Programming Menu

Display only	M00	Display flow rate and NET totalizer If the net totalizer is turned off, the net totalizer value shown on the screen is the value prior to its turn off. Select all totalizer unit in menu M31	
	M01	Display flow rate, velocity	
	M02	Flow rate and POS(positive) totalizer If the positive totalizer is turned off, the positive totalizer value shown on the screen is the value prior to its turn off	
	M03	Display flow rate and NEG(negative) totalizer If the negative totalizer is turned off, the negative totalizer value shown on the screen is the value prior to its turn off	
	M04	Display date and time, flow rate. The date and time setting method is found in Menu 60	
	M05	Display energy rate (instantaneous Caloric) and total energy (Caloric)	Thermal energy unit chosen at ***Menu 84***
	M06	Display temperatures, inlet T1, outlet T2	
	M07	Display analog inputs, AI3/AI4, current value and its corresponding temperature or pressure or liquid level value	
	M08	Display all the detailed error codes Display working condition and system error codes. 'R' stands for normal, others refer error codes	I stands for no signal detected
	M09	Display today's total NET flow	

Initial setting menu	M10	Outer perimeter of the pipe (C=2πr) If the diameter is entered in M11correctly, Outer perimeter will be automatically calculated. Example: r=100mm,Perimeter =314.16mm.	Step 1
	M11	Outer diameter of the pipe; Valid range: 0 to 6000mm.	Step 1
	M12	Pipe wall thickness.You may skip this menu and enter inner diameter in M13 instead.	Step 2
	M13	Inner diameter of the pipe. If pipe outer diameter and wall thickness are entered correctly, the inner diameter will be calculated automatically, thus no need to change anything in this window.	Step 2
	M14	Window for selecting pipe material.If standard pipe material is selected from the list # below, then no need to enter material sound speed. (0) carbon steel (1) stainless steel (2) cast iron (3) ductile iron (4) copper (5) PVC (6) aluminum (7) asbestos (8) fiberglass (9) others (need to enter material sound speed in M15)	Step 3
	M15	Window for entering the sound speed of non-standard pipe materials	Step 3
	M16	Window for selecting the liner material, select none for pipes without any liner. Standard liner materials (no need to enter the liner sound speed) include: (0) None - No liner (1) Tar Epoxy (2) Rubber (3) Mortar (4) Polypropylene (5) Polystryol (6) Polystyrene (7) Polyester (8) Polyethylene (9) Ebonite (10) Teflon (11) Other (need to enter liner sound speed in M17)	Step 4
	M17	Sound speed of non-standard liner materials	Step 4
	M18	Liner thickness (window not seen if 0- No Liner is chosen in M16)	Step 4
	M19	Window for entering the ABS thickness of the inside wall of the pipe	
	M20	Window for selecting fluid type For standard liquids (no need to enter liquid sound speed) include: (0) Water (1) Sea Water (2) Kerosene (3) Gasoline (4) Fuel oil (5) Crude Oil (6) Propane at -45ºC (7) Butane at 0ºC (8)Other liquids (9) Diesel Oil (10)Caster Oil (11)Peanut Oil (12) #90 Gasoline (13) #93 Gasoline (14) Alcohol (15) Hot water at 125ºC	Step 5
	M21	Window for entering the sound speed of non- standard liquid, used only when option item 8 'Other' is selected in M20	Step 5
	M22	Window for entering the viscosity of the non-standard liquids, used only when option item 8 'Other' is selected in M20	Step 5

Initial setting menu (contd.)	M23	Window for selecting transducer type, There are 22 types as following 0. Standard M (The middle size) 1. Insertion Type C; 2. Standard S; 3. User Type; 4. Standard B; 5. Insertion Type B(45) 6. Standrad L (The large size transducers) 7. JH-Polysonics 8. Standard-HS (small size transducer for Handheld flow meter) 9. Standard-HM (middle size transducer for Handheld flow meter) 10. Standard-M1 (middle size transducer #1) 11. Standard-S1 (small size transducer #1) 12. Standard-L1 (large size transducer #1) 13. PI-Type 14. FS410 (middle size transducer for FUJI flow meter) 15. FS510 (large size transducer for FUJI flow meter) 16. Clamp-on TM-1 (Middle size transducer for Taosonics Instrument) 17. Insertion TC-1 (for Taosonic Instrument) 18. Calmp-on TS-1 (small size for Taosonics Instrument) 19. Reserved 20. Clamp-on TL-1 (For Taosonics Instrument) 21. Insertion TLC-2 (For Taosonics Instrument) If the user-type-transducer is selected, you need enter additional 4 user-type-wedge parameters that describe the user transducers. If the PI-type transducer is selected, you need enter additional 4 PI-type transducer parameters that describe the PI-type transducers	Step 6 Default for DIN rail : 18 Calmp-on TS-1 (small size for Taosonics Instrument)
	M24	Window for selecting the transducer mounting methods Four methods can be selected: (0) V-method (1) Z-method (2) N-method small pipe (3) W-method small pipe N method rarely used. 20-300mm use V method, 300-500 use Z method	Step 7 Default (0) V method.
	M25	Display the transducer mounting spacing or distance. The spacing value shown on this window refers to the distance of inner spacing between the two transducers. The actual transducers spacing should be as close as possible to the spacing value	
	M26	Entry to store the pipe parameters into the internal NVRAM (non-volatile memory) (0). Use RAM settings: A switch for the parameters in flash memory will be loaded when power is turned on. The default option is that the parameters will be loaded. If this switch is not turned on, the system will try to use the parameters in the system RAM, if these parameters are ok, otherwise the system will load the parameters in flash memory (1). Solidify setting: Function to store the current parameters into the flash memory, so that these parameters will be solidified and will be loaded as the default parameters every time when power is turned on.	
	M27	Entry to store to or restore from the internal Flash memory, as many as 9 different pipe parameter configurations To save or load the current setup parameter, use the going up or going down keys to change the address number, press 'ENT' key, and use going down or going up keys to select to save to or load from the memory. (0) Load parameters (1) Save parameters	

Initial setting menu (contd.)	M28	Hold on poor signal. Entry to determine whether or not to keep the last correct value when poor signal condition occurs. YES is the factory default	Yes is default
	M29	Empty pipe set up:Entry to setup empty signal threshold. When the signal is less than this threshold, the pipe is regarded as empty pipe, and the flow meter will not totalize flow. This is based on the fact that, for most occasions, when pipe is empty, the transducer would still receive signal, just smaller than normal, As a result, the flow meter would show normal operation, which is not correct. Make sure that the entered value must be less than the normal signal strength. When much noisy signals are received, to make sure the flow meter will not incorrectly totalize flow, there is also a 'Q' threshold should be entered in M.5	20 is default
Units setting menu	M30	Window for selecting unit system. The conversion from English to Metric or vice versa will not affect the unit for totalisers.	(0) Metric is the factory default.
	M31	Window for selecting flow rate unit system. Flow rate can be in 0. Cubic meter short for (m3) 1. Litre (l) 2. US gallon (gal) 3. UK Gallon (igl) 4. Million US gallon (mgl) 5. Cubic feet (cf) 6. US Oil barrel (bal) 7. UK Oil barrel (ob) The flow unit in terms of time can be per day, per hour, per minute or per second. So there are 32 different flow rate units in total for selection.	m^3 is default
	M32	Window for selecting the totalizers unit. Available units are the same as those in M31	
	M33	Window for setting the totalizer multiplying factor The multiplying factor ranges from 0.001 to 10000. Factory default is 1 (0) x 0.001(1E-3); (1) x 0.01; (2) x 0.1; (3) x 1 (4) x 10; (5) x 100; (6) x 1000 (7) x10000(1E+4);	
	M34	Turn on or turn off the NET totaliser	
	M35	Turn on or turn off the POS totaliser	
	M36	Turn on or turn off the NEG totaliser	
	M37	(1) Totaliser reset (2) Restore the factory default settings. No / Yes: If Yes is selected => None, All, NET Totaliser, POS Totaliser, NEG Totaliser, Energy NET Total, Energy POS Total, Energy NEG Total, Master Erase, NET Flow Today. All is selected you can do the master erase by pressing the dot key followed by the backspace key. Attention, it is recommended to make notes on the parameters before doing the restoration.	
	M38	Manual totalizer used for easier calibration. Press a key to start and press a key to stop the manual totalizer.	
	M39	Interface Language selection. English, Italiano, Turkish The selection could also be changed automatically by the system, if English LCD display is used as the display device.	

	M3	Setup for local segmental LCD display. Enter 0 or 1 for the non-auto-scan mode; Enter 2~39 for the auto-scan mode. In the auto-scan mode the display will automatically scan displaying from 00 to the entered number of the local segmental LCD display.	
Optional setting menu	M40	Flow rate damper for a stable value. The damping parameter ranges form 0 to 999 seconds. 0 means there is no damping. Factory default is 5 seconds	5 sec is the factory default.
	M41	Lower flow rate (or low flow rate) cut-off to avoid invalid accumulation. Default is 0.03 m/s.	0.03m/s is the factory default.
	M42	*Set Zero:* Zero point setup. Make sure the liquid in the pipe is not running while doing this setup.	
	M43	Clear the zero point value, and restore the solidified zero point value.	
	M44	Set up a flow bias. Generally this value should be 0 m3/h.	
	M45	Flow rate scale factor. The factory default is '1'. Keep this value as '1' when no calibration has been made.	
	M46	Networks address identification number. Any integer can be entered except 13(0DH, carriage return), 10 (0AH, line feeding), 42 (2AH), 38, 65535. Every set of the instrument in a network environment should have a unique IDN. Please refer to the chapter for communication.	
	M47	System locker to avoid modification of the system parameters. If password is forgotten, you could send a command 'LOCK0' to the serial input to unlock. Or you can write 0 to REGISTER49-50 under MODBUS protocol.	
	M48	Entry to linearity correcting data inputs. By using of this function, the non-linearity of flow meter will be corrected. Correcting data shall be obtained by careful calibration.	
	M49	Displays the input contents for the serial port. By checking the displays, you can know if the communication is ok.	
Inputs / Outputs menu	M50	*Window to set up the logger option ON/OFF; Switches for the built-in data logger. There are as many as 22 different items can be chosen. To turn this function, select 'YES' the system will ask for selecting the items. There are 22 items available. Turn on all those items you want to output*	
	M51	Window to set up the schedule for the schedule-based data saving Start : xx:xx:xx Interval : 00:00:05 Go On : xx:xx:xx Window to setup the time of scheduled output function (data logger, or Thermo-printer). This includes start time, time interval and how many times of output. When a number great than 8000 entered for the times of output, It means the output will be keeping always. The minimum time interval is 1 second and the maximum is 24 hours.	

Inputs / Outputs menu (contd.)	M52	Data logging direction control. (0) If 'To the internal serial BUS is selected, the data will be transmitted to the internal serial bus which allows a thermal printer, or a 4-20mA analog output module, to be connected to it. (1) If 'Send to RS485' is selected, all the data produced by the data logger will be transmitted out through the RS-232/RS485 interface	
	M53	Display analog inputs, AI5, current value and its corresponding temperature or pressure or liquid level value.	
	M54	Pulse width setup for the OCT (OCT1) output. Minimum is 6 mS, maximum is 1000 mS	
	M55	Select analog output (4-20mA current loop, or CL) mode. Available options: (0) 4-20mA output mode (setup the output range from 4-20mA) (1) 0-20mA output mode (setup the output range from 4-20mA, This mode can only be used with Version-15 flow meter) (2) Serial port controls 0-20mA (3) 4-20mA corresponding fluid sound speed (4) 20-4-20mA mode (5) 0-4-20mA mode (can only be used with Version-15 flow meter) (6) 20-0-20mA mode(can only be used with Version-15 flow meter) (7) 4-20mA corresponding flow velocity (8) 4-20mA corresponding heat flow rate	**20-4-20mA** is the factory default.
	M56	4mA or 0mA output value, Set the value which corresponds to 4mA or 0mA output current (4mA or 0mA is determined by the setting in M55)	
	M57	20mA output value, Set the value which corresponds to 20mA output current	**10,000 m3/h** is the factory default.
	M58	Current loop verification Check if the current loop is calibrated correctly.	
	M59	Display the present output current of current loop circuit.	
	M60	Window to edit the year/month/date and Hour/minute/seconds. 99 years calendar. Press ENT for modification. Use the dot key to skip the digits that need no modification. **YY-MM-DD HH:MM:SS format**	
	M61	Display Version information and Electronic Serial Number (ESN) that are unique for each flow meter. The user can use the ESN for instrumentation management	e.g. Ver 18.57 S/N=18713811
	M62	Window to edit the Baud rate and Parity. RS-232 setup. Baud rate can be 300 to 19200 bps,data bits (always is 8) All the devices connected with flow meter should have matched serial configuration.	Default: 9600, None, 8, 1

Inputs / Outputs menu (contd.)	M63	Select communication protocol. Factory default is 'MODBUS ASCII. this is a mode for MODBUS-ASCII, Meter-BUS, Fuji Extended Protocol, Huizhong's various protocols. If you are using MODBUS-RTU then select 'MODBUS_RTU'.	Factory default is 'MODBUS ASCII+ TDS7
	M64	AI3 value range. Used to enter temperature/pressure values that are corresponding to 4mA and 20mA input current. The display values have no unit, so that they can present any physical parameter.	Factory default is 20~100
	M65	AI4 value range. Used to enter temperature/pressure values that are corresponding to 4mA and 20mA input current.	Factory default is 20~100
	M66	AI5 value range. Used to enter temperature/pressure values that are corresponding to 4mA and 20mA input current.	Factory default is 0~6
	M67	Windows to setup the frequency range (lower and upper limit) for the frequency output function. Valid range is 0Hz-9999Hz. Factory default value is 0-1000 Hz. For Version-12, Version-13, Version-14 flow meters, you need a hardware module, which shall be plugged to the Serial Expanding Bus, for the frequency output function. Please remember to order the module if you need frequency output function. For Version-15 flow meter, you need to indicate on your orders that you need the frequency function; Otherwise you will get a flow meter which has no frequency output circuits.	Factory default value is 0-1000 Hz. Frequency output is an option and not available for all models
	M68	Window to setup the minimum flow rate value which corresponds to the lower frequency limit of the frequency output.	
	M69	Windows to setup the maximum flow Rate value that corresponds to the upper frequency limit of the frequency output.	
	M70	LCD display backlight control. The entered value indicates how many seconds the backlight will be on with every key pressing. If the enter value is great than 50000 seconds, It means that the backlight will always keeping on.	
	M71	LCD contrast control. The LCD will become darker or brighter when a value is entered.	Default : 15
	M72	Working timer. It can be cleared by pressing ENT key, and then select YES.	
	M73	Window to setup the lower limit of flow rate for Alarm#1. When the flow rate is below the set value, Alarm#1 equals 'on'	
	M74	Window to setup the upper limit of flow rate for Alarm#1. When the flow rate is above the set value, Alarm#1 equals 'on' There are two alarms in the flow meter, and every alarm can be pointed to alarm output devices such as the BUZZER or OCT output or RELAY output. For example, if you want the Alarm#1 is to output by the OCT circuit, you need to set M78 at selection item 6.	

Inputs / Outputs menu (contd.)	M75	Window to setup the lower limit of flow rate for Alarm#2.	
	M76	Window to setup the upper limit of flow rate for Alarm#2.	
	M77	Buzzer setup. If a proper input source is selected, the buzzer will beep when the trigger event occurs. The available trigger sources are: 0. No Signal 1. Poor Signal 2. Not Ready (No*R) 3. Reverse Flow 4. AO Over 100% 5. FO Over 120% 6. Alarm #1 7. Reverse Alarm #2 8. Batch Control 9. POS Int Pulse 10.NEG Int Pulse 11.NET Int Pulse 12.Energy POS Pulse 13.Energy NEG Pulse 14.Energy NET Pulse 15.MediaVel=>Thresh 16.MediaVelo<Thresh 17.ON/OFF viaRS232 18.Daily Timer (M51) 19.Timed alarm #1 20. Timed alarm #2 21.Batch Totalizer Full 22. M51 Timer 23. Key Stroking ON 24.Disable BEEPER	Defaullt : 23. Key Stroking ON
	M78	OCT (Open Collect Transistor) Output setup By selecting a proper input source, the OCT circuit will close when the trigger event occurs. The available trigger sources are: 0. No Signal 1. Poor Signal 2. Not Ready(No*R) 3. Reverse Flow 4. AO Over 100% 5. FO Over 120% 6. Alarm #1 7. Reverse Alarm #2 8. Batch Control 9. POS Int Pulse 10.NEG Int Pulse 11.NET Int Pulse 12.Energy POS Pulse 13.Energy NEG Pulse 14.Energy NET Pulse 15.MediaVel=>Thresh 16.MediaVelo<Thresh 17.ON/OFF viaRS232 18. Daily Timer (M51) 19.Timed alarm #1 20. Timed alarm #2 21.Batch Totalizer Full 22. Timer by M51 23. Batch 90% full 24. Flow rate pulse 25. Disable OCT The OCT circuit does not source voltage at its output. It must be connected with an external power and pull-up resistant for some occasions. When the OCT circuit is close, it will draw current. The maximum current shall not be over 100mA. Attention: the maximum voltage applied to OCT cannot be over 80 volts.	

Inputs / Outputs menu (contd.)	**M79**	Relay or OCT2 setup By selecting a proper input source, the RELAY will close when the trigger event occurs The available trigger sources are: 0. No Signal 1. Poor Signal 2. Not Ready(No*R) 3. Reverse Flow 4. AO Over 100% 5. FO Over 120% 6. Alarm #1 7. Reverse Alarm #2 8. Batch Control 9. POS Int Pulse 10.NEG Int Pulse 11.NET Int Pulse 12.Energy POS Pulse 13.Energy NEG Pulse 14.Energy NET Pulse 15.MediaVel=>Thresh 16.MediaVelo<Thresh 17.ON/OFF viaRS232 18. Timer (M51 Daily) 19.Timed alarm #1 20. Timed alarm #2 21.Batch Totalizer Full 22. Periodically M51 Timer 23. Disable Relay The RELAY is of SPST(Single pole, single throw) type. It is rated for 110VAC max and have a current rating of 0.5A resistive load. It highly recommended that a salve relay to be utilized whenever a large resistive load or inductive load is to be controlled. Note. In order to make the user interface compatible with the former version7, the name RELAY was used other than OCT2, but in fact it is an OCT output.	Defaullt : 24. Disable Relay, To set Alarm #1 go to M73 and M74

	M80	Window for selecting the trig signal for the built-in batch controller. Available trig sources:
		0. Key input (press ENT key to start the batch controller)
		1. Serial port
		2. AI3 rising edge (when AI3 receives 2mA or more current)
		3. AI3 falling edge (when AI3 stop receiving 2mA or more current)
		4. AI4 rising edge (when AI3 receives 2mA or more current)
		5. AI4 falling edge (when AI3 stop receiving 2mA or more current)
		6. AI5 rising edge (when AI3 receives 2mA or more current)
		7. AI5 falling edge (when AI3 stop receiving 2mA or more current)
		8.Timer periodically (define the start time and interval time in M51)
		9.Timer daily (define the start time and interval time in M51)
		For the input analog current signal, 0 mA indicates "0", 4mA or more indicates '1'.
		By selecting item #8, the batch totalizer can be started periodically by the internal timer located at Menu51. When the batch totalizer is full, a signal which indicate the batch is full can be direct to either the OCT or the RELAY terminals to stop the pump or other devices.
		By selecting item #9, the batch totalizer could act as totalizer witch runs for only a period of the day so that a alarm signal could be produced if the total flow during that time period is over a certain amount of. For example, if you want a alarm signal which stand for the total flow is over 100 cubic meters during the period of every day from 20:00 to 06:00, setups is like M51 start time =20:00:00
		  M51 interval =10:00:00
		  M51 log times =9999 (means always)
		  M80 select item #9
		  M81 input 100 (Unit is defined in M30,M31,M32)	

Inputs / Outputs menu (contd.)	M81	The built-in batch controller Set the flow batch value(dose) The internal output of the batch controller can be directed either to the OCT or the RELAY output circuits. M81 and M80 should be used together to configure the batch controller. Note: Because the measuring period is 500mS, the flow for every dos should be keeping at 60 seconds long to get a 1% dose accuracy.	
	M82	View the daily, monthly and yearly flow totalizer and thermal energy totalizer value. The totalizer values and errors for the last 64 days, 32 last 32 months and last 2 years are stored in the RAM memory, To view them, use the 'ENT' and 'UP' 'Down' keys.	
	M83	Automatic Amending Function for automatic offline compensation. Select 'YES' to enable this function, select 'NO' to disable it. When the function is enabled, the flow meter will estimate the average flow uncounted (or 'lost') during the offline session and add the result to the totalizer. The estimation of the uncounted flow is made by computing the product of the offline time period and the average flow rate, which is the average of the flow rate before going offline and the one after going on line.	
	M84	Set the thermal energy unit: 0. GJ 1. KC 2.KWh 3. BTU	
	M85	Select temperature sources 0. from T1,T2 (factory default) 1. from AI3,AI4	
	M86	Select the Specific Heat Value. Factory default is 'GB'. Under this setting, the flow meter will calculate the enthalpy of water based on the international standard. If the fluid is other than water, you should select option '1. Fixed Specific Heat', and enter the specific heat value of the fluid.	
	M87	Turn on or turn off the Energy totalizer.	
	M88	Select thermal energy totalizer multiplying factor. Factory default is '1'.	
	M89	1. Display the temperature difference 2. Window for entering the lowest temperature difference.	

Diagnostic menu	M90	Display signal strengths S (one for upstream and one for downstream), and signal quality Q value. Signal strength is presented by 00.0 to 99.9, the bigger the value, the bigger the signal strength will be, and more reliable readings will be made. Q value is presented by 00 to 99, the bigger the better. It should at least be great than 50 for normal operations	
	M91	Display the transit time ratio. The ratio value should be in the range of 100±3% if the entered pipe parameters are correct and the transducers are properly installed. Otherwise, the pipe parameters and the transducer installation should be checked.	
	M92	Displays the estimated fluid sound velocity. If this value has an obvious difference with the actual fluid sound speed, pipe parameters entered and the transducer installation should be checked again.	
	M93	Displays total transit time and delta time (transit time difference)	
	M94	Displays the Reynolds number and the pipe factor used by the flow rate measurement program. Pipe factor is calculated based on the ratio of the line-average velocity and the cross-section average velocity.	
Other display menu	M95	(1) Display the positive and negative energy totalizers (2) Upon entering this window, the circular display function will be started automatically. The following windows will be displayed one by one, each window will stay for 8 seconds: M95>>M00>>M01>>M02>>M02>> M03>>M04>>M05>>M06>>M07>>M08>>M90>>M91>>M92>> M93>> M94>>M95. This function allows the user to visit all the important information without any manual action. To stop this function, simply press a key. Or switch to a window other than M95.	
	M96	Not used	
	M97	Not used	
	M98	Not used	
	M99	Not used	
	M+0	View the last power on and off event. The recorded information include the date and time as well as the corresponding flow rate when the power on or off occurs	
	M+1	Displays the total working time of the flow meter. When the backup battery is removed, the total working time will be reset to zero.	
	M+2	Displays the last power-off date and time	
	M+3	Display the last power-off flow rate	
	M+4	Display the total number of times the flowmeter has been powered on and off	
	M+5	A scientific calculator for the convenience of field applications. All the values are in single accuracy. All the mathematic operators are selected from a list.	

Other display menu (contd.)	M+6	Set fluid sound speed threshold Whenever the estimated sound speed (displayed in M92) exceeds this threshold, an alarms signal will be generated and can transmitted to BUZZER or OCT or RELAY. This function can be used to produce an alarm or output when fluid material changes.	
	M+7	Displays total flow for this month (only for the time past)	
	M+8	Displays total flow for this year (only for the time past)	
	M+9	Display the not-working total time in seconds. The total failure timer will also include the time when power off, if the back-up battery is applied.	