1 / 2   Full ultrasound electronics.

Miniaturized Multi-Channel System

Fraunhofer Institute **for Biomedical Engineering IBMT**
Prof. Dr. Heiko Zimmermann

Main Department Ultrasound
Dipl.-Ing. Steffen Tretbar
Joseph-von-Fraunhofer-Weg 1
66280 Sulzbach
Germany

Contact

M.Eng. Christoph Risser
Electronics Engineering
Main Department Ultrasound
Telephone +49 6897 9071-360
christoph.risser@ibmt.fraunhofer.de

www.ibmt.fraunhofer.de
www.ultrasound.fraunhofer.de

System description

The goal of this development is a portable ultrasound system, equipped with state-of-the-art data interfaces, based on a scalable concept. Compared to IBMT's smallest 8-channel ultrasound system, this device is able to generate signals with adjustable amplitudes of up to +/-100 V, store large received data in DDR3 memories and transfer data via a fast USB 3.0 interface to a terminal where advanced data processing and visualization takes place. A ZYNQ-7 module, which integrates the advantages of an FPGA with those of a microcontroller on a single chip, takes care of sequence control, transmit- and receive-side data management as well as the administration of the communication interfaces. The device is supplied by a 12 V DC input voltage and will be available as 8, 16 or 32 channel version.

The system properties listed in the table are for orientation only. On request, the device can be adapted to individual requirements.

Standard specifications

Transmitter TX

Channels:	8 / 16 / 32
Transmit voltage:	+/- 100 V (adjustable)
Transmit current:	2 A max.
Signals:	Tri-state burst signals (programmable)
Resolution:	12.5 ns
Signal length:	10 cycles

Receiver RX

Channels:	8 / 16 / 32
Noise:	6.5 dB (@ 50 Ω)
Amplification:	Max. 44.3 dB 39 dB adjustable
A/D converter:	40 MSPS / 12 bit
Local memory:	2x 4 Gbit DDR3

System

Frequency range:	800 kHz – 5 MHz
Input voltage:	+12 V (DC)
FPGA / SoC:	ZYNQ-7 XC7Z030
Signal processing:	External (on mobile device)
Data interface:	USB 3.0 (Type C) WIFI 802.11 b/g/n
Transducer interface:	Molex SlimStack
Dimensions:	132 x 98 x 10 mm (without casing)

EMI shielded