

# **Installation Manual**

# **P450**

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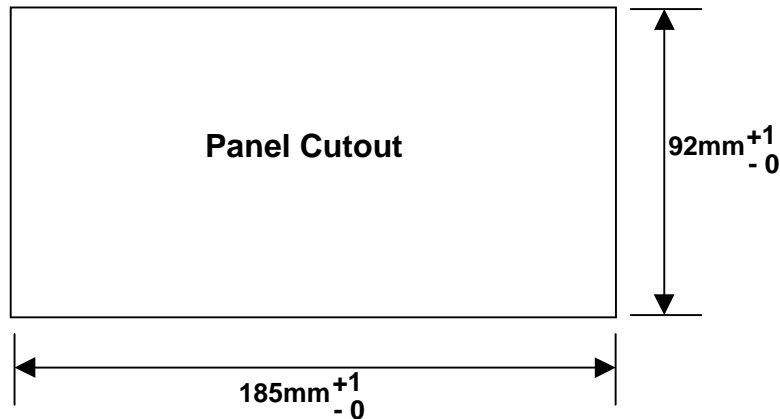
## P450 INSTALLATION MANUAL

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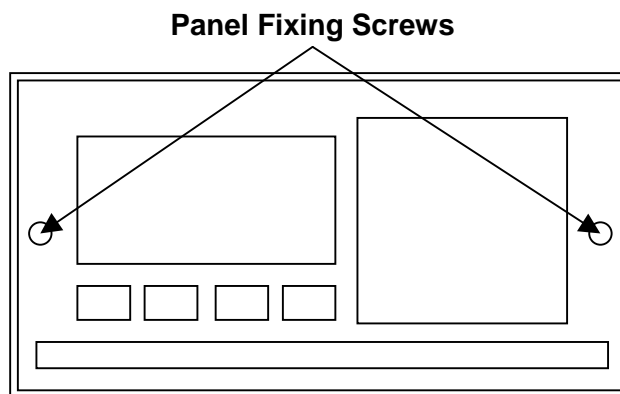
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## 1. Panel Mounting

The P450 requires a DIN standard panel cut out (see below) and may be mounted in materials up to 5mm thick.



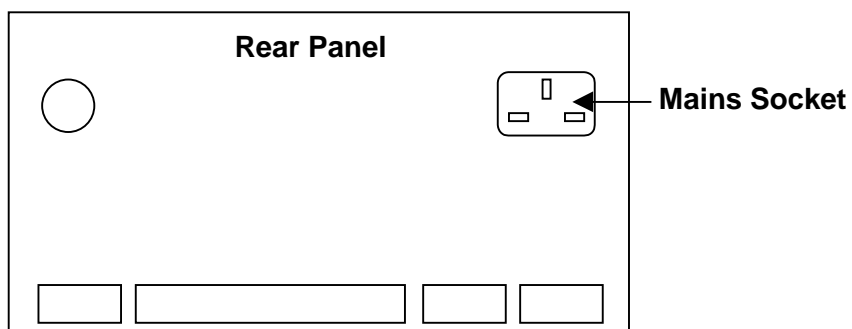
To mount the instrument in the panel, first turn both mounting screws fully anticlockwise. Pass the instrument through the cut out and hold the instrument bezel flush with the panel. Tighten the panel mounting screws until reasonably tight.



## 2. Mains Connection

The mains supply to the instrument is connected via an IEC connector. This should be wired in accordance with the L, N and E markings within the connector shell. The mains supply should be either 110V or 240V RMS, 50 or 60 Hz and should be free from noise. The required supply voltage is marked on the label at the rear of the instrument.

The IEC connector should be firmly plugged into the MAINS socket at the rear of the instrument before the supply is switched on.



The P450 incorporates a mains input filter and to ensure correct and safe operation it is important that a good earth is provided at all times. The instrument is equipped with a supply voltage monitoring circuit and is able to detect if the mains voltage provided is too low. If this is the case the instrument will display the following message:-  
If this message is present on the front of the instrument, switch off and check that the mains supply is correctly connected and is of a suitable voltage.



### 2.1 Changing the supply voltage

The P450 is shipped from the factory with the supply voltage set to the customers requirements. If this needs to be changed for any reason, first of all switch off all power to the instrument and remove it from the panel.

Remove the 10 case lid retaining screws and lift off the lid.

Remove the two quickmate connectors from the power supply board at the rear of the case and remove the three board retaining screws, finally lift out the board. Supply selection is performed by means of several 'blob' pads underneath the transformers at the rear of the board.

To change from 110V to 240V operation, remove the solder from the 4 'blob' pads labelled '1' using a soldering iron and, using an excess of solder, bridge across the two pads labelled '2'.



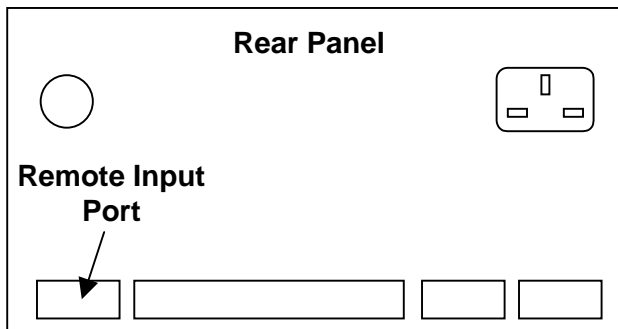
To change from 240V to 110V operation, remove the solder from the 2 'blob' pads labelled '2' using a soldering iron and, using an excess of solder, bridge across the four pads labelled '1'.

Refit the power supply board and re-assemble the case.



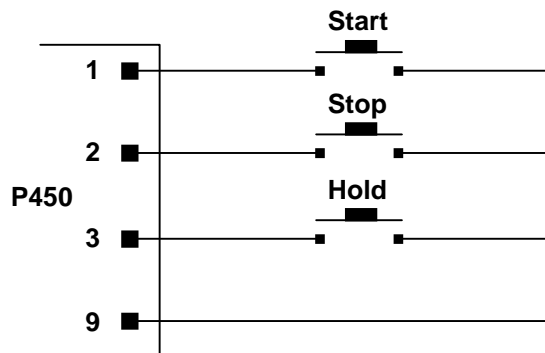
### 3. Remote Input Connection

There are 8 remote inputs on the P450. Each input shares a common with the other seven but is isolated from all other input or output ports on the instrument. Each input is designed to be connected to a voltage free push button , relay contact or switch. Connection to this port should be made using the 9 way female 'D' type connector supplied and should be firmly fixed using the jacking screws after wiring.



### 3.1 Remote Start, Stop and Hold

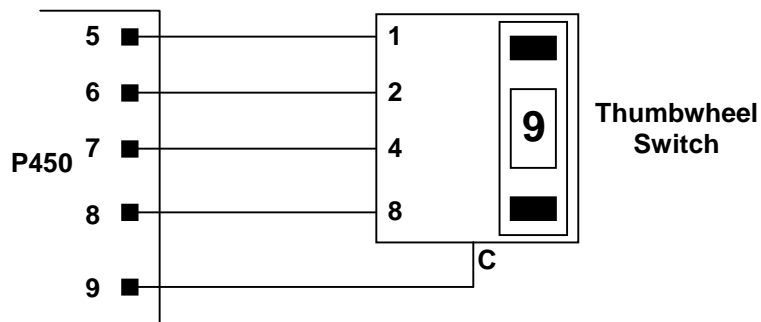
These three inputs are used to control the program execution from afar by means of push buttons or relay contacts and should be wired as shown for basic operation. Of course the user may wish to add additional contacts to the circuit for interlock purposes if required.



### 3.2 Remote Program Selection

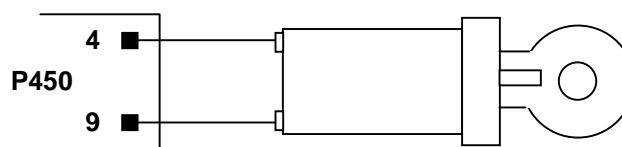
On installations where it is necessary to select the program to be run remotely, a binary encoded thumb wheel or similar type of switch may be wired to the instrument. The switch used may have up to 16 positions enabling any of the 16 available program numbers to be selected. The switch output must be in the binary form ie 4 lines signifying 1, 2, 4 and 8 respectively.

The switch should be wired as follows:-



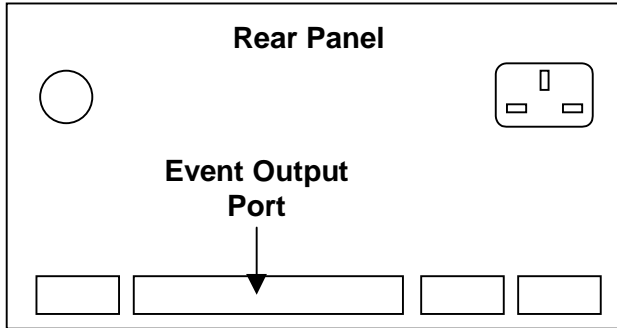
### 3.3 Remote Security Key lock

To prevent unauthorised access to the P450, a key lock may be wired to the remote input port. This key lock should be of the type that makes its contacts when in the secure position.



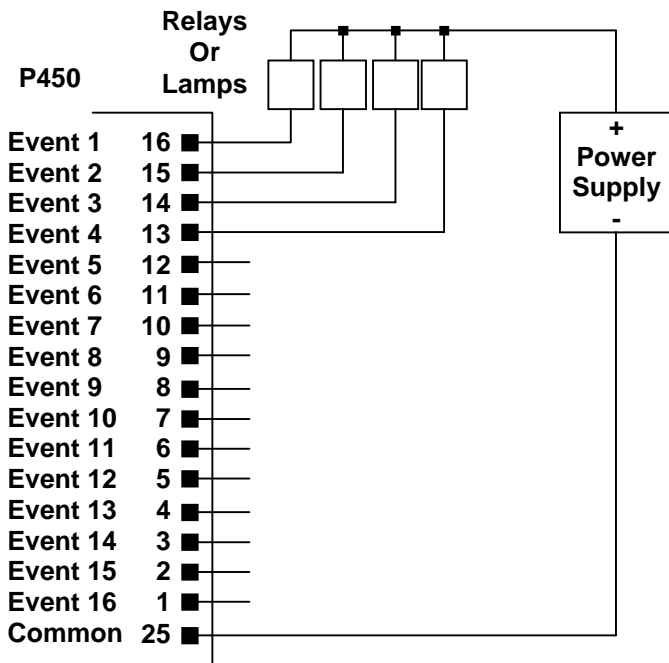
### 4. Event Output Connections

There are 16 event outputs on the P450. Each output is of the open collector type and is capable of switching a small dc relay or lamp. The maximum switching current for each input is 200mA at a maximum voltage of 50V dc, and the total current for all 16 outputs should not exceed 500mA. Connection to the event outputs is via a 25 way 'D' type female connector which is supplied with the instrument.



#### 4.1 Connection to lamps or relays

Individual lamps and/or relays may be connected to the event output port as shown. An external dc power supply will be required however to power the devices used.

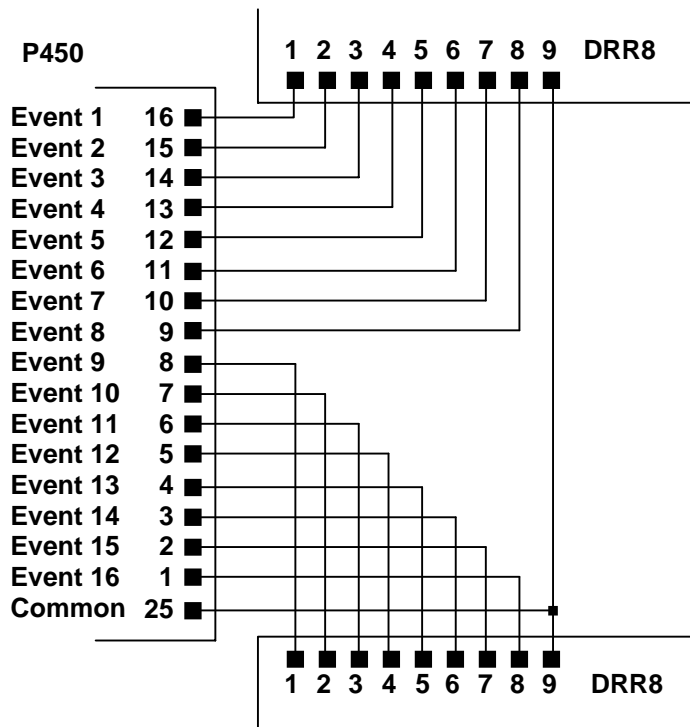


#### 4.2 Connection to DRR8 Relay modules

The DRR8 relay module is specifically designed to be connected to the P450 event outputs. Each module contains 8 single pole changeover relays with arc suppression and a power supply and is fitted into a DIN rail mounting enclosure.

Up to 2 DRR8 units may be wired to the event output port as shown below.

The unit is connected via a 9 way 'D' type female connector.



## 5. Serial Communications

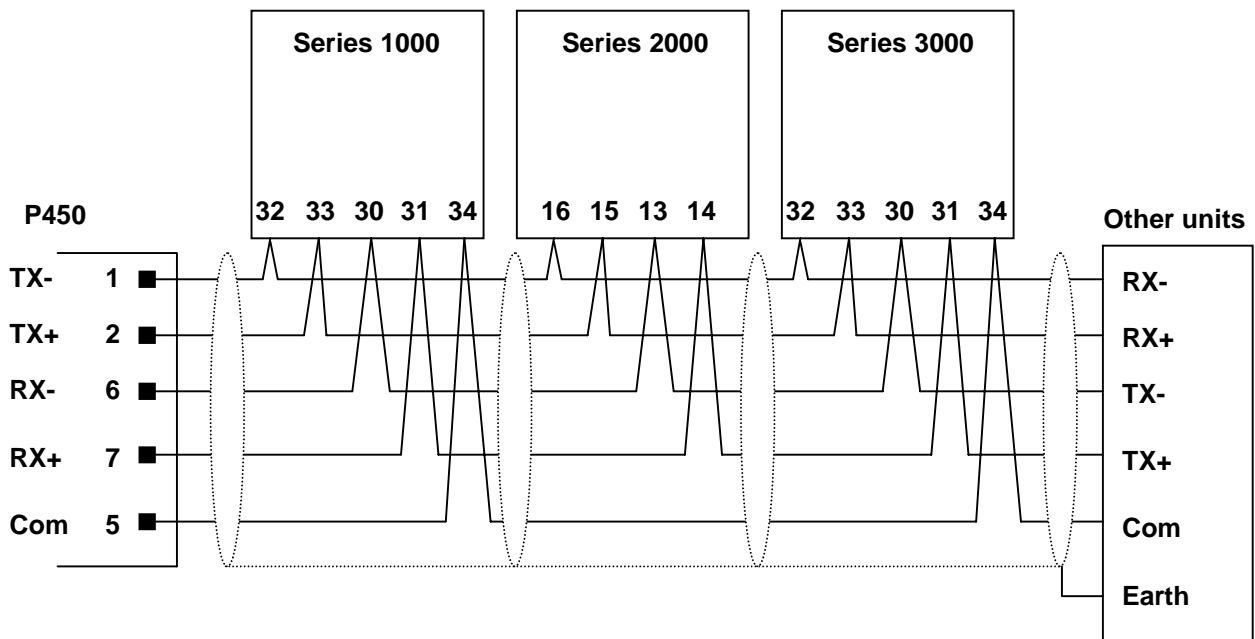
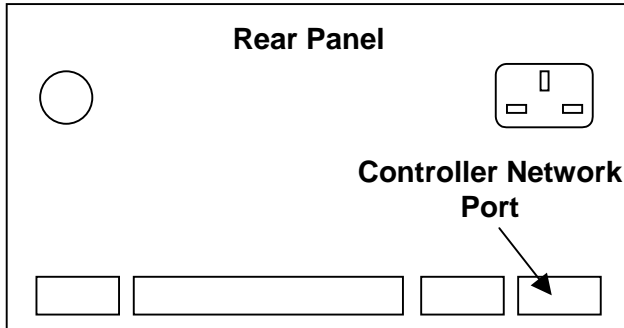
The P450 provides two serial communications ports. Both ports use the RS422 standard for data transmission. This is a balanced, voltage communications system, which will perform well under most situations at up to 1km, provided some simple guidelines are observed.

1. The communications system should be wired in screened twisted pair cable. The common connection should be used whenever possible. The cable screen should be earthed at one point only.
2. The cable should be routed well away from sources of electrical noise such as motors, contactors and any high voltage wiring.
3. The communications should be wired in a 'daisy chain' fashion, taking the wires into one instrument and hence onto the next. Wiring spurs are to be avoided. Take care to continue the cable screen through to the next unit on the network.
4. For long cable runs or noisy environments, it may be necessary to fit a terminating resistor to the network. The terminator (a 220 Ohm resistor) should be fitted between RX+ and RX- on both the P450 and the furthest other device. Only one such terminator should be fitted to each wire pair.



### 5.1 The Controller Network Port

The controller network port is used to communicate between the P450 and the remote controllers in the system. The Baud rate on this port is fixed at 4800 Baud. An RS422 interface is provided for direct connection to a number of series 1000, 2000 or 3000 instruments.



### 5.2 Assigning Controller addresses

In order that the P450 can distinguish between the remote controllers connected, each controller must be assigned a communications address.

The P450 uses addresses 10 to 39 inclusive and assumes certain addresses for each channel. The addresses used are shown in the table below.

	Channel A	Channel B	Channel C
Min Address	10	20	30
	to	to	to
Max Address	19	29	39
Master Address	10+Host	20+Host	30+Host

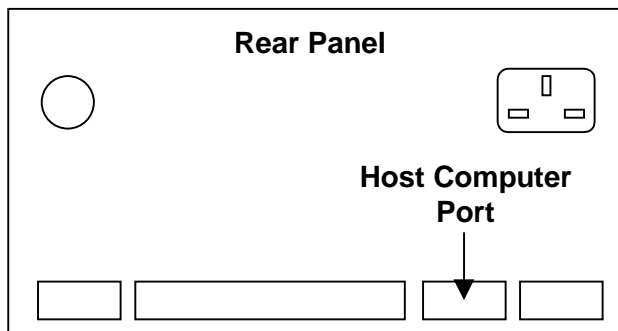
The P450 assumes that one controller on each channel is a master and it is these controllers which are used to determine servo start levels. The channel master address is the channel base address + the P450 host address.

Instruments with addresses greater than those specified above may also be connected to the controller network port. These instruments are not recognised by the P450 but will be present in the network for any communications via the host communications port.

### 5.3 Host Computer Port

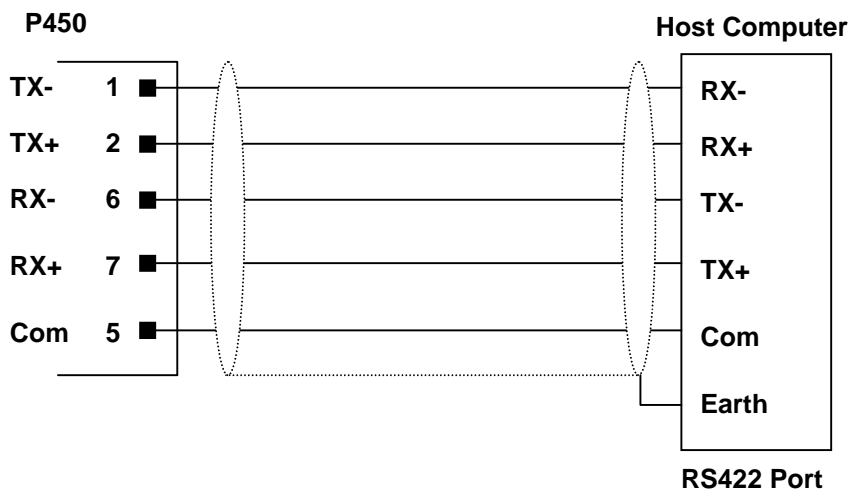
The host computer port on the P450 is used for communications with a remote computer system. This may be for data acquisition or program downloading purposes.

The host computer port is an RS422 compatible interface, but may be used with RS232 computers if necessary via an RS232/422 converter. Connections to this port are made via a 9 way 'D' type male connector.



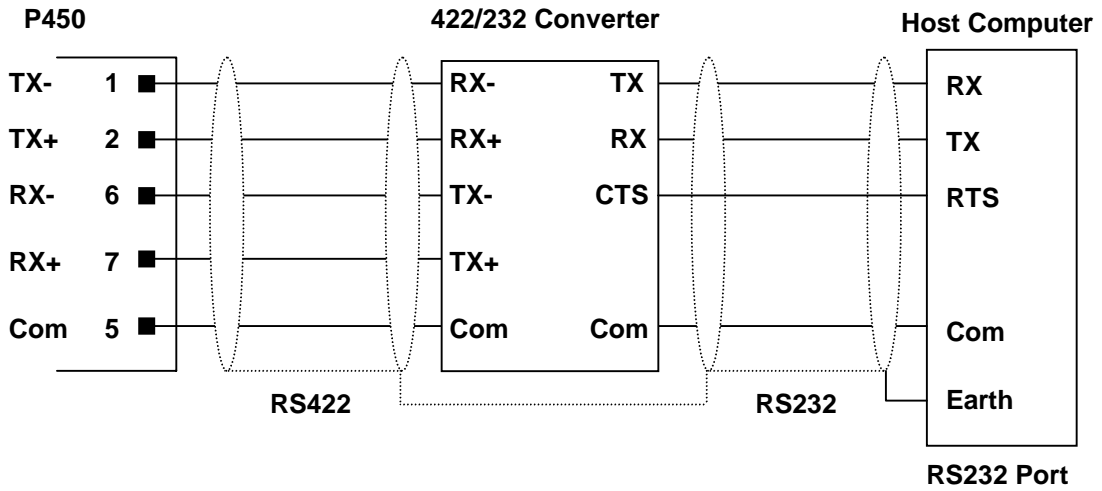
#### 5.3.1 Connection in RS422 mode

RS422 uses a balanced differential transmission technique and hence requires two wires per signal. The following diagram shows the direct connection to an RS422 computer port.



#### 5.3.2 Connection in RS232 mode

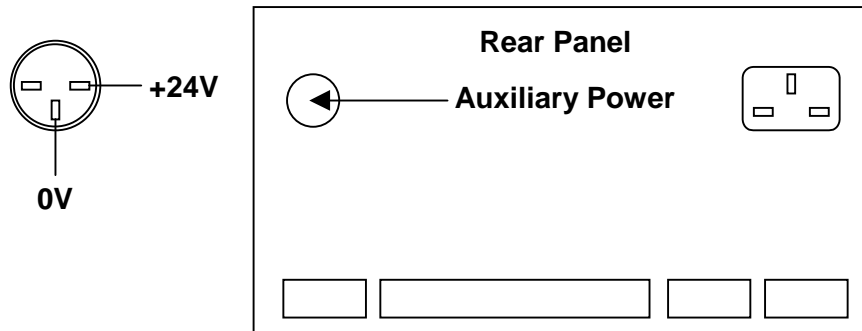
RS232 uses an unbalanced transmission technique and hence only requires one wire per signal plus a shared common. It is severely limited in operation and only allows one to one communications over very short distances (50 feet). In order to overcome these problems an RS232/422 converter module should be used to convert the computer port to RS422. The converter should be fitted at the computer end of the network. The IC-485S converter (or equivalent) converter should be connected as follows.



### 7. Auxiliary Power Supply

This supply is provided if ordered and may be used for any purpose required. The maximum load on this power supply should not exceed 50 mA.

To connect to this power socket a three pin DIN plug is supplied. This should be wired in the manner shown.



View on rear of instrument