KV-AJx-A RAJA
MULTI-BAND ANTI-JAMMING GNSS RECEIVER

- NavIC L1, L5, S-band support
- Multi-band anti-jamming GNSS receiver: 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
- 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

The purpose of using the KV-AJx-A RAJA GNSS receiver is to ensure stable reception of the navigation signal, including S-band signal, in conditions of staged interference. The receiver must be used with KV-AJAx phased antenna array (see the antenna array description page). The MIL-STD rugged enclosure is designed to work at the harsh environment and to meet EMI/EMC requirements.

Coupled with the use of a multi-band 4-element antenna array (the module can be provided by Kosminis Vytis), the tri-band solution 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-A RAJA receiver contains a MEMS inertial sensor and thus allows the creation the GNSS-aided INS (GNSS+INS) solutions for position, velocity, time, and attitude. The jamming-free cleared RF signal can also be delivered to external non-protected GNSS receivers to obtain position, velocity, and time.

TECHNICAL SPECIFICATION

Product code: KV-AJx.y-A-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
Interference rejection:		
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 interferences 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
Interference resistance:		
Single jammer	Up to 90 dB (J/S) Up to 100 dB (J/S)	With internal GNSS receiver With external third party GNSS receiver
Several jammers	Up to 82 dB (J/S)	Up to three directions
Anti-Spoofing Capability	YES	Hardware ready
Number of channels	4	For each frequency band
Operation modes:		
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
Positioning accuracy (RMS) without interference[1]:		
Horizontal / vertical	< 2.1 m / < 3.8 m	Static mode
TTFF without interference:		
Cold start	< 90 sec	
Re-acquisition time	< 3 sec	Static mode
Data interfaces	2 x RS422	
Peripheral interface	1 x 1PPSout	Time accuracy ± 20 ns
Data update rate:		
GNSS mode, GNSS measurements	20 Hz (1, 2, 5, 10)	PVT data, GNSS raw data
GNSS+INS mode parameters (optional):		
Data update rate	Up to 200 Hz	PVT data and Attitude
Data protocol	NTLaBin	PVT and Attitude based on GNSS + INS
Orientation accuracy (RMS), with internal GNSS+INS receiver:		
Roll	< 1°	Static mode, relative to the local horizon
Pitch	< 1°	Static mode, relative to the local horizon
Heading	< 1°	Mid. dynamic, true north
Operation conditions:		
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
Supply voltage	12 V...36 V	24 V typical
Power consumption	5 W...12.8 W	Depending on option
Dimensions	208 mm × 165 mm × 52 mm	
Weight	1650 g	
Operating temperature	–40 °C ... +71 °C	
Environmental	According to MIL-STD 810G	
EMC / EMI	According to MIL-STD 461G	
Connectors:		
RF	31-6111	IN+DC Antenna out, RF OUT
Power	24WA35PN	Circular MIL Spec Connector HERMETIC
Data	24WC35PN	Circular MIL Spec Connector HERMETIC

[1] Depends on atmospheric conditions, satellite visibility and geometry, multipath conditions.

CONTACTS
Kosminis Vytis UAB
88 Zalgirio, LT-09303 Vilnius, Lithuania
e-mail: sales@kosminis-vytis.lt