

The ArtUs Research Family

Open RF and channel data for ultrasound research

For research, clinical and industry customers

Configurations covered: ArtUs EXT-1H / EXT-2H with RF and I/O Modules, and the ArtUs USS-2H research scanner.

Telemed figures are drawn from pcultrasound.com and Telemed manuals. Competitor figures are drawn from publicly available vendor materials and may change over time.

1. The problem ArtUs solves

Most commercial ultrasound systems are closed. They hand back a finished image and nothing beneath it. If your work depends on the radiofrequency signal — beamforming studies, tissue characterisation, elastography, photoacoustics, or building datasets for machine learning — you are usually pushed toward a dedicated research platform that costs far more than a clinical scanner and cannot double as one for routine imaging.

The ArtUs research family closes that gap. It begins with a compact, USB-connected scanner that is CE-marked and FDA-cleared for clinical diagnosis, and it opens a documented path to beamformed and channel-level RF data through optional modules and a dedicated research configuration. You acquire clinical capability and research access on one hardware platform, at a fraction of the cost of a dedicated research platform.

2. What you get

Three configurations, one platform. Start where your budget and your questions are, and extend when you need to.

2.1 ArtUs EXT-1H / EXT-2H — clinical scanner with research extensions

A PC-based scanner over USB 3.0, certified for clinical use. The EXT-1H has one probe connector; the EXT-2H has two and supports simultaneous dual-transducer scanning under Echo Wave II. Both cover the full clinical mode set: B, M, Color / Power / PW Doppler, Duplex, Triplex, spatial compound, tissue harmonic, WideView, and optional strain elastography.

Add research access only when you need it:

- RF Module — real-time access to beamformed RF data at four points in the signal chain: beamformer output, TFC filter output, angle apodisation output, and Hilbert transform. SDK samples in C++, MATLAB, Python and LabVIEW.
- I/O Module — six SMA connectors carrying Line, Frame and ScanStart signals, inputs and outputs, for synchronising the scanner with external equipment as master or slave.

AT A GLANCE — EXT-1H / EXT-2H

64 TX / 64 RX, multiplexed to 192 transducer lines · three-level pulser 3–140 Vpp at up to 2 A · 1–18 MHz
12-bit ADC · USB 3.0 to a Windows PC · compact desktop beamformer, 0.66 kg (1H) / 1.10 kg (2H)

2.2 ArtUs USS-2H — dedicated research scanner with channel RF data

Built on the same clinical platform, reconfigured for channel-level research. It delivers both beamformed RF and raw per-channel RF data as built-in functionality, with the I/O synchronisation signals included. To keep channel-data acquisition stable, imaging is restricted to B-mode. You can program transmit delays per channel and select which of the 64 channels are active; excitation uses a tri-state pulser (+A / 0 / -A). It ships with C++ source-code samples and a MATLAB Channel Data Viewer that illustrates delay-and-sum beamforming with adjustable weighting, speed of sound, active channels and sampling period.

AT A GLANCE — USS-2H

64 TX / 64 RX, channel + beamformed RF · three-level pulser up to 140 Vpp · 6.25 ns time-delay resolution sampling up to 40 MHz · 12-bit ADC, 16-bit RF output · aluminium enclosure 140 × 204.5 × 62 mm, 1.12 kg

3. Who it is for

- Universities and clinical-research groups that need RF access and a usable diagnostic scanner in the same instrument, where pure research platforms are too expensive and pure clinical scanners are closed.
- Educators teaching beamforming, apodisation and DAS reconstruction — the USS-2H with C++ samples is a transparent, well-documented teaching platform.
- Multimodal and OEM integrators combining ultrasound with photoacoustic lasers, motion stages or robotics, using the standardised I/O signal set instead of building custom triggering hardware.
- Teams generating datasets or running parallel acquisition, where buying several units at ArtUs pricing is realistic and buying several high-channel research platforms is not.

4. How ArtUs compares

The research ultrasound market divides into dedicated research instruments, OEM engines, handheld clinical devices, and the clinical-plus-research niche that ArtUs occupies. The table below positions ArtUs against the main alternatives; read the cells as positioning summaries, not full specifications. Full specifications are available from each vendor.

	ArtUs (Teled)	Verasonics Vantage / NXT	us4us us4R / us4R-lite	Cephasonics cQuest	Clarius HD3
Primary role	Clinical scanner platform + optional RF / channel research access	Programmable research platform (lab benchmark)	GPU-streaming research platform (2D/3D, AI)	OEM ultrasound engine for device builders	Handheld wireless clinical scanner
Clinical clearance	Yes — base EXT-1H/2H CE-marked and FDA-cleared	No (research only)	No (research only)	Via customer integration (ISO 13485 design)	Yes — CE / FDA cleared handheld
RF / channel access	Beamformed RF (RF Module); raw channel RF (USS-2H)	Full channel RF, software beamforming	Full channel RF, real-time PCIe / Thunderbolt	Raw channel to beamformed to scan-converted	Beamformed RF / IQ downloaded after capture; no channel RF
Channels	64 TX / 64 RX (multiplexed to 192 crystals)	32–256; up to 2048 by synchronisation	us4R 128–1024 TX / 128–256 RX; lite 256 / 64	64–4096	Vendor-defined (handheld)
Host bandwidth	USB 3.0	PCIe (workstation host)	PCIe up to ~24–32 GB/s; Thunderbolt-3 (lite)	PCIe / USB / fibre (iCUF-Link)	Wi-Fi / Bluetooth

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Programming	C++ SDK; MATLAB / Python / LabVIEW samples	MATLAB-centric; large script library	Open SDK; C/C++, MATLAB, Python; CUDA / OpenCL	CUSDK; 1000+ parameters; C++ / MATLAB	Listener / Cast + OEM API; MATLAB / Python (GitHub)
Cost positioning*	Lowest-cost RF / channel-capable platform in this comparison; quoted on request	Research capital equipment; well above ArtUs	Mid-to-high research budget; by quotation	By OEM / project contract	Handheld scanner price plus paid research packages

In short: Verasonics and us4us lead on channel count, ADC bit-depth and host bandwidth, but they are research-only instruments at higher capital cost. Cephasonics serves device manufacturers rather than end users. Clarius wins on mobility and ease of use, but its research access is bounded by a wireless link and it exposes beamformed data only, not raw channel data. ArtUs is the one platform in this set that is clinically cleared in its base form and still opens a credible RF and channel-data research path.

On cost, ArtUs is not the cheapest instrument on the market — a channel-data research system is a serious purchase. Its advantage is relative: it is the most affordable route to RF and channel-level research among the platforms compared here, where dedicated research systems typically cost several times more. Configurations and pricing for your intended use are available from Teleded on request.

** Prices are not published in this document. ArtUs configurations are quoted on request; competitor systems are priced individually by their vendors, so the entries above are relative positioning rather than figures.*

5. Is ArtUs right for you?

We would rather place the right instrument than oversell this one. ArtUs is the rational choice when:

- you want a single scanner that is clinically cleared in its base configuration and can also be extended for research — accepting that a research-extended setup you assemble is a customer-defined integration;
- your work needs beamformed or channel RF but does not require more than 64 channels, 14-bit ADC, or PCIe-class bandwidth;
- you teach or prototype and value C++ source samples on a fixed, well-documented hardware platform;
- you synchronise with external equipment and prefer a standardised I/O signal set over custom triggering;
- you need several identical units without a lab-capital budget.

ArtUs is not the right fit for large-aperture (over 192-element) or 3D matrix-array research, HIFU or per-channel arbitrary-waveform work, ultra-fast imaging that needs multi-GB/s host bandwidth, or fully software-defined GPU acquisition pipelines. For those requirements, Verasonics Vantage NXT or us4us us4R are better suited — and we will tell you so.

REGULATORY NOTE

The CE marking and FDA clearance apply to the base ArtUs EXT-1H/2H scanner configuration, not to the optional RF Module. Once you attach your own PC, display, or external equipment to the I/O connectors, the resulting system is a custom integration whose overall safety classification is the integrator's responsibility. The USS-2H is a research system: its clinical-grade base hardware is not marketed as cleared in the research configuration.



6. Getting started

Tell us about your application and we will help you choose the right configuration, probes and modules - and arrange an online call.

- Describe your research or clinical use case and the data you need (beamformed RF, channel RF, synchronisation with external equipment).
- Ask for the SDK documentation and code samples relevant to your language (C++, MATLAB, Python, LabVIEW).
- Request a probe recommendation from the ArtUs transducer family (linear, convex, phased, endocavity, ProbeFix-compatible).
- Ask for a quotation for the configuration that matches your application.

Contact Telemed via <https://www.pcultrasound.com/support/requestquote/> to start a conversation.

7. Source documents

- [Telemed — ArtUs Scanners product page](#)
- [Telemed — Research Beamformed RF data](#)
- [Telemed — Research Channel RF data \(USS-2H\)](#)
- [Telemed — Research I/O Synchronisation](#)
- [Telemed — ArtUs USS-2H brochure](#)

Telemed — July 2026. This document is a product overview for prospective customers; it is not a specification sheet and does not form part of any contract.