 5).

Connect the bases station receivers to the RF Output ports on the rear of the RMC using high quality coaxial cable (solid or double-shielded jacket type). Unused RMC RF Outputs need not be terminated, however, any unused EXP PORT should be terminated with 50ohms until connected to an Expansion Multicoupler..

For the RMC 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 RMC. For AC Mains versions, an AC-to-DC plug pack is provided with a pre-terminated 2-Pin plug. This should be fitted into the power socket on the rear of the RMC.







Failure to correctly ground the TTA System may result in equipment failure caused by electrical surge

Note: Similar protection and grounding should be duplicated for dual TTA systems

Figure 10 – TTA System Installation

#### Installation Summary

Lightning surge protection, cable and equipment grounding, and the appropriate torqueing of connectors and the sealing of terminations are all important facets of any system installation. Careful attention should be given in these areas.

The type of interconnecting coaxial feeder cables that may be used between the TTA and the RMC may vary, but generally their type will be determined by their length (and resulting insertion loss) and associated jumper/tail requirements.

Always follow standards and engineering best practices for equipment installation.

In Diversity Receiver and Dual Receiver system installations, lightning surge protection and cable and equipment grounding should be applied to both sets of equipment.



# 11. Operation

A USB memory stick is provided with the RMC and contains copies of the QSG (Quick Start Guide), the TTA Series User's Manual and Service Bulletins.

The TTA, RMC and PF can be configured using the RMC front and rear panel switches, or via the integral RMC Web Browser GUI.

In addition to using the integral Web Browser GUI, the TTA and RMC 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.

When the TTA has been installed and connected to the RMC via the coaxial feeder cables and suitable lightning surge protectors (refer Figure 9), the power source to the RMC may be connected and switched on.

Check that the green "Power" LED light on the RMC front panel is illuminated.

All of the RMC front panel LEDs will flash on shortly afterwards, and the remaining illuminated LEDs will reflect the current state of the TTA and RMC (and any current alarms).

The TTA System is now ready for configuration and/or operation.



## 12. Commissioning

It is important that the TTA system is commissioned correctly to ensure that the best system performance is achieved. An appropriate commissioning process that is designed to standardize the testing and performance evaluation of these systems, and which includes nominating the values that attenuators in the RMC should be configured to, should be followed.

<u>Note:</u> The RMC features an "Auto" configuration feature to simplify the commissioning of the TTA/RMC system. Please refer to section 13.15 of this manual for further information on using the Auto configuration feature.

#### Configuration of TTA/RMC System

The Input Gain is the nett gain value of the system between the TTA antenna input, and the RMC receiver output ports. It includes the TTA gain, TTA-to-RMC coaxial cable feeder loss, and overcoming the RMC output divider losses.

The Distribution Gain overcomes the coaxial cable losses between the RMC and the Base Station receiver input.



Using an example Input Gain of 15dB for a 900MHz system, the Input Gain Attenuator switch position (or optionally accessed with the webserver GUI) should be set as per the following table;

	Required Input Gain	"Main" TTA to RMC Feeder Insertion Loss	Input Gain Atte x 10	enuator Setting x 1	
Γ	15 dB	0 dB	0	6	
Γ	15 dB	1 dB	0	5	
Γ	15 dB	2 dB	0	4	
	15 dB	3 dB	0	3	
Γ	15 dB	4 dB	0	2	
	15 dB	5 dB	0	1	
Γ	15 dB	6 dB	0	0	



For example ..... for the recommended Input Gain of 15dB, and if the "Main" TTA to RMC coaxial feeder cable has an insertion loss of 3dB, then the Input Gain Attenuator switch should be set to position 03.

#### Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 3dB
Input Gain Attenuator setting "03"	- 3dB
Input Gain	15dB

This initial Input Gain Attenuator value may be adjusted as a result of optimising the system installation.

#### Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 3dB
Input Gain Attenuator setting "05"	- 5dB
Input Gain	13dB

#### **Post TTA Filter**

If a Post TTA Filter is connected to the FILTER connectors on the rear of the RMC, and is switched to be 'in-line' (i.e. Filter LED 'on'), the insertion loss of the filter should be included in determining the Input Gain Attenuator switch setting. Simply add the Post TTA Filter's insertion loss value to the main feeder cable loss and use the total loss together with the above table to determine the correct switch setting.

For example ..... if the Post TTA Filter insertion loss is 2.5dB (including interconnecting cables) and the feeder loss is 2.5dB, the sum is 5dB. The above table indicates the switches should be set to '01".

Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 5dB
Input Gain Attenuator setting "01"	- 1dB
Input Gain	15dB

The Distribution Gain of the RMC overcomes the distribution cabling losses between the RMC RF Outputs and the connected base station receivers.

This switch is set to provide a value between 0 and 4 to provide distribution gain compensation as per the following table;

Distribution Cable Loss	DIST GAIN ATTEN Switch position
0 dB	4
1 dB	3
2 dB	2
3 dB	1
4 dB	0



#### Note on Attenuator Settings:

The RMC unit contains digital attenuators for setting the Input Gain and the Distribution Gain. Both the Input Gain and Distribution Gain must be configured as part of the RMC/TTA system's commissioning.

The correct adjustment of these attenuators maintains protection of the base station receivers against high level signals – while obtaining the best system sensitivity possible.

In 900MHz TTA system models, Input Gain is shipped from the factory with a default setting of switch position 3. For an Input Gain of 15dB, this assumes a 3dB "Main" coaxial feeder cable insertion loss. Distribution Gain is also shipped with a default switch position 3, which assumes a distribution cable insertion loss of 1dB.

The values selected may be determined by the RMC rear panel switches (factory default), or via the integral webserver GUI that may be accessed using a computer and a web browser.

Note: The same gain adjustment process is used for both sides of a dual TTA system.

#### Configuration of Gain Balance in dual TTA Systems

The configuration of Gain Balance in dual TTA systems can be performed as follows;

#### RF Path "A" (RxA)

- 1. In the Configuration TTA screen select the *Terminate* check box in the *Test Mode* line.
- 2. Connect a Signal Generator to the RMC front panel BNC connector TEST port.
- 3. Inject a signal at a test frequency within the frequency passband of the TTA (i.e. at a level of -60dBm) and measure the level of that frequency at one of the RxA's Receiver Multicoupler (RMC) unit's RF output ports. Alternatively, this signal level could also be read as Rx RSSI Level from a Base Station operating on the Signal Generator's frequency.
- 4. Record the measured signal level value.

RF Path "B" (RxB)

- 5. Measure the level of that frequency at one of the RxB's Receiver Multicoupler (RMC) unit's RF output ports.
- 6. Adjust the *Input Gain* setting of RxB's TTA unit until this measured level closely matches the value recorded for RF Path "A" (RxA) in step 4.

The values achieved for both RxA and RxB RF paths should be as closely matched as possible for optimum dual TTA system operation.



#### TTA Test Port

The TTA uses a non-directional coupler to inject test signals into the receive system from the RMC front panel Test Port. The coupler has a value of 30dB (typ.). The insertion loss of the Test Port coaxial feeder cable must also be taken into account.

#### Measuring Static System Sensitivity (SSS)

To measure the Static System Sensitivity the signal level into the first amplifier must be known. To do this, use one of the Test Modes of the TTA system.

- a) Place the TTA into the *Term Mode*.
- b) Inject a test signal into the RMC Test Port on the test base station receiver frequency. Adjust the test signal level until the nominated system SINAD or BER is indicated by the test receive frequency's associated base station.

The Static System Sensitivity (SSS) is calculated using the formula;

SSS (dBm) = Injected level into RMC Test Port (dBm) - TTA Test Port Feeder Loss - TP Coupler (i.e. 30dB)

Note: The TP Coupler value is 33dB in dual TTA systems.

Example .....

If the TTA Test Port Feeder cable is 3/8" and has 3.62dB of loss per 30m and is 60m long, then the TTA Test Port feeder loss is 7.24dB. This derives an adjustment value of 37.2dB (3.62\*2 + 30dB = 37.2dB). If the injected signal into the RMC front panel Test Port was required to be at -86.8dBm to achieve the nominated system performance BER, the actual Static System Sensitivity (SSS) would be -124dBm.

#### Measuring Effective Receiver Sensitivity (ERS)

To measure the Effective Receiver Sensitivity the receive antenna must now be connected.

- c) Disable the *Term Mode*.
- d) Re-adjust the test signal level until the nominated system SINAD or BER is again indicated by the test receive frequency's associated base station.

The Effective Receive Sensitivity (ERS) is calculated using the formula;

ERS (dBm) = Injected level into RMC Test Port (dBm) - TTA Test Port Feeder Loss - TP Coupler (30dB)

Note: The TP Coupler value is 33dB in dual TTA systems.

Example .....

If the injected signal into the RMC front panel Test Port is now required to be at -83.8dBm to achieve the nominated system performance BER, for the same adjustment value of 37.2dB, the actual Effective Receive System Sensitivity (SSS) would be -121dBm.

#### Degradation

The degradation within the receiver system is the difference between the measured SSS and ERS values. In the above examples, this is Degradation = 3dB.

#### History – Performance Record

The RMC allows the parameters determined in the SSS and ERS testing to be saved in the History – Performance Record screen in the GUI.

The Performance Record provide a convenient and easy to use method for storing the parameters and measured results of the SSS and ERS process, against a selected date. This data is stored in non-volatile memory within the RMC.

If you do not wish to use the Performance Record feature in the GUI, please ensure you record all site equipment details and measurements and store them in a secure place for later reference.



# 13. Manual Setup and Operation



#### Figure 11 – RMC Front Panel Layout



Figure 12 – RMC Rear Panel Layout



#### 13.1 RMC - Rear Panel Switches

#### **INPUT GAIN ATTEN switch**

The Input Gain Atten switch configures the receiver system's Input Gain. This value is the attenuator value required to achieve the desired input gain – with the gain of the TTA, the loss of the receive coaxial feeder cable, and the RMC input circuitry taken into account.

The input gain attenuator should be set based on the following table;

Required Input Gain	"Main" TTA to RMC	Input Gain Attenuator Setting	
	Feeder Insertion Loss	x 10	x 1
15 dB	0 dB	0	6
15 dB	1 dB	0	5
15 dB	2 dB	0	4
15 dB	3 dB	0	3
15 dB	4 dB	0	2
15 dB	5 dB	0	1
15 dB	6 dB	0	0

#### Table 11

If an invalid setting is selected (i.e. 16 to 98), the maximum attenuator value will be used, and the front panel "SWITCH" LED will flash. If 99 is selected on the Input Gain Atten switches during the Power Up sequence, the RMC will be forced into Switch control mode.

For a nominated "TTA to RMC Feeder Insertion Loss", an Input Gain Attenuator setting above the value shown in the above table will result in a corresponding decrease in the system's Input Gain.

Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 3dB
Input Gain Attenuator setting "03"	- 3dB
Input Gain	15dB

This initial Input Gain Attenuator setting may be adjusted as a result of site performance optimisation.

#### Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 3dB
Input Gain Attenuator setting "05"	- 5dB
Input Gain	13dB


#### Post TTA Filter

If a Post TTA Filter is connected to the FILTER connectors on the rear of the RMC, and is switched to be 'in-line' (i.e. Filter LED 'on'), the insertion loss of the filter should be included in determining the Input Gain Attenuator switch setting. Simply add the Post TTA Filter's insertion loss value to the main feeder cable loss and use the total loss together with the above table to determine the correct switch setting.

For example ..... if the Post TTA Filter insertion loss is 2.5dB (including interconnecting cables) and the feeder loss is 2.5dB, the sum is 5dB. The above table indicates the switches should be set to '01".

#### Example:

TTA Gain	25dB
Internal Circuitry (loss)	- 4dB
TTA to RMC Feeder Insertion Loss	- 5dB
Input Gain Attenuator setting "01"	- 1dB
Input Gain	15dB

#### **CONFIG** switch

The Config switch reflects the number of RMC RF outputs that are being used in the system. By setting the Config switch, the RMC will configure its internal digital attenuators to enable the Distribution Gain to be correctly set with the Distribution Gain Attenuator switch.

CONFIG Switch position	Operating Mode
1	Up to 8 RF Outputs available
I	Expansion Port is internally terminated
2	Up to 9 RF Outputs available
Ζ	Expansion Port configured as an additional RF Output
2	Up to 16 RF Outputs available
5	Expansion Port configured for an 8way Expansion Deck to be connected
	Up to 64 RF Outputs available
4	Expansion Port internally terminated
	8way Expansion Multicoupler connected to each of 8 RF Outputs as required
	Up to 128 RF Outputs available
5	Expansion Port configured for an 8way Expansion Deck to be connected
	8way Expansion Multicoupler connected to each of 16 RF Outputs as required

#### Table 12

#### **DIST GAIN ATTEN switch**

The Distribution Gain of the RMC overcomes the distribution cabling losses between the RMC RF Outputs and the connected base station receivers.

This switch is set to provide a value between 0 and 4 to provide distribution cabling losses compensation as per the following table;

Distribution Cable Loss	DIST GAIN ATTEN Switch position
0 dB	4
1 dB	3
2 dB	2
3 dB	1
4 dB	0

#### Table 13

Note: The same CONFIG switch and gain adjustment process is used for both sides of a dual TTA system.



## 13.2 Rear Panel Switches and LED Indicators

## **RESET** switch

The RESET switch has two modes of use;

1. To reset the RMC back to the Factory Default settings. This will also reset of all the RF Configuration settings and the TCP/IP address parameters.

To perform a Factory Default Reset, simply switch the RMC off by removing the DC power cable connector. Press the factory RESET button on the rear of the RMC, reconnect the DC power while continuing to hold the RESET button down for up to 10 seconds. When the green power LED light starts flashing, the reset has started and the reset button may be released.

- <u>Note:</u> This will cause the IP address, subnet and gateway addresses and all other configuration data to be reset back to factory default address.
- 2. To reset the RF Configurations only, without disconnecting the power source, simply press and hold down the factory reset button until the green "Power" LED light starts flashing. The RESET button may then be released.

#### Factory Default settings

IP Address / Access Details

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

RF Configuration Settings (RMC)

Auto Mode – Enabled Gain Control – Switch Hardware Configuration In Use – 1 Input Gain AUTO Mode – Disabled Distribution Gain AUTO Mode - Disabled Config Switch Setting – 1 Input Gain Switch Setting – 03 Distribution Gain Switch Setting – 3 Post Filter – Disabled Alarm Delay – 5 seconds

RF Configuration Settings (TTA)

Amplifier Mode – Auto TTA Alarm Mode Gain Boost - Disabled Auto Bypass - Disabled Auto Recover - Disabled Test Mode Terminate – Disabled Bypass – Disabled TP to RX - Disabled Test Mode Timeout – 1 Minute Bypass with Timeout Off – (as per current setting, does not default)

At the completion of either of the 2 reset options, you will need to wait a short time for the RMC to complete its initialization sequence.



# **IN-LINE FILTER switch**

The in-line filter switch activates the rear panel filter ports and allows the inclusion of a TTA post filter into the system.

The use of a post filter can provide two benefits in a receiver system;

- 1. To increase receive system selectivity (i.e. improve out-of-band rejection) beyond that already provided by the >110dB provided by the existing TTA preselector, and
- 2. To reduce the TTA's 794-824MHz passband to a narrower bandwidth to reject unwanted signals or to improve the immunity of the receiver system to noise and/or interference.

When not enabled, the filter ports are bypassed internally within the RMC. When enabled, all RF signals are routed via these ports - prior to distribution to the RMC RF Outputs.

To enable the filter, press the recessed pushbutton switch located behind the lower hole between the filter BNC connectors, or select it in the *Configure – RMC* GUI page.

#### **IN-LINE FILTER LED indicator**

When enabled, the green LED indicator between the in-line filter ports will be lit.

## **TTA POWER indicator**

When the TTA is powered, the green LED indicator between the RF Input and TEST ports will be lit.

## **POWER ON LED indicator**

When the RMC is powered, the green LED indicator above the power connector will be lit.



## 13.3 Front Panel Switches and LED Indicators

#### **SELECT and ENTER switches**

The two SELECT switches on the front panel of the RMC determine the TTA/RMC function to be modified.

To operate, press either button and one of the front panel LEDs will flash. Using either of the Select switches, scroll left or right until the desired function's corresponding LED is flashing.

Press the ENTER switch to toggle the selected state of that function. Using this method, valid combinations of the various TTA and RMC functions can be selected.

When first pressed, either SELECT switch will flash the corresponding LED for the function that was last selected – allowing the last modification to be easily and quickly restored if required.

<u>Note:</u> The last configuration of features will be remembered and restored in the event of a power interruption. The original default configuration is applied during either of the two reset button initiated reset modes.

#### **TTA FAULT LED indicator**

When lit, a fault condition is current in the TTA unit.

#### **AUTO LED indicator**

When lit, the selection of TTA RF path ("A" or "B") is set to "AUTO" and is controlled and automatically maintained by the RMC determined by any alarm condition being monitored from either Amplifier A or Amplifier B.

## AMP A / AMP B LED indicator

When lit, these LEDs indicate which TTA RF path is selected and active.

## **TERM LED indicator**

When lit, this LED indicates when the Term switch is active, and the termination is switched into circuit in the TTA.

## **BYPASS LED indicator**

When lit, this LED indicates when the Bypass switches are active, and the RF signal path is bypassing both RF AMP A and RF AMP B.

## SWITCH LED indicator

When lit, this LED indicates that the gain of the RMC is currently controlled by the rear panel switches.

#### LAN LED indicator

When lit, this LED indicates that the gain of the RMC is currently controlled by the GUI settings.

#### **RMC FAULT LED indicator**

When lit, a fault condition is current in the RMC unit.

## **POWER LED indicator**

When lit, power is applied to the RMC.



# 14. GUI Setup and Operation

# 14.1 Ethernet Connection Set-up

## Web Browser GUI (Graphical User Interface)

The RMC utilizes an on board Graphical User Interface (GUI) web server to provide configuration and status monitoring using a web browser and a computer. This can be accessed either locally by connecting to the RMC with a short Ethernet jumper cable from a laptop/notebook directly to the RMC or remotely via a TCP/IP network. The TTA is accessible via the RMC GUI.

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

The following web browsers are compatible with the RMC GUI;

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

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

## **IP Address**

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

http://192.168.1.200 (RMC factory default address)

Connectivity to the RMC is successful when the following "Log In" page appears.

Username	admin
Password	•••••
	Login



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<sup>™</sup> 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<sup>™</sup> in the following manner;

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

Should you still be unable to successfully connect to the RMC 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 RMC to the factory default settings.



#### Reset to factory default Ethernet addressing.

To reset the RMC back to the Factory Default settings will mean a complete reset of all RF settings and the IP address parameters. To perform a Factory Reset, simply switch the RMC off by removing the DC power cable connector. Press the factory RESET button on the rear of the RMC, 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 has started and the reset button may be released.

<u>Note:</u> This will cause the IP address, subnet and gateway addresses and all other configuration data to be reset back to factory defaults.

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

RF Configuration Settings (RMC)

Auto Mode – Enabled Gain Control – Switch Hardware Configuration In Use – 1 Input Gain AUTO Mode – Disabled Distribution Gain AUTO Mode - Disabled Config Switch Setting - 1 Input Gain Switch Setting – 03 Distribution Gain Switch Setting – 3 Post Filter – Disabled Alarm Delay – 5 seconds

RF Configuration Settings (TTA)

Amplifier Mode – Auto TTA Alarm Mode Gain Boost - Disabled Auto Bypass - Disabled Auto Recover - Disabled Test Mode Terminate – Disabled Bypass – Disabled TP to RX - Disabled Test Mode Timeout – 1 Minute Bypass with Timeout Off – (as per current setting, does not default)



# 14.2 Log In Page

Username	admin
Password	•••••
	Login

The default User Name is "admin" and Password is "admin". This default user name and password provides complete and unrestricted access to the RMC (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 displays status, and allows editing of the configuration 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 and respective site name.



# 14.3 System Overview

REI		TTA System System Overview	
	Customer Name -	County Police	
<u>Overview</u>	Site Name -	Mt Wallace	
Status Detail			
History	Item		Alarm Status
Configuration	RMC		ок
Maintenance	TTA		OK
About			UK
Logout	<u>System</u>		ок
Help			Refresh
	Cor	pyright © 2009-2016 RF Industries Pty Ltd. All Rights Reserved	

This page displays an overview of the system status.

For the System, the overall summary alarm status is displayed, for the TTA, the RMC and the overall System.

# Item:

The group of parameters relevant to each item title.

# Alarm Status:

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

The "Refresh" button reloads the page, updating the status information.

Clicking the Item will navigate to that nominated item's details page.



# 14.4 Status Detail Menu

The "Status Detail" menu allows all of the System's parameters to be viewed.

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



Help



# <u> 14.5 Status Detail – RMC</u>

Ab.		Status -	RMC		
	Customer Name -	County Police			
Allan	Site Name -	Mt Wallace			
RFI	Status				
Overview					Status
Status Detail	Amplifier				ок
RMC	Temperature				ок
	Power				ОК
<u>System</u>	TTA Power Feed				ок
Communications					
History					
Configuration	Post Filter				DISABLED
Maintenance	Gain control				SWITCHES
<u>About</u> Logout	Auto Gain (Amplifier fault)				INACTIVE
Help	Settings				
			Switch	LAN	In Use
	Hardware Configuration		1	5	1
	Input Gain Attenuator		3 dB	0 dB	3 dB
	Distribution Gain Attenuator		3 dB	0 dB	3 dB
					Refresh

The RMC "Status Detail" page reports the current status of the RMC settings. The current alarm status is shown in the background color ... i.e. green = OK, red = Alarm. Yellow indicates which configuration medium has control of the current system operation ... i.e. the Switches on the rear panel, or the LAN (webserver GUI).

# <u>Status</u>

# Amplifier:

Indicates if one or both sides of the quadrature amplifier have a fault.

## Temperature:

Indicates if the RMC operating temperature is within acceptable limits.

## Power:

Indicates if the RMC power supply voltages are within tolerances.

## **TTA Power Feed:**

Indicates if the TTA power supply voltage is within of tolerances.



## Post Filter:

Indicates if the TTA Post Filter is selected.

Note: In 900MHz systems, a Post Filter is required to be fitted. This Post Filter selection should display 'ENABLED'.

# Gain Control:

Indicates if the Input and Distribution Gain settings are being determined by the rear panel switches (Switch), or the Ethernet (LAN) settings.

## Auto Gain:

Indicates if the Auto Gain feature has been activated by a fault condition in one side of the RMC quadrature amplifier. When a fault is detected on one side of the quadrature amplifier, the Distribution Gain of the RMC is automatically increased to compensate by the lower gain that the quadrature amplifier will deliver in this fault state. This feature ensures the optimum system performance can be maintained for subscribers until the fault condition is rectified.

## Settings

#### Hardware Configuration:

Indicates the setting of the Hardware Configuration, on both the rear panel CONFIG switch (Switch) and the Ethernet (LAN) settings, and which is being presently used (In Use).

## Input Gain Attenuator:

Indicates the setting of the Input Gain Attenuator, on both the rear panel INPUT GAIN ATTEN switch (Switch) and the Ethernet (LAN) settings, and which is being presently used (In Use).

## **Distribution Gain Attenuator:**

Indicates the setting of the Distribution Gain Attenuator, on both the rear panel DIST GAIN ATTEN switch (Switch) and the Ethernet (LAN) settings, and which is being presently used (In Use).

## Refresh:

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



# 14.6 Status Detail - TTA

Al.		Status - TTA		
	Customer Name -	County Police		
S Illur	Site Name -	Mt Wallace		
RFI	Status			
Overview				Status
Status Detail	Comms			ок
<u>RMC</u>	Power			ок
TTA	Amp-A			ок
<u>System</u>	Amp_R			OK
Communications	Апр-в			OK
History	Temperature			ОК
Configuration				
Maintenance	Mode			
About	Operating Mode		Setting	Status
Logout	Auto		SELECTED	
Help	Amp-A		AUTO	ON
	Amp-B		AUTO	OFF
	Test Mode			
	Terminate		OFF	
	Bypass		OFF	
	TP -> RX		OFF	
				Refresh
		Copyright © 2009-2016 RF Industries Pty Ltd. All Rights Reserved		

The TTA "Status Detail" page reports the current status of the TTA settings. The current alarm status is shown in the background color – green = OK, red = Alarm.

# <u>Status</u>

#### Comms:

Indicates that signalling communications are present between the TTA and the RMC.

# Power:

Indicates that the TTA power supply voltages are within tolerances.

# Amp-A:

Indicates if Quadrature Amplifier A has a fault.

# Amp-B:

Indicates if Quadrature Amplifier B has a fault.

## Temperature:

Indicates if the TTA operating temperature is within acceptable limits.



# <u>Mode</u>

## Auto:

Indicates if the "Auto" TTA quadrature amplifier change-over function is active. When "SELECTED", the RMC will monitor the alarm status of the TTA quadrature amplifiers and will automatically initiate a change in TTA amplifier path should one path experience a failure.

# Amp-A:

Setting indicates the operational mode of TTA quadrature amplifier "A" RF path. When in "AUTO", the RMC will allocate TTA Amp A as the active TTA RF path - unless it has a fault condition (see "Auto" above). Status indicates its current operating condition. If *Bypass (with Timeout Off)* has been selected in the *Configuration – TTA* screen both amplifiers will be bypassed and this field will display "BYPASS", and the corresponding Status will be "OFF".

## Amp-B:

Setting indicates the operational mode of TTA quadrature amplifier "B" RF path. When in "AUTO", the RMC will allocate TTA Amp B as the backup TTA RF path – unless it has a fault condition (see "Auto" above). Status indicates its current operating condition. If Bypass (with Timeout Off) has been selected in the Configuration – TTA screen both amplifiers will be bypassed and this field will display "BYPASS", and the corresponding Status will be "OFF".

#### Terminate:

Indicates the state of the Term test mode switch in the TTA. When "on", the input to the TTA (and therefore the receive system) is switched to a 500hm termination. When "off", the system is in its normal operating mode, with the input to the TTA is connected through to the Rx antenna (via the TTA preselector). This feature is used for determining the Static System Sensitivity as part of the system's commissioning process.

## Bypass:

Indicates the state of the Bypass switch in the TTA. When "on", the Bypass mode is selected, and the TTA preselector output is connected through to the RMC until the selected timeout period expires (the TTA amplifiers and Test mode switch have been bypassed). When "off", the system is in its normal operating mode, with the output of the TTA preselector connected to the selected quadrature amplifier RF path. If *Bypass (with Timeout Off)* has been selected in the *Configuration – TTA* screen then the selected Test Mode timeout period does not apply, the TTA will remain in the Bypass Mode, and this field will display "BYPASS".

## Test Port to Rx Input:

Indicates the state of the Test switch in the RMC. When "on", the RMC front panel Test Port is connected to the rear RMC RF Input port. This allows monitoring of the TTA input to the RMC for system measurement and fault finding purposes. When "off", the system is in its normal operating mode, with the rear RMC RF INPUT port connected to the RF Outputs ports via the RMC quadrature amplifier.

## Refresh:

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



## 14.7 Status Detail - System

RFI	
<u>Overview</u>	

<u>Overview</u>
Status Detail
<u>RMC</u>
<u>TTA</u>
<u>System</u>
Communications
History
Configuration
Maintenance
<u>About</u>
<u>Logout</u>

Help

Customer Na Site Name -	me -	County Police Mt Wallace	
Settings			
Setting			Value
RMC			
Model			RX6996-3408-44-12B
Firmware	Version		V1.6_RC1
GUI Versio	on		1.5
Hardware	Revision		0
Serial Nur	nber		16088042
Date (mm	/dd/yy), Time (hh:mm:ss	)	2/7/2017, 16:52:42
ATTA			
Model			TA7982-0100-10-00
Firmware	Version		6.2
Hardware	Revision		5.0
Serial Nur	nber		13040010

Status - System

# Alarm Summary

Alarm	Status
RMC	ок
ПА	ок
Alarm Relay	ок
	Refresh

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This System "Status Detail" page reports the current system settings and alarm summary. The current alarm status is shown in the background color – green = OK, red = Alarm.

## <u>RMC</u>

Model:

The model designator of this RMC unit.

#### **Firmware Version:**

The version of the firmware.

#### **GUI Version:**

The version of the GUI.



## Hardware Revision:

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

## 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 setting.

# <u>TTA</u>

# Model:

The model designator of the connected TTA unit.

# Firmware Version:

The version of the firmware in this TTA.

# Hardware Revision:

The hardware revision status of this TTA. Future hardware revision levels may add additional capabilities.

## Serial Number:

The serial number of this TTA.

# <u>Alarms</u>

# RMC:

Indicates an alarm condition is present within the RMC.

# TTA:

Indicates an alarm condition is present within the TTA.

## Alarm Relay:

Indicates the state of the Alarm Relay on the rear panel of the RMC. A "FAIL" indicates an alarm condition is present within the RMC or the TTA and that the Alarm Relay is activated.

# Refresh:

Reloads the page, updating the status information.



# 14.8 Status Detail – Communications

Customer Name -Site Name -



<u>Overview</u>
Status Detail
<u>RMC</u>
TTA
<u>System</u>
Communications
History
Configuration
Maintenance
About
Logout

Help

Ethernet		
Setting	Stored Value	Currently In Use
MAC Address	00:50:C2:97:EF:82	
DHCP	Disabled	Disabled
IP Address	192.168.1.235	192.168.1.235
Subnet Mask	255.255.255.0	255.255.255.0
Gateway	192.168.1.254	192.168.1.254
Port 23 Command Line Interface	Enabled	
Email		
Setting	Stored Value	
Send Status Change Messages	Disabled	
SMTP Server IP Address	209.173.141.248	
SMTP Server Listening Port	25	
From Email Address	noreply@localhost	
Destination Email Address(es)	john@workshop.com.au	
SNMP		
Setting	Stored Value	
Send Alarm Notifications (Traps)	Disabled	
SNMP GET Requests (Port 161)	Enabled	
	Primary	Secondary
SNMP Manager IP Address	0.0.0.0	0.0.0.0
SNMP Manager Listening Port	162	162
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**Status - Communications** 

**County Police** 

Mt Wallace

This Communications "Status Detail" 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.

## Port 23 Command Line Interface:

Indicates if Port 23 is enabled or disabled for Command Line Interface use. Disabling this port when not in use is recommended for optimum cyber security.

# Email

## Send Status Change Messages:

Indicates if System Status Change messages will be sent via email.

## SMTP Server IP Address:

The IP address that email messages will be sent to.

## **SMTP Server Listening Port:**

The port number used by the SMTP server.

## From Email Address:

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

## Destination Email Address(es):

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

## <u>SNMP</u>

## Send Alarm Notifications (Traps):

Indicates if sending SNMP Traps are enabled or disabled.

## SNMP GET Requests (Port 161):

Indicates if Port 161 is enabled or disabled for SNMP GET requests. Disabling this port when not in use is recommended for optimum cyber security.

## SNMP Manager IP Address:

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

## SNMP Manager Listening Port:

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

Note: SNMP MIB files for the RMC are available from RFI and the www.rfiwireless.com.au website.



# 14.9 History Menu

The "History" menu allows the TTA and RMC's logged data to be viewed.

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



Help



# 14.10 History – Performance Record

Ala	Histo	ry - Performan	ice Record
	Customer Name -	Police	
Allin	Site Name -	Mt Carrie	
REI			
	Setting		Value
Overview	Test Cable Loss		4.0 dB
Status Detail			
History	TTA Coupling Loss		30dB Diversity/Dual Receiver
Performance Record	Total Test Loss		35.5dB
<u>Alarm Event Log</u>	Static System Sensitivity		dBm
Sensitivity Log			
Sensitivity Chart	Measured at		810.00000 MHz
Configuration	Effective Receiver Sensitivity (ERS)		dBm
Maintenance	Measured at		810.00000 MHz
About			THILE THILE
<u>Logout</u>			Defaults Discard Changes Save
Help			
	Convrid	bt © 2012-2018 RE Industries Pty I td	All Rights Reserved

This page saves the Performance Records for the TTA System.

## <u>Setting</u>

## Test Cable Loss:

The Test Cable coaxial feeder insertion loss for the system. The user should enter this value dependent on the installed Test Cable type and installed length.

## **TTA Coupling Loss:**

The value for the TTA Test Port coupler. For the single TTA configurations this is 30dB +/-2dB. When selected for Diversity Receiver and Dual-Receiver dual-TTA configurations this is 33dB +/-2dB. The correct TTA Coupling Loss is selected using the check box.

#### Total Test Loss:

The sum of the above two values. 1.5dB is added for the internal insertion loss between the RMC's front and rear Test Ports. A signal injected at the RMC front panel Test Port will be injected into the front of the currently selected TTA RF amplifier path with this value of attenuation.

#### Static System Sensitivity:

Static System Sensitivity (SSS) measures the sensitivity of the receive system with the receive antenna disconnected (i.e. in Terminated mode). This is measured as part of the system's commissioning or regular performance checks and the value measured is entered by the user into this field.

#### Measured at:

The user enters the test frequency on which this measurement was performed.



## **Effective Receiver Sensitivity:**

Effective Receiver Sensitivity (ERS) measures the sensitivity of the receive system with the receive antenna connected (i.e. not in Terminated mode). This is measured as part of the system's commissioning or regular performance checks and the value measured is entered by the user into this field.

## Measured at:

The user enters the test frequency on which this measurement was performed.

<u>Note:</u> A log of all Sensitivity Tests is kept in the RMC non-volatile memory. Previous test results can be viewed or downloaded, allowing any change in the system to be seen, assisting in network performance (i.e. degradation) assessment and fault finding analysis.

#### Defaults:

Clicking this sets all of the descriptions and values to the RMC default settings;

Test Cable Loss – 5.0 dB TTA Coupling Loss – 30dB Diversity/Dual Receiver - Unchecked Static System Sensitivity – Blank Measured at – Blank Effective Receiver Sensitivity – Blank Measured at – Blank

#### **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 system configuration. In this case, just select the Performance Record menu item again to re-display the current configuration.

#### Save:

This save the values entered.



# 14.11 Alarm Event Log

		History - Alarm Event Log	I	
	Customer Name -	County Police		
Allin	Site Name -	Mt Wallace		
RFI				
	1 Week			
<u>Overview</u>				
Status Detail			Download	View
History			Download	VIEW
Performance Record				
<u>Alarm Event Log</u>		Copyright © 2009-2016 RF Industries Pty Ltd. All Rights Reser	red	
Sensitivity Log				
Sensitivity Chart				
Configuration				
Maintenance				
<u>About</u>				
Logout				
Help				

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

## Select Period:

Select the past period 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.

scription, Fault Condition
Bypass Mode=OFF; Test Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=ON; Test_Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=OFF; Test_Mode=ON, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=; Test_Mode=, Status Value = 1001, TTA Feed, STATUS = FAIL
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=; Test_Mode=, Status Value = 1, TTA Feed, STATUS = FAIL
Bypass_Mode=; Test_Mode=, Status Value = 1001, TTA Feed, STATUS = FAIL
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 0, No Alarm, STATUS = OK
Bypass_Mode=; Test_Mode=, Status Value = 1, TTA Feed, STATUS = FAIL
Bypass_Mode=; Test_Mode=, Status Value = 1001, TTA Feed, STATUS = FAIL
Bypass_Mode=; Test_Mode=, Status Value = 1, TTA Feed, STATUS = FAIL
Bypass_Mode=; Test_Mode=, Status Value = 1001, TTA Feed, STATUS = FAIL
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 8000, System Restart; No Alarm, STATUS = OK
Bypass_Mode=OFF; Test_Mode=OFF, Status Value = 8000, System Restart; No Alarm, STATUS = OK

Example Alarm Event log opened in "View"



# 14.12 Sensitivity Log

Al.	History - S	Static and Effective Sen	sitivity Log	
	Customer Name -	County Police		
Allin	Site Name -	Mt Wallace		
RFI				
	1 Day			
<u>Overview</u>				
Status Detail			Download	View
History			Download	View
Performance Record				
<u>Alarm Event Log</u>	Cor	yright © 2009-2016 RF Industries Pty Ltd. All Rights Res	served	
Sensitivity Log				
Sensitivity Chart				
Configuration				
Maintenance				
<u>About</u>				
<u>Logout</u>				
Help				

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

## Select Period:

Select the past period 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.

Date, Time,	Static Sys	tem Sensi	tivity,	Effective	Receiver	Sensitivity,	Unit
28/01/16,	10:00:27,	-90.0,	-80.0,	dBm			
18/01/16,	17:26:43,	-60.0,	-80.0,	dBm			
18/01/16,	15:03:53,	-80.0,	-90.0,	dBm			
18/01/16,	11:03:54,	-, -90.	0, dBm				
18/01/16,	11:02:23,	-55.0,	-95.0,	dBm			

Example Sensitivity log opened in "View"



# 14.13 Sensitivity Chart



This page displays the logged Sensitivity Log values for a nominated period.

## Select Alarm Module:

Select the Alarm Module from which you desire to display.

## Select Input:

Select the Alarm Input that you desire to display.

# Select Period:

Select the past period for which logged data will be displayed.

# Display:

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

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



# 14.14 Configuration Menu

The "Configuration" menu allows all of the RMC and TTA's 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 (i.e. Level 1) login level, and are not visible from the User (i.e. Level 2) login level.

# 14.15 Configuration – RMC

Customer Name -

Site Name -



<u>Overview</u>
Status Detail
History
Configuration
<u>RMC</u>
TTA
<u>User Data</u>
Communications
Maintenance
About
Lonout

General	
Setting	Value
Alarm Delay	5 Seconds
Post Filter	C IN C OUT
Settings Control	• SWITCHES C LAN
Hardware Configuration	1 5 - Up to 128 RF Outputs. See Help for details.
Input Gain Attenuator	3 dB 🗖 AUTO 🛛 🗸 dB
Distribution Gain Attenuator	3 dB 🗖 AUTO 🛛 🗸 dB

**Configuration - RMC** 

**County Police** 

Mt Wallace

#### Help

# Auto Input & Distribution Attenuation

Setting	Value		
TTA Gain	25.0 dB		
Input Gain	15 dB		
Rx Cable Loss	3.0 dB		
Post Filter Loss	2.0 dB		
Distribution Cable Loss	1.0 dB		
Default	ts Discard Changes Apply		
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The RMC "Configuration" page allows the configuration of the RMC settings.

#### Setting

#### Alarm Delay:

This setting defines the length of time (in seconds) for which an alarm must be continuously present or restored before the alarm relay status changes.

#### Post Filter:

Switches the external Post Filter In or Out of the RF signal path.

Note: In 900MHz systems, a Post Filter is required to be fitted, and this Post Filter selection set to 'IN'.

# **Settings Control:**

Selects whether the unit's Gain settings are controlled through the rear panel Switches, or the LAN configured settings.

For the following three settings, the current rear panel switch settings are displayed for information only and cannot be changed via the GUI. They must be manually changed via the switches themselves.

The block of settings for the currently selected control mode are highlighted.



# Hardware Configuration:

This selects the installed hardware configuration in accordance with the following table;

CONFIG Switch position	Operating Mode
1	Up to 8 RF Outputs available Expansion Port is internally terminated
2	Up to 9 RF Outputs available Expansion Port configured as an additional RF Output
3	Up to 16 RF Outputs available Expansion Port configured for an 8way Expansion Multicoupler to be connected
4	Up to 64 RF Outputs available Expansion Port internally terminated 8way Expansion Multicouplers connected to each of the 8 RF Outputs as required
5	Up to 128 RF Outputs available Expansion Port configured for an 8way Expansion Multicoupler to be connected 8way Expansion Multicouplers connected to each of 16 RF Outputs as required

Table 14

# Configuration of TTA/RMC System

The Input Gain is the nett gain value of the system between the TTA antenna input, and the RMC receiver output ports. It includes the TTA gain, TTA-to-RMC coaxial cable feeder loss, and overcoming the RMC output divider losses.

The Distribution Gain overcomes the coaxial cable losses between the RMC and the Base Station receiver input.



#### Input Gain Attenuator:

This value configures the Input Gain Attenuator setting and is determined by the required Input Gain and Main coaxial feeder insertion loss value. Settings are as per the following table;

Required Input Gain	"Main" TTA to RMC	Input Gain Attenuator Setting	
	Feeder Insertion Loss	x 10	x 1
15 dB	0 dB	0	6
15 dB	1 dB	0	5
15 dB	2 dB	0	4
15 dB	3 dB	0	3
15 dB	4 dB	0	2
15 dB	5 dB	0	1
15 dB	6 dB	0	0

# Table 15

If AUTO is selected, and Apply clicked, the Input Gain Attenuator setting will be automatically determined by an inbuilt algorithm, based on the field values defined in the Auto Input & Distribution Attenuation fields on this screen.

#### **Distribution Gain Attenuator:**

This value configures the Distribution Gain Attenuator setting and determines the distribution gain of the RMC that overcomes the insertion loss of the distribution cabling between the RMC and the base station receiver. Settings are as per the following table;

Distribution Cable Loss	DIST GAIN ATTEN Switch position
0 dB	4
1 dB	3
2 dB	2
3 dB	1
4 dB	0

## Table 16

If AUTO is selected, and Apply clicked, the Distribution Gain Attenuator setting will be automatically determined by an inbuilt algorithm, based on the field values defined in the Auto Input & Distribution Attenuation fields on this screen

## <u>Setting</u>

## TTA Gain:

The TTA Gain shown in the Factory Test Report supplied with the TTA unit.

#### Input Gain:

The overall gain of the TTA sub-system (which includes the TTA gain, the Main coaxial feeder insertion loss, and the RMC Input Attenuator).

#### Rx Cable Loss:

The estimated or actual insertion loss for the coaxial feeder cable between the TTA "Main" and RMC "RF Input" ports (including jumper cables, etc, if fitted).

#### Post Filter Loss:

The insertion loss for the in-line Post Filter (including coaxial cables) if fitted.

#### **Distribution Cable Loss:**

The estimated or actual insertion loss for the coaxial cables between the RMC "RF Output" ports and the Base Station receiver ports.



# Defaults:

Clicking this sets all of the descriptions and values to the RMC default settings;

Gain Control – Switch Hardware Configuration In Use – 1 Input Gain AUTO Mode – Disabled Distribution Gain AUTO Mode - Disabled Config Switch Setting - 1 Input Gain Switch Setting – 03 Distribution Gain Switch Setting – 3 Post Filter – Disabled Test Modes – All OFF Alarm Delay – 5 seconds

## **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 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.



# 14.16 Configuration – TTA

REI	Customer Name - Site Name -	Configuration · County Police Mt Wallace	- TTA	
<u>Overview</u>	Setting	Value		
Status Detail	Amplifier Mode	AUTO	O AMP-A	O AMP-B
History	TTA Alarm Mode	GAIN BOOST	AUTO BYPASS	AUTO RECOVER
Configuration	Test Mode		BYPASS	TP to RX
<u>RMC</u> TTA	Test Mode Timeout	1 Minutes	BYPASS WITH TIM	EOUT OFF
<u>User Data</u>			Defaults Disca	rd Changes Apply
Communications				
Maintenance About	Copyright © 2009-2017 RF Industries Pty Ltd. All Rights Reserved			
Logout				

The TTA "Configuration" allows the configuration of the TTA settings.

## **Setting**

## **Amplifier Mode:**

This setting defines which amplifier path is being used in the TTA (Amp-A or Amp-B).

## Auto

If AUTO is selected, Amp-A is used unless it has a fault condition, at which time the RMC will acknowledge the alarm state and action a change-over to Amp-B automatically.

## Amp-A

Selecting this forces the TTA to use Amplifier A.

## Amp-B

Selecting this forces the TTA to use Amplifier B.

#### TTA Alarm Mode:

These settings define how the TTA configures itself during an alarm state.

#### Gain Boost

If selected, Gain Boost configures the RMC to maximum gain when the TTA is in the Bypass mode as a result of both amplifiers failing. This boosted RMC gain assists the recovery of some of the system gain performance normally provided by the TTA amplifiers.

#### Auto Bypass

If selected, Auto Bypass configures the TTA to bypass the amplifiers if they have both failed. This provides continued system operation – but at a reduced level of (gain) performance.

# Auto Recover

Auto Recover makes the TTA continue to monitor both failed amplifiers and revert out of bypass and back into normal operation if either or both amplifiers' fault clears.



## Test Mode:

Places the TTA system into the selected Test Mode(s).

## Terminate

This is the *Term Mode.* When selected, the input to the selected TTA RF path is switched from the receive antenna (via the TTA preselector) to a 500hm termination. Refer Figure 1.

## Bypass

This is the *Bypass Mode*. When selected, the RF signal path is switched to bypass the TTA RF amplifiers, with only the TTA preselector between the receive antenna and the RMC. Refer Figure 1. This mode is used when both Amp-A and Amp-B are faulty, and facilitates continued receive system operation – although at a degraded performance level. This mode may also be used to confirm RF amplifier operation and gain if desired.

# TP to RX

This is the *Test Port Mode*. When selected, the RMC front panel Test Port is switched through to the "Main" RF Input port on the rear of the RMC. This allows the output of the TTA to be monitored if desired.

## **Test Mode Timeout:**

The period of time after which the TTA/RMC will automatically return from its Test Mode configuration back to normal operation when a Test Mode is selected (unless Bypass and Bypass with TimeOut Off are selected). This setting prevents the system being inadvertently left in Test Mode.

## Bypass with Timeout Off:

When selected, the TTA is placed into Bypass Mode (see above) but the Test Mode Timeout period does not apply and the TTA will remain in the Bypass state until this field is de-selected. This mode may be used for prolonged testing activities, or to operate the site without the TTA amplification if desired.

## Defaults:

Clicking this sets all of the descriptions and values to the TTA default settings;

Amplifier Mode – AUTO TTA Alarm Modes – All OFF Test Modes – All OFF Test Mode Timeout – 1 minute

## 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.



# 14.17 Configuration – Gain Balance (Diversity Receiver and Dual Receiver systems)

The configuration of Gain Balance in TTA02 systems can be performed as follows;

RF Path "A" (RxA)

- 1. In the Configuration TTA screen select the *Terminate* check box in the *Test Mode* line.
- 2. Connect a Signal Generator to the RMC front panel BNC connector TEST port.
- 3. Inject a signal at a test frequency within the frequency passband of the TTA (i.e. at a level of -60dBm) and measure the level of that frequency at one of the RxA's Receiver Multicoupler (RMC) unit's RF output ports. Alternatively, this signal level could also be read as Rx RSSI Level from a Base Station operating on the Signal Generator's frequency.
- 4. Record the measured signal level value. The actual value measured here in step 4 is not critical, only that it is recorded for comparison in step 6 below.

RF Path "B" (RxB)

- 5. Measure the level of that frequency at one of the RxB's Receiver Multicoupler (RMC) unit's RF output ports.
- 6. Adjust the *Input Gain* setting of RxB's TTA unit until this measured level closely matches the value recorded for RF Path "A" (RxA) in step 4.

This values achieved for both RxA and RxB RF paths should be as closely matched as possible for optimum dual-TTA system operation.



# 14.18 Configuration – User Data

RFI	Customer Name - Site Name -	Configuration - Us County Police Mt Wallace	er Data
	Setting	Value	
<u>Overview</u>	Customer Name	County Police	
Status Detail	Site Name	MtWallace	
History		,	
Configuration		D	efaults Discard Changes Apply
<u>RMC</u>			
<u>User Data</u>		Copyright © 2009-2016 RF Industries Pty Ltd.	. All Rights Reserved
Communications			
Maintenance			
About Logout			
Help			

On this page you can enter descriptive texts for the Customer Name and Site Name

# <u>Setting</u>

#### **Customer Name:**

The descriptive text used to describe this systems user.

#### Site name:

The descriptive text used to describe this systems location.

## Defaults:

Clicking this sets all of the descriptions to the predefined product default settings.

#### **Discard Changes:**

Click this button to restore the values to those present when the page was last re-displayed. Note that if invalid values are being displayed after a Save 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.



# 14.19 Configuration – Communications



	Configu	iration	- Con	nmunie	cations
--	---------	---------	-------	--------	---------

Customer Name -Site Name -

**County Police** Mt Wallace

# Et

<u>Overview</u>
Status Detail
History
Configuration
<u>RMC</u>
<u>TTA</u>
<u>User Data</u>
Communications
Maintenance
About
Logout

Help

Ethernet			
Setting	Value		
DHCP	Enabled		
IP Address	192.168.1.235		
Subnet Mask	255.255.255.0		
Gateway	192.168.1.254		
NOTE: After saving new values for any of the <b>above</b> settings, the system must be restarted to activate them. The Restart option is under the Maintenance menu.			
Setting	Value		
Port 23 Command Line Interface	☑ Enabled		

# Email

Setting	Value		Test Email
Send Status Change Messages	Enable		
SMTP Server Address	209.173.141.248		
SMTP Server Listening Port	25		
SMTP Server Login Username	rfiASMalarms		
SMTP Server Login Password	•••••	Reveal	
From Email Address	noreply@localhost		
Destination Email Addresses	john@workshop.com.au		
SNMP			
Setting	Value		Test SNMP
Send Alarm Notifications (Traps)	Enabled		
SNMP GET Requests (Port 161)	Enabled		
SNMP Community String			
	Primary	Secondary	
SNMP Manager IP Address	0.0.0.0	0.0.0.0	
SNMP Manager Listening Port	162	162	
		Defaults	Discard Changes Apply
Copyrigh	it © 2009-2017 RF Industries Pt	y Ltd. All Rights Reserved	

On this page you can change the RMC, Email (SMTP) and SNMP TCPIP addresses and parameters.



#### **Ethernet**

## Setting

## DHCP:

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

## IP Address:

The IP address for this unit.

#### Subnet Mask:

The network address mask to be used.

#### Gateway:

The address of the network gateway to be used.

#### Port 23 Command Line Interface:

Selects if Port 23 is enabled or disabled for Command Line Interface use. Disabling this port when not in use is recommended for optimum cyber security.

## <u>Email</u>

#### Send Status Change messages:

Selects if Status Change messages are to be sent via email.

#### Detailed channel status messages:

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

#### SMTP Server IP Address:

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

## SMTP Server Listening Port:

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

## SMTP Server Login Username:

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

# SMTP Server Login Password:

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

## From Email Address:

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



#### Destination Email Address(es):

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

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

#### **SNMP**

#### Test SNMP

Sends a Test SNMP trap that will appear as a "Test Message", not a fault condition, that may be used to confirm the correct configuration of the SNMP parameters and communications to the SNMP Manager server.

#### Send Alarm Notifications (Traps):

Selects if sending SNMP Traps are enabled or disabled.

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

Selects if Port 161 is enabled or disabled for SNMP Get Requests use. Disabling this port when not in use is recommended for optimum cyber security.

#### **SNMP Community String:**

Sets the Community String that will be used in SNMP messages. This can be any case-sensitive string of up to 16 characters in length.

#### SNMP Manager IP Address:

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

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

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

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

Note: Refer to the SNMP section of this manual for further information on using SNMP with these products.

#### Defaults:

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

DHCP IP Address Subnet Mask	Disabled 192.168.1.200 255.255.255.0
Gateway	192.168.1.254
Port 23 Command Line Interface	Disabled
Send Alarm Notifications	Not Selected
SNMP GET Requests (Port 161)	Disabled
SNMP Community String	public
SNMP Manager IP Address	0,0,0,0
SNMP Manager Listening Port	162


## **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.

<u>Note:</u> 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 RMC unit, either by cycling the power, or through the Maintenance/Restart menu item.



## 14.20 Maintenance Menu

The "Maintenance" menu allows all of the RMC's interface and system-wide formatting parameters to be viewed. Selecting each indented topic under "Maintenance" will display that item as a separate display page.

RFI
<u>Overview</u>
Status Detail
History
Configuration
Maintenance
Access Management
<u>Date &amp; Time</u>
<u>Manager Interface</u>
Configuration Files
<u>Firmware Update</u>
<u>Restart</u>
<u>About</u>
<u>Logout</u>

Help

## 14.21 Maintenance – Access Management

	Maintenance - Access Management				
	Customer Name -	County Police			
Allan	Site Name -	Mt Wallace			
RFI	Access level	UserName	Password	Confirm Password	Password Strength
<u>Overview</u>	View Status only	user	••••	••••	(8) very weak
Status Detail	View Status and Modify Settings	admin	••••	••••	(14) very weak
History		,			
Configuration				Discard Cha	nges Apply
Maintenance					
Access Management	Copyright	© 2009-2016 RE Indust	ries Phy Ltd. All Righ	ats Reserved	
Date & Time	Сорунун	. © 2009 2010 Kr madst		its Reserved	
Manager Interface					
Configuration Files					
Firmware Update					
<u>Restart</u>					N
About					13
Logout					
Help					

This page is used for managing access to the RMC. There are two levels of access available:

## Access Level

## View Status only:

This is the "User" (i.e. Level 1) login level. Logging in at this level allows a user to view Status pages. Users logged in with these credentials will not be able to change any Configuration settings.

## View Status and Modify Settings:

This is the "Administrator" (i.e. Level 2) login level. Logging in at this level allows a user to have access to the Configuration 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, so that appropriate security is maintained. Passwords must meet a Password Strength value of at least 50 to be accepted.

Access level	UserName	Password	Confirm Password	Password Strength
View Status only	user	•••••		(74) strong
View Status and Modify Settings	admin	••••		(6) very weak



## Tips for strong passwords:

Make your password 8 characters or more in length. Use mixed case letters (upper and lower case). Make more than one digit a number. Use special characters  $(!,@,#,\$,\%,^{*},*,-,-)$ .

## **Discard Changes:**

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

Note that if invalid values are being displayed after a Save attempt, these values may not match the current unit configuration. In this case, just click on the Maintenance/User Management menu item to re-display the current configuration.

## Apply:

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



## 14.22 Maintenance – Date & Time

Alta	Maintenance - Date & Time			
	Customer Name -	RFI		
RFI	Site Name -	Adelaide		
	Setting	Value		
<u>Overview</u>	Date Format	Omm/dd/yy		
Status Detail	Date (dd/mm/yy)	9 / 11 / 16		
History	Time (hh:mm:ss)			
Configuration	Time (IIII.IIII.35)			
Access Management		Discard Changes Apply		
Date & Time				
<u>Manager Interface</u>		Copyright © 2005-2016 RF Industries Pty Ltd. All Rights Reserved		
Configuration Files				
Firmware Update				
<u>Restart</u>				
About				
<u>Logout</u>				
Help				

The internally maintained real time clock Date and Time values may be adjusted using these fields.

## Setting

## 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.

## 14.23 Maintenance – Manager Interface

Alta.	Maintenance - Manager Interface		
	Customer Name -	RFI	
RFI	Site Name -	Adelaide	
	Setting	Value	
<u>Overview</u>	Auto Status Packets	Enabled	
Status Detail	Manager	Primary	Secondary
History	Hundger	· · · · · · · · · · · · · · · · · · ·	Secondary
Configuration	Manager Address	192.168.1.10	192.168.1.10
Maintenance	Manager TCP Port	9123	9123
Access Management	Manager UDP Port	9124	9124
<u>Date &amp; Time</u>			·
<u>Manager Interface</u>	Manager Use TCP for Status Packets	□ Enabled	
Configuration Files			Defaults Discard Changes Apply
<u>Firmware Update</u>			
<u>Restart</u>	Copyrigh	t © 2005-2016 RF Industries Ptv Ltd	. All Rights Reserved
About		· · · · · · · · · · · · · · · · · · ·	
<u>Logout</u>			
Help			

The configuration and status of multiple RMC/TTA systems 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.

## <u>Setting</u>

## Auto Status Packets:

This controls the automatic sending of Status Change packets to the Manager application. If enabled, any change in alarm status results in a Status Change packet. This setting will be ignored if the Manager Address is set to "0.0.0.0".

## Auto Traffic Packets:

This controls the automatic sending of Tx Traffic data packets to the Manager application. If enabled, any change in detected Tx carrier presence results in a Traffic packet. In addition, if any Tx carrier remains ON or OFF for "Max Traffic Period" seconds, a STILL-ON or STILL-OFF Traffic packet is sent. This setting will be ignored if the Manager Address is set to "0.0.0.0".

## Max Traffic Period:

This controls the automatic sending of the STILL-ON and STILL-OFF traffic data packets as detailed above.

## Manager Address:

The IP address for the Manager application. If a Manager application is not being used this should be 0.0.0.0.



## Manager TCP Port:

The port number for TCP communications to the Manager application. Both a primary and a secondary address is provided if Manager Messages are desired to be sent to two applications/destinations.

## Manager UDP Port:

The port number for UDP communications to the Manager application. Both a primary and a secondary address is provided if Manager Messages are desired to be sent to two applications/destinations.

## Manager Use TCP for Status Packets:

The default communications protocol for Status change and Traffic data packets is UDP. If TCP is required for Status packets, this setting should be enabled.

<u>Note:</u> This option should only be activated if essential for networking reasons. The UDP protocol is strongly preferred, as the protocol and processing overheads are significantly lower and packets can be sent at a higher rate. Note also that Traffic data packets will always use UDP protocol.

## Defaults:

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

Auto Status Packets	Disabled
Auto Traffic Packets	Disabled
Max Traffic Period	60
Manager Address	0.0.0.0
Manager TCP Port	9123
Manager UDP Port	9124
Manager Use TCP for Status Packets	Disabled

## **Discard Changes:**

Click this button to restore the values to those present when the page was last re-displayed. Note that if invalid values are being displayed after a Save attempt, these values may not match the current unit configuration. In this case, just select the Maintenance/Manager Interface menu item again to re-display the current configuration.

## Apply:

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

## 14.24 Maintenance – Configuration Files

<u>A</u>	Maintenance - Configuration Files		
	Customer Name -	County Police	
Allin	Site Name -	Mt Wallace	
RFI	Upload a new Configuration file	1	
Overview	Note that the filename must	have a CEC extension	
Status Detail	Note that the mename must	have a .cl G extension.	
History		Browse Send	
Configuration			
Maintenance			
Access Management	Manage existing Configuration f	files	
Date & Time			
<u>Manager Interface</u>		View	
Configuration Files			
<u>Firmware Update</u>	Do	beolow	
<u>Restart</u>		Apply	
About		Delete	
Logout			
Help			
	Save current Configuration to fi	ile	
	Enter a name for the new Confi	iguration file, then click Save:	
	Note that the filename will ha	ave a .CFG extension.	
		.CFG Save	
	Сор	pyright © 2009-2016 RF Industries Pty Ltd. All Rights Reserved	

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

## Upload a new Configuration file:

Click "Browse" to locate the desired RMC/TTA 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 RMC.

	Maintenance	- Configura	ati	on Fil	es					
Customer	r Name - Demo									
Site Name	e - Mt Dand	anong						_		
Upload a n	ew Configuration file									
Note tha	t the filename must have a .CFG exten	sion.								
				Browse	a	Send				
1			_					_	_	87 D
	Choose File to Upload									x
Manage e	G Computer > I	HP_TOOLS (F:) >		•	<b>4</b> 7	Search	НР_ТОС	DLS (F:)		Q
DISPLA UHF_1.0	Organize 🔻 New folder						8			0
	Documents		*	Name			^			Da
	🖻 🎝 Music			Hew	/lett-P	ackard				18.
	Pictures			HP	Tools	ucitara				23
	Videos		_							
	Scott Alford									
Save curr	A Jee Computer		Ξ							
Enter a n	General (G)									
Note th	Drafting Data (J:)									
	ADE Data (\\rfi-ade-fp02	) (N:)								
	> 😠 Personal (P:)		-	•						•
	File name:				-	All Files (	(*.*)			-
						0				5
						Оре	n		Cancel	



#### 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 RMC/TTA.

Manage existing Configuration files	
MT+SMITH.CFG MT_SMITH.CFG RFICFG Downloa Apply Delete	Result of Apply: Verifying config file RFI.CFG Processing config file SUCCESS - Config settings applied.

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 RMC/TTA configuration to the list of stored RMC/TTA configurations. If "Save" is clicked without entering a filename, the a time/date based filename will be automatically nominated.

<u>Note:</u> The stored RMC/TTA 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.

When the *Apply* button is clicked, the screen at left will appear. Select any of the site-specific fields from the configuration file that you do want to have applied to the RMC/TTA, and then click *Apply*.

Follow the prompts and the selected configuration file, with the selected sitespecific data fields' contents, will be applied into the RMC/TTA. In this manner, one common configuration file can be applied to multiple ASMs, with the site-specific data fields not used from the configuration file contents, but then edited individually.

This new feature can save significant programming configuration time across an RMC/TTA fleet.



## 14.25 Maintenance – Firmware Update

RFI	Maintenance - Firmware Update Select the .FFP file to upload to the unit. Browse Send
Overview Status Detail History Configuration	<b>Note:</b> Backup any important configuration files to the PC prior to the upgrade process. For more details please click on the help button below the menu bar.
Maintenance	Copyright © 2009-2016 RF Industries Pty Ltd. All Rights Reserved
Access Management	
<u>Date &amp; lime</u> Manager Interface	
Configuration Files	
<u>Firmware Update</u>	
<u>Restart</u>	
<u>About</u> Logout	
Help	

This page is used for uploading firmware updates to the RMC.

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

## Browse:

Enter the file path or Browse to nominate the system firmware update file location.

#### Send:

Once the update file's location has been nominated, 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.



## 14.26 Maintenance - Restart

Alta	Maintenance - Restart
	This will restart the unit with the currently saved settings.
RFI	After restarting, close this browser tab or window, wait for about 1 minute, then re-enter the unit's IP address to return to the login page.
<u>Overview</u> Status Detail	Restart
History	
Configuration	
Maintenance	Copyright © 2009-2016 RF Industries Pty Ltd. All Rights Reserved
Access Management	
<u>Date &amp; Time</u>	
<u>Manager Interface</u>	
Configuration Files	
<u>Firmware Update</u>	
<u>Restart</u>	
<u>About</u>	
<u>Logout</u>	
Help	

## **Restart:**

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

Note: The unit will normally only need to be restarted to activate new Communications settings. If restarted, an RMC may take up to one minute to reboot and re-initialize itself before it becomes available for a "Log in" and a web browser new session.



## 14.27 About



**TTA System** 

This RFI TTA System includes a Tower Top Amplifier (TTA) and a Receiver Multicoupler (RMC) unit. The TTA includes a highselectivity preselector, low noise quadrature amplifier (with redundancy and auto-changeover in some models), a Bypass mode, and a Test function for use as part of a maintenance procedure.

The Receiver Multicoupler (RMC) provides active signal distribution from the TTA to multiple base station receivers. Its internal gain may be adjusted to overcome signal distribution losses, optimising overall receive system performance.

A TTA controller is integrated within the RMC. The TTA and RMC operating configuration, alarm status, and monitoring are accessible via the RMC switches and LED indicators, integral webserver Graphical User Interface (GUI), or text-based Command Line Interface (CLI) protocol.

The RMC design includes a low-noise quadrature amplifier circuit featuring excellent IP3 performance that caters for a broad dynamic range of input signal levels. The quadrature amplifier's inherent amplifier stage redundancy provides high reliability, and the built in "auto-gain" feature optimises system performance in the unlikely event of a failure in either of the quadrature amplifier stages. A Test Port is provided on the RMC front panel to facilitate Rx system testing using the "Test" function.

Help

In a typical installation the RF signal input to the RMC will be sourced from a receive antenna via an RFI Tower Top Amplifier (TTA) that suits the receive frequencies required at the site. An optional post-filter may also be connected to the rear of the RMC to provide additional selectivity or sub-band filtering to supplement the TTA preselector.

Optional Expansion Multicouplers are available to expand the RMC/TTA RF output port capacity up to 128 ports if required and Form-C (changeover) alarm relay contacts are also provided on the rear of the RMC for connection to a site monitoring system if required. DC power supply operation is standard, with an external plug pack power supply available for AC operation.

The following block diagram provides an overview of the typical RMC/TTA system interfaces;





## 14.28 Logout

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



If "OK" is selected, the user will be logged out of the current webserver session and the original "Log in" screen will be presented, ready for a new session.....

Username	admin
Password	•••••
	Login



## <u>15. SNMP</u>

## **Description**

The following SNMP V2c functionality is supported by the RMC/TTA products using baseline 1.61 firmware.

## SNMP Traps

Any single SNMP trap generated by the RMC/TTA includes the following OIDs and associated variables;

OID	Veriable	Compton (Toma)	Description	
OID	variable	Syntax(Type)	Description	
.1.3.6.1.4.1.32327.2.2.3.1.2.1	rmcAlarmCustName	String	Customer Name	
.1.3.6.1.4.1.32327.2.2.3.1.2.2	rmcAlarmSiteName	String	Site Name	
.1.3.6.1.4.1.32327.2.2.3.1.2.3	rmcAlarmStatusString	String	Summary status string for RMC and TTA	
.1.3.6.1.4.1.32327.2.2.3.1.2.4	rmcAlarmStatusBits	Integer	Alarm status register bit value	
.1.3.6.1.4.1.32327.2.2.3.1.2.5	rmcAlarmDescription	String	Description for the specific alarm	
.1.3.6.1.4.1.32327.2.2.3.1.2.6	rmcAlarmState	Integer	Alarm fault condition, 1 = OK and 2 = Fail	
.1.3.6.1.4.1.32327.2.2.3.1.2.7	rmcAlarmDateTime	Date and Time	The time when the trap was sent by the RMC	
.1.3.6.1.4.1.32327.2.2.3.1.2.8	rmcAlarmType	Integer	Unique number for each type of alarm (Alarm ID)	
.1.3.6.1.4.1.32327.2.2.3.1.2.9	rmcAlarmModel	Integer	RMC model number, 1 for RMC, others for future models	

## The RMC/TTA has the following types of traps;

Alarm ID	Alarm String	Alarm Description
0	Test Alarm string	SNMP trap for testing only
1	MUX_Alarm	MUX power related alarms
2	MUX_Temp	MUX temperature alarm
3	TTA_Feed	MUX to TTA communication and power related alarms
4	TTA_Alarm	TTA internal power alarms
5	TTA_Temp	TTA internal temperature alarm
6	NO_Alarms	RMC mode changes



#### **TEST SNMP Message**

.iso.org.dod.internet.mpt.mib-2.system.sysUpTime.0: TimeTicks: 22 hours, 6 minutes, 50 seconds.: .iso.org.dod.internet.snmpV2.snmpModules.snmpMIB.snmpMIBObjects.snmpTrap.snmpTrapOID.0: Object ID: .1.3.6.1.4.1.32327.2.2.3.1.6.0.1: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmCustName.0: RFI: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusString.0: Test Status: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 0: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDescription.0: Test Alarm string: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDescription.0: Test Alarm string: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDateTime.0: 2016-3-4,13: 6: 48.1: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 0: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 0: .iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 0: .iso.org.dod.inter

#### **TTA Feed Fault:**

.iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.0: TimeTicks: 22 hours, 34 minutes, 36 seconds.:
.iso.org.dod.internet.snmpV2.snmpModules.snmpMIB.snmpMIBObjects.snmpTrap.snmpTrapOID.0: Object ID: 1.3.6.1.4.1.32327.2.2.3.1.6.0.1:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmCustName.0: RFI:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusString.0: TTA\_Amp\_A=--, TTA\_Amp\_B=--, Bypass\_Mode=--, Test\_Mode=--:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 4097:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 2:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 2:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 2:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDateTime.0: 2016-3-4,13: 34: 33.9:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 3:
.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 3:



#### TTA Feed OK:

.iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.0: TimeTicks: 22 hours, 38 minutes, 24 seconds.:

.iso.org.dod.internet.snmpV2.snmpModules.snmpMIBObjects.snmpTrap.snmpTrapOID.0: Object ID: .1.3.6.1.4.1.32327.2.2.3.1.6.0.1:

.iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmCustName.0: RFI:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusString.0: TTA\_Amp\_A=ON, TTA\_Amp\_B=OFF, Bypass\_Mode=OFF, Test\_Mode=OFF:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 0: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDateTime.0: 2016-3-4,13: 38: 22.6: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 3: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 3: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 3:

#### MODE Change BYPASS ON

.iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.0: TimeTicks: 22 hours, 41 minutes, 46 seconds.:

.iso.org.dod.internet.snmpV2.snmpModules.snmpMIBObjects.snmpTrap.snmpTrapOID.0: Object ID: .1.3.6.1.4.1.32327.2.2.3.1.6.0.1:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmCustName.0: RFI:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide:

.iso.org.dod.internet.private.enterprises.rflndustries.rflPublic.rflProducts.rflRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusString.0: TTA\_Amp\_A=ON, TTA\_Amp\_B=OFF, Bypass\_Mode=ON, Test\_Mode=OFF:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 0: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDateTime.0: 2016-3-4,13: 41: 44.8: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 6: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 6: .iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 1:



#### MODE Change BYPASS OFF

.iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.0: TimeTicks: 22 hours, 41 minutes, 51 seconds.:

.iso.org.dod.internet.snmpV2.snmpModules.snmpMIBObjects.snmpTrap.snmpTrapOID.0: Object ID: .1.3.6.1.4.1.32327.2.2.3.1.6.0.1:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmCustName.0: RFI:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmSiteName.0: Adelaide:

.iso.org.dod.internet.private.enterprises.rflndustries.rflPublic.rflProducts.rflRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusString.0: TTA\_Amp\_A=ON, TTA\_Amp\_B=OFF, Bypass\_Mode=OFF, Test\_Mode=OFF:

.iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmStatusBits.0: INTEGER: 0:

.iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDescription.0: NO\_Alarms:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmState.0: INTEGER: 1:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmDateTime.0: 2016-3-4,13: 41: 49.8:

.iso.org.dod.internet.private.enterprises.rflndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmType.0: INTEGER: 6:

.iso.org.dod.internet.private.enterprises.rfIndustries.rfiPublic.rfiProducts.rfiRMCProduct.rmcAlarmMIB.rmcAlarmEntry.rmcAlarmModel.0: INTEGER: 1:

#### SNMP GET#

The SNMP GET# command is able to read individual OIDs and associated variables from the RMC/TTA as shown in the example below;

Sent GET request to 192.168.1.232 : 161	
rmcAlarmCustName.0	RFI
Sent GET request to 192.168.1.232 : 161	
rmcAlarmSiteName.0	Adelaide
Sent GET request to 192.168.1.232 : 161	
rmcAlarmStatusString.0	TTA_Amp_A=ON, TTA_Amp_B=OFF, Bypass_Mode=OFF, Test_Mode=OFF

A SNMP WALK will read all the OIDs and associated variables as shown in the example below,

Sent GET request to 192.168.1.232 : 161	
rmcAlarmCustName.0	RFI
rmcAlarmSiteName.0	Adelaide
rmcAlarmStatusString.0	TTA_Amp_A=ON, TTA_Amp_B=OFF, Bypass_Mode=OFF, Test_Mode=OFF
rmcAlarmStatusBits.0	0
rmcAlarmDescription.0	NO_Alarms
rmcAlarmState.0	okay(1)
rmcAlarmDateTime.0	2016-3-4,12:59:1.7
rmcAlarmType.0	0
rmcAlarmModel.0	1

## 16. Connectors

## RMC DC Power connector (Phoenix 2-pin) pin-out:

The pin numbers on the polarized Phoenix 2-pin connector on the rear of the RMC are illustrated below.



Figure 13 – DC Power Pinout

## Pin Function Table:

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

Table 17

## RMC Alarm connector (Phoenix 3-pin) pin-out:

The pin numbers on the polarized Phoenix 3-pin connector on the rear of the RMC are illustrated below.



## Figure 14 – Alarm Pinout

## Pin Function Table:

Pin	Function
1	Fault – Closed when an alarm is present
2	Fault – Open when an alarm is present
3	Common

Table 18



## 17. Maintenance, Inspection and Repair Advice

No special maintenance program is required for the TTA, RMC or PF. Testing and inspection of the TTA system may be included in a Periodic Maintenance Inspection (PMI) program if desired.

Firmware upgrades may periodically be made available and may be uploaded for the TTA or RMC via the RMC GUI or CLI if desired.

Checking that the RF connectors on all coaxial cables are correctly torqued (as per manufacturers' recommendations) is considered good practice.

All other connectors (power, alarm, etc) must be firmly located and pushed into their corresponding mating sockets, with fastening screws tightened securely.

Neither the TTA, RMC or PF 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.



## 18. Frequently Asked Questions (FAQ)

#### Q – How many base stations can be connected to a TA8990 TTA system?

A – Up to 128. Models offering RF outputs for 8 (or 9 in Mode #2) or 16 RF outputs are set up. 8way Expansion Decks can easily be added to increase this configuration up to a maximum of 128 channels.

#### **Q** – Can the system be expanded?

A – Yes. The TA8990 Series TTA systems can be easily and conveniently upgraded in the field by adding additional 8way Expansion Decks as and when required by network capacity expansion on a site-by-site basis.

#### Q - Can a Post Filter be added to the system?

A – Yes. An in-line Post Filter can be easily connected to the receiver multicoupler to facilitate additional selectivity, or to narrow the TTA's inherent passband for customised designs. This post filter is connected to the two "Filter" ports on the rear of the receiver multicoupler, and switched into the RF path using the "filter inline" switch located between these two ports – or via the webserver GUI. A LED indicator next to the switch is on when the post filter is switched into the RF path. The GUI also shows the post filter's in-line status.

Note: A Post Filter is always fitted to each RMC is a 900MHz system.

#### Q - Which system power supply voltages are catered for?

A – Models are available to cater for 90-264VAC, +12VDC (+11-16VDC negative ground), 24VDC (18-36VDC floating ground) and 48VDC (36-60VDC floating ground). The availability of these models ensures compatibility with the different Mains, UPS, Solar and other power system types commonly deployed in networks.

#### Q - Does the TTA System provide alarm outputs?

A – Yes. The receiver multicoupler has a separate Alarm connector that provides Form-C relay outputs for connection to an external Site Monitoring system. The GUI also provides alarm status information, and the Command Line Interface (CLI) could provide alarm polling capability for embedded and custom software applications. Future firmware can be easily flash uploaded (locally or remotely) and will include IP Manager Messages, SNMP, and SMTP Email Alarm Messages.

#### **Q** – Is performance History available?

**A** – Yes. Receive System performance can be measured and the results stored in the RMCs non-volatile memory for future review. This feature allows a long term record of system performance to be conveniently viewed, and allows ongoing system performance to be analyzed to show degradation or other customer-impacting trends.

#### Q – Is SNMP supported?

**A** – **Yes.** The APM can report alarms via SNMP v2c northbound alarm traps, and can be polled by a southbound GET# command. The GET# command will respond with a *Status* – *System - Alarm Summary* status.

#### Q - Are Dual-Receiver systems supported?

**A** – **Yes.** RFI offers an innovative mounting kit that allows two TTAs to be mounted together in a compact installation, capable of sharing a common TEST coaxial feeder cable, and using two separate RMCs. This configuration optimises cabling and installation costs and provides true full redundancy in the receiver systems - with associated high levels resistance to system outages, fault-tolerance, and resulting excellent system availability performance. This unique TTA/RMC architecture solution requires only a single mounting location on the tower and significantly minimises the dual systems's wind and weight loading impact on the tower.

#### **Q** – Are Diversity Receive systems supported?

**A** – **Yes.** Like our Dual-Receiver system solution, RFI's dual TTA mounting kit also provides a Diversity Receive solution, providing the same installation, fault-tolerance and system availability benefits for communications systems deployments using receiver diversity. RFI's unique TTA/RMC architecture also provides a convenient migration path from single receive designs to the latest diversity receive technologies – minimising spares holdings throughout the network's life, while maximising realised equipment life-cycles and a network operator's return-on-investment.

#### **Q** – Are new features planned?

**A** – **Yes.** Like other RFI products, there is a robust product development roadmap planned for the TTA system products. New features and capabilities will be released to enable system enhancements to be added to a system – continuing to add value customers. Firmware updates can be easily and conveniently uploaded into the units via the GUI. Please check the RFI web site on a regular basis for firmware updates.



## 19. Supporting Information

For Marketing Sheets, User Manuals, Firmware Upgrade files, SNMP MIB files, Service Bulletins or additional information on the RFI range of TTA and RMC products please visit:

http://www.rfiwireless.com.au

Test Drive the RMC GUI (including the TTA) by visiting the RFI TTA on-line demonstration unit:

## http://203.46.35.189

Level 1:	Username:	user
	Password:	user
Level 2:	Username:	admin
	Password:	admin

Please note that this unit is not connected to a "live" network and may be test driven and configured without impact on any user. Demonstration units may be also be off-line periodically. If you cannot connect to this unit please contact your nearest RFI Sales office so we can ensure it is available for your test drive.

Additional information is available from the RFI website http://www.rfiwireless.com.au

## Contact Information

If you would like more information on the TTA/RMC products and their applications, please contact your nearest RFI Sales Office. For more information on RFI products, please visit us at <a href="http://www.rfiwireless.com.au">http://www.rfiwireless.com.au</a>



20. User Notes:



# Australian Support

Phone: 1300 000 RFI (734) Email: enquiry@rfi.com.au

# International Support

## APAC

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

# RFI EMEA (UK)

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

## **RFI** Americas

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

# www.rfi.com.au