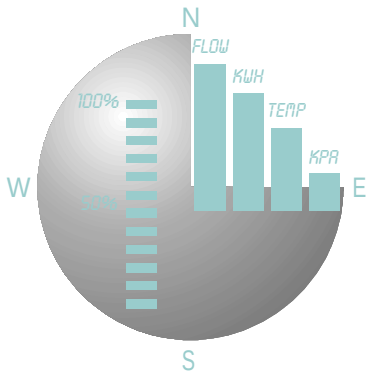
miriAD 2000 Telemetry Module

telemetry + control solutions

Installation & Wiring Manual



Version 1.02 Updated 25 June 2002

miriAD 2000

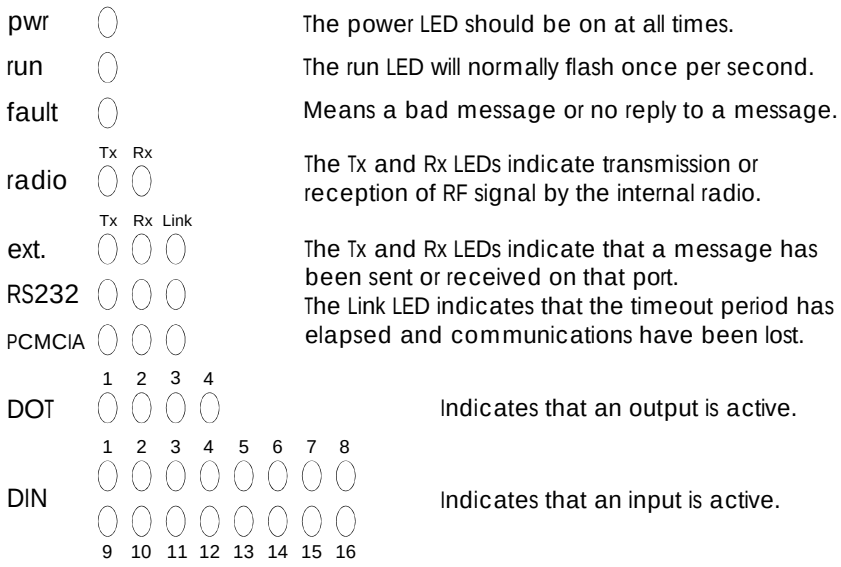
Introduction

This manual is intended to give sufficient information for the correct installation and wiring of the miriAD 2000 telemetry module. For programming information please refer to the MiriMap 2000 software on-line help.

The miriiAD 2000 will normally be delivered physically pre-configured to your requirements. Please check that the telemetry module you have is the correct model for your application.

There are many possible configurations for the physical I/O and communications options of the miriAD 2000. The following information provides for situations where it is necessary to reconfigure the unit or to set up the configuration from scratch.

Display Panel



The power LED should be on at all times.

The run LED will normally flash once per second.

Means a bad message or no reply to a message.

The Tx and Rx LEDs indicate transmission or reception of RF signal by the internal radio.

The Tx and Rx LEDs indicate that a message has been sent or received on that port.
The Link LED indicates that the timeout period has elapsed and communications have been lost.

Indicates that an output is active.

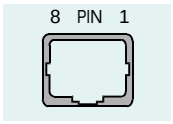
Indicates that an input is active.

miriAD 2000

Communications

RS232 Port

The RS232 port provides the facility for a serial data link to third party devices. It is also used as the programming port for the miriAD 2000. The function of the RS 232 port is selected by means of the slide switch located on the bottom right hand side of the unit. The switch has two positions, " prog " and " run ".
The slide switch should be in the “prog” position when programming or monitoring the telemetry module. The slide switch should then be moved to the “run” position for normal operation. The pin assignment of the RS232 port is as shown below.



View looking into RS232 port.

RS232 Port
Pin assignment

1.	DTR
2.	RTS
3.	TX data
4.	CD
5.	GND
6.	RX data
7.	CTS
8.	DSR

PCMCIA Port

The PCMCIA port provides the facility for the telemetry module to be connected to the PSTN via a dial up modem. It also provides the facility for the use of other PCMCIA format serial cards. The PCMCIA socket is located under the right hand side of the telemetry module.

Internal Data Radio

The internal data radio will normally come programmed to the correct system frequency.
The only connection required to the internal radio is a coaxial tail. The connector on the AD2000 is an SMA jack and therefore the coaxial tail should be terminated in an SMA plug. The coaxial tail is normally RG58 which is a readily available cable.
The radio will normally be programmed for an output power of 1 Watt however a range of 0.1 - 5 Watts is available. The internal radio configuration is downloaded via the MiriMap 2000 software.

miriAD 2000 Communications

External Radio Port

The external radio port provides the facility to connect the miriAD 2000 to an external radio or for connection to landlines or fibre-optics. The selection between internal radio and the external port is made by configuring jumpers J203, J204, J205 as shown below. In the audio format both 2 wire and 4 wire options are available. The ext. radio port is configured for RS232 or audio operation by installing links on jumpers J206, J207, J208 as shown.

	J203	J204	J205
EXTERNAL	A	B	A
INTERNAL	B	A	B

	J206	J207	J208
RS232	A	A	A
AUDIO	B	B	B

	J209	J210
2 WIRE	A	A
4 WIRE	B	B

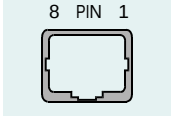
	J211	J212	J213
EXTERNAL	B	A	A
INTERNAL	A	A	A

	J201	J202
1200 baud	0	0
2400 baud	0	1
4800 baud	1	1

External Radio Port
Pin assignment

1.	n/c
2.	RTS
3.	TX data
4.	PTT
5.	GND
6.	RX data
7.	CTS
8..	n/c

View looking into ext. radio port.



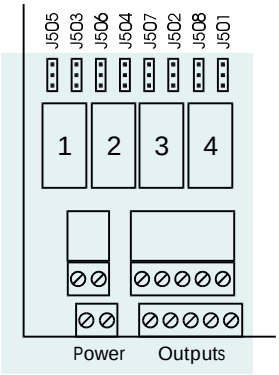
Where the telemetry module is to be connected to an external radio requiring audio modulation then the 4 wire configuration must be selected.

The baud rate is selected by the configuration of jumpers J201 and J202. This baud rate selection applies whether the telemetry module is to be used with an internal data radio or with an external device.

When using an external audio modulated radio, it is preferred if possible to retain the preset levels of modulation within the AD2000 and to adjust the levels in the external radio to match these preset levels.
The preset audio output level from pin 3 is 600mv peak to peak. This is adjusted in the AD2000 using VR201 if necessary.
The received data audio level into the AD2000 should be 500mv peak to peak. The received audio level to the modem is monitored at test point “Rx.SIG.IN” and is adjusted using VR202 if necessary.

miriAD 2000

Digital Outputs

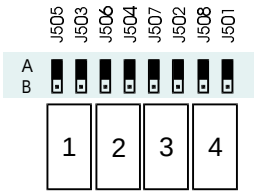


There are 4 digital outputs which can be configured as : -

Isolated Relays
or Isolated Transistors
or Common Ground Transistors

The outputs may be configured individually to provide a combination of the above. The factory preset configuration is for all outputs to be isolated relays.

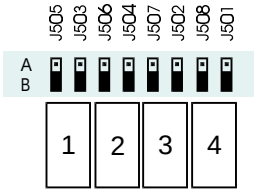
Relay Outputs

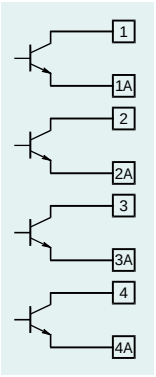


Isolated Relay Outputs *2 form A +2 form C*
Maximum Current *5 Amps*
at *30 VDC or 240VAC*

To configure all outputs as isolated relays install all links J501 - J508 to position A.

Isolated Transistors

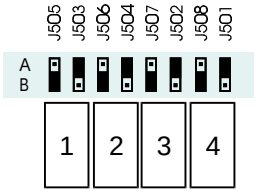


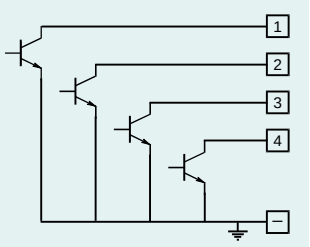


Current - 100mA
Vcc max. - 35 VDC
Isolation - 2.5kV

To configure all outputs as isolated transistors install all links in position B.

Common Transistors





To select common ground transistor outputs install the links in the following positions :-

A J501,J502,J503,J504
B J505,J506,J507,J508

miriAD 2000

Digital Inputs

There are two different versions of the miriAD 2000 with respect to Digital inputs. There is a low voltage version made for nominally 12 or 24 volt inputs and a high voltage version made specifically for 110 volt inputs.

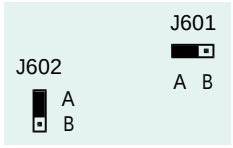
AD 2000L	- Lo Voltage	: 10 - 48 VDC/AC	10k impedance
AD 2000H	- Hi Voltage	: 48 -130VDC/AC	47k impedance

This is not an on-board selectable option so please ensure that you have the correct version of hardware for your application. The input voltage is printed on the terminal strip. The Lo voltage input labelling is blue and the Hi voltage input labelling is red.

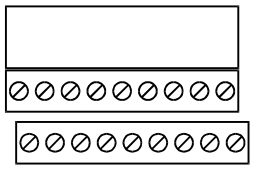
In each version of hardware there are two groups of 8 inputs each with a separate common terminal. The inputs will accept DC inputs of either polarity or AC inputs.

Pulse Counters

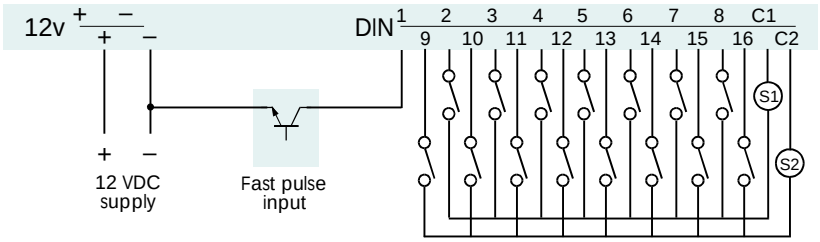
Each Digital Input to the miriAD 2000 can act as a pulse counter for DC inputs.
Input number 1 can also be configured as a fast pulse counter to 5KHz.
To configure input number 1 as a normal input link jumpers J601 and J602 in position B.
In this configuration input number 1 acts as a normal input referred to common C1.
In this mode all inputs can count pulses up to 5hz. To configure input number 1 as a fast pulse counter jumpers J601 and J602 should be linked in position A. In this mode input number 1 is referred to the supply ground and requires a sinking input.



Input #1 configured as a fast pulse counter.



Digital Inputs



miriAD 2000

Analog Channels

4-20mA/1-5 Volts
0-20mA/0-5 Volts
0-1 Volt

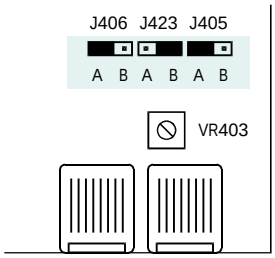
Resolution - 12bits
Accuracy - 0.1%
Linearity - 0.1%

There are several options available for the 8 analog channels. All channels can be used as inputs or any of the last 4 channels can be used as 4-20mA outputs if the analog output option is fitted. The factory preset is for all channels to be configured as inputs and for all input channels to be configured as current inputs (links installed). With channels 5-8 configured as inputs, jumpers J401, 402, 403, 404 are installed in position B. To select any of these channels as an output the links should be moved to position A. Please note that regardless of the input range selection the output channels will always be 4-20mA.

Input Range - 4-20mA/1-5V or 0-20mA/0-5V or 0-1V

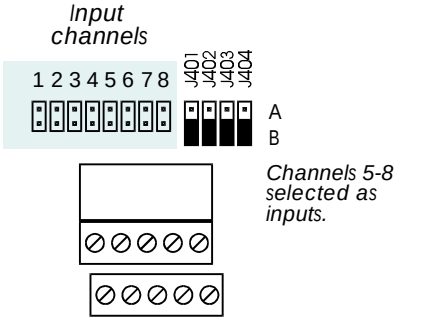
The input range is selected by the configuration of jumpers J405 and J423.
Please note that this selection will apply to all inputs and therefore a combination of different input ranges is not possible.

	J405	J423
4-20mA/1-5V	B	B
0-20mA/0-5V	A	B
0-1V	A	A



Current or Voltage Inputs

The links for channels 1-8 are installed for current inputs and removed for voltage inputs.
Any combination of current and voltage inputs may be selected.
Jumpers J401, 402, 403, 404, are installed in position B for analog inputs.



Supply Voltage Monitor

In addition to the above options, input channel 8 can be configured to monitor the supply voltage to the telemetry module. This is particularly useful where solar supplies and batteries are used. Jumper J406 is linked in position A when channel 8 is used as a normal input. To use this channel as a supply monitor move the link to position B. The input level in this mode is adjusted by VR403. The input voltage is set to equal one tenth of the actual voltage. For a supply of 12 - 15 volts the input will range from 1.2 to 1.5 volts. This input will then in turn be conditioned by the selection of analog input range.

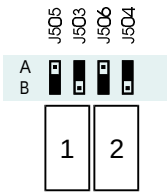
miriAD 2000

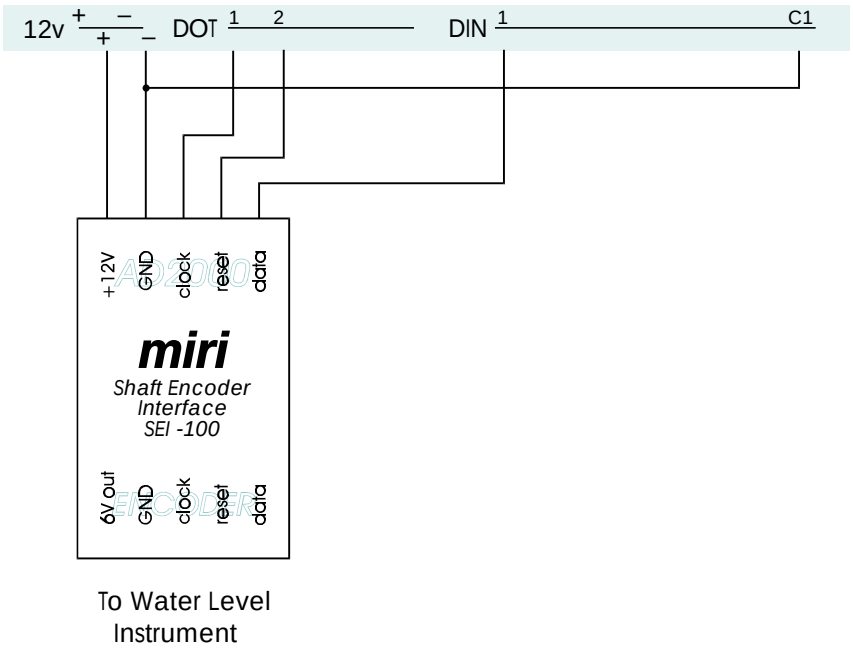
Shaft Encoder Interface

The SEI-100 shaft encoder interface provides the means to interface a Unidata 6509B Water Level Instrument to the AD2000 telemetry module.
The shaft encoder interface provides a regulated 6 volt DC supply to the instrument from the 12 volt DC supply to the AD2000. It also utilises two digital outputs from the AD2000 which should be configured as common ground transistors, and one digital input to the AD2000 which is used in normal input mode (not fast pulse mode).
In this scenario the DIN common is wired to 0 volts. The AD2000 software may be configured to use any combination of I/O for the shaft encoder interface. The wiring diagram below shows the wiring arrangement using DOTS 1& 2 and DIN 1.

Output configuration

Outputs 1 and 2 are configured as common grounded transistors.

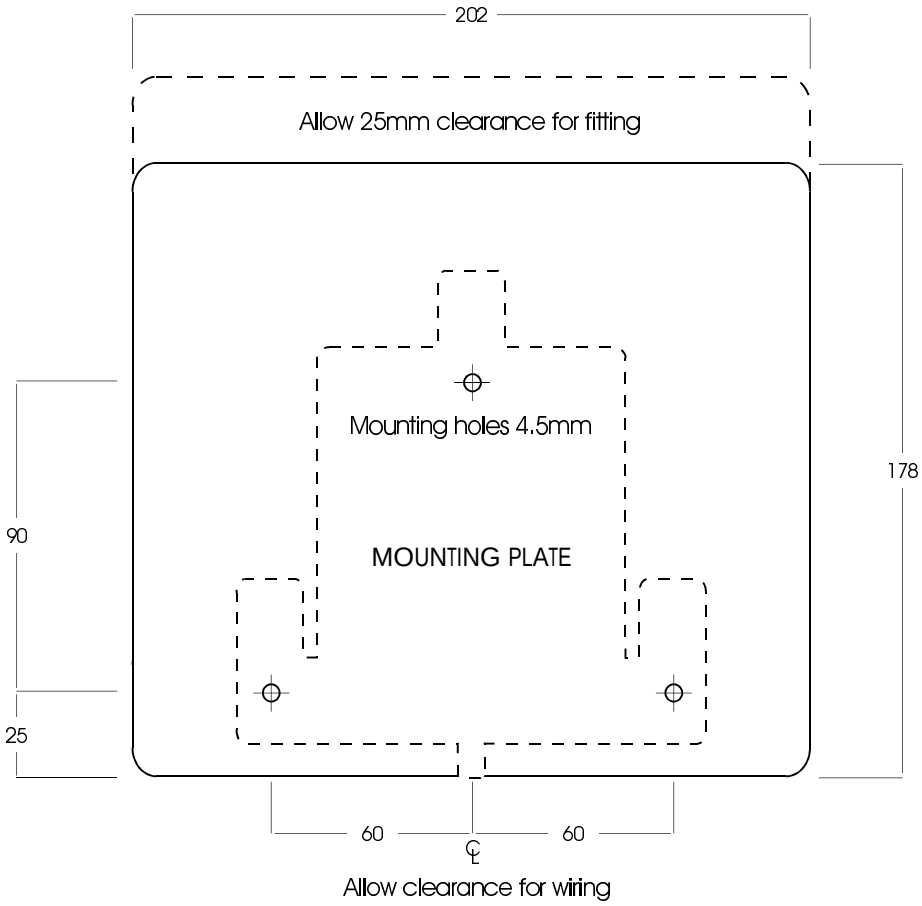




To Water Level Instrument

miriAD 2000

Mounting Detail

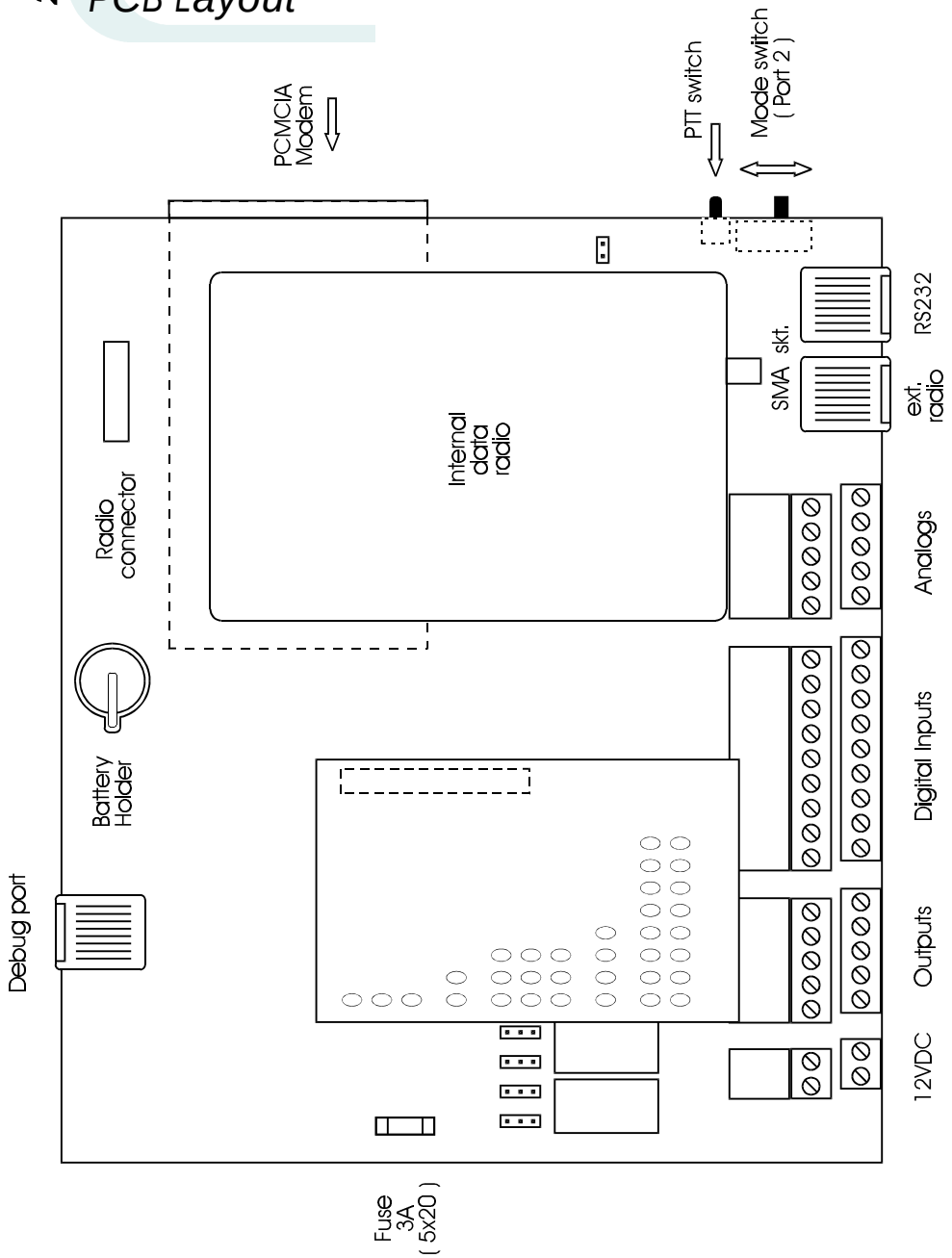


The miriAD 2000 is installed by means of the stainless steel mounting bracket supplied with the unit. Please ensure when fixing the mounting bracket to your equipment panel that sufficient space is left to install the unit from the top as shown in the above diagram. All wiring to the unit enters from below.
If a PCMCIA dial up modem is to be installed, leave a 50mm gap to the right of the AD2000 for the modem cable.

The AD2000 is removed from the mounting bracket by depressing the small tongue at the bottom of the mounting bracket and sliding the unit upwards.

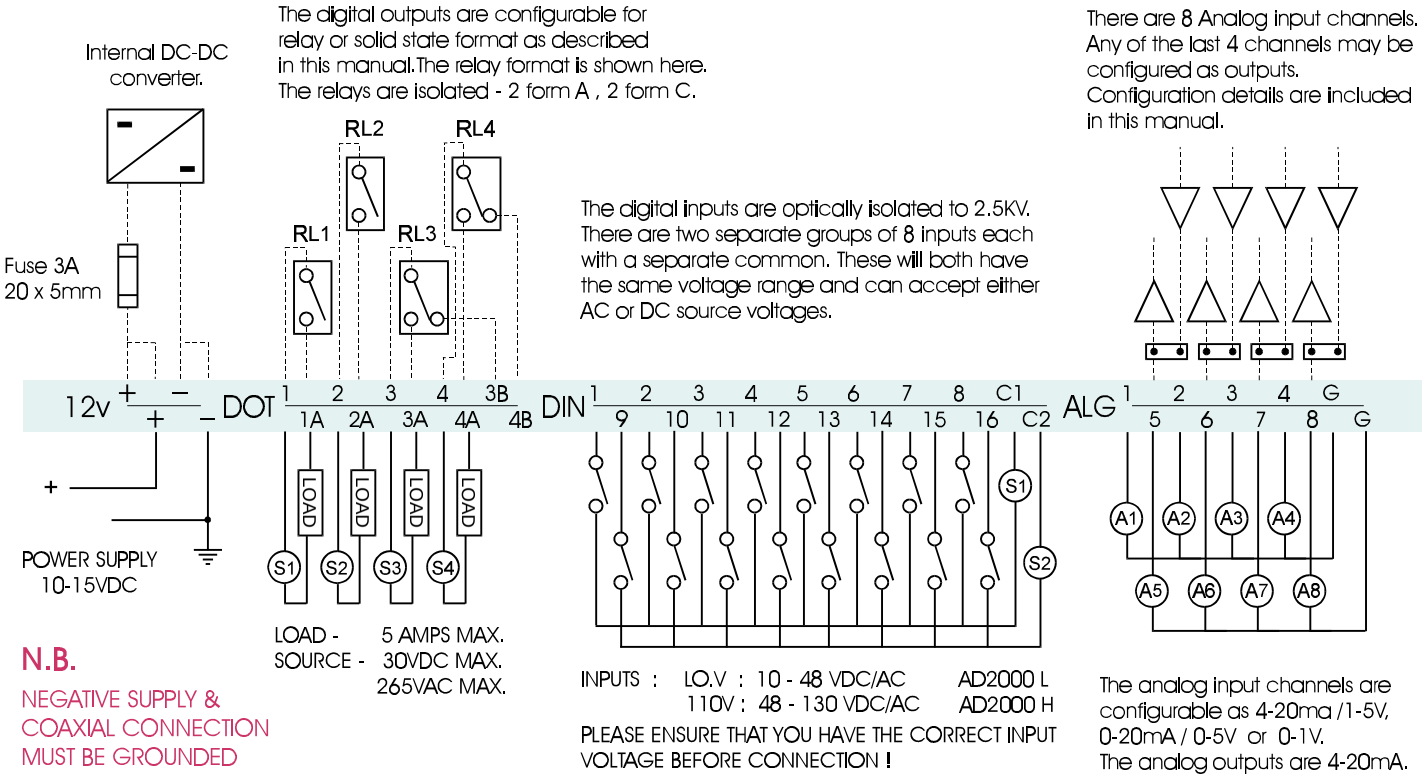
miriAD 2000

PCB Layout



miriAD 2000

Wiring Diagram



The digital outputs are configurable for relay or solid state format as described in this manual.The relay format is shown here. The relays are isolated - 2 form A , 2 form C.

LOAD - 5 AMPS MAX.
SOURCE - 30VDC MAX.
265VAC MAX.

The digital inputs are optically isolated to 2.5KV. There are two separate groups of 8 inputs each with a separate common. These will both have the same voltage range and can accept either AC or DC source voltages.

INPUTS : LO.V : 10 - 48 VDC/AC AD2000 L
110V : 48 - 130 VDC/AC AD2000 H

PLEASE ENSURE THAT YOU HAVE THE CORRECT INPUT VOLTAGE BEFORE CONNECTION !

There are 8 Analog input channels. Any of the last 4 channels may be configured as outputs. Configuration details are included in this manual.

The analog input channels are configurable as 4-20ma /1-5V, 0-20mA / 0-5V or 0-1V.
The analog outputs are 4-20mA.

N.B.

NEGATIVE SUPPLY & COAXIAL CONNECTION MUST BE GROUNDED

miriAD 2000

Ordering Information

AD2000x- xx-xx

12 - for 12VDC supply.
24 - for 24VDC supply.

N - for no analog output option.
A - for analog output option fitted.

L - for low voltage inputs 10 - 50V
H - for high voltage inputs 50 - 130V

R - with inbuilt radio
E - without radio
B - expansion base only
(no PCMCIA, no FFSK modem on Int/Ext port
but with RS232 on Int/Ext and RS232 ports)

The AD2000 part number is displayed on the rear of each unit together with other relevant information.

AD2000R-LN-12

Hardware version - Rev. 0 *serial no* 2904

Tx frequency - 472.0250MHz

Rx frequency - 472.0250 MHz *Special* 100mW

Kintore RTU 3 - Community Tank

Miri Engineering - Perth, West Australia. tel - 61 8 9378 2388 fax - 61 8 9378 2468

This page has been left blank for user notes.

miri technologies

P.O. Box 1116, Wangara, Western Australia, 6947
30 Buckingham Drive, Wangara, Western Australia, 6065
Email : miri@miri.com.au
Web : http://www.miri.com.au
Tel : (61 8) 9409 8998 Fax : (61 8) 9409 9229