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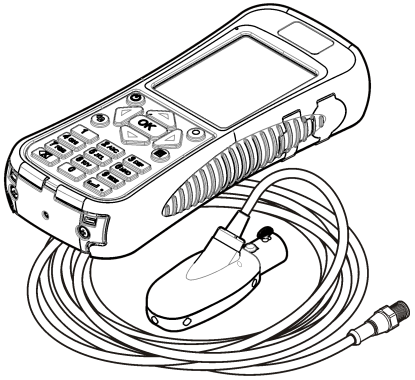


Basic User Manual
Manuel d'utilisation de base
Manual básico del usuario
Manual Básico do Usuário
基本用户手册
基本取扱説明書

Table of contents

Additional information

Additional information is available on the manufacturer's website.

Specifications

Specifications are subject to change without notice.

Sensor specifications

Specification	Details
Velocity measurement	
Method	Electromagnetic
Range	0 to 6.09 m/s (0 to 20 ft/s)
Minimum water depth	3.18 cm (1.25 in.)
Accuracy	±2% of reading ±0.015 m/s (±0.05 ft/s) 0 to 3.04 m/s (0 to 10 ft/s); ± 4% of reading from 3.04 to 4.87 m/s (10 to 16 ft/s)
Resolution	0.01 value < 100; 0.1 value < 1000; 1.0 value ≥ 1000
Zero stability	±0.015 m/s (±0.05 ft/s)
Material	ABS, glass filled
Enclosure rating	IP68
Dimensions (L x W x H)	11.9 x 4.3 x 6.3 cm (4.7 x 1.7 x 2.5 in.)
Cable material	Polyurethane jacketed
Cable lengths	1.5, 6.1, 12.2 and 30.5 m (5, 20, 40 and 100 ft)
Depth measurement	
Method	Diaphragm type: absolute pressure with single point calibration
Accuracy (static)	The larger of ± 2% of reading or ± 0.015 m (± 0.504 inches). Steady state temperature and static non-flowing water.
Range	3.05 m (0-10 ft)
Resolution	0.01 value < 100; 0.1 value < 1000; 1.0 value ≥ 1000

Portable meter specifications

Specification	Details
Pollution degree	2
Protection class	II
Charging temperature	0 to 40 ºC (32 to 104 ºF)

Specification	Details
Operating temperature	–20 to 55 ºC (-4 to 131 ºF)
Storage temperature	–20 to 60 ºC (-4 to 140 ºF)
Enclosure rating	IP67
Battery life gauge	Five-segment bar graph
Battery type	Rechargeable lithium ion, 3.7 V, 4.2 Ah
Battery life	18 hours heavy typical day use[1]; 20 ºC (68 ºF)
Battery charger	External Class III power adapter 100–240 VAC, 50–60 Hz, 0.3 A input; 12 VDC, 1.0 A output
Dimensions (L x W x H)	21.8 x 9.3 x 5.3 cm (8.6 x 3.7 x 2.1 in.)
USB connector	Type Mini-B, 5-pin, rated to IP67 when capped
Material	Polycarbonate with a thermoplastic elastomer (TPE) overmold

[1] Defined as 30 minutes of set up, six 1-hour periods of continuous use with an active sensor and the display at maximum brightness and 30 minutes of sleep mode between use periods, data download and power off.

User interface specifications

Specification	Details
Graphics display	Color, LCD 3.5" QVGA transflective (readable in direct sunlight)
Measurement resolution	0.01 value < 100; 0.1 value < 1000; 1.0 value ≥ 1000
Keypad	Alpha-numeric
Operating modes	Real time, profiling
Profile types	Stream, conduit
Conduit shapes	Circular, rectangular, trapezoidal, 2/3 egg, inverted 2/3 egg
Stream entries	Fixed, non-fixed stations
Noise rejection	User-selectable, 50 Hz or 60 Hz
Units of measure	Velocity: ft/s, m/s, cm/s, mm/s
	Flow: ft^3/sec, million gal/day, gal/day, gal/min, m^3/s, m^3/min, m^3/hour, m^3/day, liters/s, liters/min
	Depth: in., ft, m, cm, mm
Stream flow calculation	Mean-section or mid-section method
Diagnostics	Self test, keypad, display, event log
Conduit profiling methods	0.9 x Vmax, 0.2/0.4/0.8, velocity and level integrator, 2D
Stream profiling methods	1, 2, 3, 5 and 6 point (velocity method - USGS and ISO)
File types	Real-time, profiling, event log
Languages	English, French, Spanish, German, Italian, Dutch, Danish, Swedish, Chinese, Polish, Japanese, Korean, Portuguese, Slovak, Russian, Hungarian, Bulgarian, Romanian, Czech, Turkish, Finnish, Greek

General specifications

Specification	Details
Profiles	Data storage for up to 10 profiles with 32 stations per profile
Maximum number of real-time files	Three each with up to 75 readings captured by the user.
Firmware	The sensor and portable meter are field upgradeable via USB

General information

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

Safety information

NOTICE

The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

Use of hazard information

⚠ DANGER

Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation that may result in minor or moderate injury.

NOTICE

Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

Precautionary labels

Read all labels and tags attached to the instrument. Personal injury or damage to the instrument could occur if not observed. A symbol on the instrument is referenced in the manual with a precautionary statement.

	This is the safety alert symbol. Obey all safety messages that follow this symbol to avoid potential injury. If on the instrument, refer to the instruction manual for operation or safety information.
	This symbol indicates the presence of devices sensitive to Electro-static Discharge (ESD) and indicates that care must be taken to prevent damage with the equipment.
	Electrical equipment marked with this symbol may not be disposed of in European domestic or public disposal systems. Return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.

Certification

Canadian Radio Interference-Causing Equipment Regulation, IECS-003, Class A:

Supporting test records reside with the manufacturer.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de classe A répond à toutes les exigences de la réglementation canadienne sur les équipements provoquant des interférences.

FCC Part 15, Class "A" Limits

Supporting test records reside with the manufacturer. The device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. The equipment may not cause harmful interference.
2. The equipment must accept any interference received, including interference that may cause undesired operation.

Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their expense. The following techniques can be used to reduce interference problems:

1. Disconnect the equipment from its power source to verify that it is or is not the source of the interference.
2. If the equipment is connected to the same outlet as the device experiencing interference, connect the equipment to a different outlet.
3. Move the equipment away from the device receiving the interference.
4. Reposition the receiving antenna for the device receiving the interference.
5. Try combinations of the above.

Product overview

The portable velocity system is used in the field, laboratory and municipalities. Turbulent, noisy and low flows can be measured with this system.

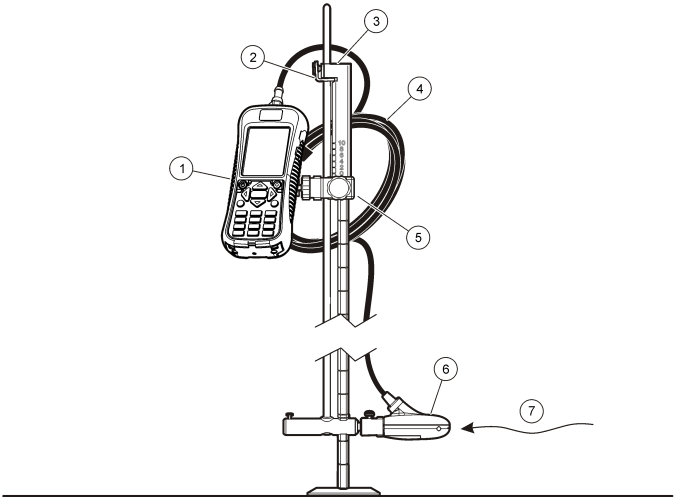
The meter and sensor get velocity information in conduits and streams. These measurements are important for calibration in municipal wastewater industries, as well as for environmental-impact evaluations.

Two types of sensor are available: velocity-only and velocity plus depth. This manual covers both types of sensors. If information applies to a specified type of sensor, this fact is noted in the text.

System overview

An overview of an assembled system is shown in Figure 1. Refer to the documentation supplied with the individual components or accessories for more information.

Figure 1 Assembled components

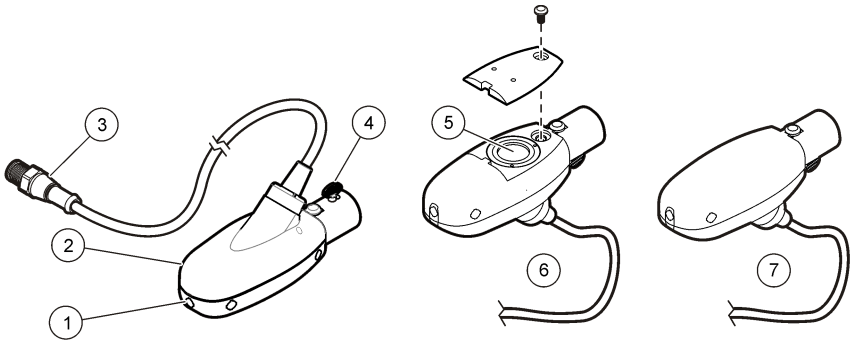


1 Portable meter	**5** Adjustable mount for portable meter
2 Sensor height lock/release device	**6** Sensor assembly
3 Top setting wading rod (accessory)	**7** Flow direction
4 Sensor cable	**8** Base

Sensor overview

Figure 2 shows the main sensor components. Instructions for how to attach the sensor on a standard or top-setting wading rod are supplied with the accessory.

Figure 2 Sensor components

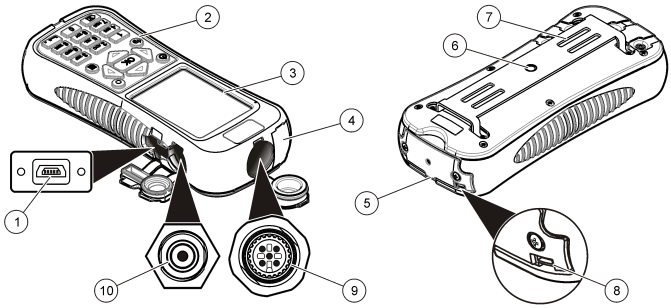


1 Sensor electrodes	**5** Pressure cell (sensors with depth option)
2 Sensor body	**6** Sensor with depth option
3 Sensor connection plug	**7** Sensor without depth option
4 Sensor attachment thumb screw	

Meter overview

Figure 3 shows the features of the meter.

Figure 3 Meter components

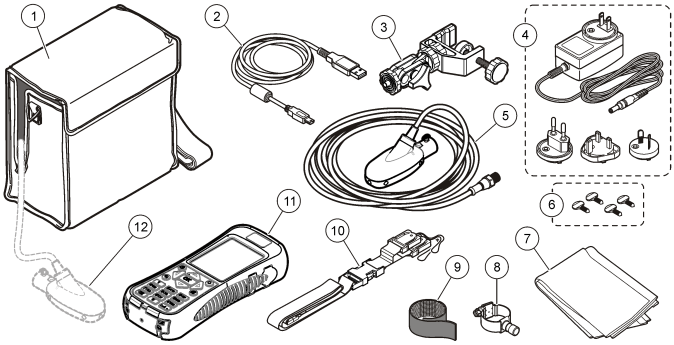


1 USB connection port	**6** Threaded hole for adjustable meter mount
2 Keypad	**7** Slots for velcro or strap attachment
3 Meter display	**8** Slot for neck strap attachment threads (2x)
4 Expansion port (not used)	**9** Sensor connection port
5 Battery compartment cover	**10** Wall-charger connection port

Product components

When purchasing a complete system, refer to Figure 4 to make sure that all components have been received. If any of these items are missing or damaged, contact the manufacturer or a sales representative immediately.

Figure 4 System components



1 Carrying case (with slot for sensor cable)	**7** Cloth to dry the sensor
2 USB communication cable	**8** Universal sensor mount
3 Adjustable portable meter mount	**9** Velcro strap
4 Wall charger and universal plug kit	**10** Lanyard
5 Sensor	**11** Portable meter
6 Extra thumb screws (4x)	**12** Sensor as connected to meter inside case

Installation

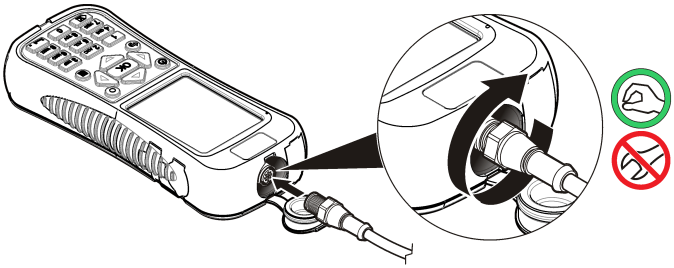
Install the sensor on the universal sensor mount

Use the universal sensor mount to attach the sensor to poles 1 inch or less in diameter. For correct operation and accurate readings, the front of the sensor must be pointed upstream with the electrodes in full contact with the flow.

Note: *Keep the sensor electrodes free from nonconductive substances such as oil and grease. To remove sensor contamination, refer to* Clean the sensor *on page 17.*

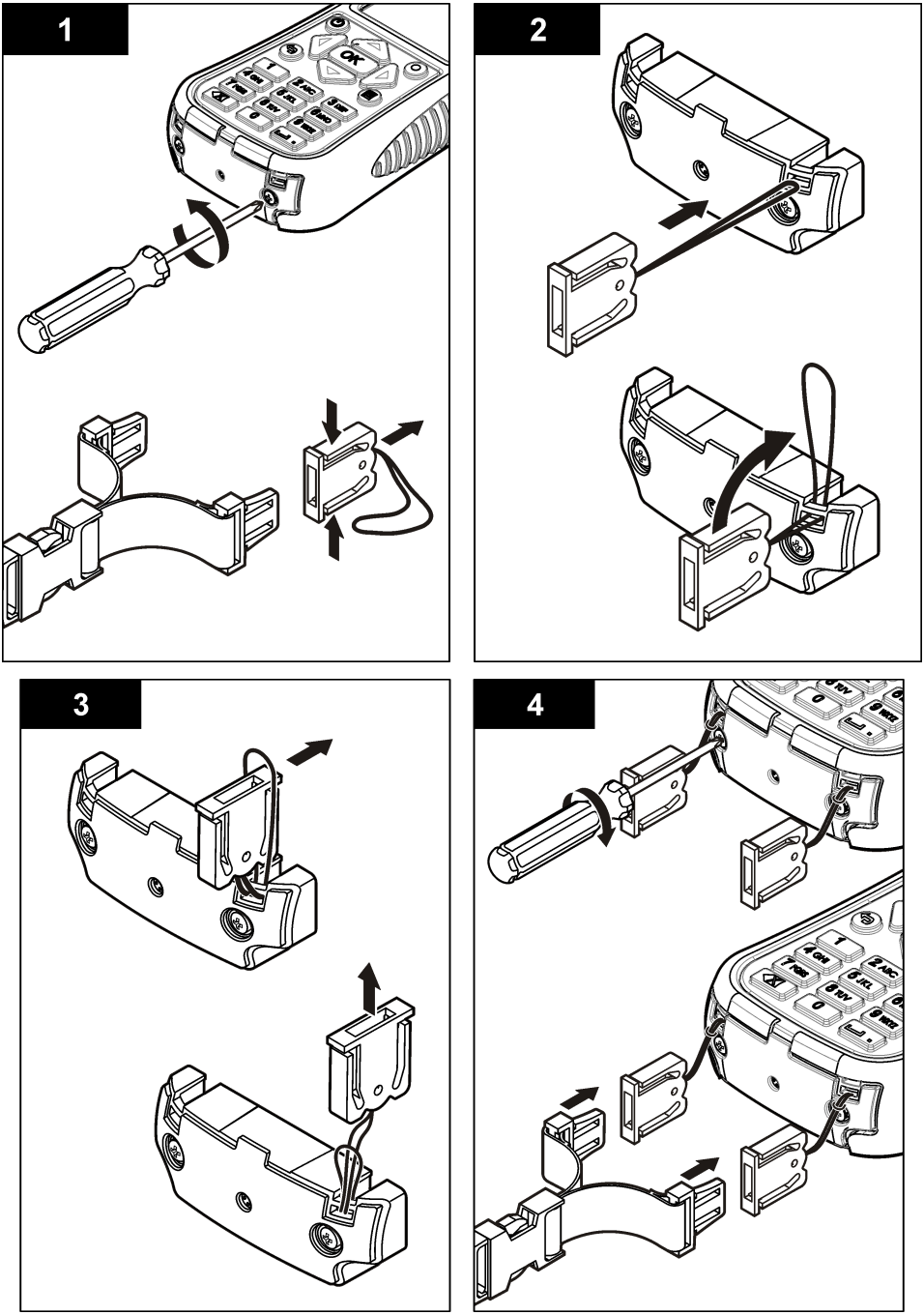
1. The front part of the sensor is round and contains three electrodes. The sensor has a mounting hole in back and a thumbscrew on top. Put the mounting shaft of the universal mount in the mounting hole at the back of the sensor. Make sure that the mounting shaft is completely engaged with the mounting hole and the thumbscrew is engaged with the groove.
2. Hand tighten the thumbscrew.
3. Move a pole 1 inch or less in diameter through the clamp of the universal sensor mount. Tighten the clamp.
   Note: *Instructions for how to mount the sensor on a standard or top setting wading rod are supplied with the accessory.*

Connect the sensor to the meter



Attach the lanyard

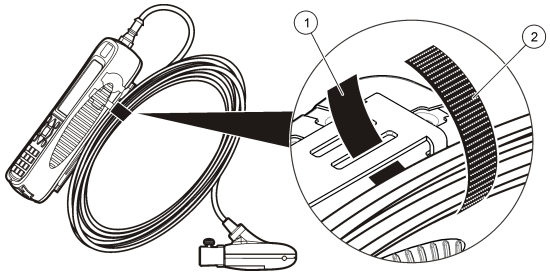
Attach the lanyard to wear the meter safely around the neck.



Attach the velcro strap

Use the velcro strap to hold the extra cable. Refer to Figure 5.

Figure 5 Attach the velcro strap



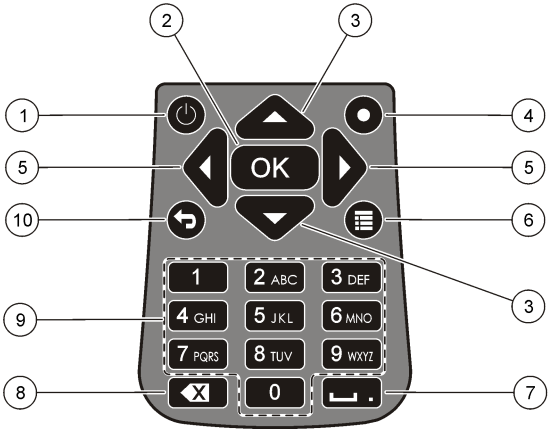
1 Loop side	**2** Hook side

User interface and navigation

Keypad and key functions

Figure 6 shows the meter keypad. Table 1 gives the functions of each key or key type.

Figure 6 Keypad



1 Power On/Off	**6** Main Menu
2 OK	**7** Underscore or decimal
3 Up and Down arrows	**8** Backspace
4 Quick Jump	**9** Alpha-numeric
5 Right and Left arrows	**10** Previous menu

Table 1 Key description

Key	Description
Power On/Off	Energizes and de-energizes the meter.

Table 1 Key description (continued)

OK	Confirms an entry or highlighted menu option.
Up and Down arrows	Moves up or down in the display. If the cursor is at the top or bottom of the display, the cursor wraps to the bottom or top when the UP or DOWN arrow is pushed.
Quick Jump	In normal operation, this key jumps to the Select conduit shape screen. If the auto-zero feature is disabled, hold this key for five seconds to do a manual zero of the depth sensor. In Real-Time mode, the Quick Jump key toggles between the digital and graph views.
Right and Left arrows	Moves to the right or left in the display.
Main Menu	Moves to the Main Menu from any submenu or screen.
Underscore or decimal	Puts in an underscore or decimal character. In numeric-only fields, this key automatically puts a decimal point in the cursor position.
Backspace	Moves the cursor back one space.
Alpha-numeric	Puts in the key alpha or numeric value. Values are put in the order shown on the key. After 2 seconds, the value shown in the display is stored and the cursor advances.
Previous menu	Moves to the previous screen.

Status bar

A status bar is shown in the top of the display. Descriptions of the information in the status bar are given in Table 2.

Table 2 Status bar indicators

Indicator	Description
Time and Date	Shows the current time and date.
USB	Shows when a USB cable is connected. If a USB cable is connected and this indicator does not show in the status bar, the USB cable is not fully engaged. Make sure that the USB cable is pushed in completely and makes full contact with the connection port.
Conductivity	If the sensor is out of the water and non-conductive, a blue ring appears next to the battery icon. If the sensor is in the water and conductive, the indicator is a solid blue circle.
Battery	A five-bar graph shows the level of charge in the battery.
File access	Shows while the meter gets access to a file.
Auto zero depth indicator	If the depth sensor was zeroed in the last 30 minutes, a solid green circle shows next to the Conductivity indicator. If the depth sensor was not zeroed in the last 30 minutes, this indicator flashes red.

Navigation and Main Menu

Push **OK** to confirm a selected menu option or a value shown in the display. Select More and push **OK** to see additional screens and options if available. Push the Main Menu button to go to the Main Menu from a submenu.

Note: *Some operations cannot be completed unless a sensor is connected to the meter. If these operations are tried when there is no sensor connected, the display shows an error message. Connect a sensor and try the operation again.*

1. **Real time**—Select this option to get real-time velocity and depth information. (A sensor with depth capability is necessary to read depth). An example of a Real Time screen for sensors with velocity only is shown in Figure 7. Real time screens for sensors with both velocity and depth is shown in . The format of the information and options shown depends on the type of sensor used. In Real Time mode, the Quick Jump key toggles between digital and graphic views of Real Time

information. The velocity is updated in FPA filter mode according to fixed period averaging time. In RC filter mode, the velocity is updated continuously on the screen every 250 ms.

Option	Description
Capture	Stores the depth and velocity information shown in memory. The information is saved until power is cycled, the memory is saved to a non-volatile real-time file, or the user exits from real-time mode.
Save	Saves captured measurements in the volatile memory to a non-volatile real-time file. A message will show if the number of files is greater than the maximum possible. Files are stored in tab delimited (.tsv) format.
Done or OK	Exits the real-time mode and returns to the Main Menu. If there is unsaved data in volatile memory, a confirmation message asks the user to confirm the exit without saving the data.
Clear	Clears captured measurements from the volatile memory buffer. The user can choose from Clear Last, Clear All or Cancel options.
Setup	Allows the user to modify the main filter parameters and enable and program the Maximum Depth sensor positioning feature. The Maximum depth feature allows a user to enter system parameters for depth measurement in Real Time mode. The user can choose to enter a maximum depth value taken directly with a ruler measurement (manual), or taken indirectly with the depth measurement (automatic). Both methods enable the Maximum Depth sensor positioning feature. In automatic mode setup, the user directly enters the distance from the bottom of the channel to the bottom of the sensor mount (offset). The setup interface will continuously show the current depth value returned by the sensor plus the offset. The meter stores this value as the Maximum Depth when the OK button is pushed. In all other cases, the depth values shown do not include the offset. The Maximum depth feature requires a sensor with velocity plus depth.
Files or View	Shows a summary of each real-time file stored in non-volatile memory. Files can be individually viewed and deleted.

Figure 7 Real time screen

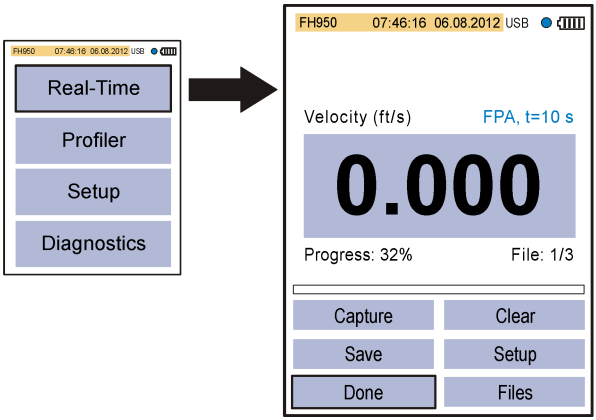
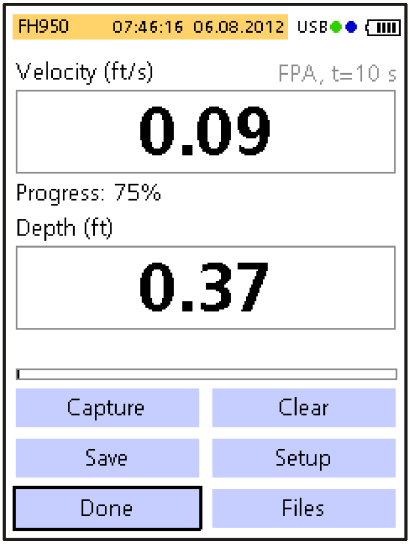


Figure 8 Real time screen for sensor with depth



2. **Profiler—** Select this option to do stream or conduit velocity measurements. The meter shows prompts when user input is necessary. The meter saves up to 10 profiles with up to 32 stations per profile. This number can be greater if data acquisition time is less than the maximum. A percentage of the remaining memory is given in 1% resolution. Refer to the expanded version of the manual for more information about profiles.

Option	Description
Stream	This option is used to set up a profile for a stream or flowing channel. Do velocity measurements to calculate total discharge based on ISO 748 or USGS standards for Mid-section or Mean-section methods.
Conduit	This option is used to set up a profile for a conduit.
Files	This option is used to view or delete stored files. Files can be deleted all at once or individually.
Setup	This option is used to set up or change the settings for filter parameters and the Maximum Depth feature.

3. **Set up**—Select this option to change general system settings and preferences.

Option	Description
Velocity calibration	Calibrates the sensor. Adds a field offset to the factory calibration. Refer to the appendix in the expanded version of the manual for more information.

Option	Description
Filter parameters	Applies a data acquisition filter (Main filter or Pre-filter). The user can select the filter parameters. **Main filter** • Fixed Period Averaging (FPA)—Fixed Period Averaging averages data over a user selectable fixed period of time (1 to 480 seconds). The default is 10 seconds. If the FPA value is 5, the velocity value shown in the display is updated once every 5 seconds. • RCA time constant—The RC filter helps smooth out turbulence through the use of a selected time constant in the filter algorithm. This mode is useful when searching for a maximum velocity, for example in the common 0.9 x Vmax profile method. High RC filter time constants give higher degrees of smoothing. The time constant can be set from 2 to 20 seconds, with a default value of 6. At 1 time constant, the filter settles to approximately 60% of the final value. At 5 time constants, the filter settles to 99.9% of the final value. Thus, if the RC value is set to 2, the final value shows after 10 seconds. **Pre-filter** • Median filter—The filtering process is done in the sensor. The feature can be disabled. However, the recommended (default) value is 5. Enable the feature to enter or change this value.
Wet/dry threshold	Sets the sensor submersion threshold for wet and dry conditions. The default value is 20%. Refer to the appendix in the expanded version of the manual for more information.
Auto zero depth	Sets the Auto Zero feature to On or Off. If set to On, the instrument does an air calibration when the sensor is removed from the water and is in the air. To do the air calibration, the instrument automatically zeroes the sensor. If set to Off, the user can manually zero the sensor. To do this, remove the sensor from the flow, then push and hold the Quick Jump key for five seconds. When the sensor has been in the flow for 30 minutes, the green circle in the upper right corner goes from green to red. This is a prompt to the user to remove and zero the sensor again.
EMI	Sets the local line frequency for ambient noise rejection to 50 Hz or 60 Hz (default).
Clock	Sets the date and time of the portable meter in 24-hour format. Daylight savings time is not supported.
USB	Sets the USB mode. • Mass Storage (default)—This mode operates like a memory stick or hard drive. Files are read-only. • CDC—This mode is used to update firmware.
Language	Selects the language used in the menus.
Units	Sets the units for velocity, flow and depth measurements. Options are Metric or English (default).
Beeper	On (default) or Off. If set to On, the meter makes an audible tone when the sensor is at the correct depth for applicable profile methods. The meter also makes an audible tone when an inactive button is pushed in any menu. This feature is available only with the optional depth sensor.
Flow calculation	Selects the method of flow calculation for open water segment (stream profiles only). Options are Mean-section or Mid-section. Refer to the appendix in the expanded version of the manual for more information.

Option	Description
Station entry	• Fixed—The operator puts in the width of the stream and the number of stations for measurements. The meter divides the cross-section into evenly spaced distances between the station verticals. • Non-fixed (default)—The operator selects the spacing between station verticals. This is the more commonly used option as it lets the operator include obstructions and other restrictions in the cross section.
Restore defaults	Sets all meter options to the factory default values.

4. **Diagnostics—** Select this option to troubleshoot problems with the meter or an attached sensor. For more information about the Diagnostics options, refer to Diagnostics on page 19.

Startup and self-test

⚠ DANGER

Chemical or biological hazards. If this instrument is used to monitor a treatment process and/or chemical feed system for which there are regulatory limits and monitoring requirements related to public health, public safety, food or beverage manufacture or processing, it is the responsibility of the user of this instrument to know and abide by any applicable regulation and to have sufficient and appropriate mechanisms in place for compliance with applicable regulations in the event of malfunction of the instrument.

⚠ WARNING

Fire and explosion hazards. Do not use or store the instrument in direct sunlight, near a heat source or in high temperature environments such as a closed vehicle in direct sunlight. Failure to take this precaution can make the battery overheat and cause a fire or explosion.

The battery must be installed in the meter and charged before use. For more information about battery installation and replacement, refer to Install or replace the battery on page 17. For information on how to charge the battery, refer to Charge the battery on page 18.
Note: *The meter is not operational while the battery charges.*

1. Push the meter power button until an audible beep is heard.
   The meter does a self test and the display shows the results. If the meter fails the self-test, the display shows FAIL next to the failed parameter. If the sensor fails, attach a different sensor if available.
2. When the self test is complete, push **OK** to go to the Main Menu.
3. To de-energize the meter, push the power button again. In the Confirmation screen, select Yes and push **OK**.
   If the portable meter becomes unresponsive, push and hold the power button for more than 3 seconds to force the power off. Do not force off the power in normal operation or when the file access icon is visible.

Instrument self test

The meter does a diagnostic self-test when energized. After the self-test is complete, the display shows the self-test results. Push **OK** to go to the Main Menu.

If the meter fails the self-test, the display shows FAIL next to the parameter in question. If the sensor fails, attach a different sensor if available.

Sleep mode

The meter backlight goes dim after 30 seconds of no activity and goes into sleep mode after 60 seconds of no activity. These actions do not occur if the meter is in real-time mode or while the meter is measuring. After 30 minutes in sleep mode, the meter power goes off.

To cancel the sleep mode, push any key. The display brightness goes back to the normal level and all keys go back to their normal functions.

Maintenance

Clean the sensor

⚠ WARNING

Chemical exposure hazard. Obey laboratory safety procedures and wear all of the personal protective equipment appropriate to the chemicals that are handled. Refer to the current safety data sheets (MSDS/SDS) for safety protocols.

Clean the sensor when unexpected increases or decreases in flow or level trends occur and after use in sandy or muddy waterways.

For heavy contamination, soak the sensor in clear water for a few minutes to help make the contamination easy to remove.

Disconnect the sensor from the meter before it is cleaned. Use only solutions listed as acceptable in Table 3 to clean the sensor. For sensors with a pressure cell (i.e., velocity plus depth sensors), make sure the holes for the pressure cell chambers are washed out and clear of contamination. Rinse the sensor with clean water before re-attaching the sensor to the assembly.

Table 3 Acceptable and unacceptable cleaning solutions

Acceptable	Do not use
Dish detergent and water	Concentrated bleach
Window cleaner	Kerosene
Isopropyl alcohol	Gasoline
	Aromatic hydrocarbons

Clean the meter

1. Push the power button to de-energize the meter.
2. Use a clean, moist cloth to clean the meter exterior. Mix the water with a mild detergent if necessary.
3. Dry the meter exterior with a clean cloth. Let the meter dry in air completely before it is energized again.
   Note: *Do not use paper-based cloths to clean the display. This type of cloth can cause damage to the display screen.*

Install or replace the battery

⚠ WARNING

Personal injury hazard. This instrument contains one or more batteries. To prevent battery degradation, leakage or explosion, do not use or keep the instrument in places where the temperature is higher than the specified temperature limits of the instrument.

⚠ WARNING

Fire and explosion hazards. Battery substitution is not permitted. Use only batteries that are supplied by the instrument manufacturer.

⚠WARNING

Multiple hazards. Do not disassemble the instrument for maintenance. If the internal components must be cleaned or repaired, contact the manufacturer.

NOTICE

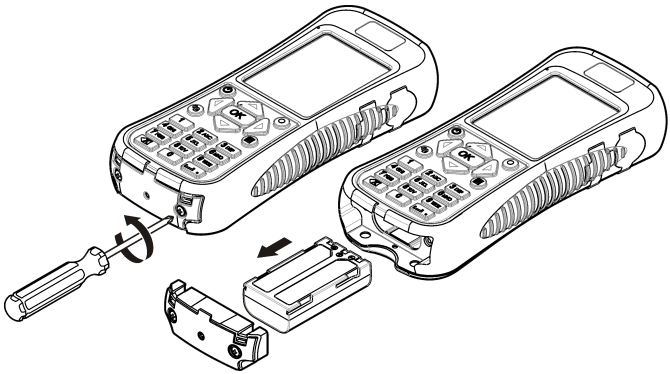
Discard used batteries promptly. Keep used batteries away from children. Do not disassemble the battery or discard the battery in fire.

The instrument is shipped without the battery installed. Order new batteries from the instrument manufacturer. Refer to Replacement parts and accessories in the expanded version of the manual. Recycle or discard used batteries in accordance with local regulations.

Note: *If the instrument must be returned to the factory for repair or maintenance, remove the battery and put the battery in a protective cover before shipment.*

1. If necessary, remove the used battery as shown in Figure 9.
2. Install a new battery in the same location and with the same orientation.
3. Install the battery cover. Make sure that the cover is secure to keep the enclosure rating.
4. Charge the battery if necessary. Refer to Charge the battery on page 18.

Figure 9 Remove the battery



Charge the battery

Make sure that the correct plug-type for the geographic location is installed on the wall charger.

Note: *Battery charger substitution is not permitted. Use only the charger specified in the list of parts and accessories for the instrument. Refer to Replacement parts and accessories in the expanded version of the manual.*

A lithium ion battery in the meter supplies power to both the meter and the sensor. Install and charge the battery before the instrument is used.

1. Connect the round end of the charger cable to the power jack of the portable meter. Refer to Figure 3 on page 8.
2. Connect the wall charger plug to a power outlet.
   A blue light shows around the charge port while the battery charges. When the charge process is complete, the blue light goes off. A discharged battery gets a full charge in about 8 hours.
   Note: *The meter is not operational while the battery charges. The battery does not charge through the USB cable connection.*

Troubleshooting

Diagnostics

In the Main Menu, select Diagnostics to see information about the meter and do the diagnostic tests in Table 4.

Table 4 Meter diagnostics

Option	Description
About	Shows information about the meter and the sensor. Includes the serial number and the firmware version.
Delete files	Deletes all files from memory to make space for new measurements. Make sure that the data is downloaded to a PC before this option is selected. The system automatically reformats the memory after file deletion.
Sensor	Shows diagnostic information about the sensor.
Self test	Makes the meter do a diagnostic self test.
Key pad test	Does a test of any button to make sure that the button is functional.
Display test	Does a test on the display to make sure that the display is functional.
Event log	Lets the user see, delete or export the event log. Export the event log to make the contents available as an accessible file through USB mass storage. This option is used primarily by factory service.

Troubleshoot errors

The meter and sensor contain no user-serviceable parts. For the errors and messages listed, try the corrective action.

If the problem does not go away or a problem occurs that is not in the list, contact the manufacturer.

Message or problem	Solution
Sensor is not connected	Connect a sensor and try the action again.
Value is out of range	Change the measurement parameters or put in a different value, then try the action again.
Sensor data is known to be not correct or not accurate	Clean the sensor and test.
Sensor is not recognized	Check the sensor connection. Make sure that the lock nut on the connection port is tight (finger-tighten only).
Display is dim or is not visible	Push a key on the keypad.
Data is not available or access to the data is not possible	Make sure that the USB option (Main Menu) is set to Mass Storage.
Meter is unresponsive	Push and hold the power button for at least 3 seconds. This de-energizes the meter. Energize the meter again. ***Note:*** *Do not use this method to power off while in normal operation or if the file access icon is visible in the display.*