ULTRASOUND BEAMFORMER SPECIFICATIONS

General System Characteristics

Hardware:
Modular design with common main board technology and application-specific front ends (detailed specifications for three versions on the backside of this flyer)
PC-based platform on Microsoft Windows operating system
High-end PC with GPU for massive parallel processing

Documentation:
User manual, programming manual for all interface functions with all SDK software samples
Documentation of electrical safety, system components up to layouts possible for OEM or user-specific medical certification testing optional available

Software and Integration

Beamforming reconstruction
Ultrafast ultrasound imaging (plane wave compounding, synthetic aperture imaging), delay-and-sum imaging both with adaptive GPU processing
Online software with full screen user interface for clinical use available
Data management for recorded data and data export functions for further analysis
Filter interface for custom processing and filtering with processing pipeline access
Closed-loop device control possibilities
Software for offline visualization and processing to be used for analysis of recorded datasets and filter development
Open file formats with readers for different programming languages
Software interface for Matlab for device parameterization, control and data processing
C# SDK for direct integration into 3rd party applications with samples

1 DiPhAS main board.
2 Xilinx Virtex FPGA on mainboard.
### Low-frequency Beamformer

#### Example application:
- Sonar imaging, transducer characterization, therapy system
- Medical imaging, thermal therapy control, VVI, photoacoustic, ultrafast imaging
- Material characterization, skin imaging, molecular imaging, small animal imaging

#### Transmitter:
- **Tx Voltage:**
  - 6 to 150 Vpp
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  - 5 to 26 Vpp
- **Tx frequency range**
  - 100 kHz - 10 MHz
  - 1 MHz - 20 MHz
  - DC - 100 MHz
- **Transmit coding with arbitrary tri-state waveform, each channel individually at 240 MHz clock rate (4 ns)**
  - at 240 MHz clock rate (4 ns)
  - at 480 MHz clock rate (2 ns)

#### Receiver:
- **Frequency range:**
  - 50 kHz - 20 MHz
  - 500 kHz - 30 MHz
  - DC - 100 MHz
- **Digitization using 12 Bit A/D converters with programmable sample rate up to 40 MSamples**
  - up to 80 MSamples
  - up to 480 MSamples
- **Gain / TGC Range:**
  - 51dB / 42dB
  - 51dB / 42dB
  - 56 dB / 8 – 56 dB
- **Local buffer memory:**
  - 4 MSamples / channel
  - 4 MSamples / channel
  - 8 MSamples / channel

#### General system characteristics:
- **Data transfer:**
  - Gigabit Ethernet
  - Gigabit Ethernet or PCIe 2.0 X8 (25 Gbps)
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- **Channels:**
  - 128 transmit channels, 128 receive channels
- **Multiplexer:**
  - None
  - 128:1024 option available
  - None
- **Power Supply:**
  - 12V or 24V
  - 12V, 110V or 230V
  - 110V or 230V
- **Size:**
  - 130 mm x 100 mm x 200 mm
  - 440 mm x 440 mm x 440 mm
  - 440 mm x 440 mm x 440 mm
- **Weight:**
  - 2 kg
  - 20 kg (including PC)
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- **Special characteristics:**
  - passive cooling possible
  - medical certification, MR compatible option
  - PC integrated
- **Connectors:**
  - 1x Cannon DLM 6-360
  - up to 4x Cannon DLM 6-360
  - 1x Samtec SaeF

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4 Medical beamformer.
5 High-frequency beamformer.