

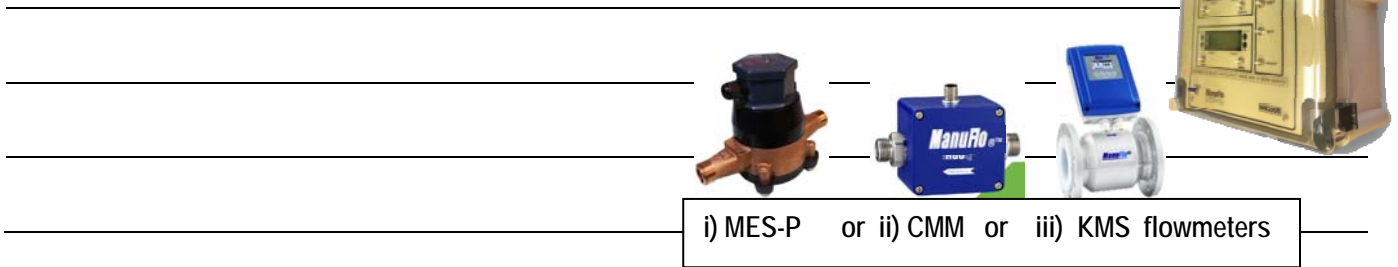
ADMIXTURE BATCHING SYSTEMS

ME2008 interface batch safety card with MES, CMM or KMS flowmeters.



Congratulations on choosing a **ManuFlo**®™ flowmetered Batch Safety Interface Control System.
You will now join many thousands of satisfied customers worldwide.

Your system comprises:



i) MES-P or ii) CMM or iii) KMS flowmeters

Information sheets included:

1. ME2000/8 Batch Safety Interface Card specification & installation datasheet
2. Basic Plumbing Pump Installation Guide
3. Flowmeter Overview + brochure spec (chosen flowmeter type)
4. Service / Troubleshooting guide. Also: <http://www.manuelectronics.com.au/technical.html>

Prior to installation:

- A. Consider a good viewing and operating position for the ME2008 Interface Safety Batch Controller in close proximity to the PLC/Computer Control System.
- B. **i)** When using **MES20/25/32/40** PD-flowmeters, the **ME2008** will supply +12vdc directly to the flowmeters. (Use the +12VDC rail to power all the flowmeters). **<most favored option>**

ii) When using **CMM15/20/25** Mag-flowmeters they require +24VDC power: Use a separate +24vdc power supply to adequately power the units. (Each Magflow will draw up to 6watts. (e.g. QTY 8 x Magflows = 48watts). (part# 240-24DR spec. 240vac in and +24VDC out Din-rail 5amp, 120W). (in this case do not use the +12vdc supply rail from ME2008).



iii) When using **KMS/RMS +DC powered** Mag-flowmeters, they draw substantial current (6watts ea.) & must be powered from a separate +24VDC regulated power supply. (part# 240-24DR spec. 240vac in and +24VDC out Din-rail 5amp, 120W).

For **AC** powered units (15V-amps ea.) power directly from the mains but use a UPS. Only use the Pulse wire & shield (0.V) wire, (2 wires) to connect to **ME2008**. (Do not use the +12vdc supply rail).

- C. Install the flowmeter as per the installation guide as stated in the flowmeter brochure.
- D. Use shielded cable only for connection between flowmeters and ME2008.
- E. Make sure all flowmeter parameters have been set and calibration taken prior to using.

If unsure on any aspect of installation or operation, call ManuFlo or your local installer.

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Flow Measurement & Control Products

Web: www.manuelectronics.com.au

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Consult your local systems integrator / admix supplier or ManuFlo for advise.
ManuFlo recommends all non-ManuFlo equipment be sourced locally where possible.
(i.e. Valves, hoses, solenoids, pipe fittings, extended electrical cables etc).
(or go visit a batch plant Install and see ManuFlo equipment in operation and requirements)

ADMIXTURE SYSTEM INSTALL PROCEDURE

- **Prior to commencing installation:** Study the ME2008 and relevant flowmeter specifications and wiring and plumbing diagrams for full understanding
- Mount the pumps on the stand with the flowmeters and fittings. Wire as per wiring diagrams.
- Protect any external 240vac power cables with channel conduit to protect from electrocution).
- Run the low voltage +12vdc power (MES-flowmeters only), SHIELDED Pulse signal cable from the flowmeters up to the rear of ME2008 inputs.
- CMM Magflows do not measure backwards so if not comfortable with a manual check valve to prevent any backflow issues, then install an electric operated ball or angle seat solenoid valve prior to the flowmeter.



MES20 20mm flowmeters install



KMS502-25F 25mm flowmeters install

PUMP SELECTION

Order Code	Size	Type	Description	Power	Watts
ONGA413	1"	Onga 413	Single phase centrifugal pump 0.5hp, < 50LPM @12m/H	240vac	400
SJ35-04	1"	Davey SJ35-04	<ul style="list-style-type: none"> • Single phase centrifugal pump. 45 Litres/min. @10m/H • IP55 motor. 2900 rpm. 2.3 Amps.. 	240vac	370

Other suggested pump options:- Onga 400 (CF) 413-417 series centrifuge pump series.
Positive Displacement Pump options:
 Mono Pumps 240vac CP25 @30LPM, CP800 @80LPM, CP1600 @120LPM. I/O 1 to 1 1/2" BSP-f
 Onga Pumps 240vac JS110 @45LPM, JS120 @ 90LPM, I/O 1" to 1 1/4" BSP-f threaded connections.
 Stats@10mtrs/H. Self-priming to 6 metres up to 25 metres head. (specs. with water)
Ideal for higher S.G chemicals and faster flow delivery requirements.




- built to cover a wide range of applications. suitable for pumping clean non-aggressive liquids without solids or fibres in suspension. Strong durable.
- manufactured from molded materials giving superior resistance to corrosion. SS304
- Efficient design produces greater flow whilst maintaining low power consumption. Maximum working pressure : 410 kPa, Liquid temp. range 1 – 50 °C
- Max. Ambient temp. 55 °C. Motor: TEFC 2 Pole Continuously rated.
- Nominal speed: 2900 rpm, IP rating: IP55

USE RE-INFORCED HOSE LINES for Admixture installs.

General Pump application use info:
Centrifuge (CF) Pumps general use for typical chemical admixtures.
Positive Displacement (PD) Pumps ideal for dispensing higher S.G. liquids Delivering faster flowrates and head heights. These pumps generate higher pressures so ManuFlo recommends a recirculation pressure relief flow line be installed. Refer to our technical guides.

Power supply for CMM/KMS Magflows
240vac to +24VDC part # 240-24DR (MP3591)
NOTE: Magflows must be permanently powered when in use.



WARNING: +24VDC powered ME2008 models must be powered by a UPS with pure regulated Voltage type of 120Watt+

GENERAL INSTALLATION GUIDE - with Flowmeters

(1) Locate the most appropriate position to mount the flowmeter (refer to the flowmeters datasheet)
 . Preferably:

- your site's flowmeters should be grouped together off the ground on a stand.
- protect the flowmeters from the elements by using a cover, which should be lightweight with handles for easy access by service personnel. (even a simple plastic cover over each unit will suffice).
- a vibration free area is recommended, to avoid any stray pulse generations.

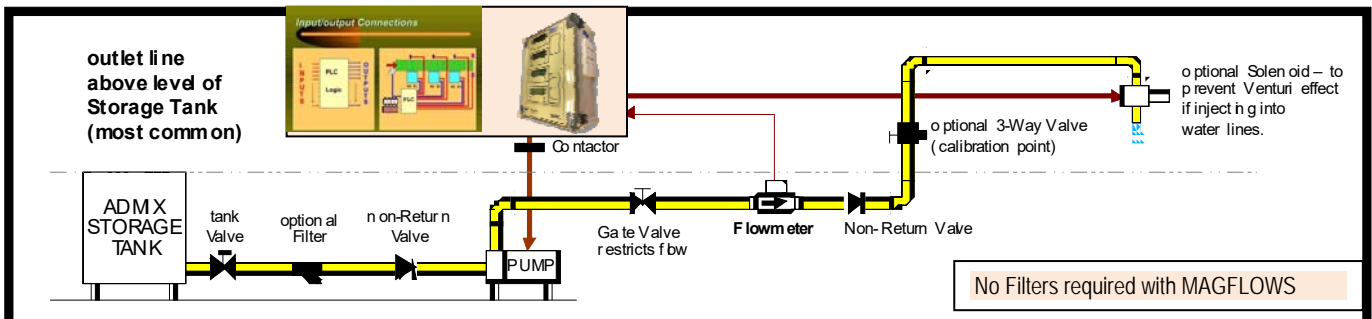
Refer to the "Installation" section in the flowmeter datasheet or ManuFlo technical guide:-

<http://www.manuelectronics.com.au/technical.html>.

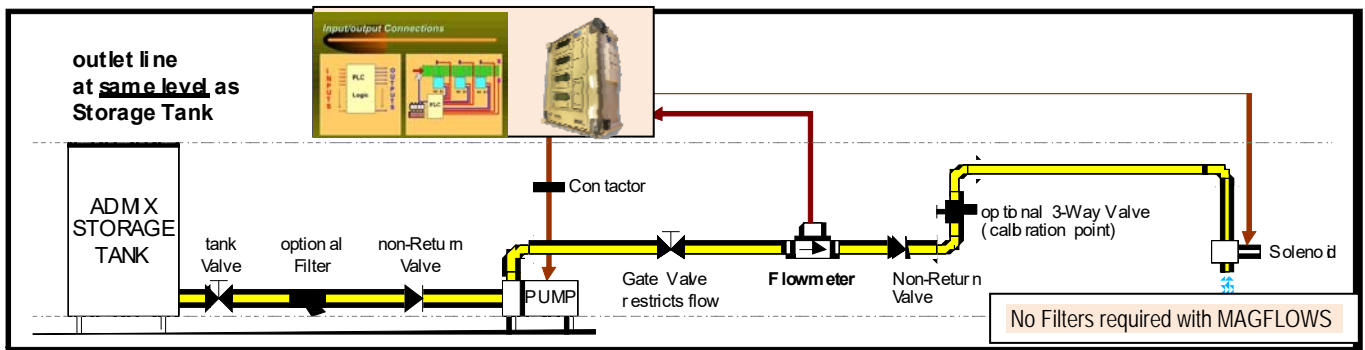
(2) Establish the outlet point position in relation to the storage tank:

2a) If the outlet point is above the top of the storage tank (the most commonly used setup), then the additional equipment you will need is at least: a pump, non-return valves or spring loaded check valves, flow restriction gate or ball valve and, optionally:

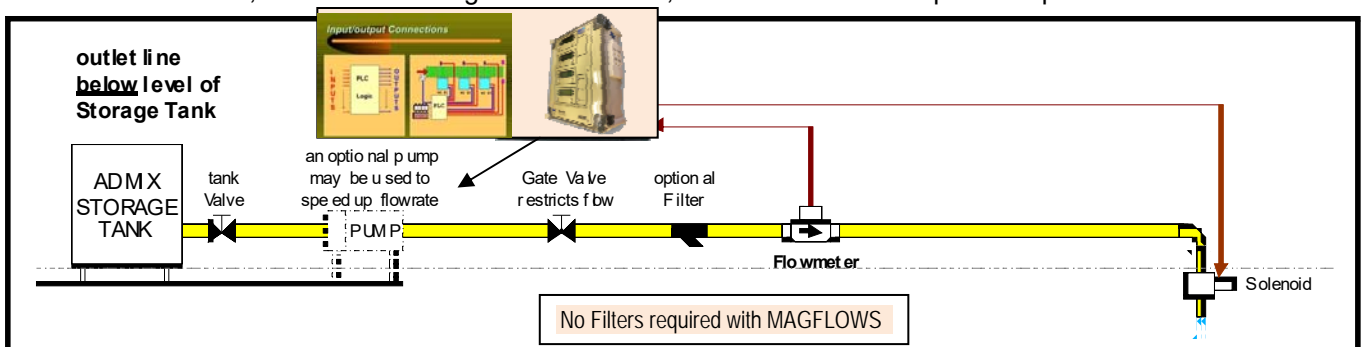
- a solenoid valve electric -ball or angle seat if using for Magflows and used in lieu of non-return valve, with optional air-assisted type for quick shut off of flow if injecting into water lines for Mags and MES. For MES flowmeters non-return valve will suffice when discharge point is highest point.
- a 3-Way Valve to provide an easily accessible calibration point.
- Use 3/4" to 1" (or larger for high volume/ high speed batching applications) pipeline or rigid hose.



2b) If the outlet point is at the same level as the storage tank, then the equipment you will need is at least: a pump, a flow restriction gate or ball valve, a flowmeter with pulse output, and a solenoid valve to stop free flow.



2c) If the outlet point is below the level of the storage tank, then the equipment you will need is at least: a flow control solenoid valve, a flow restriction gate or ball valve, and a flowmeter with pulse output.



SELECTION OF PIPE LINE DIAMETERS

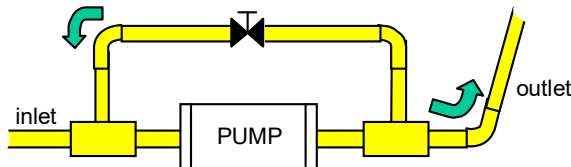
► For low flowrates and small batch quantities of liquid (approx < 2000mls), use ½" diameter pipe or hose (after the flowmeter). ► For medium to high flowrates, use ¾" to 1" diameter pipe. ► For very high flowrates, use 1¼".

NOTE: Pipeline can be flexible reinforced hose (NOT flexible expandable soft hose), rigid PVC or metallic.

*Warning: Running MES flowmeters over their maximum flow rating may damage them and cause overdosing.
(In any case the ME2008 will detect and warn the user)*

PUMP SELECTION (Also refer to PUMP SELECTION page-2)

► When 20mm MES20 flowmeters are used with fluids of specific gravity 1 - 1.25, then use centrifuge pumps of 0.5 - 1 HP- power (e.g. 1" Onga 413 or Davey pumps. When using larger capacity flowmeters, a proportionally larger pump will apply). A flowrate upto 0.8 Litres per second can be achieved, depending on head height. ► For higher density fluids, positive displacement (PD) pumps are more suitable. Because of pressures generated by PD pumps, it is important to be able to restrict the flow – this can be achieved by using an inlet-to-outlet bypass flow valve to recirculate the flow line.



Note: This method of restriction of flow eliminates any possible air being counted by MES flowmeters if the admix storage tank is empty (ME2008 can detect this thou). Also can control pressure and flowrates.

FILTERS

Although MES flowmeters can pass small solids without jamming, a considerable amount of foreign particles can be transferred into admix storage tanks. Therefore, it is advisable to install a box filter prior to positive displacement type flowmeters, to prevent blockage or damage to the flowmeter measuring chamber unit (Amiad™ Ystrainer 800-micron filter is recommended).

No FILTERS required. But Pipe lengths.

Not required with magnetic flowmeters as no moving parts. But allow 5 x dia. on inlet side and 3 x dia. on outlet of magflow of straight pipe of same diameter or larger of the flowmeter bore for flow condition straightening.

COMMISSIONING ME2008 + flowmeter BATCH CONTROL SYSTEMS

- Determine the most appropriate position to mount the ME2008 so it will be clearly visible to the operator and within easy reach and close as possible to the PLC/computer system..
- Electricians must refer to the relevant ManuFlo wiring diagram. Ensure that there is no power to the units before connecting the flowmeter signal cable into the plugs. When wiring the flowmeter, use 2-core shielded cable (use more cores if wiring more flowmeters) - this will allow future expansion, and will transmit pulses from the flowmeter to the ME2008: 1 wire for pulse, and the shield as 0.V volts return (For 2-wire contact closure flowmeters and electromagnetic flowmeters, do not use the +12 volts supply rail).
- Connect the applicable power supply voltage to the ME2008 and flowmeters). For pump applications, a heavy duty contactor (10 Amps for Onga413 pump) must be wired into the system. Contactors can be supplied by ManuFlo or local supplier. Do not use plug-in relays.
- Power up the system. Reset and start a number of times to prime the system, until fluid appears at the outlet line and the ME2008 display digits begin counting and scaled output pulses match the PLC/computer input value and display.

MAKE SURE THE OUTPUT PULSE VALUE from the ME2008 matches the input PULSE setting on the PLC/computer.

A volumetric calibration test should be performed when commissioning a new installation: place a calibrated vessel at the discharge point or before, set a batch quantity on the PLC/Computer, batch the quantity and then check that the delivered quantity is what was requested on the Computer screen and should match on the ME2008 display. A calibration check should also be performed periodically (say every 6 months):

Alternatively: Use the manual push and hold batch buttons on the ME2008, batch a amount and all displays and volume collected must correspond.

- on the ME2008 or COMPUTER, select an amount of liquid e.g. 1000 mls. Start it
- at the calibrated container, check that the amount dispensed is as requested (e.g. 1000 millilitres).
- An overflow may occur due to the inability of the pump to stop instantly. The amount of overflow will depend on how fast the liquid is being dispensed and/or the closing time of the solenoid valve. The overflow or INFLIGHT can be adjusted.
 - the system is totally controlled via PLC/Computer, overflow will be adjusted by the computer; **If required, slow down flow velocity by using a restriction gate valve, or install a quick-acting solenoid valve.**

Note: If the flow is restricted excessively, the ME2008 Pulse Fail circuitry will shut down the system for safety reasons, in which case open up the restriction gate valve or change the parameter setting via the hand held programmer.

If unsure about any aspect of installation, please check the appropriate wiring diagram, product brochure and trouble shooting guide.

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FLOWMETER OVERVIEW STATS.

i) MES-P Pulse output flowmeters (-DSP or -DSP-OC) 25+ yrs chamber operating life)^																													
<ul style="list-style-type: none"> Ideal for Admixture Batching applications. MES20 has 1 millilitre / 1 pulse output. Measures liquids to Specific Gravity 1.4 Accuracy unaffected by variations in S.G.'s. Nutating disc measuring chamber. Small Impurities can pass through Low hydraulic thrust minimises wear. No more vibration issues 	<div style="background-color: #ffffcc; padding: 5px; margin-bottom: 5px;"> 1000 pulses per litre for 20mm). Operates from +4 to 30VDC </div> <ul style="list-style-type: none"> Accuracy: $\pm 1.5\%$, Repeatability: $\pm 0.2\%$ Supply current: 5 to 25mA Prop to supply volt. Maximum working pressure: 1160 kPa Temp. 50C, Durable gunmetal body Connection: 20 - 32 mm : threaded BSP (male) 40 mm : flanged BSP (female) <div style="text-align: right;">  </div>																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Order Code</th> <th style="text-align: left;">Description</th> <th style="text-align: left;">Standard</th> <th style="text-align: left;">Flowrange</th> </tr> <tr> <th></th> <th style="text-align: left;"><u>Digital Pulse Output 4-30VDC</u></th> <th style="text-align: left;">Pulses / Litre</th> <th style="text-align: left;">Litres/min</th> </tr> </thead> <tbody> <tr style="background-color: #e0f0ff;"> <td>MES20-N</td> <td>20mm NEW compact low profile body & chamber version, 3/4" BSP(m) ends</td> <td>(1000 ppl)</td> <td>1.5 - 83</td> </tr> <tr> <td>MES25</td> <td>25mm NEW digital pulse output flowmeter, threaded 1" BSP(m) ends</td> <td>(555 ppl)</td> <td>2.7 - 113</td> </tr> <tr style="background-color: #ffffcc;"> <td>MES32</td> <td>32mm " " " " , threaded 1 1/4" BSP(m) ends</td> <td>(261 ppl)</td> <td>3.8 - 185</td> </tr> <tr> <td>MES40</td> <td>40mm " " " " , flanged 1 1/2" BSP(f) ends</td> <td>(116 ppl)</td> <td>7.5 - 375</td> </tr> <tr> <td>-T</td> <td>Tefzel coated body housing</td> <td></td> <td></td> </tr> </tbody> </table>	Order Code	Description	Standard	Flowrange		<u>Digital Pulse Output 4-30VDC</u>	Pulses / Litre	Litres/min	MES20-N	20mm NEW compact low profile body & chamber version, 3/4" BSP(m) ends	(1000 ppl)	1.5 - 83	MES25	25mm NEW digital pulse output flowmeter, threaded 1" BSP(m) ends	(555 ppl)	2.7 - 113	MES32	32mm " " " " , threaded 1 1/4" BSP(m) ends	(261 ppl)	3.8 - 185	MES40	40mm " " " " , flanged 1 1/2" BSP(f) ends	(116 ppl)	7.5 - 375	-T	Tefzel coated body housing			
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ii) CMM Compact Mini-Mag Flowmeters																	
<ul style="list-style-type: none"> 15mm, 20mm and 25mm sizes. Industrial grade light weight design. + 24 VDC powered. Mating M12 5pin 3mtr cable lead plug-set included. Accuracy @ $\pm 1.5\%$ with 0.3% repeatability of rate. From 50 μS/cm. Pressure rating to 1600 kPa (16 bar). Temp range -20 °C to 90 °C Peek lined sensor, SS316 probes with integrated earthing. BSP(m) ends.. Forward direction pulse, <u>Empty Pipe Detection</u>. Accuracy largely unaffected by varying viscosities or SG's of liquids. 																	
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iii) KMS501W Magnetic Wafer Flowmeters																													
<ul style="list-style-type: none"> <u>For Liquid (upto 20% solids).</u> K-MAGS Fully wired and custom programmed, ready to use. PFA (Teflon) liner, Hastelloy C electrodes, Wafer connection Virtually maintenance free. No moving parts. Self verifying. Accuracy: $\pm 0.5\%$ of MV +1 mm/s. 85 - 253 vac or 17 - 31 vdc powered Totaliser up to 8 digits. With Flowrate display. Process temperature: -25 to 120 °C. Measured liquid must have conductivity of at least 5 μS/cm 	 <div style="display: flex; justify-content: space-around; font-size: small;"> WAFFER ('W' VERSION) FLANGED ('F' VERSION) </div>																												
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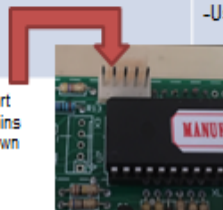
ME2008 - Troubleshooting Guide -Summary

Text on the LCD display/Alarm	Possible Cause	Remedy
"Low Flow"	-Flow Rate below setting -Pulse Fail due to flowmeter failure -Airlock in flowline	-Check "Min. flow" value -Check flowmeter, & pulse cable wiring -Check delivery line for line restriction -All Ok then return to ManuFlo for upgrade to v1.8 software + new Power upgrade
"High Flow"	-Flow Rate above Max.-Flow setting	-Check "Max. flow" value, has been exceeded -Check gate valve, restrict if necessary
"Output Overrun"	-Higher pulse rate than pulse out Hz (frequency) maximum setting (AC=15Hz, DC=35Hz).	-Check "Max Out Rate" value -Adjust pulse output value resolution -Check Flow Rate, restrict the gate valve.
"Over Dose"	-Dose Limit exceeded during batch	-Check "Dose Limit" (batch limit) value -Check PLC/Computer Settings
"Back Flow"	-Backflow of liquid after batch complete -Or excessive vibration at flowmeter install -Stuck external contactor/pump.	-Check Non-return valve, clean or replace. -Eliminate vibration source or swap with MES-DSP vibration free smart pulse heads *see also Troubleshooting-Backflow on next page -rare case continuous backflow is external stuck contactor/pump running. kill power, replace contactor/pump or ME2000 drive relay stuck.
"Diff Flow" (where used)	-Flowmeter Percent difference 5% exceeded (when comparator function is used with 2 flowmeters per 1 line)	-Check flowmeters (see comparator function explained)
"Setting Lost"	-Power Surge or major power loss to systems	-Check power supply/source -Use handheld programmer to reset the system and re-enter the parameters.

Flowrate lower than normal speeds.
Pipes hoses are clogged. Clogged near SOK -- pump has a lot of rubbish in the centrifuge rotor -- clean out pump -- gate valve seized -- rubbish jammed in non return valve -- suction side of pump issues -- piping blockages etc. change to PD pump -- close bypass valve if installed to increase pressure of flowrate.

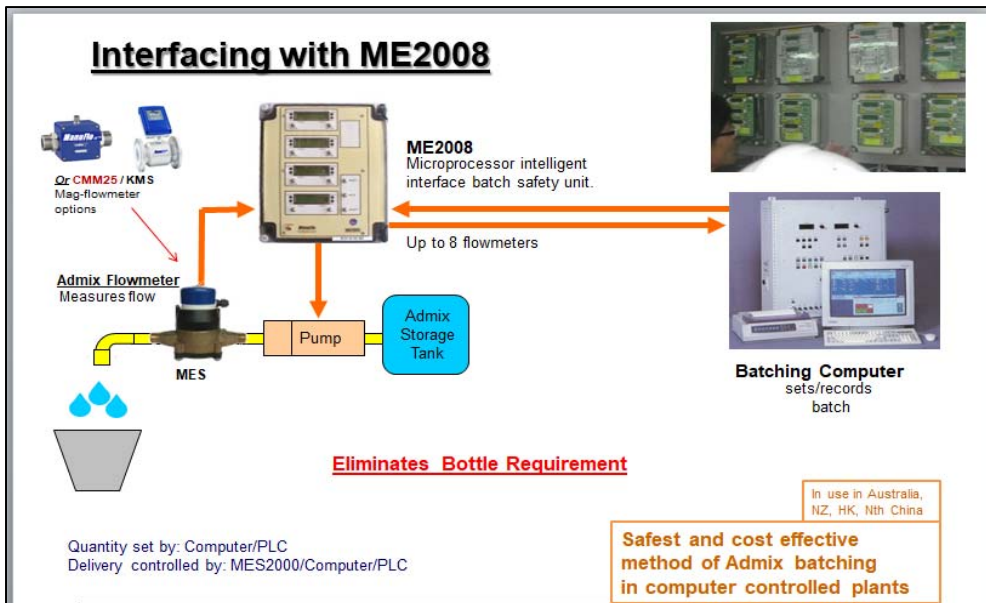
WARNING: +24VDC powered models must be powered by a UPS with pure regulated Voltage type of 120W+

Or short the 2 pins as shown



- To re-enable the module showing "settings lost", proceed as follows:
- Plug the hand-held Programmer into the Dual Channel Module;
 - To restore the default settings (which are input calibration 1000 pulses/Litre, divided pulse output 10mls/pulse), push 2 buttons simultaneously on the Programmer, being either the 2 arrow buttons or the DOWN and UP buttons;
 - Re-enter parameters (via the Programmer) and refer to program sheet settings.

On powering up the unit allow 30 seconds for ME2000/08 to fully boot up all functionalities before use.



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ME2008 Program Parameter Settings for the flowmeters

Typical Settings – MES (20,25,32,40mm)



Parameter	20mm MES20	25mm MES25	32mm MES32	40mm MES40	
Input (p/l)	1000	555.00	0261.00	0116.00	Pulses per litre
or Output (l/p) to ac computer *#	00.100	00.150	00.200	00.500	Millilitres / pulse
Output (l/p) to DC computer *#	00.050	00.100	00.100	00.200	Millilitres / pulse
Min. Flow (l/s)	00.100	00.100	00.150	00.250	Litres per Sec.
Max. Flow (l/s) *#	01.100	01.800	03.000	05.500	Litres per Sec.
Dose Limit (l)	# 050.00	100.000	100.000	150.000	Litres
Max Backflow (l)	# 000.500	000.500	001.000	001.000	Litres
Difference (%)	05.0	05.0	05.0	05.0	
Start Delay (s)	# 02.0	02.0	02.0	02.0	Seconds
Stop delay (s)	# 02.0	02.0	02.0	02.0	Seconds
Diff. Channels	1	1	1	1	
or Max Out rate (Hz) to ac computer	0015	0015	0015	0015	Output Overrun (counts/ second)
Max Out rate (Hz) to DC computer	0035	0035	0035	0035	

ME2008 – Typical Settings – CMM mags



Parameter	15mm CMM10	20mm CMM20	25mm CMM25	size item	
Input (p/l)	1000	500	100	PPL	Pulses per litres
or Output (l/p) to ac computer *#	0.100	0.050	0.250	AC-out	Millilitres / pulse
Output (l/p) to DC computer *#	0.050	0.050	0.100	DC-out	Millilitres / pulse
Min. Flow (l/s)	0.010	0.010	0.100	flow-min.LPS	Litres per sec.
Max. Flow (l/s) *#	0.500	1.000	4.000	flow-max.LPS	Litres per sec.
Dose Limit (l)	# 50.000	50.000	100.000	dose limit	Litres
Max Backflow (l)	# 0.500	0.500	0.500	MaxBack.FI	Litres
Difference (%)	05.0	05.0	05.0	05.0	
Start Delay (s)	# 02.0	02.0	02.0	02.0	Seconds
Stop delay (s)	# 02.0	02.0	02.0	02.0	Seconds
Diff. Channels	1	1	1	1	
or Max Out rate (Hz) to ac computer	0015	0015	0015	0015	Output Overrun (counts/second)
Max Out rate (Hz) to DC computer	0035	0035	0035	0035	

= Adjust to whatever is suitable for your application.

* = For ac output pulses: $\frac{\text{Max. Flow (l/s)}}{\text{Output (l/p)}} \leq 15$

* = For DC output pulses: $\frac{\text{Max. Flow (l/s)}}{\text{Output (l/p)}} \leq 35$



ME2000/08 calibration adjustment guide



A **volumetric calibration test** is performed when commissioning a new installation and periodic follow-up tests.

- To calibrate a vessel is placed near the sock or by-pass port, a selected batch quantity is either;
 - set on computer and batched or
 - can be manually batched by push & holding the manual batch over-ride pump drive button.

Now compare volume displayed on ME2008 Display and that collected.

If incorrect check flowmeter specification pulse output value which must match the input Pulses per Litre (PPL).
e.g. MES20 =1000ppl so Input p/L K-factor must be same 1000.00 p/L {on pg.131 (menu:4)}.

Then divided output pulse value Output L/p e.g. 00.100 must match the computer input pulse value = 100mls/p.

Final Calibration:

- If the liquid collected is **more** than pulse value shown on computer screen or volumetric amount on display, then **decrease** the calibration input set value (K-factor) by the same % difference
- If the liquid collected is **less** than pulse value shown on computer screen or volumetric amount on display, then **increase** the calibration input set value (K-factor) by the same % difference
- Note: Final calibration check can also be performed via computer software scaling.*

Possible Reasons for Less fluid collected than indicated:-
Fluid back flow due to faulty non-return valve.

Input K-factor set too low. Faulty Flowmeter so replace it.

Possible reasons for More fluid collected than indicated:-
Input K-factor set too high. Output Pls & PLC input not matching.
Flowmeter chamber worn, or parts missing, change flowmeter.



Take a few volumetric test volumes of say 0.25, 0.5, 1.0 or 2.0 Litres.

The percentage difference should be repeatability the same.

If so its a digital error –the settings, if not then it is analogue error –the install/meter.

NOTES:

Full support at:

<http://www.manuelectronics.com.au/pdfs/Training Manual ManuFlo%20-2020.pdf>

ManuFlo®™

Flow Measurement & Control Products

Rev: 06-20_ATM

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