

Linnet Mosaic X5

Features

- 5V-450mA power supply
- LED status: Timepulse / Power / **RTK**
- Timepulse and External interrupt
- USB and UART
- SD card log
- ESD protection diodes

Applications

- Drones
- **RTK**
- Ground vehicles
- Precise navigation
- Automation of moving machinery

Description Linnet Mosaic x5 is a compact and high precision multi bands, multi frequencies **GNSS RTK** device.

It is based on the septentrio **Mosaic-X5** module, and offers reliable and fast convergence to provide centimeter accuracy within seconds. **GPS, GLONASS, BEIDOU** and **GALILEO** signals are supported. The JSTGH connectors pinout is compatible with most of **px4** and **ardupilot** device.

Linnet is designed to work over a temperature range of -20 °C to +70 °C.



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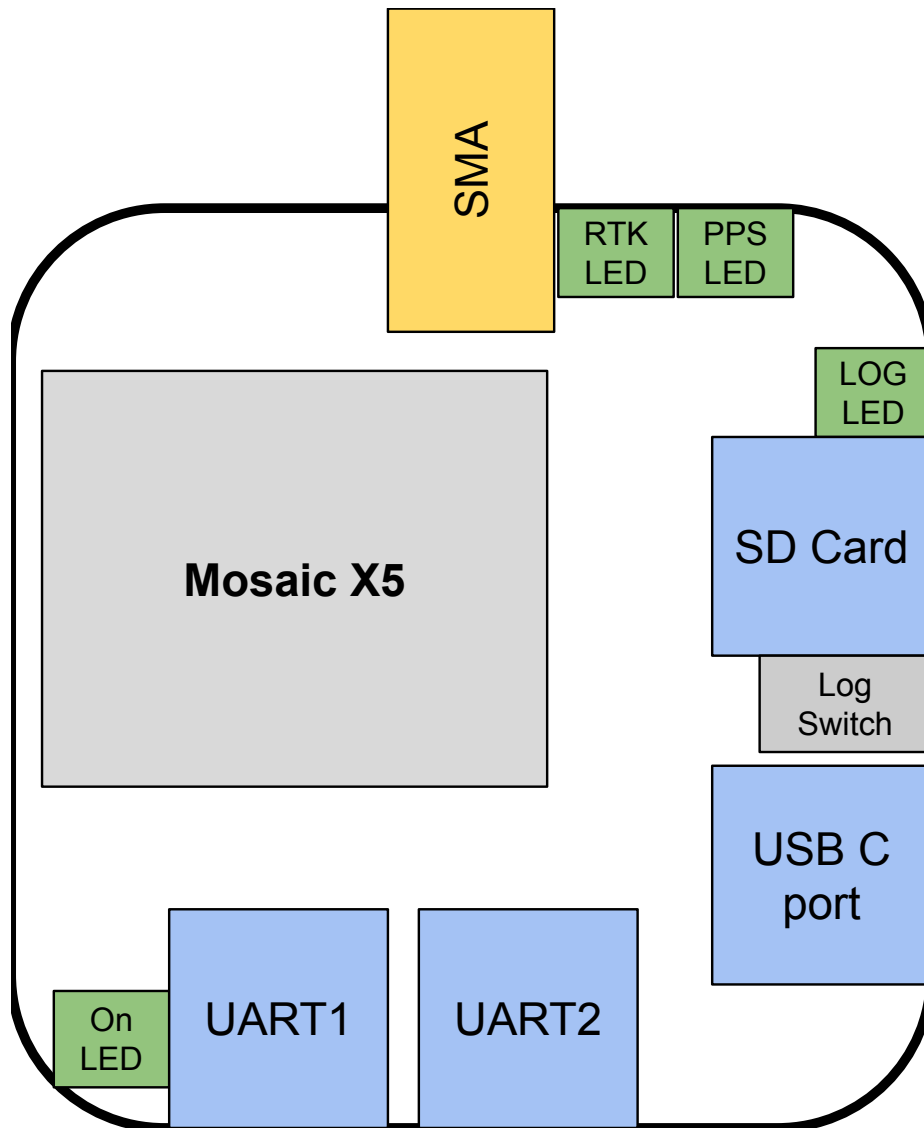
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1 : Diagram and pin description

1.1 : Diagram

The following figure represent the different LEDs and connector from Linnet.

Figure 1: Linnet Diagram



1.2 : LED description

Table 1: LED sequence status

LED name	Color	Light sequence	Comment
PPS	Green	● ○ ● ○	Blinking LED when RTK fix is available
On LED	Green	● ● ● ●	Solid green LED when powered ON
RTK	Green	○ ○ ○ ○	3D fix mode / No RTK fix
		● ○ ● ○	float RTK
		● ● ● ●	fixed RTK
Log	Green	○ ○ ○ ○	Logging disabled
		● ○ ● ○	Logging enabled

1.3 : Pin description

Pinout follows the **JST-GH** standard.

Figure 2: JST-GH, pin 1

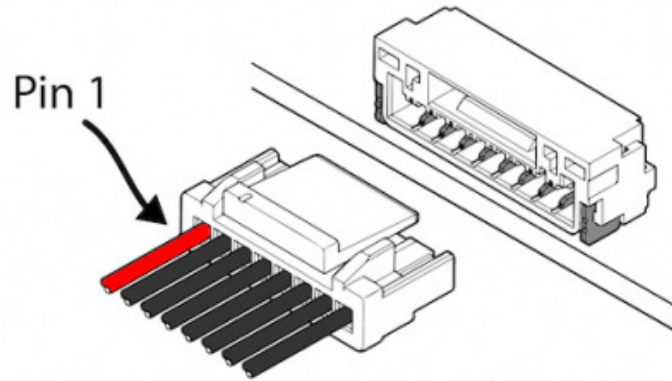


Table 2: Pinout configuration

	Pin	Name	Type	Function
UART1	B1	5V	P	5V input
	B2	RX1	I	UART1 receive
	B3	TX1	O	UART1 transmit
	B4	RTS1	O	UART1 ready to sent
	B5	CTS1	I	UART1 clear to sent
	B6	GND	P	Ground interface
UART2	C1	5V	P	5V input
	C2	TX2	O	UART2 transmit
	C3	RX2	I	UART2 receive
	C4	RTS2	O	UART2 ready to sent
	C5	CTS2	I	UART2 clear to sent
	C6	GND	P	Ground interface
RSV	-	reserved	-	-

2 : Electrical and mechanical specifications

The values for the following operating conditions have been specified at 25 °C ambient temperature.

Table 3: Electrical and mechanical specifications

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{USB}	USB supply voltage	-	4.5	5.0	5.5	V
V _{dd}	Internal supply voltage	-	-	3.3	-	V
V _{ddIO}	Supply voltage for I/O	-	-	3.3	-	V
I _{dd}	Current consumption	-	160	210	450	mA
V _{il}	IO pin low level input voltage	-	0	-	1.0	V
V _{ih}	IO pin high level output voltage	-	2	-	V _{dd}	V
V _{ol}	IO pin low level output voltage	I _{ol} = 1mA	-	-	0.15	V
V _{oh}	IO pin high level output voltage	I _{oh} = 1mA	3.15	-	-	V
T _{op}	Operating temperature	-	-20	-	+70	°C

3 : Absolute maximum rating

Stresses above those listed "absolute maximum ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device under these conditions is **not** implied. Exposure to maximum rating operations for extended period may affect device reliability.

Table 4: Absolute maximum ratings

Symbol	Parameter	Maximum value	Unit
V _{USB}	USB supply voltage	-0.3 to +6	V
V _{dd}	Internal supply voltage	-0.3 to 3.6	V
V _{ddIO}	I/O pins supply voltage	-0.3 to V _{dd} + 0.5	V
P _{wrRFIN}	Input power at RF _{IN}	20	dBm
T _{op}	Operating temperature	-20 to +70	°C
T _{stg}	Storage Temperature	-40 to +80	°C

4 : GNSS

4.1 : Frequency band

Most of the standard GNSS frequency bands are supported

Table 5: Supported frequency band

GPS	L1C/A, L1PY, L2C, L2P, L5
Glonass	L1CA, L2CA, L2P, L3 CDMA
BeiDou	B1I, B1C, B2a, B2b, B2I, B3
Galileo	E1, E5a, E5b, E5 AltBoc, E6
QZSS	L1C/A, L1 C/B, L2C, L5
Navic	L5
SBAS	Egnos, WAAS, GAGAN, MSAS, SDCM (L1, L5)

4.2 : GNSS performance

All values for proper antenna and open sky conditions.

Table 6: GNSS performance

	Parameter	Value	Unit
RTK performance	Horizontal accuracy	0.6 + 0.5ppm CEP	cm
	Vertical accuracy	1 + 0.5ppm CEP	cm
	Initialization time	7	s
Tracking performance	Tracking	20	dB-Hz
	Acquisition	33	dB-Hz
Maximum update rate	Position	100	Hz
	Measurements only	100	Hz
Time to first fix	Cold start	<45	s
	Warm start	<20	s
	Re-acquisition	1	s
Time precision	xPPS out	5	ns
	Event accuracy	<20	ns
Miscellaneous	Velocity accuracy	3	cm/s
	Latency	<10	ms

5 : Communication interface

There are several communications interfaces including UART and USB. All the inputs have internal pull-up resistors in normal operation and can be left open if unused. All the PIOs are supplied by Vdd, therefore all the voltage levels of the PIO are related to the Vdd supply voltage.

5.1 : UART interface

There are two UART interfaces: UART1 on the *Rover* connector, and UART2 on the *telem* connector. UART1 and UART2 have configurable baud rates.

Hardware flow control is not supported.

The UART settings (baud rate etc.) are set with the **setCOMSettings** user command. The maximum baud rate is 4 Mbits/s.

5.2 : USB device interface

The USB-C is configured in USB 2.0 (high speed, with a maximum of 480 Mbps). This product emulates two virtual serial and USB/IP ports to facilitate communication. By utilizing the USB/IP port, users can access access the internal Web Server configurator of mosaic.

To connect your Web Browser to the Mosaic Web Server:

- Connect Linnet using the provided USB port
- Open your preferred Web Browser and enter the following URL : <http://192.168.3.1>

6 : SD card

The mosaic X5 module can interface to an external SD card, allowing log storage.

This feature can be drive through the log button. Pressing it for 5 or more seconds will mount or unmount the SD card. A short press will toggle between logs enabled/disabled.

The LOGLED is off when the SD card is not present or unmounted. It is on when the SD card is present and mounted. Short blinks indicate logging activity.

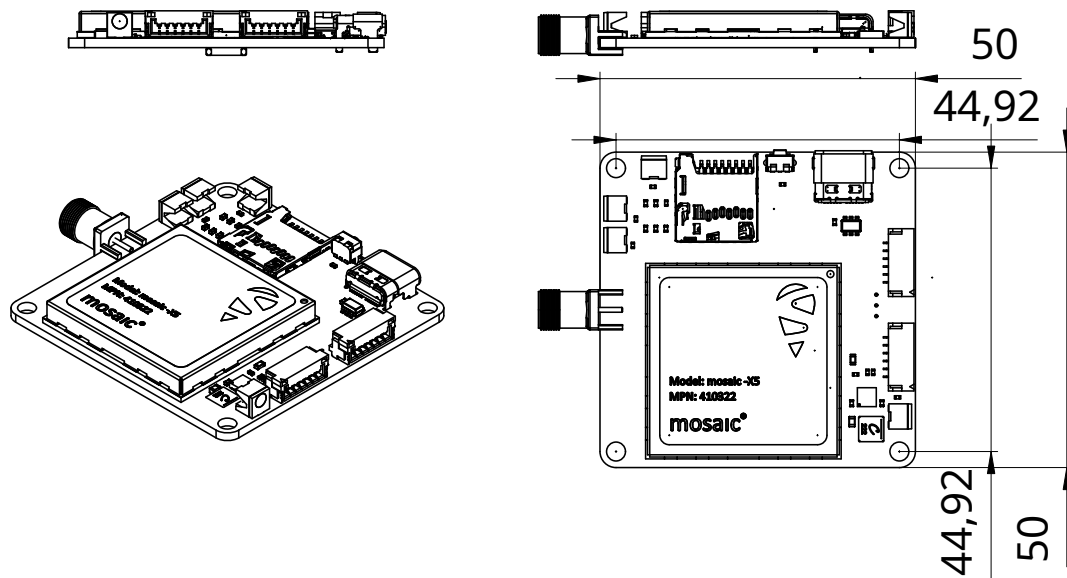
7 : Jamming protection

Septentrio provide the **AIM+** technology on his Mosaic-X5 module, offering great resistance against radio interferences and GNSS jamming and spoofing. In particular, some advanced GNSS signal generator ban de identified as "non-authentic" signal. These protections can be configured using the web-interface.

8 : Mechanical drawing

To facilitate mounting on a drone or another platform, Linnet features 4 screw passages located at the corners.

Figure 3: Mechanical drawing



9 : Appendix

9.1 : Useful link

[septentrio mosaic-X5 web page](#)

[septentrio AIM+ jamming protection](#)

[Systork forum](#)

9.2 : Glossary

10 : Revision History

Table 7: Document revision history

Date	Revision	Changes
29 May 2025	1.0	Initial release