SATELLINE®-M3-TR1

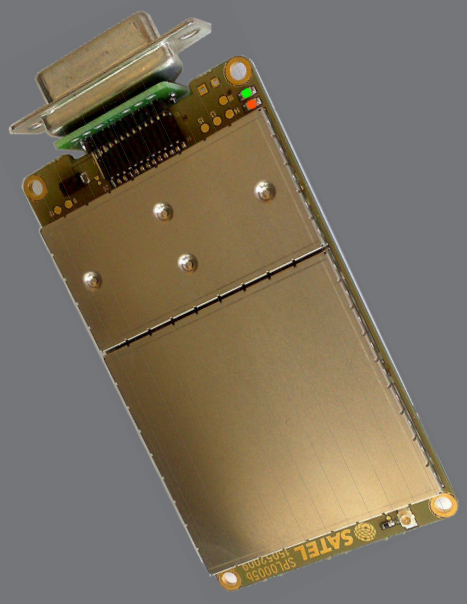
Wireless World – Local Solution

SATELLINE-M3-TR1 transceiver module provides you a compact flexible and lightweight solution. SATELLINE-M3-TR1 transceiver is a module specifically designed for small mechanics. The small current consumption and 50 g lightweight design makes this module an excellent combination for long range distance measurement applications.

The module is equipped with all necessary features; such as 70 MHz tuning range, changeable channel spacing, versatile connectivity, +3 ... +9 V and +6 ... +30 V voltage level ranges and attachable antenna connector. Settings and configuration is possible to make with a special SATEL Configuration Manager.

SATELLINE-M3-TR1 is HW compatible with SATELLINE-3AS(d) product line and SW compatible with Configuration Manager, SaTerm and PC Pro. And it can be used together with SATELLINK products.

- VHF with NMS
- UHF with NMS
- UHF
- Licence Free
- IP67
- Customer Specific



With SATEL radio modems, setting up a local data transfer network is quick and cost effective. Your wireless network is independent and free of operator services. The cost of operation is either free of charge or fixed, depending on the frequency used. SATELLINE radio modems are type-approved in over 50 countries. For the latest information, please visit our website www.satel.com.

SATELLINE radio modems are always on line, and provide reliable, real-time data communications over distances ranging from tens or hundreds of metres up to around 80 kilometres. Thanks to a store and forward function, any radio modem in a network can be used as a master station, substation and / or repeater.
SATELLINE radio modem networks are flexible, easy to expand and can cover a wide variety of solutions from simple point-to-point connections to large networks comprising hundreds of modems. Even for expanded networks, only one operating frequency is required.

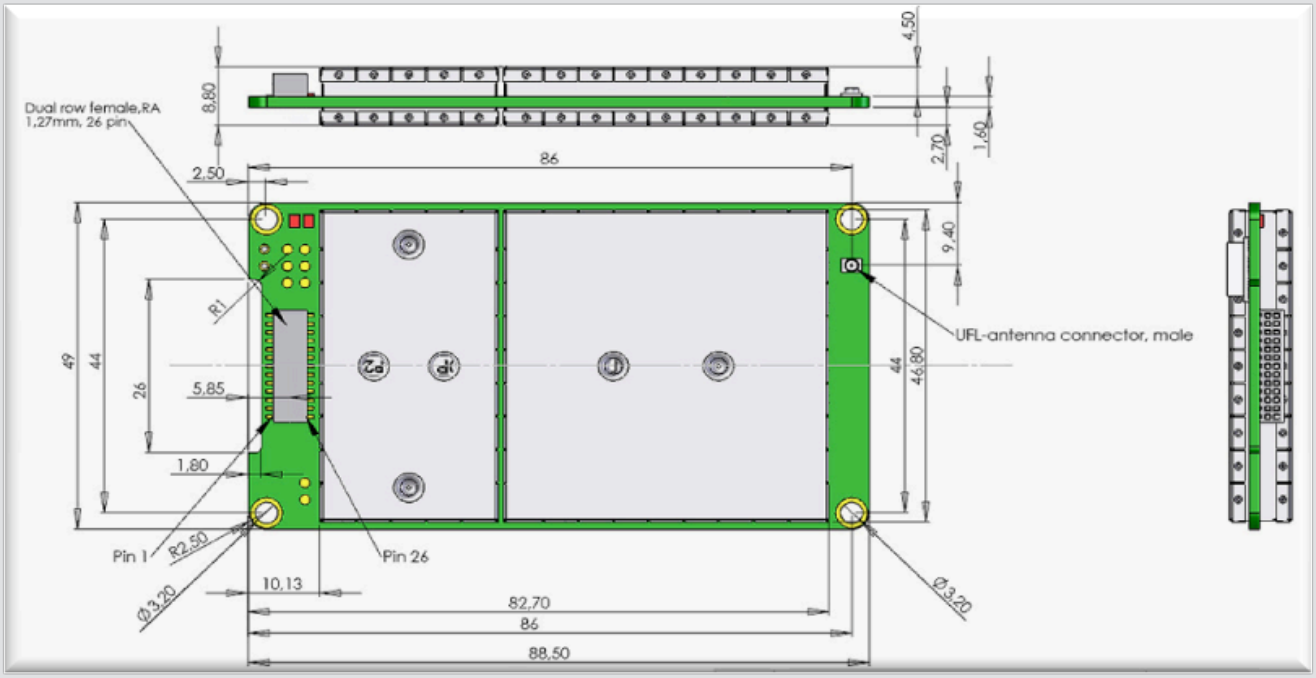
All SATELLINE radio data modems fulfil RoHS requirements (EU directives 2002/95/EC and 2002/96/EU) as of 1 July 2006.

SATEL®

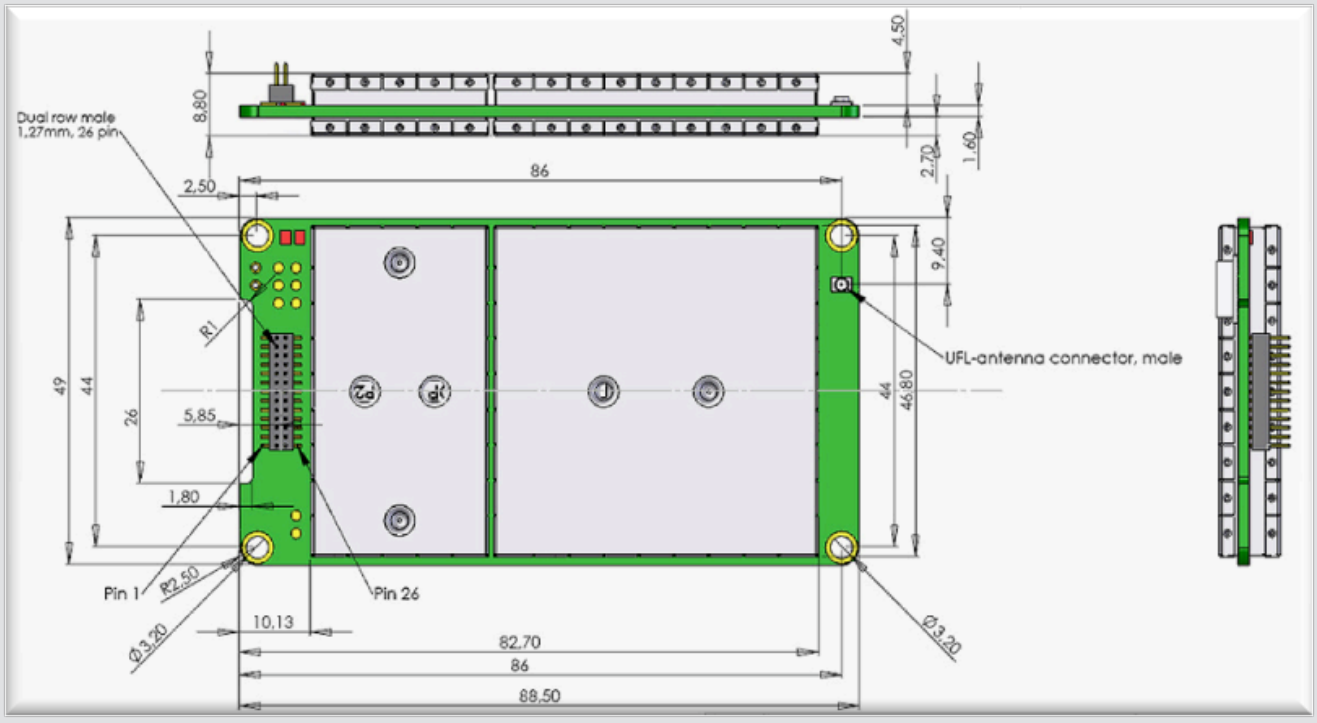
MECHANICS

Dimensions H x W x L:	8.8 mm x 49 mm x 88.5 mm
Weight:	50 g
Housing:	PCB plus metal shielding

Module with 26-pin female socket:



Module with 26-pin male strip:



CONNECTORS AND PIN ORDER

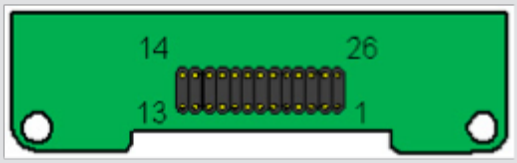
Antenna connector

50 ohm, U.FL. The module can be supplied with different U.FL –XX cable adaptors (XX= for example TNC, SMA, MCX, MMCX). The connector type is U.FL-R-SMT and manufacturer is Hirose.

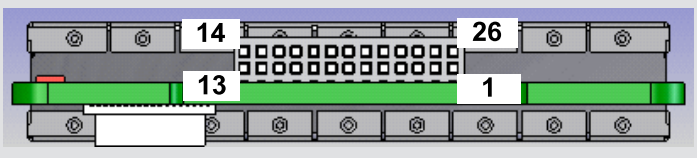
Pin order of the interface connector

26-pin	SATEL name	Level	Description	Direction *1
1	Vin	3-9 or 6-30 Vdc	Oper.voltage. Vin pins are connected together	IN
2	Vin	3-9 or 6-30 Vdc	Oper.voltage. Vin pins are connected together	IN
3	Vin	3-9 or 6-30 Vdc	Oper.voltage. Vin pins are connected together	IN
4	Vin	3-9 or 6-30 Vdc	Oper.voltage. Vin pins are connected together	IN
5	RTS_RS	RS-232	Request To Send from DTE	IN
6	MODE	0... Vdc	Programming Mode. >3 Vdc or Not connected = Data transfer mode note	IN
7	TD_RS	RS-232	Transmit Data from DTE to the radio modem	IN
8	DSR	RS-232	Data Set Ready. Indicates that the radio modem is ON	OUT
9	RD1_RS	RS-232	Receive Data to DTE from the radio modem	OUT
10	BOOT		For factory purposes	IN
11	Spare_1			
12	Spare_2			
13	CD_out TTL	TTL	Carrer Detected	OUT
14	GP			IN
15	GP			OUT
16	CD_RS**	RS-232	Carrier Detected	OUT
17	DTR	OFF ≤ 1 ... -15 V ON ≥ 1.2 V ... Vdc or "open"	Data Terminal Ready OFF=the unit goes to low current consumption mode ON=the unit is ready for normal transfer mode	IN
18	CTS_TTL/A/CD***	TTL	Clear To Send	OUT
19	RD2TTL/B/RD2_RS	TTL	Receive Data to DTE from the radio modem	OUT
20	TD2TTL/A/TD2_RS	TTL	Transmit Data from DTE to the radio modem	IN
21	RTS_TTL/B	TTL	Request To Send from DTE	IN
22	CTS_RS	RS-232	Clear To Send	OUT
23	GND		Ground. GND pins are connected together	
24	GND		Ground. GND pins are connected together	
25	GND		Ground. GND pins are connected together	
26	GND		Ground. GND pins are connected together	

*1 Direction from the modem
**2 CD, can be selected with R8 on the interface board (optional assembly)
***3 CD 3AS type, can be selected with R9 on the interface board (default assembly)
NOTE! 1. TTL-option eliminates 422-option and 422-option eliminates TTL-option
2. Unused pins can be left unconnected



Connector: 26-pin strip, male
Type: FTSH-113-04-L-DV
Manufacturer: Samtec



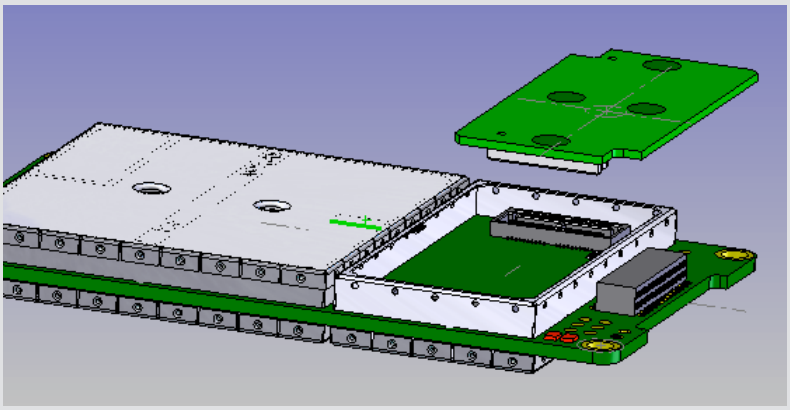
Connector: 26-pin header, female
Type: 613-26-20-10-2-10
Manufacturer: Weitronic

OPERATING VOLTAGE AND INTERFACE (PWR-MODULE)

The SATELLINE-M3-TR1 has two operating voltage ranges +3 ... +9 Vdc and +6 ... +30 Vdc (+/- 10 %). The operating voltage range is changed by replacing the PWR-module.

Communication interfaces are:
Port1: Always RS-232
Port2: RS-232/422 (programmable), LVTTL or TTL

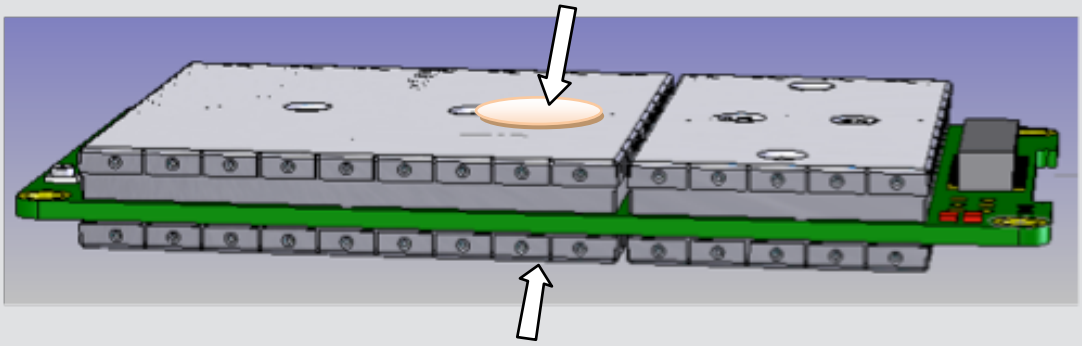
Operating voltage range is marked to the PCB:
+3 ... +9 Vdc as SPL0006x
+6 ... +30 Vdc as SPL0010x



PWR-module

NOTE!

NARS-adapters:	When the lower range PWR-module is used, NARS-1F-4A must be used instead of NARS-1F.
Shock resistance:	Dropping height 1 m / all directions.
Vibration:	At least 10 - 500 Hz / 5 g without degradation in data transfer capability, when the module is supported to the chassis with soft material in the middle of the PCB (see the picture below).



TECHNICAL SPECIFICATIONS

SATELLINE-M3-TR1 complies with the following international standards:
EN 300 113-2 (Annex A), EN60950 (Safety), EN 301 489 (EMC), FCC CFR47 section 90

	SATELLINE-M3-TR1 RECEIVER	SATELLINE-M3-TR1 TRANSMITTER	SATELLINE-3AS(d) Corresponding Values
Frequency Range	403 ... 473 MHz		330 ... 470 MHz
Tuning Range	70 MHz		+/- 2 MHz from fixed central freq.
Channel Spacing	12.5 kHz / 20 kHz / 25 kHz (Programmable)		12.5 kHz / 20 kHz / 25 kHz (Fixed)
Frequency Stability	<1 kHz		< +/- 1.5 kHz
Sensitivity BER < 10E-3 (FEC ON) NOTE*	-114 dBm @ 12.5 kHz -111 dBm @ 25 kHz		< -115 dBm
Adjacent Channel Selectivity (FEC ON)	> 47 dB @ 12.5 kHz > 52 dB @ 25 kHz		> 60 dB @ 12.5 kHz > 70 dB @ 25 kHz
Blocking (FEC ON)	> 86 dB		> 84 dBm
Spurious Emission	< -100 dBm	< -80 dBm on 3rd harmonics @ 1215 - 1240 MHz	Acc.to EN 300 220-1 / EN 300 113-1
Power Consumption, Typical	< 1.2 W	3 W @ 0.5 W output power 7 W @ 1 W ouput power	1.5 W (Receive) 5.5 W Transmit)
Power Consumption, Save Modes	Sleep: 0.24 W / DTR: 5 mW		DTR: 50 mW
Communication Mode	Half-Duplex		Half-Duplex
Type Of Emission		F1D	F1D
Carrier Power		100, 200, 500, 1000 mW	10 ... 1000 mW
Adjacent Channel Power		Acc.to EN 300 113 / FCC CRF47 part 90	Acc.to EN 300 220-1 / EN 300 113-1 / FCC CRF47 section 90
Carrien Power Stability		<± 1.5 dB	+2 dB / -3 dB
DATA MODEM			
Electrical Interface	Port1 fixed: RS-232 Port2 options: LVTTL, TTL or RS-232 / 422 (Port2 RS-232 / 422 is programmable)		Port1 fixed: RS-232 Port2 options: RS-232, RS-485 or RS-422
Interface Connector	D15 female, 26-pin male strip, 26-pin female socket		D15, female
Data Speed of Serial Interface	300 - 38400 bps		300 - 38400 bps
Data Speed of Radio Interface	19200 bps (25 kHz channel) 9600 bps (12.5 / 20 kHz channel)		19200 bps (25 kHz channel) 9600 bps (12.5 / 20 kHz channel)
Data Format	Asynchronous data		Asynchronous data
Modulation	4FSK , GMSK		4FSK, GMSK
GENERAL			
Operating Voltage	Options: +3 ... +9 Vdc or +6 ... +30 Vdc		+9 ... +30 Vdc
Temperature Range	-25 °C ... +55 °C complies with the standards -30 °C ... +65 °C functional -40 °C ... +80 °C storage		-25 °C ... +55 °C tests acc.to ETSI -40 °C ... +75 °C functional -40 °C ... +85 °C storage
Antenna Connector	TNC, SMA, MCX, MMCX		TNC, 50 ohm, female
Construction	Aluminium, Stainless Steel or without housing		Aluminium housing
Size H x W x D mm / Weight	137 x 67 x 29 mm / 250 g (in an aluminium housing)		137 x 67 x 29 mm / 260 g

NOTE* Due to radio electronic design, the receiver is about 6 - 15 dB less sensitive on the following frequencies: 403.000, 409.5875, 416.000, 429.000, 442.000, 455.000, 468.000 and 469.200 MHz.

Values are subject to change without notice.

Manufactured:

SATEL®

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