Installation Instructions

Procon

A32M

MITSUBISHI ELECTRIC (UK)

The Procon A32 provides an interface between up to 32 Mitsubishi 'A' control air conditioners and any suitable MODBUS RTU based host.

Connections

The A32M requires a 230v a.c. suppy.
The unit connects to the host system using either RS232 or two wire RS485 communications.

Wiring should be carried out by a suitably qualified person and the installation should be in accordance with the current national electrical installation regulations.

The connection detail is provided in Figure 1.

Addressing

For compatibility with the Procon A32 each 'A' control outdoor unit must be fitted with the Mitsubishi Sub I/F board.
This board carries a DIP switch (SW1) which is used to set the address of the outdoor controller. Addresses are set on the switch by using binary notation where SW1-1 represents a '1', SW1-2 represents a '2', Sw1-3 represents a '4'

SW1-4 represents an '8', SW1-5 represents a '16' and SW1-6 represents a '32'. The address is set by switching on the required number of switches to add up to the address. (e.g. for address 6, switch on SW1-2 and SW1-3)
The addresses of the outdoor units should be set to be sequential starting at address '1'.

The A32 unit also has a DIP switch SW3 which is accessible after removing the cover which is secured by the three screws 'A' (Fig 1)3. Switch SW3 also uses binary notation and should be set to the number of outdoor units.

Disconnect the power before removing the cover.

Organisation

The A32M maps the data from the outdoor units into Modbus registers. These are accessed by two Modbus parameters 'Slave No.' and 'Offset'.
The A32M behaves as 12 slaves (1 to 12) each with 30 registers (Offset = 0 to 29). The first 10 slaves each represent 3 outdoor units with 10 registers being assigned to each unit. (see Appendix A)
Slave 11 represents outdoor units 31 and 32 plus pseudo unit 33
Slave 12 represents only pseudo unit 34 (offsets 0 to 9)

Pseudo units 33 and 34.are used for configuration details as follows:

Settings *(see appendix B)*

"Unit" 33	Setpoint (Write) register '**Number Scanned**' is used to set the number of outdoor addresses to be scanned.
"Unit" 33	Mode (Write) register **'Inhibit 1'** is used to set the inhibit function for outdoor units 1 to 16. (see Appendix B)
"Unit" 33	Fan Speed (Write) register **'Inhibit 2'** is used to set the inhibit function for units 17 to 32 (see Appendix B)

Read Values *(see appendix B)*

"Unit" 33	Setpoint (Read) register reads back the set number of scanned outdoors *
"Unit" 33	Mode (Read) register reads back the Inhibit word for outdoor units 1 to 16 *
"Unit" 33	Fan Speed (Read) register reads back the Inhibit word for outdoor units 17 to 32 *
"Unit" 34	Setpoint (Read) register reads back the software number
"Unit" 34	Mode (Read) register reads back the version number.
"Unit" 34	Fan Speed (Read) register reads back the Software date

* These registers will only reflect changes to the settings after a power down.

'Number Scanned' must be set in the range 1 to 32.

Operation

In operation the A32 scans the connected outdoor units and makes them accessible via either the RS232 or RS485 serial links.

Modbus register information is detailed in Appendix A

A red LED on the A32M indicates received data from the air conditioners.

Grouping

Grouping on A-control units is achieved by hard wiring as detailed in the Mitsubishi system wiring details.

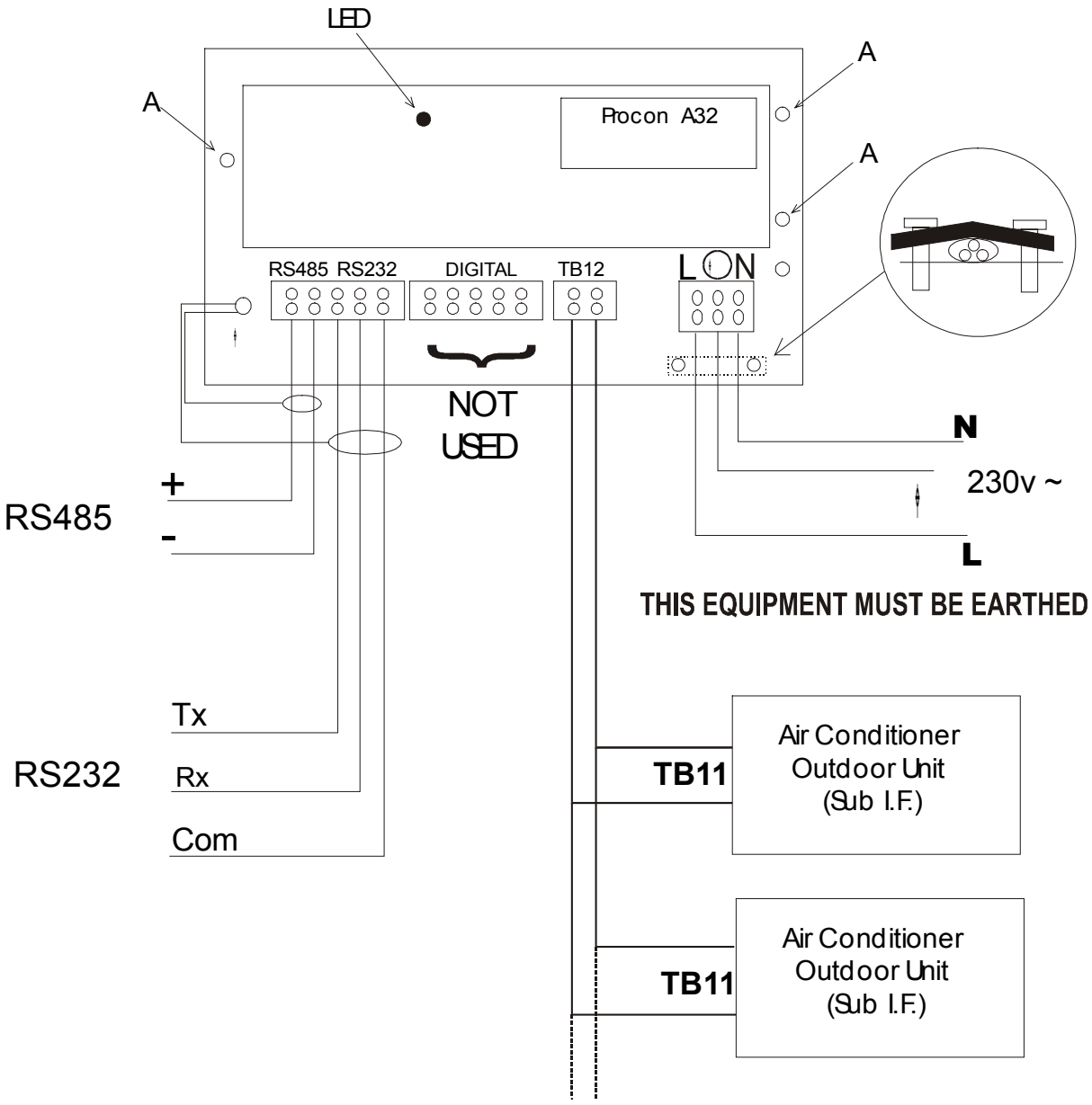

Figure 1. Procon A32 Wiring Detail

Available Information

For each of the (up to) 32 outdoor units it is possible to access:

Return Air Temperature
Error Condition.

For ungrouped units and for the first unit in any group it is also possible to access and alter the following items:

On/Off
Setpoint
Mode
Fan Speed

Where outdoor units are grouped all the units in the group will respond to this information – but it must be sent and accessed via the first unit in the group.

Mode values:

0	Auto
1	Cool
2	Heat
3	Dry
4	(Not Used)
5	(Not Used)
6	Fan

Fan Speed Values

1	Low
2	Low Medium
3	High Medium
4	High

Scanning Period:

The scanning period for the Procon A32M depends on the number of fan coils being scanned. Each fan coil takes approximately 2.5 seconds. This means that, on a full system, response to a modbus command could take up to 1.5 minutes and it could be a further 1.5 minutes before the change is reported back in the modbus registers.

Appendix A

Modbus register table

Outdoor Unit Number	Slave Number	Base Value
1	1	0
2	1	10
3	1	20
4	2	0
5	2	10
6	2	20
7	3	0
8	3	10
9	3	20
10	4	0
11	4	10
12	4	20
13	5	0
14	5	10
15	5	20
16	6	0
17	6	10
18	6	20
19	7	0
20	7	10
21	7	20
22	8	0
23	8	10
24	8	20
25	9	0
26	9	10
27	9	20
28	10	0
29	10	10
30	10	20
31	11	0
32	11	10
(33)	11	20
(34)	12	0

Parameter	Offset	Modbus Function
Return Air temperature	Base Value	3
Error	Base Value + 1	3
Setpoint (Read)	Base Value + 2	3
Mode (Read)	Base Value + 3	3
Fan Speed (Read)	Base Value + 4	3
Setpoint (Write)	Base Value + 5	6
Mode (Write)	Base Value + 6	6
Fan Speed (Write)	Base Value + 7	6
On/Off (Read)	Base Value + 8	3
On/Off (Write)	Base Value + 9	6

Appendix B

Configuration data

Setting	Slave	Offset	Function
Number of Scanned Outdoor Units	11	25	6
Inhibit 1 (Units 1 – 16)	11	26	6
Inhibit 2 (Units 17-32)	11	27	6

Reading	Slave	Offset	Function
Number of Scanned Outdoor Units	11	22	3
Inhibit 1 (Units 1 – 16)	11	23	3
Inhibit 2 (Units 17-32)	11	24	3
SW Number	12	2	3
SW Version	12	3	3
SW Date	12	4	3

‘Inhibit 1’ and **‘Inhibit 2’** each have 1 bit to represent each outdoor unit.
Inhibit 1 bit 0 represents unit 1 and bit 15 represents unit 16.
Inhibit 2 bit 0 represents unit 17 and bit 15 represents unit 32.

If any bit is set to a 1 then the A32 will allow modification of that unit’s functions to be made from the remote controller. If the bit is set to 0 then modification will not be allowed and the remote controller will display ‘Centrally Controlled’.
The setting of these registers does not activate or clear the function.
The inhibit function is activated or cleared when a parameter is sent from the A32 to the relevant unit.

(To allow remote controller operation on all units set Inhibit 1 and Inhibit 2 to ‘FFFF’ Hex. (65535). To prevent remote controller operation on all units set Inhibit 1 and Inhibit 2 to 0.)