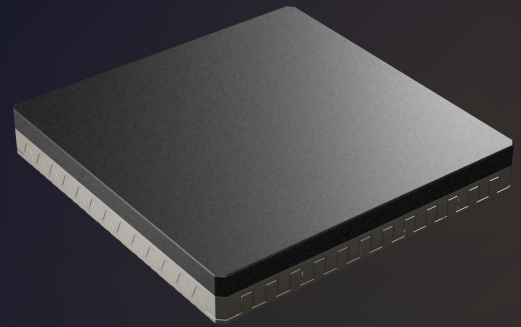


FIX

GNSS Anti-Jamming Module

The FIX-16D2-C is a 295 g, 16-element anti-jam unit for UAV, missile and manned platforms, built as two arrays: 8 elements with 7 nulls on L1 GNSS, and 8 elements with 7 nulls on L2 GNSS; >40 dB of jammer suppression, adaptive notch filtering, spoofing detection and a GNSS receiver in one 23 mm housing.



FIX-16D2-C

ELEMENTS

8 L1 + 8 L2

SIMULTANEOUS NULLS

7 L1 + 7 L2

JAMMER SUPPRESSION

>40 dB

WEIGHT

295 g

The FIX-16D2-C is a controlled reception pattern antenna (CRPA) with its adaptive nulling processor and a GNSS receiver in one sealed 155 × 155 × 23 mm housing. Its 16 elements form two arrays, 8 on L1 GNSS and 8 on L2 GNSS, each with its own nulling: 7 nulls on L1 and 7 on L2, steered onto jammers while the satellites stay in view, with >40 dB of suppression and a J/S performance of >100 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 ZED-F9P 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

7 simultaneous nulls on L1 GNSS and 7 on L2 GNSS and >40 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 ZED-F9P 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

Technical Specifications — FIX-16D2-C

ARRAY & NULLING

Protected Bands	L1 GNSS · L2 GNSS
Elements	8 on L1 + 8 on L2 (16 total)
Simultaneous Nulls	7 on L1 + 7 on L2
Jammer Suppression	>40 dB
J/S Performance	>100 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

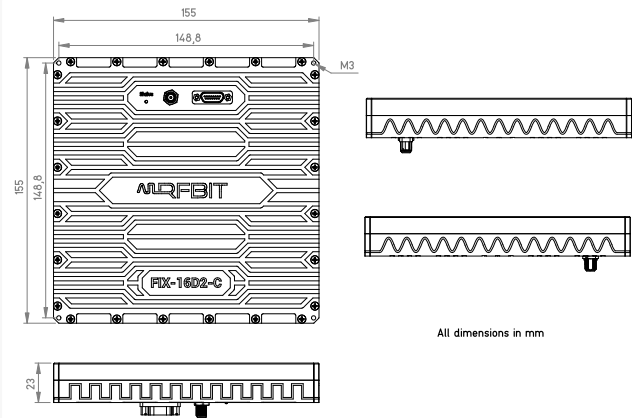
GNSS & RF

Receiver	u-blox ZED-F9P
Constellations	GPS · GLONASS · Galileo · BeiDou · QZSS · SBAS
RTK	Supported
RF Filter	Integrated SAW filter
Cleaned RF Output	–50 to 0 dBm Changed by the user via software

ENVIRONMENTAL & EMC

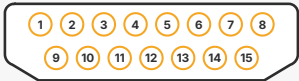
Operating Temperature	–40 to +85 °C MIL-STD-810G 501.5 / 502.5 Proc II
Storage Temperature	–40 to +85 °C MIL-STD-810G 501.5 / 502.5 Proc I
Operating Altitude	Up to 40,000 ft MIL-STD-810G 500.5 Proc I & II
Humidity	95% R.H. MIL-STD-810G 507.5 Proc II
Ingress Protection	IP66
Acceleration	MIL-STD-810G 513.6 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
155 × 155 × 23 mm	295 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	195 × 195 × 23 mm	420 g
FIX-16D2-C	8 on L1 GNSS + 8 on L2 GNSS	Compact ◀ This model	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

