Vantage 6000

Portable Ultrasonic Flow Meter

Instruction Manual

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Description

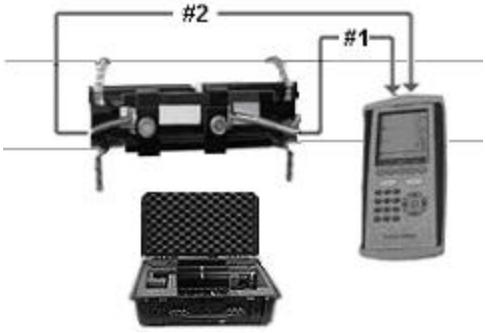
The Vantage 6000 portable transit time ultrasonic flow meter is designed for temporary flow monitoring in full pipe flow conditions. The meter can be programmed for a specific type of pipe, flow units, totalizer units and totalizer multiplier through the keypad with Menu driven selections. The unit also has a built in data logger that can be programmed to store the flow and total readings at various logging intervals.

Two types of sensors are available for the Vantage 6000. The V30S 1280 sensors are for pipes 1 inch to 12 inch in diameter and the V30L 640 are for pipes 4 inch and larger. The V30L 640 sensors should be used with mortar lined pipes.

Mounting rails are supplied for mounting the sensors in a Z-Shot, V-Shot or W-Shot configuration. The Z-Shot is where the sensors are mounted across the pipe from each other with a sensor separation based on the size of the pipe. The V- Shot and W- Shot are where the sensors are mounted on the same side of the pipe with a sensor separation based on the size of the pipe.

The Vantage 6000 is powered by a rechargeable battery. When fully charged, and the back light of the display is set to turn off when no key is press for one minute, the unit will run for 5 hours.

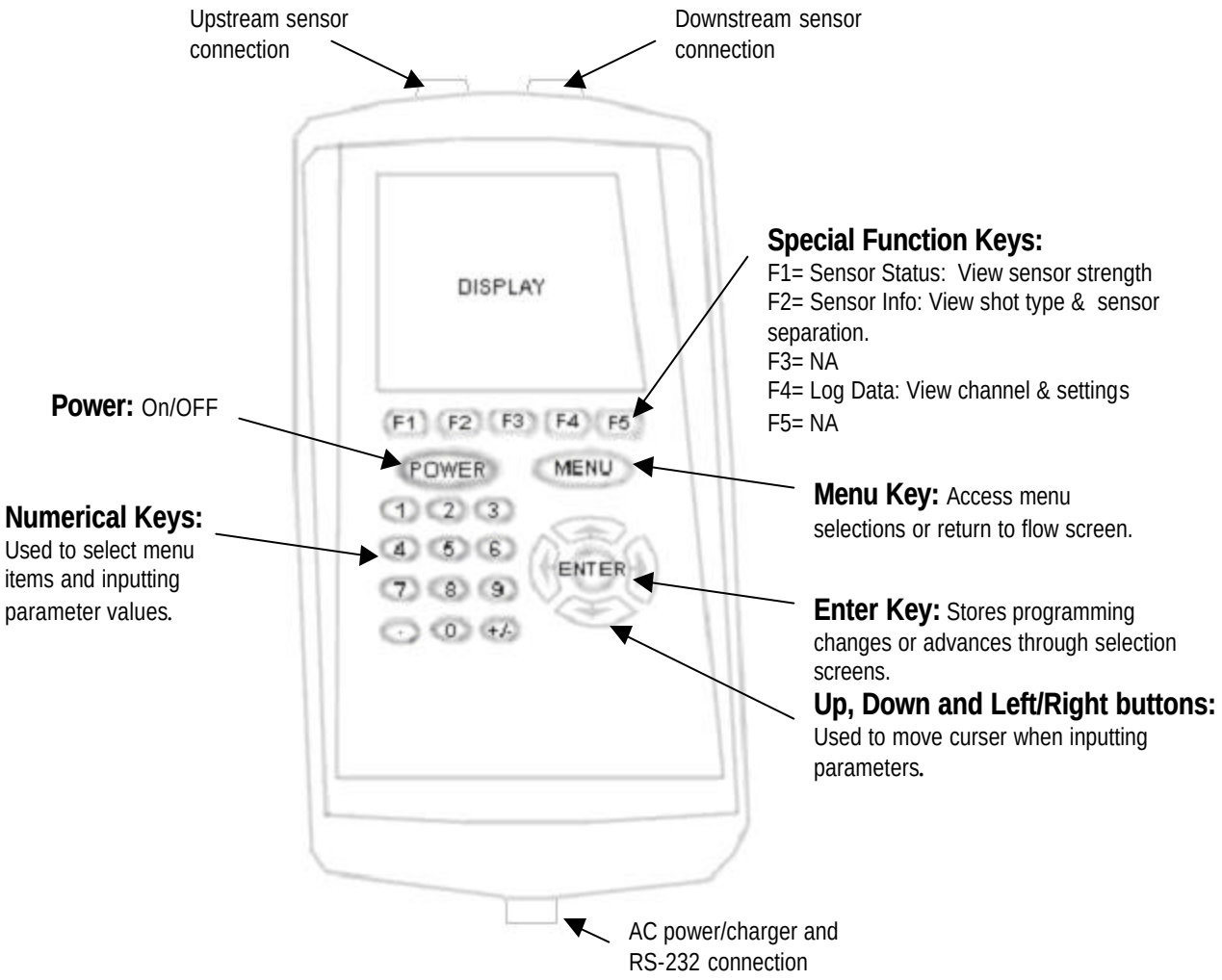
The unit, depending upon the accessories ordered will be supplied with the 6000 hand held electronics module with back lit display, AC power adapter/charger, carrying case, Speedrail mounting brackets with mounting chain, sensors, communication cable, silicone grease and a roll of template paper for use in locating placement of sensors for Z-Shot mounting. The picture below shows the carrying case and electronic unit connected to the sensors mounted in a V-Shot configuration.



The carrying case has two storage compartments. One is located under the section where the electronic unit is placed. When the electronic unit is removed a hole is visible in the top of the storage compartment. Place your finger through the hole and lift up to remove this compartment to reveal the storage compartment. The AC power adapter/charger, communication cable, grease and external battery cable will be normally stored in this compartment. The other location is under the long sensor mounting rails. Remove the rails to access this storage compartment. It will have a cover with a hole in it to allow removal. The short sensor mounting rail, used for Z-Shot mounting of the sensor on large pipes, and the roll of template paper will be stored in this compartment.

Programming Keys

The picture below shows the electronic unit with a brief description of the functions of the keys and connections.



To access the programming sections of the Vantage 6000, press the Menu key. The following list will appear on the display.

01> Review Meter (Displays sensor mounting and separation and application parameters)
02> Program (Program for specific application and units)
03> Daily Sum (Displays up to 7 days minimum/maximum flow values and time and total)
04> Data Logger (Program the setup of the Data Logger)
05> System Setup (Setup of display, data port, sensor options, resetting of totalizer)
06> View Signal (Displays signal wave form)

To select the item you want press the numbers to the left of the item. For some of the items, once you press the appropriate numbers you will be prompted to enter a security password. The factory default is 00000000. Once the correct code has been entered, press the Enter key. To select the item you want press the numbers to the left of the item. After making the desired programming changes, press the Menu key. You will be prompted to press the Enter key to save the changes. If you press the Menu key without making changes, it will take you back to the main item list. Press the Menu key to return to the flow display screen. Each item on the main selection list will be discussed in detail later in the manual.

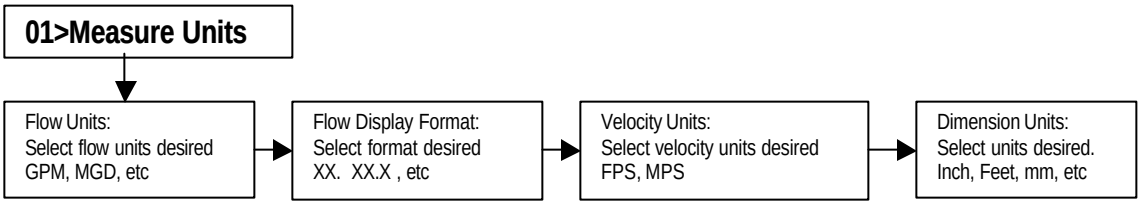
Programming the Meter for a Specific Application

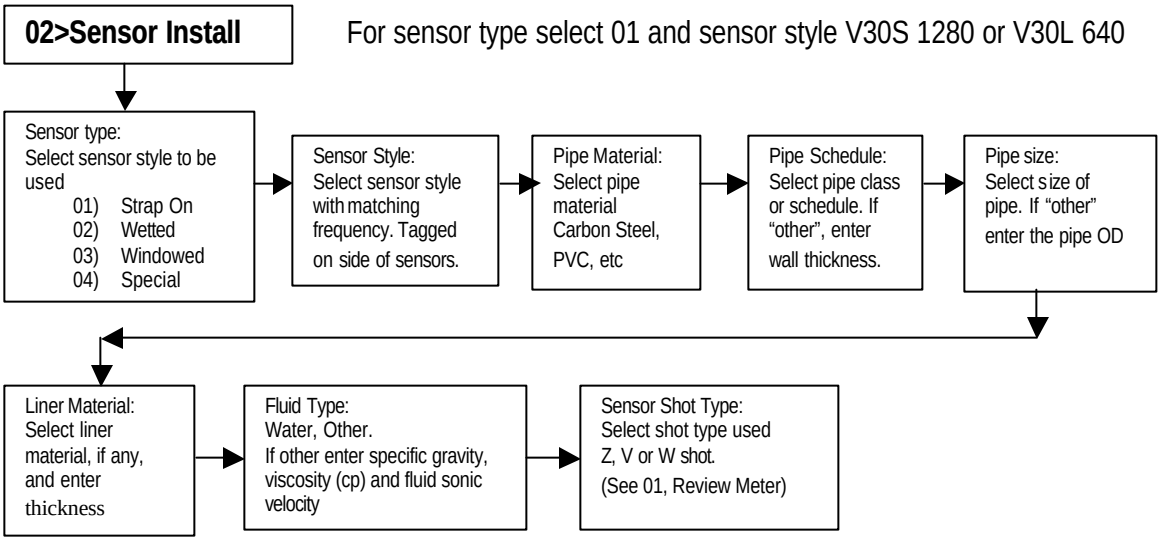
To program the 6000 for a specific application you will need to select the desired flow units, totalizer units and multiplier and program for the specific pipe information. The following shows the programming steps. Turn the meter on by pressing the Power key. The flow display screen will appear.

Press the Menu key and the following list will be displayed:
01> Review Meter (Displays sensor mounting and separation and application parameters)
02> Program (Program for specific application and units)
03> Daily Sum (Displays up to 7 days minimum/maximum flow values and time and total)
04> Data Logger (Program the setup of the Data Logger)
05> System Setup (Setup of display, data port, sensor options, resetting of totalizer)
06> View Signal (Displays signal wave form)

A pointer will be to the left of the item to indicate the last item that a programming change was made. Press the numbers 02 to enter into the Program selection. The screen will prompt you for a password. The factory default is 00000000. If you have not put in a new password, press the Enter key or enter the password.

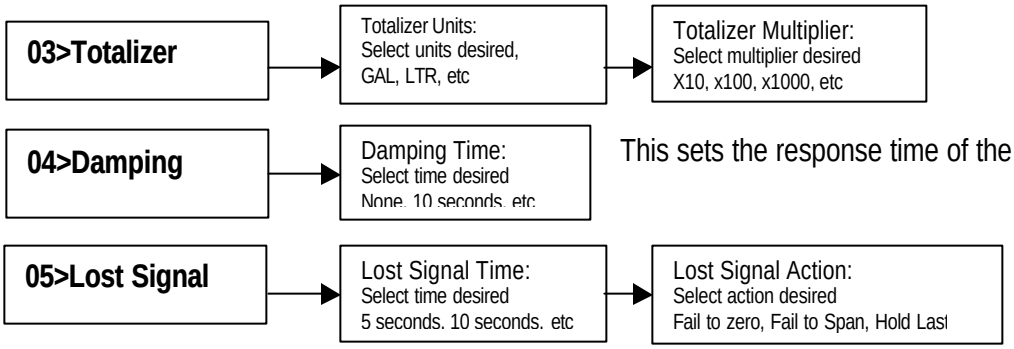
The following list will be displayed:
01> Measure Units
02> Sensor Install
03> Totalizer
04> Damping
05> Lost Signal
06> Setpoints
07> Meter Factor
08> Flow Cutoff



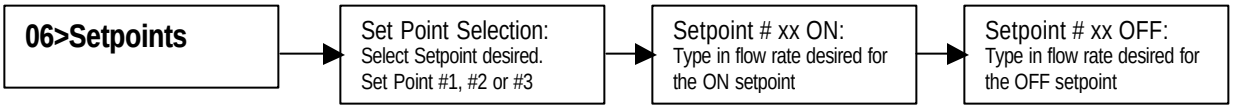


Selecting the Sensor Shot Type will depend on the application. The V-Shot is the easiest to install but the transmitted signal is reflected off the pipe wall and if there is corrosion on the wall this may prevent a good reflected sensor. Switch to the Z-Shot if the meter indicates no signal. The W-Shot is used on 1 or 2 inch pipes.

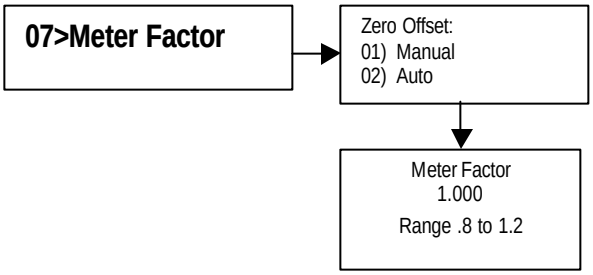
After the sensor shot type is selected the display will return to the selection list. Press the Menu key and the display will prompt you to press Enter to save the changes. You may press 01 for Review Meter to show the sensor mounting and sensor separation. Press the Menu or Enter key to return to list and the press Menu to return to main flow screen. See sensor installation instructions section for proper mounting.



The Lost Signal allows the adjustment of time to hold the last valid flow reading. When this time has elapsed the unit will go to the Lost Signal Action selected.

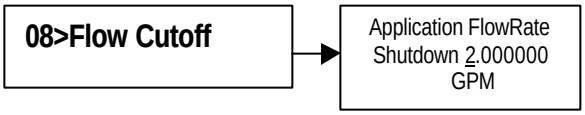


The set points can be used for the data logger storage time interval. The data logger can be set up to log at a faster interval based on the set point.



This allows setting or capturing any flow offset in the meter. This is done with zero flow in the pipe. It can be manually set or auto capture.

This is set at the factory.



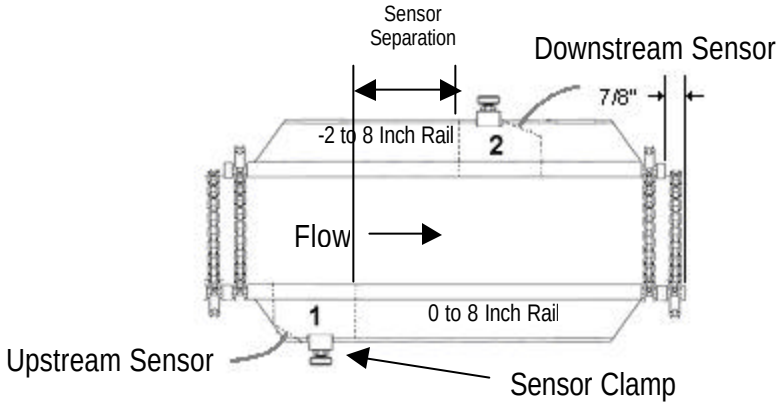
When the flow rate goes below this value the meter will indicate zero flow. Enter the value desired.

Sensor Mounting Instructions

Before installing the sensors and sensor rails, select a section of pipe that will give 15 to 20 pipe diameters of upstream straight run and 3 pipe diameters downstream. Remove any build-up of dirt or corrosion on the surface of the pipe where the sensors are to be installed. For ductile iron pipe, grind the bumps off the pipe to ensure good contact of the sensor to the pipe. If the pipe is painted, it is not necessary to remove the paint unless there is evidence that there are several layers of paint.

There are three mounting configurations that can be used when installing the sensors to the pipe: Z-Shot, V-Shot and W-Shot.

The Z-Shot configuration is where the sensors are mounted on opposite sides of the pipe. The picture below shows this mounting using the two long mounting rails. These can be used from 1 inch to 24 inch pipes (maximum sensor separation of 8 inches).



For horizontal pipes, set the longest rail (the one that has a scale of 0 to 8 inches) on top of the pipe and wrap the chains around the pipe and connect the chains to the hook on the thumbscrew assembly.

Take up some the slack in the chain with the wing nut but not so tight that you can not rotate the rail on the pipe.

Rotate the sensor rail on the pipe so that the bubble on the level is between the two lines. Tighten the wing nut to secure the rail to the pipe. Use a length of paper from the roll of template paper to wrap around the pipe next one of the ends of the mounting rail. This will be used to position the other rail.

Set the other long rail (the one with the scale of –2 to 8 inches) on the pipe and wrap the chains around the pipe with the chains going over the slots in the first rail. Connect the chain to the hook as with the first rail. Rotate the sensor rail on the pipe so that the bubble on the level is between the two lines. Before tightening the chain verify that the end of the rail is 7/8" from the edge of the template paper, and then tighten the chain with the wing nut to secure the rail to the pipe.

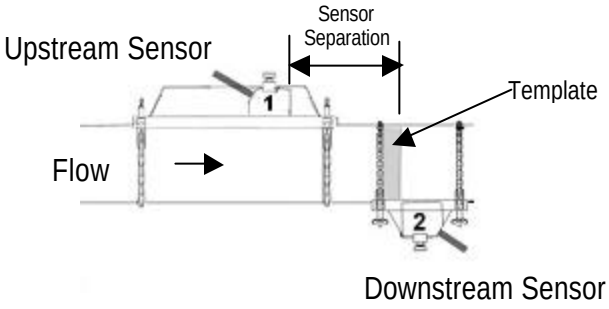
For vertical pipes, the procedure is the same except instead of using the bubble levels you will need to position the second rail so that the distance between the rails across the pipe is equal.

Once the rails are secured properly to the pipe the sensors can be installed. Place a bead of the Dow Corning 111 silicone grease in the middle of the face of the sensor along its length.

Install the sensor marked 1 in the mounting rail (0 to 8 inches) with the end opposite where the sensor cable come out lined up with the Zero on the scale. Mount the sensor marked 2 in the other mounting rail (-2 to 8 inches) with the end opposite where the sensor cable come out lined up with the number on the scale to give the sensor separation indicated in Review Meter selection or by pressing the F2 key when the main flow screen is present.

Once the sensors are mounted connect the number 1 sensor to the upstream connection on the handheld electronics unit and the number 2 sensor to the downstream connection. The sensor connectors are keyed so you may need to rotate the connector on the cable until it makes the proper alignment and then screw the connector until tight.

The other Z-Shot configuration uses one long rail and the short rail. These can be used for pipe sizes 14 inches and larger as shown in the picture below.

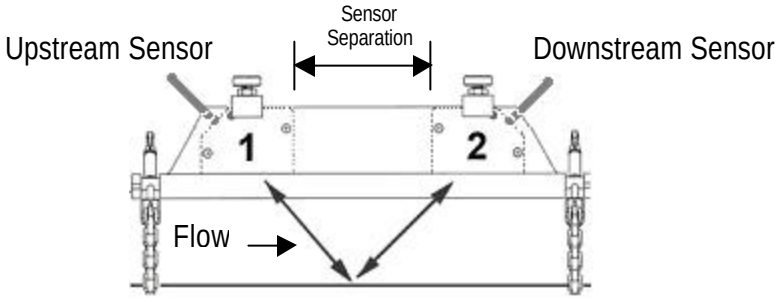


The mounting of the rails is the same except that a template is used to assist in positioning the sensor separation. A roll of template paper is provided with the Vantage 6000.

Cut a length of the template paper that is the circumference of the pipe and tape it to the pipe. Mount the smaller rail so that the bubble is level and the inside opening in the rail (where sensor is mounted) is even with the template. On the opposite side of the pipe, measure from the outside of the template and mark on the pipe the sensor separation calculated by the handheld electronic unit. Mount the other rail and position it on the pipe so the edge of the opening for the sensor lines up with the mark you made on the pipe and the bubble on the level on the rail is centered.

Install the sensors as previously described with the other Z-Shot configuration.

The V-Shot and W-Shot configurations are where the sensors are mounted on the same side of the pipe as shown in the picture below.



The large sensor mounting rail is used for the V-Shot configuration up to 12 inch pipes. For larger pipes the small mounting rail is used in conjunction with the large rail. The mounting of the rail(s) to the pipe is the same procedure as described in the Z-Shot mounting. It is not necessary for the rail to be level when using the large rail only. But the rail should never be mounted at the top or bottom of a horizontal pipe.

Pipe preparation and installation of the sensors are the same as described in the Z-Shot procedure. The sensors are to be mounted so that the inside to inside spacing of the two sensors is the value calculated by the handheld electronic unit for the specific application.

The W-Shot is used for 1 to 2 inch pipes with the small sensors.

Description of Other Main Menu Selections

03) Daily Sum

The Daily Sum records the minimum and maximum flow values and time and the total flow for a 24 hour period and stores the last 7 days. To select this item, press Menu key and then the 0 and 3 keys. To view the previous day, press the Left Arrow key.

04) Data Logger

The Data Logger has up to 8 channels that can be assigned to store flow values such as flow, total and velocity. The storage rate is selectable from one minute to 60 minutes. For flow or velocity values it stores the average value over the selected time interval. For the totalizer it stores the accumulated totalizer value at the time of the selected time interval.

To download the data, connect the Serial Com cable to the handheld connector on bottom of unit and the RS-232 on the computer where the Vantage DDS software is installed. See the instruction manual for the for installing the Vantage DDS software and do

To select this item press the Menu key and then the 0 and 4 keys. The Password screen will appear. The factory default is 00000000. The following list will be displayed. A description for each item is listed beside the item.

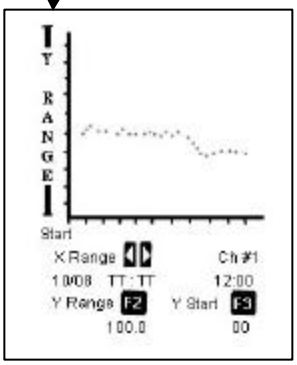
01)Set Time Date → Set time Date: To set the internal clock for time and date.

02)Storage Rate → Storage Rate: To select time interval for logged data

03)Secondary → Secondary: To select time interval for secondary time value

04)Log Channels → Log Channel #: Select channel number to set logging function → Select desired logging function for identified channel.

05)Logged Graph → Select Channel # to view graph of data. Use left or right button to scroll through data. → Y Range (F2)= Sets range of Y on graph
Y Start (F3)= Sets start value of Y range
X Range= Using left or right arrow buttons will scroll time of X axis.



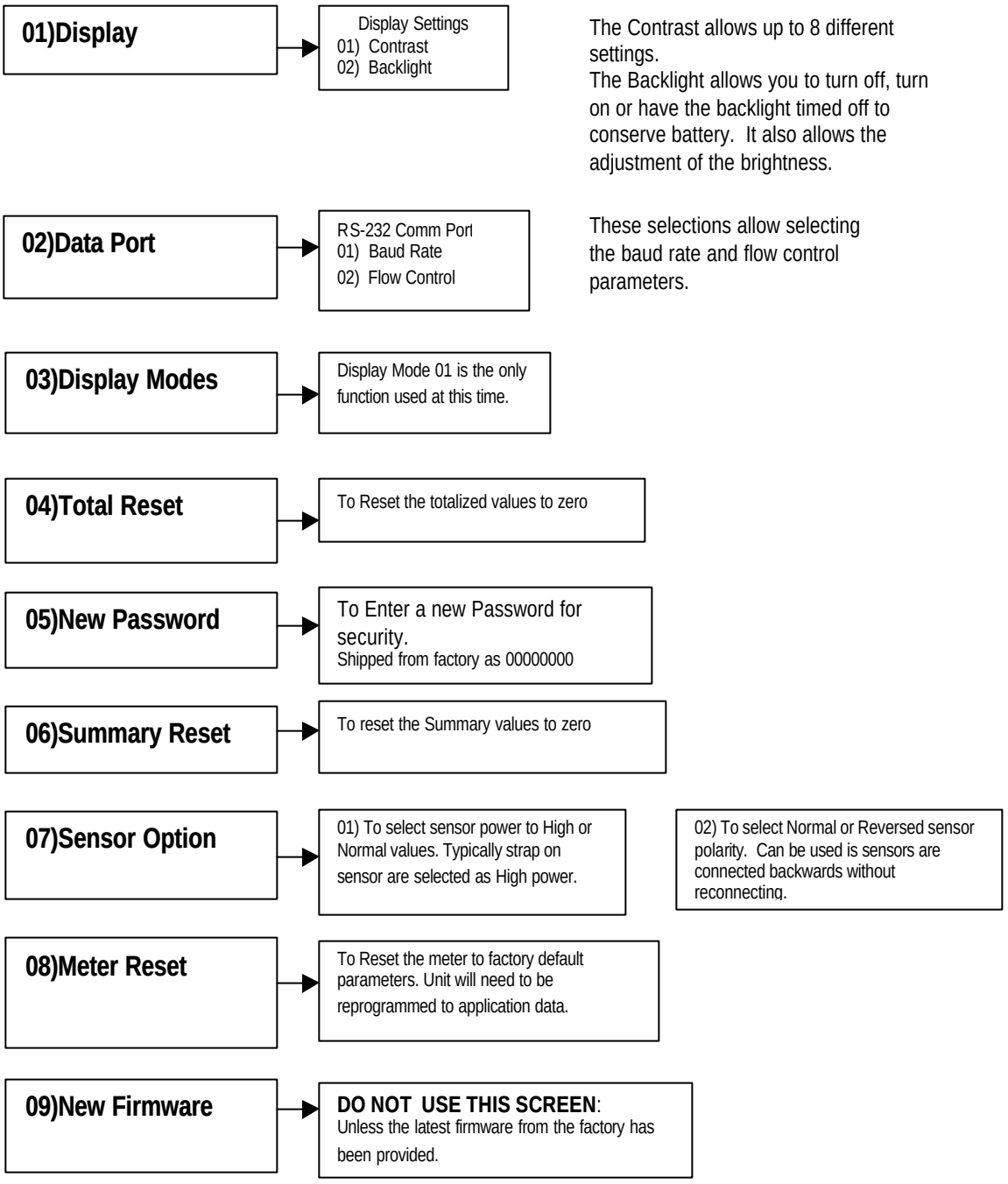
06)Logged Data → To review programmed Channels and the Present logged functions.

07)Amount Stored → To view the logger time and time to store and the amount of bytes stored and the amount of free space.

08)Clear Data → To clear the data logger of all logged data. Press "5" to clear.

05) System Setup

The System Setup selection contains items for the basic set up of the meter such as, setting up the display contrast and back light, serial communications, resetting of totalizer, etc.. Press the Menu key and then the 0 and 5 keys. The Password screen will appear. The factory default is 00000000. Press the Enter key and the following list will be displayed. A description for each item is listed beside the item. To select the desired item, press the number keys for that item.



06) View Signal

This selection allows the viewing of the signal. The signal should be a uniform sinusoidal wave. If the signal is distorted, try recycling the power or reposition the sensors. Press the Menu key and then the 0 and 6 keys. To refresh the displayed signal press the F5 key.

Components of the Vantage 6000

Description	Part Number
Handheld electronic unit	544743-0001
V30L 640 sensor (2)*	544746-0001
V30S 1280 sensor (2)*	544747-0001
Speedrail V-Shot	544727-0001
Speedrail Z-Shot up to 12" pipe	544726-0001
Speedrail Z-Shot 14" and larger pipe **	544725-0001
Sensor Clamps (2)	528360-0001
Thumb Screw (2)	528304-0002
AC adaptor/battery charger cable	544748-0001
Serial communications cable	544749-0001
External battery power cable	544750-0001
Sensor cable extension 18 Ft. ***	501733-0002

*May have one or both sets of sensors depending on unit ordered.
**Not supplied if only V30S 1280 sensor ordered.
***Optional