ME5IC-5   INTERFACE CARD (1 to 5 channels)
For ME995 Controllers (with –5P plug) to PLC/computers

INTRODUCTION

The ME5IC 5 channel interface card provides interfacing of ManuFlo preset Batch Controllers (fitted with the –5P 5 pin interface plug) with many PLC / computer system I/Os. (designed 1995).

The card is primarily designed for interfacing and incorporation/retaining the ManuFlo ME995 batch controllers & their safety systems / manual batch facility with the COMMAND-batch, Alcon & Jonel/Archer industrial computer batching systems. The ME5IC card, via relays and optos, will enable PLC/computer systems to control START/RESET the ManuFlo controllers and the MES20 flowmeters (1ml/1pulse output) via opto voltage isolation to computer input in divided pulse form. The card has onboard DIP switches to divide and scale down output pulses to 10, 20, 50 or 100 millilitres per pulse output for admixtures, all with a 50% duty cycle pulse duration as this is necessary with slow counting/scanning PLC inputs.

The **ME5IC** enables incorporation of the ManuFlo controllers and their safeties to the computer/PLC batch system, and provides an independent backup batch facility. The card can be fitted with 24-240vac Optos for switching AC pulse inputs or 5-24VDC Optos for DC pulse inputs. Start and Master reset relays on card can be 24,110 or 240vac, or 12 or 24VDC. (240vac start and master reset relays are standard).

The interface card is ideal where PLC systems do not have a STOP signal facility. Here the card provides an "artificial" stop signal to the ManuFlo ME995 at the end of duration when the Start drive latches off at completion of batch cycle target.

OPERATION (e.g. 240vac COMMAND-batch – 5 channel Admixtures)

The computer 'start' command is via a Black Opto22. The Opto **start drive** stays on for the duration of computer batch cycle. The start voltage to ManuFlo controller must be on for a minimum duration of 500 milliseconds. If start period of computer opto is beyond 0.5 seconds, this will start the ManuFlo controller which then activates the 240vac drive (or voltage as designated) to pump and or solenoid. Once liquid flow begins, flowmeter will pulse to the ManuFlo controller. Then ManuFlo controller emits 1 millilitre per pulse (unless stated otherwise) to ME5IC card. The pulses are divided by either 10, 20, 50 or 100. The divide factor on each of the 5 channels can be individually set by the 4 way DIP. Each divided pulse passing through the card is indicated via LED. The 12VDC pulse is then converted to 24-240vac pulse via Crydom AO241 triac opto (or 5-24VDC via the 4n33 opto when fitted). The Crydom opto then pulses to the computer AC Yellow Opto22 input. (or 4n33 opto to the DC White opto). At the computer program's batch target, the black AC Opto22 (or red DC opto) switches off, and the ME5IC card then internally generates stop pulse to ManuFlo controller(s) which then stop(s) pump(s) and or solenoid drive(s). At batch complete, the computer will provide 240vac (or voltage as designated) master reset to **ME5IC** master reset relay, resetting ManuFlo controller(s). Note:

- The operation instructions have mainly referred to 24-240vac commands and pulses. The card can optionally be fitted with 24 and 110vac or 12 and 24VDC start and master reset relays. The pulse output can also be via 4N33 Optos which will switch 5-24VDC computer (Jonel) PLC inputs.
- Manu controllers can be operated manually at any time, the computer registering the quantity batched (if the computer is monitoring that channel).

WIRING and SYSTEM SETUP (For wiring diagram, see page 2).

Supply 240vac (or optional voltage as ordered) to ME5IC card from computer supply line. Starts are wired to Black Opto22. Output pulses wired to input Yellow Opto22 (or white DC opto). Plug in the 5-pin socket/ plug and cable to ManuFlo controllers. Wire up ManuFlo controllers as per standard connections to flowmeters and pump/solenoid drives.

To test, push and hold TEST toggle on ManuFlo controller- this generates pulses through **ME5IC** card to computer input and screen. Check that readout on ManuFlo controller and computer screen correspond (the computer input parameter must be programmed to the same divided output pulse value).

Perform a batch test via computer start or ManuFlo controller start, the volumetric quantity received should correspond with ManuFlo controller and computer displays (a small % variation is acceptable).

SPECIFICATIONS

Channels	• (from 1 to 5) 5 is standard.
Pulse divider options	• for Admix: ÷10, 20, 50, 100 (10, 20, 50 or 100 millilitres per pulse to computer)
	• for water: ÷2, 4, 10, 20 (2, 4, 10 or 20 Litres/pulse to computer). Note: channels 1 & 2 can be water via a link jumper.
	• All pulses 50% duty cycle, and indicated by LEDs.
Power Commands	• 24, 110, **240 vac** or 12, 24 VDC from computer line. (Note: The card is powered from the +12VDC of the ME995's).
Pulse isolation	• **24 to 240vac** via Crydom AO241 triac opto or 5 to 24VDC via 4N33 Opto.
Relays	• 24, 110, **240vac** or 12, 24 VDC starts and master reset.
Connection to Manu's	• 3 metre 5-core shielded cables wired to - pin interface plug (mates to 5-pin socket on ManuFlo).
Dimensions	• 225 L x 180 W x 90 D for IP55 housing enclosure (full 5-channel model).

ME5IC-1 or ME5IC-1W (water) INTERFACE CARD (1 channel with Reset) ManuFlo Controller to PLC/computer

INTRODUCTION

The ME5IC-1 single channel interface card provides interfacing of ManuFlo preset Batch Controllers with many PLC/ computer system I/Os.
The Card can be piggy backed to existing ME5IC-5 multi-channel cards by paralleling Neutrals and Master reset wires.

The card is primarily designed for interface to COMMANDbatch, & Jonel industrial computer batching PLC systems. With relays and optos, will enable PLC/computer systems to control the ManuFlo controllers and flowmeters via opto isolation to computer input in divided pulse form. The card has onboard DIP switches to divide and scale down output pulses to 10, 20, 50 or 100 millilitres per pulse output for admixtures **and 2, 4, 10 or 20 litres per pulse for water, all with a 50% duty cycle pulse duration.**

The card can be fitted with 24-240vac Optos for switching AC inputs or 5-24VDC Optos for DC inputs. Start and Master reset relays on card can be 24, 110 and 240vac or 12, 24VDC.   **OPERATION (see -ME5IC)**

WIRING & SYSTEM SETUP

MR (Master Reset) connect to computer OPTO output control active RESET signal. **ST** (Start) connect to computer OPTO output control START signal (will stay ON for duration of batch). **N** (Neutral) connect to Neutral voltage line from computer/PLC supply board.

5-24 VDC pulse option: **C** (Collector) – connect to pulse input line OPTO (White), **E** (Emitter)   - connect to 0.V. input line.

24-240 vac pulse option: ← Active line from Computer supply line, → 24-240 vac pulse to computer input pulse OPTO (Yellow).

Wire up ManuFlo controllers as per standard connections to flowmeters and pump/solenoid drives.

To test, push and hold test toggle on ManuFlo controller, this generates pulses through ME5IC card to computer input and screen. Check that readout on ManuFlo controller and computer screen correspond (the computer input parameter must be programmed to the same divided output pulse value).

Perform a batch test via computer start or ManuFlo controller start. The volumetric quantity received should correspond with ManuFlo controller and computer displays (a small % variation is acceptable).

SPECIFICATIONS

|	
Channels	1 is standard.
Pulse divider options	**ADMIXTURE CARD ÷10, 20, 50, 100 (10, 20, 50 or 100 millilitres per pulse to computer)**
	WATER CARD ÷2, ÷4, ÷10, ÷20 (2, 4, 10 or 20 Litres per pulse output) for use with ME995-7-5P batch controllers
	All pulses being 50% duty cycle and indicated by LEDs.
Pulse isolation	**24 to 240vac** via Crydom AO241 triac opto or 5 to 24VDC via 4N33 Motorola opto
Relays	24, 110, **240vac** or 12, 24 VDC starts and master reset.
Connection to Manu's	2 metre 5-core shielded cables wired to 5-pin interface plug (mates to 5-pin socket on ManuFlo Controller).
Dimensions	60 H x 160 W

Reset
+ 12v
Pulse
Start
Stop
0.V.
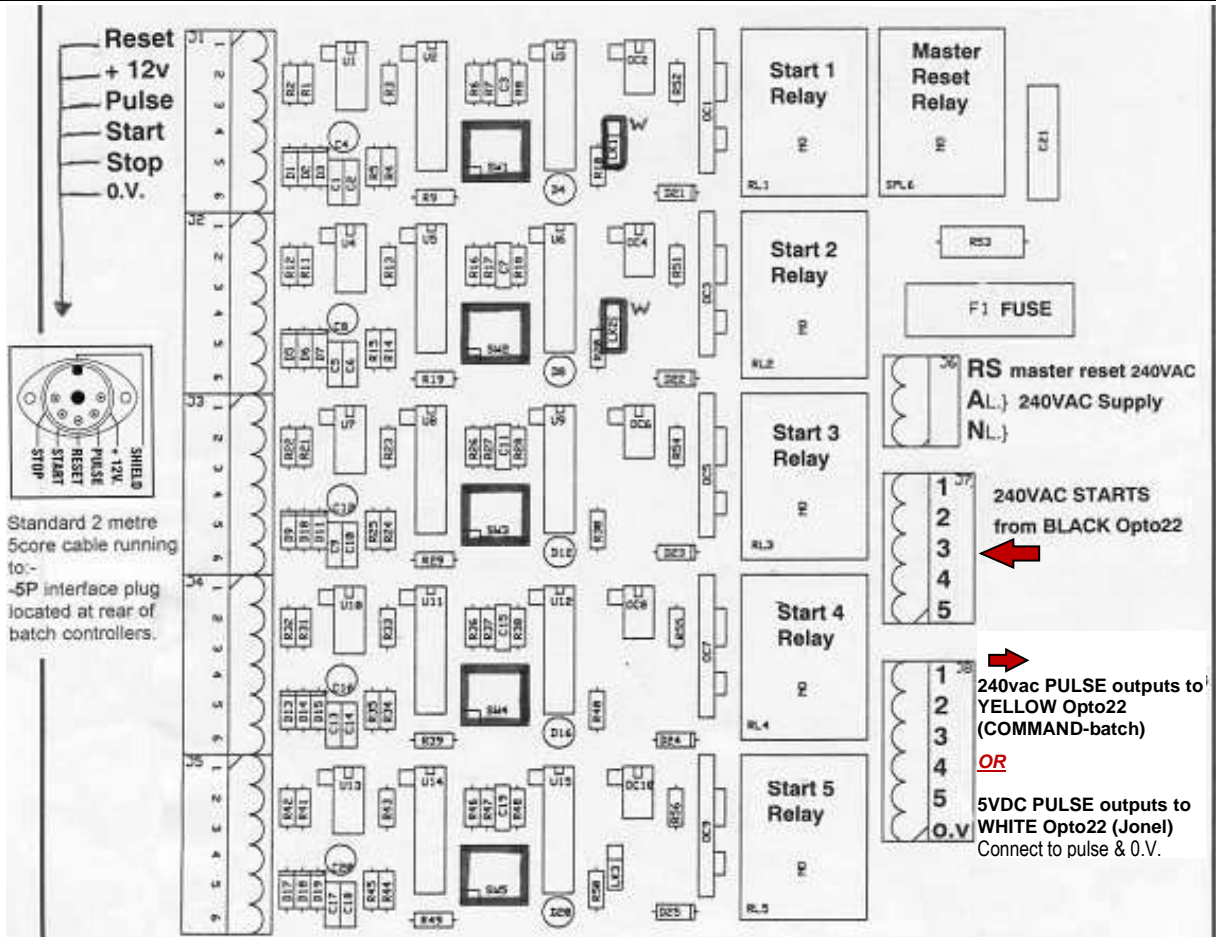
Standard 2 metre
5core cable running
to:-
-5P interface plug
located at rear of
batch controllers.

Start 1 Relay
Master Reset Relay

Start 2 Relay

F1 FUSE

Start 3 Relay

RS master reset 240VAC
AL.} 240VAC Supply
NL.}

Start 4 Relay

1
2
3   240VAC STARTS
4   from BLACK Opto22
5

Start 5 Relay

1   **240vac PULSE outputs to**
2   **YELLOW Opto22**
3   **(COMMAND-batch)**
4   *OR*
5   **5VDC PULSE outputs to**
0.V   **WHITE Opto22 (Jonel)**
       Connect to pulse & 0.V.

NOTE: Voltage conifiguration Starts / Master Reset and Pulses can be
24vac, 110vac, 240vac or 5-24VDC as designated as per order code table.

↑
TO COMPUTER
INPUT / OUTPUT
OPTO's
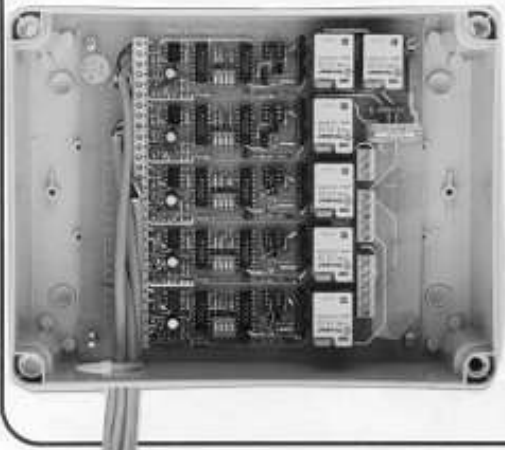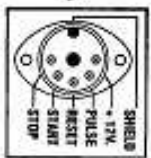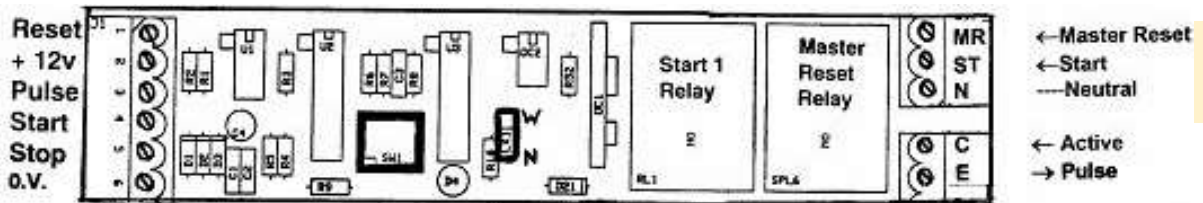
Pulse Division Settings (SW)

To set division rate slide pin to ON.

ON
↑ 1 2 3 4

All OFF   +100 (100 ml.s/pulse)
1 ON only   + 10 (10 mls./pulse)
2 ON only   + 20 (20 mls./pulse)
3 ON only   + 50 (50 mls./pulse)

Special:- DIP switches 1 & 2
optionally for water batch
controllers: Set LINK to W.
÷2 (2 litres per pulse)

2 ON only÷2 (2 litres/pulse)
3 ON only÷5 (5 litres/pulse)
All OFF ÷10 (10 litres/pulse)

Reset
+ 12v
Pulse
Start
Stop
0.V.

Start 1 Relay
Master Reset Relay

MR ←Master Reset
ST ←Start
N   ----Neutral

C   ← Active
E   → Pulse

-5P plug
mounted on Batch Controller

Pulse Division Settings (SW)

To set division rate slide pin to ON.

ON
↑ 1 2 3 4

All OFF   +100 (100 ml.s/pulse)
1 ON only   + 10 (10 mls./pulse)
2 ON only   + 20 (20 mls./pulse)
3 ON only   + 50 (50 mls/pulse)

LINK
N

Special Water Channel:-

ON
↑ 1 2 3 4

All off = 0 litres/pulse
1 ON   = 2 litres/pulse
2 ON   = 4 litres/pulse
3 ON   = 10 litres/pulse
4 ON   = 20 litres/pulse

LINK
W

INSTALLATION GUIDE FOR:
Flowmeters to Manu Batch Controllers to PLC computer systems via
ME5IC interface card.

(1) Locate the most appropriate position to mount the MES20 flowmeters. Preferably, the flowmeters should be grouped together off the ground on a stand. A cover should protect the flowmeters from the elements. A vibration-free area is recommended, otherwise the MES20 could generate some stray pulses.

(2) Establish tank position in relation to outlet point:
- A) Outlet point above top of storage tank.
- B) Outlet point middle of storage tank.
- C) Outlet point below bottom of storage tank.

Case A) If you use storage tank level below outlet line (most commonly used) you will need: Pump, non-return valve or spring-loaded check valve 12psi, flow restriction gate or ball valve, pulse flowmeter and in some cases a solenoid valve for instant shut-off of flow . However, the last item may not be required if installation has reasonable head height.

Case B) If you use storage tank level with outlet line you will need: Pump, a solenoid valve to stop free flow, a flow restriction gate or ball valve and flowmeter.

SELECTION OF PIPE LINE DIAMETERS
(MES20 20mm flowmeter)

For low flowrates and small batch quantities of liquid (approx. <2000mls, use 1/2 inch diameter pipe or hose (after the flowmeter). For medium to high flowrates, use 3/4 to 1 inch diameter pipe. For very high flowrates, use 1¼ inch. NOTE: Pipeline can be flexible reinforced hose, rigid PVC or metallic. *Warning: Running flowmeters over their maximum flow rating will damage them and cause overdosing.*

PUMP SELECTION

When 20mm MES20 flowmeters are used with fluids of specific gravity of 1 to 1.25, use centrifuge pumps 0.5 to 1 horse power (e.g. 1" Onga 413 or Davey pumps). A flowrate up to 0.8 litres per second can be achieved, depending on head height. For higher density fluids, gear pumps or other types of positive displacement pumps are more suitable. Because of pressures generated by gear pumps, it is important that restriction of flow be achieved with bypass of inlet to outlet flow valve or recirculating flow line (when using larger capacity flowmeters, a proportionally larger pump will apply).

Note: This method of restriction of flow eliminates air being counted by MES flowmeters when admix storage tank is empty.

FILTERS

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 flowmeter measuring chamber unit (Amiad™ Ystrainer 800 micron filter recommended).

COMMISSIONING BATCH CONTROL SYSTEMS

Locate the most appropriate position to mount the digital Batch Controller, so it will be clearly visible to the operator and within easy reach. Mount either in panel cutout or stand-alone ManuFlo housing box.

Electricians must refer to the relevant system wiring diagram. When wiring the flowmeter, use 2-core shielded cable (more cores for more flowmeters). This will supply the flowmeter(s) with 12VDC from the Manu Batch controller. When connecting the signal cable into the 10-pin Weidmuller plug, have the controller switched off. Connect the applicable power supply voltage to the controller(s). For pump applications, a heavy duty contactor (10 Amps for Onga413 pump) must be wired into the system (or supplied by ManuFlo).

Power up system. Reset and start a number of times to prime system, until fluid appears at outlet line and digits begin counting.

A volumetric calibration test must be performed when commissioning a new installation. A calibrated vessel should be placed near the sock, a selected batch quantity set on the ManuFlo controller, and batched. A periodic calibration check (say every 3 months) should be taken.

Select an amount of liquid on Batch Controller (e.g. 1000 mls). Reset then start, amount dispensed must be 1000 millilitres collected in calibrated container (at the sock-discharge point). An overflow may occur due to inability of pump to stop instantly. The quantity of overflow will be counted and displayed on the ManuFlo Batch Controller. The volume of overflow will depend on how fast the liquid is being dispensed an/ or closing time of solenoid valve. With the ME995 series Batch Controllers, where fitted with preact, simply set the preact to the same quantity of overflow indicated on the ManuFlo controller display.

(Ultimately when controlled via PLC/Computer batch system, the overflow will be adjusted via the computer program). If required, slow down flow velocity with restriction gate valve or install a quick acting solenoid valve. If flow is restricted excessively, controller pulse fail circuitry will shut down system for safety reasons, in which case open up restriction gate valve.

When ManuFlo controllers are interfaced with computer/PLC batch systems, set doserate and or quantity to a maximum batch required. Computer will start, stop and reset under this selected quantity, not over, as the ManuFlo Controller will override computer start system. This incorporates a maximum batch safety limit and the pulse fail safety system.

The Manu Controllers (admix) ouput 1pulse/1ml to the ME5IC interface card. The ME5IC then divides the pulses to the preferred selected volumetric value of 10, 20, 50 or 100 mls per pulse (according to the 4-way DIP). The set pulse divided value must be then entered into the computer software parameters e.g. divide by 100 on card, so computer input 1count = 100mls.

NOTE: The output rate to the computer input must not exceed 12-15Hz for AC-inputs or beyond the maximum permitted scan time.

(If unsure regarding any aspect of installation, check the wiring diagram, product brochures and trouble shooting guide. Or contact ManuFlo).

Ordering Option Codes:

No: CHANNELS (on Card)		PULSE OUTPUT (to computer input)	
Code:	**Description:**	**Code:**	**Description:**
ME5IC-5	5 channel card (5 product admix. control PCB)	2A -	110-240vac triac pulse output switching
ME5IC-4	4 channel card	2B -	24vac ""
ME5IC-3	3 channel card	2C -	5-24vdc opto isolated pulse output switching ME5IC-2
ME5IC-2	2 channel card		(sink = pulse to O.V.)
ME5IC-1	1 channel card (single card admix PCB model)	2D -	5-24vdc (source = pulse to +).
ME5IC-1W	**1 channel card (for water batch applications using ME995-7-5P)**		

START DRIVES (from computer output control drives)		CABLE LENGTH	
1A -	240vac start and reset relays	3A - 2 metres cable x 5 cords (Card to ManuFlo controllers)	
1B -	110vac "	3B - 3 "	
1C -	24vac "	3C - 4 "	
1D -	24VDC "		

When ordering ME5IC card, add the codes to indicate which specification option is required to suit your PLC/computer I/O control card.
For example: ME5IC-5-1A-2A-3B.

Due to continuous product improvement, specifications are subject to change without notice.

ME5IC -5 channel complete wiring diagram with ME995-3-5P batch controller and MES20 flowmeter

WARNING: AC Black opto's –when they latch/switch off , sometimes / intermittently they can have a residual standing voltage of over 30VAC. This can be enough to keep the ManuFlo ME5IC start relay HELD ON & ACTIVATED. This will keep the batch controller ON and powering the PUMP until power is cut off. Install the resistor to reduce / minimize OPTO leakage to solve the issue.
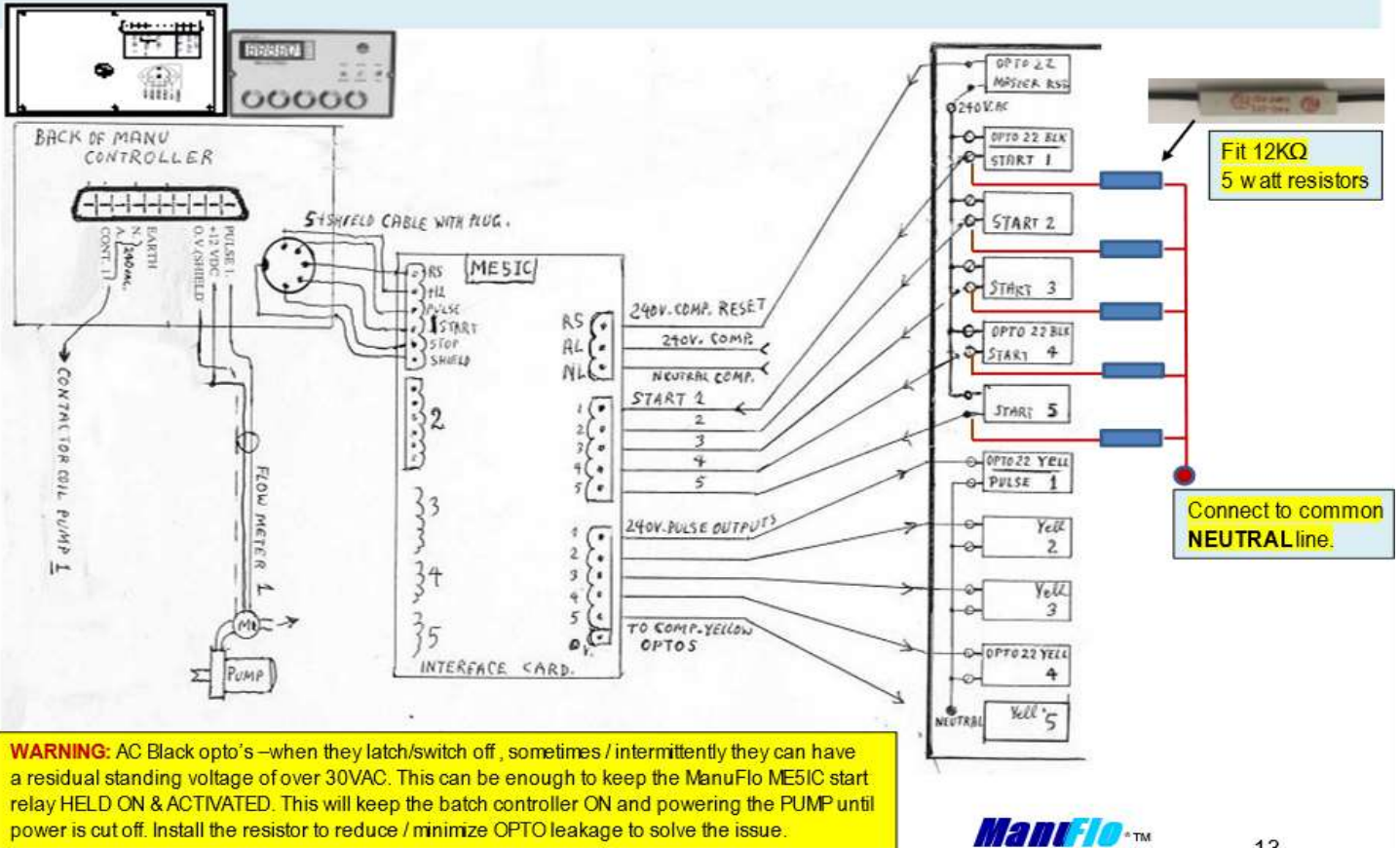
Note: For 5 VDC (e.g. Jonel) wire to white Opto inputs. Use the O.V. connection as the return line for DC.

TROUBLE SHOOTING GUIDE

| Symptom	Solution
1. Computer continues batching on after batch target.	Optos when switching off, can have residual leakage voltage, high enough to keep relay coil of ME5IC onstate, driving Batch Controller and pump until it reaches its setting on front dials. Measure between Neutral and Active of Opto, if above 50vac in off-state, fit a 10-15K 10watt resistor to drain leakage to neutral. Generally in this situation, batch will run to setting on ManuFlo controller. If running past settings, contactor coil may be stuck on (i.e. is faulty). Turn off power and replace.
2. Computer display and ME995 display not matching.	Check that the divided pulse value on ME5IC and computer pulse input value are matched e.g. 10mls/pulse. Note: Preferably use ME995 controllers that display in total millilitres or Litres dispensed.
3. Calibrated collected quantity matches ME995 display, but not computer display quantity. Computer misses pulses.	Check pulse divider value on ME5IC card, check computer input value. Pulses to AC computer inputs must not exceed 13Hz or max. scanning time. Check pulse dividers and computer input. (Admix Flow speed mls/sec) divided by (divided pulse value) =< 13Hz. e.g. AEA flowing at 150ml/sec through divider of 10ml/pulse = 15Hz. Means computer i/p will miss pulses, and overdose will occur. So, restrict flow or increase divider to 20mls/pulse.
4. Reset, start or stop function to ME995 not working. ME995 counts but no counts to ME5IC (LED pulse not blinking).	Check 5-pin (-5P) interface plug at rear of ME995 Batch Controller, may not be properly secured and locked (intermittant contact), or wire broken inside plug. Open plug and inspect wiring joints. Inspect connections from cable entering ME5IC interface plug. Wire may be shorted – inspect same.
5. ME995 Batch Controller overrides batch target	Front dial batch settings below computer batch targets. Select to higher value. Pulsefail LED activated, flowmeter blockage/problem, check flowmeter.
6. ME995 alarm condition	This indicates batch has been interupted, or overbatched. Before releasing truck load, check ME995 and computer displays. If discrepancy, dump load or compensate. Call for service. Refer to ME995/MES20 troubleshooting/maintenance guides.
7. After above checks, ME5IC still appears defective.	After consultation with installer/admix supplier or ManuFlo, replace ME5IC card, or ME995 controller, or Flowmeter or OPTO. Check operation guides for each product.

Interface Cards – Using ME5IC with ME995 / MES20

MES20 Flowmeter   ME995 Batch Controller   -5P interface   ME5IC   Computer/PLC
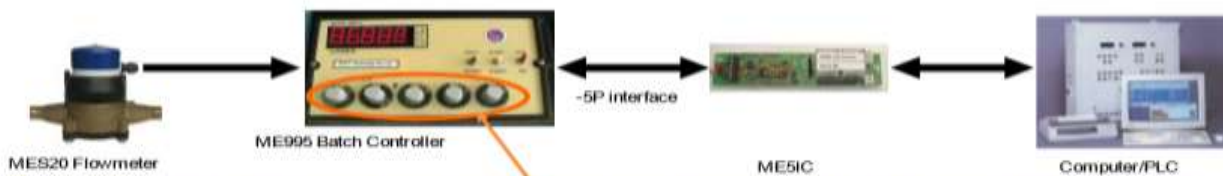
- **When the PLC/batch Computer controls the system, then set the ME995 rotary dial knobs on the maximum permissible batch limit required. E.g. 50,000 Milliliters or 50 liters. (The PLC will now control the starting and resetting the system for each batch selection via the ME5IC interface card).**

- **Interface card (1 to 5 channel options)**

- Provides interfacing and control of ManuFlo **Batch Controllers with Computer/PLC's**. Primarily designed for interfacing to American Command -batch, Eagle, Alkon and Jonel industrial computer batching systems. (which only have a PLC Start & Hold batch active drive – no stop signal).

- Enables incorporation of the ME995 Batch Controllers and their **safeties** to the Computer /PLC batch system , & provides an **independent backup batch facility**.

> Superseded by ME2008 .

- **Batch Controller must be fitted with the "–5P" 5-pin interface plug option.**

Interface Cards – ME5IC-5 – Operation
(e.g. 240vac Command – 5 channel Admixtures)

> Superseded by ME2008 .

Batch Controller   -5P interface   ME5IC-5   1 pulse = 10, 20, 50 or 100mls   Computer/PLC

MES20 Flow meter   Pump
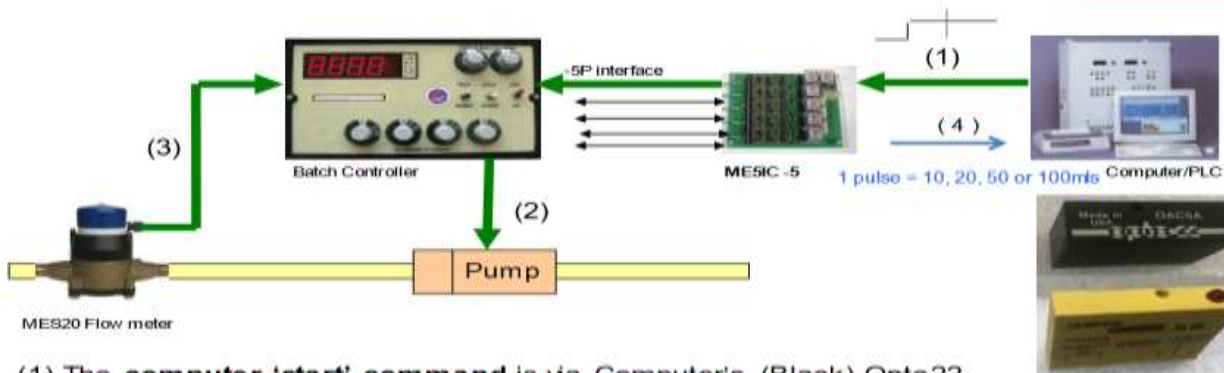
(1) The **computer 'start' command** is via Computer's (Black) Opto 22.
The Opto stays on for the duration of computer batch cycle.
The start voltage to the Batch Controller must be **on for at least 1.0 second**

(2) **Batch Controller starts** : activates 240 vac drive to pump and/or solenoid.

(3) Once liquid flow begins, flowmeter will **pulse** to the Batch Controller.
(4) Scaled pulses from the ME5IC card are sent to computer OPTO (yellow) input.

(B) Interfacing "5P" – with ME5IC-1W – Operation
(e.g. 240vac Eagle– 5 channel Admixtures)

Batch Controller   -5P interface   ME5IC-1-W   Computer/PLC

RPFS or MAG Flow meter   Pump
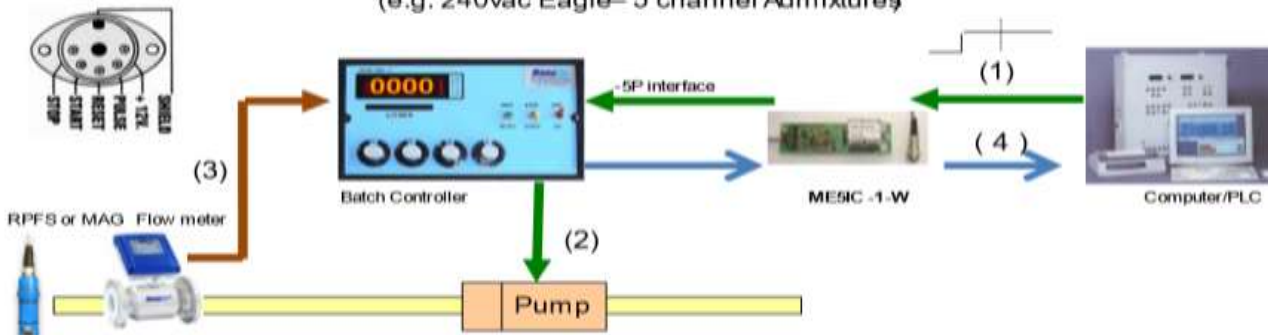
(1) The **computer 'start' command** is via Computer's Black Opto 22 (or Red DC Opto) .
The Opto stays on for the duration of computer batch cycle.
The start voltage to Batch Controller must be **on for at least 0.5 seconds**

(2) **Batch Controller starts** : activates 240 vac (or DC) drive to pump and/or solenoid.

(3) Once liquid flow begins, flowmeter will **pulse** to the Batch Controller.
(4) Scaled pulses via the ME5IC 1W card sent to computer input.
(5) When desired pulses arrive to PLC, start drive from PLC disengages , STOP pulse then generated by ME5IC card to batch controller, batch is complete.