

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.
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 2 x D37 in “JET STANDARD” pinout.
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
- 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:

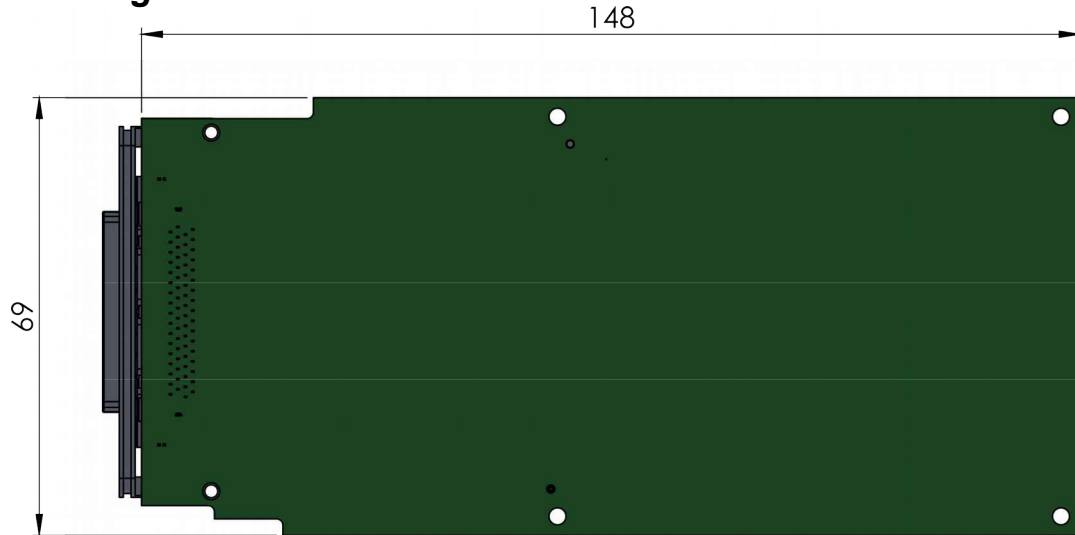
- D-TACQ **ACQ1001Q** : D-TACQ single slot FMC carrier, Z7020
 - 32 channels, VHDCI, fits single site ACQ1001, Fits ACQ1001Q box.
- D-TACQ **ACQ1002R** : D-TACQ single slot FMC carrier, Z7020
 - 32 channels, 2xD37: fits single site ACQ1001, Fits ACQ1002R box.
- D-TACQ **ACQ2106** : D-TACQ 6 slot FMC carrier, Z7030
 - Up to 192 channels, 6 x VHDCI connectors;
 - Up to 96 channels, 6 x D37 connectors.

1.4 Glossary

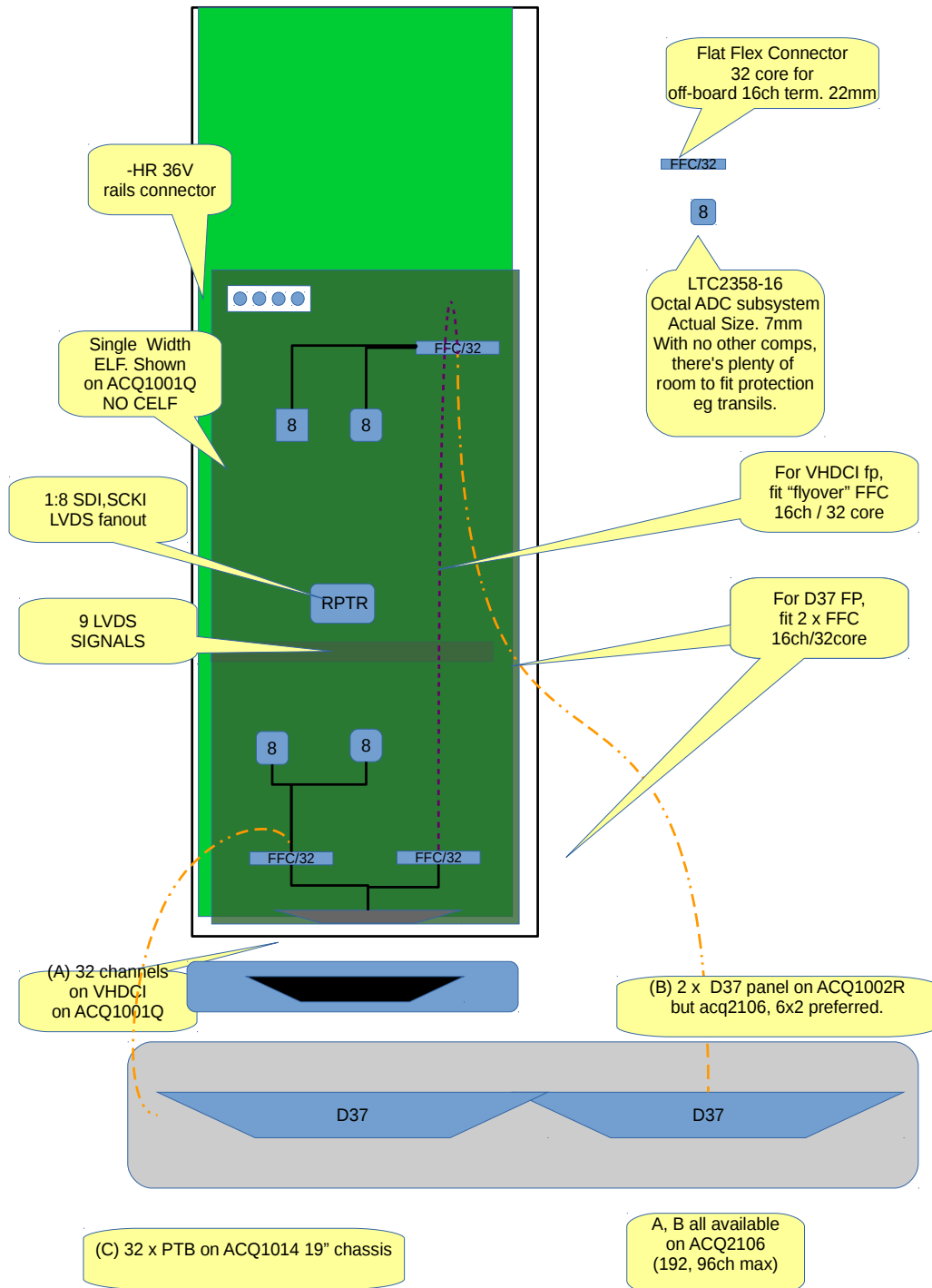
- *FMC*: [VITA57 FPGA Mezzanine Card](#).
- [Xilinx ZYNQ System-on-chip](#).
- *CPCI*: Compact PCI, PICMG 2.0r3
- *LPC* : *FMC* Low pin count wiring standard.
- *ULPC*: *FMC* Ultra low pin count (D-TACQ).
- *ELF*: D-TACQ extension to *FMC*, elongated card with provision for dedicated analog power supply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

2 Physical

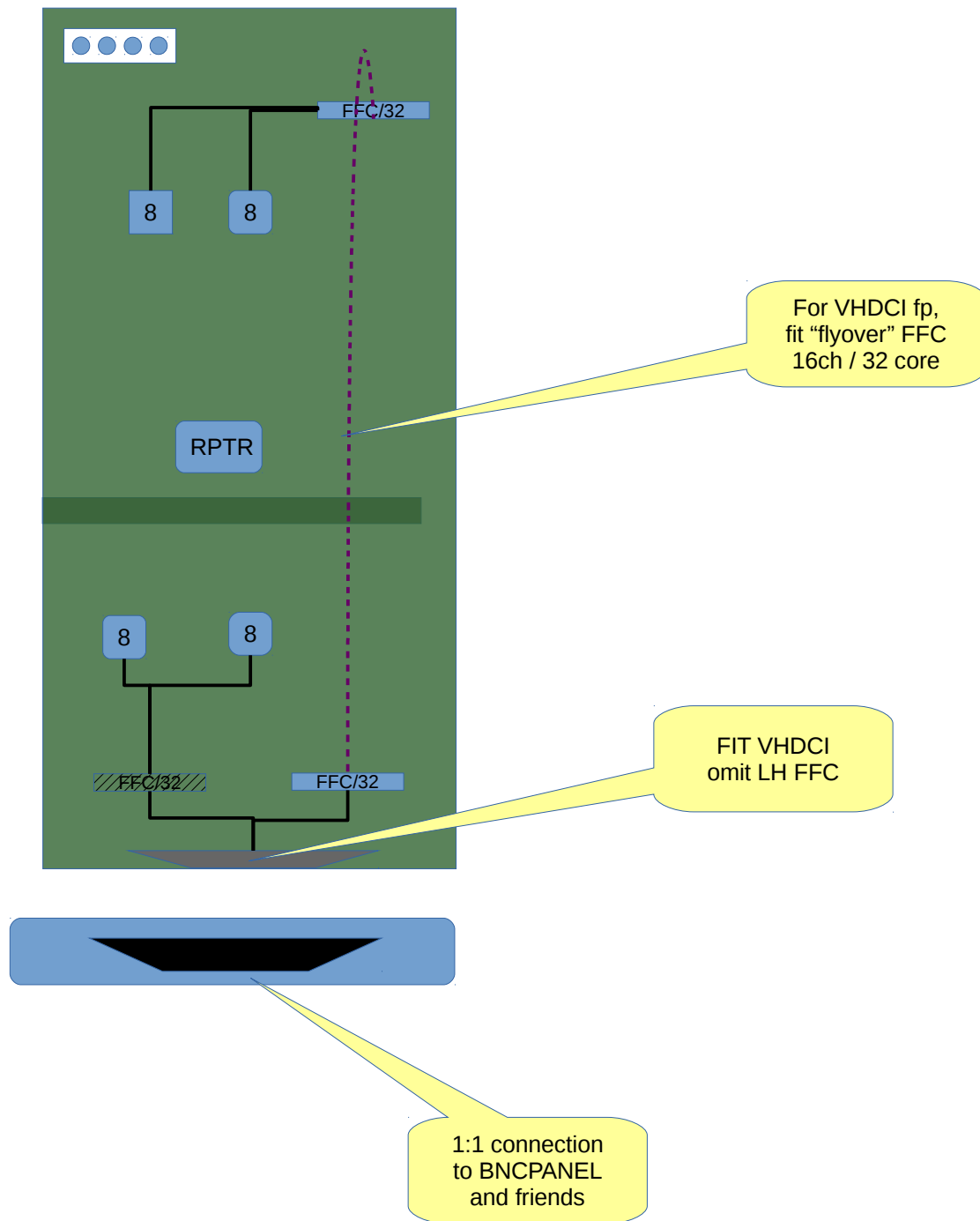
2.1 Single Width Extended FMC Module



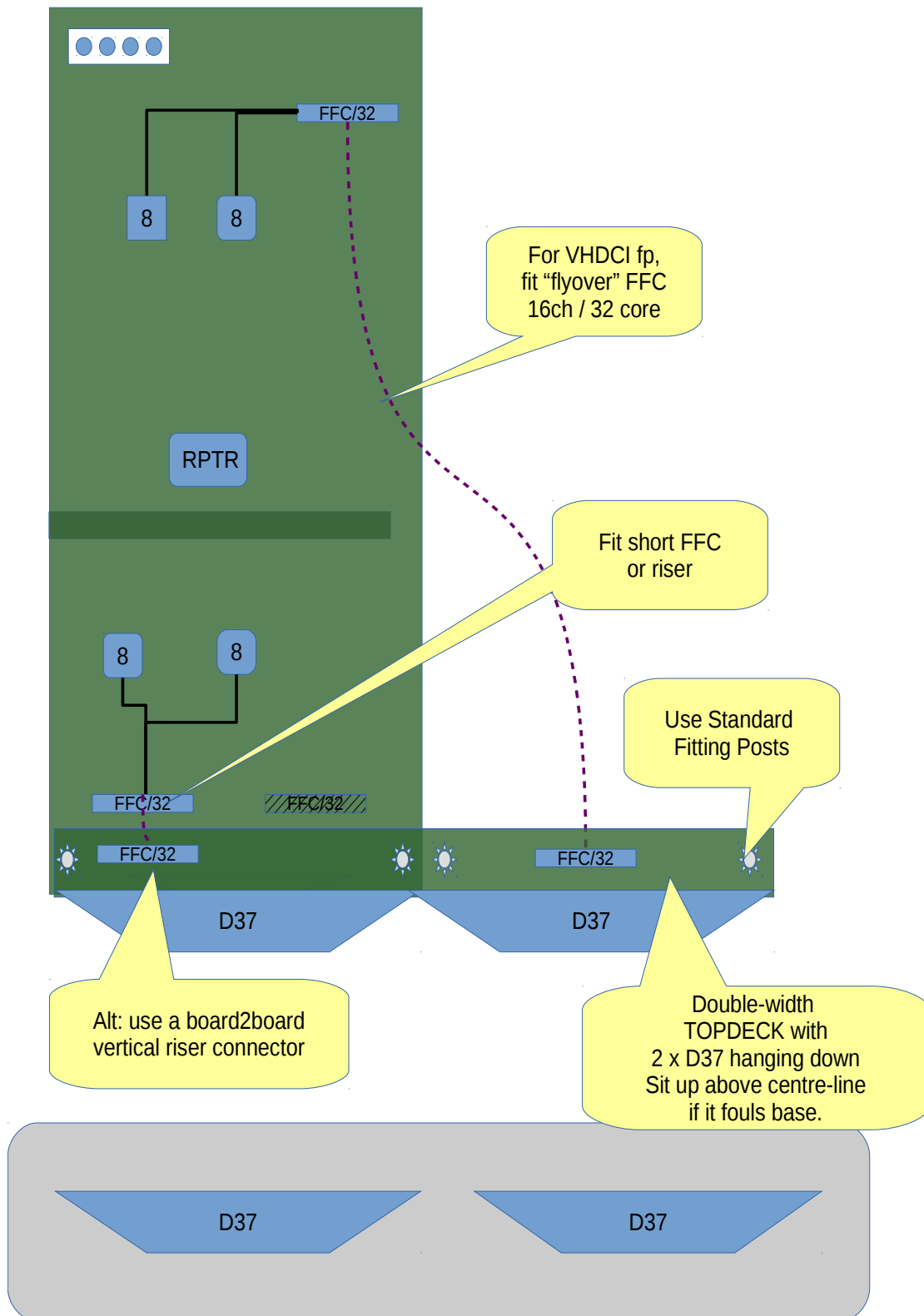
2.2 Layout Overview



2.3 Example: ACQ1001, VHDCI

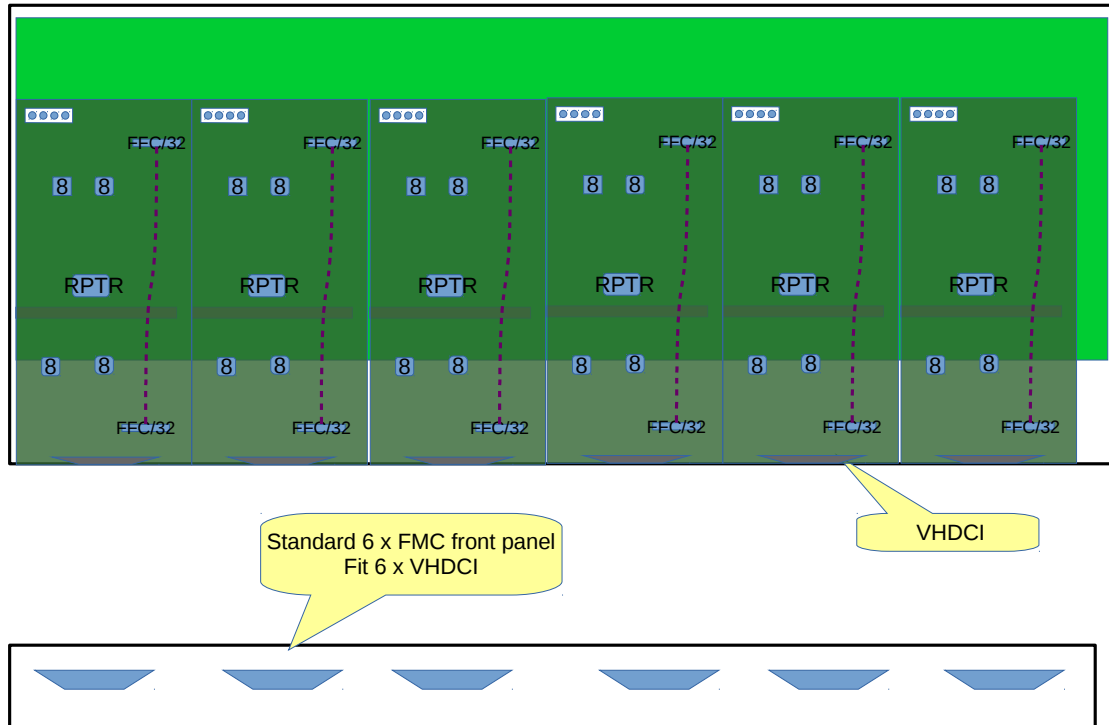


2.4 Example: ACQ1002R



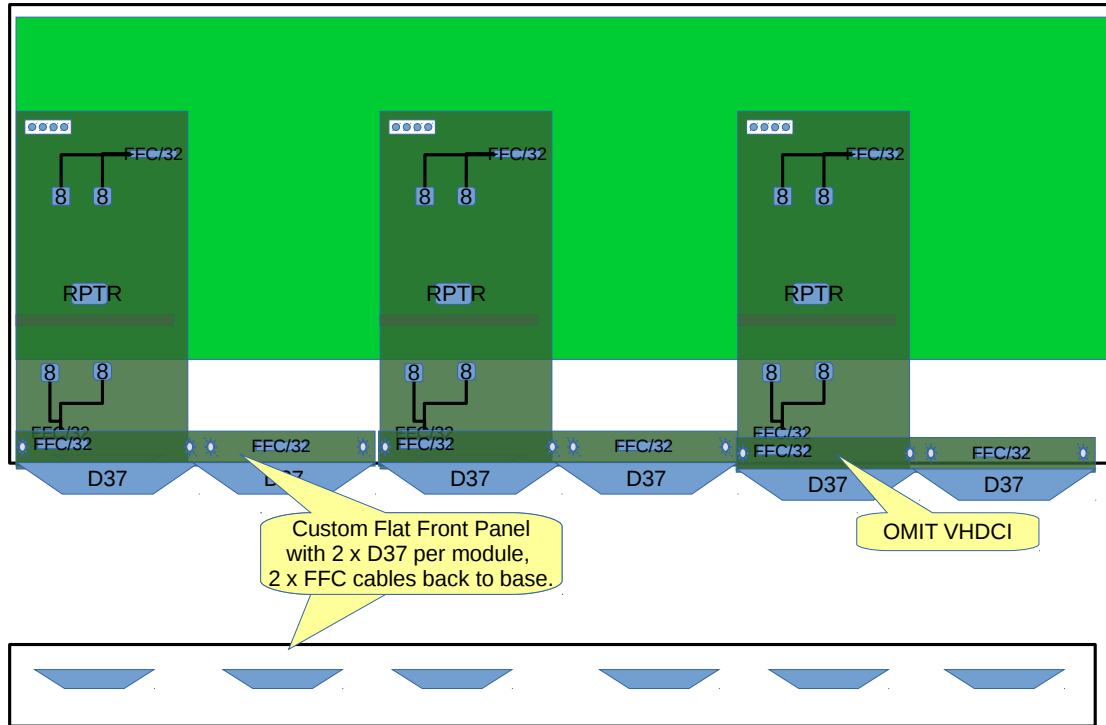
2.5 Example: ACQ2106, 192 channels, VHDCI

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



2.6 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 | 200 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 | Offset Error | 0.01% FS |
| 9 | Gain Error | 0.01% FS |
| 10 | INL | ±1 LSB |
| 11 | DNL | ±1 LSB |
| 12 | CMRR | >60dB FS @ 1 kHz |
| 13 | THD | -85 dB |
| 14 | SINAD | -84 dB* |
| 15 | SFDR | 100 dBc* |
| 16 | SNR | 90 dB |
| 17 | Full Power BW | 100 kHz |
| 18 | Small Signal BW | |
| 19 | Crosstalk | <95 dB @ 1 kHz FS Input |
| 20 | Temperature Stability | <25 ppm/C |
| 21 | Front Panel Connector | VHDCI : 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 |