

ACQ435ELF Product Specification



High Performance Simultaneous Data Acquisition

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1 Product Description

1. **ACQ435ELF** is a 32 channel, 24 bit simultaneous analog input module.
2. Standard configuration : 32 channels, 128kSPS/channel.
3. Extended module with *FMC* connector and *FMC* front panel.
4. 2-wire Differential inputs, high quality differential amplifier front end.
5. Factory set input function: Follower (voltage input) or Transimpedance (current input). Since the input is differential, there are 4 possible configurations, however only two are used:
 - FF : Both buffers in Follower configuration.
 - TF : Positive side buffer in Transimpedance configuration.
 - FF is the default and is implied.

1.1 Product Variants

- **ACQ435ELF-32FF** : 24 bit resolution, 128kSPS/channel, 32 channels + follower, - follower inputs.
- **ACQ435ELF-32FF-5V** : 24 bit resolution, 128kSPS/channel, 32 channels + follower, - follower inputs, +/-5V Input Range.
- **ACQ435ELF-24TF-8FF §** : 24 bit resolution, 128kSPS/channel, 24 channels + transimpedance, - follower inputs; 8 channels + follower, - follower inputs.
- **ACQ435ELF-24FF §** : 24 bit resolution, 128kSPS/channel, 24 channels + follower, - follower inputs.
- **ACQ435ELF-16FF §** : 24 bit resolution, 128kSPS/channel, 16 channels + follower, - follower inputs.
- **ACQ435ELF-16FF-5V §** : 24 bit resolution, 128kSPS/channel, 16 channels + follower, - follower inputs, +/-5V Input Range.
- § Special build, MOQ and/or longer lead time may apply.

For 8 channel applications, consider **ACQ430FMC**.

1.2 Applications

- Instrumentation applications, control and monitoring.
- Acoustic and seismic applications.
- LF Radar.

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

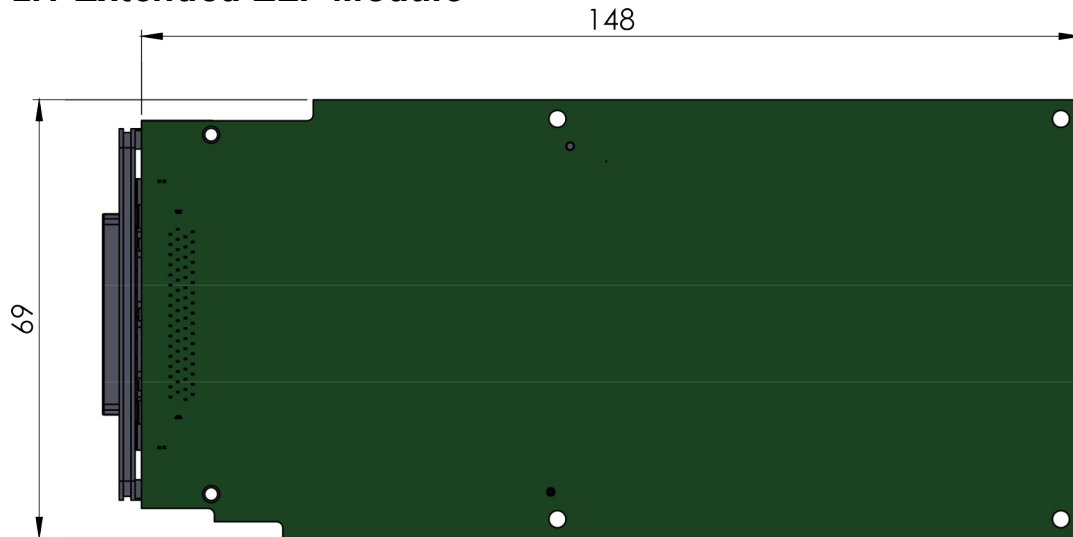
D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux.

1.4 Glossary

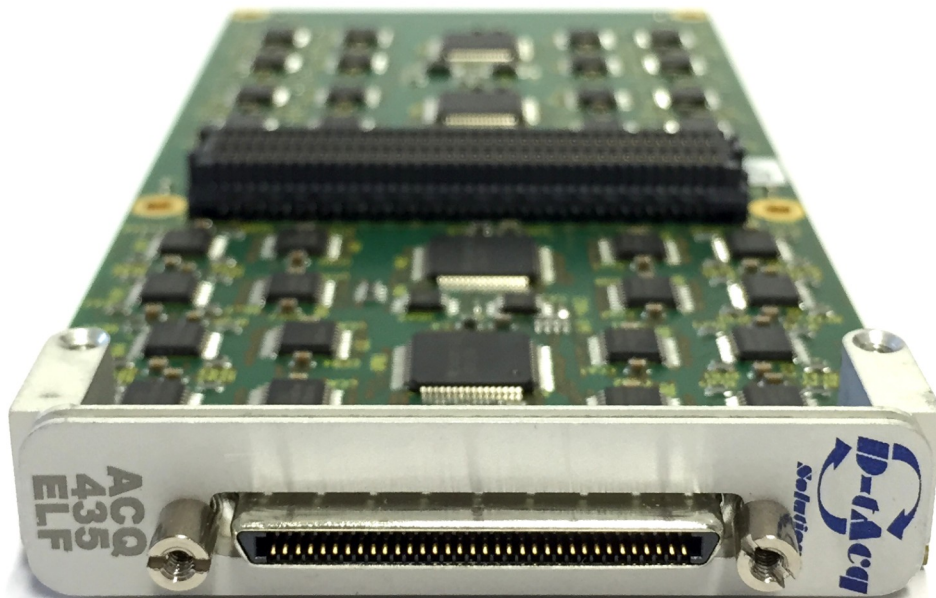
- FMC: [VITA57 FPGA Mezzanine Card](#).
- ELF: D-TACQ extension to FMC, elongated card with provision for dedicated analog power supply rails.
- [Xilinx ZYNQ Soc](#)
- LPC: FMC Low pin count wiring standard.
- ULPC: FMC/ELF Ultra low pin count (D-TACQ).

2 Physical

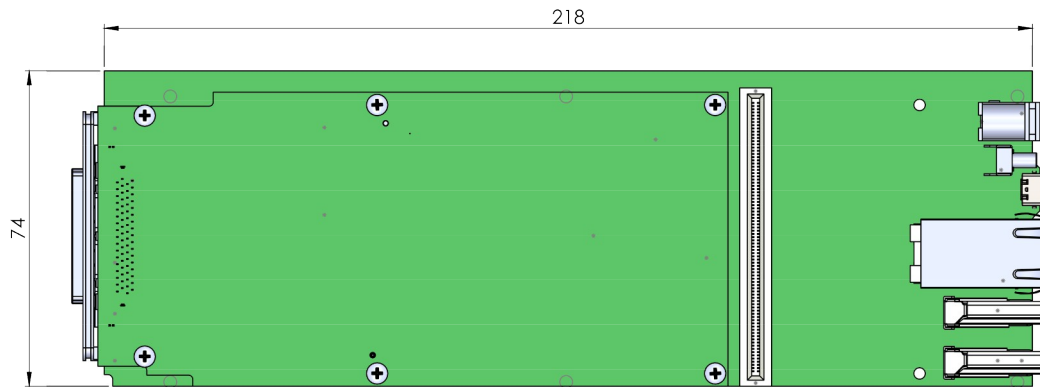
2.1 Extended ELF Module



2.2 Appearance



2.3 Example: Fitted to ACQ1001 Carrier



Carrier accommodates 1 x ELF e.g. *ACQ435ELF* or a standard size FMC module such as *ACQ420FMC* or *AO420FMC*.

3 Interface Specification.

3.1 Front Panel Connector

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

NB:

-32 variant uses entire BNCPANEL as expected.

-24 variant uses BNCPANEL CH01..CH12, CH21..CH22

-16 variant uses BNCPANEL CH01..CH08, CH25..CH32

3.2 32 Channel Pinout

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

3.3 24 Channel Pinout

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

3.4 16 Channel Pinout

Input Configuration Key	Follower	Transimpedance
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Pin	Variant	Pin	Variant
	16FF		16FF
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		45	
12		46	
13		47	
14		48	
15		49	
16		50	
17		51	
18		52	
19		53	
20		54	
21		55	
22		56	
23		57	
24		58	
25		59	
26		60	
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-

4 ACQ435ELF Electrical Specification.

#	Parameter	Value
1	Number of Channels	32
2	Sample Rate High Speed Mode High Resolution Mode	Per channel simultaneous 128 kHz 52 kHz
3	Resolution	24 bits
4	Coupling	DC, Differential Input
5	Input Impedance	1M Ω
6	Input Voltage Range	$\pm 10V$ Standard FF Version $\pm 5V$ FF-5V Version
7	Input Voltage Range including Common Mode Voltage	$\pm 12.5V$ Standard FF Version $\pm 6.5V$ FF-5V Version**
8	Input Voltage Withstand	$\pm 30V$
9	Offset Error	0.01% FS with numerical calibration
10	Gain Error	0.01% FS with numerical calibration
11	INL	$\pm 0.002\%$ FS
12	CMRR	>60dB FS @ 1 kHz
13	THD	-106 dB*
14	SFDR	107 dBc*
15	SNR High Speed Mode High Resolution Mode	104 dB* 108 dB*
16	Analog Input BW	80kHz
17	Crosstalk	<90dB @ 1kHz FS Input
18	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

** The Input range of the FF-5V version can be extended to +/-8V when the Analog Power Supply is set to +/-13V

5 ACQ435ELF 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