

Monita F Series

The Flow Monita

OPERATION MANUAL



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1.0 FEATURES

The Monita F Series is part of the Monita Range of Data Loggers and Alarm Monitoring products designed and manufactured by Monatec. The Monita F Series Flow Monita has been designed as a low-cost interval flow recorder for use in water supply systems. The key features of the product are -:

- Detects low velocities
- Simple installation
- Easily programmed
- No moving parts
- Maintenance free
- No pressure drop
- Weatherproof enclosure
- Suitable for pipe ranges from 50mm - 200mm

2.0 APPLICATIONS

The Flow Monita has been designed to suit a number of applications in water supply systems which include -:

- Detection of illegal usage (0.01 m/s to 3.0 m/s).
- Leak detection (>0.005 m/s).
- Zone / Usage pattern logging (0.01 m/s to 3.0 m/s).

In summary the main product features include:

- Measures and records flow velocity at a sample interval from 1-99 minutes
- Displays, Total Usage* and last recorded flow Velocity
- Downloadable history

Options include -:

- Up to 1 million record capacity
- Remote logging via GSM
- Up to 4 pulse input channels

*** Note:** Total Volume displayed is based on the flow measurement interval and does not comply with any metering standard. The volume on a system with constant flows (ie a pumped irrigation system) should however provide a volume to within the accuracy of the flow sensor. On systems with varying flow Velocities between the flow measurement interval there could be quite large discrepancies between the actual volume and the displayed volume. The Flow Monita has been designed to be a low cost indicator of usage not to replace a meter. The Device could however be used as a way to distribute total flows from a main meter by using the device to calculate a percentage of the master meter.

3.0 SPECIFICATIONS

MONITA F SERIES - Flow Detection & Logging			
Sensor Temp Range	Min	2°C	
	Max	50°C	
Flow Range	Min	0.005 m/s	
	Max	3.0 m/s-Will withstand up to 20 m/s but maximum flow Velocity recorded is 3.0 m/s	
Pressure	Max	2500kPa	
Accuracy		± 5% of Full Scale	
Display		2 x 8 display.	
Logging Features	Memory	0, 100K or 2 million records	
	Frequency	1 to 65,536 seconds	
	Device ID	Up to 20 alpha numeric characters & factory set 10 digit numeric value	
	Optional Meter Inputs	Up to 4 inputs in Fast Pulse Mode (software selectable)	
		Fast Switching Mode (Note:- offers lower noise immunity)	
	Max cable input cable length 2 metres		
	Switch Type	Voltage free switch with Normally Open (NO) contacts with minimal debounce	
	Min Pulse Width (N/O)	250us	
	Min Pulse Separation	2mS	
	Input Impedance	>10MOhms	
	Max Input Frequency	100Hz	
	Edge Detection	Open to Closed or Closed to Open	
	Positive Duty Cycle	>5%	
	Negative Duty Cycle	<=85% @ 100Hz	
		<=90% @ 70Hz	
		<=95% @ 25Hz	
	Up to 4 inputs in Slow Pulse Mode (software selectable)		
	Slow Switching Mode (Note:- offers higher noise immunity)		
	Max cable length 20 metres		
	Switch Type	Voltage Free switch with Normally Open (NO) contacts with minimal debounce	
	Min Pulse Width (N/O)	2.5ms	
	Min Pulse Separation	20mS	
	Input Impedance	>10MOhms	
	Max Input Frequency	10Hz	
	Edge Detection	Open to Closed or Closed to Open	
	Positive Duty Cycle	>5%	
	Negative Duty Cycle	<=85% @ 10Hz	
<=90% @ 7Hz			
<=95% @ 2.5Hz			
NOTE: All 4 inputs share a common ground return. Electrically all sensors should be isolated from all other grounds or circuitry.			
Clock	On board 24 hour real time clock with date facility.		

Physical	Dimensions (C or D Battery Pack)	Control Box Remote	88mm Ø x 177mm or 88mm Ø x 220mm
		Remote Sensor	130mm x max 27mm Ø
	Construction	Base & Sides	UV Stabilized 20% Glass Filled Nylon
		Top	UV Stabilized Polycarbonate
		Cap	UV Stabilized Polyurethane (Santoprene)
		Sensor	Copolymer Acetyl & Titanium
		Mounting Nipple	Brass
		O-Rings	Acrylonitrile
	Weight	Control Box	470 gms
	Remote Sensor	85 gms	
	Direct Mount	650 gms	
	Operating Temperature	-20°C to +75°C for all logger functions	
	Environmental Protection	IP 68 submersible to 1 metre	
	Internal Power	Lithium-Ion cell operational for up to 5 years. Low battery alarm in data packet at download.	

4.0 FLOW RANGES

The Flow Monita will record flows in the range 0.005 m/s to 3.0 m/s velocity in normal operational mode. The following table lists the range in litres/sec or litres/min the Flow Monita can report across a range of pipe sizes and velocities.

PIPE SIZE	0.005 m/s		3.0 m/s	
50mm	0.6 l/m	0.01 l/s	353 l/m	5.9 l/s
80mm	1.5 l/m	0.03 l/s	905 l/m	15.1 l/s
100mm	2.4 l/m	0.04 l/s	1414 l/m	23.6 l/s
150mm	5.3 l/m	0.09 l/s	3181 l/m	53.0 l/s
200mm	9.4 l/m	0.16 l/s	5655 l/m	94.2 l/s

The Flow Monita will detect flows greater than 3.0 m/s but they will be recorded as 3.0 m/s.

As the Flow Monita incorporates patented sensor technology with no moving parts, there is no increased wear on the product when subjected to continuous high flows.

5.0 PIPE INSTALLATION REQUIREMENTS

The Flow Monita accuracy is based on the position of the sensor head in the water flow. There are three basic types of flow profiles: *turbulent*, *laminar* and *disturbed*.

Turbulent flow exists when the speed of the fluid flowing in the pipe is nearly constant across the entire width of the pipe. This is typical of low viscosity fluids like water, flowing at high velocity.

Laminar flow exists when the speed of the fluid flowing in the centre of the pipe is greater than the speed of the fluid at the outer edge near the pipe wall. This is typical of high viscosity fluids flowing at low velocity.

Disturbed flow is caused by disturbances in the pipe. The Flow Monita accuracy is affected by disturbances such as pumps, elbows, tees, valves in the flow stream. Pulsating, swirling and other disruptions in the flow stream will affect the accuracy.

The Flow Monita with its wide velocity detection capability needs to operate in both the *laminar* and *turbulent* flow profiles. As such caution must be taken when interpreting the output of the device. In general the 'velocity' output of the Flow Monita can be assumed to approximate the 'Average Velocity' within the flow profile, independent of whether a *laminar* or *turbulent* profile exists. This assumption can lead to over-estimation of 'Average Velocity' in smaller pipes, and under-estimation in larger pipes, when the 'velocity' output of the Flow Monita is used as an 'Average Velocity' to calculate flow Velocity's or volumes. The typical insertion depth of the Flow Monita sensor in pipe sizes from 50mm to 200mm, ranges from 50% to 12.5%, as shown in the table over. A reasonable assumption for the 'Average Velocity' point in *laminar* Flow is 20% to 25% insertion depth, with any insertion depth into *turbulent* flow representing 'Average Velocity'. As such the assumption of 'Average Velocity', made for the typical insertion depth in pipe sizes from 50mm to 200mm is considered valid.

The error associated with this assumption can be reduced, by calculating the Reynolds Number as shown below, and combining this with the actual specification of the installation (actual insertion depth, and pipe configuration) to more accurately ascertain 'Average Velocity', and in turn, Average Flow Velocity. Note: a further caution is required at this stage in terms of pipe

configuration, as this will have a more substantial effect on velocity profile than any other factor (that is the length of straight pipe upstream and downstream of the flow Monita sensor).

PIPE SIZE	% Approx. Insertion	Flow Conditions Velocity Range of 0.005 to 3.0 m/s
50mm	50%	Laminar or Turbulent
80mm	31%	Laminar or Turbulent
100mm	25%	Laminar or Turbulent
150mm	16%	Laminar or Turbulent
200mm	12.5%	Turbulent

It is however better to have all pipe sizes with steady, undisturbed flow with a fully developed **turbulent** flow profile as this will ensure better accuracy.

To determine which type of flow exists in your installation, the following is required:

Average Flow Velocity (m/s) = V
 Pipe inside diameter (m) = D
 Fluid Kinematic Viscosity (m²/s) = ν

The REYNOLDS NUMBER can be calculated by using the following equation:

$$\text{REYNOLDS NUMBER} = \frac{D \times V}{\nu}$$

Flow conditions with a Reynolds Number greater than 2000 are considered **turbulent** flow.

Theoretically fully developed **turbulent** flow is not achieved until a Reynolds Number of greater than 4000 is reached, however it is generally accepted that the transition zone from 2000 to 4000 also be treated practically as **turbulent**.

The biggest factor which has the potential to reduce the Flow Monita’s accuracy is **disturbed** flow conditions. Installing the Flow Monita in a straight run of pipe as far as possible from any disturbances will minimise this. The distance required to maintain accuracy will depend on the type of disturbance. The following table shows typical recommended distances to keep from upstream disturbances, to optimise the accuracy of the output from the Flow Monita.

Disturbance	Flow Requirements
90° Elbow	20 x Inside Pipe Diameter
Reducer	15 x Inside Pipe Diameter
Flange	10 x Inside Pipe Diameter
Gate Valve	50 x Inside Pipe Diameter

In addition there should be a disturbance free area 5 x Inside Pipe Diameters downstream of the Flow Monita.

NOTE:

As the Flow Monita detects flows based on velocity, and as it is a very robust flow sensor, it is not subject to failure due to disturbed flow or cross flows that may stress or shear conventional flow sensors. Provided the experienced velocity is not greater than 10 m/s the Flow Monita will operate successfully, noting measurement above 3 m/s will be recorded as 3 m/s.

The fact that the Flow Monita can be utilised in shearing flows, allows the device to be installed in close proximity to bends / valves or disturbances, to optimise its ability to sense flows, so long as accuracy of flow Velocity measurement is not important.

It is also not recommended to install the product in highly oxygenated environments where there is a strong likelihood of algae growing. Leaving the product in this environment for extended periods may result in a growth on the sensor head which will affect the accuracy of the product. The most likely effect of this will be the inability of the product to detect low velocities. If the sensor must be used in this type of environment it is highly recommended to remove and clean the sensor head with a cleaner such as a fine automotive paint cutting compound and a soft toothbrush to remove any growth as required.

DO NOT CLEAN THE SENSOR WITH A SOLVENT AS THIS WILL AFFECT THE ACETYL HOLDING THE SENSOR HEAD.

6.0 INSTALLATION OF THE *FLOW MONITA*

The Flow Monita was designed to be installed and operated by qualified personnel only. Do not attempt to install or operate the Flow Monita if you are unsure. Seek qualified assistance.

Please note that warranty coverage does not include damage due to misuse or improper installation.

6.1 Mounting Location

The Flow Monita can be mounted on horizontal runs of pipe. Mounting at the vertical (twelve o'clock) position on horizontal pipe is recommended. Mounting anywhere around the diameter of vertical pipe is acceptable, however the pipe must be completely full of water at all times. Back pressure is essential on downward flows. Also because the product can detect such small velocities, a correction factor if the device is used for vertical installations. Note if accurate velocities are required it is strongly recommended to install into a horizontal pipe as ambient heating and cooling of a vertical pipe may effect the recorded velocity as will the direction of flow (either up or down) in a vertical pipe.

The Flow Monita will accurately measure flow from either direction provided the minimum inlet and outlet conditions are met.

The Flow Monita is designed to withstand outdoor conditions. A cool, dry location, where the unit can be easily accessed is recommended.

6.2 How to Install the Flow Monita with a Tapping Band

The Flow Monita Sensor Head, with its 20mm BSP brass nipple adaptor, is designed to screw into a standard tapping band with a 20mm BSP thread. The tapping band should be manufactured in accordance with your National Standard (In Australia use WSA 107-2001). The tapping band available from Reliance World Wide provides the correct depth of insertion to ensure the proper operation of the product.

If the Reliance Tapping Band is not used, ensure for correct operation and sensor depth that the maximum height of the tapping band thread is 25mm from the surface of the pipe.

Step 1: Shut off the Water Supply

Shut off the water supply to the pipe, by closing the closest stop tap or gate valve. Note: Monatec offers a “hot tapping” tool that will enable the Flow Monita to be installed under pressure. Please contact Monatec for details.

Step 2: Drill the Mounting Hole

Select an area on the pipe. Be sure the surface area of the pipe is clean and smooth.

The instructions given here are general in nature and are provided only as a guide and are not designed to replace the detailed installation instructions that are provided by the tapping band manufacturer. Please refer to the manufacturers detailed instructions on how to install the specific tapping band that you are using.

The Flow Monita will accurately measure flow in either direction provided the minimum inlet and outlet conditions are met.

Drill a 20mm diameter hole through the centre of the pipe wall or as recommended in the installation instructions of the Tapping Band. On horizontal installations, drill the hole as close to the vertical (twelve o'clock) position as possible. Do not exceed 25 degrees from vertical.

Once the hole has been drilled, clean all burrs from inside and outside the hole. Use fine sandpaper (440 grit) if necessary. Clean all filings from the outside of the pipe.

Step 3: Install the Tapping Band

After selecting the correct tapping band, ensure that no foreign matter has come between the pipe and the band. The outside of the pipe must be clean, smooth and free of surface imperfections. The outside diameter must be as specified to ensure a leak free installation.

After placing the split band around the pipe, lock this into position by fitting and finger tightening the nuts whilst making sure that the band remains in the required position.

Tighten the nuts down to the recommended torque as indicated on the specification and installation instructions supplied with each item.

Step 4: Install the Flow Monita

The Flow Monita has four main components. These are:-

- Flow Sensor Head with Cable Gland & Cap
- Tapping Band Nipple
- Cable
- Electronics Casing

In addition the product must be ordered as either a Direct Mount version or as a Remote Mount Version. If the product is to be installed in a pit, then the Remote mount version should be ordered. The two versions are shown below -:

Direct Mount

(Shown with Infra Red Programming Cable connected)



Pit Mount

Before installing the sensor, it is worth planning the total installation as if, for example, the Control Box is to be placed in a pit, the cable may need to be fed through a hole in the pit box before connecting the sensor to the cable.

The first step is to screw the brass nipple into the tapping band. Before this is done ensure that both threads are clean and free of dirt or grit. Note: the Nipple is supplied with Teflon tape fitted. Once this is installed the sensor head should be screwed into the brass nipple. Ensure that the sensor head has two O-Rings installed (one above the hexagon section, one below the male thread) before screwing this into the brass nipple. DO NOT use Teflon tape on the flow head male or female threads. Also, use only enough force when screwing in the flow head to bottom out the hexagon onto the nipple. Hand tightening is generally all that is required.

The Sensor Head comes with a protective end cap. This cap should remain on the sensor until the Sensor is installed in the pipe. The picture over shows the sensor head and cap

Once the sensor has been tightened, the water should be turned back on to ensure there are no leaks.

Care should be taken not to nick or bend the connection cable. If the cable has any damage the cable should be returned to the manufacturer for replacement. If the cable has any defects, there is a strong likelihood that damage will occur to the sensitive electronics through water egress.

Once the sensor head is mounted in the pipe, the exposed connector end of the sensor should be cleaned of all dirt and foreign material. Remove and retain the hexagon protective cap to expose the internal sensor socket.

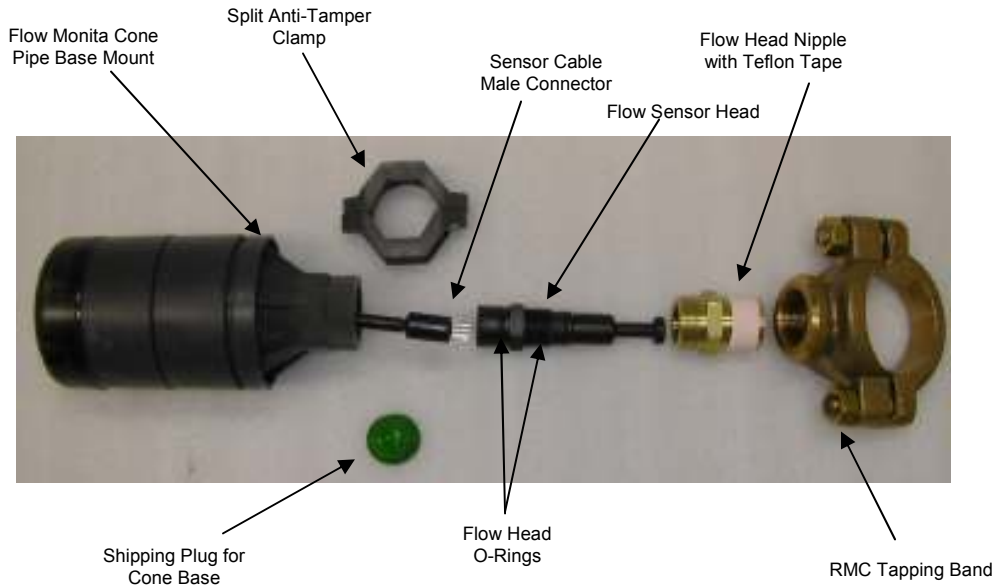
The cable should then be inserted into the sensor head ensuring that no water, dirt or foreign matter contaminates the connection. Caution should be exercised to ensure the correct alignment of the connector pins is achieved.

Direct Mount F Series Monita

This version of the Flow Monita is provided with a conical base which screws straight on to a mating thread on the flow head nipple to form a robust direct mount for the Monita on a pipe system.

The conical base is provided with a two-part clamp and two 6.0mm cap screws to firmly lock the Flow Monita housing to the nipple and tapping/pipe system.

When fitted the clamp prevents the Monita from being unscrewed by hand as it engages with the hexagon on the nipple and a spline on the Monita's cone base.



To complete an installation of this version proceed as follows:-

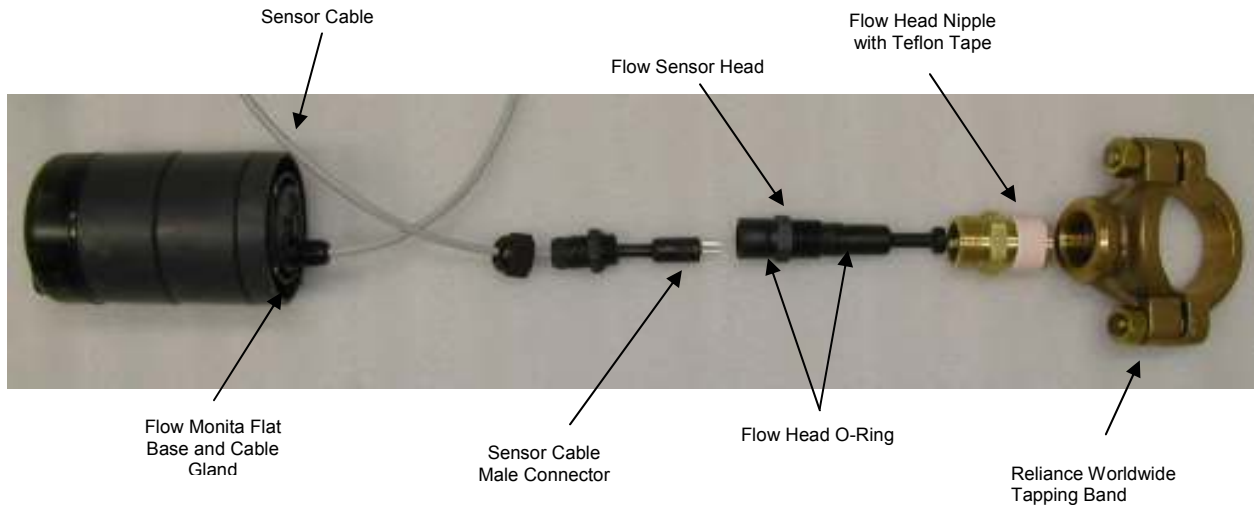
1. Install the tapping band, the flow head brass nipple and flow head in accordance with preceding steps.
2. Confirm that the flow head is fitted with an O-Ring immediately above its hexagon head.
3. Remove the hexagon headed plug from the exposed end of the tapping band to expose the recessed female cable connector.
4. Do not use Teflon tape on the brass nipple to cone base thread as this is sealed hermetically by an O-Ring
5. Unpack and examine the Flow Monita Housing to locate and so remove the plastic disposable plug in its conical base to reveal the internal Flow Head cable and connector.
6. Carefully withdraw the connector to its full extent without undue force and then twist the connector clockwise 5 times whilst partially allowing the cable to withdraw into the base. Then, whilst holding the connector to prevent it from unwinding, move the Monita to a convenient position to allow the Flow Head cable to be plugged into the Flow Head taking care to align the connector correctly whilst still not allowing the cable to unwind.

Note: Step 6 is important as it offsets stress on the cable that will result should this not be done during the process in Step 7.

7. Position the Flow Monita appropriately to allow this to be screwed onto the brass nipple and complete this process being careful to ensure that the threads engage immediately and that the cable can retract into the cone base during the process.

8. Screw the Flow Monita housing completely onto the nipple until it will go no further with the force of one hand. **DO NOT** use a spanner on the cone base hexagon for tightening purposes.
9. If necessary now unwind the Monita until the infra red port and display, if fitted, are in the best position for use and viewing. Do not unwind the Monita more than 360° to achieve this.
10. Lock the Flow Monita housing to the brass nipple in the chosen viewing position by installing and tightening the two-part split clamp around the spline and hexagonal parts of the assembly.
11. If anti-tamper protection is required fit wire and lead seals to the appropriate holes provided in the assembly's base, lid and split clamp halves.

Remote Mount Version



The remote mount version follows the same instructions for the installation of the sensor. The Remote Mounting bracket should be installed by screwing the bracket to the desired surface. Alternately the bracket can be tied on with cable ties.

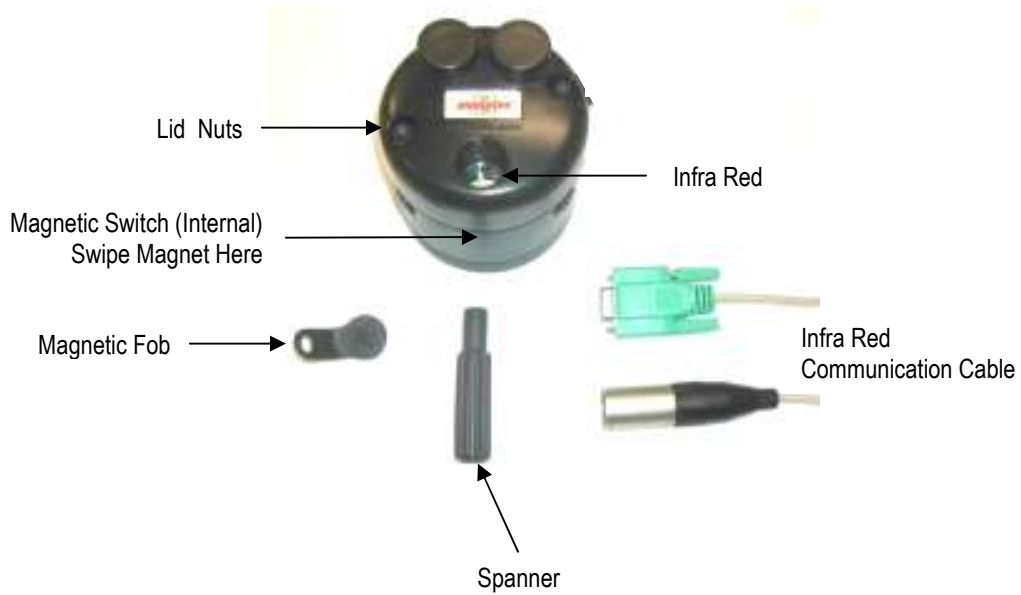
With the cable inserted, screw on the Cable Gland (Part Number PG13.5) to the sensor head, ensuring the O-Ring is between the two surfaces. Tighten to 90Nm and then tighten the head of the cable gland to 90Nm.

The cable should now be run to the mounting bracket location and passed through the hole in the mounting bracket. The Cable should be passed through the cable gland on the base of the unit and through the electronics to the terminal blocks. These are accessed by removing the two cover screws and removing the top of the Control Box.

The 5 wires should be connected to the terminal blocks of the same colour name. Once this is complete, press the reset button and put on the top cover and tighten the cover screws.

The Control Box can now be screwed into the mounting bracket with the supplied screws

7.0 HOW TO OPERATE THE *FLOW MONITA*



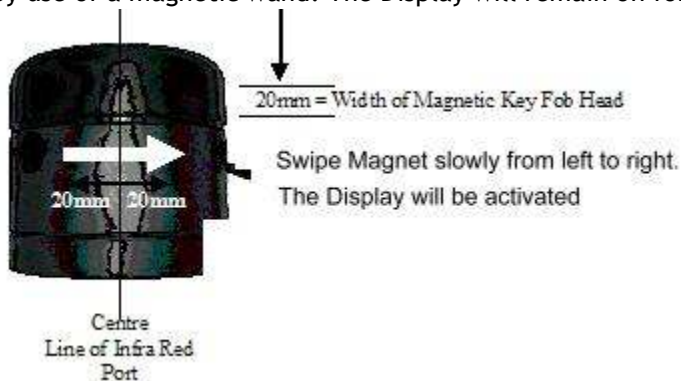
7.1 Theory of Operation

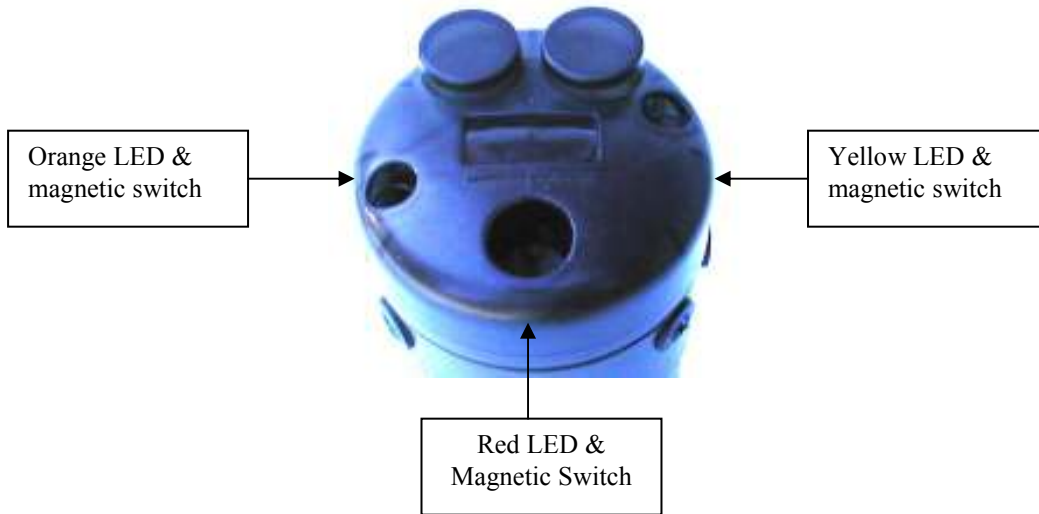
The Flow Monita operates by a patented process of heating a small amount of water and measuring the time it takes for the water to cool. The faster the flow, the quicker the cooling time.

7.2 Reading the Flow Monita

TURNING ON THE DISPLAY

Any of the Centre Lid Internal Switches as shown below will turn on the Display and is activated by use of a magnetic wand. The Display will remain on for 3 minutes from the last activation.





Reading Wand

A reading wand (Part Number MTI-MAG-01) is available that enables the user to turn on the display and scroll between the various screens if required.

MAIN DISPLAY

On Display the Main Display will show the current total consumption and the last 8 digits of the South East Water Meter Number as shown below

					7	5	k
U	A	0	0	0	0	0	1

PERFORMING A FLOW TEST

Downloading can only be carried whilst there is no flow test being carried out. Whilst this is not part of the normal reading process it is included here as the carrying out of a test is represented by the last digit of the meter number being replaced by a “.” whilst the test is being carried out. At the conclusion of the test the “.” Will be replaced by the last digit of the meter number. This is shown below.

					7	5	k
U	A	0	0	0	0	0	.

INFORMATION CODES

The flow Monita will also display a number of information or error codes.

If there are any Information codes the Main screen will replace the k (KL’s) with an “e” as shown below.

					7	5	e
U	A	0	0	0	0	0	1

TO view the Information codes the user show swipe any of the three internal switches on the lid, which are activated by the magnetic wand. The location of these switches is shown earlier.

Information codes displayed are as follows -:

- LO - Lid Opened
- BF - Flat Battery
- EE - Internal Error
- UH - High Consumption Alarm

L	O		U	H			

The User should note these codes as once they have been viewed and the Screen has gone back to the next screen or the device goes to sleep they are automatically cleared from the Display. A log of all Codes is stored in the device and can be downloaded for viewing at any time.

NOTE: the High Consumption Alarm is set in the Command Software and for South East Water is factory set to 50KL's.

High Consumption is defined as a total volume used since the last time the device's Screen was activated.

After these Information codes have been displayed and processed by user activation of any of the switches will clear these Information codes then the device will then respond to normal LCD functions.

An additional swipe on any of the Lid's three switches will take the reader back to the main screen and show the Total Consumption and the Meter Number as shown below.

					7	5	k
U	A	0	0	0	0	0	1

Centre Switch

If the Allow Flow Rates Flag is set to ON which is set for South East Water as a factory default then the activation of the any of the switches will show the last flow rate and date and time (MMDDHHMM) as shown below

0	.	0	2	3	m	/	s
1	2	0	8	1	1	1	3

To display the Total KL and Meter Number the Centre switch is used to alternate between the two screens.

NOTE: if the Sensor is not in water the flow rate will be replaced by an error message.

Err-101	Out of Water
Err-102	Heat unstable another flow test pending
Err-103	Flow Rate higher than 3.00 m/s
Err- 104	Measurement error another flow test pending.

Connecting Device With Command Software

Connecting the device with the Command software allows the user to achieve the following tasks -:

- Download the logging data in the device
- Displaying flow readings and total consumption to the laptop under live readings tab
- Advanced programming features not available to the user just through the LCD Displays or commissioning procedure.

COMMISSIONING

The Flow Monita can be supplied as either a Retrofit Device for any fire service or preconfigured mounted in a pipe.

NOTE: BOTH VERSIONS REQUIRE COMMISSIONING TO TURN ON THE DEVICE.

Reading Wand

A reading wand (Part Number MTI-MAG-01) is available that enables the user to turn on the display and scroll between the various screens if required

MONITA F100, F150 & F200 PIPE MOUNTED VERSIONS

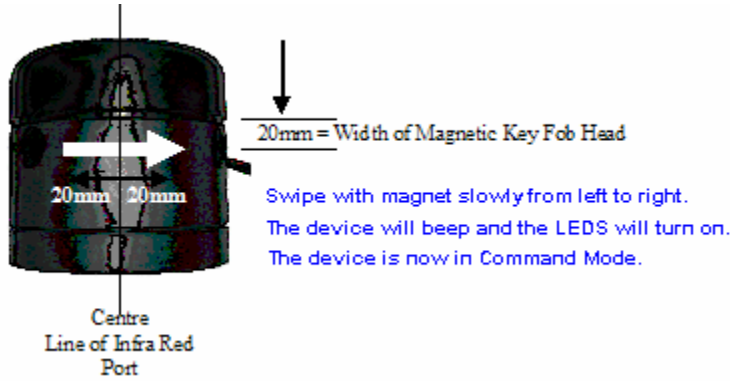
The above versions are shipped with the flow tests turned OFF. Once the device has been installed or at a convenient time, the Flow Tests must be turned ON.

This is achieved by swiping the main internal switch twice.

The first activation will turn on the orange LED which is visible through the lid. Swiping the product again will turn on Logging and the flow tests and the GREEN LED will turn on.

IF THE GREEN LED IS NOT ON, THEN THE DEVICE IS NOT MEASURING FLOW.

The location of the Switch is shown below.



COMMISSIONING A RETROFIT FLOW MONITA

The Flow Monita is able to be programmed in the field by use of the Magnetic Wand.

If the flag is set in the Command Software then when the device is woken up with the magnet on the main (non Display) internal switch and the display will show

P	R	O	G	R	A	M	E
		M	O	D	E		

NOTE: THE VALUES AS STORED IN THE DEVICE WILL ACT AS THE DEFAULT VALUES

- CENTER SWITCH will act as the ENTER button
- LEFT SWITCH will act as the SCROLL Button
- RIGHT SWITCH will act as the NEXT Button

After selecting the display will show the default value as shown below

P	I	P	E		D	I	A
1	0	0		m	m		

The User can then scroll to the correct value by use other Left Switch. Once the correct value is shown, the user should swipe the Centre (ENTER) switch

Possible choices are shown below.

PIPE SIZE - 50,80,100,125,150,175,200,51,52...200

The User will then be presented with the following screen.

T	E	S	T		I	N	T
0	0	5		m	i	n	s

The User can then increase/decrease to the correct value by use other Left Switch for decrease and the Right Switch for Increase. Once the correct value is shown, the user should swipe the Centre (ENTER) switch

The User will then be presented with the following screen.

M	O	U	N	T	I	N	G
H	O	R	I	Z	+	9	0

The User can then increase/decrease to the correct value by use other Left Switch for decrease and the Right Switch for Increase. Once the correct value is shown, the user should swipe the Centre (ENTER) switch

Possible choices are shown below.

- HORIZ 00 =>Flow Direction=0, Sensor Mounting Angle = 0
- HORIZ-90 =>Flow Direction=0, Sensor Mounting Angle = -90
- HORIZ+90 =>Flow Direction=0, Sensor Mounting Angle = +90
- VERT-UP =>Flow Direction=90, Sensor Mounting Angle = 0
- VERT-DN =>Flow Direction=-90, Sensor Mounting Angle = 0

The User will then be presented with the following screen

S	A	V	E		A	N	D
		E	X	I	T		

Swiping the ENTER Key will prompt you to make sure you have the settings correct.

A	R	E		Y	O	U	
		S	U	R	E	?	

ARE YOU SURE - (Enter) will shut down unit and save settings any other swipe will return to Program Mode screen.

At end of programming the only way to re-enter programming mode is to re-program the unit with a PC.

Once the device has been set up, the Flow Tests must be turned ON.

This is achieved by swiping the main internal switch twice.

The first activation will turn on the orange LED which is visible through the lid. Swiping the product again will turn on Logging and the flow tests and the GREEN LED will turn on.

IF THE GREEN LED IS NOT ON, THEN THE DEVICE IS NOT MEASURING FLOW.

Downloading Data With Command Software

Connecting a laptop with the command software is achieved by inserting the Infrared probe into the device and swiping the Main Internal Switch (Display Mode). This will turn on the Display at which point the user shall depress the connect to hardware tab, once connected the LCD display will display COMMAND .

The user then goes to the download raw data tab and depresses Download Raw, this will commence the download of raw data from the device which depending on the amount of data can take several minutes.

Upon completion of the Download the user can either process this information now by using the Process raw data tab or do this later back at the office. The user would then depress the disconnect from hardware button and the device would go back to Operators startup mode.

Please note the following

- 1) During downloading of data if a flow test occurs the download will pause for the duration of the flow test and display “flow test in progress please wait” the device will then continue the download
- 2) In COMMAND mode all LCD display features are disabled i.e. swiping and flow updated etc
- 3) Unit will automatically exit from DISPLAY MODE after three minutes or by depressing Operational hardware button in command software.

Live Readings

During connection to Command software in COMMAND mode by Depressing the Live readings Tab the user can see the latest flow reading update plus the total consumption figures in the units of measure selected.

Programming Device

During connection to Command software in COMMAND mode the user can achieve all additional Programming parameters that are not available upon commissioning unit through the LCD display for more information please refer to the Command user guide

Please note the following

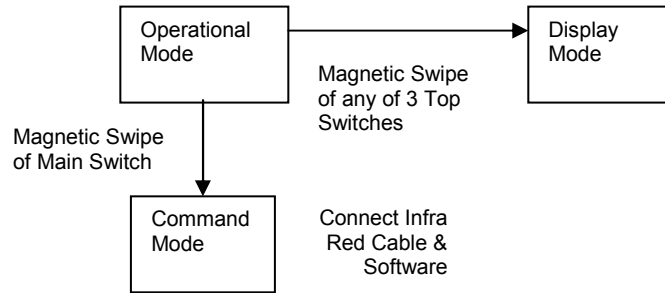
During programming setting to hardware or reading settings from hardware will pause for the duration of the flow test and display “flow test in progress please wait” the device will then continue.

^ MODES OF OPERATION

The device has four main modes of operation.

- Operational Mode
- Display Mode
- Menu Mode
- Command Mode

The modes of operation of the Flow Monita are inter-connected as shown below.



OPERATIONAL MODE

This is the devices normal operating mode and is a low power mode that keeps the LCD display off however still does Flow Tests and Logs data and waits for user intervention

DISPLAY MODE

This mode is entered by swiping any of the three lid switches. MENU MODE displays all relevant data for the user and allows the operation of all three lid switches included for example would be live flow updates to the display, meter totals and information codes etc.

In MENU MODE The Orange LED will be off and the user cannot connect to the Command software with a PC/Laptop (Programming Product tab in Command software will be greyed out) until either three minutes have expired without swiping device and display has switched off or in the Command software Operational hardware is depressed without trying firstly to connect to the device.

COMMAND MODE

Command Mode is entered by swiping the Main Internal Switch. The Orange LED will turn on to indicate the product is in Command Mode.

In this mode the user has connected to the device with a PC/Laptop to Download the logging data in the device, display flow readings and total consumption under live readings tab and use advanced programming features. The Orange LED is lit whenever the device is either in Command Mode or can be connected to by the Command Software.

If the unit is in Display Mode and Command Mode is activated and the product is connected then the display will show PC Active

In PC Active mode all LCD display features are disabled i.e. swiping and flow updated etc to exit this mode the user depresses the disconnect from hardware button and the product will return to Display Mode.

8.0 PROGRAMMING

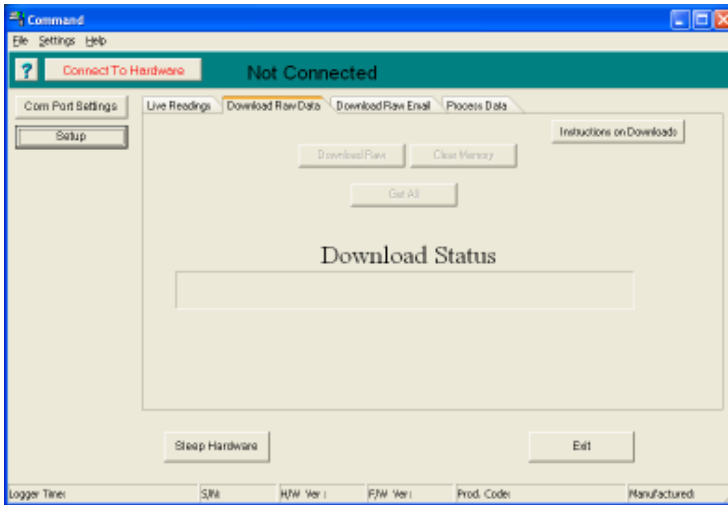
The download process involves the use of an InfraRed interface to communicate with the Flow Monita to download the “rolling” history.

To initiate the download process the reading wand should be swiped over the Magnetic Switch on the face of the product until the unit enters command mode (See above). InfraRed Communication via a laptop or PC running the Flow Monita software should then be established by pressing the connect button.

This is achieved by placing the InfraRed communication cable in the InfraRed port on the top of the Monita and then the cable should be connected to a serial port on the PC.

Please refer to the help file that comes with the PC Software on how to use the software.

A free software program called **COMMAND** is available to run on a PC that will allow programming and downloading of the Flow Monita. The Main Menu displays the Software version number and the ESN (Electronic Serial Number) of the device in the footer. The ESN is a unique number assigned by the factory. The main PC screen looks similar to what is shown below.



9.0 MAINTENANCE

The Flow Monita requires little maintenance, however, some conditions will cause increased wear or possible damage to the unit. There are no serviceable parts in the product

The Flow Monita sensor is made from Acetyl and Titanium and as such should require very little maintenance; however exposure to highly corrosive liquids is not advised.

The Control Box is a solid epoxy which is replaceable, but not repairable.

TROUBLESHOOTING

Situation

Leaking

Cause

Improper installation

Solution

Section 6

Situation

Flow Velocity reading is inaccurate

Cause

Improper installation

Solution

Section 6

Improper velocity profile

Solution

Section 4

Flow Velocity is out of range

Solution

Section 4

Flow is non turbulent

Solution

Section 5

Situation

No LED or Beeps after swiping

Cause

Dead batteries

Solution

Section 6.2, Step 5

Damaged cable

Solution

Section 6.2, Step 4

Unit is turned off

Solution

Section 6.2, Step 5

WARNINGS

Warranty is void if the Monita is installed or used in a manner not in accordance with this operation manual.

This equipment contains a Lithium Battery. There is a danger of explosion if the battery is incorrectly used or incorrectly replaced. Do not open, incinerate, expose to temperatures above 85° C or recharge. Dispose of in accordance with local regulations.

This equipment should only be interfaced to a UL or CSA, or CE listed computer with RS232 levels of not more than +/- 12 Volts.

The working temperature range of this product is from -10° C to +70 ° C

The manufacturer reserves the right to change the product specification without notice.

WARRANTY

This product is covered by a manufacturer's defects warranty of 12 months from the date of purchase. Units returned under warranty will be repaired or replaced at the manufacturer's discretion. The warranty does not cover mishandling, modification or battery replacement after 12 months and is subject to the standard terms and condition of sale of the manufacturer, a copy of which is available on request.

Our liability for a breach of a condition or a warranty implied by the Trade Practises Act is limited to the replacement of the goods or the supply of equivalent goods or the payment of the cost of replacing the goods or of acquiring equivalent goods.

Claims under warranty should be referred to the point of sale.

DISCLAIMER

The Manufacturer makes and you receive no warranties or conditions, express, implied, statutory or in any communication with you, and the manufacturer specifically disclaims any implied warranty of merchantability or fitness for a particular purpose

This product is sold "as is" and with "all faults".

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