

# SATELLINE® - 1870

## Economical Short-Range Radio Modem

*SATELLINE-1870 complements the world-wide established product line of SATELLINE radio modems at the low-power end of applications. Thanks to its small size, multiple functions and low carrier power the SATELLINE-1870 is particularly well suited for internal applications within industrial complexes.*

*The SATELLINE-1870 uses the all-European licence-free 868...870 MHz frequency band. This band is divided into sub-bands according to the output power and duty cycle allowed for the transmitter. When changing the frequency the user need not worry about the power limitations, because SATELLINE-1870 automatically sets the output power according to the regulations. Due to the limited output power the maximum communication distances are of the order of 5 km in best possible conditions.*



### Low power, high functionality

SATELLINE-1870 was designed for the transfer of data and alarm messages in a short-range network covering, for instance, factory buildings included in an industrial complex. With its small size and low output power of maximum 100 mW it meets both the technical and economic requirements set on wireless communications in this kind of application environment. The communication range can be extended by using the built-in repeater function. The data speed over the radio interface is 9 600 bps.

The DTE interface of SATELLINE-1870 is compatible with the RS-232 serial interface. The settings of the radio modem can be changed from an external terminal in the programming mode or through auxiliary SL-commands during normal operation. The software of the SATELLINE-1870 resides in a flash memory,

which is easily re-programmable through a PC and a special programming device.

### Equipment and Know-how from your radio modem supplier

Satel Oy is a Finnish electronics and telecommunications company that specialises in wireless data communications. It designs, manufactures and markets radio modems for data and alarm transfer systems. The main user groups include industrial companies, public organisations and private persons.

Today Satel is one of Europe's leading manufacturers of narrow-band radio modems.

Satel Oy has prepared an extensive set of Application Notes describing different ways of utilising the SATEL radio modems in various applications. For further information about our

products and their applications, please see our home page [www.satel.fi](http://www.satel.fi) or contact your local dealer.

#### General Information of the 868-870 MHz SRD band

New common spectrum allocations for Alarms and Short Range Devices (SRD) have recently been taken into use in the countries within the CEPT. The 868-870 MHz frequency band is divided into sub-bands according to the maximum permissible output power (max 500 mW) and transmitter duty cycle. Most of the sub-bands are assigned to SRD applications in areas like Telecommand and Telecontrol, Telemetry and Alarms.

The output power limit (5, 10, 25, 50, 100 or 500 mW ERP) is defined separately for each sub-band. The duty cycle number (0.1 to 100) indicates the percentage of a 1-hour period that a single radio modem is permitted to transmit. The duty cycle limitation is to be controlled by the terminal equipment connected to the radio modem.

## Effective package of multiple functions

As the SATELLINE-1870 is operated in the 868-870 MHz frequency band, the user may freely choose among the existing sub-bands. The maximum output power limit (5, 10, 25, 50 or 100 mW ERP for each sub-band) is pre-programmed into the SATELLINE-1870, and will be automatically set when changing the sub-band.

The channel spacing of SATELLINE-1870 is 25 kHz, and the data speed of transmission is 9 600 bps. The radio modem is compatible with the RS-232 interface. The data speed of communication through the RS-232 interface is 300-19 200 bps.

## Always precisely tuned

To avoid the carrier frequency drift a digital Adaptive Frequency Correction (AFC) function has been implemented in SATELLINE-1870. The AFC function is included in the receiver part of the radio modem. At the start of each reception the small frequency difference between the receiver and the transmitter is determined using digital measuring techniques. Based on the result the receiving modem will adjust its frequency to match the frequency of the transmitter as precisely and as fast as possible.

The AFC helps to maintain maximum sensitivity of reception, to ensure high reliability of data transfer.

## Changeable settings

SATELLINE-1870 is initialised and the settings are altered from an external terminal. The radio modem has to be set into the Programming mode when changing the radio settings.

The settings can also be altered during normal operation in the Data Transfer mode by means of auxiliary SL-commands, which are entered amidst ordinary data. In the front panel of SATELLINE-1870 there are five LED-indicators showing the status of the serial port and the radio interface.

In case it is necessary to extend the

coverage of the radio modem network, SATELLINE-1870 modems can be used as repeater stations. When operated in the Repeater mode, the radio modem receives data through the radio interface, buffers the received data and transmits it further using the same radio frequency as in the reception.

### Technical Specifications • SATELLINE®-1870

The equipment complies with the ETS 300 220-1, ETS EN 301 489-1 and IEC 60950.



#### RADIO TRANSCEIVER

|                     |                                 |
|---------------------|---------------------------------|
| Frequency Range     | 868 .... 870 MHz (programmable) |
| Channel Spacing     | 25 kHz                          |
| Number of Channels  | 74                              |
| Frequency Stability | +2.5 kHz / -2.5 kHz             |
| Type of Emission    | F1D                             |
| Communication Mode  | Half-Duplex                     |

#### RADIO TRANSMITTER

|                         |                                |
|-------------------------|--------------------------------|
| Carrier Power           | 5, 10, 25, 50, 100 mW / 50 ohm |
| Carrier Power Stability | + 1 dB / - 1 dB                |
| Adjacent Channel Power  | < -38 dBm                      |
| Spurious Radiation      | < -40 dBm                      |

#### RADIO RECEIVER

|                              |                        |
|------------------------------|------------------------|
| Sensitivity                  | < -108 dBm (BER 10E-3) |
| Co-channel rejection         | > -10dB                |
| Adjacent Channel Selectivity | > 45 dB                |
| Spurious Radiation           | < 2 nW                 |

#### MODEM

|                               |                                |
|-------------------------------|--------------------------------|
| Interface                     | RS-232                         |
| Interface Connector           | DIN41651-16pin (male)          |
| Data Speed of RS Interface    | 300 – 19200 bps (programmable) |
| Data Speed of Radio Interface | 9600 bps                       |
| Data format                   | Asynchronous RS-232            |

#### GENERAL

|                             |   |
|-----------------------------|---|
| Operating Voltage           | + 8 ... + 30 Vdc  |
| Power Consumption (average) | < 0.72 VA (60 mA @ 12 V) Receive<br>< 0.1 VA (90 mA @ 12 V / 5 mW) Transmit<br>< 1.8 VA (150mA @12 V / 100 mW) Transmit<br>< 0.0012 VA (0.10 mA @12 V) Standby mode<br>< 0.18 VA (15mA @12V) power save |

|                             |                     |
|-----------------------------|---------------------|
| Operating Temperature Range | -20 °C ... +50 °C   |
| Antenna Connector           | SMA, 50 ohm, female |
| Housing                     | Aluminium enclosure |
| Size H x W x D              | 57 x 125 x 16 mm    |
| Installation Plate          | 130 x 63 x 1 mm     |
| Weight                      | 125 g               |

**Values are subject to change without notice.**

**Manufacturer:**

**Distributor:**



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