

FLM-100 Installation Information

Software 677500

1. Terminal Assignments.

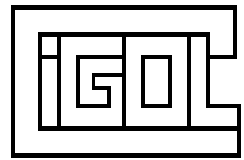
1	24Vac/dc input (L or +ve)	Supply required = 24Vac \pm 10%, 50 - 60 Hz or +24Vdc \pm 10%,
2	24Vac/dc input (N or -ve)	
3	Electrical earth	
4	Electrical earth	
5	RS-485 signal 'A'	
6	RS-485 signal 'B'	
7	RS-485 0v reference - not normally connected	
8	Electrical earth - can be used for a cable screen 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-100.

The RS485 port is fully floating with respect to electrical earth. The RS485 port is supplied without a transmission line termination resistor. When used with a long cable a termination resistor may be required for reliable communication. This may be conveniently installed as R4 (adjacent to terminals 5 to 8) on the FLM-100 PCB (C62800).

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 NPN open-collector transistor or an open drain MosFET.



2. FLM-100 Configuration Jumpers.

A series of on board jumpers are used to configure different FLM-100 operation features..

The jumpers are checked as part of the FLM-100 power up routine. Any changes made to the jumper settings will not come into effect until the FLM-100 is powered down and then power is re-applied.

2.1 Jumper J1

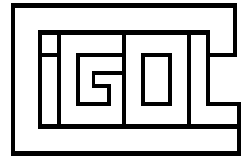
SW1/1 is used to select the baud rate used for the RS485 communications. Communication is always 8 data bits, no parity, 1 stop bit. The baud rate is set as follows:

J1 = open 9600 baud (This is the recommended baud rate)
 J1 = present 1200 baud

2.2 Jumpers J2 to J5

J2 to J7 are used to assign a particular address ID to the FLM-100. The station no. (0 to 15) is represented on the jumpers in pure binary, with J2 representing the LS bit and J5 representing the MS bit, and with present (P) = 1, open (O) = 0, as follows:

Address ID	J5	J4	J3	J2
0	O	O	O	O
1	O	O	O	P
2	O	O	P	O
3	O	O	P	P
4	O	P	O	O
5	O	P	O	P
6	O	P	P	O
7	O	P	P	P
8	P	O	O	O
9	P	O	O	P
10	P	O	P	O
11	P	O	P	P
12	P	P	O	O
13	P	P	O	P
14	P	P	P	O
15	P	P	P	P



2.3 Jumpers J6 to J8

J6 to J8 are used to assign the resolution of the monitoring function. 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.

Frequency sample period	J8	J7	J6
1s	O	O	O
2s	O	O	P
3s	O	P	O
4s	O	P	P
5s	P	O	O
6s	P	O	P
7s	P	P	O
8s	P	P	P

2.4 Jumper J9

J9 - used to select the communications protocol.

If J9 is present then between 1 and 16 FLM-100 units may be run on the same RS485 serial network. The FLM-100 RS485 port is normally inactive. It only becomes active when a poll data command is received with an address ID that matches the station number set on jumpers J2 to J5 (section 2.2 above).

If J9 is open circuit then only a single FLM-100 unit may be connected to the RS485 port. The RS485 port is always an output. Once every second the FLM-100 automatically transmits a data string for an external monitoring device (often a PC) to read.

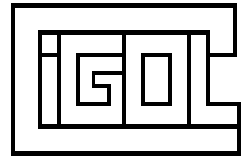
2.5 Jumpers J10 to J14

Jumpers J10 to J14 are reserved for future use. They should be left empty.

3. FLM-100 Production Test Jumpers.

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

16 way jumper K5 is used for production testing. It should be fitted with 8 jumpers (1-2, 3-4, 5-6, 7-8, 9-10, 11-12, 13-14, 15-16) 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-100 units is as follows:

Moxa 2 wire RS485 Male 9 pin D	Signal	FLM-100 Address = 0	FLM-100 Address = 1
3	A	5	5
4	B	6	6
5	0V	7	7
9	Cable screen	(Do not connect cable screen to FLM-100)	

Use of the 0V connection (FLM-100 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.