ACQ436ELF
Product Specification

High Performance Simultaneous Data Acquisition

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1 Product Description

1. ***ACQ436ELF*** is a multi function Analog input / Output Board.
2. 24 channels 24 bit Trans-impedance Analog input
3. 12 Multiplexed Analog outputs from 2 Analog Output channels.
4. Based on ACQ435ELF 32 channel digitizer with 8 channels replaced by the Analog Outputs

1.1 Product Ordering

- ***ACQ436-24TF-2AO-12M*** : 24 bit resolution, 128kSPS/channel,
  24 channels Trans-Impedance Analog Input +/- 10uA .
  12 channels Multiplexed output +/- 0.5V from 2 Analog Output channels

  Other Input Options available including Voltage Input; contact D-TACQ for information

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 **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030

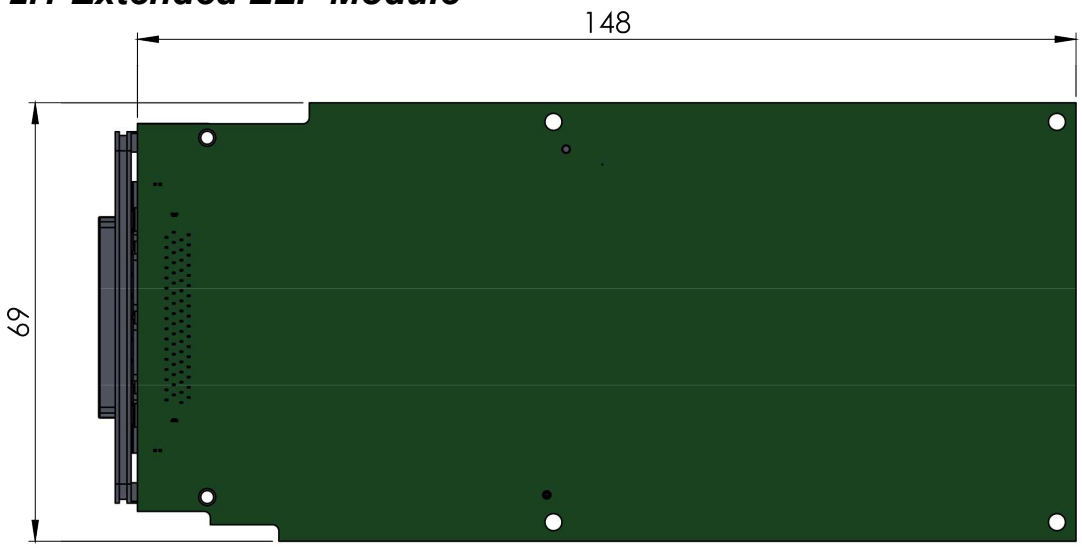
D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux.

1.4 Glossary

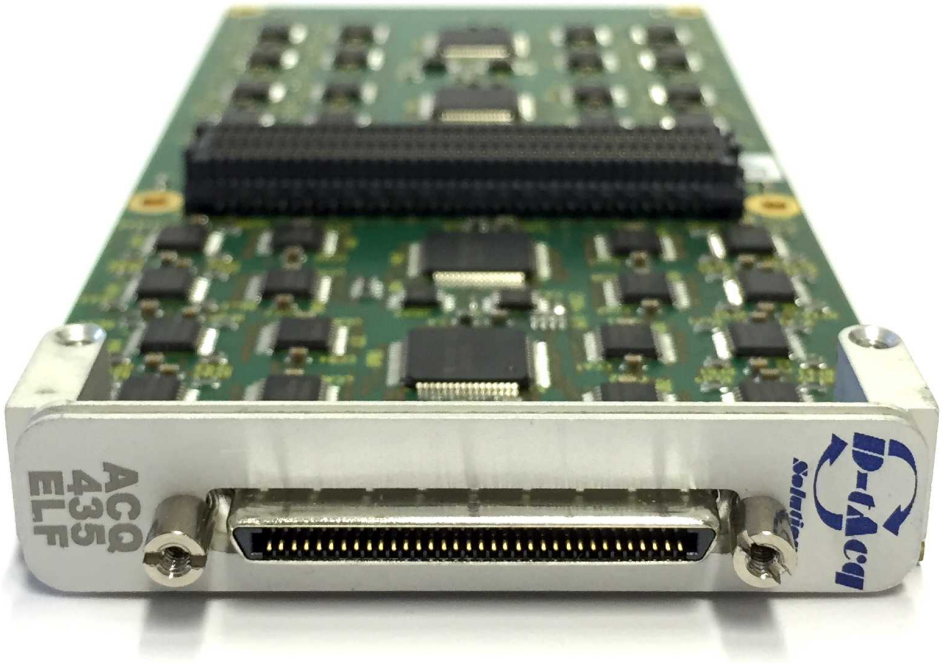
- FMC: VITA57 FPGA Mezzanine Card.
- ELF: D-TACQ extension to FMC, elongated card with provision for dedicated analog power supply rails.
- Xilinx ZYNQ Soc
- LPC: FMC Low pin count wiring standard.
- ULPC: FMC/ELF Ultra low pin count (D-TACQ).

2 Physical

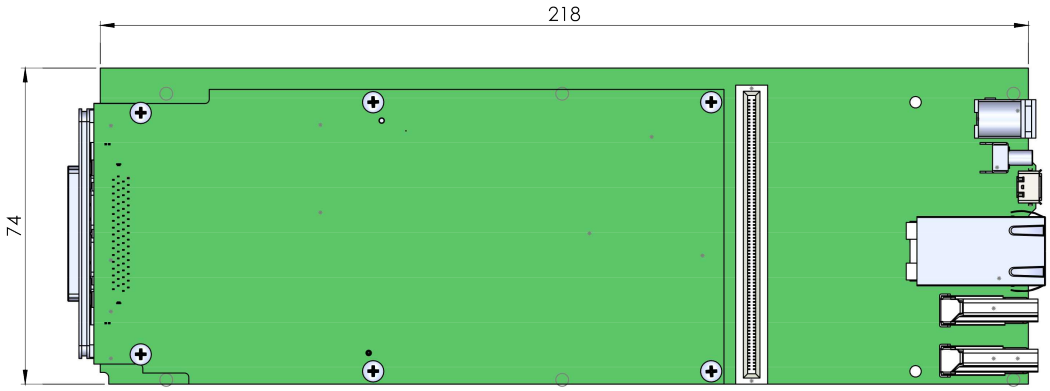
2.1 Extended ELF Module



2.2 Appearance



2.3 Example: Fitted to ACQ1001 Carrier



Carrier accommodates 1 x ELF e.g. ***ACQ436ELF*** or a standard size FMC module such as ***ACQ420FMC*** or ***AO420FMC***.

3 Interface Specification.

3.1 Front Panel Connector

- 68 Pin VHDCI
- Pinout is based on ACQ435 Connector with “Missing Channels” replaced by Analog outputs

Pin	Function	Pin	Function
1	0V	35	0V0V
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	0V	49	0V
16	OUT1	50	OUT2
17	OUT3	51	OUT4
18	OUT5	52	OUT6
19	OUT7	53	OUT8
20	OUT9	54	OUT10
21	OUT11	55	OUT12
22	0V	56	0V
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-
32	AI29+	65	AI29-
32	AI30+	66	AI30-
33	AI31+	67	AI31-
34	AI32+	68	AI32-

4 ACQ436ELF Electrical Specification.

4.1 Analog Inputs

#	Parameter	Value
1	Number of Channels	24 Input
2	Sample Rate High Speed Mode High Resolution Mode	Input Per channel simultaneous 128 kHz 52 kHz
3	Resolution	24 bits
4	Coupling	DC, Differential Input
5	Input Impedance	1MΩ
6	Input Range	±10 µA
7	Offset Error	0.01% FS with numerical calibration
8	Gain Error	0.01% FS with numerical calibration
9	INL	±0.002% FS
10	CMRR	>60dB FS @ 1 kHz
11	THD	-106 dB*
12	SFDR	107 dBc*
13	SNR High Speed Mode High Resolution Mode	 104 dB* 108 dB*
14	Analog Input BW	80kHz
15	Crosstalk	<90dB @ 1kHz FS Input
16	Digital Filter:Pass Band Digital Filter:3dB Digital Filter:Stop Band Digital Filter:Attenuate	0.453 Fsample 0.490 Fsample 0.547 Fsample 95 dB

* Typical values measured at full scale with a 9.76kHz input

4.2 Analog Outputs

#	**Parameter**	**Value**
1	Number of Channels	2 Outputs multiplexed to 12
2	DAC Update Rate	1 MHz Per channel simultaneous
3	Resolution	16 bits
4	Output	2 pole reconstruction 5 KHz Low Pass
4	Output Voltage Range	±0.5 V
5	Offset Error	0.1% FS*
6	Gain Error	0.1% FS*
7	Output Multiplexer	Each Output channel multiplexed onto 6 outputs
8	Multiplexer Control	Each Output Individual Enable
9	Multiplexer Update Rate	10 kHz

* Additional numerical calibration available

5 ACQ436ELF 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