

# Datalogger



- ① **Manuale d'uso**
- ② **User manual**
- ③ **Einbau und Bedienungsanleitung**
- ④ **Manuel d'utilisation**
- ⑤ **Manual de utilización**

→ **LEGGI E CONSERVA  
QUESTE ISTRUZIONI** ←  
→ **READ AND SAVE  
THESE INSTRUCTIONS** ←

**CAREL**  
Technology & Evolution



**I Smaltimento del prodotto**  
L'apparecchiatura (o il prodotto) deve essere oggetto di raccolta separata in conformità alle vigenti normative locali in materia di smaltimento.

**GB Disposal of the product**  
The appliance (or the product) must be disposed of separately in accordance with the local waste disposal legislation in force.

**F Élimination du produit**  
L'équipement (ou le produit) doit faire l'objet d'un ramassage particulier en conformité avec les normes en vigueur locales en matière d'élimination des déchets.

**D Entsorgung des Produktes**  
Das Gerät (oder Produkt) muss im Mülltrennungsverfahren in Übereinstimmung mit den örtlichen Entsorgungsnormen entsorgt werden.

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Los componentes (o el producto) deben ser tratados separadamente en conformidad a la normativa local vigente en materia de reciclaje.

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Il prodotto CAREL è un prodotto avanzato, il cui funzionamento è specificato nella documentazione tecnica fornita col prodotto o scaricabile, anche anteriormente all'acquisto, dal sito internet [www.Carel.com](http://www.Carel.com). Il cliente (costruttore, progettista o installatore dell'equipaggiamento finale) si assume ogni responsabilità e rischio in relazione alla fase di configurazione del prodotto per il raggiungimento dei risultati previsti in relazione all'installazione e/o equipaggiamento finale specifico.

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*Das CAREL Produkt ist ein Produkt nach dem neuesten Stand der Technik, dessen Betriebsanleitungen in den dem Produkt beiliegenden technischen Spezifikationen enthalten sind oder - auch vor dem Kauf - von der Internetseite [www.carel.com](http://www.carel.com) heruntergeladen werden können.*

*Der Kunde (Hersteller, Planer oder Installateur der Endausstattung) übernimmt jede Haftung und Risiken in Bezug auf die Produktkonfiguration zur Erzielung der bei der Installation und/oder spezifischen Endausstattung vorgesehenen Resultate. Die Unterlassung dieser Phase, die im Benutzerhandbuch verlangt/ angegeben ist, kann zu Funktionsstörungen der Endprodukte führen, für welche CAREL nicht verantwortlich gemacht werden kann. Der Endkunde darf das Produkt nur auf die in den Produktspezifikationen beschriebenen Weisen verwenden. Die Haftung CARELS für die eigenen Produkte ist von den allgemeinen CAREL Vertragsbedingungen (siehe Internetseite [www.carel.com](http://www.carel.com)) und/oder durch spezifische Vereinbarungen mit den Kunden geregelt.*

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El producto CAREL es un producto avanzado, cuyo funcionamiento está especificado en la documentación técnica suministrada con el producto o descargable, incluso antes de la compra, desde el sitio de internet [www.carel.com](http://www.carel.com). El cliente (constructor, proyectista o instalador del equipo final) asume toda la responsabilidad y el riesgo relativos a la fase de configuración del producto con el fin de los resultados previstos en relación a la instalación y/o equipamiento final específico.

Pasar por alto dicha fase de estudio, la cual es solicitada/indicada en el manual de uso, puede generar funcionamientos anómalos en los productos finales, de los cuales no se podrá responsabilizar a CAREL. El cliente final debe utilizar el producto sólo en las modalidades descritas en la documentación relativa al producto en sí.

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# User manual

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## Introduction

CAREL presents the new Datalogger range compliant with European directives 89/108/EEC, 92/2/EEC, EC regulation 37/2005 and Italian decree laws no. 110 of 27/01/92 and no. 493 of 25/09/95, which require the recording and conservation of data corresponding to the temperature of frozen foodstuffs for at least one year. As regards EC regulation 37/2005, the Datalogger model fitted with standard Carel NTC probe, code DLOGNTC015, is compliant with standard EN 12830 on temperature recorders for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream. Designation of the instrument: EN 12830, S, A, 1. -35T30 °C.

The Datalogger of the Carel range is an electrical device offered in various models, that can monitor and record data read by two or four temperature probes. In this manual we present the two-channel model.

## Kit

Description of the kit content: 1 Datalogger, 1 manual, 1 calibration certificate, 1 small bag containing 5 screws, packing. The probes are sold separately. The use of CAREL code DLOGNTC015 probes is suggested.

## Mounting

The Datalogger can be both panel or wall mounted.

### Panel mounting

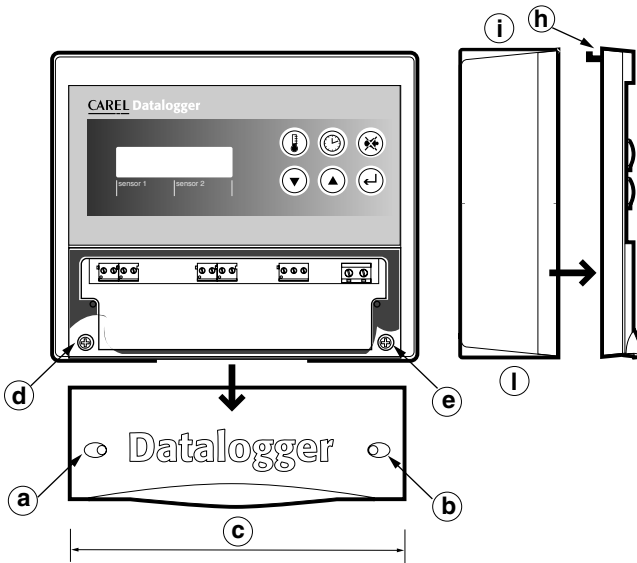
- Make a hole in the panel with the following dimensions: 182x153mm.
- Unscrew the two frontal screws (see a, b) and take out the central door (c).
- Unscrew the two screws (d, e) that keep connected the lower and frontal cover of the Datalogger and separate the two parts.
- Make two holes in the back part (in the perforated part- f, g).
- Join the back part and the front, with the panel in between, and fix the whole with the two screws (dimensions: 4x10mm) that are contained in the kit.

**N.B.** It is necessary to remove the two upper fixing teeth (h) of the frontal part before the panel insertion. Make the hole in the back upper (l) or lower part (i) to allow the cable passage. The pitches of the established threads ranges from PG9 (diameter: 16mm) to PG21 (diameter: 29mm). In order to make easier the drilling operation, the use of a drill and a cutter is suggested. Connect the cables to the terminal block. Screw again the screws (d, e). Then screw the door (c).

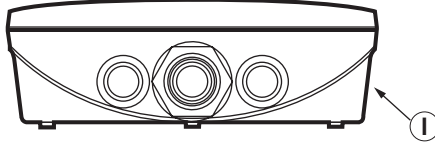
### Wall mounting

- Unscrew the two frontal screws (see a, b) and remove the central door (c).
- Unscrew the two screws (d, e) that keep connected the lower and frontal cover of the Datalogger and separate the two parts.
- Once decided where to pass the cable duct or the cables (from above or from below) and then after making the proper holes (in the part drilled in advance - i, l) for cablepresses and pipepresses, make three holes (m, n, o) both in the Datalogger and in the wall itself.
- Insert the "wall" nugs, contained in the kit, into the holes made in the wall and then fix the back part of the Datalogger with the three screws (m, n, o) and the relevant Orings to the wall itself.
- Afterwards, fix the cablepresses or pipepresses before mounting the frontal part of the Datalogger.
- Subsequently, mount the frontal part, being careful with the positioning of the upper teeth (h) and the proper fixing of the two screws (d, e) (do not press excessively in order to avoid plastic deformation).
- Only after the connection of the cables to the terminal block, the door can be shut again.

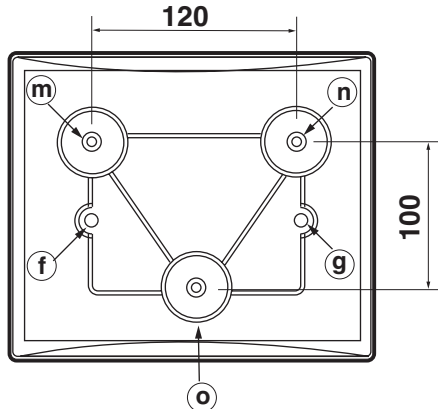
**Attention:** After the wiring fix the cables by the proper cable-tie.



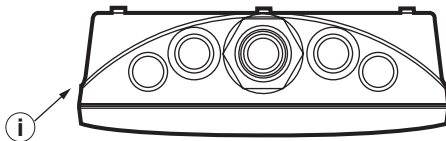
upper part



back side

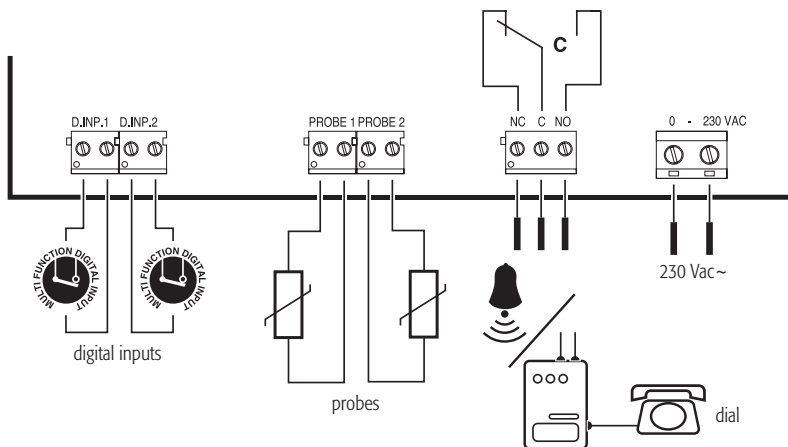


lower part



**Important:**

- Avoid mounting the instrument in rooms with the following characteristics:
  - wide and fast fluctuations of the ambient temperature;
  - relative humidity exceeding 80%;
  - exposure to direct water jets under pressure;
  - remarkable magnetic and/or radio frequency interferences (e. g., of transmitting antennas).
- Utilize lugs suited to the terminal block in use. Loosen each screw and insert into them the lugs, afterwards tighten the screws. Finally, gently pull the cables to check their correct clamping.
- Separate as much as possible the cables of the probe signals and of the digital inputs from the power and inductive load cables in order to avoid possible electromagnetic noises. Absolutely do not introduce into the same cable ducts (included those of the electric cables) power cables and probe cables. Avoid the probe cables being installed close to power devices (contactors, magnetothermals, or other devices). Reduce as much as possible the course of the probe cables in order to prevent the occurrence of spiral courses enclosing power devices. To extend the probe cables, utilize cables with a minimum section of 0.5 mm<sup>2</sup> at least.
- Do not get near the electronic components mounted on the cards with your fingers in order to avoid stray currents (extremely harmful) from the operator to the components themselves.

**Connection**

**Caution:** an improper power supply connection can seriously damage the system.

**Power ON**

When switched on, the instrument displays an introductory mask reporting the version of the software installed. After a few seconds, the instrument enters the normal functioning mode, in which the read temperature and date are shown. At the first switching on, the operation parameters are those of default (see the table on page 15).

Once selected, the desired values of the parameters are stored and recalled at every successive Power ON.

If at the switching on the mask:

## FLASH DOCTOR...

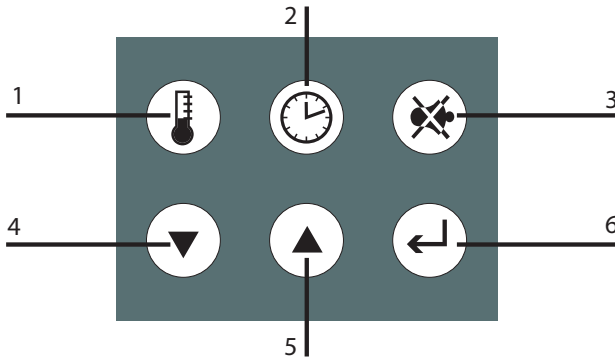
appears, it means that the instrument has undergone damages of the hardware type (see the ALARM section).

## Programming

The instrument allows the display and storage of the temperature measured with, at most, two distinct probes (NTC). The stored temperature is the instantaneous value detected at selectable time intervals (see mask 3). In addition to the two probe inputs, the instrument is equipped with two clean digital outputs and one exchange-relay alarm digital output. It is possible to choose whether to activate only one probe or both.

Each digital input is coupled with only one of the two probes. The keyboard consists of six buttons, four of which are provided with back-lit LEDs.

### Description of the buttons



Function buttons provides an easy to use format

- 1 Recorded temperature and general information display button;
- 2 clock programming button;
- 3 buzzer silencing and alarm display button;
- 4/5 stored data scrolling buttons;
- 6 parameter selection button.

### TEMPERATURE Button

#### TEMPERATURE Mode

With a gentle pressure on the button, the main mask is displayed (also present at the switching on and during the normal functioning of the instrument).

05/11/1996 12:53  
+18.5°C ROOM1




1 configured probe

05/11/1996 12:53  
+18.5°C -12.5°C

2 configured probes



Date, hour and alphanumeric field ("Room 1" in the example) are selectable by entering the mode "MODIFY PARAMETERS". In the presence of particular conditions (alarms, defrosting) the unit of measure of the temperature (°C) is being replaced with a special character indicating the type of alarm or the cell state. As regards the description of the special characters and the management of the alarm conditions, see the description of the "ALARMS" mode.

By pressing the   buttons it is possible to scroll the temperature data previously stored (i.e. the "historical"), followed by the relevant possible alarm characters (in this mode the LED relevant to the  buttons lights up).




If at the storage moment the instrument was configured for two probes, two temperature values will be displayed (only one value otherwise). Other special characters show special situations such as a power supply failure, special character the letter "P" (Power ON) in a time selection one "T" (Time) is being displayed, whereas one "D" indicates a "cell defrosting" (see parameters 6 and 7 in the mode "MODIFY PARAMETERS").


In the absence of data of the historical, the following mask appears:

**No Data Logged**


It is possible to select a date from which to begin to scroll the historical, by selecting the "CLOCK" mode. If no button is pressed for at least one minute, the Datalogger automatically displays the main mask.

### INFORMATION Mode

A prolonged pressure (5s) of the  button enters the information mode. With the   buttons the following information masks are being scrolled:

**Available Memory**   
**352 days**

Storage day number still available before the old ones are being overwritten. The maximum available storage occurs after a Download.

**Last Alarm 10**   
**02/05/96 15:42**

Date and hour of the last alarm numeric code associated with the alarm (in the table no. 1 a list of codes is shown).

**Last Download**   
**02/05/96 13:15**

Date and hour of the last Download.




**Last Power On**   
**02/05/96 12:42**

Date and hour of the last Power ON.

**User Name**   
-----

**Serial Number**  
150 (V2.2)

Serial number of the instrument and software version.






After a switching off, the last alarm information is lost. The "Operator Name" is selectable manually with the mode "MODIFY PARAMETERS", whereas the serial number and versions are fixed. The  button, finally, allows regulating manually the display contrast by pressing it simultaneously with  or  (to darken or clear).

## **CLOCK Button**


### **CLOCK Mode**

A gentle pressure on the button causes the following mask display appearance:



**Search Log Data:**  
04/04/1995 11:12

The cursor is already positioned on the first digit. It is now possible to select a date for the search of the temperature values at a certain moment, in the "historical": each pressure of the button  carries the cursor onto a different field of date and hour. The   buttons permit the variation of each singular digit. With a last pressure of the  button, the search of the data corresponding with the selected date. The **search** is successful if a datum is found with a date corresponding with the selected one or if there are two dates respectively preceding or following the selected one. In case of discontinuities in the date storage (e.g.: after a solar/summer time selection), it is possible that one and the same date appears several times. In this case the search start recognizes the less recent one. By pressing the  button, all the other ones are being circularly displayed. In the absence of the searched datum or if, after finding a datum there are no other data to be shown, the following mask appears:

**No Data Logged**

The prolonged pressure (about 3s) of the button  displays the mask:




**Summer/Solar**  
▲+1 15:42 -1▼

for the rapid change of the summer time to the solar time and viceversa. When the summer time is selected and the solar time is requested, 1 hour is added to the clock by pressing the  button (+1 ▲). If erroneously the  button (-1 ▼), is pressed, nothing happens. The same is true, with the due differences, in the reverse passage from the solar time to the summer time. The modification, if it occurred, is automatically being accepted by the instrument. If no button has been pressed, the instrument returns to the main mask after about 1 minute.

**Caution:** if the LED coupled to the CLOCK button blinks, this means that the Clock chip is damaged and a backup "virtual" clock has been activated, in order to go on with the recording. For further details see the "Accidental alarms" section.

## **ENTER Button**

### **PARAMETER MODIFICATION Mode**

The access is possible through a prolonged pressure (about 3s) of the  button. In this mode it is possible to select different parameters of operative interest and to enter them a 4 digit numerical password is required (for default it is 0015). It is keyed in by utilizing   and if it is correct, direct access to the "parameter" mask is allowed. Otherwise, after the message of "Wrong Password", the main mask is displayed again.

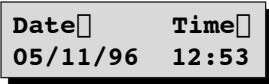
The modifiable parameters are:

- 1**  **Number of Probes**  
1

Number of configured probes (1 or 2). Default 1.
- 2**  **User Language**  
English

Language being utilized (English, Italian, French, Spanish, German). Default English.
- 3**  **Sample Time**  
15 min

Time interval between two successive samplings. (Default 15 min). If a reduced value is selected, not allowing a continuous recording for one year, or an anomalous interval, the user is informed by a message (beside the selected value the word "Warn.!" appears).
- 4**  **Text Probe 1**  
Room1

It is possible to assign a name to the probe 1.
- 5**  **Date** **Time**  
05/11/96 12:53







Date and hour.
- 6**  **Digital Input n1**  
Disabled

Door no.1 switch (Disabled, norm. open, norm. closed, defrosting). Default Disabled.
- 7**  **Digital Input n2**  
Norm.Open

Door no. 2 switch (Disabled, norm. open, norm. closed, defrosting). Default Disabled.
- 8**  **Temperature Unit**  
°C





Temperature unit of measure (°C, °F). Default °C.

- 8 **Temperature Unit**  
°C  
Temperature unit of measure (°C, °F). Default °C.
- 9 **Buzzer Status**  
Enabled  
Buzzer (Enabled, Disabled). Default Enabled.
- 10 **User Name**  
-----  
Operator Name (responsible of the checking).
- 11 **Door Alarm Delay**  
60 min.  
Door Alarm Delay. Default 60 min.
- 12 **Relay contact**   
Norm.Close  
Relay Contact management (Disabled, norm. open, norm. closed). Default Normally Closed.
- 13 **MaxBlackoutTime**  
15 hours  
Maximum selectable time (in hours) to signal a selectable blackout with a longer duration. It can also be disabled. Default = 0 (disabled). If the instrument will be switched off for a time exceeding this parameter, an alarm is being started.
- 14 **Serial address**   
05  
Identifies the instrument in the serial communication.
- 15 **LO\_Al HI\_Al Del1**  
-50 +50 20 min  
HIGH and LOW temperature threshold of the probe 1 and respective alarm DELAY. Default +50 °C of high temperature, -50 °C of low temp., 30 min of delay.
- 16 **LO\_Al HI\_Al Del2**  
-50 +50 30 min  
HIGH and LOW temperature thresholds of the probe 2 and respective alarm DELAY. Visible only when the second probe too is configurated. Default -50°C of high temp., +50°C of low temp., 30 min of delay. To avoid erroneous alarms, it is not possible to select high temperature thresholds lower than the low temperature ones.
- 17 **New Password**  
0001  
New password, to modify the one already existent. The "0000" value disables the password.

To scroll the different masks, the   buttons are usually being used. By pressing  the cursor is being positioned on the parameter to be modified and with   its value is being increased/decreased. By pressing again  the cursor disappears and the modification of the parameter becomes operative.

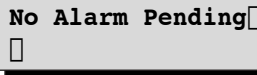
## **ALARM Button**

### **ALARM Mode**

The instrument can manage two different types of alarms, that is those directly dependent on the temperature change and those caused by accidental conditions such as prolonged blackouts or damages to the Datalogger itself. In both cases, the recognition of the alarm condition is followed by the buzzer activation (if previously enabled), the switching of the alarm relay and the lighting of the red LED coupled with the button . A pressure on the button  silences the buzzer, releases the relay and displays the informative masks regarding the activated alarms. By moving with the   buttons all the present masks are being scrolled, if they are more than one.

- **Lack of alarms, normal functioning conditions**

If the  button is pressed under normal conditions, simultaneously appears the mask:




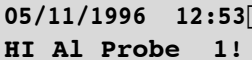
**No Alarm Pending**

- **Alarms depending on temperature variation**

For these alarms the user has the opportunity to select a time delay between the occurrence of the alarm condition and its notification by means of the procedure that has been previously described (buzzer activation, relay switching, red LED lighting). The alarms that depend on the temperature variation are:

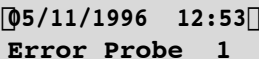
- *Open door (#)*: if the alarm is being signalled, the door of a cell remains open for a time exceeding the selected one.
  - *Short-circuited probe error (Err+)*: the instrument signals if a probe is short-circuited. The signalling delay is of one minute not selectable.
  - *Open probe error (Err-)*: the instrument signals if a probe is open. The signalling delay is of one minute not selectable.
- High and low temperature limits (!): the instrument signals if the temperature of one of the probes is beyond the selected limits of high or low temperature (after time delay).

The alarms of this type are signalled in the main mask by special characters, here indicated in brackets, that appear overlapping the field reserved to the temperature (or to the unit of measure) relevant to the alarm probe. If for a same probe two error conditions occur simultaneously, the symbol “\*” appears. Some examples are further illustrated. The masks relating to these alarms that appear when pressing the  button are:



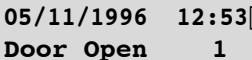
**05/11/1996 12:53**  
**HI\_A1 Probe 1!**

Alarm of high temperature measured by the probe 1 (the case of the alarm of low temperature and of the probe 2 is similar).




**05/11/1996 12:53**  
**Error Probe 1**

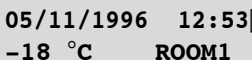
The probe 1 is short-circuited.



**05/11/1996 12:53**  
**Door Open 1**

The door 1 is open (analogous for the door 2).

The hour reported in these masks that of the alarm beginning. As long as the alarm condition is present, the LED coupled with the  button is blinking, whereas when the anomaly cases the LED switches off. To better explain the use of the special characters, below is shown how the main mask appears in the cases of alarm that can take place with only one probe configured.



**05/11/1996 12:53**  
**-18 °C ROOM1**

Normal condition.

```
05/11/1996 12:53 [
-12.5 # ROOM1
```

Door 1 open.

```
05/11/1996 12:53 [
Err- ROOM1
```

Open probe.

```
05/11/1996 12:53 [
+5.0 ! ROOM1
```

Alarm of high temperature.

The last one occurs when the limit of high temperature, selected in the mode of "PARAMETER MODIFICATION", is placed, e.g., at 30 °C. Analogous is the case of the low temperature alarm.

#### • Other alarms

For these alarms, a delay selectable by the user is not provided. They are:

- *Blackout*: if the parameter "Maximum Time of Blackout" (parameter 13 in hours) is enabled, the duration of each power failure is evaluated in hours. If it is greater than the selected Maximum Time, the instrument warns through an alarm according to the previously indicated procedure. The mask indicating the presence of this alarm is:

```
Warn.!Black out!
```

- *System error*: when switching on, in the presence of damages to the Clock chip, a routine of reconstitution of the Flash pointer is started and on the display the following message will appear:

```
FLASH DOCTOR...
```

If the reconstitution has a favourable outcome, only the selected values of the parameters are lost, and so the instrument will start again with the default values. The user is warned of this by an alarm and the mask:

```
System failure: [
FLASH EPROM
```

After stopping the alarm, it will be possible to reset the desired values of the parameters.  
 If on the contrary the reconstitution fails, it means that the temperature data previously stored are, at least in part, cannot be retrieved. In this case the alarm starts and the fixed mask below appears:

**System failure:**  
**LOST PARAMETERS**

Even though the Datalogger keeps on sampling the temperatures, the management of the stored data is no more ensured, and so it is advisable to contact CAREL.

Furthermore, there is the case in which the instrument shows some irregularities of the Clock during the normal operation. In this case a "virtual clock" begins functioning and ensures, as far as possible, the data acquisition and storage. The user is informed on this possibility by the blinking of the LED coupled with the "clock" button, in addition to the usual alarm procedure. The mask revealing this alarm is:

**System failure:**  
**CLOCK ERROR**

In the presence of this mask, it is advisable to insert the date again (see "Enter button - Parameter Modification Mode"). If this mask persists, contact CAREL for assistance.  
 Anyway, the virtual clock is activated.

**The temperature storing**

The temperature data are stored together with the date and hour and further information that appear with the stored temperature. As regards the encoding of this information, see table 2.

Note that a selection of the sampling time lower than 14 minutes (also for a time period) does not ensure any more the data conservation for the period established by the law (one year).

**Alarm codes**

Cod.	Description	Cod.	Description
1	probe 1 temperature alarm	9	open door 1 error
2	probe 2 temperature alarm	10	open door 2 error
3	-----	11	-----
4	-----	12	-----
5	probe 1 error	13	blackout error
6	probe 2 error	14	flash fair
7	-----	15	clock error
8	-----		

Tab. 1

**Symbol description**

P	identifiers the first datum recorded at the power on together with the switching on hour
T	identifiers the first datum recorded after the hour selection by user
D	defrosting activated
#	situation of open door
Err+	short-circuited probe
Err-	open probe
!	alarm of high or low temperature
*	alarm of high or low temperature and situation of open door



Tab. 2

## Default parameters



Parameter	Default value
• probe 1 high temperature alarm	50 °C
• probe 1 low temperature alarm	-50 °C
• probe 1 temperature delay alarm	30 minutes
• probe 2 high temperature alarm	50 °C
• probe 2 low temperature alarm	-50 °C
• probe 2 temperature delay alarm	30 minutes
• probe number	1
• sampling period	15 minutes
• password	15
• buzzer	ON
• digital input 1	disabled
• digital input 2	disabled
• temperature	°C
• open door delay alarm	60 minutes
• blackout alarm	disabled
• relay	normally open
• probe 1 text	room1
• user name	-----

Tab. 2

## Specifications for the Download

It is possible to transfer the data concerning the temperatures to be filed (by means of a PC or printer) by utilizing an appropriate module connected to the Datalogger: the CAREL Download module (code DLOGSER000). If this does not happen, after a period of time higher than one year, the Datalogger begins the overwrite of the old data in order to place the new ones (see the mask "Available storage" in the "INFORMATION MODE"). The dumping of the data takes place through a telephone dial. Once the serial connection has been established, press simultaneously the  and . Now a mask for the choice of the established type of Download is displayed.

▲ From last D.L.  
▼ All data log.

When pressing the  button the transfer of the data recorded by the previous Download starts. When pressing the  button the Download of the whole storage starts. If the buttons have been pressed before connecting the Download module, the following warning appears on the display:

Connection fail.

If, on the contrary, the connection has already been carried out during the button pressure, the transmission starts immediately. The Download operation starts after an acoustic signalling and the mask below appears:

Downloading...   
25 %



The percentage indicates the fraction of data already transferred. If the operation is carried out correctly it will be possible to read the following message:





Download OK

otherwise, if for instance there is no more place in the storage of the Download module (where the data are being dumped) or an error has occurred in the connection or something else, the following message will appear:



Download failure

The Download operation ends after an acoustic signalling. Being in the Download mode, it is possible to go to the other modes (for example, to check possible new alarms) by pressing the relevant buttons. In this case the user will be informed on the state of the Download by an arrow on the right bottom corner of the display. By pressing the two  and  buttons as long as the arrow is present, it will be able to return into the Download mode and display the mask relevant to the phase being reached by the data transfer. When being in the Download mode, the temperature sampling is in any case active.

### Example of data print by Download (table print)

The following page is a model of printing of the data recorded by a Datalogger and dumped on a disk through the CAREL Download modules – DLOGSER000. From October 1997 the portable module DLOGPC0000 will be available. Both modules are managed by Windows™.

In fact each line of the table corresponds to a recording, of which the date, the hour, the temperature measured by the probes, the state of the digital inputs and of the relay outputs, the information on the Power ON, on the time change and the alarms are reported.

Furthermore, the data that are included within particular ranges (“filters”) selected by the user via software are pointed out in italic boldface. Thus, it is possible to detect which temperatures have exceeded the high or low temperature thresholds or which are the data stored by the Datalogger at a certain time interval.

In the model page here reported the following filters were selected:

- Selection 1: the data stored between 12:00 and 13:30 hours of the 18/02/1997 day have been sought
- Selection 2: for the probe 1 a high temperature threshold equal to -17.5°C has been selected, equal to the relative threshold selected in the Datalogger (and so in the Alarm column the corresponding alarm symbol appears).
- Selection 3: for the probe 2 a low temperature threshold equal to -19.0°C, different from the relevant to the threshold selected in the Datalogger (as a consequence, in the Alarm column no alarm symbol appears).
- Selection 4: the probe 2 has been configured only at 9:00 hours of the 18/02/1997 day, and therefore there are temperature recordings relevant to it only beginning from this hour. In the previous recordings the character “-” is reported to indicate its absence.

For a two channel Datalogger model (such as the one presented in the example) the absence of the probes 3 and 4, of the digital inputs 3 and 4 and of the digital output 2 is similarly reported.

At the end of each page the serial number and model (2N=2 channels, 4N = 4 channels) of the Datalogger, with which the data have been stored, the name of the operator in charge of the instrument, the signature and date at and hour in which the print has been carried out are reported.

A space is also provided for the authentication of the document by the firm that is the holder of the Datalogger, that may personalize the print by inserting its own name (“Supermarket “XYZ” in the example) at the head of each page, near the logo and the writing “Datalogger CAREL”.

Finally it is worth noting that the print is optimized if the interval between two successive recordings is of 15 minutes. In this case to each page correspond the data being recorded throughout 24 hours.

**Note:** it is possible to print the temperature data graphic on a A4 format sheet. Please find an example of graph print on page 20.

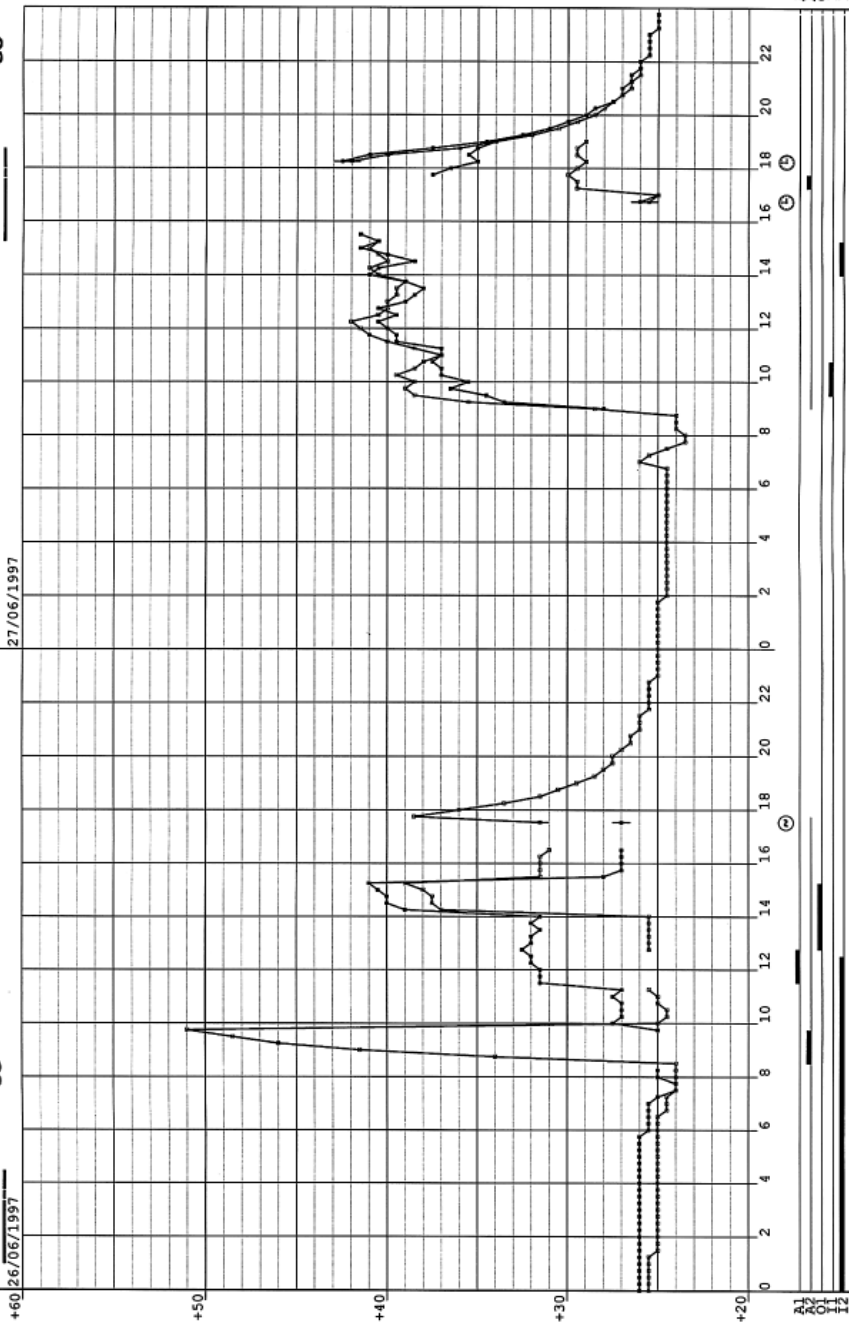




# Example of graph print by Download

CAREL Datalogger

CAREL Datalogger

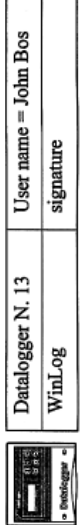


ⓐ Power on  
ⓑ time ch.  
ⓓ Alarm probe 1  
ⓔ Alarm probe 2  
ⓕ Dig. Output 1  
ⓖ Dig. Input 1  
ⓗ Dig. Input 2

ⓐ Datalogger

Datalogger N. 13      User name = John Bos      07/07/1997

WinLog      signature      page n. 1



# Technical specifications

## Inputs

Temperature	2 NTC configurable probes. °C	°F
Range of measure	-50T75°C	-58T167°F
Precision	1°C from -35°C to +30°C	
Resolution	0.5°C	1 °F
Digital	2 digital inputs with clean connection and not optoinsulated (configurable).	
Probe response time (at 90% of the final value)	70 s. in still air for NTC probe, 80 s. in total, instrument response time included.	

## Outputs

Alarm relay	1 exchange relay
Relay specification	Maximum voltage 300 Vdc/250 Vac, maximum current 8A, maximum power 2000VA (with resistive charge).

## Serial connection

1 serial RS 485 (not optoinsulated) for Download.

## Power supply

Voltage	From 230 Vac -15% to 230 Vac +10% (i.e. 196 to 253 Vac)
Absorption	5 VA

## Immunity of the device against overvoltage

Category 3

## Conditions of utilization

Operating temperature	0T50 °C (32T122 °F)
Storage and transport temperature	-30T70 °C (-22T158 °F)
Ambient relative temperature	20 to 80 % r.H. no condensating, both when operating and in storage
Environmental pollution	Normal
Electrical stress across insulating parts	Long period utilized for continuous use
Ageing period	60.000 h

## Insulation

PTI of materials used for insulation	Class II 250 V
--------------------------------------	-------------------

## Mechanical specifications

Instrument connections	At will, panel or wall mounting
Containers	Plastic self-extinguishing (according to UL94-V0) - category D according to CEI60730-1
Protection degree	IP65
Connections	Through screw terminals with a maximum section of 1.5 mm <sup>2</sup> , minimum section 0.5 mm <sup>2</sup>
Parameter modifications	From keyboard and from PC by the DLOGSER000 module
Software structure	Class A
Dimensions	190x160x65 mm (see the draw on page 27)
Disposal of the product	avoid to put the device on the domestic rubbish. To dispose the device refer to the environmental protection laws in force in your country

**N.B.:** When cleaning do not use ethylic alcohol, hydrocarbons (oil), ammonia and its derivates. It is advisable to use neutral detergents and water

## Periodical verification procedures

CAREL certifies, with a paper included in the packaging ("Calibration certificate"), that the Datalogger was calibrated in the factory. Nonetheless, as established by standard EN 13486, the instrument must be periodically tested to ensure the reliability of the data recorded. Whatever the outcome of the verification, this one must be noted down and kept. CAREL reports an example of forms (see enclosures A, B and C). CAREL advises to follow the periodical verification procedures here enclosed which generally follows verification procedures established by the normative law relevant to the CAREL Datalogger. For more details, please refer to the laws in force in your Country.

### Measurement instrument

Direct comparison by using a measuring apparatus, periodically tested with thermometer and multimeter checked and certified by SIT. Since the Datalogger is guaranteed with a precision of  $\pm 1.0^{\circ}\text{C}$ , the error of the standard thermometer must be lower than  $\pm 0.2^{\circ}\text{C}$ , resolution 0.1.

### Preliminary operations

- Make sure the Datalogger is not near devices that cause electromagnetic interferences.
- Make sure the probes, and the relevant cables, are not placed immediately near other cables of electronic and electric devices.
- Clean the probe.
- Check the connections to the Datalogger, by making sure the Datalogger is carrying out the measurement of the temperature.

### Performance of the verification

- Verification should be carried out around the working temperature, keeping it constant as much as possible. It is absolutely necessary to avoid excessive changes of the equilibrium of the system, once the verification stage has been started (e.g. open the door, to allow the compressor to start, switch on the light, ...).
- Place the calibrated thermometer as near as possible to the probe to be verified, striving for an acceptable thermal coupling (e.g. by constraining the two - probe and Datalogger - sensors, with thermoconductive materials such as copper).
- Note down periodically the temperature simultaneously read by the precision instrument and the Datalogger, noting down possible modifications of the state of the system (e.g. stopped compressor, open door etc., so as to point out time response, delay time, heat radiation, etc.).

### Results of the verification

If the difference between the value measured by the Datalogger and that of reference is:

- Lower than or equal to  $\pm 0.8^{\circ}\text{C}$ , the outcome is acceptable.
- Ranging from  $-1.0^{\circ}\text{C}$  to  $-0.8^{\circ}\text{C}$  and from  $0.8$  to  $-1.0^{\circ}\text{C}$ , the outcome is acceptable, but the instrument must be verified within 6 months.
- Lower than  $-1.0^{\circ}\text{C}$  and higher than  $1.0^{\circ}\text{C}$ : the outcome is negative.

If the verification has a negative outcome, you can try to replace the Datalogger probe. If the Datalogger with a new probe proved again to be out of precision, the instrument has to be returned to CAREL for a new calibration.

### Important

The enclosures A and B of the manual are the masters to be photocopied at each verification. The copies of the enclosures A and B must be filled in and kept and represent the verification report of the Datalogger instrument.

The enclosure °C is the life-cycle sheet. It collects the data of each verification report. *These documents do not replace the calibration certificate issued by CAREL.* CAREL can carry out, on request, the periodical verification of the Datalogger for the customers. Please contact CAREL after sales service.

**Identification of the Body  
responsible for the Audit**

**Audit report  
n°: .....**

Complete at or by: .....

Designation  
of the audited equipment: .....

Manufacturer: .....

Type: .....

Serial number: .....

Audit date: .....

Performed by: .....

Name: .....

Signature: .....

Approved by: .....

Name: .....

Signature: .....

Test report no. ....

Page 2/" ....."

Measuring methods used: .....  
.....

Test equipment used: .....  
.....

Test conditions: .....  
.....

List of parameters tested: .....  
.....

Measurement uncertainties: .....  
.....

**Results**

Value measured by the working sample (A)	Value measured by the device being tested (B)	Difference B-A
.....	.....	.....

**Conclusion:**

The device tested satisfies the conditions for acceptance as defined in the procedure.

Yes  No

Remarks:





## Verification of the internal clock

The Datalogger records temperature and time. It periodically verifies the temperature measurement and also the precision of the internal clock. The maximum error permitted in the time measurement is 0.1% (equivalent to 8h and 40' per year). In order to test this, use a sample clock with an error lower than of 200 ppm. and note the seconds it indicates the instant that the Datalogger display shows a change of minute. Repeat this operation after at least an hour. The two second readings of the sample clock should not differ by more than one second. In this case the test is passed.

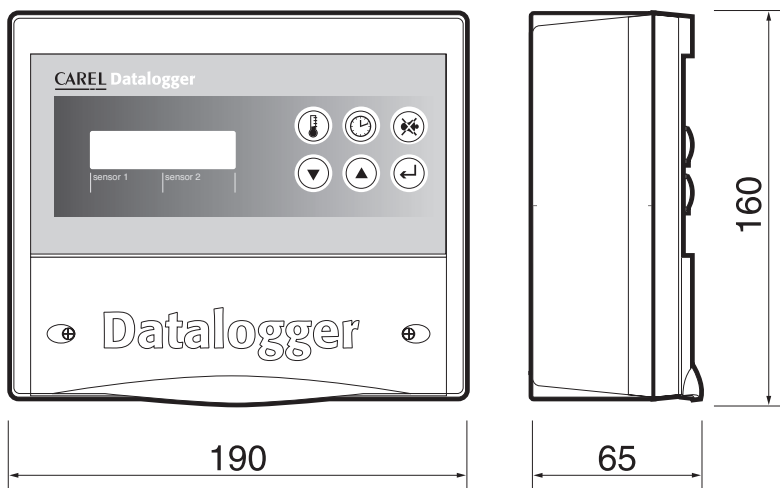
The error range during these operations could in fact be considered not greater than 3 seconds (1s of error in the initial second reading, 1s in the final one and a maximum of 1s of difference between the two sample clock readings) on a measured total time of 3600 seconds (1h). In percentage, 3/3600 is an error lower than the 0.1% required. If the sample clock is a chronometer, the test is easier.

For example, if the first reading is 26" and the second is 27" the test can be plotted as follows:

Serial number:		Installation date:		Place:	
Date	Test duration	Seconds of tot. error	Resultant precision	Result	Operator signature
01/01/98	1h	3	0.083	yes	.....

CAREL guarantees that the clock has been calibrated at ambient temperature with a maximum error of 50ppm = 0.005% (equivalent to 26' per year).

# Dimensioni / Dimensions / Dimensions / Abmessungen / Dimensiones (mm):



# CAREL

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Technology & Evolution

**CAREL S.p.A.**

Via dell'Industria, 11 - 35020 Brugine - Padova (Italy)  
Tel. (+39) 049.9716611 - Fax (+39) 049.9716600  
e-mail: [carel@carel.com](mailto:carel@carel.com) - [www.carel.com](http://www.carel.com)

**Agenzia / Agency:**