Multi Tracker

Cerlic
for cleaner water

MultiTracker

2019-02-05

C84G5EN19

Table of Content

General information

It is of great importance to read all parts of this manual prior to start up of the instrument. If the Multitracker is not used and handled according to this manual, then the life and functionality may be jeopardized, and all warranties will be void.

Security information

This instrument should be handled by trained and authorized personnel only. It is mandatory to follow all safety and other routines that apply at the plant when using the Multitracker in tanks and basins.

Within EU it is prohibited to dispose of electric and electronic waste in regular waste as these may contain harmful substances. All electric and electronic waste must be sorted and left for recycling. Such products are labeled with an X-marked waste bin. It is important that everyone cooperate when it comes to recycling and help to save our environment. If such waste not is handled and recycled according to regulation (EC Directive 2002/96/EC) the environment as well as people's health may be jeopardized.

Description of the Operation

Multitracker is a portable hand controller designed to be connected to various sensors. The hand controller connects to different sensors with an M12 connector. All data stored while measuring is stored in the hand controller and can be downloaded to a PC with the optional USB cable.

Measurement Functions

The Multiracker is able to store up to 250 measurements, each with information about time, date, location. Location may be named by the user with maximum of 10 characters e.g. Clarifier 2; Thickener 5, etc. Blanko sensor has unique information like blanket profile.

2. Unpacking

Open the instrument case and check that no damages have occurred during shipping. The instrument case should contain the following items plus the service manual, see figure 1.

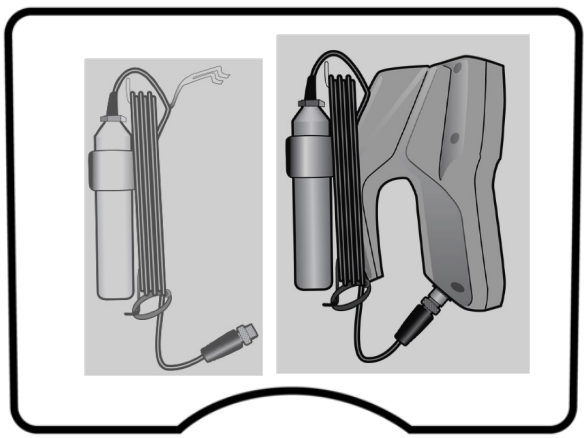


fig 1

Cable Hook

In order to facilitate the handling of the MultiTracker it is supplied with a SS cable hook that is attached to the battery case, see fig 2. It is possible to wind up all of the cable on the cable hook. The cable is held in place on the hook with an O-ring, see fig 3.

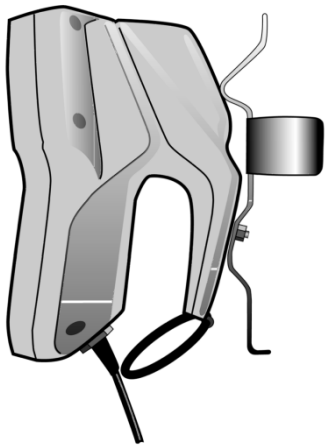


fig 2

fig 3

Removing the cable hook

To detach the cable hook , unsnap the SS sensor from the cable hook . Turn the key, see fig 4, 90 degrees to release the cable hook from the hand unit. Release the cable hook by pulling it up and then pushing forward.

fig 4

fig 5

3. Turning On the Hand Controller

It is important that any sensor that is attached to the hand controller is in the air when the hand controller is powered up. Sensors should not be in the liquid since this will effect the pressure sensor!

To start measuring with the instrument press the key (on/off).
The measurement starts automatically with any sensor attached to the hand controller. The measured value is displayed on-line in text mode on the display. Some attached sensors support a graphical image of the measured value. If the instrument has been inactive for 8 minutes (possible to modify under "Preferences" – "Auto Off") it will automatically switch off. To manually switch off the hand controller, then press key (on/off).

4. Handling and Interface

The following icons show the keypad push buttons and describe their functions.

Opens the main menu or confirms (enters) a choice in the menus.

Closes a menu choice without changing, or exit's one-step backwards in the menu tree (escape function).

Navigates up one step in the menu tree or increases the value of a chosen number in a menu.

Navigates down one step in the menu tree or decreases the value of a chosen number in a menu.

The profile button alternates between measuring values in text or sludge profile presentation. This function is sensor dependant.

Restart or Store of a measurement. At restart, a new measuring will be initiated and replaces the existing value. The measured values will be stored in the displayed log file or field at the bottom of the screen.

Turns on the backlight for display for two minutes but can be adjusted under "Preferences" – "Light Time".

On/Off switch. Press the button in order to turn on or off the Hand Controller.

Description of the Display in Text Mode

At start up, the display is shown in fig 6 and description in fig 7. Measured concentration is displayed on the left and alarm values for Threshold 1 (6) and Threshold 2 (7). General information like time, date and temperature will always be displayed in the top

left side of the screen. Different sensors attached to the hand unit will display different information on the display. The screen shoot below is showing an attached Blanko sensor.

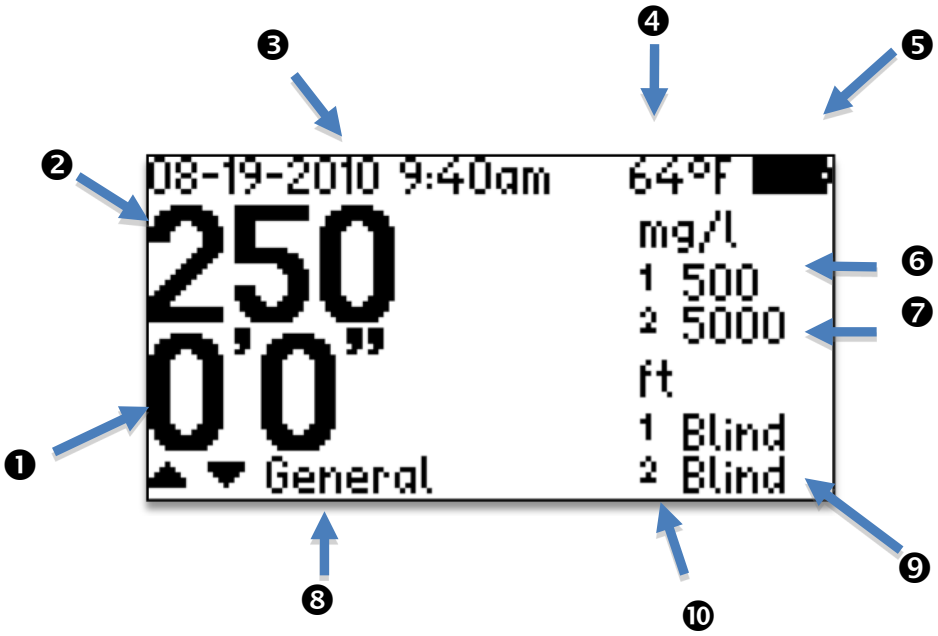


fig 6

❶ Depth
❷ Solids conc or DO level
❸ Date, Time
❹ Water temperature
❺ Battery Power
❻ Threshold 1 – like Fluff or min. DO
❼ Threshold 2 like Sludge or max. DO
❽ Measuring location or Field
❾ Level 1
❿ Level 2

fig 7

Description of the Display in Profile Mode

When pressing the Profile button marked the display will show the sludge profile. See fig 3 below. At any time during a measurement it is possible to switch between text mode and profile mode by pressing the button without affecting the measuring value. General information such as sludge concentration and depth is always shown in either the text or profile modes windows.

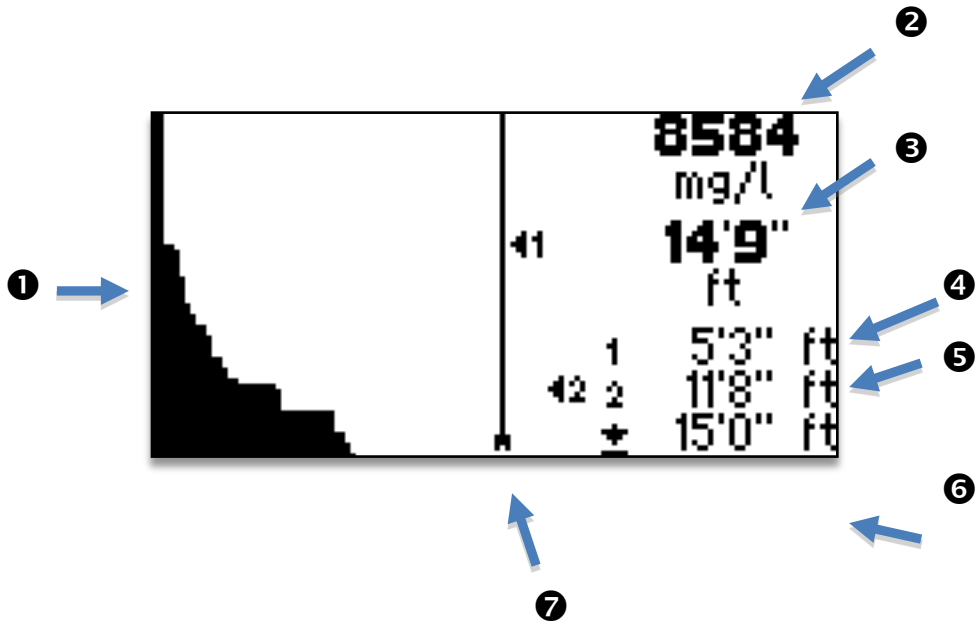


fig 3

❶ Profile displayed in x=mg/l and y=depth
❷ Solids Concentration
❸ Depth – current
❹ Fluff level
❺ Blanket depth
❻ Maximum depth
❼ Sensor position during depth measuring versus max. depth

fig 4

5. Main menu

Press ✔ to open the main menu. See fig 8.

Use ▲ or ▼ to pick the desired sub menu and open with ✔.

fig 8

Settings

In the SETTINGS menu (fig 9) it is possible to set thresholds concentrations. In this menu the span (max depth) measurement is set to fit the profile scale maximum depth. The settings are senor dependent and the screen shoot below is done with a Blanko sensor attached the hand controller .

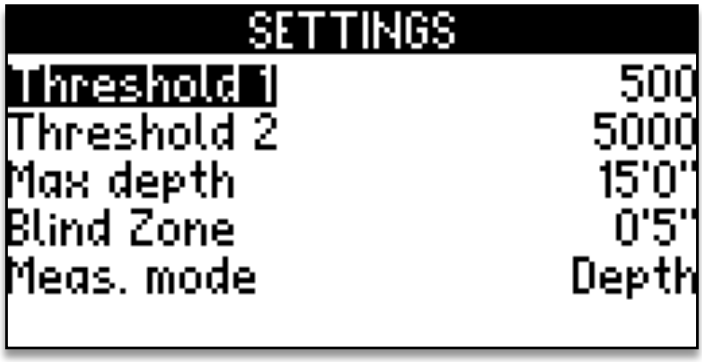


fig 9

Preferences

In the Preferences menu (fig 10) it is possible to change settings for the hand controller. Auto off is the time in minutes before the hand controller is automatically switched off when not used. Light time is time in minutes before the backlight is switched off. Vibrator is on/off and Beeper is on/off for the hand controller.

fig 10

SETUP

The SETUP menu (fig 11) enables selection of language, time and date formats, temperature units, concentration format, and depth format.

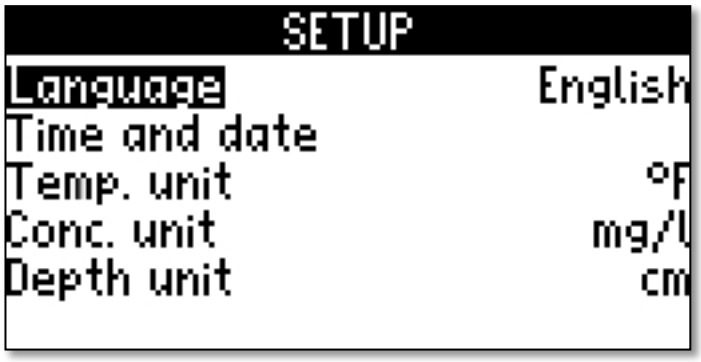


fig 11

Language

The following languages are available; Swedish, English, German and French. To select the desired language, perform the following steps;

Press ✔ to open the menu and step down with ▼ and select ”SETUP” with ✔. Select ”LANGUAGE” and confirm with ✔. Step up with ▲ or down with ▼ until desired language is found and confirm with ✔. Exit the menu with ✖ until one of the two main windows appear (text mode or profile mode).

Time and date

To set time and date;

Press ✔ to open the menu and step down with ▼. Select ”SETUP” with ✔. Step down with ▼ and select ”Time and Date”. Confirm with ✔. Step up with ▲ or down with ▼ until desired time and date format. Step up with ▲ or down with ▼ and set actual time and date. Confirm and step further with ✔. When all settings are done, exit with ✖ until one of the two main windows appear (text mode or profile mode).

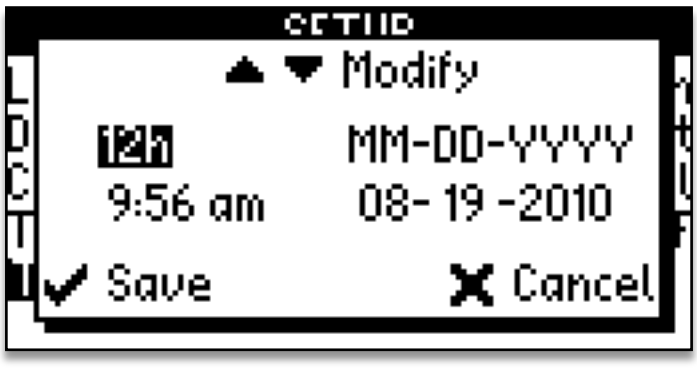


fig 12

Temperature units

Following temperature units are available; °C, °F, or °K.

Press ✔ to open the menu and step down with ▼. Select ”SETUP” with ✔. Step down with ▼. Select ”Temp. unit” and confirm with ✔. Step upwith ▲ or downwith ▼ until desired unit (C, F, K). Confirm with ✔. When all settings are done, exit with ✘ until one of the two main windows appear (text mode or profile mode).

Concentration Units

Following units for sludge concentration are available; g/l, mg/l, %, and ppm.

Press ✔ to open the menu and step down with ▼. Select ”SETUP” with ✔. Step down with ▼ and selsct ”Conc unit”. Confirm with ✔. Step upwith ▲ or down with ▼ until desired unit (g/l, mg/l, %, ppm). Confirm with ✔. When all settings are done, exit with ✘ until one of the two main windows appear (text mode or profile mode).

Depth units

Following depth units are available; cm, dm, m, in, ft with inches.

Press ✔ to open the menu and step down with ▼. Select ”SETUP” with ✔. Step down with ▼. Select ”Depth unit” and confirm with ✔. Step upwith ▲ or downwith ▼ until desired unit (cm, dm, m, in, ft with inches). Confirm with ✔. When all settings are done, exit with ✘ until one of the two main windows appear (text mode or profile mode).

Log

Up to 250 measurements may be stored in the MultiTracker internal memory. Every stored measurement is saved and it contains all data available at the actual measurement. Each individual line in the log may be tagged with 10 alphanumerical characters; e.g. Clarifier 2; Thickener 5, etc. “Location” shows the field you are working at the moment. “Show” shows a list of all the stored data at the above named Location or Field. Empty and delete are local commands and will only effect the current Location or Field you are working in. Create will create a new Location or Field.

fig 13

Press ✔ to open the menu and step down with ▼. Select ”Log” and confirm with ✔ Step down with ▼ and select Position - Show, Empty, Delete, or Create”. Confirm with ✔. ”Delete” and ”Empty” are local and are only valid in its choosen Location or Field. ”Show” or ”Create” are universal and valid for all Locations or Fields.

Step up with ▲ or down with ▼ to navigate the menu tree.Confirm with ✔ or reverse the selection with ✖.

When all settings are done, exit with ✖ until one of the two main windows appear (text mode or profile mode). This data is stored in the MultiTracker controller and not in the sensor.

6. Getting Started

Save a measurement

To save a measurement, or to perform a new measurement, press ☺, When doing this, an option to save ✔ or restart the measurement ✖ will be presented, There is a short command from the text mode display where it is possible to select position for storing the measurement profile. Step up with ▲ or down with ▼ to reach desired log Location or Field. The Location tag will be shown in the lower left margin in the display window. Fig 14 below, shows that the actual profile will be stored in that Location or Field, ”General ”

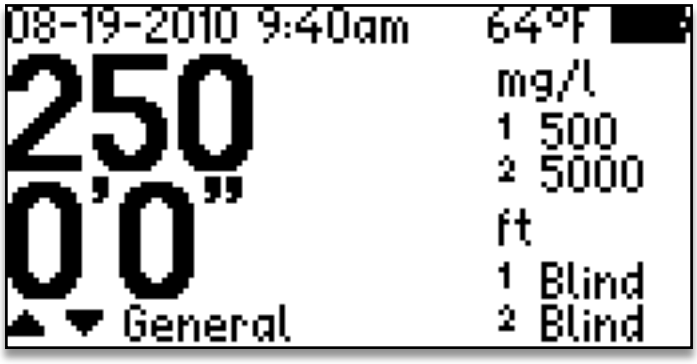


fig 14

It is possible to tag each of the 250 log locations with up to 10 alphanumerical characters. By entering the log location by tag name, all actual information for the stored measurement may be retrieved.

Downloading data from the MultiTracker Controller

To be able to download data from the hand controller to a computer you need a USB communication cable. The USB communication is a part of a package that contains the following parts, see fig 15. We recommend that you download the latest driver for the USB adapter from the www.cerlic.com/software/drivers website. You also need a PC software named Traker Talk to interface with the hand unit and move the stored data to the PC. The software can be downloaded free of charge from the Cerlic home page.

fig 15

To transfer the stored data, disconnect the sensor from the hand controller and attach the communication cable to the same M12 connector, fig 16. Start the software Tracker Talk and follow the instructions on the screen.

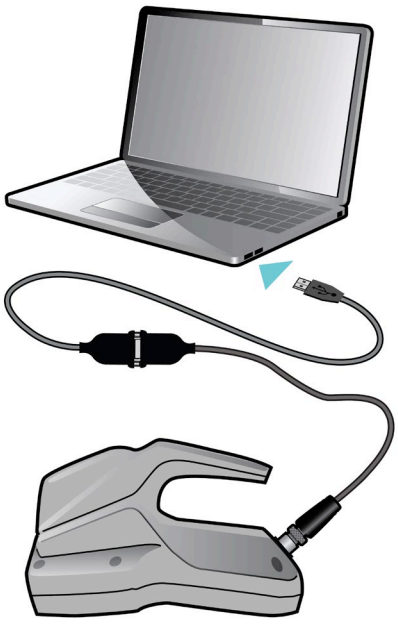


fig 16

Software update

You can update the software in the hand controller with the communication cable and Tracker Talk software. Download the latest Multitracker software from www.cerlic.com/software/drivers and follow the instruction in the software.

7. Maintenance

The instrument is designed to reduce the manual maintenance to a minimum. All metal parts are stainless steel (SS 2343/SS316). The enclosure is IP65/NEMA 4. The sensor cable is a specially manufactured PUR™ with a strong shield and extra heavy wires to withstand mechanical wear for a long life. The sensor and enclosure cable fittings are high quality MatchClamp™ to ensure a water proof connection even should the outer shield be damaged.

Inspection of the sensor

The sensor should be cleaned, if any solids or fouling of the measuring windows occurs. When cleaning the sensor, it is preferred to use the Cerlic Sensor Cleaning (CSC) liquid. It is also possible to use a soft cloth and water. Pay attention not to scratch the quartz measuring windows or damage the built in pressure sensor.

Changing of Batteries

Cerlic Blanket Tracker is supplied with four AA batteries, placed inside the Controller handle. To change the batteries, follow the steps below;

1. Open the back part of the handle on the Controller . This part is a combined battery lid and cable hook . This is done by removing the two countersunk screws into the back of the enclosure, see fig 17. You do not have to remove the screw holding the cable hook .

2. Remove the battery lid and replace the batteries. Make sure to follow the label showing the battery polarity (+/-).

3. Remount the battery lid.

4. Mount the back of the handle containing the battery lid by tightening the two countersunk screws. It is important to make sure the lid is well closed with no visible gaps or cables between the housing and lid.

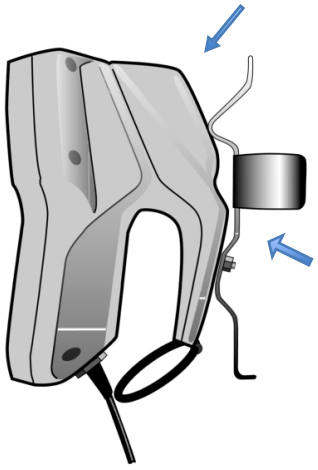


fig 17

8. Trouble shooting

Check that the batteries are in good condition. The MultiTracker has built in logic to increase the battery life. If the battery voltage goes below a certain level, then the software will block the following functions; display back light, acoustic and vibration signals. Battery life is displayed on the top of the screen.

If the sensor should deviate from expected values, then a new calibration should be performed. Please see section Calibration for instructions under each sensor.

In case of any malfunction that is not possible to correct with a new calibration, please contact Cerlic or a local Cerlic representative. In the event of returning the MultiTracker to Cerlic for checkup or repair, please make sure to use the form for Return of Material (RMA) prior to shipping . The RMA document can be downloaded from the Cerlic web page www.cerlic.com. The WEB page also has the correct shipping address.

9. Spare Parts

The MultiTracker is supplied with four AA batteries. The batteries are the only parts that are subject to be replaced by the user. It is suggested to keep an extra set of batteries available.
Spare part list:

Part no	Description
21450731	Battery 3V 200mAh
21450989	Battery AA (4 required)
20250978	Case for MultiTracker
20250979	Big case for more than 2 sensors
20201021	Battery Holder Case for 4 AA batteries
20201020	Handle Tracker
21650997	O-ring for cable hook 25,0x4,0 EPDM 70 or BunaN
11201058	Cable Hook for MultiTracker
21101037	Lock key cable hook
10206149	Horisontal attachement for Oxyduo cable

10. Contact information

Actual shipping address is always available at the Cerlic web page www.cerlic.com.

Cerlic Controls AB
Mälarvägen 3, SE 141 71 SEGELTORP, Sweden
Phone:+46 850 169 400
Mail address: P.O. Box 5084, SE-141 05 KUNGENS KURVA, Sweden
web: www.cerlic.com

11. Warranty

Instruments delivered from Cerlic Controls AB, are carefully checked and tested prior to the shipment.

Cerlic will repair or replace the product if a problem related to manufacturing or design occur during the warranty period.

12. Technical Specifications, MultiTracker Hand Controller

Number of Detectable Levels	Two
Measuring units	g/l, mg/l, %, ppm
Display	Graphical, 128 x 64 pixels, LCD
Back light	Yes & time adjustable
Languages	Swedish, English, German, French
Log Function	250 Measurements
Signal at Preset Alarm Values	Acoustic, Vibration, Display
Temperature Range - Liquid	0 – +50°C (+32 - 122°F)
Temperature Range of hand controller	-10 - +50°C (+14-122°F)
Key Pad	8 Membrane Push Buttons
Cable	PUR, Shielded
Cable Fitting	MatchClamp™
Weight Hand Held Unit w/ sensor	1.4 kg (3.0 lb)
Batteries	Four AA 1.5V
Battery Life, Continuous Use	Up to 100 hours
Battery Life, Normal Use	Approx. 1-2 years
Dimensions - SS Sensor Body	145mm x 32 mm Ø (5.7”x1.26”Ø)
Dimensions - MultiTracker Controller	200x105x130mm (L x W x H) 7.87” x4.13” x 5.12” (L x W x H)
Cable Lengths	4 m (13 ft) or 8 m (26 ft).
Enclosure MultiTracker Controller	IP65 (NEMA 4)

Appendix 1, Blanko (Sludge Blanket Sensor)

Blanko
Sludge Blanket Sensor

Description of the function

Blanko is a portable optical suspended solids meter designed to measure sludge blanket depth and suspended solids in clarifiers, thickeners, aeration basins, etc. in water and wastewater plants, as well in other facilities. It is possible to display measured values as text or as a graphic image of the sludge profile. Two different alarm levels for the sludge blanket may be set to indicate fluff and sludge blanket levels. These may be displayed next to the graphic sludge profile.

Measurement Functions

It is able to store up to 250 measurements as a graphic profile, each with information about time, date, location, that may be named by the user (maximum 10 characters e.g. Clarifier 2; Thickener 5, etc.) Each profile also contains data about blanket and fluff depths that applied for the specific measurement.

Sensor body

The sensor body contains optics and electronics that should not be exposed to mechanical abuse or high temperatures. If the sensor body has mechanical damages, water may penetrate into the sensor and destroy the electronics and optics. Please see section Maintenance for more information.

Description of the Display in Text Mode

At start up, the display is shown in fig 1 and description in fig 2. Value for solids concentration and depth are displayed on the left and alarm values for fluff (6) and sludge blanket (7) with actual depth for each as (9) & (10) below. Depths are shown as Blind until alarm for each concentration goes off. Plus date, time and temperature across the top.

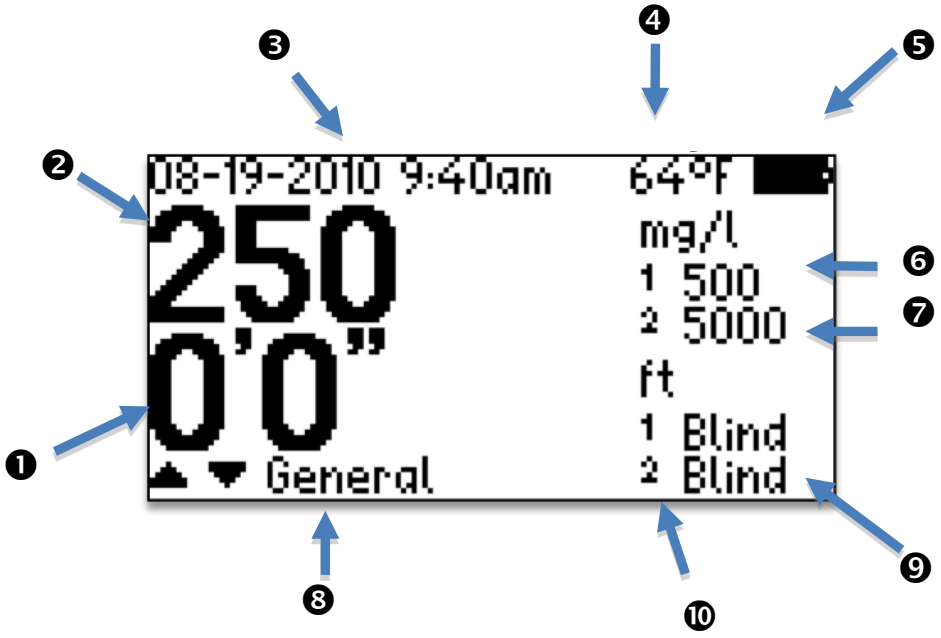


fig 1

❶ Depth
❷ Solids concentration
❸ Date, Time
❹ Water temperature
❺ Battery level
❻ Threshold 1 - Fluff
❼ Threshold 2 - Sludge
❽ Measuring location
❾ Fluff level
❿ Blanket depth

fig 2

Description of the Display in Profile Mode

When pressing the Profile button marked  the display will show the sludge profile. See fig 3 below. At any time during a measurement it is possible to switch between text mode and profile mode by pressing the button  without affecting the measuring value. General information such as sludge concentration and depth is always shown in either the text or profile modes windows.

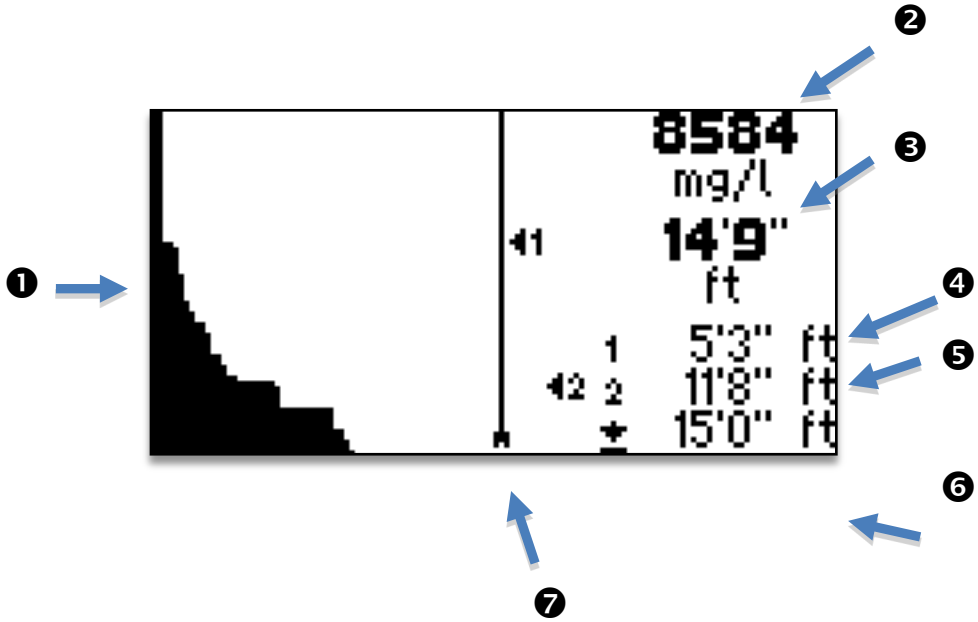


fig 3

❶ Profile displayed in x=mg/l and y=depth
❷ Solids Concentration
❸ Depth – current
❹ Fluff level
❺ Blanket depth
❻ Maximum depth
❼ Sensor position during depth measuring versus max. depth

fig 4

Main menu

Press ✔ to open the main menu. See fig 5.

Use ▲ or ▼ to pick the desired sub menu and open with ✔.

fig 5

Settings

In the SETTINGS menu (fig 6) it is possible to set the following functions:

Threshold 1 – preset Fluff concentration
Threshold 2 – preset Blanket concentration
Max Depth – depth from top of liquid to bottom of clarifier or tank
Blind Zone – depth at which sensor will start to measure solids. Normally set at 6" or so. This alleviated false readings due to sludge or solids on top of liquid.
Meas. Mode –
Depth – shows depth from top of liquid to bottom of tank as sensor is lowered.
Height – Starts out at Max Depth and depth values go down as sensor is lowered to 0' or bottom of the tank. Basically shows depth like a sludge judge from the bottom of tank.

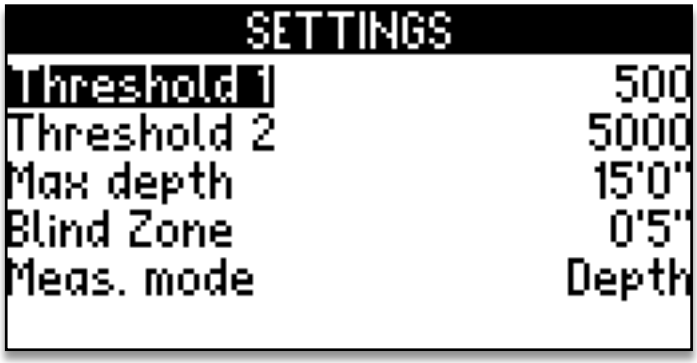


fig 6

Threshold 1 (Fluff)

This value defines the solids concentration that indicates the fluff level. The concentration may be given in g/l, mg/l, % or ppm For more information see "Settings". When the preset alarm value is reached, then this will be shown on the display as fluff level. The sensitivity for fluff concentration is normally set at 10% to 25% of the sludge blanket alarm value.

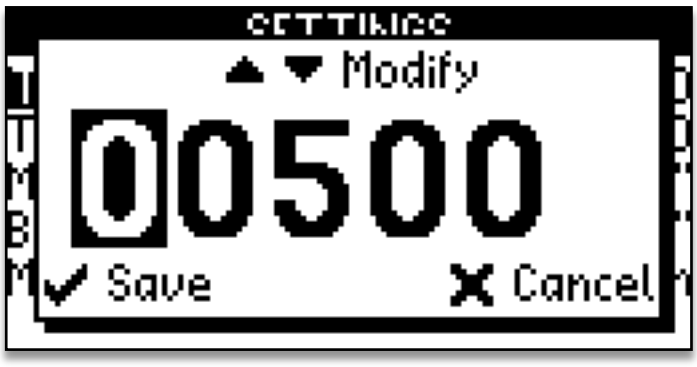


fig 7

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and pick ”Threshold 1” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✘ until one of the two main windows appear (text mode or profile mode).

Threshold 2 (Sludge Blanket)

This value defines the solids concentration that defines the sludge blanket level. The concentration may be given in g/l, mg/l, % or ppm For more information see ”Settings”. When the preset alarm value is reached, then this will be shown on the display as sludge blanket level. In a clarifier this concentration is normally choosen to correspond with the return sludge (RAS) concentration, e.g. 5,000 mg/l (ppm) and in a thickener e.g. 7,000 mg/l.

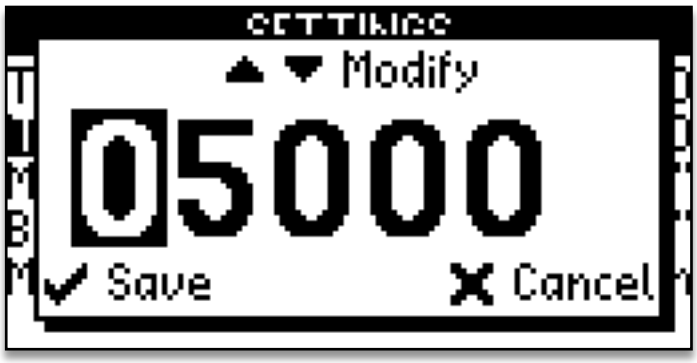


fig 8

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and select ”Threshold 2 ” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✘ until one of the two main windows appear (text mode or profile mode).

Maximum depth

Press ✔ to open the menu and select “SETTINGS”. Confirm with ✔. Step down with ▼ and select ”MAX DEPTH” with ✔. To scale the “MAX DEPTH” span that is shown at profile measurement, step up with ▲ or down with ▼ until desired value. Confirm with ✔. Exit the menu with ✘ until one of the two main windows appear (text mode or profile mode).

Blind zone

Press ✔ to open the menu and select “SETTINGS”. Confirm with ✔. Step down with ▼ and select ”Blind zone” with ✔. To scale the “Blind zone” span that is shown at profile measurement, step up with ▲ or down with ▼ until desired value.Confirm with ✔. Exit the menu with ✖ until one of the two main windows appear (text mode or profile mode).

Measuring mode

In order to define how the levels for fluff and sludge blanket are presented, it is possible to select if the depth is shown from the surface top down (Depth) or from the bottom up(Height). To choose between these options perform the following steps;

Press ✔ to open the menu and select ”SETTINGS”. Confirm with ✔. Step down with ▼ and select ”MEAS. MODE” with ✔. Step up with ▲ or down with ▼ in order to select desired mode. Confirm with ✔. Exit the menu with ✖ until one of the two main windos appear (text mode or profile mode).

Setup

See setup in section for MultiTracker hand controller.

Preferences

See preferences in section for MultiTracker hand controller.

Language

See language in section for MultiTracker hand controller.

Depth Unit

Following units for depth measurements are available; cm, dm, m, inch and ft (with inches).

Press ✔ to open the menu and step down with ▼ Select.”SETUP” with ✔. Step down with ▼ and select ”Depth unit”. Confirm with ✔. Step up with ▲ or down with ▼ until desired unit (cm, dm, m, in, ft). Confirm with ✔. When all settings are done, exit with ✖ until one of the two main windows appear (text mode or profile mode).

Concentration Units

See Concentration Units in section for MultiTracker hand controller.

Temperature units

See Temperature units in section for MultiTracker hand controller.

Calibration

Calibration can be done for both depth measurement and sludge concentration. For depth measurement, zero compensation is performed every time when the MultiTracker is turned on to adjust for barometric pressure. It is also possible to perform a manual calibration of zero and one meter (3.3 ft) depth. This is done by starting the MultiTracker and perform a zero and 1 meter calibration of the depth.

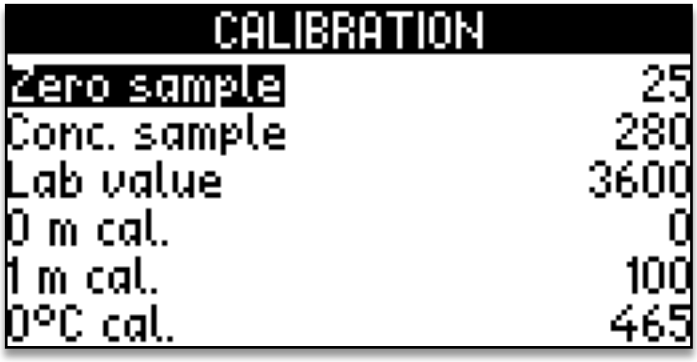


fig 9

Zero Sample

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”zero sample”. Confirm with ✔. Put the sensor in clean, deareated water and cover it to prevent the sensor from being exposed to light and confirm with ✔ ✖. When zero calibration is done, exit with ✖ until one of the two main windows appears (text mode or profile mode).

Conc. sample – Sludge Sample

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”Conc sample”. Confirm with ✔. Put the senor in a sample with known concentration and stir sample with sensor to keep solids in suspension. Confirm with ✔ when the values are stable. When complete then exit with ✖ until one of the two main windows appears(text mode or profile mode).

Lab Value

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”lab value ”. Confirm with ✔. Step up with ▲ or down with ▼ until the value corresponds with the lab value. Confirm with ✔. When all settings are done, exit with ✖ until one of the two main windows appears (text mode or profile mode).

0 m Cal. - Zero depth calibration

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”0 m cal. ”. Hold sensor vertically in the air and start zero calibration with ✔. Continue until value is stable and then save calibration with ✔. Exit the menu with ✖.

1 m Cal. – 1 m or 39.4” depth calibration

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and to ”1 m cal. ”. Lower the sensor into the water until the 1 meter SS collar is level with the top of the liquid. Start Calibration with ✔ and save calibration when value is stable by once again pressing ✔. When all settings are done, exit with ✖ until one of the two main windows appears (text mode or profile mode).

Must turn Tracker OFF/ON after zero & 1 m depth calibrations

Turn tracker OFF ⏻ and ON ⏻ after you have completed zero & 1 m depth calibrations. This resets the MultiTracker to accept the new depth values.

Getting Started

Getting started with the Blanko

Start the MultiTracker by pressing the button marked ⏻. To switch OFF/ON the unit, press the same button. The unit will do a atmospheric pressure compensation at start-up and measurement will start automatically. Values for sludge concentration and depth are displayed in clear text and real time. If the unit is not active during an eight minute period then it will automatically be turn off without saving the measurements.

In order to get correct scaling of the depth range in profile range shown on the display, then it is necessary to set the maximal depth at the actual measuring position.

Setting of Maximum depth

Press ✔ to open the menu and select ”Settings” with ✔. Step down with ▼ until desired Max Depth is selected with ✔. Select the depth value numbers by stepping ✔ and change the values with ▲ or ▼. Save by pressing ✔ to save.

fig 10

Profile mode

In order to switch between text mode and profile mode, press the button marked . It is possible to step back and forth with this button without affecting the actual measurement.

Save a profile

To save a measurement profile, or to perform a new measurement, press , when doing this, an option to save or restart the measurement will be presented, There is a short command from the text mode display where it is possible to select position for storing the measurement profile. Step up with or down with to reach desired log position. The postion tag will be shown at the bottom of the display window. Fig 11 below, shows that the actual profile will be stored at position "General"

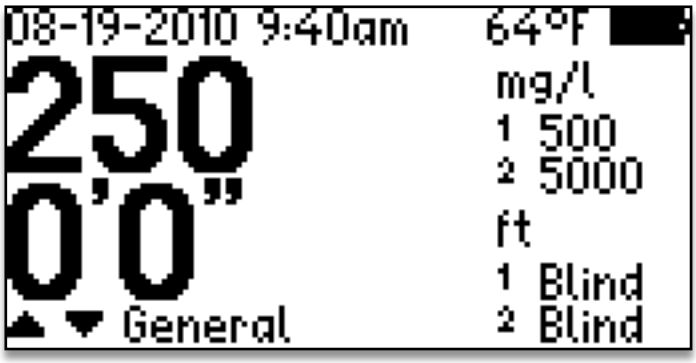


Fig 11

It is possible to tag each of the 250 log positions with up to 10 alphanumerical characters. By entering the log position by tag name, all actual information for the stored measurement may be retrieved.

Alarm values

At delivery the Blanko is preset with the following values; Fluff (1,000mg/l) and Sludge Blanket (5,000mg/l). Using these values, it is possible to instantly start to measure and get a picture of the sludge profile. To change the settings please see Threshold 1 for Fluff and Threshold 2 for Sludge Blanket.

Maintenance

The Blanko is designed to reduce the manual maintenance to a minimum. All metal parts are stainless steel (SS 2343/SS316). The enclosure is IP68/NEMA 7. The sensor cable is a specially manufactured PUR™ with a strong shield and extra heavy wires to withstand mechanical wear for a long life. The sensor and enclosure cable fittings are high quality MatchClamp™ to ensure a water proof connection even should the outer shield be damaged.

Inspection of the sensor

The sensor head should be cleaned if any solids or fouling of the measuring windows occurs. In order to verify the necessity of cleaning, place the sensor in clean, de-aerated water and read the display value. The value should not differ more than ±100mg/l from zero. If the value is off the cleaning is required, a new zero calibration may be performed. See section Calibration.

In order to verify if a depth calibration is needed, lower the sensor into water until the one meter cable mark. The depth value should not differ more than ±2cm (±1”). A higher deviation requires a zero and one meter calibration, see section Calibration.

When cleaning the sensor, it is preferred to use the Cerlic Sensor Cleaning (CSC) liquid. It is also possible to use a soft cloth and water. Pay attention not to scratch the measuring windows or damage the built in pressure sensor.

Trouble shooting

If the Blanko values for depth and concentration should deviate, a new calibration for depth and/or concentration. Please see section Calibration for instructions.

In case of any malfunction that is not possible to correct with a new calibration, please contact Cerlic or a local Cerlic representative. In case of sending the Blanko to Cerlic for check up or repair, please make sure to use the form for Return of Material (RMA) prior to dispatch. The RMA document can be downloaded from the Cerlic web page www.cerlic.com. The WEB page also has the actual and correct receiving address.

Specification, Blanko

Function	Sludge Concentration and Depth
Measuring principle	Optical light transmission
Wave length	NIR 850 nm
Measuring range	Max – 20,000 mg/l (ppm)
Accuracy suspended solids	1% FS (full scale)
Repeatability	< 2% of Measured Value
Type of Measurement	Continuous with Profile
Number of Detectable Levels	Two (fluff and sludge blanket)
Measuring units	g/l, mg/l, %, ppm
Depth units	cm, dm, m, in, ft with inches
Principe of Depth Measurement	Pressure cell, absolute pressure
Accuracy Depth Measurement	+/- 0,5% FS
Altitude limitation	Max 4,500 feet (optional 15,000 feet)
Signal at Preset Alarm Values	Acoustic, Vibration, Display
Temperature Range - Liquid	0 – +50°C (+32 - 122°F)
Sensor Body	Stainless Steel, BK7 Glass Windows
Cable	PUR, Shielded
Cable Fitting	MatchClamp™
Weight Sensor	450g (1 lb)
Weight Hand Held Unit w/ sensor	1.4 kg (3.0 lb)
Dimensions Sensor Body	145mm x 32 mm Ø (5.7”x1.26”Ø)
Cable Length	8 m (26 ft)
Enclosure Sensor Body	IP68 (NEMA 7)

Appendix 2, Oxyduo (DO Sensor)

Oxyduo
DO Sensor

Description of the function

Oxyduo is a portable oxygen meter designed to measure oxygen levels in aeration basins, etc. in water and wastewater plants, as well in other facilities. It is possible to display measured value as text on the screen and set two different alarm levels for high and low levels.

Measurement Functions

It is able to store up to 250 measurements with information about time, date, location, that may be named by the user (maximum 10 characters e.g. Clarifier 2; Thickener 5, etc.) Each location will contain data oxygen level and temperature that applied for the specific measurement sample.

Sensor body

The sensor is equipped with a horizontal attachement to enable the sensor to hang horizontally to avoid accumulation of air bubbles.
The electronics should not be exposed to mechanical abuse or high temperatures. If the sensor body has mechanical damages, water may penetrate into the sensor and destroy the electronics. Please see section Maintenance for more information.

Description of the Display

At start up, the display is shown in fig 1 and description in fig 2. Value for oxygen concentration are displayed on the left and alarm values to the right. Date, time and temperature are shown across the top.

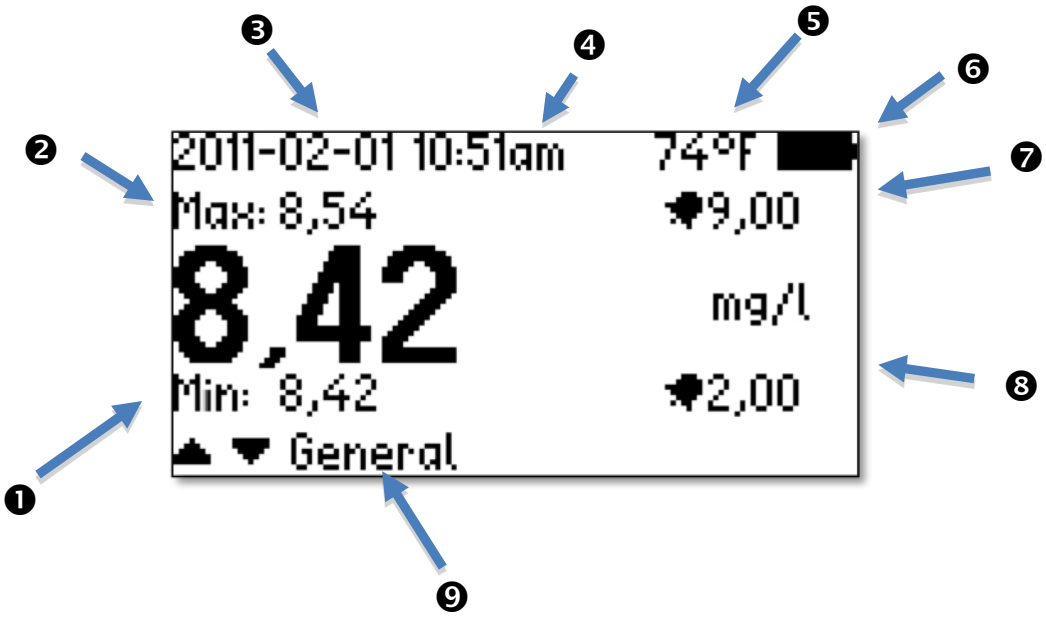


fig 1

❶ Min measured oxygen level
❷ Max measured oxygen level
❸ Date
❹ Time
❺ Water temperature
❻ Battery level
❼ Threshold 1 – High alarm level
❽ Threshold 2 – Low alarm level
❾ Measuring location

fig 2

Main menu

Press ✔ to open the main menu. See fig 3.

Use ▲ or ▼ to pick the desired sub menu and open with ✔.

fig 3

Settings

In the SETTINGS menu, below, it is possible to set alarm values for high and low oxygen level concentrations. When oxygen levels are outside this Min limit the hand controller will make one acoustic beep signal. When oxygen levels are outside this Max limit the hand controller will make two acoustic beep signals.

Threshold 1 (Low oxygen level)

This value defines the oxygen concentration that indicates the low alarm. The oxygen level may be given in g/l, mg/l, ppm. For more information see ”Settings”. When the preset alarm value is reached, then this will be shown on the display as Low

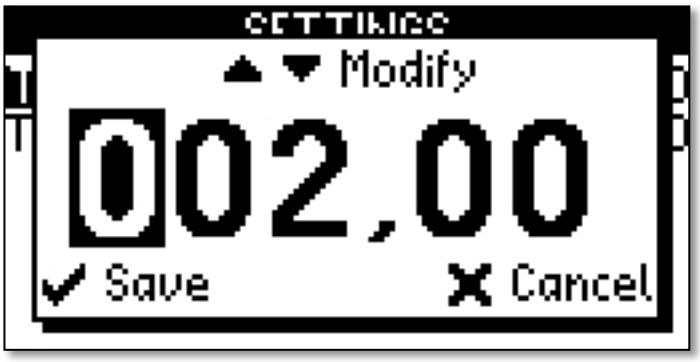


fig 5

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and pick ”Threshold 1” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✖ until one of the main windows appears.

Threshold 2 (Max oxygen level)

This value defines the oxygen concentration that indicates the high alarm. The oxygen level may be given in g/l, mg/l, ppm. For more information see ”Settings”. When the preset alarm value is reached, then this will be shown on the display as High .

.

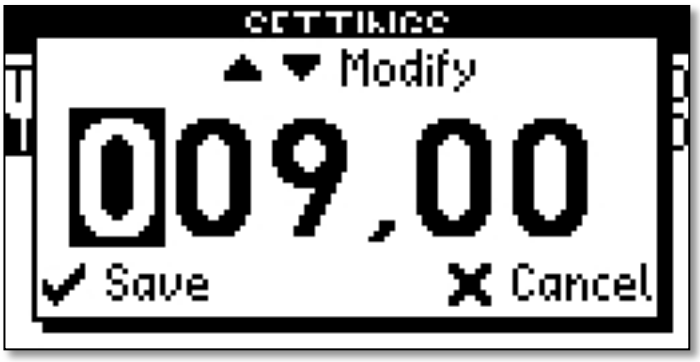


fig 6

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and select ”Threshold 2 ” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✖ until one of the main windows appear.

Setup

See setup in section for MultiTracker hand controller.

Preferences

See preferences in section for MultiTracker hand controller.

Language

See language in section for MultiTracker hand controller.

Concentration Units

See Concentration Units in section for MultiTracker hand controller.

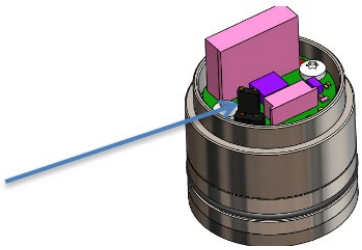
Temperature units

See Temperature units in section for MultiTracker hand controller.

Calibration

Calibration of sensor with Optical cell

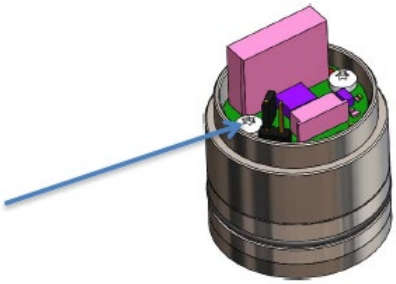
Remove the black protective cover around the new cell's connector. End the circuit with the bracket as shown. Connect the cell.



Zero calibration of the sensor:

- Open the main menu with ✔
- Step down to Calibration ✔
- Use the ▲ / ▼ buttons to chose ”Zero” (two choices can be done Zero/Sample) and confirm with ✔.
- Wait for a stable value and confirm with ✔.
- Leave the menu with ✘ until the main menu is reached.

Disconnect the bracket. Put the bracket on one pin for future use. Replace the protective cover. Mount the cell.

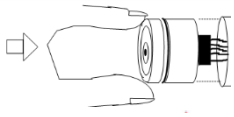


Continue with ”Air calibration of sensor”

Air calibration of sensor with Optical cell

- Open the main menu with ✔
- Step down to Calibration ✔
- Use the ▲ / ▼ buttons to chose ”Sample” (two choices can be done Zero/Sample) and confirm with ✔.
- Wait for stable value and confirm with ✔.
- Leave the menu with ✘ until the main menu is reached.

Changing/installing an Optical cell



Unscrew the electrode holder, release the contact.
Push out the electrode from the back, clean the electrode holder.
Change o-ring (29,87x1,78) apply silicone lubricant, also on the o-ring around the electrode. Carefully mount the electrode in the holder and reconnect.
Turn the electrode holder anticlockwise to get the cables right. Tighten.
NOTE! Flushing max 1 time/hour, max 2 bar and max 10 sec.

Getting Started

Getting started with the Oxyduo

Start the MultiTracker by pressing the button marked . To switch OFF/ON the unit, press the same button. The unit will start automatically. Values for oxygen concentration are displayed in clear text and real time. If the unit is not active during an eight minute period then it will automatically be turn off without saving the measurements.

Save a measurement

To save a measurement, or to perform a new measurement, press , when doing this, an option to save or restart the measurement will be presented. There is a short command from the text mode display where it is possible to select position for storing the measurement. Step up with or down with to reach desired log position. The postion tag will be shown in the lower margin in the display window. Fig 8 below, shows that the actual profile will be stored at position "General"

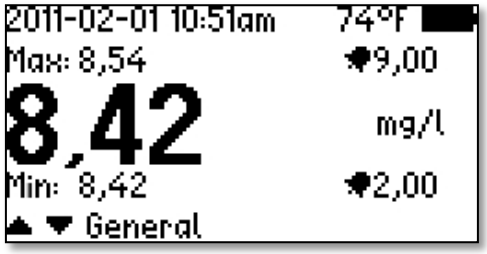


fig 8

It is possible to tag each of the 250 log positions with up to 10 alphanumerical characters. By entering the log position by tag name, all actual information for the stored measurement may be retrieved.

Alarm values

At delivery the MultiTracker is preset with the following values; Threshold 1, 9mg/l (High oxygen level) and Threshold 2, 2mg/l (Low oxygen level). Using these values, it is possible to instantly start to measure. To change the settings, please see Threshold 1 and Threshold 2.

Maintenance

The Oxyduo is designed to reduce the manual maintenance to a minimum. All metal parts are stainless steel (SS 2343/SS316). The sensor cable is a specially manufactured PUR™ with a strong shield and extra heavy wires to withstand mechanical wear for a long life. The sensor and enclosure cable fittings are high quality MatchClamp™ to ensure a water proof connection even should the outer shield be damaged.

Inspection of the sensor

The sensor head should be cleaned, if any solids are present on the cell it can create a measuring error. To verify that the cell is working properly an air measurement can be performed. Place the sensor in clean, perform an air calibration, See section Calibration. When cleaning the sensor, it is preferred to use the Cerlic Sensor Cleaning (CSC) liquid. It is also possible to use a soft cloth and water. Pay attention not to scratch the measuring cell.

Trouble shooting

In case of any malfunction that is not possible to correct with a new calibration, please contact Cerlic or a local Cerlic representative. In case of sending the Oxyduo to Cerlic for checkup or repair, please make sure to use the form for Return of Material (RMA) prior to dispatch. The RMA document can be downloaded from the Cerlic web page www.cerlic.com. The WEB page also has the actual and correct receiving address.

Specification, Oxyduo

Function	Dissolved oxygen
Measuring principle	Optical
Measuring range	0 to 20 mg/l (ppm)
Accuracy	+/- 0,1 mg/l O_2 <5 mg/l
	+/- 0,2 mg/l O_2 >5 mg/l
Type of Measurement	Continuous
Number of Detectable Levels	Two (High and low alarm)
Measuring units	mg/l, g/l, ppm, %
Temperature Range - Liquid	0 – +50°C (+32 - 122°F)
Sensor Body	Stainless Steel,
Cable	PUR, Shielded
Cable Fitting	MatchClamp™
Weight Sensor	450g (1 lb)
Dimensions Sensor Body	145mm x 32 mm Ø (5.7”x1.26”Ø)
Cable Length	4 m (13’) or 8 m (26 ft)
Enclosure Sensor Body	IP68 (NEMA 7)

Oxygen Solubility - chart

Oxygen Solubility in freshwater - Salinity - *0*

Oxygen Solubility in freshwater - Salinity - 0										
Pressure abs	*mm Hg*	760			1520			3040		
	psi	14.7			29.3			58.7		
	bar	1			2			4		
	kPa	101.1			202.2			404.3		
Temperature		Solubility								
°C	*°F*	*µMol*	*mg/l*	*ml/l*	*µMol*	*mg/l*	*ml/l*	*µMol*	*mg/l*	*ml/l*
0	32	457	14.6	10.2	913	29.2	20.5	1823	58.4	40.9
5	41	399	12.8	9.1	798	25.5	18.2	1595	51.1	36.4
10	50	353	11.3	8.2	705	22.6	16.4	1411	45.1	32.8
15	59	315	10.1	7.5	630	20.2	14.9	1260	40.3	29.8
20	68	284	9.1	6.8	568	18.2	13.7	1137	36.4	27.3
25	77	258	8.3	6.3	517	16.5	12.6	1034	33.1	25.3
30	86	236	7.6	5.9	473	15.2	11.8	947	30.3	23.6
35	95	218	7	5.5	436	14	11	872	27.9	22.1
40	104	202	6.5	5.2	404	12.9	10.4	808	25.9	20.8
45	113	189	6	4.9	375	12	9.8	751	24	16.9
50	122	177	5.6	4.6	355	11.3	9.3	710	22.7	18.7

Oxygen Solubility in sea water - *Salinity ~ 35*

Oxygen Solubility in sea water - Salinity - 35										
Pressure abs	*mm Hg*	760			1520			3040		
	psi	14.7			29.3			58.7		
	bar	1			2			4		
	kPa	101.1			202.2			404.3		
Temperature		Solubility								
°C	*°F*	*µMol*	*mg/l*	*ml/l*	*µMol*	*mg/l*	*ml/l*	*µMol*	*mg/l*	*ml/l*
0	32	349	11.2	7.8	699	22.4	15.7	1399	44.8	31.3
5	41	308	9.9	7	616	19.7	14.1	1233	39	28
10	50	275	8.8	6.4	550	17.6	12.8	1099	35.2	25.6
15	59	248	7.9	5.9	495	15.9	11.7	991	31.7	23.4
20	68	225	7.2	5.4	450	14.4	10.8	901	28.8	21.7
25	77	206	6.6	5	413	13.2	10.1	826	26.4	20.2
30	86	190	6.1	4.7	381	12.2	9.5	761	24.4	18.9
35	95	176	5.6	4.5	353	11.3	8.9	706	22.6	17.9
40	104	165	5.3	4.2	329	10.5	8.5	658	21.1	16.9
45	113	154	4.9	4	308	9.9	8	616	19.7	16.1
50	122	146	4.6	3.8	292	9.4	7.7	585	18.7	15.4

Appendix 3, Solido (Suspended Solids Sensor)

Solido
Suspended Solids Sensor

Description of the function

Solido is a portable optical suspended solids meter designed to measure suspended solids in aeration basins, RAS, aerobic digesters, etc. in water and wastewater plants, as well in other facilities. Two different alarm levels for the suspended solids may be set to indicate high and low levels.

Measurement Functions

It is able to store up to 250 measurements with information about time, date, location, that may be named by the user (maximum 10 characters e.g. Clarifier 2; Thickener 5, etc.) Each location contains suspended solids level and temperature that applied for the specific measurement sample.

Sensor body

The sensor body contains optics and electronics that should not be exposed to mechanical abuse or high temperatures. If the sensor body has mechanical damages, water may penetrate into the sensor and destroy the electronics and optics. Please see section Maintenance for more information.

Description of the Display

At start up, the display is shown in fig 1 and description in fig 2. Value for suspended solids concentration is displayed on the left and alarm values to the right. Date, time and temperature are shown across the top.

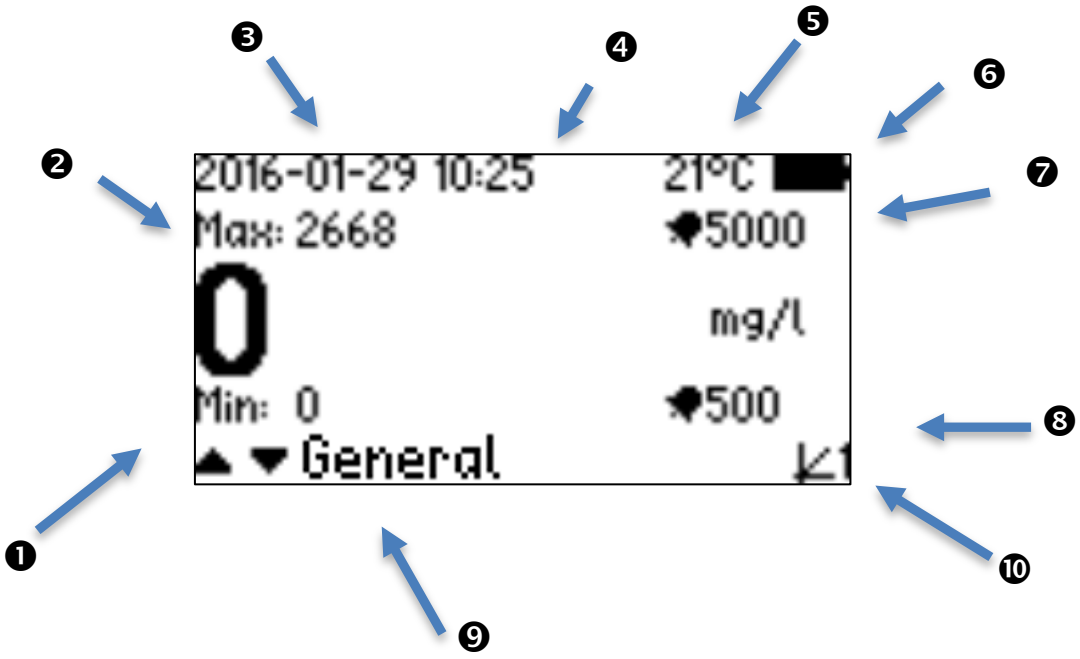


fig 1

❶ Min measured suspended solids conc
❷ Max measured suspended solids conc
❸ Date
❹ Time
❺ Water temperature
❻ Battery level
❼ Threshold 2 – High alarm conc
❽ Threshold 1 – Low alarm conc
❾ Measuring location
❿ Selected calibration

fig 2

Main menu

Press ✔ to open the main menu. See fig 3. Use ▲ or ▼ to pick the desired sub menu and open with ✔. Exit the menu with ✘ until one of the main windows appear.

fig 3

Settings

In the SETTINGS menu (fig 4) it is possible to set alarm values for high and low suspended solids level. When suspended solids concentration levels are outside this Min limit then the hand controller will make one acoustic beep signal. When suspended solids concentration levels are outside this Max limit the hand controller will make two acoustic beep signals.

fig 4

Threshold 1 (Low Concentration)

This value defines the suspended concentration that indicates the low alarm. The concentration level may be given in g/l, mg/l, ppm or %. For more information see ”Settings”. When the preset alarm value is reached, then this will be shown on the display as Min.

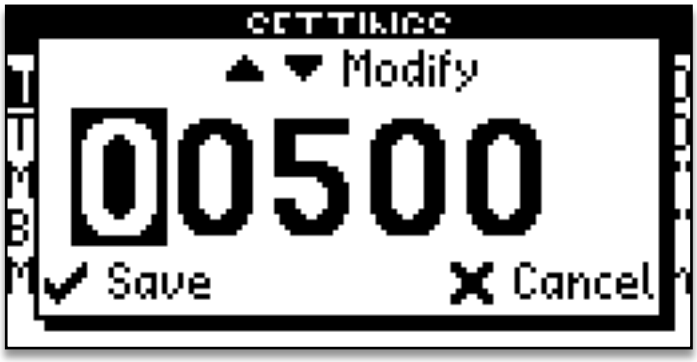


fig 5

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and pick ”Threshold 1” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✘ until one of the main windows appear.

Threshold 2 (Max Concentration)

This value defines the suspended solids concentration that indicates the high alarm. The concentration level may be given in g/l, mg/l, ppm or %. For more information see ”Settings”. When the preset alarm value is reached, then this will be shown on the display as Max.

.

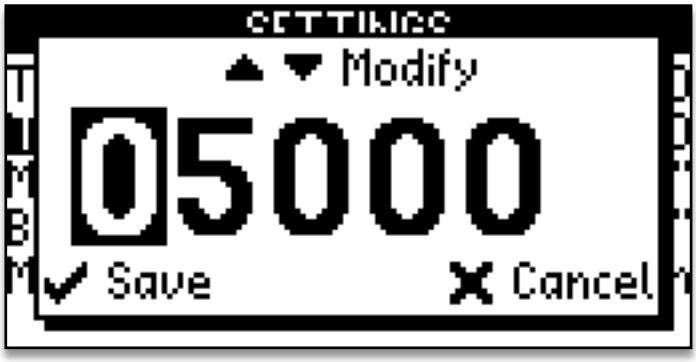


fig 6

Press ✔ to open the menu and select ”SETTINGS” confirm with ✔. Step down with ▼ and select ”Thrreshold 2 ” with ✔. Step up with ▲ or down with ▼ until desired concentration is obtained. Confirm and step to next digit with ✔. Exit the menu with ✘ until the main windows appear.

Setup

See setup in section for MultiTracker hand controller.

Preferences

See preferences in section for MultiTracker hand controller.

Language

See language in section for MultiTracker hand controller.

Concentration Units

See Concentration Units in section for MultiTracker hand controller.

Temperature units

See Temperature units in section for MultiTracker hand controller.

Calibration

Calibration can be done for both zero and lab sample concentration.

fig 7

Zero Sample

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”zero”. Confirm with ✔. Put the sensor in clean, deareated water and cover it to prevent the sensor from being exposed to light and confirm with ✔ ✖. When zero calibration is done, exit with ✖ until one of the two main windows appears.

Conc. sample – Sludge Sample

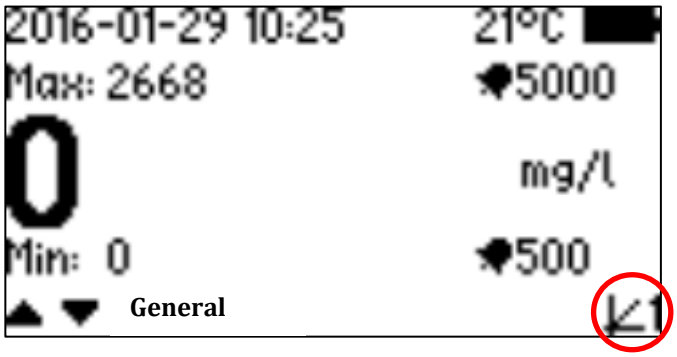
Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”Sample”. Confirm with ✔. Put the senor in a sample with known concentration and stir sample with sensor to keep solids in suspension. Confirm with ✔. When complete then exit with ✖ until one of the two main windows appears.

Lab Value

Press ✔ to open the menu and step down with ▼. Select ”Calibration” with ✔. Step down with ▼ and select ”Lab”. Confirm with ✔. Step up with ▲ or down with ▼ until the value corresponds with the lab value. Confirm with ✔. When all settings are done, exit with ✖ until one of the two main windows appears.

Three Calibration Curve Setup*

When using the Solido sensor, the Mulitracker supports up to three different calibration curves. This could be used to improve accuracy when measuring in different types of sludge´s.



The symbol indicated above shows the selected calibration curve (curve 1 is currently active). To change curves then you need to be on start-up screen which shows solids concentration. To change the selected calibration curve, press and hold ✕ while using the ▲ / ▼ buttons to change curves. Three curves are available.

To modify or recalibrate one of these curves, then first select the calibration curve to be recalibrated as described above, which must be done before entering the main menu screen by pressing ✓ and then calibration option.

To recalibrate multiple calibration curves, you will have to exit the menu between each recalibration, select the next calibration curve, and enter the calibration menu again. Only one calibration point can be entered for each curve.

Note
The zero (water) calibration value is common to all three calibration curves, and therefore does only need to be performed for one of them.

*This function is supported with software version MT2.3 and above.

Getting Started

Getting started with the Solido

Start the MultiTracker by pressing the button marked ⏻. To switch OFF/ON the unit, press the same button. The unit will start automatically. Values for suspended solids are displayed in clear text and real time. If the unit is not active during an eight minute period then it will automatically be turn off without saving the measurements.

Save a measurement

To save a measurement, or to perform a new measurement, press ↻, when doing this, an option to save ✓ or restart the measurement ✕ will be presented. There is a short command from the text mode display where it is possible to select position for

storing the measurement. Step up with ▲ or down with ▼ to reach desired log position. The postion tag will be shown in the lower margin in the display window. Fig 8 below, shows that the actual profile will be stored at position "General"

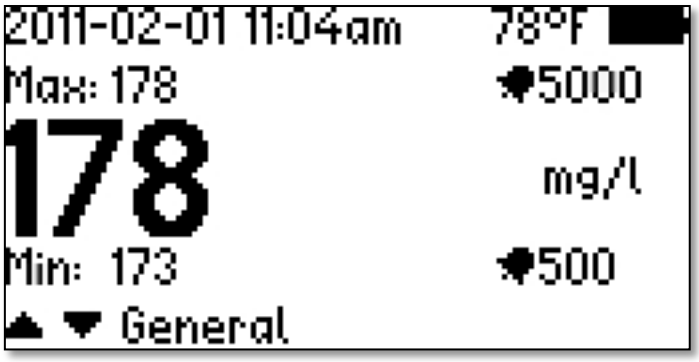


fig 8

It is possible to tag each of the 250 log positions with up to 10 alphanumerical characters. By entering the log position by tag name, all actual information for the stored measurement may be retrieved.

Alarm values

At delivery the MultiTracker is preset with the following values; Threshold 1, 500mg/l (Low suspended solids level) and Threshold 2, 5,000mg/l (High suspended solids level). Using these values, it is possible to instantly start to measure. To change the settings please see sections for Threshold 1 and Threshold 2.

Maintenance

The Solido is designed to reduce the manual maintenance to a minimum. All metal parts are stainless steel (SS 2343/SS316). The enclosure is IP68/NEMA 7. The sensor cable is a specially manufactured PUR™ with a strong shield and extra heavy wires to withstand mechanical wear for a long life. The sensor and enclosure cable fittings are high quality MatchClamp™ to ensure a water proof connection even should the outer shield be damaged.

Inspection of the sensor

The sensor head should be cleaned if any solids or fouling of the measuring windows occurs. In order to verify the necessity of cleaning, place the sensor in clean, de-aerated water and read the display value. The value should not differ more than ±10mg/l from zero. If the value is off the cleaning is required, a new zero calibration may be performed. See section Calibration.

When cleaning the sensor, it is preferred to use the Cerlic Sensor Cleaning (CSC) liquid. It is also possible to use a soft cloth and water. Pay attention not to scratch the optical windows.

Trouble shooting

In case of any malfunction that is not possible to correct with a new calibration, please contact Cerlic or a local Cerlic representative. In case of sending the Solido to Cerlic for checkup or repair, please make sure to use the form for Return of Material (RMA) prior to dispatch. The RMA document can be downloaded from the Cerlic web page www.cerlic.com. The WEB page also has the actual and correct receiving address.

Specification, Solido

Function	Suspended solids
Measuring principle	Optical light transmission
Wave length	NIR 850 nm
Measuring range	Up to 35,000 mg/l (ppm) dependent on solids type
Accuracy suspended solids	1% FS (full scale)
Repeatability	< 2% of Measured Value
Type of Measurement	Continuous
Number of Detectable Levels	Two
Measuring units	g/l, mg/l, %, ppm
Temperature Range - Liquid	0 – +50°C (+32 - 122°F)
Sensor Body	Stainless Steel, BK7 Glass Windows
Cable	PUR, Shielded
Cable Fitting	MatchClamp™
Weight Sensor	450g (1 lb)
Dimensions Sensor Body	145mm x 32 mm Ø (5.7”x1.26”Ø)
Cable Length	4 m (13’) or 8 m (26 ft)
Enclosure Sensor Body	IP68 (NEMA 7)