

## KV-AJx-OEM RAJA MULTI-BAND ANTI-JAMMING OEM GNSS MODULE

- NavIC L1, L5, S-band support
- Multi-band, anti-jamming GNSS OEM module: up to 3 frequency bands simultaneously (consider specified options)
- Multi-system solution: NavIC (IRNSS) / GPS / Galileo / GLONASS / BeiDou can be used (consider specified options)
- Up to 100 dB J/S performance
- Small size: 113 mm × 78 mm
- Low power consumption: 5 W ...12.8 W (depending on options)
- Support of up to 3 jammers simultaneously for each of frequency bands
- Receiver based on own NTLab's high-performance ASICs: RFFE, baseband, anti-jamming processors
- Up-converter RF output for external GNSS receivers
- Internal receiver with INS, RAW data and with velocity, acceleration option by request
- IP or MIL case option (see the KV-AJx RAJA and KV-AJx-A RAJA series)



The purpose of using the KV-AJx-OEM RAJA module is to ensure stable reception of the navigation signal, including S-band signal, in conditions of staged interference. The module can be used with the KV-AJx phased antenna array (see the antenna array description page), and can be separately integrated into a third-party device. These OEM modules can also be presented in the form of rugged enclosure version with external connectors to meet the requirements of IP or MIL-STD (please see KV-AJx RAJA or KV-AJx-A RAJA blocks).

Coupled with the use of a multi-band 4-element antenna array (the module can be provided by Kosminis Vytis), the tri-band solution (AJ3-OEM) allows to suppress interferences in up to 3 directions on 3 frequency plans simultaneously. This approach provides significantly higher protection against interference compared to single-frequency options. KV-AJx-OEM RAJA module can be connected to external GNSS receiver or use internal receiver based by own NTLab's ASIC with INS, RAW data and with velocity, acceleration option by request.

### TECHNICAL SPECIFICATION

Product code: KV-AJx.y-OEM-zz (x - band options, y - GNSS signal options, zz - Output options)  
(RO - RF Only, DO - Digital Only, RD - RF+Digital)

Output options		Single-band Option* 1.2	Dual-band		Tri-band	
			Option* 2.3	Option* 2.4	Option* 3.3	Option* 3.4
RF only Option RO	GNSS signals	NavIC S	NavIC L1, S GPS L1(C/A), L2 Galileo E1 QZSS L1 SBAS L1	NavIC L5, S GPS L5 BeiDou B2a Galileo E5a QZSS L5 SBAS L5	NavIC L1, L5, S GPS L1(C/A), L5 BeiDou B2a Galileo E1, E5a QZSS L1, L5 SBAS L1, L5	NavIC L1, S GPS L1(C/A) Galileo E1 GLONASS G1 QZSS L1 SBAS L1
	Power	4.3 W (typ)	6.4 W (typ)		10.3 W (typ)	
Digital only Option DO	GNSS signals	NavIC S	NavIC S GPS L1(C/A) Galileo E1 SBAS L1	NavIC L5, S GPS L5 Galileo E5a	NavIC L5, S GPS L1(C/A), L5 Galileo E1 SBAS L1	NavIC S GPS L1(C/A) Galileo E1 GLONASS G1 SBAS L1
	Power	5.4 W (typ)	6.4 W (typ)		9.1 W (typ)	
RF+Digital Option RD	GNSS signals	RO+DO signals of option 1.2	RO+DO signals of option 2.3	RO+DO signals of option 2.4	RO+DO signals of option 3.3	RO+DO signals of option 3.4
	Power	6.6 W (typ)	8.7 W (typ)		12.6 W (typ)	
Full bandwidth, MHz		2481...2506	1564...1589 2481...2506	1164...1189 2481...2506	1564...1589 1164...1189 2481...2506	1564...1606 2481...2506

\* - other GNSS signals available on request

Parameter	Description	Note
<b>Interference rejection:</b>		
Single interference suppression	Up to 40 dB	For one CW signal of single jammer
	Up to 30 dB	For one AWGN signal of single jammer
Several interference suppression (up to three)	Up to 32 dB	For one CW signal of each jammer
	Up to 23 dB	For one AWGN signal of each jammer
<b>Interference resistance:</b>		
Single jammer	Up to 90 dB (J/S)	With internal GNSS receiver
	Up to 100 dB (J/S)	With external third party GNSS receiver
Several jammers	Up to 82 dB (J/S)	Up to three directions
<b>Anti-Spoofing Capability</b>	YES	Hardware ready
<b>Number of channels</b>	4	For each frequency band
<b>Operation modes:</b>		
GNSS mode	Internal GNSS receiver	By default
GNSS+INS mode	Internal GNSS +INS receiver with onboard MEMS sensor	Optional
RF output	Up-converter	Clear L1, L5, S bands depending on option
<b>Positioning accuracy (RMS) without interference<sup>1</sup>:</b>		
- horizontal	< 2.1 m	Static mode
- vertical	< 3.8 m	Static mode
<b>TTFF without interference:</b>		
Cold start	< 90 sec	
Re-acquisition time	< 3 sec	Static mode
<b>Data interfaces</b>	2xRS422	
<b>Peripheral interface</b>	1xI2Cout	Time accuracy ±20 ns
<b>Data update rate:</b>		
GNSS mode	20 Hz (1, 2, 5, 10)	PVT data
GNSS measurements	20 Hz (1, 2, 5, 10)	GNSS raw data
<b>GNSS+INS mode parameters (optional):</b>		
<b>Data update rate</b>	Up to 200 Hz	PVT data and Attitude
<b>Data protocol</b>	NTRIP	PVT and Attitude based on GNSS + INS
<b>Orientation accuracy (RMS), with internal GNSS+INS receiver:</b>		
Roll	< 1°	Static mode, relative to the local horizon
Pitch	< 1°	Static mode, relative to the local horizon
Heading	< 1°	Mid. dynamic, true north
<b>Operation conditions:</b>		
Altitude	18 000 m	Up to 50 000 m by request
Velocity	515 m/s	Up to 3000 m/s by request
Acceleration	Up to 10 g	Up to 36 g by request
Jerk	Up to 2 g/s	Up to 20 g/s by request
<b>Supply voltage</b>	12 V...36 V	24 V typical
<b>Power consumption</b>	5 W...12.8 W	Depending on option
<b>Dimensions</b>	113 mm x 78 mm x 9,5 mm	
<b>Weight</b>	50 g	
<b>Operating temperature</b>	-40 °C ...+71 °C	

<sup>1</sup> Depends on atmospheric conditions, satellite visibility and geometry, multipath conditions.