

PCUS[®] *pro* ARRAY – PHASED-ARRAY ULTRASONIC FRONTEND

Compact industrial phased-array ultrasonic frontend for automated testing of wheelsets, axles and complex-shaped geometries.

DRIVING PROBES WITH UP TO 64 ELEMENTS IN 16:64 CONFIGURATION

The PCUS[®] *pro* Array is a complete phased-array ultrasonic frontend for use in automated and manual inspection systems.

An integrated scanner interface allows the direct connection of up to four incremental encoders. Testing at high speeds and with fully flexible parameterization is possible due to the high data transfer speed of up to 40 MB/s and the full parallel FPGA design. The 64 independent transmitters allow large transmit apertures.

The PCUS[®] *pro* Array delivers an unreached signal to noise ratio and high dynamic range together with an accurate 14 bit analog to digital converter. The device can be used with the PCUS[®] *pro* Lab software or with .NET SDK (Software Development Kit), which enables customized solutions and get the total control over all hardware features.

All devices are calibrated and tested against the ISO 18563-1 ultrasonic standard. New features can be implemented with firmware updates.

1 PCUS[®] *pro* Array frontend – front side.



Fraunhofer Institute for Ceramic Technologies and Systems IKTS

Maria-Reiche-Strasse 2
01109 Dresden, Germany

Contact

Christian Richter
Phone +49 351 88815-635
christian.richter@ikts.fraunhofer.de

www.ikts.fraunhofer.de

Category	Characteristics	Value
General	Dimensions (L, W, H)	190 x 190 x 65 mm ³
	Weight	1.9 kg
	Operating temperature and humidity range	5...50 °C @ 75 % relative humidity (non-condensing)
Transmitter	Number of transmitters	64
	Transmitter pulse voltage into internal 50 Ω	-20 to -180 V adjustable
	Pulse	Negative rectangle pulse
	Output impedance	< 15 Ω
	Pulse width	0 to 500 ns, in steps of 3.125 ns
	Pulse fall time	< 9 ns
	Pulse delay	0 s to 40 μs, in steps of 3.125 ns
	Pulse repetition frequency	Up to 2 kHz
Receiver	Number of receivers	16 (4:1 multiplexed)
	Input mode	Pulse/Echo mode for array transducers
	Frequency range	500 kHz to 30 MHz (-3 dB)
	Input impedance	50 Ω
	Filters	Two analog band filters per channel (user defined)
	Preamplifier gain	0/40 dB switchable
	Main amplifier gain	0...80 dB, maximum input signal 10 V _{pp} (100 % screen height)
	TGC	0...80 dB, max. 40 dB/μs

Signal path	Probe delay	0 to 819 μs in steps of 12.5 ns
	Maximum recording length	65,535 samples per channel
	A/D converter	14 bit, 80 MS/s
	Gates	One start gate and four measurement gates
	Rectification	None, positive-, negative-, or full-wave
Interface and connectors	Array transducer connector	I-Pex or Hypertronics NEBV19/16PFD/THA
	PC interface	USB 2.0 high-speed: Bulgin connector PX0443, max. 40 MB/s
	Trigger in/out	TTL high or low active (Lemo 00)
	Scanner interface inputs	DSUB-25 socket (4 encoders, RS422/485)
	Power supply	12–24 V DC, max. 48 W (30 W typical); Bulgin connector PX0412/2S
Software	Digitally signed drivers for Windows® (Windows® 7 or higher), x86 and x84	
	Managed Windows® SDK based on .NET 4.8	
System conformity	The PCUS® <i>pro</i> Array system meets all relevant requirements of ISO 18563-1	

Disclaimer

Distribution and copying of this document, utilization and reporting of its contents are prohibited – even in parts – if not explicitly allowed. Violation commits to amends.

All rights reserved, especially if a patent is assigned or a trademark is registered.