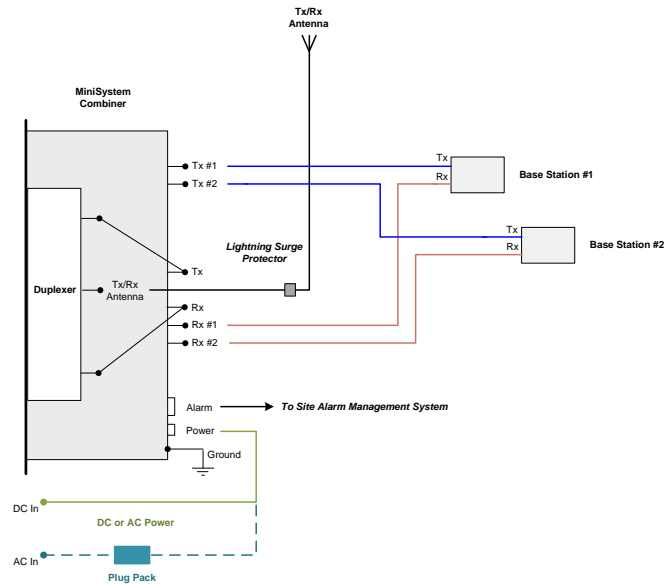
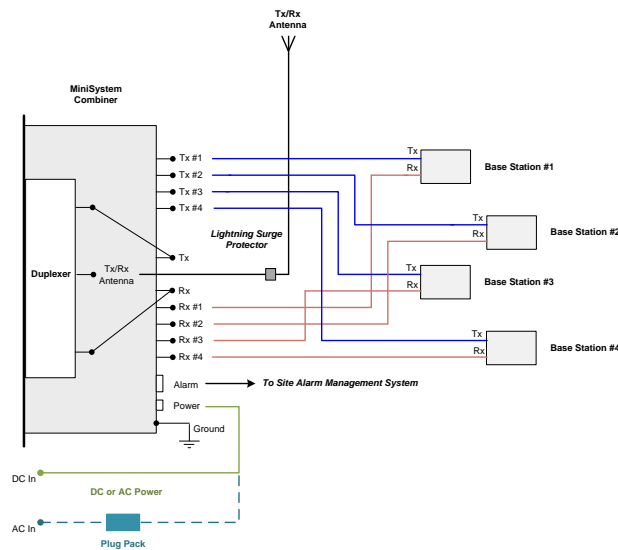


2 Channel MiniSystem Combiner Interconnection



4 Channel MiniSystem Combiner Interconnection



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MINISYSTEM COMBINER

Quick Start Guide



INTRODUCTION

The MiniSystem Combiner (MSC) is a compact combining solution for applications requiring RF combining for 1-4 channels. The MSC is compatible with analogue and digital technologies and may be used in applications including PMR, Links, DMR, Network Sites, Telemetry, DPMR, In-Plant, TETRA, Voice, Remote Sites, Conventional, Data and Trunking.

The individual transmit (Tx) and receive (Rx) ports of the connected network base stations are combined in the MSC, and then connected by a high performance bandpass duplexer to a single Tx/Rx antenna port. An innovative hybrid combiner design is used in the MSC Tx path, with dual stage high-power isolators providing excellent Tx-Tx isolation for the suppression of intermodulation (IM). In the MSC Rx path, a low-noise amplifier (LNA) provides excellent linearity and output Intercept (3OIP) performance to optimise network receive sensitivity and performance.

INSTALLATION

Mounting

The MSC is to be mounted indoors only. It is designed to fit in a 7RU 19inch rack mount space and should be mounted clear of any equipment that generates excessive heat. Do not mount the unit inside small unventilated enclosures.

Frequencies

Check that the required operating frequencies are compatible with the MSC model and the duplexer's Tx and Rx passband frequencies.

DC Power

Power the MSC from any convenient external supply that can provide the appropriate voltage and current. The DC power input is reverse polarity protected.

AC Power

The optional AC plug pack is supplied with a two pin Phoenix plug. The plug pack should be mounted safely in a convenient location and clear of any equipment or obstructions which may cause it to overheat.

Alarm Connector

A three pin Phoenix plug is provided to connect the alarm relay to external alarm monitoring equipment if desired. Under normal operating conditions the alarm output pins marked NC and CMN are closed. If a fault occurs, or power is disconnected, these pins open.

Earthing

Compliance with international electrical safety standards requires that the external Protective Earthing point on this equipment, as indicated by this symbol, be permanently hardwired to the premise's protective earth system using a 1.5mm² (14AWG) minimum cross-sectional area conductor. This provides protection from hazardous and transient voltages.



RF Input

The specified maximum input signal level should be observed to avoid damaging the Rx low-noise amplifier (LNA).

Tx Inputs

Tx inputs from the network base stations use N (female) connectors. For optimum performance, 50 Ohm terminations should always be fitted to any unused Tx Input ports.

Rx Outputs

Rx outputs to the network base stations use BNC (female) connectors. For optimum performance, 50 Ohm terminations should always be fitted to any unused Rx Output ports.

Cabling and Connections

Please ensure that all cabling is installed using good quality cable types. For all RF cabling, double-screened or solid-screen coaxial cable types are recommended for optimum performance. For connection integrity, the use of coaxial adapters should be avoided. All coaxial, DC power and alarm connectors should be checked for correct termination to their associated cables, Coaxial cable connectors should be firmly tightened when cables are installed. DC and Alarm cable connectors should have their securing screws used to ensure secure connector mating is maintained.

PIM Management

The antenna output of the MSC is a multi-carrier RF path. As such, good quality silver-plated double-screened or solid-screen coaxial cable types, and appropriately rated lightning protection devices and antennas are recommended for the reduction of Passive InterModulation (PIM).

Lightning Protection

A multi-carrier compatible lightning protector should be fitted to the antenna system connected to the MSC. In conjunction with correctly installed Earthing, this lightning protection device will assist in protecting the MSC, and the network base station equipment connected to it, from hazardous and transient voltages.

OPERATION

Green Power LED

The green LED on the rear of the MSC is active when external power is present. If the green LED is not illuminated then either there is no DC power present or the polarity is incorrect.

Red Fault LED

The red LED on the rear of the MSC will illuminate under the following circumstances;

- The DC input voltage is too low.
- The LNA's internal amplifier currents are outside their normal operating range.

Operating Precautions

- There is no On/Off switch on the unit. It becomes active as soon as DC power is connected or the AC plug pack is switched on at the AC outlet.
- Do not operate the unit outside its stated specifications.
- Do not open the MSC as there are no user-serviceable parts or adjustments inside. Faulty equipment should only be repaired by qualified technical personnel – or returned to the supplier for repair.

User Manual and Help

For more detailed information on the MiniSystem Combiner (MSC), refer to the MiniSystem Combiner User Manual - or contact your nearest Sales Office.

www.rfi.com.au



SPECIFICATIONS

Model MSxxx-0y05-SP	1313	1314	1415	1516	1517	1616	1617
Frequency Range (MHz)	132-142	138-148	148-158	155-165	151-172	160-170	164-174
Tx Channel Capacity	≤2 (2 Channel Models)		≤4 (4 Channel Models)				
Tx Input Power	≤ 50Watts						
Tx Duty Cycle	≤ 100%						
Tx-Tx Bandwidth	1.0MHz						
Tx Insertion Loss	<6dB (2 Channel Models)		<9dB (4 Channel Models)				
Tx-Tx Isolation	>60dB typ.						
Tx Input Return Loss	>20dB						
Tx-Antenna Isolation	>50dB						
Tx-Rx Separation	4MHz min.	4MHz min.	4MHz min.	4MHz min.	21MHz min.	4MHz min.	4MHz min.
Tx-Rx Isolation	65dBmin. (70dB typ.)						
Rx Channel Capacity	≤2 (2 Channel Models)		≤4 (4 Channel Models)				
Rx-Rx Bandwidth	1.0MHz						
Rx System Gain	0dB to 30dB (in 1dB steps)						
Rx-Rx Isolation	>18dB						
Rx LNA Noise Figure	1.2dB typ.						
Rx Max. RF Input Level	-10dBm						
Rx Output Return Loss	>20dB						
Impedance	50 Ohms						
Alarms	DC Supply Voltage Low, Rx LNA Fail						
Alarm Outputs	Dry Relay Form-C (N.C. / N.O. / CMN)						
Alarm Relay Ratings	50VDC 1A max.						
RF Connectors	Tx = N (female) Rx = BNC (female) Antenna = N (female)						
DC Connector	2pin 5mm Phoenix (mating plug supplied)						
Alarm Connector	3pin 5mm Phoenix (mating plug supplied)						
Enclosure	7RU 19in Rack Mount (Black)						
DC Power Requirements	+11VDC to +28VDC 3.5W typ. (polarity protected)						
Grounding	5mm and 6mm stainless steel studs						
IP Rating	Indoor Use Only						
Operating Temperature	-30° to +60°C -122° to +140°F						
Dimensions (HxWxD)	133x483x430mm 5.23x19x17in						
Weight	18.5Kg / 40.7lbs (2 Channel Models)			22.5Kg / 49.5lbs (4 Channel Models)			

Notes: xxxx in the model number denotes the frequency sub-band. (i.e. '1516' = 156 to 166MHz)
y in the model number denotes the channel capacity. (i.e. 2 = '2' Channel, '4' = 4 Channel)