



FLM-101 Installation Information

Software 677511

1. Terminal Assignments.

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|----|---|---|
| 1 | 24Vac/dc input (L or +ve) | Supply required = 24Vac \pm 10%, 50 - 60 Hz
or +24Vdc \pm 10%, |
| 2 | 24Vac/dc input (N or -ve) | |
| 3 | Electrical earth | |
| 4 | Electrical earth | |
| 5 | RS-485 signal 'A' or RS232 receiver input | |
| 6 | RS-485 signal 'B' or RS232 transmitter output | |
| 7 | RS-485/RS232 0v reference | |
| 8 | Electrical earth - can be used for a cable screen connection | |
| 9 | Flow sensor pulse input channel 3 signal input | |
| 10 | Flow sensor pulse input channel 3 0Vdc (internally connected to electrical earth) | |
| 11 | Flow sensor pulse input channel 2 signal input | |
| 12 | Flow sensor pulse input channel 2 0Vdc (internally connected to electrical earth) | |
| 13 | Flow sensor pulse input channel 1 signal input | |
| 14 | Flow sensor pulse input channel 1 0Vdc (internally connected to electrical earth) | |
| 15 | Flow sensor pulse input channel 0 signal input | |
| 16 | Flow sensor pulse input channel 0 0Vdc (internally connected to electrical earth) | |

Notes.

Either side of the incoming 24Vac or 24Vdc supply may be optionally connected to electrical earth external to the FLM-101.

The RS485/RS232 port is fully floating with respect to electrical earth. The RS485/RS232 port is supplied without a transmission line termination resistor. When used for RS485 with a long cable a termination resistor may be required for reliable communication. This may be conveniently installed as R6 (adjacent to terminals 5 to 8) on the FLM-101 PCB (C62803). R6 should never be fitted when used in RS232 mode.

The digital counter inputs float to +12Vdc and require a negative edge pulling down to 0Vdc for each count pulse. Sink current is typically 2mA. They may be driven using either an external volt-free contact, an external NPN open-collector transistor or an open drain MosFET.



2. FLM-101 Configuration Jumpers.

A series of on board jumpers are used to configure different FLM-101 operation features.

The jumpers are checked as part of the FLM-101 power up routine. Any changes made to the jumper settings will not come into effect until the FLM-101 is powered down and then power is re-applied.

2.1 Jumper J1

J1 is used to select the baud rate used for the RS485/RS232 communications. Communication is always 8 data bits, even parity, 1 stop bit. The baud rate is set as follows:

J1 = open 9600 baud (This is the recommended baud rate)

J1 = present 1200 baud

2.2 Jumpers J2 to J5

Used for address selection when in multi-drop (RS485) polled mode:

Address	J5	J4	J3	J2
0	open	open	open	open
1	open	open	open	present
2	open	open	present	open
3	open	open	present	present
4	open	present	open	open
5	open	present	open	present
6	open	present	present	open
7	open	present	present	present
8	present	open	open	open
9	present	open	open	present
10	present	open	present	open
11	present	open	present	present
12	present	present	open	open



13	present	present	open	present
14	present	present	present	open
15	present	present	present	present

2.3 Jumpers J6 to J8

J6 to J8 are used to select the time period over which the inputs are counted to determine the flow rate. The flow rate monitoring is achieved by counting the number of pulses over a given time period. A higher resolution gives greater accuracy of reading, but also results in a slower response time.

Seconds	J8	J7	J6
1	open	open	open
2	open	open	present
3	open	present	open
4	open	present	present
5	present	open	open
6	present	open	present
7	present	present	open
8	present	present	present

2.4 Jumper J9

J9 - used to select the communications protocol.

If J9 is present the FLM-101 does not transmit data until it receives a data request command with a matching address (ie polled mode). Polled mode must be used if more than one FLM-101 is connected to an RS485 network. Polled mode can also be used for a single FLM-101 directly connected to a monitoring "master" device (such as a PC) using either RS232 or RS485.

If J9 is not present the FLM-101 outputs the measured flow rate data every once every second.

2.5 Jumper J10

J10 - used to select pulse width measuring mode.



If J10 is fitted the FLM-101 measures the cycle time period of the incoming wave form by measuring the time between incoming negative edges. Periods from 250ms to 15s are supported. The minimum negative or positive pulse width is 50ms.

If J10 is fitted the settings of J6, J7 and J8 are ignored.

2.6 Jumpers J11 to J14

Jumpers J11 to J14 must be left open circuit.

2.7 Jumpers J15 and J16

Jumpers J15 and J16 are used to select the type of serial port.

J15 = 1-2 and J16 = 1-2 selects an RS485 port

J15 = 2-3 and J16 = 2-3 selects an RS232 port

Any other permutation of J15 and J16 will cause incorrect operation.

3. FLM-101 Production Test Jumpers.

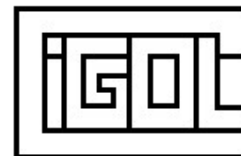
5 way jumper K3 must not be connected.

6 way jumper K4 is used for production testing. It should be left open for normal use.

4. Example of Connection To RS485 Port.

One common way of implementing an RS485 port on a Windows XP PC system is to use the quad or octal RS232/RS422/RS485 USB to serial port boxes manufactured by Moxa (available in the UK from Amplicon (www.amplicon.co.uk)).

The port settings for the Moxa port must be set to “2 wire RS485”.



A suitable lead for connection to two FLM-101 units is as follows:

Moxa 2 wire RS485 female 9 pin D	Signal	FLM-101 Address = 0	FLM-101 Address = 1
3	A	5	5
4	B	6	6
5	0V	7	7
9	Cable screen	(Do not connect cable screen to FLM-101)	

Use of the 0V connection (FLM-101 pin 7) reduces common mode voltage across the RS485 network and is more important when transmitting over long distances. A good choice of cable is a single twisted pair (use for signals A and B) with a separate 0V wire (use for 0V dc connection) and a separate overall screen.

5. Example of Connection To RS232 Port.

A suitable lead for connection of a single FLM-101 unit (configured as RS232) to a standard PC RS232 COM port is as follows:

PC RS232 COM Port Female 9 pin D	Signal	Direction	FLM-101
3	FLM-101 Rx	-->	5
2	FLM-101 Tx	<--	6
5	0V		7
9	Cable screen	(Do not connect cable screen to FLM-101)	