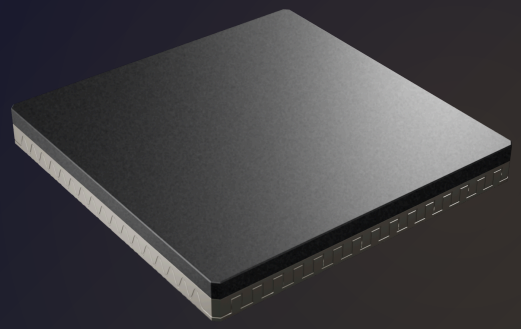
FIX

GNSS Anti-Jamming Module

The FIX-16-P is a 420 g, 16-element L1 GNSS anti-jam unit for UAV, missile and manned platforms: up to 15 independent nulls, >50 dB of jammer suppression, adaptive notch filtering, spoofing detection and a GNSS receiver in one 23 mm housing.



FIX-16-P

ELEMENTS	SIMULTANEOUS NULLS	JAMMER SUPPRESSION	WEIGHT
16 L1	15	>50 dB	420 g

The FIX-16-P is a controlled reception pattern antenna (CRPA) with its adaptive nulling processor and a GNSS receiver in one sealed 195 × 195 × 23 mm housing. Its 16 L1 GNSS elements steer up to 15 independent nulls onto jammers while the satellites stay in view, with >50 dB of suppression and a J/S performance of >110 dB. CW, narrowband, wideband, swept and pulsed jammers are handled, and spoofing detection runs alongside the nulling. Adaptive notch filters follow narrowband jammers in frequency and depth.

FIX fits a platform in either of two ways. In drop-in use the cleaned GNSS signal leaves on a 50 Ω SMA connector at a programmable −50 to 0 dBm, so the receiver already on the platform keeps working unchanged. In standalone use the internal u-blox MAX-M10 tracks GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS and sends position, velocity and time as NMEA, UBX, MAVLink or DroneCAN, together with the jamming and spoofing status and the bearing of each jammer.

Power, data and control come in on a single 15-pin Micro-D connector: Fast Ethernet, RS-232, RS-422 and CAN, from a 9 to 36 VDC supply at under 25 W. A WebGUI on the Ethernet port shows the antenna pattern, the spectrum and every jammer the unit is nulling; nothing has to be installed. FIX is ITAR-free, sealed to IP66 and qualified to MIL-STD-810G and MIL-STD-461F.

Key Features

Adaptive Nulling & Notch Filtering
15 simultaneous nulls on L1 GNSS and >50 dB jammer suppression, and adaptive notch filters against narrowband jammers

Spoofing Detection
Purpose-built detection algorithms flag spoofed signals; the status and each event go to the autopilot and the log

Integrated GNSS Receiver
u-blox MAX-M10 tracking GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS; position, velocity and time as NMEA, UBX, MAVLink or DroneCAN

Virtual Antenna Pattern
Shows in real time where each jammer is coming from and where the nulls are placed; the data can be read out of the unit

Onboard Sensors & Logging
9-axis IMU, barometer, humidity and temperature; jamming and spoofing events are logged with a time stamp

Autopilot Integration
Works as the platform's GPS and compass module in one unit, over DroneCAN or MAVLink, directly with ArduPilot and PX4

UAV | MISSILE | ROCKET | AIRCRAFT

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Technical Specifications — FIX-16-P

ARRAY & NULLING

Protected Bands	L1 GNSS
Elements	16 on L1
Simultaneous Nulls	15
Jammer Suppression	>50 dB
J/S Performance	>110 dB
Jammer Types	CW · narrowband · wideband · swept · pulsed
Adaptive Notch Filter	Automatic; frequency and depth follow the jammer
Spoofing Detection	Built in
Virtual Antenna Pattern	Live jammer bearing and null map, readable as data

INTERFACES & POWER

Data Connector	1× 15-Pin Micro-D
RF Connector	1× SMA, 50 Ω
Digital Interfaces	1× Fast Ethernet · 1× RS-232 · 1× RS-422 · 1× CAN
Protocols	NMEA · UBX · MAVLink · DroneCAN
Input Voltage	9 – 36 VDC
Power Consumption	< 25 W
Power Protection	Over/under-voltage, over-current, short-circuit
Surge Protection	ESD & lightning

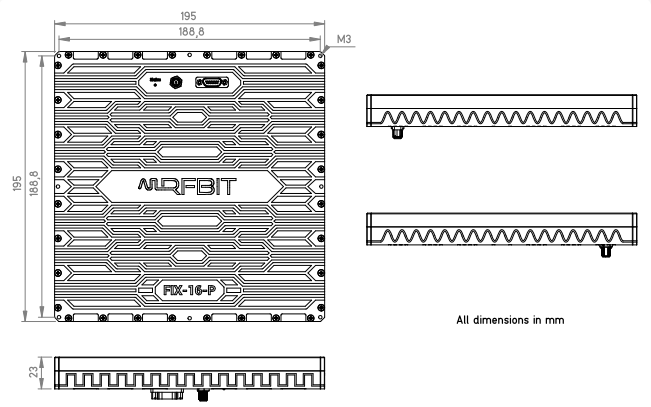
GNSS & RF

Receiver	u-blox MAX-M10
Constellations	GPS · GLONASS · Galileo · BeiDou · QZSS · SBAS
RTK	No
RF Filter	Integrated SAW filter
Cleaned RF Output	−50 to 0 dBm Changed by the user via software

ENVIRONMENTAL & EMC

Operating Temperature	−40 to +85 °C MIL-STD-810G 501.5 / 502.5 Proc II
Storage Temperature	−40 to +85 °C MIL-STD-810G 501.5 / 502.5 Proc I
Operating Altitude	Up to 40,000 ft MIL-STD-810G 500.5 Proc I & II
Humidity	95% R.H. MIL-STD-810G 507.5 Proc II
Ingress Protection	IP66
Acceleration	MIL-STD-810G 513.6 Proc I & II
Vibration	MIL-STD-810G 514.6D-2 Proc I · 514.8D-1 Proc I
Mechanical Shock	MIL-STD-810G 516.6 Proc I & II
EMC	MIL-STD-461F CE102 · CS114 · CS115 · CS116 · RE102 · RS103

MECHANICAL DRAWING



DIMENSIONS	WEIGHT	MOUNTING	MATERIAL
195 × 195 × 23 mm	420 g	4× M3	Aluminium

CONNECTOR PINOUT

1	ETH TX+	9	CAN H
2	ETH TX−	10	CAN L
3	ETH RX+	11	232 TX
4	ETH RX−	12	232 RX
5	422 TX+	13	DGND
6	422 TX−	14	PWR IN−
7	422 RX+	15	PWR IN+
8	422 RX−		

Pin 13 (DGND) is the ground reference for the RS-232 and CAN lines.

Accessories

PART NUMBER	DESCRIPTION
FIX-ACC-CBL-15D	15-Pin Micro-D Interface Cable, 1 m (extra)
FIX-ACC-RF-SMA	SMA Male to SMA Male RF Cable, 0.5 m (extra)

Ordering Information

PART NUMBER	ELEMENTS	BUILD	DIMENSIONS	WEIGHT
FIX-4-C	4 on L1 GNSS	Compact	80 × 80 × 23 mm	120 g
FIX-4-P	4 on L1 GNSS	Performance	100 × 100 × 23 mm	150 g
FIX-8-C	8 on L1 GNSS	Compact	115 × 115 × 23 mm	185 g
FIX-8-P	8 on L1 GNSS	Performance	145 × 145 × 23 mm	265 g
FIX-16-C	16 on L1 GNSS	Compact	155 × 155 × 23 mm	295 g
FIX-16-P	**16 on L1 GNSS**	**Performance** ◀ This model	**195 × 195 × 23 mm**	**420 g**
FIX-16D2-C	8 on L1 GNSS + 8 on L2 GNSS	Compact	155 × 155 × 23 mm	295 g
FIX-16D2-P	8 on L1 GNSS + 8 on L2 GNSS	Performance	195 × 195 × 23 mm	420 g
FIX-16D5-C	8 on L1 GNSS + 8 on L5 GNSS	Compact	160 × 160 × 23 mm	300 g
FIX-16D5-P	8 on L1 GNSS + 8 on L5 GNSS	Performance	200 × 200 × 23 mm	435 g

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