

ACQ423ELF-32 Product Specification



High Performance Simultaneous Data Acquisition

Preliminary Product Information

Subject to Change

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1 Product Description

1. **ACQ423ELF-32** is a minimum cost 32 channel simultaneous analog input module, intended to replace obsolete high channel count digitizers operating in the range 10..200kHz, while still providing high quality conversion.
2. Standard configuration : 32 channels, 200kSPS/channel, 16 bit, differential. Software channel mask allows 16 channels to capture at 350kSPS/channel.
3. ELF module with single *FMC* connector and *FMC* front panel with VHDCI connectors, compatible with D-TACQ termination such as BNCPANEL
4. Option for alternative chassis front panel on ACQ2106, with
 - 3 ACQ423 x 2 x D37 in “JET STANDARD” pinout for legacy replacement
 - Possibility for other front panel connector types, please contact D-TACQ with your requirement.
5. Front end tolerates significant continuous overvoltage. Transient suppression is provided for VHDCI via transition panel eg BNCPANEL, and is provided on the D37 front panel.
6. ACQ423ELF-32-HR: High CMR version with 36V CMR*, 18 bit ADC.
 - * needs user supplied power rails, and is NOT symmetric about 0V.
7. High impedance input, software switched voltage ranges
8. Oversampling capability with FIR digital filter allows operation at lower rates with effective anti-alias filtering.

1.1 Product Variants

- **ACQ423ELF-32-200-16** :
 - 32 channels, 200kSPS/ch 16 bit, VHDCI.
- **ACQ423ELF-32-200-16-D37** :
 - ditto, 2 x D37 front panel, use with ACQ2106 only
- **ACQ423ELF-64-200-18-HR** :
 - High CMR version with 18 bit adc.

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:

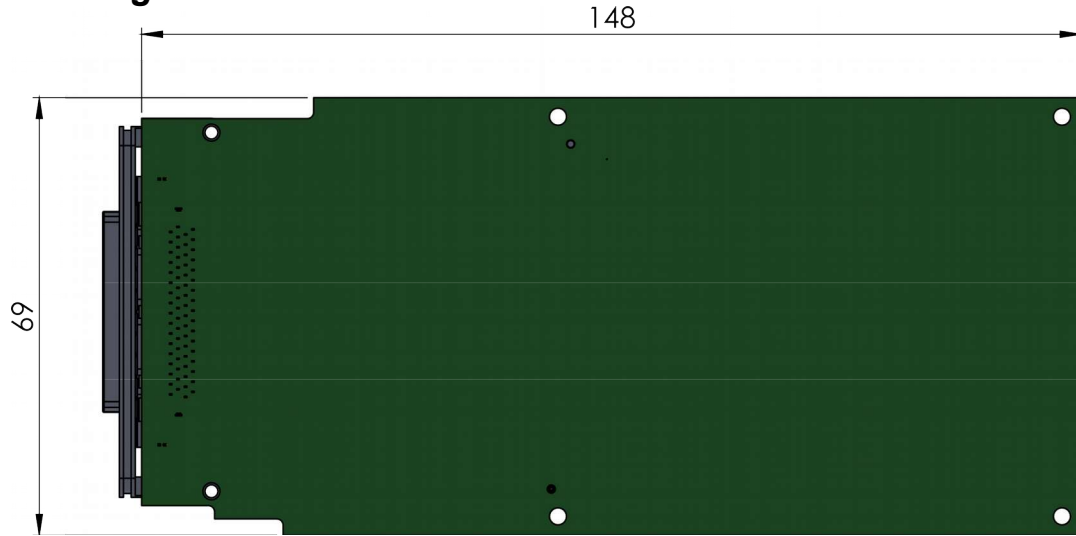
- D-TACQ **ACQ1001Q** : D-TACQ single slot FMC carrier, Z7020
 - ACQ1001Q+ACQ423ELF-32
 - 32 channels, VHDCI, fits single site ACQ1001, Fits ACQ1001Q box.
- D-TACQ **ACQ1002R** : D-TACQ single slot FMC carrier, Z7020
 - ACQ1002R+2xACQ423ELF-32
 - 64 channels, VHDCI: fits single site ACQ1001, Fits ACQ1002R box.
- D-TACQ **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030
 - ACQ2106+6xACQ423ELF-32
 - 192 channels, 6 x VHDCI connectors;
 - ACQ2106+3xACQ423ELF-32_D37
 - 96 channels, 6 x D37 connectors.

1.4 Glossary

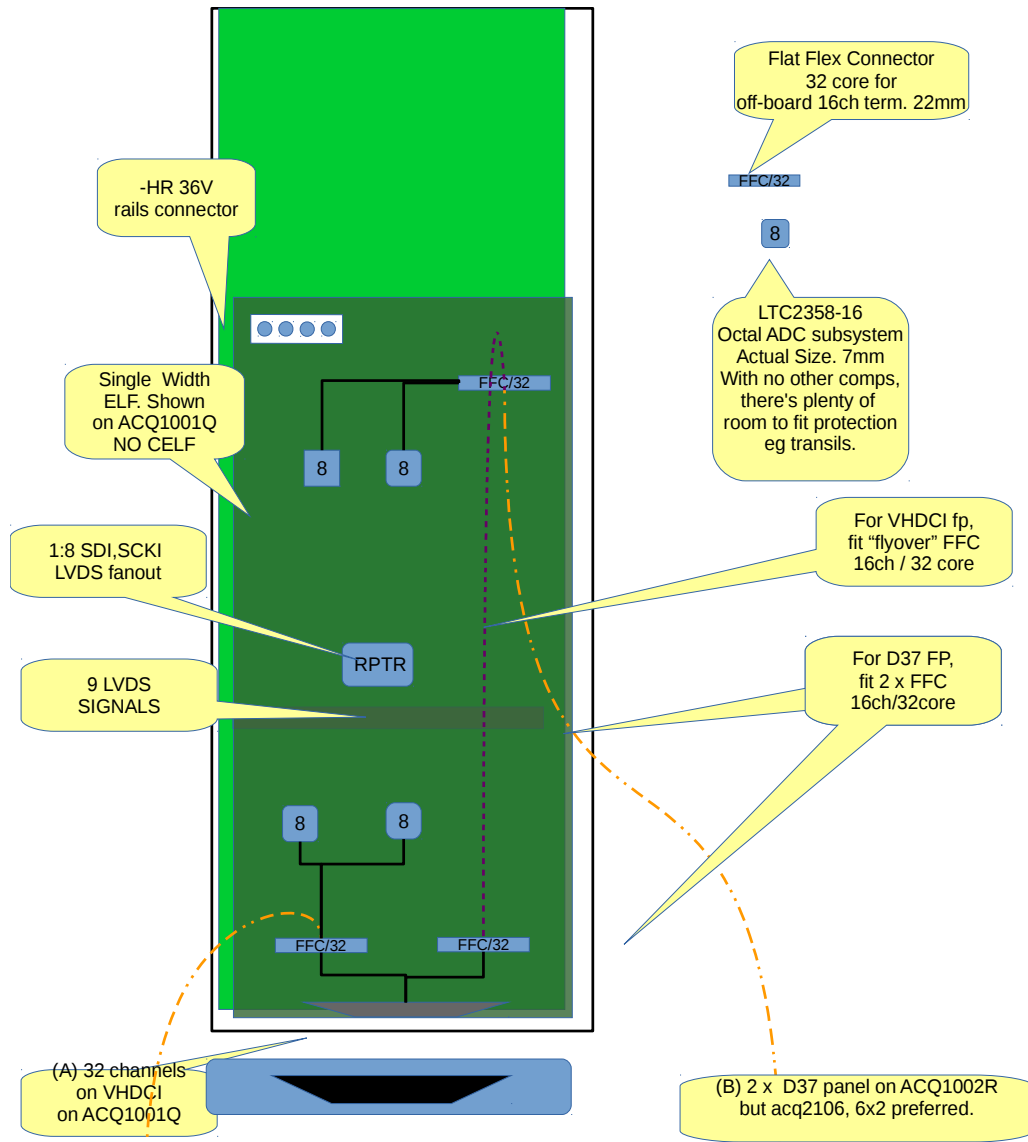
- *FMC*: [VITA57 FPGA Mezzanine Card](#).
- [Xilinx ZYNQ System-on-chip](#).
- *CPCI*: Compact PCI, PICMG 2.0r3
- *LPC* : *FMC* Low pin count wiring standard.
- *ULPC*: *FMC* Ultra low pin count (D-TACQ).
- *ELF*: D-TACQ extension to *FMC*, elongated card with provision for dedicated analog power supply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

2 Physical

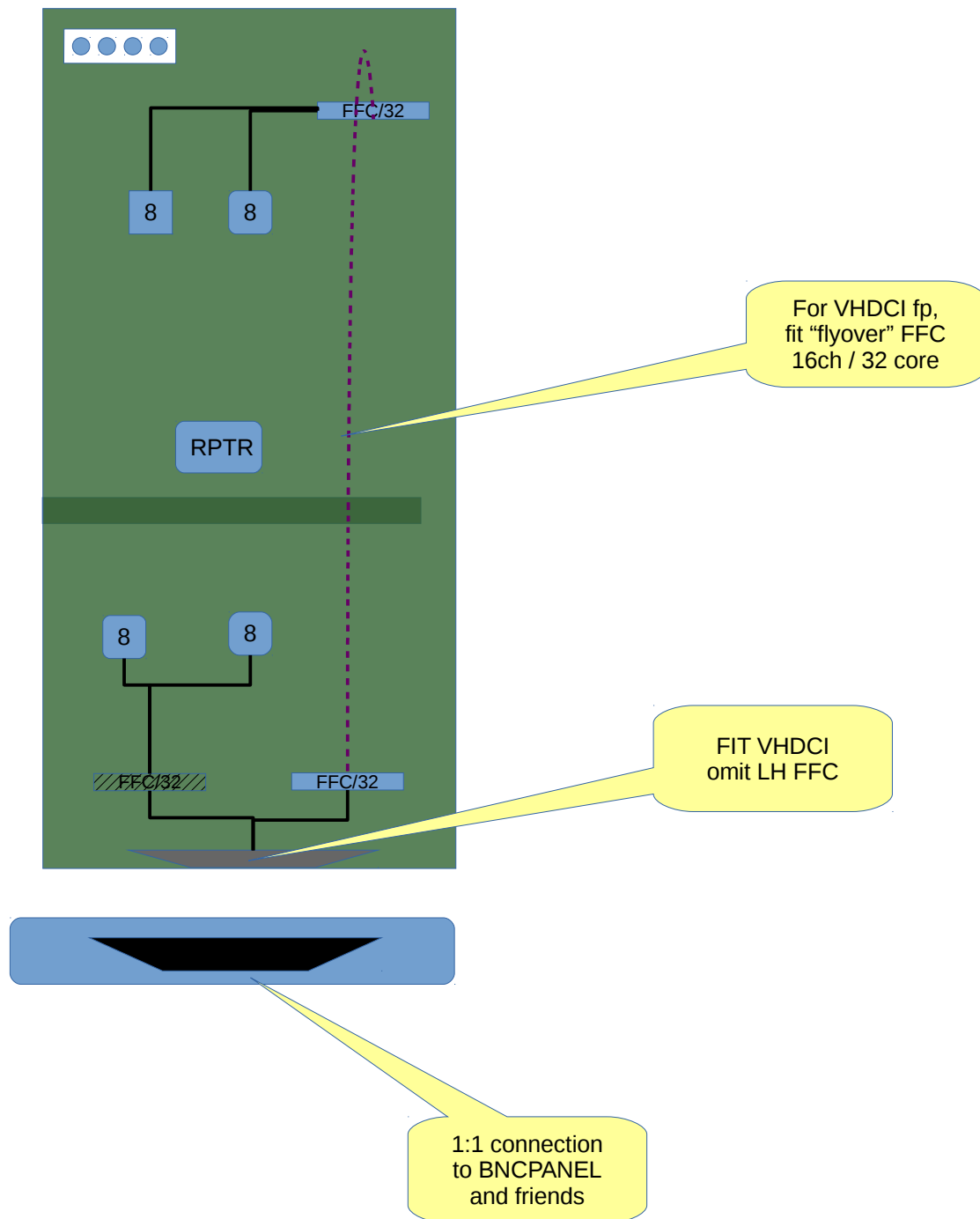
2.1 Single Width Extended FMC Module



2.2 Layout Overview

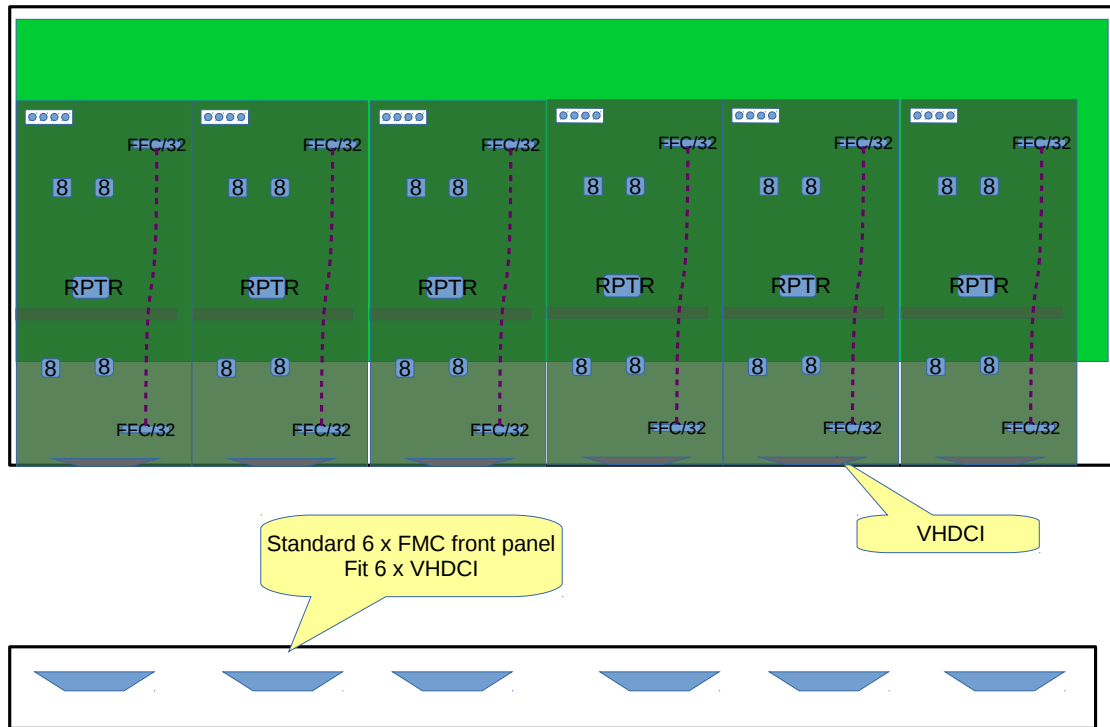


2.3 Example: ACQ1001, VHDCI



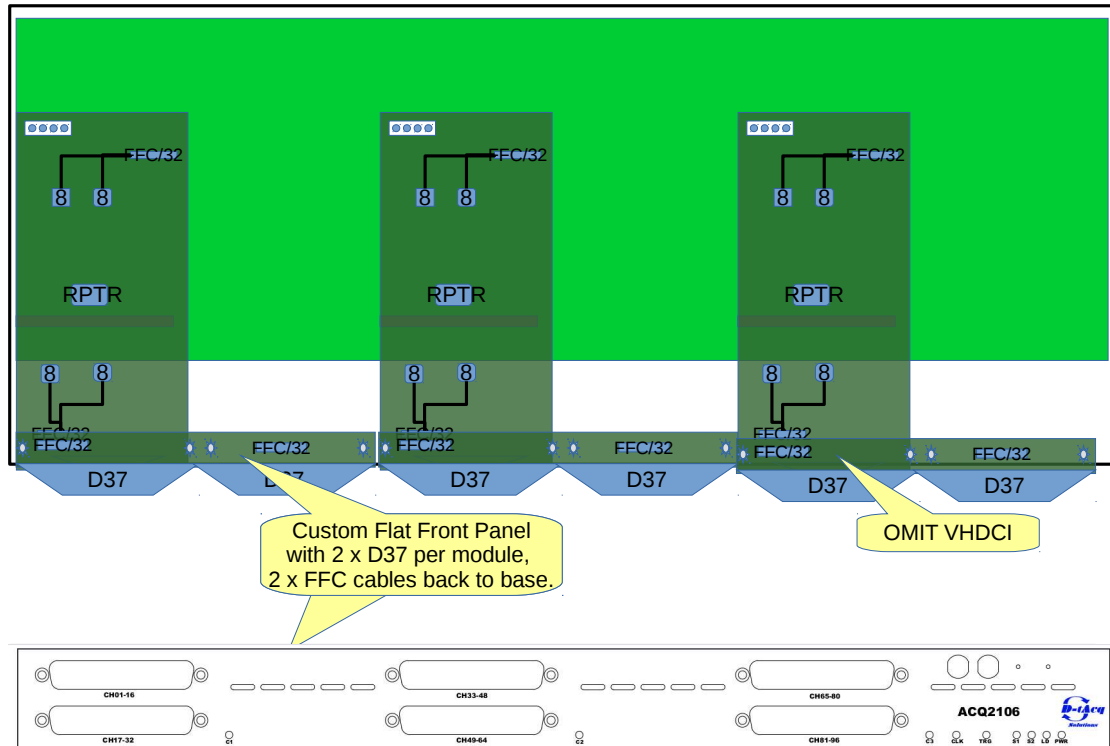
2.4 Example: ACQ2106, 192 channels, VHDCI

Fit 6 modules in standard chassis, standard FMC-style front panel, VHDCI per 32 channels, compatible with full range of BNCPANEL etc.



2.5 Example: Fitted to ACQ2106 Carrier, 96 channels in 1U

- 1U appliance with 3 x ACQ423ELF-64 modules]
- BLF chassis with 6 x D37 front panel



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

3.1.2 Alternative – D37 Pinout

<i>Pin</i>	<i>Function</i>	<i>Pin</i>	<i>Function</i>	
			<i>Single</i>	<i>Differential</i>
1	AI01+	20	0V	AI01+
2	AI02+	21	0V	AI02+
3	AI03+	22	0V	AI03+
4	AI04+	23	0V	AI04+
5	AI05+	24	0V	AI05+
6	AI06+	25	0V	AI06+
7	AI07+	26	0V	AI07+
8	AI08+	27	0V	AI08+
9	AI09+	28	0V	AI09+
10	AI10+	29	0V	AI10+
11	AI11+	30	0V	AI11+
12	AI12+	31	0V	AI12+
13	AI13+	32	0V	AI13+
14	AI14+	33	0V	AI14+
15	AI15+	34	0V	AI15+
16	AI16+	35	0V	AI16+
17	nc	36	nc	
18	nc	37	nc	0V
19	0V			

4 ACQ423ELF Electrical Specification.

#	Parameter		Value		
1	Number of Channels		32		
2	Sample Rate	32 channels	200 kSPS per channel simultaneous		
		16 channels	350 kSPS per channel simultaneous		
3	Resolution		16 bits		
4	Coupling		DC, Differential		
5	Input Impedance		1M		
6	Input Voltage Range		±10V, ±5V, 0..+5V		
7	Input Voltage Withstand		±100V		
8	<i>Offset Error</i>		0.01% FS		
9	<i>Gain Error</i>		0.01% FS		
10	<i>INL</i>		±1 LSB		
11	<i>DNL</i>		±1 LSB		
12	<i>CMRR</i>		>60dB FS @ 1 kHz		
13	<i>THD</i>		-85 dB		
14	<i>SINAD</i>		-84 dB*		
15	<i>SFDR</i>		100 dBc*		
16	<i>SNR</i>		90 dB		
17	<i>Full Power BW</i>		100 kHz		
18	<i>Small Signal BW</i>				
19	<i>Crosstalk</i>		<95 dB @ 1 kHz FS Input		
20	<i>Temperature Stability</i>		<25 ppm/C		
21	<i>Front Panel Connector</i>		VHDCI : or custom eg D37		

5 ACQ423ELF 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 Low Pin Count DLPC