CHALLENGE. SOLUTION. SUCCESS.

25
PRODUCT CATALOGUE

High-quality radio technology for real-time wireless data communication.

SATEL

Mission-Critical Connectivity

SOLVING YOUR CHALLENGES

SATEL is a trusted wireless technology expert and innovator who develops and sells high quality connectivity solutions.

Our solutions are used in a wide range of industrial applications enabling secure, mission-critical connections. All SATEL products are designed and manufactured in Finland.

Reliable connections, protected business

SATEL technology is easy and fast to implement and use with low life cycle costs. Our solutions are expandable, customizable, flexible and secure.

You get added value from our services. We offer network design and technical support, and we have a wide distributor network at your service.

Expertise
High quality
Operational security
Independence

Easy implementation
Low life cycle costs
Service and support
Global distribution network

SUSTAINABILITY AS A CORE VALUE

SATEL is committed to carrying out its business in a sustainable way. Our radio technology is designed, manufactured and tested in Finland. We have a long tradition of environmentally friendly practices, and we perform highly in ESG (Environmental, Social and Governance) criteria.

SATEL radio technology can be used in various mission-critical applications such as SCADA, machine control, smart farming, ITS, autonomous vehicles, GNSS, offshore, environmental monitoring and Industrial Internet. Mission-critical nature of these applications calls for very tight requirements for connectivity, reliability, accuracy and security. Many of the applications that use radio connectivity solutions make operations safer and more sustainable.

APPLICATIONS

SATEL's technology is used globally in a wide range of industrial applications that require the utmost reliability and security. The application possibilities are numerous.

MACHINE CONTROL

Modern construction machinery transfer data from/to cloud environment to ensure efficient and safer worksite, and enable accurate workflow.

Machine control requires accurate position based on design models and plans. SATEL's connectivity technology is perfect for mission-critical operations in harsh extreme areas, even in areas with limited network coverage or no coverage at all.

With machine control operations become easier and more sustainable. Environmental impact is manifested in lower fuel consumption and CO_2 emissions, and longer machine lifecycle. For example, in precision farming, the use of seeds, fertilizers and pesticides becomes more accurate.

ITS

Intelligent Transport Systems are improving travel experience everywhere, and operational communication is a major factor in this. Private radio data network ensures the functionality of these applications. SATEL's radio technology is used in in public transport e.g. in traffic light and traffic sign control, real-time passenger information systems and automatic vehicle location.

In ITS radio technology contributes to making transportation more efficient, environmentally friendly and safe. The results can be seen in reduced driving times, less fuel consumption and less CO^2 emissions.

ENVIRONMENTAL MONITORING

Wireless radio technology is one key aspect in Environmental Monitoring. It brings safety, operability and control. With SATEL's solutions you can monitor weather conditions and get information for example in flood, fire or drought situation. They provide real-time information of environmental conditions without additional costs and with a minimum supervision.

TELEMETRY

Telemetry refers to the process of collecting and transmitting data from remote or inaccessible sources to a central location for monitoring, analysis, and decision-making. This data can include various measurements, such as temperature, pressure, speed, location, or any other relevant parameter depending on the application.

SATEL's solutions provide real-time data from remote locations, and improve efficiency and safety in mobile or temporary telemetry applications. High-quality radio technology is reliable even in the most difficult environments, such as hot desert or icy arctic conditions.

UTILITIES

Utility systems require a highly reliable monitoring and controlling network. Malfunctions should be pinpointed quickly and even restored remotely. SATEL offers comprehensive solutions that are easy to implement and expand. SATEL radio technology is currently being used e.g. in power distribution, advanced metering infrastructure, windmills, waterworks, sewer networks, district heating and gas pipelines.

In utility communications, real-time wireless monitoring and remote access add efficiency and support interference-free operation, cut reaction times and minimize the environmental impact, for example water losses.

OEM

SATEL have produced a range of OEM radio modules for system manufacturers to integrate into customer solutions. They are secure, customizable and flexible in mounting options. SATEL's solutions are widely compatible and also support other manufacturers'radio protocols.

DEFENCE

Defense forces all around the world use lot of time and money for practicing. To get the most out of the investment and to guarantee the quality and safety, practices are monitored in real-time and the results are analyzed for further development.

SATEL's radio technology is used for example in target practice on land, at sea, and in the air. SATEL products can be used to transmit location and telemetry data from a moving target to the operator reliably, even over long distances.

SATEL MCCU

The MCCU (Mission-Critical Connectivity Unit) platform is designed to resolve connectivity challenges in harsh environments. It delivers mission-critical signaling from relatively small machine control messages with constant latency to wideband and low latency camera stream.

SATEL focuses on mission-critical connectivity applications by intelligently and smartly combining multiple wireless technologies. The machine and vehicle manufacturers, and machine control system providers can integrate SATEL MCCU into their offering without knowing what kind of technology is available in the operating area. The vehicle can be operated under varying connectivity environments.

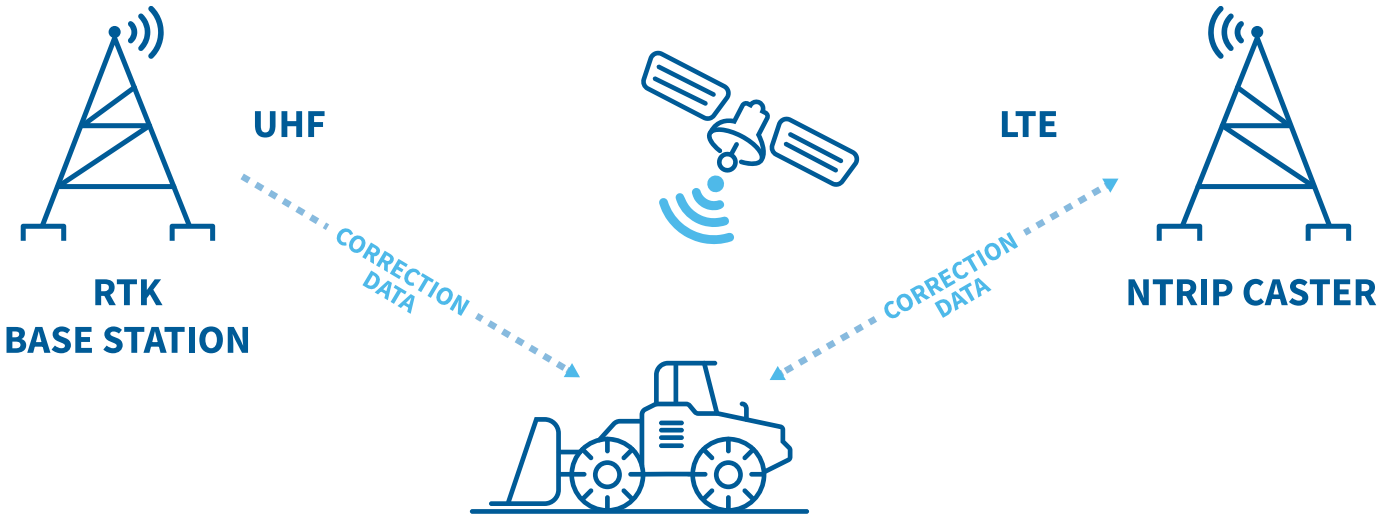
SATEL MCCU-20

The SATEL MCCU-20 is a unique dual-technology RTK transceiver for receiving RTCM correction data either with UHF radio from local base station or from internet with LTE interface by using NTRIP protocol.

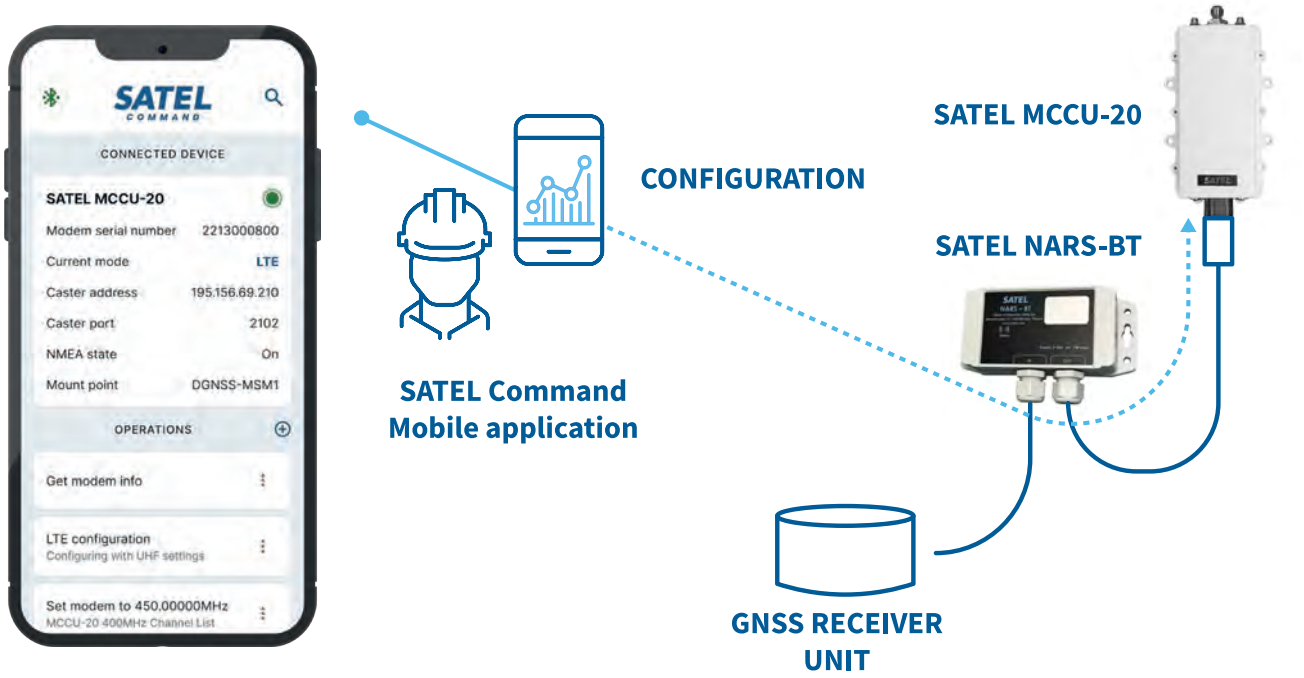
SATEL MCCU-20 has built-in NTRIP client and RS-232 interface, the current GNSS system capabilities can be upgraded to have always the possibility to receive RTCM corrections, no matter whether working in rural areas where no cellular coverage is present, or receiving RTCM corrections from NTRIP caster services when operating in areas where cellular coverage is available.

SATEL MCCU-20 has IP67 and IP69K classification and it withstands vibration and shock. It is based on field proven mechanics, and all the electrical connections are equipped with surge and ESD (Electrostatic Discharge) protection.

SATEL MCCU-20	
SATEL order code	YT0200 SATEL MCCU-20 EU, with encryption support, with eSIM YT0205 SATEL MCCU-20 EU, w/o encryption support, with eSIM YT0210 SATEL MCCU-20 US/CA, with encryption support, with eSIM YT0225 SATEL MCCU-20 BR, with encryption support, with eSIM
Communication modules	**LTE:** (NTRIP application, NMEA position upstream) **UHF:** 410 …475 / 902 … 928 MHz radio (RTK Receiver)
Serial interface	RS-232 (TD, RD lines)
Operating voltage range	+9 … +30 VDC (-15% / +20%)
Power consumption	Typ. 2.4 W (NTRIP receive) / Typ. <1 W (RTK receive)
Serial data speed	4800 – 460800 bps



To ease up the SATEL MCCU-20 configuration SATEL offers: **SATEL NARS-BT** Bluetooth device together with **SATEL Command** application (for iOS and Android).



SATEL CONNECT: GLOBAL CONNECTIVITY SOLUTION

The SATEL CONNECT is a unique cellular connectivity service concept that solves complex cellular subscription and SIM card issues.

Each SATEL MCCU device contains a SATEL CONNECT eSIM solution by default. It is perfect for machine control applications because SIM installations are not needed for the devices that can be in very hard-to-reach locations.

satel.hapyservices.com

SATEL MCCU-30

The SATEL MCCU-30 is a versatile, innovative, and robust multi-band vehicle router solution that effectively tackles connectivity challenges in a wide range of applications, including machine control and off-highway vehicles.

It excels in providing reliable connectivity by smartly integrating various wireless technologies to tackle even the most intricate scenarios, all within a single unit. Whether you are dealing with a new build or retrofit projects, SATEL MCCU-30 offers adaptability, thanks to its field proven and IP classified mechanics.

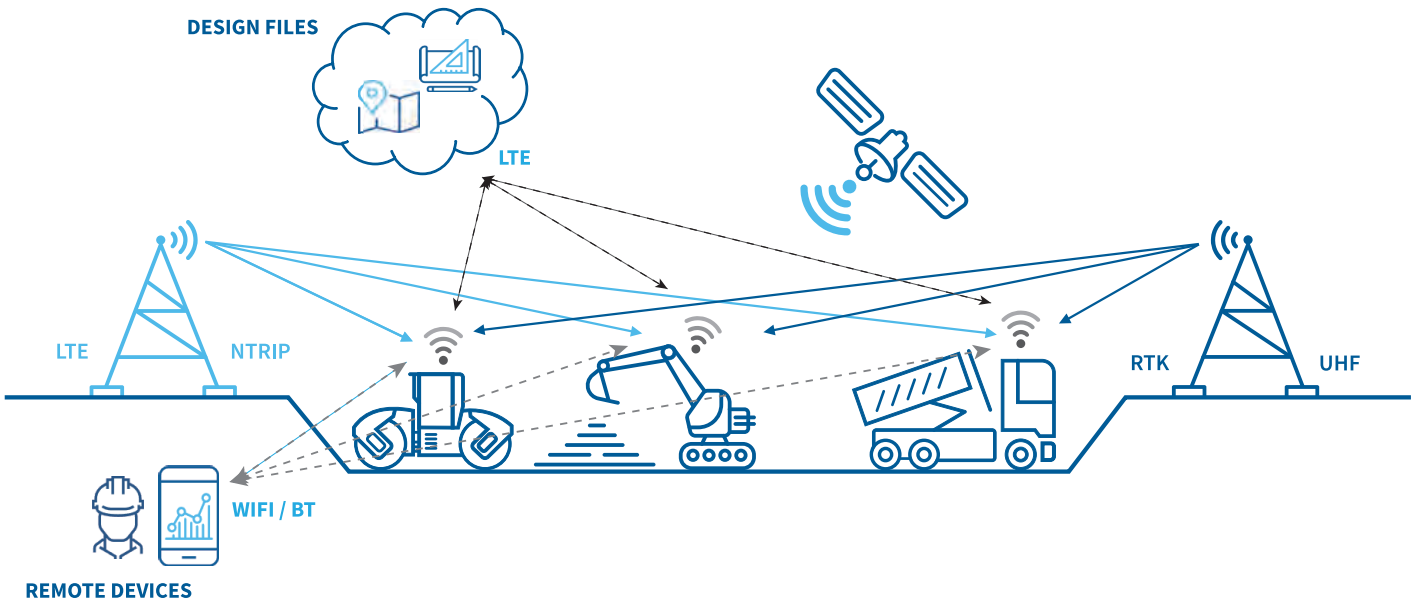
SATEL MCCU-30 is designed to resolve various connectivity challenges in harsh environments:

- LTE, Wi-Fi, UHF, BT (all can be used simultaneously)
- Based on field proven mechanics
- IP67 / IP69K classification
- Vibration, shock and temperature
- Connections with surge and ESD (Electrostatic Discharge) protection

SATEL MCCU-30	
Communication technologies	LTE Cat 4 (RX MIMO) UHF 403 … 473 MHz WiFi 802.11a/b/g/n/ac 2.4 GHz and 5 GHz Bluetooth V5.2
Interface	1 GB Ethernet
Operating voltage range	+9 … +40 VDC (-15% / +20%)
Power consumption, typical	< 10 W

SATEL VISIONERDS ARE HERE TO HELP YOU

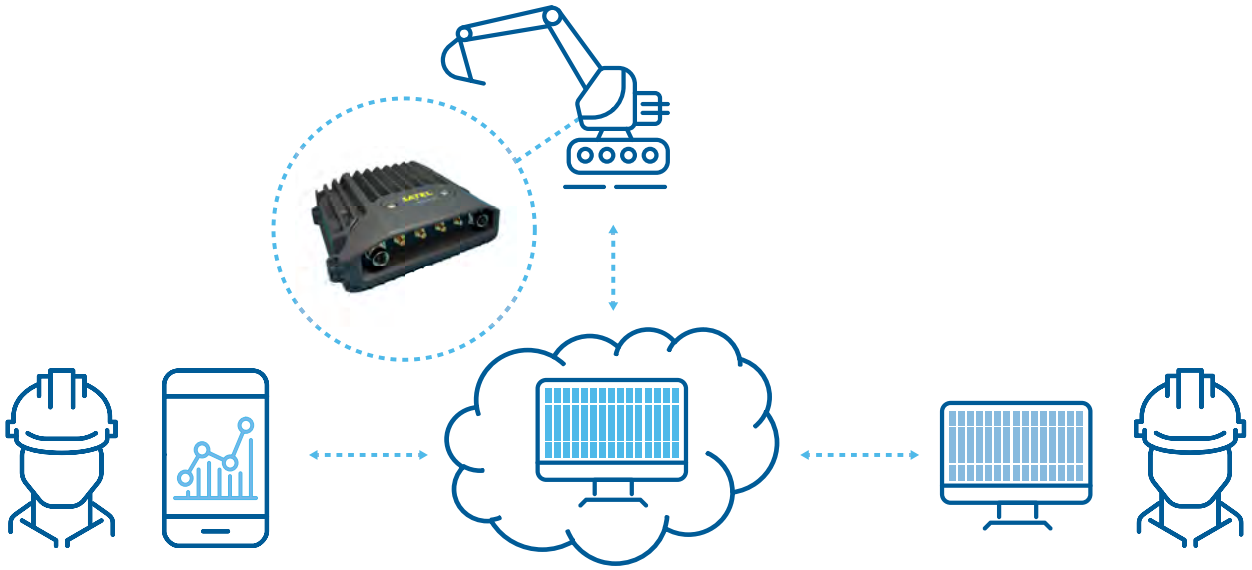
We know how to make intelligent machines and work sites seamless in their connections, good for business and safe for everyone with future proof MultiTech connectivity solutions. Feel free to contact our experts; SATEL Visionerds.



SATEL SECURE REMOTE

SATEL SECURE REMOTE is a cloud-based device management system designed to enhance the value of your SATEL device by addressing maintenance requirements and simplifying configuration complexities in machine control applications.

When combined with the SATEL MCCU-30, it presents a comprehensive connectivity solution that prioritizes user-friendliness and peace of mind, providing significant value to customers.



END USER CONFIGURATION

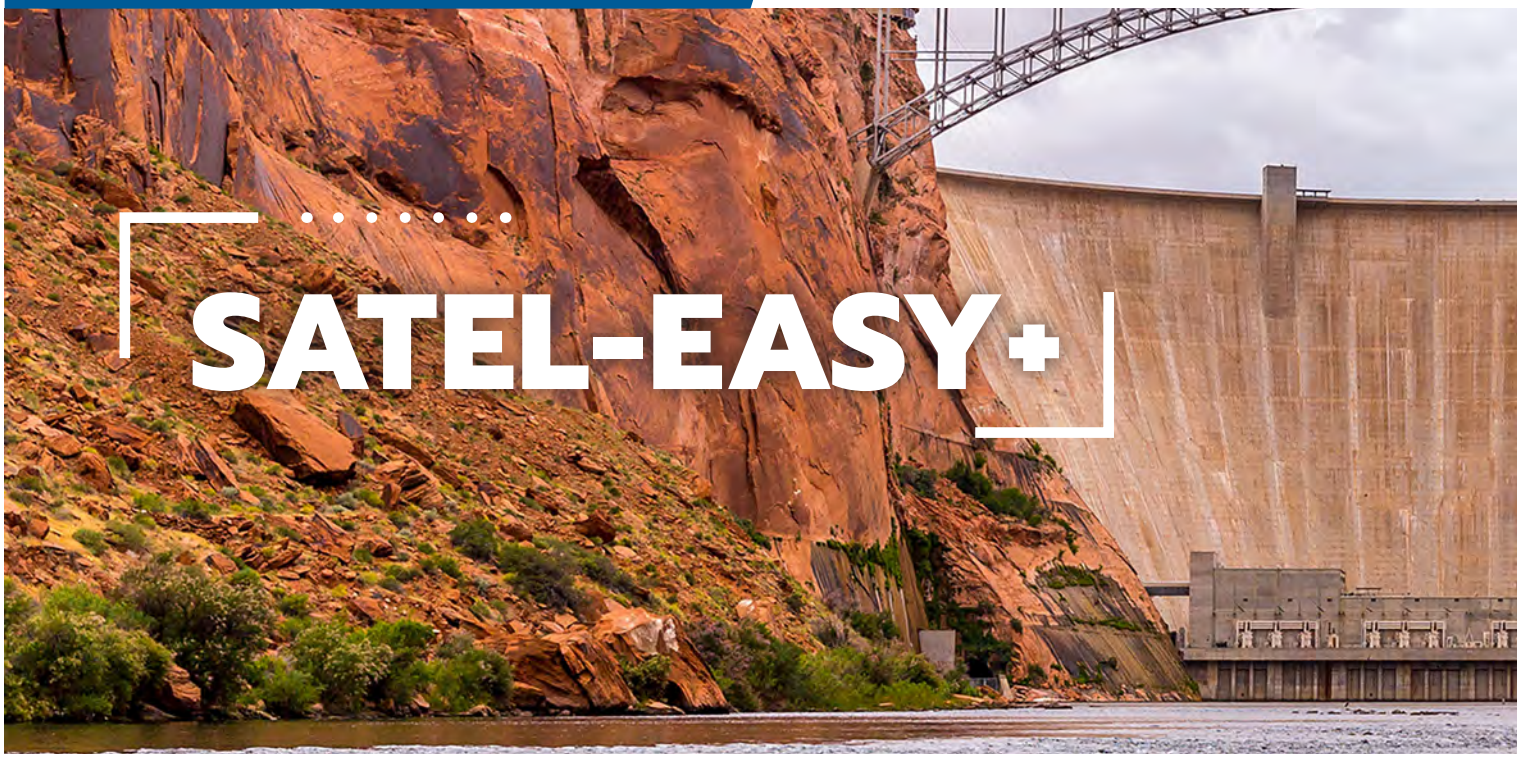
CONFIGURATION MANAGEMENT
FEATURE ENABLE/DISABLE

SATEL SECURE REMOTE CLOUD

SOFTWARE UPDATES
CYBER SECURITY FIXES

TECHNICAL SUPPORT

REMOTE ACCESS
DIAGNOSTICS AND LOG FILES



SATEL-EASY+

The SATEL-EASy+ offers improved LCD for easy configuration and more memory, several interfaces are available from standard serial (variant 1) to Ethernet / Bluetooth / USB (variant 2). Both are with the same functionality: Data transfer, diagnostics, configuration and updating the device.

SATEL-EASy+ is available on two different frequency ranges; 403 … 473 MHz that is a common frequency range in Europe and in USA, and lower 320 … 380 MHz (only variant 1), that is an excellent choice for GNSS industry in Asia and utility business in the Middle East.

All interfaces are available at the same time with ETH/BT/USB variant. For example ETH for system data, USB for NMS monitoring and Bluetooth for field configuration. Bluetooth interface is available also for system data; for example the radio to be connected to GNSS receiver.

SATEL-EASy+ ETH supports both TCP and UDP, and can act as a server or a client. Radio extracts the data payload from the IP frames and transfers only the data frame via radio interface through the radio network.

BLUETOOTH

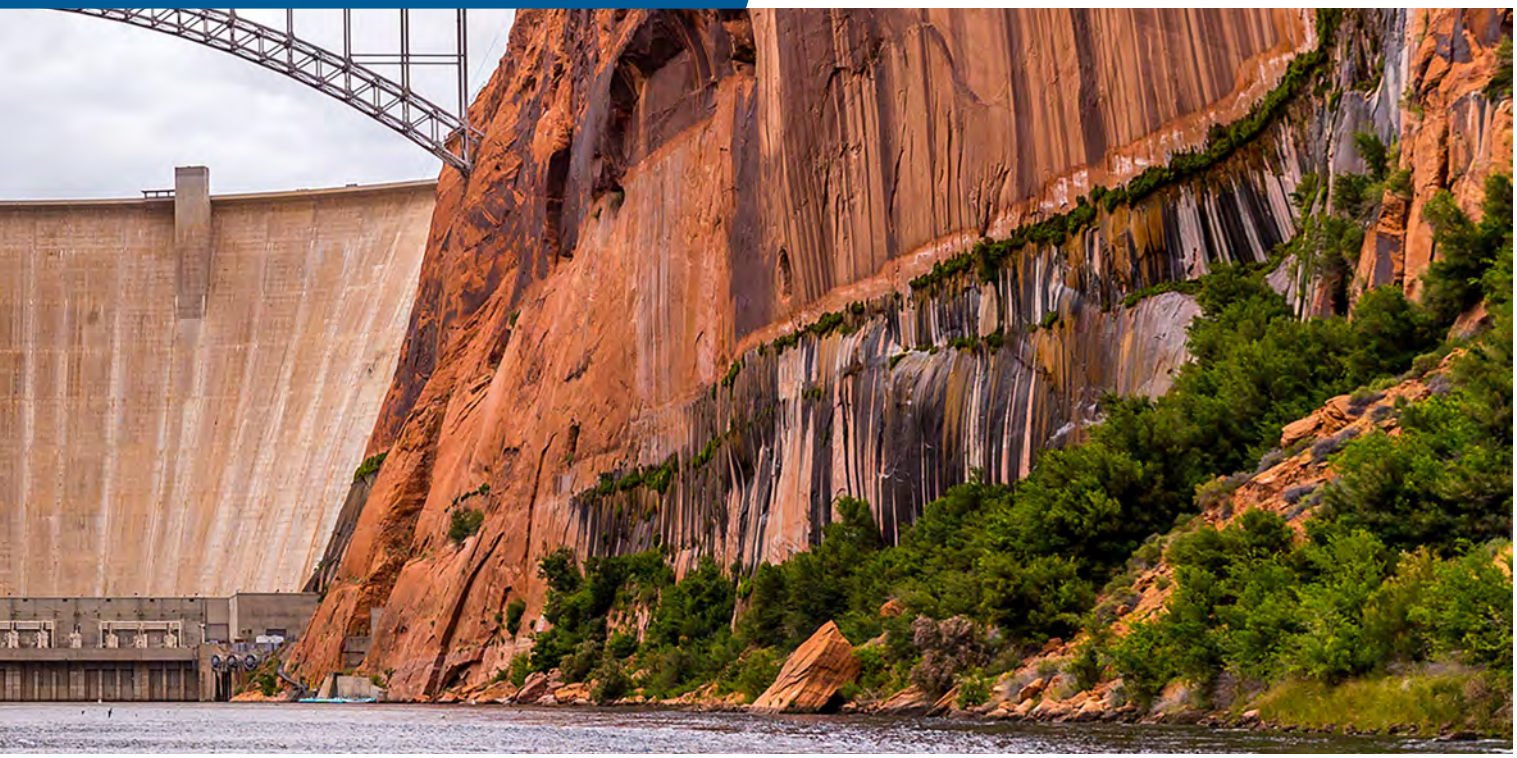
Bluetooth connectivity is provided by a dual-mode BT / EDR BLE module, and following operating modes are supported:

- Bluetooth Server using SPP (Serial Port Protocol)
- Bluetooth Client using SPP
- BLE peripheral

SATEL-EASy+ will only act as a USB Serial device, with the other device being the USB Host (that device sees the USB connection as a serial port).

SATEL-EASy+ is compatible with SATELLINE-EASy and -M3-TR4 / SATEL-TR4+ based radios as well as with SATELLINE-3AS NMS modems.

To ease up the SATEL-EASy+ variant 2 configuration, SATEL offers SATEL Command application (for iOS and Android).



SATEL-EASY+

SATEL order code	**320 … 380 MHz:** YM6030 SATEL-EASy+ (with AES) YM6035 SATEL-EASy+ YM6060 SATEL-EASy+ (with display and AES) YM6065 SATEL-EASy+ (with display) **403 … 473 MHz:** YM6010 SATEL-EASy+ (with AES) YM6015 SATEL-EASy+ YM6050 SATEL-EASy+ (with display and AES) YM6055 SATEL-EASy+ (with display) YM6070 SATEL-EASy+ ETH (with display and AES) YM6075 SATEL-EASy+ ETH (with display)
Frequency	320 … 380 (only variant 1) / 403 … 473 MHz
Tuning range	60 (only variant 1) / 70 MHz
Channel width	6.25 / 12.5 / 20 / 25 kHz @ 320 ... 380 MHz (only variant 1) 12.5 / 20 / 25 kHz @ 403 ... 473 MHz
RX sensitivity	-115 dBm @ 12.5 kHz (4FSK) / -113 dBm @ 25 kHz (4FSK) -102 dBm @ 25 kHz (16FSK)
TX power (max.)	1W
Interface	RS-232, -422, -485 (variant 1) USB, ETH, Bluetooth (variant 2)
Operating voltage range	+7 ... +27.5 Vdc (-15% / +20%)
Power consumption TX / RX	< 6 W / < 1.5 W
Data speed (max.)	Radio 28800 bps / Serial 115200 bps (variant 1) Ethernet 10/100 Mbps, USB2.0 (variant 2)

D15 variant 1

M8-power, M8-USB, M8-ETH variant 2

NMS

NMS (Network Management System) protocol compatibility (with routing, diagnostics and packet filters) offers the following benefits:

- Enhanced reliability, through advance indication of anticipated faults and failures
- Reduced configuration and maintenance costs, through remote configuration
- An efficient tool for network development

THE FOLLOWING VARIANT IS COMING NEXT

Multifrequency transceiver:

- Licensed 403 … 473 MHz
- License-free 869.4 … 869.65 MHz
- License-free 902 … 928 MHz

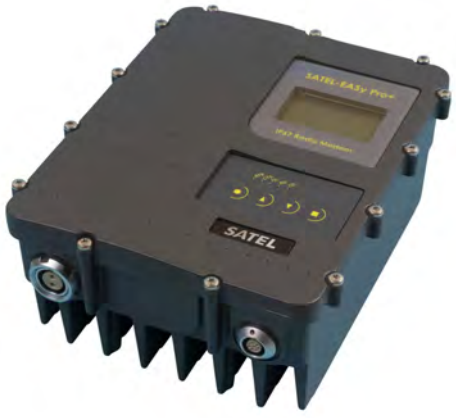
SOLUTIONS FOR THE TOUGHEST PLACES

SATEL-EASy Pro+ is a new IP67 classified UHF radio modem with a high 35 W power transmitter, wide 70 MHz tuning range (403 ... 473 MHz) in one hardware and selectable channel spacing.

SATEL-EASy Pro+ is equipped with one antenna port and either with one RS-232 port for data (with NMS features, no diagnostic port) or with dual serial port, RS-232 by default and RS-485/-422 data ports optional (with NMS features and diagnostic port). Note! Dual serial port model is needed for NMS master operation. Supported AES128 (by default) / AES256 (as an order option) encryption on radio channel increases the data security. Future options include for example lower frequency band 320…380 MHz.

Due to the high transmitting power, connection distances more than 80 kilometres can be covered in favorable conditions.

SATEL-EASy Pro+	
SATEL order code	**Models with one serial port:** YM6820 SATEL-EASy Pro+ (with AES, 25 W, for EU) YM6823 SATEL-EASy Pro+ (with AES, 35 W) YM6825 SATEL-EASy Pro+ (w/o AES, 25 W, for EU) YM6830 SATEL-EASy Pro+ (with AES, 25 W, for AU) YM6833 SATEL-EASy Pro+ (w/o AES, 35 W) YM6835 SATEL-EASy Pro+ (w/o AES, 25 W, for AU) YM6840 SATEL-EASy Pro+ (with AES, 35 W, for BR) YM6845 SATEL-EASy Pro+ (w/o AES, 35 W, for BR) **Models with dual serial port:** YM6843 SATEL-EASy Pro+ (with AES, 35 W) YM6853 SATEL-EASy Pro+ (w/o AES, 35 W) YM6860 SATEL-EASy Pro+ (with AES, 25 W, for EU) YM6865 SATEL-EASy Pro+ (w/o AES, 25 W, for EU) YM6870 SATEL-EASy Pro+ (with AES, 25 W, for AU) YM6875 SATEL-EASy Pro+ (w/o AES, 25 W, for AU)
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 20 / 25 kHz
RX sensitivity	-114 dBm
TX power (max.)	35 W (Limited 25 W version is available as an order option)
Interface	RS-232 / HW model with data port 2: RS-232/-485/-422 (data/NMS)
Operating voltage range	+9 ... +30 Vdc (-15% / +20%)
Power consumption	TX: 9 ... 10 W @ 1W output power TX: 60 ... 72 W @ 25 W output power TX: 84 ... 97 W @ 35 W output power RX: 1.8 ... 2.3 W Sleep mode: 0.9 ... 1.4 W
Data speed (max.) radio / serial	28800 bps / 115200 bps



SATEL Proof radios are heavy-duty models. Housing of these models has the IP69K rating, which is the highest protection available. It protects against ingress of dust, high temperature and high-pressure water.

HEAVY-DUTY SOLUTION FOR HARSH ENVIRONMENT

SATEL Proof radio with IP67 / IP69K-classifications meets, for example, the requirements of machine control, smart farming and marine applications. It is a flexible and cost-effective solution that has profound electrical protection; both the power and data lines as well as the antenna interface are surge protected. It also has additional filtering on GNSS frequencies.

SATEL Proof-TR4+ / -TR9
SATEL Proof-TR489

To ease up the SATEL Proof radios configuration SATEL offers: SATEL NARS-BT Bluetooth device together with SATEL Command application (for iOS and Android).

SATEL Proof-TR4+ / -TR9

SATEL order code	YM6577 SATEL Proof-TR4+ (with AES) YM6578 SATEL Proof-TR4+ YM6410 SATEL Proof-TR9 YM6411 SATEL Proof-TR9 for US, CA YM6412 SATEL Proof-TR9 for AU,NZ, BR
Frequency	403 … 473 / 902 …928 MHz
Channel width	12.5 / 20 / 25 kHz @ TR4+
Spreading method	Frequency hopping @ TR9
RX sensitivity	-118 … -105 dBm
TX power (max.)	1 W
Interface	RS-232 (TD, RD lines)
Operating voltage range	+7 ... +27.5 Vdc (-15% / +20%)
Power consumption TX / RX	7 / 1.2 W (typical)
Data speed (max.) radio / serial	28800 bps / 115200 bps @ TR4+ 115200 bps / 115200 bps @ TR9

SATEL Proof-TR489

SATEL order code	YM6920 SATEL Proof-TR489 (with AES, region all), YM6925 SATEL Proof-TR489 (w/o AES, region all) YM6930 SATEL Proof-TR489 (with AES, for US/CA 400/915), YM6935 SATEL Proof-TR489 (w/o AES, for US/CA 400/915) YM6940 SATEL Proof-TR489 (with AES, for AU/BR 400/915), YM6945 SATEL Proof-TR489 (w/o AES, for AU/BR 400/915) YM6950 SATEL Proof-TR489 (with AES, for EU 400/869), YM6955 SATEL Proof-TR489 (w/o AES, for EU 400/869
Frequency	403 … 473 / 869.4 … 869.65 / 902 … 928
Tuning range	70 MHz / 0.25 MHz / frequency hopping spread spectrum
Channel width	12.5, 20, 25 kHz / 25, 50 kHz / 7 user selectable hopping bands
RX sensitivity	-113 dBm / -108 dBm / -106 dBm
TX power (max.)	1 W / 0.5 W / 1 W
Interface	RS-232 (TD, RD lines)
Operating voltage range	+7 … +27.5 Vdc (-15% / +20%)
Power consumption TX / RX	7 / 1.3 W (typical)
Data speed (max.) radio / serial	28800 bps / 115200 bps @ 400 MHz 38400 bps / 115200 bps @ 869 MHz 115200 bps @ 915 MHz

LONG DISTANCES MADE SHORT

SATELLINE-3AS VHF is a half-duplex VHF radio modem that operates on 135 … 174 MHz frequency band. A special advantage of the VHF frequency band is the extremely wide coverage. With the same carrier power and antenna gain, the connection ranges are 30 to 50 per cent larger than those reached with an equivalent UHF radio modem.

*NETWORK MANAGEMENT SYSTEM

SATEL NMS software can be used to set up a new radio modem network or modify an existing one. It is also an excellent tool for monitoring the condition of the radio network, and by setting different alarm levels it enables immediate reactions.

- Graphical tool for designing a radio network
- Enhanced reliability through advance indication of anticipated faults and failures
- Reduced configuration and maintenance costs through remote configuration
- Flexibility in adapting to customer protocols and applications

SATELLINE-3AS VHF

SATEL order code SATELLINE-3AS VHF SATELLINE-3ASd VHF SATELLINE-3AS VHF C SATELLINE-3ASd VHF C	 YM5000 YM5010 (with display) YM5020 (with cooling part) YM5030 (with display and cooling part)
Frequency	135…174 MHz
Tuning range	135…155, 138…160,155…174 MHz
Channel width	12.5 / 25 fixed kHz
RX sensitivity	-115 dBm
TX power (max.)	5 W
Interface	RS-232, -422, -485
Operating voltage range	+10.6 ... +25 Vdc (-15% / +20%)
Power consumption TX / RX	6.6 W @ 1 W, 22 W @ 5 W / 1.7 W
Data speed (max.) radio / serial	19200 bps / 38400 bps

YM5000

YM5010

YM5020

YM5030

BLUETOOTH DEVICES

SATEL BT-RS232 is an IP66-rated robust and waterproof Bluetooth to RS-232 serial port adapter. It offers a compact and easily integrable solution for devices that needs to communicate without a cable connection.

SATEL BT-RS232 is equipped with long range Bluetooth 2.1, that offers connection distances upto 400 meters.

SATEL BT-RS232	
SATEL order code	YI0232 SATEL BT-RS232 adapter
Electrical interface	RS232
Data speed serial	115200 bps
TX power	+12 dBm with Bluetooth BR/EDR
RX sensitivity	-96 dBm
Operation mode	Slave mode
Operating voltage	+9 … +27.5 Vdc (-15% / +20%)

SATEL BT-RS232

The SATEL NARS-BT is a robust Bluetooth – RS232 device. Together with SATEL COMMAND mobile application, they solve wireless configuration needs in the field.

- Quick and easy to perform daily setting changes from single channel setting to more complex full settings list
- Different settings and several use cases can be covered, and no time is wasted for hard-to-find settings or too complex technical terms
- SL command based configuration operations, supported by wide range of SATEL devices
- Quick mode change between radio interfaces (LTE/UHF) when using with SATEL MCCU-20

SATEL NARS-BT	
SATEL order code	YI0220
Electrical interface and speed	RS232, 115200 bps
Radio interface	Bluetooth v4.2 BR/EDR and BLE compliant (Operation mode: Slave)
Operating voltage	+9 … +30 VDC (-15% / +20%)

SATEL NARS-BT

COMPACT AND COMPATIBLE

SATEL has a wide range of OEM radio modules for system manufacturers to integrate into customer solutions. They are secure, customizable and flexible in mounting options. SATEL's solutions are widely compatible and also support other manufacturers' radio protocols.

The latest addition to SATEL radio modules is the SATEL GO radio module family. SATEL GO modules introduce new revolutionary features: one to three frequencies in the same small module and more practical interfaces. The design is compact and the integration easy.

SATELGO

SATEL-TR49 SnapOn

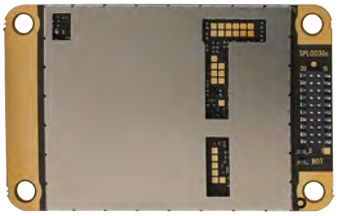
SATEL-TR49 SnapOn fits to a standard PCIe bus. This makes it compatible with millions of equipment already in the market, and the integration is easy. If there is Mini PCIe bus, it can replace other technologies such as cellular and LoRa. Ideal for real-time IoT applications!

- Ultra-compact design
- Easy integration and deployment
- Possibility of power over USB (max 500 mW, more with extra input)
- Robust mounting and interfaces

SATEL order code	YM8600 region all, with AES YM8605 region all, w/o AES YM8610 region US/CA, with AES YM8615 region US/CA, w/o AES YM8630 region AU/BR, with AES YM8635 region AU/BR, w/o AES
Frequency	410 ... 475 / 902 ... 928 MHz
Channel width	12.5 / 25 kHz @ 400 MHz
Spreading method	Frequency hopping @ 900 MHz
RX sensitivity	-120 dBm @ 400 MHz -109 dBm @ 900 MHz
TX power (max.)	1 W
Interface	CMOS / UART
Operating voltage	+3.3 Vdc +/-9%
Power consumption TX / RX	4.5 – 4.8 W / 400 mW @ 400 MHz 4.0 W / 400 mW @ 900 MHz
Data speed (max.) radio / serial	19200 bps (115200 bps @ 900 MHz) / 115200 bps

SATEL-TR49

SATEL order code	YM8490 region all, with AES YM8495 region all, w/o AES YM8500 region US/CA, with AES YM8505 region US/CA, w/o AES YM8510 region AU/BR, with AES YM8515 region AU/BR, w/o AES YM8520 region NZ, with AES YM8525 region NZ, w/o AES
Frequency	410 … 475 / 902 … 928 MHz
Channel width	12.5 / 20 / 25 kHz @ 400 MHz
Spreading method	Frequency hopping @ 900 MHz
RX sensitivity	-120 dBm @ 400 MHz -109 dBm @ 900 MHz
TX power (max.)	1 W
Interface	CMOS / UART
Operating voltage range	+3.7 ... +5.5 Vdc
Power consumption TX / RX	4.8 W (TX 1 W) / 440 mW (RX) @ 400 MHZ 4.1 W (TX 1 W) / 440 mW (RX) @ 900 MHz
Data speed (max.) radio / serial	19200 bps (115200 bps @ 900 MHz) / 115200 bps



Ask availability from SATEL for the modules with region limitations.

SATEL-R4+

SATEL order code	YM7490 with AES YM7495 w/o AES YM7491 DTE connector at TOP YM7496 w/o AES, DTE connector on TOP
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity	-115 dBm
Interface	CMOS-UART
Operating voltage range	+3.8 … +5.5 Vdc
Power consumption RX	0.86 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

SATEL-TR4+

SATEL order code	YM7470 with AES YM7475 w/o AES YM7480 DTE connector at TOP YM7485 w/o AES, DTE connector on TOP
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity / TX power (max)	-115 dBm / 1 W
Interface	CMOS-UART
Operating voltage range	+3.8 … +5.5 Vdc
Power consumption TX / RX	4.8 W / 0.89 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

SATEL-R4+

RECEIVER ONLY

SATEL-TR4+

TRANSCEIVER

SATEL-TR489

SATEL order code	YM8810 region all YM8815 w/o AES, region all YM8816 SATEL-TR489 w/o AES, region all, DTE connector on TOP YM8820 region US/CA YM8825 w/o AES, region US/ CA
Frequency	403 … 473 MHz / 869.4…869.65 MHz (856…876 MHz*) / 902 … 928 MHz
Tuning range	70 MHz / 20 MHz / frequency hopping spread spectrum
Channel width	12.5, 20, 25 , 50*) kHz / 25, 50 kHz / 7 user selectable hopping bands
RX sensitivity / TX power (max.)	-115 dBm / -110 dBm / -108 dBm 1 W / 0.5 W / 1 W
Interface	CMOS-UART
Operating voltage range	+3.8 … +5.5 Vdc
Power consumption TX / RX	4.7 W / 0.73 W
Data speed (max.) radio / serial	28800 bps / 115200 bps @ 400 MHz 38400 bps / 115200 bps @ 800 MHz 115200 bps / 115200 bps @ 900 MHz

*) Ask availability from SATEL.

SATEL-TR300

SATEL order code	YM7300 with AES YM7305 w/o AES YM7315 w/o AES, DTE connector on TOP
Frequency	320 ... 380 MHz
Tuning range	60 MHz
Channel width	6.25 / 12.5 / 20 / 25 kHz programmable
RX sensitivity / TX power (max.)	-113 dBm / 1 W
Interface	CMOS-UART
Operating voltage range	+3.8 … +5.5 Vdc
Data speed (max.) radio / serial	28800 bps / 115200 bps
Power consumption TX / RX	6.4 W / 0.9 W

SATEL-TR489

LICENCE FREE

SATEL-TR300

LICENCED

RADIO MODULES

SATELLINE-M3-TR9

SATEL order code	YM7900 region all YM7920 DTE TOP/U.FL same side YM7910 region US/CA YM7915 region AU
Frequency	902 … 928 MHz
Spreading method	Frequency hopping
RX sensitivity / TX power (max.)	-109 dBm / 1 W
Interface	CMOS-UART
Operating voltage range	+3.5 ... +5.5 Vdc
Power consumption TX / RX	3.2 W / 0.3 W
Data speed (max.) radio / serial	115200 bps

SATELLINE-M3-R9

SATEL order code	YM7950
Frequency	902 … 928 MHz
Spreading method	Frequency hopping
RX sensitivity / TX power (max.)	-109 dBm
Interface	CMOS-UART
Operating voltage range	+3.5 ... +5.5 Vdc
Power consumption TX / RX	0.3 W
Data speed (max.) radio / serial	115200 bps

SATELLINE-M3-TR9

FREQUENCY HOPPING TRANSCEIVER MODULE

SATELLINE-M3-R9

FREQUENCY HOPPING RECEIVER MODULE

SATEL-B2 MOTHERBOARD ASSEMBLIES

SATEL-B2 motherboard and SATEL radio module combinations are available either as enclosed assemblies or as a board level OEM variant.

SATEL-B2 motherboard is easy to integrate into the host device and due to the modular structure, user can select the optimum radio solution fitting to their application.

Three variants of SATEL-B2 motherboard are available as a board level OEM variant:

- MP1 = With horizontal female 26-pin connector
- MP2 = With horizontal 26-pin female connector with D15 female adapter
- MP3 = With vertical 26-pin male connector

Radio module for each motherboard variant as defined by the order code. And the following RF adapters are available separately: u.FL to TNCf / SMAf / MMCxf / MCXf / BNCf.

For example, the variants with SATEL-TR489 module, please visit:
https://www.satel.com/products/radio-modems/satel-tr489/

The combination of SATEL-B2 motherboard and radio module is available as enclosed assembly inside an aluminium enclosure with D15 female data connector and mounting ears. Three models available:

- ME1 = With TNC female antenna connector
- ME2 = With TNC female antenna connector and DIN clip
- ME3 = With BNC female antenna connector and DIN clip

To see all available variants inside an aluminium enclosure and product codes for those, please visit:
https://www.satel.com/products/radio-modems/satel-b2-motherboard-with-enclosure/

MP2 with TNC female RF adapter

ME1 TNC female antenna connector

Software –Ready,steady,go!

SOFTWARE

SATEL product	SATEL NETCO DEVICE	SATEL NETCO DESIGN	SATEL Configuration Manager	SATELLINE SaTerm	SATEL NETCO NMS	SATEL NMS PC
	SATEL software					
SATEL MCCU-20	■			*		
SATEL-EASy+	■	■	■		■	■
SATEL-EASy Pro+	■	■			■	■
SATEL Proof-TR4+, -R4+	■		■	*		
SATEL Proof-TR489	■		■	*		
SATEL Proof-TR9	■		■	*		
SATELLINE-3AS VHF	■	■			■	■
SATEL-TR4+, -R4+	■		■	*		
SATEL-TR300	■		■	*		
SATEL-TR49	■		■	*		
SATEL-TR489	■		■	*		
SATEL-TR49 SnapOn	■		■	*		
SATELLINE-M3-TR9, -R9	■		■	*		
SATEL-TR4+ OA	■			*		
SATEL-B2-TR4+	■			*		
SATEL-B2-TR489	■			*		
SATEL-B2-TR4+ OA	■			*		

*) SL command support

SATEL NETCO DESIGN

SATEL NETCO DESIGN is an intuitive and user-friendly network configuration software for network design and management. The software supports configuration of the Routing Setup and NMS Routing Setup modes for SATEL-EASy+ product family.

The user interface of the product is browser-based and can therefore be used both locally and remotely. Design with graphical user interface for easy optimizing network design and deployment in a few simple steps, with local and remote connection to SATEL radios. SATEL NETCO DESIGN supports importing also .saxd file format, files created with the SATEL NMS PC software.

SATEL NETCO NMS

SATEL NETCO NMS is an intuitive and user-friendly network configuration software for network design and management with radio network monitoring option. The software supports configuration of the Routing Setup and NMS Routing Setup modes for SATEL-EASy+ product family.

The user interface of the product is browser-based and can therefore be used both locally and remotely. Design with graphical user interface for easy optimizing network design and deployment in a few simple steps, with local and remote connection to SATEL radios. SATEL NETCO NMS supports importing also .saxd file format, files created with the SATEL NMS PC software.

SATEL NETCO DEVICE

SATEL NETCO DEVICE is a software for configuring and updating a device. The configuration parameters can be read and written from/to the locally connected, powered device. The device configuration can be also created/saved/explored from/to a file without device connection.

The most common use case for which the SATEL NETCO DEVICE is optimized for is editing existing parameters in a SATEL radio product using local connection, such as serial interface.

SATELLINE SaTerm

SATELLINE SaTerm is a terminal software for configuring the Routing Setup mode and for configuring and testing the radios. Routing Setup refers to Message Routing feature for SATEL-EASy+ and SATELLINE-EASy family radio modems, where messages can be automatically routed over the radio network to correct recipient terminal. This SW can assist in tests procedures and configuration for the radios via terminal interface with SL command support.

SATEL NMS PC

SATEL NMS PC is a software for creating and managing SATEL-EASy+ and SATELLINE-3AS VHF product families for NMS Routing networks with radio network monitoring option. NMS Routing refers to NMS Message Routing feature, where messages can be automatically routed over the radio network to correct recipient terminal, monitoring and diagnostics included for the radio network. Graphical design of topology for NMS Message Routing, remote modification of settings, online storing and trending of field data with programmable alarm triggers.

SATEL Configuration Manager

SATEL Configuration Manager is a software for SATEL radio device configuration and reprogramming. The parameters can be read and written from/to the connected, powered device. The program file can be saved into a separate file to be used to other devices.

The most common use case for which the SATEL Configuration Manager is optimized for is editing existing parameters in a SATEL radio product using locally connected product over a serial interface.

PROTOCOLS

SATEL radio modems are compatible with all commonly used industrial protocols. Here are some examples of the protocols: ANSI, CACTUS, COMLI, DNP 3.0, Exoline, HostLink, IEC 60870-5-101, Mewtocol, Modbus ASCII, Modbus RTU, Modbus TCP, Profibus DP, R-com, RP-570, RP-571, SATELLINK, S-bus, Siemens 3946 (R), Siemens Sinaut ST1/ST7 FT1.2/FT2.0, Siemens Sinaut ST7 FT2.0 and NMEA 0183, Ethernet/IP, SATEL NMS, Rockwell DT1 etc.

Ask for more information from your local distributor.

Antennas & cables

Antennas

- Half Wave Antennas for frequencies 400 ... 470 MHz for short distances.
- Quarter Wave Antennas for frequencies 400 ... 470 MHz and 869 MHz for short distances.
- Helix Antennas for frequencies 400 ... 470 MHz for short distances.
- Directional Antennas for frequencies 330 ... 470 MHz, 869 MHz and 135 ... 174 MHz for long distances.
- Omnidirectional Antennas for frequencies 330 ... 470 MHz, 869 MHz and 135 ... 174 MHz for long distances.

Cables

- CRF-1 RG58 lenght 1 meter with TNC male / TNC female -connectors.
- CRF-5F RG58 lenght 5 meter with TNC male / TNC female -connectors or CRF-5M TNC male / TNC male -connectors.
- ECOFLEX10 low loss (0.9 dB / 10 m) cable for cable lengths up to 20 meter with N or TNC -connectors.
- ECOFLEX15 low loss (0.6 dB / 10 m) cable for cable lengths over 20 meter with N -connectors.

We can also offer a wide range of interface and power cables, for example:

- CRS-2M length 2 meter, includes power supply wires, with D15 / D9 male or CRS-2F female -connectors.
- CRS-PB length 2 meter, includes power supply wires, with D15 / D9 male -connectors for RS-485 interface.
- CRS-35W 8-pin 2 m cable ODU 8-pin male / D9 female.
- C-P-Pro+ 2m Power cable 2 m, ODU 2-pin male / 4 mm lab plugs.

Please contact your local distributor to get more information regarding cable types.

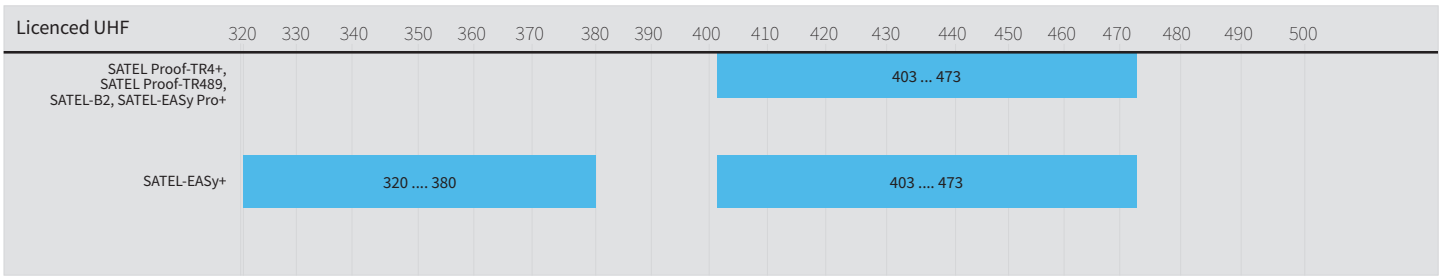
Selection guide

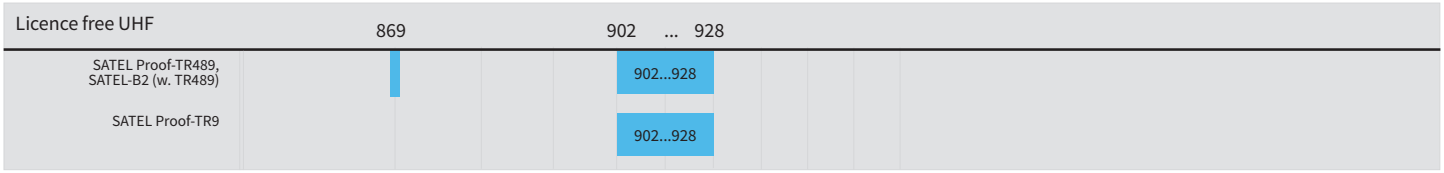
1) Check product details

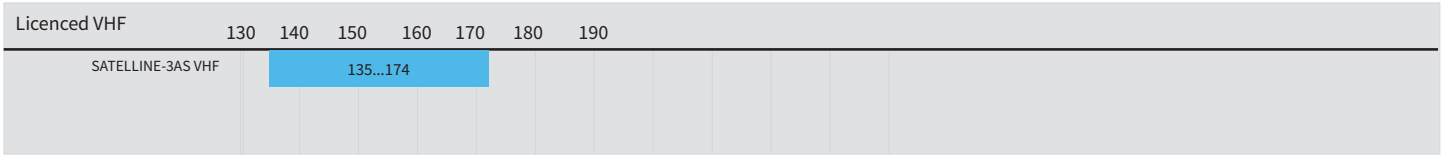
	SATEL MCCU-20	SATEL MCCU-30	SATELLINE-3AS VHF	SATEL-EASy+	SATEL-EASy Pro+	SATEL-B2	SATEL-TR4+ / -R4+	SATEL-TR489	SATEL-TR49	SATEL-TR300	SATEL-TR49 SnapOn	SATEL Proof-TR4+, -TR9	SATEL Proof-TR489	SATELLINE-M3-TR9 / -R9	SATEL I-LINK
Frequency range															
UHF	•	•		•	•		•			•					
VHF			•												
UHF & Licence free						1)		•	•		•	•	•	•	
LTE	•	•													
Bluetooth		•													
WiFi		•													
Interfaces															
RS-232	•		•	•	•	•						•	•		•
RS-422			•	•	•										
RS-485			•	•	•										
CMOS-UART							•	•	•	•	•			•	
Ethernet		•		1)											
USB				1)											
Digial / Analog I/O															•
Bluetooth				1)											
Tuning range															
≤ 2 MHz						1)		•					•		
20 MHz			1)					•							
65 MHz	•								•	1)	•				
60 / 70 MHz	1)	•		•	•	1)	•	•				•	•		
FHSS	•					1)		•	•		•	•	•	•	
Channel width kHz															
Fixed (12.5 or 20 or 25)			•												
Programmable (6.25 / 12.5 / 20 / 25)				1)						•					
Programmable (12.5 / 20 / 25)	•	•			•		•		•			•			
Programmable (12.5 / 25)										1)	•				
Programmable (12.5 / 20 / 25 / 50)						1)		•					•		
FHSS	•					1)		•	•			•		•	
Max. TX power															
500 mW						1)		•							
1 W	•	•		•		1)	1)	•	•	•	•	•	1)	1)	
5 W			•												
35 W					•										
Operating voltage range															
+3.3 Vdc +/- 9%											•				
+3.5 ... +5.5 Vdc														•	
+3.7 … +5.5 Vdc									•						
+3.8 ... +5.5 Vdc							•	•		•					
+7 ... +25 Vdc (-15% / +20%)															
+7 ... +27.5 Vdc (-15% / +20%)				•		•						•	•		
+9 ... +30 Vdc (-15% / +20%)	•	•			•										
+10.6 ... +25 Vdc (-15% / +20%)			•												
Housing															
Aluminium IP44			•	•											
Aluminium IP67	•	•			•							•	•		
Aluminium IP69K	•	•										•	•		
Sheet metal aluminium / Stainless steel						1)									•
Module: PCB card only						1)	•	•	•	•	•			•	
Interface connector															
RJ-45				1)											
D9															
D15			•	1)		1)									•
ODU 8 pin					•										
26 pin header / 26 pin strip						1)									
USB				1)							•				
1.27 mm pitch socket							•	•	•	•				•	
Deutsch DT04-6P-CL09	•											•	•		
Screw connector															•
Model or variant w. display			•	•	•										

Size / Weight			
174 x 95 x 46 mm / < 500 g	SATEL Proof-TR4+/ -TR9 / -TR489	138 x 67 x 29 mm / < 350 g	SATEL-EASy+
174 x 95 x 47 mm / 520 g	SATEL MCCU-20	126 x 63 x 23 mm / < 300 g	SATEL-B2 with enclosure
182 x 187 x 55 / 1550 g	SATEL MCCU-30	57 x 36 x 6.9 mm / 20 g	SATEL-TR4+, SATEL-TR49, SATEL-TR489, SATEL-R4+, SATEL-TR300
180 x 138 x 71mm / 1400 g	SATEL-EASy Pro+	57 x 36 x 6.7 mm / 20 g	SATELLINE-M3-TR9, SATELLINE-M3-R9
139 x 67 x 29 mm / < 300 g	SATELLINE-3AS VHF	51 x 30 x 4.75 mm / 10 g	SATEL-TR49 SnapOn

Available frequencies for SATEL radio modems







Channel width and data speed

	Max. air data speed					Max. serial data speed
Channel width	12.5 kHz	20 kHz	25 kHz	50 kHz	FHSS	
SATELLINE-3AS VHF	9600 bps	9600 bps	19200 bps			38400 bps
SATEL-EASy+	14400 bps	14400 bps	28800 bps			115200 bps
SATEL-EASy Pro+	14400 bps	14400 bps	28800 bps			115200 bps
SATEL Proof-TR4+ / -TR9	14400 bps	14400 bps	28800 bps		115200 bps	115200 bps
SATEL Proof-TR489	14400 bps	14400 bps	28800 bps	38400 bps	115200 bps	115200 bps
SATEL-B2 (w. TR489 module)	14400 bps	14400 bps	28800 bps	38400 bps	115200 bps	115200 bps
SATEL-B2 (w. TR4+ module)	14400 bps	14400 bps	28800 bps			115200 bps

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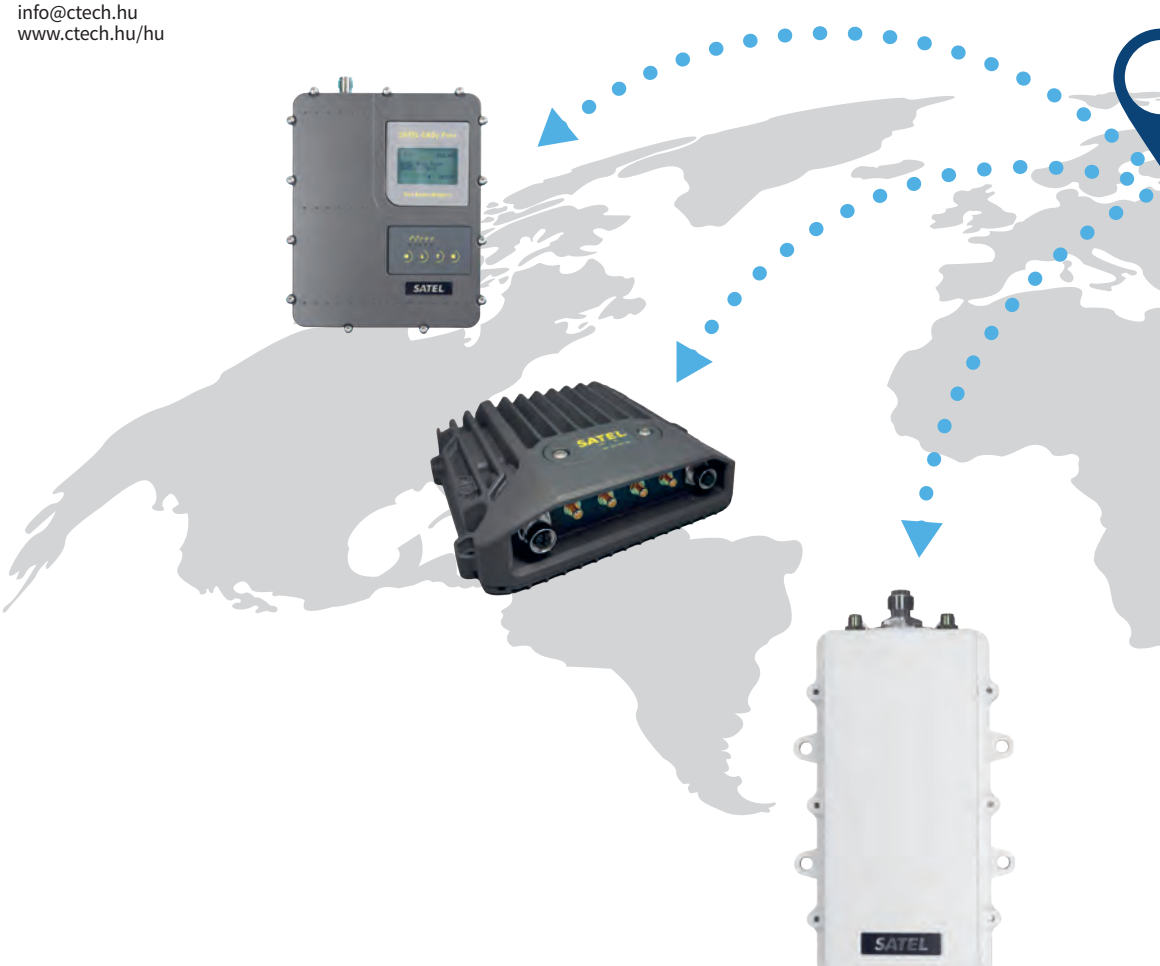

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