FT500 Flow Computer Instructions

General Information

The FT500 flow computer provides rate and total flow display, as well as additional output features. It is designed for use with SeaMetrics meters, as well as many other meters which provide a pulse-type output. Flow rate and total are alternately shown, in user-selectable units, on a large alphanumeric LCD display. The accumulated total can be reset with a series of keystrokes.

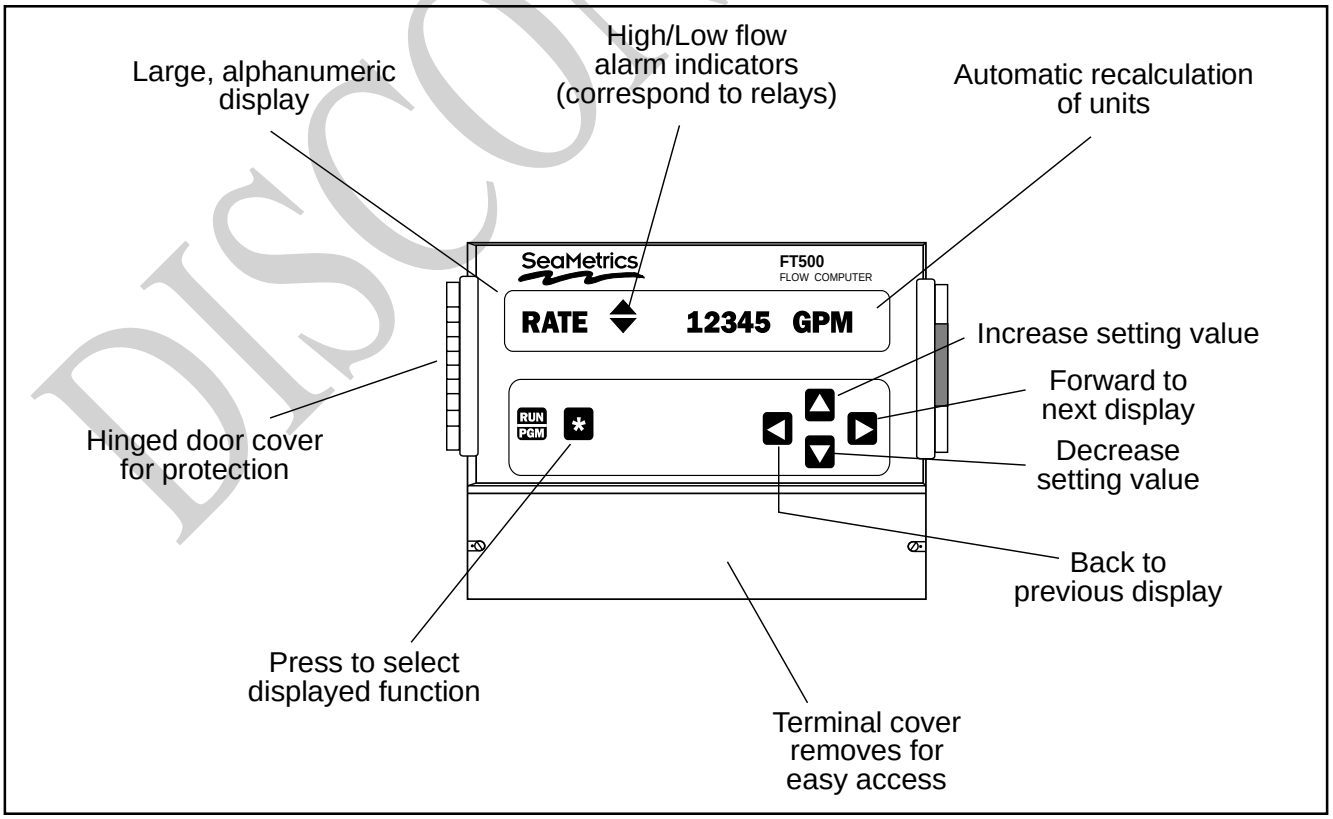
High-flow and low-flow alarm setpoints are a standard feature. The relay outputs of these alarms can be used to operate a warning device such as an autodialer, or to shut off critical equipment, such as a pump. The standard programmable pulse output is useful for metering pump proportional feed or telemetry.

An optional analog output (0-10 V or 4-20 mA) is easily field-calibrated. Zero and span are front-panel programmed in flow units.

The FT500 comes in a weathertight enclosure with a hinged clear cover over the membrane front panel. Terminal acccess is simplified by a separate cover. Both 12 VDC and 115 VAC versions are available.

Specifications

Power	115 VAC or 12-16 VDC (optional), 4 watts max
Temperature	32° - 130° F (0° - 55° C)
Humidity	85% non-condensing relative
Enclosure	Polystyrene (NEMA 4X with conduit connection option)
Outputs	Two form C SPDT relay 120 VAC 5 A max.
Max Pulse Output	100 mA at 60 VDC (100ms)
Memory Type	Battery-backed RAM (10 year retention)
Sensor Power	12-16 VDC, 50 mA
Totalizer	8 digit (resettable)
Rate Display	5 digit (0-99999)
Engineering Units	1000 gal., cubic mtr., cubic ft., Imp. gal., gal., liters, 0.1 gal., fluid oz., cubic in., and mL.
Analog Output	Optional 0-10 VDC or 4-20 mA 8-bit resolution, 500 ohm max load
Sensor Input	Max. current 25 mA at 12 VDC, Max. frequency 500 hz
Shipping Weight	5 lbs.



Installation

Caution: The FT500 like any other electronic control can suffer failure. If failure of the unit could result in personal injury or property damage, safeguards must be installed to prevent such injury or damage.

Mounting. The FT500 enclosure can be mounted to any secure surface with three screws. Drive the center screw first, leaving the head protruding slightly from the surface. Locate the center mounting lug on the back of the control, and slide it over the shaft of the screw. Remove the terminal cover to expose the other two holes. Insert screws through them and tighten.

Connections.

Caution: Always disconnect power to the unit before opening the terminal cover. Do not reconnect power until all connections have been made and the terminal cover has been replaced.

All connections are made with the lower terminal cover removed. Follow the connection diagram or the terminal markings on the board(s) to make connections. Connect the meter first, then the outputs, and the power last. Leave the other end of any outputs disconnected until output programming is completed, since they may activate unexpectedly and unpredictably when the unprogrammed unit is powered up.

Meter Input. Note that either powered (3-wire, typically with Hall-effect sensors) or unpowered (2-wire, reed switch) meters can be connected by following the connections diagram. The strain relief provided with the meter can be used with most types of meter cable. If the FT500 is equipped with a SeaMetrics 3-pin connector, a SeaMetrics meter with mating connector can be plugged in with no additional connection.

Pulse Output. This open-collector transistor output is useful for proportional feed using an electronic metering pump, for telemetry, or for remote indication. Follow the diagram, noting the proper polarity. Cables are available from SeaMetrics for specific metering pumps, if required.

Flow Alarm Outputs. If you are using the high-flow or low-flow alarms, connect to the K1 or K2 relay terminals, following the diagram. The relays energize when their respective flow rate setpoints are reached. You can use the normally-open contacts (they close when the setpoint is reached) or normally-closed contacts (they open when the setpoint is reached).

Analog Output. If the optional analog board has been specified, it will be present on the right hand side of the terminal compartment. There are two sets of terminals on the board, one pair for 4-20 mA and one pair for 0-10 V. The board is factory-configured for one output or the other, and is marked accordingly in the appropriate box. Connect following the diagram. Note that the standard internal power source for the 4-20 mA current loop will drive up to a 500 Ohms load. If your load exceeds this amount, it is necessary to connect an external power source in series to drive it.

Caution: When the control is powered up, relay or analog outputs may be present. If this could be a hazard, wait to make external connections until programming is complete.

Programming

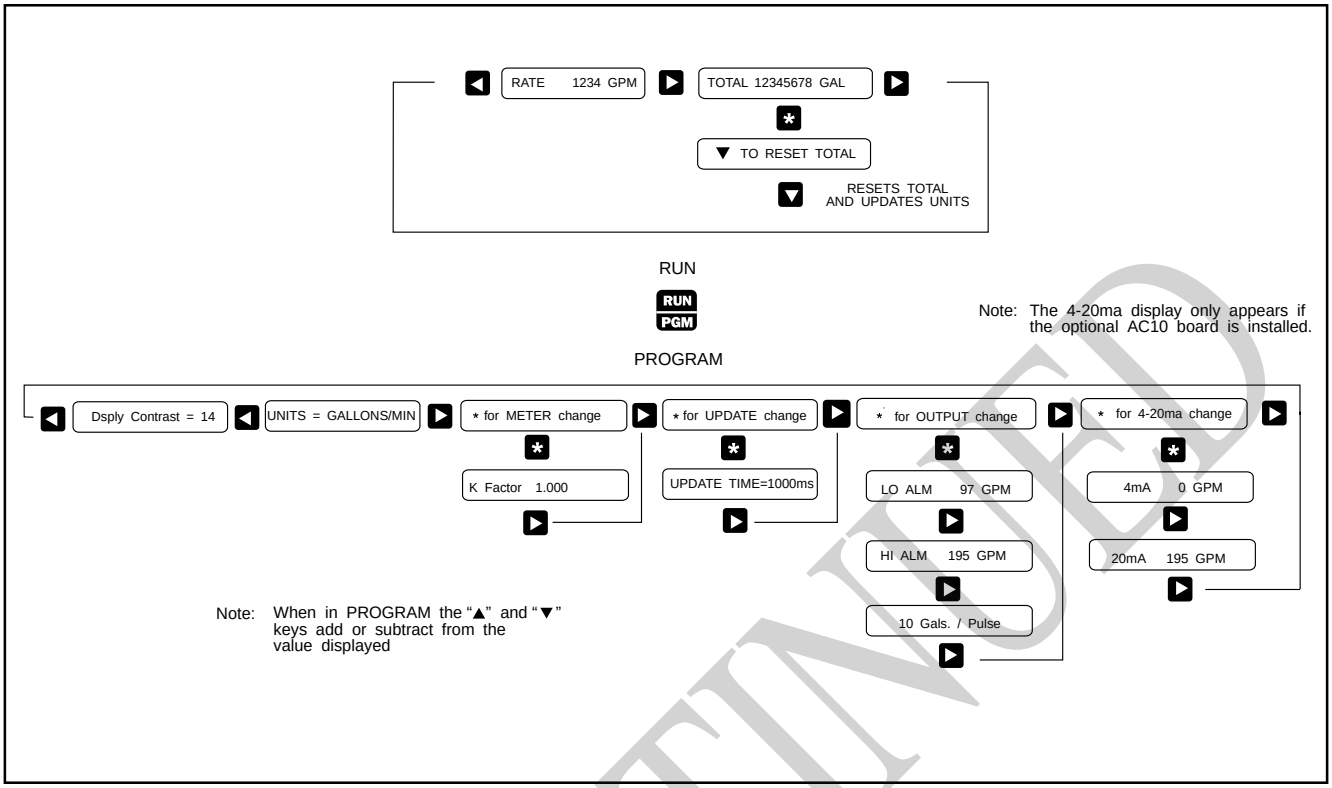
Run/Program Key. Pressing this key switches back and forth between RUN and PROGRAM. Normal operation is in RUN. Changes to settings are made in PROGRAM.

Arrow Keys. Either key may be used at any time. The forward key brings up the next display, and the back arrow returns to the last one.

Increase/Decrease (▲/▼) Keys. Any setting which is being displayed is increased by the (▲) key and decreased by the (▼) key. The longer a key is held down, the faster the setting changes. If the desired setting is overshot, use the other key to go back to it.

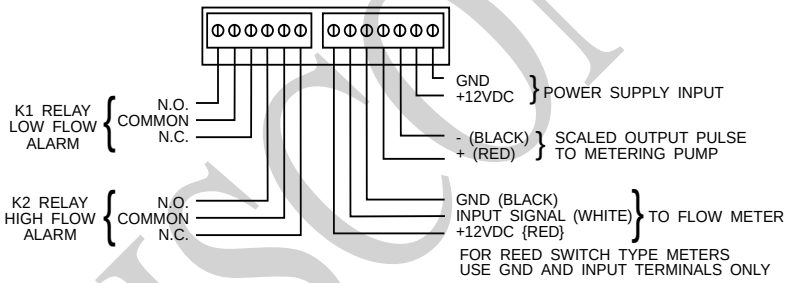
Select Key (*). When this key is pressed it selects the option displayed. For example, pressing this key when the display reads " * for OUTPUT change" brings up the first of the output settings.

Displays

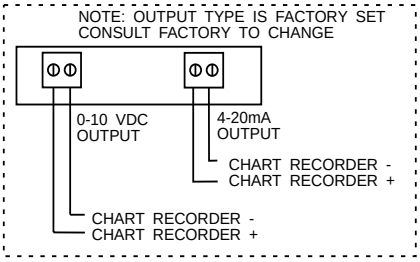


Connections

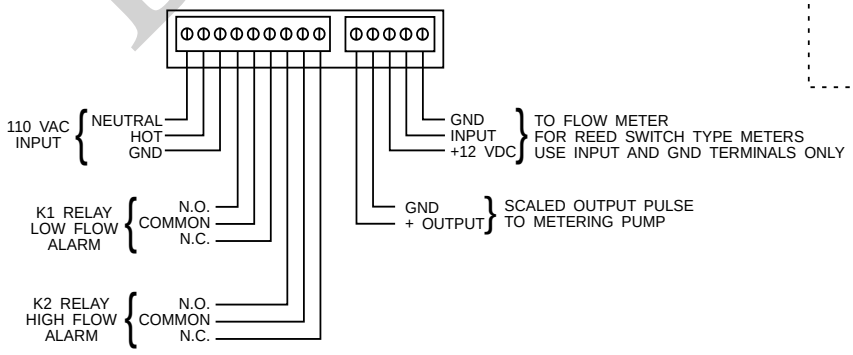
Optional 12-18 VDC Power



Optional Analog Output



Standard 110 VAC Power



Units Setting. This determines which flow rate and volume units will be displayed. Pressing the ▲ key changes to larger units, and pressing the ▼ key changes to smaller ones. The largest unit is 1,000 gallons, and the smallest is milliliters.

Meter Setting. Select this setting to set the *K-factor*. This is the number of pulses per gallon which the meter produces. For SeaMetrics meters, this number is either on a tag (80-Series IP, S-Series, M-Series, WT Turbine) or in a chart for the particular pipe size (100/200-Series IP). For other meters, it may be given as a meter factor or as a "pulse rate", in pulses per gallon.

Update Setting. This determines the interval at which the flow rate display is updated. It can be set anywhere from one to 2,000 milliseconds. Typically 1,000 to 2,000 is the best range. Longer intervals stabilize the display by averaging more pulses, but also decrease the responsiveness to fast fluctuations. This setting applies to rate only, and does not effect total.

Output Settings. There are three output settings:

LO ALARM is the low-flow setpoint. When flow drops below this setting, the LO relay energizes and a down arrow appears in the Rate display.

HI ALARM is the high-flow setpoint. When flow exceeds this setting, the HI relay energizes and an up arrow appears in the Rate display.

PULSE OUTPUT controls the ratio, in units per pulse, of the open-collector transistor pulse output.

Analog Settings. This choice only appears if the optional AC10 analog output board has been installed, either in the factory or the field. The two settings are:

4 mA = (set in flow rate units, for example, 0 GPM)
20 mA = (again, set in units, for example, 200 GPM)
Display Contrast Setting. A number between 1 and 14 controls the contrast of the LCD display. The best setting depends on location (high or low on the wall) and lighting (indoor or outdoor) but typically a number between 10 and 14 gives the best results.

Operation

Rate Display. Flow rate is displayed in the selected units. If units are changed at any point, all of the settings will recalculate themselves into the new units. Total will remain in the previous units, however, until it is reset to zero.

Total. The accumulated total is shown up to 99,999,999 units. To reset to zero, press the select (*) key while total is showing on the display. Then press (▼) as instructed to reset.

High/Low Alarm. Whenever flow exceeds the "HI" setpoint, an up arrow appears on the Rate display and the appropriate relay energizes. When flow drops below the "LO" setppoint, a down arrow appears and the matching relay energizes.

Analog Output. If this option is installed, the 4-20 mA or 0-10 V signal varies continuously with the flow, between the two programmed endpoints.

Maintenance and Repair

Repair. The circuit boards of the FT500 are not designed for field repair. If the unit fails for any reason other than a blown fuse or lack of power, it is generally advisable to contact the distributor through whom the unit was purchased. The distributor or factory can generally repair and return the unit quickly, for a flat fee repair. Any returns to SeaMetrics must be accompanied by an RMA (returned material authorization) number.

Front Panel Removal. The front panel must be removed to change a fuse, or to add an analog or other accessory board. To remove it, open the front (clear) cover. Remove the two screws on the left side and the two hex standoffs on the right. Gently loosen the panel and lift it out. The main (display) board is attached and will come out with the panel. This exposes the fuses, which are on the power supply board.

Fuses. The power supply and the pulse output circuit have fuse protection. The two fuses are on the power supply board. If it is necessary to replace a fuse, use a 1/2 Amp AGC, readily available from auto parts or electronic supply stores.

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