FIXPOSITION

Precision That Works

AI-Enhanced Positioning for Smarter Off-Road Autonomy

Introducing the **Fusion™** Software Suite and PBx-A1

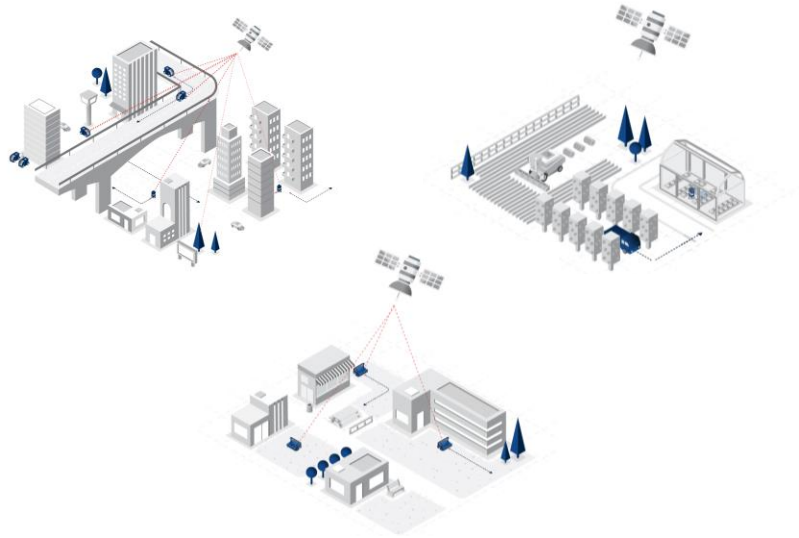
FIXPOSITION

Precise global positioning everywhere ™

Intelligence Driven Positioning

Leading GNSS and **Vision algorithms** with proprietary **deep sensor fusion software** to deliver a **complete positioning solution**!

Engineered for the Real World's Toughest Applications



Limited Operational Range

Under roofs or dense foliage, GNSS signals are completely lost. This results in positioning dropout and unpredictable **system drift**, rendering traditional nav systems ineffective.

Vision Enhances INS

IMUs Need Sight. Inertial Navigation Systems are great for short gaps, but their error accumulates rapidly. To maintain sustained, centimeter accuracy, IMUs must be fused with a **reliable visual reference.**

The Fixposition Solution

The software suite that let's you operate anywhere, anytime!

xFusion™

Go where GPS can't.

xRTK™

Precision that performs when others fail.

xCruise™

Hold the line when the signal drops.

xStart™

Wake up and work.

- **Accelerate Time-to-Market**
- **Reduce Development Costs**
- **Best-in-Class Solution**
- **Focus on Your Core Business**

PBx-A1 EVK Included Software

xFusion™

Go where GPS can't.

xFusion is the brain that tightly couples satellite data (RTK GNSS) with visual data (VIO). When your machine enters a "GPS dead zone" — like a tunnel, an urban canyon, or deep tree cover — most systems go blind. xFusion keeps you going.

- **Why you need it:** Your operation shouldn't stop just because a bridge or building blocks the sky.
- **The Value:** By fusing vision and satellite data, it extends high-precision positioning into GNSS-denied environments. It allows your robots to transition seamlessly from outdoors to indoors (and back) without missing a beat.

xRTK™

Precision that performs when others fail.

Standard RTK engines are great in perfect conditions, but the real world isn't perfect. **xRTK** is our state-of-the-art engine deeply embedded within the system to squeeze every ounce of performance out of available satellite signals.

- **Why you need it:** You can't afford to lose precision just because the horizon isn't perfectly clear.
- **The Value:** It delivers robust, centimeter-level accuracy in both open skies and challenging edge-cases where standard receivers give up, ensuring your machine knows exactly where it is, always.

xCruise™

Hold the line when the signal drops.

Losing your RTK correction stream usually means disaster: immediate, rapid drift that ruins crop lines or causes navigation errors. **xCruise** acts as a high-precision flywheel. If you lose your correction signal, xCruise takes over to maintain relative accuracy.

- **Why you need it:** In agriculture or lane-keeping, a drift of a few meters is unacceptable. You need "pass-to-pass" perfection even when connectivity blinks.
- **The Value:** We enable 15cm accuracy for up to 15 minutes without corrections. It turns a potential stoppage into a minor hiccup, keeping your lines straight and your machine productive while the signal reconnects.

xStart™

Wake up and work.

Traditionally, global positioning systems need to "see" the sky to figure out where they are before they can move. **xStart** eliminates the wait. It enables instant initialization from a known location in global coordinates — even inside a garage or warehouse without any GPS signal.

- **Why you need it:** Needing to move your robot before it can get going and waiting for a satellite lock every morning kills efficiency and burns battery.
- **The Value:** Your fleet is ready the second you turn it on. It knows its full pose instantly, allowing it to navigate out of a depot and into the field immediately.

PBx-A1 Hardware: Rugged, Compact, and Integrator-Ready

Hardware built for the toughest jobs!

Moving beyond standard sensors, the **PBx-A1** includes High-Precision RTK GNSS, a High-Grade Industrial IMU, and Multi-Camera GMSL support – ideal to run the **xFusion** engine.

Enclosure
Aluminium,
IP66 Rated

Vibration
MIL-STD-810G
(20 g RMS)

Dimensions
16cm x 11cm x 6cm

Connectivity
1x GbE, 2 x COM
(RS232/485/UART/CAN),
8x GPIO

Weight
600g

Vision Interface
2x GMSL2 Fakra Ports

Operating Temp
-40°C t o +85°C

GNSS Interface
2x GNSS Fakra Ports

PBx-A1 Datasheet Overview

Category	Specification
Proprietary Technologies	• xFusion • xRTK • xCruise • xStart
Performance	**xRTK** • Horizontal position accuracy (RMS): 0.6cm + 1ppm • Velocity accuracy: 0.03m/s • Heading accuracy: 0.05° @4m baseline, 0.15° @1m baseline **xFusion** • UDR: < 0.75 % of distance travelled without GNSS • ADR: < 0.4% of distance travelled without GNSS • HDR: < 0.05% of distance travelled without GNSS

GNSS	• Dual-Antenna RTK (Heading + Position)
	• GPS + Galileo + BDS + GLONASS + QZSS
	• Supported bands:
	  • GPS/ QZSS: L1 C/A, L2C, L5
	  • Galileo: E1 B/C, E5a, E6
	  • BDS: B1I, B1C, B2a, B3I
	  • GLONASS: L1, L2

Inertial Sensor	**Primary:** High-Grade Industrial IMU
	• Bias Stability: 0.3°/h
	• Random Walk:
	  • XY axis: 0.015 °/√h
	  • Z axis: 0.025 °/√h
	Secondary: Automotive Grade IMU (SoM integrated)

Vision Interface	**Ports:** 2x or 4x Fakra (Variant Dependent) **Protocol:** GMSL2 Deserializers **Launch Support:** 3MP Global Shutter RGB (External)
RF Interfaces	2x Fakra (GNSS Antennas)
Compute	• High-performance SoM • Integrated NPU for Edge AI acceleration

Category	Specification
Connectivity	**Ethernet:** 1x M12 (X-Coded) - 1GbE **Coms:** 2x M12 (A-Coded) supporting: • RS232 / RS485 / UART / CAN Bus • 8x GPIO / 2x PPS / 2x 5V Output **Power:** 1x M12 (Input 9-36V DC)
Protocols	• FP_A (Fixposition ASCII output) • NMEA 0183(output) • NOV_B (output) • RTCM 3.x (input) **Network:** TCP/IP, UDP, NTP, PTP **Compatible with:** J1939, ISOBus, NMEA 2000, EtherCAT, CANopen
Mechanical	**Rugged Aluminium Enclosure, IP 66** **Temperature:** • Operating -40°C to +85°C • Storage -40°C to +90°C **Humidity:** 95% non-condensing **Vibration:** • Random12 MIL-STD-810G (CH1) Method • 514.7 (Cat 24, 20 g RMS) • Sinusoidal IEC 60068-2-6 **Mounting:** Flange mount points **Dimensions:** 16cm x 11cm x 6cm **Weight:** 450g
Compliance	• RoHS compliant (lead-free, 2015/863/EU) • Green (halogen-free) • EU Radio Equipment Directive compliant 2014/53/EU • Qualification according to ISO 16750 • Manufactured and fully tested in ISO/TS 16949 certified production sites • CE, WEEE, FCC, UKCA

PBx-A1 EVK Hardware

The Core

- 1x **PBx-A1 Unit**

Vision & GNSS

- 2x **3MP Global Shutter RGB Cameras**
- 2x **Multi-Band GNSS Mushroom Antennas**
- 1x **Mounting System** (Camera, camera stereo, antenna brackets)

The Cabling

- 2x **Fakra-to-Fakra Cable (3m)** (For Cameras - Green coded)
- 2x **Fakra-to-TNC Adapters (3m)** (For GNSS Antennas - Blue coded)
- 1x **M12 X-Code to RJ45 Ethernet (1m or 3m)**
- 2x **M12 A-Code Breakout Cable (3m)** (1x 12 pin, 1x 17pin).
- 1x **M12 Power Breakout Cable (3m)**

Documentation

- "Quick Start Guide" card
- Calibration Certificate (IMU/Camera intrinsics)

PBx-A1 EVK Stereo Test System

Ready-to-Test Out of the Box

- **Complete Solution:** The PBx-A1 EVK includes all necessary components and mounting brackets to start testing immediately.
- **Rapid Deployment:** The EVK features a pre-calibrated stereo camera setup, allowing for instant operation.

Fully Integratable

- **Modular Design:** The system is completely modular, allowing you to position components to perfectly suit your specific platform.
- **Custom Calibration:** Five system calibrations are included with every EVK purchase.
- **Data Stream:** Provides fully timestamped camera streams.