

# ***INTIEL***

***THE ELECTRONICS ON YOUR SIDE***

## **Monitoring system for temperature and humidity control**

**User's Manual**

## I. Application

The System is designed to replace the current diaries for temperature control filled in manually, and which are obligatory concerning the food stock premises.

The System is consisted of computer software for data registration and processing and a hardware part for measurement and connection to a computer. It has twelve channels for temperature and humidity measurements. The connection between the hardware and the computer is provided by a communication cable for serial interface RS232.

The software enables initiation of normative temperature or humidity for each separate channel, a period for report taking and the type of undertaken steps, in case there are differences between the measured and normative fixed values. The software provides information printing out in table or graphic formats for a different period from to another date. There could be a different period for reporting concerning each channel, which is in relation to the legislation requirements.

The hardware is equipped with independent power supply, and it goes on operating even the main power supply is shut off. The data in the hardware can be restored even for past periods of time, in terms of data loosing from the computer or any other reasons.

## II. System components

1. Controller for temperature and humidity measurements and registrations
2. Temperature sensors
3. Humidity sensors – are to be specified in the order
4. Communication cable
5. CD installation software

## III. Technical data

- |  |                            |
|--|----------------------------|
| 1. Power supply  | ~230V/50Hz                 |
| 2. Consumption   | 1.5W                       |
| 3. Input for outer battery                             | 12V $\pm$ 10%              |
| 4. Precision of temperature measurement                | $\pm$ 0.1°C                |
| 5. Precision of humidity measurement                   | 1%                         |
| 6. Operation time after dropping the main power supply | 40 hours                   |
| 7. Temperature sensor type                             | DS18S20                    |
| 8. Humidity sensor type                                | XH20P, 0-99%, 4-20mA       |
| 9. Range of temperature measurement                    | from (-50) up to (+120 °C) |

## IV. Wiring

The wiring scheme is shown on Figure 1 bellow. To the controller can be connected humidity sensors XH20P and temperature sensors DS18S20, as the sensors terminals on the controller are divided by pairs. The sensors are to be connected to the controller by means of two wire cables 2 x 0.5 mm<sup>2</sup> or 2 x 0.75 mm<sup>2</sup>. The cable length of the humidity sensors is up to 100 m, and the cable length of the temperature sensors is up to 30m.

To terminals 1 and 2, 3 and 4, ..., 23 and 24 are to be connected humidity sensors XH20P and temperature sensors DS18S20.

To terminals 27 and 28 are to be connected to the main power supply ~220V / 50Hz. A light indication "Led Power" is activated when the main power supply is provided.

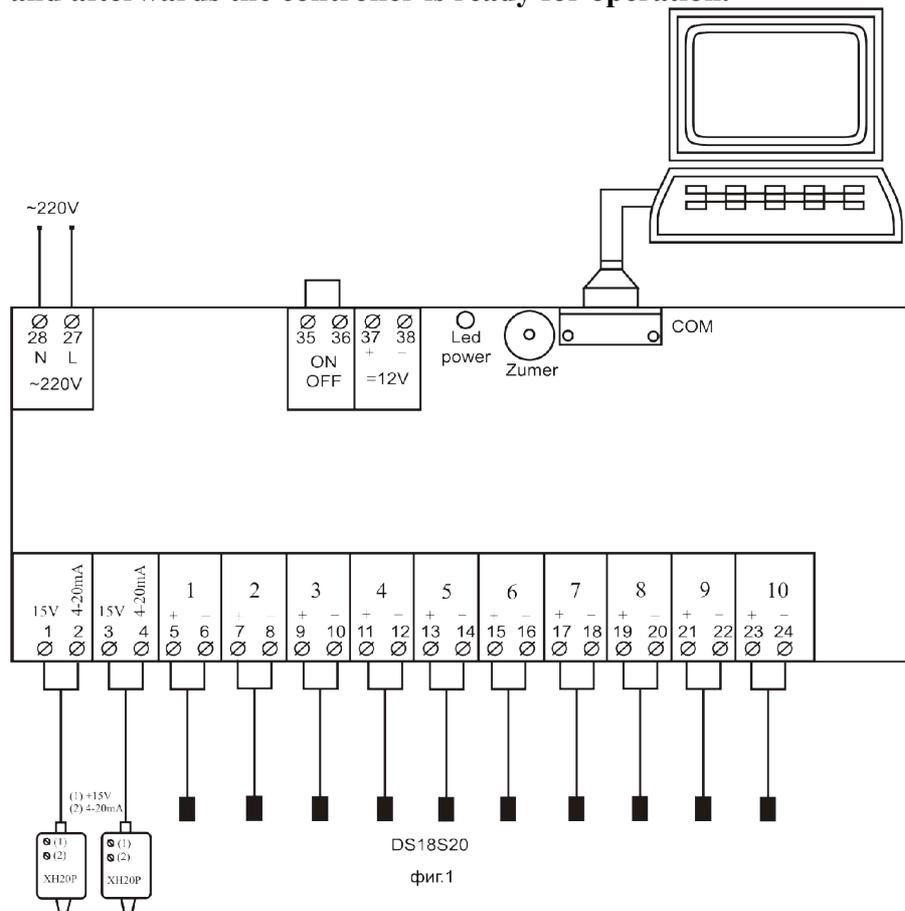
To terminals 35 and 36 is to be placed an electrical bridge in order to switch on the controller. After controller switch off and its subsequent switch on (also after the battery

replacing) it is necessary the settings to be provided by the software (see “software part” of the manual)

To terminals 27 and 38 are to be connected outer battery of 12 V/DC. This power supply will be switched on when the main power supply drops for longer than 40 hours, or due to any other reason the built-in battery in the controller cannot provide a normal operation without main power supply. When the power supply is provided by the outer battery an interrupted sound signal is being heard.

The communication cable is to be connected to controller COM port and to computer COM port too.

**After the first switch on it is necessary to wait for 1(one) minute in order a internal procedure to be done. The internal procedure end is being announced by a sound signal, and afterwards the controller is ready for operation.**



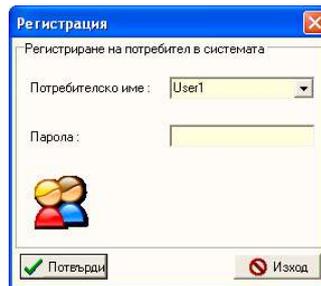
## V. Software installation

Requirements:

Computer with CD-ROM, 5MB or more free hard disk space, operation system Windows 98SE or higher.

Place the installation CD into the CD-ROM and wait for until the installation program will be activated, if it does not start automatically, run Setup.exe from the CD. An icon “rmonitor” will appear on the desktop after successful software installation.

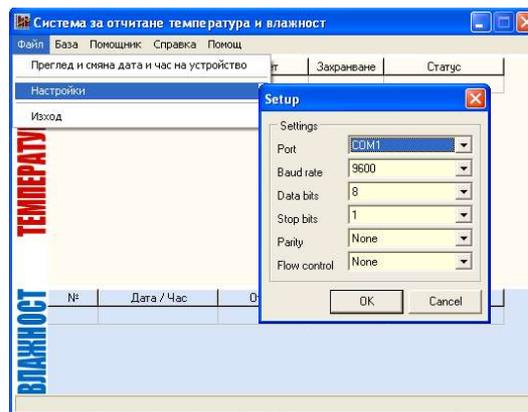
Start the software application and a user registration window will appear. The user name “User1” has supervisor's rights for settings, as well for data input and corrections. To continue, select user name “User1” and enter password “user1” and afterwards press “Confirm”.



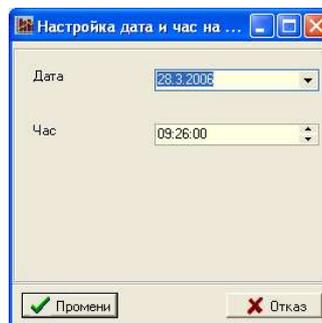
A new window “Temperature and humidity measurement system” will be open. The window fields are empty during the first installation. It is necessary the system settings to be done by means of entering the data concerning the fridges, correctives, the user names and their access passwords.

## 1. Settings

1.1 Choose file, “Settings”. “Setup” window will be opened. Then select the port to which the Controller is switched on, for example : COM1 and confirm with “OK” button.



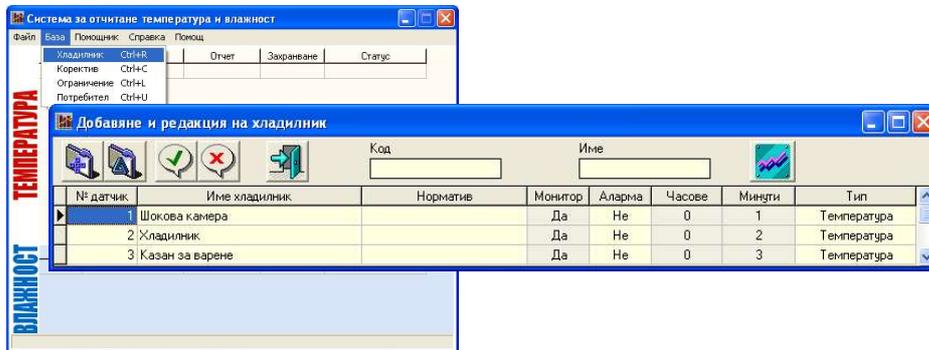
1.2 Select file, “Inspection of devise date and time”. Window “Adjustment of date and time of...” will be opened, where the current date and time can be entered and confirmed by means of “Changes” button. When you want just to review the current date and time without making any changes, press “Cancel” button.



## 2. Data input

### 2.1 Fridge adding and editing.

Select Base and Fridge from window “Measurement system for temperature and humidity”. A new window will be opened “Adding and editing a new Fridge”



In this window can be added, deleted and changed the fridges' data. A new row can be added by the following button , it is necessary all fields to be filled in after each row entering.

- Field “Sensor №”. Click the left hand mouse button in order to edit this field. It can consist of numbers from 1 to 12, which are in compliance with sensor numbers on the controller.
- Field „Fridge name”. Click the left hand mouse button in order to edit this field. It can consist text with a convenient for you name.
- Field „Normative” has information meaning, and it consists of text with prescribed norm of the corresponding products.
- Field „Monitor”. Click the left hand mouse button in order to edit this field. An arrow for drop down menu will appear with two possible choices “Yes” and “No”.
  - “Yes”- when you want data collecting from the relevant source.
  - “No” - when you do not want collecting from this sensor (reports are not being done for the sensor, but it presents in the data base, and it will start working after subsequent selecting of position “Yes”)
- Field “Alarm”. Click the left hand mouse button in order to edit this field. An arrow for drop down menu will appear with two possible choices “Yes” and “No”.
  - “Yes” - a notice will appear concerning norms diversion. (see **Limitations**)
  - “No” - switch off the alarm.
- Fields “Hours” and “Minutes”. Click the left hand mouse button in order to edit this field. In these fields are being entered the period of time after which the report concerning each fridge will be taken out. In fact, this is the time from the previous report until the next one. The first report is after you save the entered data.
- Field “Type” - it is filled in automatically in relation to field “Sensor №”.

Save the entered data with the following save button . Check out the connection with the controller if a notice for unsuccessful save appears.

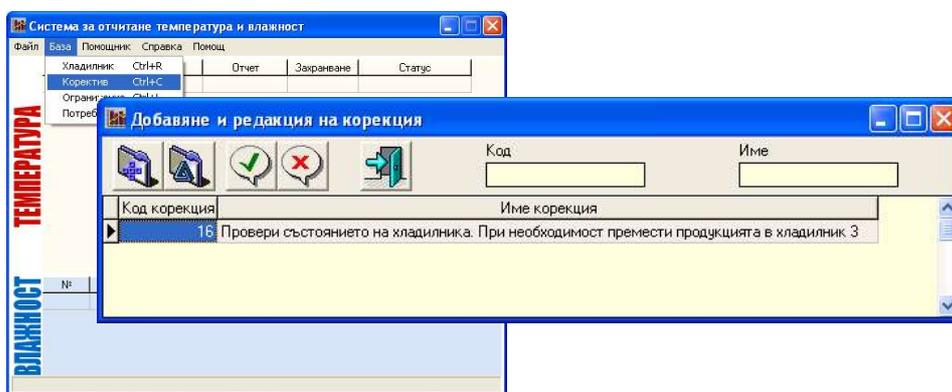
Repeat the described steps at point 2.1 for each of the fridges, which will be monitored.

In case, of wrong field eneter, please press “Cancel” button  and fill in the row again.  
When you want to delete eneterd row, mark it and afterwards press button for row delete  and afterwards confirm with save button.

After the end press the exit button  or close the window.

## 2.2 Correctives entering and editing

Choose Base, Corective from the window “Temperature and humidity measurment system”. A new window will be opened, named “Correction adding and editing”.



The copletion of these fields will be useful, when there is controlling of any process and it is necessary the correctives to be enetered, showing to the Staff what activities have to be undertaken at norm diversions.

- Field “Correction Code” is to be filled in automatically.
- Field “ Correction name” consists of text with the necessary prescriptions.

After row completion the changes are to be saved by means of pressing save button. 

Press the button for a new row  and eneter the next correction in “Correction Name” field. Save it again by pressing the save button.

Repeat the above mentioned again in order to enter other necessary corrections.

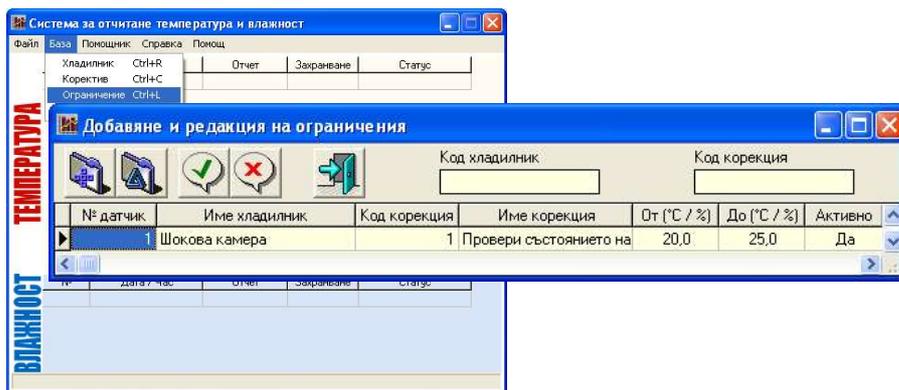
In terms of wrong field entering, press cancel button to deny the changes  and fill in the row again.

When you want to delete already enetered row, press the delete button after you mark the row  and confirm with the safe button.

After you finish, press the exit button  or close the window.

## 2.3 Limitations adding and editing

Choose Base, Limitations from window “Temperature and humidity measurment system”. A new window will be opened, named “Limitations adding and editing”



In these fields can be entered normative limitations concerning the temperature or humidity, and in case there is a diversion from them, a notice will be shown.

- Fields “№ of sensor” and “Correction Code” are being filled in automatically.
- Field “Fridge name” - select from the drop down menu the name of the relevant fridge, which was already filled in at point 2.1.
- Field “Correction name” - select the name of the relevant correction from the drop down menu among already filled in at point 2.2.
- In fields “From (°C / %)” and “Untill (°C / %)” are to be entered the boundaries, within which there will be announcement at their reaching. The announcement is provided by showing the text “Alarm” in “Status” field from window “Temperature and humidity measurement system”.

There can be entered positive or negative temperatures with a step of 0.1 °C and of 1% concerning humidity.

- Field “Active” - select “Yes” or “No” from the drop down menu, which will switch on or switch off the limitation.

After row completion save the changes with save button .

Press the button for new row  in order to enter new limitation.

Select the next name of the list from “Fridge name” field.

Select the desired correction from “Name correction” field.

Enter the desired boundary in the fields “From (°C / %)” and “Untill (°C / %)”.

Select “Yes” or “No” from “Active” field.

Save again the changes by pressing the save button .

Make the above mentioned again in order to enter limitations concerning the rest fridges.

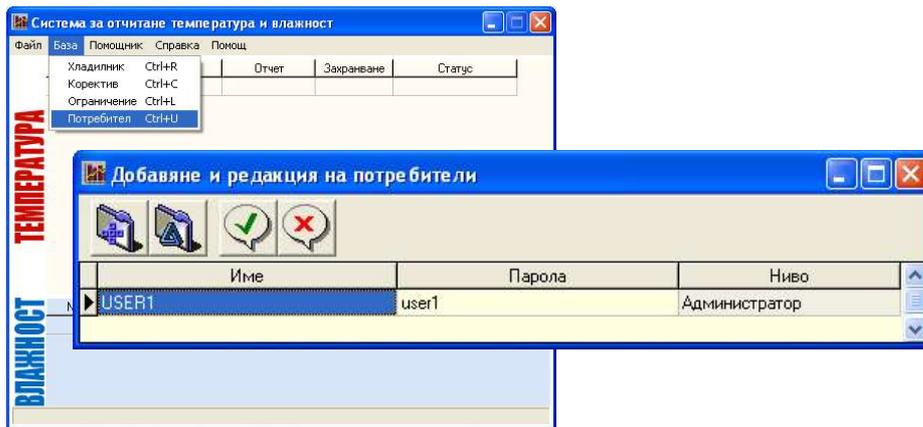
In terms of wrong field entering, press the cancel button to deny the changes  and filled in the row again.

When you want to delete an entered row, you need to mark it and to press delete row button , and finally to confirm with the save button.

After the finish you have to press the exit button  or close the window.

## 2.4 Users adding and editing

Choose Base, Limitations from window “Temperature and humidity measurement system”. A new window will be opened, named “Users adding and editing”.



In these fields are to be filled in data about all users of the software. The factory settings includes entered user name “USER1” and password “user1”.

The user name “USER1” has “Supervisor” level and it can add or edit all data in the software.

- Field “Name” can be consisted of unspecified latin letters and numbers.
- Field “Password” can be consisted of unspecified latin letters and numbers.
- Filed “Level” from the drop down menu can select “Supervisor” or “User”.

“Supervisor” can adds or edits all data in the software.

“User” can only observes the temperature and humidity in the fridges, as well to see a report about them.

After row completion you need to save the changes with the save button. .

**YOU MUST REMEMBER YOUR PASSWORD BECAUSE IT IS REQUIRED ANY TIME YOU START THE SOFTWARE.**

Press the button for new row  in order to enter a new user.

Repeat the above mentioned steps concerning the rest users, too.

In terms of wrong field enetering, press the cancel button to deny the changes  and filled in the row again

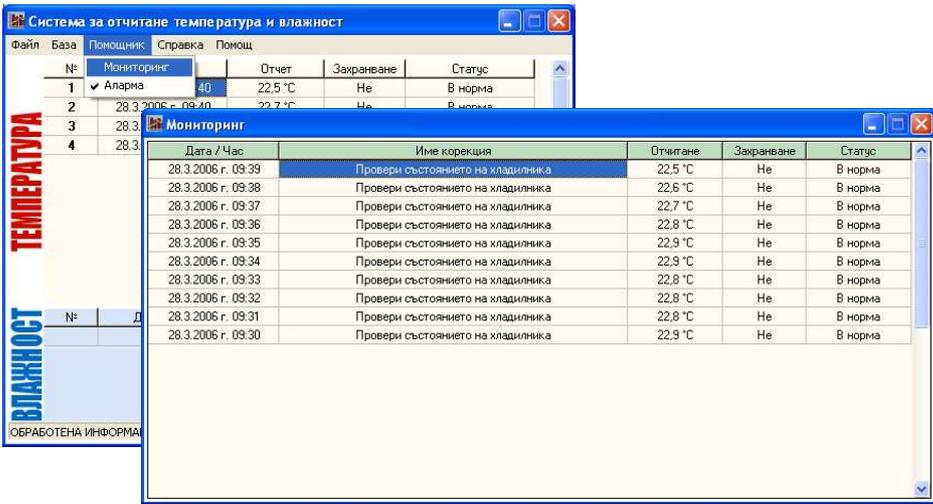
When you want to delete an entered row, you need to mark it and to press delete row button  and finally to confirm with the save button.

After the finish you have to press the exit button  or close the window.

### 3. Data and reports obtaining

#### 3.1 Monitoring

Choose Assistant, Monitoring from window “Temperature and humidity measurement system”. In these field can be seen the last ten reports concerning selected fridge from the window “Temperature and humidity measurement system”



The screenshot shows two overlapping windows from a software application titled "Система за отчитане температура и влажност".

The background window has a menu bar with "Файл", "База", "Помощник", "Справка", and "Помощ". Below the menu is a table with columns: "№", "Мониторинг", "Отчет", "Закранване", and "Статус".

The foreground window, titled "Мониторинг", displays a detailed log with the following columns: "Дата / Час", "Име корекция", "Отчитане", "Закранване", and "Статус".

Дата / Час	Име корекция	Отчитане	Закранване	Статус
28.3.2006 г. 09:39	Провери състоянието на хладилника	22,5 °C	Не	В норма
28.3.2006 г. 09:38	Провери състоянието на хладилника	22,6 °C	Не	В норма
28.3.2006 г. 09:37	Провери състоянието на хладилника	22,7 °C	Не	В норма
28.3.2006 г. 09:36	Провери състоянието на хладилника	22,8 °C	Не	В норма
28.3.2006 г. 09:35	Провери състоянието на хладилника	22,9 °C	Не	В норма
28.3.2006 г. 09:34	Провери състоянието на хладилника	22,9 °C	Не	В норма
28.3.2006 г. 09:33	Провери състоянието на хладилника	22,8 °C	Не	В норма
28.3.2006 г. 09:32	Провери състоянието на хладилника	22,8 °C	Не	В норма
28.3.2006 г. 09:31	Провери състоянието на хладилника	22,8 °C	Не	В норма
28.3.2006 г. 09:30	Провери състоянието на хладилника	22,9 °C	Не	В норма

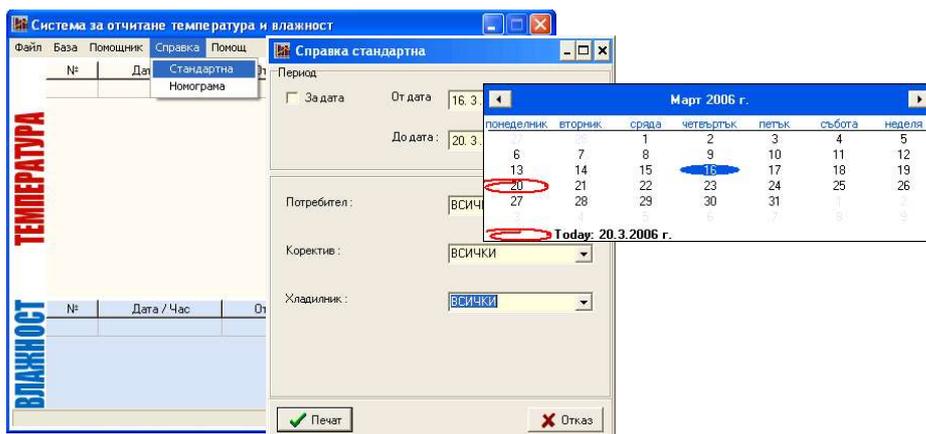
In the basic form can be seen the last date and time, the correction name (if it was necessary), the measured temperature and humidity, power supply (whether it uses the power supply grid or battery), status (whether the temperature or humidity are in correspondance within the norms).

The Monitoring can be switched off from window “Temperature and humidity measurement system” after selection of Assistant, Monitoring and removing the tick against “Monitoring”.

With fixing the tick before “Alarm” announcement appearance will be allowed if the temperature or humidity are in the range of preliminary fixed ones in “Limitations adding and editing”. The alarm switching off can be done by the tick removing.

#### 3.2 Reports

Choose “Report”, Standard (table type) or Nomogramme (graphic type) from window “Temperature and humidity measurement system”. A new window will appear concerning the relevant report, for example you choose “Standard”, window “Standard report”.



The report can consists the following data:

- Period – when you desire only one day, you have to put a tick against “For date” and in the field “For date” you have to enter the desired date or open the drop down menu, selecting a date from the calendar.

When the report concerns longer period of time, you have to enter the beginning date in the field “From date” or to open the drop down menu thus selecting the desired date, and in the field “Untill date”, you have to enter the end date period or to open the drop down menu, selecting a date from the calendar.

- Users – select a defined name or all names from the drop down menu.

- Corrective – select the defined correction name or all type corrections from the drop down menu.

- Fridge – select defined fridge name or all available ones from the drop down menu.

Press “Print” in order to see the table and afterwards to print it out, if you do not need printing you have to press “Cancel”.

Concerning “Nomogramme” report all above mentoned steps are same, just the presentation is in graphic way.

## VI. Troubleshooting

### 1. Announcement for unsuccessful record.

- Check out if the connection cable between the controller and the computer is placed properly.

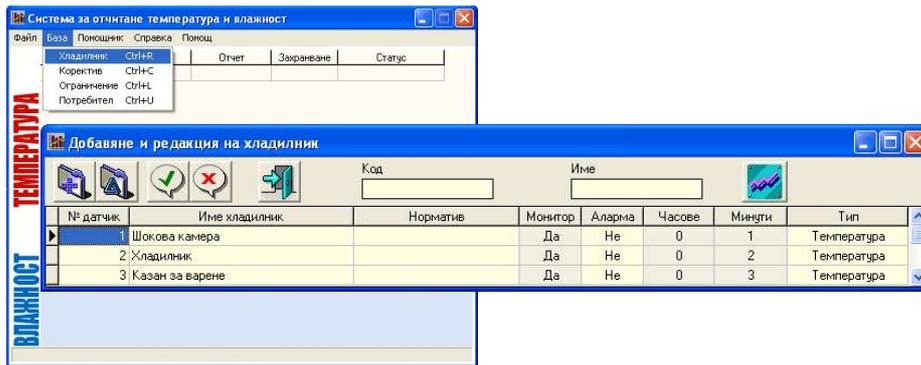
- Check out in “Settings” whether COM port number corresponds to the number to wich the controller is connected.

### 2. Database losses in the computer

- Choose “Base”, “Fridge” from window “Temperature and humidity measurment system”. A new window will be open, named “Fridge adding and editing”. The program will automatically read and enter the current controller data.

### 3. Database losses in the controller

- Choose “Base”, “Fridge” from window “Temperature and humidity measurment system”. A new window will be open, named “Fridge adding and editing”.



Press the button for monitoring synchronizing  and fridge available data will be transmitted to the controller.

**4. Prepares reports, but there is a message “Missing sensor” in “Report” field.**

- Check out the connection of the relevant sensor.
- Replace the sensor with another one, working with another channel. In case it works properly now, it means that the first one is to be replaced with new sensor.

**VII. Warranty**

The warranty period is 24 months following the purchase date of the unit or its installation by a qualified staff, but not exceeding 28 months after the production date. The warranty is extended to the malfunctions that occur during the warranty period and are result of the production reasons or defective used parts.

The warranty does not relate to malfunctions corresponding to not-qualified installation, activities directed to the product body interference, not regular storage or transport.

*The repairs during the warranty period can be done after correct filling of the manufacturer warranty card*

**Warranty Card**

<b>Manufacturer: <i>INTIEL</i></b>	
<b>Product type</b>	<b><u>Monitoring system for temperature and humidity control</u></b>
<b>Production number</b>	
<b>Production date</b>	
<b>Dealer’s confirmation</b>	
<b>Purchase date</b>	
<b>Invoice number</b>	
<b>Dealer’s name, address and stamp</b>	
<b>Seller’s name and signature</b>	
<b>Installation date</b>	
<b>Date</b>	
<b>Company (address, stamp)</b>	
<b>Installer’s name and signature</b>	