

## xFusion-A1 Module

Fixposition's xFusion-A1™ is the world's first Global Positioning Awareness Module. Powered by Fixposition's proprietary algorithms, xFusion-A1™ goes beyond pure GNSS to provide you with a complete solution so that you can navigate in any and all environments. With unparalleled reliability and availability, xFusion-A1™ means no more compromising.



### PRODUCT DESCRIPTION

The xFusion-A1™ is engineered to meet all your positioning needs in a compact, scalable package. Powered by industry-leading technology, it delivers a comprehensive solution for even the most demanding applications.

At the core of our offering is Fixposition's advanced technology suite, designed to provide unmatched performance, robustness, and reliability:

- **xFusion:** Our cutting-edge fusion technology tightly integrates GNSS and IMU data with your cameras, vehicle motion inputs, and other sensors.
- **xRTK:** An advanced RTK solver embedded within xFusion, xRTK excels in challenging conditions, mitigating issues like jamming and multipath.
- **xCruise:** Confidence in your pass-to-pass accuracy is guaranteed, even in vast areas without corrections, thanks to xCruise.
- **xStart:** Initialize your system using saved known positions, enabling instant global coordination before GNSS signals are even detected.
- **xTend:** Navigate indoors indefinitely using global coordinates with seamless transition to outdoor environments.
- **xPlore:** The real world is complex and messy; xPlore uses advanced AI methods to provide understanding and adapts to make it simple.

### FEATURES

- ✗ Precise global positioning everywhere
- ✗ Compact size with unmatched performance
- ✗ Initialise in known locations without GNSS availability
- ✗ Navigate indoors while keeping globally precise positioning coordinates
- ✗ Flexible solution for a variety of applications



Global Positioning



Object Detection\*



Semantic Segmentation\*



Lane Detection\*

\*Coming soon



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FEATURES

|                             |                                   |
|-----------------------------|-----------------------------------|
| GNSS supported bands        | GPS/QZSS: L1 C/A, L5              |
|                             | Beidou: B1I, B2a                  |
| Default GNSS constellations | Galileo: E1, E5a                  |
|                             | GLONASS: L1                       |
| Proprietary technologies    | GPS+Beidou+Galileo+GLONASS+QZSS   |
|                             | xFusion                           |
|                             | xRTK                              |
|                             | xCruise                           |
|                             | xStart                            |
|                             | xTend                             |
|                             | xPlore                            |
| Protocols                   | FP_B (Fixposition Binary output)  |
|                             | FP_A (Fixposition ASCII output)   |
|                             | NMEA 0183/NMEA 2000(output)       |
|                             | J1939 - ISO 11783 (output)        |
|                             | NOV_B (output)                    |
|                             | RTCM 3.x (input)                  |
|                             | TCP/IP compatible                 |
|                             | UDP compatible                    |
|                             | NTP compatible                    |
|                             | PTP compatible                    |
|                             | EtherCAT compatible               |
|                             | CANopen compatible                |
| Interfaces                  | 5 x SPI                           |
|                             | 1 x RGMII                         |
|                             | 4 x MIPI-CSI (4*2lane/2*4lane)    |
|                             | 1 x MIPI-DSI                      |
|                             | 1 x USB2.0 OTG, 1 x USB3.0 HOST   |
|                             | 6 x I2C                           |
|                             | 12 x GPIO                         |
|                             | 5 x UART                          |
|                             | 2 x SD/SDIO                       |
|                             | 1 x PPS                           |
| External antenna interface  | Antenna type: Active              |
|                             | Antenna power supply: External or |
|                             | VDD_RF pin of module              |

PHYSICAL & ENVIRONMENTAL

|               |                                         |
|---------------|-----------------------------------------|
| Package       | Dimensions                              |
|               | 52mm x 52mm x 7.4mm                     |
|               | Weight                                  |
|               | 25g                                     |
|               | Format                                  |
|               | 184 pin QFN                             |
| Electrical    | Supply voltage                          |
|               | 4.5V to 5.5V                            |
|               | Power consumption                       |
|               | 1A @ 5.0V                               |
| Environmental | Temperature                             |
|               | Operating -40°C to +85°C                |
|               | Storage -40°C to +90°C                  |
|               | Humidity                                |
|               | 95% non-condensing                      |
|               | Vibration                               |
|               | MIL-STD-810G                            |
| Compliance    | RoHS compliant (lead-free, 2015/863/EU) |
|               | EU Radio Equipment Directive compliant  |
|               | 2014/53/EU                              |
|               | Qualification according to ISO 16750    |
|               | CE                                      |
|               | WEEE                                    |
|               | UKCA                                    |

PERFORMANCE

|                            |                                            |
|----------------------------|--------------------------------------------|
| GNSS performance           | Horizontal position accuracy (RMS)         |
|                            | Single point L1: 1.5 m                     |
|                            | Single point L1/L5: 1.2 m                  |
|                            | SBAS*: 60cm                                |
|                            | RTK: 1 cm + 1 ppm                          |
|                            | Velocity accuracy                          |
|                            | 0.03 m/s                                   |
|                            | Heading accuracy (RMS-dual antenna)        |
|                            | 1 m baseline: 0.4°                         |
|                            | 2 m baseline: 0.2°                         |
|                            | 4 m baseline: 0.15°                        |
|                            | Time-to-first-fix (with AGNSS)             |
|                            | Full Cold Start: 5 s                       |
|                            | Time-to-first-fix (without AGNSS)          |
|                            | Full Cold Start: 26 s                      |
|                            | Warm Start: 16 s                           |
|                            | Hot Start: 1 s                             |
|                            | Sensitivity                                |
|                            | Acquisition: -145 dBm                      |
|                            | Tracking: -165 dBm                         |
|                            | Reacquisition: -157 dBm                    |
|                            | PPS signal accuracy                        |
|                            | 20 ns                                      |
| Dead reckoning performance | UDR                                        |
|                            | < 1 % of distance traveled without GNSS    |
|                            | ADR                                        |
|                            | < 0.5 % of distance traveled without GNSS  |
|                            | HDR                                        |
|                            | < 0.05% of distance travelled without GNSS |
| Maximum update rate        | 100 Hz                                     |

