C312-DLA

Universal Platform Datalogger for Analog and Digital Sensors

Real Time or Off-Line Wireless Acquisition

Long-Life Lithium Thionyl Chloride or Lithium Polymer Rechargeable Battery

Full Compliance with CEAM © CWS32

Technological Microprocessor Platform CEAM © Smart1

Operator Manual

Cod. C312-DLA_Serie_EN_M1

English Language

Product Rev: 2.2 - Manual Rev: 4.0

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Index:

1. Overview

C312-DLA is more than just an instrument, it is a true next-generation multi-purpose platform, a versatile device with a long-lasting Lithium Thionyl Chloride battery (from 6 months to 2 years depending on use) and a brand new circuit design that guarantees excellent performances with low power consumption.
The C312-DLA is also offered in a version with rechargeable lithium polymer battery.

The device is designed to be a new technology platform with many innovative features and utilities to manage several kinds of digital and analog sensors.

The instrument has been designed to become the platform for a wide range of CEAM sensors of the future, ready to support what today is known as Cloud Computing, in the field of data acquisition and integrated management with collaborative systems such as CEAM © platform CWS32 .

The C312-DLA is a datalogger and therefore has the capability to acquire samples from the field and store them internally. The user can download the samples in two ways:

- A direct download via the USB connection
- An indirect download via a gateway

The direct download via the USB is generally used for a stand-alone use, for small installations or for test/debug operations.
The indirect download is used for networked, medium to large installations; in this case the data are transferred from the C312-DLA to a gateway and then to a server and recorded into a database.
There are different models of CEAM gateways to use with C312-DLA, please refer to CEAM web site or contact CEAM customer service.

2. Housing

2.1 Case

The C312-DLA has 2 possible cases: a plastic case, the default case for most applications, and a metallic case, more suitable for outdoor or harsh environmental conditions. Both cases are available for 4 bayonet or 1/2/4 multipolar inputs.

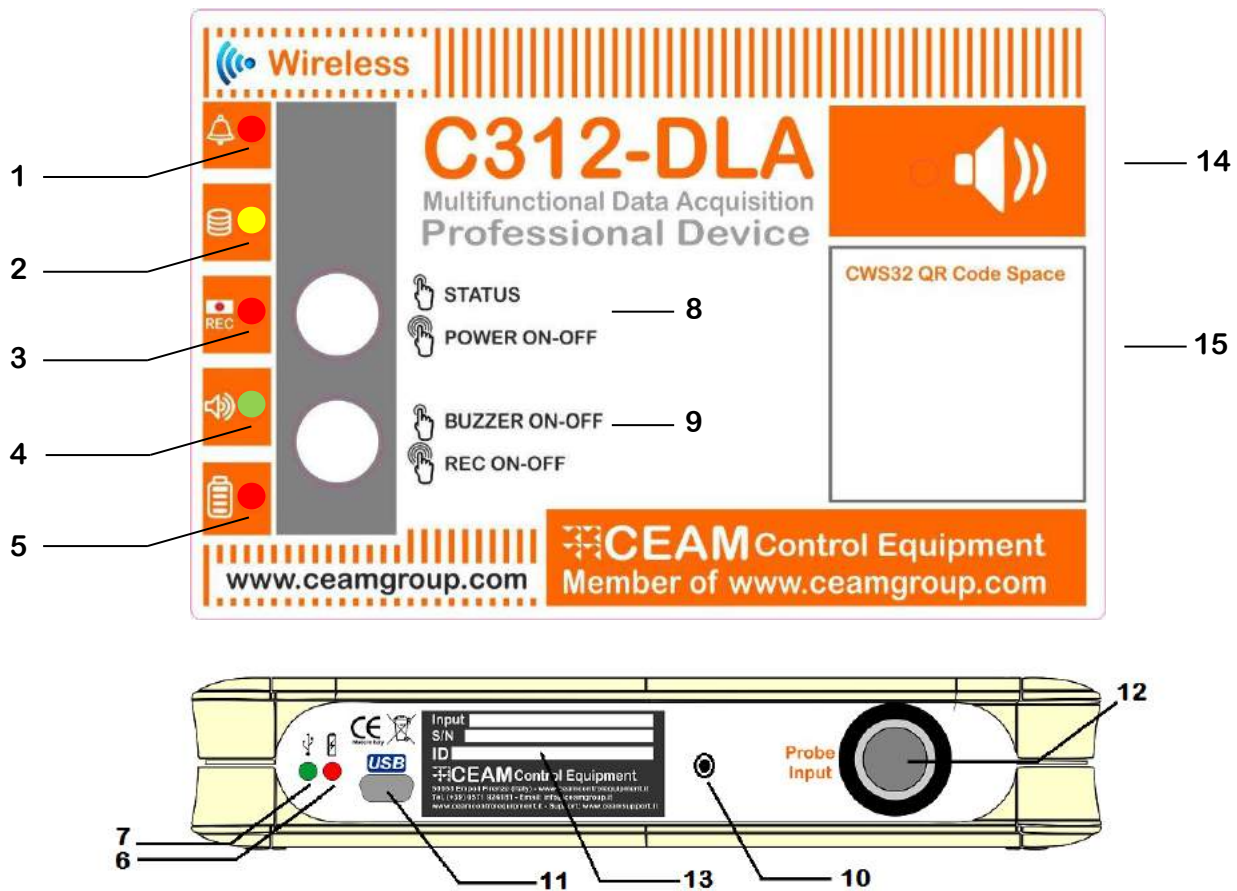**Version with four standard bayonet inputs for thermocouples**

Version with four multipolar inputs

Version with metallic case and PTFE sides (available also for multipolar inputs)

2.2   LEDs, Buttons and Buzzer

Legenda

1. **Alarm**
2. **Sampling**
3. **Recording**
4. **Buzzer**
5. **Battery**
6. **Charging Battery**
7. **USB connection LED**
8. **Status / Power On-Off**
9. **Buzzer On-Off / Recording On-Off**
10. **Printing button (only available for single input version)**
11. **Mini-USB Connector**
12. **Multipolar connector for External Digital and Analog Probes**
    (also available versions with 1, 2 or 4 multipolar inputs / 4 bayonet inputs for thermocouples)
13. **Device Identification Label**
14. **Buzzer for Local Alarm Warning**
15. **QR Code Space (Special Functions of CWS32)**

2.2.1 Buttons

Both buttons (8, 9) distinguish a short press from a long press.

POWER BUTTON
The Power button (8) when short pressed gives a visual status of the device:
> **- LED 1 flashes if one or more values are in the alarm state**
> **- LED 3 flashes if the device is recording**
> **- LED 4 flashes if the buzzer is enabled**
> **- LED 5 flashes if the battery has low charge (<30%)**

The Power button (8) when long pressed causes the device to power ON/OFF

Powering OFF: LED 3 flashes x3 and buzzer sounds x3

Powering ON: LED 4 flashes then LED 3 flashes while buzzer sounds a sequence of 1,1,3 buzzes

RECORD BUTTON
Record button (9) when short pressed enables/disables the buzzer:
Enabling the buzzer: LED 4 has a long flash and the buzzer sounds
Disabling the buzzer: LED 4 has 3 short flashes

Record button (9) when long pressed enables/disables the recording:

Recording ON: LEDs 1-5 flash in a fast rising sequence LED5=>LED4=>LED3=>LED2=>LED1 x3 times and the buzzer sounds

Recording OFF: LEDs 1-5 flash in a decreasing sequence LED1=>LED2=>LED3=>LED4=>LED5 and the buzzer sounds

PRINT BUTTON
Print button is only available for single input version. First connect the USB printer to the C312-DLA (ask customer service for more details); when the print button is pressed it causes the receipt to be printed.

2.2.2 LEDs

LED 1 flashes when one or more channels are in alarm state
LED 2 flashes when the C312-DLA is sampling
LED 3 flashes when:
> **- the C312-DLA is transferring data to the gateway**
> **- at the beginning of the transmission and the buzzer sounds**
> **- at the end of the transmission and the buzzer sounds (x2)**
> **- when the power button is short pressed, if the C312-DLA is recording**
LED 4 flashes when the power button is short pressed, if the buzzer is enabled
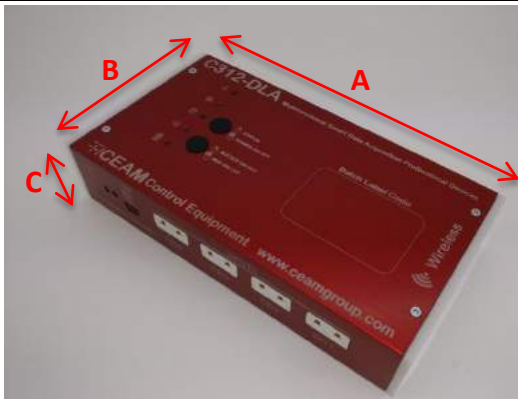**LED 5 flashes when the battery charge is low (<30%):**
> **- every minute when battery powered**
> **- every second when connected to USB**
> **- when the power button is short pressed**
LED 6 is ON when the C312-DLA is USB connected and the battery is charging
LED 7 is ON when the C312-DLA is connected via the USB

3. **Technical Characteristics**

3.1   **Overall Dimensions**

T3.1 Dimensions Table – In the picture the dark version of C312-DLA in light plastic housing	
	A = Length 150.0 mm. ± 0.5 mm. **B = Width Max. 92.0 mm ± 0.5 mm** **C = Height Max 28.5 mm ± 0.5 mm**
	A = Lunghezza 150.0 mm. ± 0.5 mm. **B = Larghezza Max. 80.0 mm ± 0.5 mm** **C = Altezza Max 30 mm ± 0.5 mm**

3.2   **Compatible Sensors**

The modules Data-Logger DLA-C312 Series can be ordered with either the sensor directly integrated on the instrument body and not separable. Only in this case the sensors are included in the supply of the instrument. Alternatively, they can be ordered with the remote input connector where you can connect interchangeable probe and separate from the tool body, in this case the probes are never included in the supply of the device and must be purchased separately choosing from those available in the series C312-PRB and compatible, as shown in the table below (Tab.3.2.1).

Compatible Analog or Digital Probes are listed below:

T3.2 Probe Table (Updated 08-2016)		
Sensors Series or Input Type	**Sensors Technology & Input**	**Measured Variable**
CEAM © PRB-D1	**Digital Sensor**	**Temperature**
CEAM © PRB-D2	**Digital Sensor**	**Relative Humidity & Temperature**
Luxmeter	**Digital Sensor**	**Illuminance**
PT100	**Analog**	**Temperature**
Voltage (0-5V, 0-10V)	**Analog**	**Voltage**
4÷20 mA Transmitter	**Analog**	**Universal, Configurable**
Oxygen	**Analog**	**Oxygen 0-25%**
Thermocouple	**Analog**	**Temperature**
Contact	**Analog**	**Contact**
Photosensor (optical switch)	**Analog**	**Optical switch**

Warning: The C312-DLA series is not a fixed product, but it has been upgrading, so beyond what is mentioned in the table, we are developing a number of other sensors and interface modules. For more information please contact CEAM customer service.

3.3   Power Supply

C312-DLA battery is available in two versions: 1- Non-rechargeable Battery   2- Rechargeable Battery.

3.3.1   Non-Rechargeable Battery

The power supply of the device is ensured by the internal and not rechargeable Lithium Thionyl Chloride battery, which guarantees a long period which can vary from 6 months to 2 years, depending on the use. This remarkable variability of battery life is justified by the fact that the maximum consumption of the device is during the acquisition and the transmission of the data, so the longer will be the interval between two events, the longer will be the battery life.

Warning: Lithium Thionyl Chloride batteries are not rechargeable and attempting to recharge or to replace by unauthorized personnel may damage the device making dangerous its use and immediately voiding the warranty.

3.3.2   Rechargeable Battery

This version allows you to recharge the battery via the mini USB plug. The power charging is 5V through a common USB charger not included.

Warning: The power connection should only be performed with cables and Original accessories CEAM. Using other products may damage the device making dangerous its use and immediately voiding the warranty.

3.4   Housing

Construction: ABS Plastic Material - With alarms LEDs on the front and on the top, connectors on the front.

Shape: Ergonomic case of modern design, rectangular with rounded corners

Index of Protection: IP20

Dimensions: length 150 mm. ± 0.5 mm. - Width Max. 92 mm ± 0.5 mm. Maximum height 28.0 mm ± 0.5 mm

Warning: The expressed dimensions are of the case only; probes, external antenna or optional wall anchor clips are not considered.

Note: CEAM also produces other series of instruments with similar features, but different housing.

3.5   Connections

The external connections of the C312-DLA may be different depending on the ordered model (See Table Encoding Product), then some connections described below may be absent in some models.

Internal sensors: integrated inside the case, do not require any additional connection

External probes: can be connected via special connector L-PULL or standard bayonet for thermocouples; connectors are located on the front.

Configuration - Data Management - Firmware Update: Mini-USB connector

Warning: The power connection should only be performed with original CEAM cables and accessories. Using different products may damage the device and immediately voiding the warranty.

3.6   Environmental conditions (Housing)

Operative Conditions: -20 ÷ 70 °C – 10 ÷ 90 RH% (Non-condensing)
Stocking Conditions: -20 ÷ 50 °C – 10 ÷ 80 RH% (Non-condensing)

4. Wiring

4.1   Configuration Wiring

To perform the configuration of the device it is possible to operate in two different ways depending on the ordered device model:

If the C312-DLA was purchased without wireless option and intended for an Off-Line use (typical of traditional Datalogger instruments), the configuration can only be performed using the proper kit (Cable and Off-Line Software Bundle), connecting the PC to the device via the Mini-USB connector.

In case the DLA-C312 was purchased with a wireless connection it can also be configured via the wireless network using the CEAM © CWS32 Software Platform.

For the wireless connection of the C312-DLA you need to use a PBX (Gateway Ceam D9040 or compatible) that operates at 868 MHz either with CEAM © CWSmart-C proprietary protocol or a standard MiWi.

4.2   Power Supply Wiring

The C312 is battery powered so it does not need any additional power supply. If the device hosts a rechargeable battery, it uses the same Mini USB port used for configuration also to re-charge the battery, in accordance to the latest international directives about the last generation of mobile devices.

4.3   External Probes Wiring

The C312-DLA can be equipped with both built-in sensors and with remote external probes; external probes are acquired by means of two connectors, a standard bayonet connector for thermocouples or a multipolar L-PULL circular connector for the other sensors.

5. Features

5.1   Clock Function

The device has an integrated RTC (Real Time Clock) to record the time of the data acquisition from sensors. Through the software user interface it is possible to synchronize the RTC with the computer clock.

The integrated RTC timer, has an independent autonomous backup battery, to avoid the loss of time reference in case of power failure of the device.

5.2   Storage Function

The local data storage is the most important function performed by the device and is used to store the data acquired from the sensors to make them available for the user at the appropriate time.

The internal memory is capable to store up to 60k samples (minimum 30k); the number of samples depends on the number of channels to acquire. The maximum number of 60k is for the case of just one channel, while 30k is for the worst case of nine channels to be acquired.

The internal memory is used with a cyclic writing, both to uniformly use all cells (flash memories do have a limited number of reading/writings cycles) and to avoid the saturation of the memory and the consequent loss of recent data. If the data samples exceed the capacity of the memory of course there is a loss of data, keeping in memory the most recent data and overwriting the oldest.

Here below the maximum number of samples that can be stored (approximately), depending on the number of channels to be acquired:

	1 ch	2 ch	3 ch	4 ch	5 ch	6 ch	7 ch	8 ch	9 ch
Max number of samples (k)	62	55	50	45	42	39	36	34	31

To determine the time in which the memory will be saturated, the user can use the table above in addition to the sampling time: for instance, for a configuration with a single channel and a sampling time of 1 minute, the memory will be filled in 62k x 1 minute = 62k minutes ≈ 43 days.

5.3   Wireless Communication (optional)

The wireless communication of the C312 DLA, operating at 868 MHz, enables the acquisition and the total management of one or more devices wirelessly.
The C312-DLA can use two different wireless protocols: a proprietary CWSMart-C and a standard MiWi protocol. Both protocols allow you to easily create small and large networks of wireless sensors, thereby reducing time and installation costs.

To create a wireless network, in addition to the datalogger C312-DLA, one or more gateways are needed; gateways of the CEAM D9000 Series can be used, as D9019 or D9040 (ask CEAM support service for more details and specifications).

6. Configuration

The DLA-C312 is fully configurable via Windows software; as for the data download, also for the C312-DLA configuration two ways are possible: a direct connection of a PC to the C312-DLA via a mini-USB cable, or an indirect connection via one Ethernet to wireless gateway of the D9000 family.

Minimum system requirements are:
- Intel 2 GHz processor (or equivalent)
- RAM memory 4GB
- HD available space 100 GB
- Windows 7 OS
Note: The configuration software and USB cable for PC connection are optional and sold separately, for more details contact CEAM customer service.
In the following paragraphs the procedure for configuring the C312-DLA via direct USB connection is described.

6.1 Power on/off

Press and hold the STATUS/POWER button for a few seconds to power ON the C312-DLA: the green LED flashes and the red LED lights up for about 2 seconds with a series of beeps.
Same procedure to turn off: press and hold the STATUS/POWER button, the buzzer plays 3 beeps and at the same time the central red LED flashes 3 times.

6.2 CWSDAC Net Scanner

The CWSDAC Scanner is the software tool that allows you to scan the serial network.
It is an independent program to use, but with very similar features of the main program CWS32. The configuration below is typical for the use of the C312-DLA with appropriate change of address, and serial port.
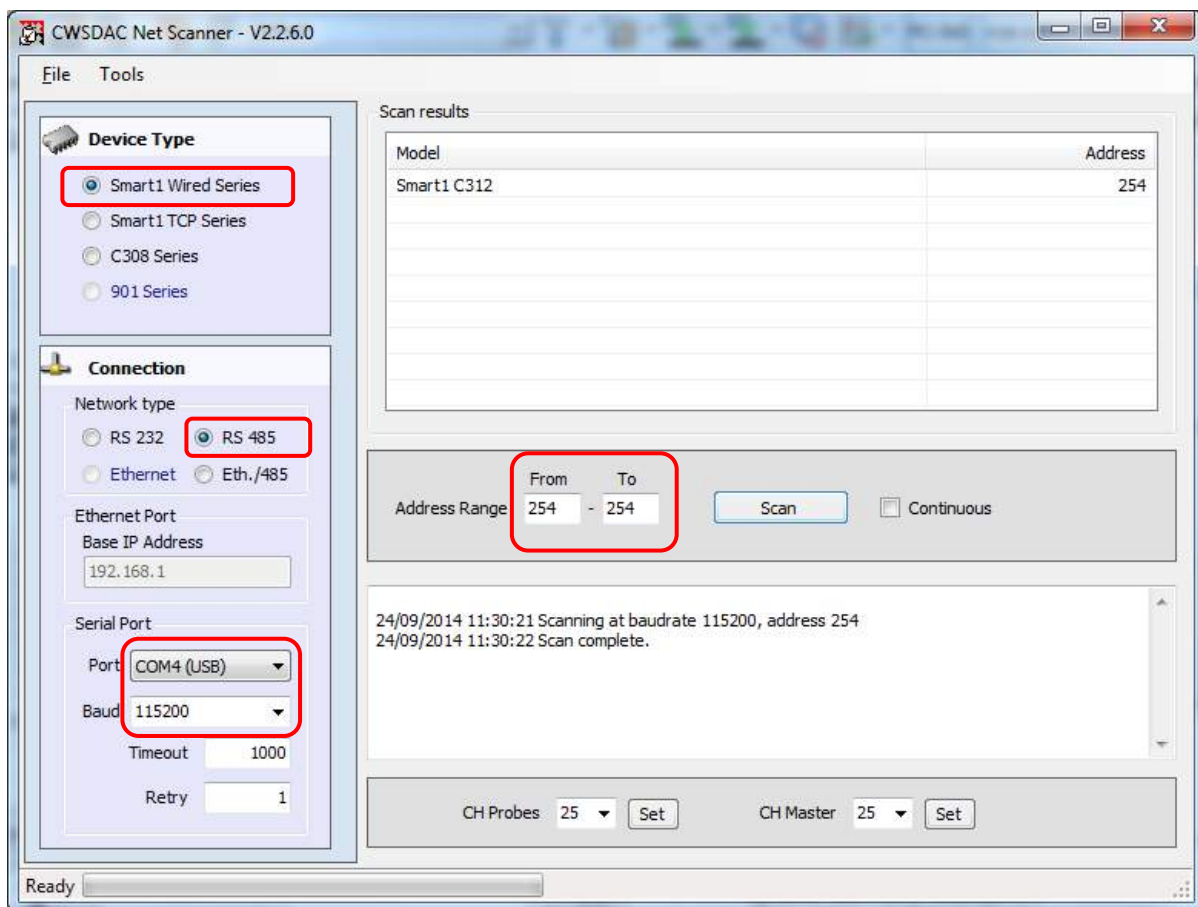
In the picture above the COM Port associated to the USB connection is the COM4; please select the COM the OS has associated to your actual USB connection.

The C312-DLA has a default ID address that is 254; the ID 254 is a "recovery" ID that can be used whenever the user does not know the current ID of the device.
WARNING! Please note that not all functions are allowed when connected to a C312-DLA via its recovery address 254: for instance the data download is not allowed. Therefore we recommend the user to use the 254 ID just to connect and check the current ID, then disconnect and reconnect with the correct ID.

If the connection established correctly, in the Scan Results box the discovered device is listed.
By double-clicking on the resulted device the user can access the device configuration window.

6.2.1 Login

The Login Tab is the first tab opened: a login is required to proceed further.
The default password is: Cws32

6.2.2 Overview

This is the home screen of the device, it is used to summarize some basic information **(in this tab all info are read-only)** such as:
- Module name
- Firmware and Hardware Revision
- Device ID
- Serial Number
- Record ON/OFF
- Battery
- Data Percentage

Module Name: the user can personalize the device name.
Device ID: in this case the ID used to connect to is showed. So if the default ID 254 has been used, 254 is showed. To check the current device ID see the tab Settings.
Record ON/OFF: indicates if the datalogger is recording or in stand-by mode.
**Battery**: estimation of battery charge.
Data Percentage: estimation of filling of the internal memory.

At the first access to the tab, all other tabs are grouped into three main groups: communication, data acquisition and configuration. Just click the "+" to expand the group.
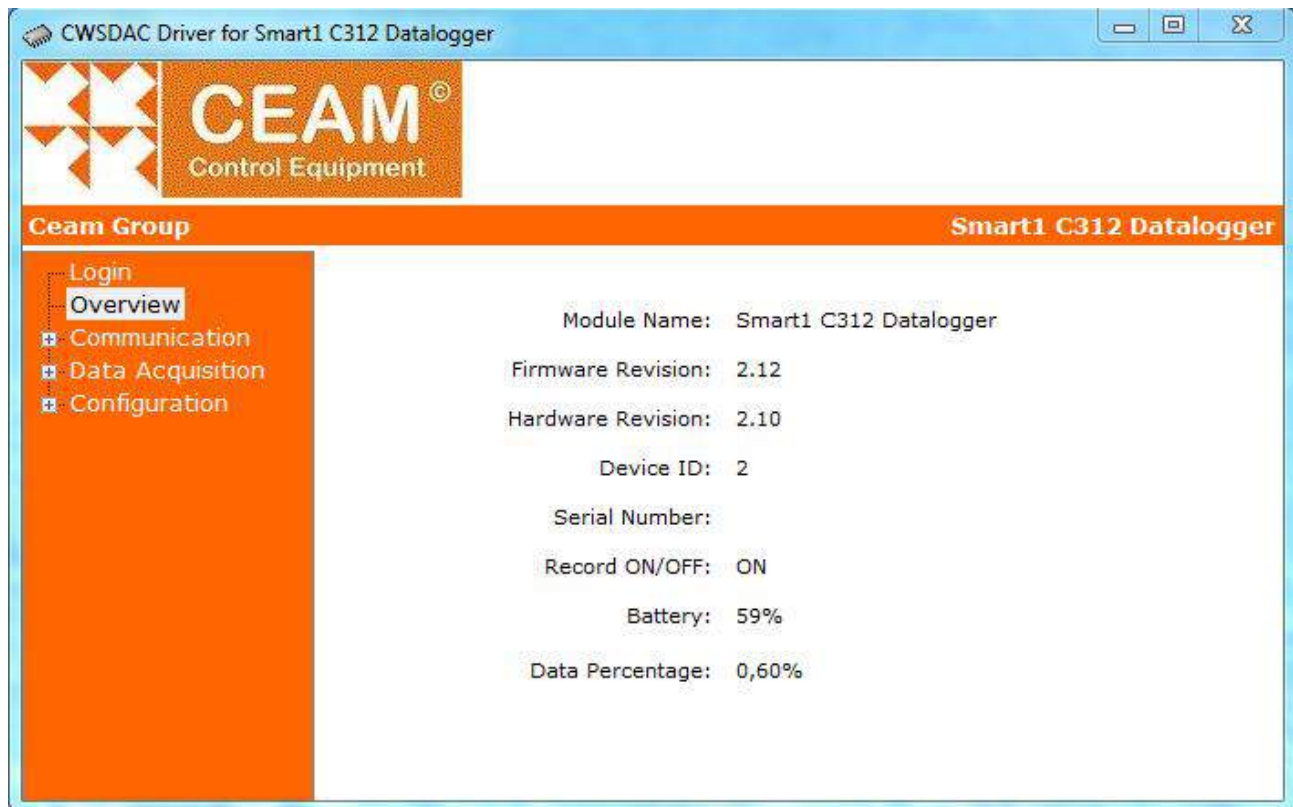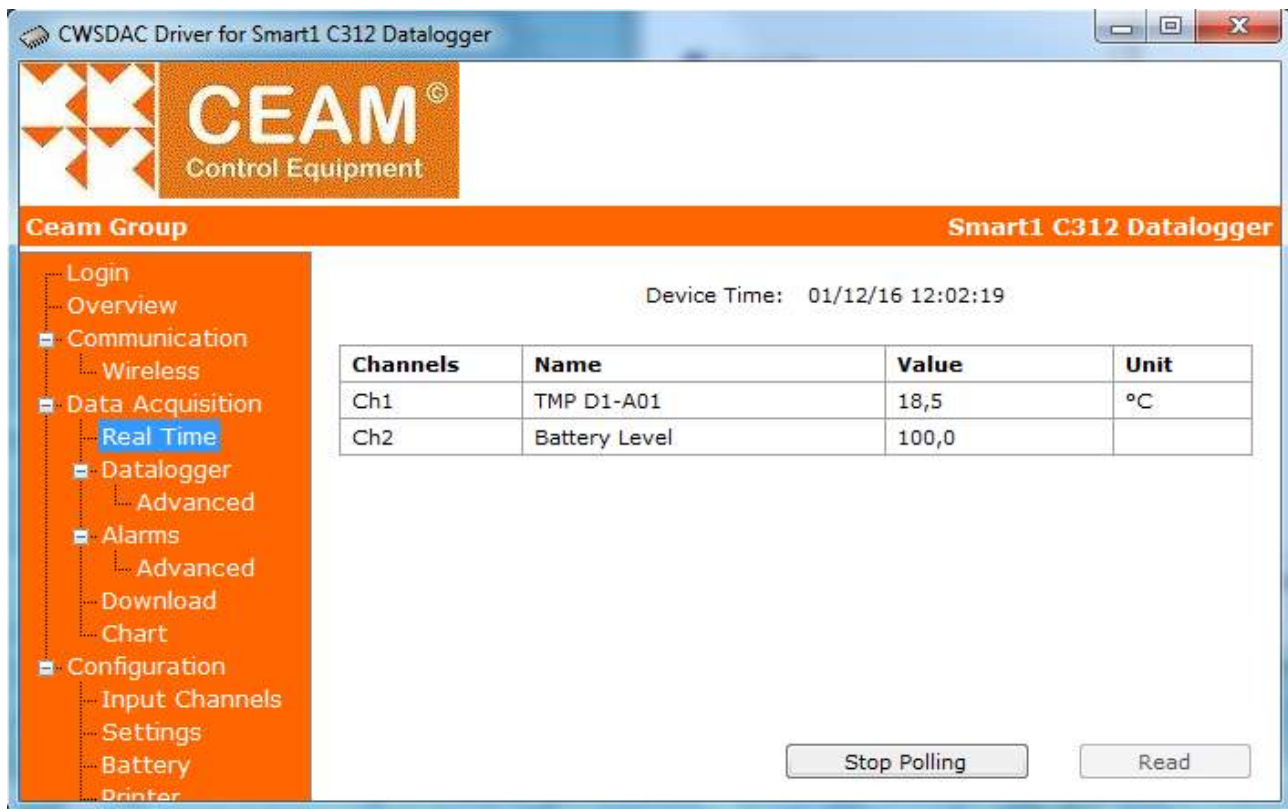
6.2.3   Wireless

In the case of the C312-DLA the Communication group only contains the Wireless tab: the user can enable/disable the radio transmissions (if the radio module is present) and select the radio channel. After any modification the user needs to click the Set CH button to apply the modifications.
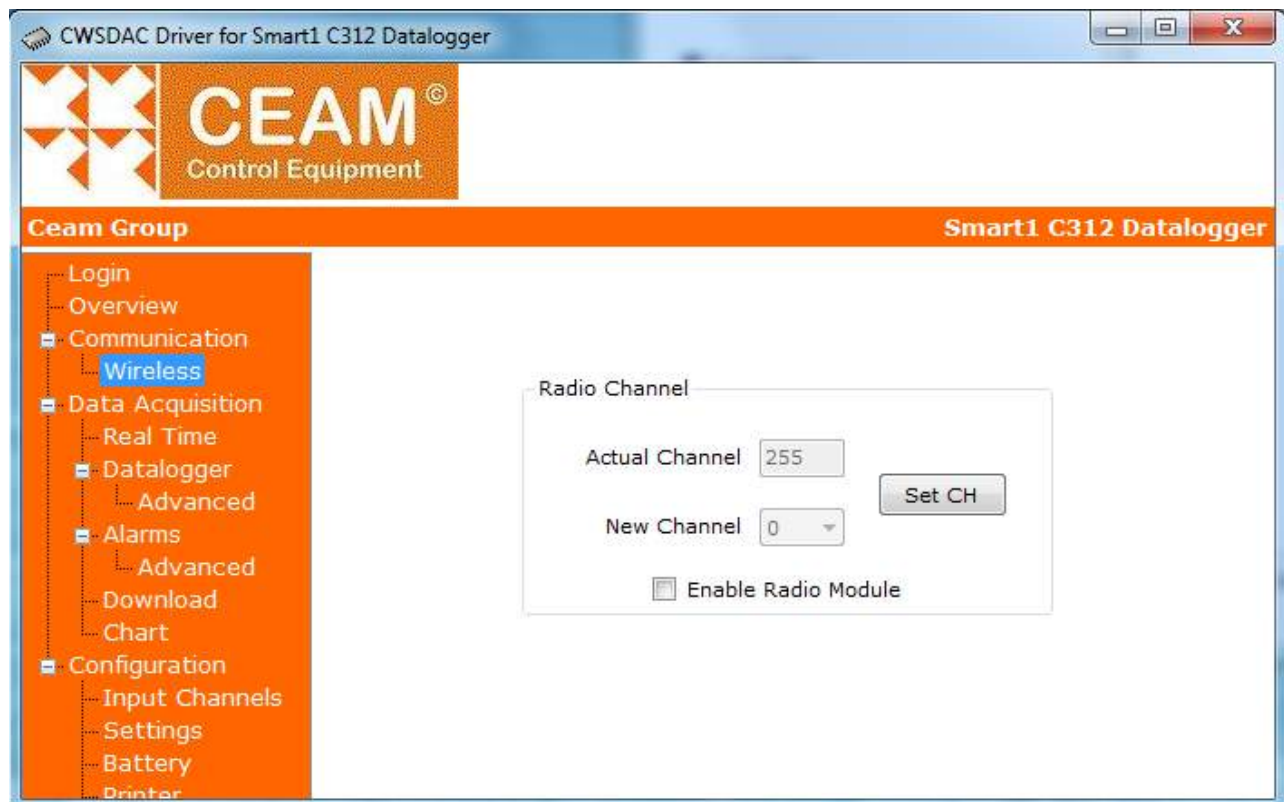
6.2.4   Real Time

The Real Time is the first tab of the Data Acquisition group.
In this tab real time acquisitions are shown on the table. Only the channels configured are shown of the maximum nine channels allowed. In the above picture only one channel is acquiring data from an external probe, since the battery level is an internal reading.
Channels are the physical quantities that are associated with the inputs, numbered consecutively, and identifying the variables at the software level (CWS32). Input is the physical input of the board, i.e. the multipolar connector (or the bayonet connector for the thermocouples). Not necessarily channels and inputs coincide: for example if I connect a URT (relative humidity and temperature probe) to the input 1, it will result in having two channels associated to the same input, one to the temperature variable and one to the relative humidity variable. If I plug a URT probe also on input 2, it will result in having channels 3 and 4 associated to input 2.
Samples are acquired continuously from the device until the tab is open; if the user wants to keep the tab open without reading, just press the Stop Polling button. This action enables the Read button for single acquisitions. To enable endless readings press "Start Polling" again.

6.2.5   Datalogger

The Datalogger tab is about the configuration of the recording feature. As a reminder to the reader, the C312-DLA can be used as a stand-alone device or inserted into a wireless network of several devices. In a stand-alone configuration (for instance a measurement campaign to monitor the environment, or inside an oven to monitor a thermal cycle) it is usually set to record the measurements for a certain period, then taken from the field to download all the stored data. When inserted into a wireless network the data transmission is scheduled to happen with a certain frequency. Usually the transmission time is set as a multiple of the sampling time, i.e. the radio module is "awaken" after the acquisition of n samples. There is a trade-off between saving energy (greater transmission time) and availability of the device for testing or reconfiguration (shorter transmission time). In fact the device inserted in a wireless network is a master in the communication, i.e. cannot be called by the SW user interface until it starts a new data transmission. Only at that time it is "booked" and at the end of the data transmission the configuration window becomes active. This situation does not apply to a USB communication, since the communication is always active. When a data transmission has been completed successfully, the stored samples are cancelled by the C312-DLA. Thus, a huge amount of stored data samples is common in a stand-alone configuration, while it only happens in a network configuration when a failure in the communication link happens.

In the top left box the user can START/STOP the recording by clicking on the button.
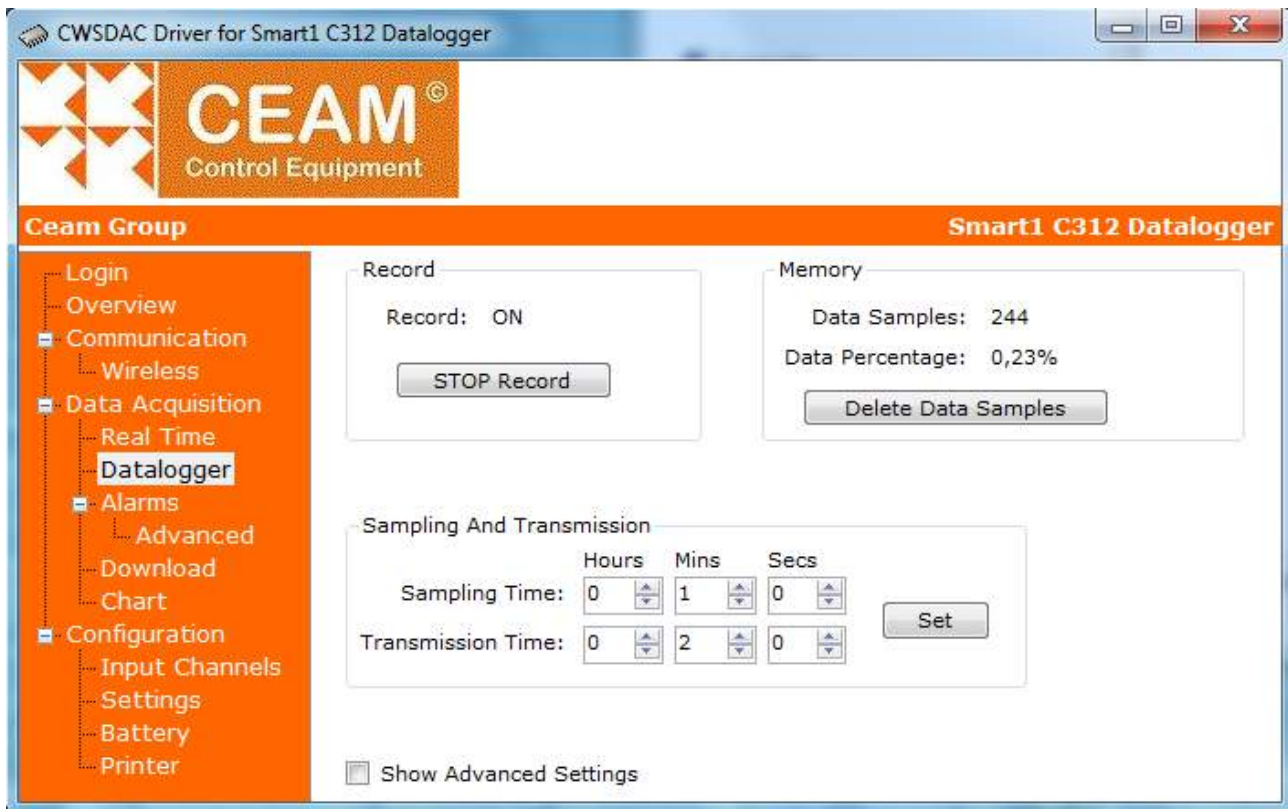
On the top right box there are indications about the current number of samples and the relative percentage of memory. There is a button to delete the current samples stored in memory.
On the bottom box the sampling and transmission times can be set.

These are the common functions and parameters a user needs to configure a datalogger. Just check Show Advanced Settings to enable the Datalogger Advanced Settings tab.

6.2.6   Datalogger Advanced Settings
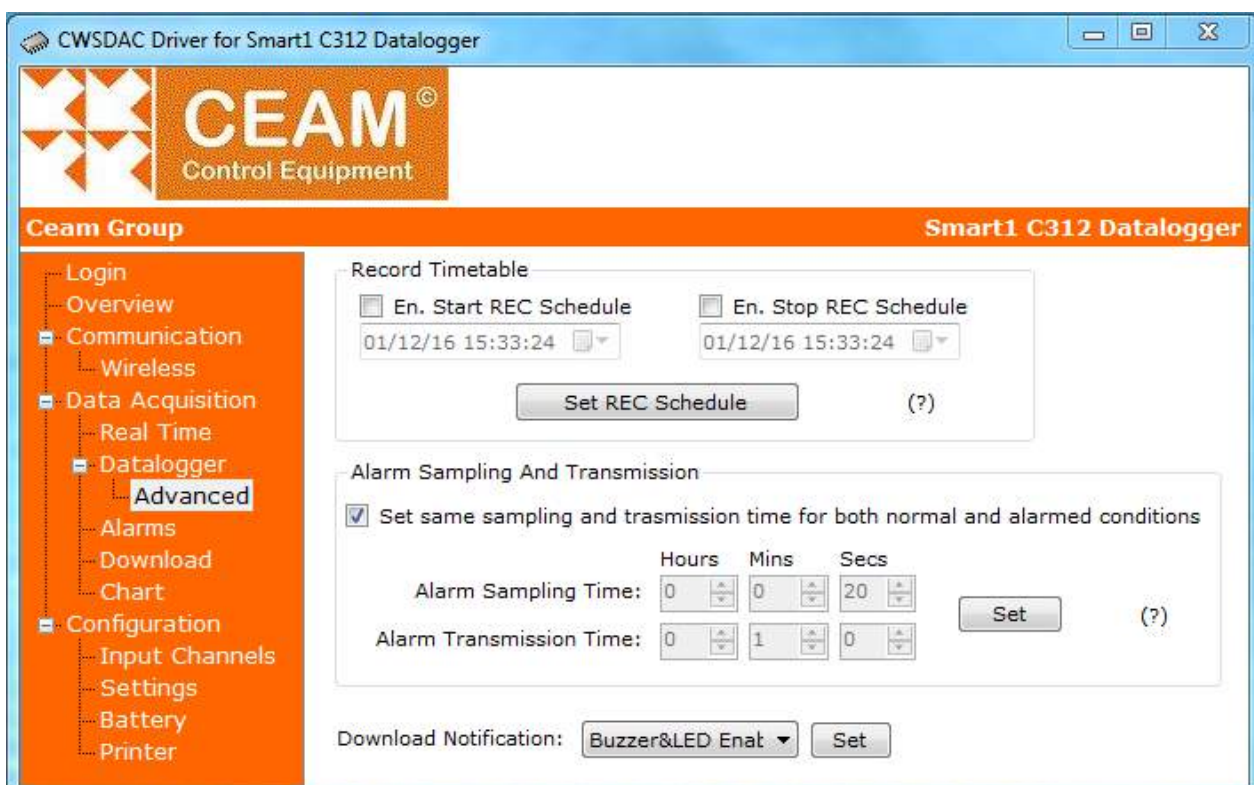
In the top box a Recording Timetable can be set, i.e. a user can schedule a start recording or a stop recording or both. To do this, first check the Enable Start REC or Enable Stop REC, then set the timetable and click the Set REC Schedule button.

In the central box a user can distinguish the sampling and transmission times when the data give an alarm condition respect to a normal condition. For instance, if a certain process is monitored with a slow frequency, let's say once per hour, the user can choose to increase the sampling and transmission frequency when a sample gives an alarm condition.
To perform this operation, first uncheck the "Set same sampling and transmission time for both normal and alarm conditions" (by default they are equal); then choose sampling and transmission time for alarm condition and finally click on the SET button.

In the bottom drop-down box the user can choose to assign a sound and/or a blinking of a LED to the End-of-download notification.

6.2.7   Alarms

The tab Alarms allows the user to configure alarms for all the active channels. In this simplified page the more common features are available: for each channel it is possible to set a Low and a High Level Alarm, i.e. an alarm that is triggered when a value drops below (Low) or rises above a threshold (High). Then for each alarm a local buzzer can be associated to be played for 1, 2, 3 or no-stop buzzes.
In case a more complex alarm is needed, click the Advanced Settings to enable the Alarms Advanced Settings Tab.
In the Advanced Settings Tab the full alarm table is shown, with several other features.
All features are shown when Add (a new alarm) or Modify buttons are clicked.
- Hysteresis: for the deactivation of the alarm can be set a different threshold compared to the activation threshold.
- Inverted: the default alarm is a high level alarm, i.e. the alarm is triggered when the value rises above a threshold. To activate a low level, check Inverted.
- Latched: if flagged, the alarm condition is kept, despite the value comes back to the normal range. The alarm can only be deactivated manually.
- FSAD: if flagged it means that the device is in alarm condition when it is started and the alarm is disabled until the value goes back to a not-alarmed status. In other words, only the next alarm condition will trigger the alarm.
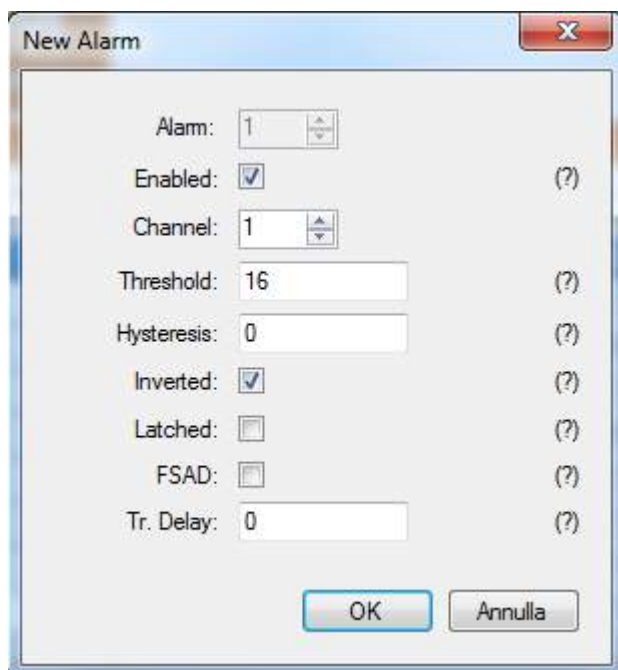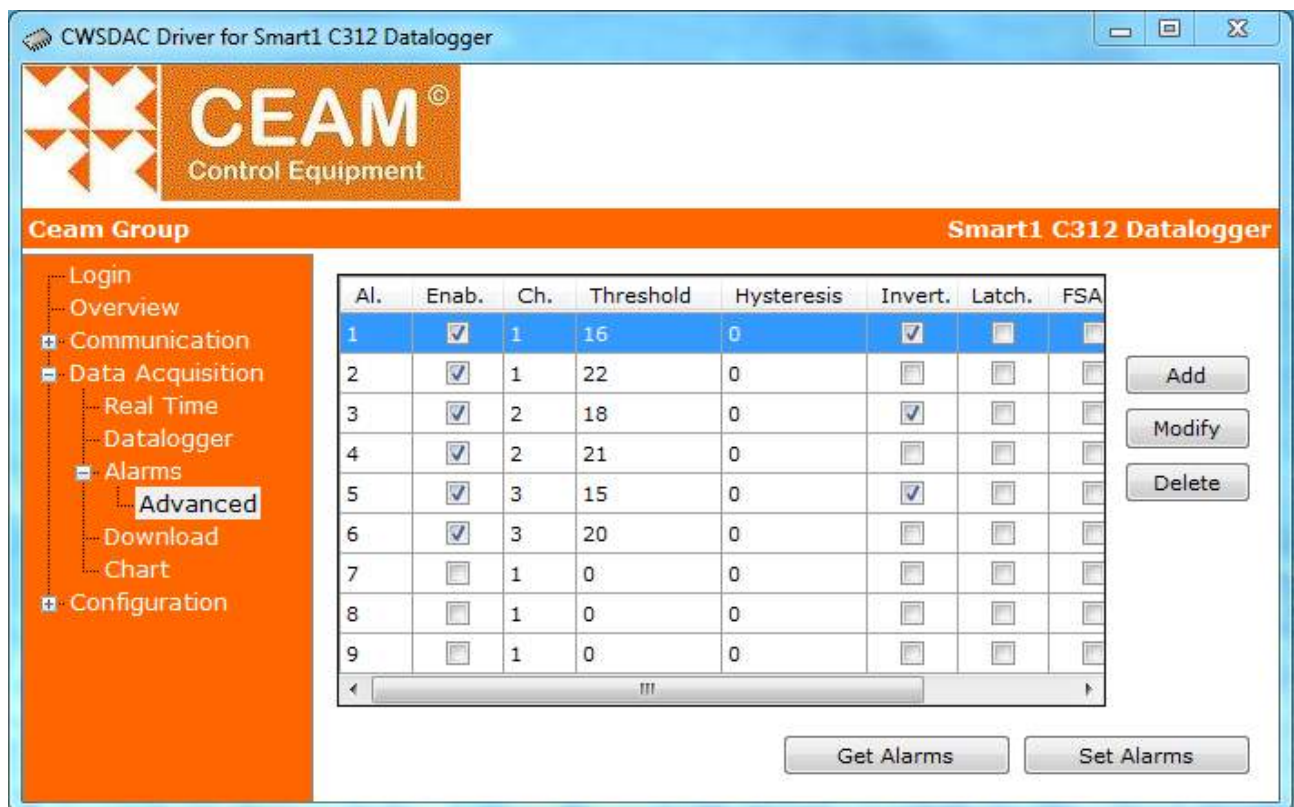
- Trigger Delay = set the alarm delay i.e. after how many samples being in alarm level the device will trigger the alarm.

6.2.8   Download

The user can download the samples stored by the datalogger by pressing the Download Samples button. In the main window the list of all samples is shown, with acquisition date and time in the first column. After a successful download is possible to save the acquired data in CSV format (CSV export).
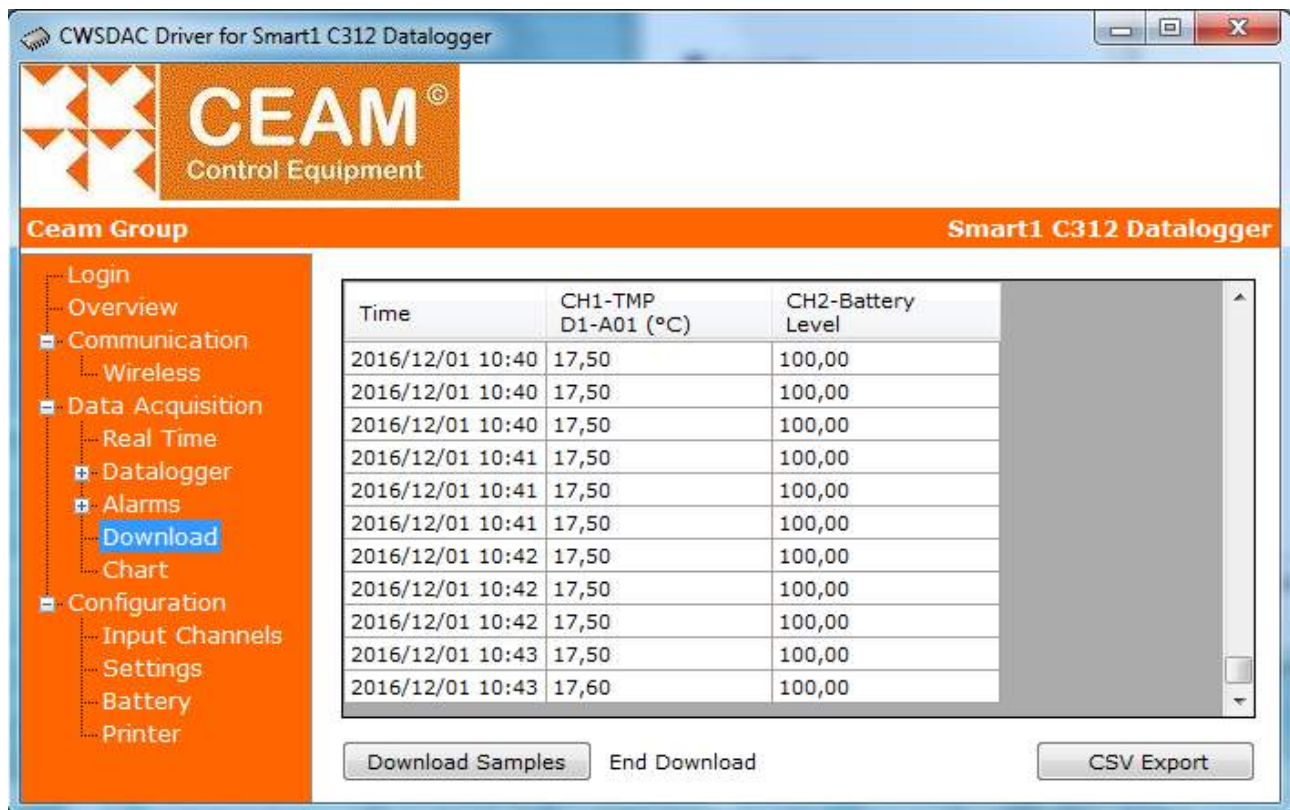
6.2.9   Chart

In the Chart tab, the user can view graphs of the acquired samples. The graphics are not navigable nor modifiable; they are intended to give the user an immediate feedback on the progress of the acquired samples.
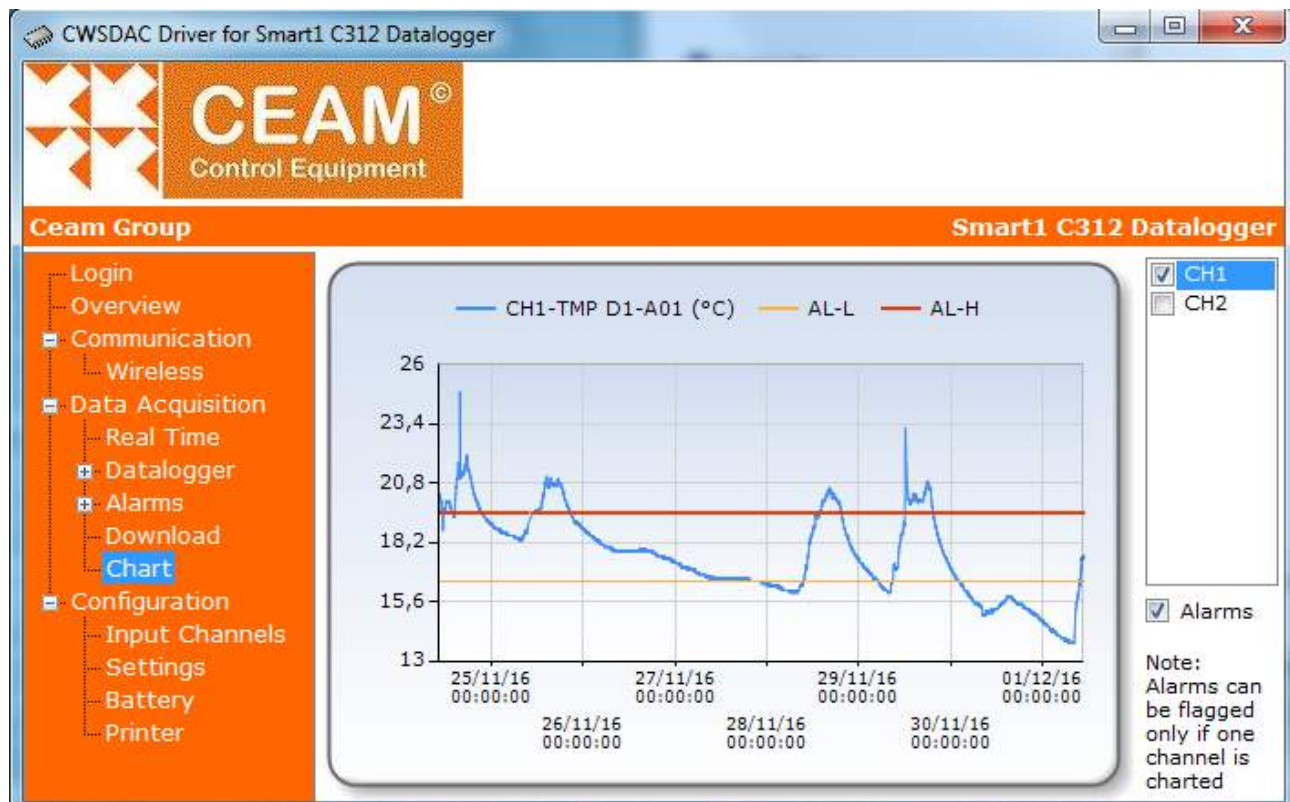
By default the first channel is plotted; on the right all the active channels are listed and the user can select multiple charts to be plotted at the same time. The window adapts to the sample values, so mixing charts of channels with very different values may result in a visualization harder to discriminate.
The graph can be zoomed, by clicking and dragging the mouse to create a rectangle around the area to be zoomed in. To go back to the previous visualization, i.e. to expand the vertical and horizontal ranges, just click on the small circles on the axes.
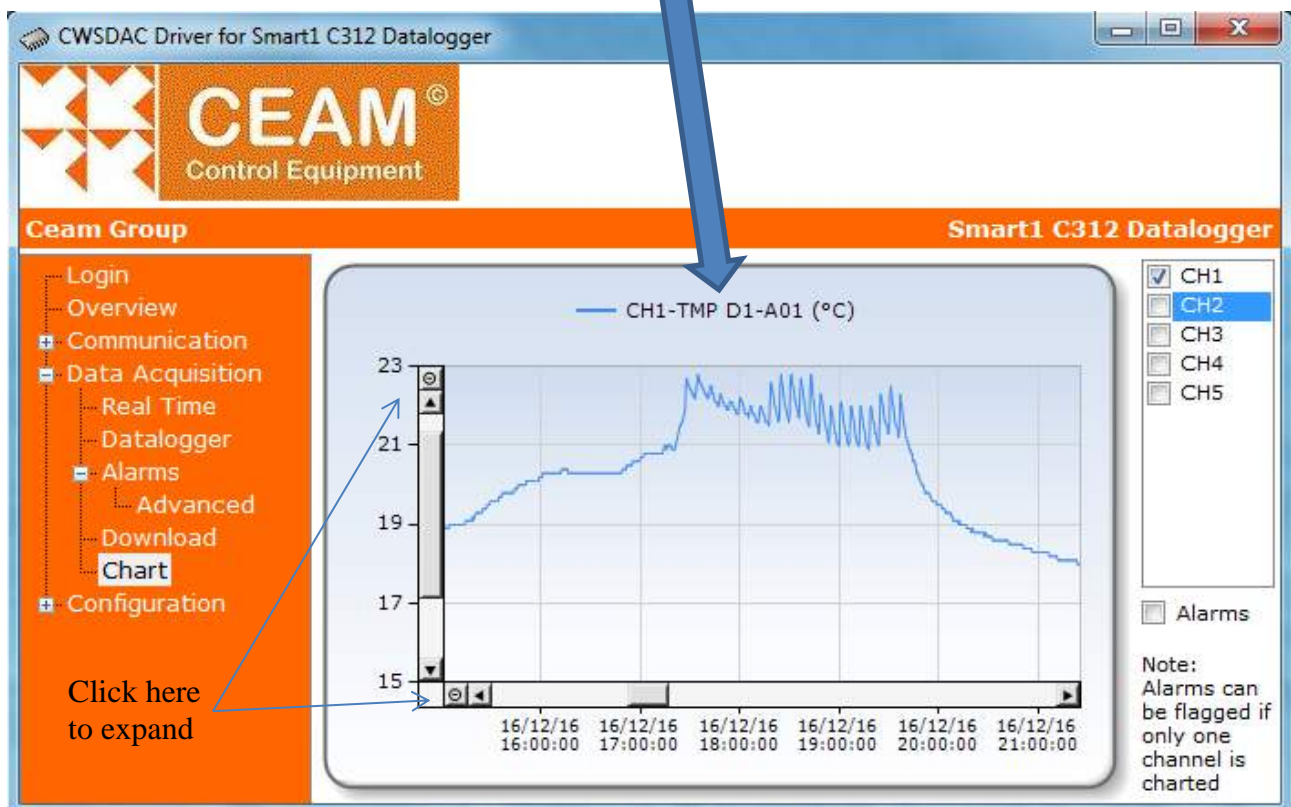
If only one channel is charted, the Alarms checkbox is active. If flagged, the low-level and high-level alarms (if present) are added to the graph.
If more features are needed, export data samples in csv format (explained in the previous section) and use standard software tools.

6.2.10 Input Channels
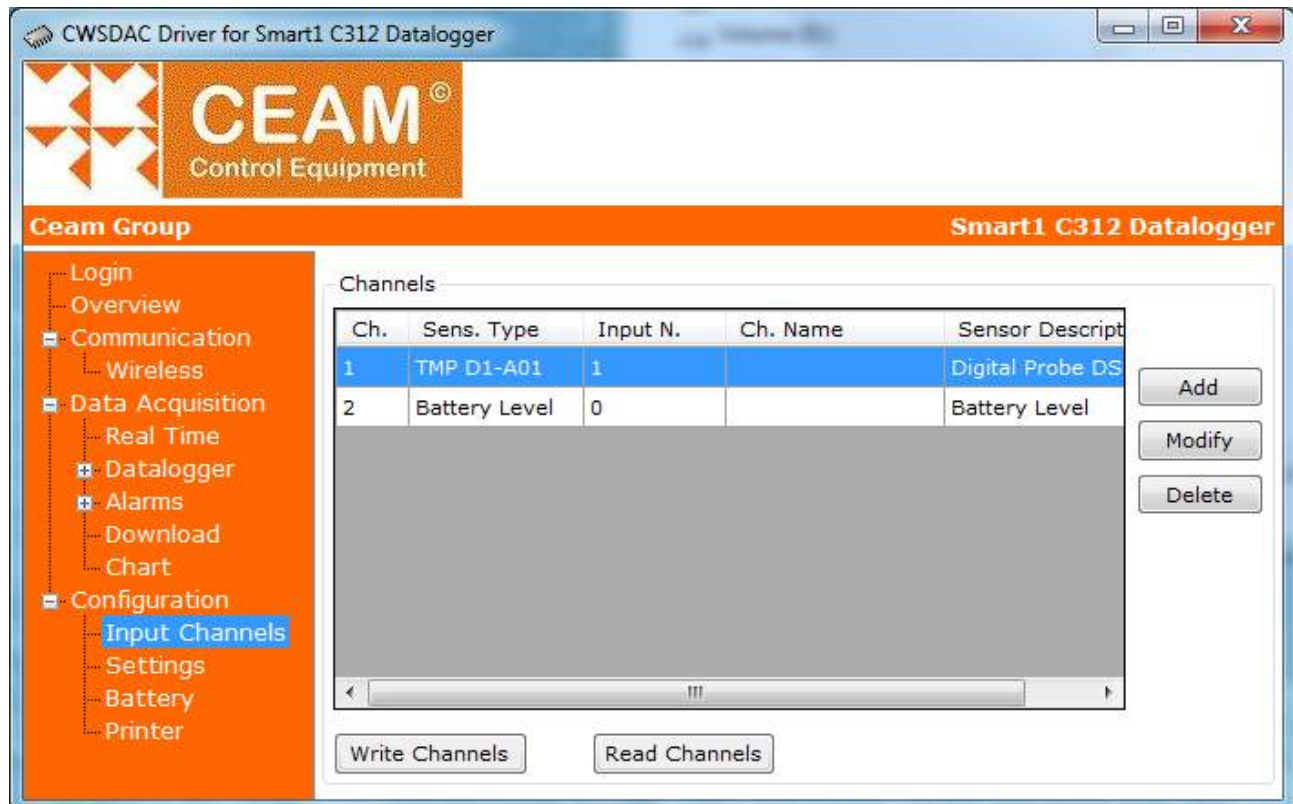
The Input Channels tab allows the user to configure the input physical ports and to associate them to channels.
By clicking on Add or on Modify, the user can access the New Channel pop-up and define a new channel (or modify an old one).
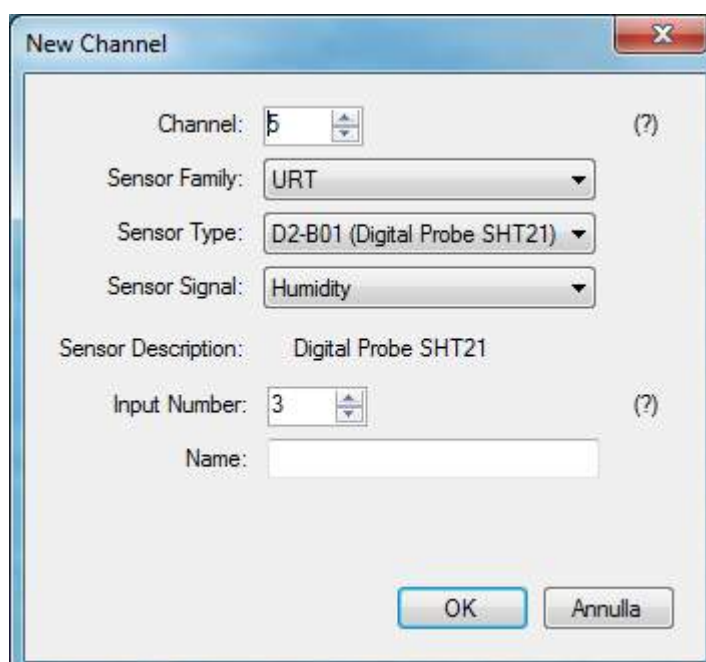
First select the Sensor Family, then the Sensor Type and eventually the Sensor Signal (only available for multiple channel digital probes).
Please remember the difference between Channel and Input: channel is a progressive number that is associated to the input variable so that it can be identified by the user interface software. Input is the physical connector of the device (use 0 for internal sensor).
Warning: changing the Input Channels settings and/or using different probes respect to those purchased may damage the device and immediately voiding the warranty.

6.2.11 Settings
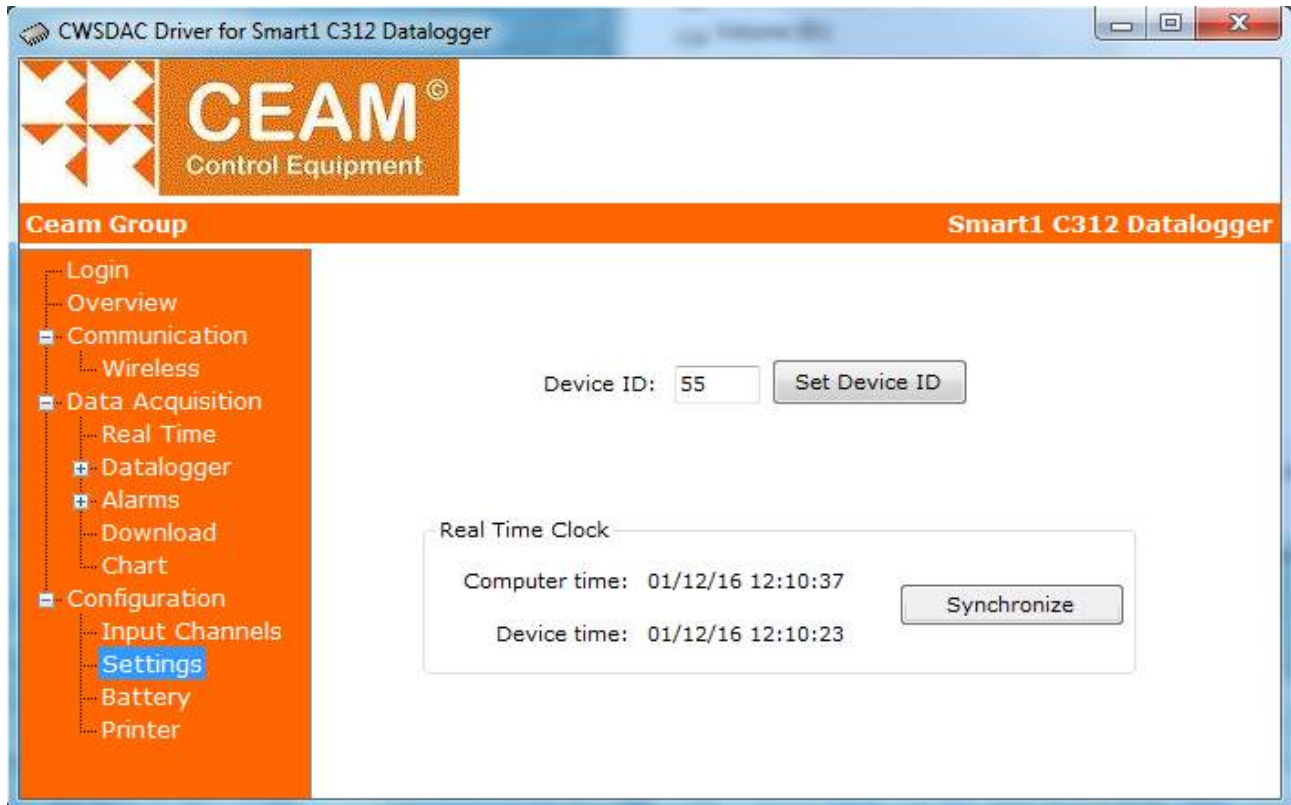
In the Settings tab the device ID can be read and, if needed, modified.
It is also shown the device time; a synchronization with the PC time is available.

6.2.12 Battery

The Battery tab is about the type of battery currently installed in the C312-DLA. The default battery is the Lithium-Polymer Rechargeable with a capacity of 2600 mAh.

6.2.13 Printer

The Printer tab is about the customization of the receipt.
In the fields Title, Subtitle and Footer the user can enter the text strings that will be printed on the receipt.
The printer is connected to the USB port.
Please note that currently the print button is only available on the version with one multipolar connector. Ask CEAM Customer Service for more details.

6.3   Creation of a virtual serial port

As already described at the beginning of this chapter, two ways are available to connect to the C312-DLA: a direct connection of a PC to the C312-DLA via a mini-USB cable, or an indirect connection via one Ethernet-to-wireless gateway of the D9000 family.

If we connect to the C312-DLA via USB cable, the PC will automatically create a COM port and will be automatically added to the list of existing COM.

Warning: first connect the C312-DLA to the PC, wait for the driver installation, then open the Netscanner to have the new USB COM in the list of available COM ports.

To use an indirect connection via a Ethernet-to-wireless gateway, we need to create a new virtual serial port.

Here below a brief guide to the creation of a virtual serial port. Several applications can be used to create a virtual serial port; just as an example, we describe the steps to create a virtual COM by using the Tibbo Device Server Toolkit (TDST) Software for Windows, downloadable for free from http://tibbo.com/soi/software.html.

1.   Install the VSP Manager program.

2.   Run the VSP Manager.

3.   Clic Add
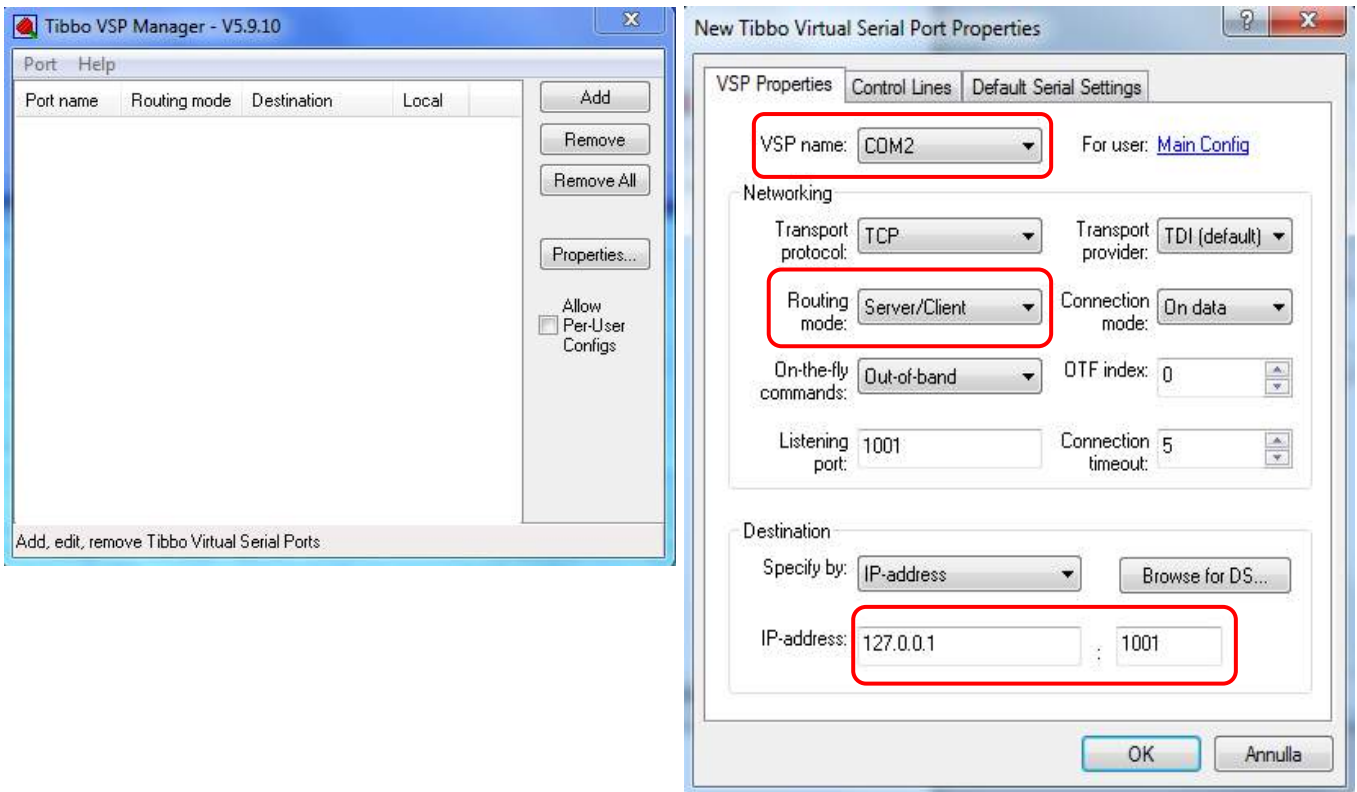
Specify the COM port to be created and other parameters, including the IP address and port of the Ethernet-to-wireless gateway connected to the C312-DLA and the Routing Mode.
Routing Mode: if you are using a D9040 gateway, select Server / Client; if you are using a D9019 gateway, select Server.

Click the Default Serial Settings Tab and set the speed of the COM port:
Set the baud rate to 19200.

Then click OK to create the new virtual port.

6.4   Configuration of a variable with CWS32

To ensure a proper visualization of the data samples recorded by the C312-DLA, here below a brief guide to configure a new input variable in CWS32, the web-based platform from CEAM. The intention of this guide is to configure a variable acquired from the C312-DLA; the reader is supposed to be already familiar with CWS32 and having already installed in the PC. Please refer to the CWS32 manual for more details about the installation and an overview of its features.

- Run CWS32

- Click the Configure Tab => Variables

- Click the New icon

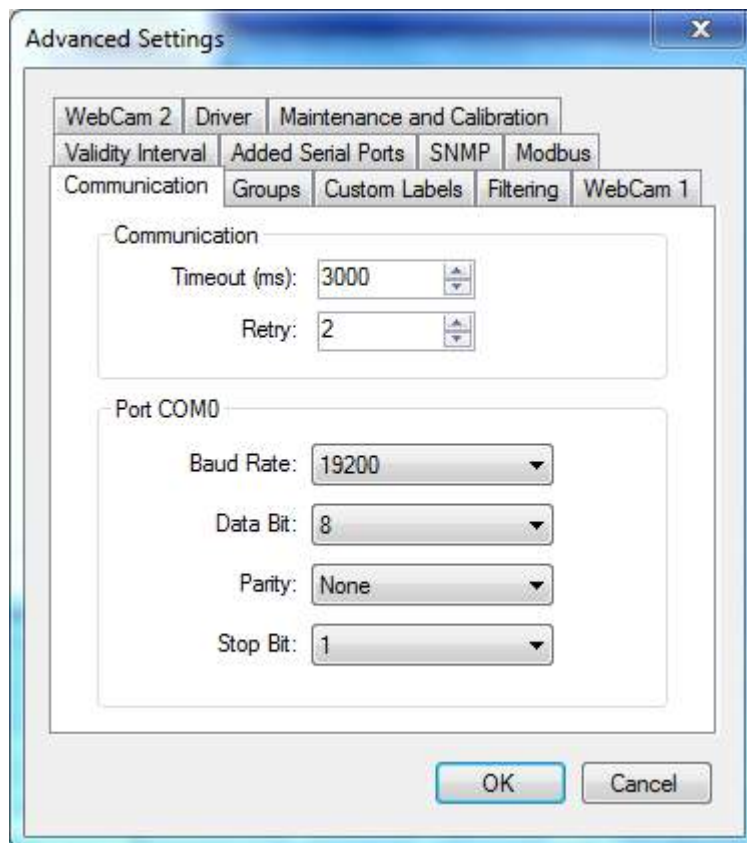Set the highlighted fields as shown in the image (for the complete guide, please refer to the manual of CWS32).

Finally, click on the button "Advanced" to set the baud rate of the COM port:
For the wireless connection set to 19200.

Now the variable is successfully configured and it appears on the CWS32 main page. For example it can be one of the variables displayed in the following picture: please note that all the active variables in the picture have a time in the lower part of the window; this indicates they are acquired through a wireless connection and the C312-DLAs are supposed to connect again after that time.

## 6.5 Configuration of the C312-DLA via gateway (CWS32)

In the 6.2 paragraph we have already described how to connect to a C312-DLA via USB connection and how to configure it using the Netscan software. In this paragraph we will see how to perform the same operations via indirect mode (i.e. through a Ethernet-to-wireless gateway).
In the main page of CWS32, right-click on a variable acquired by a C312-DLA (see the previous picture as an example); in the pop-up menu, select "Device".

The first page that will pop-up is a login page; after submitting the correct password (CWS32 is the default password) the following page will be the Overview. Despite the USB connection, the Overview page is not immediately available: in the top bar the text "Device available in…." appears and the whole page is greyed and all functions are disabled. This is because the DLA-C312 is a stand-alone, battery-powered device and communication occurs only at certain intervals of time.

As soon as the C312-DLA connects to the CWS32 to transfer its data samples, it is notified by the SW to keep active the connection and wait for user's inputs: the page gets black and all functions active. If the window is closed the connection will be closed as well, so to communicate again we have to repeat the reservation operation.
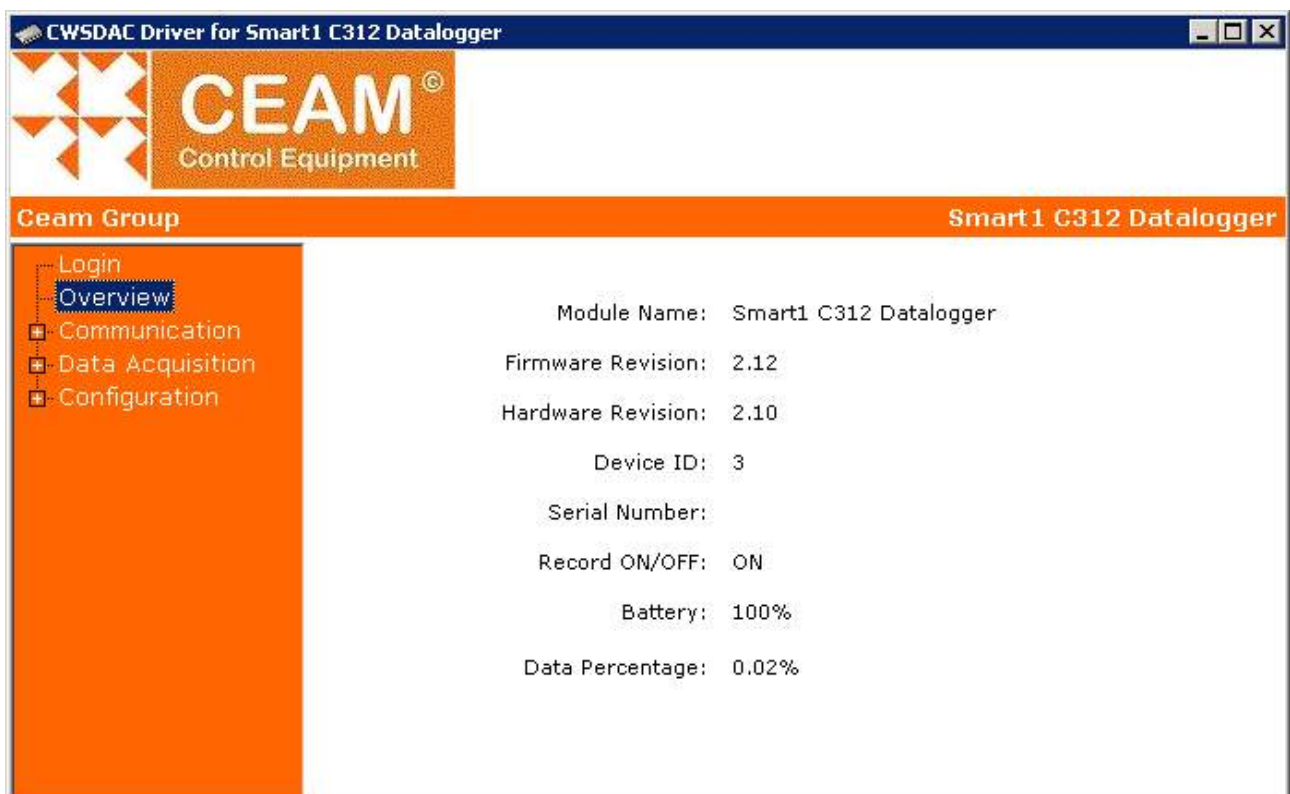
6.6   Transport mode

The C312-DLA is a battery-powered datalogger so one of its possible applications is monitoring the transportation of goods; in particular a common use is to monitor medical transports, where the organic material must be kept under monitoring to record a potential anomaly during the transport.

6.6.1   Automatic download (stand-alone mode)

When a C312-DLA is used in a transport application can exploit a couple of more features; the first is the automatic data sample download.
First of all connect the C312-DLA with a mini-USB cable to the PC and follow the brief guide of par. 6.4 to create a new variable with CWS. The only differences are those highlighted in the following picture:
1 – the connection uses a USB connection instead of a virtual serial port: in this case COM24 is the COM the O.S. has automatically associated to the USB.
2 – check the Enable Data-Logger Option: this checkbox enables the automatic download. When the variable has been created, the C312-DLA can be disconnected. Typically the C312-DLA is started recording as soon as the transport begins and is connected back to the PC as the transport ends. The data samples are store in the C312-DLA memory during the transportation; to download the data to the PC, just connect to it via USB cable. Once the C312-DLA is connected via USB the CWS forces the data sample download, with no need of user interaction, so that the variable is immediately updated with the new data.

6.6.2   On-the-fly download (wireless network)

In case multiple gateways are met by the C312-DLA along its trip, another feature is available: it is possible to configure multiple virtual serial ports for a single variable (see picture). After having configured the variable as depicted in the par. 6.4, click the Advanced button and select the Added Serial Ports tab. Here multiple virtual ports can be associated to the variable, each corresponding to a Ethernet-to-wireless gateway. All gateways supposed to communicate to the C312-DLA must use the same radio channel as the C312-DLA. The C312-DLA is set to try to transmit its data with a period corresponding to a Transmission Time (see par. 6.2.5).
If one transmission is captured by a gateway, it is re-transmitted to the CWS and an acknowledge sent back to the C312-DLA. If no gateway is in a valid range, the C312-DLA will abort the transmission and re-try at the next period. With this feature a C312-DLA can acquire data sample during a transportation and transmit data to the server every time it meets a gateway; so it is possible that data acquired along each leg are then transmitted to the server in the following station, not just at the headquarter.
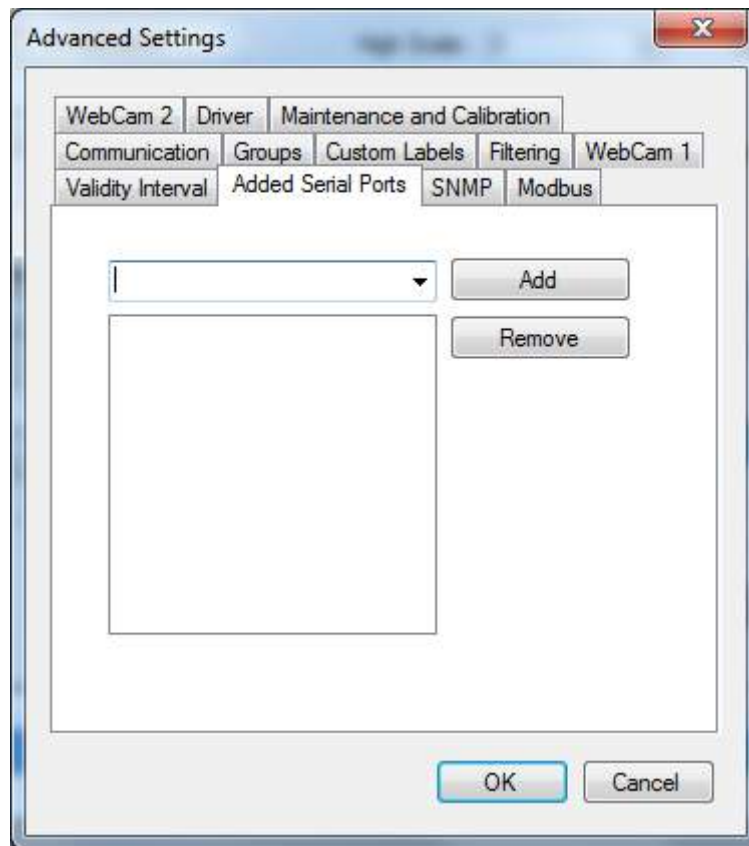
7. **Warranty**

Attention!!

The present handbook is merely indicative, and it is subject to changes in any moment, without giving any notice.

Not respecting strictly the indications of this handbook, opening and altering the product, the incorrect use, the wrong wiring, the using of spare parts or optional accessories not original CEAM Control Equipment, the removing of the labels, of the identification marks put by CEAM Control Equipment, and the hidden export to Extra CE countries, all these make CEAM Control Equipment no more responsible of the product and the warranty is void.

WARRANTY TERMS: the product is under warranty for a period of 12 Months (Art. 1490 C.C. and following) starting from the delivery note date, also in case it is in vision, and then transformed in selling, the complete text of the warranty conditions offered by CEAM Control Equipment in conformity to the actual laws are published and are at disposal of any people which demand for them. The document is registered both in paper form and in electronic form and to see it, it is sufficient to make a written request, specifying the title of the applicant.

The warranty covers:
The products and the components whose bad functioning is referable for sure to production defects. The eventual defect gives the right to repair it, and not to substitute the product. An eventual production defect does not give any right to resolute the contract, or to suspend the payment if not expressly given a written consent by CEAM.

The warranty does not cover:
Defects generated by incorrect or improper use of the product
Defects generated by using spare parts or consumables products not original CEAM
Defects generated by environmental and/or atmospheric problems and/or natural calamity
Products and/or services tampered or modified even partially
Products and/or services to which have been taken off, or tampered, even partially, labels and lot codes original CEAM

In any case, the warranty does not cover:
Batteries, magnetic devices, perishable products and/or consumable products
The components of Third parts, to which it must answer directly, the assistance service of the same, with the modalities provided from them.
The technical time used to verify and/or to repair the products
The travelling allowance, and the technical intervention on place, if effected.
The packaging and shipping cost of the products to the customer and back.
All the additional costs supported by CEAM to fulfil the warranty.

Clause of responsibility exclusion
CEAM does not assume any responsibility, regarding eventual damages, direct or in direct, caused to people or things, or damages for non-production and/or incorrect production and/or eventual damage, in some way referable to the product and/or to this handbook service.

CEAM does not assume any responsibility regarding eventual damages caused to people or things because of the eventual not conformity to the product and/or service of the present handbook, which is merely indicative, and that can be changed by CEAM in any moment without giving any notice.

8. **How to Order**

Base Instrument:

The DLA-C312 is a multifunctional device that can be purchased in various operating configurations depending on the application.

For the definition of the correct complete order code refer to the product code table that can be downloaded directly from the Internet or requested to the customer service.

Accessories & Options:

External probes for C312-DLA that do not include the built-in sensor
Probes only for Analog Temperature RTD PT100 - Compatible with C312-DLA:
Series C312-PRB-RTD - Remote Probes, Only Temperature, Analog RTD PT100 Sensor
Request Table Coding Product for the definition of the Complete Code of Desired Version

Only Digital Temperature probes - Compatible with C312-DLA:
Series C312-PRB-D1 - Remote Probes Only Temperature with Digital Sensor (Sensor CEAM © D1)
Request Table Coding Product for the definition of the Complete Code of Desired Version

Digital Temperature-Humidity Probes - Compatible with C312-DLA
C312-PRB-D2 - Remote Probes Temperature + Relative Humidity with Digital Sensor (CEAM Sensor © D2)
Request Table Coding Product for the definition of the Complete Code of Desired Version

Software Utility - Vers. For Off-Line application (Config. - Management - Data Download Direct via USB cable)
Art. 5B090 - C312-CWS32-SWT1-PRO

Professional Monitoring Software Via Wireless - Web - Cloud Computing
Note: These software versions in addition to the C312-DLA model, are multi-protocol and enables users to manage all the other instruments of the series © Smart1 CEAM and may also acquire and manage third-party products, for more details contact customer service or ask for specific documentation

Art. 5A638 - CWS32-H01-LT - Base License Remote Control & Monitoring
Version limited to max 6 Variables acquirable

In alternative to the limited version

Art. 5A637 - CWS32-H01-PRO - Base License Remote Control & Monitoring
Professional version without limits of acquirable Variables

Power Kit – Battery Recharging + USB Standard cable for Recharge & PC connection:
Art. 0A729 -Kit Complete USB Recharging - Network Module 220Vac + Car Cigarette Lighter Form 12 Vdc + USB Cable 1 mt
Art. 0B080 - Cable + USB Power Supply Network Module 220Vac + USB Cable 1 mt
Art. 0A731 - USB Charging Kit - Car Cigarette Lighter Socket - 12 Vdc - USB Cable 1 mt

USB cable for power supply - Charging and PC Connection:
Art. 7638 - USB-Mini USB cable - length 1,5 mt
Art. 7637 - SB-Mini USB cable - Length 5 meters

OEM USB cable Only Power for Fixed Wireless Professional Applications
Art. 5B088 - C312-PCA-12-24-MUSB - Movable Cable Supply OEM 12-24 Vdc

Auxiliary battery modules for life extension:
C312-APU - Various models of Auxiliary Power Unit - Require Available models
Auxiliary battery packs to extend the range of the datalogger C312-DLA

Wireless Gateway module for the creation of the Wireless Network Compatible with C312-DLA
D9020 Series - Various models available - Demand for the Table Product Coding for choosing the desired model

Other Matching Products Reported:
Tools - Sensors and Calibration Systems for the Periodic verification of calibration of instruments

Company With Quality System Certified

UNI EN ISO 9001:2008

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