M.2 RTK GNSS Receiver

A+E-Key M.2 RTK Receiver with ZED-F9P-01B
Datasheet

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An A+E-key M.2 featuring the u-blox ZED-F9P-01B, allowing for easy integration into autonomous, industrial, and IoT applications.

High precision location coordinates are easy to inject into your system with this small M.2 form-factor RTK GNSS receiver. For fast time to market and future-proofing your GNSS solution, all that is needed is an "A" or "E" key M.2 connector slot. When paired with a multi-band antenna, ~2 centimeter range positioning is achievable.

Operating Conditions

Ambient Temperature	-40°C - 85°C
+3.3V Current (MAX)	150 mA
Voltage Range (200mA)*	3.24V - 3.46V (+/- 2%)

Key Details

Supported Interfaces	USB 2.0, I2C, CMOS (1.8V) UART
Antenna Port	u.FL
Supported GNSS Constellations	GPS (L1C/A, L2C), GLONASS (L1OF, L2OF), Galileo (E1-B/C, E5b), BeiDou (B1I, B2I), QZSS Satellites (when GPS is enabled)
Supported Protocols	UBX, NMEA 4.10, RTCM 3.3
Chipset	u-blox ZED-F9P-01B
Size and Weight	42mm x 30mm x 5mm, 4.5g

Size Diagram

Features

- Made in the USA from globally sourced components.
- Ultra-Low noise on-board LDO for improved receiver immunity from system noise
- USB interface (USB 2.0 support)
- M.2 Module-controlled LED
- ZED's UART (1.8V) and I2C (3.3V) signals exposed at the M.2 Interface for additional connectivity options
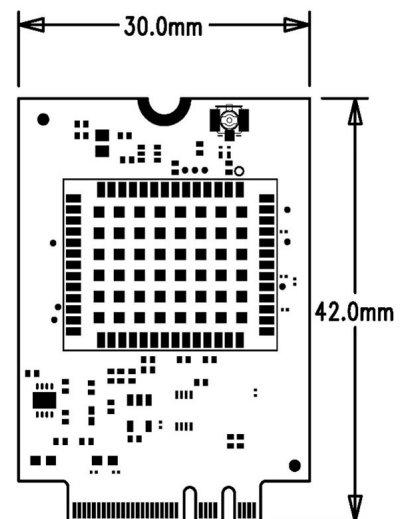
Pin Definitions and Supported Pins

All pinouts in this section are written from the ZED point of view when referencing signal direction.

	Abbreviation	Definition
Pin Types	U	USB Signaling
	I	Input from module
	I/O	Bidirectional signaling
	O	Output to module

Pin#	M.2 Name	Type	Domain	Module Type
3	USB_D-	U		U
5	USB_D+	U		U
6	LED1#	I	3.3V	O
22	UART_TXD	O	1.8V	I
32	UART_RXD	I	1.8V	O
52	PERST#	O	3.3V	I
58	I2C_Data	I/O	3.3V	I
60	I2C_CLK	O	3.3V	I

	Power Domain		Description	Min	Max	Unit
Level	1.8V	V_{IL}	Low-level Input		0.8	V
		V_{IH}	High-level Input	1.17		V
		V_O	Output Voltage ($I_{OUT} < 2mA$)	0	1.8	V
		$I_{OH/L}$	Output/Input Current			mA
	3.3V	V_{IL}	Low-level Input			V
		V_{IH}	High-level Input	2.0		V
		V_O	Output Voltage ($I_{OUT} < 2mA$)v	0	3.3	V
		$I_{OH/L}$	Output/Input Current		4	mA

Reference Documents

The following documents are external reference documents and should be consulted when applicable:

- PCI Sig M.2 Electromechanical Specification Revision 5.1, Version 1.0 2023
- USB Specifications (www.usb.org)
- The I2C Specification, Version 2.1 January 2000, Philips Semiconductor (now NXP: www.nxp.com)
- u-blox ZED-F9P-01B high precision GNSS module (www.u-blox.com)

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