



iTraceRT-MVT-200/SLN & -/SLN-DA

Precise MEMS Based Inertial Measurement System with integrated INS/GNSS/xxx Data Fusion

iTraceRT-MVT-200/SLN is a member of the advanced iTraceRT-MVT series, which is directly based on iMAR's iNAT (Navigation and Timing) system architecture, and which is one of the smallest powerful MEMS based INS/GNSS inertial navigation, measurement, surveying and control systems in the market for automotive applications. It provides all kinematic measurements like acceleration, angular rate, attitude, true heading, velocity and position of the target vehicle in real-time with an data update rate of up to 250 Hz.

- robust, compact, light weight system, ~850 grams
- based on high grade MEMS gyro & accel technology and up to all frequency GNSS with optional dual-antenna heading (-DA) and RTK support; gyros highly resistant against vibration impacts
- GPS, GLONASS, BeiDou, GALILEO
- options for high/low range angular rate (-HRR/-LRR) and high range acceleration (-HRA) available
- odometer / wheel sensor aiding capability
- output of angular rate, acceleration, attitude, true heading, CoG, velocity and position in realtime with up to 250 Hz (adjustable) with minimum latency
- several processing modes: Standard mode with 1 m position accuracy and RTK / PPP mode with 0.02 m position accuracy
- interfaces: UART RS232 & RS422 / CAN / Ethernet / USB for realtime data output and RS232 for DGPS/RTK correction input; odometer / VMS
- up to 128 GByte internal memory ("black-box")
- several versions with surveying grade GNSS, economic grade GNSS, standard noise as well as lownoise inertial sensors are available
- easy to use, easy to configure; powerful GUI

Depending on the application, environmental environment and required realtime accuracy, the data fusion includes INS, GNSS, VMS or any other external sensor providing position and/or velocity, standard deviation and time stamp.

In urban canyons often the number of observable satellites is quite limited and therefore the iTraceRT-MVT-M200/SLN supports an all GNSS constellation data fusion. The 42+ state Kalman filter processing provides a significant better and more robust position and velocity result compared to standard solutions.

An odometer aiding capability is available to further impove system accuracy where available, the scale factor of the wheel sensor is estimated automatically. The **iTraceRT-MVT-M200/SLN** provides system performance and system reliability which is required in standard tasks of navigation, guidance and control, mapping, vehicle motion dynamics testing, trajectory surveying and platform control tasks for cars, trucks, motorcycles etc.



The iTraceRT-MVT-M200 is delivered with the MS Windows (or LINUX or MacOS alternatively) based configuration software <u>iXCOM-CMD</u>. This software allows to configure the output interfaces, furthermore all output data can be displayed and stored online on the user's notebook, tablet or process computer. It also allows powerful playback capabilities and provides data export in many formats (csv, xml, GoogleEarth, InertialExplorer, GrafNav). With <u>iREF-GNSS</u>, iMAR also provides a GNSS reference station to pro-



vide RTK corrections for centimeter level accuracy on demand. Also PPP is supported.

A powerful postproc software is available to allow post-mission processing including a multi station GNSS correction data solution and a direct visualisation of the results in Google Earth[™].







Technical Data iTraceRT-MVT-200/SLN & /SLN-DA (typical, rms):

 Nas Stability (AV): < 0.3 "/h < 0.00 mg (Nuture Control) ngles (Attitude, Hdg.): 		Rate	Acceleration	Attit./Heading	Position	Velocity	Height	
 (a) (filterd?): (a) 3 "/h < 0.3 mg (b) 02" / 0.1" RP/Y (INS/GNSS) [under best conditions 0.01" / 0.03" RP/Y] (c) 03" / 0.1" RP/Y (INS/GNSS) [under best conditions 0.01" / 0.03" RP/Y] (c) 0.02" / 0.1" RP/Y (INS/GNSS) [under best conditions 0.01" / 0.03" RP/Y] (c) 0.02" / 0.1" RP/Y (INS/GNSS) [under best conditions 0.01" / 0.03" RP/Y] (c) 0.1 dep heading for 2 m baseline in dual-antenas setup (/SLN-DA) 2 (c) 0.1 dep heading for 2 m baseline in dual-antenas setup (/SLN-DA) 2 (c) 0.1 dep heading for 2 m baseline in dual-antenas setup (/SLN-DA) 2 (c) 0.0 m CEP (INS/GNSS RTK post-proc) 5 (c) 0.15 % of DT CEP (WN VMS, during GNSS outages)¹⁶ (c) 1.5 % of DT CEP (WN VMS, during GNSS outages)¹⁶ (c) 1.5 % of DT CEP (WN VMS, during GNSS outages)¹⁶ (c) 0.02 % < 0.02 % < 0.01 % < 0.01 m < 0.01 m /s (c) 0.01 % < 2.0 00 % < 0.1 % (c) 0.01 % < 0.06 % < 0.1 % (c) 2.0 mrad (c) 3.8 S, Bedou, Q2SS (commercial grade) (c) 1.1 GPS-4GLONASS, SBAS, Be	Range ¹ :			unlimited	unlimited		unlimited	
 Jias day-o-day², < 0.07 */s < 2 mg² control (Jinder best conditions 0.01*/0.03* RPXI)⁵ O.03* / 0.12* RPX (Jaffer 10 s GNSS outage) [best cond. 0.02* / 0.04* RPXI)⁹ O.03* / 0.12* RPX (Jaffer 10 s GNSS outage) [best cond. 0.02* / 0.04* RPXI)⁹ Tosition (horizontal plane)⁴						•		
0.05*/0.12* RPY (after 10 s GNSS outgage) [best cond. 0.02*/0.04* RPX) • otation (horizontal plane) *	Bias day-to-day ³ :							
0.05*/0.12* RPY (after 10 s GNSS outgage) [best cond. 0.02*/0.04* RPX) • otation (horizontal plane) *	Angles (Attitude, Hdg.):		Ŭ	0.03° / 0.1° RP/Y	(INS/GNSS)	[under best c	onditions 0.01° / 0.03° RP/Y] 5	
'osition (horizontal plane) *				0.05° / 0.12° RP/Y	′ (after 10 s G	iNSS outage)	[best cond. 0.02° / 0.04° RP/Y] 5	
 +/- 0.03 m CEP (INIS/GNSS RTK post-proc) ⁵ +/- 0.14 m CEP (INIS/GNSS) +/- 1.8 m CEP (INIS/GNSS) +/- 1.1 GPS+CLONASS, BEAS, Beldou, QZS (Commercial grade) +/- 1.8 m CEP (INIS/GNSS) +/ 1.4 m CEP (INIS/GNSS) +/ 1.4 m CEP (INIS/GNSS)<td></td><td>. 4</td><td></td><td></td><td></td><td></td><td></td>		. 4						
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H-1.8 m CEP (INS/GNSS) Ioise: 0.15 */sqtt(hr) 25 µg/(Hz) 0.03 * < 0.01 m								
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tesolution: < 0.0001 */s	•	0 15 %cart(br)	25 110/2	0.03 0	< 0.01 m	-0.02 m/s (in	NS / RTK GNSS)	
inearity error: < 0.002 % < 0.02 % < 0.1 % (cale factor error: < 0.002 % < 0.02 % < 0.1 % (on-Orthogonality: < 0.2 mrad < 0.2 mrad WS / GNSS / ODO proc.: internal GNSS Engine: version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CALLEO, SBAS, C2SS, RTK version / SLN: up to all frequency CPS+GL0NASS, Beidou, CASS (commercial grade) up to 250 Hz; PPS timing accuracy better 10 ns 1250 Hz; il GPS+GL0NASS, SBAS, Deidou, CASS (commercial grade) up to 250 Hz; PPS Unit gracuracy better 10 ns 1250 Hz; il data available in real time, latency < 3 ms, jitter < 1 ms PPS_OUT (RS422 level, latency < 1 µs); 2x EVENT_IN (RS422 or TL level, latency < 2 ms) PDFS/GTK correction data from base station, if available (RS232); odometer / VMS (A or AB at RS422 level) as an option < 11.3 ms (sampling accuracy better 1 µs, time-stamped according to PPS; jitter < 1 ms) MIL-C-38999 III (data), SMA (anterna), M12 (Ethernet) 32 GByte non-vlatime memory, option 128 GByte (lasts for several days continuous data sampling as "black-box") WS vindows or UINUX or MacOS based Solver bXCOM_OT or configuration, visualization, data recording, data converting and playback operation 34 V DC, two independent and isolated inputs available; reverse an overvoltage protection: approx. 50 grams .approx. 102 x 138 x 65 mm; IP67 environmental protection application specific aiding information (posititute), heading, standard deviations, time stamp) application specific aiding information (posititute), read, subdard (diviations, time stamp) applications predictic allows heading (TrraeRT-MYT-200-2000LHz 2 grms (aperational); 60'000							5	
cicale factor error: < 0.05 %							-	
NS / GNS5 / ODD proc:: integrated advanced 42+ state INS/GNSS/+ extended Kalman filter based data fusion version //LN: up to all frequency (PS+GLONASS, Beidou, GZLLEO, SBAS, GZSS, RTK version //LN: L1 GPS+GLONASS, Beidou, GZSS (commercial grade) vala Output Rate: 1250 Hz; 11 GPS-GLONASS, Beidou, GZSS (commercial grade) version //LN: L1 GPS+GLONASS, SBAS, Beidou, GZSS (commercial grade) version //LN: L1 GPS-GLONASS, SBAS, Beidou, GZSS (commercial grade) vala Output Rate: 1250 Hz; 11 data available in real time, latency < 1 ms;	Scale factor error:							
 version /LLX: up to all frequency GPS-GLONASS. Beidou, GALLEO, SBAS, QZSS, RTK version /MLX: L1 GPS-GLONASS, SBAS, Beidou, QZSS (commercial grade) up to 250 Hz; PPS timing accuracy better 10 ns 250 Hz; all data available in real time, latency < 3 ms, jitter < 1 ms PPS_OUT (RS422 level, latency < 1 µs; Zz VENT) N(RS422 or TTL level, latency < 2 ms) USB, 2 x CAN, 4 x UART RS232/422, Ethernet 100 Mbits, MMEA183, ARINC825, TCP/IP, UDP, NTRIP caster with RTCM104 rev 3 (can serve as a GNSS reference station); PTP / NTP Time Server (since HW rev. 4) DGPS/RTK correction data from base station, if available (RS232); odometer / VMS (A or AK at RS422 level) as an option vata Latency and Jitter: C1.33 ms (sampling accuracy better 1 µs, time-stamped according to PPS; jitter < 1 ms) MLC-38999 III (data), SMA (antenna), M12 (Ethernet) 32 GByte non-vlatime memory, option 126 GByte (lasts for several days continuous data sampling as "black-box") MS Windows or LINUX or MacOS based software <u>XCOM-COM</u> for configuration, visualization, data recording, data coverting and playback operation 934 V DC, two independent and isolated inputs available; reverse an overvoltage protection; approx. 8511 W (dep on options): 14 W for 1 sec after power-on 40+71 °C (outer case temperature) Operating. 4085 °C Storage; 49000 hrs (AUC, Airborne Uninhabited Cargo, 25 60 g, 11 ms; 1000 g, 0.5 ms; 102000 Hz 5 g ms (endurance); 102000 Hz 2 g ms (operational); 60000 ft < 1 "h/g" (0.6 "h/g" [at 5 g / 1000 Hz] (internally compensated) aptrox. 900 grams, approx. 102 x 138 x 65 mm; IP67 environmental protection 41/borne, Ground (with and without downere); Seas GUI / HMI software (if ordered) improved version: P/N 00190-06001-xxxx (rev. 03A) [this datasheet] tartOum DM SW inhows or LINUX or MacOS based GUI	Non-Orthogonality:	< 0.2 mrad	< 0.2 mrad					
bata Output Rafe: 1250 Hz; all data available in real time, latency < 3 ms, jitter < 1 ms	INS / GNSS / ODO proc. Internal GNSS Engine:	version /SLN	: up to all frequency GF	PS+GLONASS, Beidou	u, GALILEO, S	BAS, QZSS, R	тк	
Synchronisation: PPS_OUT (R\$422 level, latency < 1 µs); 2x Ev[ENT_IN (R\$422 or TTL level, latency < 2 ms) Dutput (options): USB 2 x CAN, 4 x UART R\$232/422, Ethernet 100 Mbit/s, NMEA183, ARINC825, TCP/IP, UDP, NTRIP caster with RTCM104 rev 3 (can serve as a GNSS reference station); PTP / NTF Time Server (since HW rev. 4) Dpputs: DGFS/RTK correction data from base station, if available (RS232); dometer / VMS (A or AVB at R\$422 level) as an option Vala Latency and Jitter: <1.13 ms (sampling accuracy better 1 µs, time-stamped according to PPS; jitter < 1 ms)	Data Processing Rate:					,		
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bonnectors: MIL-C-38999 III (data), SMA (antenna), M12 (Ethernet) 32 GB/te non-vlatime memory, option 128 GByte (lasts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based Software (acts for several days continuous data sampling as "black-box") MS_Windows or LINUX or MacOS based Software (acts for severs an overvoltage protection; approx. 900 grams , approx. 102 x 138 x 65 mm; IP67 environmental protection Airborne, Ground (with and without odometer), Sea, Subsea; ZUPT (auto or on demand), open interface to feed in application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp) Veliverables: - MEMS based INS with integrated GNSS receiver, GNSS antenna, cable set - iXCOM-CMD MS Windows or LINUX or MacOS based GUI / HMI soft	Data Latency and Jitter:				according to PF	PS: iitter < 1 ms	3)	
Braphical User Interface: MS Windows or LINUX or MacOS based software iXCOM-CMD for configuration, visualization, data recording, data converting and playback operation vower Supply: 934 V DC, two independent and isolated inputs available; reverse an overvoltage protection; approx. 8.5 11 W (dep. on options); < 14 W for < 1 sec after power-on	Connectors:	MIL-C-38999 III (data), SMA (antenna), M12 (Ethernet)						
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Yower Supply: 934 V DC, two independent and isolated inputs available; reverse an overvoltage protection; approx. 8.511 W (dep. on options); < 14 W for < 1 sec after power-on	Graphical User Interface.					guration,		
'40+71 °C (outer case temperature) operating, -4085 °C storage; 49'000 hrs (AUC, Airborne Uninhabited Cargo, 25 'hock, Vibration, Altitude: '60 g, 11 ms; 1'000 g, 0.5 ms; 102'000 Hz 5 g rms (endurance); 102'001 Hz 2 g rms (operational); 60'000 ft 'g' depenent gyro drift: 'aprox. 900 grams , approx. 102 x 138 x 65 mm; IP67 environmental protection 'perational Support: Airborne, Ground (with and without odometer), Sea, Subsea; ZUPT (auto or on demand), open interface to feed in application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp) 'PartNumber: 'MEMS based INS with integrated GNSS receiver, GNSS antenna, cable set 'iXCOM-CMD MS Windows or LINUX or MacOS based GUI / HMI software (if ordered) 'mproved version: P/N 00190-06001-xxxx (rev. 03A) 'Philog ' to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver 'dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline 'odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) 'interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms))	Power Supply:	934 V DC,						
Shock, Vibration, Altitude: 60 g, 11 ms; 1'000 g, 0.5 ms; 102'000 Hz 5 g rms (endurance); 102'000 Hz 2 g rms (operational); 60'000 ft / g² depenent gyro drift: Ars, size; IP: approx. 900 grams , approx. 102 x 138 x 65 mm; IP67 environmental protection Airborne, Ground (with and without odometer), Sea, Subsea; ZUPT (auto or on demand), open interface to feed in application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp) - MEMS based INS with integrated GNSS receiver, GNSS antenna, cable set 'excOM-CMD MS Windows or LINUX or MacOS based GUI / HMI software (if ordered) 'mproved version: P/N 00190-06001-xxxx (rev. 03A) [this datasheet] 'standard version: P/N 00190-06001-xxxx (rev. 03) [this datasheet] Options: - SW-Development Kit with DLL (with SDK under Qt / C); Python scripts available - L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver - dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline - odometer (VMS) interface for velocity aiding longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) - interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms)))								
/ g² depenent gyro drift: < 1 °/h/g / 0.06 °/h/g² [at 5 g / 1'000 Hz] (internally compensated)	•							
Operational Support: Airborne, Ground (with and without odometer), Sea, Subsea; ZUPT (auto or on demand), open interface to feed in application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp) Deliverables: - MEMS based INS with integrated GNSS receiver, GNSS antenna, cable set - iXCOM-CMD MS Windows or LINUX or MacOS based GUI / HMI software (if ordered) PartNumber: improved version: P/N 00190-06001-xxxx (rev. 03A) Options: - SW-Development Kit with DLL (with SDK under Qt / C); Python scripts available - L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver - dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline - odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) - interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms))	g / g² depenent gyro drift	: < 1°/h/g / 0	.06 °/h/g² [at 5 g / 1'000) Hz] (internally compe	ensated)	0	- (),	
application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp) beliverables: - MEMS based INS with integrated GNSS receiver, GNSS antenna, cable set - iXCOM-CMD MS Windows or LINUX or MacOS based GUI / HMI software (if ordered) brance improved version: P/N 00190-06001-xxxx (rev. 03A) [this datasheet] standard version: P/N 00190-00001-xxxx (rev. 03) bptions: - SW-Development Kit with DLL (with SDK under Qt / C); Python scripts available - L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver - dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline - odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) - interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms)))	Mass, size; IP:	approx. 900	grams , approx. 102 x 1	138 x 65 mm; IP67 env	vironmental pro	otection		
 - iXCOM-CMD MS Windows or LINUX or MacOS based GUI / HMI software (if ordered) PartNumber: improved version: P/N 00190-06001-xxxx (rev. 03A) [this datasheet] standard version: P/N 00190-00001-xxxx (rev. 03) SW-Development Kit with DLL (with SDK under Qt / C); Python scripts available L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms)) interface to ABD driving robot (via Ethernet) 	Operational Support:	application s	application specific aiding information (position, velocity, attitude, heading, standard deviations, time stamp)					
standard version: P/N 00190-00001-xxxx (rev. 03) Options: - SW-Development Kit with DLL (with SDK under Qt / C); Python scripts available - L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver - dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline - odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) - interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms))		- iXCOM-CN	6					
 L1L2 up to all-frequency / all constellations RTK / PPP accuracy of the integrated GNSS receiver dual-antenna GNSS based true heading (iTraceRT-MVT-200-200/SLN-DA allows heading determination even at standstill conditions -> typ. 0.2° at 1 m baseline odometer (VMS) interface for velocity aiding during longer GNSS outages (position error is then correlated to wheel sensor performance, typically 0.1 % longitudinal error of distance travelled) interface to iMAR Dynamic Mesh Communication System iDMN of up to 128 vehicles on a proving ground (car-2-base and car-2-car simultaneously with up to video data rate and latency < 50 ms (rms)) interface to ABD driving robot (via Ethernet) 	PartNumber:	standard ver	sion: P/N 00190-000	001-xxxx (rev. 03)	•			
	Options:	 L1L2 up to dual-antenrallows head odometer (correlated t interface t 	all-frequency / all const na GNSS based true he ling determination even /MS) interface for veloc o wheel sensor perform o iMAR Dynamic Me	ellations RTK / PPP a ading (iTraceRT-MVT a at standstill condition city aiding during longe nance, typically 0.1 % I esh Communication	ccuracy of the -200-200/SLN s -> typ. 0.2° a er GNSS outag ongitudinal err System <u>iDMN</u>	integrated GNS -DA t 1 m baseline es (position eru or of distance t or of up to 128	ror is then ravelled) vehicles on a proving ground	
 fully compatible to the Proving Ground Automation <u>i\$WACO-ARGUS</u> 		- interface to	<u>ABD driving robot</u> (v	ia Ethernet)				
		- fully comp	atible to the Proving	Ground Automation	i\$WACO-AR	GUS		

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¹ Option: **iTraceRT-MVT-200/SLN-HRR** for high rate range tasks:

Option: iTraceRT-MVT-200/SLN-HRA for high range acceleration tasks:

up to 30 g [then it might require an export license]

Option: iTraceRT-MVT-200/SLN-HRS for high range speed tasks: >515 m/s (requires an export license) ² heading accuracy at initial standstill even without any required motion due to dual-antenna GNSS feature (requires sufficient GNSS satellite observability) ³ values without sufficient INS/GNSS data fusion conditions; the bias are estimated / compensated during GNSS aiding under motion automatically (Kalman filter); iTraceRT-MVT-200/SLN provides 10 deg/hr bias stability for several hours duration at const. temperature

⁴ GNSS based altitude deviation is abut 1.5 times of GNSS based horizontal error



 \odot imar^{(R)} 26.05.2023 rev. 1.08 DocNo.: DOC200413016 technical modifications reserved w/o notice

up to 1'200 deg/s

⁵ after algorithm converging under sufficient motion / trajectory and multiple heading changes with GNSS aiding ⁶ Position error in relation to distance travelled (DT) during GNSS outages (requires a vehicle motion sensor / wheel sensor), after suffic. GNSS