SATEL-LP

WIRELESS MODULES • EXTENSION MODULES • PROGRAMMING & ANTENNA CABLES • ANTENNAS

A SIMPLE SOLUTION FOR I/O AND SERIAL COMMUNICATIONS

MESH NETWORKS - PLUG & PLAY - FREQUENCY HOPPING

SATEL

SATEL-LP

for simple I/O and serial communication

The new SATEL-LP product family offers an extremely easy solution for simple I/O and serial communications.

With software-free radio setup, SATEL-LP offers a cost-effective wireless solution where it is too costly or not possible to run a wire.

All SATEL-LP modules are DIN rail mountable. The communications over the air interface is secured with a 128-bit AES encryption and authentication.

3 frequency ranges - 2.4 GHz, 869 MHz and 900 MHz.

2.4 GHz

Designed for international use and suitable for short-range, clear line-of-sight applications.

869 MHz

Designed to be used in Europe for short- or middle-range applications of up to 20 kilometres.

900 MHz

Designed for North American use and suitable for either short-range, non-line-of-sight applications or for long-range applications of up to 30 kilometres.

3 modes of operation:

Wire-in – Wire-out

Maps I/O from one location to another via wireless without the need for an additional controller or software.

Wireless I/O to Modbus

Collects I/O directly at SATEL-LP radio module using extension modules. I/O is addressed via Modbus without the need for additional hardware.

Wireless Serial

Provides RS-232 and RS-485 networking, reliable connecting serial end devices, PLCs and RTUs.

No need for RTU or PLC devices

SATEL-LP expansion modules offer direct connection of common industrial signals to the SATEL-LP radio modules, eliminating the need for RTU or PLC devices. Expansion modules are hot-swappable and up to 32 expansion modules can be added to one SATEL-LP radio module.

Mesh networks with up to 250 nodes. Easy point-to-point or network structures such as line, star or mesh.

- **Easy, software-free configuration**
- **High-speed communications, up to 500 kbps**
- **2.4 GHz, 869 MHz or 900 MHz licence free frequency range**
- **Hot-swappable modular I/O**
- **All-in-one wireless platform**
- **Mesh networks with up to 250 nodes**
- **Frequency hopping spread spectrum**

SATEL-LP24
YM0424

- Licence free 2.4 GHz
- Designed for global use
- For short-range, clear line-of-sight applications up to 5 kilometres
- FHSS (Frequency Hopping Spread Spectrum)
- Licence-free ISM (Industrial, Scientific and Medical) band
- Mesh networks of up to 250 devices

SATEL-LP9
YM0409

- Licence free 900 MHz
- Designed for North America, South America and Canada
- For short-range, non-line-of-sight applications or for long-range applications of up to 30 kilometres
- FHSS (Frequency Hopping Spread Spectrum)
- Licence free ISM (Industrial, Scientific and Medical) band
- Mesh networks of up to 250 devices

SATEL-LP8
YM0408

- Licence free 869 MHz
- Designed to be used in Europe
- For short- or middle-range applications of up to 20 kilometres
- FHSS (Frequency Hopping Spread Spectrum)*
- Mesh networks of up to 99 devices

* Depends on the topology and baud rate

Comparison chart

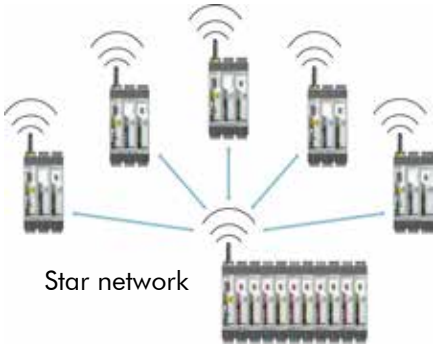
	SATEL-LP24	SATEL-LP9	SATEL-LP8
Frequency Range	2.4002 ... 2.4785 GHz	902 ... 928 MHz	869.4 ... 869.65 MHz
Receiver sensitivity (adjustable)	-106 dBm (16 kbps)	-112 dBm (16 kbps)	-122 dBm (1.2 kbps)
	-96 dBm (125 kbps, default)	-105 dBm (125 kbps, default)	-114 dBm (9.6 kbps, default)
	-93 dBm (250 kbps)	-102 dBm (250 kbps)	-111 dBm (19.2 kbps)
		-95 dBm (500 kbps)	-104 dBm (60 kbps)
			-103 dBm (120 kbps)
Carrier max. power	100 mW (adjustable)*	1000 mW (adjustable)	500 mW (adjustable)
Supply voltage	19.2 ... 30.5 Vdc	10.8 ... 30.5 Vdc	19.2 ... 30.5 Vdc
Max. current consumption (@ 24 VDC@25°C, stand-alone)	≤ 65 mA	328 mA	≤ 65 mA
Temperature Range	-40 ... +70°C		
Serial Interface	RS-232, RS-485	RS-232, RS-485	RS-232, RS-485
Size H x W x D	17.5 x 99 x 114.5 mm	35 x 99 x114.5 mm	17.5 x 99 x 114.5 mm
Antenna Connector	RSMA (female)		
Air Interface Encryption	AES128		
Transient Surge Protection	Yes		
Degree of protection	IP20		
Number of supported devices	≤ 250 (Addressing via software)	≤ 250 (Addressing via software)	≤ 99 (per wireless network)
Conformance	CE compliance (R&TTE 1999/5/EC) FCC Part 15.247, IC RSS-210	FCC Part 15.247, IC RSS-210	CE compliance (R&TTE 1999/5/EC)
Vibration (operation)	in accordance with IEC 60068-2-6: 5g, 10 Hz ... 150 Hz		
Shock	16g, 11 ms		

* In Europe max. 19 dBm

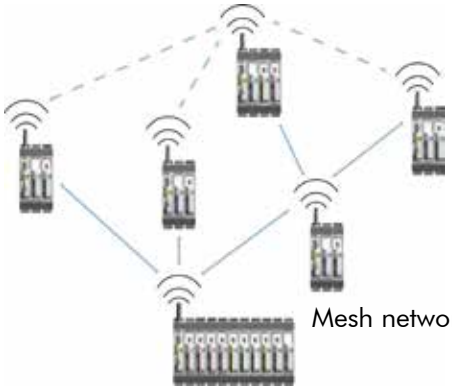
Local radio regulations need to be taken into account.
Values are subject to change without a notice.

Network options

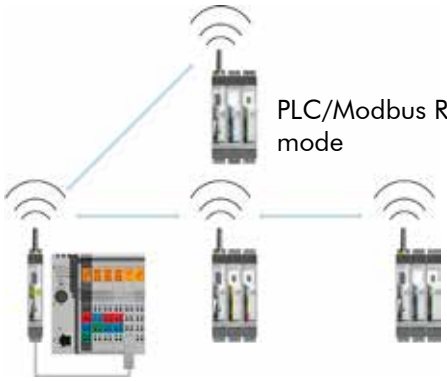
Point-to-point connection



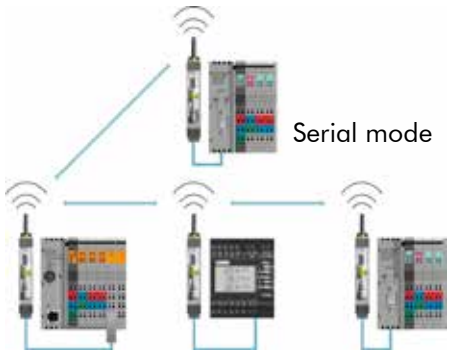
Star network



Mesh network



PLC/Modbus RTU mode



Serial mode

Examples of use

Various network structures can be quickly and easily implemented with SATEL-LP: from a simple point-to-point connection to complex mesh networks.

Use as a point-to-point connection

One option for transmitting wireless I/O signals in both directions is to use a point-to-point connection. Connect the signals, apply the operating voltage and set the addresses via the thumb wheel - and the wireless connection is established automatically without any further settings.
If the network is extended with additional I/O modules, they can be assigned to one another quickly and easily via the thumb wheel on the front of the module (I/O mapping).

Use in a star network

Signals can also be transmitted bidirectionally with SATEL-LP in a star configuration. Connect the signals, apply the operating voltage and set the addresses via the thumb wheel - and the wireless connection is established automatically without any further settings.
The signals can be easily split or multiplied by additional receivers. If the network is extended with additional I/O modules, they can be assigned to one another quickly and easily via the thumb wheel on the front of the module (I/O mapping).

Use in mesh networks

Up to 250 devices can be used in one high-performance mesh networks. In the event that a connection in the network fails, information is redirected via another network node (roaming). Self-organization and self-healing functions keep the network stable, each device has multiple communications paths.

Use in PLC/Modbus RTU mode

With I/O integration in the control level, you can wirelessly connect I/O extension modules directly to a controller (I/O to serial). The wireless module provides an RS-232 or RS-485 interface for this purpose. In PLC/Modbus RTU mode, the master wireless module works as a Modbus slave and has its own Modbus slave address.

Use in a serial mode

In serial data mode, multiple controllers or serial I/O devices are networked easily and quickly using wireless technology. In this way, serial RS-232 or RS-485 cables can be replaced.

I/O extension modules

SATEL-LP-DI4
YI0101
• 4 digital inputs (0 … 250 V AC/DC)

SATEL-LP-DOR4
YI0102
• 4 digital relay outputs (5 A, 24 VDC / 250 VAC)

SATEL-LP-AI4
YI0103
• 4 analog inputs
(0...20 mA / 4 … 20 mA)

SATEL-LP-AO4
YI0104
• 4 analog outputs
(0… 20 mA / 4 … 20 mA, 0 … 10 VDC)

SATEL-LP-DAIO6
YI0105
• 1 analog input
(0… 20 mA / 4 … 20 mA)
• 1 analog output
(0… 20 mA / 4 … 20 mA, 0 … 10 VDC)
• 2 digital inputs
(0 … 250 V AC/DC)
• 2 digital relay outputs
(2A, 24 VDC / 250 VAC)

SATEL-LP-DI8
YI0106
• 8 digital inputs (0 … 30.5 VDC)
OR
• 2 pulse inputs (0 … 100 Hz)

SATEL-LP-DO8
YI0107
• 8 digital transistor outputs
(30.5 VDC / 200 mA)

SATEL-LP-PT100
YI0108
• 4 PT 100 resistance thermometer
(-50 °C … +250 °C)

Cables

Cable for programming
USB data cable for SATEL-LP -radio modules. Length 2 meters, incl. power feed
SATEL-LP-PROG
YC0520

Antenna cable
2 m antenna cable, N male to RSMA male, impedance 50ohm
SATEL-LP-RF2
YC1520

Antenna cable
50 cm cabin feedthrough cable, N female to RSMA male, impedance 50ohm
SATEL-LP-RF50
YC1550

Low loss cable
(attenuation: 1.34dB/10m @ 896/900 MHz *max. length 15m, 2.36dB/10m @ 2.4 GHz, *max. length 8m)
ECOFLEX10
YC1004

Low loss cable
(attenuation: 0.92 dB/10m @ 896/900 MHz, *max. length 22m, 1.63dB/10m @ 2.4GHz, *max. length 12m)
ECOFLEX15
YC1006

* recommended max. length.

Connectors for Ecoflex cables

CONNECTOR
N male connectors for ECOFLEX10
YC1003

CONNECTOR
N male connectors for ECOFLEX15
YC1007

Power supply

PS-DIN-2
Power supply for DIN-rail, IN 100-240Vac, OUT 24Vdc/2.5A
YP0118

Omnidirectional antennas

Omnidirectional antennas incl. wall mounting bracket and mast clips.

Antenna 2.4 GHz, 6dBi, N female
SATEL-LP-ANT24N
YA2400

Antenna 900 MHz, 7dBi, N female
SATEL-LP-ANT9N
YA1900

Antenna 869 MHz, 4dBi, N female
SATEL-LP-ANT8N
YA0868

Portable antennas

Antenna 820-960MHz
SATEL-LP-ANT8/9
YA0899

Antenna 2.4GHz
SATEL-LP-ANT24
YA2410

Accessories for configuration

Configuration memory
Memory stick for saving individual configuration data
SATEL-LP-MEMORY
YO0010

CONF –sticks
for creating unique network ID and changing RF band:

SATEL-LP-CONF3
stick for SATEL-LP24 (RF band 3)
YO0003

SATEL-LP-CONF5
stick for SATEL-LP24 (RF band 5)
YO0005

SATEL-LP-CONF7
stick for SATEL-LP24 (RF band 7)
YO0007

SATEL-LP8-CONF1
stick for SATEL-LP8 (RF band 1)
YO0001

SATEL-LP9-CONF1
stick for SATEL-LP9 (RF band 1)
YO0002

SATEL

MISSION-CRITICAL CONNECTIVITY

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