

ACQ424ELF

32 Channel Simultaneous Analog Input Module

Product Description

- 32 channel simultaneous inputs
- 1 MSamples/s per channel
- 16 bit resolution
- High SNR typical 88dB

Digitiser Key Features

- Ideal for Instrumentation applications, control and monitoring
- Compatible with all D-TACQ Carriers offering up to 192 channels in a 1U 19" system
- Wide range of triggering and capture modes
- Compatible with a range of D-TACQ Breakout Panels and Termination Modules

Platform Key Features

D-TACQ supplies a complete working Intelligent Digitizer Appliance providing:

- FPGA based system with a range of flexible and customisable features
- Microprocessor system running open source Linux
- Comprehensive API provided in Python
- Onboard EPICS IOC for rapid integration

Please contact info@d-tacq.com for details on the above system integration options.

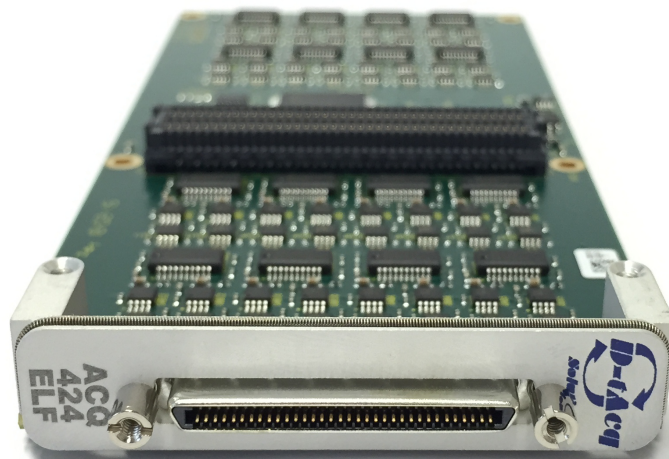


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Glossary

- FMC : VITA57.1 FPGA Mezzanine Card
- ELF : Electrically Extended FMC, implies ULPC or DULPC (only compatible with D-TACQ carriers)
- LPC : FMC Low Pin Count standard as per VITA57.1
- ULPC : Subset by D-TACQ, Ultra Low Pin Count
- DULPC : Subset by D-TACQ, Differential Ultra Low Pin Count (ULPC with extra differential signalling)
- ZYNQ: Xilinx System on Chip (SoC) + FPGA logic
- FPGA : Field Programmable Gate Array

1 Product Description

1. ACQ424ELF is a 32 channel simultaneous analog input module.
2. Standard configuration : 32 channels, 1MSPS/channel.
3. Extended module with FMC connector and FMC front panel.
4. 2-wire Differential inputs, high quality differential amplifier front end with single factory fixed input voltage range.

1.1 Product Variants

- ACQ424ELF-32-1000-16 : 32 channels, 16 bit resolution, 1000kSPS/channel $\pm 10V$ Input Voltage Range.

Please contact info@d-tacq.com for ordering information on other input voltage ranges.

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 site FMC/ELF carrier, ZYNQ Z7020
- D-TACQ ACQ1002 : D-TACQ dual site FMC/ELF carrier, ZYNQ Z7020
- D-TACQ ACQ2106 : D-TACQ 6 site ELF carrier, ZYNQ Z7030
- D-TACQ ACQ2206 : D-TACQ 6 site ELF carrier, ZYNQ Z7030
- D-TACQ ACQ1102 : D-TACQ 2 site FMC/ELF carrier, Z7030
- DAMC-FMC1Z7IO + D-TACQ ACQ400-MTCA-RTM-2 : 2 site ELF + 1 site FMC carrier, ZYNQ Z7030/7035

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

2 Physical

2.1 Board Outline

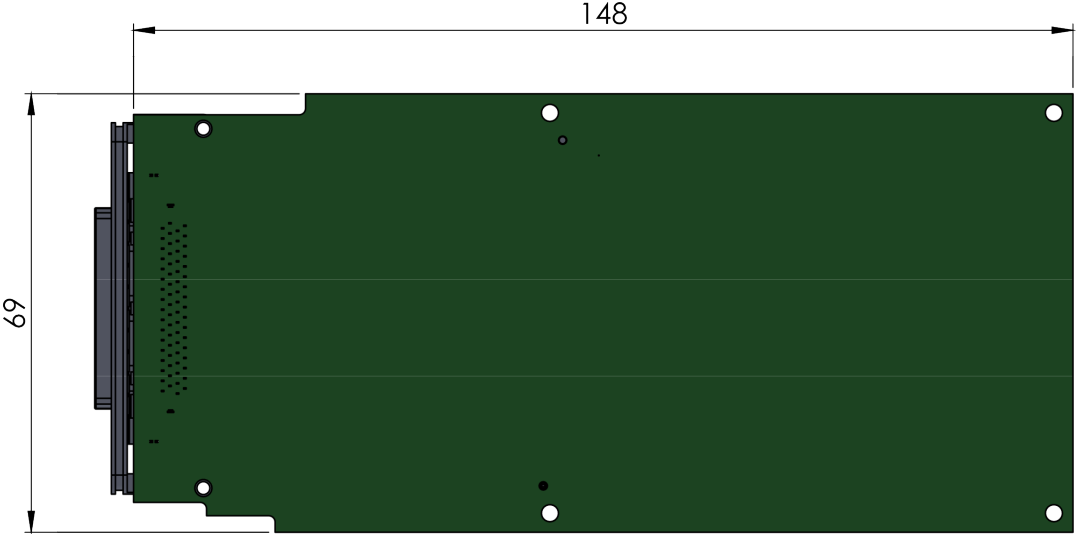


Figure 1: Board Outline

2.2 Appearance



Figure 2: Board Photo

2.3 Front Panel Connectors

2.3.1 VHDCI

- 68 Pin VHDCI. Pinout compatible with D-TACQ BNCPANEL, SMAPANEL, LEMOPANEL, PTBPANEL
- For direct external cable to front panel

Pin	Function	Pin	Function
1	0V	35	0V
2	0V	36	0V
3	AI01+	37	AI01-
4	AI02+	38	AI02-
5	AI03+	39	AI03-
6	AI04+	40	AI04-
7	AI05+	41	AI05-
8	AI06+	42	AI06-
9	AI07+	43	AI07-
10	AI08+	44	AI08-
11	AI09+	45	AI09-
12	AI10+	46	AI10-
13	AI11+	47	AI11-
14	AI12+	48	AI12-
15	AI13+	49	AI13-
16	AI14+	50	AI14-
17	AI15+	51	AI15-
18	AI16+	52	AI16-
19	AI17+	53	AI17-
20	AI18+	54	AI18-
21	AI19+	55	AI19-
22	AI20+	56	AI20-
23	AI21+	57	AI21-
24	AI22+	58	AI22-
25	AI23+	59	AI23-
26	AI24+	60	AI24-
27	AI25+	61	AI25-
28	AI26+	62	AI26-
29	AI27+	63	AI27-
30	AI28+	64	AI28-
31	AI29+	65	AI29-
32	AI30+	66	AI30-
33	AI31+	67	AI31-
34	AI32+	68	AI32-

Table 1: Front Panel VHDCI Connector Pinout

3 Electrical Specification

#	Parameter	Value
1	Number of Channels	32
2	Sample Rate (Max)	1 MHz per channel simultaneous
3	Resolution	16-bit
4	Coupling	DC, Differential Input
5	Input Impedance	1 M Ω
6	Input Voltage Range	$\pm 10V$ ¹
7	Input Voltage Withstand	$\pm 30V$
8	Offset Error	0.01% FS with numerical calibration
9	Gain Error	0.01% FS with numerical calibration
10	INL	± 2.5 LSB
11	DNL	± 1 LSB
12	CMRR	>80dB FS @ 1 kHz
13	THD	-90 dB
14	SINAD	-86 dB ²
15	SFDR	100 dBc ²
16	SNR	88 dB ²
17	Power BW (-3dB)	580 kHz
18	Small Signal BW	1 MHz
19	Crosstalk	<100 dB @ 1 kHz FS Input
20	Temperature Stability	<25ppm/ $^{\circ}C$

¹ Other factory set fixed ranges available – contact D-TACQ for details.

² Typical values measured at full scale with an 8.9 kHz input

Table 2: ACQ424ELF Electrical Performance

4 Mechanical & Environmental Specification

#	Parameter	Value
1	Form Factor	D-TACQ Standard ELF
2	Power Consumption	D-TACQ ELF Module – Please contact us if details are required.
3	Environmental	0 $^{\circ}C$ - 50 $^{\circ}C$ Operational -10 $^{\circ}C$ - 85 $^{\circ}C$ Non-Operational
4	Mezzanine Socket	D-TACQ ELF Ultra Low Pin Count ULPC

Table 3: Mechanical & Environmental Specification

Revision History

Revision	Date	Author(s)	Description
4	9/7/2018	JMcL	First Release of Full data sheet
5	X/X/2024	JMcL	Updated Format



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