SMA PROGRESS,LLC

GAJR© GNSS Anti-Jamming Receiver

All in one device with GNSS Receiver and Antenna Array

Industry-leading, advanced GLONASS/GPS/BieDou/Galileo anti-jam/anti-spoof antenna electronics. Designed to meet evolving threats for mission-critical needs of all manned and unmanned land, sea and airborne platforms.

Benefits

- GNSS Receiver integration and Antenna Array
- Low cost jammer protection for all manned and unmanned air/sea/ land platforms Ideal for retrofitting
- Provides anti-jam protection in dynamic multi jammer scenarios
- Digital interface with UAV System

Features

- GLONASS L1/L2 + GPS L1/L2 + BeiDou B1/B2 + Galileo E1/E5 satellite system calculating
- All-in-view navigation using proven, GLONASS/GPS/BeiDou/Galileo signal processor
- Standalone Position Accuracy < 1.5 m
- Up to 110 dB of additional anti-jamming protection
- Adaptive digital nulling

Intelligent Transportation Systems (ITS) and Autonomous Vehicles make extensive use of GNSS (Global Navigation Satellite System including GLONASS/GPS/Galileo/BeiDou)technology and this dependence will only grow in the future. It's not just that GNSS has become ubiquitous in our daily life, but many critical infrastructures worldwide have some sort of reliance on it. GNSS plays a significant role in synchronization in the power grid, high frequency trading operations, and synchronization of distant wireless communications towers. This growing dependence on GNSS within critical (and non-critical) infrastructures has posed some concerns on the potential vulnerabilities of GNSS. As a consequence, there is a need for protecting GNSS against intentional and unintentional interference sources since disruption of GNSS can lead to catastrophic consequences.

The jamming threat, a specific form of intentional interference, is real and its occurrence has been documented in many occasions. Jamming devices are illegal in most (not all) countries, yet they are very easy and cheap to buy. Simple jammers can disrupt GNSS-based services in wide geographical areas (even in several kilometers), a fact that has certainly triggered research into anti-jamming techniques. Not only is jamming a threat, but other sources of unintentional interference can severely compromise GNSS performance. The jamming of signals and frequencies seems so farfetched, even in today's world, that many don't understand the importance of this kind of technology. GNSS has become integral to the navigation and planning systems of many military and civilian devices. There exists technology today that can prevent devices from receiving GNSS signals from the satellites. In a military situation and unmanned ground vehicles or UAV, this can mean everything, as so many vehicles are equipped with GNSS devices that will not run without receiving the signal from the GLONASS/GPS/Galileo/BeiDou.

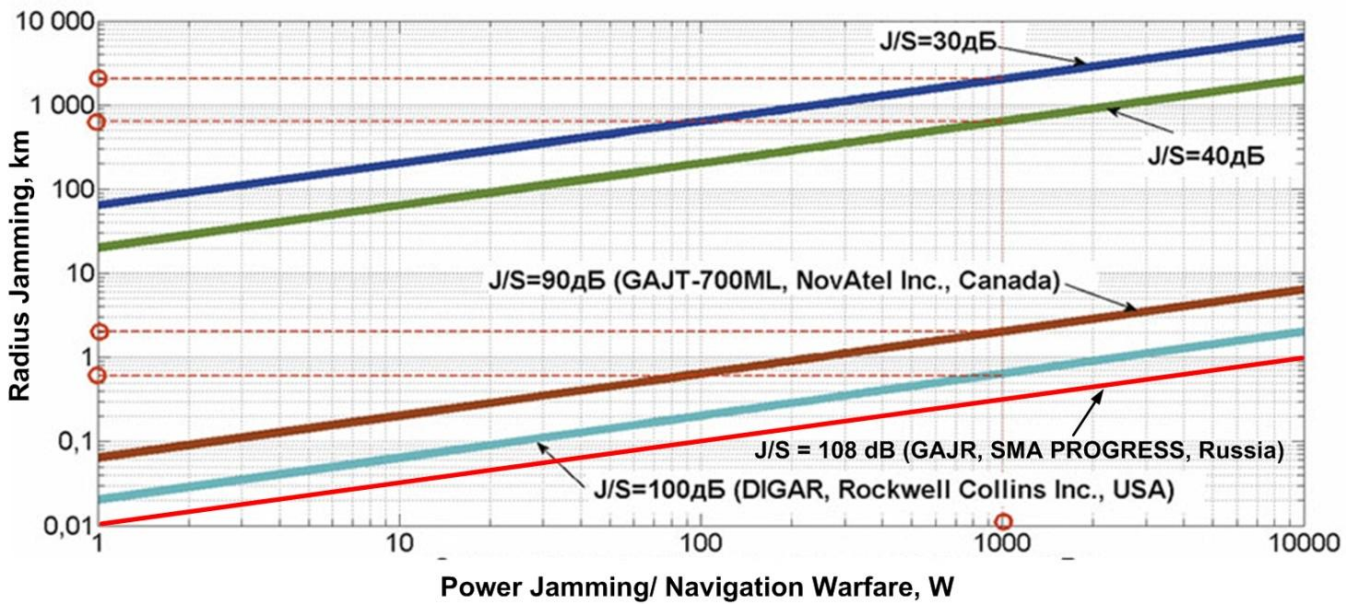
Also, the use of anti-jamming systems and technology with GNSS receivers and antennas helps prevent the jamming of signals. Therefore, the high demand for GPS and GNSS devices in military applications is driving the growth of the anti-jamming market for GPS.

The development and production of anti-jamming technology is limited to a very specific, closed market sector with a particularly high cost of admission. Worldwide, only about 5-6 companies work with this technology. World leaders include the U.S./Canada companies Rockwell Collins, Mayflower Communications Company, NovAtel; the British company BAE Systems; the France company Thales; the England company Cobham Antenna Systems; and also the Russian SMA PROGRESS,LLC. The latter is the leading Russian developer and manufacturer of anti-jamming technology.

SMA PROGRESS,LLC ***GNSS Anti-Jamming Technology*** addresses the needs of Navigation Warfare, including Electronic Protection, Electronic Support and Electronic Attack. This equipment ensures continuous positioning even in the face of interference and jamming.

Comparative Analysis of GNSS Anti-Jamming Systems

	BAE Systems & Mayflower Communications Company UNITED KINGDOM & USA	Rockwell Collins *USA*	THALES *France*	NovAtel & QinetiQ *Canada & USA*	COBHAM *England*	SMA PROGRESS,LLC *Russia*
Type	SAS Anti-Jam Module	DIGAR-300	TopShieled	GAJT-700ML	DACU (Type 7-6005)	GAJR©
GNSS	GPS L1/L2	GPS L1/L2	GPS L1/L2	GPS L1/L2	GPS L1/L2	GPS L1/L2 + GLONASS L1/L2 +BeiDou B1/B2+Galileo L1/L2
Position accuracy (CEP)	5 m [NavAssure®[1] SAASM GPS Receiver]	5 m	-	-	-	1.5 m
Anti-Jam Performance	90 dB J/S	105 dB J/S (State 5 tracking)	90 dB J/S	90 dB J/S	85 dB J/S	110 dB J/S



The best protected on the market

The key elements of the system are the GAJR 1,3,5© the GNSS Receiver and the Adaptive Antenna Array. A 4-element Adaptive Antenna Array allows gain pattern shapes to be changed in response to interference. Provides 3 independent nulls.

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Specifications

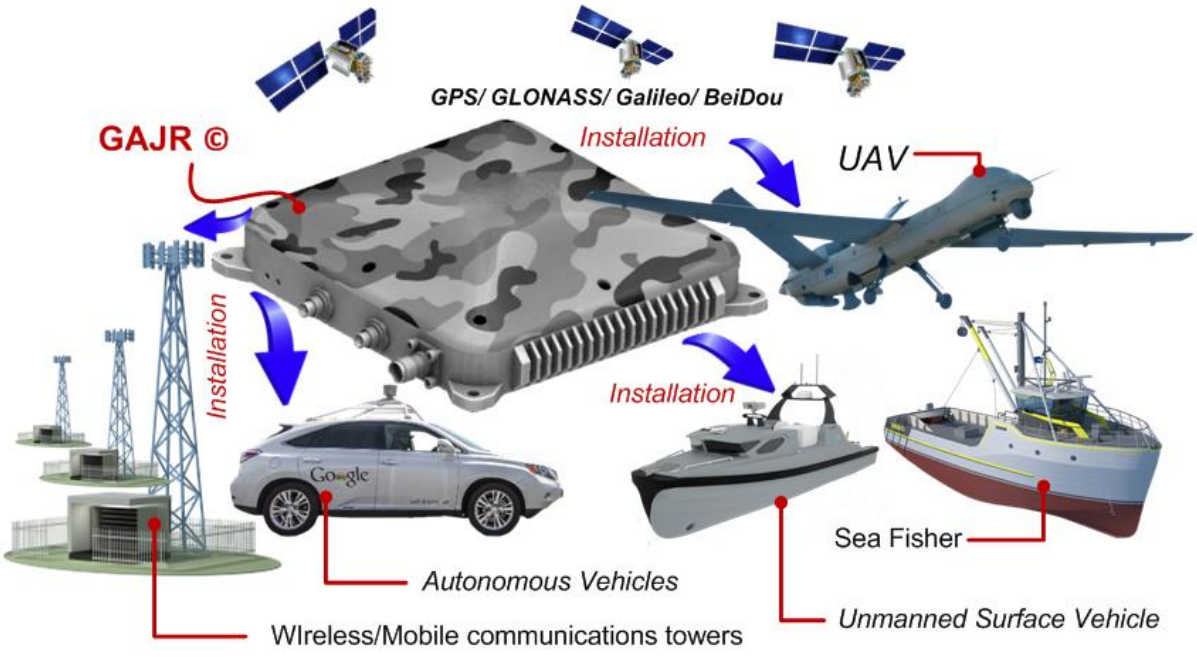
Adaptive Antenna Array + GNSS Receiver

GNSS Signals: **GPS L1/L2 + GLONASS L1/L2 + Galileo E1B/ E1C / E5b + BeiDou B1/B2**
Interference Rejection: Wide band suppression **50 dB**
Controlled radiation pattern antennas (CRPA): number of elements - **4**
Anti-Jam Performance (20 MHz broadband jammer): **110 dB J/S**
Standalone Position Accuracy: 1.5 m and horizontal - 3 m
PPS time Accuracy: **50 nanoseconds**
Input voltage: +20 to 28 VDC
Interfaces: RS-422
Dimensions: 200 x 200 x 65 mm
Weight: 2400 g
Temperature (operating): - 40º C to + 71º C
Temperature (storage): - 55º C to + 85º C
Connectors: D38999/24WB35PN compliant
EMC: MIL-STD-8109
MTBF: 15,000 hours (MIL-HDBK-217+)

Specifications subject to change without notice.

"According to the new research "Anti-Jamming Market for GPS by Receiver Type (Military & Government Grade, and Commercial Transportation Grade), Technique (Nulling, Beam Steering, and Civilian), End-User (Military, and Civilian), Application, and Geography - Global Forecast to 2023", is expected to grow from USD 3.86 billion in 2018 to USD 5.50 billion by 2023, at a CAGR of 7.34%. The growth of this market is mainly driven by factors such as the high demand for GPS technology in military applications and the ongoing developments to improve the overall GPS infrastructure". Source: MarketsandMarkets™

One solution for all manned and unmanned air/ sea/ land platforms



Ordering Information (01/29/2019)

- **GAJR-3©: GLONASS L1/L2 + GPS L1/L2 + Galileo E1B/E1C/E5b + BeiDou B1/B2**
- **OEM GAJR-5©: GLONASS L1/L2 + GPS L1/L2 + Galileo E1B/E1C/E5b + BeiDou B1/B2**
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For more information about GAJR©, please contact:

SMA PROGRESS,LLC; Russian Federation. Tel: + 7. 495. 506. 3252, e-mail: info@mriprogress.ru