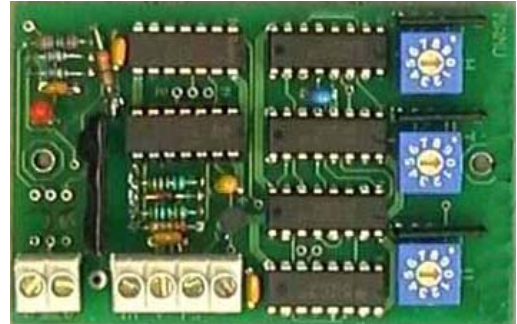


UIC - UNIVERSAL PULSE INTERFACE CARD

FEATURES



- Simple calibration setup and use.
- Suitable with most NPN & contact closure flowmeters.
- Fully isolates flowmeter pulses to PLC input.
- Australian Made.

The Universal Interface Card (UIC) provides signal scaling and an isolation interface to pulse flowmeter outputs, and re-transmits to PLC/computer inputs. Three model variants are available:

- 1) **UIC/A2** : 24-250 vac pulse switching via a heavy duty triac opto.
- 2) **UIC/A1** : 110-240 vac pulse switching via a triac opto.
- 3) **UIC/D** : 5- 30 VDC NPN/PNP (sink/source) pulse switching via a 4N33 opto.

■ x10 input is standard. A x50 input is optionally available. ■ Common to all is a low voltage 5-12 VDC NPN (sinking) scaled output pulse (proportional to supply voltage), which can be used for connection to counters or other devices. ■ All scaled output pulses are indicated by a LED, with pulses feeding the PLC input device having 50% duty cycle (square wave). There are two mounting holes, for fixing to panels, enclosures etc. ■ The card requires a regulated voltage supply of 5 to 12VDC, which in turn supplies the flowmeter. If only 24 VDC supply is available, then, as an option, a special voltage regulator can be fitted on to the card.

CALIBRATION AND USE

■ The UIC is suitable for use with most types of pulse output flowmeters. ■ Calibrating or scaling of pulse output signals is via three decade rotary select switches (numbered 0-9) marked H (Hundreds), T (Tens) and U (Units). ■ To change calibration, use a small flat-bladed screw driver, insert into switch slot and turn arrow to desired number (**see calibration calculation examples on page 3**) ■ For batching with concrete admixtures, the MES20/MES20S 20mm pulse flowmeters are primarily used. For pulse scaling setpoint values, refer to the following table (for a x10 input standard UIC card):

Rotary value H T U	UIC card pulse o/p rate	Volume per pulse
0 2 5	200 pulses/Litre	5 ml/pulse
0 5 0	100 pulses/Litre	10 ml/pulse
1 0 0	50 pulses/Litre	20 ml/pulse
1 5 0	33.3 pulses/Litre	30 ml/pulse
2 5 0	20 pulses/Litre	50 ml/pulse
5 0 0	10 pulses/Litre	100 ml/pulse
9 9 9	5 pulses/Litre	200 ml/pulse

Final Calibration:

If the liquid collected is **more** than pulse value shown on computer screen, then **decrease** the rotary decade set value by the same % difference.

If the liquid collected is **less** than pulse value shown on computer screen, then **increase** the rotary decade set value by the same % difference.

Note: Final calibration can also be performed via computer software scaling.

For calibration for use with larger MES meters and other flowmeters (e.g. RPFS paddlewheel) see calibration calculation examples on page 3.

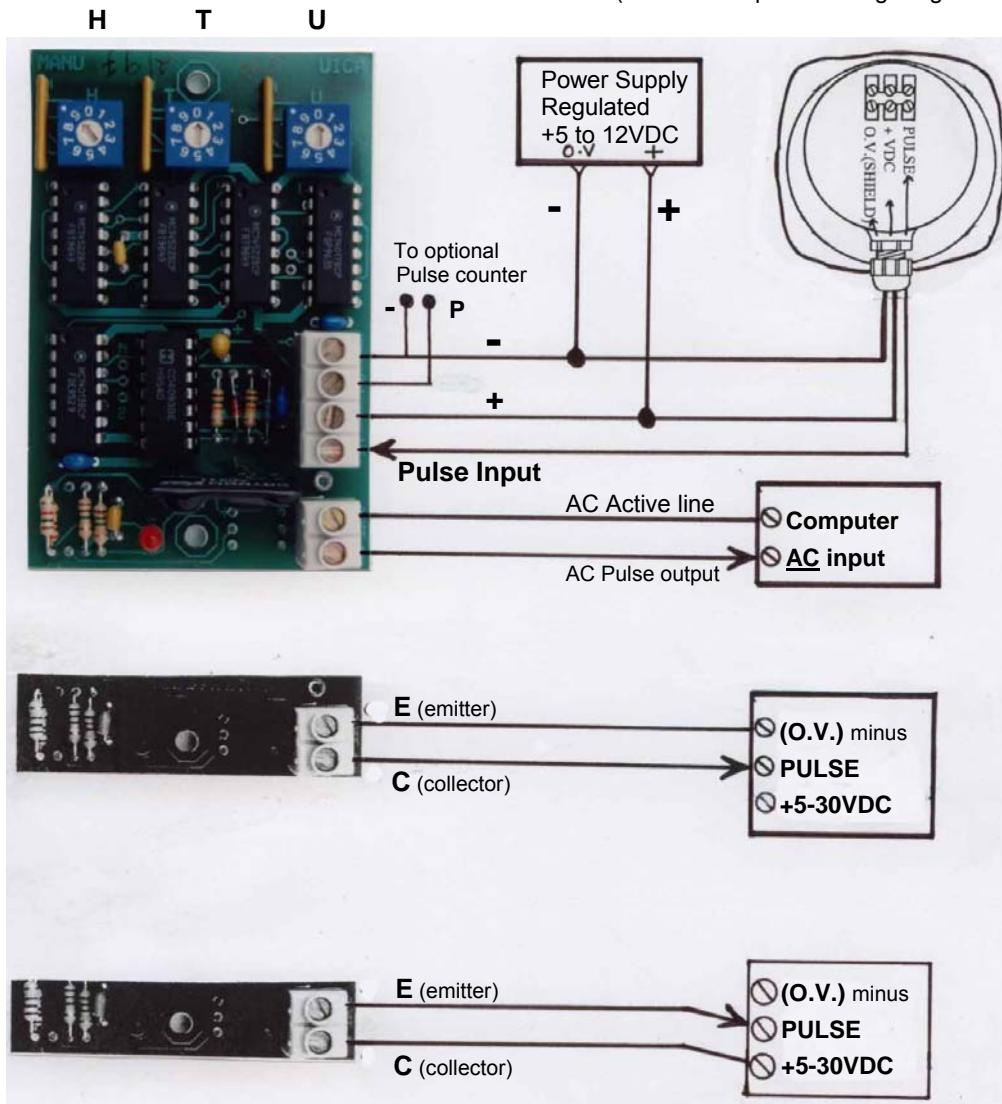
SPECIFICATIONS

Supply voltage	5 to 12 VDC, must be regulated DC voltage (optional 24 VDC input with voltage regulator)
Pulse input frequency max: x 10 input (standard) x 50 input (optional)	2 kHz (e.g. with MES20) 350 Hz (used with low frequency pulse output flowmeters).
UIC/A2 AC switching	24 - 250 vac switching* up to 1 Amp via CRYDOM AO241 solid state opto triac, with surge protection to 2500 V RMS. Drives yellow Opto22 input modules or equivalent solid state inputs.
UIC/A1 AC switching	110-240 vac switching* Motorola 3041 opto drives solid state inputs. * Due to AC triac opto isolator characteristics, frequency output to computer inputs should not exceed 15Hz.
UIC/D Open Collector switching	5-30 VDC via 4N33 Motorola opto, open collector (sink or source), surge protection to 7500 V RMS.
Pulse Data	Pulses from flowmeters can be needle shaped, so UIC's Schmitt trigger input filters possible industrial noise. UIC output pulses are conditioned to 50% duty cycle.

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

WIRING /CONNECTION DETAILS

Note: Supply voltage must be regulated 5-12 VDC only
(Unless the special voltage regulator is fitted on UIC card)



Flowmeter Pulsehead entry
MES20 or other meter
Upto 1km distance
USE SHIELDED CABLE ONLY

UIC/A1 or A2
AC Pulse version
AC Pulse to TRIAC

UIC/D SINK
DC Pulse wiring
Pulse & Ground (o.v.) Connection

UIC/D SOURCE
DC Pulse wiring
Pulse & Positive (+) Connection

Note: Pulse output rate to AC input PLC/computers must not exceed 13Hz (13 pulses per second rule). Any pulserate faster than 13Hz will cause overdose, as computer will miss pulses due to its AC input or scanning time limitations. Relates to any 24-240 vac pulse inputs (Eagle/Alcon/Jonel etc). To use UIC/A (x10input) card with each MES flowmeter size, refer to the following scaling chart (other combinations can be set):

** means best and most common settings

Meter Model	Size	UIC/A card setting H T U	Pulse Output value	Flowrate	Equivalent pulse frequency
MES20	20mm	5 0 0	100 mls per pulse	1 Litre/sec	10 Hz **
"	"	2 5 0	50 mls per pulse	0.65 Litres/sec	13 Hz
"	"	1 0 0	20 mls per pulse	0.26 Litres/sec	13 Hz
"	"	0 5 0	10 mls per pulse	0.13 Litres/sec	13 Hz
(Maximum flowrate of MES20 is about 1000mls/sec i.e. 1Litre/sec, 60 LPM)					
MES25	25mm	2 7 7	100 mls per pulse	1.3 Litres/sec	13 Hz
"	"	5 5 5	200 mls per pulse	1.8 Litres/sec	09 Hz **
"	"	6 9 3	250 mls per pulse	1.8 Litres/sec	7.2 Hz
(Maximum flowrate of MES25 is about 1830mls/sec i.e. 1.83 Litres/sec, 110 LPM)					
MES32	32mm	1 3 0	100 mls per pulse	1.3 Litres/sec	13 Hz
"	"	2 6 1	200 mls per pulse	2.6 Litres/sec	13 Hz **
"	"	3 2 6	250 mls per pulse	3.0 Litres/sec	12 Hz **
"	"	6 5 2	500 mls per pulse	3.0 Litres/sec	06 Hz
(Maximum flowrate of MES32 is about 3000mls/sec i.e. 3 Litres/sec, 180 LPM)					
MES40	40mm	1 4 5	250 mls per pulse	3.2 Litres/sec	13 Hz **
"	"	2 9 0	500 mls per pulse	5.0 Litres/sec	10 Hz **
"	"	5 8 0	1 Litre per pulse	10.0 Litres/sec	10 Hz
(Maximum flowrate of MES40 is about 6000mls/sec i.e. 6 Litres/sec, 300 LPM)					

Notes: Maximum flowrate for each meter size must never be exceeded, in order to prevent damage to flowmeter chamber parts and/or overdose problems. Install a Flow Restrictor Valve inline for safety, or use the ME2000 pulserate limiter.

For long-life durability of the flowmeter chamber parts, best flowrange is nominal continuous rating (Qnom.) - see MES brochure.

INSTALLATION GUIDE for UIC interface card(s) with MES20 flowmeter(s) systems.

- (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. The cover should be lightweight, with handles, for access by service personnel. A vibration free area is recommended, as the the MES20 is sensitive to high vibrations that could generate some stray pulses.
- (2) Outlet point position in relation to storage tank determines the equipment you will need:

Outlet point location	Pump	Non-Return Valve or spring-loaded Check Valve	flow restriction Gate or Ball Valve	Flowmeter with pulse output	Solenoid Valve
above top of storage tank (most common)	yes	yes (12 psi)	yes	yes	in some cases, for instant shut-off of flow. May not be required if installation has reasonable head height.
middle of storage tank	yes	yes (12 psi)	yes	yes	yes
below bottom of storage tank			yes		yes

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" diameter pipe. For very high flowrates use 1 1/4 inch. NOTE: Pipeline may be reinforced hose, rigid PVC or metallic.

Warning: Running flowmeters over their maximum flow rating will damage them and cause overdosing.

PUMP SELECTION

With 20mm MES20 flowmeters 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/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 inlet to outlet flow valve or recirculating flow line. When using larger capacity flowmeters, a proportionally larger pipe and pump will apply). **Note:** This method to restrict flow eliminates air being counted by MES flowmeters when the 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, preventing blockage or damage to flowmeter measuring chamber unit (Y-strainer 800 micron filter recommended).

COMMISSIONING FLOWMETER / UIC INTERFACE CARD SYSTEM(S)

- Electricians must refer to the relevant system wiring diagram. Mount the UIC interface cards on a suitable panel or inside an enclosure near the computer/PLC input panel. When wiring the flowmeter(s), use shielded cable. For example, when wiring 4 flowmeters in the one installation, use at least 6-core shielded cable: 4 cores for each pulse wire and at least one core for the positive DC voltage supply linked to each UIC card and the flowmeters, and one core coupled with the shield as 0.V.
- Wire the Pulse Output and return line from the dual (white) terminal to the computer/PLC pulse input(s).
- Wire the external power supply (also available from ManuFlo, to the UIC card which in turn supplies voltage to flowmeter(s). Power supply must be +5 to 12 VDC only, noting each UIC card/flowmeter can draw up to 25mA each.
- Set the appropriate calibration setting on the UIC via the 3 decade rotary pots, marked H (Hundreds), T (Tens) and U (Units).
- Power up the system. Prime the admix line, until liquid appears at outlet line, UIC's pulse LED is blinking and your computer screen is counting.
- A volumetric calibration test must be performed when commissioning a new installation, and a follow-up quarterly test:** a calibrated vessel is placed near the sock, a selected batch quantity set on computer, and batched. See UIC card's brochure for calibration details. Example: MES20 flowmeter used, 10.1 Litres called on batch computer program, 100mls/pulse set on UIC (HTU=500), 10.1 litres of admixture collected in container, 101 counts on computer. 101 x100mls =10.1 Litres = CORRECT RESULT. If 10.3 Litres collected in container, is approximately 2% excess admix, so subtract 2% from the current HTU=500 setting i.e. set HTU=490. Batch again, result should BE CORRECT.

CALIBRATION VALUES using RPFS-P paddlewheel flowmeters for water

Pipe size (mm)	UIC card with STANDARD x10 pulse input multiplier		UIC card with x50 pulse input multiplier	
	UIC Set Value H T U	Output pulses per Litre to PLC/computer	UIC Set Value H T U	Output pulses per Litre to PLC/computer
25	3 7 5	1 pulse per 1 Litre	1 8 5	10 pulses per 1 Litre
32	2 3 0	1 pulse per 1 Litre		
40	1 5 0	1 pulse per 1 Litre		
50	1 0 0	1 pulse per 1 Litre	5 0 0	1 pulse per 1 Litre
65	0 6 0	1 pulse per 1 Litre	3 0 0	1 pulse per 1 Litre
80	3 6 5	1 pulse per 10 Litre		
80	0 7 3	1 pulse per 2 Litre	3 6 5	1 pulse per 2 litres
100	0 9 2	1 pulse per 4 Litre	1 2 5	1 pulse per 1 Litre
	$HTU = \frac{\text{input pulses/Litre}}{\text{output pulses/Litre}} \times 5$ e.g. to convert 20 pulses/Litre to 1 pulse/Litre: $HTU = \frac{20 \text{ pulses/Litre}}{1 \text{ pulse/Litre}} \times 5$ HTU = 100 (i.e. H=1 T=0 U=0)		$HTU = \frac{\text{input pulses/Litre}}{\text{output pulses/Litre}} \times 25$ e.g. to convert 7.3 pulses/Litre to 1 pulse/2 Litres: $HTU = \frac{7.3 \text{ pulses/Litre}}{0.5 \text{ pulse/Litre}} \times 25$ HTU = 365 (i.e. H=3 T=6 U=5)	

All values are starting reference values for RPFS-P and are approximate only, due to possible variations in installation conditions e.g. due to pipe direction, water quality etc. Values could vary up to 10%.