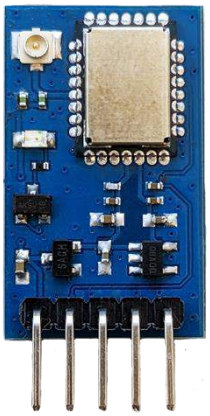
REYAX
TECHNOLOGY CORPORATION, LTD

08-DEC-2022 56312E40

RYS8839_Lite

Ultra-low power **1.8V**, L1 L5 Dual-band multi-constellation GNSS module
Lite Evaluation Board



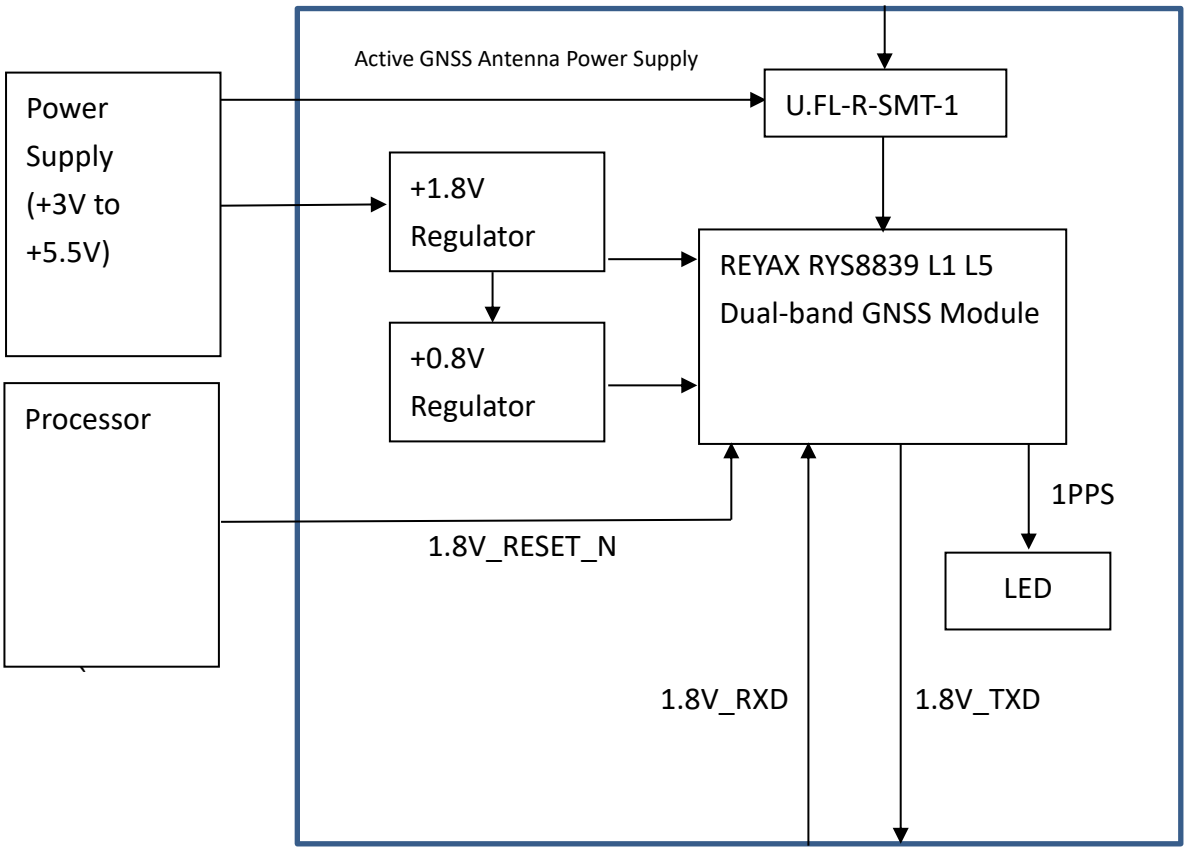
PRODUCT DESCRIPTION

The RYS8839 is an ultra-low power, L1 L5 Dual-band multi-constellation GNSS module. It also has integrated digital noise filters for coexistence with other radio systems.

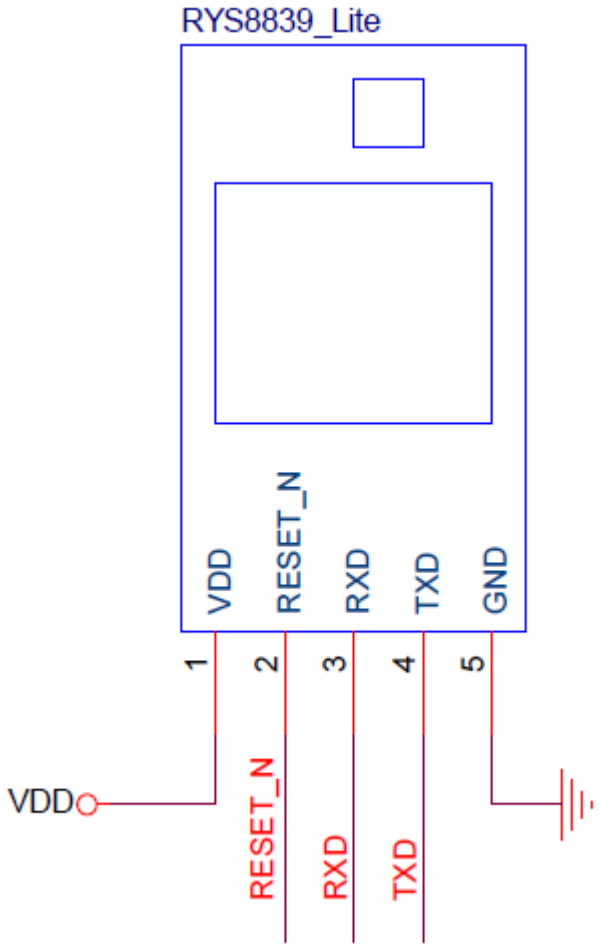
FEATURES

- SONY CXD5610GF Engine
- A L1 L5 Dual-band GNSS receiver.
- Supports multi-constellation :
  GPS(L1C/A,L5) GLONASS(L1OF)
  BeiDou(B1I. B1C, B2a)
  Galileo(E1, E5a)
  QZSS(L1C/A, L1S, L1C/B, L5)
  IRNSS NAVIC(L5)
  SBAS(L1)
  *GNSS performance could depend on the setting.
- Embedded digital noise filters and spectrum analyzer.

BLOCK DIAGRAM

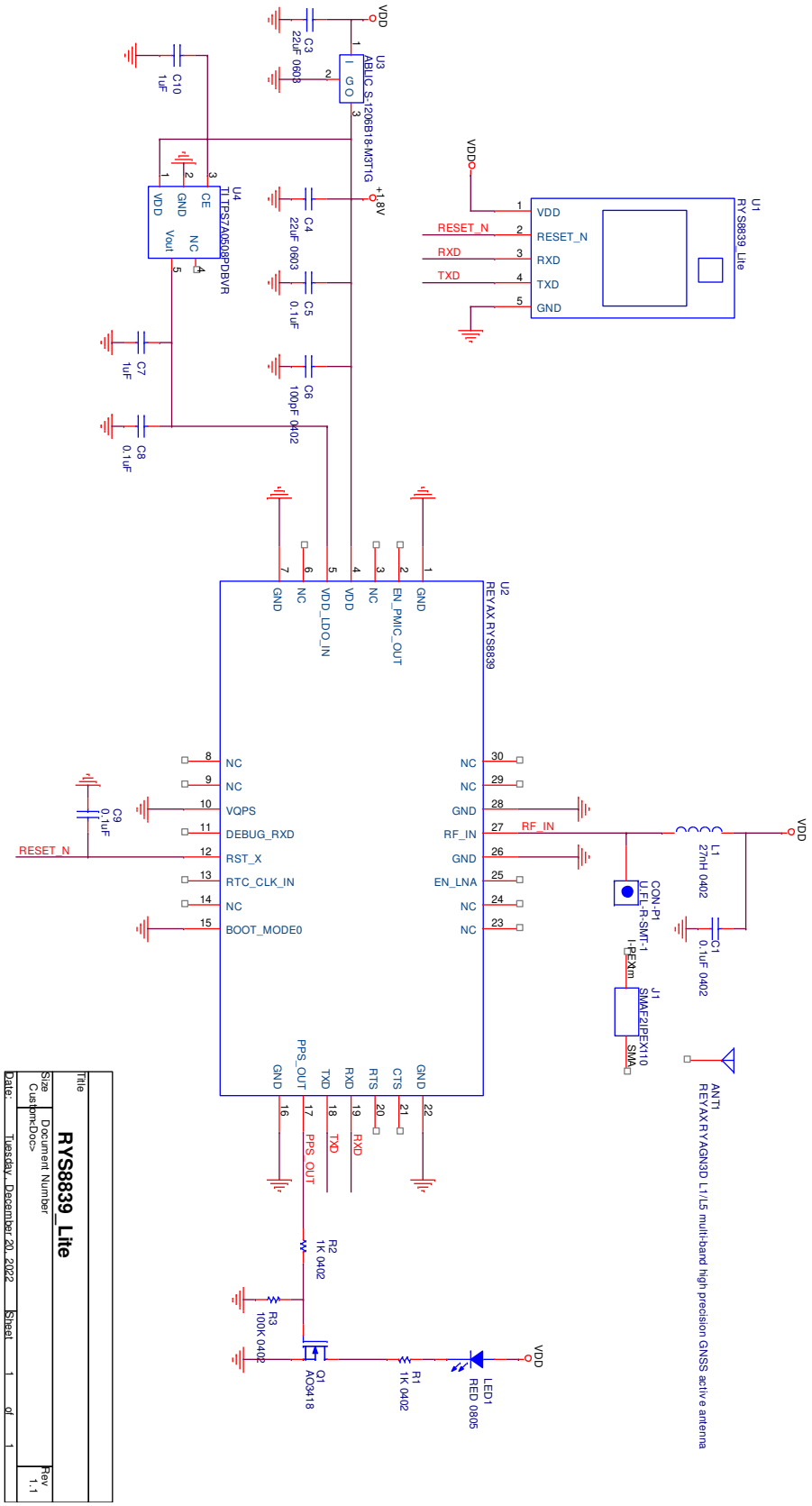


PIN DESCRIPTION



Pin	Name	I/O	Condition
1	VDD	I	Power supply(+3V to +5.5V)
2	RESET_N	I	Active Low(+1.8V)
3	RXD	I	Serial interface Input (+1.8V)
4	TXD	O	Serial interface Output (+1.8V)
5	GND	-	Ground

APPLICATION SCHEMATIC

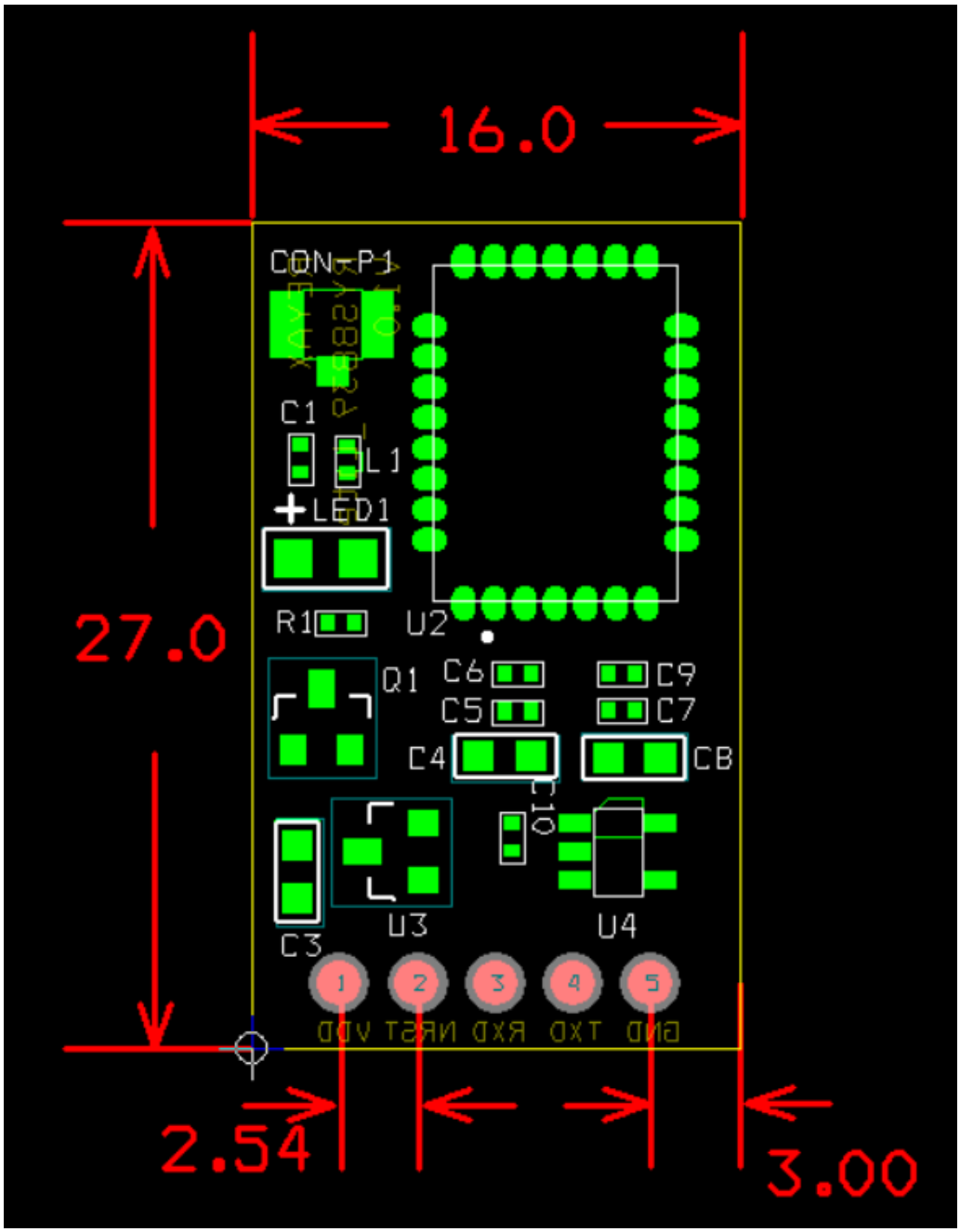


SPECIFICATION

Item	Min.	Typical	Max.	Unit	Condition
Power Supply Voltage	3		5.5	V	VDD for RYAGN3D active antenna & RYS8839
Default Baud Rate		115200		bps	8,N,1
Digital input level high	1.26	1.8	2.1	V	VIH
Digital input level low	-0.3		0.54	V	VIL
Digital output level high	1.44		1.8	V	VOH 2mA
Digital output level low	0		0.36	V	VOL 2mA
GNSS Center Frequency		1176.45 1561.098 1575.42 1602.5625		MHz	GPS L5 BeiDou GPS L1 Glonass
Navigation update rate		1	25	Hz	L1 L5 Signal strength is -130dBm
Accuracy		1		M	L1 L5 Signal strength is -130dBm
Cold start		24		Sec.	L1 L5 Signal strength is -130dBm
Hot start		1		Sec.	L1 L5 Signal strength is -130dBm
Tracking Sensitivity		-167		dBm	
Hot starts Sensitivity		-163		dBm	
Cold starts Sensitivity		-149		dBm	
Operating Temperature	-40	+25	+85	℃	
Dimensions					32mm*16mm*7mm (include pin header)
Weight		2.4		g	
Active antenna (VDD = 3.3V)					
Idle Current		15.7		mA	
Satellite acquisition Current		27.5	42	mA	L1 Band
Satellite tracking Current		22	25	mA	L1 Band
Satellite acquisition Current		37	50	mA	L1+L5 Band
Satellite tracking Current		27.5	30	mA	L1+L5 Band
Sleep mode		13.87		mA	
Deep sleep mode		11.36		mA	
Passive antenna(VDD = 3.3V)					
Idle Current		5		mA	Passive antenna
Satellite acquisition Current		16.5	30	mA	L1 Band
Satellite tracking Current		12	15	mA	L1 Band

Satellite acquisition Current		24	38	mA	L1+L5 Band
Satellite tracking Current		18	21	mA	L1+L5 Band
Sleep mode		3		mA	
Deep sleep mode		580		uA	

DIMENSIONS



Unit : mm

PCB Thickness : 1.6mm

GNSS Monitor software

STEP 1. INSTALL THE SOFTWARES

1.) Download the GNSS_Monitor2_ForCustomer_Setup

https://drive.google.com/file/d/1e6uwdC3NmsTMZIWHbXxcK98Ul8Ng-4RC/view?usp=sharing

STEP 2. CONNECTION SETTING

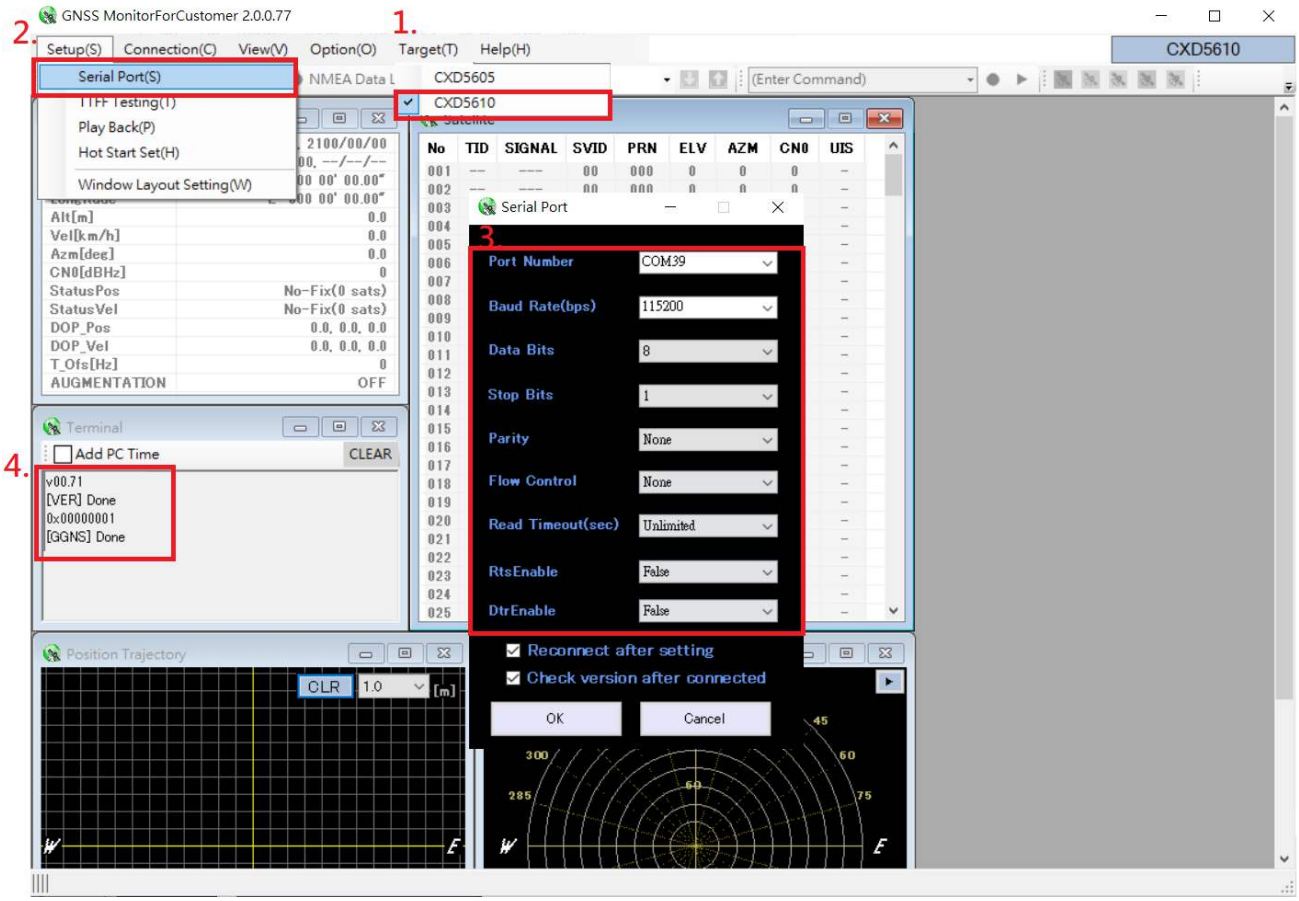
Plug USB to TTL cable to connect the RYS8839_lite and the PC.

1.) Open the software GNSS_Monitor2_ForCustomer Target → CXD5610

2.) Open the Serial Port setting

3.) Set the COM port number and the baud rate (Default is 115200bps).

4.) If connection successful, will show FW version message.



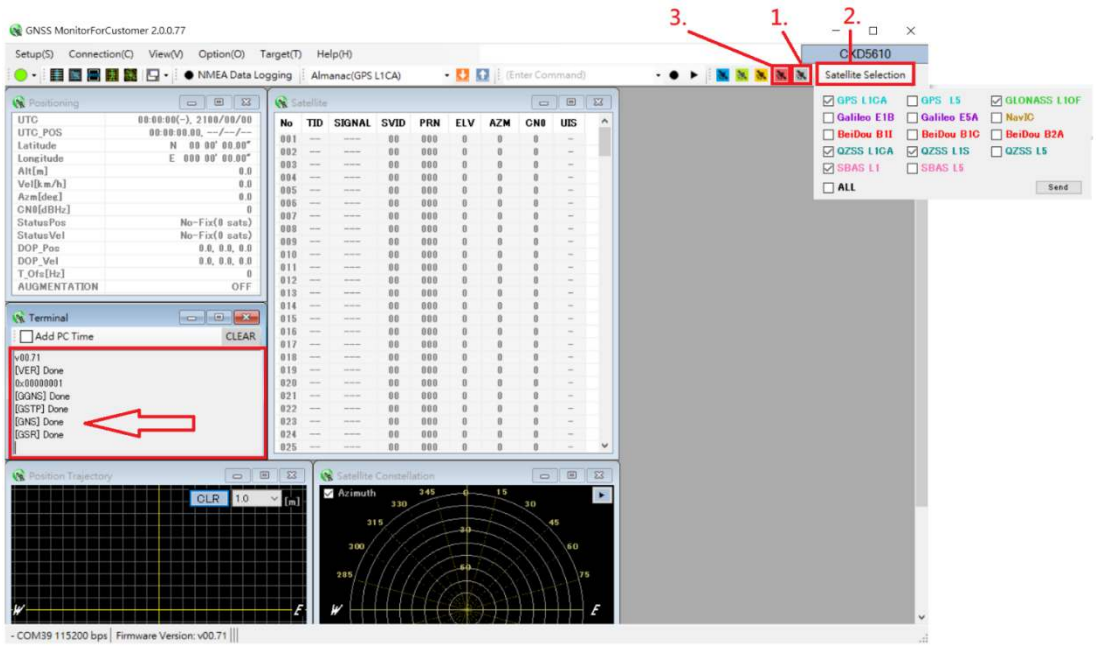
STEP 3. Command input setting

1.) Click “IDLE” button, Terminal window will show [GSTP]Done.

2.) Click “Satellite Selection” button, after select Satellite and click “Send”. Terminal window will show [GNS]Done.

3.) Click “Hot start” button, Terminal window will show [GSR]Done. Module start output NMEA log.

4.) If want to stop tracking, click “IDLE” button.



*For detailed command user guide, please refer to RYS8839_Software_Guide

https://reyax.com//upload/products_download/download_file/RYS8839_Software_Guide.pdf

QUICK START GUIDE

STEP 1. Power on module

STEP 2. Issue command

1.) @GSTP // Positioning stop

2.) @GNS 815

// Positioning-use satellite use GPS L1 L5 + GLONASS L1OF + SBAS + QZSS L1-CA + QZSS L1-S + QZSS L5

3.) @GTIM 2022 12 20 00 00 00 // inject UTC time

4.) @GPPS 1 // enable 1PPS function

5.) @GSR // hot start

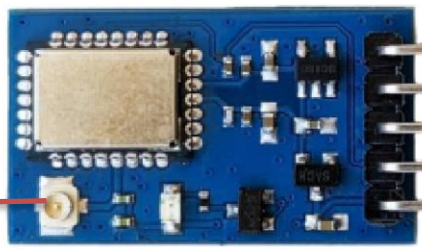
*For detailed command user guide, please refer to RYS8839_Software_Guide

https://reyax.com//upload/products_download/download_file/RYS8839_Software_Guide.pdf

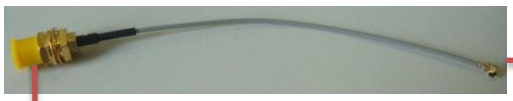
RYS8839_Lite test connection diagram

REYAX RYLS135

REYAX RYS8839_Lite



SMAF2IPEX110 Cable



REYAX RYAGN3D Antenna

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