# GESYSENSE® Components

Technical Specifications

Sensors and Loggers

Receivers

Software

Radio Waves Everywhere

GES**Y**SENSE

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# Overview Wireless Modules

| | Housing | | Sensor | Logger | Measurement Types | | | | Aktuator |
|---|---|---|---|---|---|---|---|---|---|
| | flat | box | | | T$_{ambient}$ | PT1000 | digital | analog | Relay |
| | | | | | °C | °C | ON/OFF  or  pulses/min | rel. humid. | |
| **TEMPERATURE** | | | | | | | | | |
| Thermo-Sensor | + | | + | | + | | | | |
| Thermo-Logger | + | | + | + | + | | | | |
| PT1000-Sensor | | + | + | | + | 1 | | | |
| PT1000-Logger | | + | + | + | + | 1 | | | |
| **DIGITAL** | | | | | | | | | |
| Digital-Sensor | | + | + | | | | 2 | | |
| Digital-Logger | | + | + | + | | | 2 | | |
| **SENSOR-AKTUATOR** | | | | | | | | | |
| SAM-2PT-1D-R | | + | + | + | | 2 | 1 | | 1 |
| **MIXED SIGNAL** | | | | | | | | | |
| T-H-Sensor | + | | + | | + | | | + | |
| T-H-Logger | + | | + | + | + | | | + | |
| T-2D-Sensor | + | | + | | + | | 2 | | |
| T-2D-Logger | + | | + | + | + | | 2 | | |
| T-PT-1D-Sensor | | + | + | | + | 1 | 1 | | |
| T-PT-1D-Logger | | + | + | + | + | 1 | 1 | | |



The system is continuously enhanced.
Current information is available at www.gesytec.com.

## THERMO-SENSOR

| | |
|---|---|
| Measuring range | -35 – +70 °C, (-31 F to 158 F) |
| Accuracy | 0.3 °C |
| Resolution | 0.1 °C |

## LOGGING

| | |
|---|---|
| Interval | 15 min |
| Time stamp | real time clock |
| Capacity | >1 year at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

## RADIO DATA TRANSMISSION

| | |
|---|---|
| Emitter | low power radio system |
| Europe | ISM 433-MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |
| Measuring-/trans- mission interval | 270 s, option. adjustable from 15 to 3600 s |

## PARAMETERIZATION

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| Range | <10 cm |

## POWER SUPPLY

| | |
|---|---|
| Lithium Battery | 3.6 V, 2.4 Ah, size AA |
| Battery use | >5 years at a measuring interval of 270 s and operating temperature -30 – +25 °C (deviant times and temperatures may result in reduced operating periods) |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | |
|---|---|
| Weight | 90 g |
| Housing  dimensions | 77 x 110 x 18.5 [mm] |
| material | ABS, 20% glass fiber reinforced |
| color | light gray, RAL 7035 |
| Flammability | UL94 HB, self-extinguishing |
| Temperature | operating         -35 – +70 °C |
| | storage           0 – +30 °C |
| Protection class | IP 64 acc. to DIN EN 60 529 |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-1 |
| | | DIN EN 62479 |
| EC 37/2005 | | DIN EN 12830: S, C, 1, |

### GesySense® Thermo-Sensor

Wireless temperature sensor
| | |
|---|---|
| - for European ISM band | P.W00101 |
| - for American ISM band | P.W01101 |

Wireless temperature sensor for self-conf. systems
| | |
|---|---|
| - for European ISM band | P.W00107 |
| - for American ISM band | P.W01107 |

### GesySense® Thermo-Logger

Wireless temperature sensor with data storage
| | |
|---|---|
| - for European ISM band | P.W00111 |
| - for American ISM band | P.W01111 |

# GESYSENSE® Thermo-Sensor / -Logger
## Wireless Thermometer on Site

▸ Compact wireless sensor for temperature measurement

▸ Temperature logger for long term measurement

▸ Battery life greater than 5 years

▸ No calibration required

▸ Food safe and freezer suitable

▸ Convenient fitting adapters



The GESYSENSE® Thermo-Sensor measures the ambient temperature in fixed intervals with an accuracy of 0.3 °C and transmits it to the receiver.

In its Logger variant measured values including time stamp (RTC in module) are stored on the module. Memory capacity is sufficient for 1 year. Even at a battery failure the values will be preserved. Correct operation of the module is indicated by a LED.

The measuring range is between -35 °C and +70 °C. Within this range the radio system adapts itself to the environmental conditions and compensates any temperature dependent drift of the transmitter. A calibration of the temperature measurement is not necessary.

The wireless module is powered by a 3.6 V AA battery. Running at a sensible measurement cycle of 4.5 minutes the replaceable battery will operate a minimum of 5 years up to and possibly exceeding a 10 years life expectancy depending on circumstances.

The flat housing is made of fiber glass reinforced ABS which can be safely used in the food industry. It provides high impact strength even at low temperatures. It is suited for a temperature range of -50 °C to approximately +70 °C.

For mounting an adapter is available, also allowing for step joint installation towards the potential fixing spot.

The GESYSENSE® Thermo-Logger is compliant with regulation EC 37/2005 on the monitoring of temperatures in the means of warehousing and storage of quick-frozen foodstuffs intended for human consumption

A special variant for self-configuring systems is available.

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# GESYSENSE® PT1000-Module

## Documentation of Spot Temperature Measurements

▶ Wireless module for PT1000 probe connection

▶ Continuous temperature measurements via radio

▶ Data recording for 1 year with logger

▶ Read out via radio

▶ Battery life exceeding 5 years

▶ IP66 housing for wall mounting



The GESYSENSE® PT1000-Sensor is a wireless module for radio transmitting temperature values measured by a connected PT1000 probe. A version as PT1000-Logger is available storing the measured values internally.

The module regularly measures the temperature using a PT1000 probe in 2-wire technology. The time stamped values are transmitted to receivers of the GESYSENSE® wireless sensor network from where they are available to further processing.

The logger generates a 15-minute value which is stored on the module in a memory with a capacity sufficient for one year. Even at a battery failure the values will be preserved. Along with this operation mode measured values can be radio transmitted as well immediately. Correct operation of the module is indicated by a LED.

Parameterization of the logger module as well as reading out the data is done via radio using the GESYSENSE® Configurator.

The wireless module is powered by a 3.6 V AA battery. Running at a sensible measurement cycle of 4.5 minutes the replaceable battery will operate a minimum of 5 years up to and possibly exceeding a 10 years life expectancy depending on circumstances.

Generally the module is prepared for PT1000 probes measurements in the range from -99 °C to + 391 °C. Within the operating range of -40 °C – +40 °C measurement accuracy is compliant with the requirements of regulation EC 37/2005 on the monitoring of temperatures in the means of warehousing and storage of quick-frozen foodstuffs.

## SENSOR INPUT

| | |
|---|---|
| Number | 1 connection for PT1000 probe |
| Measuring range | -99 °C – +319 °C (-146 °F – +606 °F) |
| Method | 2-wire measurement |
| Accuracy | ≤1 °C, for DIN B probes, between -40 °C and +40 °C (-40 °F – +104 °F) |
| Resolution | 0.04 °C |
| Connection | 4-pole screwing terminal 0.13 – 1.5 mm² |

## LOGGING

| | |
|---|---|
| Interval | 15 min |
| Time stamp | real time clock |
| Capacity | >1 year at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

## RADIO DATA TRANSMISSION

| | |
|---|---|
| Emitter | low power radio system |
| Europe | ISM 433 MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |
| Measuring-/transmission interval | 270 s, option. adjustable from 15 to 3600 s |

## PARAMETERIZATION

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| Range | <10 cm |

## POWER SUPPLY

| | |
|---|---|
| Lithium Battery | 3.6 V, 2.4 Ah, size AA |
| Battery use | >5 years, cf. Thermo-Sensor p. 23 |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 210 g | |
| Housing dimensions | 94 x 94 x 57 [mm], w/o gland | |
| material | Polycarbonate | |
| color | light gray, RAL 7035 | |
| Flammability | UL94 HB-V2, self-extinguishing | |
| Temperature | operating | -40 – +70 °C |
| | accuracy guarant.: | -40 – +40 °C |
| | storage | 0 – +30 °C |
| Protection class | IP 66 acc. to DIN EN 60 529 | |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-1 |
| | | DIN EN 62479 |

### GESYSENSE® PT1000-SENSOR

Wireless module for PT1000 connection

| | |
|---|---|
| - for European ISM band | P.W00104 |
| - for American ISM Band | P.W01104 |

### GESYSENSE® PT1000-LOGGER

Wireless module for PT1000 connection with memory

| | |
|---|---|
| - for European ISM band | P.W00114 |
| - for American ISM Band | P.W01114 |

### PERIPHERALS

| | |
|---|---|
| PT1000 probe, DIN B, -50...+105 °C, cable 2 m | P.WZ0311 |
| PT1000 probe, DIN B, -50...+105 °C, cable 5 m | P.WZ0312 |

## DIGITAL INPUTS

| | |
|---|---|
| Status-Sensor | 2 contacts for switches or |
| Counter–Sensor | 2 pulse counters, 20 Hz max. |
| Resolution | 32 bit |
| Switching voltage | 3.3 V |
| Switching current | 0.33 mA |
| Max. cable length | 1.5 m |
| Connection | 4-pole screwing terminal 0.13 – 1.5 mm² |

## LOGGING

| | |
|---|---|
| Interval | 15 min |
| Time stamp | real time clock |
| Capacity | >1 year at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

## RADIO DATA TRANSMISSION

| | |
|---|---|
| Emitter | low power radio system |
| Europe | ISM 433 MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |
| Measuring-/trans- mission interval | 270 s, option. adjustable from 15 to 3600 s |

## PARAMETERIZATION

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| range | <10 cm |

## POWER SUPPLY

| | |
|---|---|
| Lithium battery | 3.6 V, 2.4 Ah, size AA |
| Battery use | >5 years, cf. Thermo-Sensor p. 23 |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 230 g | |
| Housing dimensions | 94 x 94 x 57 [mm], w/o gland | |
| material | Polycarbonate | |
| color | light gray, RAL 7035 | |
| Flammability | UL94 HB, self-extinguishing | |
| Temperature | operating | -35 – +70 °C |
| | storage | 0 – +30 °C |
| Protection class | IP 66 acc. to DIN EN 60 529 | |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-1 |
| | | DIN EN 62479 |

**GesySense® Digital-Sensor**

| | |
|---|---|
| - for European ISM band | P.W00102 |
| - for American ISM band | P.W01102 |

**GesySense® Digital-Logger**

| | |
|---|---|
| - for European ISM band | P.W00122 |
| - for American ISM band | P.W01122 |

# GESYSENSE® Digital-Modules
## Monitoring and Counting

▸ Digital wireless sensors
▸ Settable for status monitoring or pulse counting
▸ Data recording for 1 year with logger
▸ Battery life greater than 5 years
▸ IP66 housing for wall mounting



The GESYSENSE® Digital -Sensor offers 2 functionalities:

• Status-Sensor
• Counter-Sensor

As **Status-Sensor** it is used to monitor devices and system components. It reads the status of connected passive contacts.

The Status-Sensor transmits the status of the connected contacts at a fixed interval. To avoid that "oscillating" contacts generate false alarms, there must be a minimum period of time for a status message to be considered as valid.

As **Counter-Sensor** the module records pulses up to 20 Hz at its 2 digital inputs and stores the values locally. The resolution is 32 bit. The meter reading of the previous interval is reported in the defined transmission interval.

Operation of the two inputs can only be set for both as status or counter inputs using the GESYSENSE® configuration software.

Further to the sensor there is a logger version of the module storing measured pulses or status modifications in the module. The logger stores 15-minute value in a memory which is even preserved at a battery failure. Along with this operation mode measured values can be radio transmitted as well immediately. Correct operation of the module is indicated by a LED.

The module is supplied by a 3.6 V AA battery. At a measuring and broadcasting interval of 5 min a service life of 5 years can be achieved, dependent on the circumstances even 10 years can be realized.

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# GESYSENSE® T-H-Modules

## Measurement of Temperature and Humidity

▸ Compact module measuring temperature and humidity

▸ Continuous data acquisition via radio

▸ Reliable long-term data logging

▸ Read out via radio

▸ Battery life greater than 5 years

The GESYSENSE® T-H-Sensor measures ambient temperature and humidity in fixed intervals and transmits it to the receiver.

In its Logger variant measured values including time stamp (RTC in module) are stored on the module. Memory capacity is sufficient for 1 year. Even at a battery failure the values will be preserved. Correct operation of the module is indicated by a LED.

Parameterization of the logger module as well as reading out the data is done via radio using the GESYSENSE® Configurator.

The temperature measuring range is between 5 °C and + 50 °C, with a high accuracy in a smaller range. A calibration of the temperature measurement is not necessary.

Humidity measurement has a high accuracy in the range of 10 to 90 %rH.

The module is supplied by a 3.6 V AA battery. At a measuring and broadcasting interval of 5 min a service life of 5 years can be achieved, dependent on the circumstances even 10 years can be realized.

The flat housing is made of fiber glass reinforced ABS which can be safely used in the food industry.

For mounting an adapter is available, also allowing for step joint installation towards the potential fixing spot.

### AMBIENT TEMPERATURE MEASUREMENT

| | |
|---|---|
| Measuring range | +5 – +50 °C, (41 °F to 122 °F) |
| Accuracy | 0.2 °C, typically |
| Resolution | 0.01°C |

### HUMIDITY MEASUREMENT

| | |
|---|---|
| Measuring range | 10 – 90 %rH |
| Accuracy | 1,8 %rH , typically |
| Resolution | 0,04 %rH |

### LOGGING

| | |
|---|---|
| Interval | 15 min, adjustable |
| Time stamp | real time clock |
| Capacity | >1 year at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

### RADIO DATA TRANSMISSION

| | |
|---|---|
| Emitter | low power radio system |
| Europe | ISM 433-MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |
| Measuring-/transmission interval | 270 s, option. adjustable from 15 to 3600 s |

### PARAMETERIZATION

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| Range | <10 cm |

### POWER SUPPLY

| | |
|---|---|
| Lithium Battery | 3.6 V, 2.4 Ah, size AA |
| Battery use | >5 years, cf. Thermo-Sensor p. 23 |

### DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 100 g | |
| Housing  dimensions | 77 x 110 x 18.5 [mm] | |
| material | ABS, 20% glass fiber reinforced | |
| color | light gray, RAL 7035 | |
| Flammability | UL94 HB, self-extinguishing | |
| Temperature | operating | +5 – +50 °C |
| | storage | 0 – +30 °C |
| Protection class | IP 61 acc. to DIN EN 60 529 | |

### CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-2 |
| | | EN 62479 |

### GESYSENSE® T-H-Sensor

Wireless temperature-humidity sensor

| | |
|---|---|
| - for European ISM band | P.W00208 |
| - for American ISM band | P.W01208 |

### GESYSENSE® T-H-Logger

Wireless temperature sensor with data storage

| | |
|---|---|
| - for European ISM band | P.W00218 |
| - for American ISM band | P.W01128 |

## PT1000 Inputs

| | |
|---|---|
| Measuring range | -99 °C – +319 °C (-146 °F – +606 °F) |
| Method | 2-wire measurement |
| Accuracy | ≤1 °C, for DIN B probes, between -40 °C and +40 °C (-40 °F – +104 °F) |
| Resolution | 0.04 °C |

## Digital Input

| | |
|---|---|
| Status sensor | 2 x input, 1 used for internal power supply monitoring |
| Voltage | 24 V |
| Relay Output | open contact |
| Nominal voltage | 24 V |
| Current | 3 A, use surge proof fuse max. 6 A (C) |

## Logging

| | |
|---|---|
| Interval | 15 min |
| Time stamp | real time clock |
| Capacity | 6 months at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

## Radio Transmission of Data, Switching Parameters

| | |
|---|---|
| Emitter, Receiver | ISM 433 MHz band (433.05 – 434.79 MHz) |
| Transmitter power | low power radio system <10 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |
| Measuring-/transmission interval | 270 s, option. adjustable from 15 to 3600 s |

## Parameterization

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| Range | <10 cm |

## Power Supply

| | |
|---|---|
| External | 24 V AC (min: 19.2 V, max: 26.4 V), max. 100 mA |
| Internal | Lithium battery 3.6 V, 2.4 Ah, size AA |

## Dimensions & Environmental Conditions

| | |
|---|---|
| Weight | 250 g |
| Housing dimensions | 130 x 94 x 57 [mm] , w/o gland |
| material | Polycarbonate |
| color bottom | light gray, RAL 7035 |
| cover | transparent |
| Flammability | UL94 HB-V2, self-extinguishing |
| Temperature | -20 – +50 °C |
| Protection class | IP 66 acc. to DIN EN 60 529 |

## Certificates

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-2 |
| | | EN 62479 |
| EC 37/2005 | | DIN EN 12830: TS, B, 1/2 |

**GesySense® SAM 2PT-1D-1R**
Sensor-actuator module
- for European ISM band                    P.W00146-3

# GesySense® SAM 2PT-1D-1R
### Sensor-Actuator Module with Relay

▸ Wireless module for connection of 2 PT1000 probes
▸ Wireless recording of digital input
▸ Wireless or locally controlled relay
▸ Data recording and direct transmission
▸ 24 V or battery supply



The GesySense® Sensor-Actuator Module 2PT-1D-1R is used to record temperatures by the connected PT1000 probes and allows measurement-based switching actions. With its integrated receiver it can be parameterized via radio. In addition, an active switch contact can be connected.

The module collects and sends within the specified time interval the temperatures measured by 2-wire method through PT1000 probes and the value from one digital input. Time stamped readings are transmitted to the receiving station of the GesySense® wireless sensor network and further processed.

All values are additionally recorded in the local memory of the module. These records can be automatically transmitted as soon as a vehicle-installed module re-enters the reception range of a GesySense® Receiver \LAN.

In addition, the module switches the digital output based on preset limit values or times. This can be controlled locally or by direct radio command. The local control algorithm is active only at 24 V supply of the module. Only then the module can receive wireless commands. An external voltage supply is automatically detected and interrupts the battery supply.

The module can be used in self-configuring systems.

The GesySense® SAM 2PT-1D-1R is compliant with regulation EC 37/2005 on the monitoring of temperatures in the means of warehousing and storage of quick-frozen foodstuffs intended for human consumption.

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## AMBIENT TEMPERATURE MEASUREMENT

| | |
|---|---|
| Measuring range | -35 – +70 °C, (-31 °F – 158 °F) |
| Accuracy | 0.3 °C |
| Resolution | 0.1 °C |

## PT1000 INPUT

| | |
|---|---|
| Measuring range | -99 °C – +319 °C (-146 °F – +606 °F) |
| Method | 2-wire measurement |
| Accuracy | ≤1 °C, for DIN B probes, between -40 °C and +40 °C (-40 °F – +104 °F) |
| Resolution | 0.04 °C |

## DIGITAL INPUT

| | |
|---|---|
| Status-Sensor | 1 contact for switches or |
| Counter-Sensor | 1 pulse counter, 20 Hz max. |
| Resolution | 32 bit |
| Switching voltage | 3.3 V |
| Switching current | 0.33 mA |
| Max. cable length | 1.5 m |

## LOGGING

| | |
|---|---|
| Interval | 15 min |
| Time stamp | real time clock |
| Capacity | >1 year at 1 value/15 min |
| Storage | non-volatile flash memory |
| Operation indicator | 1 LED |

## RADIO DATA TRANSMISSION

cf. GESYSENSE® T-2D-Modules on previous page

## PARAMETERIZATION

| | |
|---|---|
| Receiver, inductive | ISM 13.56 MHz band |
| Range | <10 cm |

## POWER SUPPLY

| | |
|---|---|
| Lithium Battery | 3.6 V, 2.4 Ah, size AA |
| Battery use | >5 years, cf. Thermo-Sensor p. 23 |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 230 g | |
| Housing  dimensions | 94 x 94 x 57 [mm], w/o gland | |
| material | Polycarbonate | |
| color | light gray, RAL 7035 | |
| Flammability | UL94 HB-V2, self-extinguishing | |
| Temperature | operating | -35 – +70 °C |
| | storage | 0 – +30 °C |
| Protection class | IP 66 acc. to DIN EN 60 529 | |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-1 |
| | | DIN EN 62479 |

## GESYSENSE® T-PT-1D-Sensor

| | |
|---|---|
| - for European ISM band | P.W00126 |
| - for American ISM band | P.W01126 |

## GESYSENSE® T-PT-1D-Logger

| | |
|---|---|
| - for European ISM band | P.W00136 |
| - for American ISM band | P.W01136 |

# GESYSENSE® T-PT-1D-Modules
## Temperature Measurement and Digital Input

▸ Wireless sensor with triple input

▸ Ambient and spot temperature measurement

▸ Settable for status monitoring or pulse counting

▸ Battery life greater than 5 years



The GESYSENSE® T-PT-D-Sensor combines the functionality of the Thermo-Sensor with those of the PT1000 and the Digital-Sensor. In one measuring spot ambient and spot measured temperature and the operational status of a device or the number of pulses can be continuously captured.

The specification of this mixed signal module corresponds to those of the separate sensors with respect to measurement method and data transmission as well as to radio technology and battery operation. However, there is just one digital input available in this module, which can be used either as status or as counter input.

This module with ample functionality is available in box shaped IP 66 housing for wall mounting.

A logger version with local memory offering as well the operation mode of immediate radio transmission is also available.

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# GESYSENSE® Receiver / Repeater

## Radio Path to Data Acquisition

▸ Receiver in wireless sensor system

▸ Repeater in the transmission path

▸ Modbus connection to data logger

▸ Range increase of the radio system

▸ Cascading of repeaters

Receiver and Repeater of the GESYSENSE® wireless sensor network are devices identical in construction but for different use, which is set at commissioning. They are reception and emitting devices operating within the 433 MHz (Europe) or 915 MHz (America) ISM band.

For connection with a data server or a PC they are fitted with a serial connection optionally usable with either EIA-232 or EIA-485. Data transfer to the data server is using the Modbus protocol.

A download of updated device software is realized through the serial connection and further on to the repeaters via radio transmission. The optional real-time clock of the devices is synchronized via the connection to the data server. The devices require a mains power supply.

An assembly bracket is provided for wall or ceiling mounting of the devices, allowing the alignment of the antenna vertical to the floor for optimal reception. The device antenna may also be replaced by a displaced antenna with cord connection.

## RADIO DATA TRANSMISSION

| | |
|---|---|
| Receiver, Emitter | low power radio system |
| Europe | ISM 433 MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |

## SERIAL INTERFACE

| | |
|---|---|
| EIA-232 | TxD, RxD, GND, CTS, RTS |
| EIA-485 | RxTx, GND, RxTx, 3.3 V |
| Connection | 9-pin socket, D-type |

## POWER SUPPLY

| | |
|---|---|
| Supply Voltage | 230 V, 50 Hz (or 120 V, 60 Hz) |
| Power Input | 2 W typ., 3 W max |
| Connection | internal, fixed, cable length 1.5 m |

## FEATURES

| | |
|---|---|
| Real-time clock | battery buffered |
| Monitoring | watchdog timer |
| LEDs | 4: Power, Status, Radio, Comm. |
| Antenna connector | SMA socket, 50 Ohm |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 310 g, incl. mains cable | |
| Housing  dimensions | w/o antenna | 40 x 65 x 120 [mm] |
| | with antenna | 40 x 65 x 285 [mm] |
| material | ABS | |
| Mounting | wall mounting with assembly bracket | |
| Fitting position | vertical | |
| Assembly bracket | 40 x 65 x 160 [mm] | |
| Weight | 145 g | |
| Flammability | UL94 HB, self-extinguishing, | |
| Temperature | operating | -20 – +55 °C |
| | storage | -20 – +35 °C |
| Protection class | IP 40 acc. to DIN EN 60 529 | |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022, living space (B) |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-3 |
| | | DIN EN 62479 |

## GESYSENSE® RECEIVER/REPEATER

| | |
|---|---|
| - for European ISM band | P.W00211 |
| - for American ISM band | P.W01211 |

## ACCESSORIES

| | |
|---|---|
| EIA-232 connection cable | P.WZ0200 |
| Antenna cable 1.5 m | P.WZ0202 |
| Antenna cable 5 m | P.WZ0203 |
| Splitter/combiner with 1.5 m cable and antenna | P.WZ0212 |

## Radio Data Transmission

| | | |
|---|---|---|
| Receiver, Emitter | | low power radio system |
| | Europe | ISM 433 MHz band (433.05 – 434.79 MHz), <10 mW |
| | America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| | Free field range | up to 250 m |
| | Emitter recognition | unique 10 digit ID |

## Interfaces

| | | |
|---|---|---|
| EIA-485 | | Data+, Data-, GND |
| | Connection | 3-pin screw-plug terminal |
| Ethernet | | 10/100baseT |
| | Connection | RJ 45 |
| Relay | | switch over |
| | Electric strength | max. 230 V |
| | Nominal current | 2 A, use 2 A surge proof fuse (C) |

## Power Supply

| | | |
|---|---|---|
| Supply Voltage | | 90 – 264 V AC, 50 – 63 Hz |
| | Power input | 2 W typ., 3 W max |
| | Connection | internal, fixed, cable length 1.5 m |
| Alternatively | | Power over Ethernet, 802.3af, PD |
| | Power input | 2 W typically, 3 W max. |

## Features

| | |
|---|---|
| Real-time clock | battery buffered |
| Monitoring | watchdog timer |
| LEDs | 4: Power, Status, Radio, Comm., Ethernet |
| Local memory | slot for FAT32 microSD card |

## Dimensions & Environmental Conditions

| | | |
|---|---|---|
| Housing dimensions | w/o antenna | 50 x 80 x 150 [mm] |
| | with antenna | 50 x 80 x 315 [mm] |
| | material | ABS |
| Mounting | | wall mounting with assembly bracket |
| | Fitting position | vertical |
| | Assembly bracket | 40 x 79 x 170 [mm] |
| Flammability | | UL94 HB, self-extinguishing, |
| Temperature | | operating          0 – +55 °C |
| | | storage          -20 – +70 °C |
| Humidity | | class F acc. DIN 40 040, 5 – 93%, no condensation |
| Protection class | | IP 40 acc. to DIN EN 60 529 |

## Certificates

| | | |
|---|---|---|
| EMC | emission | EN 55022, living space (B) |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-1 V2.3.1 DIN EN 62479 |

## GesySense® Receiver \LAN

Wireless receiver with Ethernet and
| | |
|---|---|
| - mains supply | P.Wof204 |
| - power over Ethernet | P.Wof214 |

  f = 0 for European ISM band
  f = 1 for American ISM band

## Accessories

| | |
|---|---|
| Antenna cable 1.5 m | P.WZo202 |
| Antenna cable 5 m | P.WZo203 |
| Splitter/combiner with 1.5 m cable and antenna | P.WZo212 |

# GesySense® Receiver \LAN
## Networked Wireless Data Acquisition

- ▶ Receiver in wireless sensor system
- ▶ Ethernet connection
- ▶ Local data storage on microSD card
- ▶ Modbus/TCP or EIA-485 connection
- ▶ Base station for self-configuring systems
- ▶ Local control operation
- ▶ Switching output

The GesySense® Receiver \LAN is receiver and networked data recorder in the wireless sensor network. The receiving and emitting device is operating within the 433 MHz ISM band (European version). A 915 MHz version for American ISM band is also available.

Data connection of the Receiver \LAN is using Modbus/TCP or Modbus via the EIA-485 connector. Its Ethernet connection allows web browser access to measured data and for configuration purposes. For a quick view on current values an ordinary web browser is sufficient.

A microSD card serves for local storage of measured values in .csv format. The information can be read out and further processed using the GesySense® LogIt software. Archived data can as well be downloaded via FTP.

The real-time clock of the device is synchronized with an NTP server. The device requires a mains power supply. A variant with PoE supply is alternatively available.

An assembly bracket is provided for wall or ceiling mounting of the device, allowing the alignment of the antenna vertical to the floor for optimal reception. The device antenna may also be replaced by a detached antenna with cord connection, e.g. to place it on the other side of a wall.

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# GESYSENSE® Configurator

## Radio Commissioning and Operation

▶ PC interface to GESYSENSE® wireless network

▶ Receiver for measured values

▶ Parameterization tool for wireless modules

The GESYSENSE® Configurator is a receiver and transmitter device connecting a PC to the wireless sensor network via USB.

On one hand the Configurator is the PC's receiver for messages transmitted in the network. On the other hand it serves as a tool for commissioning the wireless sensor network and to configure and read out GESYSENSE® sensors and loggers. The device is used with the PC program GESYSENSE® LogIt.

The GESYSENSE® Configurator represents the radio bridge to the system. It broadcasts and receives within the 433 MHz or 915 MHz band and inductively, at a frequency of 13.56 MHz, transmits configuration data to the sensors or triggers logger modules to transmit archived values. The Configurator is supplied by the PC via the USB connection. The antenna can be removed during configuration transmission for better handling.

### RADIO DATA TRANSMISSION

| | |
|---|---|
| Receiver, Emitter | low power radio system |
| Europe | ISM 433-MHz band (433.05 – 434.79 MHz), <10 mW |
| America | ISM 915 MHz band (902 – 928 MHz), <1 mW |
| Free field range | up to 250 m |
| Emitter recognition | unique 10 digit ID |

### PARAMETERIZATION

| | |
|---|---|
| Emitter, inductive | ISM 13.56-MHz band |
| Range | <10 cm |

### INTERFACE

| | |
|---|---|
| USB | 2.0 full speed |
| Power Supply | via USB connection |

### FEATURES

| | |
|---|---|
| LED | 1 tricolor: communication, configuration process |
| Push button | 1 |
| Acoustic signal | configuration process |

### DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | |
|---|---|---|
| Weight | 135 g | |
| Housing dimensions | w/o antenna | 79 x 117 x 24 [mm] |
| | antenna | 165 mm |
| | material | ABS, TPE |
| | color | light gray RAL 7035 |
| | | basalt gray RAL 7012 |
| Flammability | UL94 HB, self- extinguishing | |
| Temperature | operating | -30 – +70 °C |
| | storage | -5 – +35 °C |
| Protection class | IP 30 acc. to DIN EN 60 529 | |

### CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 living space (B) |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 330-1 |
| | | ETSI EN 300 220-3 |
| | | DIN EN 62479 |

### SYSTEM REQUIREMENTS

IBM compatible PC from Pentium 3
Operating system Windows XP or later

### GESYSENSE® CONFIGURATOR

| | |
|---|---|
| - for European ISM band | P.W00401 |
| - for American ISM band | P.W01401 |

## INTERFACES

| | | |
|---|---|---|
| Receiver | Europe | ISM 433 MHz band (433.05 – 434.79 MHz) |
| Serial Interface | | EIA-232, not optically isolated |
| | Connector | 9 pin D-type |
| Ethernet Interface | | 100 Mbps |
| | Connector | RJ45 |
| USB Host | | acc. full speed USB standard 2.0 |
| | Connector | USB type B |

## POWER SUPPLY

| | |
|---|---|
| Voltage | 24 V DC (± 20%), |
| Consumption | 10 W max. |

## DISPLAY & OPERATION

| | |
|---|---|
| LEDs | power, USB active, status, radio, comm. |
| Push button | terminate USB |

## DIMENSIONS & ENVIRONMENTAL CONDITIONS

| | | | |
|---|---|---|---|
| Weight | | 350 g | |
| Housing | dimensions | w/o antenna | 157 x 86 x 58 [mm], |
| | | height w. antenna | 218 mm |
| | material | top | Lexan 940 |
| | | base | Noryl VO 1550 |
| | color | top | RAL 7035 (grey) |
| | | base | RAL 7021 (black) |
| Mounting | | top hat rail (EN 60715: 35x15, 35x7.5) | |
| Humidity | | class F, accord. DIN 40040, 5 – 93 %, no condensation | |
| Flammability | | UL94-Vo, self-extinguishing | |
| Temperature | | operating | 0 – +55 °C |
| | | storage | -20 – +70 °C |
| Protection class | | IP 20 acc. to DIN EN 60 529 | |

## CERTIFICATES

| | | |
|---|---|---|
| EMC | emission | EN 55022 A/B |
| | immunity | EN 61000-6-2 |
| Radio | | ETSI EN 300 220-3 |
| | | DIN EN 62479 |

## DELTA 1000 GESYSENSE®

| | |
|---|---|
| Delta 1000 with GESYSENSE® receiver module for europ. ISM-Band | P.L50400-2 |

### ACCESSORIES

| | |
|---|---|
| Antenna cable 1.5 m | P.WZ0202 |
| Antenna cable 5 m | P.WZ0203 |

# DELTA 1000 GESYSENSE®
## Receiver and Data Server in Sensor Network

▶ Receiver in wireless network
▶ Data server with Ethernet connection
▶ Online presentation of current values
▶ FTP access to recorded data
▶ Remote monitoring unit
▶ Browser interface for setup and diagnosis

The Delta 1000 GESYSENSE® integrates the functionalities of receiver and data server. It is a compact and reliable solution for smaller wireless sensor networks.

The device receives the messages from the GESYSENSE® wireless sensors and archives them in its data base. Networked PCs can access these data via Ethernet.

The Delta 1000 GESYSENSE® offers a browser interface by which current values can be accessed online any time. Further to the measured values this comprises information on signal quality or battery status of the sensor modules. Device parameterization is made through this interface is as well.

The GESYSENSE® LogIt software is used to read archived values into a PC. This can be done spontaneously or following a schedule. Furthermore e-mails can be configured, which will be sent on alarm conditions.

If the device for DIN rail mounting is installed in a switching cabinet a detached antenna can be used.

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# GesySense® LogIt

## PC Software for Wireless Network Operation

▶ Configuration of wireless modules

▶ Configuration of receivers

▶ Online recording and presentation of sensor data

▶ Data transfer from loggers and memory cards

▶ Data transfer from receivers

▶ Analysis of measured values
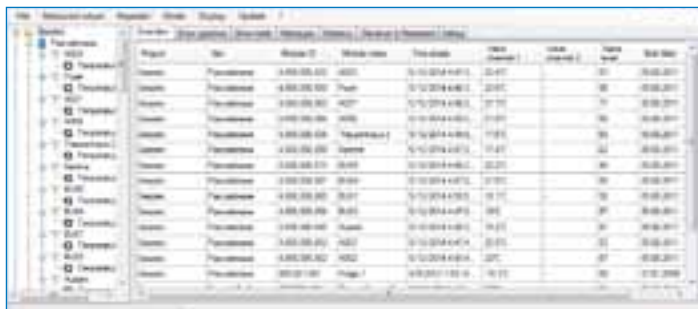


GesySense® LogIt is software for Windows PC from Windows XP onward. This application is used for setting up, operation and data analysis of the wireless sensor network. Furthermore it serves for configuration of GesySense® wireless modules and receivers.

As configuration software GesySense® LogIt provides different methods to commission GesySense® systems and put them into operation. For this GesySense® LogIt communicates with the wireless modules and the system Receiver. Configurations can be modified, received messages can be stored. Numerous data for network analysis and optimization is provided.

The program can read the archives of logger modules and write individual information into them, supporting a mobile usage. Archives collected on the microSD card of a receiver are read as well. Defining conditions for e-mail messages, or starting manual updates are further operations.

As software of a PC based data center GesySense® LogIt archives the messages transmitted by sensors and displays the contents. Further to tabular presentations measured values can be displayed graphically. Graphical comparisons between selected sensors can be shown and printed. Data is stored in a Microsoft Access data base.

For ease of handling the software enables a structured organization of the wireless modules. Definition and monitoring of limit values can as well be done.

The software requires the GesySense® Configurator to receive messages from the wireless network and communication with the modules.

**System requirements**

PC with

| | |
|---|---|
| Operating system | Windows XP, Vista, 7, 8 |
| Interfaces | USB |
| | EIA-232 (EIA-485) |
| | Ethernet |
| Peripherals | GesySense® Configurator as interface to wireless network and modules |

**GesySense® LogIt**

Software for Windows PC                    P.W00431

**GesySense® LogIt Software with**

GesySense® Configurator
- for European ISM band              P.W00432
- for American ISM band              P.W01432

**Software Features**

• Setting up an organization structure for sensor data

• Allocating wireless modules to the structure

• Management of wireless modules if used in different sites

• Activation and configuration of modules including parameterization of limit values and alarming in off-limit conditions

• Activation and deactivation of modules

• Online representation of received values

• Archiving of values from modules received

• Protection of archived data against manipulation

• Graphical presentation of measured values including accentuation of limit value infringements for one or more data series

• Tabular presentation of measured values including accentuation of limit value infringements. Comments can be added to single entries

• Special analysis of counter module data:
  - scaling
  - start value
  - interval definition for consumption analysis
  - physical units

• Data reduction by storing of minimum, maximum, mean or differential value calculated for a definable interval

• Graphic print of measured values

• Export of measured values in csv format

• Transfer of defined network configuration to GesySense® receivers

• Recording of receiver data

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