



INSTALLATION AND OPERATION

QUICK GUIDE

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UM220-INS NL

Integrated Navigation and Positioning Module Evaluation Kit

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Revision History

Version	Revision History	Date
R1.0	First release.	Apr., 2023
R1.1	Changed the product name from UM220-INS EVK Suite to UM220-INS NL EVK. Changed the product photos.	June, 2025

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Foreword

This document provides information of Unicore's UM220-INS NL Evaluation Kit (EVK). It can be used together with *UPrecise_User Manual*.

Target Readers

This manual is written for technicians who are familiar with GNSS modules. It is not for general readers.

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1 Overview

UM220-INS NL Evaluation Kit (hereinafter referred to as EVK) is mainly used to test and evaluate the function and performance of UM220-INS NL module for user convenience.

The delivered package contains:

Table 1-1 UM220-INS NL EVK Package

Type	Contents	Number
Main device	UM220-INS NL EVK	1
Accessory	GNSS single-frequency antenna - JCA236	1
Accessory	Micro-B USB cable	1

2 EVK Introduction

The figure below shows the appearance of UM220-INS NL EVK.



Figure 2-1 UM220-INS NL EVK

3 Interfaces & Indicators

The interfaces and indicators on UM220-INS NL EVK is shown below. For detailed description, see Table 3-1.



Figure 3-1 Interfaces & Indicators on UM220-INS NL EVK

Table 3-1 Interfaces & Indicators on UM220-INS NL EVK

Interface/Indicator	Type	Description
S1	Reset	Reset the module by inserting and removing the jumper cap
S2	Antenna feed	Control the antenna feed on and off by the jumper cap
L1	Power/1PPS indicator	The indicator lights up when powered on, and flashes when the 3D positioning is effective.
ANT	RF signal input connector (SMA)	Antenna signal input
FWD	Direction signal connector (SMA)	Access the odometer directional signal, 3.3V~12V
L2	Speed pulse signal indicator	The indicator flashes when receiving the speed pulse signal
SPD	Speed pulse signal connector (SMA)	Access the odometer speed pulse signal, 3.3V~12V
USB	Micro-B USB connector	Power supply (+5V) and data communication
SD-card	SD card slot	Insert an SD card
UART	Communication DB9 connector	Backup serial communication interface with RS232

4 Installation & Calibration

4.1 Installation

Step 1: Make sure to take full anti-static measures, such as wearing anti-static wrist straps and grounding the workbench.

Step 2: Select the GNSS antenna with appropriate gain (the GNSS systems and frequencies supported by the antenna should be in line with the module), fix it in the non-blocking area, and connect the antenna to the ANT port on the EVK.

Step 3: Connect the EVK to the PC using the Micro-B USB cable.

Step 4: Open the UPrecise software on the PC.

Step 5: Configure the receiver through UPrecise to display the constellation view, data stream, tracking status, etc. For more information, please refer to *UPrecise_User Manual*.

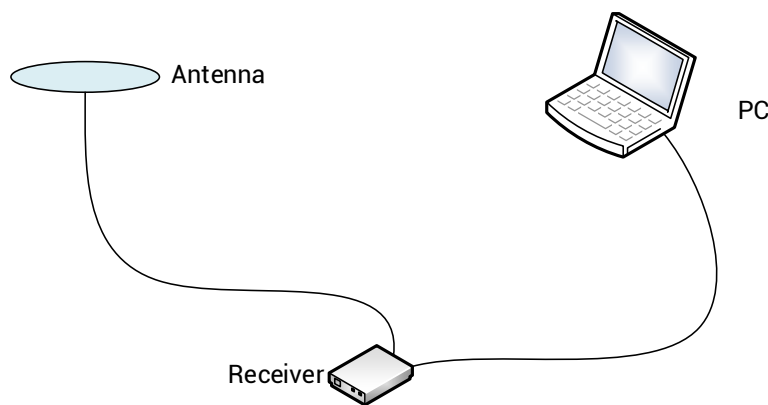


Figure 4-1 Installation of the EVK

4.2 Calibration

a) Installation on the Vehicle

UM220-INS NL EVK must be firmly connected to the vehicle to prevent any offsets or vibrations between the module and the vehicle. UM220-INS NL EVK should not be installed in the suspension part of the vehicle (with elastic part). When the vehicle is moving, any change relative to the vehicle coordinate system will seriously affect the performance of UM220-INS NL module and prevent it from working normally.

b) Calibration

The EVK is in free installation mode by default and can be placed freely on the premise that the above installation conditions are met. Refer to *UM220-INS Series Module_User Manual* for details.

If the manual installation mode is required, it should be placed according to the following coordinate system, and the installation angle should be manually configured into the module. Refer to *UM220-INS Series Module_User Manual* for details.

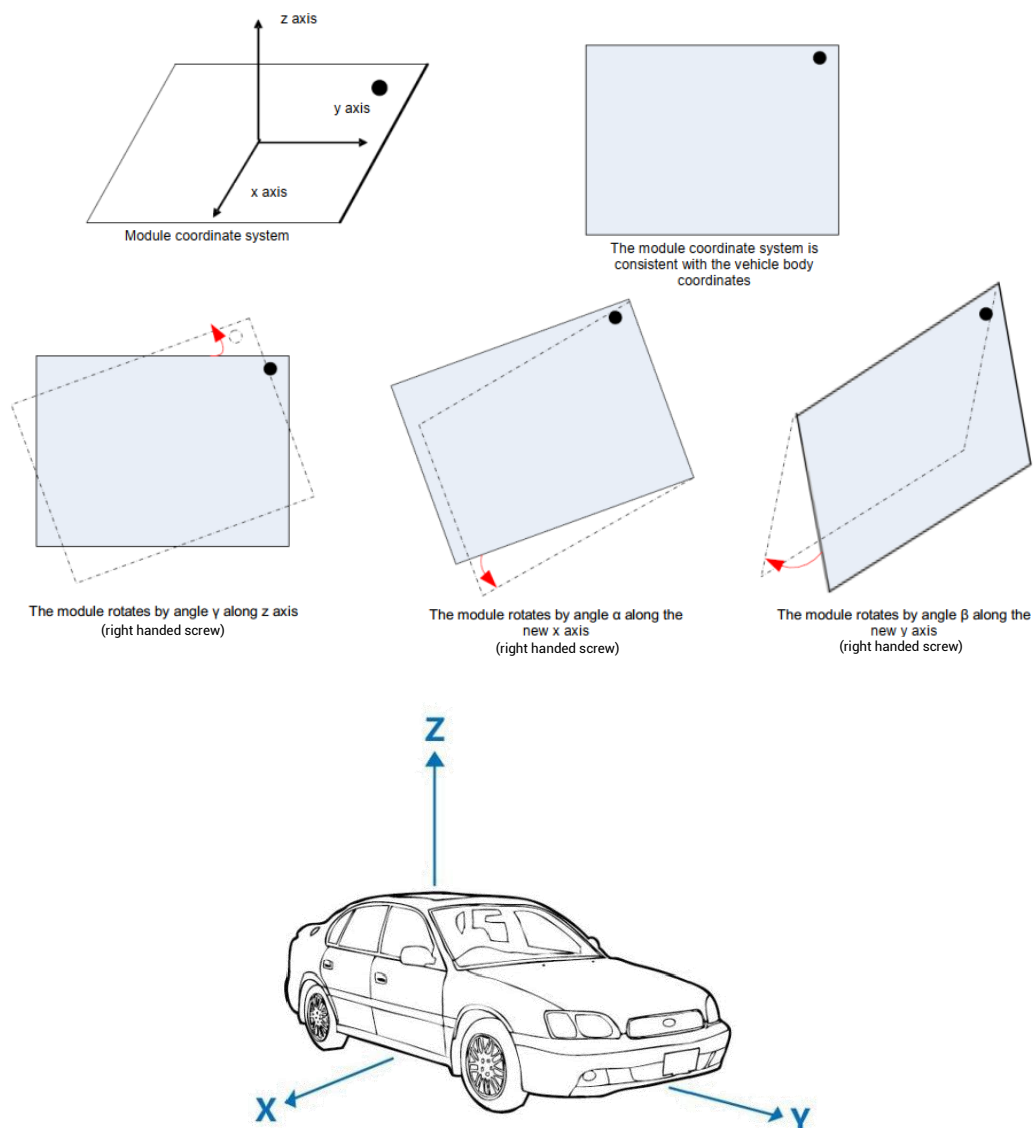


Figure 4-2 Coordinate System of the Module and Vehicle

4.3 SD Card Instructions

There is an SD card slot on the UM220-INS NL EVK, which is used for data storage and firmware upgrade.

 You can also use UPrecise to store data and upgrade the firmware. For more information, see *UPrecise_User Manual*.

4.3.1 Contents of the SD Card Folder

Before using the SD card, you need to copy the zipped folder **UM220-INS_EVK_V2.0_sdcard** to the card. The folder contains the following items:

Name	Date modified	Type	Size
 bootloader	4/24/2023 11:28 AM	File folder	
 firmware	4/24/2023 11:28 AM	File folder	
 Log	4/24/2023 11:28 AM	File folder	
 config.ini	4/24/2023 6:24 PM	Configuration settings	1 KB

Figure 4-3 Contents of the SD Card Folder

1. The “bootloader” folder contains the loader file for firmware upgrade.

 Unicore has already provided the loader file, which can be used directly.

2. The “firmware” folder is used to store the firmware file.
3. The “Log” folder is used for data storage.
4. The “config.ini” is the configuration file, of which the contents are as follows:

```
#####
#Description of the configuration items:
#1. SingleFileSize: It specifies the size of a single file. If the file size exceeds the specified one, a
new file will be created.
# Notes: Hexadecimal format is not supported; please convert the size to a decimal number.
#
#2. StartRecordStyle: It defines the recording style after starting up, either to create a new file or
append to the existing file.
# When the value = append, the data will be logged in the existing file; when the value = new,
the data will be logged in a new file.
#
#3. The character '#' at the beginning of a line means that the line is a comment.
#####
[config]
SingleFileSize = 512000000

#(new or append)
StartRecordStyle = new

WorkBaudrate = 115200

LogFileName = log

#When the value is 1, the firmware will be upgraded; otherwise, it will not be upgraded.
update = 0
```

Figure 4-4 Contents of the config.ini File

Table 4-1 Description of the config.ini File

Contents	Description
[config]	/
SingleFileSize = 512000000	The size of a single file. If the file size exceeds the specified number, a new file will be created. (Hexadecimal format is not supported; please convert the size to a decimal number.)
StartRecordStyle = new	The recording style after starting up (new or append): Append = log data in the existing file; New = log data in a new file
WorkBaudrate = 115200	The working baud rate of UM220-INS NL module
LogFileName = log	The name of the log file
update = 0	1 = Upgrade the firmware; 0 = Do not upgrade the firmware

4.3.2 Data Storage Instructions

Step 1: Insert the SD card into the PC, and copy the zipped folder **UM220-INS_EVK_V2.0_sdcard** to the card.

Step 2: Unzip the folder and open the "config.ini" file, then set the "update" value to 0, set the "WorkBaudrate" the same as that of the UM220-INS NL module and set other parameters as needed (see Table 4-1 for more information).

Step 3: Remove the SD card from the PC, insert it into the EVK, and power on the EVK¹.

Step 4: Waiting for a while and you can get the logged data in the SD card. During the process, you may use the Micro-B USB cable to connect the EVK to PC in order to check the status of data transmission with a port monitor tool.

4.3.3 Firmware Upgrade Instructions

Step 1: Insert the SD card into the PC, and copy the zipped folder **UM220-INS_EVK_V2.0_sdcard** to the card. Unzip the folder and open "bootloader" to make sure that it contains the loader file. Then, put the firmware file² in the "firmware" folder.

 For the bootloader and firmware folders, only one file can be stored in each folder.

Step 2: Open the "config.ini" file, and set the "update" value to 1.

Step 3: Remove the SD card from the PC, insert it into the EVK, and power on the EVK.

Step 4: During upgrade, the indicator L1 is off. After the upgrade is finished, the light turns on. You may also use the Micro-B USB cable to connect the EVK to PC in order to check the status of upgrade with a port monitor tool.

¹ If the antenna is not connected, the EVK will output debug information; if you need the positioning information, please connect the antenna before powering on.

² Please contact Unicore to get the latest firmware.

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