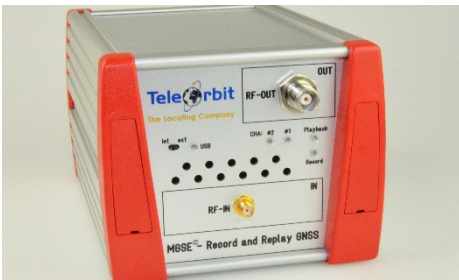
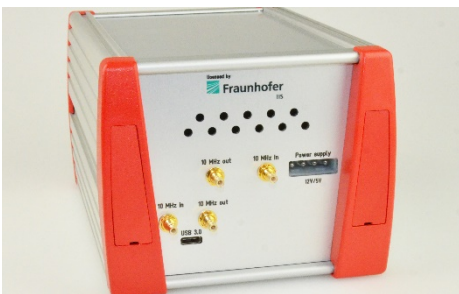


Flexiband Front-End 2.0 (Mobile Record and Replay GNSS Front-End)



Front side of Flexiband Front-end 2.0



Back side of Flexiband Front-end 2.0

Key features

Record Mode (REC)

- Reception of up to 3 simultaneously sampled radio frequency (RF) channels
- Pre-configurable bandwidth, bitwidth, sampling rate, intermediate frequency
- Extension to up to 6 RF channels via synchronized parallel operation of two front-ends
- Powered via USB

Replay Mode (REP)

- Playback of recorded or user-specific generated signals
- Playback of one or two signal data files
- RF transmission on up to two different carrier frequencies

Performance

- Record and replay GNSS signals:
 - GPS L1, L2, L5
 - Galileo E1abc, E5a, E5b, E5, E6
 - GLONASS G1, G2, G3
 - BeiDou B1, B2, B3
 - QZSS and IRNSS L5
 - IRNSS on S-band
- Customized configurations:
 - Bandwidth: up to 68 MHz
 - Sampling rate: up to 81 MHz
 - Bitwidth: up to 2x8 bit (complex)

Interfaces

- *REC*: up to three antenna inputs
- *REC*: antenna supply with a maximum of 70 mA at 4.3 VDC
- *REC*: parallel digital data output (optional)
- *REC*: u-blox ubx embedded as internal reference (optional)
- *REP*: RF signal output
- *REC/REP*: 10 MHz Reference clock input and output
- *REC/REP*: Trigger in/out

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Frequency band	Band-width [MHz]	Center frequency [MHz]	Intermediate frequency [MHz]		Sampling rate [MHz]	Sample width [bit]	USB data rate [MBit/s]	Remarks
Triple band front-end configurations								
L1/E1abc/B1/G1	54	1580.000	L1: -4.580	G1: 22.000	81	2x 4 (complex)	972	GPS, Galileo, Glonass, Beidou, QZSS, IRNSS, etc.
IRNSS-S	18	2491.250	0.778000		20.25	2x 4 (complex)		
L5/E5a	38	1173.547	2.903125		40.5	2x 2 (complex)		
L1/E1bc/B1	38	1574.938	0.482500		40.5	2x 4 (complex)	1296	Extended Galileo CS, QZSS, etc.
E6abc	38	1278.688	0.062500		40.5	2x 4 (complex)		
L5/E5/B2	54	1190.000	L5/E5a: -13.550	E5b: 17.140	81	2x 4 (complex)		
L1/E1abc/B1/G1	54	1580.000	L1: -4.580	G1: 22.000	81	2x 2 (complex)	810	Extended GPS, Galileo, Glonass, Beidou, etc.
L2/L2C/G2	38	1232.500	L2: -4.900	G2: 13.500	40.5	2x 2 (complex)		
L5/E5/B2	54	1190.000	L5/E5a: -13.550	E5b: 17.140	81	2x 2 (complex)		
L1/E1bc	18	1586.250	-10.830		40.5	8 (real)	972	Array recording config; 3 x RF-input
L1/E1bc	18	1586.250	-10.830		40.5	8 (real)		
L1/E1bc	18	1586.250	-10.830		40.5	8 (real)		
Dual band front-end configurations								
L1/E1abc/B1/G1	54	1580.000	L1: -4.58	G1: 22.00	81	2x 4 (complex)	1,296	Wideband E1 / E5 e.g. Galileo OS
L5/E5/B2	54	1190.000	E5a: -13.55	E5b: 17.14	81	2x 4 (complex)		
L1/E1abc/G1	54	1580.000	L1: -4.58	G1: 22.00	81	2x 4 (complex)	1,296	Wideband E1 / E6 e.g. Galileo PRS
E6abc/B3	54	1270.000	E6: 8.75	B3: -1.48	81	2x 4 (complex)		
L1/E1abc/G1	54	1580.000	L1: -4.58	G1: 22.00	81	2x 4 (complex)	1296	Wideband E1 / E6 with u-blox ubx output embedded in raw data stream
E6abc/B3	54	1270.000	E6: 8.75	B3: -1,48	81	2x 4 (complex)		
u-blox M8T			N/A					
Single band front-end configurations								
L1/E1	8	1574.890625	0.529375		10.125	2x 4 (complex)	81	Narrowband, medium dynamic
L1/E1abc/B1/G1	54	1574.890625	0.529375		81	2x 8 (complex)	1,296	Wideband, high dynamic

Configuration examples

Technical details

- Dimensions (L/W/H): 188/125/100 mm, weight: 1.6 kg
- High stability internal reference oscillator (OCXO)
- Super speed USB 3.0 (up to approx. 1.3 Gbit/s)
- Large FPGA (Xilinx Spartan7) for signal conditioning and algorithms
- USB driver with application programming interface (API)
- Supporting the ION Metadata Standard
- GUI for visualization, record and replay included
- Drivers for Windows 7/10 and Linux

Application examples

- Development of software defined radios/receivers (SDR)
- GNSS multi-system signal analysis and comparison
- Analysis of atmospheric effects, e.g. iono-/tropospheric irregularities, scintillation etc.
- Interference monitoring for protecting critical infrastructures
- Beamforming
- GNSS multi-system, multi-band receiver performance testing
- Jamming and spoofing test and evaluation
- Testing repeatability by the exact replay of synthetic or recorded live sky signals