

WATER BATCHING SYSTEMS

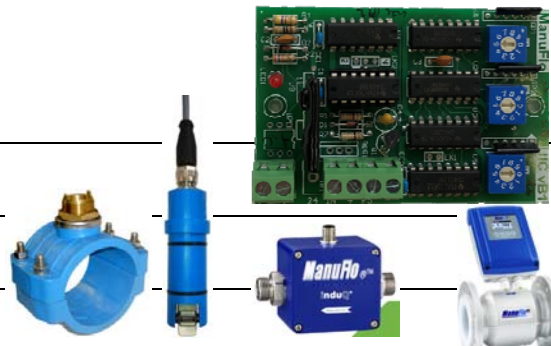
UIC Universal interface pulse scaling card

with RPFS-P, CMM or KMS flowmeters.



Congratulations on choosing a **ManuFlo**®™ flowmetered Interfaced Measurement System.
You will now join many thousands of satisfied customers worldwide.

Your system comprises:



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

Information sheets included:

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

Prior to installation:

- A. Consider a good access position for the UIC Interface Card for any future calibration scaling changes in close proximity to the PLC/Computer Control System.
- B. **i)** When using **RPFS** Paddlewheel flowmeters, the **UIC-24VDC** versions will supply +12vdc regulated voltage directly to the flowmeters. (Use the +12VDC rail to power all the flowmeters). When using the **UIC** versions with power supply of +5-12VDC, the card will output the same proportional voltage to the flowmeter.

ii) When using **CMM15/20/25** Mag-flowmeters they require 24VDC power:
1/ If Using the +12VDC power rail from the **UIC-24VDC** or **UIC-5-12VDC** then use a 12-24VDC voltage step up converter (part# CV12-24) the power the **CMM** Magflows with the required +24vdc.
or alternatively:
2/ use a separate +24vdc power supply to adequately power the **UIC-24VDC** and the **CMM 25** Magflow directly.

iii) When using **KMS/RMS** (and other) Mag-flowmeters, these Magflows draw too much current to be powered via the **UIC** cards. In this case power the Magflows directly and only use the pulse wire and shield (o.v.) wire (2 wires) to connect to **UIC inputs**. (Do not use the +12vdc supply rail).
- C. Install the flowmeter as per the installation guide found on the flowmeter brochure.
- D. Use shielded cable only for connection between flowmeters and UIC interface cards.
- 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.

ManuFlo®™

Flow Measurement Products

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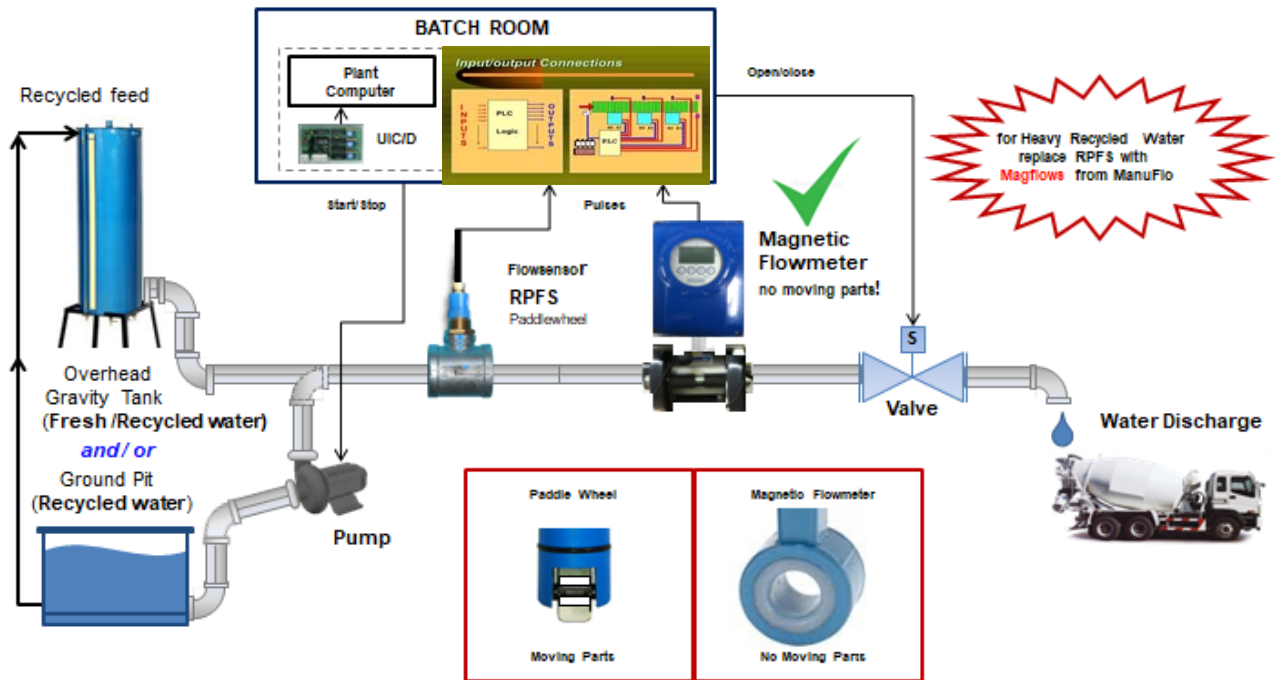
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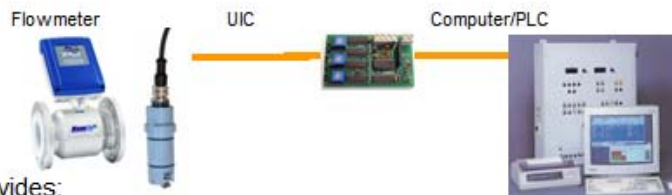
Heavy Recycled Water - Measurement - Solution



ManuFlo™

MANU ELECTRONICS PTY LTD
41 Carter Rd, Brookvale

Interface Cards – UIC for Water Batching



The UIC **Universal Interface Card** provides:

- signal **scaling** and
- an **isolation interface**

to pulse flowmeter outputs, and re-transmits to PLC/computer inputs. Models available:

- 1) **UIC/A2** : 24-250 **vac** pulse switching via a heavy duty triac opto
- 2) **UIC/D** : 5 - 25 **VDC** NPN/PNP (sink/source) pulse switching via a 4N33 opto
- 3) **-24** : As above but 24VDC supply input as opposed to the standard 5-12VDC supply to card

UIC/A2



triac

UIC/D



-24 with /A2 or /D option



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CONVERTER FOR CMM25 MAGFLOWS
12-24vdc part # CV12-24)

FLOWMETER OVERVIEW STATS.

i) RPFS-P Rota Pulse paddlewheel output flowmeters

- **Ideal for Water Measurement applications.**
- Fresh and Mild recycle

- Full range Accuracy: $\pm 2\%$, Repeatability: $\pm 0.8\%$
- Supply current: 5 to 25mA.
- Maximum working pressure: 1160 kPa
- Temp. 45°C, cold water,
- 120°C hot water version



Order Code	Description	Approx. Pulses / Litre	Approx. Flowrange Litres/min
	Digital Pulse Output +5 to 30VDC		
GAL25		(80 ppl)	20 - 220
GAL40		(30 ppl)	50 - 550
PVC50		(20 ppl)	90 - 990
PVC80		(7 ppl)	200 - 2500
PVC100		(4 ppl)	300 - 3500

ii) CMM Compact Mini-Mag Flowmeters

- 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 $\mu\text{S/cm}$.
- 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, Empty Pipe Detection.
- Accuracy largely unaffected by varying viscosities or SG's of liquids.



Order Code	Description	Pulses / Litre	(Litres/min)
CMM15	1/2" MiniMag (15mm -Bsp(m) connection, 7mm ID bore). pulse output	1000	0.5 -- 30
CMM20	3/4" MiniMag (20mm -Bsp(m) connection, 10mm ID bore). pulse output.	500	1.0 -- 60
CMM25	1" MiniMag (25mm -Bsp(m) connection, 20mm ID bore). pulse output.	100	5.0 -- 250

iii) KMS501W Magnetic Wafer Flowmeters

- For Liquid (upto 20% solids).
- 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 $\mu\text{S/cm}$



Order Code	Description	Flowrange (Litres/min)		
		min. ($\pm 3\%$)	min ($\pm 0.5\%$)	max ($\pm 0.5\%$)
KMS501-015W	15 mm Wafer tube, PFA SS reinforced liner, Hast-C-probes 85-253vac	0.5	5	106
KMS501-025W	25 mm Wafer connection, " " " " "	1.5	14	295
KMS501-040W	40 mm Wafer connection, " " " " "	10	20	667
KMS502-050F	50mm Flanged	15	30	1100
KMS502-080F	80mm Flanged	25	45	2800
KMS502-100F	100mm Flanged	35	70	4500
KMS502-150F	150mm Flanged	60	100	10000
-DC	24vdc powered version			

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Interface Card - UIC – installation

- Mount UIC interface cards on a suitable **panel** or **inside an enclosure** near the Computer/PLC input panel.
- When wiring the flowmeter, 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.
- Select the appropriate **calibration pulse ratio** setting via the 3 decade rotary pots, marked **Hundreds(H) Tens(T) and Units(U)**.
- **Power up the system.**
- **Prime the admix line**, until liquid appears at outlet line, UIC card's pulse LED is blinking and the 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.



Interface Card - UIC - scaling

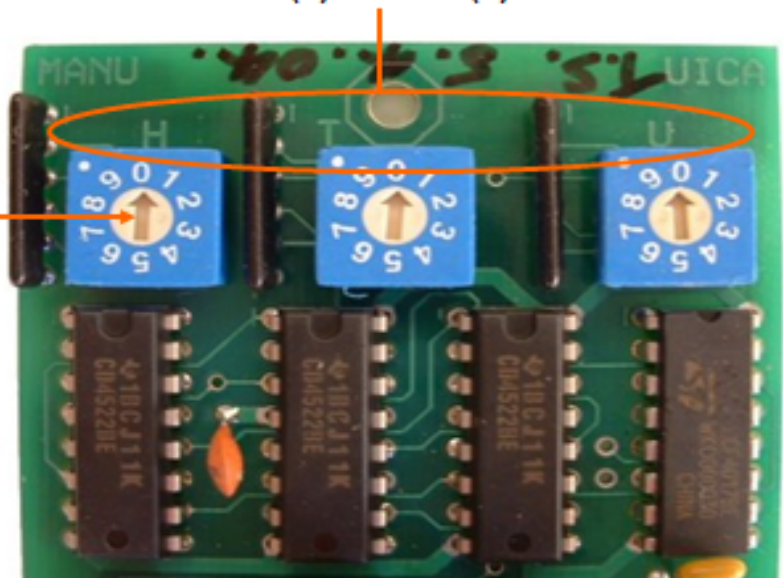
Calibrating or scaling of pulse output signals is via 3 rotary select switches (numbered 0-9) marked **Hundreds (H), Tens (T) and Units (U)**.

Use small flat-bladed screwdriver, insert into switch slot and turn arrow to desired number.

$$HTU = \frac{(\text{input ppL}) \times 5}{(\text{output ppL})}$$

e.g. to convert 1000 ppL to 10 ppL:

$$\begin{aligned} HTU &= \frac{1000 \text{ ppL} \times 5}{10 \text{ ppL}} \\ &= 100 \times 5 \\ &= 500 \\ &= (H=5) (T=0) (U=0) \end{aligned}$$



Interface Cards - UIC – scaling for Water Batching

- interface cards are available to scale output pulses.
- to avoid interference, use only shielded cable.
- make sure only pure regulated supply DC voltages used.
- For AC pulse inputs the 15Hz maximum pulse speed rule applies.
- For DC inputs 40Hz or high speed with some PLC's



For batching with water lines, the RPFS paddlewheel and Magflow flowmeters are primarily used. Scaling values (x10 input card standard) :

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.

Rotary decade value H T U	Pulse output rate
Magflow with 10 ppl	
0 5 0 DC	1 Litre /pulse
1 0 0 AC	2 Litres/pulse
2 0 0	4 Litres/pulse
2 5 0	5 Litres/pulse
5 0 0	10 Litres/pulse

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

■ x10 input. ■ 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. ■ A special voltage regulator is fitted on to the card for use with a +24 VDC power supply. The UIC card supplies regulated +12VDC power to the flowmeter (where required).

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 the following table (for a x10 input standard UIC card):

Rotary value	UIC card	Volume
H T U	pulse o/p rate	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.

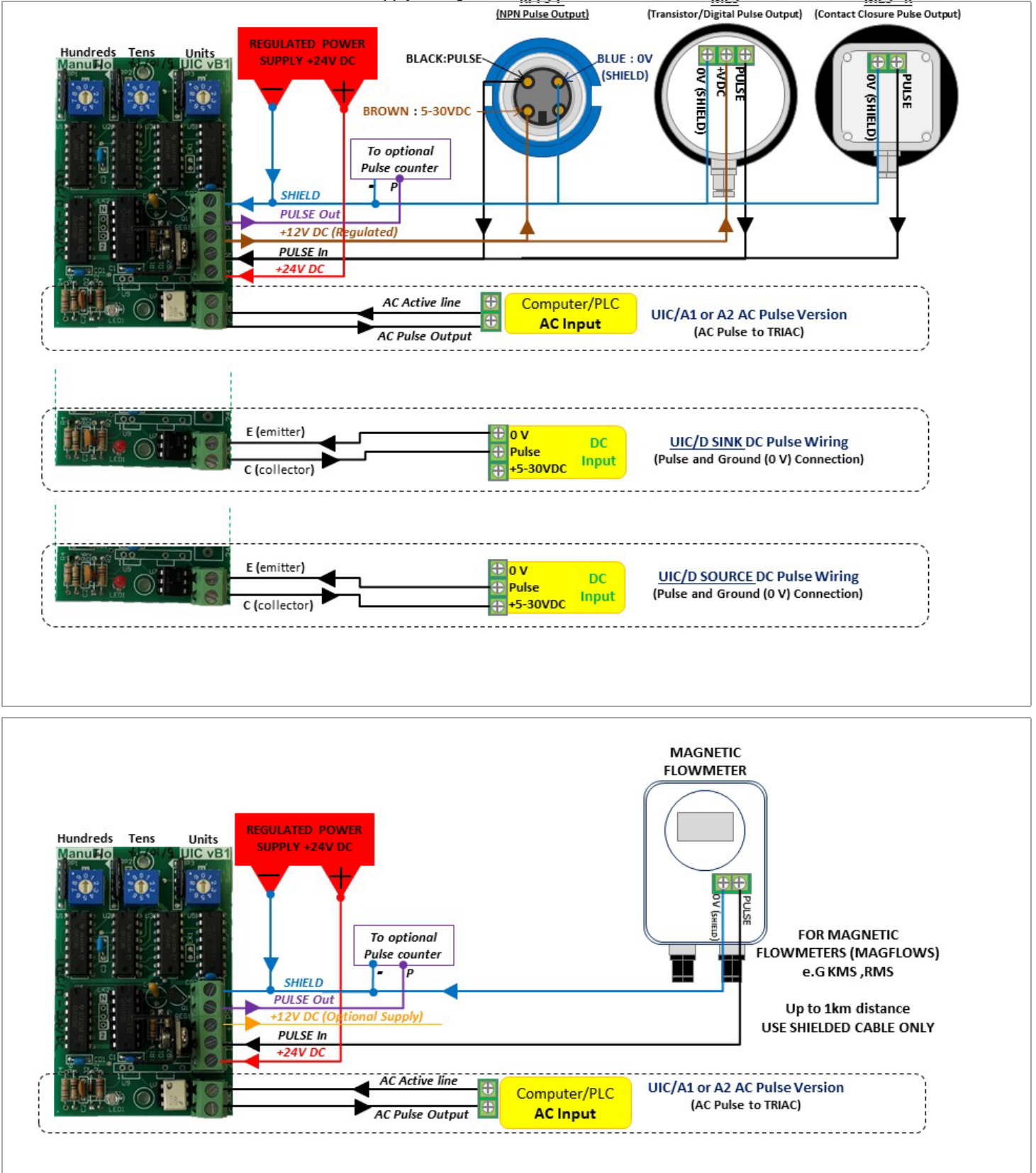
Note: Final calibration can also be performed via computer software scaling.

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	+24V DC
Voltage to flowmeter	+12 VDC regulated, supplied by UIC to power the flowmeter
Input	Accepts NPN Transistor or contact closure input
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 UIC/A1 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. 110-240 vac switching* Motorola 3041 opto drives solid state inputs. <i>* Due to AC triac opto isolator characteristics, frequency output to computer inputs should not exceed 15Hz.</i>
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.

WIRING / CONNECTION DETAILS Note: Supply voltage must be +24V DC.



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 24V DC 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. $101 \times 100\text{mls} = 10.1 \text{ Litres} = \text{CORRECT RESULT}$. 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.

If there is no pulse output from the UIC

1. Check that the HTU settings on the UIC card are not set to H=0 T=0 U=0, and are correct for your application.
2. Turn off power to the UIC, then turn power on again.
3. Have a low flow through flowmeter (or simulate a low flow by inputting pulses to the UIC).
4. Observe if the UIC's output LED blinks at the rate expected for the output pulse rate.
5. If the problem still exists, repeat steps 1 to 4 (2-3 times) until the UIC card autocorrects itself.
6. If the UIC does not autocorrect, then return the suspect UIC card to ManuFlo for further checking or repair.

CALIBRATION VALUES using RPFS-P paddlewheel flowmeters for water		
UIC card with STANDARD x10 pulse input multiplier		
Pipe size (mm)	UIC Set Value H T U	Output pulses per Litre to PLC/computer
25	3 7 5	1 pulse 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
65	0 6 0	1 pulse per 1 Litre
80	3 6 5	1 pulse per 10 Litre
80	0 7 3	1 pulse per 2 Litre
100	0 9 2	1 pulse per 4 Litre
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%.		

CALIBRATION VALUES using MAGFLOWS (e.g. PMS, MFS, RMS)		
UIC card with STANDARD x10 pulse input multiplier		
Output pulse from Magflow	UIC Set Value H T U	Output pulses per Litre to PLC/computer
1 pulse per 1 Litre	0 0 5	1 pulse per 1 Litre
	0 1 0	1 pulse per 2 Litres
	0 2 5	1 pulse per 5 Litres
	0 5 0	1 pulse per 10 Litres
10 pulses per 1 Litre	0 5 0	1 pulse per 1 Litre
	1 0 0	1 pulse per 2 Litres
	2 5 0	1 pulse per 5 Litres
	5 0 0	1 pulse per 10 Litres
100 pulses / 1 litre	0 5 0	100 mls per pulse
" " "	0 1 0	020 mls per pulse
" " "	0 0 5	010 mls per pulse
For CMM25 magflow		

$$\text{HTU} = \frac{\text{input pulses/Litre}}{\text{output pulses/Litre}} \times 5$$

e.g. to convert 20 pulses/Litre to 1 pulse/Litre:

$$\text{HTU} = \frac{20 \text{ pulses/Litre}}{1 \text{ pulse/Litre}} \times 5$$

$$\text{HTU} = 100 \text{ (i.e. H=1 T=0 U=0)}$$

Calculation Example

CALIBRATION VALUES using MES flowmeters

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	1.2 Litres/sec	12 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)					