

ACQ465ELF Product Specification **Preliminary**



High Performance Simultaneous Data Acquisition

Table of Contents

1	Product Description.....	3
1.1	Product Variants.....	3
1.2	Applications.....	3
1.3	Overview.....	4
1.4	Glossary.....	4
2	Physical.....	5
2.1	Extended ELF Module.....	5
2.2	Appearance.....	5
2.3	Example: Fitted to ACQ1001 Carrier.....	6
3	Interface Specification.....	7
3.1	Front Panel Connector.....	7
3.1.1	Pinout.....	7
3.2	16 Channel Pinout.....	8
4	ACQ465ELF Electrical Specification.....	8
5	ACQ465ELF Physical Specification.....	9

1 Product Description

1. **ACQ465ELF** is a 32 channel, 24 bit simultaneous analog input module, implemented with the ADC7134 ADC with extremely good SNR.
2. Standard configuration : 32 channels:
 - Sample rate up to 374kSPS/channel, 24 bit
 - Sample rate up to 1.496 MSPS/channel, 16bit
3. Device includes many features including programmable filters.
4. Extended module with *FMC* connector and *FMC* front panel.
5. 2-wire Voltage Differential inputs, high quality differential amplifier front end.
6. Front panel connector: VHDCI or FFC (for local interconnect).
 - VHDCI compatible with D-TACQ range of termination panels.
 - FFC compatible with 2xD37 front panel and facilitates custom transitions.
7. -HR Version, best possible SNR from the AD7134 ADC.
8. -HG version with high quality instrumentation amplifier front end, high CMRR and a choice of gains.

1.1 Product Variants

- **HR optimised for Highest Resolution**
 - **ACQ465ELF-32-HR** : 24 bit resolution, 32 channels +/-4V inputs.
 - **ACQ465ELF-32-HR-8V** : 24 bit resolution, 32 channels +/-8V inputs.
- **HR High Gain**
 - **ACQ465ELF-32-HG-*nnn*** : 24 bit resolution, 32 channels Instrumentation Amplifier inputs with Gain 4..400:
 - **ACQ465ELF-32-HG004** : Gain=X4, +/-1V inputs
 - **ACQ465ELF-32-HG040** : Gain=X40, +/-0.1V inputs
 - **ACQ465ELF-32-HG400** : Gain=X400, +/-0.01V inputs
 - **ACQ465ELF-32-HG *ggg*** : *ggg* any gain 4..400 custom.

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:

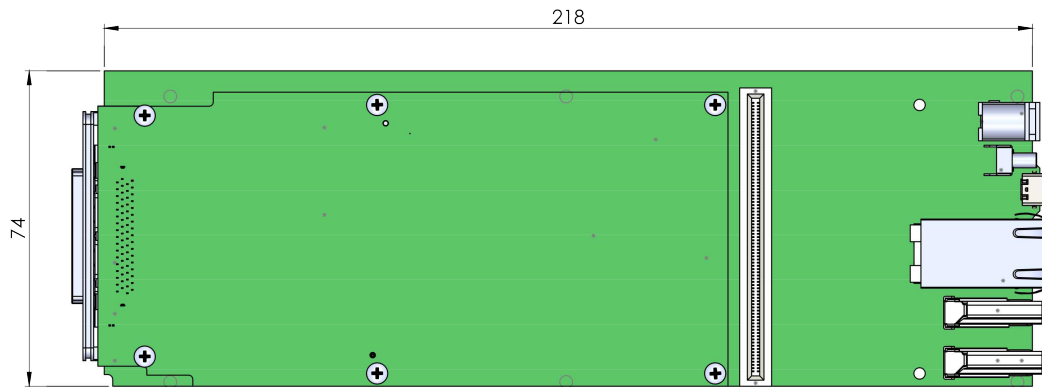
- D-TACQ **ACQ1001** : D-TACQ single slot FMC carrier, Z7020
- D-TACQ **ACQ1002** : D-TACQ dual slot FMC carrier, Z7020
- D-TACQ **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030

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).

2.3 Example: Fitted to ACQ1001 Carrier



Carrier accommodates 1 x ELF e.g. *ACQ465ELF* 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 BNC PANEL, SMAPANEL, LEMOPANEL, PTBPANEL.

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-

3.2 16 Channel Pinout**4 ACQ465ELF Electrical Specification.**

#	Parameter	Value
1	Number of Channels	32
2	Sample Rate (Max) High Speed Mode	Per channel simultaneous 1.1 MSPS
	High Resolution Mode	0.374 MSPS
3	Resolution High Speed Mode > 1MSPS	16 bits
	High Res Mode < 375kSPS	24 bits
4	Coupling	DC, Differential Input
5	Input Impedance	1M Ω
6	Input Voltage Range	See Product Variants
7	Input Voltage Withstand	\pm 30V
8	Offset Error	0.01% FS \pm 1
9	Gain Error	0.01% FS \pm 1
10	INL	TBD
11	CMRR	>60dB FS @ 1 kHz
		>> 60dB \pm 2
12	THD	TBD dB*
13	SFDR	TBD dBc*
14	SNR	Model ACQ465ELF-32-10V
	Filter: Sinc3 1 MSPS	High Speed Mode 98 dB*
	Filter:(0.433) 374 kSPS 128 kSPS	High Resolution 1 106 dB* 111 dB*
	Filter:(0.108) 32 kSPS	High Resolution 2 120 dB*
15	Analog Input BW	400kHz Max
16	Crosstalk	<90dB @ 1kHz FS Input
17	Digital Filters	
	High Speed Mode Filter: Sinc3	Sample rate > 1MSPS 0.2617 x Fsample
	High Resolution 1	0.433 Fsample
	High Resolution 2	0.108 Fsample

#	Note	Value
†1	Error	with numerical calibration
†2	Higher CMRR	Much Higher CMRR with Instrumentation Amplifier Version

Note all performance figures are preliminary. Full Filter definitions can be found on the ADC datasheet for the AD7134 at

<https://www.analog.com/media/en/technical-documentation/data-sheets/ad7134.pdf>

5 ACQ465ELF Physical 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