AO424ELF
Product Specification

High Performance Simultaneous Data Acquisition

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1 Product Description.

1. ***AO424ELF*** is a standard D-TACQ product, 32 channels simultaneous analog output.
2. Standard configuration: 32 channels, 16 bit resolution, 500kSPS/channel
3. Complies with *D-TACQ ELF* standard.
4. +/-10V,+ /-5V per channel 20mA drive.
5. Standard reconstruction filter at 50kHz. Also available in a Low-Latency Control configuration at 250kHz. Please contact D-TACQ for custom options.
6. DC and AWG operating modes.

1.1 Product Variants

- ***AO424ELF-32*** : 32 channels, 16 bit resolution, 500kSPS/channel.
- ***AO424ELF-16*** : 16 channels, 16 bit resolution, 1000kSPS/channel.

-LL versions have a filter at 250kHz:

- ***AO424ELF-32-LL*** : 32 channels, 16 bit resolution, 500kSPS/channel.
- ***AO424ELF-16-LL*** : 16 channels, 16 bit resolution, 1000kSPS/channel.

1.2 Applications

- Instrumentation applications, control and monitoring.

1.3 Overview

The *ELF* module standard, based on the same front panel and connector footprint as *FMC*, adds user IO to carrier modules fitted with *FPGA* resource. D-TACQ recommends carriers based on the *Xilinx* ZYNQ system on chip, combining *FPGA* resource with a dual-core ARM Cortex A9 and gigabit Ethernet.

Compatible carriers include:

- D-TACQ **ACQ1001** : D-TACQ single slot FMC carrier, Z7020
- D-TACQ **ACQ1002** : D-TACQ dual slot FMC carrier, Z7020
- D-TACQ **ACQ2006** : D-TACQ 6 slot FMC carrier, Z7020
- D-TACQ **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030
- D-TACQ MTCA-RTM2 : 2 slot ELF carrier, MTCA.4 compatible.

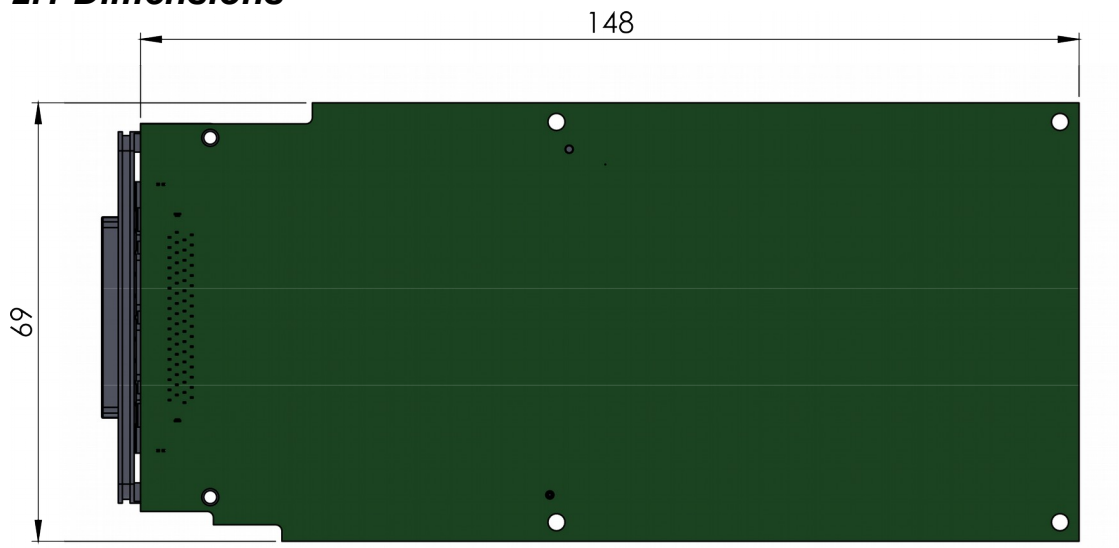
D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux.

1.4 Glossary

- FMC: VITA57 FPGA Mezzanine Card.
- ELF: D-TACQ extension to FMC, elongated card with provision for dedicated analog power supply rails.
- Xilinx ZYNQ Soc
- LPC: FMC Low pin count wiring standard.
- ULPC: FMC/ELF Ultra low pin count (D-TACQ).

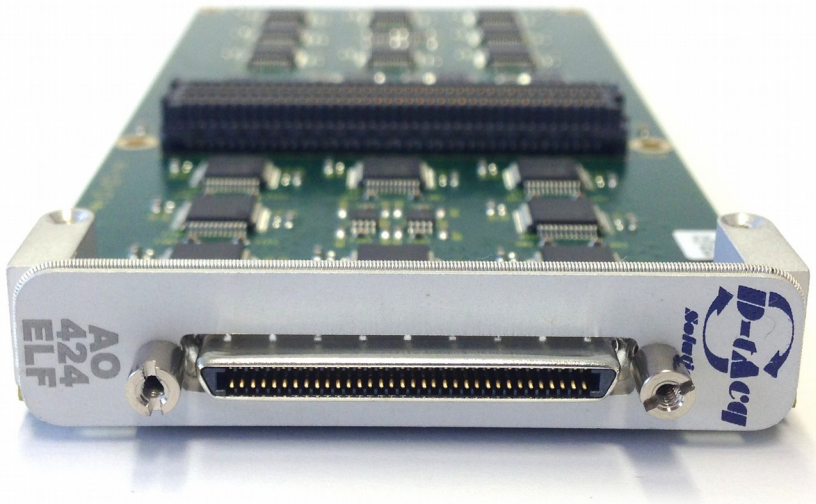
2 Physical

2.1 Dimensions



- Single ELF Formfactor.
- VHDCI connector

2.2 Appearance



3 Interface Specification

3.1 Front Panel Connector

- 68 Pin VHDCI
- Pinout compatible with D-TACQ BNCPANEL, SMAPANEL.

3.1.1 Pinout 32-Channel

Pin	Function	Pin	Function
1	0V	35	0V
2	0V	36	0V
3	AO01	37	0V
4	AO02	38	0V
5	AO03	39	0V
6	AO04	40	0V
7	AO05	41	0V
8	AO06	42	0V
9	AO07	43	0V
10	AO08	44	0V
11	AO09	45	0V
12	AO10	46	0V
13	AO11	47	0V
14	AO12	48	0V
15	AO13	49	0V
16	AO14	50	0V
17	AO15	51	0V
18	AO16	52	0V
19	AO17	53	0V
20	AO18	54	0V
21	AO19	55	0V
22	AO20	56	0V
23	AO21	57	0V
24	AO22	58	0V
25	AO23	59	0V
26	AO24	60	0V
27	AO25	61	0V
28	AO26	62	0V
29	AO27	63	0V
30	AO28	64	0V
31	AO29	65	0V
32	AO30	66	0V
33	AO31	67	0V
34	AO32	68	0V

3.1.2 Pinout 16-Channel

Pin	Function	Pin	Function
1	0V	35	0V
2	0V	36	0V
3	AO01	37	0V
4	Not Used	38	0V
5	AO02	39	0V
6	Not Used	40	0V
7	AO03	41	0V
8	Not Used	42	0V
9	AO04	43	0V
10	Not Used	44	0V
11	AO05	45	0V
12	Not Used	46	0V
13	AO06	47	0V
14	Not Used	48	0V
15	AO07	49	0V
16	Not Used	50	0V
17	AO08	51	0V
18	Not Used	52	0V
19	AO09	53	0V
20	Not Used	54	0V
21	AO10	55	0V
22	Not Used	56	0V
23	AO11	57	0V
24	Not Used	58	0V
25	AO12	59	0V
26	Not Used	60	0V
27	AO13	61	0V
28	Not Used	62	0V
29	AO14	63	0V
30	Not Used	64	0V
31	AO15	65	0V
32	Not Used	66	0V
33	AO16	67	0V
34	Not Used	68	0V

4 AO424ELF Electrical Specification.

#	**Parameter**	**Value**
1	Number of Channels	32
2	Sample Rate	500 kHz, per channel simultaneous 1 MHz, per channel simultaneous limited to **16 channels**
3	Resolution	16 bits
4	Coupling	DC, Single-ended
5	Maximum output current	20mA per channel, 200mA Total
6	Output Voltage Range	±10 V, ±5 V ranges
7	Output Impedance	50Ω
8	Offset Error	0.01% FS with numerical calibration
9	Gain Error	0.01% FS with numerical calibration
10	INL	±2 LSB
11	DNL	±1 LSB
13	THD	92 dB
14	SINAD	87 dBc
15	SFDR	93 dBc
16	SNR	88 dB
17	Reconstruction Filter Cutoff	70 kHz - Standard 250 kHz - Low Latency (LL)
18	Amplifier Slew Rate	2.5 V/us
19	Crosstalk	<90 dB @ 1 kHz FS Output
20	Temperature Stability	<25 ppm/C

5 AO424ELF Specification

#	Parameter	Value
1	Form Factor	D-TACQ Standard ELF
2	Power source	D-TACQ ELF Module – Please contact us if details are required.
3	Environmental	0°C-50°C Operational -10°C-85°C Non-Operational
4	FMC Socket	Standard ELF D-TACQ Ultra Low Pin Count ULPC