

SensMax Hardware User manual



Contents

SensMax SE Uni-directional sensor	3
SensMax S1 Uni-directional sensor	3
SensMax PRO D2 Bi-directional.....	7
SensMax PRO D3 Bi-directional.....	7
SensMax SE Mobile Data collector	11
SensMax Pro PC Data collector	15
SensMax Pro TCPIP Data collector	18
SensMax Pro GPRS Data collector	22
SensMax Server	28

SensMax SE Uni-directional sensor

SensMax S1 Uni-directional sensor

User manual



Description of sensors:

SensMax SE Uni-directional / SensMax S1 Uni-directional

The sensor is designed to count visitors to the premises, that have one or more passages.

Structurally, the sensor is designed as two units - transmitter and receiver. Devices are installed opposite each other, and form the infra-red barrier.

The intersection of the barrier is fixed and stored in internal memory.

The sensor **SensMax S1 Uni-directional** has an internal memory for 25 days, to store data for each hour.

The sensor **SensMax SE Uni-directional** has an internal memory for 250 days, to store data for each hour.

The sensor can not distinguish the direction of the passage, it considers each intersection. In the viewer statistics data from these sensors can be divided in 2, if necessary.

Data from **SensMax S1 Uni-directional** is transmitted over the radio channel from the sensor to the collector. Distance communication is 20-50 meters, depending on the presence of walls and metal structures in the way of radio signals.

Data from **SensMax SE Uni-directional** is transmitted via an infra-red link, using a special data collector.

SensMax S1 Uni-directional	Works with the following types of the collectors: <i>SensMax PRO PC data collector</i> <i>SensMax TCPIP data collector</i> <i>SensMax GPRS data collector</i>
SensMax SE Uni-directional	Works with collector type <i>SensMax SE Mobile Data collector</i>

The sensors operate on AA type batteries. The operation time is more than two years, when providing data every hour.

Attaching sensors to the data collector

Each sensor must be attached to its collector.

Following steps must be performed to attach sensors to the collector:

1. Insert the batteries in the sensor
2. Connect the collector to the power supply
3. Press the button on the collector
4. Press the button located inside the sensor enclosure

For a more detailed description of the collector see the user's manual for the particular collector type.

Sensor starts counting as soon as the current time and date are set. The time and date are set automatically when connecting to the collector for the first time.

Sensors can be distinguished by the serial number.

The serial number of **SensMax S1 Uni-directional** starts with "03". For example: 030000123

The serial number of **SensMax SE Uni-directional** starts with "01". For example: 010000123

Item description



Icon	Status	Description
1. Link lamp	Flashes	The sensors see each other
2. Crossing lamp	Flashes	Indication of the intersection
3. RF Link lamp	Flashes	Data transmission over the radio / Power supply
4. Power lamp	Flashes	The power indicator
5. Low Battery lamp	Flashes	Low battery power
6. Serial number	n/a	The unique serial number
7. Sound signal	Sound	The sensor is blocked

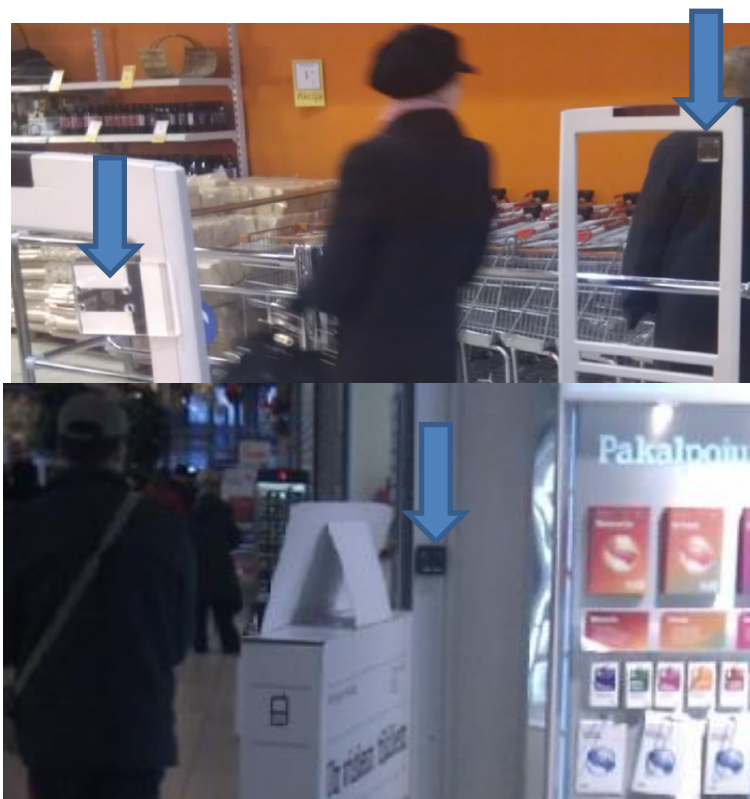
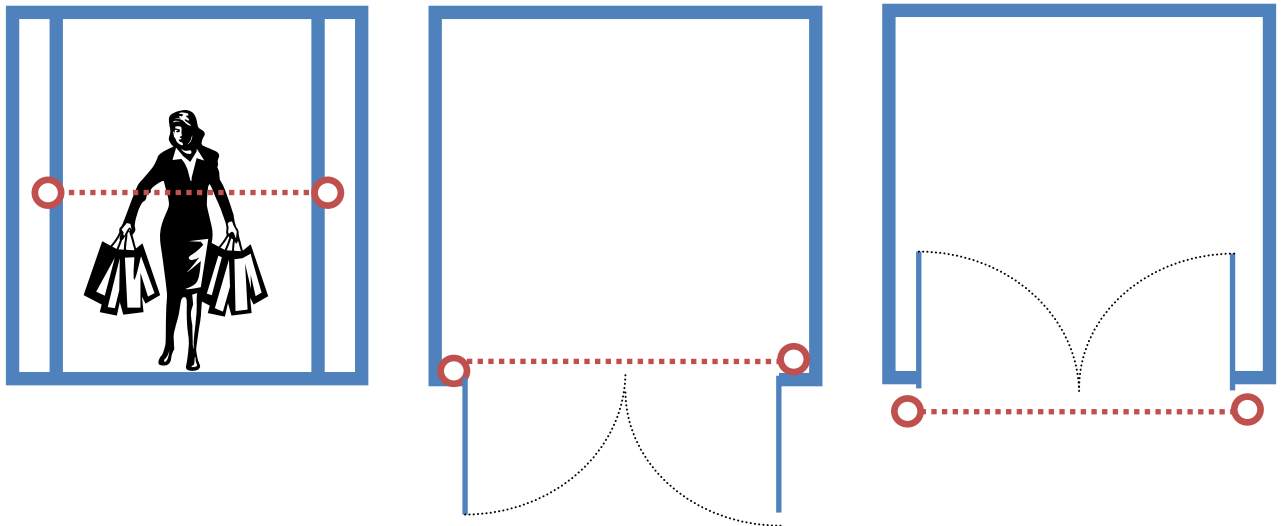
Technical Specification

Parameter	Description
Operating principle	Intersection of the IR beam
Determination of the direction	Unidirectional
Width of the passage	Optimal 1m-6m, Max 8m
Internal memory	25 days, for each hour
Carcass	ABS Plastic, black
Power supply	2AA + 3 AA batteries, up to 2 years lifetime
Data collection	Automatic for S1 Uni-directional Manual for SE Uni-directional
Dimensions	67x67x25 mm
Fixing to the wall	Two-sided adhesive tape
Counting accuracy	95% 3m, >3m +0.6%/m

Installation

Parameter	Description
Recommended distance from the floor	1.5m-1.6m
Orientation	Horizontal
Passage width	Optimal 1m-6m, Max 8m
Angle of the infrared radiation	6%
Fastening	Two-sided adhesive tape

Installation examples



SensMax PRO D2 Bi-directional
sensor with an external power supply

SensMax PRO D3 Bi-directional
battery-powered sensor

User manual



Description of sensors:

SensMax PRO D2 Bi-directional / SensMax PRO D3 Bi-directional

The sensor is designed to count visitors to the premises that have one or more passages.

With the sensor it is possible to count the number of visitors and to determine the number of people in the real time, who are in the premises at the particular moment.

Structurally, the sensor is designed as two units - transmitter and receiver. Devices are installed opposite each other, and form the infra-red barrier.

The intersection of the barrier is fixed and stored in internal memory.

The sensor has an internal memory for 25 days, to store data for each hour. The sensor has a built-in clock and calendar.

The sensor distinguishes the direction of the passage. The direction entrance or exit is being set in the programme to view the statistics.

Data is transmitted over the radio channel from the sensor to the collector. Distance communication is 20-50 meters, depending on the presence of walls and metal structures in the way of radio signals.

Power supply of SensMax **PRO D2** is from internal adapter. The installation of power wire has to be performed.

SensMax PRO D3 sensor operates on AA type batteries. The operation time is more than two years, when providing data every hour.

Sensors are designed to be used with the following types of collectors:

SensMax PRO PC data collector

SensMax TCP/IP data collector

SensMax GPRS data collector

Attaching sensors to the data collector

Each sensor must be attached to its collector.

Following steps must be performed to attach sensors to the collector:

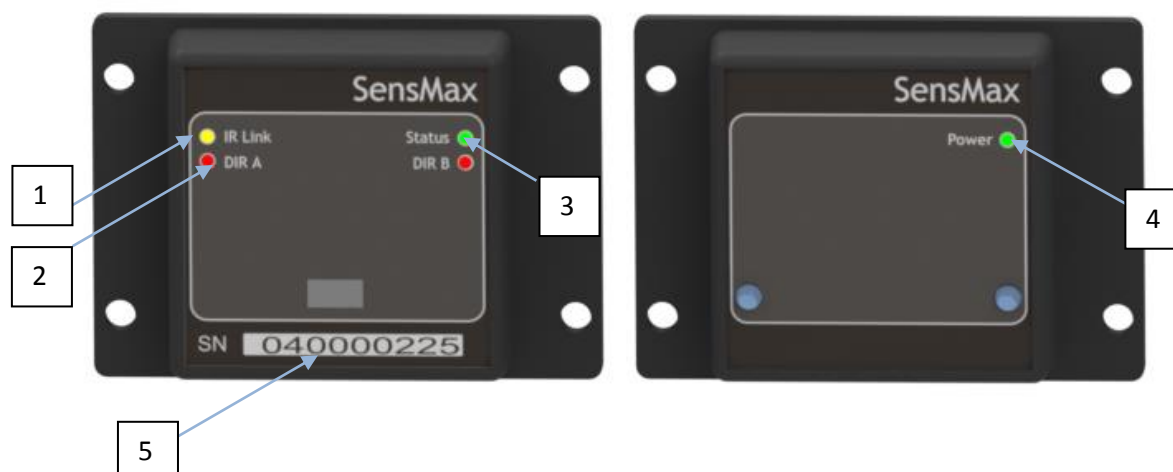
1. Connect the sensor to the power supply/ Insert the batteries in the sensor
2. Connect the collector to the power supply/ USB
3. Press the button on the collector
4. Press the button located inside the sensor enclosure

For a more detailed description of the collector see the user's manual for the particular collector type.

Sensor starts counting as soon as the current time and date are set. The time and date are set automatically when connecting to the collector for the first time.

The bi-directional sensor may be distinguished from other SensMax sensors by the serial number. The serial number for this type of sensors starts with "04". For example: 040000123

Item description



Icon	Status	Description
1. Link lamp	Flashes	Sensors see each other
2. Crossing lamp	Flashes	Indication of intersection DirA or DirB
3. Status lamp	Flashes	Data transmission over the radio, power supply
4. Power lamp	Flashes	Power indicator
5. Serial number	n/a	Unique serial number
6. Sound signal	Sound	Sensor is blocked

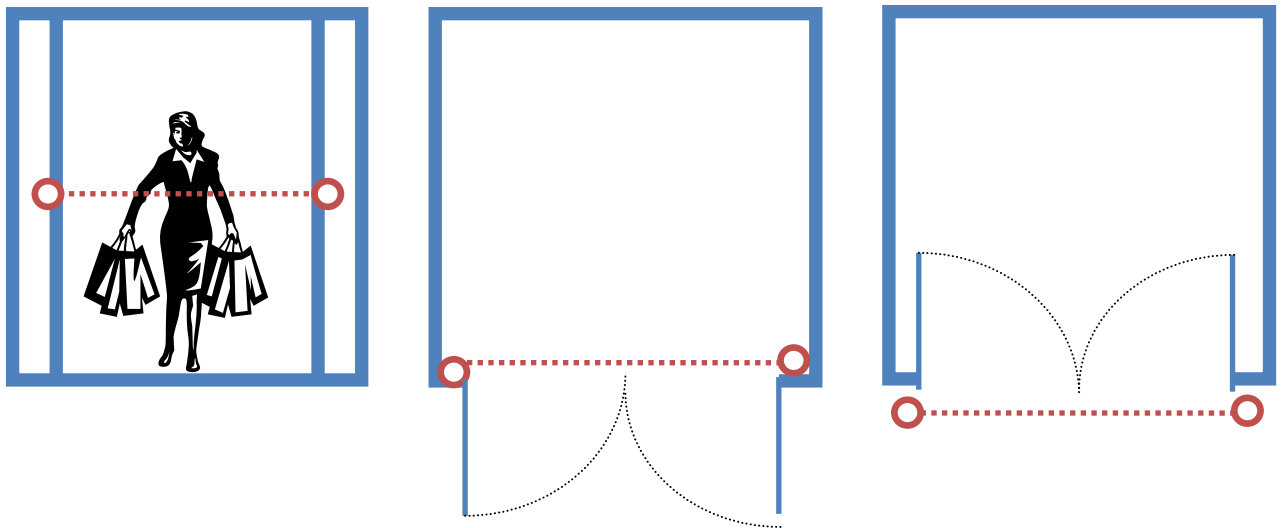
Technical specification

Parameter	Description
Operating principle	Intersection of the IR beam
Determination of the direction	Bi-directional
Width of the passage	Optimal 1m-6m, Max 7m
Internal memory	25 days, each hour for each passage direction
Carcass	ABS Plastic, black
Power supply	Power supply 12 VDC or 2AA + 2 AA batteries, >1 year lifetime
Data collection	Automatic
Dimensions	67x67x25 mm
Fixing to the wall	Two-sided adhesive tape or screws
Counting accuracy	95% 3m, >3m +0.6%/m

Installation

Параметр	Описание
Recommended distance from the floor	1.5m-1.6m
Orientation	Horizontal
Passage width	Optimal 1m-6m, Max 7m

Installation examples



SensMax SE Mobile Data collector

User manual



Description of SensMax SE Mobile data collector

Data collector SensMax SE Mobile is designed to collect the accumulated statistics of visits from the SensMax S1 Uni-directional sensors.

This is a mobile data collector, which does not require a permanent connection to the computer. Data transmission from the sensor to the collector is done by the infra-red channel.

To read data from the sensor, you must send it to the collector, and click the button.

The collector may service 100 different sensors simultaneously. Data from all read sensors will be stored in internal memory, awaiting transfer of the statistics to the computer.

Data transfer to PC

The collector is connected via USB cable to the computer.

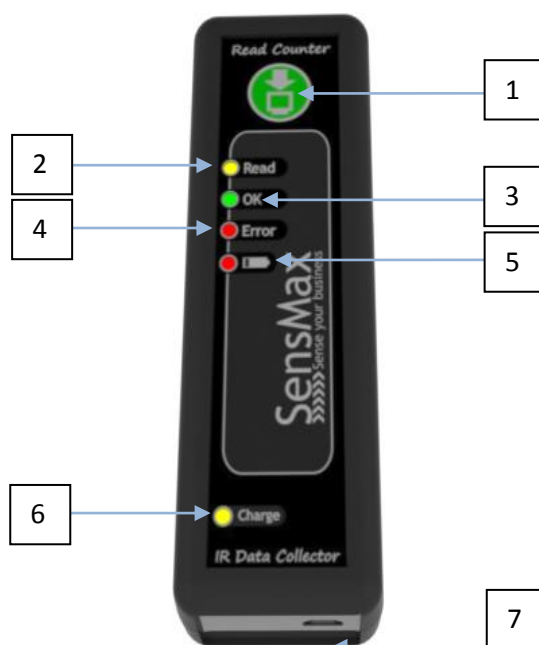
Click the button "Download from collector" in SensMax EasyReport programme.



For more information about using SensMax EasyReport program, refer to instructions for using the program.

The collector has a built-in Li-Ion battery. It is automatically charging from the USB port.

Description of the elements of SensMax SE data collector.



Icon	Status	Description
1. Read button	Short push	Reading data from the sensor
2. Read lamp	Flashes	Reading is in process
3. OK lamp	Lights for 1 second	Reading is finished
4. Error lamp	Flashes 1 time Flashes 2 times Flashes 3 times Flashes 4 times	Sensor not found Reading error Collector memory is full Time is not set in the sensor
5. Battery lamp	Lights for 1 second	Low battery charge
6. Charge lamp	Flashes on	Charging is in process
7. USB port	n/a	USB port

Collector technical specification

Collector SE Mobile	
Data collection	Manually, IR-channel
Working distance	Up to 1 meter from sensor
SensMax SE support	Up to 100 sensors
Memory	2000 days
Carcass	ABS Plastic, black
Power supply	Li-Ion 600mA accumulator. Work on a single charge - 60 days (depends from capacity)
Dimensions	110x25x25 mm
PC connection	USB port
Data transfer to PC	Manually

Setting time in data collector and sensor

Both collector and every sensor has its own clock and calendar. The sensor is based on the clock to record visitor statistics in memory. Each entry in the memory contains information about date and time, so it is very important to check if the sensor's clock is installed correctly.

Time synchronization in the SensMax system is organized as follows:

The collector receives the exact time from the computer at the time of each interaction with the SensMax EasyReport program. In turn, the collector transmits the exact time of the sensor, each reading the data.

To set the time in the collector, follow these steps:

- Run the SensMax EasyReport program
- Connect the collector to the computer using a USB cable

After these steps, your computer system time will be installed in the collector.

To set the time in the sensor, just read the data from it with the collector. If the time is correct, a green **OK** indicator will light on the collector, if the time in the sensor is not set, then the red **Error** indicator will flash 4 times.

Failure to set time in the sensor can be only for one reason - the collector also has incorrect time set. Set the time in the collector, as described above and then re-download the data from the sensor.

SensMax Pro PC Data collector User manual



Description of SensMax Pro PC data collector

Data collector SensMax SE Mobile is designed to read the data from SensMax sensors. The data collection is performed, using radio channel.

The data from the collector is sent to the computer via USB cable.

SensMax Agent is a programme that provides service to the data collector. The programme is designed to read the statistics from the collector and to transfer the data further, to the local directory or on the FTP server.

All the SensMax Agent functions are described in the instructions for using this program.

Attaching sensors to the data collector

Each sensor must be attached to its collector.

Following steps must be performed to attach sensors to the collector:

1. Connect the sensor to the power supply/ Insert the batteries in the sensor
2. Connect the collector to the power supply/ USB
3. Press the button on the collector
4. Press the button located inside the sensor enclosure

Note:

Button to search for new sensors is located on the frontal side of the collector, near the port USB.

Button is pressed with a sharp object, such as a pencil or pen.

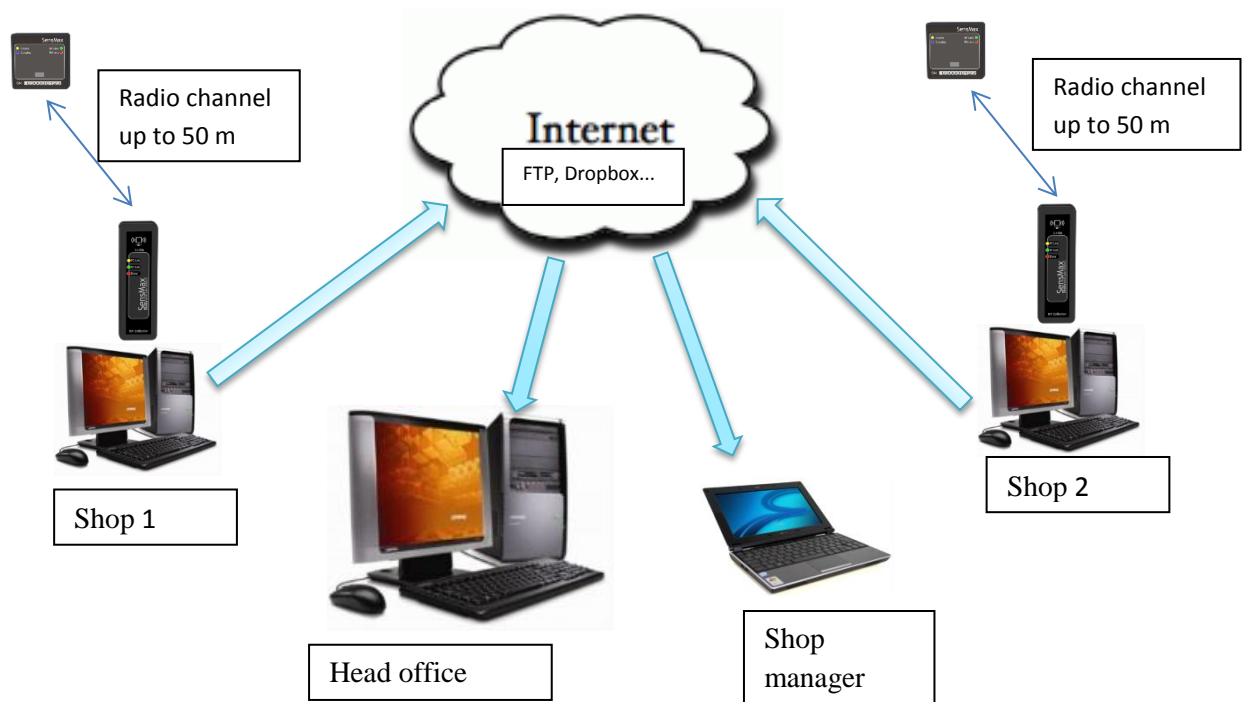
A short press takes the collector in the search mode for the new sensor.

Long press of the button (10 seconds) removes all the attached sensors from memory.

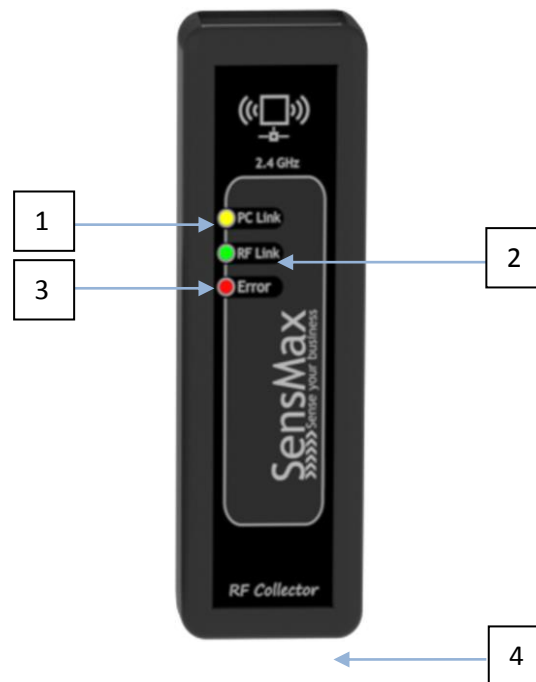
One collector can service 10 SensMax sensors

The collector has an internal memory for storing statistics for 250 days, as well as clock and calendar.

The figure below illustrates an example of a collector.



Description of SensMax Pro PC elements



Icon	Status	Description
1. PC Link	Flashes	Data exchange with PC
2. RF Link	Flashes	Reading data from the sensor
3. Error	Flashes	Sensor reading error
4. USB Port	n/a	USB port

Technical specifications of the collector

Pro PC Collector	
Data collection	Automatic, radio channel
Working distance	20-50 meters
Number of sensors serviced	10
Memory	250 days
Carcass	ABS Plastic, black
Radio channel frequency	2,4 GHz
Radiant power	3.2 mW
Power supply	Computer USB port
Dimensions	110x25x25 mm
PC connection	USB port
Transfer of data to the PC	Automatic

SensMax Pro TCPIP Data collector

User manual



Description of SensMax Pro TCPIP data collector

Data collector SensMax SE Mobile is designed to read the data from SensMax sensors. The data collection is performed, using radio channel.

The data from the collector is sent to the computer via TCP/IP protocol.

SensMax Server is a programme, that provides service to the data collector. The programme is designed to read the statistics from the collector. The description of the programme is provided below.

Attaching sensors to the data collector

Each sensor must be attached to its collector.

Following steps must be performed to attach sensors to the collector:

1. Connect the sensor to the power supply/ Insert the batteries in the sensor
2. Connect the collector to the power supply/ USB
3. Press the button on the collector
4. Press the button located inside the sensor enclosure

Note:

Button to search for new sensors is located on the frontal side of the collector, near the port USB.

Button is pressed with a sharp object, such as a pencil or pen.

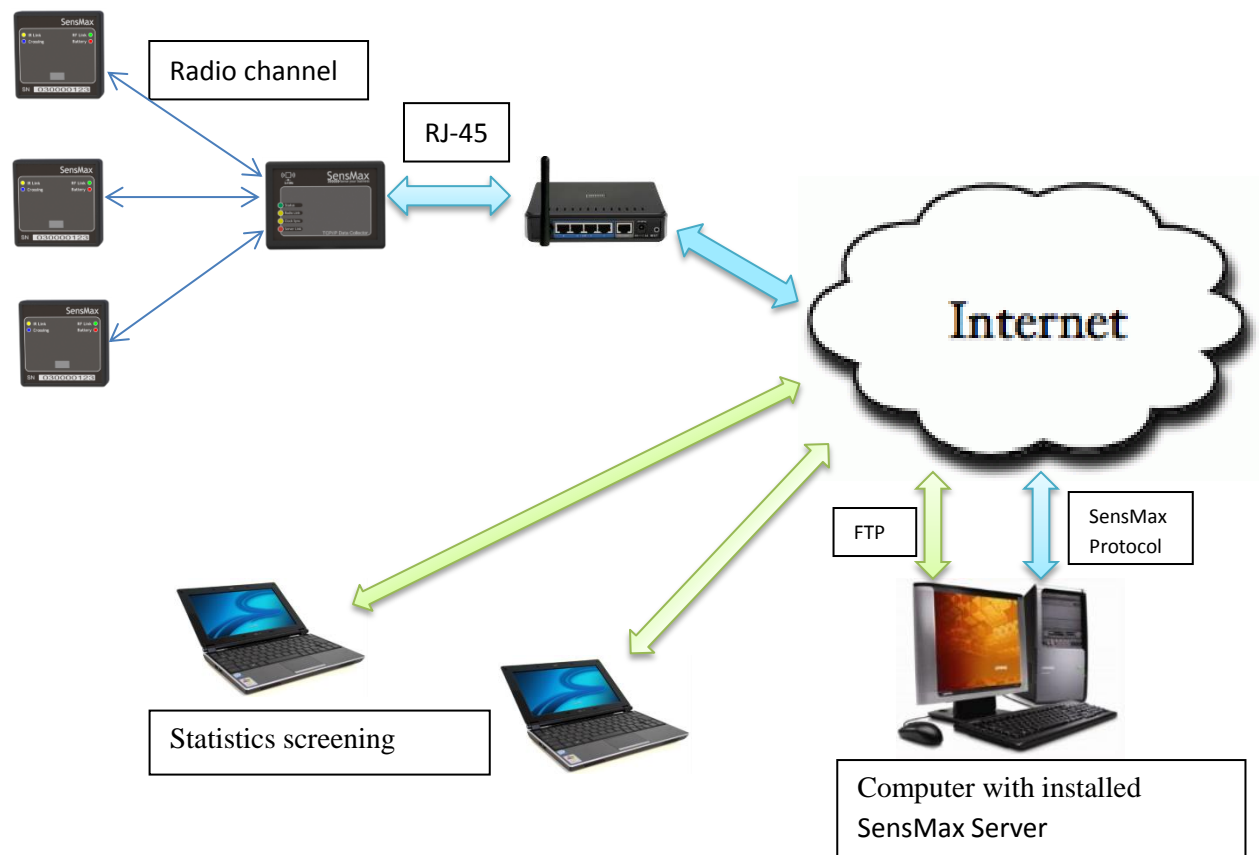
A short press takes the collector in the search mode for the new sensor.

Long press of the button (10 seconds) removes all the attached sensors from memory.

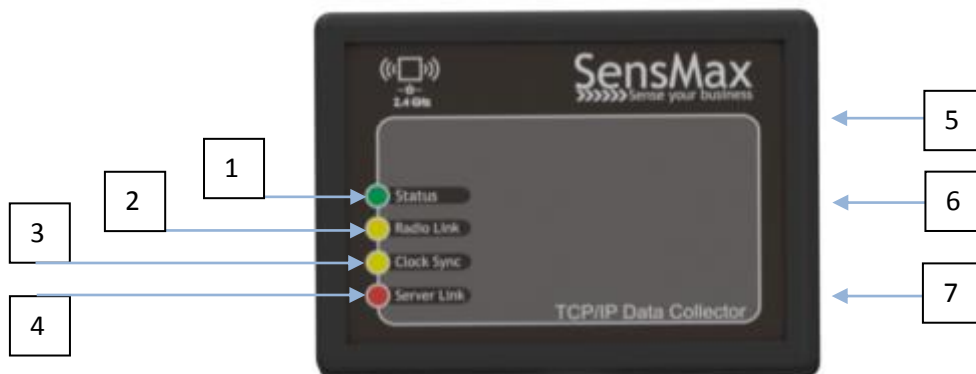
One collector can service 10 SensMax sensors

The collector has an internal memory for storing statistics for 250 days, as well as clock and calendar.

The figure below illustrates an example of a collector.



Description of SensMax Pro TCPIP controller elements




Icon	Status	Description
1. Status	Lights	The collector is trying to connect to server Collector is functioning
2. Radio Link	Flashes	
	Lights	The connection with sensor exists
	Flashes	Search for new sensor
3. Clock Sync	Lights	Clock/calendar successfully synchronised with server
4. Server Link	Lights	The connection with server exists
5. USB port	n/a	USB port
6. Button	n/a	Button for pairing with sensors
7. RJ-45 connector	n/a	Socket for internet connection

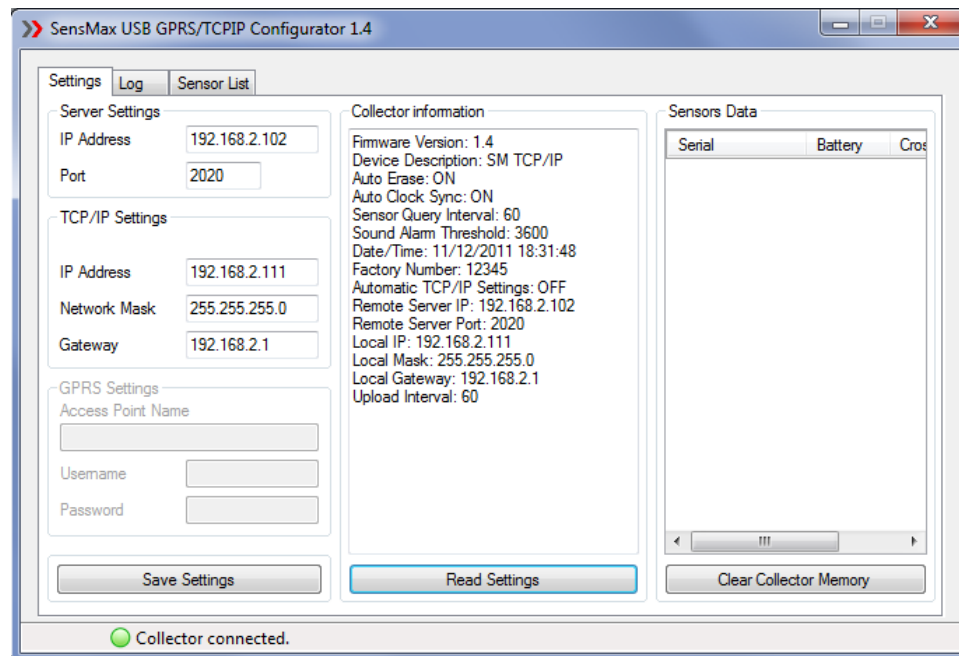
Technical specifications of the collector

Collector TCP/IP	
Data collection	Automatic, radio channel
Collector-sensor distance	20-50 meters
Number of sensors serviced	10
Memory	250 days
Carcass	ABS Plastic, black
Radio channel frequency	2,4 GHz
Radiant power	3.2 mW
Power supply	Internal power supply 5V
Dimensions	110x66x28 mm
PC connection	USB port
Transfer of data to the network	Automatic

Configuration of the collector SensMax Pro TCPIP

When first used, the collector must be configured. **SensMax USB Config** is a program to configure the collector.

Connect the collector to the computer via USB cable. Run the SensMax USB Config program. Click the button .



Server Settings

- IP Address -IP server address
(the address of the computer where the server is installed)
- Port -Server port (default 2020)

TCP/IP Settings

- IP Address - the address of this collector (if DHCP not used)
- Network Mask - the network mask (if DHCP not used)
- Gateway - the gateway (if DHCP not used)

Please enter your settings and click "Save Setting ".

Note:

Windows Firewall may be blocking the port 2020. Make sure that this port is added to the exceptions on the computer, on which SensMax Server installed.

SensMax Pro GPRS Data collector

User manual



Description of SensMax Pro GPRS data collector

Data collector SensMax Pro GPRS is designed to read the data from SensMax sensors. The data collection is performed, using radio channel.

The data from the collector is sent to the computer via GPRS protocol.

SensMax Server is a programme, that provides service to the data collector. The programme is designed to read the statistics from the collector. The description of the programme is provided below.

Attaching sensors to the data collector

Each sensor must be attached to its collector.

Following steps must be performed to attach sensors to the collector:

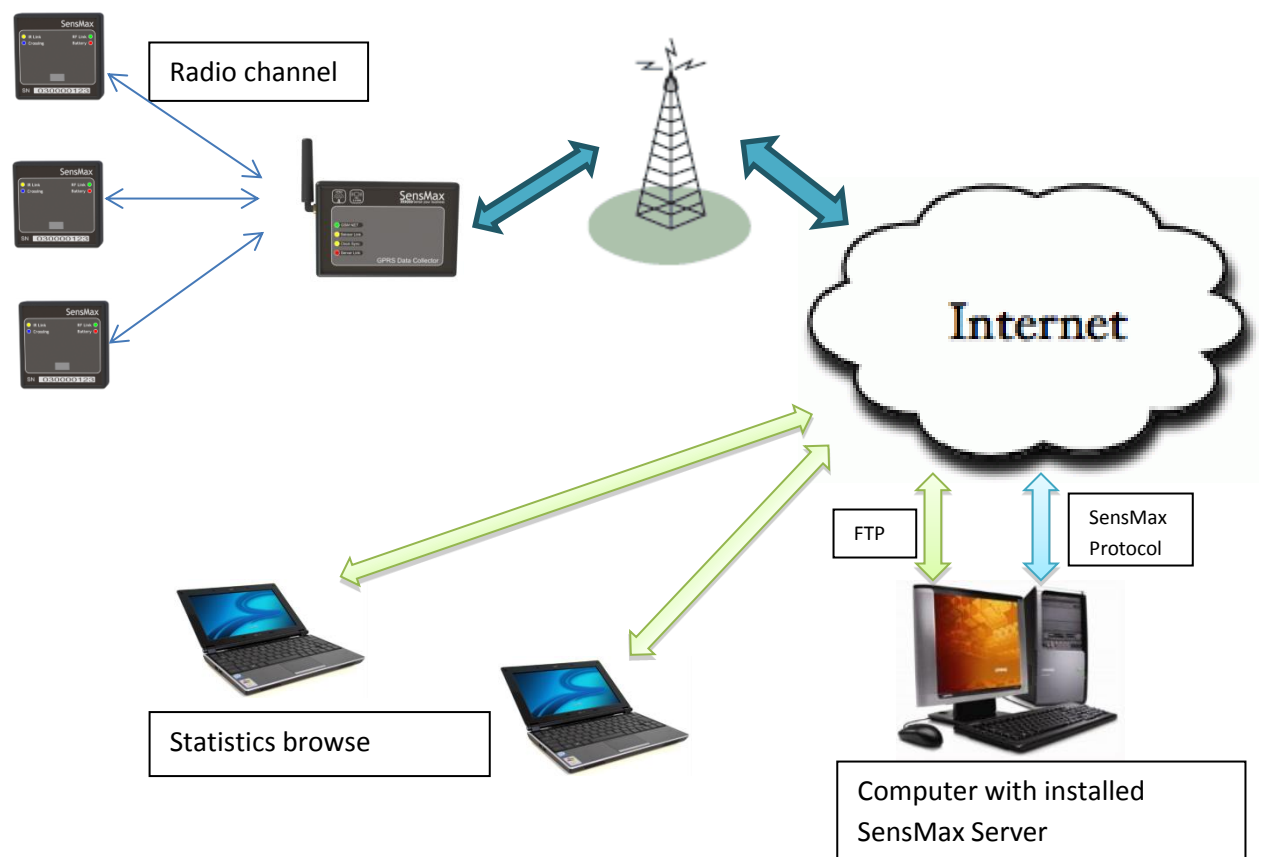
1. Connect the sensor to the power supply/ Insert the batteries in the sensor
2. Connect the collector to the USB
3. Press the button on the collector
4. Press the button located inside the sensor enclosure

Note: Button to search for new sensors is located on the frontal side of the collector, near the port USB. Button is pressed with a sharp object, such as a pencil or pen. A short press takes the collector in the search mode for the new sensor. Long press of the button (10 seconds) removes all the attached sensors from memory.

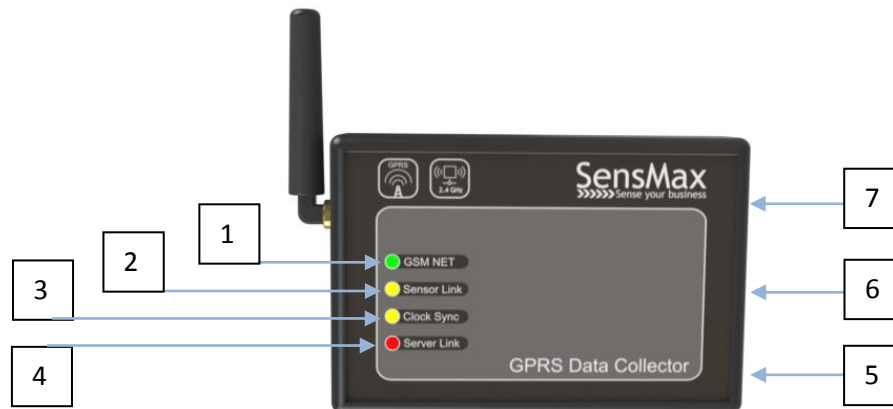
One collector can service 10 SensMax sensors

The collector has an internal memory for storing statistics for 250 days, as well as clock and calendar.

The figure below illustrates an example of a SensMax Pro GPRS collector use:



Description of SensMax Pro GPRS collector's elements



Icon	Status	Description
1. GSM NET	Flashes	GSM/GPRS network is found
2. Sensor Link	Lights	The connection with sensor exists
	Flashes	Search for new sensor
3. Clock Sync	Lights	Clock/calendar successfully synchronized with server
4. Server Link	Lights	The connection with server exists
	Flashes	No connection to the server
5. USB port	n/a	USB port
6. Button	n/a	Button for pairing with sensors
7. SIM Connector	n/a	Socket for SIM card connection

Technical specifications of the collector

Collector TCP/IP	
Data collection	Automatic, radio channel
Collector-sensor distance	20-50 meters
Number of sensors serviced	10
Memory	250 days
Carcass	ABS Plastic, black
Radio channel frequency	2,4 GHz
Radiant power	3.2 mW
Power supply	Internal power supply 5V
Dimensions	110x75x25 mm
PC connection	USB port
Transfer of data to the network	Automatic
GSM standards supported	850 MHz / 900 MHz / 1800 MHz / 1900 MHz

The volume of consumed traffic in GPRS network

The collector consumes a small amount of Internet traffic for work - about 0.4 kB per one session of data transfer to the server.

The volume of traffic depends from the frequency of the data transfer to the server.

The amount of data per day is calculated as follows:

$$G = A / B * C$$

Where G is the volume of traffic in kB, A is a number of minutes in a day (1440), B is a frequency of updates, C is a consumption of traffic by the collector.

For example, the frequency of data updating is set for 20 minutes in settings.

During 24 hours of work the collector will spend:

$$1440 / 20 * 0.4 = 28,8 \text{ kB (per daynight)}$$

$$28,8 * 31 = 892,8 \text{ kB (per month)}$$

SIM card connection

Collector supports standard SIM cards, 15 x 25 mm.




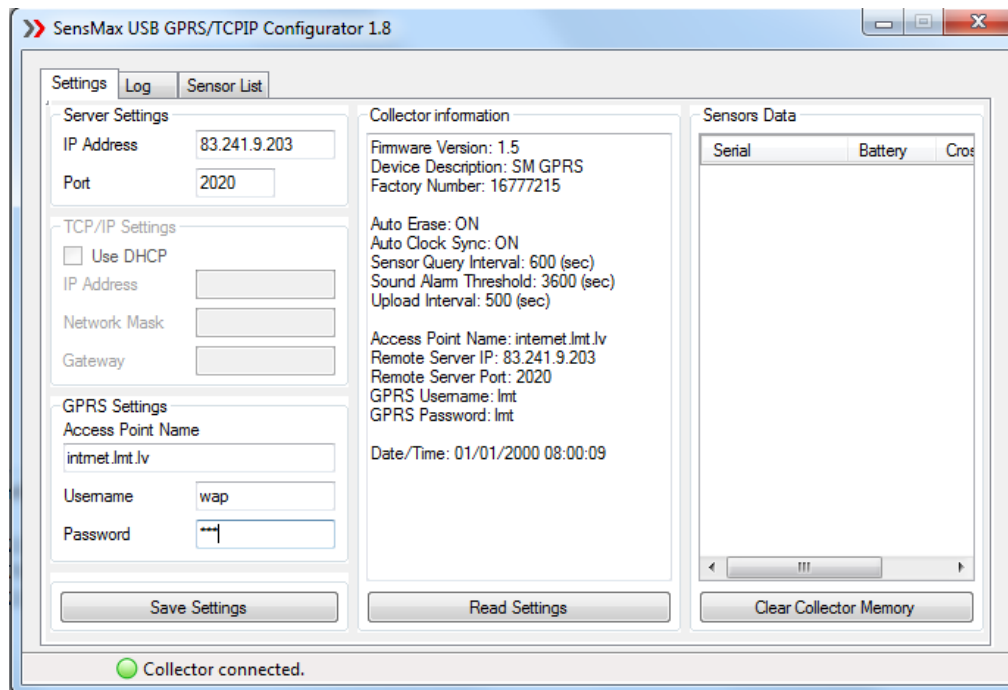
Attention

Collector does not support PIN code call. PIN code call must be disabled before use.

Configuration of the collector SensMax Pro GPRS

When first used, the collector must be configured. **SensMax USB Config** is a program to configure the collector.

Connect the collector to the computer via USB cable. Run the SensMax USB Config program. Click the button .



Server Settings

- IP Address -IP server address (the address of the computer where the server is installed)
- Port -Server port (default 2020)

GPRS Settings

- Access Point Name
- Username
- Password

Please enter your settings and click "Save Setting ".

Note:

Windows Firewall may be blocking the port 2020. Make sure that this port is added to the exceptions on the computer, on which SensMax Server installed.

SensMax Server

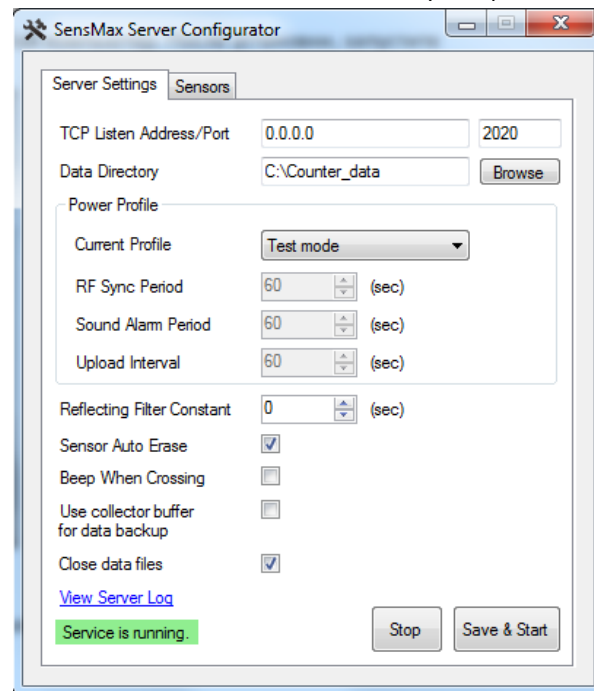
User manual



SensMax Server software is designed to read the statistics from the collectors SensMax TCP/IP и GPRS and to manage settings of these collectors. Settings made in the programme, automatically applied to all connected collectors.

Installation

Install SensMax Server software on any computer. After installation, run the server configuration:



Note: In Windows 7 the program must be run by administrator.

Settings

TCP Listen Address

Listening IP address. If the computer receives an address on DHCP, you must enter 0.0.0.0

Port

Listening port. Default 2020.

Windows Firewall Settings:

Make sure that on a computer that is running SensMax Server, port 2020 is added to exceptions.

*At Windows 7, you need to add **gprsserver.exe** programme, which is located in a directory **C:\Program Files\SensMax\Server**, to exceptions*

Data Directory

Selecting a directory to store the statistics from the sensors.
This directory should be allowed the right read \ write.

Current power profile

To optimize the use of batteries in the sensors it is necessary to configure the system. The user is offered to choose one of four power profiles:

Test Mode – is used in the test mode

- Normal Mode* – recommended power profile
Max battery live – rare polling of sensors, which allows maximally prolongation of battery live.
Custom – manual entering of settings

RF Sync Period

Poll interval of sensors, in seconds. It is recommended to set the value of 1800 (30 minutes) to save batteries in the sensor.

Sound Alarm Period

This setting is designed for the sensor. The sensor will signal an error if it will be blocked longer than this interval. Recommended value of 900 (15 minutes).

Upload Interval

This setting is designed for the collector. Determines the range of data discharge to the server.

Clock Auto Sync

Automatic time synchronization of the collector and the server. It is recommended to check this box.

Sensor Auto Erase

Automatic sensor memory cleaning after reading. It is recommended to check this box in order to save sensor's batteries.

Beep When Crossing

If this check-box is set, the sensors will make a sound at each new visit.

Use collector buffer for data backup

If this check-box is set, the collector will store the data for the last 250 days in internal memory. If the tick is removed, the data from the collector will be cleared after a successful transfer to the server.

Close data files

If the tick is set the server will close the data files after the communication session with collector is ended. This mode loads the server computer stronger, but this mode is necessary for the use of FTP server for the later data transfer.

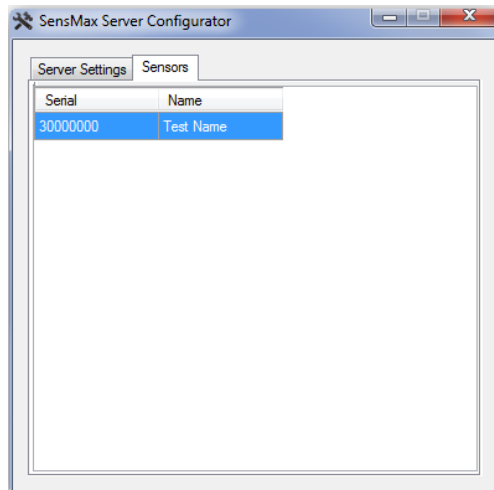
If the tick is removed, server will hold data files open, this reduces the system booting.

Please, enter settings and press the "Save" button to start the server.

If all is done correctly, the server will start: **Service is running.**

The names of the of sensors

Each sensor can be given its own name. For the naming the sensors use Sensors tab. A list of sensors contained in the database will appear:



To give a name to a sensor, you need to double-click in the Name box, in front of the sensor of interest, and enter a name.

Note: If the list is empty, this means, that none of the sensors is in the database yet.