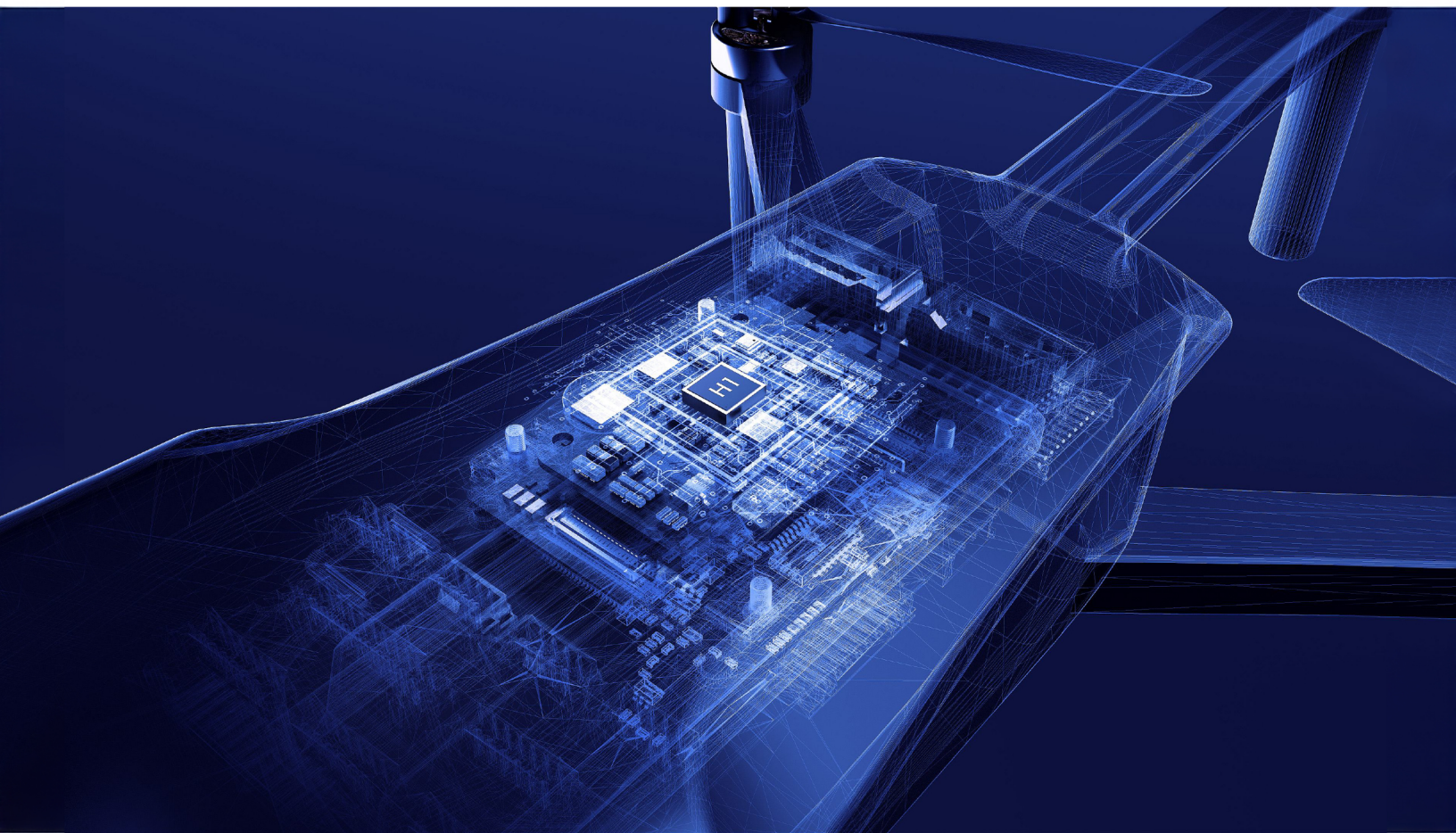




H1 AUTONOMOUS SYSTEMS CHIP

Precise Positioning • Secure Comms • Flight Control • Onboard AI

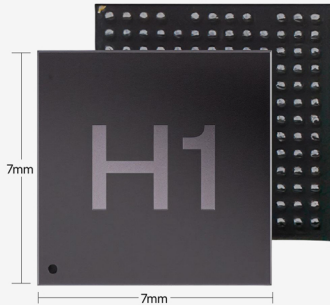


PRODUCT OVERVIEW

Preliminary Information

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INTRODUCING HYFIX H1 AUTONOMOUS SYSTEMS CHIP



The HYFIX H1 is the first-generation Autonomous Systems Chip developed to empower a new class of affordable autonomous drones. Fabricated using an advanced low-power process node at a U.S. Trusted Foundry, the H1 integrates radio-frequency (RF), satellite navigation, sensor fusion, vehicle control and computation technologies into a single, compact device.

This integration establishes the H1 as a foundational platform for next-generation robotics, drones, and autonomous systems requiring dependable, real-time spatial intelligence.

For reliable precise positioning, the H1 combines 800 channels of satellite tracking with software-defined radio (SDR) baseband signal processing, providing superior accuracy and robustness. The H1 supports dual-antennae, quad-constellation, and quad-band Global Navigation Satellite System (GNSS) signals as well as emerging Low-Earth Orbit (LEO) constellations, including Xona's X1 and X5 signals. The H1 also incorporates integrated anti-spoofing, anti-jamming, and Real-Time Kinematic (RTK) algorithms to deliver resilient, high-precision positioning even in harsh or contested environments. Sensor fusion algorithms embedded on the H1 fuse optional inertial measurement unit (IMU) and camera data for navigation in contested environments.

Beyond precise positioning and navigation, the H1's dual 64-bit processor cores and comprehensive suite of advanced peripherals enables the hosting of ROS2 robot operating system, and PX4 flight control for flight control, secure communications, and on-board AI.

ABOUT HYFIX

	Headquarters:	Santa Clara, CA
	Industry:	Semiconductors for Autonomous Systems
	Founded:	January 2022
	Funding:	Backed by Craft Ventures and other leading venture capital firms

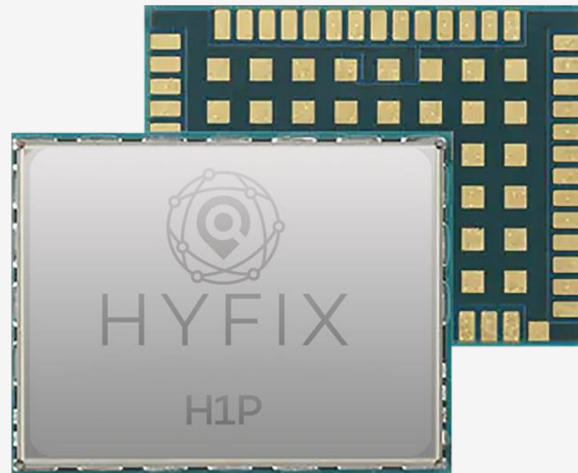
HYFIX Spatial Intelligence, Inc. is an American semiconductor company specializing in the development of Autonomous Systems Chips that will enable a low-cost domestic drone supply-chain. HYFIX's system-on-chip technology combines on-board RF signal processing, vision processing, AI, and control technologies into a single chip solution—significantly reducing the cost and development time of autonomous drone and robot systems.

The company also specializes in manufacturing terrestrial GNSS base stations that power the world's largest precise location, real-time kinematic network, GEODNET.

KEY ACCOMPLISHMENTS:

- Development of the H1 Autonomous Systems Chip
- Produced over 20,000 GNSS base stations deployed globally
- Primary hardware supplier for the GEODNET RTK Network, a decentralized GNSS correction system
- Broad industry usage including autonomous vehicles, drones, precision agriculture, robotics, mapping, and surveying

HYFIX H1P – POSITIONING, NAVIGATION AND OPEN-COMPUTE MODULE



The HYFIX H1P is an advanced Autonomous System Module built with the H1 Autonomous Systems Chip and assembled in the United States of America. The H1P is an 800-channel, resilient Position, Navigation, and Timing (PNT) module with extensive algorithm and controls support via dual 64-bit processor cores. The H1 supports dual-antennae, quad-constellation, and quad-band Global Navigation Satellite System (GNSS) signals as well as Low-Earth Orbit (LEO) constellations, including Xona's X1 and X5 signals.

Delivered in a 22 × 17 mm industry-standard module footprint, the H1P is hardware-compatible with leading GNSS and RTK receiver modules, enabling seamless integration into existing designs. The combination of resilient, high-precision positioning performance and compact form factor makes the H1P ideal for integration into robotic and drone platforms, as well as other autonomous systems requiring resilient navigation in complex and contested environments.

KEY FEATURES

- Small Size, Surface-Mount Land Grid Array
- Full-Constellation, Quad-Frequency Receiver
- Low-Earth Orbit Satellite Ready (Xona Pulsar)
- Reliable PPS Output for Timing
- Integrated 6-Axis IMU Sensor
- On-Board Sensor Fusion
- Open Application / Control Processor Core
- Advanced On-Board Algorithms
 - Centimeter-Accurate Positioning (RTK)
 - Static Heading Determination
 - Inertial Navigation Outputs
 - Anti-Jamming Protection
 - Anti-Spoofing Protection
 - Integrated GEODNET Trusted Ephemeris
 - Integrated GEODNET RTK Corrections
- Extensive peripherals (CAN, USB, UART, GPIO)

HYFIX H1D – FULLY-INTEGRATED DRONE MODULE



The HYFIX H1D is a fully-integrated Drone Module built with the H1 Autonomous Systems Chip and assembled in the United States of America. Designed specifically for drone and robotic applications, the H1D integrates satellite navigation, Inertial Measurement Unit (IMU), and vision-based technologies into a single, compact platform. The module hosts the PX4 flight control stack, and the ROS 2 robot operating system, as a companion compute capability. The H1D integrates a dual-band 2.4 GHz + 5.8 GHz 2T2R encrypted low-latency radio for reliable command, control, and 1080P digital-video data transmission.

By combining advanced sensing, flight control, and high-speed communications, the H1D module is optimized for next-generation drones and autonomous aerial systems. The H1D module is delivered in a compact MiniPCIe form-factor weighing less than 15 grams making it ideal for even the smallest FPV class drones. Optionally installed heatsink, fan or thermal electric cooler provides maximum thermal range and radio operating performance.

KEY FEATURES

- MiniPCIe form-factor
- PX4 Flight Control
- ROS2 Companion Computer
- Dual-Band 2.4 GHz + 5.8 GHz 2T2R MIMO Radio
- Up to 3 camera sensors (MIPI)
- Visual Inertial Odometry (VIO)
- Visual Obstacle Avoidance (VOA)
- Centimeter Accurate RTK Positioning & GPS-based Heading
- Anti-Jamming & Anti-Spoofing Protection
- Integrated GEODNET Connectivity
- SD Card Interface
- Fleet Management Console
- Demo Flight Mobile App

HIGH-PRECISION RESILIENT PNT H1P AND H1D

Satellite Tracking

GPS:	L1 C/A, L1C, L2C, L2PY, L5
GLONASS:	G1CA, G2CA
BeiDou:	B1I, B1C, B2a, B2I, B2b, B3I
Galileo:	E1, E5a, E5b, E6
QZSS:	L1 C/A, L1C/B, L2C, L5, L6
Xona:	X1, X5

PNT Algorithm

100Hz INS position and attitude outputs
IMU-based short-term dead reckoning
Static heading determination
LEO satellite signal tracking, Xona support
Built-in GEODNET RTK corrections
Jamming detection and anti-jamming features
Anti-spoof protection using GEODNET trusted ephemeris

GNSS/RTK Protocol Support

HYFIX Binary with I/Q SDR Output Options
NMEA 0183
RTCM 3.2 (MSM)

DRONE CONTROL FEATURES H1D ONLY

Software

Integrated Flight Control	PX4
Messaging Protocol	MAVLink, MAVSDK
Companion Computer	ROS 2
Algorithms	Visual Inertial Odometry (VIO) Visual Obstacle Avoidance (VOA)
Cloud Transport	Fleet Management Console & OTA
IOS and Android	Sample Flight Control App

Camera Interface (3)

MIPI	1x (4K), 2x (1080P)
Encoder/Decoder	H.264, JPEG

Radio

Range	Up to 10km
Frequencies	2.4GHz, 5.8GHz
MIMO	2T2R
Power	+20dbm – 30dbm (digital PA)

I/O

PWM / ESC	8 channels
Misc	Serial, I2C, USB, DroneCAN

POSITIONING PERFORMANCE H1P AND H1D

RTK

Horizontal Accuracy	0.8cm + 0.5ppm
Vertical Accuracy	1.0cm + 1.0ppm
Initialization	< 10s

Standalone

Horizontal Accuracy	1.5m
Vertical Accuracy	2.0m

DGNSS

Horizontal Accuracy	0.5m
Vertical Accuracy	0.8m

Update Rate

GNSS Only	10Hz
GNSS+INS	100Hz
Latency	<10ms

Timing

Time Precision	1.5nS
Event Accuracy	<3nS

Time to First Fix (TTF)

Cold Start	<30s
Warm Start	<10s
Re-acquisition	<1s

ELECTRICAL SPECIFICATIONS

Type	SMT solderable land grid array
Size	22.0 × 17.4 × 2.4mm (H1P) 30.0 × 50.0 × 4.0mm (H1D)
Weight	<2.5g (H1P) <15g (H1D)
Input Voltage	3.3VDC
Power consumption	<0.8W (H1P) <10W (H1D)
Operating Temp	-40 to 85C
Storage	-55 to 85C
Humidity	5–95%
Certification	CE, FCC, RoHS, WEEE



ENABLING THE U.S. DOMESTIC DRONE SUPPLY CHAIN

HYFIX builds semiconductor technology enabling high-quality, low-cost autonomous drone systems.



Contact:
info@hyfix.ai