



Global Infrastructure & Security Solutions

SatPack COBALT

Pointing manual SHORTED



www.giss.pl

SatPack COBALT

- Modular construction SWaP-C
- Light weight (easy to carry by a single operator)
- Bands available: X, Ku, (Ka coming)
- Output power:
 - up to 20W passively cooled
 - up to 40W actively cooled
- Antenna size: from 60cm up to 130cm
- Integrated antenna pointing system, enabling to point out the antenna in less than 5 minutes
- Intuitive and easy to use



Terminal setting-up manual

Ku-Band

Tripod setup



First, spread the tripod on a possibly flat and even surface in such a way that the leg with the power supply holder was directed in the direction of "looking" of the reflector. The legs should be extended to the maximum span of the rubber feet.

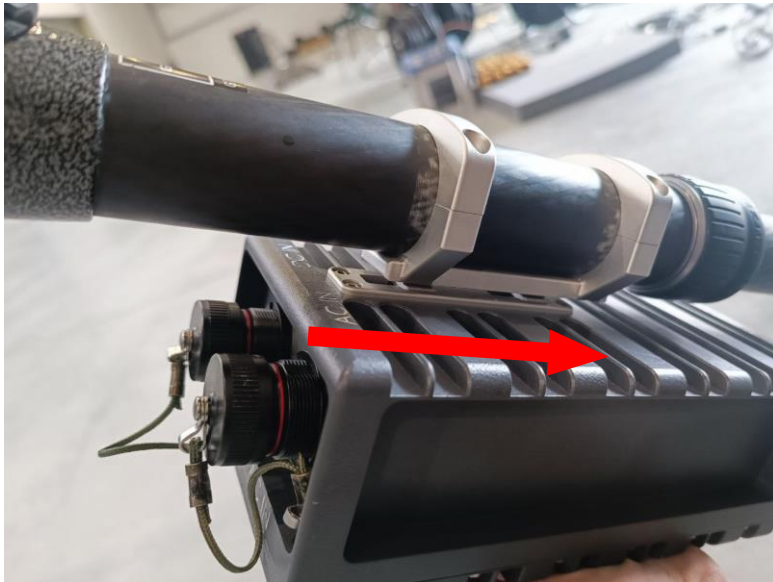
Tripod leveling

The next step is to set the tripod horizontally so that the bubble in the vial is within the black circle. The knobs on each leg can be used to adjust the level.



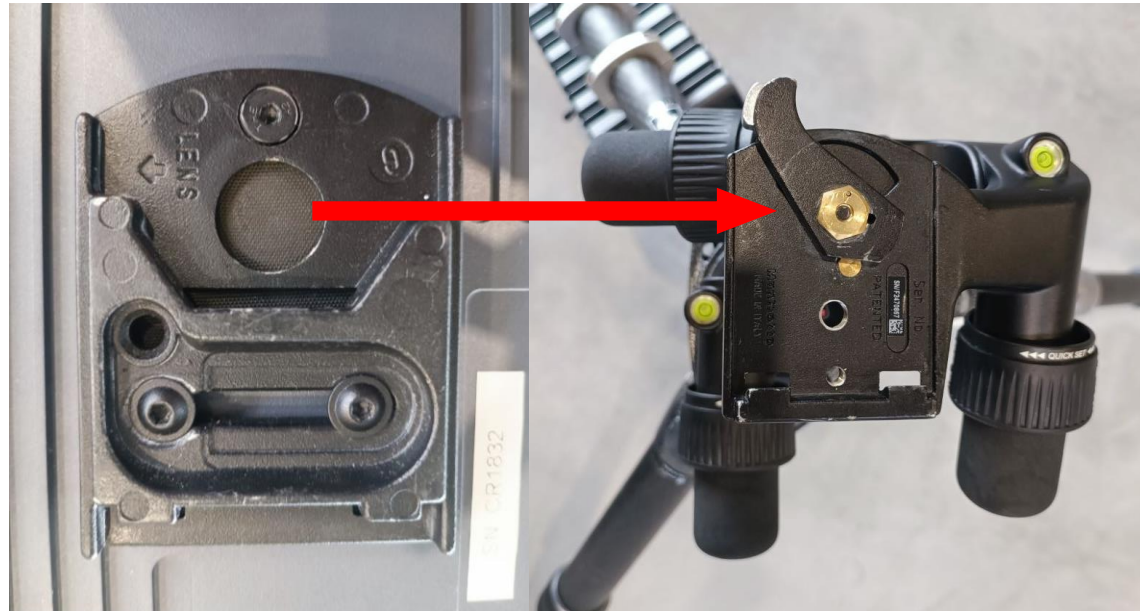
Power supply installation

In order to mount the power supply unit properly, place its two guides in the hooks located on one of the legs of the tripod, and then slide it to the bottom as far as possible to completely secure the device.



RF module installation – Step 1

To mount the RF module on a tripod, place its catch in such a way that the hole in the module hits the hexagonal element located on the tripod lever. Correct fastening of both elements will be signaled by a characteristic click.



RF module installation – Step 2

After fastening the module on the tripod, move the lever as far as possible to the left in order to completely secure the device.



Modem module installation – Step 1

In order to connect the Modem module with the RF module properly, insert the metal sleeves located on the Modem module into the holes located in the RF module.



Modem module installation – Step 2

Secondly, secure the Modem part by attaching the tabs on both sides of the unit to the RF module. Then tighten the screws until the devices are completely secured.



Supporters installation

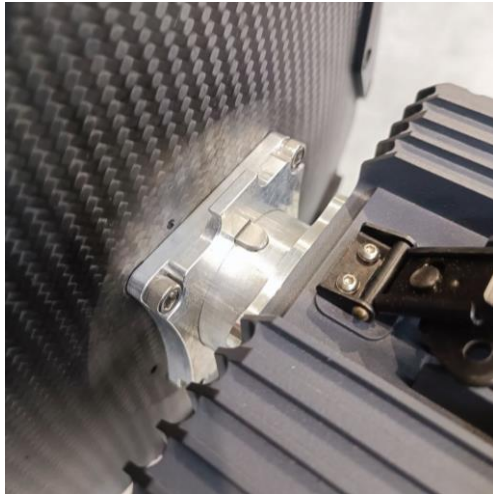
The tripod should be supplemented with supporters. To do this, loosen all the supporters knobs and screw the fasteners into the handles on the tripod and the threads on the Modem module. **ATTENTION!** The handle in the middle part of the supporters should be tightened only after the antenna is pointed out to the satellite.



Antenna installation – Step 1

The next step is to assemble the reflector, starting from the central petal. The central petal should be put on the HUB being the part of the RF module until it stops, then the catch should be put on and tighten, until the reflector is completely secured.

Repeat the operation with the hook located on the other side of the RF module.



Antenna installation – Step 2

Then, mount the two reflector petals by inserting them into the holes in the central petal. The operation should be repeated for all the reflector petals so as to build the entire dish of the antenna. To completely secure all reflector petals, fasten all metal clips on their back side.



FEED installation

To mount the FEED, place it in the HUB of the RF module located in the central part of the reflector, hitting the four holes of the FEED with the four inserts on the HUB and turn the FEED clockwise until it is completely secured.



Power supply connecting

The first step is to connect the cable of the power supply to the DC IN connector on the Modem module. **NOTE** that switch on RF module should be in position OFF.



Then connect the power supply to the power source (mains, DC or batteries, depending on the choice).



Terminal securing

After pointing out the antenna to the satellite, tighten the screws on both supporters to prevent uncontrolled changes in the terminal position.



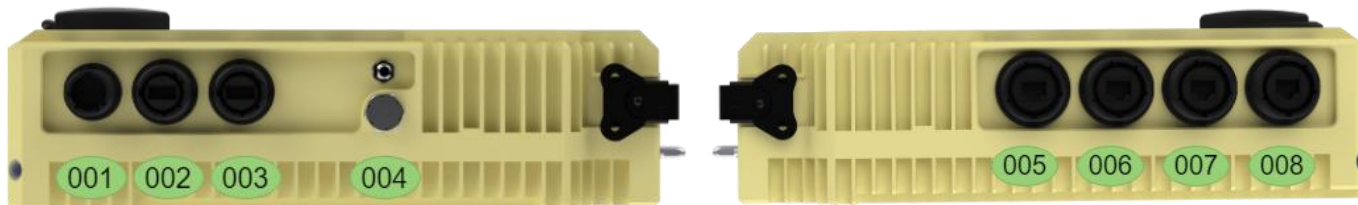
Properly assembled terminal



Connectors description

Modem module

Connectors description



F/N	NAME	DESCRIPTION
001	PWR IN	Power input.
002	MODEM	Console port of the integrated modem.
003	DIAG	Diagnostic port (for service purposes).
004	RX DIAG	Rx diagnostic port (SMA connector). Possibility of observing the (Rx-3dB) spectrum while spectrum analyzer. For diagnostic purposes.
005	ETH1	Integrated modem ETH ports.
006	ETH2	
007	ETH3	
008	ETH4	

Graphical User Interface

Pointing assistance only

GUI – Main screen

```
SatPack COBALT 98%
Band: >Ku Ant: 100cm
Modem: TDMA DVB: OFF
Rx Es/No: 6.3 dB
Tx Es/No: 7.1 dB
DVB Es/No: --.- dB
Transmission: OK
Menu
```



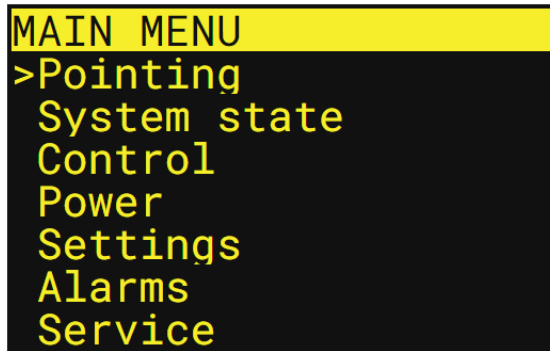
After the terminal is turned on, the Main screen shows.

To start the pointing procedure, use keyboard and go to:

→ **Menu**

Parameter	Description	Range
Band	Currently chosen band.	X, Ku, Ka
Ant	Antenna size.	60, 100, 130cm
Modem	Modem integrated in currently used Modem module.	TDMA, SCPC
Rx Es/No	Signal to noise ratio in Rx path.	Read only
Tx Es/No	Signal to noise ratio in Tx path.	Read only
RTT	Round trip time.	Read only
Transmission	Information about transmission state and possibility of turning it off in emergency.	ALARM, OK, Turn off

GUI – Main Menu



Main menu allows to switch to a proper submenu and check the terminal state, set desired parameters of the modem, LNB, RFT, etc..

Firstly, you have to set the modem parameters (you can skip this step if preset was already done).

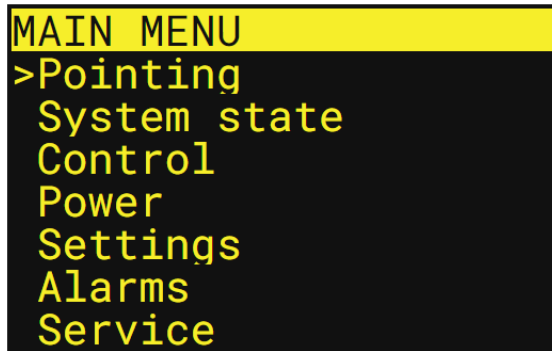
To do this, go to:

→ **Control**

As Control submenu is different for each installed modem, it is not included in the presentation in details.

Submenu	Description
Pointing	Allows you to point out the antenna to the satellite using selected signal source. After that, this submenu gives possibility to turn transmission on.
System state	Contains information about the installed modem, operating frequency, GPS and definitions of operating channels.
Control	Provides the functionality of changing parameters of the modem (including RTT), RFT, LNB.
Power	It contains information about the current power source of the terminal and the parameters of the connected BB-2590 batteries. The option is available only for terminals equipped with ULTRA power supplies.
Settings	Allows on turning on the screensaver, turning off the LEDs, changing the menu language and setting satellite parameters in the Satellite base.
Alarms	Provides current Alarms state.
Service	Allows you to carry out service work.

GUI – Main Menu



When all needed parameters of the modem are set, check terminal’s Alarms.
As the SatPack comes with RF part, parameters of RFT and LNB are preset to proper values, so you do not need to change it at this stage.

To do this, go to:
→ Alarms

Submenu	Description
Pointing	Allows you to point out the antenna to the satellite using selected signal source. After that, this submenu gives possibility to turn transmission on.
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Alarms	Provides current Alarms state.
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GUI – Alarms

```

Alarms
Sensors Pol: OK
Sensors Az/EI: OK
GPS: OK
Modem: OK
RFT: down
LNB: OK
Power supply: OK
    
```

This window shows general state of the terminal. If everything is connected correctly, all the parameters besides RFT should present *OK* state. RFT should present *down* state at this stage.

When alarms are checked, you can check your GPS position. To do this return to:

- **Main menu**
- Then go to:
- **Control** → **Location**

Parameter	Description	Range
Sensors Pol	Polarization sensor status (only for linear polarization).	OK, Alarm
Sensors Az/EI	Elevation and azimuth sensors status.	OK, Alarm
GPS	GPS status.	OK, Alarm
Modem	Modem status.	OK, Alarm
RFT	RFT status.	up, down, alarm
LNB	LNB status.	<i>Depends on the integrated modem</i>
Power supply	Power supply unit status.	OK, Alarm

GUI – Location

```

Location
GPS: auto

GPS read position:
 052.13N  021.00E

Location
GPS: manual

Preset location:
 052.13N  021.00E
    
```

Parameter	Description	Range
GPS	Toggles the GPS signal between automatic and manual mode.	Auto, manual
GPS read position	Position read from GPS.	0,00 – 90,00 N/S 0,00 – 180,00 E/W

Parameter	Description	Range
GPS	Toggles the GPS signal between automatic and manual mode.	Auto, manual
Preset location	Allows to enter the terminal location manually.	0,00 – 90,00 N/S 0,00 – 180,00 E/W

By default, current terminal location is read from built-in GPS receiver.
 In case you do not want to use it, you can switch to *Manual* mode and set your location manually.

Finally, you have to choose the satellite you want to point out the antenna to.

To do this return to:

→ **Main menu**

Then go to:

→ **Settings → Satellite base**

GUI – Satellite base

```
Satellites base
>SAT2
 017.8W
Band: X
Pol. TX: LHCP
Pol offset.: 0
DVB-S2: 12567.0V
Beacon: 12501.5H
```

Satellite base provides functionality of presetting parameters up to 9 satellites of User choice. To pick currently used satellite, go up and down with arrows on keyboard.

When the satellite is chosen, you can start antenna pointing procedure

To do this return to:

→ **Main menu**

Then go to:

→ **Pointing**

Parameter	Description
SAT	Number of the currently selected satellite. Go up and down with arrows and press the OK button to choose the currently used satellite.
xxx.x	Latitude of the selected satellite.
Band	Operating band of chosen satellite.
Pol. Rx	Received signal polarization.
Offset Pol	Polarization Offset.
DVB-S2	Frequency and polarization of the DVB-S2 signal transmitted by the defined satellite (if pointing using DVB-S will be picked).
Beacon	Frequency and polarization of the Beacon signal transmitted by the defined satellite (if pointing using Beacon Receiver will be picked).

GUI – Pointing – Step 1

```
Pointing
>TDMA Es/No
  TDMA/DVB-S2
  SCPC Es/No
  SCPC/Beacon
  SCPC/DVB-S2
```

To start antenna pointing, choose the signal source you want to use. To do this, go up and down with arrows and press OK button on your select. You will be automatically moved to the next window.

Options highlighted yellow are not supported by your Modem module.

Submenu	Description
TDMA Es/No	Pointing using TDMA modem signal.
TDMA/DVB-S2	Pointing using DVB-S2 signal, for modem module with installed TDMA modem.
SCPC Es/No	Pointing using SCPC modem signal.
SCPC/Beacon	Pointing using Beacon Receiver signal, for modem module with installed SCPC modem.
SCPC/DVB-S2	Pointing using DVB-S2 signal, for modem module with installed SCPC modem.

GUI – Pointing – Step 2

```

Pointing TDMA Es/No
Satellite: 36.0E
TDMA Tx: --.-/--.- dB
          AZ      EL      POL
CLC  ---.-  ---.-  ---.-
CUR 161.1  28.6  -11.0
MAX  ---.-  ---.-  ---.-
      >Start pointing
    
```

This window lets you start the antenna pointing procedure.

To start it, select **Start pointing** option.

NOTE that the switch located on RF module still should be in *Off* position.

To change the terminal position in AZ/EL use knobs located on the tripod.

To change POL, use arrows on the keyboard (for linear POL) or shift Feed by 90° manually (for circular POL).

Parameter	Description	Range
Sat.	Longitude of the selected satellite.	0° - 180° E 0° - 180° W
TDMA Rx	Rx signal to noise ratio.	Read only
AZ/EL/POL CLC	Azimuth/Elevation/Polarization Calculated value of coordinates, indicating the theoretical direction in which the maximum signal strength will be obtained. The current location of the terminal and the coordinates of the selected geostationary satellite are taken into account for the calculations.	AZ: 0° - 360° EL: -90° - 90° POL: -90° - 90°
AZ/EL/POL CUR	Azimuth/Elevation/Polarization The current value of the coordinates.	
AZ/EL/POL MAX	Azimuth/Elevation/Polarization The position where the maximum strength of the received signal was noticed.	

GUI – Pointing – Step 3

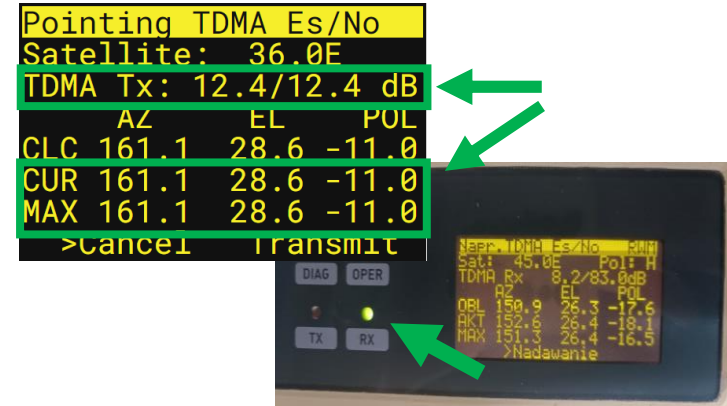
Keep adjusting antenna position using knobs to maximize Rx signal to noise ratio.

```

Pointing TDMA Es/No
Satellite: 36.0E
TDMA Tx: 8.9/12.4 dB
      AZ      EL      POL
CLC 161.1  28.6  -11.0
CUR 161.1  28.6  -11.0
MAX 161.1  28.6  -11.0
>Cancel Transmit
    
```

3 2 1

To optimize the pointing process, start with setting polarization, then elevation and in the end azimuth to CLC values. Then adjust SatPack position (focus on EL and AZ rather than POL) until Es/No ratio is the best of obtained. You can also observe Rx LED on the terminal. The better Es/No ratio is, the faster the LED blinks green.



The antenna is pointed out to the chosen satellite when CUR position is equal to MAX position, and Rx LED of the terminal is blinking so quickly, that is almost lighting green.

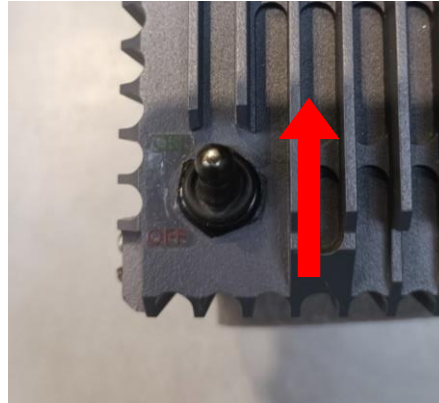
CLC position is for reference, but is not always position with the best Es/No ratio.

GUI – Pointing – Step 4

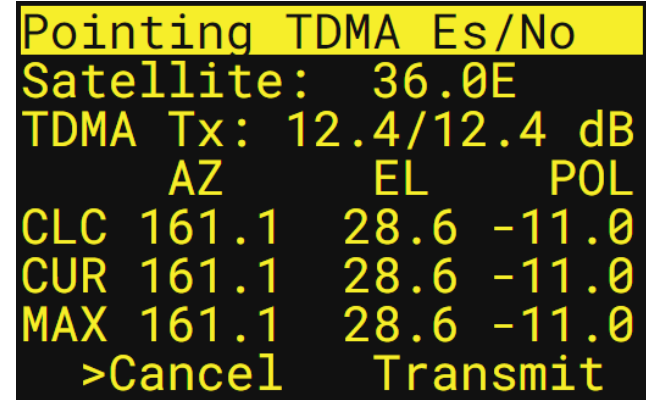
When the terminal is pointed out the satellite, you can:



1. Secure the supporters ([Terminal securing](#) slide).



2. Put switch located on the RF module in On position.



3. Turn the transmission on.
To do this, select **Transmit** option and press OK button.

After that you will be automatically moved to Transmission control window, where you can monitor Working terminal parameters.

GUI – Transmission

```
TDMA TX Transmit
TDMA Rx: 6.3 dB
TDMA Tx: 7.1 dB
Circ. Grade: Acquire
State: Operational
RTT: 2582222 →

>Tx stop OK
```

In this window you can monitor current state of transmitting terminal.

To stop transmission, select **TX stop**.
To go to other menu window, press **OK**.
Transmission will be preserved.

Parameter	Description	Range
TDMA Rx	Modem received signal level.	Read only
TDMA Tx	Modem transmitter signal level.	Read only
Circ. Grade	Circular Grade	0 – 100%
State	Current modem state.	Depending on the installed modem
RTT	Round trip time. To set this parameter manually, select „→” and press OK.	0 – 280 000 [μs]



Global Infrastructure & Security Solutions

Thank you

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