

# L M M Micro Batcher

## Operating Instructions



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**Section 1** Basic Description

The LMM Batching system is designed to provide a flexible solution to common batching applications. As standard it provides 4 high current relay outputs for batch, pre-batch and flow alarms. With a signal input section that provides signal conditioning for multiple types of inputs.

The input consists of a comparator set to about 2.5v, therefore using current pulses and Namur type inputs require an external sinking resistor to meet the trip voltage of 2.5v.

Optional analogue out of either 0-10v or 4-20mA can be fitted together with a serial link either RS232 or RS485.

## Section 2 Displays and Front Panel Keys

The basic displays are shown below; the up and down arrows set the display to the desired value. The default display on switch on is the Batch.

### Navigation keys

↓	↑	<b>SB</b>	<b>0.0LTR</b>	<b>SetBatch</b> display (required batch quantity)
↓	↑	<b>F</b>	<b>0.0Hz</b>	<b>Frequency</b> display of sensor input
↓	↑	<b>T</b>	<b>0.0LTR</b>	<b>Total</b> Display
↓	↑	<b>RT</b>	<b>0.0LTR</b>	Flow <b>Rate</b> display
↓	↑	<b>BAT</b>	<b>0.0LTR</b>	<b>Batch</b> display will count up during batching default

Batch control:

The use of the **START**, **STOP** and **RESET** are described below.

<b>START</b>	used to start or to restart the batcher, will energise the Batch relay and if required by the remaining quantity energises the Pre-Batch relay.
<b>STOP</b>	used to stop or halt the batcher, de-energises the batch and pre-batch relays.
<b>RESET</b>	used to reset the batch value to zero only operates is the batch is finished or has been halted (stopped).

In general the keys on the front perform alternative uses when in the programming mode or the setting of the batch. This description is used in the manual through out.

<b>RESET</b>	Used to clear a variable for new data to be entered.
<b>STOP</b>	Used to stop and enter a variable.
<b>ALTER</b>	Used to gain either access to programming or Set the new batch.
↓↑	Scrolls through the digits in integer 0-9, decimal 0-9 plus “.” And for alpha the entire 127 characters can be scrolled and selected.
→	Selects the next digit to be altered.

**Section 3** Programming the Set Batch and gaining entry to the programming menus

To gain access to program the SET BATCH the following sequence will be required in this example the batch is set to 12.5 litres.

Scroll to the SB display using the up and down arrow keys.

↓	↑	<b>SB</b>	<b>5.00LTR</b>	<b>Set Batch</b>
Press <b>ALTER</b>				
		<b>SB</b>	<b>0LTR</b>	<b>Set Batch</b>
Press ↑				
		<b>SB</b>	<b>1LTR</b>	<b>Set Batch</b>
Press →				
		<b>SB</b>	<b>10LTR</b>	<b>Set Batch</b>
Press ↑↑				
		<b>SB</b>	<b>12LTR</b>	<b>Set Batch</b>
Press →				
		<b>SB</b>	<b>120LTR</b>	<b>Set Batch</b>
Press ↓				
		<b>SB</b>	<b>12.LTR</b>	<b>Set Batch</b>
Press →				
		<b>SB</b>	<b>12.0LTR</b>	<b>Set Batch</b>
Press ↑↑↑↑↑				
		<b>SB</b>	<b>12.5LTR</b>	<b>Set Batch</b>
Press <b>STOP</b>				
		<b>SB</b>	<b>12.50LTR</b>	<b>Set Batch</b>

If at any time an error is made pressing **RESET** will reset the variable again for data entry. This example will continue throughout the manual as general programming.

Coded entry to the menu system.

Scroll to the Frequency display using the up and down arrow keys.

↓	↑	<b>F</b>	<b>0.00HZ</b>	<b>Frequency</b>
Press <b>ALTER</b>				
		<b>CODE?</b>	<b>000</b>	<b>Entry Display</b>

As above use the up, down and right arrow to set the code up, please note that the code is fully alpha numeric and as such can contain any of the 127 characters. It is best to ensure that you keep a safe copy of this, the default is **000**.

**Section 4** Menu System

This section shows all of the possible menu and programmable areas that are available; again the use of the up, down, right and left arrows are required.

Press STOP	CODE?	000	Entry Display			
	SETUP	INPUT	→←	UPD	0.3SEC	update time in seconds
			↓	ZCUT	1.0SEC	time zero frequency
			↓	AVE	1	average readings 1 to 10
			↓	TB	60	time base 1, 60, 3600
↓	SETUP	CURVE	→←	HZ01	100.HZ	curve point 1 frequency
			↓	RT01	10.LPM	flow rate point 1
				..... points 1 to 16 .....		
			↓	RT16	200.LPM	curve point 16 frequency
			↓	RT16	20.LPM	flow rate point 16
↓	ENG	UNITS	→←	RATE	LPM	legend for flow rate
			↓	TOTAL	LTR	for total
			↓	BATCH	LTR	for batch
↓	SET	FACTORS	→←	RFAC	1.	Factor for flow rate
			↓	TFAC	1.	for total
			↓	BFAC	1.	for batch
↓	SET	ALARMS	→←	HIF	9999.	Flow high alarm point
			↓	LOF	0.	Flow low alarm point
↓	SET	DECIMAL	→←	DPR	2.	Decimal point for rate
			↓	DPT	2.	for total
			↓	DPB	2.	for batch
			↓	DPF	3.	for frequency
↓	TEST	MODES	→←	PULSE	1000.	Reserved
			↓	PT	10.	Reserved

↓	<b>BATCH</b>	<b>OPT</b>	→←	<b>PREB</b>	<b>5.LTR</b>	<b>Pre-Batch value</b>
			↓	<b>FAIL</b>	<b>3.SEC</b>	<b>Batch Fail Timer</b>
			↓	<b>OVER</b>	<b>1.5LTR</b>	<b>Batch overrun value</b>
			↓	<b>RESET</b>	<b>TOTAL</b>	<b>reset total</b>
↓	<b>ENTRY</b>	<b>CODE</b>	→←	<b>CODE</b>	<b>000</b>	<b>set entry code value</b>
↓	<b>EXIT</b>	<b>MENUS</b>	→←			<b>SAVE AND EXIT</b>

The menu system is rotational and therefore any position in the menu the up or down can be used to gain the quickest menu or sub menu required.

## **Section 5** Menu's Explained

**INPUT:** **update time** is the time that units waits before updating, so in the example the unit will update at 300ms to the nearest whole input pulse. The update time can be varied from 100ms to 1000 seconds.

**Zcut** is the time the unit waits for no pulses to appear before resetting the frequency and hence the flow rate to zero. Zcut should always be larger than the update to allow the update to occur, Zcut should be used for very low flow meters with long time between pulses 1 to 1000sec is possible.

**Ave** is used to set a rolling average system from 1 to 10, as each new update comes in the last update in the stack is lost and the stack is added and divided by this number. Good for filtering unstable flow rates while preserving a more rapid update time.

**Time base** is used to instruct the total and batch that the data is in seconds 1, minutes 60 and hours 3600.

**CURVE:** The curve data are pairs of numbers based on Frequency and Flow Rate from 1 to 16 points can be entered. The order is important and the lowest frequency and flow rate should be entered in the lower point points.

**ENG UNITS:** The main variables of Batch, Rate and Total can by use of the factors by programmed for any units, this menu allows the last three digits for example LPM to be changed for all three variables. It is purely an alpha numeric field and has no mathematical basis. So if the main curve was in litres per minute and you used a factor of 60 in the rate factor the resultant displayed value would be LPH. You can program the LPH into this area.

**SET FACTORS:** As described above these factors act on the base units, so flow rate multiplied by rfac = final display value. The same for the batch and the total. As the unit only keeps the real values from the curve and the time base the data can never be lost only altered for display purposes, these factors should be used in conjunction with the ENG UNITS.

**SET ALARMS:** This allows the user to setup a high and low alarm set point for the flow rate, using the relays as detailed in the termination.



**SET DECIMAL:** This section is for setting the resolution of the displays for the Batch, Rate, Total and Frequency. From 0 to 6 decimal places can be used on each display. For example for a very low frequency meter system the decimal place can be set to 6 in the frequency. All of the displays are self adaptive and as such will display the 8 most significant digits, limited to the decimal resolution chosen, but will lose decimal places if the integer portion demands it. i.e. 123456.789 will with decimal place set to 3 will be displayed as 123456.78 (8 digits).

**TEST MODES:** reserved for now.

**BATCH OPT:** Optional batch setting variables. The Pre-Batch is a relay contact that will close an amount of fluid before the main batch valve will close, normally used to slow the flow rate for a more accurate batch. The Fail timer is used to detect an open valve with no flow, if the system has the valve open and no pulses are received for this period of time the Stop the batch and display FAIL. The over batch allows a quantity of fluid to be deducted from the batch to allow for the overrun of fluid during the valve closure. To reset the total select this display and press reset on the front panel.

**ENTRY CODE:** Allows a new security code to be entered, as this is alpha-numeric the user should be careful to understand that abc or 123 are valid codes and case sensitive. A secure copy should be made as losing this not allow the user to gain access to the menu system.

**EXIT MENU** Pressing alter on this display will save or all the data to the non-volatile memory and transfer the data to the batch card.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16      1 2 3 4 5 6 7 8 9 10 11 12



- |    |   |    |                                 |
|----|---|----|---------------------------------|
| 1  | + common remote switches                      | 1  | Low relay Common                |
| 2  | remote reset                                  | 2  | Low relay Normally Closed       |
| 3  | remote stop                                   | 3  | Low relay Normally Open         |
| 4  | remote start                                  | 4  | High relay Common               |
| 5  | OC 2  | 5  | High relay Normally Closed      |
| 6  | reed out common                               | 6  | High relay Normally Open        |
| 7  | reed out normally open                        | 7  | Pre-Batch relay Common          |
| 8  | OC 1  | 8  | Pre-Batch relay Normally Closed |
| 9  | 0v  | 9  | Pre-Batch relay Normally Open   |
| 10 | Analogue output                               | 10 | Batch relay Common              |
| 11 | Signal Low                                    | 11 | Batch relay Normally Closed     |
| 12 | Signal High                                   | 12 | Batch relay Normally Open       |
| 13 | 15vDC output 100mA                            |    |                                 |
| 14 | 15vDC output 100mA (duplicate of 13)          |    |                                 |
| 15 | 0v power input or output                      |    |                                 |
| 16 | 10 to 35vDC input or 24vDC output if on mains |    |                                 |

Input Links.

```

3 4 6 5 2 1
* * * * *
* * * * *
    
```

links 5 and 6 are spare to park the jumper if not used

```

3 4 6 5 2 1
Open Collector          *   fit 2 for optional filter at 3kHz
Reed                   **
PNP                     *   fit 2 for optional filter at 3kKz
    
```