

# ACQ424ELF Product Specification



*High Performance Simultaneous Data Acquisition*

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# 1 Product Description

1. *ACQ424ELF* is a 32 channel simultaneous analog input module.
2. Standard configuration : 32 channels, 1000kSPS/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.

## 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

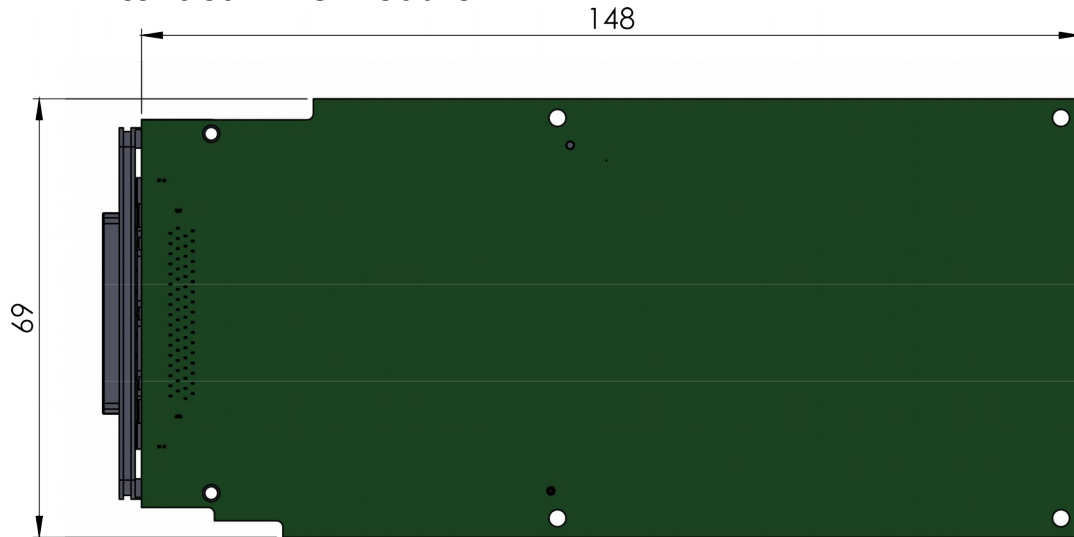
D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux.

## 1.4 Glossary

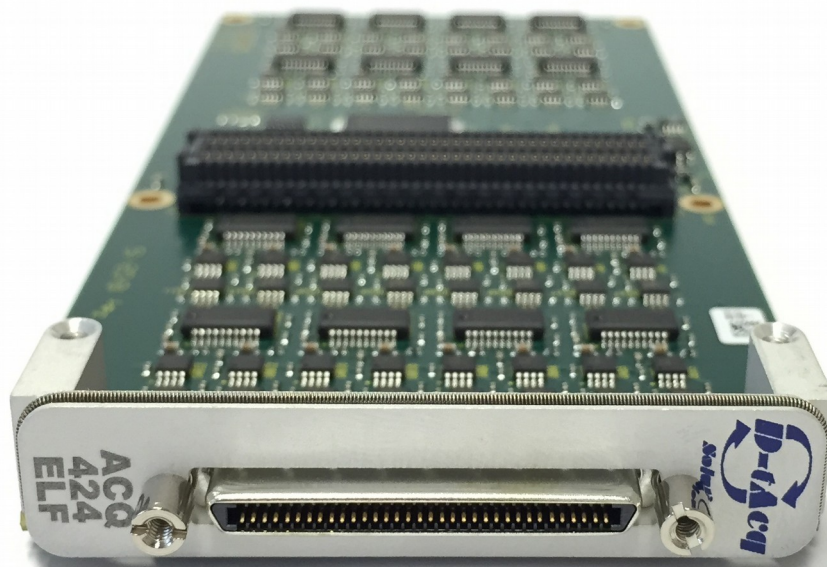
- *FMC*: [VITA57 FPGA Mezzanine Card](#).
- [Xilinx ZYNQ System-on-chip](#).
- *CPCI*: Compact PCI, PICMG 2.0r3
- *LPC* : *FMC* Low pin count wiring standard.
- *ULPC*: *FMC* Ultra low pin count (D-TACQ).
- *ELF*: D-TACQ extension to *FMC*, elongated card with provision for dedicated analog power supply rails.

## 2 Physical

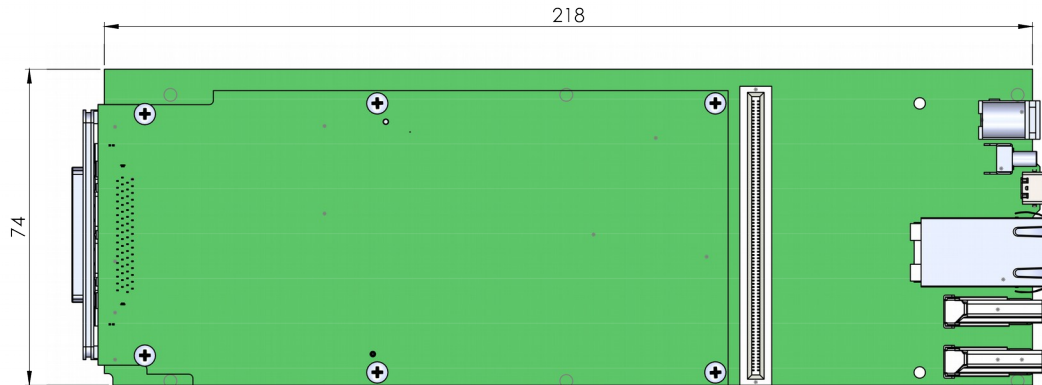
### 2.1 Extended FMC Module



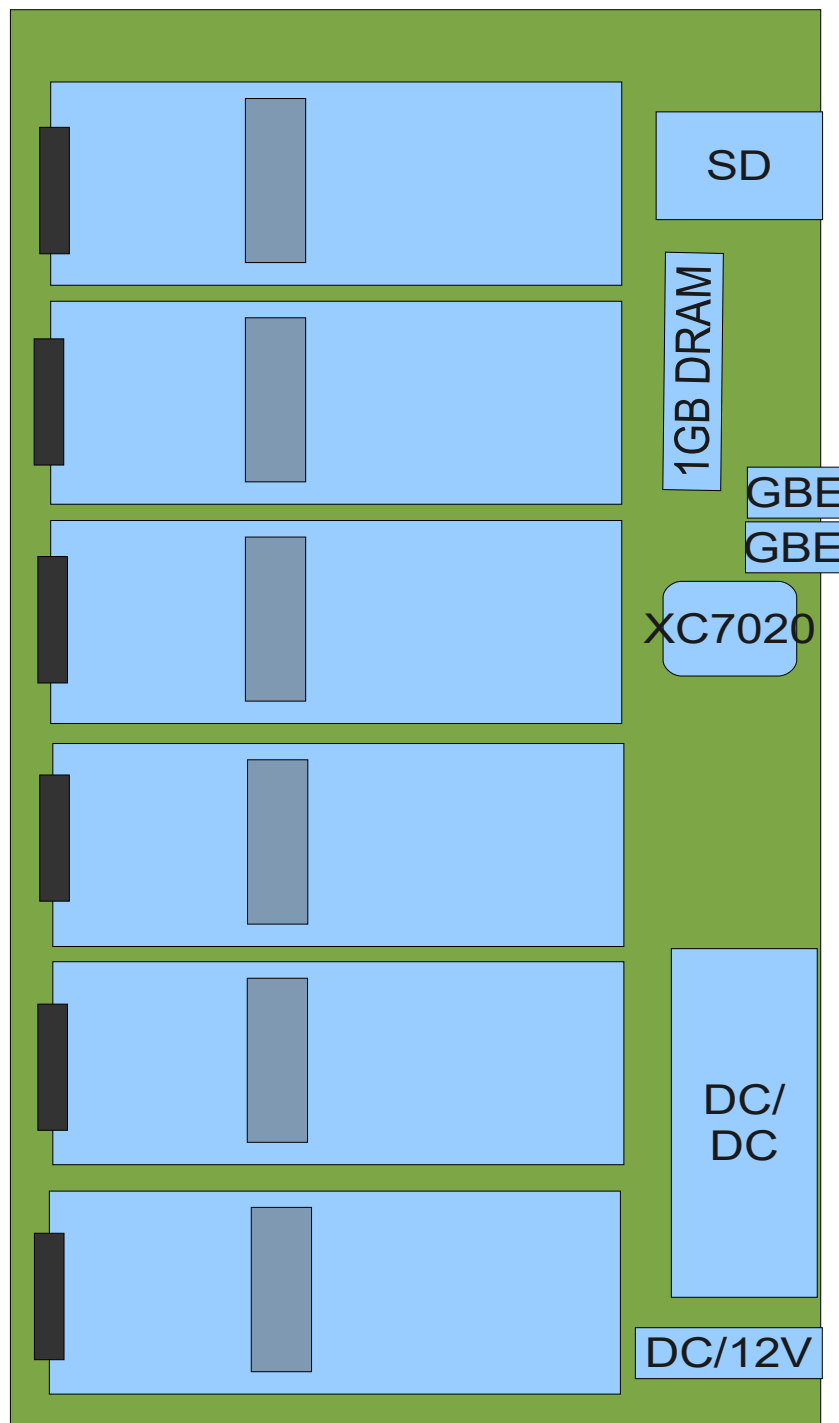
### 2.2 Appearance



### 2.3 Example 1: Fitted to ACQ1001 Carrier



Carrier fits 1 x standard FMC eg *ACQ420FMC* or an extended size module eg *ACQ424ELF*

**2.4 Example 2: Fitted to ACQ2006 Carrier, 192 channels in 1U**

- 1U appliance with 6 x ACQ424ELF modules.
- Replaces 2 x ACQ196CPCI with higher performance.
- For fast serial comms, use ACQ2106.

## 3 Interface Specification.

### 3.1 Front Panel Connector

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

#### 3.1.1 Pinout.

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-

## 4 ACQ424ELF Electrical Specification.

#	Parameter	Value
1	Number of Channels	32
2	Sample Rate	1 MHz, per channel simultaneous
3	Resolution	16 bits
4	Coupling	DC, Differential Input
5	Input Impedance	1 M $\Omega$
6	Input Voltage Range	<b><math>\pm 10V</math></b> Other factory set fixed ranges available - contact D-TACQ for details.
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	$\pm 2.5$ LSB
11	DNL	$\pm 1$ LSB
12	CMRR	>80dB FS @ 1 kHz
13	THD	-90 dB
14	SINAD	-86 dB*
15	SFDR	100 dBc*
16	SNR	88 dB*
17	Power BW (-3dB)	580 kHz
18	Small Signal BW	1 MHz
19	Crosstalk	<100 dB @ 1 kHz FS Input
20	Temperature Stability	<25 ppm/C
21	Front Panel Connector	VHDCI

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



## 5 ACQ424ELF 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