SATELLAR® Digital System

Radio Modem for Long Range Wireless Data Communication

• ETHERNET • INTEGRATED MODULAR SOLUTION • DSP RADIO WITH 45 MHz TUNING RANGE •
• LINUX OS • OUTPUT POWER UP TO 10 W •

SATEL®

WIRELESS WORLD – LOCAL SOLUTION

A UNIQUE DIGITAL RADIO MODEM SYSTEM

SATELLAR is designed to be flexible and expandable. It can be used in transparent or IP transfer (TCP/IP; UDP/IP), allowing operation in packet-based mode. The Linux operating system enables the design and addition of new functions and features. Over-the-air remote management and firmware updating are possible without a need to visit the installation site. Handy size, positioning of interface connectors on the bottom, a large color display and keypad make it a dream come true for the installer. Do you want to reduce your system costs long-term and embed SATELLAR as a part of your system?

SUPREME PERFORMANCE

SATELLAR has many unique features like Software radio technology.

Selectable main functions:

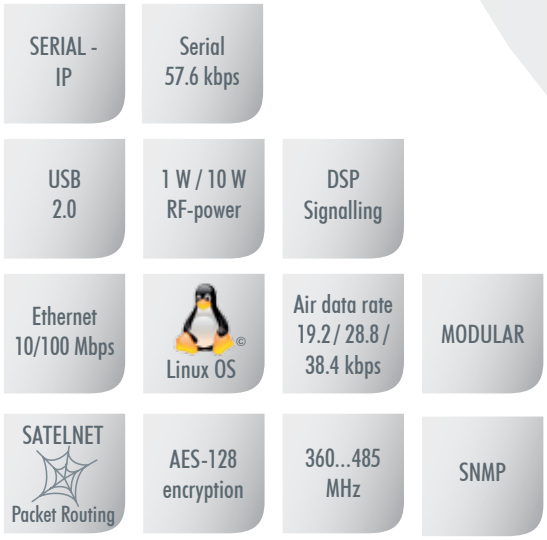
- Operating frequency range 360 … 485 MHz
- Tuning range 45 MHz
- Data rate over-the-air up to 38.4 kbps
- Output power level from 0.1 W to 10 W
- Channel spacing 6.25 … 25 kHz

SATELLAR is easy to connect to any system, due to:

- Ethernet 10/100 Mbps
- Serial interface RS-232, -422, -485
- USB host and device connections
- Data encryption according to AES-128 standard
- Built-in firewall for radio and wired IP network

SATELLAR's heart and brain is Linux OS, giving:

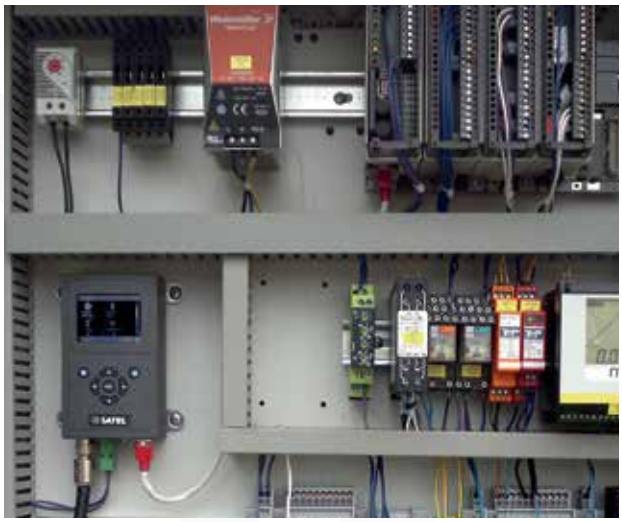
- Easy and fast implementation of new features
- Controls SATELLAR's internal operations and creates reports on its LCD



MODULAR CONSTRUCTION – SELECT ONLY WHAT YOU NEED

The SATELLAR Digital System consists of the principal module Radio Unit (RU) and the Central Unit (CU). The RU alone can be used as a radio modem with serial interface and as a router in packet-routing networks. Combination of CU and RU works as a TCP/IP radio modem.

- SATELLAR-1DS – 1W RU
- SATELLAR-10DS – 10W RU
- SATELLAR-2DS – 1W RU and CU
- SATELLAR-20DS – 10W RU and CU
- SATELLAR-2DS and 20DS are available with a Graphical User Interface (GUI)
- Expansion Units (XUs) – like I/O, GSM and GPS units can be designed and incorporated



MULTIDIMENSIONAL CONFIGURATION OPTIONS

SATELLAR's powerful features can be configured by various easily-accessible methods:

- WEB SERVER Using IP connectivity for normal and advanced settings.
- USB Transferring firmware, files and settings by a USB memory stick.
- SNMP For collecting and organizing information from the devices in IP networks.
- KEYPAD AND DISPLAY To set and read settings and configure all SATELLARs in the network.
- OVER-THE-AIR Enables remote management and firmware updating to all installed radio modems in the field.

FLEXIBILITY IN INSTALLATION

Combining innovative modularity, compact unit size and low weight, it gives users supreme flexibility in cabinet mounts and usage.

- Installation on a flat surface with mounting clips or to a DIN rail
- All interfaces requiring cabling are located on the bottom of the unit
- A wide operating voltage range and low power consumption
- D9; RS-232/422/485 interfaces in transparent mode
- RJ-45 with Auto-MDIX interface in packet-based mode

TYPICAL SATELLAR APPLICATIONS IN A SMART GRID NETWORK

Technical specifications

RADIO UNIT

Frequency range *1)		
- 1 W radio unit	360 - 485 MHz	
- 10 W radio unit	400 - 485 MHz	
Tuning range	45 MHz	
Channel spacing	12.5 and 25 kHz, selectable	
Carrier frequency configuration	Frequency programmability in 6.25 kHz steps	
Carrier frequency accuracy	+/- 2.5 ppm, at temp. -25 ... +55 °C	
Carrier frequency long term stability	+/-2.0 ppm / 3 years	
Data latency (transparent mode)	<18 ms @ 25 kHz channel	
Forward error correction (FEC) configurable	off, rate 0.5 or rate 0.667	
TRANSMITTER PARAMETERS		
Output power / SW adjustable	0.1 ... 1W / 100 mW steps 1 ... 10 W / 1 W steps	
Adjacent channel power typically (meas. method EN 300113)	< -63 dBc	
Maximum air interface data rates	38400 bps @ 25 kHz channel, 19200 bps @ 12.5 kHz channel	
RECEIVER PARAMETERS		
Sensitivity (dBm, FEC OFF) Channel spacing / air speed	BER	
	10E-3	10E-6
25 kHz /19200 bps (4-FSK)	-116	-112
12.5 kHz /9600 bps (4-FSK)	-119	-115
25 kHz /38400 bps (16-FSK)	-102	-98
12.5 kHz /19200 bps (16-FSK)	-105	-98
GENERAL		
Power consumption - 1 W radio unit TX / RX - 10 W radio unit TX / RX	 8.5 W / 3 W 35 W / 4.2 W	
Interfaces - power	Screw terminal	
Interfaces - DTE (D9 female)	a) RS-232 with handshaking OR b) RS-422/485/232 without handshaking	
Interfaces - RF	TNC female	
Size / Weight - 1 W radio unit - 10 W radio unit	 130 x 24.3 x 76.5 mm / 300 g 129 x 82 x 76.5 mm / 1020 g	

CENTRAL UNIT

CPU	ARM 9 @ ~ 200 MHz
RAM	64 MB RAM
ROM	128 MB flash
Display	2.4 ", 320 x 240 pixel resolution, 65 k colours
Keypad	up, down, left, right, OK (select) and two SW defined keys
Power consumption (no USB device connected)	2.0 W With UI 1.4 W Without UI
USB interfaces	USB-host & USB-device USB2.0 full speed
Ethernet interface	10/100 Mbit Ethernet RJ-45 with Auto-MDIX
Mechanical dimensions	130 x 21.7 x 76.5 mm
Weight	260 g

COMMON PARAMETERS FOR RADIO AND CENTRAL UNIT

Standard compliance *2)	
Radio requirements	EN 300 113-1, -2, FCC Part 90
Emissions, immunity, radio unit	EN 301 489-1, -5, FCC Part 15
ESD, radio unit	EN 61000-6-2 level 4
Emissions, immunity, ESD central unit	EN 61000-6-2, 61000-6-4
RoHS	2002/95/EC
Temperature ranges	-25 ...+55 °C complies with the radio standards, -30 ...+75 °C functional, -40 ... +85 °C storage
Humidity	< 95 % @ 25 °C, non-condensing
Mounting	DIN rail (side or back), Direct on flat surface (with two mounting clips)
Vibration	at least 10 - 500 Hz/5 g without degradation in data transfer capability
Shock resistance	dropping height 1 m / all directions
IP rating	IP52
DC input range	+9 Vdc...+30 Vdc

Values are subject to change without notice.
*1) Check the available versions from local SATEL distributor.
*2) Check the local standard compliances from local SATEL distributor.

SATEL reserves the right to change the technical specifications or functions of its products.

SATELLAR-1DS
1 W radio unit

SATELLAR-2DS
1 W radio unit + central unit without display

SATELLAR-2DS
1 W radio unit + central unit with display

SATELLAR-20DS
10 W radio unit + central unit with display

Designed and manufactured in Finland by:

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