



Spectra Technologies

Model TTM-500

Digital Transit Time Flow Monitor

Programming Parameter Manual

The Spectra Technologies TTM-500 utilizes an menu driven programming system. For convenience, the following information and table will allow the user to quickly set the unit up for the type of application that needs to be monitored.

Key Functions

The TTM-500 series ultrasonic flow meter utilizes a 16-key keypad for programming all parameters. The keypad consist of 10 numerical keys (0-9), 2 up/down arrow keys, a Menu key (M), an enter key, a decimal point key and a backspace key. This configuration allows for quick and convenient programming of the unit.

Key pad definitions

0-9 and <•> are used to input digits or Menu number.

◀ key is used to left backspace or delete character(s) to the left of the cursor.

<▲/+> and <▼/-> keys are used to enter the upper and lower Menus when programming digits and is used to enter plus or minus signs.

The Menu key (M) is used to enter the Menu, by pressing “M” key and then the two digit Menu number (listed in the table below) you can quickly navigate to that particular menu item. For example: if you want to enter the outside pipe diameter, press Menu (M), then enter 11 this will take you to the outside pipe diameter parameter.

Pressing the “ENT” key allows you to edit that parameter. Once the parameter is set to the desired input press the “ENT” key to save the entry.

Display Options

00	Displays instant flow rate/net totalizer, adjust the units in M30-M32
01	Displays instant flow rate/instant flow velocity, adjust the units in M30-M32
02	Displays instant flow rate/positive totalizer, adjust the units in M30-M32
03	Displays instant flow rate/negative totalizer, adjust the units in M30-M32
04	Displays instant flow rate/date time
05	Displays heat flow rate/total heat quantity; adjust the units in M84, M88.
06	Displays temperature input T1, T2
07	Displays present battery voltage. (suitable to TDS16)
07	Displays analog input AI3, AI4
08	Displays system error code
09	Displays current day net totalizer

Application Setup

10	Input inside diameter of pipe
11	Input outer diameter of pipe
13	Input wall thickness
*14	Choose the kinds of pipe materials
15	Input sound velocity of pipe material
16	Select type of pipe liner
17	Input the sound velocity of liner
18	Input the thickness of liner
19	Input inner pipe wall absolute degree of roughness
*20	Select type of fluids
21	Input fluid velocity
22	Input fluid viscosity
*23	Select transducer type, 20 types available
*24	Select transducer installation method
*25	Display transducer spacing
*26	Solidify settings, Store specific application parameters and setup (This must be done anytime programming changes are made to the unit).
27	Store and read installation parameters on installation point
28	Set what occurs on poor signal, hold last data, selecting "yes" means when there is a poor signal, the meter will display the last correct measured data.
29	Input signal strength when the pipe flow is set to be empty. For example: if 65 is set, when the signal strength is lower than 65, the flow meter will display the flow value as zero.
30	Selects English or Metric Units
31	Selects the instantaneous flow rate units
32	Selects the totalizer units
33	Selects the totalizer multiplying factor. The default is set it as x1
34	net totalizer switch
35	positive totalizer switch
36	negative totalizer switch
37	restores unit to factory defaults Note: all totalizers will be reset to zero
38	manual totalizer (the key to control on/off)
39	Select operating language
*40	Damping Level
*41	Programs a low flow velocity cutoff value
42	Setup static zero point
43	Clears zero-point setup and manually setup zero point, restore default before leaving factory.
44	Set up zero-point deviant by hand
45	Meter coefficient, rectification coefficient

Communications Setup

46	input Network address identification number(IDN)
47	Password protecting operation, after the meter was setup with password, only browses menus without any modification.
48	Input degree of linearity broken line rectification data.at most there is 12 segments broken line, used for users to rectify meter nonlinear.
49	Network communication test, use this window to review the data transferred from upper computer to evaluate problems that arise during communication.
50	Optional setup of data output at scheduled time, choose output content at scheduled time to print, 20 to select from
51	Setup output time at scheduled time
52	Printing data flow direction control.by default printing data will flow directly to the thermal printer when installed... Setup printing data output to outside serial port (RS485 port)
53	display analog input AI5(reserved for the TDS16 mainboard)
54	Setup of OCT totalizer pulse output, pulse width, range:6 Ms-1000Ms.
55	Select current loop mode
56	corresponding data to output of current loop 4mA or 0mA
57	corresponding data to output of current loop 20mA
58	Verification of current loop output. Set to ON to test if the current loop is normal or not.
59	present output of current loop
60	Date time and setup. The date time of the new flow meter is set by the CPU, when upgrading software, time will be slow, so after upgrading, adjust the date and time to display correctly
61	Software version information and Electronic Serial Number (ESN)
62	setup serial port parameter
63	Communication protocol choosing (including compatible protocol choosing), two options, choosing MODBUS-RTU means using binary system MODBUS-RTU Protocol. Choosing MODBUS-ASCII+previous protocol means using ASCII protocol, the unit can support several protocols simultaneously, including MOSBUS-ASCII, previous 7 version protocols, FUJI protocol, Meter-BUSx protocol etc.

Analog Input and Digital Output Setup

64	analog input AI3
65	Analog input AI4
66	Analog input AI5
67	Setup frequency range of frequency output signal. Frequency signal output represent instant flow rate value by signal frequency value.default:0-1000Hz. Max-range:0-999Hz.output frequency signal by special frequency output unit
68	setup lower limit flow of frequency signal output
69	setup upper limit flow of frequency signal output

LCD Display Options

70	LCD back light control
71	LCD contrast ratio control

Misc. Setup Options

72	Work timer, logs up time of the meter by unit of second.it can reset.
73	Setup lower limit flow frequency signal output
74	setup upper limit flow frequency signal output
75	LCD back light control
76	LCD contrast ratio control
77	Keypad beep setup options
78	setup Open Collector Transistor output(OCT) output options
79	setup relay(OCT2) output options
80	choose input signal of batch controller
81	batch controller
82	day/month/year totalizer, check the flow rate and heat quantity of the totalizers
83	Automatically resets flow switch during the period of power off, default status: off. This function is not available under special conditions.

Energy\BTU Options Setup

84	Choosing heat quantity unit, 0. GJ (default) 2. Kcal 3.Kw 4.BTU (imperial unit)
85	Choose temperature signal origin, if choosing inputting temperature signal by AI3, AI4, then need temperature transmitter that can output 4-20mA current signal.
86	Heat capacity, default: GB-CJ128 enthalpy potential method. Temperature difference method is available also
.5	setup threshold value of Q value

Reporting Options

+7	Net totalizer of this month
+8	Net totalizer of this year
+9	Not used

Other Functions

.2	store static zero point
.8	max flow rate for current day and current month
.9	serial port testing window with CMM direct output
-0	circuitry hardware parameter adjusting entrance (only inputting following windows)
-1	4-20mA current loop calibration
-2	AI3 input calibration of analog input 4 mA
-3	AI3 input calibration of analog input 20mA
-4	AI4 input calibration of analog input 4mA
-5	AI4 input calibration of analog input 20mA
-6	AI5 input calibration of analog input 4mA
-7	AI5 input calibration of analog input 20mA
-8	zero-point setup of PT100 at lower temperature (<40°C)
-9	PT100 setup zero point at higher temperature (>55°C)
-A	PT100 standard calibration at 50°C
-B	PT100 standard calibration at 84.5°C



: * means common required menus, red color indicates new added or changed functions, blue color indicates the menus related with heat quantity measurement.