SATEVIS

BEANAIR® SENSORS BRAND

Technical Note

TN-02-Satevis Batch Configuration Tool

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Contents

1 LIST OF ABBREVIATIONS AND ACRONYMS

Acronym / Abbreviation	Definition
AMRR	Alarm Monitor Refresh Rate
AppEUI	Application Extended Unique Identifier
AppKey	Application Key
CFG	Configuration (File format)
CH	Channel (e.g., CH0, CH1, CH2)
CSV	Comma-Separated Values
DevEUI	Device Extended Unique Identifier
FSB	Frequency Sub-band
ID	Identifier
INCX / INCY/ INCZ	Inclinometer X-Axis / Y-Axis /Z-Axis
INT-TEMP	Internal Temperature
JoinEUI	Join Extended Unique Identifier
KARR	Keep-Alive Refresh Rate
LoRaWAN	Long Range Wide Area Network
MRR	Monitoring Refresh Rate
RF	Radio Frequency
SDRR	System Diagnostic Refresh Rate
THOLD	Threshold
YMODEM	A standard file transfer protocol used in terminal emulators

2 PURPOSE & SCOPE

2.1 PURPOSE

The primary purpose of this document is to provide users, system integrators, and technicians with comprehensive instructions for the local configuration and management of Satevis® devices (such as the Satevis Alpha Inclinometer series). This manual serves as a step-by-step guide to successfully connect the device to a computer, navigate the serial interface, upload configuration files, and ensure proper communication with a LoRaWAN® network.

2.2 SCOPE

This manual covers the software configuration and diagnostic procedures performed via a direct USB serial connection using a terminal emulator (e.g., Tera Term). The scope of this document includes:

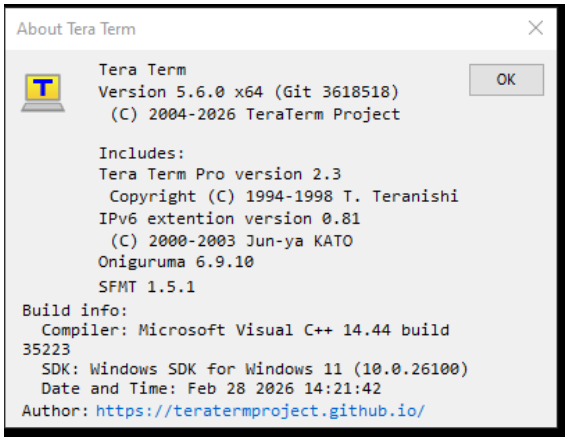
- Accessing the device's main menu and navigating the configuration interface.
- Generating configuration files using the provided Satevis Excel tool.
- Uploading configuration files to update device parameters, including LoRaWAN network keys (AppKey, JoinEUI), reporting rates (MRR, AMRR, KARR), and datalogger settings.
- Establishing and verifying X and Y-axis inclinometer alarm thresholds.
- Interpreting configuration upload summaries (modified vs. unmodified settings).
- Basic troubleshooting for configuration upload errors.

Note: This document does not cover the physical installation and mounting of the sensor hardware, nor does it cover the setup of third-party LoRaWAN Network Servers (LNS) or cloud visualization dashboards.

3 PREREQUISITES (EXCEL VERSION, MACROS ENABLED, ETC.)

Before you begin, ensure the following:

1. **Battery power is turned off: The device must be powered exclusively via USB to allow for easy power cycling.**
2. **The device is connected: Your Satevis® device must be connected to your PC using a USB-to-M8 cable adapter.**
3. **Tera Term 5.6.0 is installed. This software must be installed on your PC (available for download via our FTP access)**



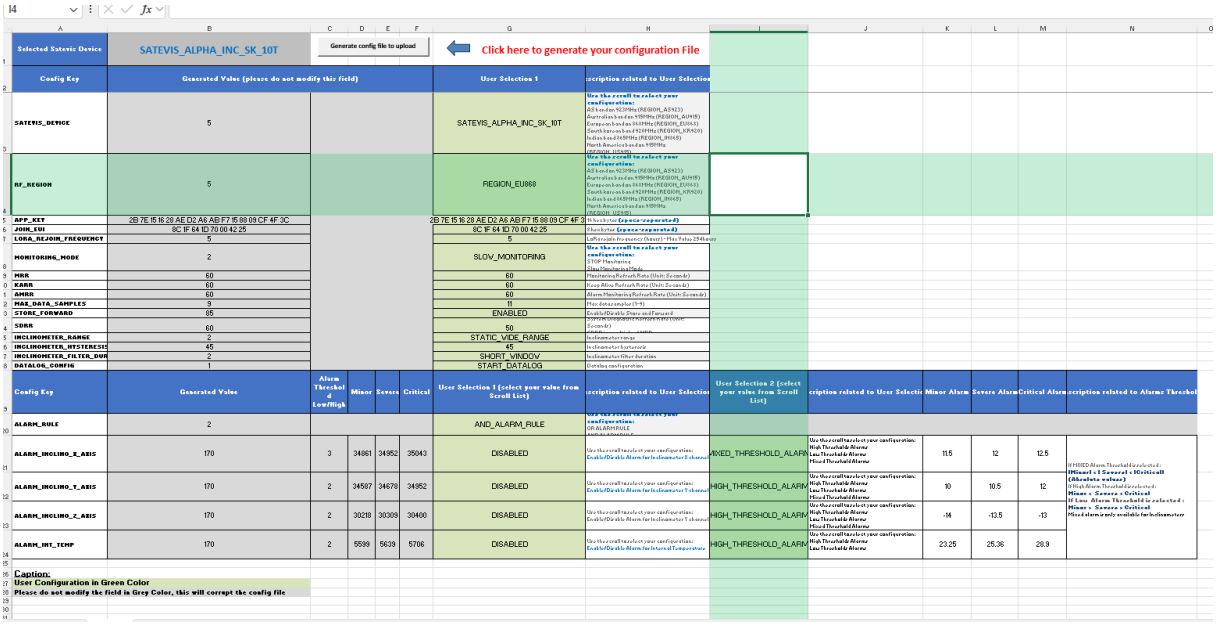
4 OVERVIEW OF THE BATCH CONFIGURATION TOOL

Provided free of charge via our FTP server, the Satevis Batch Configuration Tool is a macro-enabled Excel document designed to streamline the deployment of Satevis sensors.

The interface is structured into several functional sub-sections:

- **Satevis Device Selection:** Allows users to choose their exact Satevis device from a scrollable list. Once selected, the spreadsheet automatically adjusts to show only the relevant settings (for example, hiding the Z-axis for bi-axial sensors).
- **LoRaWAN Settings:** Used to establish connectivity. Users can input their APP_KEY, JOIN_EUI, and select the appropriate RF Region.
- **Monitoring Configuration:** Defines the sensor's behavioral lifecycle. Users can configure the Monitoring Mode (e.g., Slow, Alarm Mode) alongside Keep-Alive and Alarm Monitor refresh rates.

- **Inclinometer Configuration:** Controls the raw measurement parameters of the sensor, including the measuring Range, Hysteresis, and Filtering Window.
- **Datalogger Configuration:** Manages how the device stores data locally, including the maximum number of data samples and the Store & Forward feature.
- **Alarm Configuration:** Provides axis-by-axis control over alerts. For each sensor channel, users can enable or disable alarms, apply specific Alarm Rules, and define precise Warning and Severe threshold values.



Selected Satevis Device	SATEVIS_ALPHA_INC_SK_10T	Generate config file to upload	Click here to generate your configuration File		
Config Key	Generated Value (please do not modify this field)			User Selection 1	scription related to User Selection
SATEVIS_DEVICE	5			SATEVIS_ALPHA_INC_SK_10T	Use the scroll to select your configuration: AS1 bands 923MHz (REGION_AS923) Australia bands 915MHz (REGION_AU915) Europe bands 868MHz (REGION_EU868) South Korea bands 923MHz (REGION_KR920) India bands 865MHz (REGION_IN865) North America bands 915MHz (REGION_US915)
RF_REGION	5			REGION_EU868	Use the scroll to select your configuration: AS1 bands 923MHz (REGION_AS923) Australia bands 915MHz (REGION_AU915) Europe bands 868MHz (REGION_EU868) South Korea bands 923MHz (REGION_KR920) India bands 865MHz (REGION_IN865) North America bands 915MHz (REGION_US915)
APP_KEY	2B 7E 15 16 28 AE D2 A6 AB F7 15 88 09 CF 4F 3C			2B 7E 15 16 28 AE D2 A6 AB F7 15 88 09 CF 4F 3C	Write bytes (space-separated)
JOIN_EUI	8C 1F 64 1D 70 00 42 25			8C 1F 64 1D 70 00 42 25	Write bytes (space-separated)
LORA_REJOIN_FREQUENCY	5			5	LoRa private frequency (hours) = Max Value 254 hours
MONITORING_MODE	2			SLOW_MONITORING	Use the scroll to select your configuration: STOP Monitoring FAST Monitoring Mode SLOW Monitoring Mode
MRR	60			60	Monitoring Refresh Rate (Unit: Seconds)
KARR	60			60	Keep Alive Refresh Rate (Unit: Seconds)
AMRR	60			60	Alarm Monitoring Refresh Rate (Unit: Seconds)
MAX_DATA_SAMPLES	3			11	Max data samples (1-11)
STORE_FORWARD	85			ENABLED	Enable/Disable Store and Forward
SDRR	60			50	Store & Forward Monitoring Refresh Rate (Unit: Seconds)
INCLINOMETER_RANGE	2			STATIC_WIDE_RANGE	Inclinometer range
INCLINOMETER_HYSTERESIS	45			45	Inclinometer hysteresis
INCLINOMETER_FILTER_DUR	2			SHORT_WINDOW	Inclinometer filter duration
DATALOG_CONFIG	1			START_DATALOG	Datalog configuration

Config Key	Generated Value	Alarm Threshold Low/High	Minor	Severe	Critical	User Selection 1 (select your value from Scroll List)	scription related to User Selection	User Selection 2 (select your value from Scroll List)	scription related to User Selection	Minor Alarm	Severe Alarm	Critical Alarm	scription related to Alarms Threshold
ALARM_RULE	2					AND_ALARM_RULE	Use the scroll to select your configuration: OR ALARM RULE AND ALARM RULE						
ALARM_INCLINO_X_AXIS	170	3	34861	34952	35043	DISABLED	Use the scroll to select your configuration: Enable/Disable Alarm for Inclinometer X channel	MIXED_THRESHOLD_ALARM	Use the scroll to select your configuration: High Threshold Alarms Low Threshold Alarms Mixed Threshold Alarms	11.5	12	12.5	If MIXED Alarm Threshold is selected: (Minor) < (Severe) < (Critical) (Absolute values) If High Alarm Threshold is selected: Minor < Severe < Critical If Low Alarm Threshold is selected: Minor > Severe > Critical Mixed alarms only available for Inclinometer
ALARM_INCLINO_Y_AXIS	170	2	34587	34678	34952	DISABLED	Use the scroll to select your configuration: Enable/Disable Alarm for Inclinometer Y channel	HIGH_THRESHOLD_ALARM	Use the scroll to select your configuration: High Threshold Alarms Low Threshold Alarms Mixed Threshold Alarms	10	10.5	12	
ALARM_INCLINO_Z_AXIS	170	2	30218	30309	30400	DISABLED	Use the scroll to select your configuration: Enable/Disable Alarm for Inclinometer Y channel	HIGH_THRESHOLD_ALARM	Use the scroll to select your configuration: High Threshold Alarms Low Threshold Alarms Mixed Threshold Alarms	-14	-13.5	-13	
ALARM_INT_TEMP	170	2	5599	5639	5706	DISABLED	Use the scroll to select your configuration: Enable/Disable Alarm for Internal Temperature	HIGH_THRESHOLD_ALARM	Use the scroll to select your configuration: High Threshold Alarms Low Threshold Alarms	23.25	25.36	28.9	

Caption:
User Configuration in Green Color
Please do not modify the field in Grey Color, this will corrupt the config file

Important: Only edit the cells highlighted in **green**. The **grey** cells are read-only and should not be modified.

5 HOW TO GET THE DEVICE CURRENT CONFIGURATION

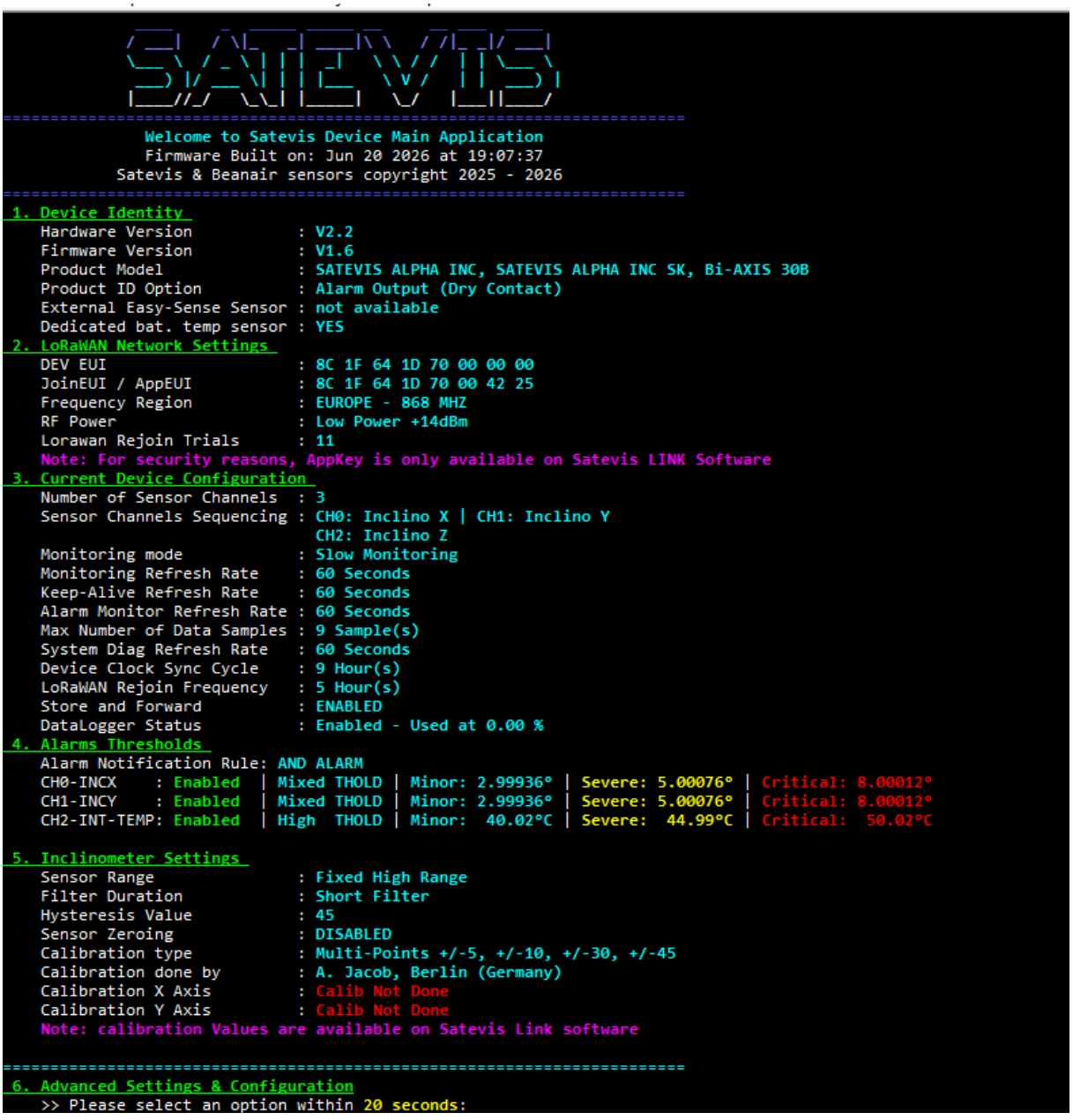
Accessing Tera Term is done in the exact same way as when uploading firmware.

Please follow the technical note related to the Firmware Upgrade to properly configure your system:

Click here: TN-RF-01-Satevis-Firmware-Update.pdf

After plugging your device into USB power, it initially boots into the Firmware Management menu. You can bypass this step by pressing any key (except 'Y' for Yes) or by simply waiting 10 seconds.

The system will then proceed to the Main Application where you can view your current device settings (as shown below). All device settings are fully detailed in the User Manual.

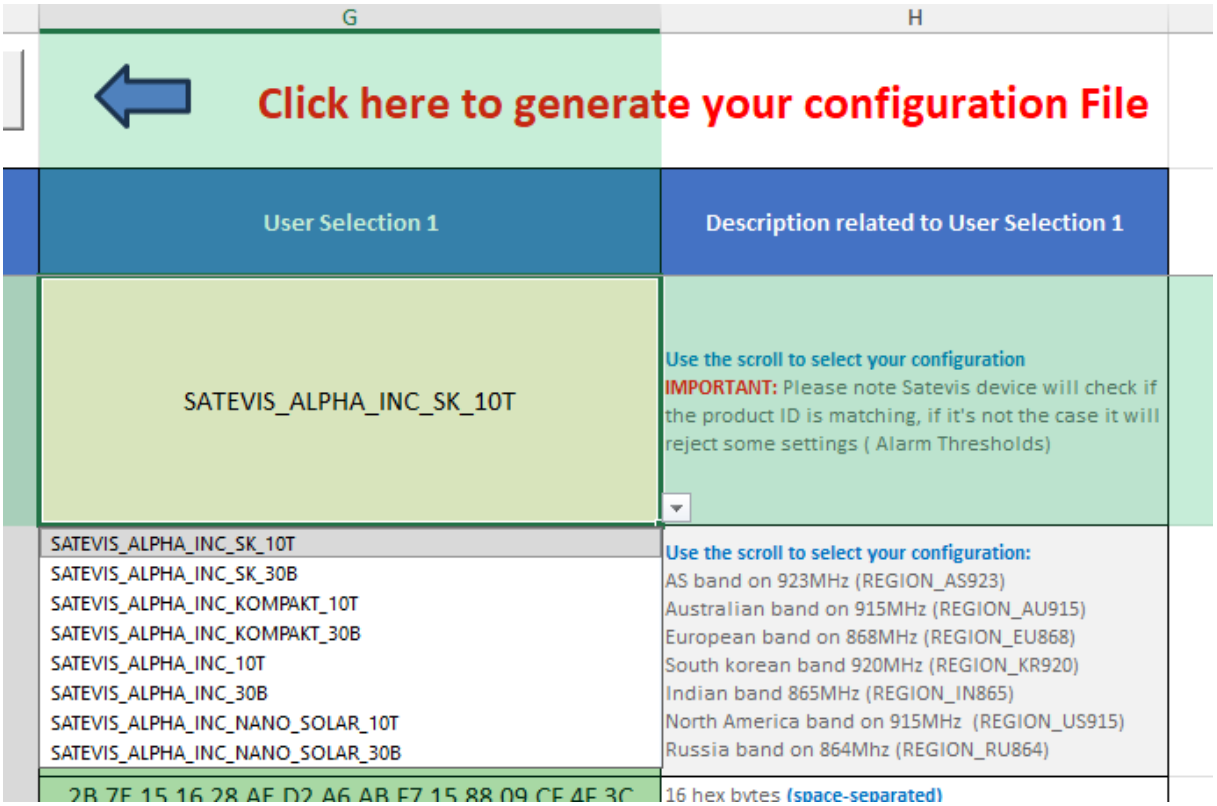


6 STEP-BY-STEP: CREATING A CONFIGURATION FILE

6.1 SELECTING THE DEVICE

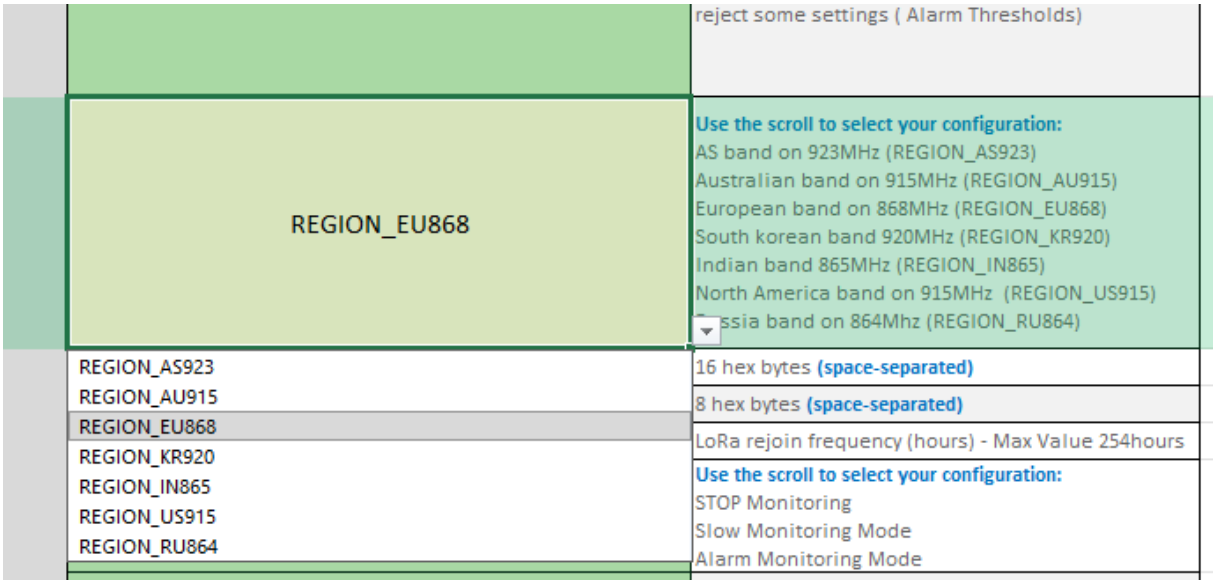
Use the drop-down menu to select your device model.

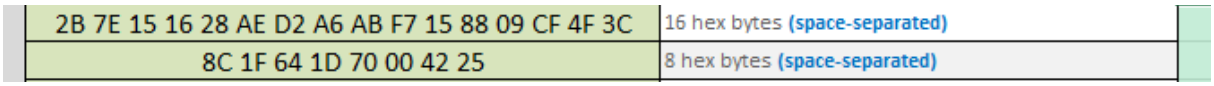
IMPORTANT: The Satevis® device validates the Product ID. If there is a mismatch, the device will reject certain parameters, including Alarm Thresholds.



6.2 LORAWAN SETTINGS

- **Device EUI (DevEUI):** Please note that the Device EUI cannot be modified. It is hardcoded into the device, as it contains our specific manufacturer OUI code.
- **RF Region:** Use the drop-down menu to select your geographic operating frequency (e.g., REGION_EU868, REGION_US915).
- **Network Keys:** Enter your **App Key** (16 bytes) and **Join EUI / App EUI** (8 bytes). These values must be formatted as space-separated hexadecimal bytes (for example: 2B 7E 15 16...).





LoRa Rejoin Frequency: Define how often (in hours) the device will attempt to rejoin the network if the connection is lost. The maximum allowed value is 254 hours.

6.3 MONITORING SETTINGS

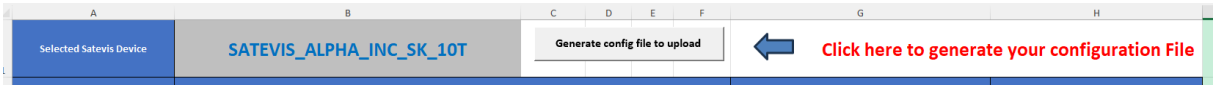
All the Monitoring Mode and Timing Parameters are fully described on the main user guide.

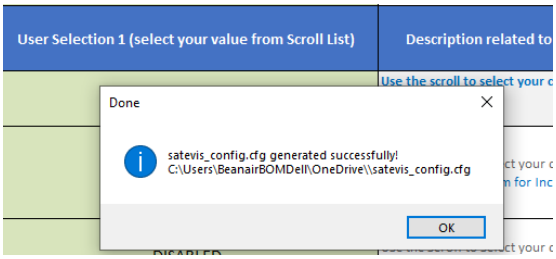
6.4 SETTING ALARM THRESHOLDS

All the alarms thresholds are fully described on the user guide.

6.5 GENERATING THE CONFIG FILE

After successfully entering all your parameters, click on "Generate config file".
A pop-up message will be displayed stating **"satevis_config.cfg generated successfully!"** along with the exact file path where your new configuration file has been saved on your computer.





If you open the generated .cfg file in a text editor, you will see it contains:

- **A Header:** Showing the exact date/time of generation and the Satevis Product ID (e.g., SATEVIS_ALPHA_INC_SK_10T).
- **Machine-Readable Configuration:** All your chosen settings (LoRaWAN keys, alarm thresholds, monitoring modes) converted into key-value pairs ready to be uploaded to the sensor.

satevis_config.cfg - Notepad

File Edit Format View Help

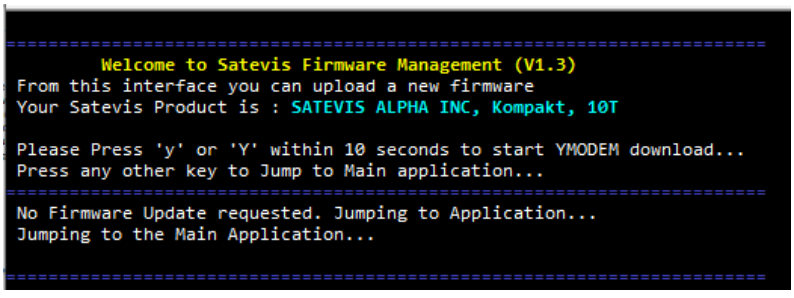
```
# Auto-generated configuration file for Satevis Sensor
# Generated: 22.06.2026 17:43:18
# Device   : SATEVIS_ALPHA_INC_SK_10T

SATEVIS_DEVICE=5
RF_REGION=5
APP_KEY=2B7E151628AED2A6ABF7158809CF4F3C
JOIN_EUI=8C1F641D70004225
LORA_REJOIN_FREQUENCY=5
MONITORING_MODE=2
MRR=60
KARR=60
AMRR=60
MAX_DATA_SAMPLES=9
STORE_FORWARD=85
SDRR=60
INCLINOMETER_RANGE=2
INCLINOMETER_HYSTERESIS=45
INCLINOMETER_FILTER_DURATION=2
DATALOG_CONFIG=1
ALARM_RULE=2
ALARM_INCLINO_X_AXIS=170,3,34861,34952,35043
ALARM_INCLINO_Y_AXIS=170,2,34587,34678,34952
ALARM_INCLINO_Z_AXIS=170,2,30218,30309,30400
ALARM_INT_TEMP=170,2,5599,5639,5706
```

6.6 UPLOADING THE CONFIGURATION TO THE DEVICE

Accessing the device via Tera Term is done in the exact same way as when uploading firmware. Please follow the technical note related to Firmware Upgrades to properly configure your system:

Click here: TN-RF-01-Satevis-Firmware-Update.pdf

When you power the device, it boots into the Satevis Firmware Management interface. You can bypass the firmware upgrade step and jump to the main application by pressing any key (except 'Y' or 'y'). Alternatively, you can simply wait 10 seconds.



The terminal will then display the Main Application menu, which shows all of the device's current settings.

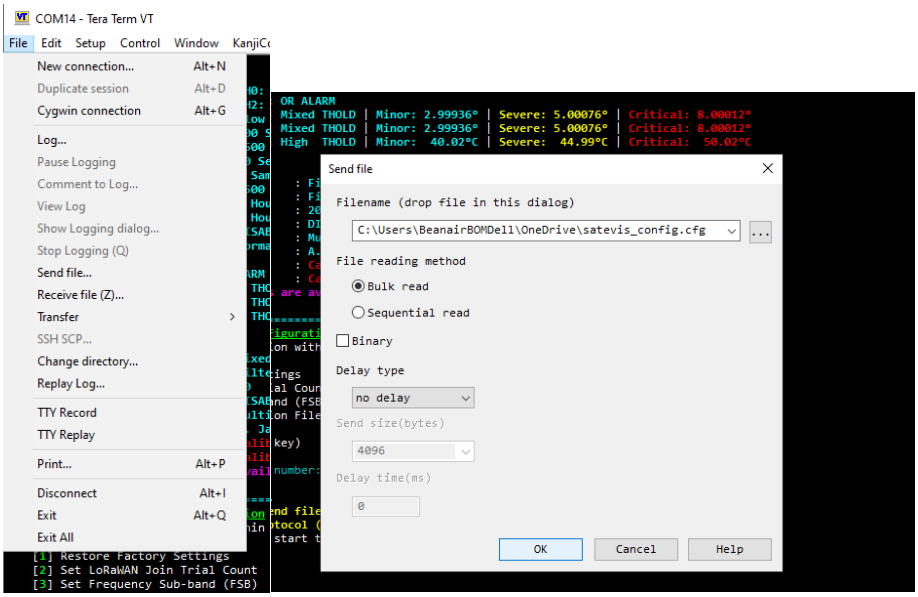
```
No Firmware Update requested. Jumping to Application...
Jumping to the Main Application...

            Welcome to Satevis Device Main Application
              Firmware Built on: Jun 20 2026 at 19:07:37
           Satevis & Beanair sensors copyright 2025 - 2026

 1. Device Identity
    Hardware Version           : V2.2
    Firmware Version           : V1.6
    Product Model              : SATEVIS ALPHA INC, SATEVIS ALPHA INC SK, Bi-AXIS 30B
    Product ID Option          : Alarm Output (Dry Contact)
    External Easy-Sense Sensor : not available
    Dedicated bat. temp sensor : YES
 2. LoRaWAN Network Settings
    DEV EUI                    : 8C 1F 64 1D 70 00 00 00
    JoinEUI / AppEUI           : 01 01 01 01 01 51 55 67
    Frequency Region           : EUROPE - 868 MHZ
    RF Power                   : Low Power +14dBm
    Lorawan Rejoin Trials      : 11
    Note: For security reasons, AppKey is only available on Satevis LINK Software
 3. Current Device Configuration
    Number of Sensor Channels  : 3
    Sensor Channels Sequencing : CH0: Inclino X | CH1: Inclino Y
                                 CH2: Inclino Z
    Monitoring mode            : Slow Monitoring
    Monitoring Refresh Rate    : 300 Seconds
    Keep-Alive Refresh Rate    : 1500 Seconds
    Alarm Monitor Refresh Rate : 40 Seconds
    Max Number of Data Samples : 1 Sample(s)
    System Diag Refresh Rate   : 1500 Seconds
    Device Clock Sync Cycle    : 9 Hour(s)
    LoRaWAN Rejoin Frequency   : 8 Hour(s)
    Store and Forward          : DISABLED
    DataLogger Status          : Formated Ready to be used
 4. Alarms Thresholds
    Alarm Notification Rule: OR ALARM
    CH0-INCX    : Enabled  | Mixed THOLD | Minor: 2.99936° | Severe: 5.00076° | Critical: 8.00012°
    CH1-INCY    : Enabled  | Mixed THOLD | Minor: 2.99936° | Severe: 5.00076° | Critical: 8.00012°
    CH2-INT-TEMP: Enabled  | High  THOLD | Minor:  40.02°C | Severe:  44.99°C | Critical:  50.02°C

 5. Inclinometer Settings
    Sensor Range               : Fixed High Range
    Filter Duration            : Filter Medium
    Hysteresis Value           : 20
    Sensor Zeroing             : DISABLED
    Calibration type           : Multi-Points +/-5, +/-10, +/-30, +/-45
    Calibration done by        : A. Jacob, Berlin (Germany)
    Calibration X Axis         : Calib Not Done
    Calibration Y Axis         : Calib Not Done
    Note: calibration Values are available on Satevis Link software

 6. Advanced Settings & Configuration
    >> Please select an option within 20 seconds:
```

To upload your new configuration file:

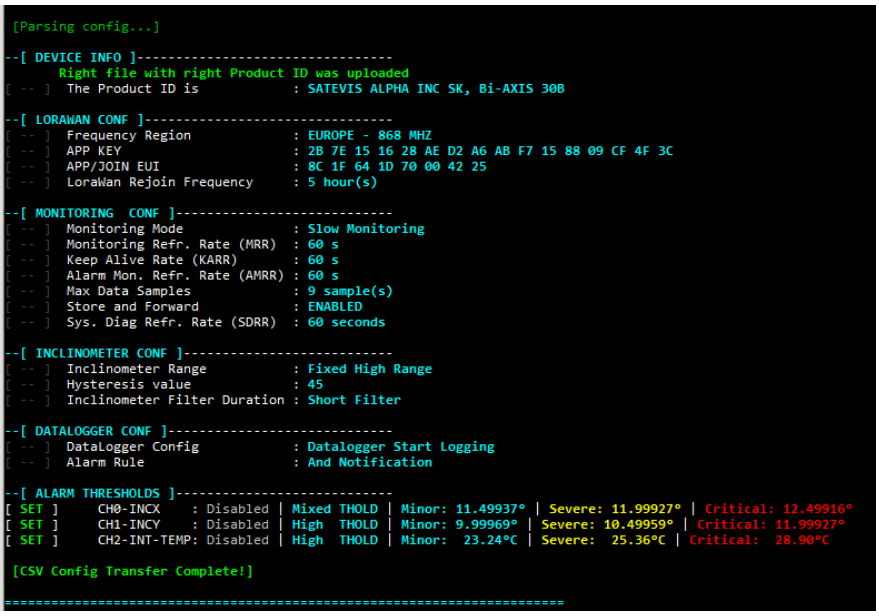
1. Scroll down to section **6. Advanced Settings & Configuration**.

```
 6. Advanced Settings & Configuration
    >> Please select an option within 20 seconds:

    [1] Restore Factory Settings
    [2] Set LoRaWAN Join Trial Count
    [3] Set Frequency Sub-band (FSB)   (US / AUS regions only)
    [4] Load Batch Configuration File
    [5] Download DataLogger
    [6] Exit  (or any other key)

    >> Choice :      Enter a number: 4

 >> Waiting for .cfg file...
    In Tera Term: File -> Send file... -> Select your .cfg
    Do Not use any other protocol (X/Y/Z Modem)
    (You have 60 seconds to start the transfer...)
```

2. Type **4** and press Enter to select **"Load Batch Configuration File"**.
3. The prompt will read >> Waiting for .cfg file... and you will have 60 seconds to initiate the transfer. *(Note: Do not use any other transfer protocol like X/Y/Z Modem).*
4. In the top Tera Term menu bar, click on **File** -> **Send file...**



5. Browse your computer to locate and select your generated .cfg file (e.g., satevis_config.cfg). Ensure the "File reading method" is set to the default (Bulk read) and click **OK**.
6. After parsing the file, the terminal will display all the settings that have been successfully modified.
7. Once the transfer is complete, review the parsing summary on the screen. Modified settings are clearly indicated with a green **[SET]** prefix, whereas unmodified settings are marked with gray dashes ([--]).

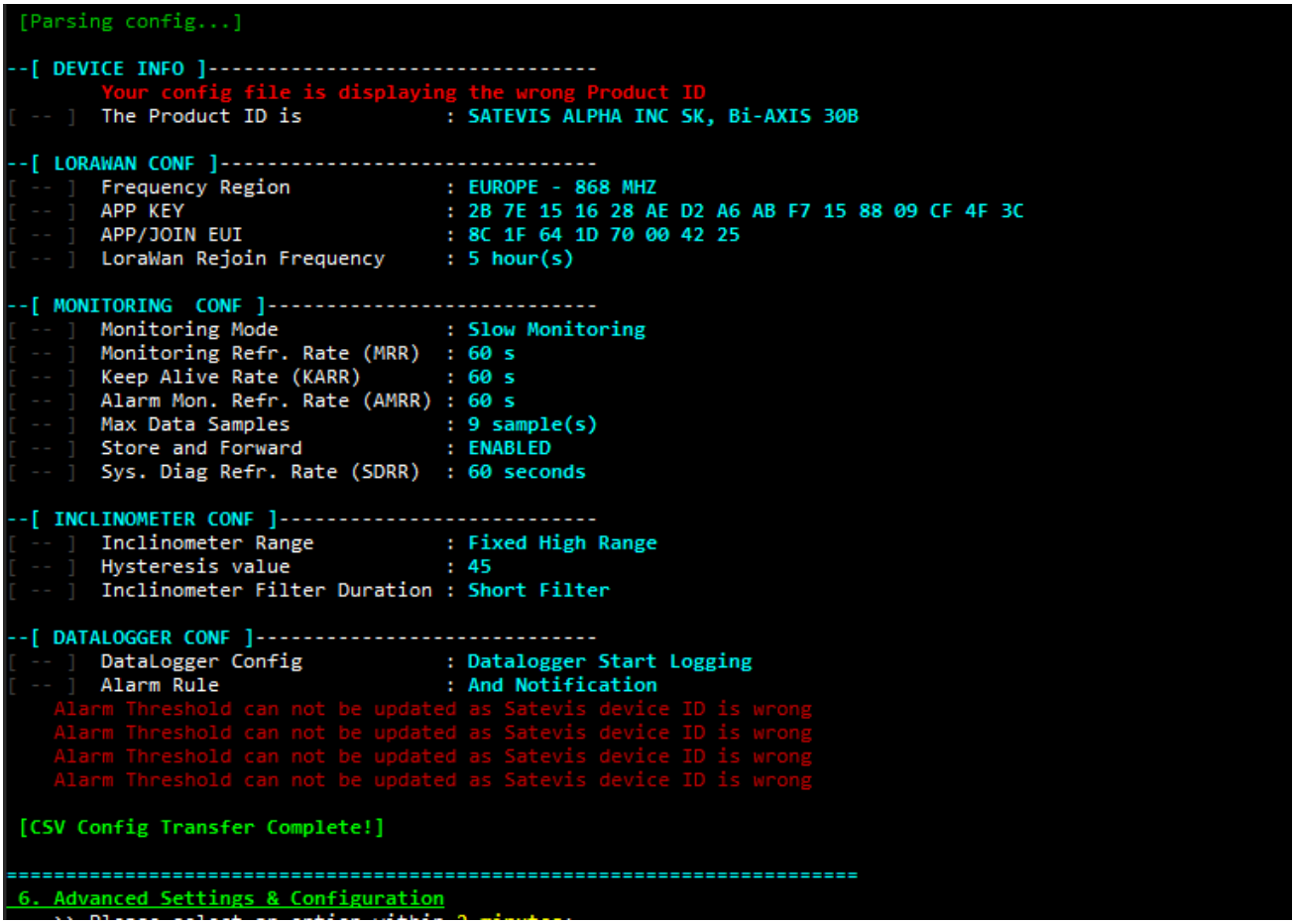


7 TROUBLESHOOTING

7.1 WHY DO I SEE THE ERROR: "ALARM THRESHOLD CAN NOT BE UPDATED AS SATEVIS DEVICE ID IS WRONG"?

As indicated in the [DEVICE INFO] section at the top of the parsing screen, this error occurs when the Product ID selected in your configuration file does not match the actual connected device.

For safety and compatibility, the Satevis® device actively checks the Product ID during a transfer. If there is a mismatch, the device will automatically reject certain critical settings, such as Alarm Thresholds.



Resolution:

1. Open your Excel configuration document.
2. Go to the Device Selection section and ensure you have selected the exact Satevis Product ID that matches your physical hardware.
3. Generate a new .cfg file.
4. Upload the corrected file to the device.