

CBX

Cerlic





CBX – sludge blanket tracker

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Introduction

The sludge blanket tracker CBX is primarily designed for use in water and waste water treatment plants. It measures the suspended solids concentration as the sensor is lowered to determine the sludge blanket depth in clarifiers and sludge thickeners. An output signal is generated that can be used for process control or as an alarm for process upsets, e.g. when the sludge blanket starts to rise and thus will give an early warning for solids wash out.

The design of the CBX makes it possible to use it in other applications where reliable monitoring of interface or stratification in suspensions is desired.

The CBX works in conjunction with a Cerlic BB2 control box for configuration, local presentation of measurements and 4-20 mA or digital outputs.

About this manual

This manual details installation procedures and operational features of the Cerlic sludge blanket tracker, CBX. Menu navigation and technical data for the BB2 control box can be found in the BB2 service manual.

Design

The CBX is made with a stainless steel enclosure, equipped with built in fan & heater, flushing system to maintain a clean sensor and obtain a reliable operation in most environments and processes.

Working principle

The sensor is sent down into the clarifier/thickener and measures the suspended solids as it descends and sends the data via a communication cable to the BB2 control box. By submersing the sensor into the liquid you are able to obtain reliable suspended solids readings and avoid problems from foam and fluff layers in the clarifier/thickener.

Installation

Operation and maintenance may only be carried out by trained personnel authorized by the supervisor of the facility.

Unpacking

The unit has been tested and approved before delivery from factory. Please check to confirm that no visible damages occurred during shipment. **Open the CBX stainless steel cabinet and cut the Ty-Rap that locks the cable for transport.** Make sure that all equipment inside the cabinet is secure and that the sensor and cable can move freely.

Damages

If damages occurred during shipment, immediately contact your shipper as well as your Cerlic representative within 2 days of receipt. The shipment may be returned only after contact has been made with Cerlic.



Fig 1

Packing

The original packing is designed to protect the equipment and should be used for storage or if the goods must be returned.

Content

Please check that the content corresponds to your order and packing list. Every shipment should include:

Options and accessories

	P/N
• SS Handrail Mounting Bracket	10305893
• BB2	11905426
• Mounting plate for BB2	10305851
• Cable 1,5m (5')	20805752
• Cable 10m (33')	20805510
• Cable 30m (100')	20850727

Optional parts for CBX

• Sensor with cable	11305888
• Flushing Valve 115V	11705516B
• Motor 115V	21750924
• Fan 115V	21750926



Starting up

Connect the CBX to the BB2 and connect 110/1/60 power to both units. BB2 must have program version 3.1 or higher so it will automatically detect and install the CBX.

Mechanical installation

Mechanical mounting is described in appendix 1 “Mounting of stand”.

When CBX is installed outdoors there is a risk of flush lines freezing at sub zero temperatures

Water connection

On the bottom right hand side of the cabinet there is a ¼” npt male connection for flexible flush hose. A description of the connection can be found in appendix 3 “Mounting of hose”. Outdoor installations must protect water pipe or hose from freezing conditions or the water must be disconnected and emptied to avoid the hose or valve from freezing. Under all circumstances flushing should be avoided when the outdoor temperature is below 0 °C (32°F).

Electrical connection

In the bottom lower left corner of the cabinet there are the four (4) ½” npt female electrical connections. Any wires meant to go outside the cabinet can be found here.

Electrical connections must be installed by authorized personnel only. The connections are terminated in the junction box inside the cabinet on the left side. Description is given in appendix 4 “Electrical connections”.

Sludge rake guard limit switch

All sampling modes are, more or less, dependent of the connection of a rake guard limit switch which is a N/O (normally open) contact. The digital input for the limit switch can be used in several different ways for control of the CBX

The only case where the rake limit switch can be ignored is when the rake is only present below the “RAKE HEIGHT” setting stated in the CBX Setup. In that case the “Rake Interval” should be specified as zero.

NOTE! A limit switch must be used in all applications where a rake or other moving equipment may come in contact with the sensor or cable. Cerlic Controls AB does not assume any responsibility for damages caused by the absence or malfunction of the rake guard limit switch



User interface

The following section describes the user interface that is used with BB2 to configure and operate the CBX.

Configuration terms

The figure below shows the different terms used for distances that are involved in the configuring of the CBX.

To set the basic parameters like, Blind zone, Max depth, and rakers do the following.

Lower the sensor head to 1' (0.3m) below the liquid surface (see calibration section for instructions), note the distance on the BB2. This is the length of the blind zone (B). Continue to feed the sensor down until the sensor is just touching the bottom. You can see this by watching the cable, when the sensor is all the way down the cable will go slack. Feed sensor back up until you have about 2" (5 cm) of clearance between the bottom of clarifier and sensor. Note the distance on the BB2, this is the Max Depth (C). Exit the Manual UP/DOWN mode and scroll down to "CBX setup" and enter the "blind zone (B)" "Max depth (C)" and "rake height (F)" if you have a rake or if you want to compensate for a slope.

Home position, A

The sensor will always return to this position.

Blind zone, B

Sludge or foam detected in this zone during lowering of the sensor is not registered. Unwanted interference is prevented by setting this zone to be 1' (0.3m) below the normal liquid surface.

Max depth, C

This is the maximum distance from the home position. The sensor will stop at this depth if no sludge is detected. The sensor might stop and return at a shorter distance if a rake guard offset is entered.

Sludge blanket, D

The sludge level found when the preset sludge concentration is reached.

Measuring range, E

The output signal will vary from 4-20 mA within this range.

Rakers, F

This denotes the safe height from the bottom (Max depth) to a point where the sensor always must stop and then turn back to home position to alleviate hitting the bottom rake.

Fluff, G

The fluff layer found when the present fluff concentration is reached.

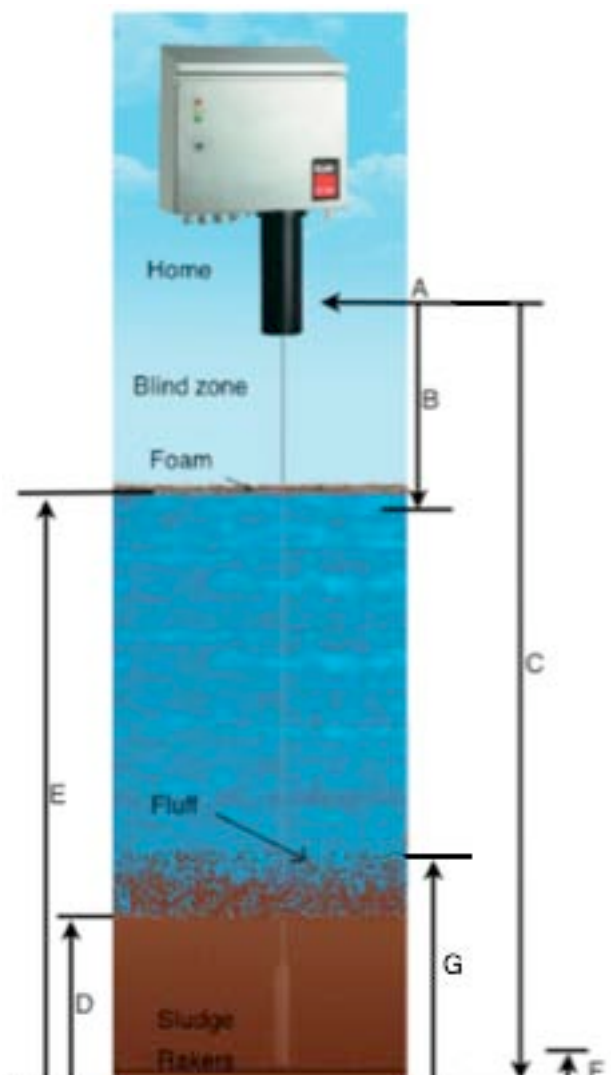


Fig 2



LED indication

There are three LED lamps in the front of the CBX which are used to indicate status information from the CBX.

Red	Yellow	Green	Description
On	On	On	Starting up
Off	Off	On	Standby, waiting for next sampling cycle
Off	Off	Blink	Configuration mode
Off	Blink	Off	Sampling
Blink	Blink	Blink	Configuration error Something in the parameter settings stops the CBX from operating, not valid numbers.
On	Off	Off	Operation error Mechanical/electrical fault that stops the CBX from operating

fig 3

Main menu

In the BB2 menu the CBX will be presented in a similar manner as other X-sensors from Cerlic Controls AB.

The sludge blanket height value will be presented as the primary measurement. If the BB2 that the CBX is connected to only uses one slot, then the secondary value presented on the front screen will be the actual measured concentration peak value at the sludge blanket. Otherwise the peak value can be found in the second information display.

Sensor displays (optional)

By simultaneously pressing arrow down and ENTER you alter between BB2 main menu and the sensor information displays for the selected sensor.

For the CBX there are three information displays available.

Information display (optional)

The information displays shows a number of parameters of interest regarding the CBX:

- Concentration value for the blanket
- Measured peak value for concentration.
- Blanket max height
- Blanket min height



Profile (optional)

CBX users can get the sludge profile using the 4 output signals on the BB2. It is updated at the end of each sampling cycle (channel 3 & 4 are on-line during sampling). This option requires an extra card in the BB2 unit with two more 4-20mA signals (total 4 outputs)

Attach the extra mA card to the BB2 (P/N 11905782) see appendix 7.

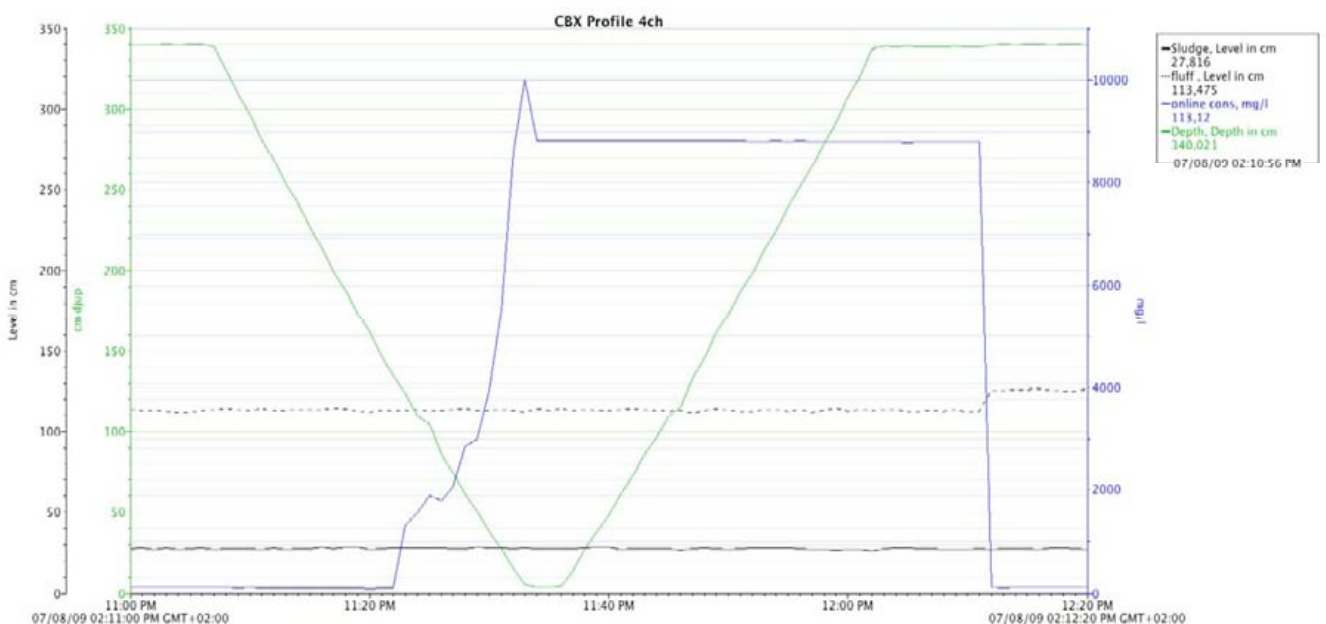
Follow the checklist below to get started

- Set the analog outputs on the BB2 to “all” (settings/analog)
- Set second to “fluff” (settings/second)
- Set the track to “profile” (settings/CBX setup/track)

The analogue 4-20mA assign to the following channels when using “profile”

- Channel 1 High of sludge blanket, signal updated every time a new measurement is done. Scale is the same as (scale/alarms/Max depth).
- Channel 2 High of fluff blanket, signal updated every time a new measurement is done (scale/alarms/Max depth).
- Channel 3 Consistency on-line during a sample otherwise 0. Scale is looked to 0-10000 mg/l.
- Channel 4 Depth of sensor on-line during sampling otherwise 20mA. Scale is same as (scale/alarms/Max depth)

See graph below how a typical profile can look like when you have about 1ft of sludge and 3ft fluff on top of the sludge.





BB2 menu for CBX

This section describes the menus used in BB2 to set up the CBX for operation.

! Important, you need to exit the Settings menu to save the parameters or changes !

Settings

Tag	Name of the sensor (10 characters) shown in the main display.
I-Time[s]	Integration time or dampening - can be set up to 999 seconds. This is integration in BB2. The value coming from CBX is normally also an average.
Manual up/down	Enables the BB2 to control the sensor in the CBX to go UP and DOWN. In this mode the depth and consistency are displayed in the BB2. . Must change "MODE" to "TRIG" to activate.
Depth Unit	Unit used for distances in CBX settings m, cm, inch, foot
Cons units	Unit for consistency "%", "ppm", "g/l", or "mg/l"
Analog	Set the analog output channels for sludge blanket depth (distance D in fig 4) as primary and (optional) second analog for fluff (distance G in fig 4) if used.. 1, 2, 3, 4, 1&2, 3&4, all or none
Second	This shows the height of the fluff layer from the bottom
Blanket Cons	Set the consistency that will define the blanket. This can be done by entering a blanket consistency.
Fluff Cons (optional)	Set the consistency that will define the fluff layer. This can be done by entering a fluff consistency.
CBX setup	Sub Program for initial CBX set-up
Mains freq	The frequency of the power, i.e. 50HZ in Europe and 60Hz in the USA.
Trig	Number of trig event before lowering the sensor

**CBX
setup**

Max depth The maximum travel distance from home position (**A**). The sensor will stop at this depth if no blanket or sludge is detected (**Distance C**). This travel distance will be shortened if a rake offset exists (**distance F**)

Blind zone **Distance B.** Distance to where sensor must travel before it starts to measure solids. Sludge or foam detected in this zone during lowering is not registered. Unwanted registration is prevented by setting this zone to reach approximately 25cm (1 ft) below liquid surface.

Rake height **Distance F.** Fluff height from bottom and up.

Fluff height **Distance G.** In case of a bottom rake or a slope this parameter is subtracted from the Max depth to set the actual stop where the sensor will stop and return home in case of no sludge.

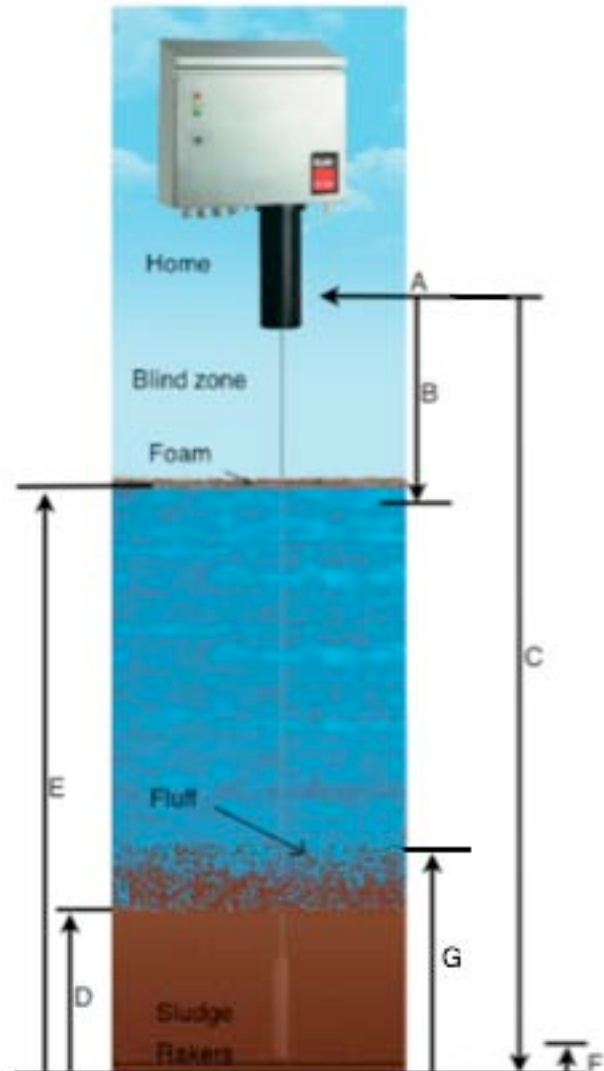


Fig 4



Calibrate

Mode	Setup: The CBX must be set to this mode before changing calibration parameters or using “MANUAL UP/DOWN” button. Trig: This is the normal working mode. In this mode the CBX will take a sample on every external trig. Set CBX back to Trig for normal use.
Manual up/down	Enables the BB2 to control the sensor in the CBX to go UP and DOWN. In this mode the depth and consistency are displayed in the BB2. . Must change “MODE” to “TRIG” to activate.
Take sample	No / Zero / Sample - Chose the type of calibration
Cons	Current consistency
Sample	Enter consistency from Lab test – consistency/suspended solids value for Sample

Cleaning Cleaning

Manual up/down	Yes/no Yes, flush cleaning is witched on. No, the cleaning is switched off. Enables the BB2 to control the sensor in the CBX to go UP and DOWN. In this mode the sensor is switched off and can be left out unlimited time for cleaning. Must change “MODE” to “TRIG” to activate.
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Scale / Alarm

Max	Max level or 20 mA output, distance E in fig 4
Min	Min level or 4 mA output
Hi-Alarm	Max level for alarm
Low-Alarm	Min level for alarm
Alarm Relay	Pick which alarm relay is to be used on the BB2



System

Type	Type of sensor, read only information
Serial	Serial number of the sensor, read only information
SoftW	Software version of the sensor, read only information
Info	
Ch1	Info
Ch2	Info
Ch3	Info
Ch4	Info
Samples	Counter that shows total number of samples taken by the CBX to day

Calibration of sensor

Before leaving the factory the CBX sensor is calibrated to give accurate measurement but during the lifetime of the system it might be necessary to re-calibrate the sensor. Even at installation, a re-calibration with sludge might improve the accuracy.

Zero calibration is done with clean, de-aerated water in a bucket. Sludge (Sample) calibration is done with a known sample in a bucket.

Calibration procedure

The operations below are done in the menu “Calibration”

1. Set the CBX in Configuration mode (Calibration/Modes). The green LED on the door should now blink

The green LED on the door should blink while making changes.

2. Set the sensor in calibration position (Calibration) by using “Manual up/down” and position the sensor approximately 1 meter under the flushing tube.

3. Put the sensor in the clean water or sludge sample.

4. Go to “Take sample” and choose either “Zero” (for clean water) or “sample” depending on type of calibration to be preformed.

The CBX will collect samples and the BB2 shows this with a pop-up window.

5. In case of sludge calibration enter the “Sample” consistency from the lab test.

6. Set the CBX in Trig mode (Calibration/Modes) and back out of the menu to save the changes.

The green LED on the door should now be a constant green light for operation mode



Maintenance

The electronics in the CBX is self monitoring and requires very low maintenance. The mechanical parts need to be inspected at regular intervals and the optical parts may need cleaning.

Manual activation of CBX

It is possible initiate a manual trig of a sample. By holding down the “down arrow” for 5 sec on the BB2. The CBX starts a sampling cycle ASAP and returns the sensor back home and normal mode.



Starts lowering of sensor.



Stops lowering of sensor and return the sensor home.

Maintenance schedule

Once a month	Once every 6 months	Once a year
Check sensor for buildup, clean with damp if necessary	Clean sensor lens.	General check and cleaning

*Also check SAMPLES under SYSTEM to review the number of times the sensor has cycled
Cable with sensor.*

Visual check that the cable is correctly wound on the drum and that cable does not show wear.

Sensor lenses.

Visual check of the lenses. Clean with a suitable agent like water or isopropyl alcohol & soft rag, if necessary. Check for build up or “film” on lenses.

Fan

Air filter, remove the cover from the outside and check the filter. The air filter might need to be replaced or cleaned if the equipment is installed in a dusty environment. Remove the protective grating with a screwdriver and put it back by pressing it by hand. Make sure the fan starts every time when the sensor is on the way up. Be aware that condensation inside the CBX can cause problems.

Screws and nuts

Verify that everything is properly secured, no loose parts or rattling

Sensor check

The sensor is easily checked by immersion in water. This should give a low value of about 0. By putting something solid (a finger) in the gap a value of 3000 - 9999 depending on calibration, should be given.



Errors

Troubleshooting

If external power surges, or any other problems, have caused the electronics to stop, then a reset may be performed by switching the power OFF and then ON. This can easily be done by opening the CBX door and then closing.

Alarms (optional)

A number of errors can be detected and shown on the BB2. The alarm error is displayed in plain text and the alarm contact is closed. It may stop the operations of the CBX and it is reset by pressing ENTER on the BB2.

SENSOR TILT means that the sensor has tilted more than 45 degrees and the tilt switch in the sensor has detected this. The sensor is retracted to home position and an alarm is shown.

SENSOR ERROR means that no signals are being received from the sensor. The sensor is retracted to home position and an alarm is given.

SENSOR STOPPED means that the drum with sensor and cable is standing still when it should be moving. The control stops and an alarm is given.



Technical specifications for the CBX sludge blanket tracker

Manufacturer	Cerlic Control AB, Sweden. Made in Sweden
Name	CBX
P/N	12705845A (220V/1/50) Europe 12705845B (110 V/1/60) US
Dimensions	See drawing page 16
Weight	21 Kg (46 lb) incl. accessories
Enclosure	NEMA4 (IP65), Stainless steel
Measuring principle	Sounding by optical sensor with straight light transmission of NIR-light For suspended solids monitoring.
Supply voltage	115 V/1/60 Hz (US) P/N 12705845B 230-240 V 50 Hz (Europe) P/N 12705845A
Fuse (S1)	5 A(T1AH, 20 x 5 mm fuse)
Power Usage	Max 450 W (24 V electronics)
Stand by power	10 W
Ambient temp	-20°C to 50 °C (-4°F to 122°F)
Internal heating	Full power below 5 °C (41°F), Off above 15 °C (59°F)
Storage temp	-20 to +60 °C (-4°F to 140°F)
Rake Limit Switch	Closing contact normally open, 24VDC is supplied from CBX.
Sensor	Waterproof to 10m (30 ft.) in stainless steel 2343 with cable in PUR
Motor	1800 rpm synchronous with gearbox 1:100 (1500 rpm at 230 V)
Lowering speed	Max 15cm/s (12.5 cm/s at 50 Hz) Full cycle time for 10 meters (33') is 3min.
Measuring range	0... 10 m (33')
Accuracy sensor	5 % Full Scale
Accuracy level	0,5 % Full Scale

Dimensions



Fig 5

Detailed information of CBX structure

The sludge blanket tracker system is constructed from parts built inside a cabinet. The parts are described and illustrated in the sections below.

Main control board

The main control board controls the mechanical events in the cabinet and communicates with both sensor and BB2. The BB2 communication is done through RS-485 interface.

Other signals going in and out of the cabinet are also connected to the main control board.

The board collects the values of sludge concentration from the sensor and distributes them to the BB2 for presentation.



fig 6

Pickup board

The pickup board for drum is used to transfer power and communication signals to the cable drum. It also decodes the movement of the cable drum using sensors.

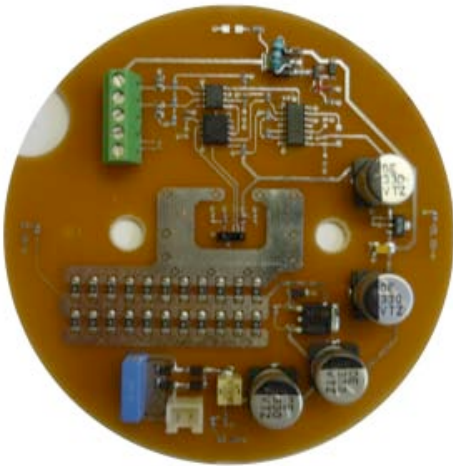
The pickup board is mounted on a spring loaded lever arm.



fig 7

Axle board

The axle board mounted on the cable drum is powered by contact free power (inductive) from the pickup board. It communicates with the main board via the pickup board and it communicates with the sensor through an optical RS-485 interface.

*fig 8***Sensor**

The sensor is connected to a cable that supplies it with power and transmits the communication signals. The sensor contains an near-infrared light source and a receiver that are positioned in such a way that the light between them passes through the liquid.

Fig 9

Cable drum assembly

The cable drum moves the sensor up and down in the basin. It is mounted directly on the axle of a synchronous motor, hidden behind the drum mounting plate, with a very constant speed. Since the diameter of the cable roll in the drum varies, the speed of the sensor will vary. It will move slower during the end of the sampling.

The cable and sensor are cleaned by a water spray in the flushing tube mounted below the SS enclosure during return to the home position.

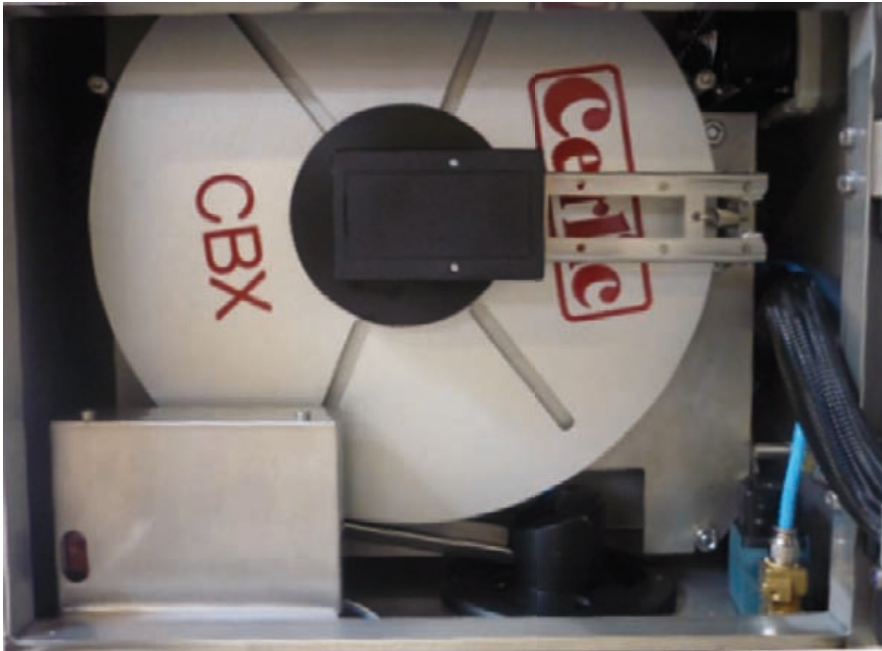


fig 10

Heater & fan

Hidden behind the drum mounting plate there is a heater which is used in cooperation with the fan to maintain a stable temperature inside the cabinet. The fan is mounted on the top right side of the cabinet.



fig 11

Flushing tube & valve

The flushing tube contains a nozzle ring that sprays cleaning water around the sensor and cable during the return or rising of the sensor.

The flushing valve is controlled by the main control board.

In the top of the flushing tube is the home position for the sensor. There is an inductive limit switch to determine the correct position or home position of the sensor.



fig 12

Connection terminal

In the lower left corner of the cabinet there are connection terminals for the external wire connections.

To the left of this terminal block there is a safety switch that will disconnect the power when the cabinet door is opened. There is also an emergency motor control switch, UO/DOWN which can be used to control the sensor movement even if the normal control function becomes faulty.

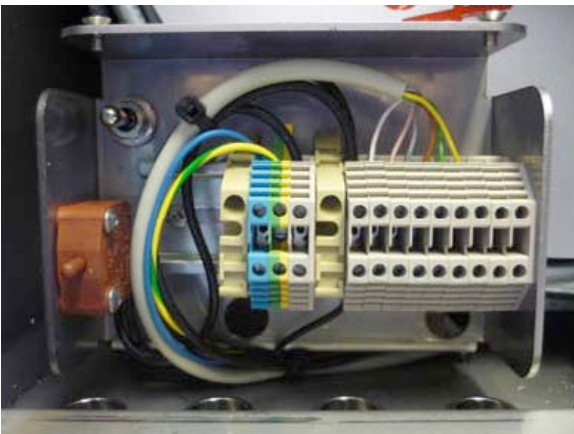


fig 13

Appendix 1, Mounting of stand



fig 14



fig 15

The stand consists of two brackets, left and right hand, and a crossbar brace. Assemble the parts according to the figure. There is two kinds of mounting brackets see the difference in fig 14 and fig 15.

Hang the assembly on the handrail and secure it with the set screws to the handrail brackets. Open the door and adjust horizontally with the screws on the consoles.



Appendix 2, Mounting of flush pipe

Sensor and cable are cleaned with flush water from a hose or pipe connected to the cabinet. A bushing with 1/4" npt male thread is located under the lower right hand corner of the cabinet. Connect a hose or pipe of at least 10mm (3/8") diameter to fitting.

The water pressure must not exceed 6 bars (90 psi).

A last check before starting the CBX:

1. Check that the sensor cable is properly wound on drum and cable guide.
2. Check that all screws and nuts are properly tightened.

Appendix 4, wiring diagram

Connection box for power supply & rake limit switch

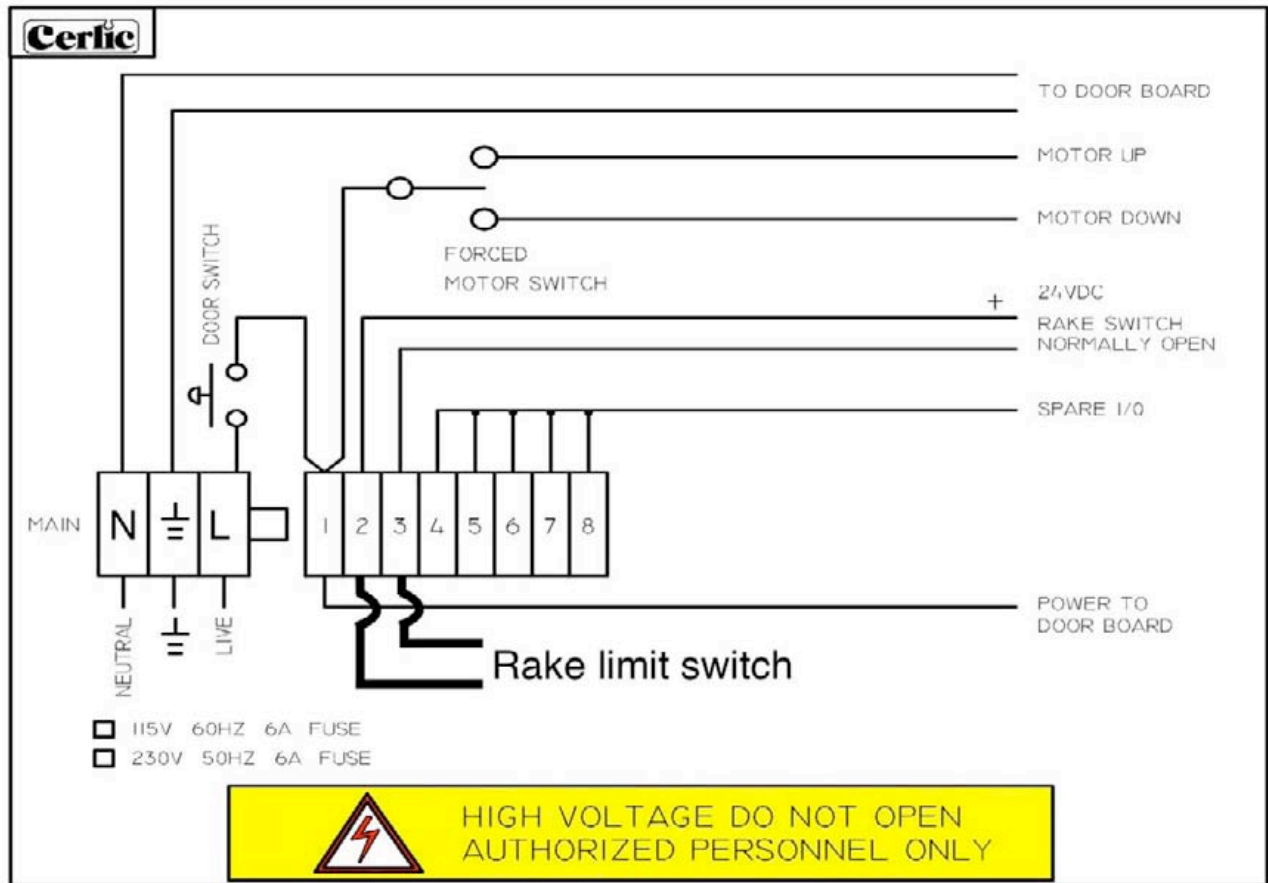


fig 16

Connection terminals for control board

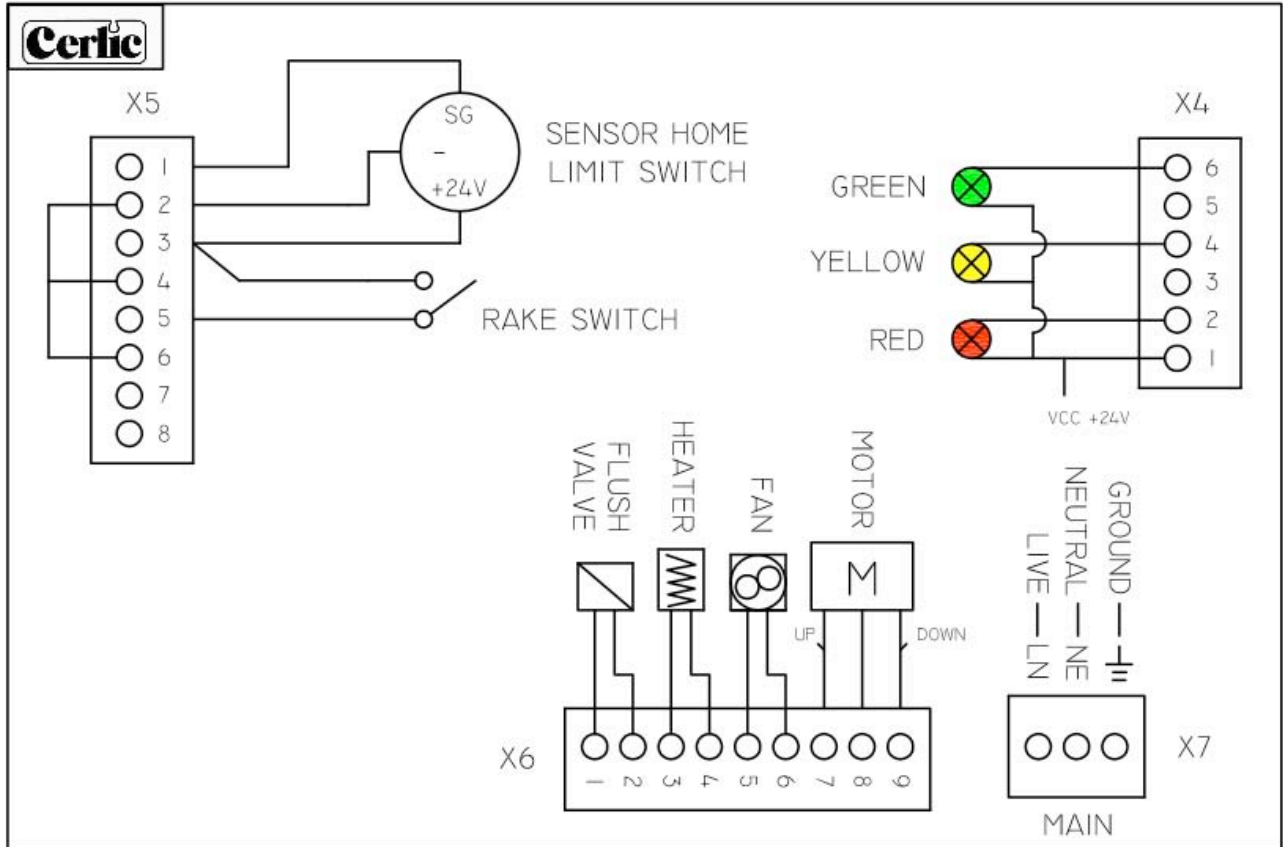


fig 17



Appendix 5, Safety instruction

The CBX is designed and manufactured with the greatest possible safety. It meets state-of-the-art safety requirements and all relevant recommendations and standards.

The instrument is CE marked and follows EU directives and standards as listed below.

The electrical equipment fulfills applicable regulations and the electronics are encapsulated (IP 65, NEMA 4). Electrical connections must only be carried out by authorized personnel.

CBX should not be installed in hazardous areas. It should not be installed in places where explosive gases may occur.

Operation and maintenance may only be carried out by trained personnel authorized by the operator of the facility.

The instrument should be connected to the power with a safety or local cut-off switch.

Certificate of conformity:

The CBX conforms to the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation:

73/23/EEC Low Voltage Directive as amended by 93/68/EEC

89/336/EEC EMC Directive as amended by 92/31/EEC and 93/68/EEC

Standards

EN 61000-6-4:2001

Electromagnetic compatibility (EMC) Part 6-4

Generic standards – Emission standard for industrial environments

EN 61000-6-2:2001

Electromagnetic compatibility (EMC) Part 6-2

Generic standards - Immunity for industrial environments

EN 61010-1:2001

Safety requirements for electrical equipment for measurement, control, and laboratory use



Appendix 6, Operation

All configuration is done on the BB2 control box connected to the CBX. This should be done before starting the sampling cycle. During the execution of a sampling cycle the results are presented on the BB2 screen and any manual operations are done from the BB2.

Modes

The mode that is selected (Trig or Setup) controls the way that the CBX is working and also the way it uses the rake guard trigger (limit switch) input to alleviate hitting the rake.

CBX Setup

This is the starting mode of the CBX in which it is waiting to receive a configuration from the BB2 control box.

Rake interval

The rake (limit) switch is used as a trigger to start the sampling process. When the trigger is activated after being triggered the sampling process is started. The number of rake passes that should occur before sampling is setup as Trigger Interval. This mode is suitable when the rake position is well known, e. g. surface rakes. Triggering of switch during sampling aborts the sampling.

Emergency hauling

In case the CBX stops functioning correctly during an active sample when the sensor is being lowered then there is an emergency switch to override the main board control of the cable drum motor.

At the left side of the connection terminals box there are two switches that might be used.

To get power to the cabinet the safety switch must be pressed. To make the sensor to go UP and DOWN, then the emergency switch is pushed either up or down.

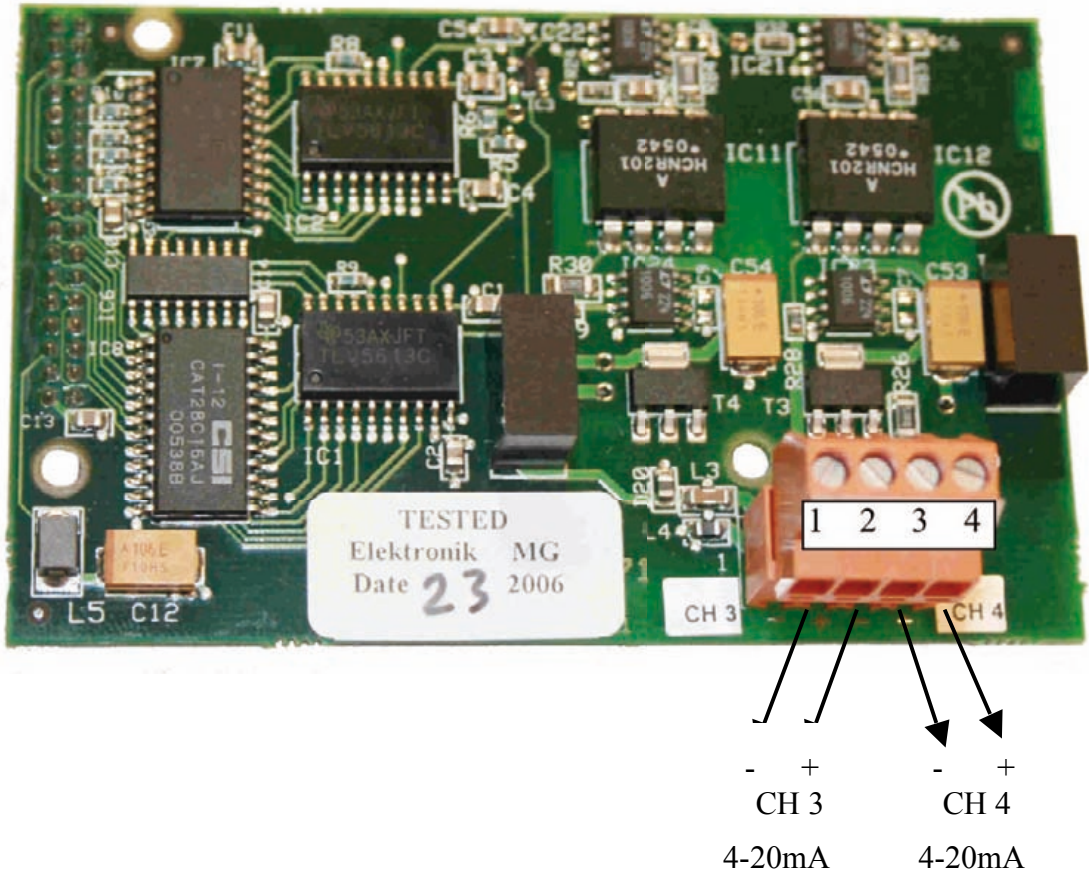
Appendix 7, Optional 4-20mA output module

Introduction

The BB2 4-20mA module is used to expand the BB2 central unit with two 4-20mA loops. It is assumed that the user is familiar with the BB2 and 4-20mA technology.

Module Overview

The module has two active 4-20mA outputs. The module is connected to the control box via a 34 pin connector, and fixed with three M2.5 screws.



Mounting in the 4-20 mA module in the BB2 control box

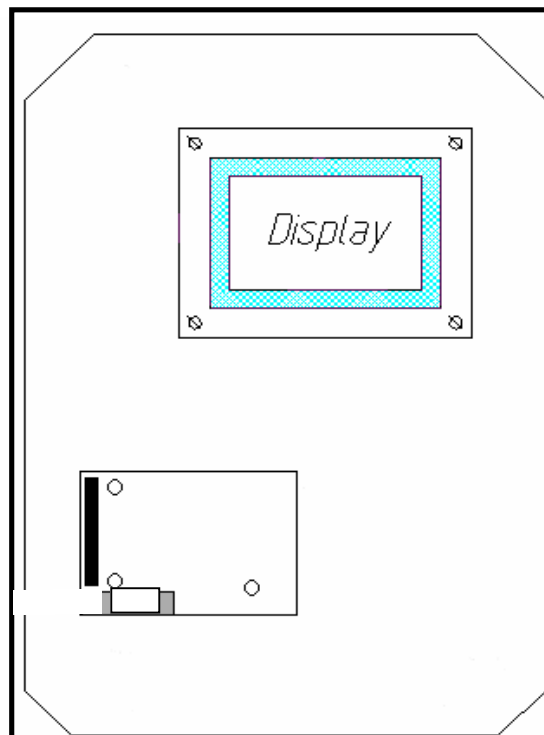
The 4-20mA module shall be mounted in a BB2 control box. Make sure the power to the control box is switched off before mounting the module.



Connect yourself and the control box chassis to protective ground before opening the antistatic package of the module to avoid static discharges that can damage the module or the box.

Be careful to get all 34 pins into their sockets. Fasten the module using the three M 2,5x5 screws that comes with the module.

When correctly mounted, the module will identify itself as “4-20mA” in the BB2 startup display, and under “Exp.module” in the BB2 Settings-menu.



Mounting the module in the control box

Wiring Connections

Connect the 4-20mA loops to the screw terminals according to the table below.

No	Name	Function
1	Ch3 -	Channel 3 return
2	Ch3 +	Channel 3 positive
3	Ch4 -	Channel 4 return
4	Ch4 +	Channel 4 positive



Getting started with the 4-20 mA module

A step by step guide to get the 4-20mA module up and running.

- Make sure the BB2 box to be used is switched off.
- Open the front and locate the expansion module connector.
- Connect yourself and the control box chassis to protective ground before opening the antistatic package of the module to avoid static discharges that can damage the module or the box.
- Mount the module into the box, be careful to fit all 34 pins into the socket.
- Fasten the three M2.5x5 screws.
- Connect the mA loops, negative line to screw terminal 1, and 3, positive to terminal 2, and 4.
- Switch on the power to the BB2 box and check that the module identifies itself in the BB2 menu under Settings / Exp.module.
- Configure the sensor(s) that shall use channels 3, and 4 to do so in the sensor menu.

Technical specification for the 4-20mA module

Manufacturer	Cerlic Controls AB, Sweden
Name	BB2 4-20mA expansion module
Measurement	86 x 54mm
Weight	35g
Ambient temp	-20 - +50°C (-4 - +122°F)
Storage temp	0 - 60°C (32 - +140°F)
Output signals	Two (2) 4 – 20 mA (20 – 4 mA), galvanic isolated, 450 ohm



Appendix 8, Support information

Before calling Cerlic Support, please collect the following information and have it at hand.

Company _____


Name _____

Phone _____

E-mail _____

Sensor Type _____




Position / Tag _____

First go to the BB2 menu, it is accessed by pressing  and ENTER at the same time for five seconds. Select "System" and press.

Version _____

Serial _____

Box temp _____

Leave the BB2 menu by pressing  and ENTER at the same time. Use  or  to select the sensor in the main display. Go to the sensor menu, it is accessed by pressing ENTER for five seconds. Select "System" and press ENTER.

Type _____

Serial _____

SoftW _____

Leave the BB2 menu by pressing  and ENTER at the same time.



Appendix 9, Setup information

This sheet can be used to document the setup of a sensor.

Sensor Type _____

Position / Tag _____

In the System sub menu of the sensor menu the following information can be collected.

Serial _____

SoftW _____

Samples _____

In the Settings sub menu of the sensor menu the following parameters can be set.

I-time _____

Analog _____

Blanket Conc. _____

Fluff Conc. _____

Mode _____

Mains Freq. _____

Trigger _____

Max depth _____

Blind zone _____

Rake height _____

Track _____

In the Scale sub menu of the sensor menu the following parameters can be set.

Max _____

Min _____

High alarm _____

Low alarm _____

Alarm Relay _____

Leave the BB2 menu by pressing  and ENTER at the same time.

