



GPS RECEIVER

LGSK2 MRS232 V1.1



GPS Receiver + patch antenna

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PRESENTATION

ZTI has selected a GPS receiver "LGSK2 MRS232" produced by Naelcom (France), based around the LASSEN SK2 high integration and performance GPS board (Trimble OEM). This robust module is dedicated to embedded or industrial applications involving transport over long distances (in 422) of positioning and timing information.

Advantages

- Back-up capacitor with an autonomy of 200 hours for hot start-up after a power cut.
- The reacquisition time when hot (thanks to the back-up capacitor) is extremely short (~ 20 s 90% of the time).
- High accuracy in differential mode.
- Low power consumption.
- The 2 ports can be configured to suit your requirements: input and output protocol and transmission speed.
- Configuration parameters backed-up to an EEPROM.
- Compact (~162 x 95 x 26 mm).
- Protected power supply accepting from 7 to 40 V (compliant with automobile 12 and 24 V).
- Communication port outlet in RS232 or RS422, depending on the version.

Connections

- For the power supply, automobile type locking.
- For the communication, two female DB9.
- For the aerial, SMB type.

SUMMARY OF THE CHARACTERISTICS

Performances:

- | | |
|--|---|
| • 8 channel receiver | |
| • Update speed: | TSIP 1 Hz, NMEA 1 Hz |
| • Accuracy: | position: 25 m CEP (50 %) without SA
speed: 0.1 m/sec (nominal)
time: ± 95 nanoseconds 1σ |
| • Accuracy in DGPS mode: | position: 2 m CEP (50 %)
speed: 0.05 ms
time: ± 95 nanoseconds 1σ |
| • Initial acquisition time: | cold: less than 2 mm (90 %)
intermediate: less than 45 seconds (90 %)
hot: less than 20 seconds (90 %). |
| • Reacquisition time after loss of signal: | less than 2 seconds (typical) |
| • Altitude: | 1000 m at + 18,000 m |
| • Speed: | 515 m/second maximum |
| • Acceleration: | 4 g (39.2 m/s ²) |
| • Aerial field clear. | |

Physical characteristics:

- Power supply: 7 to 40 Volts
- Overall dimensions: 162 x 95 x 26 mm
- Weight: 450 grams

STANDARDS

The LGSK2 MRS232 V1.1 has successfully completed the test of the standards listed below:

- Product standard ETS300830
- Generic standard EN50081-1 (residential areas):
EN55022 group 1 class B (conducted and radiated emissions) dated July 1991.
- Generic standard EN50082-2 (industrial areas):
 - EN61000-4-4 (Immunity to rapid transitions) dated June 1995.
 - EN61000-4-6 published in February 1997: "Immunity tests on conducted interference, induced by radio-electrical fields."
 - EN61000-4-3 published in February 1997: "Immunity tests on electromagnetic fields radiated at radio-electrical frequencies."
 - ENV50204: "Immunity tests on electromagnetic fields radiated at 900 MHz".
 - EN61000-4-2: (Immunity to electrostatic discharges) dated June 1995.
 - EN61000-4-5: (Immunity to shock waves) dated June 1995.
 - EN61000-4-11: "Immunity tests on voltage drops, short power cuts and voltage variations" dated January 1995.
 - ISO 7637 (parts 1 and 2): goods vehicles at nominal voltages of 12 and 24 V - Transmission of electrical interference by conduction exclusively along the power supply lines) dated 1990. (Test not performed on this module but on the LGSK8 V1.0 module, which has exactly the same power supply circuit).

The tests were performed under the following conditions:

- Shielded series connection cables with the shielding connected to the equipment earth (including for two wire pairs in RS422).
- Power supplied either from a 12 V automobile circuit or by a rectifying transformer (CE approved) from a 220 V circuit.

For information:

The EN61000-4-3 standard is identical to the CEI 1000-4-3 standard and replaces ENV50140.

The EN61000-4-3 standard (see note A) is mentioned in the EN50082-2 generic standard for electrical and electronic equipment designed for use in industrial environments.

The NF EN61000-4-6 standard is identical to the CEI 1000-4-6 standard dated 1996 which replaced the ENV50141 standard. The EN61000-4-6 standard (see note B) is mentioned in the EN50082-2 generic standard for electrical and electronic equipment designed for use in industrial environments.

Note A: The EN50082-2 generic standard dated June 1995 refers to the ENV50140 standard, and this standard was replaced by the NF EN61000-4-3 standard.

Note B: The EN50082-2 generic standard dated June 1995 refers to the ENV50141 standard, and this standard was replaced by the NF EN61000-4-3 standard.

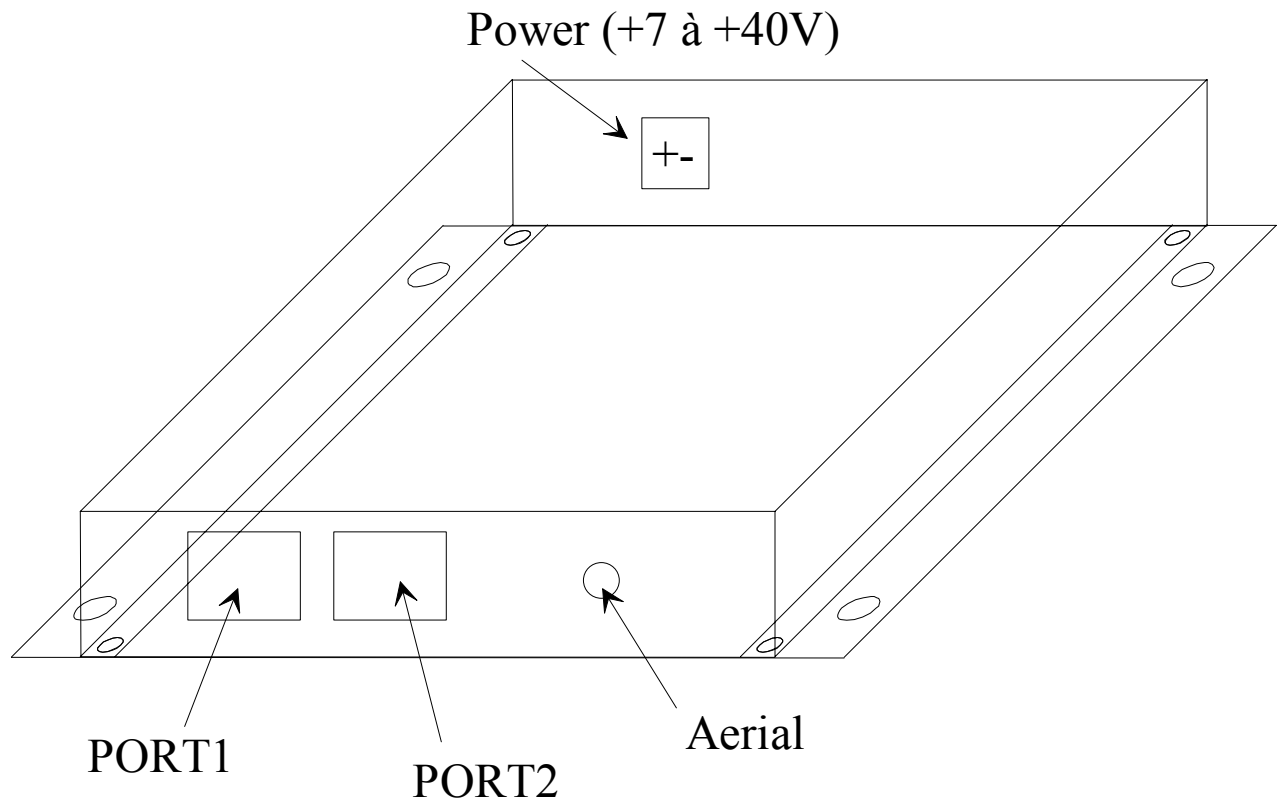
GENERAL DESCRIPTION

The LGSK2 MRS232 V1.1 module has the same functional characteristics as the LASSEN SK2 OEM Trimble GPS board. However, the following characteristics are different:

- Stainless steel housing.
- Communication port outlets in RS232 or RS422, thanks to a TTL RS232 or TTL RS422 conversion.
- PPS outlet in TTL or RS232 or RS422 (depending on model).
- Power supply module between 7V and 40 V protected against voltage surges and inversion of the polarity (instead of 5V precise and unprotected).
- DB9 female connection for ports 1 and 2, SMB for the aerial, automobile type power connections*.

*The power supply connector should be removed by pressing on the top of it to clear the locking lug.

Assembly drawing and identification of the connectors



References of the standard configurations

- **LGSK2 MRS232 V1.1**

This is the RS232 version. The two ports use RS232 input/output for communication (RX/TX) and both supply the PPS (pulse per second) in RS232 level.

- **LGSK2 MRS422 V1.1**

This is the RS422 version. The two ports use RS422 input/output for communication (RX/TX) and both supply the PPS (pulse per second) in RS422 level.

This version is pin compatible with the TRIMBLE SV6 422 module.

Mixed configurations can also be made: Port 1 in RS232 with PPS in TTL, and port 2 in RS422 and PPS in RS422. Ask us for details

Description of the connectors

Pins of the two ports (DB9 female connectors)

PIN DB9	LG SK2 MRS232 V1.1	LG SK2 MRS422 V1.1
1	NC	TX-
2	RX	TX+
3	TX	RX+
4	NC	RX-
5	GND	GND
6	NC	NC
7	NC	NC
8	PPS (RS232 level)	PPS+
9		PPS-
shield	GND	GND

Remark: In RS422 configuration, the polarities indicated can be inverted with respect to the polarity of the equipment of other manufacturers. This is not serious, as inversion of the polarity when connecting will not damage the equipment, if you do not receive anything, try changing over the + and -.

To connect the LGSK2 MRS232 V1.1 model to a PC, a straight shielded cable should be used, DB9 male to DB9 female.

Aerial: SMB connector.

Power supply: AMP connector with locking clip. (Reference of the removable male part: male module for 2 point female contacts, ref. 0-0176271-9. Reference of the contacts for this module: universal power connector ref. 0-0175155-1).

Factory configuration of the 2 ports

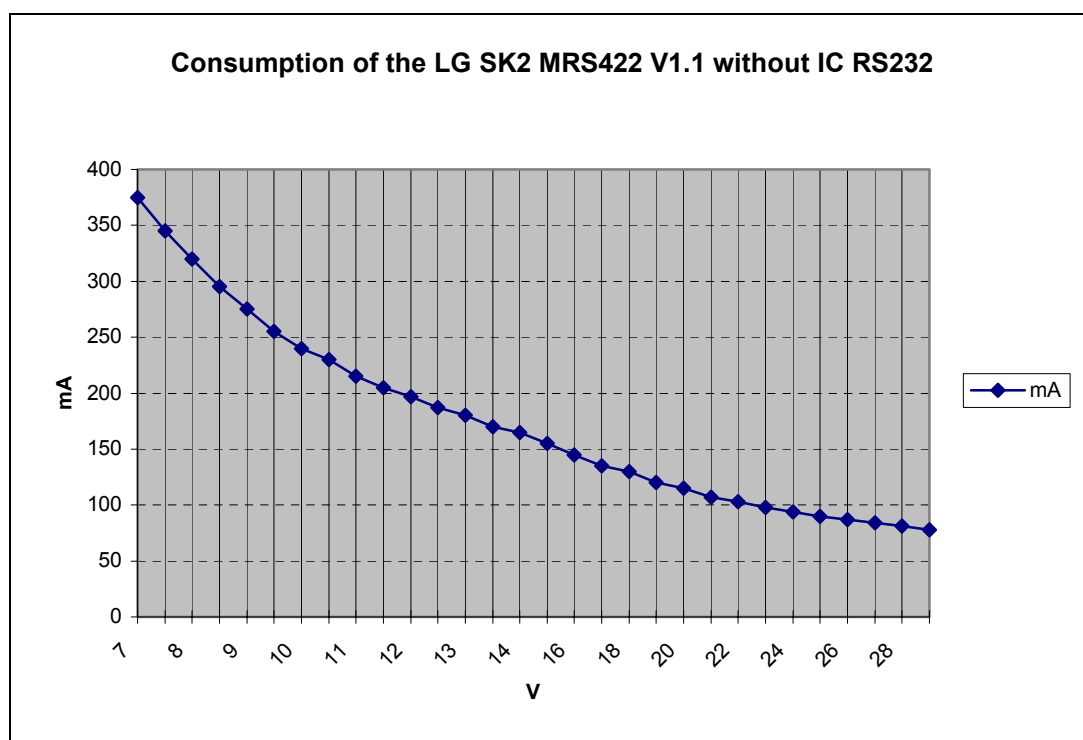
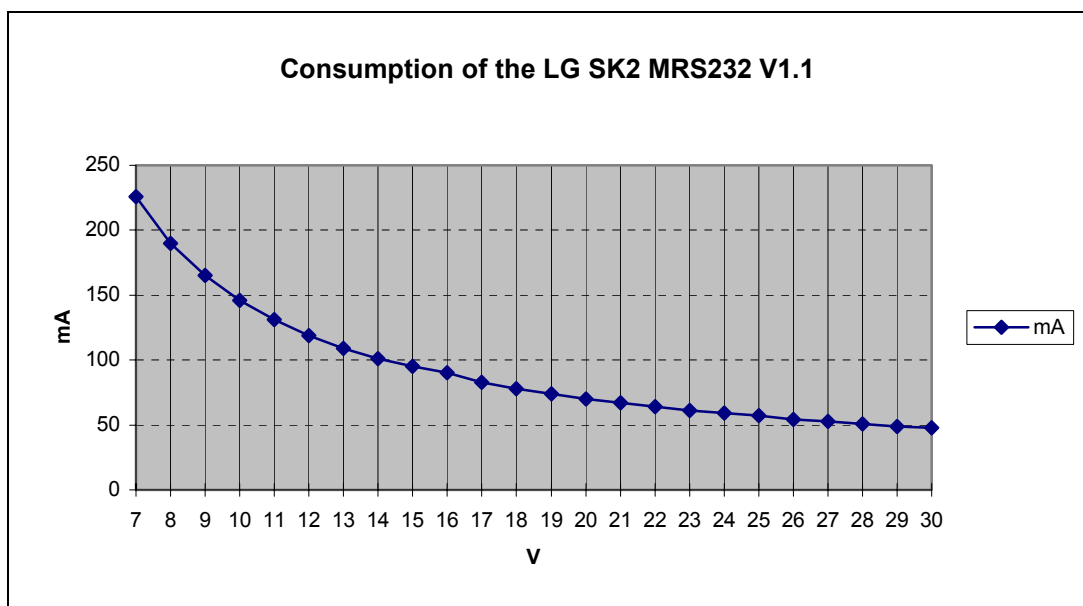
The 2 communication ports are set as standard as follows:

Port 1:

- Input: TSIP protocol, 9600 bauds, 8 bits, odd parity, 1 stop bit
- Output: TSIP protocol, 9600 bauds, 8 bits, odd parity, 1 stop bit

Port 2:

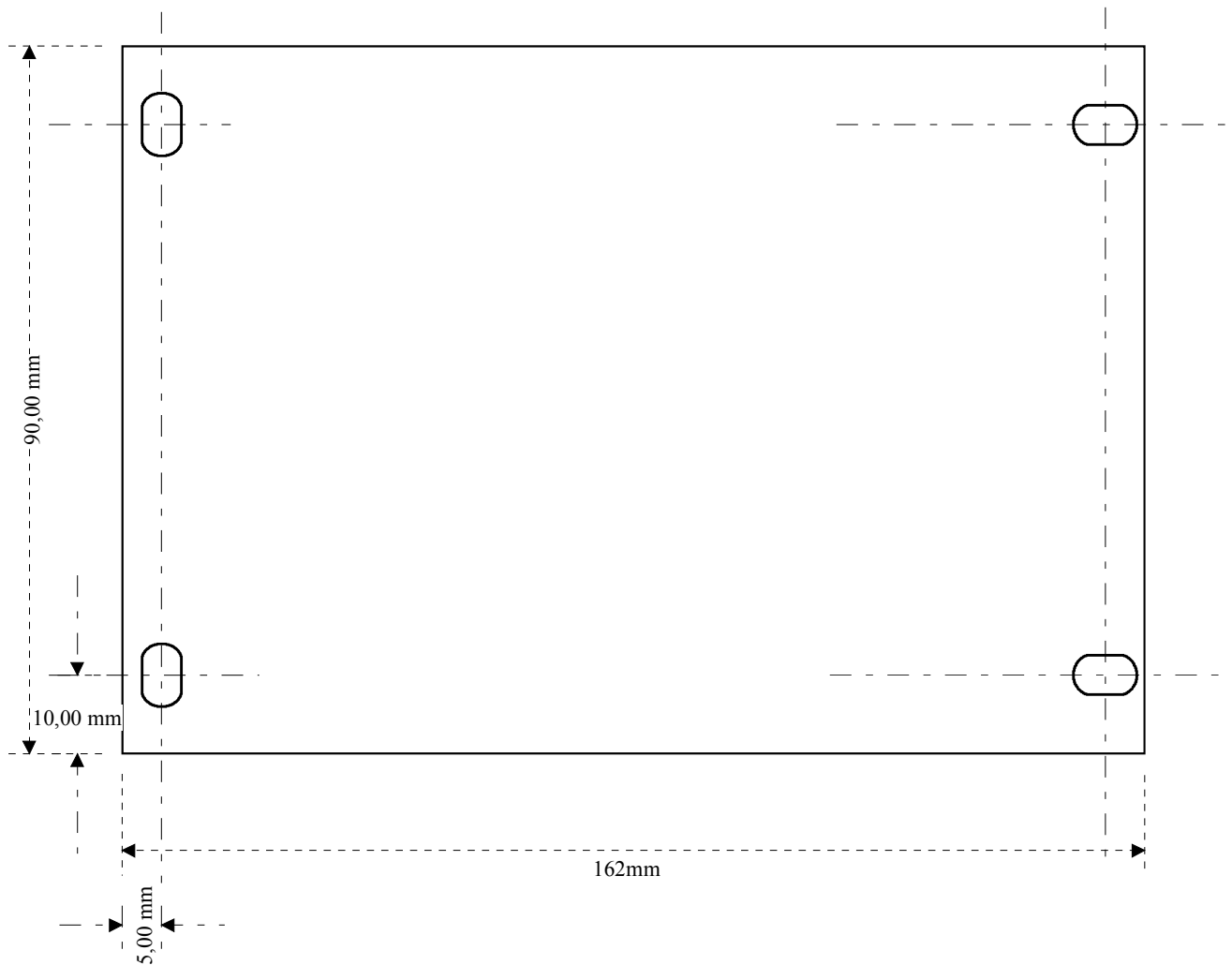
- Input: RTCM protocol, 4800 bauds, 8 bits, no parity, 1 stop bit
- Output: NMEA protocol, 4800 bauds, 8 bits, no parity, 1 stop bit

Power consumption

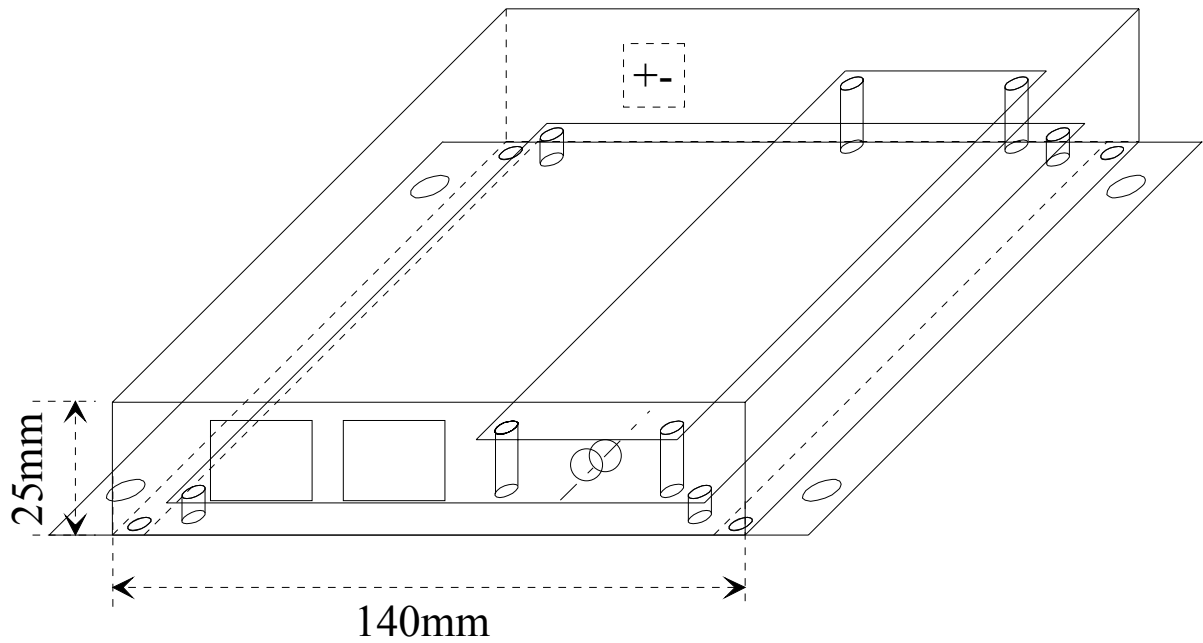
Consumption measured on models in original configuration, connected to a patch type aerial (as the aerals are active, they have an influence on the consumption of the module).

MECHANICAL DRAWINGS

Lower attachment plate:



Upper section:

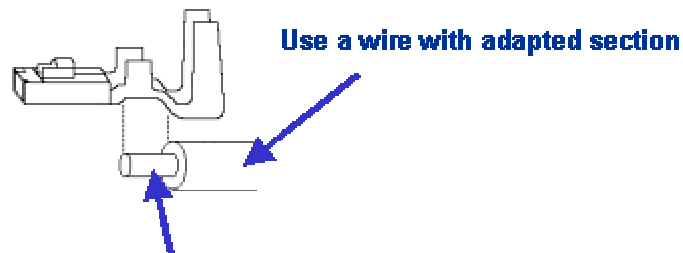


Module dimensions (without the connectors): 162 x 26 x 90 mm

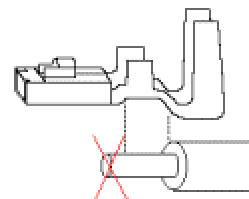
Overall dimensions: 162 x 26 x 100 mm

Annex 1 : Information for assembling and mounting the power connector

Step 1: Preparation

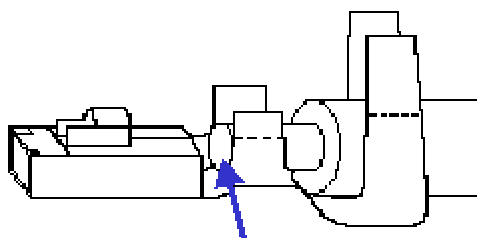


Please strip only the necessary length as described



A too important stripped length could hamper the insertion of the assembled connector

Step 2: Assembling

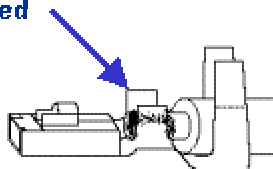


Position the stripped wire in the metal connector

Please don't make exceed the stripped party

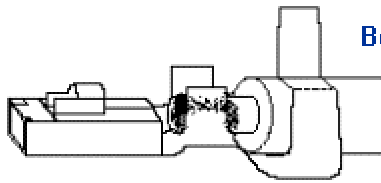
Step 3: Soldering

Put a blob of solder as indicated



Do not overload with solder because it could hamper insertion of the assembled and welded metal connector in the black female receiving part.

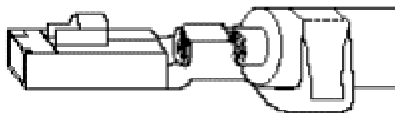
Step 4: Crimping



Begin by setting one of the big flaps around the wire.



Set the second big flap around the first crimping flat.



Set the small flaps of the connector around the weld.

Don't crimp by crushing too much flats, it could hamper the insertion of the assembled metal connector in the black female receiving part.

Important: During final assembling of both metal connectors with the black female receiving part, one should hear a click indicating that connectors are well driven.

Annex 2: GPS accessories

Bullet antenna -35 db

This Bullet GPS Antenna provides a perfect solution for users who need a fixed-sight, rooftop GPS antenna. It is housed in waterproof packaging designed to withstand continuous exposure to shock, excessive vibration, extreme temperatures, water and sunlight

Extend temp (-40°C to + 85°C), F connector, Off-white, all plastic enclosure, 35 db pre-amp with HE pre-amp. Great for marine or stationary timing applications. This antenna is particularly adapted for usage in severe climatically conditions.



Mechanical Fixation Kit



Includes all necessary accessories for a quick assembling on mast or plan (roof, wall) vertical or horizontal. This kit contents:

- one 20 cm hollow tube
- 1 square
- Two 28 mm stirrups
- Two 62 mm stirrups
- 2 screws (8 x 50)
- 2 pegs of 10

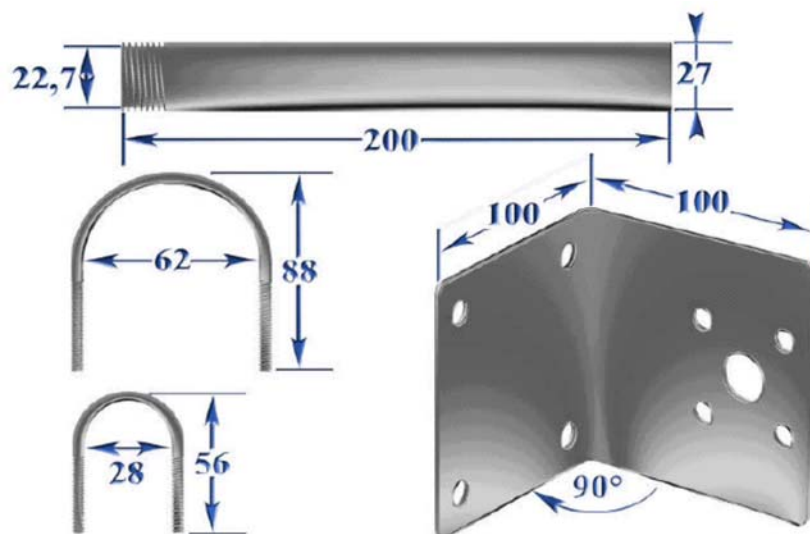


illustration of the mechanical fixation kit