



MiMOMax Wireless Ltd

Radio Unit Internal Interface Manual

Assembly & Installation Instructions

(Synchronous, Asynchronous and Fibre)

2011

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**MiMOMax Wireless Ltd
Radio Unit (RU) Internal Interface Manual 2011**

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CONTENTS

1	Overview	4
1.1	Synchronous Serial Option (DIF-SS2)	4
1.2	Asynchronous Serial Option (DIF-232).....	5
	C37.94 Fibre Option (DIF-FBR).....	6
2	Interface Details	7
2.1	Synchronous Serial	7
2.1.1	RS422 (Includes V.35 and V.11)	8
2.1.2	X.21	11
2.1.3	G.703.....	12
2.1.4	High Speed Serial Interconnect (HSSI).....	13
2.1.5	Optional Alarm.....	14
2.2	Asynchronous Serial.....	16
2.2.1	Dual EIA232	17
2.2.2	Terminal Server (EIA232).....	17
2.2.3	RJ45 to DB9 Cable.....	18
2.2.4	Alarm	19
2.3	C37.94 Fibre	20
2.3.1	850nm Fibre (multi-mode)	20
2.3.2	1300nm Fibre (single-mode).....	20
2.3.3	Alarm	21
3	System Considerations	22
3.1	End to End Delay.....	22
4	Technical Data	23

1 OVERVIEW

1.1 SYNCHRONOUS SERIAL OPTION (DIF-SS2)

The Synchronous Serial option is hardware configurable for RS-422, X.21 or G.703;

- When configured for RS-422, data rates between 32 and 128kbps are selectable (also supports V.35).
- When configured for X.21 the data rate is 64kbps.
- When configured for G.703 only the 64kbps co-directional mode is available.
(Note: The symbol rate for the G.703 interface is 256kbps).

The Synchronous Serial option provides independent end-to-end data paths;

- For RS422, when the transmit clock (input to Radio Unit) is available as either co-directional or contra-directional while the receive clock (output from the Radio Unit) is available as co-directional only.
- Where V.11 and V.35 compatibility is provided when configured for RS422.
- Where X.21 Clocking is sourced from the Radio Units. i.e. the MiMOMax Radio Link acts as the timing master preserving timing end-to end.

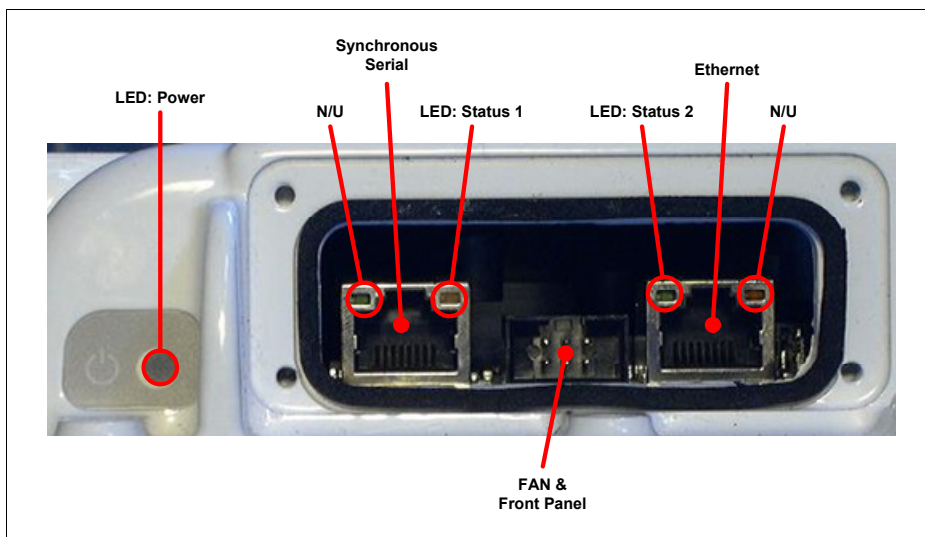


Figure 1 - Radio Unit Synchronous Serial Option Connectors and LEDs

Ethernet:	A single shielded RJ45 socket provides for 10BaseT Ethernet connectivity.
Data Port:	A single shielded RJ45 socket provides for Synchronous Serial Data connectivity.
Power (LED):	Indicates power is applied to the Radio Unit (replicated on rack mount front panel).
Status 1 (LED):	Provides product defined status 1 indication (replicated on rack mount front panel).
Status 2 (LED):	Provides product defined status 2 indication (replicated on rack mount front panel).
Alarm:	An Alarm interface is available as an optional add-on to the Synchronous Serial Interface.
Fan & Front Panel:	Provides connection to the rack mount FAN and LEDs.

1.2 ASYNCHRONOUS SERIAL OPTION (DIF-232)

The Asynchronous Serial option provides for two UART options;

1. Point-to-point EIA232 interfaces configured as either;
 - Dual point-to-point UARTs or,
 - Single point-to-point UART with hardware flow control.
2. Dual Terminal Server based EIA232 UART interfaces.

Note: Hardware based selection is required when changing between dual point-to-point and Terminal Server implementations. The selection is provided for by dip switches on the interface PCB.

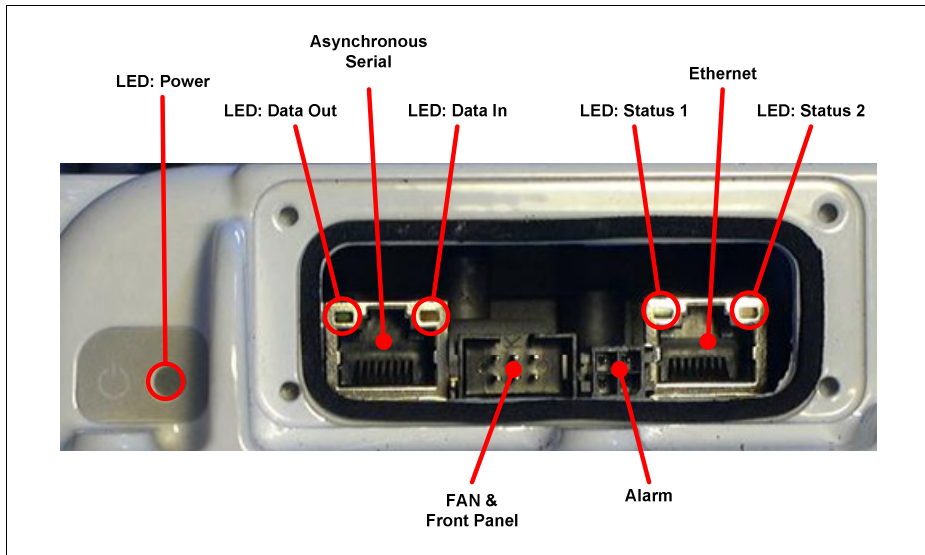


Figure 2 - Radio Unit Asynchronous Serial Option Connectors and LEDs

Ethernet:	A single shielded RJ45 socket provides for 10BaseT Ethernet connectivity.
Asynchronous Serial:	A single shielded RJ45 socket provides for Asynchronous Serial Data connectivity.
Power (LED):	Indicates power is applied to the Radio Unit (replicated on rack mount front panel).
Status 1 (LED):	Provides product defined status 1 indication (replicated on rack mount front panel).
Status 2 (LED):	Provides product defined status 2 indication (replicated on rack mount front panel).
Data In (LED):	Indicates data input by flashing when either asynchronous port receives data.
Data Out (LED):	Indicates data output by flashing when either asynchronous port outputs data.
Fan & Front Panel:	Provides connection to the rack mount FAN and LEDs.
Alarm:	Single Relay (volt free changeover contacts) Alarm Interface.

C37.94 FIBRE OPTION (DIF-FBR)

The fibre option provides a C37.94 compliant interface at 850 nm (multimode) where;

- A single 64kbps point-to-point channel is provided for (N = 1).
- A connection is provided through ST connectors.

Although C37.94 allows for higher throughputs (N > 1) this is not currently supported.

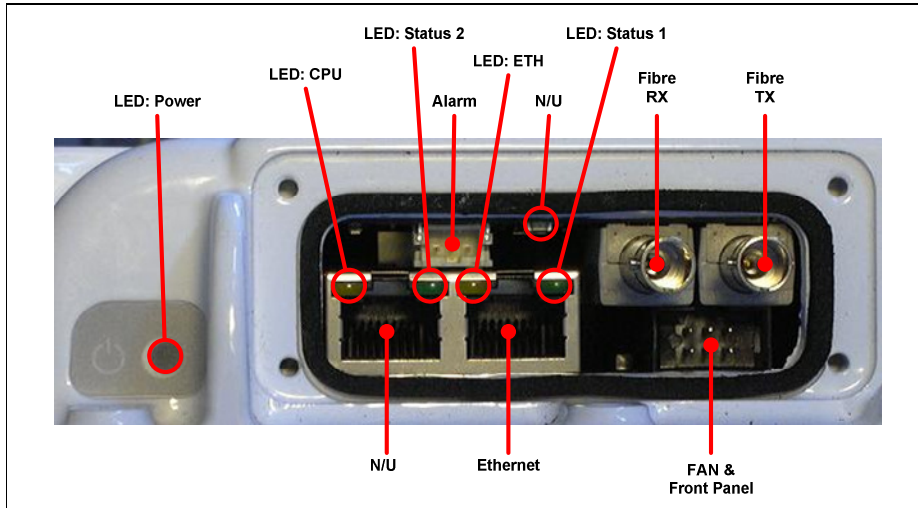


Figure 3 - Radio Unit Fibre Option Connectors and LEDs

Ethernet:	A shielded RJ45 socket provides for 10BaseT Ethernet connectivity.
Fibre TX:	ST Fibre transmit connector.
Fibre RX:	ST Fibre receive connector.
Power (LED):	Indicates power is applied to the Radio Unit (replicated on rack mount front panel).
Status 1 (LED):	Provides product defined status 1 indication (replicated on rack mount front panel).
Status 2 (LED):	Provides product defined status 2 indication (replicated on rack mount front panel).
CPU (LED):	Provides product defined status indication.
Fan & Front Panel:	Provides connection to the rack mount FAN and LEDs.
Alarm:	Single Relay (volt free changeover contacts) Alarm Interface.

2 INTERFACE DETAILS

2.1 SYNCHRONOUS SERIAL

Orderable Options¹

Configuration Option	Product Part Number	Features
1	INT-DIF-SS2-A00-CCXX	- Sync Serial RS422, V.35, X.21, HSSI - Optional External Alarm Output
2	INT-DIF-SS2-B00-CCXX	- Sync Serial G.703 - Optional External Alarm Output

RJ45 Pinout

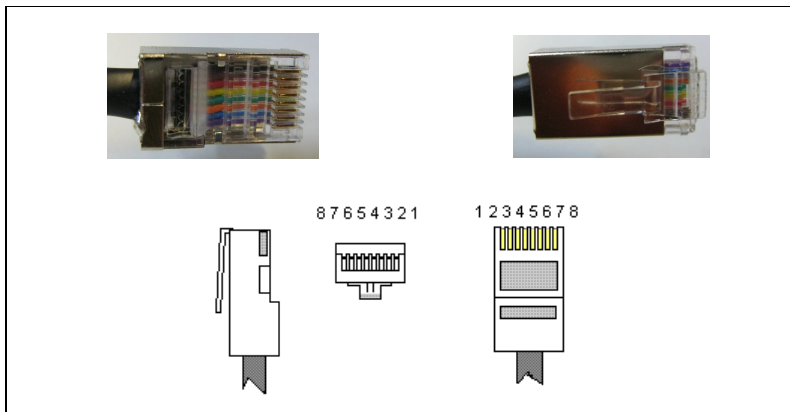


Figure 4 - Shielded RJ-45 Plug Pinout

Synchronous Serial Interface Grounding

To prevent the possibility of ground loops the circuitry providing the electrical interfaces is by default isolated from the chassis ground.

There is an option of connecting the isolated interface ground to chassis ground through a shorting link. If this option is required please contact MiMOMax Wireless directly.

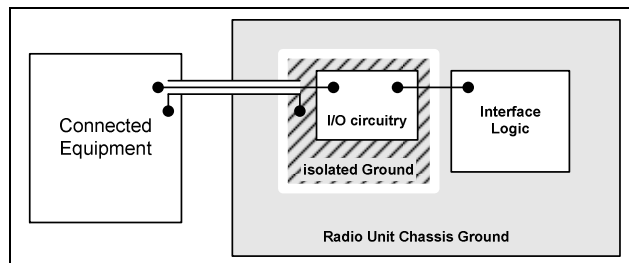


Figure 5 - Synchronous Serial IO Grounding

¹ For full details on options, features and pricing, please refer to the MiMOMax International Price Book

2.1.1 RS422 (Includes V.35 and V.11)

Supporting Product Part Number: INT- DIF- SS2- A00- CCXX

The provided interface is directly compatible with RS422 and V.11 standards. V.35 compatibility is discussed separately.

Circuit Overview

RS422 Circuit Outline (*Figure 6*) shows the basic functional blocks that form the RS422 sub system and corresponding data paths.

Transmit and receive paths including their clocks are independent of each other.

The transmit clock is internally selectable as co-directional or contra-directional.

The receive clock may be disabled such that a static state exists on the Rx Clock output.

The naming convention used is compatible with the Radio Unit acting as a DCE.

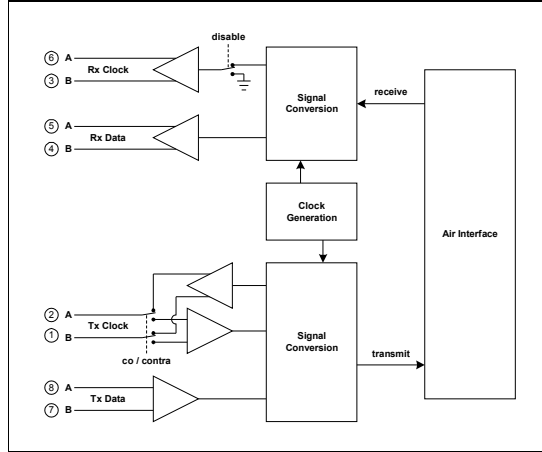


Figure 6 - RS422 Circuit Outline

Connectivity

The recommended cable for the connection between equipment is shielded twisted pair similar to 'Belden 1868E' fitted with a shielded RJ-45 plug as shown in the following images.

The following table outlines the Synchronous Serial RS422 signals that are provided on the RJ45 connector.

Connected Equipment Interface (DTE)		Radio Unit (DCE convention)		
Termination Required	Signal	Pin – RJ45 (male)	Signal	In / Out
N	Tx Data (non inverted)	2	Tx Data A	I
	Tx Data (inverted)	1	Tx Data B	
Y	Rx Timing (non inverted)	6	Rx Clock A	O
	Rx Timing (inverted)	3	Rx Clock B	
Y	Rx Data (non inverted)	5	Rx Data A	O
	Rx Data (inverted)	4	Rx Data B	
Y ⁽¹⁾	Tx Timing (non inverted)	8	Tx Clock A	I/O
	Tx Timing (inverted)	7	Tx Clock B	
N/A	Shield	Body	Shield / GND ⁽²⁾	N/A

NOTE (1): Termination is required for co-directional mode only.

NOTE (2): The interface GND is isolated from chassis ground and is accessible through the body of the socket.

Grounding

A Connection is required between the Radio Unit's isolated interface ground and the connected equipments' chassis ground. This would normally be achieved through the cable's shield.

Termination

Although operation will not normally be prevented if the connecting cable is incorrectly terminated at the user equipment, proper termination is strongly advised. As well as ensuring maximum signal integrity over longer cables, correct termination is necessary to ensure that compliance with CISPR22/EN55022 EMC standards is maintained.

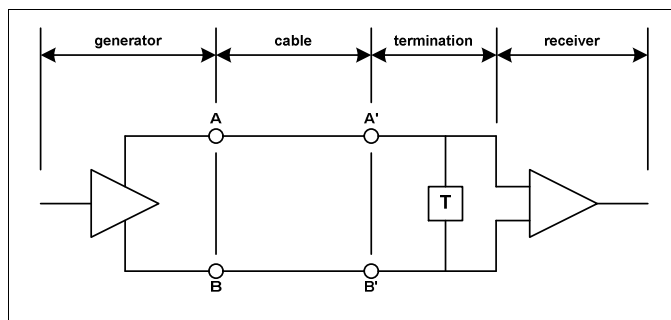


Figure 7 - Differential Signal Path Overview
(T indicates point of termination)

Termination is generally a single resistor across the inputs of the receiver of a value no less than 100 ohms and generally between 100 and 150 ohms (nominally 127 ohms).

The Radio Unit's synchronous serial inputs are internally terminated.

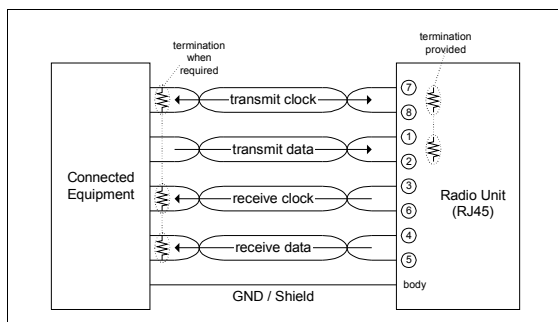


Figure 8 - RS422 Connections and Termination

Where the connected equipment does not provide internal termination then external termination is advised.

Equipment supporting a multi-drop architecture is unlikely to have internal termination and should be checked to determine if external termination is required.

Any termination either internal or external should be within the range of 100 to 150 ohms.

V.35 Considerations

Signal Levels

Although the RS422 and V35 generator drive levels (± 5 volts for RS-422 and ± 0.5 volts for V.35) are different the receiver decision levels are the same for both standards (± 0.2 volts for RS-422 and V.35) meaning the two standards are compatible.

Termination

RS-422 and V.35 have somewhat different termination topologies however this alone will not prevent operation.

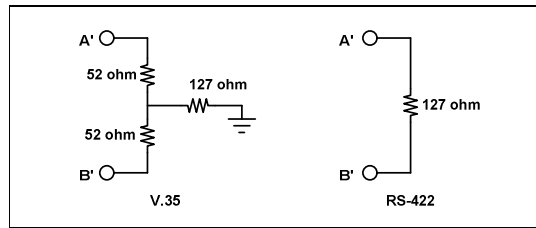


Figure 9 : Termination Comparison

Grounding

As with RS-422 a ground connection is required between the Radio Unit's isolated interface ground and the connected equipments' chassis ground.

2.1.2 X.21

Supporting Product Part Number: INT-DIF-SS2-A00-CCXX

The provided interface is directly compatible with X.21 standards.

Circuit overview

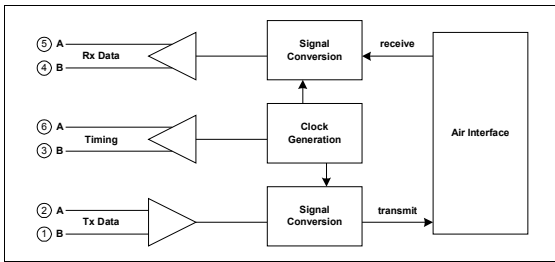


Figure 10 - X.21 Circuit Outline

X.21 Circuit Outline (*Figure 10*) shows the basic functional blocks that form the X.21 sub system and corresponding data paths.

The timing signal is common for both transmit and receive paths and is an output only.

External timing sources are not supported.

Connectivity

The following table outlines the Synchronous Serial X.21 signals that are provided on the RJ45 connector.

Connected Equipment Interface (DTE)		Radio Unit (DCE)		
Termination Required	Signal	Pin – RJ45 (male)	Signal	In / Out
N	Tx Data (non inverted)	2	Tx Data A	I
	Tx Data (inverted)	1	Tx Data B	
Y	Timing (non inverted)	6	Rx Clock A	O
	Timing (inverted)	3	Rx Clock B	
Y	Rx Data (non inverted)	5	Rx Data A	O
	Rx Data (inverted)	4	Rx Data B	
N/A		8	N/U	I
		7	N/U	
N/A	Shield	Body	Shield / GND ⁽¹⁾	N/A

NOTE (1): The interface GND is isolated from chassis ground and is accessible through the body of the socket.

Grounding

A connection is required between the Radio Units isolated interface ground and the connected equipments chassis ground. In the situation where a non-shielded cable is utilized the spare signal wires may be used to provide the ground connection.

Termination

The figure Differential Signal Path Overview (*Figure 7*) shows the basic circuit outline and the location of required termination.

The MiMOMax X.21 interface provides internal termination for all incoming signal pairs.

Equipment requiring a X.21 interface is expected to have internal termination. However where connected equipment does not provide internal termination then external termination is advised.

Any termination either internal or external should be within the range of 100 to 150 ohms.

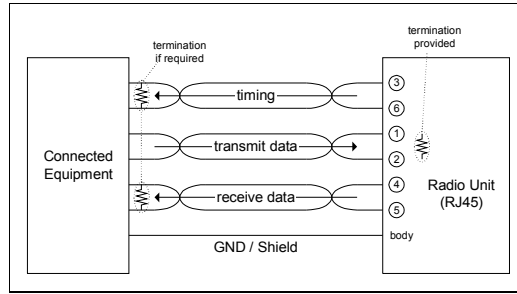


Figure 11 - X.21 Connections and Termination

2.1.3 G.703

Supporting Product Part Number: INT- DIF- SS2- A00- CCXX

The provided interface is compatible with G.703 64kbps co-directional standard.

Circuit overview

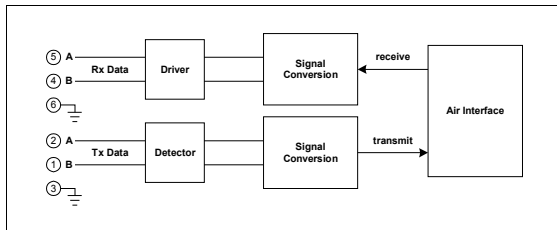


Figure 12 - G.703 Circuit Outline

G.703 Circuit Outline (Figure 12) shows the basic functional blocks that form the G.703 sub system.

Connectivity

The following table outlines the Synchronous Serial G.703 connections between Radio Units and the connected equipment.

Connected Equipment Interface		Radio Unit		
Termination Required	Signal	Pin – RJ45 (male)	Signal	In / Out
N	Tx Data (non inverted)	2	Tx Data A	I
	Tx Data (inverted)	1	Tx Data B	
N/A	Individual pairs screen	3	Signal GND ⁽²⁾	N/A
	Individual pairs screen	6	Signal GND ⁽²⁾	
Y	Rx Data (non inverted)	5	Rx Data A	O
	Rx Data (inverted)	4	Rx Data B	
N/A	NO CONNECT	8	NO CONNECT	N/A
		7	NO CONNECT	
N/A	Shield	Body	Shield / GND ⁽¹⁾	N/A

NOTE (1): The interface GND is isolated from chassis ground and is accessible through the body of the socket.

NOTE (2): Provides for the connection of signal screens from screened twisted pair cable.

Grounding

A ground connection is required between the Radio Units isolated interface ground and the connected equipments chassis ground.

In the event that a cable with individually screened pairs is used, connection of those shields to ground is possible through pins 3 and 6 of the RJ45 socket as shown, however it is recommended that the shield only be connected at one end and then only at the end where the signal is sourced from.

Termination

The figure Differential Signal Path Overview (*Figure 7*) shows the basic circuit outline and the location of required termination.

The nominal impedance for G703 termination is 120 ohm.

The MiMOMax G703 interface provides internal termination for the incoming signal pair.

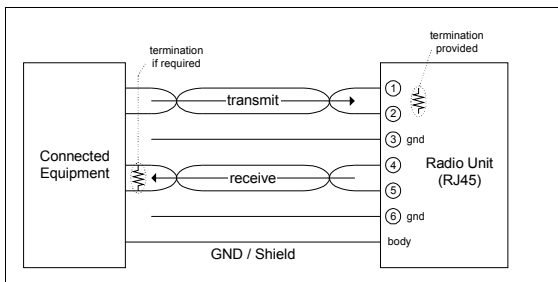


Figure 13 - G.703 Connections and Termination

Correct termination of signal pairs is required and is expected to have a nominal value of 120 ohms. If the connected equipment does not have internal termination then external termination as shown will be required. It is the responsibility of the installer to ensure the correct termination is provided.

2.1.4 High Speed Serial Interconnect (HSSI)

Supporting Product Part Number: INT- DIF- SS2- A00- CCXX

Overview

HSSI is a proprietary interface for direct connection between MiMOMax products.

When using the HSSI interface no other serial interface is available as the HSSI uses the synchronous serial connector and physical drivers for connection at the Radio Unit.

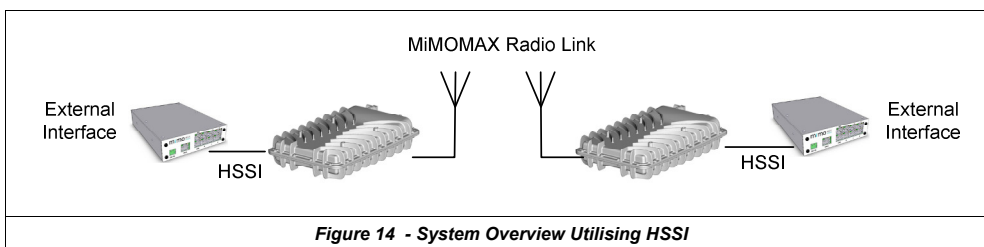


Figure 14 - System Overview Utilising HSSI

Cabling and Connectivity

HSSI version 1 (RJ45 socket)

Provides direct connection between MiMOMax Radio Unit and external interface multiplexers.

Pin	Signal	Description
1,2	Transmit Data	Data From Multiplexer
7,8	Transmit Timing	Timing From Multiplexer
4,5	Receive Data	Data From Radio Unit
3,6	Receive Timing	Timing From Radio Unit
Shield	Ground	Cable Shield

HSSI version 2 (RJ45 socket)

Provides direct connection between MiMOMax Radio Unit and external interface multiplexers.

Pin	Signal	Description
1,2	Transmit Data	Data From Multiplexer
4,5	Receive Data	Data From Radio Unit
3,6,7,8	N/A	Not Used ⁽¹⁾
Shield	Ground	Cable Shield

NOTE (1): The cable should be constructed for compatibility with HSSI version 1.

2.1.5 Optional Alarm

Available for Product Part Numbers: INT- DIF- SS2- A00- CCXX and INT- DIF- SS2- B00- CCXX

Overview

The Alarm is provided by a separate add on board. This board is not able to be fitted retrospectively so must be specified at the time of placing an order.

The Alarm Interface provides an alarm indication by means of a 'closed' switch state. Otherwise the switch is 'open'.

The interface driver comprises a bipolar transistor switch Q1, driven from radio circuitry via an opto-isolator. This allows the external interface circuit to have either a positive or negative ground. The switch is protected from transient over voltage and reverse polarity by a shunt zener diode D1 and limited shorts by a 1W series resistor R2. The switch is self-biased from the output by resistor R1. An external current-limiting load resistor R3 is always required.

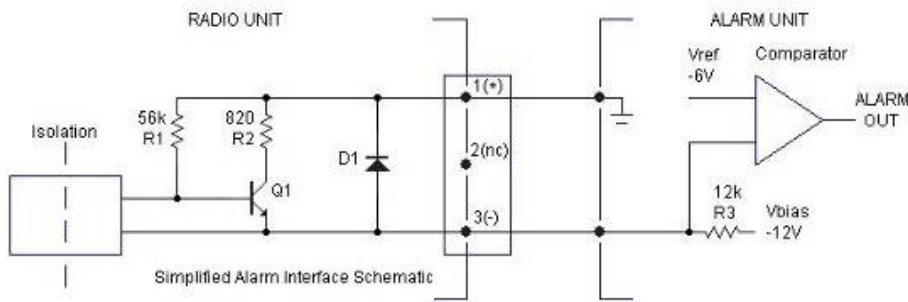


Figure 15 - Typical Interface Circuit Application

Maximum Ratings:	
Off state voltage	56V (nominal zener clamp voltage 62V)
On state current	34mA
Short circuits across switch or across load	≤28V bias supply: Indefinite
	>28V bias supply: Transient Only
Isolation	>1500V rms

Driver Characteristics:			
Off state resistance	min 50kΩ	typ >56kΩ	(V _{bias} = <56V)
On state resistance	typ 1.1kΩ	(I _{switch} = 1mA)	
	typ 0.95kΩ	(I _{switch} = 2mA)	
	typ 0.88kΩ	(I _{switch} = 4mA)	

Cabling and Connectivity

The isolated output of the switch driver may be connected to a sensor load having either polarity of bias supply. However, it is essential for Pin1 of the Alarm connector, which is the pin closest to the centre of the Radio Unit housing, to be wired to the more positive side of the network, as shown in Figure 14. When using the pre-wired cable supplied, the red lead is positive.

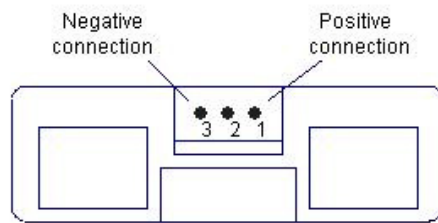


Figure 16 - "DIF-SS2" Alarm Interface Connections

Alarm connector mating parts:

Housing	JST VH Series, 3-way, VHR-3N
Crimp terminal	22-18AWG, SVH-21TP1.1 (2 only required)

2.2 ASYNCHRONOUS SERIAL

Orderable Options²

Configuration Option	Product Part Number	Features
1	INT- DIF -232- Q00-CCXX	- Dual RS232 Terminal Server S/W Optional - External Alarm Output
2	INT- DIF -232- R00-CCXX	- Dual point-to-point RS232 w/o flow control - External Alarm Output
3	INT- DIF -232- R01-CCXX	- Single point-to-point RS232 w flow control - External Alarm Output

Circuit overview

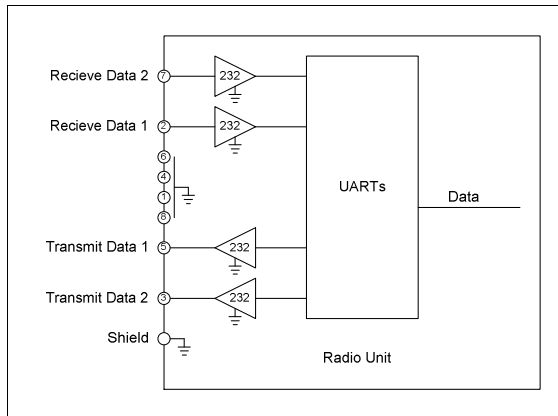


Figure 17 - EIA232 Circuit Outline

EIA232 Circuit Outline (*Figure 17*) shows the basic functional blocks that form the EIA232 (UART) sub system and corresponding data paths.

Hardware based selection is required when changing between Dual Point-to-Point and Terminal Server implementations. The selection is provided for by dip switches on the interface PCB.

Note: All grounds share a common ground isolated from the chassis ground.

RJ45 Pinout

The interface is provided through a single RJ45 socket. The signal definitions are provided in the following sections.

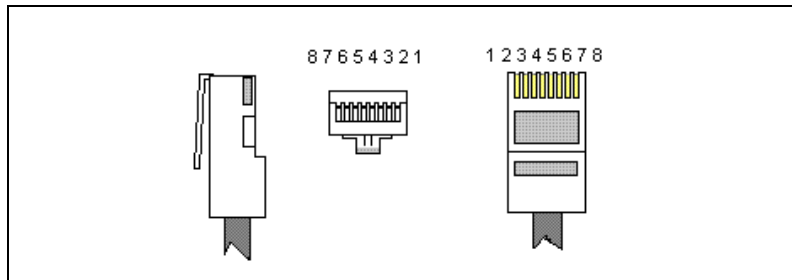


Figure 18 - RJ-45 Plug Pin Out

² For full details on options, features and pricing, please refer to the MiMOMax International Price Book

Asynchronous Serial Interface Grounding

To prevent the possibility of ground loops the circuitry providing the electrical interfaces is by default isolated from the chassis ground. All grounds at the RJ45 connector share this isolated ground.

There is an option of connecting the isolated interface ground to chassis ground through a shorting link. If this option is required please contact MiMOMax Wireless directly.

2.2.1 Dual EIA232

Supporting Product Part Numbers: INT- DIF -232- R00-CCXX and INT- DIF -232- R01-CCXX

Two configurations are possible when the hardware is set to support Dual EIA232. The options are either:

- Dual independent UARTs (INT- DIF -232- R00-CCXX) or,
- Single UART with hardware flow control (INT- DIF -232- R01-CCXX).

For hardware flow control the signals that provide for the second UART are reassigned as flow control signals.

Cabling and Connectivity

Dual UART (EIA232) Connector (RJ45 socket)

Signal	Pin	Description
Transmit Data 1	5	Port 1 Data Output From Radio
Receive Data 1	2	Port 1 Data Input To Radio
Signal Ground	1, 6	Port Ground Reference ⁽¹⁾
Transmit Data 2	3	Port 2 Data Output From Radio / RTS (soft selectable)
Receive Data 2	7	Port 2 Data Input To Radio / CTS (soft selectable)
Signal Ground	8, 4	Port Ground Reference ⁽¹⁾
Shield	Ground	Cable Shield ⁽¹⁾

NOTE (1): All grounds share a common isolated ground.

2.2.2 Terminal Server (EIA232)

Supporting Product Part Number: INT- DIF -232-Q00-CCXX

Overview

For the Terminal Server to operate the hardware must be appropriately configured and the applicable SFE installed. This is defined at the time of placing an order.

The hardware providing the interface is essentially the same as that for the Dual EIA232 except that the data paths are remapped to allow for Terminal Server operation.

When configured for terminal Server operation hardware flow control is NOT supported.

Terminal Server (EIA232) Connector (RJ45 socket)

Signal	Pin	Description
Transmit Data 1	5	Port 1 Data Output From Radio
Receive Data 1	2	Port 1 Data Input To Radio
Signal Ground	1, 6	Port Ground Reference ⁽¹⁾
Transmit Data 2	3	Port 2 Data Output From Radio
Receive Data 2	7	Port 2 Data Input To Radio
Signal Ground	8, 4	Port Ground Reference ⁽¹⁾
Shield	Ground	Cable Shield ⁽¹⁾

NOTE (1): All grounds share a common isolated ground.

2.2.3 RJ45 to DB9 Cable

Asynchronous Serial Port 1 (with Hardware Flow Control)

Radio Unit (RJ45)		Connected Equipment (DB9)	
Signal	Pin	Pin	Signal
Transmit Data 1	5	2	Receive Data
Receive Data 1	2	3	Transmit Data
Signal Ground	1 or 4 or 6 or 8	5	Signal Ground
RTS	3	8	CTS
CTS	7	7	RTS

NOTE: Only applies to Dual EIA232 and NOT to the Terminal Server.

Asynchronous Serial Port 1 (No Flow Control)

Radio Unit (RJ45)		Connected Equipment (DB9)	
Signal	Pin	Pin	Signal
Transmit Data 1	5	2	Receive Data
Receive Data 1	2	3	Transmit Data
Signal Ground	1 or 6	5	Signal Ground

Asynchronous Serial Port 2 (No Flow Control)

Radio Unit (RJ45)		Connected Equipment (DB9)	
Signal	Pin	Pin	Signal
Transmit Data 2	3	2	Receive Data
Receive Data 2	7	3	Transmit Data
Signal Ground	4 or 8	5	Signal Ground

2.2.4 Alarm

Supporting Product Part Numbers: INT- DIF -232-Q00-CCXX, INT- DIF -232-R00-CCXX and INT- DIF -232-R01-CCXX

Overview

The interface is provided for by a relay having a change-over contact set that allows the user to select a normally-open or normally-closed contact pair for the Alarm state (relay de-energized).

The contacts are protected against excess current flow in the event of inadvertent direct connection to a low impedance power source (up to 32V) by a series PTC device.

Cabling and Connectivity

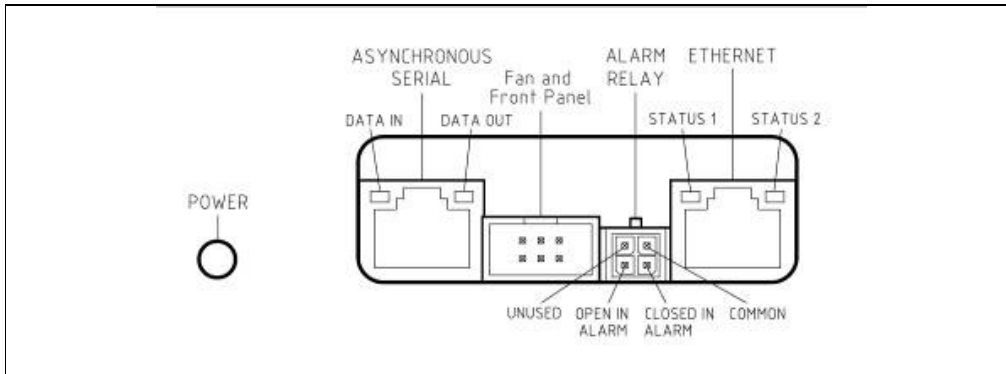


Figure 19 - "DIF-232" Alarm Interface Connections

Alarm Connections:

Terminal	Function
CLOSED IN ALARM	CLOSED in the Alarm State
COMMON	COMMON
OPEN IN ALARM	OPEN in the Alarm State

Alarm connector mating parts:

Housing	Molex Micro-Fit p/n 43025-0400
Crimp terminal	Molex p/n 43030-0001 crimp socket contacts for 20-24AWG wire

2.3 C37.94 FIBRE

Orderable Options³

Configuration Option	Product Part Number	Features
1	INT- DIF- FBR- 085- CCXX	- C37.94 compliant full duplex Fibre interface
2	INT- DIF- FBR- 135- CCXX	

Overview

The Fibre interface provides a C37.94 compliant interface intended for connection to power line protection relays or RTU devices with C37.94 Fibre Optical interface capability. The supported fibre is multi-mode at a nominal wavelength of 850nm.

Although the C37.94 standard provides for other data rates, the current implementation only supports 64kbps (N =1).

Connectors

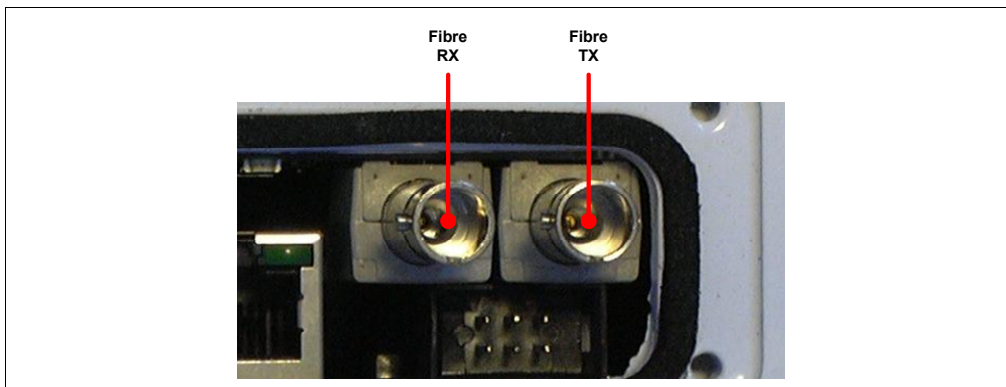


Figure 20 - "DIF-FBR" Fibre Interface Connections

The connectors for both fibre solutions are the ST (IEC 61754-2) type.

2.3.1 850nm Fibre (multi-mode)

Supporting Product Part Number: INT- DIF- FBR- 085- CCXX

Supports the C37.94 standard through 850nm multi-mode fibre.

2.3.2 1300nm Fibre (single-mode)

Supporting Product Part Number: INT- DIF- FBR-135- CCXX

Supports the C37.94 standard through 1300nm single-mode fibre.

³ For full details on options, features and pricing, please refer to the MiMOMax International Price Book

2.3.3 Alarm

Supporting Product Part Numbers: INT- DIF- FBR- 085- CCXX and INT- DIF- FBR- 135- CCXX

Overview

The interface is provided for by a relay having a change-over contact set that allows the user to select a normally-open or normally-closed contact pair for the Alarm state (relay de-energised).

The contacts are protected against excess current flow in the event of inadvertent direct connection to a low impedance power source (up to 32V) by a series PTC device.

Cabling and Connectivity

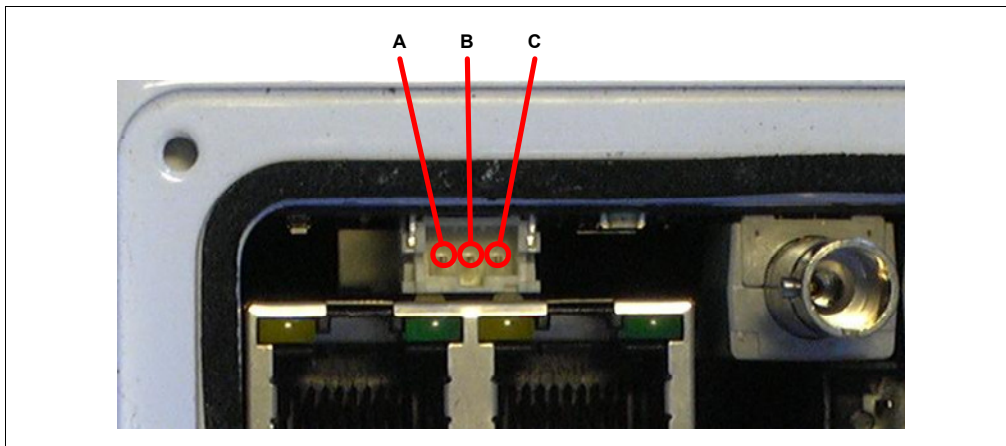


Figure 21 - "DIF-FBR" Alarm Interface Connections

Alarm Connections

Terminal	Function
A	CLOSED in the Alarm State
B	COMMON
C	OPEN in the Alarm State

Alarm connector mating parts:

Housing	JST P/N: PHR-03
Crimp Terminal	JST P/N: SPH-002T-P0.5S (For use with 30 to 24 AWG cable)

3 SYSTEM CONSIDERATIONS

3.1 END TO END DELAY

End-to-end delay is primarily defined by the Air Interface configuration although for some serial interfaces, supporting logic and/or data framing will add additional delay.

As an example the nominal end-to-end delay provided by a Radio Unit set to 25kHz and 16QAM is better than 6ms with a resulting end-to-end delay for X.21 of 6ms or better while for RS422 the resulting end-to-end delay is 8ms or better.

4 TECHNICAL DATA

Ethernet	
Connector	RJ45

Synchronous Serial	
RS422 / X.21 / G.703	
Connector	RJ45

RS422 (V.35)	
Number of Channels	1
Supported Data Rates	32 - 128 kbps
end-to-end Delay	<8ms ⁽¹⁾

X.21	
Number of Channels	1
User Data Rate	64 kbps
end-to-end Delay	<6ms ⁽¹⁾

G.703	
Number of Channels	1
User Data Rate	64 kbps
end-to-end Delay	<6ms ⁽¹⁾

Fibre C37.94	
Connector	ST
Wavelength	850 nm OR 1300nm
User Data Rate	64 kbps
end-to-end Delay	<6ms ⁽¹⁾

Asynchronous Serial	
EIA232	
Connector	RJ45

Dual EIA232	
Number of Channels	2 (OR 1 with H/W flow control)
Supported Data Rates (bps)	600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600
end-to-end Delay	<7ms (@ 9600) ⁽¹⁾

Terminal Server	
Number of Channels	2
Supported Data Rates (bps)	600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600

NOTE (1): Provided delays are for a system with the radio configured as 25 kHz and 16 QAM.