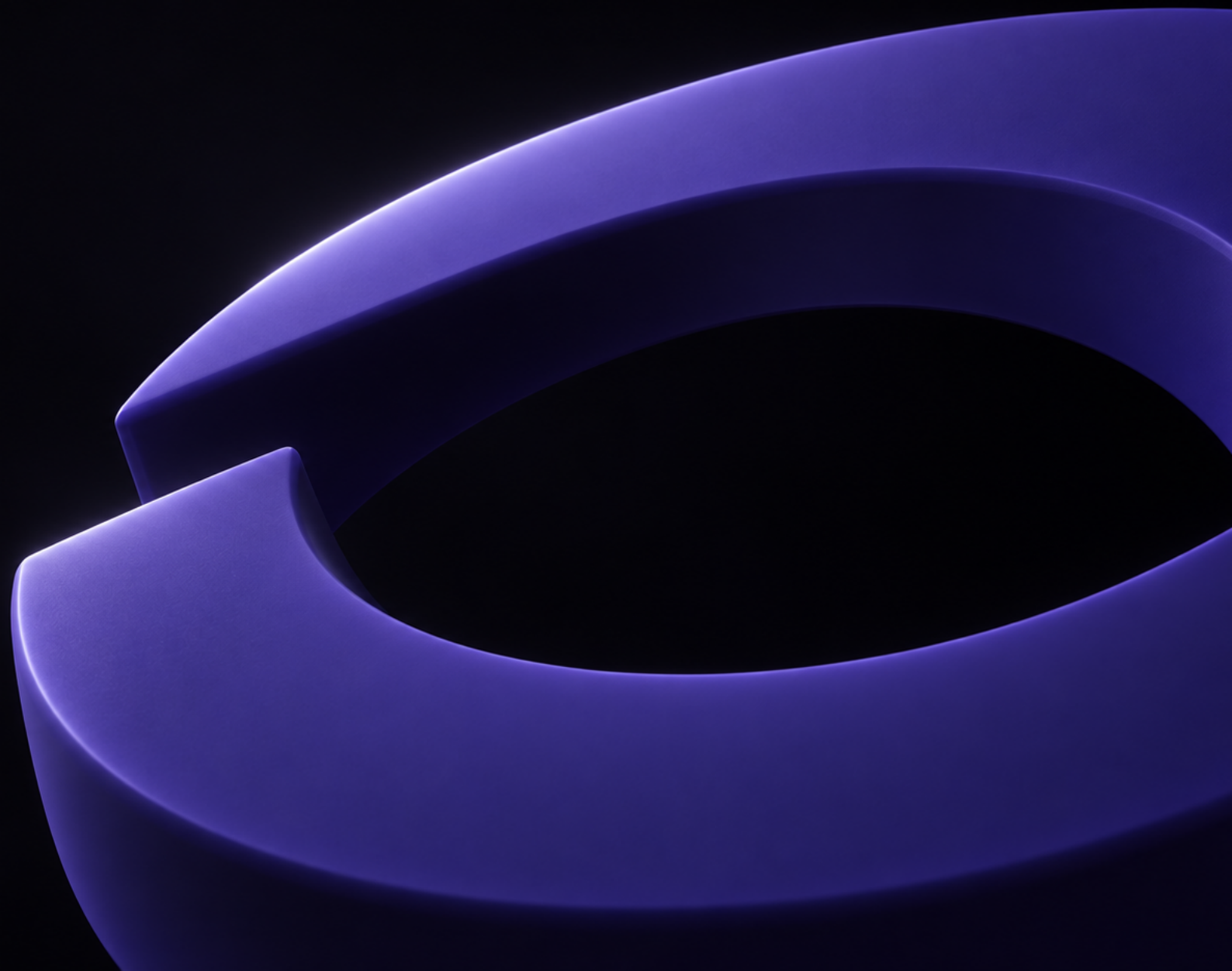




INERTIAL SENSORS • PRODUCT PORTFOLIO

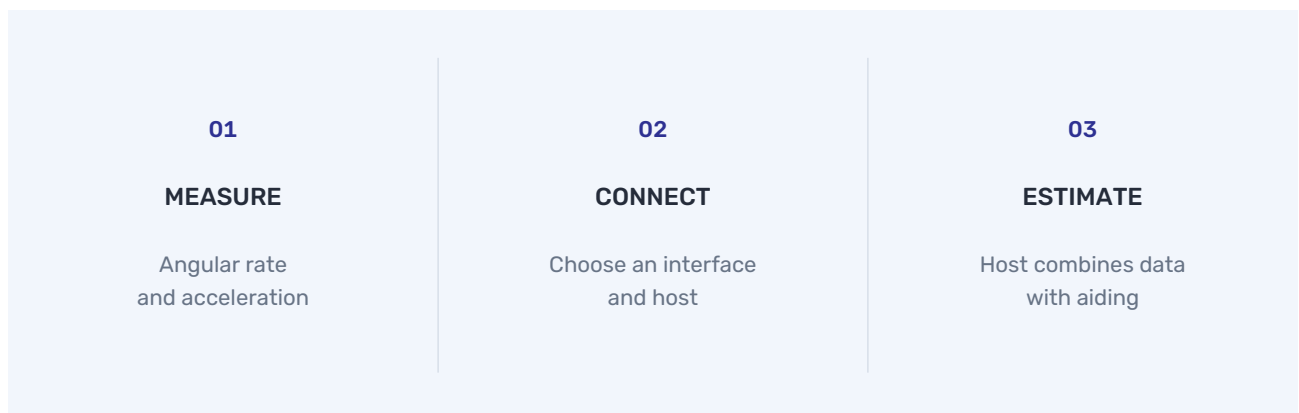
Inertial sensing for *autonomous* systems.



An IMU measures motion. A host estimates navigation.

An inertial measurement unit reports angular rate and acceleration. A host combines those measurements with its estimator and aiding sensors to estimate navigation state; the IMU alone does not determine absolute position.

The MK2 family spans MEMS and hybrid photonic/MEMS architectures. InertialGate connects an OSCP IMU to documented computer, Raspberry Pi and custom-host interfaces.



Navigation performance depends on the complete system: its estimator, aiding sensors, configuration and application.



ITAR-FREE



MADE IN CANADA

Choose the sensing architecture.

Three IMUs across MEMS, hybrid photonic/MEMS and prototype designs.

INERTIAL MEASUREMENT UNITS

MK2M2



MEMS inertial sensing

MK2E2



Photonic Z-axis gyro + MEMS

MK2Z^{*}

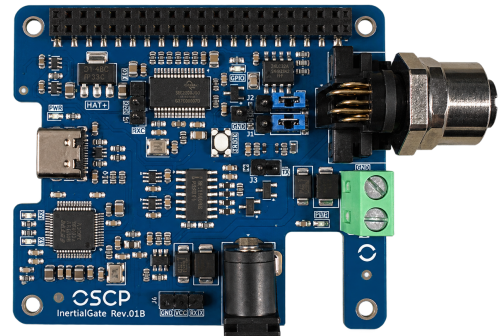


Photonic/MEMS • prototype

EVALUATION HARDWARE

InertialGate

Connect an MK2 IMU to a documented host interface for evaluation. See page 8 for board options and setup.



IMU > INERTIALGATE > CONFIGURED HOST

Product images not to scale.

Compare the architectures.

MK2M2

MEMS inertial sensing



0.5 to <1.0 °/hr

MEMS gyro in-run bias stability

0.06 °/√hr

MEMS ARW

< 15 μg

Accelerometer bias stability

MK2E2

Photonic Z-axis gyro + MEMS on remaining axes



0.5 to <1.0 °/hr

Optical Z-axis in-run bias stability

0.03 °/√hr

Optical Z-axis ARW

< 15 μg

Accelerometer bias stability

Figures are indicative. Confirm the current product documentation for operating conditions and limits.

Two IMUs. The same drive.

MK2E2 ended at 5.7 m: almost 4x lower final position error than MK2M2 in this test.

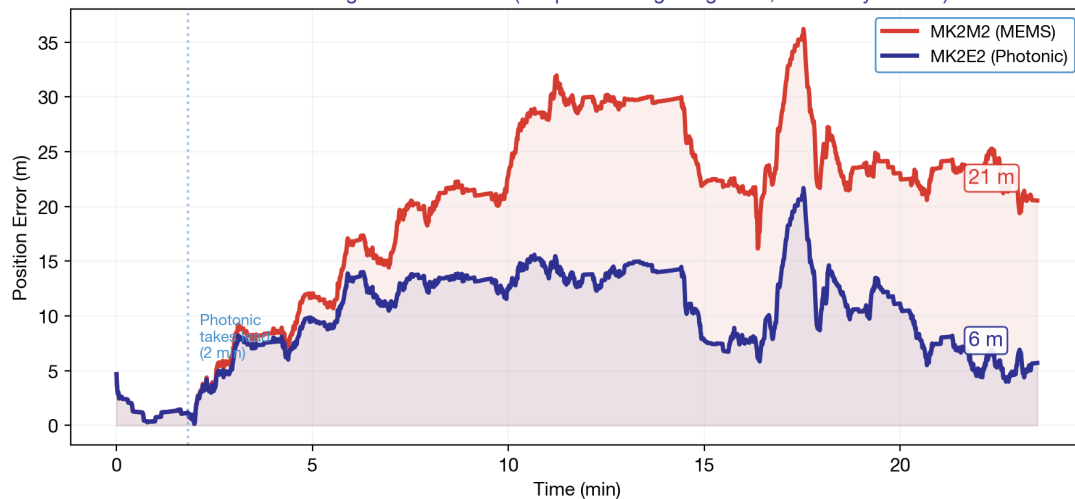
After a 21-minute drive; GNSS position was withheld.

MK2M2
20.5 m

MK2E2
5.7 m

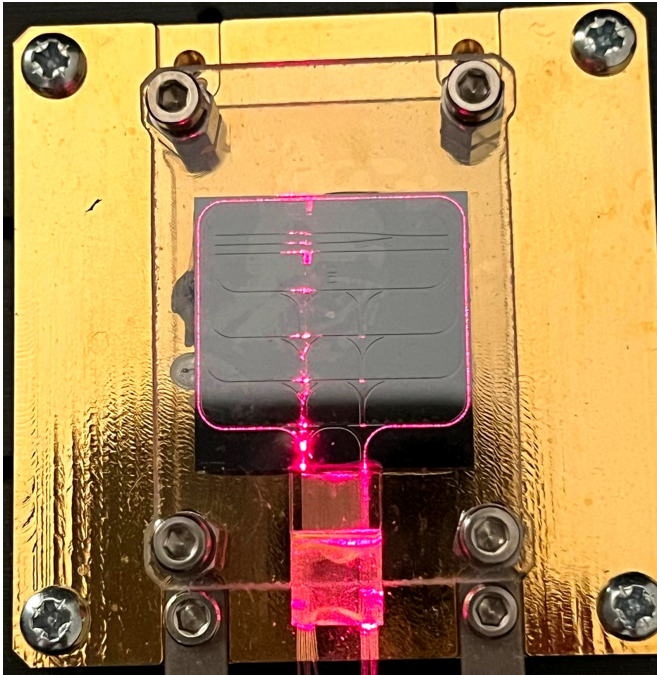


Dead Reckoning Error Over Time (Simple Heading Integration, Odometry at 1 Hz)



Montréal, 9 January 2026. One 21-minute drive; both IMUs were mounted in the same vehicle and logged at 100 Hz. GNSS position was withheld and used only as ground truth after the drive; the 1 Hz speed input came from that same GNSS log. Heading was integrated from each Z-axis gyroscope alone. No EKF, position aiding, zero-velocity updates or model-specific tuning. Results are specific to this test, not guaranteed.

Photonic sensing on the Z axis.



PHOTONIC INTEGRATED CIRCUIT / ON THE TEST BENCH

Development hardware; not a shipping part.

THE SAGNAC EFFECT

Light travels around a closed optical path in opposite directions. Rotation creates a phase difference between the beams, proportional to rotation rate.

PHOTONIC INTEGRATION

In the MK2E2, a photonic gyro measures the Z axis; MEMS gyros cover the remaining axes. The optical path is integrated on a photonic circuit.

01

SPLIT

Send light around the path in opposite directions.

02

ROTATE

Rotation changes the relative phase.

03

READ PHASE

Measure phase to determine rotation rate.

MK2Z*

HYBRID PHOTONIC / MEMS • PROTOTYPE

The MK2Z pairs an optical gyroscope on the Z axis with MEMS gyroscopes, accelerometers, magnetometers and inclinometers.

0.005 to <0.01 °/hr

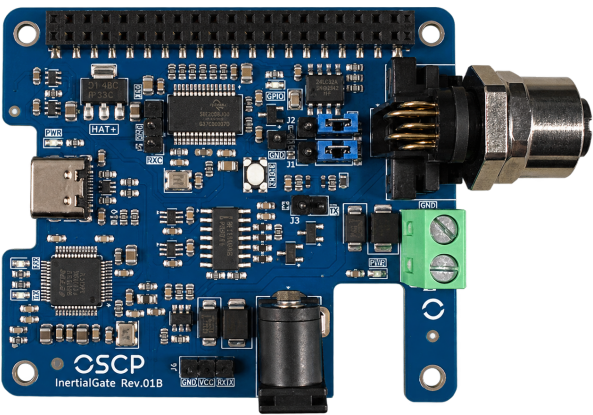
Indicative optical Z-axis bias stability



* Prototype. Public figures are preliminary and indicative; confirm the current specification before design-in.

InertialGate

A documented evaluation board for connecting OSCP IMUs to a host. Select the interface variant, then follow the current manual; host configuration may be required.



INTERFACE	DOCUMENTED CAPABILITY
IMU protocol	RS-422 or CAN-FD
Computer access	USB-C virtual COM port on RS-422 variant
Raspberry Pi	HAT+ compatible; host configuration required
Custom systems	40-pin and direct headers, per interface
Board size	57 × 66 mm

01

SELECT INTERFACE

RS-422 or CAN-FD

02

CONFIGURE HOST

Follow the board manual

03

READ IMU DATA

Access data through your host

IMU specifications

PARAMETER	MK2M2	MK2E2	MK2Z
OPTICAL GYROSCOPES • Z AXIS			
Z-axis range	—*	±250 °/s	±250 °/s
Z-axis bias stability	—*	0.5 to <1.0 °/hr	0.005 to <0.01 °/hr
Z-axis ARW	—*	0.03 °/√hr	0.02 °/√hr
MEMS GYROSCOPES • X / Y / Z			
X/Y/Z range	±125 to ±4000 °/s	±125 to ±4000 °/s	±125 to ±4000 °/s
X/Y/Z bias stability	0.5 to <1.0 °/hr	0.5 to <1.0 °/hr	0.5 to <1.0 °/hr
X/Y/Z ARW	0.06 °/√hr	0.06 °/√hr	0.06 °/√hr
ACCELEROMETERS			
Range	±2, ±4, ±8, ±16 g	±2, ±4, ±8, ±16 g	±2, ±4, ±8, ±16 g
Bias stability	< 15 µg	< 15 µg	< 15 µg
Velocity random walk	0.008 m/s/√hr	0.008 m/s/√hr	0.008 m/s/√hr
OTHER SENSORS			
Magnetometer range	±20 G	±20 G	±20 G
Inclinometer range	±0.5, ±1, ±2, ±3 g	±0.5, ±1, ±2, ±3 g	±0.5, ±1, ±2, ±3 g

MK2M2 • Z-AXIS MEMS

Range: ±125 to ±4000 °/s • In-run bias: 0.5 to <1.0 °/hr at +25 °C • ARW: 0.06 °/√hr at +25 °C

Public figures are indicative; confirm current revision and test conditions. —* = no MK2M2 optical gyro; see MK2M2 • Z-axis MEMS below. MK2Z is a prototype.

Hardware and interfaces

PARAMETER	MK2M2	MK2E2	MK2Z*
COMMUNICATIONS			
Protocol	RS-422 or CAN-FD	RS-422 or CAN-FD	RS-422 or CAN-FD
Output data rate	Up to 500 Hz	Up to 500 Hz	Up to 500 Hz
ELECTRICAL / ENVIRONMENTAL			
Supply voltage	12–34 V	12–34 V	12–34 V
Power	1.2 W	2 W	4.5 W typ. / 7.5 W max
Operating temperature	–40 °C to +85 °C	–40 °C to +85 °C	–40 °C to +70 °C
Ingress rating	IP67	IP57 (IP67 in certification)	IP67 (certification in progress)
MECHANICAL			
Body dimensions	40 × 40 × 25 mm	78 × 63 × 36 mm	83 × 86.5 × 65 mm
With flanges	45 × 58.5 × 25 mm	78 × 80 × 36 mm	90 × 90 × 65 mm
Weight	75 g	230 g	475 g

Public technical figures are indicative and may change. MK2Z is a prototype. MK2M2 / MK2E2 qualification: sine sweep 20–2000 Hz up to 8 g peak and half-sine shock up to 40 g peak, 11 ms, all three axes. Emissions: EN 55032 Class A / FCC Part 15 / ICES-003; immunity: EN 55035 / CISPR 35; ESD: 4 kV touch / 8 kV air.

Units were tested unpowered and verified functional afterwards. These are survival-test results, not performance during exposure. Use the linked current manuals for complete test conditions and controlled specifications.



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