# SATEL Compact-4BT

# Mobile radio modem transceiver

# USER GUIDE

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# 1  IMPORTANT NOTICE

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Salo, FINLAND 2017

# 2  RESTRICTIONS ON USE

SATEL Compact-4BT radio modem has been designed to operate on frequency ranges, the exact use of which differs from one region and/or country to another. The user of a radio modem must take care that the said device is not operated without the permission of the local authorities on frequencies other than those specifically reserved and intended for use without a specific permit.

SATEL Compact-4BT (403-473 MHz) is allowed to be used in the following countries, either on licence free channels or on channels where the operation requires a licence. More detailed information is available at the local frequency management authority.

Countries*:    AT, BE, BG, CY, DK, FI, FR, DE, GR, IS, IE, IT, LU, MT, NL, NO, ES, SE, CH, GB
AU, CA, CZ, EE, HU, LV, LT, PL, PT, RO, SI, SK, ZA, US

* codes of the countries follow the ISO 3166-1-Alpha-2 standard

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**WARNING!** Users of SATEL Compact-4BT radio modems in North America should be aware, that due to the allocation of the frequency band 406.0 – 406.1 MHz for government use only, the use of radio modem on this frequency band without a proper permit is strictly forbidden.

**WARNING!** Users of SATEL Compact-4BT radio modems in Canada should be aware, that operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. (RSS Gen section 7.1.5)

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**Warning – RF Exposure (CP-4BT)**

The minimum safe distance however must be always at least 20 cm.

In addition, this device must not be co-located or operating in conjunction with any other amplifier etc.

**Modification warning statement**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**Class B digital device statement**

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

# 3 PRODUCT CONFORMITY

Hereby, SATEL Oy declares that SATEL Compact-4BT radio modem is in compliance with the essential requirements (radio performance, electromagnetic compatibility and electrical safety) and other relevant provisions of Directive 2014/53/EU. Therefore the equipment is labelled with the CE-marking.

$$\mathsf{C}\mathsf{E}$$

# 4  WARRANTY AND SAFETY INSTRUCTIONS

Read these safety instructions carefully before using the product:

o  Warranty will be void, if the product is used in any way that is in contradiction with the instructions given in this manual, or if the radio modem housing has been opened or tampered with.

o  The radio modem is only to be operated at frequencies allocated by local authorities, and without exceeding the given maximum allowed output power ratings. SATEL and its distributors are not responsible, if any products manufactured by it are used in unlawful ways.

o  The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices is appropriate. This also applies to the maintenance of the products.

## 4.1  Handling the battery operated device and safety issues

To maximize the device battery life a certain precautions should be noticed. If the device is left unused for a long period of time a charging could take place to prevent battery going totally empty. The best way to realize the battery capacity is that if the battery indicator LED is Red or the device won't start normally from the power button. These both conditions indicate that the battery has ran or is running empty.

The best temperature for storing the device is the normal room temperature, around +20°C.

If the batteries cannot maintain a charge for long periods of time or they charge not normal way, this may indicate that the battery is defect.

The performance and life expectancy of the battery depends heavily on how the batteries are used. Misusing the battery operated device may cause the battery to get hot, break or ignite and cause serious injury. Be sure to follow the safety rules listed below:

- Do not place the device in fire or heat the device with external source.
- Do not open or modify the device by any means.
- Do not mechanically abuse the device over its limits or otherwise subject it to strong impacts or shocks.
- Do not use the device to any other purpose that it is intended to.
- Do not use the device if, while using, charging, or storing the device, the device emits an unusual smell, leaks or appears abnormal in any other way.

- Do not place the device in ovens, high-pressure containers, or expose it to high water streams or underwater conditions for long periods.
- In the event that the device leaks battery fluids and the fluid gets into one's eye, do not rub the eye. Rinse well with water and immediately seek medical care. Do not leave it untreated as the fluid could cause damage to the eye.

Be sure to follow the rules listed below while charging the device or operate with the external power supply.

- When charging the device either use a specified cable and power source or otherwise ensure that the charging conditions meet the specifications given in this manual.
- Do not attach the device directly to a mains powered AC supply line. This will cause permanent damage to the device and could lead to an electric shock.
- When the device becomes hot, the built- in safety feature is activated preventing the battery from charging further. If this happens reduce the heat to build up like shutting down the device during charging or placing the device to a cooler place.
- When charging in cold conditions, do not heat up the device to extend its operational temperature range. Bring the device indoors to charge it.
- Do not continue charging the device if it does not recharge within the specified charging time or the charging gives constant error indications. This might indicate that the battery is defect or the charging conditions are out of range.
- It is recommended to use the power supply YP1240 that can be purchased from SATEL Oy or from the local SATEL distributor. If other power supplies are used the safety and performance are not guaranteed.

# 5  DESCRIPTION OF THE PRODUCT

SATEL Compact-4BT is a UHF radio transceiver modem. It provides a transparent data link with other SATEL Compact-4BT or SATELLINE-EASy family modems (SATELLINE-EASy, -TR1, -TR3, -TR4, -R3, -EASy Pro, -4Pro, SATEL Compact-Proof and EASy-Proof). SATEL Compact-4BT can be interconnected to a data terminal or similar devices by three different transmission standards; USB, RS-232 or Bluetooth. Data is further transmitted via UHF data modem.

SATEL Compact-4BT contains a circular M12 connector for USB/RS-232 and TNC for UHF radio modem, Bluetooth antenna is integrated.

SATEL Compact-4BT contains an integrated rechargeable Li-Ion battery pack which maintains the operation without external supply. Internal battery is not removable or serviceable by the user.

SATEL Compact-4BT is intended to use inside or outside environment and fulfills IP67 ratings (1meter / 30minutes). See more detailed description on chapter "Technical Specifications".
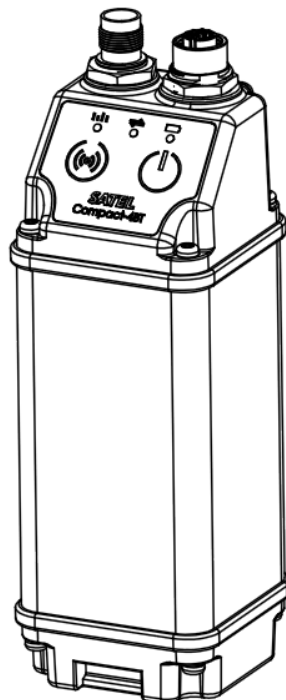


Figure 1.0 SATEL Compact-4BT radio data modem
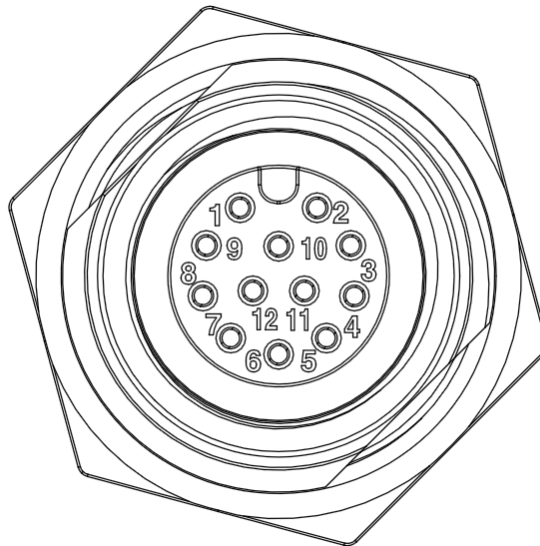
# 6  USER INTERFACE

## 6.1  Data/DC-supply interface



Figure 1.1 M12 circular connector and its pin configuration

| PIN | SIGNAL NAME | DIRECTION | DESCRIPTION |
|---|---|---|---|
| 1 | USB D+ | IN/OUT | USB data positive |
| 2, 5, 6 | GND | | DC supply- and Signal ground |
| 3 | TXD | IN | Transmit data (V.24 level) |
| 4 | RXD | OUT | Receive data (V.24 level) |
| 7, 8 | +V | IN | **Supply voltage, 12-30 V (+/- 10%) |
| 9 | USB D- | IN/OUT | USB data negative |
| 10 | RTS | IN | Handshake (V.24 level) |
| 11 | CTS | OUT | Handshake (V.24 level) |
| 12 | +VUSB | IN | USB Supply voltage 5V |

** DC input should be used with 3A fuse for protection.

## 6.2  LED indicators and buttons

| SYMBOL | NAME | COLOR | DESCRIPTION |
|---|---|---|---|
| ⅰ₀ⅰⅰ | Bluetooth status | Blue | All devices can pair and connect |
| | | Red | Only ( 10 most recent ) paired devices can connect |
| ⇌ | Data / Mode | Green | CP-4BT is on |
| | | Red | Receives or transmits data over the serial interface |
| ▭ | Battery status (Power supply connected) | Green blink | Charging ongoing |
| | | Green static | Charging complete |
| | | Red blink | Charging error |
| | Battery status (During battery operation) | Green | Battery level is full |
| | | Orange | Battery level is fair |
| | | Red | Battery level is low |
| ((•)) | Bluetooth button | | Enable / disable Bluetooth |
| ⏻ | Power button | | Power on / off |
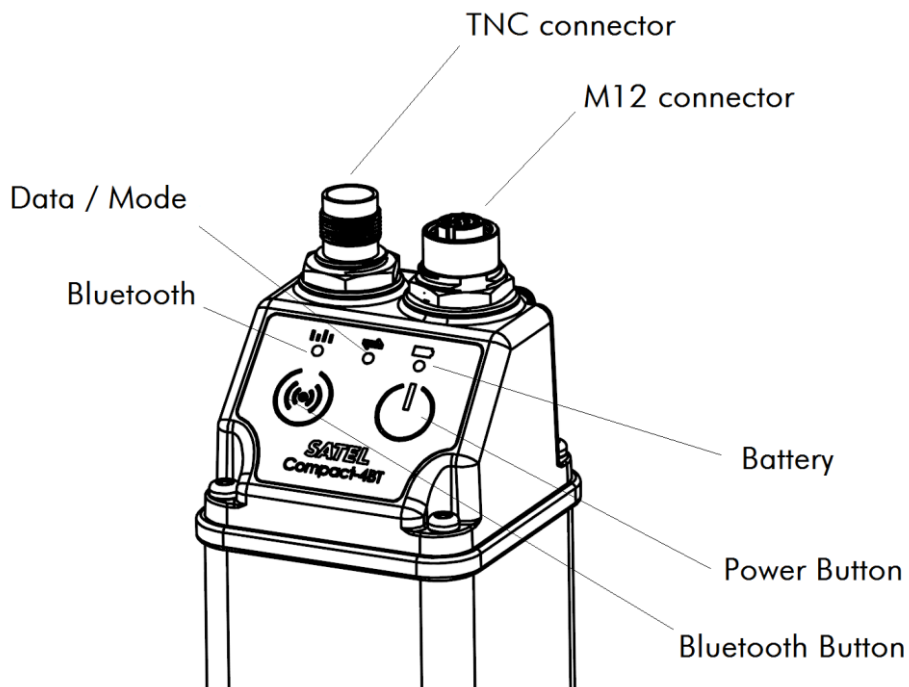


Figure 1.2 User interface

## 6.3 <u>RF interface</u>

The SATEL Compact-4BT has a single TNC female connector with impedance of 50 Ohm.

The output power of the transmitter is adjustable between 100, 200, 500 and 1000 mW. The greatest allowable power depends on limits set by local authorities, which should not be exceeded under any circumstances. The output power of the transmitter should be set to the smallest possible level, which still ensures error free connections under variable conditions. Large output power levels using short connection distances can, in the worst case, cause disturbances to the overall operation of the system.

> **NOTE!**
> Setting the radio data modem output power level to that which exceeds the regulations set forth by local authorities is strictly forbidden. The setting and/or using of non-approved power levels may lead to prosecution. SATEL and its distributors are not responsible for any illegal use of its radio equipment, and are not responsible in any way of any claims or penalties arising from the operation of its radio equipment in ways contradictory to local regulations and/or requirements and/or laws.

## 6.4 <u>Modem start up</u>

SATEL Compact-4BT is operated by two push buttons. Operational states are shown with three LEDs and different LED colours. To turn on CP-4BT push Power button continuously for three seconds. Battery LED and DATA/Mode LED will illuminate. To turn off SATEL Compact-4BT push power button continuously for three seconds.

Pushing power button continuously for 10 seconds SATEL Compact-4BT will internally reset.

## 6.5 <u>Bluetooth</u>

To turn on Bluetooth push Bluetooth button for three seconds. Bluetooth LED starts to blink Blue. To turn off Bluetooth push Bluetooth button for three seconds. Bluetooth LED will go off.

If Bluetooth was enabled when device was operational Bluetooth will start next time automatically when device is switched on. If Bluetooth was disabled when device was operational Bluetooth will remain off during next time device is switched on.

After enabling Bluetooth LED will blink Blue. During this period all devices can find, pair and connect. After two minutes LED will switch to Red and further on no new devices can pair but (10 most recent) paired devices can connect.

SATEL Compact-4BT is possible to set to a Bluetooth remote mode. Remote mode allow users to switch on the device remotely only by creating a connection to Bluetooth. To set the device to a remote mode Bluetooth should be enabled when the device is off by pushing the Bluetooth button for three seconds.

Notice that Bluetooth uses an internal antenna, so no external antenna is required. Bluetooth antenna is positioned on a bottom of the device so for the best performance the internal antenna should not be blocked or screened by metal objects set close to the housing.

## 6.6 Data transfer via SATEL Compact-4BT

Data can be sent via Bluetooth, USB or RS-232 which are ON simultaneously so no extra setting is needed to choose which port shall be opened, choosing the data port is done by selecting the dedicated cable.

If Bluetooth port is used for data transmission USB and RS-232 ports are also operational. User should not send data to two different ports simultaneously as this might corrupt the data.
All serial ports including Bluetooth do not output or pass through data to other serial ports, all data input is directed to internal UHF modem.

If Bluetooth data transmission is required Bluetooth must first pair and connect with SATEL Compact-4BT.

## 6.7 Charging the battery

SATEL Compact-4BT contains a Li-Ion battery which can be charged from external DC supply. The device can be operated either battery powered or external DC supply powered. During the external DC supply internal battery is charged. This influence the power consumption from the external source up till 2 Amps @ 12V. When external DC supply is connected all power is drained from that source. After battery is fully charged the external DC supply will continue to feed the device hence not draining the battery. DC supply can be disconnected at any time or it can be left connected all times.

When external DC supply is connected Battery LED will illuminate Green or blinking Green when charging is ongoing.

If during the charging Red LED starts blinking there is an internal error in charging process. Error can occur in a following circumstances; charging temperature is too low or high, maximum charging time has exceeded, battery absent or defect. In a case of error occurrence assure that the device is in a proper temperature range. Notice that inner temperature may be different than outside, or the device may take a while to cool down or heat up. If charging takes too long or behaves not normal, battery may be defect. In this case contact manufacturer for further instructions.

## 6.8 <u>Battery capacity</u>

A good practise is to minimise battery consumption during the operation as this can dramatically extend the operational time. The best way to minimize battery drainage is to use as little Transmit power as possible. If Transmission distances are short, output power of 100 mW could be adequate. As well the device should be switched off if not in use.

Below are the typical operational times in various conditions.

| Condition, +20°C | Operation | Notes |
|---|---|---|
| Transmit, 50 % duty cycle, 1 W output | 6 hours* | |
| Transmit, 50 % duty cycle, 500 mW output | 8 hours* | |
| Receiver | 20 hours* | |
| Bluetooth only | >20 days* | discoverable mode |
| Power off | >1 year* | |
| Charging | 4 hours | empty → full |
| Cycle life | >500** | full charge - discharge cycles |

\*    In -20 °Celsius operational times can decrease 40 %.
\*\*   Due to the Li-Ion battery technology capacity will slightly decrease after each cycle effecting directly to the operation times.

## 6.9 <u>Battery maintenance</u>

Li-Ion battery technology requires some maintenance procedures to optimise its longevity during use and storage. SATEL Compact-4BT uses its internal battery to some minor functionalities even if the unit is set to OFF. This means that the battery is constantly drained and will eventually deep discharge the battery which radically effects its durability. Therefore it is essential to maintain the battery charge state even if the unit is stored and not used for longer periods. The simple way to maintain the battery condition is to keep the unit in a room temperature and periodically charge it fully every 6 months.

# 7 TECHNICAL SPECIFICATIONS

SATEL Compact-4BT complies with the following international standards:
- o EN 300 113
- o EN 300 489 (EMC)
- o IEC 60950 (safety)
- o CFR47 part90

*Values are subject to change without a notice.*

|  | RECEIVER | TRANSMITTER | Note! |
|---|---|---|---|
| Frequency Range | 403 ... 473 MHz | | |
| Tuning range | 70 MHz | | |
| Minimum RF Frequency Step | 6.25 kHz | | |
| Channel Bandwidth | 12.5 kHz / 25 kHz | | Programmable |
| Frequency Stability | <1 kHz | | |
| Maximum Receiver Input Power without Damage | +14 dBm | | |
| Maximum Receiver Input Power without Transmission Errors | -10 dBm | | FEC ON |
| Sensitivity | -112 dBm @ 25 kHz -116 dBm @12.5 kHz | | FEC ON |
| Blocking | > 86 dB @ 25 kHz > 88 dB @ 12.5 kHz | | FEC ON |
| Intermodulation Attenuation | > 61 dB @ 25 kHz > 61 @ 12.5 kHz | | FEC ON |
| CO-Channel Rejection | > -11 dB @ 25 kHz > -10 dB @ 12.5 kHz | | FEC ON |
| Adjacent Channel Selectivity | > 56 dB @ 25 kHz > 51 dB @ 12.5 kHz | | FEC ON |
| Spurious Rejection | > 67 dB | | FEC ON |
| Typical Power Consumption Note 1. | Charging | 12 V: 7.4 W | RX-OFF |
| | Charging + RX | 12 V: 8.4 W | RX-mode |
| | Charging + TX | 12 V: 13.2 W @ 1 W RF | TX-mode, Continuous, 50Ω |
| | Device OFF | 12 V: 0.46 W | Not Charging |
| | RX | 12 V: 1.32 W | Not Charging |
| | TX | 12 V: 5.8 W @ 1 W RF | |
| Transmitter Power (programmable) | | 0.1, 0.2, 0.5, 1 W | TX-mode, 50Ω load |
| Communication Mode | Half-Duplex | | |
| Adjacent Channel Power | | acc. to EN 300 113 | TX-mode |

| | | | |
|---|---|---|---|
| Transient Adjacent Channel Power | | acc. to EN 300 113 | TX-mode |
| Carrier power stability | | < ±1.5 dB | |

Note 1: Power consumption is measured using an external power source.

| | DATA MODEM | Note |
|---|---|---|
| Electrical Interface | RS-232 / USB | |
| Bluetooth | Bluetooth 2.1 / BLE | |
| Interface Connector | M12 Circular | |
| Data speed of I/O-interface | 9600 – 115200 bps | |
| Data speed of Radio Interface | 4FSK FEC OFF: 19200 bps (25 kHz) 9600 bps (12.5 kHz)<br>4FSK FEC ON: 14400 bps (25 kHz) 7200 bps (12.5 kHz)<br>8FSK FEC OFF: 28800 bps (25 kHz) 14400 bps (12.5 kHz)<br>8FSK FEC ON: 19200 bps (25 kHz) 9600 bps (12.5 kHz)<br>16FSK FEC ON: 28800 bps (25 kHz) 14400 bps (12.5 kHz) | |
| Data Formats | Asynchronous data | |
| Air Interface Encryption | AES128 | Programmable |
| Modulation | 4FSK, 8FSK, 16FSK, GMSK | |

| | GENERAL | Note |
|---|---|---|
| Operating Voltage | +12 … +30 Vdc +/- 10% Vdc | External DC supply |
| Temperature Range | Type approval condition: -25 ... +55 °C. | |
| Battery pack | 2S1P, 7.4V 3350 mAh Li-Ion | |
| Charging condition | 0 °C ... +45 °C | |
| Temperature Ranges | -25 °C ... +60 °C | Battery operated |
| | -40 °C ... +85 °C | Operational |
| | -25 °C ... +55 °C | Complies with standards |
| | -40 °C … +85 °C | Storage |
| Antenna Connector | 50 Ω, TNC female | |
| Housing | Shielded / bare PCB  inside metal / plastic housing | |
| UHF Antenna | External | |
| Bluetooth antenna | Internal | |
| Size L x W x H | 165 mm x 55 mm x  55 mm | overall height |
| IP rating | IP67 | 30min / 1meter |
| Mechanical Properties | IEC60068-2-32, ISO9022-36-08, ISO9022-31-06, ISO9022-33-06 | |
| Weight | 420 g | |

| | OTHER MEASURES | Note |
|---|---|---|
| ESD-failure threshold | 8 kV contact, 15 kV air discharge | |
| Immunity test | 10 V/m | |

# 8  MODEM SETTINGS

## 8.1  Default settings

The radio modem is delivered with the following default settings (unless otherwise specifically ordered):

| DEFAULT VALUES  OF THE ADJUSTABLE SETTINGS ( the user can change these settings later on ) | | |
|---|---|---|
| | | |
| Setting | Default value | Range |
| Radio frequency | | |
| Operating TX frequency | 438.000  MHz | Range: 403-473 MHz |
| Operating RX frequency | 438.000  MHz | Range: 403-473 MHz |
| Reference Frequency | 438.000 MHz | Range: 403-473 MHz |
| Channel Spacing | 25 kHz | Range: 12.5 kHz or 25 kHz |
| | | |
| Radio settings | | |
| TX Power | 1000 mW | Range: 100, 200, 500 or 1000 mW |
| Signal threshold | -115 dBm | - 80 … -118 dBm |
| TX-Start Delay | 0 ms | 0-65535 ms |
| Radio Compatibility | SATELLINE 3AS | SATELLINE 3AS<br>PacCrest-4FSK<br>PacCrest-GMSK<br>TrimTalk450s(P)<br>TrimTalk450s(T)<br>PacCrest-FST<br>SATELLINE 2ASx<br>SATELLINE 3AS-1<br>SOUTH<br>SATEL 8FSK-1<br>SATEL 8FSK-2<br>SATEL 16FSK-1 |
| | | |
| Addressing | | |
| RX Address | OFF | ON/OFF |
| TX Address | OFF | ON/OFF |
| | | |
| | | |
| Serial port | | |
| Data speed | 115200 bps | 1200 – 115200 bps |
| Data bits | 8 | 8 |
| Parity bits | None | None, Even, Odd. |
| Stop bits | 1 | 1 |
| | | |

| | | |
|---|---|---|
| **Handshaking** | | Handshaking lines apply to the DATA-port. |
| CTS | TX buffer state | Clear to send, TX buffer state |
| CD | *not supported* | RSSI- threshold, Data on channel,    Always ON. |
| RTS | Ignored | Ignored, Flow Control, Reception Control. |
| Pause length | 3 bytes | 3….255 |
| | | |
| **Additional setup** | | |
| Error correction, FEC | OFF | ON/OFF |
| Error check | OFF | OFF, CRC8Partial, CRC8Full, CRC16Full |
| Repeater Mode | OFF | ON/OFF |
| SL-commands | ON | ON/OFF |
| TX Delay | 0 | 0 …. 65535 ms |
| Over-the-Air-Encryption | OFF | ON/OFF |
| Use Channel List | OFF | ON/OFF |
| Power Save Mode | OFF | ON/OFF |
| Add RSSI to Data | OFF | ON/OFF |
| | | |

## 8.2 Configuration

The configuration of SATEL Compact-4BT radio modem can be modified by connecting the modem to the PC and using SATEL Configuration Manager (CM). Programming is done using RS-232 or USB port. The RS-232 serial port settings must match between SATEL Compact-4BT and Configuration Manager. SATEL terminal program SaTerm supports also SATEL Compact-4BT configuration.

### 8.2.1 <u>Controlling the device with Configuration Manager</u>

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

### <u>QuickStart</u>

Preliminary settings:

1. Save the SATEL Configuration Manager, SATEL_Configuration_Manager.help and the SatelNMS.ID to the same directory. If available, save also the Firmware to the same directory.
2. Connect the modem module to the PC using either YC0401 DC/USB or YC0400 DC/RS232 or Bluetooth.

3. Connect supply power to the module. Check that you have the correct Supply Voltage.

4. Open the SATEL Configuration Manager program. Check from the "Program Preferences" tab, that you have selected correct COM-port number and that the Baud rate is set to 9600 (when programming adapter is used, and according to the modem serial port data rate, when the direct data cable is used.)

5. To establish connection between the modem and the PC, press the blue Connect tab. To get the radio modem info, press blue Read Settings tab. Now all the information from the modem is available.

6. Changed serial interface parameters are taken in use immediately.

For more information about Configuration Manager can be found from User Guide. www.satel.com
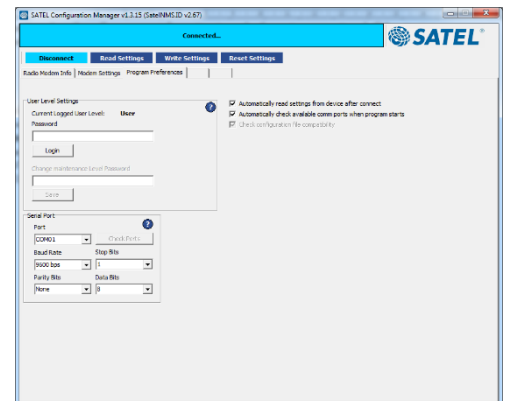
### 8.2.2  Controlling the device with SaTerm software

1. Start the "Satelline_Saterm.exe" software.
2. Click on the "New Terminal" button.
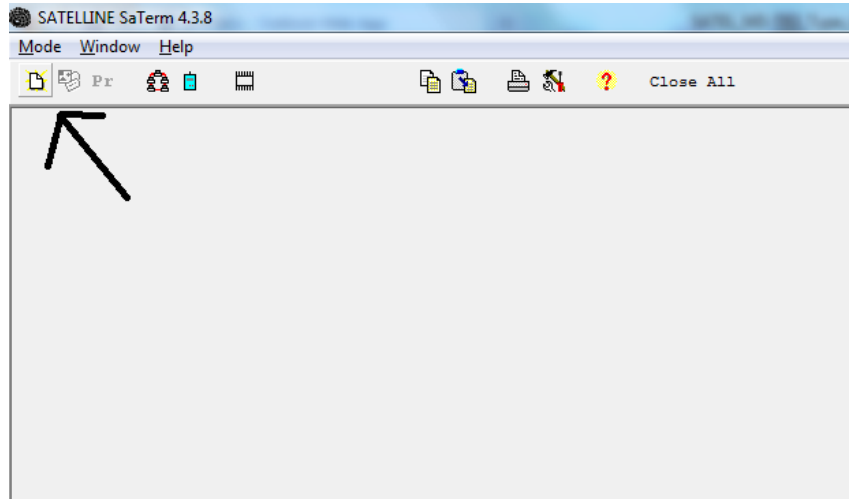


3. The "Serial Port Setup" window will appear. The settings should be as in the picture below except Port number should be changed to correspond with the COM port in use. Baud rate should be 115200, parity none, data bits 8 and stop bits 1. After settings are in order, click "OK".
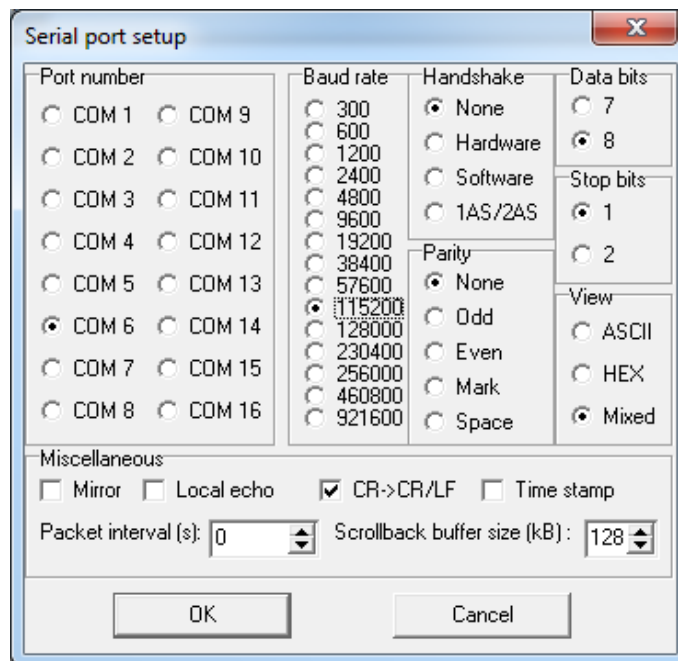
4. Now a terminal window appears. This window shows all the commands to the module and its responses. Any characters typed into the terminal will be transmitted by the modem.
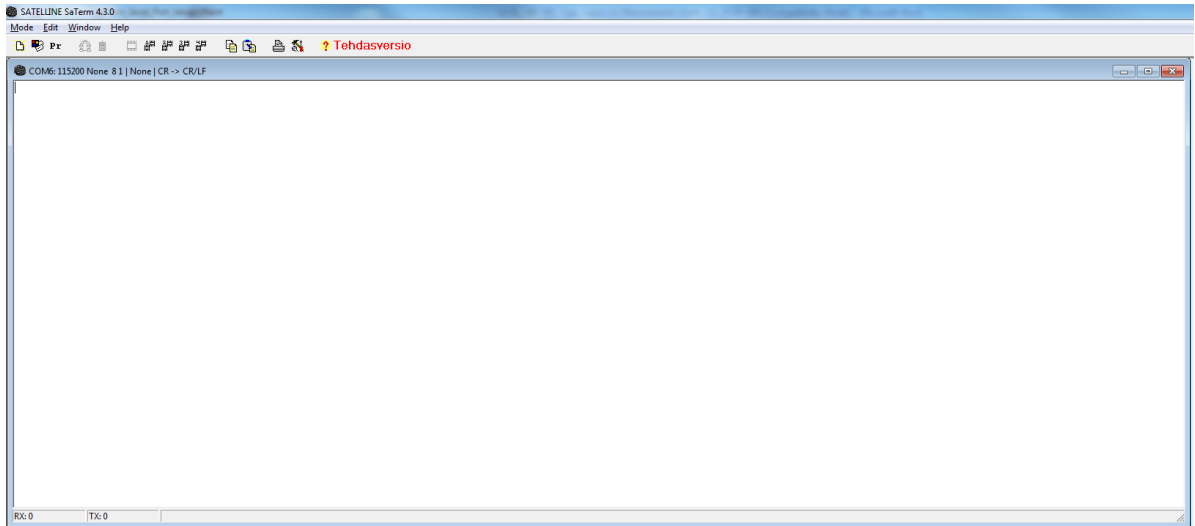


5. SL commands are transmitted via the "Transmit" window. Right click on the terminal and a menu will appear. Select "Transmit".
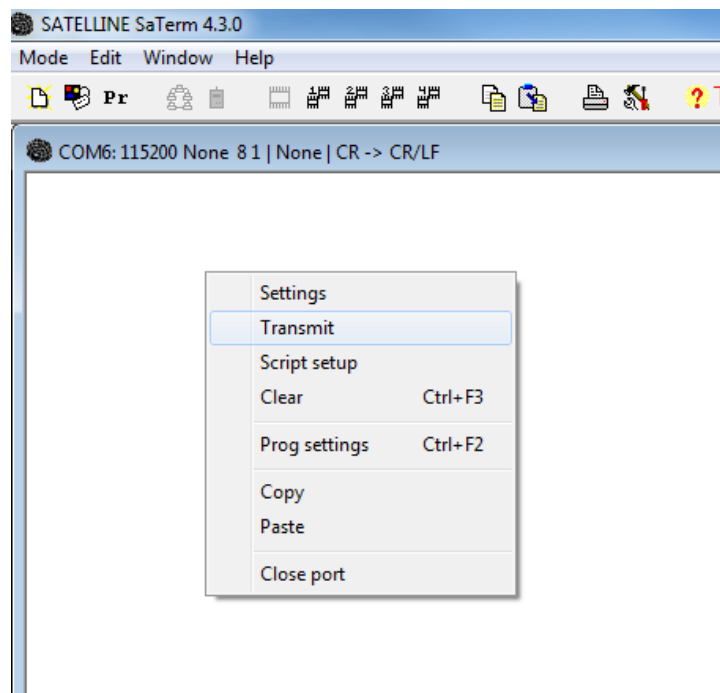
6. Type the desired command into the Transmit window and send it to the module by clicking "Send". The module response will appear at the terminal.
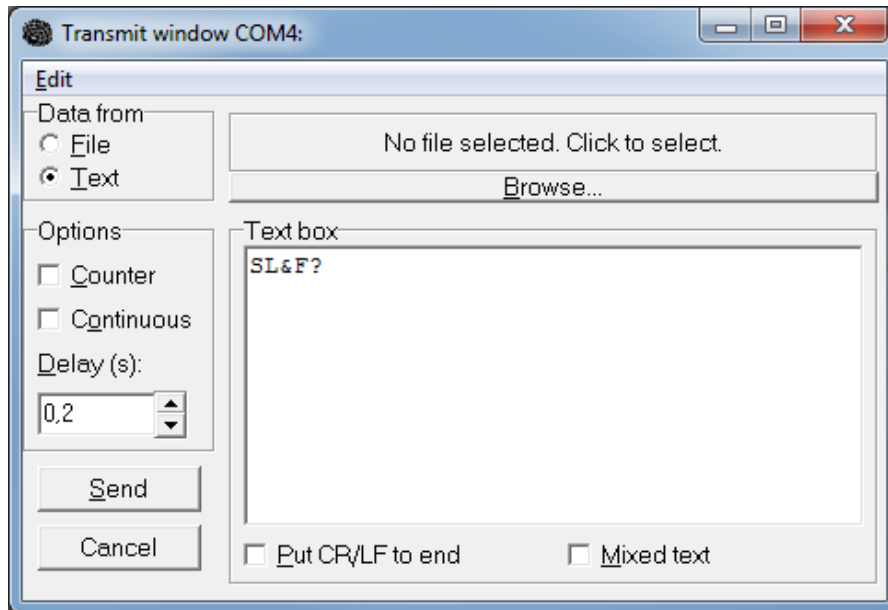


In the example above, the module active frequencies are queried. The active RX and TX frequencies are then shown at the terminal.  To write commands the module should reply "OK".

If settings are altered with SL commands the data must be stored to a non-volatile memory as a last command "SL**>" .. Without the SL**> data is not stored and is lost during the next power up.

### 8.2.3 <u>Using a mobile application</u>

SATEL Compact-4BT configuration can also be modified by Mobile application NETCO Mobile. When mobile application is used a Bluetooth is needed for data transmission.
Mobile application can be downloaded from Android PLAY-shop or Apple Store with the name of "SATEL NETCO Mobile".

Once the application is installed, an icon is placed on a home screen of the device.
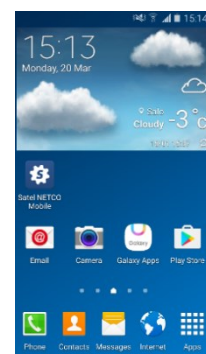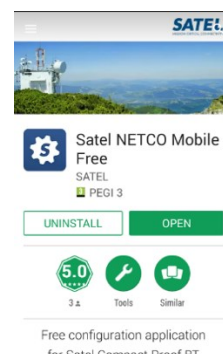
To be able to use SATEL Compact-4BT with Bluetooth it first should be paired with the user device where SATEL NETCO is installed. The pairing is similar what other Bluetooth devices use in general and in Android devices pairing is done through "Settings" → "Bluetooth".

Pairing is allowed only if the blue LED is blinking. After two minutes blue LED turns to red, now only paired devices can connect. There is a memory of ten (10) most recent paired devices which are sequentially replaced when new devices are paired.

When Bluetooth red LED is blinking and pairing is no longer possible, turn off the Bluetooth and restart it by again pushing the Bluetooth button. This will start a new two minute period for pairing.

Once the pairing is accomplished, using the application is very straightforward. Open the SATEL NETCO Mobile application and search for nearby Bluetooth devices. Once the SATEL Compact-4BT is found, simply connect to it.

1. Choose the connection style "Bluetooth"
2. Connect to a found device "CP-4BT"
3. Choose "Configuration" to change modem parameters.
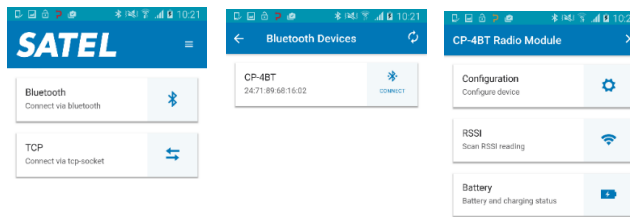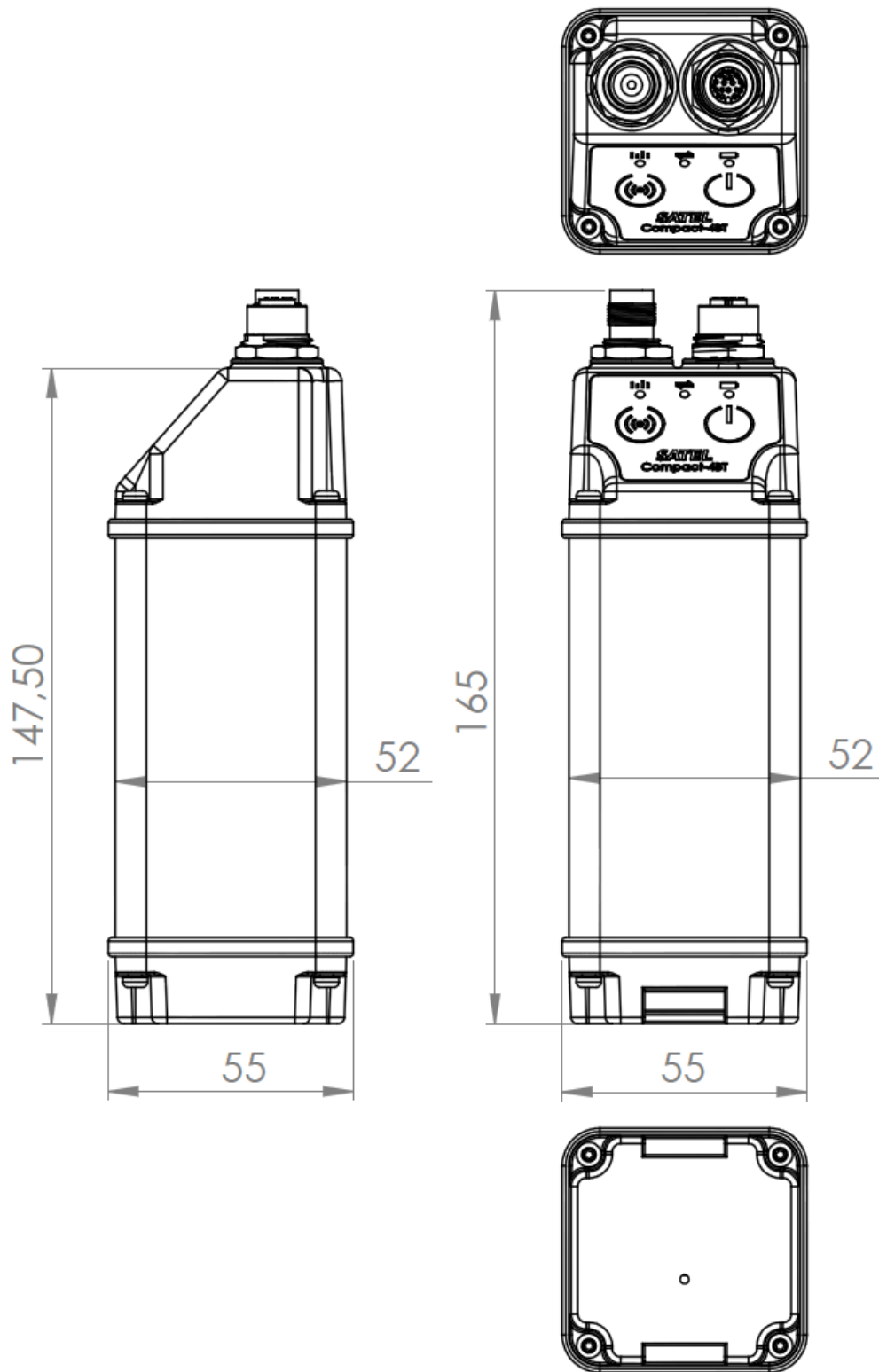
# 9 MECHANICAL DIMENSIONS



Figure 1.3 Mechanical dimensions

# 10 ACCESSORIES

## 10.1 Data cable

SATEL Compact-4BT can be connected to a terminal device by two additional cables, YC0401 DC/USB and YC0400 DC/RS232.
YC0401 is intended for RS-232 serial transmission and YC0400 is intended for USB transmission. Cables allow the interconnection to USB port or to RS-232 port by D-SUB 9pin female connector. There is also on both cables a DC plug of 5.5 mm / 2.1 mm to the external DC supply.

M12 cable connector has an alignment notch to position itself together with the connector on the device. Do not turn the connector against the counterpart to find the alignment notch as this might damage the connector. Find the correct position before trying to mate the connectors. Once they mate, press the connector down and lock it by turning the knurled ring till the connector is fully locked.

D-SUB9 has a securing screws which should be closed for reliable connection.

DC-plug does not have a locking mechanism and is based on a friction only.
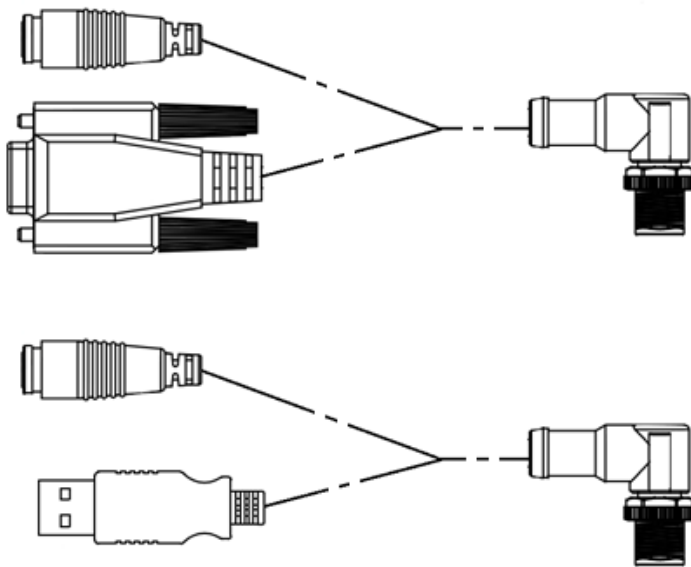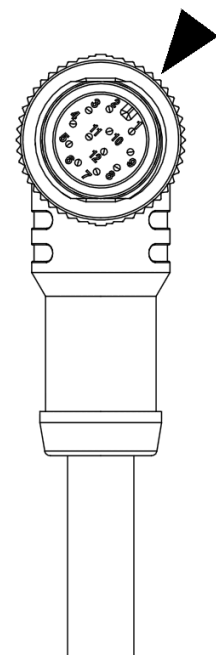
Figure 1.4 Cable assemblies YC0401, YC0400

Figure 1.5 Alignment notch

## 10.2 **Mechanical attachments**

SATEL Compact-4BT can be attached in multiple ways to, wall, tripod, pole or round objects by selecting the right mechanical attachment method.

### 10.2.1 **Rubber cover**

Rubber cover (MD0037) can be used to minimize the handling impacts from all directions creating a robust shield to resist, shock, vibration and drop. It also can hold a multipurpose metal insert to function as a platform for screws, belts or straps (ME0532) and acts as a hook to hang on to a tripod (ME0531).

Cover can be attached without tools just simply sliding it over the SATEL Compact-4BT by pushing the top of the device first from the front side in to its position and then bottom should follow. Some slight bending of the cover should be used to get the cover to its position.
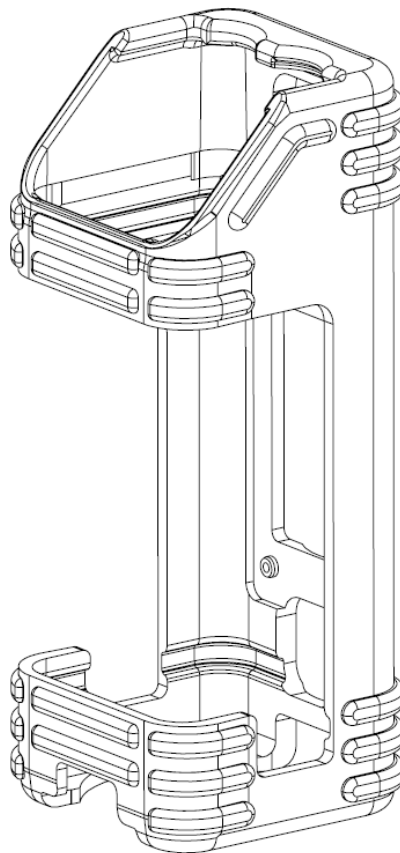


Figure 1.6 Rubber cover

## 10.2.2      Multipurpose attachment bracket

SATEL Compact-4BT can be attached to different locations by using metal brackets. These multipurpose brackets should be combined with the rubber cover to become functional. Bracket is first inserted to its position inside the rubber cover before its usage. Bracket B is specially used for hooking setups for tripods or other similar positions. Bracket A is used for wall and strap attachments. Bracket A is 1 mm and bracket B is 2 mm thick, stainless steel.
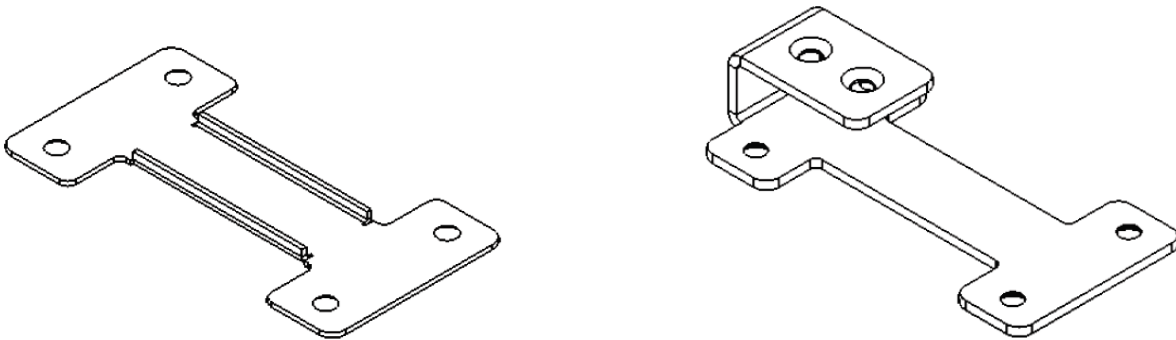


Figure 1.7 Multipurpose brackets A (ME0532) and B (ME0531
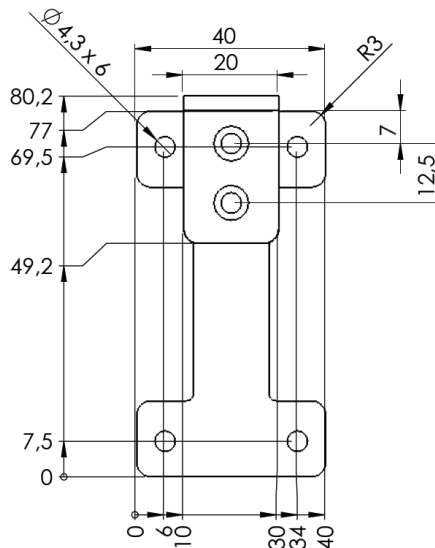


Figure 1.8 Multipurpose bracket B dimensions

### 10.2.3      <u>Mast attachment clip</u>

SATEL Compact-4BT can be attached to top of the mast or a tripod with 5/8"-11 UNC thread with fast attachment clip mechanism. This clip is available soon, ask more from manufacturer. Clip mechanism allows user to attach the device quickly to the mast and remove it for charging or for transportation.

Clip mechanism is intended for use in normal environment and handling. Its mechanism is designed to release in a case of an impact beyond normal manoeuvres to protect the mast and the device and this way keep them both intact. In heavy collisions clip mechanism acts as a fuse between the mast and the device, and can break giving a good chance to device itself to survive. In this case the broken part should be replaced.

Clip mechanism should be attached the rigid clip side first and then pressing the device downwards till the spring loaded lever "klicks" to its position. Lever can be released by pressing down the lever and lifting the device off.
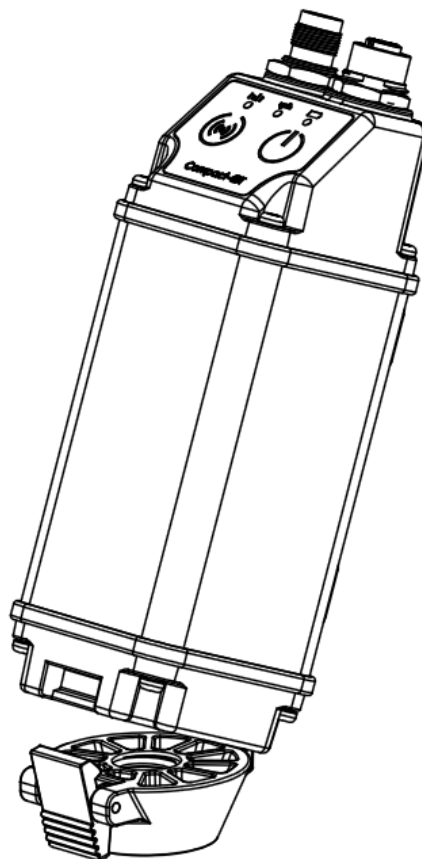


Figure 1.9 Clip mechanism.

**10.2.4**     **<u>Clamp attachment</u>**

SATEL Compact-4BT can be attached to an object, like pole, with an adjustable clamp. The clamp allows user to attach the device quickly and remove it for charging or for transportation. The clamp is used with a multipurpose bracket B and the rubber cover with UNC 8#-32 x 3/8 screws (supplied with the clamp). Suitable diameter to clamp to can be between 18–40 mm.
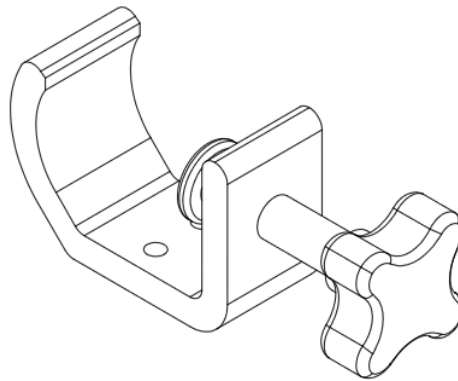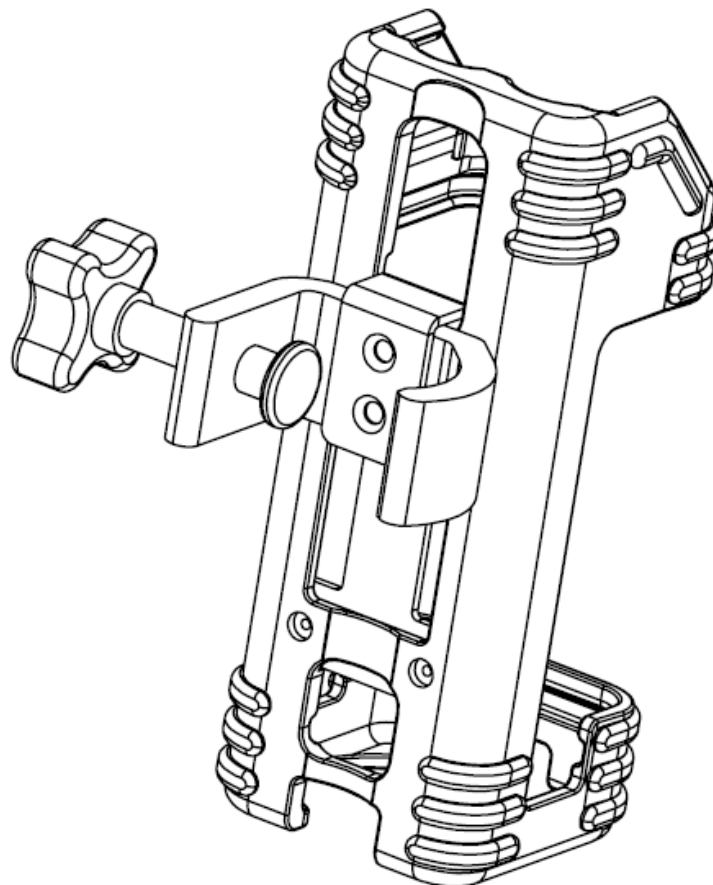


Figure 2.0 Clamp mechanism.



Figure 2.1 Clamp attachment with a rubber cover.

## 10.3 <u>Power source</u>

To connect the device to an external DC supply a power source of YP1240 AC adapter 40W can be used. Any other power source do as well as long as it comply the voltage- and current requirements given in this manual. Power supply DC jack is 5.5 mm / 2.1 mm. Inner pin is positive. AC inlet connector is: (IEC 60320-2-2) type E (C14) male.
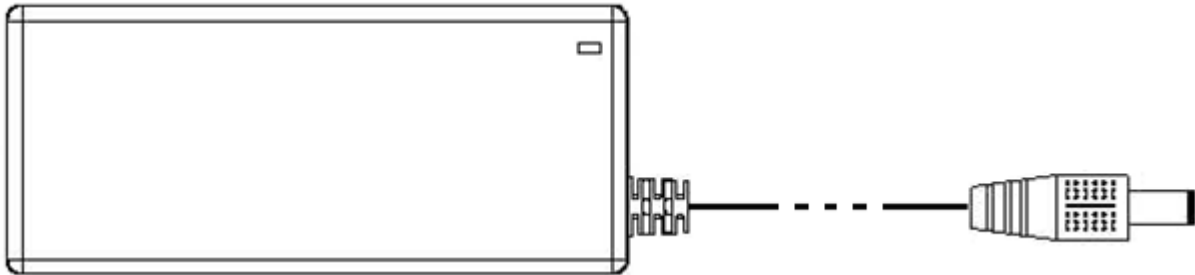
Figure 2.2 Power supply 240 AC / 12VDC

## 10.4 <u>Car lighter plug</u>

Mobile charging can be accomplished by car lighter plug adapter cable. Will be available soon, ask more from manufacturer. This allows SATEL Compact-4BT to be charged from any vehicle having a socket for this universal plug. This cable has an internal fuse protection.
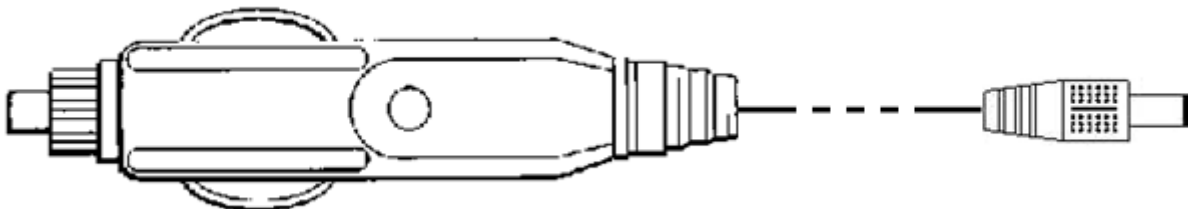
Figure 2.3 Car lighter plug cable