

PHOENIX

Based on SFX4 GNSS SDR Receiver Platform

2023

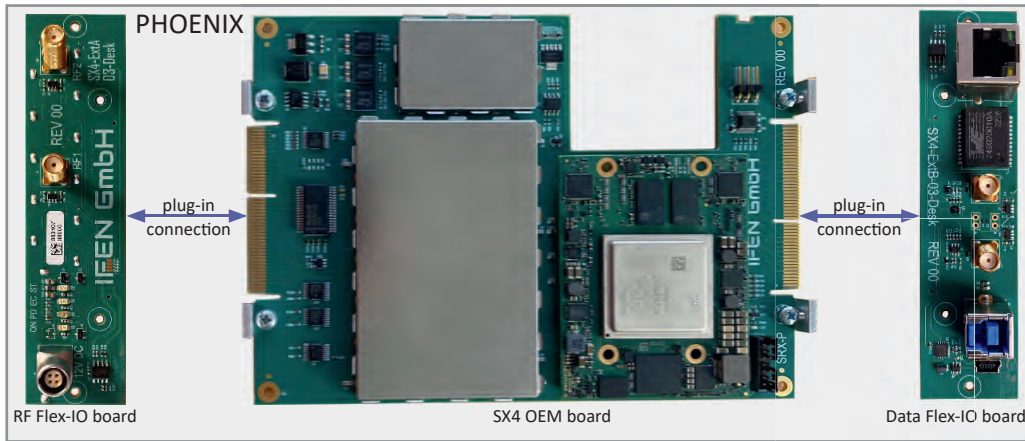


Controlled Traffic Farming with the PHOENIX GNSS HAS-PPP receiver - 20 cm accuracy, no service costs!



PHOENIX - SFX4 Derived Receiver

The PHOENIX is based on a specific configuration of the SFX4 SDR GNSS receiver platform, here optimized for agriculture application use cases. The high performance SX4 OEM core module hosts the signal conditioning & processing, but also the PVT PPP-HAS processing solution. The 'Data' Flex-IO board for PHOENIX is hosting a MEMS IMU for terrain level compensation.



Specification

RF Flex-IO Board	SX4 OEM Module	Data Flex-IO Board
PHOENIX RF board <ul style="list-style-type: none"> • 2 x sma RF-inputs • Active antenna support: 5V/150 mA • 1st LNA per chain for low receiver noise • 12 VDC power supply interface • Rear-side: connector to SX4 module 	Signal processing board <ul style="list-style-type: none"> • 4 RF chains simultaneously with 50 MHz RF bandwidth each • 1.1 to 1,6 GHz (all L-band) frequency support • 4-bit ADC with SAW RF-filter (application market) • Plug-in MPSoC (FPGA & ARM) for scalable processing power 	PHOENIX 'Data' board <ul style="list-style-type: none"> • 1 GB Ethernet • 1 x USB 3.0 • 10-MHz in • 1-pps-out • Rear-side: connector to SX4 board
RF-IO options <ul style="list-style-type: none"> • None 	GNSS signal options <ul style="list-style-type: none"> • Galileo E1, E5ab (AltBOC), E6 (HAS SL1) • GPS L1-CA & L1C, L2C & L2P, L5 • SBAS L1 (and L5 tracking only) 	Communication options <ul style="list-style-type: none"> • CAN bus optional
Signal routing <ul style="list-style-type: none"> • Routing of single or dual antenna inputs to the four different SX4 RF-chains 	Acquisition and tracking capability and configurability <ul style="list-style-type: none"> • Standard Tong acquisition, but also fast acquisition unit (FAU) • From 60 (standard) up to 300 (next. gen. MPSoC) tracking channels • Interference detection and mitigation (notch and pulse blanking) 	Signaling options <ul style="list-style-type: none"> • None
Signal amplifiers options <ul style="list-style-type: none"> • By-passable LNA (for high CN0) 	Measurement performance <ul style="list-style-type: none"> • Code accuracy: < 2 ... 20 cm (with good CN0) • Carrier accuracy: < 1.5 mm • CN0 range from 30 dBHz up to 65 dBHz 	Wireless communication options <ul style="list-style-type: none"> • TBD extension
Signal frequency conversion options <ul style="list-style-type: none"> • None 	PVT capabilities and performance <ul style="list-style-type: none"> • PVT modes: WLSQ, SBAS, DGNSS, PPP(HAS) • PVT accuracy: 20 cm using HAS PPP floating solution • PVT update rate: 0.02 - 20 Hz (up to 100 with IMU) • TTFF: 60 s(cold), 30 s(warm), 10 s(hot), 2 s (re-acquisition) typical 	Sensor options <ul style="list-style-type: none"> • MEMS IMU (baseline)
Power options <ul style="list-style-type: none"> • TBD 	Outputs at all levels <ul style="list-style-type: none"> • Code and carrier measurements in IFEN binary & ASCII, RTCM, RINEX • PVT solution in IFEN binary & ASCII format, NMEA 	Clock options <ul style="list-style-type: none"> • TCXO (baseline)

Advantages

Accuracy: 20 cm horizontal <ul style="list-style-type: none"> • Based on PPP 'float' solution algorithm using HAS Service Level 1 • Position error correction through 'terrain level compensation' by IMU 	Existing Advantages	User Accuracy Improvement <ul style="list-style-type: none"> • Using also HAS GPS orrections for improved accuracy & availability • Accuracy improvement down to 2 cm using PPP-'ambiguity fixing'
Cost: 24/7 Service 'Free of charge' <ul style="list-style-type: none"> • Usage free of charge of 'High Accuracy Service' from Galileo • No need of local reference stations or communication 	PHOENIX	New HAS Service Level 2 <ul style="list-style-type: none"> • Reduction of convergence time down to 100 s with coming HAS Service Level 2 (with atmospheric corrections over Europe)
Availability: Global high availability <ul style="list-style-type: none"> • Correction data are transmitted by all Galileo satellites with > 87% availability (low-risk of loss of transmitted correction data) 	Coming Improvements ⇨	Further System Integrations <ul style="list-style-type: none"> • Extension towards automatic steering and guidance • CAN-bus interface to tractor & implements

The PHOENIX project is funded by the European Union Agency for the Space Programme (EUSPA) under the European Union's Fundamental Elements programme under grant agreement No. GSA/GRANT/04/2019



Disclaimer:
All specifications subject to change without prior notice



IFEN GmbH
+49 8121 2238 20
sales@ifen.com