

# RC-3

## Temperature Data Logger Operation Instruction

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# RC-3 Temperature Data Logger Operation Instruction

## 1. Product overview

This data logger is mainly used for temperature recording during storage and transportation of foodstuff, medicine, chemicals and other products which are temperature sensitive. It is widely used in the ocean/air/highway transportation for the export oriented enterprises, or for large-sized global chain businesses.

## 2. Technical parameters

- Temperature measuring range : -30°C ~ +60°C
- Ambient temperature: -30°C ~ +60°C
- Storage temperature: -40°C ~ +70°C
- Accuracy : +/-1°C
- Resolution : 0.1°C
- Max Record capacity : 16000points
- Record interval : 10s ~ 24hour adjustable
- Sensor: Internal NTC thermal resistor
- Communication interface : USB interface
- Power supply CR2460 battery or USB port

**Power supply** : Internal CR2450 battery or via USB interface;

### **Battery life:**

If the record interval is 15 minutes, it can be used for more than one year at normal temperatures.

## 3. Physical specification

Product size: 84mm (length) X 44mm (width) X 20 mm (height); Weight: 38 g

## 4. Initial use

- 1) Install RC-3 temperature data logger software on a PC from the mini - CD.
- 2) Connect RC-3 with computer via USB, and install USB driver according to the Installation Tips.
- 3) Open RC-3 temperature data logger software, and click the "Connect" icon  in the toolbar to check the connection, and then exit from the connection interface.
- 4) Click the parameters icon  in the toolbar to set parameters. After setting the parameters, click "save" button to save all the parameters and exit from parameter setting interface.
- 5) Exit from RC-3 temperature data logger software.

## 5. Data access by software

The recorded data information can be accessed by the temperature data logger software. This process will not clear the historical memory or stop the recording process if it is in the recording state.

- 1) Connect the data logger with computer via USB cable.
- 2) After a successful connection the icon:  will be shown in the LCD display.
- 3) Open RC-3 temperature data logger software, and click the "Connect" icon  in the toolbar to check the connection, and then exit".
- 4) Click the icon  in the toolbar to upload the recorded data to the computer.

**Note:** Use the data logger software to set the parameters of RC-3. See section 8.2 for the details.

## 6. Function description of the LCD display

The data logger display interfaces includes: status display, record capacity display, time display, date display, Max. temperature display, Min. temperature display, temperature upper limit display, temperature lower limit display. The display is activated by pressing the button on the data logger.

If the button is not pressed for 15 seconds, the data logger will turn off the display automatically .

If the display is turned off, a short press of the button will activate the display. Each time the button is pressed the display will shift among the 8 display states according to the sequence as described below.

### 6.1 Status display

(Figure 1)



After a short press of the button, the display will be activated from the display-off state.

The temperature shown in the status display state is the current environmental temperature.

(full), (medium) or (low) indicates the battery level. See 7.5

In the status display state the following symbols can be shown:

- The symbol indicates that the data logger is in the state of recording
- The symbol indicates that the data logger has stopped the recording
- If the data logger has not started the recording function, then none of the symbols or are visible
- The symbols or indicates that the temperature measured has exceeded the upper or lower alarm level defined by setting of the parameters (see 8.2.3)

### 6.2 Record capacity display :

The symbol "Log" indicates that the number shown in the LCD is the recorded temperature group.

The interface is shown as Figure 2:

(Figure 2)



### 6.3 Time display:

The time display shows the hour and minute of the data logger. The time format is 24 hours.

The display interface is as shown in Figure 3:

(Figure 3)



### 6.4 Date display :

The date display shows the month and date of the data logger, as shown as Figure 4:

Note: The data below the symbol "M" indicates month, and the data below the symbol "D" indicates date.

(Figure 4)



### 6.5 Max.temperature display:

The maximum temperature measured since the beginning of recording is shown as in Figure 5:

(Figure 5)



### 6.6 Min.temperature display :

The minimum temperature measured since the beginning of recording, display interface is shown as Figure 6 :

(Figure 6)



### 6.7 Temperature upper limit display :

This value is defined in Parameter Setting  in the data logger software

(Figure 7)



### 6.8 Temperature lower limit display:

This value is defined in Parameter Setting  in the data logger software

(Figure 8)



## 7. Operation instruction

### 7.1 Start recording

After setting RC-3 parameters in the data logger software(see 8.2), the recording has not been started yet. This means that none of the symbols  or  are visible on the LCD display in the "Status display" mode. At this time, press the button for more than three seconds in the status display state to start recording. The symbol  will appear to show that the recording has started.

*\* Once the parameters have been entered using the data logger software any recorded data in RC-3 from a previous recording session will be erased. So please remember to read and save these data before parameter setting if required!*

## 7.2 Stop recording :

- The data logger will automatically stop recording when the recording capacity is full. In the LCD status display, the symbol “■” indicates that the recording has stopped.
- If “Stop by press” is set(See 8.2), press the key for more than three seconds, in the LCD status display the symbol “■” indicates that the recording has stopped.
- The recording can also be stopped by clicking the “Stop recording” icon  in the data logger software. In the status display state on the LCD-display the symbol “■” indicates that the recording has stopped. Note however that the data acquisition continues – also while RC-3 is connected to a PC and an while the “Upload data” icon  in the data logger software is used. In this manner the display of all data recorded so far can be refreshed from time to time by clicking the  icon.

\*After the data logger has stopped recording, it can not be started again by pressing the button. It can *only* be started by setting the parameters in RC-3 data logger software. See section 8.2 and 8.2.6.

## 7.3 Alert status Instruction

If the measured temperature during recording is higher than temperature upper limit, then the symbol “↑” will be shown in the status display interface - indicating upper limit alert; if the measured temperature is lower than temperature lower limit, in the LCD status display the symbol “↓” is shown, indicating lower limit alert.

## 7.4 Start a new recording

A new recording can *only* be started after the “Parameter Setting” icon has been selected and parameters saved in the data logger software( See section 8.2 and 8.2.6 ). Then none of the symbols  or  are visible on the LCD display in the “Status display” mode so the RC-3 can be disconnected from the PC and the recording can be started at a later time by pressing the button on the RC-3 for at least 3 seconds.

Many different RC-3 units can be initiated in this manner without terminating the data logger program, but after a new RC-3 unit has been connected it is necessary to click the “Connect” icon before any other operation.

## 7.5 Battery level indication

1) The battery level is displayed in RC-3 LCD screen.

2) Click the connection icon  in the toolbar of RC-3 data logger software to see the battery level.

Battery level indication on the LCD screen	Battery level color in the software	Level
	Blue 	25% - 100%
	Yellow 	10% - 25%
	Red 	<10%

Note: If the battery level is very low (<10%), please replace the battery. (See section 9)

# Software

## 8. RC-3 temperature data logger software

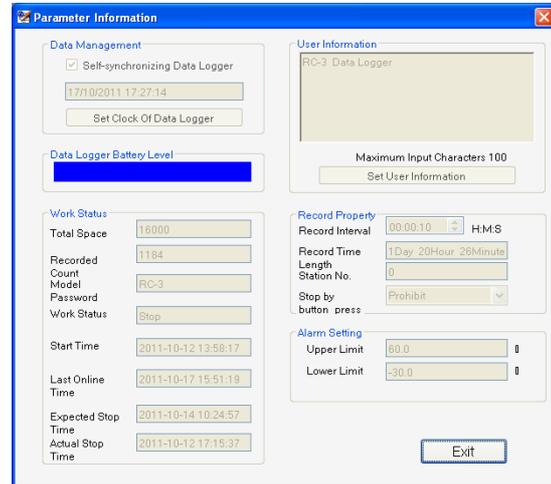
The software can analyze the data in the form of data table and curve graph and exported in picture format. Data recorded in RC-3 can be retrieved, saved, printed or exported in Word/Excel/TXT format.

More detailed information follows here.

### 8.1 Start of the program

When the data logger program is started the "Parameter Information" window will be shown if an RC-3 is connected. Otherwise connect an RC-3 to the USB port of the PC and click the "Connect" icon . This will make the "Parameter information" window appear showing current "Work status" (left frame) and "Record parameters" (right frame) of the RC-3.

These data are only shown for information purpose and none of them can be set here, so click the "Exit" button to close the "Parameter Information" window.



### 8.2 Setting parameters

#### 8.2.1 Record interval

The record interval is the time interval between the temperature readings. It can be set from 10 sec to 24 hours in RC-3 data logger software. The corresponding maximum duration of the recording will automatically be calculated and shown in the box: Record Time Length".

#### 8.2.2 Record time length

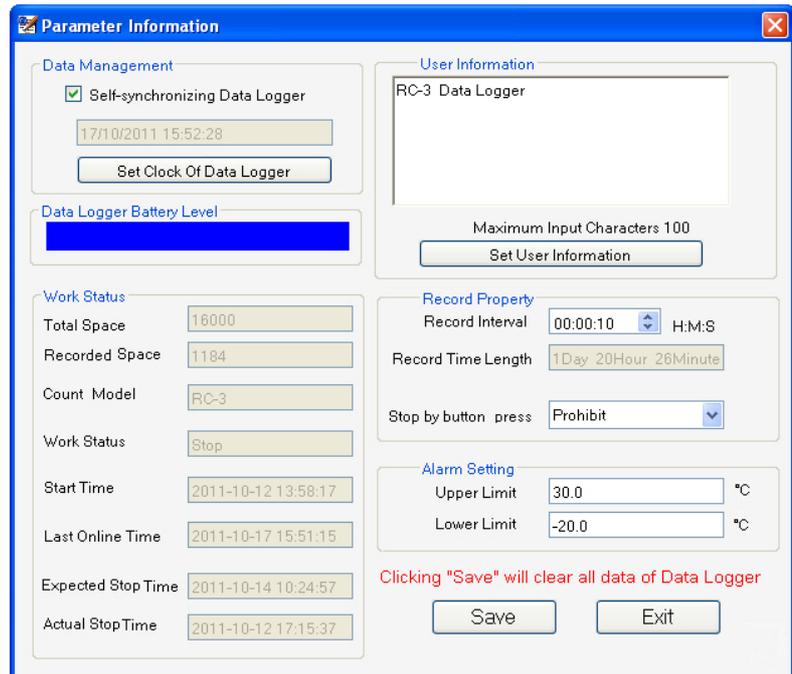
The "record time length" is the calculated total record time when the data memory reaches its full capacity.

#### 8.2.3 Alarm setting

Upper and lower Limit are the temperatures which will make RC-3 enter into an alerted state indicated by the symbols  $\uparrow$  or  $\downarrow$  on the LCD display

#### 8.2.4 Stop by button press

If "Permit" is selected then the recording of data can be stopped by pressing the button on the RC-3 for 3 seconds. Select "Prohibit" to prevent this event to occur by accident.



## 8.2.5 Internal clock and calendar

The settings of clock and calendar can be entered by RC-3 data logger software or it can be automatically synchronized to the clock and calendar of the connected PC

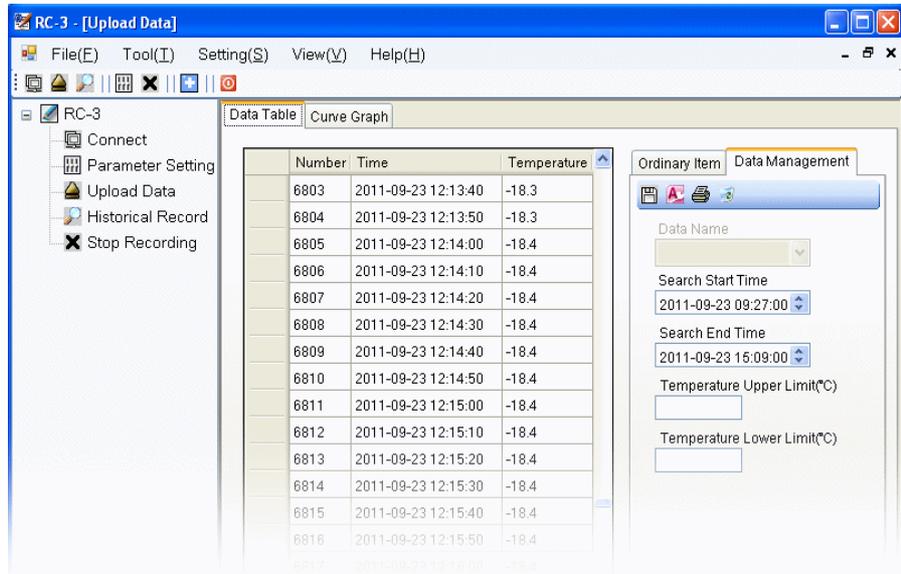
## 8.2.6 Save parameters

By clicking the “Save” button the parameters to be used for a new recording session will be set. This will also delete all recorded data in RC-3.

## 8.3 Retrieve data

If recorded data exists in RC-3 (the symbol ► or ■ is seen on the LCD display), then these data can be retrieved by clicking the “Upload data” icon, or data which have been saved on the PC(see 8.5) can be retrieved by clicking the “Historical Record” icon.

The data will be shown in table format and the parameters for the recording is shown in the right side of the data window, if the “Ordinary item” tab is selected in the box at the right side of the Data window .



If however the “Data management” tab is selected, then data can be Exported, Saved, Printed or Deleted as described in section 8.4, 8.5, 8.6 and 8.7)

## 8.4 Export Data

Data can be exported in various formats by clicking on the “Export Data” icon → 

Data can be saved as:

- .xls** report                      Microsoft Exel compatible
- .doc** file                         Microsoft word compatible
- .bmp** graphics file             Compatible to any graphics program
- .txt** file                         Compatible to Notepad and any other text editor program

Note that the exported data can be filtered – based on the values entered in the 4 search criteria boxes:

- **Search Start Time**
- **Search End Time**
- **Temperature Upper Limit**
- **Temperature Lower Limit**

In this way the data extracted can be limited to show only events of interest

## 8.5 Save to Database

Data is saved in a database on the PC as -.odb file by clicking on the “Save to database” icon → 

The data saved can be retrieved by clicking on the “Historical record” icon in the main menu → 

## 8.6 Print

Print the data table or graphical image on a printer by clicking on the “Print” icon → 

## 8.7 Delete



Delete the selected data from the database file on the PC by clicking on the “Delete” icon →

## 8.8 Display data

The data can be displayed in table format as shown in section 8.3 or as a graphical image as shown here.

### Cursor

A vertical cursor line can be dragged by the mouse to select a point on the graph which is shown in a table row below the graph.

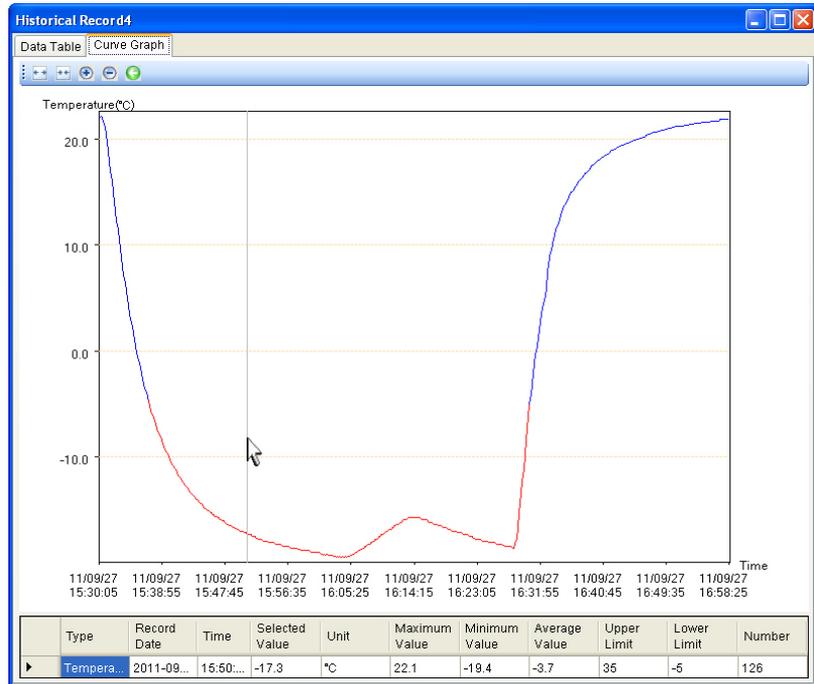
### Upper/lower limits

Temperatures beyond the upper and lower limits are shown in red colour on the graph.

### Graph format

The time axes can be extended or contracted by clicking the or icons and or can enlarge or contract the temperature/time display, while restores the both axes to the “auto-configured” state

Also note that the data can be filtered before the graph is shown. If the “Data management” tab is selected in the box at the right side of the Data window after the data has been retrieved(see section 8.3), then the 4 search criteria boxes: “Search Start Time”, “Search End Time”, “Temperature Upper Limit” and “Temperature Lower Limit” can be used to select show only the data of interest



Horizontal extension Horizontal contraction Enlarge Contract Restore

## 9. Battery replacement :



Figure 1



Figure 2

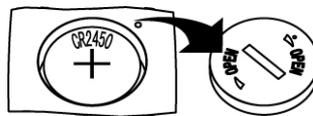


Figure 3

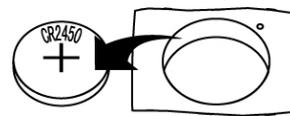


Figure 4

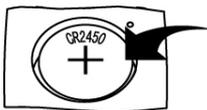


Figure 5



Figure 6



Figure 7

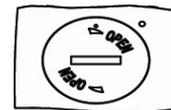


Figure 8

### Replacement steps :

- 1) Rotate the battery cover clockwise to the position as shown in Figure 2
- 2) Remove the battery cover.
- 3) Remove the old battery from the battery slot
- 4) Put the new 3V lithium battery (type CR2450) into the battery slot
- 5) Place the battery cover in the position shown in Figure 6
- 6) Rotate the battery cover counter clockwise to the position shown in Figure 8

## 10. Device list

- One RC-3 temperature data logger with 3V battery
- One software installation mini-CD
- One operation instruction
- One USB cable





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