TELEMED

Ultrasound Medical Systems

Internet page: https://www.pcultrasound.com/
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ArtUs USS-2H research system

Portable Ultrasound Research System

The system is based on a clinical diagnostic ultrasound platform, with features comparable to those used in everyday medical practice. This cost-effective system supports a range of research tasks, including the development of novel beamforming algorithms, creation of custom receive weighting methods, transmit–receive focusing programming, advanced digital signal and image processing and the use of deep learning methods for ultrasonic image formation. It also minimizes hardware resources while enabling reconstruction of diagnostic-quality images.

System Advantages

• Ability to program custom transmit delay values for individual channels and apertures, enabling precise control of transmit focusing.

• Ability to select active channels from the 64 available, allowing a balance between frame rate and image quality.

• Support for custom excitation pulses using a tri-state pulser (+A, 0, -A).

• Flexible beam selection to create a custom sequence of working apertures.

• Adjustable AFE filters: anti-aliasing filter, programmable high-pass filter and depth-dependent received echo gain.

• Capability to create custom software based on channel or beamformed RF data using the TELEMED C++ SDK.

Usage Notes

- Excitation pulse amplitudes and shapes, analog front-end, and amplification parameters are applied uniformly across all channels. Individual channel adjustments are not available.
- The system supports RF channel data transfer and B-mode imaging. Other imaging modes are disabled to ensure optimal performance as a channel data device.

General Features

- Real-time access to beamformed and individual channel RF data.
- Supports ultrasound probes up to 192 elements (linear, convex, phased-array, custom).
- Two transducer ports.
- USB 3.0 interface enabling real-time streaming of raw RF data to modern Windows PCs.

Transmit Parameters

- 64 TX channels.
- Three-level pulsers up to 18 MHz frequency with programmable amplitude up to 140 Vpp, maximum current 2A, time delay resolution 6.25 ns.

Receive Parameters

- 64 RX channels.
- Sampling rate up to 40 MHz, ADC resolution 12-bit, RF data output format 16-bit.
- Programmable analog front-end anti-aliasing filter.
- Programmable analog front-end high-pass filter.

Input / Output synchronization capabilities

Six SMA-type connectors installed for support triggering:

- Ultrasound Line output
- Ultrasound Frame output
- Ultrasound Line input
- Ultrasound Frame input
- ScanStart output
- ScanStart input

Power Requirements and Dimensions

- External power supply 100V-240V ,50 - 60 Hz.
- 12V, 3A power consumption.
- Aluminium enclosure.
- Size 140 x 204.5 x 62 mm (W x D x H).
- Weight 1.12 kg.

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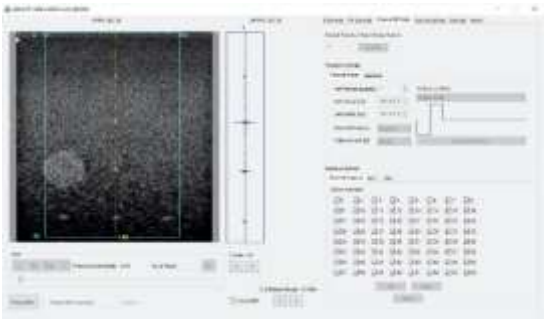
Supported Transducers

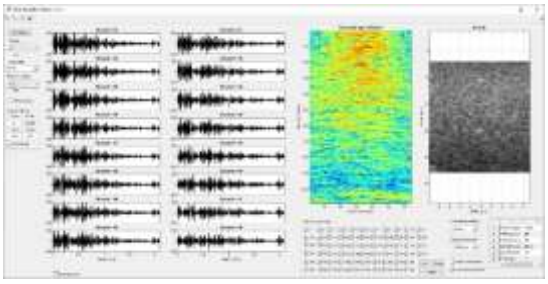
- MCV9-5N10-A3, 128-element micro convex.
- C6-1H50-A5, 192-element convex.
- C5-2H60-A5, 192-element convex.
- L12-5N40-A4, 128-element linear.
- L15-7H40-A5, 192-element linear.
- L18-7H30-A5, 192-element linear.
- LF9-5N60-A3, 128-element linear.
- LF11-5H60-A3, 182-element linear.
- P5-1S15-A6, 64-element phased array.
- Custom transducers with up to 192 elements (on request).

Supporting Software

The ArtUs RF Data Control II C++ sample program and its source codes enable programming of channel data acquisition parameters, recording channels, and beamformed data to files for offline analysis. Using the sample, you can incorporate your own algorithms for channel data processing (such as beamforming, apodization) and set custom scanning parameters (such as plane waves).



The **Channel Data Viewer** MATLAB sample program allows users to import recorded channel RF data files into a MATLAB environment, convenient for research. The sample included illustrates simple delay-and-sum beamforming and enables evaluation of how the image quality is affected by parameters such as the number of active channels, speed of sound, and data sampling. The sample can serve as an initial point for custom algorithm development and as a tool to familiarize oneself with the RF data.



The **TELEMED C++ SDK** opens new possibilities for creating your own software with a channel RF data-equipped beamformer. Users can program ultrasound scanning parameters such as imaging depth, scanning frequency, transmit focal depth, and channel data acquisition parameters, including transmit delays, arbitrary apertures, analog front-end parameters, and pulser parameters.

Package Contents

- ArtUs USS-2H research ultrasound beamformer.
- USB 3.0 cable, power supply, USB memory with manuals and the software.
- Optional transducer of client's choice.

Recommended Computer

- Windows 8/10/11 64-bit operating system.
- 32 GB or more RAM.
- USB 3.0 port.
- Installed and configured MATLAB.

Contact Us

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