CTR/CTHR
4 Channels
Cellocator Temperature / Humidity and Event Recorder
User Guide
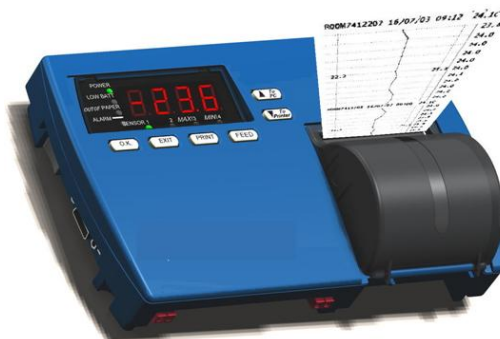
EN12830

Limited Warranty

Pointer Telocation Ltd hereby warrants that it will repair or replace, at its option, any part of the Cellocator Temperature / Humidity and Event Recorder or any of its accessories, which proves defective by reason of improper workmanship or material, free of charge for parts and labor, for a period of ONE YEAR from the date of original purchase by the buyer. This warranty does not apply if, in the sole opinion of Pointer Telocation Ltd, the CTR/CTHR, or any of its accessories, has been intentionally or accidentally damaged due to misuse, neglect, or improper packing, shipping, modification or servicing, by other than Pointer Telocation Ltd, or personnel authorized by Pointer Telocation Ltd. For information on how to obtain service under this warranty, contact the dealer where your CTR/CTHR was purchased or contact Pointer Telocation Ltd at the address shown below:

POINTER TELOCATION LTD. 14 HAMELACHA ST., ROSH HA'AYIN 48091, ISRAEL • TEL: 972-3-5723111 • FAX: 972-3-5723100 • www.pointer.com

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Installation Instructions and Precautions

1. The appliances in the package are designed for wall mounting or table-top installation.
2. When mounting the product on a wall, be sure to use the correct type of screw. Secure all screws to prevent the product from falling from its mounting.
3. Make all the connections to the product first and only afterwards mount the transformer on the wall.

Safety Precautions

1. Install the product in a dry environment. Prevent humid conditions and water leakage.
2. Protect the project and power supply from extreme temperatures. Do not install the product near radiators or in direct sunlight.
3. Prevent any foreign objects from falling on the product. Prevent spillage of any liquids, such as strong acids.
4. Connect the power supply to the appropriate voltage, as marked on the unit.
5. In order to prevent damage to cables and connectors, do not disconnect cables by pulling on them.
6. Route all cables where they will not cause hazard and ensure that the cables are not harmed in any way.

Warnings

1. Do not replace cables or connectors with non-original parts.
2. Fault connections may cause electrocution.
3. The power supply is designed for indoor use only.

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CHAPTER 1   INTRODUCTION

DEFINITION OF TERMS

▲ **CTR** model – Cellocator Temperature Recorder – Supporting 4 sensor inputs of Temperature or Switches (Event) in any combinations (up to 4 channels).

▲ **CTHR** model – Cellocator Temperature & Humidity Recorder – Supporting 2 physical sensors of Temperature & Humidity (4 channels), or one sensor of Temperature & Humidity and one Switch (Event) indication (3 channels).

▲ **T** sensor **-** Temperature sensor (for CTR only).

▲ **TH** Sensor **-** Temperature and Humidity sensor (for CTHR only).

▲ **S** Sensor – Event\ Switch (On/Off indication, for both CTR and CTHR).

▲ **LED** – Light indicator (Light Emitting Diode).

▲ **RS-232 -** A standard for serial transmission of data between two devices.

The Cellocator Temperature / Humidity and Event Recorder (CTR/CTHR) records, saves, and prints up to 16,200 readings at predefined intervals. The CTR produces an alarm whenever the measured value goes above or below a defined range, or whenever the Event (switch) changes its position. The alarm can be produced immediately when the measured value goes out of the defined range, or after the measured value remains out of range for a certain period of time. The CTR provides several printing options, including the ability to send data to a Control Center application via the Cellocator unit. The CTR can also send alarms to an external device via a relay contact.

Measuring Range:

The CTR temperature range: -40°C to +130°C ±0.5°C (-40°F to +266°F ±1.0°F).

The CTHR Temperature range: -40°C to +85°C ±0.5°C (-40°F to +185°F, ±1.0°F). The CTHR Relative Humidity range: 0% to 100% RH, Accuracy: 10% to 90% RH ±2%RH, Other ±4%RH.

Operating Temperature Range for the CTR/CTHR:

Without the thermal paper: -40°C to +85°C (-40°F to +185°F)

With the thermal paper: -40°C to +65°C (-40°F to +150°F)

Note: Please refer to the CTR Product Overview for information on integrating the CTR with the Cellocator unit and with the Control Center application.

FEATURES

Table 1 describes the CTR features, with references to the section and page in this manual describing how to use or configure the feature.

Table1: Temperature Recorder Features

FEATURE (ACCORDING TO THE UNIT MODEL)	FOR FURTHER INFORMATION SEE
Setup the sensor input type between: Temperature\ Temperature & Humidity\ Event readings	*Configuring Sensors Types Settings* on page 21
Records Temperatures\ Humidity\ Events readings at intervals of between 0.5 to 120 minutes	*Changing the Sampling Rate* on page 32
Produces an alarm if the temperature\humidity\event values goes above or below a predefined range	*Configuring the Alarm Range* on page 23
Display the measured \Max. \Min. values and change the Display to show the next channels	*View Current\ Max.\ Min. Measured Values* on page 12
Reset the Highest and Lowest statistical values from the memory	*Reset the \ Max.\ Min. Alarm Statistical Values* on page 13
Records and displays temperatures in either Celsius or Fahrenheit, and date in European or English (American) format	*Configuring Temperature and Date Formats* on page 28
Records and prints 16,200 readings on request at any time	*Printing* on page 13
Four printing formats, including graphic or text, ID name/ number, time, temperature, humidity, event, and alarm status	*Configuring Print Settings* on page 26
Printing Sorted measuring reports and Summary Reports	*Print sorted memory reports list* on page 14 and *Print summary report* on page 14
Audio and visual alarms, including an option for sending alarms to an external device	*Alarms* on page 16 and *Optional Connections* on page 8
Sounds an alarm if the Backup Battery become Weak or if the Thermal Paper Ends	*Configuring the Low Backup Battery Alarm* on page 25 and *Configuring the End of Paper Alarm* on page 25
Option to export data to external PC	*Viewing Information on an External PC* on page 8
Optional backup battery for up to 60 hours	*Battery Installation and Replacement* on page 10

DESCRIPTION

Figure 1 shows the front and top of the CTR.
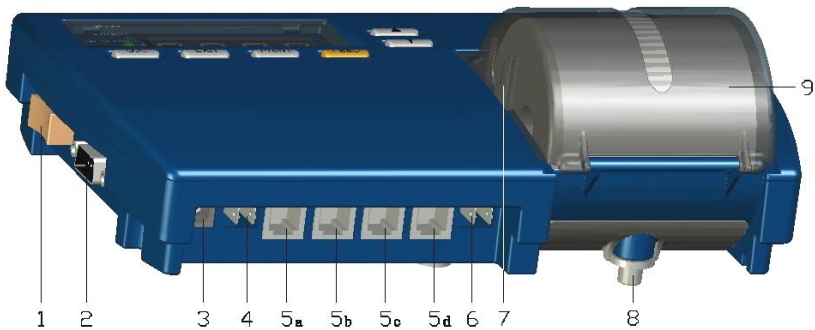
Figure 1: CTR - Front/Top View

1. Power switch
2. RS-232 port
3. 12V power jack
4. Buzzer silent contacts
5. Physical sensor input jacks. 5a, 5b, 5c and 5d (for Temperature\ Humidity or Event sensors)

    ∇   Model: CTR - Can use the 4 inputs jacks, 5a – 5d.

    ∇   Model: CTHR - Can use only 2 inputs jacks (the 2 jacks on the left side, 5a and 5b)

6. Remote alarm contacts
7. Paper cover clip
8. Secure to the bracket
9. Paper cover

Figure 2 shows the rear and bottom of the CTR.
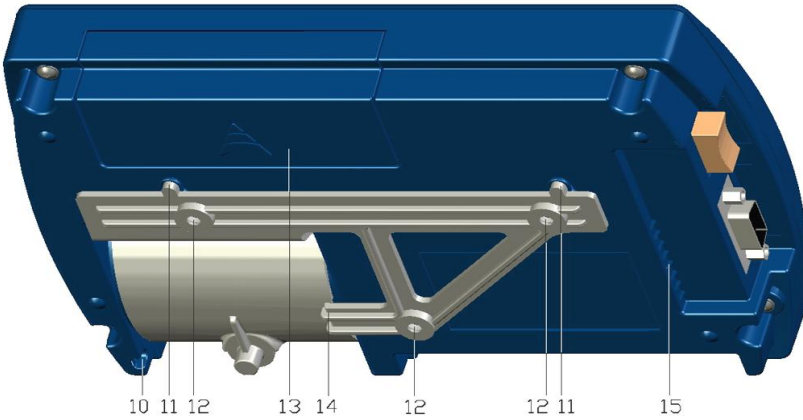
Figure 2: CTR - Rear View

10. Secure tie hole
11. Hanging hole
12. Bracket hanging hole
13. Batteries cover
14. Bracket mounting
15. Buzzer alarm grill

Figure 3 shows the display area of the CTR.

Figure 3: CTR - Display Area

CHAPTER 2   INSTALLATION

This chapter explains how to install the CTR, and includes the following topics:

▲ **Package Contents** – Lists the contents of the CTR package.

▲ **Installation Options** – Describes the possible ways to install the CTR, and describes how to attach the CTR to a wall bracket.

▲ **Connections** – Describes the mandatory and optional cable connections, including instructions on how to start the CTR.

▲ **Power** – Describes the CTR's power requirements and backup battery operation capability, and explains how to install or replace batteries.

PACKAGE CONTENTS

The CTR package should include the following components:

Table 2: CTR Package Contents

DESCRIPTION	QUANTITY	PART NUMBER
CTR unit with capability to read up to 4 channels	1	
Remote 33 feet (10 meter) cord for event (on/off switch)	1	CSR CABLE
Remote 33 feet (10 meter) temperature sensor for CTR	1	CTR PROBE 10
Thermal paper roll, 2 inches wide, 131 feet long (40 meters) for max. 12,750 text lines.	2 (1 installed)	CTR PAPER
12V DC power cable	1	CTR Power Cable
Communication cable for connecting the CTR to the Cellocator unit RS232 interface	1	CTR Communication Cable
3.6V Lithium battery (CR2032)	1 (installed)	
Hanging bracket	1	
CTR-CTHR User's Guide	1	
Bracket mounting screws + Secure screw	3 + 1	

Note: When purchasing the CTHR, the package includes the CTHR unit instead of the CTR and CTHR PROB 10 instead of the CTR PROB 10.

INSTALLATION OPTIONS

You can use the CTR as a standalone unit or attach it to a proper location in the driver cabin. There are two ways to attach the CTR to the driver cabin:

▲ **Direct Mounting** – Attach the CTR directly to a proper location in the driver cabin.

▲ **Bracket Mounting** – Attach the CTR bracket to a proper location in the driver cabin, and hang the CTR on the bracket, as described below. This is the preferred option as it allows the removal of the CTR unit for maintenance purposes.

Bracket Mounting

To attach the CTR to the vehicle using the bracket:

1. Mount the CTR bracket to a proper location in the driver cabin with three screws, as shown in Figure 4.
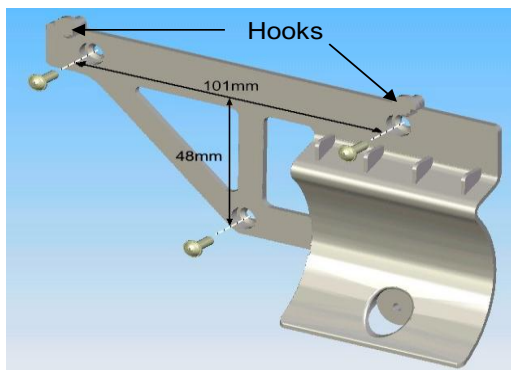
Figure 4: Bracket Mounting

Note: Make sure to leave enough space on the left to operate the main switch and connect all the other cables mentioned in *Connections* on page 7.

2. Hang the CTR on the two mounted bracket hooks, as shown in Figure 4.
3. Open the paper cover by pushing the two cover clips (item 7 in Figure 1) to the inside and pulling the cover out.
4. Fasten one screw through the hole under the paper roll to secure the CTR to the bracket, as shown in Figure 5.
5. Return the paper cover to its place.
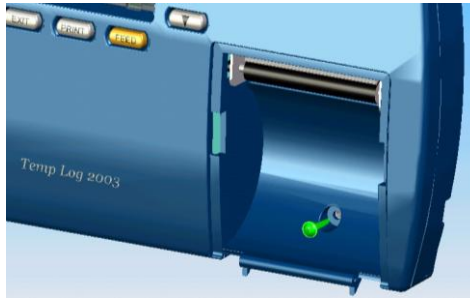
Figure 5: Securing the Unit to the Bracket

CONNECTIONS

This section describes the cables you must connect in order to use the CTR, as well as cables you can attach in order to use optional features.

Mandatory Connections and Startup

To connect and start up the CTR:

1. Connect the CTR power cable to the CTR 12V power jack (item 3 in Figure 6) on one side and the two leased lines (polarity is not needed) to the Vehicle 12V and GND. The power may be connected also to the ignition switch or to the cooling system.

2. Connect the DB9 connector of the CTR communication cable to the CTR RS-232 port (item 2 in Figure 6). Connect the RJ45 male connector of the CTR communication cable to the RJ45 female connector of the Cellocator unit harness.

3. Connect the temperature / temperature-humidity/ event sensors cord to the sensor input jacks (items 5 in Figure 6). The CTR recorder has 4 input jacks. Connect the sensors 1 through 4 from left to right. The CTHR uses only the first 2 left input jacks.

4. Switch the power switch to the On position (item 1 in Figure 6). The Power and Sensor LEDs turn green. After a few moments, the first channel value should appear in the display area.
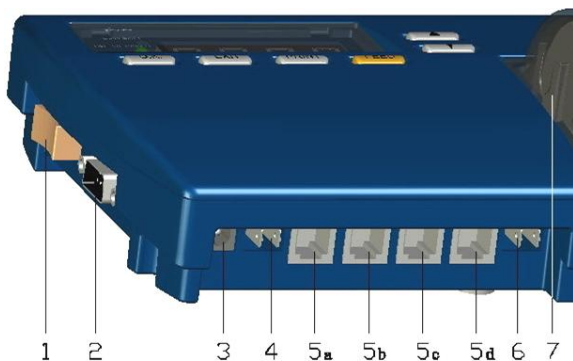
Figure 6: Connections

Optional Connections

You can connect the following optional cables:

▲ To send alarms to a remote device, attach a cable to the remote alarm contacts (item 6 in Figure 6). The remote alarm contacts are a pair of ¼" terminals, 1 Amps, 12V.

▲ To export data to a PC, attach the optional CTR RS-232 cable (not included) from the PC to the CTR RS-232 port (item 2 in Figure 6).

▲ To silence the alarm, connect a remote buzzer silencing device by attaching a cable with a momentary switch to momentarily short the buzzer silencer contacts (item 4 in Figure 6). The buzzer silencer contacts are a pair of ¼" terminals.

Viewing Information on an External PC

Normally the CTR is configured to send information to the Control Center application via the Cellocator unit. However, for diagnostic purposes, there is a need to connect an external PC to the RS232 port of the CTR.

Before you can view information from the CTR on an external PC, you must establish a new Hyper Terminal connection on the PC.

Note: If you have already established a Hyper Terminal connection on your PC, skip to *Import information to view on an external PC* on page 9.

Establishing a New Hyper Terminal Connection

To establish a new Hyper Terminal connection on your PC:

1. Connect an RS-232 cable from the PC to the RS-232 port (item 2 in Figure 6).

2. On the PC, open Hyper Terminal. To open Hyper Terminal, select **Start**>**Programs**>**Accessories**>**Communications**>**HyperTerminal** and double-click **HYPERTRM.EXE**.

Note: If Hyper Terminal is not installed on your computer, you can install it from the Control Panel. Double-click **Add/Remove Programs**, click the **Windows Setup** tab, select **Communications**, click **Details**, select **Hyper Terminal**, click **OK**, then click **OK** again.

3. Enter a name for the CTR connection.

4. Select an icon and click **OK**.

5. In the **Connect to** window, go to the lower **Connect using:** menu and select **Direct to Com1** (making sure to choose a free Com port).

6. Click **OK**. If the Com port is not free, choose another port by selecting **File**> **Properties**> and selecting the corresponding COM port, and then click **OK**.

Note: Configure the COM properties as follow: **Bits per second** - 9600; **Data bits** - 8; **Parity** - None; **Stop bits** - 1; **Flow control** - None,

Import Information to view on an External PC

To view information from the CTR on an external PC:

1. Connect an RS-232 cable from the PC to the RS-232 port (item 2 in Figure 6).

2. On the PC, open the CTR Hyper Terminal connection program. To open it, select **Start**> **Programs**> **Accessories**> **Communications**> **HyperTerminal** and double-click the CTR Hyper Terminal icon that you previously created (refer to the previous section *Establishing a New Hyper Terminal Connection*).

The CTR Hyper Terminal window on the PC displays message lines according to the sampling rate. The Hyper Terminal displays information like the CTR prints in full text format, both manually and automatically. For information on printing manually, refer to *Printing* on page 13. For information on printing automatically, refer to *Configuring Print Settings* on page 26.

Notes: To capture lines one after the other, select **File**> **Properties** and select the **Setting** tab. Under **ASCII Setup**, select **Append line feed to incoming line ends**.

To capture the data to a file, select **Transfer**> **Capture Text**. Enter the file name and click **Start**.

POWER

This section explains the CTR's power requirements and backup battery operation capability, and explains how to install or replace batteries.

Power Source and Power in Backup mode

The CTR uses a 12V power supply from the vehicle battery. When the CTR is using the main power supply, the Power LED is lit green.

Power consumption: 12V, 1550mA max. while printing (100mA without printing).

In the event of a power failure, or if the working environment temperature goes over 150°F (65°C), the CTR automatically switches over to a 9V backup battery (if installed). When operating in backup mode, the CTR logs measurements to memory, but does not print. The Power LED blinks and the display area shows the current measurements value according to sample rate, minimum every 15 minutes for two seconds.

You can also display the current measurements value for two seconds at a time manually by pressing OK . With a new 9V battery, the CTR can operate in backup mode for 60 hours.

When the main power returns, the Power LED goes on without blinking, and the printer (if enabled) prints the measurements value that were recorded but not printed when the CTR was operating in backup mode.

Battery Installation and Replacement

The CTR uses two batteries:

⚠ **3.6V Lithium battery (CR2032)** – Used for saving logging data and configuration settings, and for running the real-time clock. After replacing the Lithium battery, you should check and reset the CTR configuration settings.

⚠ **9V alkaline backup battery** – Used for backup operation (refer to *Power Source and Power in Backup mode* on page 10). This battery is optional, and is not included with the CTR package. When the Low Batt LED illuminates, you should replace the 9V backup battery (refer to *Configuring the Low Backup Battery Alarm* on page 25).

To change or install batteries:

1. Push and slide the cover of the battery compartment out, as shown in Figure 7.
2. Install the batteries as indicated, according to the polarity marks in the battery compartment.

3. Position the cover over the battery compartment and snap it back into place.

Figure 7: Battery Installation and Replacement

CHAPTER 3   OPERATION

This chapter explains how to operate the CTR, and includes the following topics:

▲ **Displaying Measurements Value**

▲ **Printing**

▲ **Advancing and Changing Printer Paper**

▲ **Alarms**

DISPLAYING MEASUREMENTS VALUE

When the CTR is on, it displays the current first Channel value (Sensor 1). You can also display the value of other channels by pressing ⬜OK⬜ and their maximum ("HI_") and minimum ("LO_") measured values in the CTR's memory by pressing ⬜▲⬜ ones and twice. The CTR's memory can store up to 16,200 readings. The time period this covers depends on the sampling rate. For example, if the sampling rate is 15 minutes, the CTR's internal memory contains the measurements value data from the last 170 days.

View Current\ Max.\ Min. Measured Values

▲ **Display the measured value and the next channels value** - The Display will show by default the value of channel # 1and the *Channel LED* # 1 will be ON. Press ⬜OK⬜ to display the next channel value and the sensor LED will be switched accordingly to the next *Channel LED*.

▲ **Display the highest value (Max)** - The current *Channel LED* is ON, according to the displayed channel # (1-4). By Pressing ⬜▲⬜ the Maximum statistical value for the current channel will be displayed. The display will show: "**HI__**" for 2 sec., then it will show the highest memory value for that channel.

▲ **Display the lowest value (Min)** - The current *Channel LED* is ON, according to the displayed channel # (1-4). By pressing ⬜▲⬜ again, the Min. statistical value for the current channel will be displayed. The display will show: "**LO__**" for 2 sec., then it will show the lowest memory value for that channel.

Reset the HI_\LO_\Alarm Statistical Values

The Reset will erase the memory of: "HI_" (Max.)\"LO_" (Min.) and Alarm statistical values for all four channels. Press ▼ twice, to display **rESt**. Press **OK** to agree, the displayed **rESt** will be flashing. Press **OK** again to approve - all the four channels, HI\LO\Alarm statistical values will be erased from the memory – the display will return to current measured value. Date and time of the Last HI_/LO_/Alarm statistical values reset will be saved in the memory.

Notes: By pressing ▲ again or while in **HI_** or **LO_** value or while **rESt** displayed and no key is pressed for three seconds or **EXIT** pressed – the display will return to show the last measured value for the current channel.

Event (Switch) channel does not have Max and Min values

You can configure the CTR to display temperatures in either Celsius or Fahrenheit. Refer to *Configuring Temperature and Date Formats* on page 28.

Possible Value Formats and Warnings Display

The measured value will be display by the 4 digit display as the following optional format and according to the connected type of sensor and warnings:

∇   Temperature: **130.0 / -40.9** (without a degree sign C / F)
∇   Humidity: **100.0 / H99.9 /H_0.1** (begins with H, except of 100.0)
∇   Event: **_On_ / _OFF** (state position)
∇   No sensor: **_noS** (when no sensor is attached according sensor setup)
∇   Error sensor: **ErrS** (sensor malfunction or mismatch to sensor setup)

PRINTING

The CTR can be configured to print measurements values automatically at defined intervals. For a description of the available print modes and instructions on configuring the print settings, refer to *Configuring Print Settings* on page 26.

Note: It is recommended to disable automatically printing in order to save battery power, especially if the CTR is connected directly to the vehicle battery.

⚠ In addition, you can manually print on demand: memory report (a list of all saved measurements), sorted reports divided by date and time, summary report of the setup, alarms and statistic or to send the reports to the Control Center application to view and save the information.

Print a recent memory report list

The CTR can manually print on demand a recent report list of the last 270 saved measurements. To print the recent memory report list on the printer:

1. Press 〔PRINT〕, **SEnd** appears (send report)
2. Press 〔▼〕, to send report list to the printer, **rEPL** appears
3. Press 〔OK〕, **rEPO** appears (report approved)
4. Press 〔OK〕, start printing the last report list, the current value appears

Print sorted memory reports list

The CTR can manually print a sorted reports list on demand (a list of all saved measurement reports). Every report divided by time and date and contains 270 lines. To print that sorted memory reports list on the printer:

1. Press 〔PRINT〕, **SEnd** appears (send report)
2. Press 〔▼〕, to send report list to the printer, **rEPL** appears
3. Press 〔OK〕, **rEPO** appears (report approved)
4. Press 〔PRINT〕, start printing the available reports list, the current value appears
   Choose the report number from the printed list according to time and date
5. Press 〔PRINT〕, **SEnd** appears (send report)
6. Press 〔▼〕, to send report list to the printer, **rEPL** appears
7. Press 〔OK〕, **rEPO** appears (report approved)
8. Use the 〔▲〕 and 〔▼〕 to choose the report number of your selection.
9. Press 〔OK〕, start printing the chosen report list, the current value appears

Print summary report

The CTR can manually print on demand a summary report list of all the current measurements, alarms and setup configurations of the CTR. For example: The highest, lowest, current measurements, sampling rate, channels type, channels names, last alarm values, alarm threshold and delay setup, status etc.:

1. Press 〔PRINT〕, **SEnd** appears (send report)
2. Press 〔▼〕, to send summary report to the printer, **rEPL** appears
3. Press 〔▼〕, **rEPS** appears (report summary approved)
4. Press 〔OK〕, start printing the summary report, the current value appears

Export memory report to the Control Center application

The CTR can manually send on demand a report list of all the saved measurements to the Control Center application via the Cellocator unit for managing and monitoring the temperature and humidity information:

1. Press ⌨PRINT⌨, **SEnd** appears (send report)
2. Press ⌨▲⌨, to send report list to the Control Center application**, rEPL** appears
3. Press ⌨OK⌨, start sending the report list to the Control Center application, the current value appears

Note: Exporting reports to the Control Center might be activated if some measurements were lost.

Export summary report to the Control Center application

The CTR can manually send on demand a summary report list of all the current measurements, alarms and setup configurations of the CTR to the Control Center application. For example: The highest, lowest, current measurements, sampling rate, channels type, channels names, last alarm values, alarm threshold and delay setup, status etc.:

1. Press ⌨PRINT⌨, **SEnd** appears (send report)
2. Press ⌨▲⌨, to send summary report to the Control Center application**, rEPL** appears
3. Press ⌨▼⌨, **rEPS** appears (report summary approved)
4. Press ⌨OK⌨, start sending the summary report to the Control Center application, the current value appears

Note: The export summary report may be required by the fleet manager for remote debugging.

The CTR prints or sends the memory report in whichever print mode is currently configured. If the CTR is also configured to print or send measurements automatically, then when the printing is finished, the CTR prints or sends all measurements that were recorded during the on demand memory report printing or sending operation.

Every report that is printed or sent on demand begins with the message *MEMORY REPORT* and ends with the message *END OF REPORT*. The printed or sent on demand report displays the measurements in reverse order (i.e., current measurements are displayed before the earlier measurements).

To manually **stop printing** or sending a report on demand, press (EXIT). The printout or sent report displays the message *MEMORY REPORT STOPPED BY USER*.

Notes: When you send a report to the Control Center application, all data is sent within ten seconds.

On every two pages of the **Memory Report** print, allow at least 2 minutes timeout, in order for printer to not overheat.

While printing, either on the PC or on paper, the print button is not active

ADVANCING AND CHANGING PRINTER PAPER

The CTR uses thermal printing paper to print temperature readings. This type of paper uses heat, rather than ink, to print. The CTR's printer does not print on ordinary paper. When ordering replacement paper rolls, make sure to order thermal paper.

When a red mark appears on the side of the paper, this indicates that the paper roll is almost finished. You should replace the paper roll before it reaches the end, so that the printer paper will not stop or get stuck.

To replace the paper roll:

1. Press (FEED) two or three times to advance the paper.

Note: The (FEED) button does not work unless the printer is set for automatic printing. Refer to *Configuring Print Setting*s on page 26.

2. Tear out the latest printed report.
3. Open the paper cover and remove the leftover paper roll. The alarm buzzer will sound, and the Out of Paper LED will blink.
4. Straighten the edge of the new paper roll with a scissors.
5. Place the new paper roll in the paper compartment, or inside the open paper cover, and push the edge of the paper straight through the printer under the printer's black rubber roller.
6. Press (FEED) to advance the paper through the printer. After installing the new roll, the alarm buzzer and the Out of Paper LED should go off.

ALARMS

Alarm indicators

The CTR has the following three alarm indicators:

▲ **Buzzer** – Some alarms trigger an internal buzzer. You can silence the buzzer by pressing ⌷EXIT⌷ or on the optional remote buzzer-silencer switch. Refer to *Optional Connections* on page 8. On Alarm situation, the *Buzzer* will be activated accordingly, only if that trigger or channel was chosen to be ON you can also configure the CTR so that the buzzer does not go on. Refer to *Configuring the Alarm Output* on page 24 and Refer to *Configuring the Low Backup Battery Alarm* on page 25 and Refer to *Configuring the End of Paper Alarm* on page 25.

Note: The buzzer silencer only shuts off the internal buzzer sounds. The alarm LEDs and the external device connected to the relay contact (if enabled) remain operational.

▲ **LEDs** – The four LEDs to the left of the display area indicate various alarms, as described below. The top LED indicates that the CTR's power is on. The four LEDs located below the display indicate the Channels alarm. On Alarm of the current displayed channel, the current *Channel LED* will flash rapidly 0.5 sec. ON, 0.5 sec. OFF while *the Alarm LED* is ON. On Alarm of other channels (not the current displayed channel), their corresponding *Channel LED's* will flash, 1 sec. ON, 1 sec. OFF while *Alarm LED* is ON.

▲ **Relay Contact to External Device** – You can connect the external device to the CTR remote alarm contacts (item 6 in Figure 6 on page 7) and configure the CTR to send alarms to the external device via a normally open relay contact. Refer to *Configuring the Alarm Output* on page 24 and Refer to *Configuring the Low Backup Battery Alarm* on page 25 and Refer to *Configuring the End of Paper Alarm* on page 25.

Alarm triggers

The following events trigger an alarm:

- ▽ Channel value exceeds the alarm range and delay time elapsed
- ▽ Disconnected sensor
- ▽ Sensor malfunctioned or mismatch to sensor type setup
- ▽ Low Backup Battery
- ▽ Printer out of paper

▲ **Alarm Range** – If the measured value goes outside the maximum or minimum defined value Alarm range for a consecutive period of time equal to the defined alarm delay period (if any), an alarm is sent. The internal buzzer sounds (if enabled), and an alarm is sent to an external device via the relay contact (if enabled). In addition, the Alarm LED

lights. For instructions on configuring the buzzer and relay contact to respond to Alarm Range alarms, refer to *Configuring the Alarm Output* on page 24.

▲ **Disconnected Sensor**– If the sensor is disconnected from the CTR, the display area shows the message **nOS**, the Alarm LED lights, the corresponding *Channel LED will* flash, the internal buzzer sounds and an alarm is sent to an external device via the relay contact.

▲ **Sensor malfunction or sensor setup mismatches** – The display area shows the message **ErrS** and the corresponding *Channel LED will* flash. The Alarm LED lights, the internal buzzer sounds and an alarm is sent to an external device via the relay contact. For **CTHR** if a TH Sensor is disconnected or not working this will cause error on two channels.

▲ **Low Backup Battery** – If the battery is low or there is no battery installed, the internal buzzer actives (if enabled), and an alarm is sent to an external device via the relay contact (if enabled). In addition, the LOW BATT LED lights. For instructions on buzzer and relay configuration in case of Low Backup Battery alarms, Refer to *Configuring the Low Backup Battery Alarm* on page 25.

▲ **End of Paper** – If the printer paper runs out, the internal buzzer sounds (if enabled), and an alarm is sent to an external device via the relay contact (if enabled). In addition, the Out of Paper LED lights. For instructions on configuring the buzzer and relay contact to respond to Out of Paper alarms, refer to *Configuring the End of Paper Alarm* on page 25.

Note: If an alarm situation activated the Buzzer or the Alarm Contact for some reasons, the alarm will be activated continuously until all the triggers of the alarm will be cleared.

Figure 8 provides a close-up of the rear panel, including the remote alarm contacts on the right side and the remote buzzer silencing device contacts on the left side.

Figure 8: Rear Panel Close-Up

CHAPTER 4   CONFIGURATION

This chapter explains how to configure the CTR. To configure CTR parameters, you must enter a password. The default password is [▲] [▼] [OK] [EXIT]. For instructions on changing your password, refer to *Changing the password* on page 29.

To change the CTR configuration:

1. Press [▲] or [▼] until **AdJ** appears in the display area.
2. Press [OK]. **PASS** appears in the display area.
3. Enter your password. **StyP** appears in the display area. **StyP** allows you to set the sensors types.
4. The CTR has 10 root menu items. To scroll through the root menu items, press [▲]. To scroll through the root menu items in reverse order, press [▼]. The following are the root menu items:

   ∇   **StyP** – Sensors types set
   ∇   **ALr** – Alarm configuration
   ∇   **Prn** – Printing configuration
   ∇   **SCAL** –Temperature units and date format configuration
   ∇   **CLoC** – Date and time configuration
   ∇   **ChPA** – Change password
   ∇   **SIdn** – ID number configuration
   ∇   **CALb** – Temperature calibration
   ∇   **Lo9r** – Erasing the logging measurements from the memory
   ∇   **SAPr** – Sampling rate configuration

Note: For a full diagram of the CTR menu tree, refer to Appendix C, *Menu Structure* on page 40. For a list of the default factory settings, refer to Appendix A, *Factory Default Settings* on page 34.

5. When you reach the root menu item that you want, press [OK]. The first sub-menu item appears.
6. When you have finished configuring an item, you must press [EXIT] to save the configuration changes.

ONLINE HELP

The CTR offers online help that explains the short format display massages and guides you through the menu configurations.

1. Open the paper cover to best view the printed online help messages.

2. If you want help on any menu item, press PRINT. The CTR will print and/or send the online help message in whichever format is currently configured (as described in *Configuring Print Settings* on page 26).

Note: The PRINT key can be used to access the online help in all situations, except while the current measured value is being displayed.

3. The CTR prints and/or sends a blank line after every online help message.

Notes: You cannot print online help unless the printer is set for automatic printing. Refer to *Configuring Print Settings* on page 26.

If the CTR is configured to send output to the Control Center application, help messages will also be sent to the Control Center application.

CONFIGURING SENSORS TYPES SETTINGS

To configure the sensors type settings, display the **StyP** root menu. From the **StyP** root menu. Assign the sensor type for each input jack and respectively the channel number, corresponding to the CTR model. This gives you the ability to change the sensors default allocation and to configure the sensor type for each jack.

▲ **Input jack** – corresponds to the RJ45 connectors on the panel. Refer to the input jacks, items 5a, 5b, 5c and 5d in Figure 6 on page 7.

▲ **Logical channel** – corresponds to 1 value which is measured, displayed, saved, and printed. This value can be temperature, humidity or event.

▲ **t Sensor -** Temperature sensor, 1 logical channel (for CTR only).

▲ **tH Sensor -** Temperature and Humidity sensor, connected to 1 physical input jack but include 2 logical channels (for CTHR only).

▲ **S Sensor –** Event\ Switch (On/Off indication, for both CTR and CTHR).

▲ **nOS** – No sensor is connected to that input jack (for both CTR and CTHR).

Notes: The **t Sensor** isn't compatible with model # CTHR,
The **tH Sensor** isn't compatible with model # CTR.

To configure the sensors type's in each physical input jack:

1. Display the **StyP** from the root menu, press OK. **SnS1** (sensor 1) appears.
2. To scroll among the possible input jacks (**SnS1..4**), Press ▲ or ▼. When the physical sensor input jack you want to setup appears, press OK. The current sensor setup: **t** / **tH**, **E** or **nOS** appears.

3. To scroll among the possible sensor types: **t** / **tH**, **E** or **nOS**, press
   ⬆ or ⬇. When the sensor type you want to select appears,
   press OK. The next possible input jacks (**SnS1..4**) Appears.
   (**SnS1** - sensor 1**, SnS2** - sensor 2, **SnS3 -** sensor 3, **SnS4 -** sensor 4)

4. To configure other possible input jacks (**SnS1..4**), repeat steps 2 and 3.

5. Press EXIT twice to exit configuration and display the current measured value.

Notes: The change of the sensor type in the StYP menu will cause a reset of
the statistics of all channels and also changes in the Alarm thresholds –
they will be set to the default values according to the sensor type.

It is recommended to disconnect the sensors from the connectors, when
you are going to change the sensor type in the menu.

As TH sensor needs 2 logical channels, when connecting Event sensor
– there will be one free channel (no alarm).

CONFIGURING ALARM SETTINGS

To configure alarm settings, display the **ALr** root menu. From the **ALr** root
menu, you can configure the following alarm settings:

▲ **Alarm Range Set (ALS1..4)** – Allows to define an alarm range for
temperature/ humidity or a switch state for each channel. When the
current measured value is outside of this range, the CTR sends an alarm.

▲ **Alarm Delay (ALd1..4)** – Allows you to define an individual alarm
delay for each channel. If the current measured value goes out of the
defined value range, the CTR does not send an alarm until the measured
value remains outside of the range for the length of time defined by the
Alarm Delay parameter.

▲ **Alarm Output (ALO1..4)** – Allows you to define separately for each
channel whether or not the CTR's internal alarm sounds when an alarm
is sent, and whether or not alarms are sent to an external device.

Table 3: 4 Channels Alarm Settings Legend

DESCRIPTION	CHANNEL1	CHANNEL 2	CHANNEL 3	CHANNEL 4
Alarm Setting	ALr1	ALr2	ALr3	ALr4
Alarm Range Set	ALS1	ALS2	ALS3	ALS4
Low / High Alarm	LoA1 / HIA1	LoA2 / HIA2	LoA3 / HIA3	LoA4 / HIA4
Alarm Delay	ALd1	ALd2	ALd3	ALd4
Alarm Output	ALO1	ALO2	ALO3	ALO4

▲ **End of Paper Alarm (EOFP)** – Allows you to define whether or not the CTR's internal alarm sounds, and whether or not alarms are sent to an external device, when the paper runs out.

▲ **Low Backup Battery Alarm (bAtA)** – Allows you to define whether or not the CTR's internal alarm sounds, and whether or not alarms are sent to an external device, when the Backup Battery is low.

Configuring the Alarm Range

Each channel has individual alarm range. To configure the high and low temperatures or humidity values that will trigger an alarm:

1. From the **ALr** in the root menu, press ⬭OK⬭. **ALr1..4** (alarm, channel #) appears.
2. To scroll among other alarmed channels (**ALr1..4**), Press ⬭▲⬭ or ⬭▼⬭. When the alarmed channel you want to configure appears, press ⬭OK⬭. The same chosen alarm channel to set (**ALS1..4**) Appears.
    - ∇ After choosing the channel, the following alarm menus will refer to it.
    - ∇ While pressing ⬭▲⬭ or ⬭▼⬭ you will see also **EOFP** and **bAtA**.
3. Press ⬭OK⬭. **LoA1..4** (low alarm value, channel #) appears.
    - ∇ For Event (Switch) channel:
        - o The alarm trigger stage **On** or **OFF** appears.
        - o Press ⬭▲⬭ or ⬭▼⬭ to change the alarm trigger stage.
4. Press ⬭OK⬭. The current minimum value appears.
    - ∇ For Event (Switch) channel: **ALS1..4** appear. Pass to step 10.
5. Press ⬭▲⬭ or ⬭▼⬭ to set the minimum temperature/humidity value. Temperatures/humidity value below this value will trigger an alarm.
6. Press ⬭OK⬭. **HIA1..4** (high alarm value, channel #) appears.
7. Press ⬭OK⬭. The current maximum value appears.
8. Press ⬭▲⬭ or ⬭▼⬭ to set the maximum temperature/humidity value. Temperatures/humidity values above this value will trigger an alarm.
9. Press ⬭EXIT⬭. The changes are saved and **ALS1..4** appears.
    - ∇ To change other alarm settings as **ALd1** (alarm delay) or **ALO1** (alarm output), press ⬭▲⬭ or ⬭▼⬭ to display the other alarm menu items.
10. Press ⬭EXIT⬭. **ALr1..4** appears.
11. To configure alarm range for other channels (**ALr1..4**), repeat steps 2 to 10.
    - ∇ To go to another root menu item, press ⬭EXIT⬭ again, then press ⬭▲⬭ or ⬭▼⬭ to display the other root menu items.

∇ To exit configuration and display the current measured value, press ⟦EXIT⟧ twice.

Configuring the Alarm Delay

Each channel has individual alarm delay. To configure the alarm delay:

1. From the **ALr** menu, press ⟦OK⟧. **ALr1..4** (alarm, channel #) appears.
2. To scroll among other alarmed channels (**ALr1..4**), Press ⟦▲⟧ or ⟦▼⟧. When the alarmed channel of your choice appears, press ⟦OK⟧. The same chosen alarm channel to set (**ALS1..4**) Appears.
3. Press ⟦▲⟧. **ALdl..4** (alarm delay, channel #) appears.
4. Press ⟦OK⟧. The current alarm delay setting appears (in minutes).
5. Press ⟦▲⟧ or ⟦▼⟧ to scroll among the possible alarm delay values: 00 (no delay), 10 (minutes), 20 (minutes), 30 (minutes), 60 (minutes), and 120 (minutes). When the value you want to select appears, press ⟦OK⟧. **ALdl..4** appears.
6. Press ⟦EXIT⟧. The changes are saved and **ALr1..4** appears.
7. To configure alarm delay for other channels, repeat steps 2 to 6.
8. Press ⟦EXIT⟧ again to exit configuration and display the current measured value.

Note: The Low Backup Battery Alarm (**bAtA**) and the End of Paper Alarm (**EOFP**) do not have alarm delay.

Configuring the Alarm Output

To configure the alarm output:

1. From the **ALr** menu, press ⟦OK⟧. **ALr1..4** (alarm, channel #) appears.
2. To scroll among other alarmed channels (**ALr1..4**), Press ⟦▲⟧ or ⟦▼⟧. When the alarmed channel of your choice appears, press ⟦OK⟧. The same chosen alarm channel to set (**ALS1..4**) Appears.
3. Press ⟦▲⟧ or ⟦▼⟧ twice. **ALO1..4** (alarm output, channel #) appears.
4. Press ⟦OK⟧. The current alarm buzzer setting appears:
   ∇ **buOn** – The internal buzzer will sound when there is an alarm.
   ∇ **buOF** – The internal buzzer will not sound when there is an alarm.
5. To keep the current setting, press ⟦OK⟧. To change the setting, press ⟦▲⟧ or ⟦▼⟧ to toggle the setting, then press ⟦OK⟧. The current external Normally Open contact device setting appears:
   ∇ **CoOn** – The external Normally Open contact is closed and a signal is sent to the external device when there is an alarm.
   ∇ **CoOF** – A signal is not sent to the external device when there is an alarm.

6. To keep the current setting, press ⌷OK⌷. To change the settings, press ⌷▲⌷ or ⌷▼⌷ to toggle the settings, then press ⌷OK⌷. **ALO1..4** appears.

7. Press ⌷EXIT⌷. The changes are saved and **ALr1..4** appears.

8. To configure the alarm output for the other channels, repeat steps 2 to 7.

9. Press ⌷EXIT⌷ again to exit configuration and display the current value.

Configuring the End of Paper Alarm

To configure the End of Paper alarm output:

1. From the **ALr** menu, press ⌷OK⌷. **ALr1..4**, **EOFP** or **bAtA** appears.

2. To scroll among the alarmed channels (**ALr1..4**, **EOFP** or **bAtA**), Press ⌷▲⌷ or ⌷▼⌷. When the **EOFP** appears, press ⌷OK⌷.

3. The current End of Paper alarm buzzer setting appears:

   ∇   **buOn** – The internal alarm sounds when the printer is out of paper.

   ∇   **buOF** – The internal alarm does not sound when the printer
        is out of paper.

4. To keep the current setting, press ⌷OK⌷. To change the setting, press the ⌷▲⌷ or ⌷▼⌷ button to toggle the setting, then press ⌷OK⌷. The current End of Paper external device setting appears:

   ∇   **CoOn** – An alarm is sent to the external device when the
        printer is out of paper.

   ∇   **CoOF** – An alarm is not sent to the external device when
        the printer is out of paper.

5. To keep the current setting, press ⌷OK⌷. To change the setting, press ⌷▲⌷ or ⌷▼⌷ to toggle the setting, then press ⌷OK⌷. **EOFP** appears.

6. Press ⌷EXIT⌷. The changes are saved and **ALr** appears.

7. Press ⌷EXIT⌷ again to exit configuration and display the current measured value.

Configuring the Low Backup Battery Alarm

To configure the Low Backup Battery alarm output:

1. From the **ALr** menu, press ⌷OK⌷. **ALr1..4**, **EOFP** or **bAtA** appears.

2. To scroll among the alarmed channels (**ALr1..4**, **EOFP** or **bAtA**), Press ⌷▲⌷ or ⌷▼⌷. When the **bAtA** appears, press ⌷OK⌷.

3. The current Low Battery alarm buzzer setting appears:

   ∇   **buOn** – The internal alarm sounds when the 9v battery is
        low or if there is no battery installed.

   ∇   **buOF** – The internal alarm does not sound when the 9v
        battery is low or if there is no battery installed.

4. To keep the current setting, press ⌾OK⌾. To change the setting, press the
⌾▲⌾ or ⌾▼⌾ button to toggle the setting, then press ⌾OK⌾. The current
Low Battery external device setting appears:

    ∇   **CoOn** – An alarm is sent to the external device when the 9v
battery is low or if there is no battery installed

    ∇   **CoOF** – An alarm is not sent to the external device when
the 9v battery is low or if there is no battery installed

5. To keep the current setting, press ⌾OK⌾. To change the setting, press ⌾▲⌾
or ⌾▼⌾ to toggle the setting, then press ⌾OK⌾. **bAtA** appears.

6. Press ⌾EXIT⌾. The changes are saved and **ALr** appears.

7. Press ⌾EXIT⌾ again to exit configuration and display the current measured value.

CONFIGURING PRINT SETTINGS

To configure print settings, display the **Prn** root menu. From the **Prn** root menu,
you can configure the following print settings:

▲ **Channels to Print** – Allows you to choose whether to print the all 4 channels
value in a table, or the value of one chosen channel (1, 2, 3 or 4) only.

▲ **One Channel Print Format** – If one channel format is selected, it allows you
to choose from among three print formats: small font, Large font or graphic.

▲ **Printer** – Allows you to define whether or not the CTR automatically prints
measured value readings. When the printer is set to print automatically, the
CTR prints each time, measured value reading that it measures, at the defined
measurement intervals. Refer to *Changing the Sampling Rate* on page 32.

▲ **PC Output** – Allows you to define whether or not the CTR sends measured
value readings to the Control Center application.

Configuring which Channels to Print

1. From the **Prn** menu, press ⌾OK⌾. The current channel name to print appears:

    ∇   **4Chn:** The CTR prints all the 4 channels. The following is a portion
record example of the 4 channel format:

    12:01 123.4C^ 123.4C^ 123.4C^ 123.4C^

           T1ABC T2ABC T3ABC T4ABC

    0123456789ABC 31/12/08 EVERY 1 MIN

    The 4 channels format begin with 2 information harder lines and
continue with 12 measured value lines, according to the sample rate.

In this example, the CTR name is 0123456789ABC, the date is 31/12/08, and the sample rate is every 1 minute.

T1ABC, T2ABC, T3ABC, and T4ABC are the channels name.

The last measured time is 12:01, the temperature is: 123.4C in all 4 channels and there is a high alarm (^) in all the channels.

    ∇   **Ch1/Ch2/Ch3/Ch4:** The CTR prints only the one chosen channel.

2. To keep the current setting, (**4Chn/Ch1/Ch2/Ch3/Ch4**) press ⟨EXIT⟩. To change the setting, press ⟨▲⟩ or ⟨▼⟩ to toggle the setting, then press ⟨EXIT⟩.

3. **Prn** appears. Press ⟨EXIT⟩ to save your changes, exit configuration and display the current measured value or continue to the next paragraph.

Configuring Print Setting for One Channel

Note: If you choose to print the all 4 channels format (**4Chn**), the printer will print only in SChr mode (small character).

1. From the **Prn** menu, press ⟨OK⟩. The current chosen channel (**Ch1..4**) appears.

2. Press ⟨OK⟩. The current print format appears:

    ∇   **LChr** – The CTR prints a large character format. Each record includes the following information: name of the channel, time, and measured value. The following is an example of a temperature record in large character format:

```
T1AB2^23:12 123.4C
```

In this example, the name of the channel is: T1AB2, the time is 23:12, the temperature is: 123.4C, and there is a high alarm (^).

    ∇   **SChr** – The CTR prints a small character format. Each record includes the following information: ID of the reordering unit (shortened), name of the channel, time, date, and value. The following is an example of a record in small character format:

0123456-T1ABC 31/12/05 12:00 123.4Cv

In this example, the (shortened) ID of the CTR unit is 0123456 (refer to *Changing the Device ID* on page 30), the channel name is: T1ABC, the date is December 31, 2005 (refer to *Changing the Time and Date* on page 29), the time is 12:00, the temperature is 123.4C, and there is a low alarm (v).

    ∇   **9rAP** – The CTR prints in a graph format. The graph format prints measurements in the form of a curved graph. Every value is printed next to the relevant graph point. The minimum and maximum value thresholds are shown as separate striped lines. If the value range alarms are enabled, the sign v or the sign ^ appears next to any line in which the value is outside of the defined range and the delay time has elapsed. In every 12th row, full information is printed in small character format.

Note: When information is sent to the Control Center application in graph format, only the current value and the alarm range are sent, but the graph itself is not sent.

3. To keep the current setting, (**LChr/SChr/9rAP**) press ⌈OK⌉. To change the setting, press ⌈▲⌋ or ⌈▼⌋ to toggle the setting, then press ⌈OK⌉.
4. Press ⌈EXIT⌉ three / four times to save your changes, exit configuration and display the current measured value or continue to the next paragraph.

Configuring the Printer and the communication with the Control Center application

1. From the **Prn** menu, press ⌈OK⌉ two / three times until displaying **PrOn** or **PrOF**.
2. To keep the current setting, press ⌈OK⌉. To change the setting, press ⌈▲⌋ or ⌈▼⌋ to toggle the setting, then press ⌈OK⌉. The current printer setting appears:

    ∇   **PrOn** – The CTR printer prints records automatically at the defined measurement intervals.

    ∇   **PrOF** – The CTR printer does not print records unless you request a printout manually. Refer to *Printing* on page 13.

3. To keep the current setting, press ⌈OK⌉. To change the setting, press ⌈▲⌋ or ⌈▼⌋ to toggle the setting, then press ⌈OK⌉. The current PC output setting appears:

    ∇   **PCOn** – The CTR sends records to the Control Center application automatically at the defined measurement intervals.

    ∇   **PCOF** – The CTR printer does not send records unless you request it to send output manually. Refer to *Printing* on page 13.

4. To keep the current setting, press ⌈OK⌉. To change the setting, press ⌈▲⌋ or ⌈▼⌋ to toggle the setting, then press ⌈OK⌉. **Prn** appears.
5. Press ⌈EXIT⌉ to save your changes, exit configuration, and display the current measured value.

Notes: It is recommended to disable automatically printing (**PrOF**) in order to save battery power, especially if the CTR is connected directly to the vehicle battery.

The CTR must be programmed to send the information to the Control Center application (**PCOn)**.

CONFIGURING TEMPERATURE AND DATE FORMATS

To configure the format in which the CTR displays temperatures (Celsius or Fahrenheit) and dates (European or American):

1. Display the **SCAL** root menu.

2. From the **SCAL** menu, press `OK`. The current temperature format appears:

   ∇   **F d9** – Fahrenheit
   ∇   **C d9** – Celsius

3. To keep the current setting, press `OK`. To change the setting, press `▲` or `▼` to toggle the setting, then press `OK`. The current date format appears:

   ∇   **EndA** – English (American) date format (mm/dd/yy)
   ∇   **EudA** – European date format (dd/mm/yy)

4. To keep the current setting, press `OK`. To change the setting, press `▲` or `▼` to toggle the setting, then press `OK`. **SCAL** appears.

5. Press `EXIT` to save your changes, exit configuration, and display the current measured value.

CHANGING THE TIME AND DATE

To change the time and date:

1. Display the **CLoC** root menu.

2. From the **CLoC** menu, press `OK`. **SdAY** appears.

Note: To keep the current date and change the time, press `▲` or `▼` to toggle the setting to **Shr**, then follow the instructions starting at number 4.

3. To change the date, press `OK`. The current month appears in numerical format (01 = January, 02 = February, etc.). Press `▲` or `▼` to change the setting, then press `OK`. The current day of the month appears. Press `▲` or `▼` to change the setting, then press `OK`. The last two numbers of the year appears. Press `▲` or `▼` to change the setting, then press `OK`. **Shr** appears.

4. To change the time, press `OK` when **Shr** is displayed. The current hour appears. Press `▲` or `▼` to change the setting, then press `OK`. The current time in minutes appears. Press `▲` or `▼` to change the setting, then press `OK`. **CLoC** appears.

5. Press `EXIT` to save your changes, exit configuration, and display the current measured value.

CHANGING THE PASSWORD

To change the CTR password:

1. Display the **ChPA** root menu.

2. From the **ChPA** menu, press `OK`. **PASS** appears.

3. Enter a sequence of four keys. **PASS** appears again.

4. Enter the same sequence of four keys to confirm the password. If the second sequence is the same as the first sequence, **ChPA** appears. If it is not, **PASS** appears again, and you must repeat steps three and four.

5. Press [EXIT] to save the new password, exit configuration, and display the current measured value.

CHANGING THE DEVICE ID NAME

The CTR has a device ID that appears in reports. The purpose of the device ID is to identify the device producing printouts and reports when printouts and reports are being collected from more than one device.

The device ID name consists of 13 alphanumeric characters. You can change each character individually by entering a numerical code of one or two numbers. Table 4 shows the code for setting the device ID name.

To change the device ID name:

1. Display the **SIdn** root menu. Press [OK]. **SId** appears.
2. Press [OK]. The number 1 appears, followed by a space and a code for the first ID character that will appear in the device. Press [▲] or [▼] to change the character, according to the code in Table 4.
3. Press [OK] to move on to the next character. Repeat this procedure for each character.
4. When you are finished, press [EXIT] to save your changes. **SIdn** appears.
5. Press [EXIT] again to exit configuration and display the current measured value.

CHANGING THE CHANNELS ID NAME

Every channel has its own ID name that appears in the reports. The purpose of the channel ID is to identify a channel from the others.

The channel ID name consists of 5 alphanumeric characters. You can change each character individually by entering a numerical code of one or two numbers. Table 4 shows the code for setting the ID name.

To change the channels ID name:

1. Display the **SIdn** root menu.
2. Press [OK]. **SId** appears. Press [▲] to set the ID number for channel 1.
3. Press [OK]. The number 1 appears, followed by a space and a code for the first ID character that will appear in the device. Press [▲] or [▼] to change the character, according to the code in Table 4.
4. Press [OK] to move on to the next character. Repeat this procedure for each character.
5. Press [OK] to move on to the next channel. Repeat this procedure for each channel.
6. When you are finished, press [EXIT] to save your changes. **SIdn** appears.
7. Press [EXIT] again to exit configuration and display the current measured value.

Table 4: Numerical Code for Setting Device & channel ID name

CHR.	CODE	CHR.	CODE	CHR.	CODE	CHR.	CODE	CHR.	CODE
0	0	8	8	F	16	N	24	V	32
1	1	9	9	G	17	O	25	W	33
2	2		10	H	18	P	26	X	34
3	3	A	11	I	19	Q	27	Y	35
4	4	B	12	J	20	R	28	Z	36
5	5	C	13	K	21	S	29	-	37
6	6	D	14	L	22	T	30	%	38
7	7	E	15	M	23	U	31		

CHANGING THE TEMPERATURE CALIBRATION

To change the temperature calibration:

1. Display the **CALb** root menu.
2. Press ⟨OK⟩. **CAL1..4** (calibration channel #) appears.
3. To scroll among other channels for calibration (**CAL1..4**), Press ⟨▲⟩ or ⟨▼⟩.
4. Press ⟨OK⟩. The number 0.0 or the last calibration number appears.
5. Press ⟨▲⟩ or ⟨▼⟩ to raise or lower the temperature measurement, in steps of 0.1°. You can raise or lower the measurement by -8° to 8° in one action.
6. Press ⟨OK⟩. The next channel **CAL1..4** appears. To calibrate other channel, repeat this procedure form step 3.
7. When you are finished, press ⟨EXIT⟩. **CALb** appears.
8. Press ⟨EXIT⟩ to save your changes, exit configuration, and display the current measured value.

Notes: This vision logger is factory calibrated with the supplied sensors. **Customers, who recalibrate it, are doing so on their responsibility.**

No calibration needed for the Humidity and Switch Channels

ERASING THE LOG

The CTR saves the last measurements values (up to 16,200 logs to each channel). To erase the log:

1. Display the **Lo9r** root menu.
2. Press ⟨OK⟩. The log is erased, and **ALr** appears.

3. The CTR will print and/or send the message ***MEMORY RESET BY USER,*** *<date>*, *< time>* in the currently configured print format.

4. Press ⌊EXIT⌋ to exit configuration and display the current temperature.

CHANGING THE SAMPLING RATE

The CTR measures values at defined intervals. To change the intervals at which values are measured:

1. Display the **SAPr** root menu.

2. Press ⌊OK⌋. The current sampling rate appears. The sampling rate can be 0.5 minute or any value between 1 and 120 minutes, every 1 minute.

3. Press ⌊▲⌋ or ⌊▼⌋ to change the sampling rate. When you are finished, press ⌊OK⌋. **SAPr** appears.

4. Press ⌊EXIT⌋ to save your changes, exit configuration, and display the current measured value.

CHAPTER 5   TROUBLESHOOTING

Table 5 lists common problems and suggested solutions.

Table 5: Troubleshooting

PROBLEM	SUGGESTED SOLUTIONS
No power	Wait five seconds after switching on the power switch.
Poor or no printing	• Make sure you are using thermal printing paper. The CTR will not print on non-thermal paper. • Replace the printing side of the thermal paper, or replace the thermal paper itself. • Make sure you are using an original Power adaptor / supply of 12V AC\DC, 2000mA (24VA) • Move the CTR to a location with a temperature between 0 to 149°F (-18 to 65°C).
Paper stuck	• Make sure that the paper is starched, straight and that there is no feed interference. • Make sure that the paper roll is perfectly aligned to be parallel to the paper inlet. Use the 2 plastic discs supplied to ensure a parallel paper lay.
Wrong time or date	• Change the time or date. Refer to *Changing the Time and Date* on page 29. • Make sure you are using the correct date format (dd/mm/yy or mm/dd/yy). Refer to *Configuring Temperature and Date formats* on page 28. • Replace the Lithium battery (CR2032). Refer to *Battery Installation and Replacement* on page 10.
Printing "???? ..." or cant setup the clock	• Take out the Lithium battery (CR2032) for 5 min and install it back. Refer to *Battery Installation and Replacement* on page 10. Set the time and date. Refer to *Changing the Time and Date* on page 29.
Forget the Password	• Enter the factory default Password. Refer to *Chapter 4, Configuration* on page 20. • Restore the Password to its factory default setting. Refer to *Appendix A* on page 34.
Cannot print online help	Change the print mode to PrOn. Refer to *Printing* on page 13.

APPENDIX A   FACTORY DEFAULT SETTINGS

To restore the CTR to its factory default settings:

1. Switch the power switch off.
2. Switch the power switch back on while pressing $\boxed{\text{FEED}}$.
3. When **FAdF** appears in the display area, press $\boxed{\text{OK}}$.

Note: Restoring factory settings does not delete the measured value logs.

Table 6 lists the factory default settings.

Table 6: Factory Default Settings for CTR and CTHR Models

MENU ITEM	PARAMETER	DEFAULTS	LEGAL VALUES
		PASSWORD SETTINGS	
PASS	Password	$\boxed{\blacktriangle}$ $\boxed{\blacktriangledown}$ $\boxed{\text{OK}}$ $\boxed{\text{EXIT}}$	
StYP		*Active Sensor Configuration for CTR*	
SnS1	Connector 1	sensor type T (Temp.)	T / S/ nOS
SnS2	Connector 2	sensor type T (Temp.)	T / S/ nOS
SnS3	Connector 3	sensor type T (Temp.)	T / S/ nOS
SnS4	Connector 4	sensor type S (Switch)	T / S/ nOS
ALr		*Alarm Settings*	
ALr1		*Alarm Channel 1 (T)*	
ALS1	Alarm Range Settings		resolution: 0.1 degree
LoA1	Low Alarm Threshold	-20°C	from -55°C to 150°C from -67°F to 302°F
HiA1	High Alarm Threshold	30°C	from -55°C to 150°C from -67°F to 302°F
ALd1	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO1	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf

MENU ITEM	PARAMETER	DEFAULTS	LEGAL VALUES
ALr2	*Alarm Channel 2 (T)*		
ALS2	Alarm Range Settings		resolution: 0.1 degree
LoA2	Low Alarm Threshold	-20°C	from -55°C to 150°C from -67°F to 302°F
HiA2	High Alarm Threshold	30°C	from -55°C to 150°C from -67°F to 302°F
ALd2	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO2	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
ALr3	*Alarm Channel 3 (T)*		
ALS3	Alarm Range Settings		resolution: 0.1 degree
LoA3	Low Alarm Threshold	-20°C	from -55°C to 150°C from -67°F to 302°F
HiA3	High Alarm Threshold	30°C	from -55°C to 150°C from -67°F to 302°F
ALd3	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO3	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
ALr4	*Alarm Channel 4 (S)*		
ALS4	Alarm State Settings	On	On/Off
ALd4	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO4	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
EOFP	*End of Paper Alarm Settings*		
EOFP	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
bAtA	*Low Battery Alarm Settings*		
bAtA	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf

MENU ITEM	PARAMETER	DEFAULTS	LEGAL VALUES
Prn		*Print Mode*	
4Chn/ Ch1/ Ch2/ Ch3/ Ch4	All channels/ channel1/ channel 2/ channel 3/ channel 4	4Chn (All 4 channels)	4chn/ch1/ch2/ch3/ch4
9rAP/Lchr/SChr	Graph/ Large/ Small One channel print font		9rAP/Lchr/SChr
PrOn/ PrOF	Printer On/ Printer Off	PrOn (Printer On)	PrOn/PrOF
PCOn/ PCOF	PC, RS232 On / Off	PCOn (PC Output On)	PCOn/PCOF
SCAL		*Standards Scale*	
C d9/ F d9	Celsius/ Fahrenheit Scale	C d9 (Celsius)	C d9 (Celsius), F d9 (Fahrenheit)
EudA/ EndA	Europe/ English date	EudA, European date, (dd/mm/yy)	EudA (dd/mm/yy), EndA (mm/dd/yy)
CloC		*Clock Set*	
SdAY	Set Date	01/01/01 (dd/mm/yy)	current date
Shr	Set Hour (time)	01:01 (24hours format)	current time
Sidn		*Set ID Name*	
Sid-	Set Device ID Name	123AB45C67DE8	13 chars
Sid1	Set Channel1 Name	123AB	5 chars
Sid2	Set Channel2 Name	123AB	5 chars
Sid3	Set Channel3 Name	123AB	5 chars
Sid4	Set Channel4 Name	123AB	5 chars
		Sensor Calibration	
CAL1	Temp. Calibration	0°	from −8.0° to 8.0°
CAL2	Temp. Calibration	0°	from −8.0° to 8.0°
CAL3	Temp. Calibration	0°	from −8.0° to 8.0°
---	Switch	---	no calibration needed

MENU ITEM	PARAMETER	DEFAULTS	LEGAL VALUES
		Sampling Rate	
SAPr	Sampling Rate	10 min	from 0,5 to 120 minutes.
StYP		*Active Sensor Configuration for CTR*	
SnS1	Connector 1 type	TH (Temp. & Humidity)	TH/ S/ NO
SnS2	Connector 2 type	TH (Temp. & Humidity)	TH/ S/ NO
ALr		*Alarm Settings*	
ALr1		*Alarm Channel 1 (Temperature from Sensor 1, TH)*	
ALS1	Alarm Range Settings		resolution: 0.1 degree
LoA1	Low Alarm Threshold	-20°C	from -40°C to 123.8°C from -67°F to 254.9°F
HiA1	High Alarm Threshold	30°C	from -40°C to 123.8°C from -67°F to 254.9°F
ALd1	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO1	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
ALr2		*Alarm Channel 2 (Humidity from Sensor 1, TH)*	
ALS2	Alarm Range Settings		resolution: 0.1%
LoA2	Low Alarm Threshold	30%	from 0% to 100%
HiA2	High Alarm Threshold	90%	from 0% to 100%
ALd2	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO2	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
ALr3		*Alarm Channel 3 (Temperature from Sensor 2, TH)*	
ALS3	Alarm Range Settings		resolution: 0.1 degree
LoA3	Low Alarm Threshold	-20°C	from -40°C to 123.8°C from -67°F to 254.9°F
HiA3	High Alarm Threshold	30°C	from -40°C to 123.8°C from -67°F to 254.9°F
ALd3	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min

MENU ITEM	PARAMETER	DEFAULTS	LEGAL VALUES
ALO3	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf
ALr4	**Alarm Channel 4 (Humidity from Sensor 2, TH)**		
ALS4	Alarm Range Settings		resolution: 0.1%
LoA4	Low Alarm Threshold	30%	from 0% to 100%
HiA4	High Alarm Threshold	90%	from 0% to 100%
ALd4	Alarm Delay	0 min (no delay)	0min, 10min, 20min, 30min, 60min, 120min
ALO4	Alarm Output	BuOn (buzzer On) CoOn (contact On	buOn/buOf CoOn/CoOf

Note: There is no calibration needed for the Humidity and Switch Channels

APPENDIX B   SPECIFICATIONS

Table 7 lists the CTR/CTHR specifications.

Table 7: Specifications

DESCRIPTION	CTR - SPECIFICATIONS	CTHR - SPECIFICATIONS
Measurement Range	-40°/ +266°F (-40°/ +130°C)	-40°/ +185°F (-40°/ +85°C) 0-100% RH
Temp. Measurement Accuracy	± 1.0°F (+/- 0.5°C)	± 1.0°F (± 0.5°C)
Humidity Measurement Accuracy	Not applicable	In range of 10.0 - 89.9% RH: ± 2% RH, else: ± 4% RH
Ambient Operating Range	0°F to +150°F (-18°C to +65°C), 0 to 95% RH non-condensing	
Measurement Resolution	0.2°F (0.1°C)	0.2°F (0.1°C), 0.1% RH
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C) **without** the Thermal Paper -40°F to +150°F (-40°C to +65°C) **with** the Thermal Paper	
Sensor Diameter	0.25 inches (6.35 mm)	0.55 inches (14 mm)
Sensor Cord Length	33 feet (10 m)	33 feet (10 m)
Alarm Contact Rating	1 Amps, 12V AC/DC	
Chart Paper Width and Length	Thermal Chart Paper , 2 inches (50.8 cm), 131 feet (40 m)	
Display (LED Display)	Numeric, 4 characters	
Power consumption	12Vac/dc, 1550 mA while printing, 100 mA without printing	
Battery Backup	9V battery, logs up to 50 hours (not supplied)	
Clock Battery Life	3.6V Lithium battery, two years in average use (supplied)	
Repeatability	± 0.2°F (± 0.1°C)	Temp.: ± 0.2°F (± 0.1°C) Humidity: in range of : 10.0-89.9%RH: ±0.1%RH Humidity in other: ± 0.5%RH
Response Time	Temp.:5-30 sec. Event:1 sec.	Temp.:5-30 sec. Event: 1 sec. Humidity: 6-10 sec.
Size and Weight without sensors	8.2x5.3x2.7 inches (208.6x135x69mm), 4 lbs. (1.8 Kg)	
Certification	EN12830 ISO 9001 2000 RoHS C E FC	

CTR/CTHR
4 Channel Temperature Recorder

Menu structure Ver: 0.25

To make Adjust: [▼] : Adj.
Access Menu entry: [OK] : PASS

Enter Default Password: [◄] : - ASS
[►] : - - SS
[OK] : - - - - S
[EXIT] : - - - - -

Prn — Print Mode
SCAL — Standards Scale
CloC — Clock Set
ChPA — Change Password
SIdn — Set ID Name
CALb — Calibration
Lo9r — Log Erase
SAPr — Sampling Rate

Direct Key Operation

View Next Channel: [OK]
Highest measure: [▲]
Lowest measure: [▼]
Reset High & Low: [►] [OK] [OK]
Print Latest report: [PRN] [▼] [OK] [PRN]
Print Sorted report: [PRN] [▼] [OK] [PRN]
>Select report No.: [◄] . . . [▼] [OK]
Print Summary: [PRN] [◄] [▼] [OK]
Summary to PC: [PRN] [◄] [▼] [OK]
To Exit or Cancel: [EXIT]
Buzzer mute: [EXIT]

ID Name. Number Code Set

Chr.	Code	Chr.	Code	Chr.	Code	Chr.	Code
0	0	A	10	J	20	T	30
1	1	A	11	K	21	U	31
2	2	B	12	L	22	V	32
3	3	C	13	M	23	W	33
4	4	D	14	N	24	X	34
5	5	E	15	O	25	Y	35
6	6	F	16	P	26	Z	36
7	7	G	17	Q	27	-	37
8	8	H	18	R	28	%	38
9	9	I	19	S	29		

Legend:

Adj	Adjust
PASS	Password
StyP	Sensor Type Set
ALr	Alarm
AlS1..4	Alarm Range Settings
LoA1..4	Low Alarm Threshold
HiA1..4	High Alarm Threshold
Ald1..4	Alarm Delay, channel #
AlO1..4	Alarm Output, channel #
EoFP	End Of Paper
bu On/OF	Buzzer On Off
Co On/OF	Contact On Off
Prn	Print
9rAP/LChr/SChr/4Chn	Grap/ Large/ Small Font/ 4 Channels

BAtA - Low	backup battery Alarm
PrOn/PrOF	Printer On Off
PCOn/PCOF	PC port On Off
SCAL	Standards Scale
C/F d9	Celsius/Fahrenheit degrees
EudA/EndA	Europe (d/m/y) / English (m/d/y)
CloC	Clock Set
SdAy	Set Date
Shr	Set Time
ChPA	Change Password
SIdn	Set ID Number Code
CALb	Temperature Calibration
Lo9r	Logging Reset
SAPr	Sampling Rate

StyP — Sensor Type Set
SnS1 SnS2 SnS3 SnS4
NoS — Sensor type
T(TH) S

Alr — Alarms Set
Alr1 Alr2 Alr3 Alr4
EoFP BAtA
AlS1..4 — Set Range
LoA1..4 — Set Low Alarm Threshold
hiA1..4 — Set High Alarm Threshold
Ald1..4 — Delay
delay No, 10, 20, 30, 1h, 2h
AlO1..4 — Output
buOn/buOF — Buzzer On/Off
CoOn/CoOF — Contact On/Off
buOn/buOF — Buzzer On/Off
CoOn/CoOF — Contact On/Off

Prn — Print Mode
4Chn
Ch1 Ch2 Ch3 Ch4
Channel to print
9rAP Graphics
LChr Large font
SChr Small font
PrOn/PrOF — Printer On/Off
PCOn/PCOF — PC Port On/Off

SCAL — Standards Scale
F d9 / C d9 — Fahrenheit / Celsius degrees
EudA / EndA — Date format: d/m/Y, m/d/Y

CloC — Clock Set
SdAy — Set Day
'dd' — Day
'mm' — Month
'yy' — Year
Shr — Set hour
'hh' — Hour
'mn' — Minute

ChPA — Change Password
PASS — Enter new sequence of 4 keys.
PASS — Repeat the sequence to approve.

SIdn — Set ID Name
SId- (13)
SId1 (5) SId2 (5) SId3 (5) SId4 (5)
Channel ID Name
set 1'ch' set 2'ch' set 3'ch' set 4'ch' set 5'ch' set 6'ch' set 7'ch' set 8'ch' set 9'ch' set 10'ch' set 11'ch' set 12'ch' set 13'ch'

CALb — Calibration
CAL1 CAL2 CAL3 CAL4
-Sensor Difference

SAPr — Sampling Rate
'mn' - Minutes

To make Adjust: ▼ : Adj.
Access Menu entry: OK : PASS

Enter Default Password: ▲ : ASS · - · SS
OK : - - - S
EXIT : - - - - -

StyP Sensor Type Set
- SnS1
- SnS2
- SnS3
- SnS4

T(TH)S NoS Sensor type

Alr Alarms Set
- Alr1
- Alr2
- Alr3
- Alr4

EoFP / BAtA

AlS1..4 Set Range
- LoAL..4 Set Low Alarm Threshold
- hiAL..4 Set High Alarm Threshold

AdL1..4 Delay
- 'delay' No. 10, 20, 30, 1h, 2h

AIO1..4 Output
- buOn / buOF Buzzer On/Off
- CoOn / CoOF Contact On/Off

buOn / buOF Buzzer On Off
CoOn / COOF Contact On Off

Prn Print Mode
- 4Chm
  - Ch1
  - Ch2
  - Ch3
  - Ch4
  Channel to print
- 9rAP Graphics
- LChr Large font
- SChr Small font
- PrOn / PrOF Printer On Off
- PCOn / PCOF PC Port On Off

SCAL Standards Scale
- F d9 / C d9 Fahrenheit / Celsius degrees
- EudA / EndA Date format: d/m/Y; m/d/Y

CloC Clock Set
- SdAy Set Day
- 'dd' Day
- 'mm' Month
- 'yy' Year
- Shr Set hour
- 'th' Hour
- 'mn' Minute

ChPA Change Password
- PASS Enter new sequence of 4 keys.
- PASS Repeat the sequence to approve.

Sidn Set ID Name
- Sid- (13)
- Sid1 (5)
- Sid2 (5)
- Sid3 (5)
- Sid4 (5)
Channel ID Name
- set 1st ch
- set 2nd ch
- set 3rd ch
- set 4th ch
- set 5th ch
- set 6th ch
- set 7th ch
- set 8th ch
- set 9th ch
- set 10th ch
- set 11th ch
- set 12th ch
- set 13th ch

CALb Calibration
- CAL1
- CAL2
- CAL3
- CAL4
'Sensor' Difference

Lo9r Log Erase

SAPr Sampling Rate
- 'mn' Minutes

Direct Key Operation
View Next Channel: OK
Highest measure: ▲
Lowest measure: ▼
Reset High & Low: PRINT ▲ OK OK
Print Latest report: PRINT ▼ OK PRINT
Print Sorted report: PRINT ▼ PRINT OK
>Select report No. : ▲ ..... OK
Print Summary: PRINT ▼ ►
Summary to PC: PRINT ▲ ►
To Exit or Cancel: EXIT
Buzzer mute: ▼

ID Name. Number Code Set

Chr.	Code	Chr.	Code	Chr.	Code	Chr.	Code
0	0	A	10	J	20	T	30
1	1	A	11	K	21	U	31
2	2	B	12	L	22	V	32
3	3	C	13	M	23	W	33
4	4	D	14	N	24	X	34
5	5	E	15	O	25	Y	35
6	6	F	16	P	26	Z	36
7	7	G	17	Q	27	-	37
8	8	H	18	R	28	%	38
9	9	I	19	S	29		

Legend:
- Adj — Adjust
- PASS — Password
- StyP — Sensor Type Set
- ALr — Alarm
- AlS1..4 — Alarm Range Settings
- LoAL..4 — Low Alarm Threshold
- HiAL..4 — High Alarm Threshold
- AdL..4 — Alarm Delay, channel #
- AlO1..4 — Alarm Output, channel #
- EoFP — End Of Paper
- bu On OF — Buzzer On Off
- Co on OF — Contact On Off
- Prn — Print
- 9rAP/LChr/SChr/4Chn — Grap/ Large/ Small Font/ 4 Channels

- BAtA - Low — backup battery Alarm
- PrOn/PrOF — Printer On Off
- PCOn/PCOF — PC port On Off
- SCAL — Standards Scale
- C/F d9 — Celsius/Fahrenheit degrees
- EudA EndA — Europe (d/m/y) / English (m/d/y)
- CloC — Clock Set
- SdAy — Set Date
- Shr — Set Time
- ChPA — Change Password
- Sidn — Set ID Number Code
- CALb — Temperature Calibration
- Lo9r — Logging Reset
- SAPr — Sampling Rate