



RFI
TECHNOLOGY SOLUTIONS

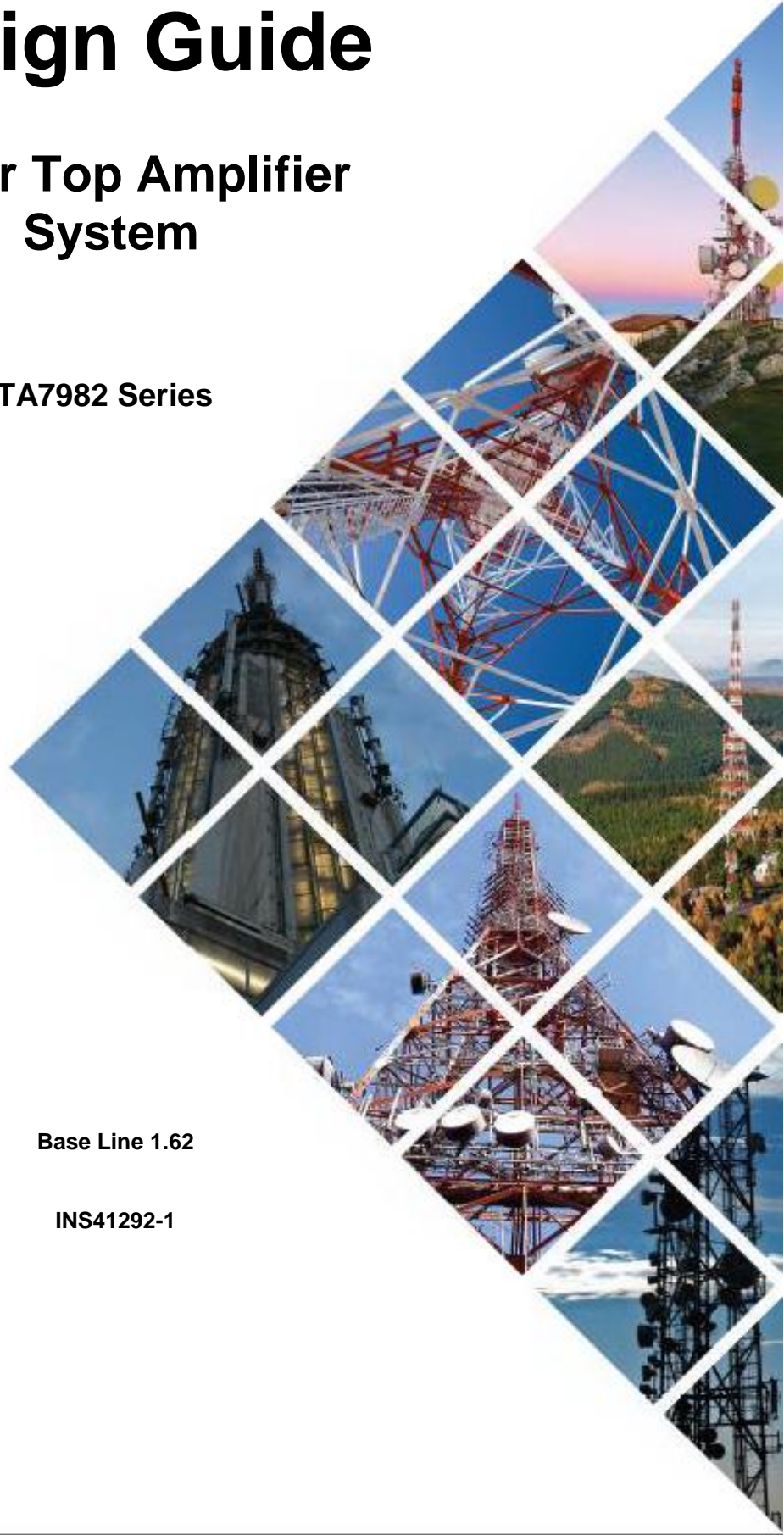
Design Guide

Tower Top Amplifier System

TA7982 Series

Base Line 1.62

INS41292-1



Company Overview

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

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

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

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

Document Number INS41292-1 Copyright © 2013 RF Industries Pty Ltd First Printing: 18 st Jan 2013	
Version Number	Version Date
1.00	18 th January 2013
1.20	19 th November 2013
1.30	27 th February 2014
1.50	07 th March 2016
1.60	
1.61	15 th May 2017
1.62	25 th October 2017

Disclaimer

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

TABLE OF CONTENTS

1. INTRODUCTION	7
2. APPLICATION AND INSTALLATION	10
3. TTA - ELECTRICAL AND MECHANICAL SPECIFICATIONS	13
4. RMC - ELECTRICAL AND MECHANICAL SPECIFICATIONS	14
5. INTERCONNECTION DIAGRAMS	17
6. MANUAL SETUP AND OPERATION	21
7. ETHERNET CONNECTION	28
8. OPTIONAL POST FILTER	35
9. TTA SYSTEM RF OUTPUT CAPACITY EXPANSION.....	36
10. CONNECTORS	39
11. ORDERING INFORMATION	40
12. MAINTENANCE, INSPECTION AND REPAIR ADVICE	41
13. FREQUENTLY ASKED QUESTIONS (FAQ)	42
14. BACKGROUND MATERIAL AND OTHER RESOURCES:	43
15. USER NOTES:	44

Notice

The information contained in this document is subject to change without notice.

RF Industries Pty. Ltd. makes no warranty of any kind with regard to this material, including but not limited to, the implied warranties of merchantability and fitness for a particular purpose. RF Industries Pty Ltd shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of the material.

All information contained in this manual has been reviewed. However RF Industries Pty Ltd accepts no liability for any omissions, errors or construed information.

© 2013, RF Industries Pty Ltd. All rights reserved. Reproduction, adaptation or translation without prior written permission is prohibited except as allowed under copyright laws.

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

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

TA7982-01xx-12-AC Series

Tower Top Amplifier Unit



Front View



Bottom View

Receiver Multicoupler Unit – RMC01

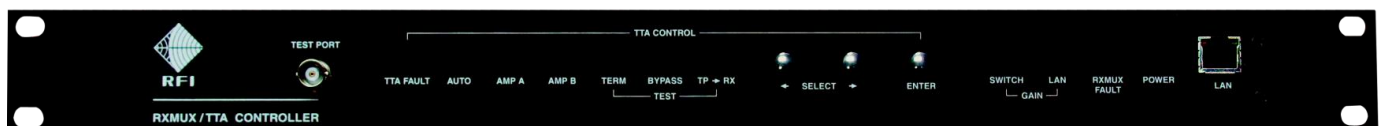


Front View



Rear View

Receiver Multicoupler Unit – RMC03



Front View



Rear View

1. Introduction

This design guide will discuss the TA7982 Series Tower Top Amplifier System. We will discuss the interface of these products into a system, design considerations, the layout and use of the connectors, switches and indicators, and the Graphical User Interface (GUI). Design recommendations will also be discussed.

The TA7982 Series are full-featured, high performance systems comprising a Tower Top Amplifier (TTA) and a Receiver Multicoupler/TTA Controller unit (RxMux).

The TTA unit features a milled cavity bandpass preselector providing exceptional selectivity (>110dB) and a 28MHz bandwidth (796-824MHz). 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.

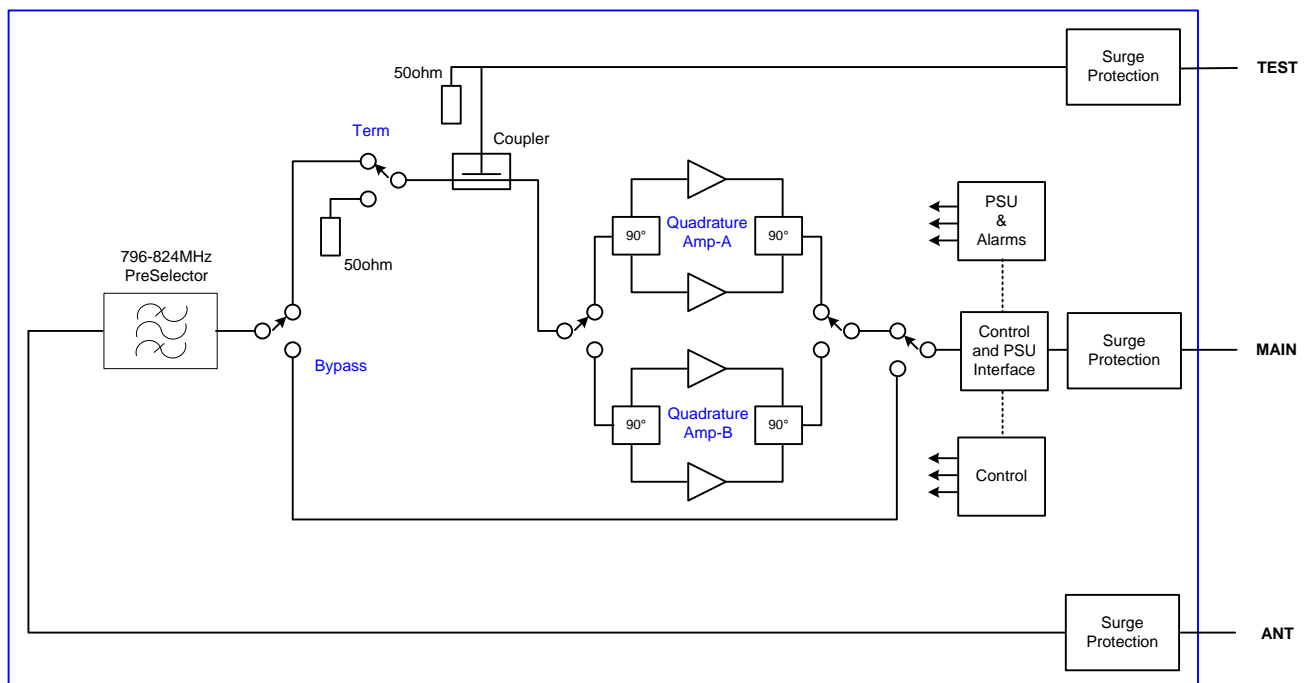


Figure 1 - TTA Block Diagram

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 30dB 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 (refer *Motorola Five Step Process for Receive System Verification*).

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.

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.

Two versions of the RMC (RMC01 and RMC03) are available as follows;

The RMC01 (MCU) has adjustable attenuators for both Input and Distribution (Output) gain settings, adjustable in 1dB increments (0.5dB in later models). Rear panel CONFIG, INPUT GAIN ATTEN, and DIST. GAIN ATTEN switches provide a simple and convenient method of configuring the RMC to meet Motorola’s guidelines for both Reserve (Input) gain, and Distribution gain for the number of base stations connected to the TTA system.

The RMC01 unit distributes signals to 8 base station receivers (9 in Config Mode 2 – refer Section 12), 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.

ESS and mixed mode MCU/ESS (using Config Modes 6 and 7) base station equipment can be supported.

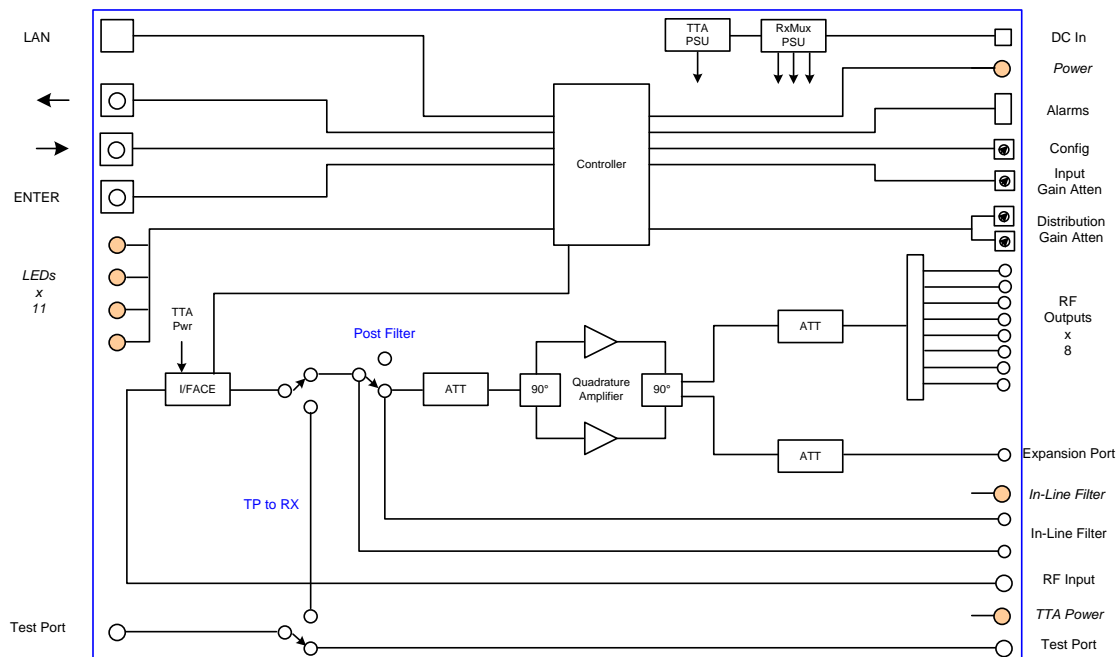


Figure 2 – RMC Block Diagram (RMC01)

The RMC03 (ESS) has adjustable attenuators for Input gain settings, adjustable in 1dB increments (0.5dB in later models). Rear panel INPUT GAIN ATTEN switches provide a simple and convenient method of configuring the RMC to meet Motorola's guidelines for Reserve (Input) gain.

The RMC03 unit distributes signals to up to 2 base station racks (ESS).

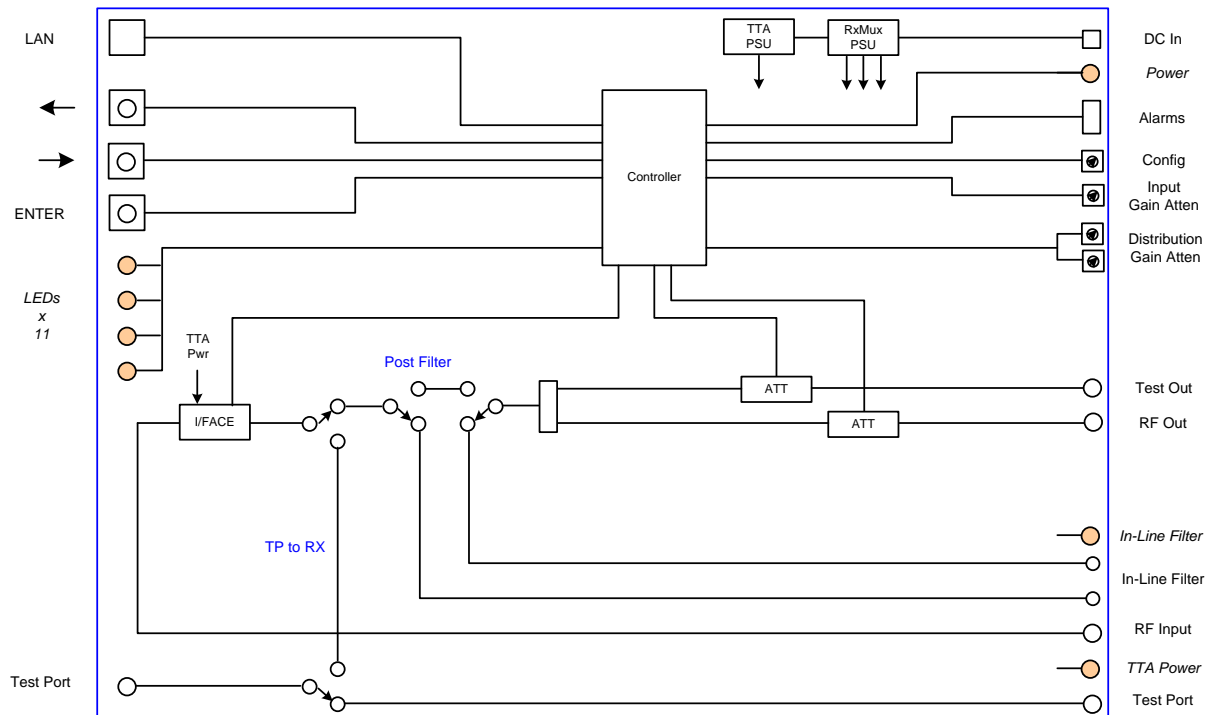


Figure 3 - RMC Block Diagram (RMC03)

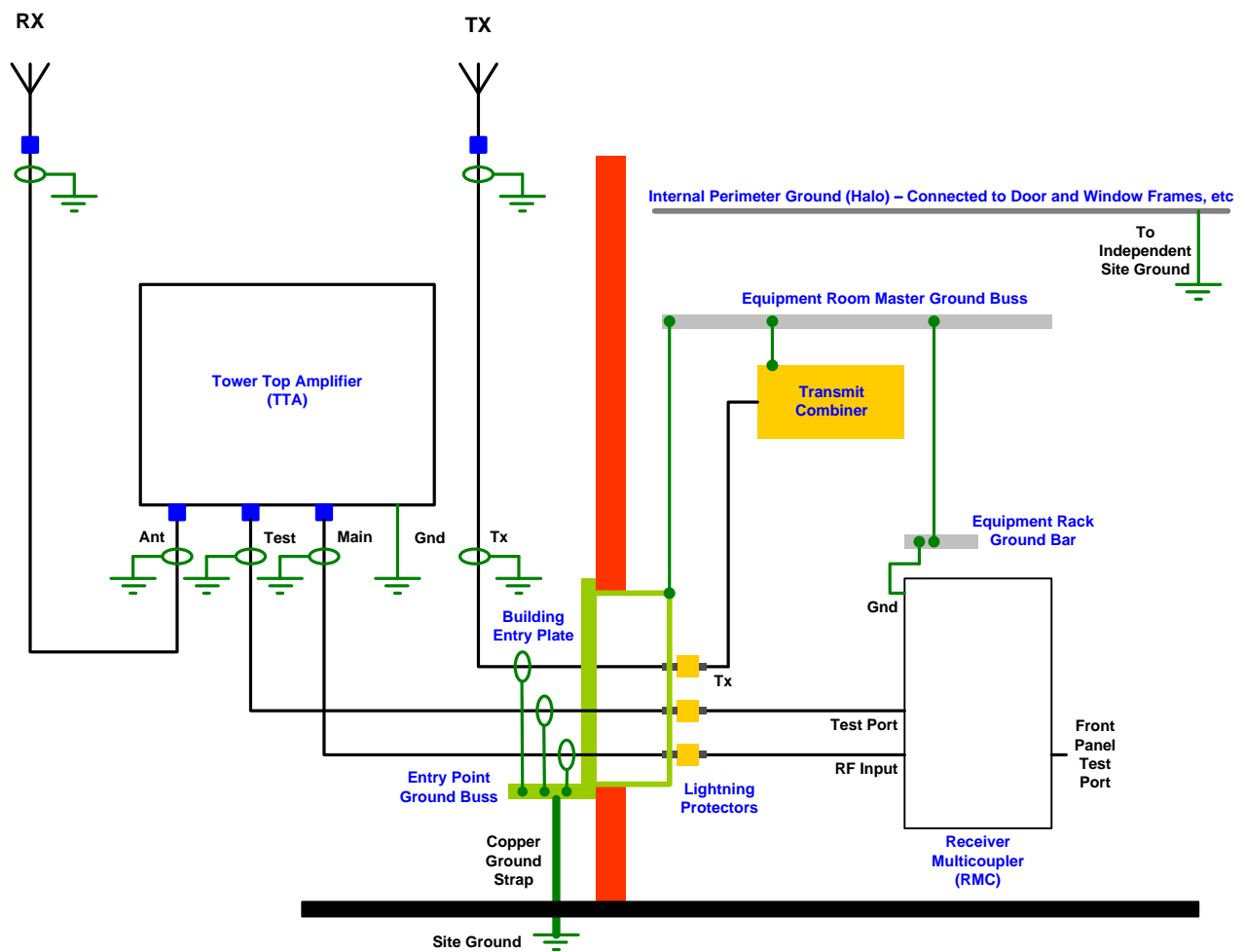
A Test Port is provided on the RMC front panel to be used in conjunction with the TTA's Bypass mode to sweep the receive antenna system and antenna using a distance-to-fault (DTF) test set.

If desired, an integral web-server 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/workstation/mainframe and a Telnet 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), Design Guide and SNMP MIB files are also available from RFI.

2. Application and Installation



WARNING

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

Diagram 1

The TA7982 Series of Tower Top Amplifier systems are designed to be mounted into a wide range of capacity configurations. The Interconnection Diagrams (Diagrams 2 and 3) show two examples.

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 allows the TTA to be installed onto most antenna mounting head frames, tower spaces, or flat surfaces (such as building parapets or room walls).

RMC Installation

The RMC is designed to be installed into standard 19inch rack mount frames or cabinet spaces. Although it is not necessary to terminate any unused RF ports on the RMC with a 50 Ohm low power resistive termination load from a performance perspective, it is often considered good RF engineering practice to terminate any spare or unused port to minimize susceptibility to unwanted RF signals.

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 already terminated onto the end of the plug pack's DC cable. This should be fitted into the power socket on the rear of the RMC.

Lightning protection, 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), associated jumper/tail requirements. Always follow engineering best practices for equipment installation.

Earthing

An M8 stud is located on the TTA for earthing the unit to the mounting structure, and an M6 stud and M5 screws are located on the rear of the RMC for earthing to a suitable earthing point within the 19" rack cabinet or rack frame.

Lightning Protection



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

AISG signaling 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 this purpose.

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

Note: All installation practices should be carried out in compliance to Motorola's R56 standard.

Installation Guidelines

1. All coaxial feeder cables to be grounded at top, bottom, equipment shelter entrance and every 75 feet along their length.
2. All external cable connectors to be weatherproofed.
3. Hoisting Grips used every 200 feet per coaxial feeder cable.
4. 1/2in LDF cable (or approved equivalent) from each antenna to its coaxial feeder cable and tower top amplifier (TTA).
5. 1/2in Superflex (or approved equivalent) for all coaxial cable runs inside equipment shelter.
6. 1/2in LDF cable (or approved equivalent) for TTA “Test” coaxial feeder cable run.
7. Lightning Protector on “Tx” coaxial feeder cable(s) - Note: Customer Supplied
Motorola Part Number DSTSXDFMBF (Female / Male)
Motorola Part Number DSTSXDFFBF (Female / Female)
8. Lightning Protector on “Main” coaxial feeder cable from TTA – Note: Customer Supplied
Motorola Part Number DS1090501WA (Male / Female)
Motorola Part Number DS1090501WB (Female / Female)
9. Lightning Protector on “Test” coaxial feeder cable from TTA – Note: Customer Supplied
Motorola Part Number DS1090501WA (Male / Female)
Motorola Part Number DS1090501WB (Female / Female)

Note: All installation practices should be carried out in compliance to Motorola’s R56 standard.

3. TTA - Electrical and Mechanical Specifications

TTA-01

TTA Model Number	TA7982-0100-10-00
Frequency Band	700 / 800MHz
Preselector Included	Yes
Preselector Frequency Range	796–824MHz
Preselector Selectivity (High)	>110dB @ 851MHz
Preselector Selectivity (Low)	>110dB @ 776MHz
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)	<2.7dB typ.
Noise Figure (System)	<3.5dB (includes TTA, 6dB feeder, and RMC)
TTA Amplifier IIP3	>+15dBm
Return Loss (All Ports)	>14dB
Power Requirements	Power Derived from "Main" port coaxial cable
Operating Temperature Range	-22°F to 140°F / -30°C to +60°C
Operating Temperature Range (with minor performance degradation)	-22°F to 158°F / -30°C to +70°C
Redundancy	Automatic Changeover (configurable)
Lightning Protection	20kA IEC 61000-4-5 8/20uS
Fail-Over / Bypass Modes	Yes (Receiver Multicoupler controlled) Gain Boost / Auto-Bypass Fail-Over / Auto-Recover / Bypass
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

Table 1

4. RMC - Electrical and Mechanical Specifications

RMC-01

Receiver Multicoupler Model Number	RX6996-3408-34-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 rd Order Intercept Point (3OIP)	>45dB (48dB typ.)
Number of Output Ports	8way (field expandable to 128 way) Supports ESS-only and mixed mode MCU/ESS operation
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#)
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	32°F to 122°F / 0°C to +50°C
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)

Table 2

RMC-03

Receiver Multicoupler Model Number	RX6996-3001-36-xxN
Frequency range	698-960MHz
Number of RF Output Ports	1
Number of RF Test Ports	1
Expansion Port	No
Net Gain or Loss (RMC In to RMC Out)	-10dB (Total System Gain = 8dB)
Number of Output Ports	2way Supports ESS operation
RF Port Return Loss (All Ports)	>14dB
Connectors (to TTA)	N-type (female)
RF Output Connectors	N-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)
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#)
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	32°F to 122°F / 0°C to +50°C
Mounting	1RU 19inch Rack mount (2way)
Dimensions (W x H x D)	19 x 1.75 x 5.9" / 483 x 44.75 x 150mm (2way)

Table 3

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	32°F to 122°F / 0°C to +50°C
Mounting	1RU 19inch Rack mount
Dimensions (W x H x D)	19 x 1.75 x 5.9" / 483 x 44.75 x 150mm

Table 4

Mains Power Supply - Electrical and Mechanical Specifications

Plug Pack Power Supply	RXTA0000-3060US-AC
Input Voltage	90-264VAC 50/60Hz
Input Plug	IEC
Input Cable	1.5m long USA plug
Output Voltage	12VDC @ 5A (60W)
Output Connector	2pin Phoenix style (locking)
Mounting	Free-standing
Dimensions (W x H x D)	5 x 1.25 x 2" / 125 x 31.5 x 50mm

Table 5

TA7982-0108-12-xx



TA7982-0116-12-xx

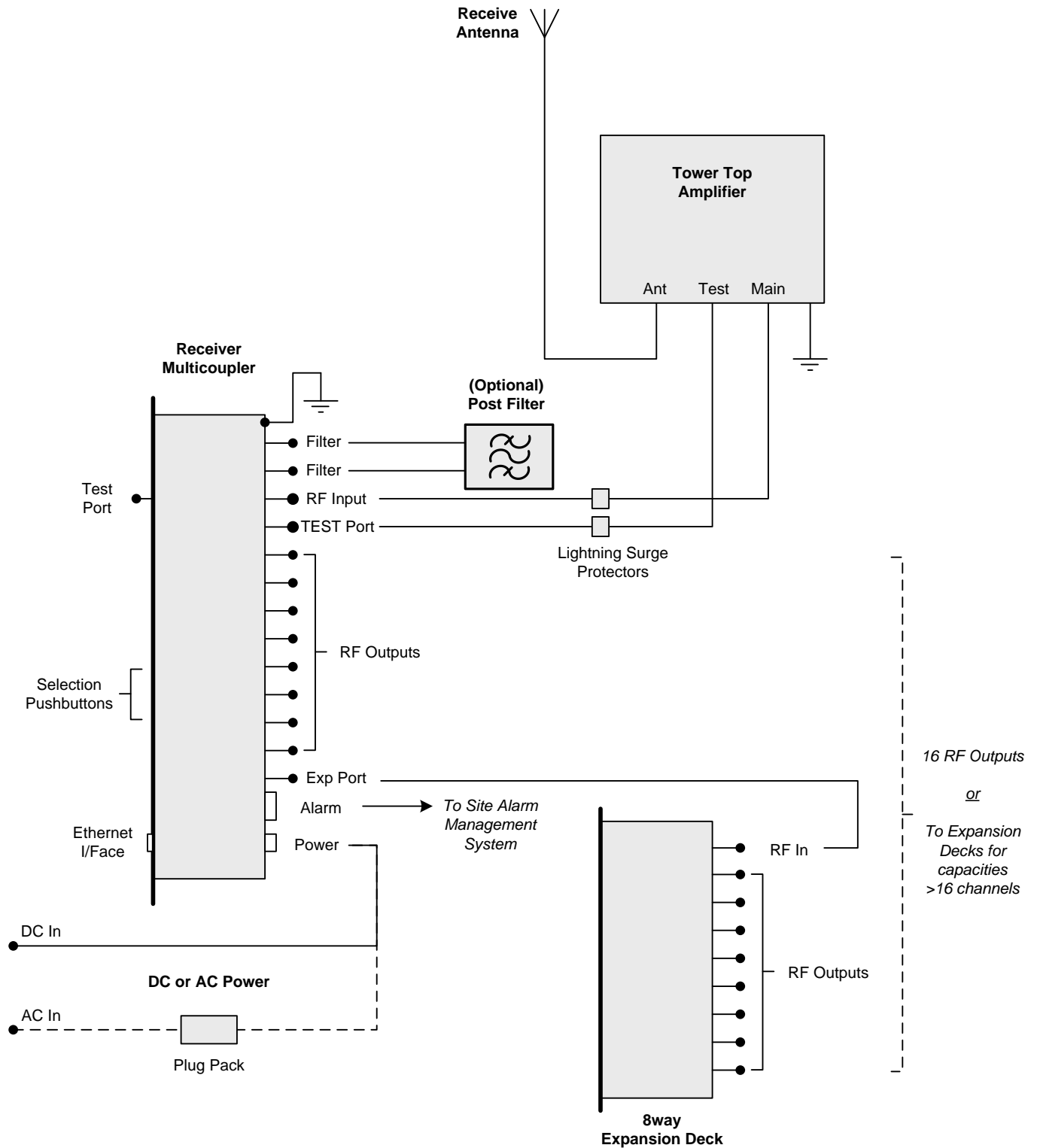


Diagram 3

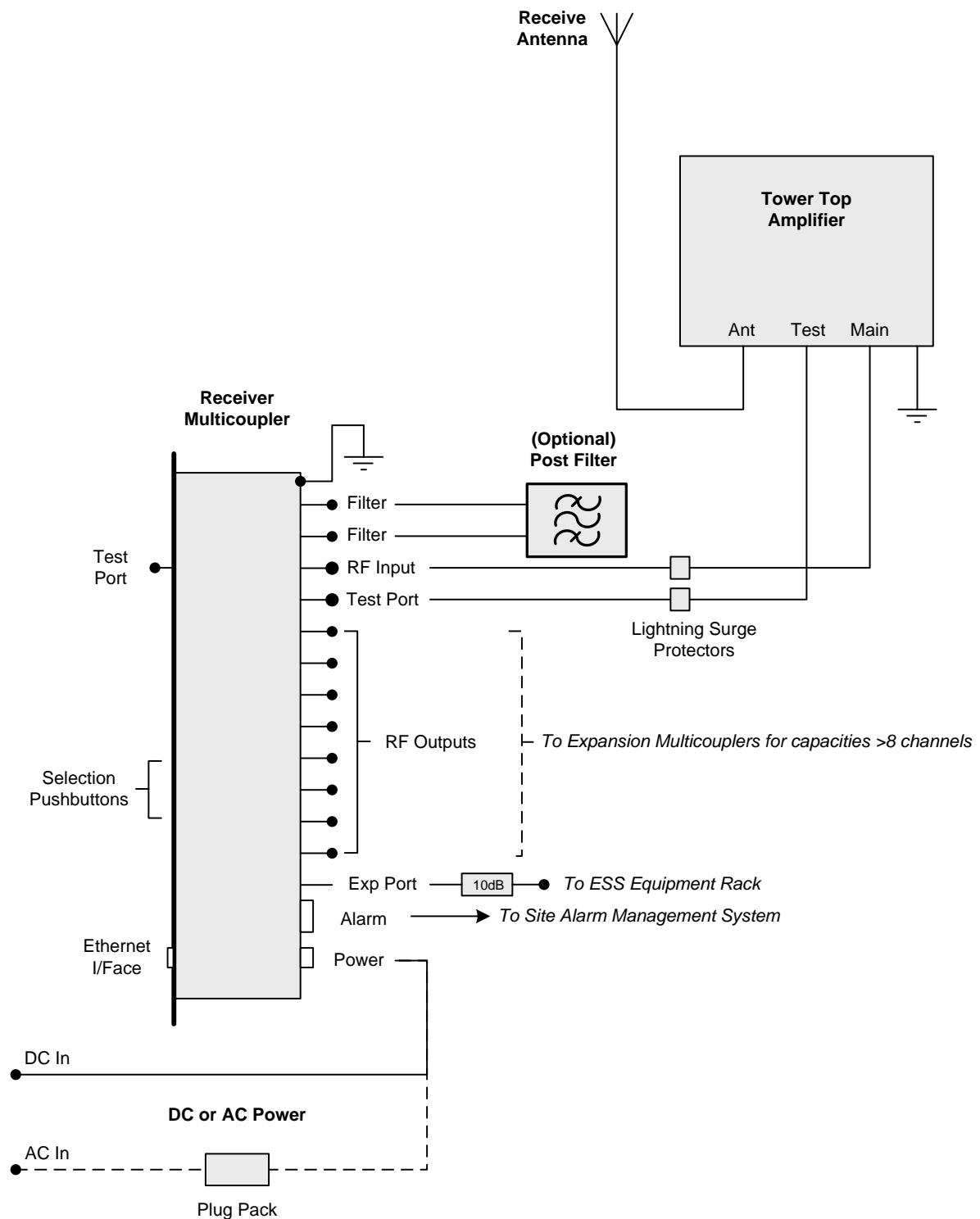


Diagram 4

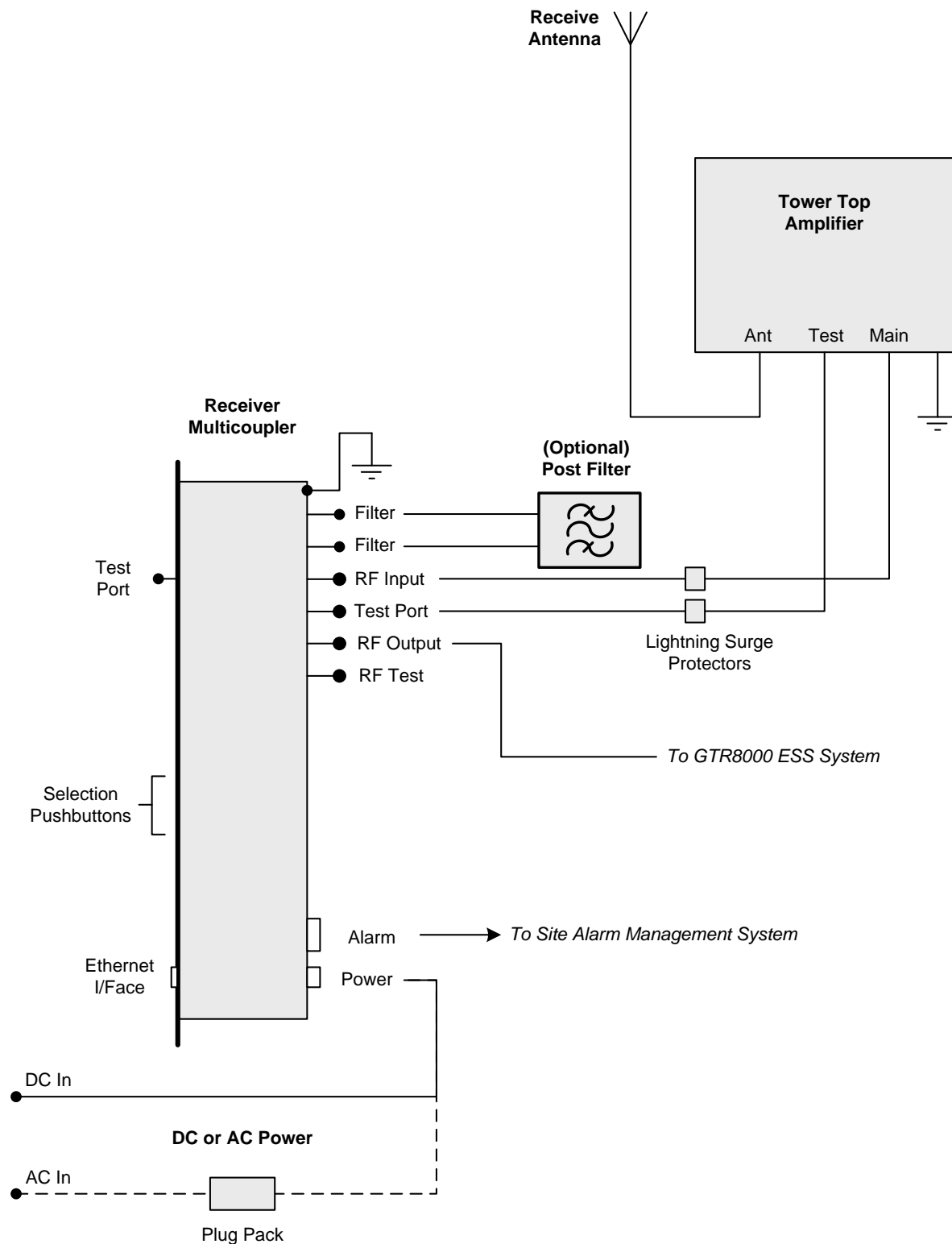


Diagram 5

6. Manual Setup and Operation

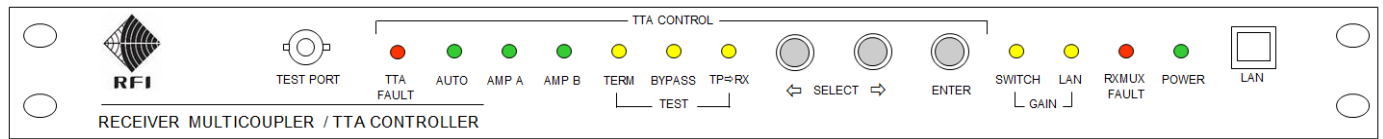


Figure 3 – RMC01 Front Panel Layout

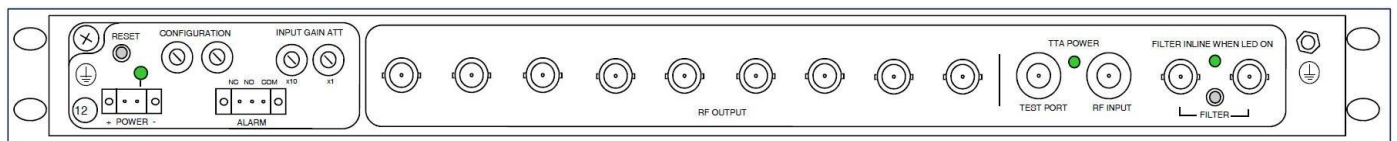


Figure 4 – RMC01 Rear Panel Layout

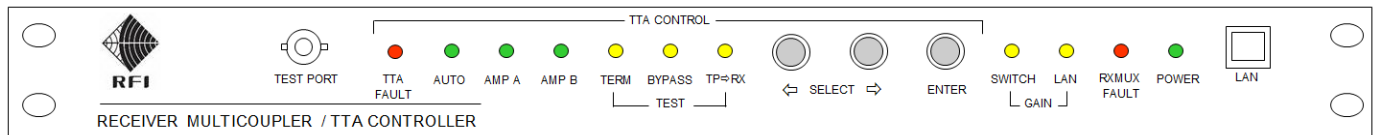


Figure 5 – RMC03 Front Panel Layout

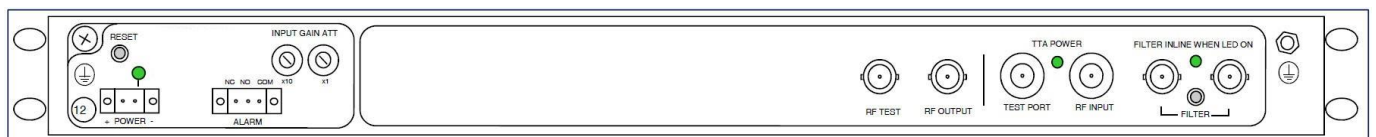


Figure 6 – RMC03 Rear Panel Layout

6.1 RMC01 - Rear Panel Switches

INPUT GAIN ATTEN switch

The Input Gain Atten switch configures the receiver system's input (or "Reserve") 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 ("Reserve Gain")	"Main" TTA to RMC Feeder Insertion Loss	Input Gain Attenuator Setting	
		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 6

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
<i>Internal Circuitry (loss)</i>	<i>- 4dB</i>
TTA to RMC Feeder Insertion Loss	- 3dB
<i>Input Gain Attenuator setting "03"</i>	<i>- 3dB</i>
Input Gain ("Reserve Gain")	15dB

This initial Input Gain Attenuator setting may be adjusted as a result of the Spectrum Analysis step in the *Motorola Five Step Process for Receive System Verification* (the "Five Step Program")

Example:

TTA Gain	25dB
<i>Internal Circuitry (loss)</i>	<i>- 4dB</i>
TTA to RMC Feeder Insertion Loss	- 3dB
<i>Input Gain Attenuator setting "05"</i>	<i>- 5dB</i>
Input Gain ("Reserve 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".

Examples:

TTA Gain	25dB
<i>Internal Circuitry (loss)</i>	<i>- 4dB</i>
TTA to RMC Feeder Insertion Loss	- 5dB
<i>Input Gain Attenuator setting "01"</i>	<i>- 1dB</i>
Input Gain ("Reserve 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 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 Deck to be connected
4	Up to 64 RF Outputs available Expansion Port internally terminated 8way Expansion Multicoupler connected to each of 8 RF Outputs as required
5	Up to 128 RF Outputs available Expansion Port configured for an 8way Expansion Deck to be connected 8way Expansion Multicoupler connected to each of 16 RF Outputs as required
6	Up to 8 RF Outputs available Expansion Port gain configured for ESS Mode using a 10dB in-line attenuator to be fitted to RMC Expansion Port
7	Up to 64 RF Outputs available Expansion Port gain configured for ESS Mode using a 10dB in-line attenuator to be fitted to RMC Expansion Port

Table 7

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 8

6.2 RMC03 - Rear Panel Switches

INPUT GAIN ATTEN switch

The Input Gain Atten switch configures the receiver system's input (or "Reserve") 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 ("Reserve Gain")	"Main" TTA to RMC Feeder Insertion Loss	Input Gain Attenuator Setting	
		x 10	x 1
8 dB	0 dB	0	6
8 dB	1 dB	0	5
8 dB	2 dB	0	4
8 dB	3 dB	0	3
8 dB	4 dB	0	2
8 dB	5 dB	0	1
8 dB	6 dB	0	0

Table 9

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.

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'.

6.3 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.

Note: 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 (RMC01 only)

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 (RMC03 only)

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

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.

RF Configuration Settings (TTA only)

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)

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 796-824MHz 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.

6.4 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.

Note: 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.

7. Ethernet Connection

Web Browser GUI (Graphical User Interface)

The RMC utilizes an on board web server (that resides in the RMC) to provide web browser access to the GUI. This can be accessed directly by connecting a short Ethernet cable jumper from a laptop/notebook directly to the RMC or remotely via a TCP/IP network. A standard Ethernet CAT5e jumper cable terminated with RJ45 connectors at either end is provided with the unit in the packing box for your convenience. Plug one end of the Ethernet jumper cable into the RMC and the other end into your laptop Ethernet socket. Internet Explorer 8 is the recommended web browser.

The TTA appears in the RMC GUI and is automatically recognised when connected to the RMC in a “plug’n’play” style.

IP Addressing

Initiate the web browser and type in the address field the following default address; <http://192.168.1.200> (RMC factory default address). This address can be restored at any time simply by performing a “hard reset” of the RMC. A “hard reset” is obtained by depressing and holding the reset switch at the rear while the power is turned on. When the green power LED starts to flash the reset switch may be released.

Factory Default settings

Static IP address:	192.168.1.200
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.1.254
Level 2 User name:	admin
Level 2 Password:	admin

Types of Networks the TTA/RMC can be used on

The RMC GUI security was aimed at meeting the **Security Technical Implementation Guidelines (STIG)**. This focus allows the RMC to meet the most stringent requirements for any network. The network type used for access depends on connection availability and network’s security requirements.

Programming IP Address for use on a Master Network

Before the RMC can be connected to an IP Network, the addressing and password must be changed using the configuration screen. The IP address must conform to the network architecture and must be controlled by the design engineer.

Password programming

In addition to adjusting the IP address the User Name and Password must be set. The Password convention within the RMC allows for Strong Password selection and will provide an indicator of the strength of the Password. Follow Motorola protocol and the direction of the design engineer in the selection of the User name and Password. Consult the RMC User Manual for instructions on setting up the User Name and Password.

There are two User Names and Password levels:

Level 1: User name and password access via the web browser GUI interface displays only status screens. No editing or changes are allowed under this level.


Level 2: User name and password access via the web browser GUI interface facilitates status, configure and maintenance screens.

Username	<input type="text" value="admin"/>
Password	<input type="password" value="....."/>
<input type="button" value="Login"/>	

Graphical User Interface (GUI)

A comprehensive and user-friendly Graphical User Interface (GUI) is available within the Receiver Multicoupler (RMC) that manages both the RMC and the TTA. A sample of pages from the GUI is included here for interest. For more information on the GUI, please refer to the TA7982-01xx-12-xx Series User's Manual.

Graphical User Interface (GUI) – Example screens



- [Overview](#)
- [Status Detail](#)
- [History](#)
- [Configuration](#)
- [Maintenance](#)
- [About](#)
- [Logout](#)

TTA System

Model - TA7982-01xx-12-xx


System Overview

Customer Name - RFI - RMC01
Site Name - Adelaide

Item	Alarm Status
RMC	OK
TTA	OK
System	OK

Copyright © 2009-2013 RF Industries Pty Ltd. All Rights Reserved

Graphical User Interface (GUI) – Example screens



[Overview](#)
[Status Detail](#)
[RMC](#)
[TTA](#)
[System](#)
[Communications](#)
[History](#)
[Configuration](#)
[Maintenance](#)
[About](#)
[Logout](#)

Help

Status - TTA

Customer Name - RFI - RMC01
Site Name - Adelaide

Status

	Status
Comms	OK
Power	OK
Amp-A	OK
Amp-B	OK
Temperature	OK

Mode


Operating Mode	Setting	Status
Auto	SELECTED	
Amp-A	AUTO	ON
Amp-B	AUTO	OFF

Test Mode

Terminate	OFF
Bypass	OFF
TP -> RX	OFF

Refresh

Copyright © 2009-2013 RF Industries Pty Ltd. All Rights Reserved



[Overview](#)
[Status Detail](#)
[RMC](#)
[TTA](#)
[System](#)
[Communications](#)
[History](#)
[Configuration](#)
[Maintenance](#)
[About](#)
[Logout](#)

Help

Status - RMC

Customer Name - RFI - RMC03
Site Name - Adelaide

Status

	Status
Temperature	OK
Power	OK
TTA Power Feed	OK
Post Filter	DISABLED
Gain control	LAN

Settings

	Switch	LAN	In Use
Input Gain Attenuator	0 dB	0 dB	0 dB

Refresh

Copyright © 2005-2015 RF Industries Pty Ltd. All Rights Reserved

Graphical User Interface (GUI) – Example screens



[Overview](#)
[Status Detail](#)
[History](#)
[Configuration](#)
[RMC](#)
[TTA](#)
[User Data](#)
[Communications](#)
[Maintenance](#)
[About](#)
[Logout](#)

[Help](#)

Configuration - RMC

Customer Name - RFI - RMC01
 Site Name - Adelaide

General

Setting	Value
Alarm Delay	5 Seconds
Post Filter	<input type="radio"/> IN <input checked="" type="radio"/> OUT
Settings Control	<input checked="" type="radio"/> SWITCHES <input type="radio"/> LAN
Hardware Configuration	2 1 - Up to 8 RF Outputs.
Input Gain Attenuator	0 dB <input type="checkbox"/> AUTO 3 dB
Distribution Gain Attenuator	0 dB <input type="checkbox"/> AUTO 3 dB

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

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

Copyright © 2009-2013 RF Industries Pty Ltd. All Rights Reserved



[Overview](#)
[Status Detail](#)
[History](#)
[Configuration](#)
[RMC](#)
[TTA](#)
[User Data](#)
[Communications](#)
[Maintenance](#)
[About](#)
[Logout](#)

Configuration - TTA

Customer Name - County Police
 Site Name - Mt Wallace

Setting	Value
Amplifier Mode	<input checked="" type="radio"/> AUTO <input type="radio"/> AMP-A <input type="radio"/> AMP-B
TTA Alarm Mode	<input type="checkbox"/> GAIN BOOST <input type="checkbox"/> AUTO BYPASS <input type="checkbox"/> AUTO RECOVER
Test Mode	<input type="checkbox"/> TERMINATE <input type="checkbox"/> BYPASS <input type="checkbox"/> TP to RX
Test Mode Timeout	1 Minutes <input checked="" type="checkbox"/> BYPASS WITH TIMEOUT OFF

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

Copyright © 2009-2017 RF Industries Pty Ltd. All Rights Reserved

Graphical User Interface (GUI) – Example screens



- Overview
- Status Detail
- History
- Performance Record
- Alarm Event Log
- Sensitivity Log
- Sensitivity Chart
- Configuration
- Maintenance
- About
- Logout

Help

History - Performance Record

Customer Name - RFI
Site Name - Adelaide

Setting	Value
Test Cable Loss	5.0 dB
TTA Coupling Loss	30 dB
Total Test Loss	35 dB
Static System Sensitivity	-123.5 dBm
Measured at	796.00000 MHz
Effective Receiver Sensitivity (ERS)	-122.1 dBm
Measured at	796.00000 MHz

Copyright © 2005-2015 RF Industries Pty Ltd. All Rights Reserved



- Overview
- Status Detail
- History
- Performance Record
- Alarm Event Log
- Sensitivity Log
- Sensitivity Chart
- Configuration
- Maintenance
- About
- Logout

Help

Sensitivity History Chart

Customer Name - RFI
Site Name - Adelaide

Select Period
6 Months

1 Static System Sensitivity


2 Effective Receiver Sensitivity

Sensitivity RMC



Copyright © 2005-2015 RF Industries Pty Ltd. All Rights Reserved

Graphical User Interface (GUI) – Example screens



RFI

[Overview](#)
[Status Detail](#)
[History](#)
[Configuration](#)
[Maintenance](#)
[Access Management](#)
[Date & Time](#)
[Firmware Update](#)
[Restart](#)
[About](#)
[Logout](#)

[Help](#)

Maintenance - Access Management


Customer Name - RFI - RMC01
 Site Name - Adelaide

Access level	UserName	Password	Confirm Password	Password Strength
View Status only	<input type="text" value="user"/>	<input type="password" value="...."/>	<input type="password" value="...."/>	
View Status and Modify Settings	<input type="text" value="admin"/>	<input type="password" value="....."/>	<input type="password" value="....."/>	

Copyright © 2009-2013 RF Industries Pty Ltd. All Rights Reserved

Access level	UserName	Password	Confirm Password	Password Strength
View Status only	<input type="text" value="user"/>	<input type="password" value="....."/>	<input type="password"/>	(74) strong
View Status and Modify Settings	<input type="text" value="admin"/>	<input type="password" value="....."/>	<input type="password"/>	(6) very weak

Graphical User Interface (GUI) – Example screens



- [Overview](#)
- [Status Detail](#)
- [History](#)
- [Configuration](#)
- [RMC](#)
- [TTA](#)
- [User Data](#)
- [Communications](#)
- [Maintenance](#)
- [About](#)
- [Logout](#)

Help

Configuration - Communications

Customer Name -

County Police

Site Name -

Mt Wallace

Ethernet

Setting	Value
DHCP	<input type="checkbox"/> Enabled
IP Address	<input type="text" value="192.168.1.235"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text" value="192.168.1.254"/>

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

Setting	Value
Port 23 Command Line Interface	<input checked="" type="checkbox"/> Enabled

Email

Setting	Value	Test Email
Send Status Change Messages	<input type="checkbox"/> Enable	
SMTP Server Address	<input type="text" value="209.173.141.248"/>	
SMTP Server Listening Port	<input type="text" value="25"/>	
SMTP Server Login Username	<input type="text" value="rfiASMalarms"/>	
SMTP Server Login Password	<input type="password" value="....."/> <input type="checkbox"/> Reveal	
From Email Address	<input type="text" value="noreply@localhost"/>	
Destination Email Addresses	<input type="text" value="john@workshop.com.au"/>	
	<input type="text"/>	
	<input type="text"/>	

SNMP

Setting	Value	Test SNMP						
Send Alarm Notifications (Traps)	<input type="checkbox"/> Enabled							
SNMP GET Requests (Port 161)	<input checked="" type="checkbox"/> Enabled							
SNMP Community String	<input type="text"/>							
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Primary</th> <th>Secondary</th> </tr> </thead> <tbody> <tr> <td><input type="text" value="0.0.0.0"/></td> <td><input type="text" value="0.0.0.0"/></td> </tr> <tr> <td><input type="text" value="162"/></td> <td><input type="text" value="162"/></td> </tr> </tbody> </table>	Primary	Secondary	<input type="text" value="0.0.0.0"/>	<input type="text" value="0.0.0.0"/>	<input type="text" value="162"/>	<input type="text" value="162"/>	
Primary	Secondary							
<input type="text" value="0.0.0.0"/>	<input type="text" value="0.0.0.0"/>							
<input type="text" value="162"/>	<input type="text" value="162"/>							

Copyright © 2009-2017 RF Industries Pty Ltd. All Rights Reserved

8. Optional Post Filter

An optional in-line “post” filter may be added the TTA system to further increase selectivity or to reduce the passband width of the system. In normal circumstances, this optional filter is not required.

When deployed, this filter may be connected between the two *Filter* ports on the right-hand side of the rear of the RMC unit (refer below). Once connected, the filter can be switched in line with the RF signal path by pressing the switch located low between the two filter ports. A LED indicator high between the two filter ports will light when the filter is selected.

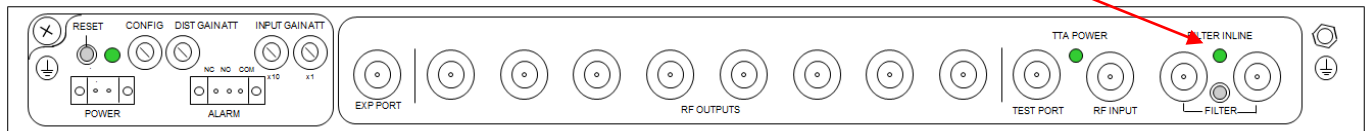



Figure 7 – RMC01 Rear Panel Layout



Figure 8 – RMC03 Rear Panel Layout

The in-line Post Filter can also be selected, and its selection status shown, via the GUI if desired.



- Overview
- Status Detail
- History
- Configuration
- RMC**
- TTA
- User Data
- Communications
- Maintenance
- About
- Logout

Help

Configuration - RMC

Customer Name - RFI - RMC01
Site Name - Adelaide

General

Setting	Value
Alarm Delay	5 Seconds
Post Filter	<input type="radio"/> IN <input checked="" type="radio"/> OUT
Settings Control	<input checked="" type="radio"/> SWITCHES <input type="radio"/> LAN
Hardware Configuration	2 1 - Up to 8 RF Outputs.
Input Gain Attenuator	0 dB <input type="checkbox"/> AUTO 3 dB
Distribution Gain Attenuator	0 dB <input type="checkbox"/> AUTO 3 dB

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

Defaults Discard Changes Apply

Copyright © 2009-2013 RF Industries Pty Ltd. All Rights Reserved

9. 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.

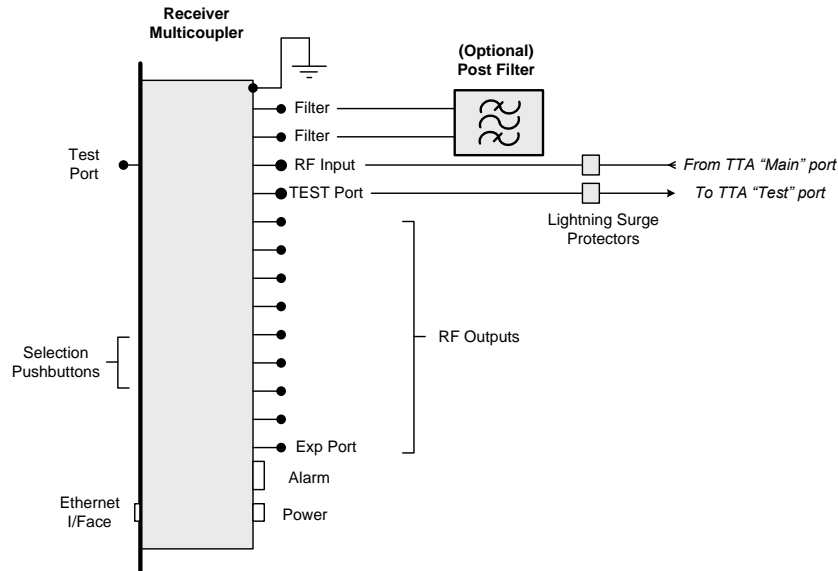


Diagram 6 - Receiver Multicoupler (RMC01) configuration for up to 8 (or 9) base station receivers

To optimise site cabling material and installation effort, 8-way Expansion Decks may be “distributed” around a site equipment room, with one (or more) Expansion Decks installed in each 19inch cabinet, with short interconnect cables then being run between that cabinet’s Expansion Deck and the base station receivers co-located in that cabinet.

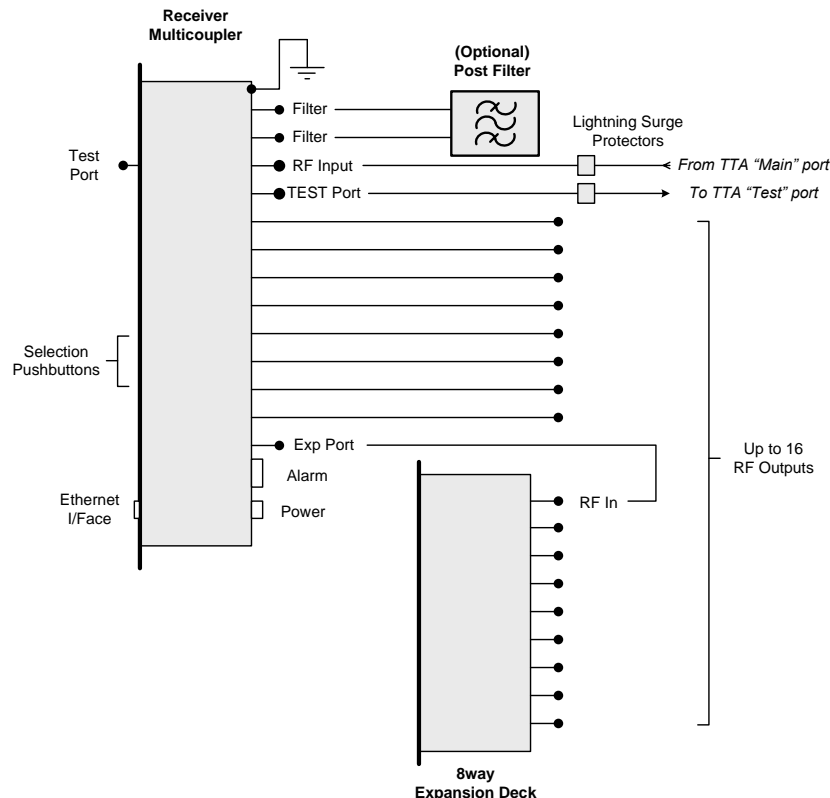
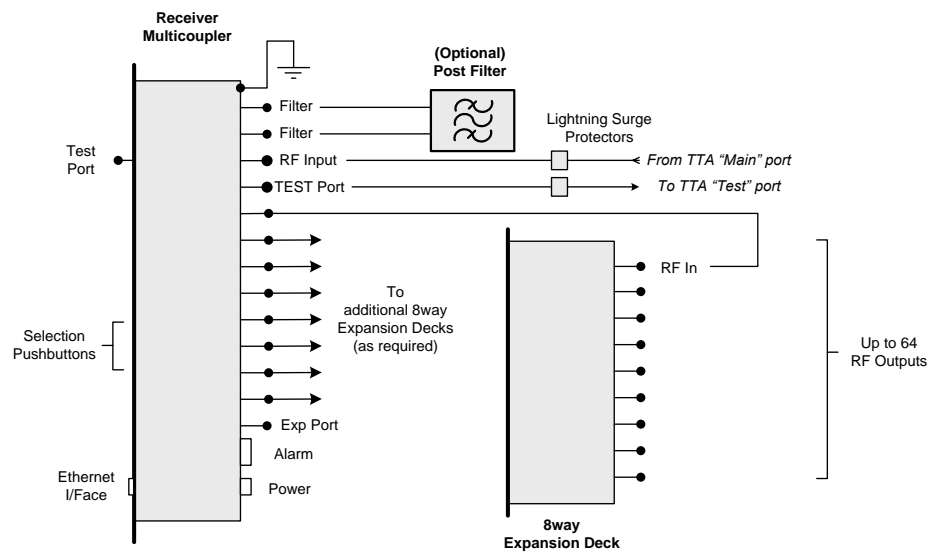
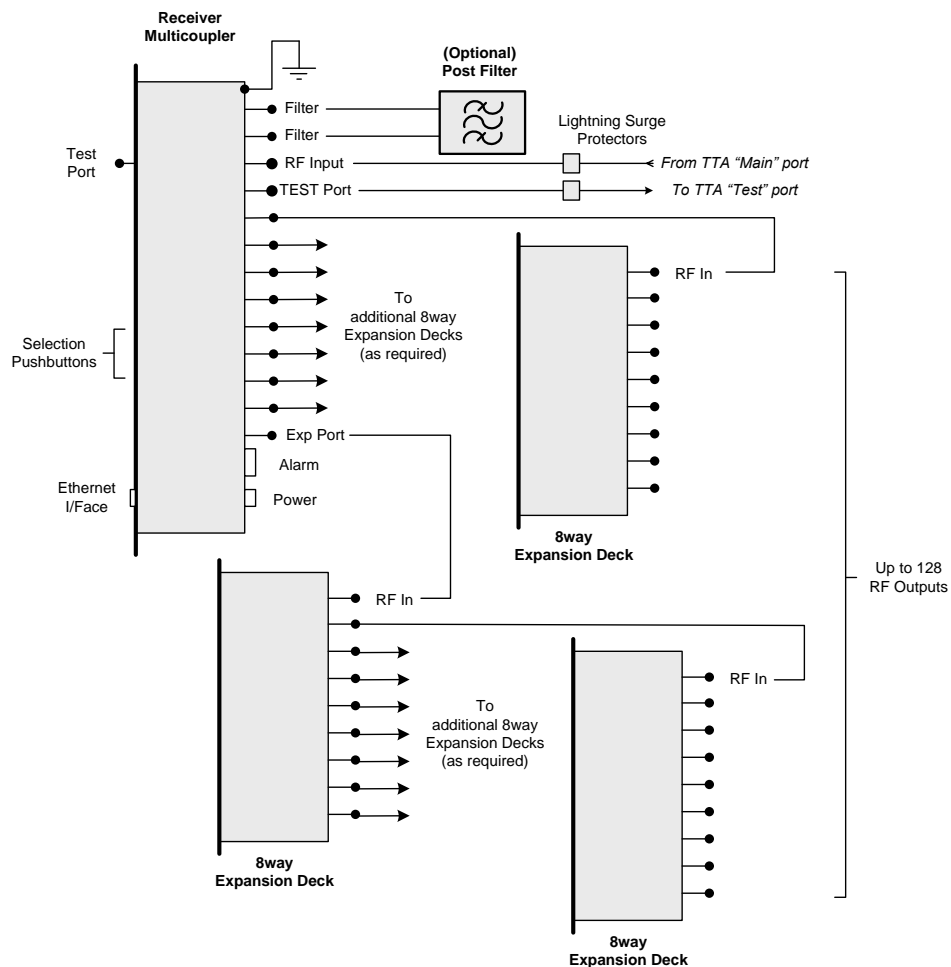


Diagram 7 - Receiver Multicoupler (RMC01) configuration for up to 16 base station receivers



**Diagram 8 - Receiver Multicoupler (RMC01) configuration for up to 64 base station receivers
(using multiple 8way Expansion Decks for desired capacity)**



**Diagram 9 - Receiver Multicoupler (RMC01) configuration for up to 128 base station receivers
(using multiple 8way Expansion Decks for desired capacity)**

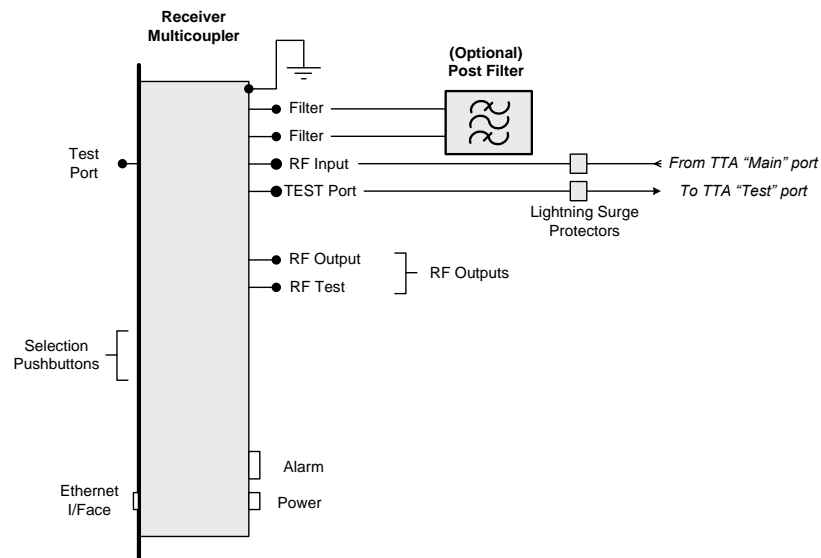


Diagram 10 - Receiver Multicoupler (RMC03) configuration for ESS operation

10. 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.

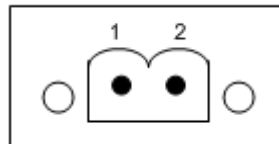


Figure 9 – DC Power Pinout

Pin Function Table:

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

Table 10

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.

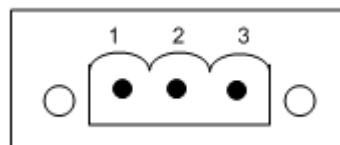


Figure 10 – Alarm Pinout

Pin Function Table:

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

Table 11

11. Ordering Information

Ordering Information		
System Model Numbers		
Motorola E-CAT Part Number	RFI Part Number	Description
DSTA7982010812AC	TA7982-0108-12-AC	TTA/RMC in "TTA01/RMC01" configuration 8 Port Receiver Multicoupler & Tower Top Amplifier 796-824MHz, 90-264VAC (complete with RXTA0000-3060US-AC Plug Pack Power Supply)
DSTA7982011612AC	TA7982-0116-12-AC	TTA/RMC in "TTA01/RMC01" configuration 16 Port Receiver Multicoupler & Tower Top Amplifier 796-824MHz, 90-264VAC (complete with RXTA0000-3060US-AC Plug Pack Power Supply)
DSTA7982310211AC	TA7982-3102-11-AC	TTA/RMC in "TTA01/RMC03" configuration 2 Port Receiver Multicoupler & Tower Top Amplifier 796-824MHz, 90-264VAC (complete with RXTA0000-3060US-AC Plug Pack Power Supply)
Separate Items		
Motorola E-CAT Part Number	RFI Part Number	Description
DSTA798201001000	TA7982-0100-10-00	TTA in "TTA01" configuration Tower Top Amplifier, 796-824MHz
DSRX6996340834ACB	RX6996-3408-34-ACB	RMC in "RMC01" configuration 8 Port Receiver Multicoupler, 698-960MHz, 90-264VAC (complete with RXTA0000- 3060US-AC Plug Pack Power Supply)
DSRX0696300831B	RX0696-3008-31B	8 Port Expansion Multicoupler, 66-960MHz, BNC Connectors
DSRX6996300136ACN	RX6996-3001-36-ACN	RMC in "RMC03" configuration 2 Port Receiver Multicoupler, 698-960MHz, 90-264VAC (complete with RXTA0000- 3060US-AC Plug Pack Power Supply)
DSRXTA00003060USAC	RXTA0000-3060US-AC	90-264VAC 50/60Hz 12VDC Plug Pack Power Supply c/w 1.5m IEC cable with USA plug

Table 12

12. Maintenance, Inspection and Repair Advice

No special maintenance program is required for the TTA or RMC. 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 into the RMC if desired using the *Firmware Upgrade* feature within the GUI. Automated firmware upgrades (and communications connectivity checks) to a fleet of RMCs can be managed using the RFI Uploader software package.

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 nor the RMC 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.

13. Frequently Asked Questions (FAQ)

Q – How many base stations can be connected to a TA7982 TTA system?

A – **Up to 128.** Models for MCU and ESS systems are available. The ESS model provides 1 RF output and a Test Output port. The MCU models offer 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. In all configurations from 8 through to 128 channels the TA7982 Series TTA systems can be configured to comply with the Motorola RF Distribution product program's specifications for gain and noise figure.

Q – Are ESS configurations also supported on MCU models?

A – **Yes.** Config Switch Modes 6 and 7 support the use of ESS base station equipment racks. The RMC Expansion Port is used for this feature, with the standard RF Output ports being able to be used for non-ESS base stations. This MCU/ESS "mixed mode" of operation supports existing MCU systems that are being expanded with (or migrating towards) ESS equipment configurations.

Q – Can the system be expanded?

A – **Yes.** The TA7982 Series RMC MCU models 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.

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 (i.e. MOSCAD). The GUI also provides alarm status information, and the Command Line Interface (CLI) could provide alarm polling capability for embedded and custom software applications. SNMP Traps, Manager Messages and a Command Line Interface (CLI) are also available to provide additional alarm monitoring, status and reporting capabilities.

Q – Is Performance History available?

A – **Yes.** Receive System performance can be measured using the *Motorola Five Step process for Receive System Verification* and the results stored in the receiver multicoupler's 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 TTA system can report alarms via SNMP v2c northbound alarm traps, and it can also be polled by a southbound GET command.

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 are regularly released to enable system enhancements to be added to a system – continuing to add value to Motorola's offering to their 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.

14. Background Material and other resources:

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

<http://www.rfi-motorola.com>

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

<http://203.46.35.188>

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 our RFI-Motorola website <http://www.rfi-motorola.com>

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 <http://www.rfiwireless.com.au>

RFI Americas

2023 Case Parkway North
Twinsburg, OH 44087, USA
Phone: +1 330 486 0706
Fax: +1 330 486 0705
Email: [Sales and Enquiries](#)

15. User Notes:



RFI
TECHNOLOGY SOLUTIONS

Australian Support

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

International Support

APAC

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

RFI EMEA (UK)

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

RFI Americas

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

www.rfi.com.au