CHALLENGE. SOLUTION. SUCCESS.

High quality radio technology for wireless data communication

19
PRODUCT CATALOGUE

SATEL

Mission-Critical Connectivity

SOLVING YOUR CHALLENGES

SATEL is a leading expert and innovator in independent radio networking technology. We develop high-quality private radio technology solutions that enable secure, mission-critical connections.

Our solutions are used in wide range of industrial applications. We are known for our high quality and expertise. All SATEL radio modems are designed and manufactured in Finland.

Reliable connections, protected business

SATEL radio technology is easy and fast to implement and use, and has low life cycle costs.

The solutions we offer are also 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
Easy implementation
Independence
Operational security
Low life cycle costs
Service and support
Global distribution network

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.

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.

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.

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.

MACHINE CONTROL

Machine control is used to accurately position machinery based on GNSS systems and 3D design models. Several machine control systems use the Real-Time Kinematic (RTK) to improve positioning accuracy for streamlining the different construction site workflows.

SATEL's radio technology is used worldwide in machine control. Our technology is perfect for mission-critical operations. It is a safe way to ensure availability even in areas with limited coverage or no coverage at all.

THE HEART OF THE SATEL XPRS SOLUTION

SATEL XPRS IP radio router is an excellent choice for data transfer for mission-critical applications requiring long range and the benefits of the privately owned networks.

The IP radio router provides high availability connections with device and routing protection. The SATEL XPRS solution utilizes the interoperability of the radio routers with other communications technologies, as well as technology switchovers.

IP RADIO ROUTER

SATEL XPRS IP radio router is suitable for both serial and IP data networking in UHF and VHF frequencies. It provides a reliable data connectivity for applications that require stability, high availability and long range. It supports low latency networking and has easy remote management with intuitive user interface.

The product consists of two separate modules, a radio unit and central unit. The radio unit alone can be used as a serial data radio router and as a repeater in packet routing networks. When central unit is added to the radio unit, full TCP/IP functionality is obtained. Advanced features, such as adaptive modulation and radio parameters, cyber security features, monitoring and management, protocol routing and conversion functionality provide a complete digital solution that takes into account all data transfer scenarios.

Radio unit only
YF0100 / YF0200 / YF0500

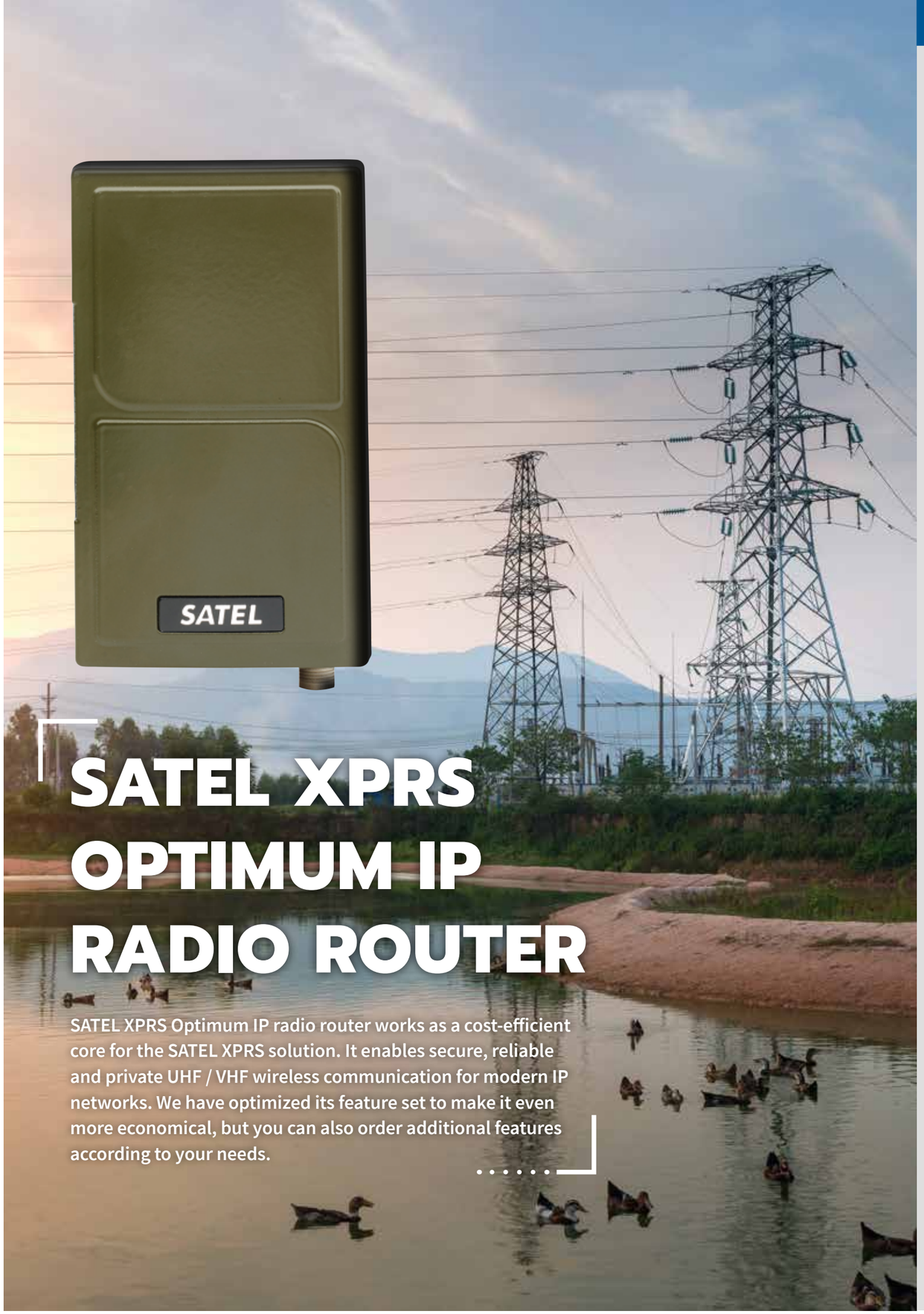
Radio and central unit w/o display
YF0110 / YF0210 / YF0510

Radio and central unit w display
YF0120 / YF0220 / YF0520

	XT 5R (FSK)		XT 5RC (FSK)		XT 5R (QAM)		XT 5RC (QAM)	
Model / Type identification	SATELLAR RU / TA-26		SATELLAR RU / TA-26		SATELLAR RU-Q / TA-26		SATELLAR RU-Q / TA-26	
SATEL order code with display	YF0100		YF0110 YF0120		YF0200 UHF / YF0500 VHF		YF0210 UHF / YF0510 VHF YF0220 UHF / YF0520 VHF	
Frequency MHz	360–405				135–175			
	400–445				360–405			
	440–485				400–445			
Modulations	4, 8, 16 FSK				2, 4, 8, 16, 32, 64 QAM (2QAM only for UHF)			
Tuning range	40 / 45 MHz							
Channel width	12.5 kHz / 25 kHz / 150 kHz				12.5 kHz / 25 kHz			
Data speed radio (max.)	19.2 kbps @ 12.5 kHz (16FSK) 38.4 kbs @ 25 kHz (16FSK) 230 kbps @150 kHz (16FSK)				60.5 kbps @ 12.5 kHz (64QAM) 121 kbps @ 25 kHz (64QAM) Max. coded			
RX sensitivity (BER 10E-6)	Air speed	Channel width	Modulation	Sensitivity (10E-6)	Air speed	Channel width	Modulation	Sensitivity (10E-6) UHF / VHF
	230.4 kbps	150 kHz	16FSK	-82 dBm	121 kbps	25 kHz	64QAM	-98 / -98 dBm
	38.4 kbps	25 kHz	16FSK	-94 dBm	60.5 kbps	12.5 kHz	64QAM	-100 / -99 dBm
	19.2 kbps	12.5 kHz	16FSK	-97 dBm	80.6 kbps	25 kHz	16QAM	-105 / -104 dBm
	115.2 kbps	150 kHz	4FSK	-97 dBm	40.3 kbps	12.5 kHz	16QAM	-106 / -106 dBm
	19.2 kbps	25 kHz	4FSK	-108 dBm	40.3 kbps	25 kHz	4QAM	-111 / -110 dBm
	9.6 kbps	12.5 kHz	4FSK	-114 dBm	20.2 kbps	12.5 kHz	4QAM	-113 / 113 dBm
TX power (nominal)	37 dBm (5 W)				37 dBm (5 W) mean: average 30 dBm (1 W), max 32 dBm (1.5 W) PEP: average 37 dBm (5 W), max 38 dBm (6.6 W)			
Interface	RS-232, -422 / -485		RS-232, -422 / -485, USB, Ethernet		RS-232, -422 / -485		RS-232, -422 / -485, USB, Ethernet	
Operating voltage	+ 10.6 Vdc ... +30 Vdc							
Power consumption without display TX / RX with display TX / RX	22.8 W / 2.8 W		24.4 W / 4.2 W 24.8 W / 4.8 W		UHF 14.4 W / 3.8 W	VHF 16 W / 4.4 W	UHF 15.8 W / 5.2 W 16.4 W / 5.8 W	VHF 17.4 W / 5.8 W 18 W / 6.4 W

Long range | **VLAN** | **Unicast Broadcast** | **Bridge mode** | **NETCO** | **Redundant routing** | **SNMP monitoring** | **Radio data up to 230 kbps**

Protocol conversions | **IEC-104/101, DNP3, Modbus TCP/RTU** | **Firewall** | **0.1-5 W TX-power** | **Interoper-ability** | **Serial over IP** | **Cyber security** | **UHF / VHF**



SATEL XPRS OPTIMUM IP RADIO ROUTER

SATEL XPRS Optimum IP radio router works as a cost-efficient core for the SATEL XPRS solution. It enables secure, reliable and private UHF / VHF wireless communication for modern IP networks. We have optimized its feature set to make it even more economical, but you can also order additional features according to your needs.

SATEL XPRS OPTIMUM

Model / Type identification	SATELLAR RU-Q / TA-26
SATEL order code	YF0410 with encryption support YF0415 without encryption support
Frequency MHz	135–175 360–405 400–445
Tuning range	40 / 45 MHz
Channel width	12.5 kHz / 25 kHz (programmable)
TX power (nominal)	37 dBm (5 W) mean: average 30 dBm (1 W), max 32 dBm (1.5 W) PEP: average 37 dBm (5 W), max 38 dBm (6.6 W)
Modulations	Modulations 2, 4, 8, 16 QAM (2QAM only for UHF)

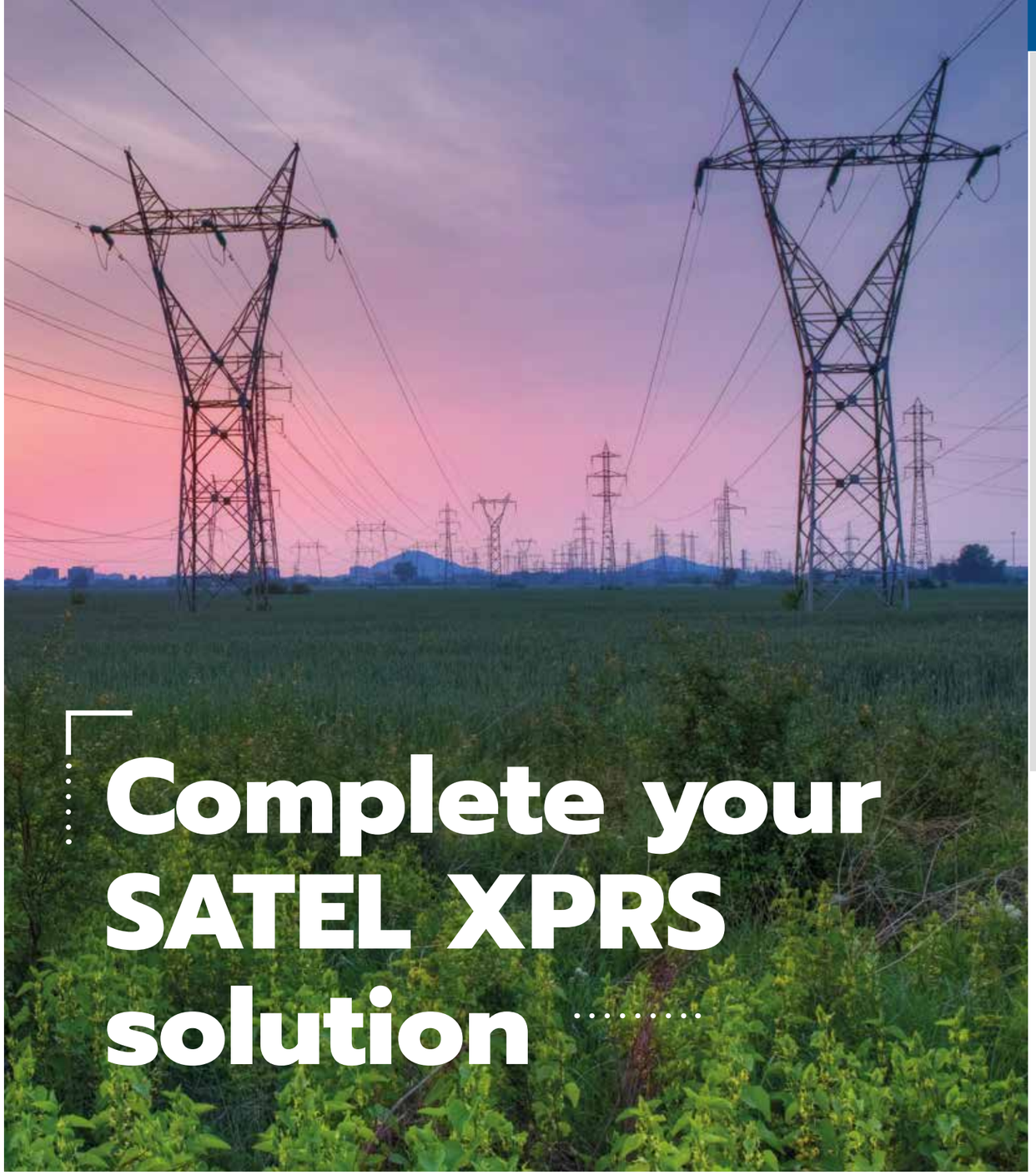
RX sensitivity (BER 10E-6)	Air speed	Channel width	Modulation	Sensitivity (10E-6) UHF / VHF
	40.3 kbps	25 kHz	4QAM	-111 / -110 dBm
	20.2 kbps	12.5 kHz	4QAM	-113 / -113 dBm
	80.6 kbps	25 kHz	16QAM	-105 / -104 dBm
	40.3 kbps	12.5 kHz	16QAM	-106 / -106 dBm

Interface	RS-232, -422 / -485, USB, Ethernet
Operating voltage	+ 10.6 Vdc ... +30 Vdc
Power consumption TX / RX	VHF: 17.4 W / 5.8 W UHF: 15.8 W / 5.2 W

FEATURES

Included	Order separately	Explanation
Routed mode Bridge broadcast mode Transparent mode for serial	Proxy ARP	IP routing to remote networks in the same LAN or IP address range
Firewall (iptables, ebtables)	NMS to Modbus	Diagnostics with Modbus protocol
SSH access	Application routing	DNP3 IP to serial, Modbus TCP to Modbus RTU, Serial IP, UDP/TCP Proxy, Sinaut S7, custom protocol etc.
VLAN support	IEC104/IEC101 conversion	Protocol master is using IEC 60870-5-104 RTUs operate on IEC 60870-5-101
Encryption AES128, AES256	Redundant routing	IP routing table enhancement: Automatic route selection VRRP and other related features for high availability
Link specific modulation (Each remote can operate on separate modulation)	Adaptive modulation	Radio interface automatically adapts to SNR level
SNMPv1, 2, 3	Upgrade 16QAM to 32QAM	To achieve higher radio bit rate, up to 101 kbps
USB diagnostics port	Upgrade 16QAM to 64QAM	To achieve higher radio bit rate, up to 121 kbps
	Upgrade 32QAM to 64QAM	To achieve higher radio bit rate, up to 121 kbps

0.1-5 W TX-power	Inter-operatibility	Unicast Broadcast	VLAN	Bridge mode	SNMP moritoring	Firewall
Spectral efficient	Long range	Cyber-secure	NETCO	Remote configuration	Cost-effective	UHF / VHF



Complete your SATEL XPRS solution

BENEFIT FROM THE USE OF MULTIPLE TECHNOLOGIES

The SATEL XPRS solution takes your mission-critical communications to the next level. Varying system requirements such as different investment profiles and increasing redundancy and performance are met by the SATEL XPRS solution with wireless cellular routers.

Co-operation of adjacent technologies adds even more reliability, predictability and security to your mission-critical connectivity.

SATEL-GW600

SATEL order code	YG0600
Cellular technologies	LTE, HSPA+, HSPA, UMTS, EDGE, GPRS, GSM
Interfaces	Dual SIM, Quad Ethernet ports, RS-232 and RS-485 serial ports, Digital inputs for event detection
Cyber security	For example IPsec and OpenVPN
Special features	Protocol conversions, Relay contact options, Interface connectivity monitoring

The versatile 2G/3G/LTE wireless router is suitable for a variety of industrial deployments. The compact structure makes it excellent for M2M applications like SCADA, telemetry and intelligent traffic systems. The router supports the following radio access technologies: LTE, HSPA+, HSPA, UMTS, EDGE, GPRS and GSM.

- Dual SIM
- Quad Ethernet ports
- SMS commands
- RS-232 and RS-485 serial ports
- Digital inputs for event detection
- Relay contact options
- Extended list of routing protocols
- Security features
- Protocol conversions
- Centralised management and monitoring

SATEL-GW120

SATEL order code SATEL-GW100 without WiFi SATEL-GW120 with WiFi	 YG0100 YG0120
Cellular technologies	LTE, HSPA+, HSPA, UMTS, EDGE, GPRS, GSM
Interfaces	Dual SIM, 2.4 GHz WiFi, Dual Ethernet ports
Cyber security	For example IPsec and OpenVPN

The small and robust 2G/3G/LTE router with WiFi option is perfect for M2M applications like remote monitoring and control. It offers a new entry point for 2G/3G/LTE data applications and supports the following radio access technologies: LTE, HSPA+, HSPA, UMTS, EDGE, GPRS and GSM.

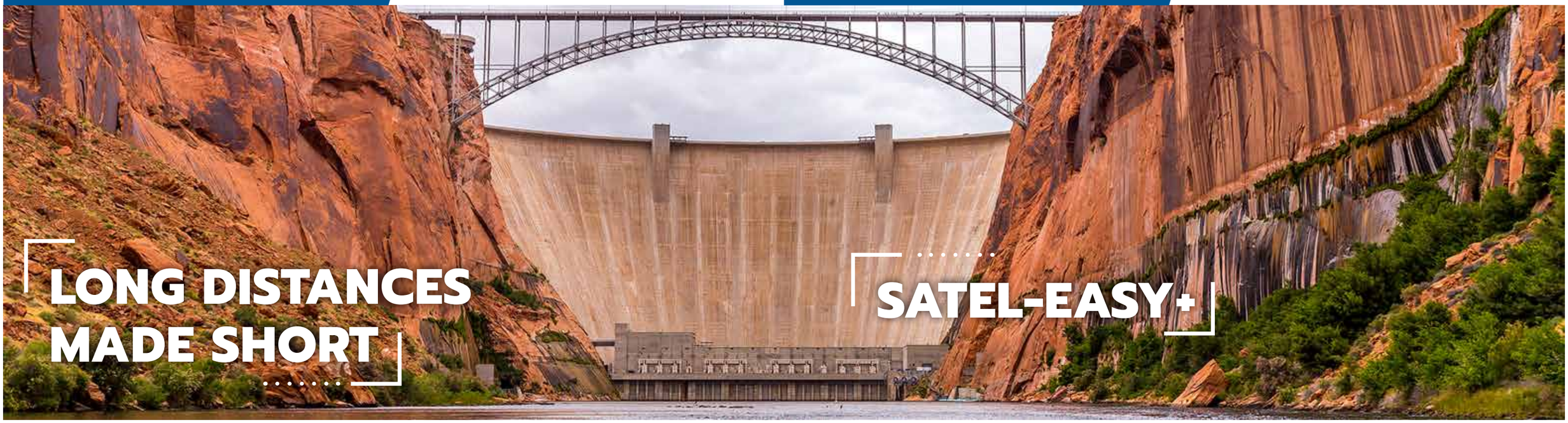
- Dual SIM
- 2.4GHz WiFi
- Dual Ethernet
- Extended list of routing protocols
- Security features
- GPS receiver
- SMS management
- Active power conditioning
- Centralised management and monitoring

In case WiFi is not needed, a good choice is SATEL-GW100. It has all the same functions than SATEL-GW120 except WiFi.

FRONT PANEL

REAR PANEL

RACK



* 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 / 218…238 MHz
Tuning range	135…155, 138…160,155…174, 218…238 MHz
Channel width	12.5 / 25 fixed kHz
RX sensitivity	-115 dBm
TX power (max.)	5 W
Interface	RS-232, -422, -485
Operating voltage	+9 … +30 Vdc
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

SATEL launches a new product family SATEL-EASy+, which has an improved LCD display to enable easy configuration, an improved MCU capacity and variable physical interfaces available. It enables compatibility with SATELLINE-EASy and -M3-TR4 based radios as well as with SATELLINE-3AS NMS modems. The first product variant is for 400 MHz frequency band and with 1W output power. Other frequencies will follow the soonest, ask more from SATEL.

HW

- New generation mechanics
- Operating voltage +6…30 VDC
- Improved LCD display
- Improved MCU capacity
- Variable physical interfaces (D15, RJ45, USB, IO's)

FW

- NMS Protocol Compatibility (With routing, diagnostics and packet filters)
- ETH & TCP/IP Connectivity
- BT/BLE Connectivity
- DRM Feature support (IP networking, Cyber security)
- FW Over-The-Air Update *)

SW/DM

- Legacy support for SATEL NMS PC Software
- NETCO Stacks compatibility *) (Configuration + Monitoring)
- NETCO Mobile compatibility *)

SATEL-EASY+

SATEL order code	TBD 400 MHz, 1W (without display) TBD 400 MHz, 1W (with display)
Frequency	403 - 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity	-116 dBm @ 12.5 kHz (4FSK) / -112 dBm @ 25 kHz (4FSK) -106 dBm @ 25 kHz (16FSK)
TX power (max.)	1W
Interface	RS-232, -422, -485 (default) USB, ETH, BT (optional variant*)
Operating voltage	+7 ... +27.5 VDC (+20 % / −15 %)
Power consumption TX / RX	< 6.0 W / < 1.4 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

*) Ask availability from SATEL.

THE FOLLOWING SOFTWARE ARE SUPPORTED:

- SaTerm (terminal SW for SL commands or data transmit/ reception)
- SATEL Configuration Manager (Configuration)
- NETCO Stacks *) (Configuration and monitoring)
- NETCO Mobile *) (Configuration over BT)
- SATEL NMS PC (Configuration and monitoring)

THE WORLD IS OPEN

UHF RADIO MODEM

SATELLINE-EASy

SATEL order code	YM6500 / YM6505 YM6510 / YM6515 (with AES) YM6550 / YM6555 (with display) YM6560 / YM6565 (with display and AES)
Frequency	330 ... 420 / 403 … 473 MHz
Tuning range	90 / 70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity	-114 dBm
TX power (max.)	1 W
Interface	Port1: RS-232 fixed Port2: RS-232 / -422
Operating voltage	+3 … +9 / +6 … +30 Vdc
Power consumption TX / RX	7 W / 1.2 W
Data speed (max.) radio / serial	19200 bps / 38400 bps

YM6500/ YM6505
YM6510/ YM6515

YM6550/ YM6555
YM6560/ YM6565

LICENCE FREE RADIO MODEM

SATELLINE-EASy 869

SATEL order code SATELLINE-EASy 869 SATELLINE-EASy 869	YM6501 YM6551 (with display)
Frequency	869.4125 … 869.6375 MHz (865 … 867 MHz for India)
Channel width	25 kHz
RX sensitivity	-111 dBm
TX power (max.)	500 mW (1 W for India)
Interface	RS-232, -422
Operating voltage	+6 … +30 Vdc
Power consumption TX / RX	TX 3.8 W (869 MHz)/7 W (865 MHz)/ RX 1.2 W
Data speed (max.) radio / serial	19200 / 38400 bps

YM6501

YM6551

SOLUTIONS FOR THE TOUGHEST PLACES

SATEL Compact-4BT for heavy-duty outdoor use

SATEL Compact-4BT is an IP67 (NEMA 6) classified UHF radio modem with integrated battery, Bluetooth, wide tuning range and selectable channel spacing. It is designed for easy mobile use in demanding field conditions. IP67 ensures it is waterproof and secured against dust. SATEL Compact-4BT can be configured by using the well-known SATEL Configuration Manager or SaTerm programs, or by a mobile application called SATEL NETCO mobile. Mobile application can be downloaded from Google Play.

SATEL Compact-4BT

SATEL order code	YM6590 (YM6591 w/o AES)
Frequency	403…473 MHz
Tuning range	70 MHz
Channel width	12.5 / 25 kHz (software selectable)
RX sensitivity	-116 dBm
TX power (max.)	1 W
Interface	RS-232 / USB
Operating voltage	+12 … +30 Vdc
Power consumption	Charging: 7.4 W Charging + RX: 8.4 W Charging + TX: 13.2 W @ 1 W RF Device OFF: 0.46 W RX: 1.32 W TX: 5.8 W @ 1 W RF
Data speed (max.) radio / serial	28800 / 115200 bps

Ask the availability for 915 MHz version!

DEFYING ALL CHALLENGES

SATEL Compact-Proof is particularly well suited for outdoor use (land surveying, for instance) under varying weather conditions.

The lithium-ion battery provides a long-lasting performance and plenty of operating hours. The operating time in +25°C is more than 15 h.

LICENCE FREE RADIO MODEM

SATEL Compact-Proof (869 MHz)

SATEL order code	YM6575 with battery YM6576 w/o battery
Frequency	869.4125 … 869.6375 MHz (865 … 867 MHz for India)
Channel width	25 kHz
RX sensitivity	-111 dBm
TX power (max.)	500 mW (1 W for India)
Interface	RS-232
Operating voltage	+9... + 16 Vdc
Power consumption TX / RX	TX 3.8 W (869 MHz) / 7 W (865 MHz) / RX 1.2 W
Data speed (max.) radio / serial	19200 bps / 38400 bps

IP67 RADIO MODEM

SATEL Compact-Proof

SATEL order code	YM6570 / YM6573 (with battery) YM6571 / YM6574 (w/o battery)
Frequency	330… 420 / 403...473 MHz
Tuning range	90 / 70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity	-114 dBm
TX power (max.)	1 W
Interface	RS-232
Operating voltage	+9... + 16 Vdc
Power consumption TX / RX When idle (no charging and modem off)	7 W / 1.2 W 6 mW
Data speed (max.) radio / serial	19200 bps / 38400 bps

BATTERY for SATEL Compact-Proof

Capacity and type	7.2 V, 8700 mAh, Li-Ion	
Charging current (max.)	1.6 A	
Charging time (empty to full)	5.5 h @ + 25 °C	
Charging voltage	+9... + 16 Vdc	
Max. time of operation	+ 60 °C (1 W) + 60°C (50% TX / RX ratio 1 W) - 20 °C (1 W) - 20 °C (50 % TX / RX ratio 1 W) - 20 °C RX	13.8 h 22.2 h 10.5 h 16.9 h 44 h

SATELLINE-4Pro

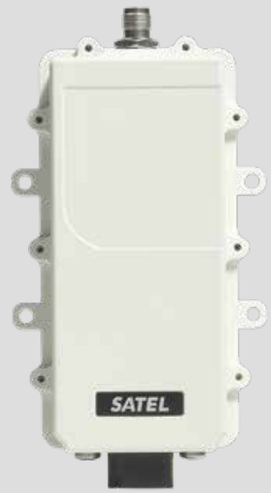
SATEL order code	YM6804
Frequency	406.180 … 470 MHz
Tuning range	63.8 MHz
Channel width	12.5 / 25 kHz
RX sensitivity	<-117 dBm
TX power (max.)	35 W
Interface	RS-232
Operating voltage	+9 … +16 Vdc
Power consumption TX / RX	120 W / 1.8 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

SATELLINE-EASy Pro

SATEL order code	YM6803
Frequency MHz	403 … 473 MHz
Tuning range	70 MHz
Channel width kHz	12.5 / 20 / 25 kHz programmable
RX sensitivity	-114 dBm
TX power (max.)	35 W (25 W as an order option)
Interface	RS-232
Operating voltage	+9 … +16 Vdc (≥ +12 Vdc @ 35 W)
Power consumption TX / RX	120 W / 1.8 W
Data speed (max.) radio / serial	19200 bps / 38400 bps

SATELLINE-4Pro

SATELLINE-EASy Pro



SATEL EASy-Proof
SATEL Proof-TR4 / TR9

IP69K RADIO MODEMS

SATEL EASy-Proof

SATEL order code	YM6580 / YM6480 YM6585 / YM6485 (with AES)
Frequency	330 ... 420 / 403 … 473 MHz
Tuning range	90 / 70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity	-114 dBm
TX power (max.)	1 W
Interface	RS-232
Operating voltage	+6 … +30 Vdc
Power consumption TX / RX	7 W / 1.2 W
Data speed (max.) radio / serial	19200 bps / 38400 bps
Note	Interface connector: Deutsch DT04-6P-CL09

SATEL Proof-TR4 / TR9

SATEL order code	YM6583 SATEL Proof-TR4 with AES YM6584 SATEL Proof-TR4 w/o AES YM6587 SATEL Proof-TR9
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	+6 ... + 30 Vdc
Power consumption TX / RX	TX max. 4 … 7 W / RX < 1 W
Data speed (max.) radio / serial	28800 bps / 115200 bps @ TR4 115200 bps / 115200 bps @ TR9

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: two frequencies in the same small module and more practical interfaces. The design is compact and the integration easy.

The first products available in SATEL GO product family are dual-band and multimode transceivers for the licensed 410-475 MHz and license-free 902-928 MHz bands. Those are compatible with SATELLINE product line on 410-475 MHz and Freewave and Intuicom products on 902-928 MHz.

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	TBD
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, without AES YM8500 region US/CA, with AES YM8505 region US/CA, without AES YM8510 region Australia, with AES YM8515 region Australia, without AES YM8520 region New-Zealand, with AES YM8525 region New-Zealand, without 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	+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

SATELLINE-M3-TR4

SATEL order code	YM7400, YM7410 w/o AES, YM7405 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)	-116 dBm / 1 W
Interface	CMOS-UART
Operating voltage	+4 Vdc
Power consumption TX / RX	4.7 W / 0.73 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

TRANSCEIVER WITH 16FSK MODULATION

SATELLINE-M3-TR9

SATEL order code	YM7900 region all YM7905 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	+3.5 … +5.5 Vdc
Power consumption TX / RX	3.2 W / 0.3 W
Data speed (max.) radio / serial	115200 bps

FREQUENCY HOPPING TRANSCEIVER MODULE

SATELLINE-M3-TR8

SATEL order code	YM7800, YM7810 w/o AES
Frequency	868 ... 870 MHz (865 ... 867 MHz for India)
Tuning range	2 MHz
Channel width	25 kHz
RX sensitivity / TX power (max.)	-112 dBm / 0.5 W (1 W for India)
Interface	CMOS-UART
Operating voltage	+4 Vdc
Power consumption TX / RX/	TX 4.3 W (869 MHz) / 7.3 W (865 MHz) / RX 0.875 W
Data speed (max.) radio / serial	19200 bps / 115200 bps

LICENCE FREE

SATELLINE-M3-TR3

SATEL order code	YM7000, YM7100 w/o AES
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 25 kHz programmable
RX sensitivity / TX power (max.)	-116 dBm / 1 W
Interface	CMOS-UART
Operating voltage	+4 Vdc
Power consumption TX / RX	4.7 W / 0.73 W
Data speed (max.) radio / serial	19200 bps / 115200 bps

TRANSCEIVER

SATELLINE-M3-R4

SATEL order code	YM7050, YM7150 w/o AES, YM7250 w/o AES DTE connector on TOP
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 25 kHz
RX sensitivity	-116 dBm
Interface	CMOS-UART
Operating voltage	+4 Vdc
Power consumption RX	0.73 W
Data speed (max.) radio / serial	28800 bps / 115200 bps

RECEIVER WITH 16FSK MODULATION

SATELLINE-M3-R3

SATEL order code	YM6900
Frequency	403 … 473 MHz
Tuning range	70 MHz
Channel width	12.5 / 25 kHz programmable
RX sensitivity	-114 dBm
Interface	CMOS-UART
Operating voltage	+4 Vdc
Power consumption RX	0.5 W
Data speed (max.) radio / serial	19200 bps / 115200 bps

RECEIVER

CUSTOMIZED RADIO MODEMS

Examples of the customized radio modems.
Ask your local SATEL distributor about the various options.

SATELLINE-M3 VHF

SATEL order code	YM6000
Frequency	135…174 / 218…238 MHz
Tuning range	135…155, 138…160, 155…174, 218…238 MHz
Channel width	12.5 / 25 fixed kHz
RX sensitivity / TX power (max.)	-115 dBm / 1 W
Interface	RS-232, -422, -485
Operating voltage	+9 … +30 Vdc
Power consumption TX / RX	6.6 W / 1.7 W
Data speed (max.) radio / serial	19200 / 38400 bps

SATELLINE-M3-TR1

SATEL order code	YM6300 / YM6305 YM6310 / YM6315 (with AES)
Frequency	330 … 420 / 403...473 MHz
Tuning range	90 / 70 MHz
Channel width	12.5 / 20 / 25 kHz programmable
RX sensitivity / TX power (max.)	-114 dBm / 1 W
Interface	RS-232, -422, LVTTL, TTL
Operating voltage	+3 … +9 / +6 ... +30 Vdc
Power consumption TX / RX	3 W @ 0.5 W, 7 W@ 1 W / 1.2 W
Data speed (max.) radio / serial	19200 / 38400 bps

SATELLINE-M3-TR1 869

SATEL order code	YM6301
Frequency	869.4125 ... 869.6375 MHz (865 … 867 MHz for India)
Tuning range	0.25 MHz (2 MHz India)
Channel width	25 fixed kHz
RX sensitivity / TX power (max.)	-111 dBm/ 0.5 W (1 W for India)
Interface	RS-232, -422, LVTTL, TTL
Operating voltage	+6 ... +30 Vdc
Power consumption TX / RX	3.8 W / 1.2 W
Data speed (max.) radio /serial	19200 bps / 38400 bps

SATELLINK I/O CONVERTERS

* Extension module for I-LINK

SATEL i-LINK

SATEL I-LINK 100

SATEL I-LINK 200

SATEL I-LINK 300

	SATEL order code	Digital I/Os	Analog I/Os 4-20 mA	Pulse counter	Connectors, switches
SATEL i-LINK	YI0090	2	-	•	Screw conn. / 16-pin 2x8 f / DIP
SATEL I-LINK 100	YI0007	4	2	-	Screw conn. / D15m / D15f / DIP
SATEL I-LINK 100 MB	YI0017	4	2	-	Screw conn. / D15m / D15f / DIP
SATEL I-LINK 200*	YI0009	4	2	-	Screw conn. / D15m / D15f / DIP.
SATEL I-LINK 300*	YI0010	6	-	-	Screw conn. / D15m / D15f / DIP

SATEL-LP MODULES

SATEL-LP24

SATEL order code	YM0424
Frequency	2.4002 ... 2.4785 GHz
Tuning range	FHSS
RX sensitivity / TX power (max.)	-106 dBm / 100 mW
Interface	T-BUS (for extension modules), RS-232, -485
Operating voltage	+19.2 ... +30.5 Vdc
Power consumption (Max. @ 24 Vdc)	≤ 65 mA
Dataspeed (max.)	250 kbps

SATEL-LP9

SATEL order code	YM0409
Frequency	902 ... 928 MHz
Tuning range	FHSS
RX sensitivity / TX power (max.)	-112 dBm / 1000 mW
Interface	T-BUS (for extension modules), RS-232, -485
Operating voltage	+10.8 ... +30.5 Vdc
Power consumption (Max. @ 24 Vdc)	328 mA
Dataspeed (max.)	500 kbps

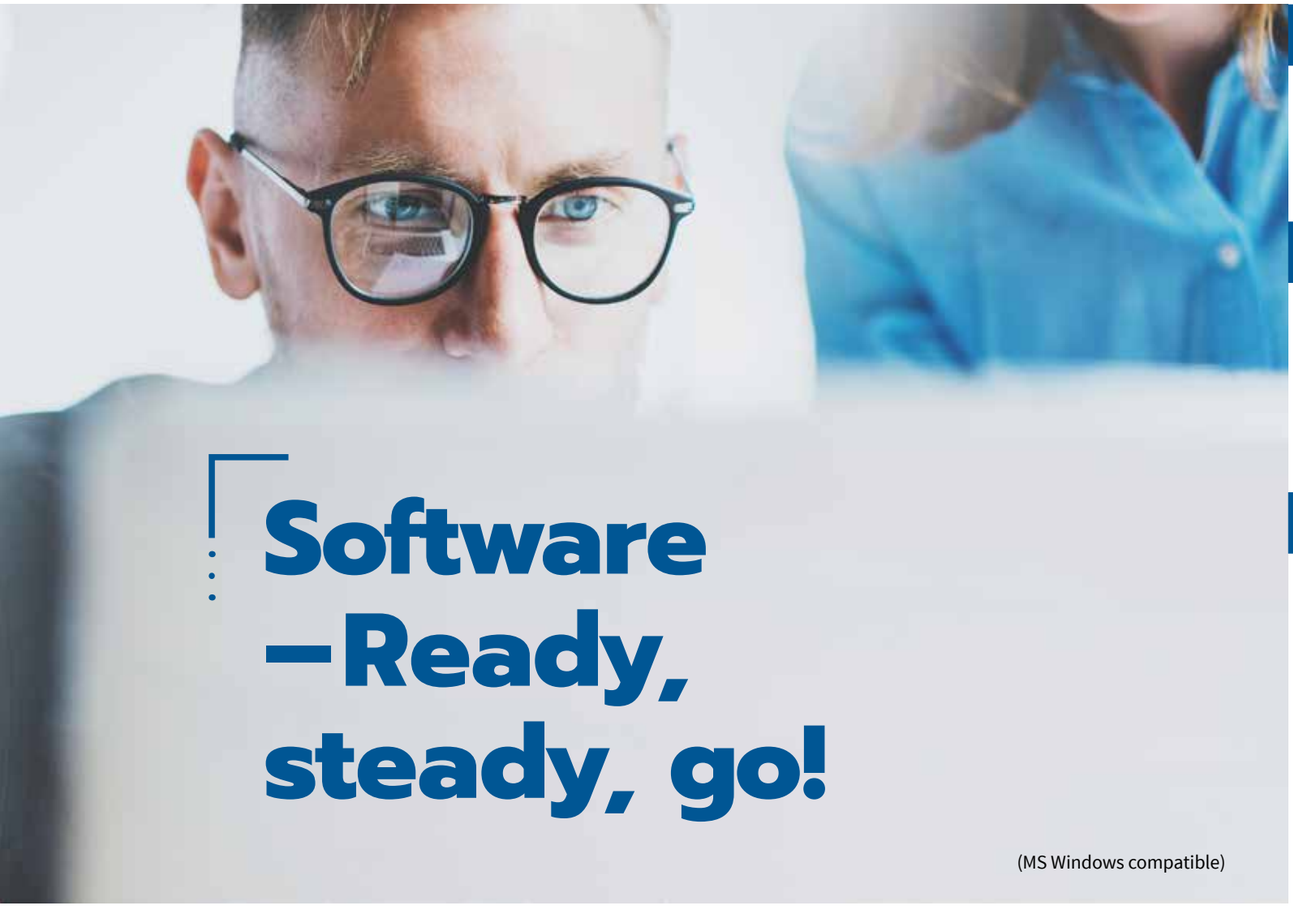
SATEL-LP8

SATEL order code	YM0408
Frequency	869.4 ... 869.65 MHz
Tuning range	FHSS*
RX sensitivity / TX power (max.)	-122 dBm / 500 mW
Interface	T-BUS (for extension modules), RS-232, -485
Operating voltage	+19.2 ... +30.5 Vdc
Power consumption (Max. @ 24 Vdc)	≤ 65 mA
Dataspeed (max.)	120 kbps

* Depends on topology and air interface data rate.

SATEL-LP I/O EXTENSION MODULES

Product	SATEL order code	Interfaces
SATEL-LP-DI4	YI0101	4 x digital inputs (0 … 250 V AC/DC)
SATEL-LP-DOR4	YI0102	4 x digital relay outputs (6 A, 24 Vdc / 250 Vac)
SATEL-LP-AI4	YI0103	4 x analog inputs (0...20 mA / 4 … 20 mA)
SATEL-LP-AO4	YI0104	4 x analog outputs (0… 20 mA / 4 … 20 mA, 0 … 10 Vdc)
SATEL-LP-DAIO6	YI0105	1 x analog inputs (0… 20 mA / 4 … 20 mA) 1 x analog outputs (0… 20 mA / 4 … 20 mA, 0 … 10 Vdc) 2 x digital inputs / outputs (0 … 250 V AC/DC)
SATEL-LP-DI8	YI0106	8 x digital inputs (0 … 30.5 Vdc) OR 2 x pulse inputs (0 … 100 Hz)
SATEL-LP-DO8	YI0107	8 x digital transistor outputs (30.5 Vdc / 200 mA)
SATEL-LP-PT100	YI0108	4 x PT 100 resistance thermometer inputs (-50 °C … +250 °C)



Software –Ready, steady, go!

(MS Windows compatible)

NETCO

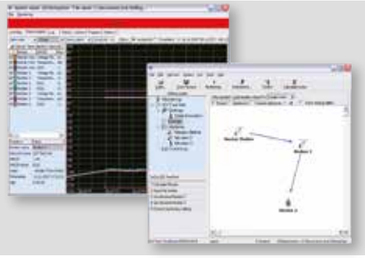
NETCO is a intuitive and user friendly network configuration program for SATEL XPRS IP radio router. It is designed to make configuration as easy as possible. With NETCO a fully functional communication network can be configured with a few simple clicks. It has SATEL XPRS IP radio router -based network comissioning and it can configurate large network (up to 5000 devices) without delays.

Configuration Manager

SATEL Configuration Manager (CM) is available for SATELLINE-M3-TR1, -EASy, -EASy Pro, -M3-R3, -M3-TR3, -M3-TR4, -M3-TR8, -EASy 869, -M3-TR1 869, SATEL Compact-4BT, Compact-Proof, EASy-Proof, TR49 and TR49 SnapOn. The program makes it possible to edit the modem settings and update the firmware.

SATEL NMS PC

Network Management System software for creating and managing SATELLINE-3AS VHF, SATEL-EASy+ and SATEL XPRS IP radio networks, including the graphical design of topology and message routing or repeater functions, remote modification of settings, and logging and trending of field data.

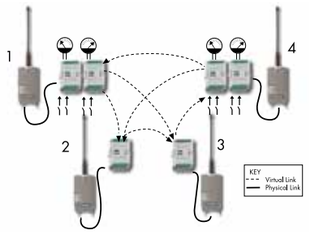


SaTerm

SaTerm is software, which can be used for configuration, testing, reprogramming and for updating the firmware of the SATELLINE-EASy and -Easy Pro modems.

SATELLINK PC Pro

Point-to-multipoint program for driving SATEL I-LINK and i-LINK I/O-converters. Operate systems, which are connected to the I/O-ports, change values, collect pulses and monitor the radio link. For max. 127 slaves.



FCS Monitor

Free Channel Scanning Monitor program can be used for setting the FCS parameters and for loading them to modems and for monitoring the channels for noise or interference.

Channel List Editor

Channel List Editor program can be used for creating the channel list for Epic Pro modems.

Help Editor

Help Editor can be used for creating and editing different language versions for Configuration Manager.

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 / 218 ... 238 MHz for long distances
- Omnidirectional Antennas for frequencies 330 ... 470 MHz, 869 MHz and 135 ... 174 / 218 ... 238 MHz for long distances.

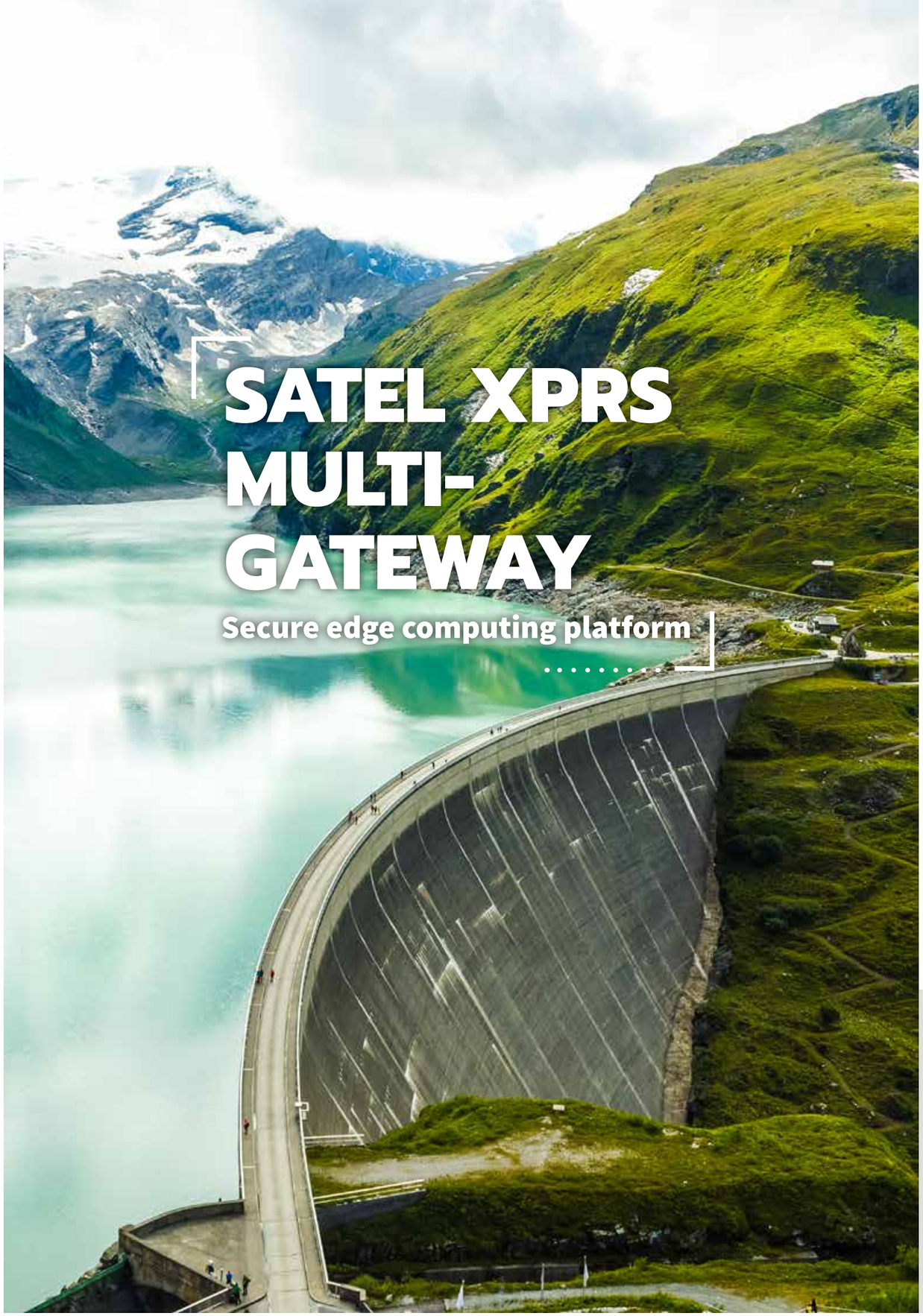
Cables

- 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 over 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-35W 2m Power cable 2 m, ODU 4-pin male / 4 mm lab plugs
- DC / RS232 Cable 1 m, M12 / D9 female / 2.1 mm DC jack male

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



SATEL XPRS MULTI-GATEWAY

Secure edge computing platform

SATEL XPRS Multigateway is a secure edge computing platform, combining multiple technologies in one device. It offers connectivity options for redundant back haul over LTE or SATEL XPRS IP radio, while SATEL GO modules communicate in local network, for example with SATELLINE-EASy modems. Various low-power radios are supported as well, so the local sensor connectivity could be with LoRa or Bluetooth. In addition to using SATEL XPRS IP radio as a back haul connection, the Multigateway can operate as a secure, high-available master device for IP radio network, where the slave devices are SATEL XPRS or SATEL XPRS Optimum IP radio routers.

Customized, user specific software can be embedded to Multigateway, enabling for example data analysis and local storage or customer specific interfaces towards cloud services.

SATEL XPRS Multigateway use cases are for example concentrator communications for Automated Meter Infrastructure, NTRIP Bridge for precision positioning applications, master device for Smart Grid communications or connectivity for water treatment application. Even better, the SATEL XPRS Multigateway may have multiple roles simultaneously, as each application may have their own communication module in one device.

SATEL XPRS Multigateway enables savings by reducing complexity and footprint of the network. It also provides significant reliability upgrade. The enhanced security and high-availability features help avoid communication failures and downtime, and thus help avoid high costs in mission-critical applications.

EXAMPLES OF INTEGRATED CONNECTIVITY:

- Wifi
- Bluetooth
- SATEL XPRS IP radio (QAM modulation)
- SATEL GO modules / SATELLINE-EASy family modems
- 2G/3G/4G (5G in the future)
- LoRa

Selection guide

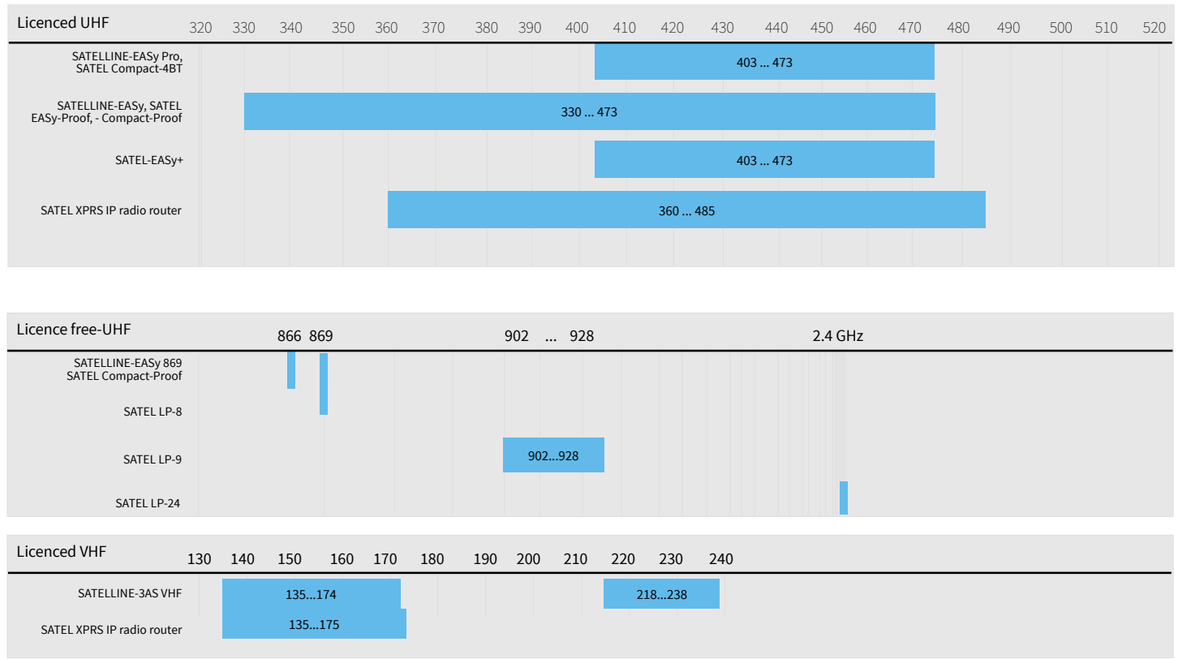
1) LP24
2) LP8
3) LP9
4) SATEL XPRS IP radio router
5) Check product details

compatible | compatible

	SATEL XPRS radio router	SATELLINE-3AS VHF	SATELLINE-M3 VHF	SATELLINE-EASy	SATEL-EASy+	SATELLINE-4Pro	SATELLINE-EASy Pro	SATEL Compact-Proof	SATEL EASy-Proof	SATEL Compact-4BT	SATELLINE-M3-TR1	SATELLINE-M3-R3, R4	SATELLINE-M3-TR3, TR4	SATEL-TR49 *)	SATEL-TR49 SnapOn *)	SATEL Proof-TR4, TR9 *)	SATELLINE-M3-TR9 *)	SATELLINE-EASy 869	SATELLINE-M3-TR1 869	SATELLINE-M3-TR8	SATEL I-LINK	SATEL-LP
Frequency range																						
UHF	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				
VHF	•	•	•																			
UHF & Licence free																		•	•	•		•
Interfaces																						
RS-232	•	•	•	•	•	•	•	•	•	•	•					•		•	•		•	•
RS-422	•	•	•	•	•						•							•	•			
RS-485	•	•	•		•																	•
TTL / LV-TTL											•							•	•			
CMOS-UART												•	•	•	•		•			•		
Ethernet	4)				•																	
USB	4)				•					•												
Digital / Analog I/O																					•	•
Pulse counter																					•	•
Bluetooth					•					•												
Tuning range																						
0.25 MHz																		•	•	•		
4 MHz							•															
20 MHz		5)	5)																			
45 MHz	•					5)																
65 MHZ														•	•							
70 / 90 MHz				•	5)		•	5)	•	5)	•	•	•			•						
FHSS														•	•	•	•					•
Channel width kHz																						
Fixed (12.5 or 20 or 25)		•	•															5)	5)			
Programmable (12.5 / 20 / 25)				•	•		•	•	•		•	•				•						
Programmable (12.5 / 25)						•				•			•	•	•							
Programmable (12.5 / 25) (4)150)	•																					
FHSS														•		•	•					•
Max. TX power																						
100 mW																						1)
500 mW																		•	•	•		2)
1 W			•	•	•			•	•	•	•		•	•	•	•	•					3)
5 W	•	•																				
10 W																						
35 W						•	•															
Operating voltage range																						
+ 4 Vdc												•	•							•		
+3 … +9 Vdc				•							•											
+3.7 … +5.5 Vdc														•			•					
+3.3 Vdc +/- 9%															•							
+6 … +30 Vdc				•	•				•		•					•		•	•			
+9 … +16 Vdc						•	•	•														
+9 … +30 Vdc		•	•																			
+10.6 … +30 Vdc	•																					
+10.8...30.5 Vdc																						3)
+11.8 … +30 Vdc																						
+12 … +30 Vdc										•												
+19.2...+30.5 Vdc																						1), 2)
Battery								•		•												
Housing																						
Plastic IP20																						•
Aluminium IP44		•		•	•													•				
Aluminium IP52	•																					
Aluminium IP67						•	•	•														
Aluminium IP69K									•							•						
Plastic / Aluminium IP67										•												
Sheet metal aluminium / Stainless steel			•								•								•		•	
Module: PCB card only											•	•	•	•	•		•		•	•		
Interface connector																						
RJ-45	4)				5)																	
D9	•																					3)
D15		•	•	•	5)						•							•	•		•	
ODU 8 pin						•	•	•														
26 pin header / 26 pin strip											•								•			
USB					5)										•							
1.27 mm pitch socket												•	•	•			•			•		
Deutsch DT04-6P-CL09									•							•						
Screw connector																						•
M12 circular										•												
COMPATIBILITY																						
Software																						
Configuration Manager				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
SATELLINK PC Pro		•	•	•		•	•	•		•	•							•	•		•	
SaTerm		•	•	•	•	•	•	•		•	•							•	•			
NMS PC	•	•	•		•																	
FCS				•		•	•	•	•	•	•							•	•			
NETCO Mobile	•				•					•												
LP-CONF																						•
Accessories																						
SATEL I–LINK 100, 200, 300	•	•	•	•	•	•	•	•		•	•							•	•			
I/O expansion modules																						•
Model or variant w. display	•	•		•	•	•	•	•										•				

*) Check the product details for frequency compatibility.

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	150 kHz	
SATEL XPRS IP radio router	19.2 kbps (FSK) 60.5 kbps (QAM)		38.4 kbps (FSK) 121 kbps (QAM)	230.4 kbps (FSK)	256 kbps
SATELLINE-EASy Pro SATELLINE-EASy SATEL EASy-Proof SATEL Compact-Proof	9600 bps 9600 bps 9600 bps 9600 bps	9600 bps 9600 bps 9600 bps 9600 bps	19200 bps 19200 bps 19200 bps 19200 bps		38400 bps 38400 bps 38400 bps 38400 bps
SATEL-EASy+ SATEL Compact-4BT	14400 bps 14400 bps	14400 bps 14400 bps	28800 bps 28800 bps		115200 bps 115200 bps
SATELLINE-3AS VHF	9600 bps		19200 bps		38400 bps
SATEL Compact-Proof 869 SATELLINE-EASy 869			19200 bps 19200 bps		38400 bps 38400 bps

Channel width	FHSS
SATEL LP-8	max. air data speed 120 kbps
SATEL LP-24	max. air data speed 250 kbps
SATEL LP-9	max. air data speed 500 kbps

Protocols

SATEL radio modems are compatible with all commonly used industrial protocols. Here are some examples of the protocols: ANSI, ASCII, CACTUS, COMLI, DNP 3.0 Serial & IP, 4 Exoline, HostLink, IEC 60870-101, IEC 60870-104, IEC 61850, Mewtocol, Modbus ASCII, Modbus RTU, Modbus TCP, Profibus DP, R-com, RP-570, RP-571, SATELLINK, S-bus, Siemens 3946 (R), SNMP, TCP/IP, SATEL NMS, Rockwell DF etc.

Ask for more information from your local distributor.

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1/2019

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