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Thank you very much for purchasing our Ionometer **IM806v2**!

Please read this manual and the safety instructions carefully **before** using the device.

The portable Ionometer **IM806v2** has been developed for continuous measurement of the concentration of positively and negatively charged ions in the air.

The Ionometer **IM806v2** may explicitly only be used in non-corrosive atmospheres.

Please note the safety instructions in section 8 of this manual.

This manual has to be provided to all persons operating the device and must be kept easily accessible.

The following pictograms are intended to help you read this instruction manual:



We recommend reading this paragraph very carefully.



The actions listed in this paragraph are dangerous to persons and the device and are not permitted.



This paragraph describes troubleshooting and maintenance tasks.

The pictograms used are subject to the Creative Commons License; the author of the pictograms is the Regional Computing Centre of Erlangen (RRZE).

1. The Ionometer IM806v2

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Figure 1 The Ionometer **IM806v2**

The **IM806v2** distinguishes itself through:

- ▶ the simultaneous measurement of both ion polarities (positive and negative)
- ▶ the open measuring system with two parallel electrodes
- ▶ a wide measurement range from 0...1,000 ions/cm³ in the smallest range up to 40,000,000 ions/cm³ in the largest range
- ▶ the integrated microSD memory card for storage of measurements
- ▶ a graphic representation for fast trend recognition
- ▶ a battery operation of up to 15 hours with one charge
- ▶ the integrated FTP server for transferring recorded measurements and the web server for displaying measurements via network
- ▶ the servo-driven electrode lid
- ▶ the galvanically isolated and configurable analog outputs 0...10V and 0...20mA for every polarity
- ▶ display and recording of climate data (air pressure, temperature* and relative humidity*)

*Temp. and humidity with optional rotronic HC2-S Sensor

2. Package Contents

Scope of delivery of the Ionometer **IM806v2**:

- ▶ Ionometer **IM806v2**
- ▶ battery charger for operation with 100 - 240 V, 50 - 60 Hz
- ▶ this operating manual
- ▶ USB (A - B) cable for connection with a PC
- ▶ software IM806.EXE for configuration, remote control, data transfer and adjustment of the **IM806v2** (on included disk)
- ▶ cable with alligator clip to drain off charges
- ▶ network cable to connect the device to the network (LAN)

Optional accessories:

- ▶ Extension tube for directed measurements
- ▶ Temperature / humidity sensor, Make: rotronic, Type: HC2-S
- ▶ Handling case (available colors: light gray, anthracite, blue)

3. Measurement Principle

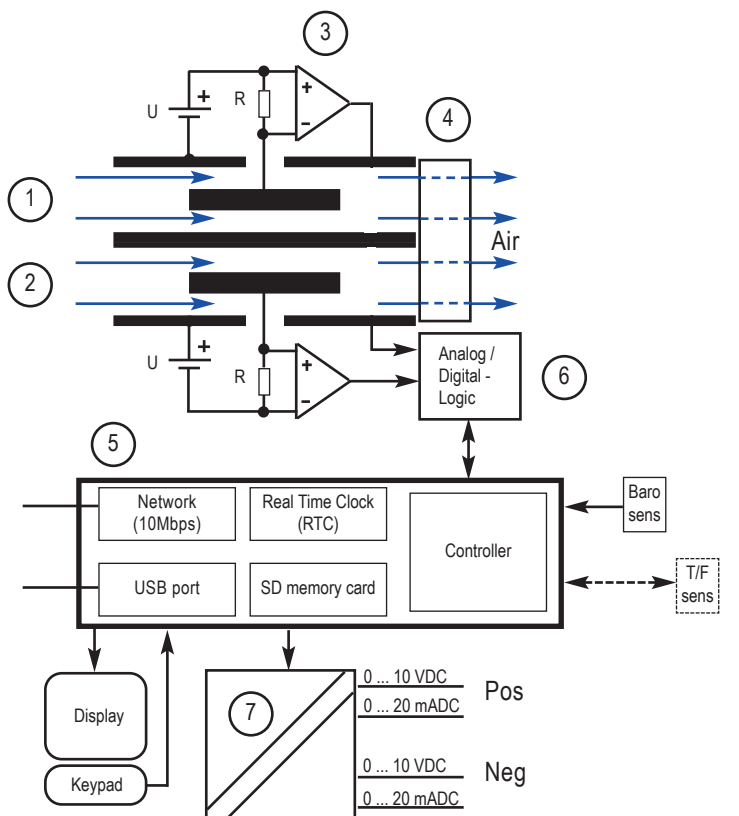


Figure 2 The measurement principle of the **IM806v2**

The measuring system consists of two outer electrode tubes (1 & 2), each of which holds a centric and electrically insulated smaller electrode. Between the outer and inner electrodes, a DC potential is applied, thus generating a DC electric field between the electrodes. The fan (4) continuously draws air at a defined flow rate through both of the electrode tubes. The DC electric field exerts a force in the vicinity of the electrodes on the ions in the streaming airflow

3. Measurement Principle

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(Coulomb's law) and deflects them to the inner electrodes. Since the polarities of the applied voltage differ in both electrodes, one electrode accelerates the positively charged ions and the other electrode the negatively charged ions to the inner electrode. The flow velocity of the air, the level of the deflection voltage and the geometry of the electrodes are dimensioned such that ions of defined ion mobility reach the inner electrode. Air ions of lower ion mobility (medium and large ions) only partially reach the inner electrode.

At very high ohmic resistances (R) (up to 10^{11} ohm), the charge current flowing during the charge neutralization generates a measurable drop in voltage, which is boosted using suitable measuring amplifiers (3) to a measurable signal proportional to the air ion concentration and then digitalized in the pre-amplifier (6).

The entire sequence of operations is controlled using a microcontroller (5) which also handles the display, the storage logic, the analog outputs (7), the USB interface, the network interface and the climate sensors.

The **IM806v2** has an integrated barometric pressure sensor. A connector for the optional temperature / humidity sensor (rotronic HC2-S) is mounted on the back side of the device.

4. Control Elements and Connectors

4. Control Elements and Connectors

4.1 Front control elements

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Figure 3 IM806v2 front view

4.2 Keys and display

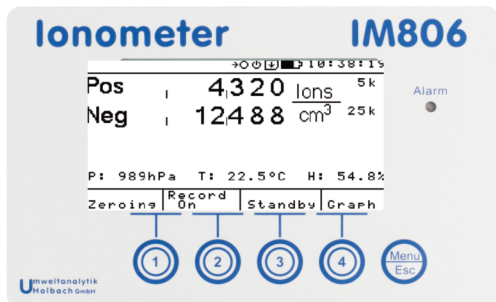


Figure 4 Keypad and display

On the front side is the keypad with the keys 1 to 4 and the Menu/Esc key. The illuminated LC display is located above the keys.

4. Control Elements and Connectors

The screen is divided into several sections:

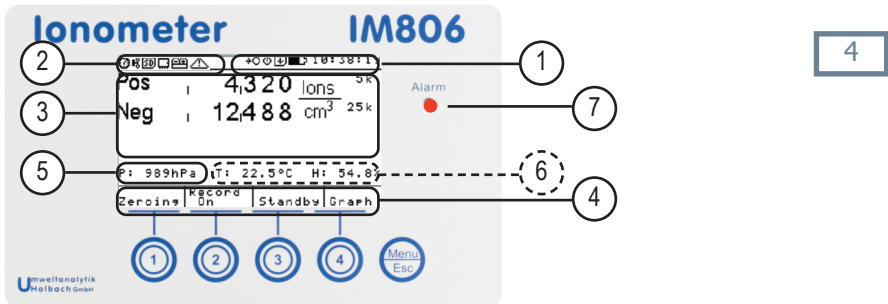


Figure 5 Screen sections

- Header including the system time and the following icons
 - Shows the battery state. The more capacity is left the more the icon is filled. The icon blinks when the capacity is low.
 - Measurement recording is active.
 - Automatic power-off after recording is enabled. This function is only active if the recording was triggered via timer.
 - Automatic zero-adjustment is enabled.
IM806v2 will do a zero-adjustment in the defined intervals.
- Errors encountered by the **IM806v2** are displayed with the following blinking icons:
 - Data in the real time clock is not consistent. Check time and date. Replace RTC battery if this error occurs repeatedly.
 - The fan is not running (anymore). Check if the rotor is blocked.
 - The SD memory card could not be mounted on program start.
 - The device configuration is inconsistent. Device configuration is stored in a non-volatile memory (EEPROM). Check configuration and save a configuration item.
 - Electrode lid error. Check if lid is blocked.
 - The **IM806v2** is in test mode. All monitoring except for the battery state is disabled.

4. Control Elements and Connectors

3. Screen section for current ion measurements.
4. Above every key its function is displayed in the key field. Icons are sometimes used instead of text.
5. The air pressure measured by the integrated barometer is displayed in this section.
6. If a optional temperature and humidity sensor is attached, its readings are displayed here.
7. Errors are indicated by the red (ultra-bright) LED right of the display. It also flashes periodically in standby mode.

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Warning: Ultra-bright LED - Do not look directly into it!



The **Menu / Esc** key has multiple functions. There is a difference between short and long presses:

- In **lists or sub-menus**, a short press takes you one step back to the higher menu, or to the previously active main function (measuring, standby, zero adjustment).
- **Within a main function** (warm-up, measuring and standby), a short press displays system information. The displayed configuration can be edited with the program IM806.EXE.
- **Within a main function** (warm-up, measuring and standby), a long press displays the configuration menu.

Hint: Press the keys quickly and precisely.



NEVER use sharp subjects for pressing the keys - they might be damaged.



4. Control Elements and Connectors

4.3 Rear Control Elements and Connectors

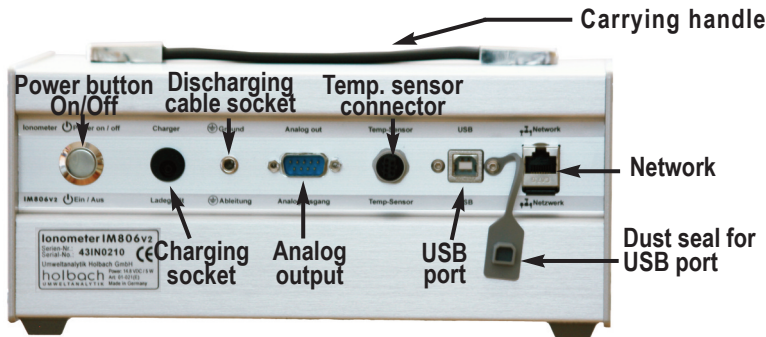


Figure 6 IM806v2 rear view

4.3.1 The power button

The **IM806v2** is switched on and off by pressing the power button.
 Power-on: Press the button until the LED near the display lights up.
 Power-off: Press the button for at least 2 seconds.
 Resetting the **IM806v2**: Press the button for at least 8 seconds.
 This reset directly affects the microcontroller in the **IM806v2**.

4.3.2 The charging socket

The charging plug of the included charger has to be plugged into the round charging socket.

Use only the included charger for charging the battery. Using another charger may damage the electronics, the integrated battery and the charger itself.

Polarity: Inside "Plus 14,4 Volt", Outside "Ground".



4. Control Elements and Connectors

4.3.3 The discharging cable socket

In order to discharge possible electrostatic charges from the housing of the **IM806v2** the included discharging cable can be plugged into this socket.

This connector is not a protective ground!



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4.3.4 Analog output

The readings are also available as analog voltage/current signals for connection to a writer, a control device, or a data logger. The configuration is explained in chapter 7 "Configuration". The pin assignment is described in appendix A.

4.3.5 The connector for temperature / humidity sensor

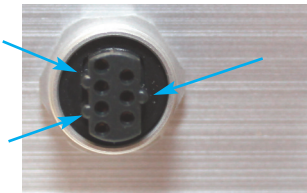
The optional temperature / humidity sensor HC2-S by rotronic can be attached here.

This sensor's data is transferred digitally to the **IM806v2**. The adjustment data of the sensor is stored within itself. The readings of the sensor are displayed in measuring mode, if available.



Figure 7 The temp./humidity sensor rotronic HC2-S

Since the connection pins are arranged asymmetrically, the temp./humidity sensor HC2-S can only be attached in **one** direction.



The sensor is secured using a coupling nut.

Figure 8 The connector for the temp./humidity sensor

Hint: The thermic influence of the housing mass is reduced due to the external placement of the temperature / humidity sensor.

4. Control Elements and Connectors

4.3.6 The USB port

Using the USB port, the included PC software IM806.EXE and the included USB cable (Type A-B) you can transfer recorded data, change device configuration, remote control the **IM806v2** and modify the adjustment values.

The USB port is protected by a dust seal.

4.3.7 The network port

The 10Mbps network port is available via an 8-pin RJ45 socket.

Note: The **IM806v2** does not feature an auto-sensing network port. A cross-over cable may be required for direct connection to another end device (e.g. PC).



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4. Control Elements and Connectors

4.4 Mechanical Connections

The tripod sockets

The Ionometer **IM806v2** has two tripod sockets on the bottom side of the device: UNC 1/4 inch (photo) and UNC 3/8 inch (microphone).

Only use tripods that can support the weight of the **IM806v2** (3.1 kg) and that provide a safe standing.

4

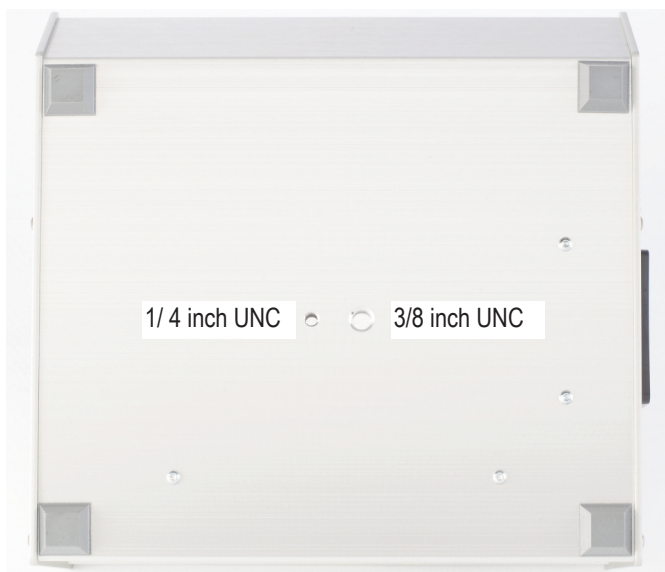
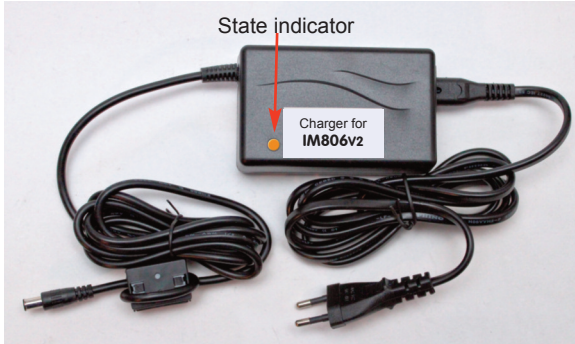


Figure 9 The tripod sockets on the bottom side

5. The charger

The scope of delivery of the **IM806v2** includes a quick-charger to charge the integrated LiPo battery pack.



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Figure 10 The quick-charger for the **IM806v2**

The charger can be operated off the mains within a voltage range of 100 Volts to 240 Volts with a frequency between 50 Hz and 60 Hz.

5.1 Using the charger

Connect the main power plug to the main power socket.

After connecting the main power the state LED lights up in green.

Connect the low voltage plug of the battery charger to the charging socket of the **IM806v2**.

The state of the charger is indicated by the multi color state LED:

Orange: Quick-charge until about 80..95% of the capacity are reached.

Yellow: Final charge until 100% are reached.

Green: Battery is fully charged or the charging plug is not connected.

If the battery is completely discharged the charging takes about 5 hours. 80% of the capacity are reached in about 2 hours.



6. Operation of the IM806v2

6.1 Power-on

Press the power button on the rear side until the red LED lights up.

The display brightness is initially set to 5 (medium brightness). First, the display, the SD memory card and the interfaces (network, USB) are initialized.

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After about. 5 seconds another image (logo) is displayed. This image can be changed and is stored on the SD memory card.

The program versions of the device and the operating system are displayed in the lower two lines of the screen.

The warm-up mode is initialized after another 5 seconds. Besides on start-up, this mode is only entered again after an error occurred.

The warm-up phase takes 20 seconds. While this countdown runs the following functions are possible:

Key 1: Start a zero point adjustment (zeroing)

Key 2: Start the measuring process

Key 3: Switch to standby mode

Key 4: Show the system messages list

Menu/Esc key short: Show the system information list

Menu/Esc key long: Open the configuration menu

When the warm-up phase has finished the measuring process starts.

6.2 Measuring

When entering the measuring mode, the electrode lid opens. When the electrodes are fully opened the fan turns on. Shortly after, the readings are shown in the display.

The keys have the following functions:

Key 1: Start a zero point adjustment (zeroing)

Key 2: Recording the measurements on / off

Key 3: Switch to standby mode

Key 4: Show the system messages list

Menu/Esc key short: Show the system information list

Menu/Esc key long: Open the configuration menu

6

Some general information on measuring air ions:

Every electric (DC) field affects air ions and distracts them. If the Ionometer **IM806v2** is electrically isolated and has received a charge through coupling, it is possible that it can influence the surrounding air ionization. Accordingly, less ions get into the tube which results in a lower reading.



In order to avoid this effect, electric charges should be drained off with the provided cable. Plug a 4 mm laboratory plug into the socket of the **IM806v2** and connect the other connector to an earth connected electrical connector.

Never plug a laboratory plug into a power socket! **Danger for life!**



Avoid electrostatically chargeable plastics in the surroundings of the tube.

6. Operation

Display of the measurements as curve chart

After pressing key 4 the measurements are displayed as a curve chart. The last 30 seconds are visible.

The range for the displayed values can be seen in the upper left corner.

The curve for the positive ions is displayed a bit thicker than the one for the negative ions.

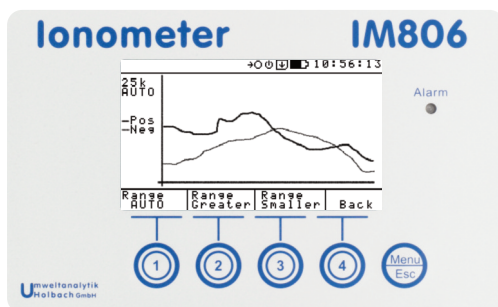


Figure 11 The measurements as curve chart

In this representation fast changes of the measurements can be easily spotted.

The displayed range can be changed with the keys 1 to 3.

Key 4 leads back to the numeric display.

Note: No climate data is shown in this mode.




6. Operation

6.3 Measurement recording

Measurement recording can be activated:

- ▶ by setting up a starting time and enabling the timer in the configuration (see section 7 "Configuration")
- ▶ by pressing key 2 ("Record on")

6


The icon  is displayed in the status bar during recording.

The filename without the extension CSV is displayed below the measurements. The filename format is described in appendix D.

One line below the filename the sequential number of the current record is printed ("Record no.").

An active recording is ended:

- ▶ by reaching the configured recording duration
- ▶ by pressing key 2 ("Record off")
- ▶ by switching off the Ionometer **IM806v2**

Note: When the automatic power-off after recording is enabled (Icon: ) the **IM806v2** switches itself off after the configured recording duration is reached.



The structure of the recorded data is described in appendix D.

The files can be transferred via USB using the software IM806.EXE or over the network using an FTP client.

Note: The system needs up to 4 seconds to create a new file, if there are more than 50 measurement files on the SD memory card.



6. Operation

6.4 Zero point adjustment

In order to metrological avoid offset values of the different parts in the input amplifier, a zero point adjustment is implemented. Because of the offset values' dependence on temperature, the warm-up should be completed before starting a zero point adjustment.

A zero point adjustment is initiated:

- ▶ in defined time intervals, if "auto zeroing" is enabled.
- ▶ by pressing key 1 ("Zeroing")
- ▶ before a timed measurement recording, if enabled.

Procedure of a zero point adjustment:

- ▶ The electrode lid is closed
- ▶ For each of the eight measurement ranges, the necessary offset voltage is set, checked and corrected, if necessary
- ▶ The offset values are displayed and saved for further calculations
- ▶ The electrodes are opened again
- ▶ The **IM806v2** initiates the measuring

A zero point adjustment may take between 1 and 4 minutes.

The zero point adjustment interrupts the data recording but does not end it.

Hint: After about 30 minutes of operation, a new zero point calibration is only necessary when measuring small concentrations of ions (<500 ions/cm³).



6.5 Standby mode

The Ionometer **IM806v2** can be set to standby mode between measurements or during configuration.

The standby mode is activated:

- ▶ by pressing key 3 ("Standby")
- ▶ automatically when the battery is low

6

In standby mode

- ▶ the fan is turned off
- ▶ the electrodes are sealed
- ▶ the display illumination is turned off
- ▶ the measurement recording is interrupted but not ended

To avoid a mix-up with the turned-off Ionometer IM806, the LED flashes every 5 seconds.

The number of flashes per interval gives information about the charge of the battery. If the battery is fully charged it flashes 4 times.

If the discharging threshold of the battery is reached, an additional acoustic signal sounds every minute.

Exiting the standby mode:

Press any key. The display illumination is turned on. Choose the desired function within 6 seconds:

Key 1: Start a zero point adjustment

Key 2: Start the measuring process

Key 3: Stay in standby mode

Key 4: Show the system messages list

Menu/Esc key short: Show the system information list

Menu/Esc key long: Open the configuration menu

If you do not press any other key within 6 seconds, the **IM806v2** stays in standby mode.

The standby mode is also ended by the measurement recording timer.

6. Operation

Hint: Always activate the standby mode if you do not need data. The electrodes are closed then and protected from any unnecessary dirt.



6.6 System messages

Events such as the end of measurement recording and alarms are written to the system message list.

This list contains the last 25 messages since the **IM806v2** was turned on.

The number of messages and alarms is printed in the header of the list.

Alarms are displayed inverted.

The list is activated using key 4 ("Info") or within the system information list by pressing key 3 ("Info").

Note: During measurement key 4 is used for the curve chart ("Graph"). Therefore you have to switch to another mode, e.g. the system information list (Short-press Menu/Esc key).

If the number of list entries exceeds the maximum number that can be displayed the keys 1 and 2 (Up and down arrows) can be used to scroll through the list page by page. An inverted arrow indicates the end of the list.

The keys perform the following functions:

Key 1: Scroll towards the top of the list

Key 2: Scroll towards the bottom of the list

Key 3: Delete all entries

Key 4: Back to previous screen

Menu/Esc key short: Back to previous screen

Menu/Esc key long: No function

If no key is pressed in the list screen for 60 seconds, the function is terminated.

6. Operation

6.7 Alarm messages

During operation, the peripheral units such as fan and battery voltage are continuously monitored. In case of a failure, an alarm is raised.

The LED lights up and, if "beep on event" is enabled, an audible signal is activated until a key is pressed.

To dismiss the alarm message, press key 3 ("continue").

The alarm event is inserted into the message list.

If no key is pressed in the alarm message screen within 3 minutes, the alarm message screen disappears automatically.

Note: An error of the optional temperature and humidity sensor does not raise an alarm. In that case the Ionometer **IM806v2** acts as if there is no sensor attached.



6.8 Power-off

Press the power button for at least 2 seconds. If the parameter "beep on key press" is set, the Ionometer **IM806v2** will sound a confirmation sound. An informational message is displayed.

The electrodes will be closed and the Ionometer **IM806v2** will power-off afterwards.

6

7. Configuration

7. Configuration of the IM806v2

7.1 System information list

The current state parameters and many configuration parameters are displayed in the system information list.

The system information list is activated by short-pressing the Menu/Esc key.

7

Parameter	Description	Editable
Battery	current battery voltage and capacity	no
Serial no.	serial number of the IM806v2	no
Operating time	operating time of the fan (= measuring mode)	no
IM806 version	version of the Ionometer firmware	no
OS version	version of the Ethernet operating system	no
Bootloader vers.	version of the upgrade program	no
Preampl. no.	number of the pre-amplification unit	no
Host name	name of the Ionometer on the network	yes
IP address	IP address of the IM806v2	yes
Subnet mask	subnet mask of the current network	yes
Gateway	IP address of the router	yes
MAC address	physical network address	no
Address of TFTP server	IP address of the computer that serves the file for an upgrade	yes
Analog output Min. voltage	Lower voltage limit of the analog output	yes (PC)
Analog output Min. ions	Lower ion concentration in 1,000 ions/cm ³ of the analog output	yes (PC)

7. Configuration

7.1 System information list (continued)

Parameter	Description	Editable
Analog output Max. voltage	Upper voltage limit of the analog output	yes (PC)
Analog output Max. ions	Upper ion concentration in 1,000 ions/cm ³ of the analog output	yes (PC)
TFTP enabled	if „yes“, the Ionometer IM806v2 will do a firmware upgrade via the configured TFTP server on the next power-on	yes (PC)
Last calibration on	Date of the last calibration	yes (PC)
Next calibration on	Date of the next recommended calibration	yes (PC)
Next calibration in	Remaining operation time until the next recommended calibration	yes (PC)

7

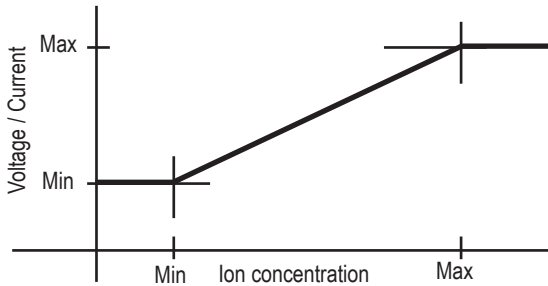
7.1.1 Analog output

For the analog output, 4 parameters have to be defined:

1. the lower voltage value in mV
2. the lower ion concentration value in 1,000 ions/cm³
3. the upper voltage value in mV
4. the upper ion concentration value in 1,000 ions/cm³

Every channel (positive ions/negative ions) has a resolution of 4,000 increments (12 bit) over a voltage of 0 ... 10 volt and a current from 0 ... 20 mA, respectively.

7. Configuration



7

Figure 12 Chart of the analog output

The setting applies to the negative and the positive channel.

Example configuration 1:

Target configuration: At 0 ions / cm^3 , 0 volt (corresponds to 0 mA) should be output, at 10,000 ions / cm^3 , 10 volt (corresponds 20 mA) should be output.

Configure the following values:

1. Lower voltage value: **0 mV**
2. Lower ion concentration value: **0 klons/ cm^3**
3. Upper voltage value: **10,000 mV**
4. Upper ion concentration value: **10 klons/ cm^3**

Example configuration 2:

At 5,000 ions/ cm^3 , 4 mA (corresponds to 2,000 mV) should flow, at 50,000 ions/ cm^3 , 20 mA (corresponds to 10,000 mV) should flow.

Configure the following values:

1. Lower voltage value: **2,000 mV**
2. Lower ion concentration value: **5 klons/ cm^3**
3. Upper voltage value: **10,000 mV**
4. Upper ion concentration value: **50 klons/ cm^3**

If the measurement is less than 5,000 ions/ cm^3 , 4 mA will be discharged at the output. If the measurement is more than 50,000 ions/ cm^3 , 20 mA will be discharged.

Note: 1 klons/ cm^3 corresponds to 1,000 ions/ cm^3

7. Configuration**7.2 The configuration menu**

The configuration menu is entered by long-pressing the Menu/Esc key.

The following parameters can be configured:

Parameter	Setting
Display brightness	Selection screen from 0 (off) to 10 (max)
Beep on key press	Enable / Disable (X = Enabled)
Beep on event	Enable / Disable (X = Enabled)
System date and time	Input screen date / time
Record mode	Selection screen (Manual, Timed, Timed with zeroing)
Auto off	Enable / Disable (X = Enabled)
Start recording	Input screen date / time
Recording duration	Input screen duration
Recording interval	Input screen interval time
Auto zeroing	Enable / Disable (X = Enabled)
Zeroing interval	Input screen interval time
Local IP address	Input screen IP address
TFTP server IP address	Input screen IP address
Subnet mask	Input screen IP address
Gateway	Input screen IP address
Barometer adjustment	Input screen air pressure
Temperature unit	Toggle between °C / °F
Language	Selection screen English / German

7. Configuration

In order to change a parameter, place the selection bar (inverse line) on the parameter text using keys 1 and 2 (arrow keys) and press key 4 (return key).

Parameters that can be enabled / disabled can be toggled by pressing key 4.

Selections in a selection screen can be made the same way as in the configuration menu. After selection you return to the configuration menu.

7

If you do not want to change a selection, you can use the Menu/Esc key to go back to the configuration menu.

In the input screens for date / time, interval times, durations, IP addresses and air pressure you can use keys 1 and 2 (arrows up and down) to increment / decrement the value of the selected field. Use key 3 to go to the next field (month / year / hour etc.). The selected field is inversely displayed. By pressing key 4 (return key) the settings are saved. To go back to the configuration menu without saving press the Menu/Esc key.

Display brightness

The brightness of the display illumination can be adjusted from 0 (= off) to 10 (= max). With increasing brightness the operating time using the battery decreases because of the required current.

Beep on key press

The Ionometer **IM806v2** is able to confirm every key press with a beep of 0.1 seconds. If this function is enabled a push on the power button is also confirmed with a short sound.

Beep on event

If this function is enabled, an occurring error is indicated by a continuing sound. The sound lasts until the error is acknowledged.

System date and time

The date and time are required for controlling the measurement recording. Changing it during an ongoing recording may lead to unforeseeable behaviour of the device.

7. Configuration

Record mode

This parameter determines how the measurement recording is activated:

Manual: Measurement recording can only be activated manually (by pressing key 2 in measuring mode). The "Start" parameter has no effect.

Timed: The measurement recording is activated when the time configured for the "Start" parameter is reached and if the **IM806v2** is switched on.

Timed with zeroing: A zero point adjustment is initiated when the time configured for the "Start" parameter is reached and if the **IM806v2** is switched on. After that, the measurement recording is activated.

Auto off

If this parameter is enabled, the **IM806v2** will switch itself off after the measurement recording is finished. This is only done if the recording was activated automatically via timer.

Start (of measurement recording)

If this time is reached and the record mode is set to "Timed" or "Timed with zeroing", the measurement recording is activated. The **IM806v2** has to be switched on at this time.

Duration (of measurement recording)

The measurement recording is stopped after the duration configured here. The hours can be set with 4 digits. Also manually activated recordings will be stopped after this duration.

Recording interval

The recording interval can be set as a time in the range of 1 second to 23 hours, 59 minutes and 59 seconds.

Auto zeroing

If this parameter is enabled, a zero point adjustment is initiated in configurable intervals.

Zeroing interval

The zeroing interval can be set as a time in the range of 1 second to 23 hours, 59 minutes and 59 seconds.

7. Configuration

Local IP address

TFTP server IP address

Subnet mask

Gateway

You can get these network parameters from you network administrator.

Barometer adjustment

The integrated barometric sensor can be easily adjusted. Enter the current air pressure value (e.g. from a reference device) and confirm with key 4 to save.

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Temperature unit

Press key 4 to toggle between °C and °F.

Note: The temperature / humidity sensor rotronic HC2-S has to be always set to °C internally.



Language

You can choose between English and German.

8. Safety Instructions

8. Safety Instructions

Non-compliance with these safety instructions may lead to damages of the device and even to dangerous personal injury!

- ▶ The **IM806v2** may only be used for the intended purpose!
- ▶ **IM806v2** may only be used by qualified personnel!
- ▶ Prevent fluids from entering the **IM806v2** and the charger!
- ▶ Keep the **IM806v2** and the charger away from children!
- ▶ Avoid touching the membrane keyboard with sharp or pointed objects!
- ▶ The air has to be dry and free from oil or other impurities which could affect dust particles in the air which in turn settle on the walls of the electrodes.
- ▶ Therefore avoid measuring in an atmosphere containing conductive dust particles such as graphite or similar materials!
- ▶ Avoid condensation of the air in the electrodes!
- ▶ Do not insert objects into the measuring system (tube electrodes)!
- ▶ Keep the electrode lids free! Risk of crushing!
- ▶ Do not use in areas with danger of explosions!
- ▶ Use the charger only in dry indoor areas!
- ▶ Do not use defective connection cables!
- ▶ Do not cover the charger during operation!
- ▶ Use the charger only to charge the integrated LiPo battery!



8



9. Cleaning and Maintenance Instructions

9. Cleaning and Maintenance Instructions

Clean the **IM806v2** with a damp and lint-free cloth.

Do not use abrasives.

Do not exert pressure on the display window in the membrane keypad.



9.1 Calibration and maintenance interval

The recommended calibration and maintenance interval is at every 2000 operating hours of the fan - however, at least every 2 years.



9

Note

When not in use charge the battery pack of the **IM806v2** at least every 12 months with the included battery charger.



10. Technical Data

Measuring system:	Open measuring system without absorbent parts and with two electrodes arranged in parallel for simultaneous recording of negatively and positively charged air ions. Servo-driven electrode lid.
Measuring scope:	Air ions with an ion mobility of 1.3 cm ² /Vs (small ions) and faster. Ions with lower mobility are partially detected
Ion polarity:	Positively charged air ions, negatively charged air ions
Measuring ranges:	Eight measuring ranges: from 0 ... 1,000 Ions/cm ³ up to 0 ... 40,000,000 Ions/cm ³ automatic measuring range switchover
Flow of sampling air:	24.5 l/min per channel, via integrated fan, approx. 1.8 m/s at inlet
Zero-offset adjust.:	Manually and automatically at definable time intervals
Warm-up time:	Min.: 30 seconds, typical: 15 minutes
Measurement display:	Numeric display and graphical representation on illuminated display
Operation:	Keypad with 5 keys
Operator guidance	English / German
Storage of measurements	Ion measurements (min., average and max. value), air pressure, temperature*, humidity*, device state onto integrated microSD memory card in CSV format. Starting time, duration and recording interval are freely definable. Data transfer via integrated FTP server or PC software (included in delivery). * with optional temp. / humidity sensor

10. Technical Data (continued)

10. Technical Data (continued)

Analog outputs:	One output per channel 0 ... 10 VDC / 0 ... 20 mA, lower and upper limits definable. Both outputs are galvanically isolated from the measurement device. Voltage output: min. input resistance of follow-on device: 10 kOhm Current output: max. load resistance of follow-on device: 400 Ohm
Battery operation:	Integrated lithium polymer battery (up to 15 hours of operating time)
Battery for RTC:	Lithium button cell CR2032
Ambient temperature:	Operation: 0 ... 40 °C, Storage: -10 ... 50 °C
Network services:	Web server, FTP server
Data storage:	microSD memory card, also contains system files and web pages
Dimensions :	1246 mm x 108 mm x 226 mm (W x H x D)
Weight	3110 g
Housing:	Anodised aluminium profile housing
Tripod sockets:	UNC 1/4 inch (photo), UNC 3/8 inch (microphone)
EC conformity:	Conforms to EU guidelines on electromagnetic compatibility
Warranty:	24 months (limited to 12 months for battery and servo drive)
Scope of delivery:	IM806v2 , charger, manual, PC software, USB cable, discharging cable, network cable

10

Charger :

Operating voltage:	100 ~ 240 Volt AC, 50 ~ 60 Hz
Charging current:	max. 2 A
Approval marks:	CE, UL 60601

10. Technical Data (continued)

10. Technical Data (continued)

Optional accessories

- Temp.- / humidity-sensor: rotronic Hygroclip2 (HC2-S),
- Extension tube: Screw-on extension tube, length: 7.5 inches
- Handling case: Robust handling case (systainer T-Loc 3) with
 PE foam cut-outs, delivery in 3 colors:
 light gray, anthracite, sapphire

Subject to technical modifications

11. Conditions of Warranty

11. Conditions of Warranty

Umweltanalytik Holbach GmbH provides 24 months warranty (servo drive and battery: 12 months) on the Ionometer **IM806v2** from the date of purchase. Should faults occur in operation, please consult your dealer or supplier.

We reserve the right to repair or exchange the Ionometer **IM806v2**. The parts used for this are new or as new. Parts returned shall become the property of Umweltanalytik Holbach GmbH. The guarantee period shall not be extended for the replaced parts or for the Ionometer **IM806v2** for repair carried out under guarantee.

This guarantee shall not include damage caused by improper use, operating errors, misuse, external influences, flash of lightning / overload, modifications to the product and attachments. Also excluded are parts subject to wear (e.g. batteries, fuses), as well as damage caused by wearing parts (e.g. leaked batteries). The guarantee does not cover damage in transit, consequential damage, costs for down time and infrastructure. The guarantee claim shall lapse if repairs are carried out by unauthorised persons or if the serial number is removed or made illegible. Warranty can only be granted upon presentation of a clear supporting document of purchase (invoice or sales receipt). In case of repair, please send the device with postage adequately pre-paid and carefully packed (if possible in its original packaging inside a cardboard box) together with a detailed description of the fault to your dealer or to Umweltanalytik Holbach GmbH.

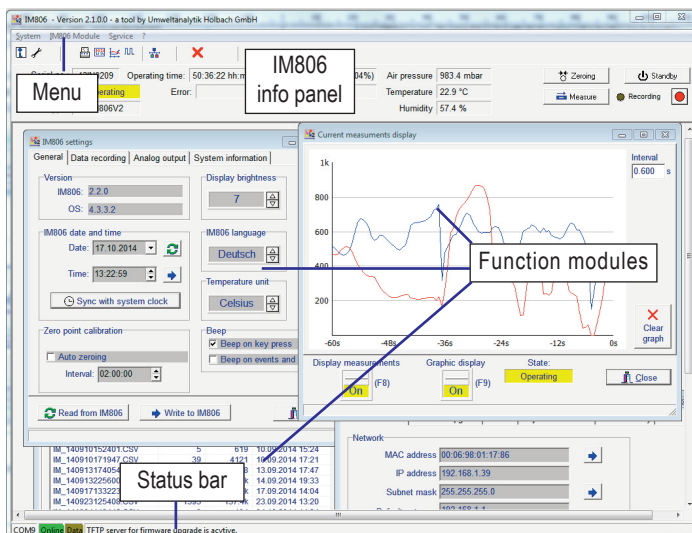
Unfortunately, consignments that have not been prepaid cannot be accepted.

12. The Program IM806.EXE

12. The Program IM806.EXE

The included disk contains the program IM806.EXE for remote controlling and configuration of the **IM806v2**, data transfer of the recorded measurements and to modify the adjustment data.

All configuration except the set-up of the analog output can also be done directly on the **IM806v2** (see section 7.2: "Configuration"). The program is also not required for measuring.



12

Figure 13 The program IM806.EXE for **IM806 / IM806v2**

Note:

The program IM806.EXE is compatible to the Ionometer **IM806**



12. The Program IM806.EXE

12.1 The installation of IM806.EXE

12.1.1 System requirements

To successfully install and run IM806.EXE you need:

- ▶ A running PC system:
 - ▶ Microsoft Windows XP, Vista, Win7, Win8 with USB 2.0 port
 - ▶ depending on the operating system you need administrator privileges
- ▶ The installation software on the data media included in the delivery of the **IM806v2** or downloaded from the manufacturer's web site
- ▶ The USB connection cable (included in delivery)
- ▶ Microsoft EXCEL for creating the sampling data sheet (EXCEL is **not** included in the delivery of the **IM806v2**)

12.1.2 Installation

Note: Depending on the version of the Microsoft Windows operation system the displayed windows might look a bit different from the following screenshots.



12

Run the program "IM806_Setup.exe" in the directory "IM806V2\English\Program" on the provided disk by double-clicking.

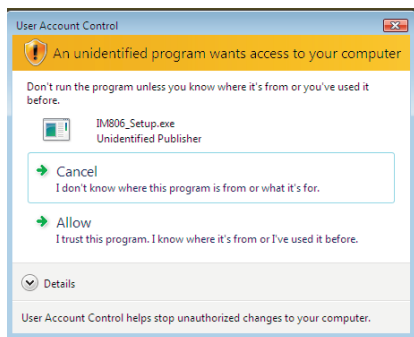


Figure 14 Security confirmation (here for Windows Vista)

Please click "yes" when the security confirmation pops up. The installation wizard will start and guide you through the installation.

12. The Program IM806.EXE

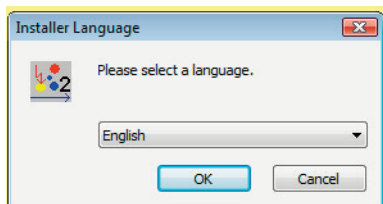
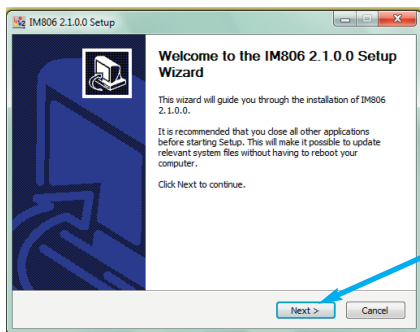


Figure 15 Selection of the installation language

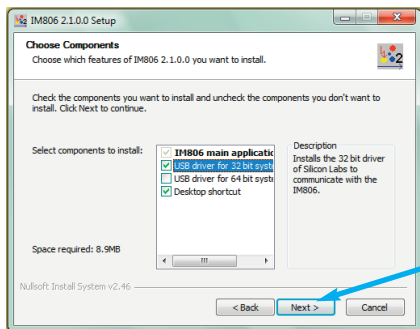
Select the desired language between English and German.



12

Click on Next

Figure 16 The installation wizard guides you through the installation

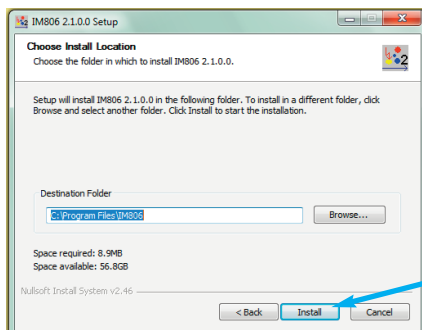


Select which components should be installed. If this is the first installation, you should install the appropriate USB driver (64 bit or 32 bit).

Click on Next.

Figure 17 Component selection, here with 32 bit USB driver

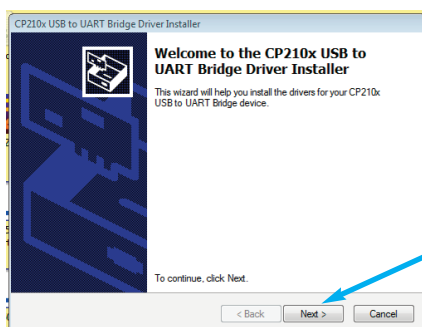
12. The Program IM806.EXE



The installation folder of IM806.EXE can be changed here.

Click on Install.

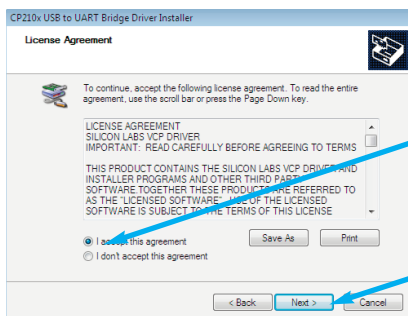
Figure 18 Installation folder for IM806.EXE



First, the USB driver will be installed (if selected).

Click on Next.

Figure 19 Installation of the USB driver



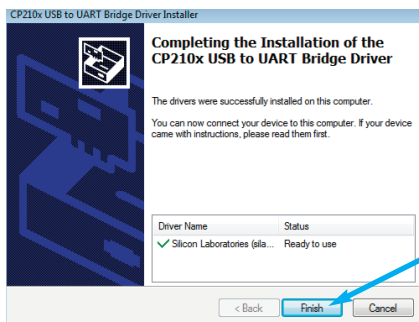
Please read the license agreement and accept it.

Click on Next

Figure 20 License agreement of the USB Driver

12

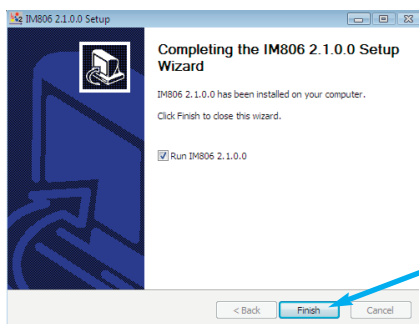
12. The Program IM806.EXE



The installation of the USB driver is complete.

Click on Finish

Figure 21 The installation of the USB driver is complete




The program IM806.EXE will be installed after the USB driver.

Click on Finish

12

Figure 22 The installation is finished

If you selected "Desktop icon" during the installation, you will find the

program icon  on your desktop and can run the program by double-clicking on it. You will also find the icon in the start menu.

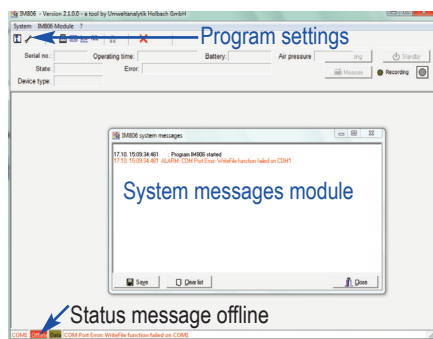
12. The Program IM806.EXE

Remove the dust seal from the USB connector of the **IM806v2** and connect the **IM806v2** with the PC using the provided USB cable.

12.1.3 First launch of IM806.EXE

Launch the program IM806.EXE.

The program IM806.EXE will be displayed.



On first run, the communication port is set to COM1.

If there is no connection to the **IM806v2** (Offline),

click the icon  to set-up.

12

Figure 23 First launch of the program IM806.EXE

The program settings form will be opened. Click on the ? button to list the currently available communication ports.

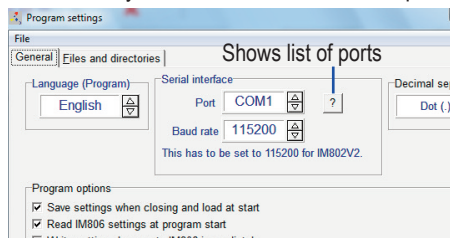


Figure 24 Program settings (partial view)

12. The Program IM806.EXE

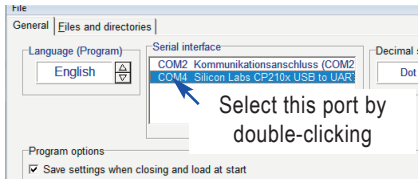
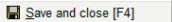


Figure 25 Port list

Select the port labelled „Silicon Labs CP210x USB to UART“ by double-clicking and save by clicking on the button .

If the connection has been successfully established, the online field in the status bar (Figure 28) will be green. The serial number, the operating time, the battery voltage and other information of the connected **IM806v2** will be displayed in the info panel.

For **IM806v2** the baud rate is fixed to 115200. For the **IM806** the baud rate of the device and the program IM806.EXE have to be configured to be equal. You can change this setting by clicking on the small arrows in the field.

12

If the connection fails, please check the following:

1. Is the **IM806v2** switched on?
2. Is the connecting cable correctly plugged into the Ionometer's USB port and the USB port of the PC?
3. Is the correct communication port selected in the program settings?
4. Is the correct baud rate configured (for **IM806v2** always 115200)?

12.2 Using IM806.EXE

The program form (Figure 13) of IM806.EXE contains:

1. Menu and icons to open the function modules
2. **IM806v2** info panel displaying of the operation time etc.
3. Work space of the function modules
4. Status bar displaying the communication

12. The Program IM806.EXE

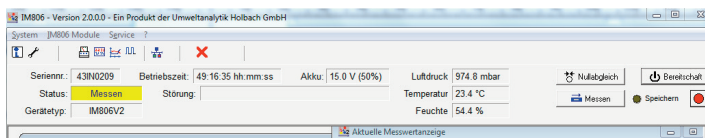


Figure 26 Menu, info and remote control panels

12.2.1 The menu

The following functions can be reached via the menu:

Icon	Menu	F-Key	Function
	System -> System messages	F2	Opens a window with system messages
	System -> Program settings		Program configuration
	IM806 Modules -> Settings		Configuration of IM806v2
	IM806 Modules -> Measurement display		Show current measurements
	IM806 Modules -> Data transfer		To load the measurement data from IM806v2
	IM806 Modules -> Interval mode		Remote control IM806v2 in interval mode
	IM806 Modules -> System configuration		To modify adjustment data, network settings, etc.
	System -> Exit program		Closes IM806.EXE

12

12.2.2 Remote controlling IM806v2

In the upper right panel you can remote control the **IM806v2** by clicking on one of the icons.



Figure 27 Remote controls of the **IM806v2**

12. The Program IM806.EXE

12.2.3 The status bar at the bottom of the main form

The status bar shows:

1. the configured serial port number
2. the status of the communication
3. the sending event of a request from the PC to the **IM806v2**
4. System message (Error messages are displayed in red)

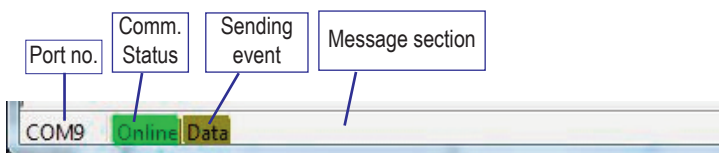


Figure 28 Status bar (here without any messages)


12

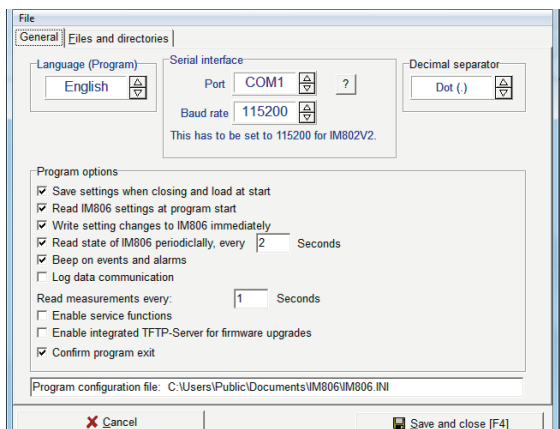
12.2.4 System messages

System messages are displayed in a separate system messages window. This window opens itself when an error message occurs. The window can be opened and closed using the function key [F2]. Size and position of the system messages window are stored. The system messages window can also be placed outside of the main form.

12. The Program IM806.EXE

12.2.5 Program settings

The program IM806.EXE can be adjusted to the installation environment and the connected **IM806v2** using the program settings form. Changes are only applied if the form is closed by clicking on the button  Save and close [F4].



12

Figure 29 Program settings form

The settings group "Serial interface" is described in the previous section 12.1.3 "First launch of IM806.EXE".

By checking "Log data communication" you can enable the readable logging of the communication between the PC and the **IM806v2**. This can be helpful if you encounter problems with the communication. The files will be stored in the configured folder.

The selection of the decimal separator is used for the displaying and the export of the optional temperature and humidity sensor to text or EXCEL files.

If you need to change system relevant settings of the **IM806v2** you can activate the module "System configuration" by checking the box "Enable service functions"

12. The Program IM806.EXE

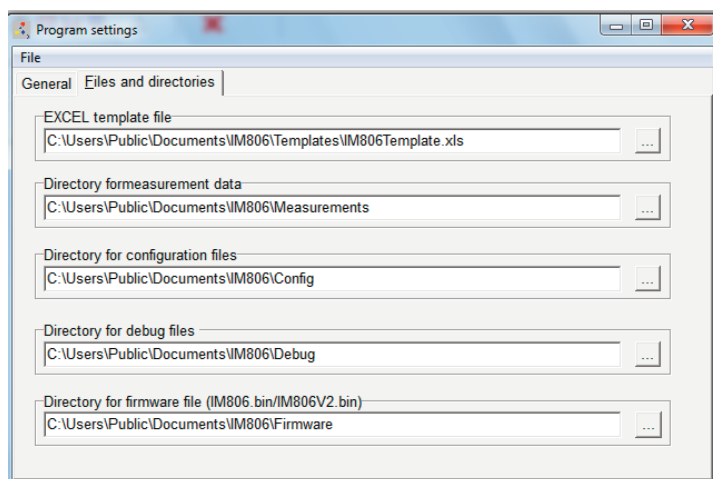
The directories in the tab "Files and directories" are created during installation in the public folders in, until Windows XP:

C:\Documents and Settings\All Users\Documents\IM806\Data

and since Windows Vista in:

C:\Users\Public\Documents\IM806\Data

The files and directories are pre-configured during installation but can be changed in this form.



12

Figure 30 Files and directories in the program settings

Note: The directory for configuration files is not used by this version of IM806.EXE



12. The Program IM806.EXE

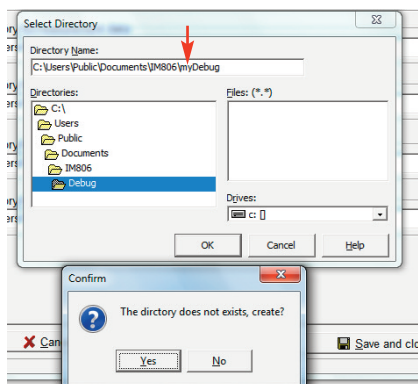



Figure 31 Creation of a new directory

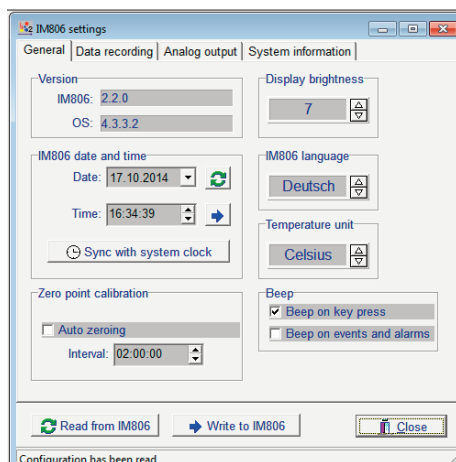
12

Directories and files can be changed by clicking on . The example in Figure 31 shows how the directory name was changed from "Debug" to "MyDebug". After clicking on "OK" and the following confirmation, the directory "MyDebug" will be created.

During installation, the EXCEL template file "IM806Template.xls" is created and will be used when exporting measurements to EXCEL. Please adjust the template files to your needs, especially the header and the macro "IMStart", if necessary.

12. The Program IM806.EXE

12.2.6 Program module "Settings"



12

Figure 32 IM806 settings module

In the module "IM806 Settings" you can configure all those settings which can also be set directly on the **IM806v2**. Additionally, you can also set-up the analog output of the **IM806v2** here.

If the program setting "write setting changes to IM806 immediately" is enabled, new values are transferred to the **IM806v2** and will be effective directly after leaving the input field in the module (by hitting the tab or return key). This does not apply to the date and time setting.

You can read the current configuration using the button "Read from IM 806" and transfer all settings to the **IM806v2** by clicking "Write to IM806".

In all modules, buttons with the icon  perform a read operation and buttons with the icon  perform a write operation of parameters.

12. The Program IM806.EXE

The module has 4 tabs:

- ▶ "General" to configure date and time, display brightness, language etc.
- ▶ "Data recording" with input fields for start time, duration, interval, start mode and automatical power-off after completion
- ▶ "Analog output" to configure the analog output (see section 7.1.1)
- ▶ "System information" to generate a list of the current settings and adjustment values. This list can also be exported to the system messages list.

12.2.7 Program module "Measurement display"

The module "Measurement display" shows the current measurements of the **IM806v2**. If the module is resized, the display size of the digits is also changed.

The values are only shown if the device is in measuring mode.

The displaying can be enabled and disabled using the key [F8].

12

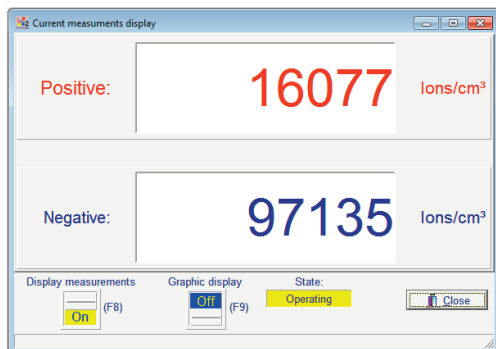


Figure 33 Measurement display module - numeric

By pressing [F9] you can switch to graphic display of the measurements.

12. The Program IM806.EXE

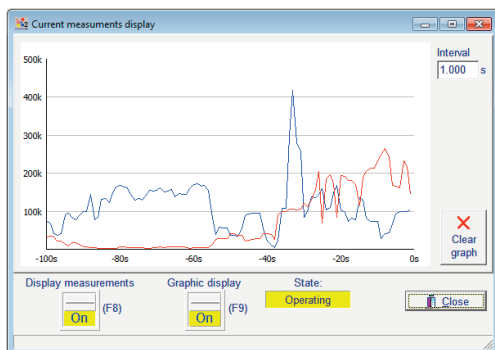


Figure 34 Measurement display - graphical

12

The measurements of the last 100 seconds are always shown.

The interval of the measurement retrieval can be adjusted.

12.2.8 Program module "Measurement processing"

Using the module "Measurement processing", you can read data from **IM806v2** and export them to a text file or an EXCEL spread sheet.

An EXCEL template file can be selected in the program settings.

After generating the diagram, the EXCEL-macro "IMStart" is run. That way the data of the measurement can automatically be processed.

First, load the reading directory.

Select the reading file you want to export.

Choose the fields you want to export in the selection panel.

Start the export to EXCEL or to a text document

Please take care of the decimal separator, if the temperature and humidity sensor is installed.

12. The Program IM806.EXE

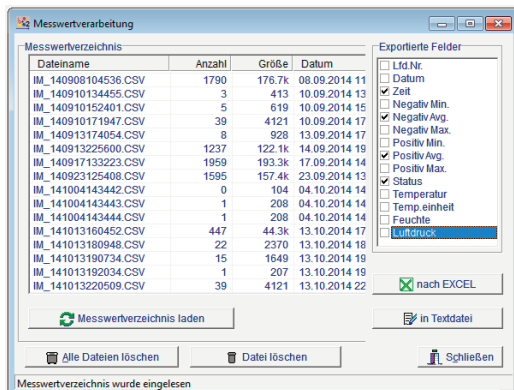


Figure 35 Measurement processing module

Hint: Big files (more than 500 measurement records) can be transferred much faster using an FTP client.

This module also allows to delete single files or all files.

12



12.2.9 Program module "Interval mode"

The module "Interval mode" is intended for long-term measurements. To reduce pollution of the electrode you can define an interval operation with standby and measuring cycles.

An active interval operation is indicated in the info panel:

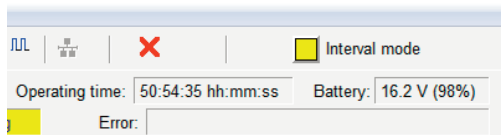


Figure 36 Interval mode is active

12. The Program IM806.EXE

Figure 37 The interval mode form

Meanings of the "Active" indicator and the "Interval mode" indicator on the main form:

12

Yellow continuous: Interval mode is active but the starting time is not yet reached.

Green blinking: Interval mode is active and **IM806v2** is in measuring mode.

Yellow blinking: Interval mode is active and **IM806v2** is in standby mode.

Purple blinking: Interval mode is active and **IM806v2** is doing a zero point adjustment.

Notes:

When in interval mode, all settings except the ending time are locked. The control of the interval mode is done inside of the program IM806.EXE in the interval mode form. The interval mode form (module) has to be opened during the interval operation.

The points in time are saved in the program parameter file.

A short interruption of the program should not have any negative effects.

If the connection to the **IM806v2** is interrupted, the control will "hang" during the switching process until the connection is established again. The active mode of the device is monitored during interval mode and is changed if required.

12. The Program IM806.EXE

12.2.10 Program module „System configuration“

The module "IM806 system configuration" allows access to system relevant settings and all adjustment values of the **IM806v2**.

This module has to be enabled in the system configuration (see section 12.2.5). The module has 5 tabs.

You can use this module to:

- ▶ change the network settings of the **IM806v2**
- ▶ change the baud rate (only for **IM806**)
- ▶ configure and start a firmware upgrade
- ▶ modify calibration values and settings
- ▶ modify service intervals
- ▶ read the error memory

12

Changes in this module are **not** automatically transferred to the **IM806v2**.

Changes to these parameters may lead to a reboot of the **IM806v2**.
Changes to the adjustment values will be logged internally.

Note: Changes to the parameters in this module may influence the function of the IM806v2. Incorrect settings may lead to defects and failures of the device.

If incorrect settings lead to defect, the warranty is void.

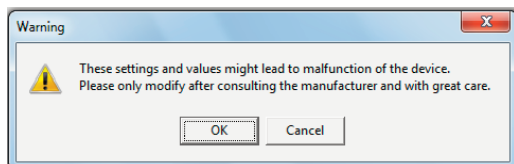
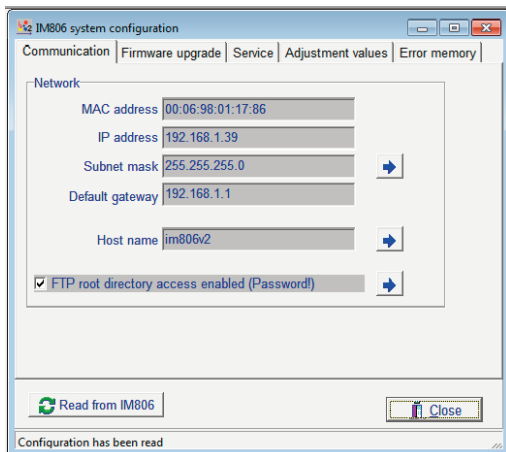


Figure 38 Warning when opening the module

12. The Program IM806.EXE

Before the module is shown, a warning is displayed (Figure 38). After that, the actual module is opened.



12

Figure 39 The IM806 system configuration module

Network specific settings can be changed in the "Communication" tab. You can get the correct values for the network settings from your network administrator.

Hint for accessing the device via FTP:

For access to the measurement data files via FTP, no user name or password is required. The FTP root directory is the directory in which the measurement data files are placed.

If you activate the FTP root access, the root directory of the SD memory card is set as the FTP root directory. In this case, you need a user name and a password.

You will find the credentials for full access to the SD memory card on the label on the last page of this manual.



The "Firmware upgrade" tab is described in section 13.

12. The Program IM806.EXE

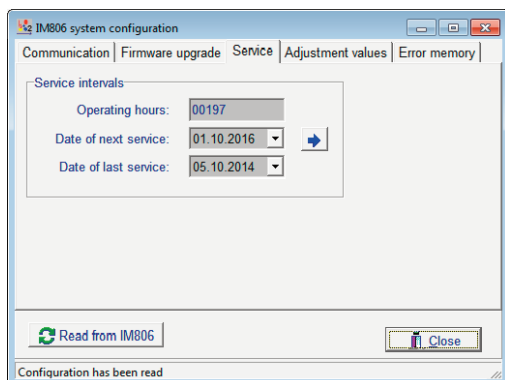



Figure 40 The "Service" tab in the system configuration module

You can modify the interval for the next service / recalibration and the last service in this tab. To transfer the settings to the **IM806v2** click on the  button.

The values in the "Adjustment values" tab should only be changed after consulting the manufacturer.

The "Error memory" tab is for reading the error memory stored in the **IM806v2**. The list can be exported to the system messages list and be saved from there.

No.	Date & Time	State	Event	Oper. time
16	15.10.2014 23:02:21	0x0000	Peripheral control err...	49:57:00
15	04.10.2014 19:03:08	0x0000	Battery discharged! (13)	47:20:00
14	04.10.2014 19:03:04	0x2000	Battery discharged! (13)	47:20:00
13	04.10.2014 19:01:21	0x2000	Battery discharged! (13)	47:20:13
12	04.10.2014 09:52:25	0x2000	Battery discharged! (13)	47:07:48
11	28.09.2014 17:25:42	0x2000	Battery discharged! (13)	46:58:34
10	14.09.2014 19:32:19	0x2000	Battery discharged! (13)	35:03:44
9	11.09.2014 15:10:36	0x0000	Peripheral control err...	07:03:00
8	11.09.2014 15:09:08	0x0000	Peripheral control err...	07:03:00

Figure 41 Error memory (extract)

13. Firmware Upgrade

13. Firmware Upgrade of the IM806v2

The firmware of the **IM806v2** is under continuous development. New versions of the firmware can be downloaded from the manufacturer's web site and can be installed on the **IM806v2** via network and a TFTP server.

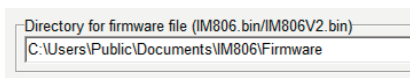
The program IM806.EXE includes a TFTP server function.

When using the integrated TFTP server the program IM806.EXE has to run.

An installed firewall must not block the TFTP network port (69).

13.1 Preparing

Copy the firmware file to the directory defined in the program settings:



Alternatively, the correct directory for the firmware file can be selected in the program settings.

The firmware file for the lonometer **IM806v2** is called IM806V2.bin.

The firmware file for the lonometer **IM806** is called IM806.bin.

13

Attention: Interchanging these two files will lead to immediate hardware defect of the lonometer.

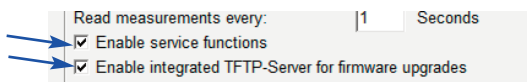


Connect the lonometer **IM806v2** to the network.

Connect the lonometer **IM806v2** to the PC.

Start the program IM806.EXE on the PC that is connected to the lonometer **IM806v2**.

Enable the TFTP Server and the service functions in the program settings:



Possibly, the program IM806.EXE has to be unblocked in the firewall.

13. Firmware Upgrade

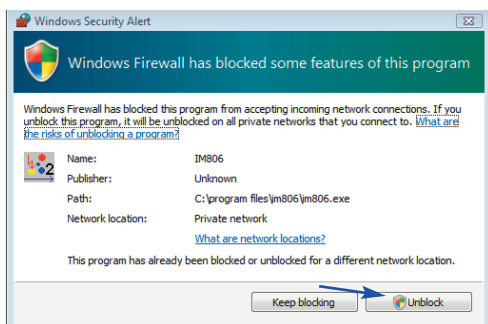


Figure 42 Grant network access for the program IM806.EXE

13.2 Procedure

Open the IM806 system configuration module and select the "Firmware upgrade" tab:

13

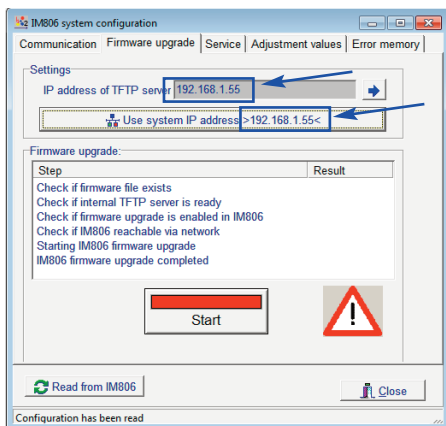


Figure 43 Firmware upgrade tab

If the TFTP server address configured in the **IM806v2** is not the one used by the TFTP server, click the button "Use system IP address > ... <"

13. Firmware Upgrade

Click the button "Start".

The program IM806.EXE will do the following checks:

- ▶ can the firmware file IM806V2.bin / IM806.bin be accessed?
- ▶ is the TFTP server active?
- ▶ is the upgrade enabled in the **IM806v2**?
- ▶ can the **IM806v2** be reached over the network (since Windows Vista only if the program was run with administrator privileges)?

After that, the upgrade is started. A flag will be set in the **IM806v2**.

The **IM806v2** closes its electrode lid and reboots. The bootloader, a program in the **IM806v2**, will be activated. The display of the **IM806v2** shows the network parameters:

```
IM806V2
Bootloader V2.1
Local IP:  192.168.001.039
Netmask:   255.255.255.000
Server IP: 192.168.001.036
Trying to connect ...
```

13

Figure 44 Display of the **IM806v2** in bootloader mode

If the connection to the TFTP server was successful, the new firmware will be loaded into the program memory of the **IM806v2**. This procedure takes about 20 seconds.

Do not switch off the IM806v2 nor the PC during the upgrade!

The flag remains set if the upgrade was not successful what makes the power-on procedure very long. The flag can be turned off by clicking on the "Reset firmware upgrade flag of IM806" button.



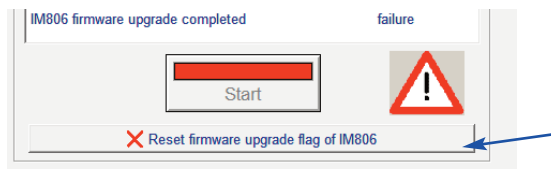
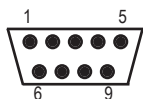
13. Firmware Upgrade

Figure 45 Button to clear the upgrade flag of the **IM806v2**

Appendix A: Analog Output

The Sub-MinD socket on the back side is for the analog output.



View on connector

Layout of the connectors.

Top view



The output signals are together galvanically isolated from the electronics of the device.

A

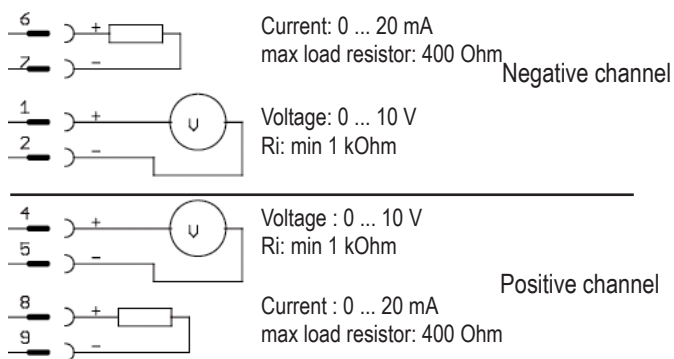


Figure 46 Pin assignment for the analog output

Appendix B: Options during Power-On

Appendix B: Options during Power-On

By pressing the **Menu/Esc key** during power-on (power button on the read side) the **IM806v2** is put manually into firmware upgrade mode (bootloader). The controller of the **IM806v2** has an additional program to upgrade the complete firmware over the network interface.

This mode is indicated by 3 successive beep sounds.

The firmware upgrade is described in section 13.

By pressing **key 2** during power-on (power button on the rear side) the **IM806v2** is switched off or does not switch on, respectively. This function is intended to be used in case of malfunctions after a reset (pressing the power button for more than 10 seconds) to power-off the device.



Appendix C: Structure of Recorded Data**Appendix C: Structure of Recorded Data**

Data is stored on the **IM806v2** as plaintext in CSV format.

The fields are separated by a semicolon (;).

1. Date (Format: DD.MM.YYYY)
2. Time (Format: hh.mm.ss)
3. Minimum of the negative ion concentration in that interval
4. Moving average of the negative ion concentration in that interval
5. Maximum of the negative ion concentration in that interval
6. Minimum of the positive ion concentration in that interval
7. Moving average of the positive ion concentration in that interval
8. Maximum of the positive ion concentration in that interval
9. System status (0 = no errors)
10. Status of the temperature / humidity sensor (1 = OK, 2 = no sensor detected)
11. Temperature value in 1/10 °C (22,4 °C are represented as 224) or 0 if no sensor is detected
12. Temperature unit (0 = °C, 1 = °F)
13. Humidity value in 1/10 % (34,5 % are represented as 345) or 0 if no sensor is detected
14. Status of the air pressure sensor (1 = OK, 0 = no sensor detected)
15. Air pressure in 1/10 hPa (973,8 hPa are represented as 9738)

C

The file name consists of the letters "IM", followed by an underscore and a timestamp.

The timestamp has the format YYMMDDhhmmss

Meaning of these format characters:

YY	Year without century
MM	Month
DD	Day
hh	Hour
mm	Minute
ss	Second

Appendix D: Extension Tube

The optional Extension tube (Article no. 01-026E) allows to aspirate air remote from the **IM806v2**. Due to the distance from the Ionometer it is possible to measure small air ion emitters without the influence of the Ionometer.

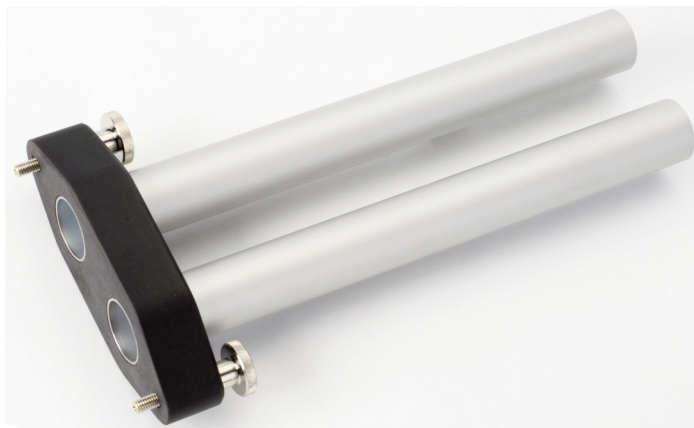


Figure 47 The optional extension tube, length 19cm

D

Mounting the extension tube

Secure the extension tube to the side panel with the inlets (Figure 48) using both knurled screws. Both tubes are conductive and are electrically connected to the housing when secured to the **IM806v2**. It is recommended to discharge the housing via the discharging cable with alligator clip.

Appendix D: The Extension Tube



Figure 48 Mounting of the extension tube

D

Safety instruction: Never touch live parts with the tubes!
Risk of short-circuit!



Intentionally left blank

► Ionometer IM806v2



IM806v2

Manual

Note: Old batteries

This device contains batteries.

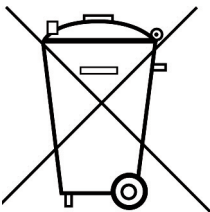
1 piece, type CR2032 lithium button cell for energy buffering of the real-time clock.

1 piece, type lithium polymer 14.4 Volt industrial battery (rechargeable) for the operation of the device.

Old batteries (rechargeable batteries are also batteries in terms of the Batteries Act) may not be disposed in household waste.

Consumers are obliged to take batteries to an appropriate collection point in the trade or local authority.

The batteries of this device may be returned to us after use.



Batteries may contain harmful substances or heavy metals that can harm the environment or personal health.

Batteries are recycled; they contain important raw materials such as iron, zinc, manganese or nickel.

The garbage can symbol means: batteries and rechargeable batteries may not be disposed of in household waste.

The batteries in this device do not contain lead, cadmium or mercury.

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holbach
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