

# ACQ420FMC Advance Product Specification



*High Performance Simultaneous Data Acquisition*

*Preliminary Product Information  
Subject to Change*

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# 1 Product Description

1. *ACQ420FMC* is a 4 channel simultaneous analog input module.
2. Standard configuration : 4 channels, 500kSPS/channel.
3. Complies with *VITA57 FMC* standard, *LPC* version.
4. 2-wire Differential inputs, high quality instrument amplifier front end with switched input voltage ranges.
5. Provision for 4 wire bridge input.

## 1.1 Product Variants

- *ACQ420FMC-4-500* : 4 channels, 16 bit resolution, 500kSPS/channel.
- *ACQ420FMC-4-1000* : 4 channels, 16 bit resolution, 1000kSPS/channel.
- *ACQ420FMC-4-2000* : 4 channels, 16 bit resolution, 2000kSPS/channel.
- *ACQ420FMC-4-500-18* : 4 channels, 18 bit resolution, 500kSPS/channel.
- *ACQ421FMC-4-500* : 4 channels, 16 bit, 500kSPS microphone input.

## 1.2 Applications

- Instrumentation applications, control and monitoring.

## 1.3 Overview

The *FMC* module standard adds user IO to carrier modules fitted with *FPGA* resource. D-TACQ recommends modules based on the *Xilinx ZYNQ* system on chip, combining *FPGA* resource with a dual-core ARM Cortex A9 and gigabit Ethernet. Compatible modules include

- D-TACQ *ACQ1001* : D-TACQ single slot *FMC* carrier, Z7010
- D-TACQ *ACQ2006* : D-TACQ 6 slot *FMC* carrier, Z7020
- *Xilinx ZC702* evaluation board with 2 *FMC* slots.
- *Xilinx Zedboard* evaluation board with 1 *FMC* Slot.

D-TACQ supplies a complete working Intelligent Digitizer appliance including programmable logic and microprocessor system running Linux. Evaluation boards are useful for evaluation, but for production use, D-TACQ recommends use of a production-quality carrier such as *ACQ1001*.

## 1.4 Glossary

- *FMC*: [VITA57 FPGA Mezzanine Card](#).
- [Xilinx ZYNQ Soc](#)
- *FPGA* : Field Programmable Gate Array.
- *LPC* : *FMC* Low pin count wiring standard.
- *ULPC*: *FMC* Ultra low pin count (D-TACQ).
- Extended, E : *FMC* Extended size module (D-TACQ).

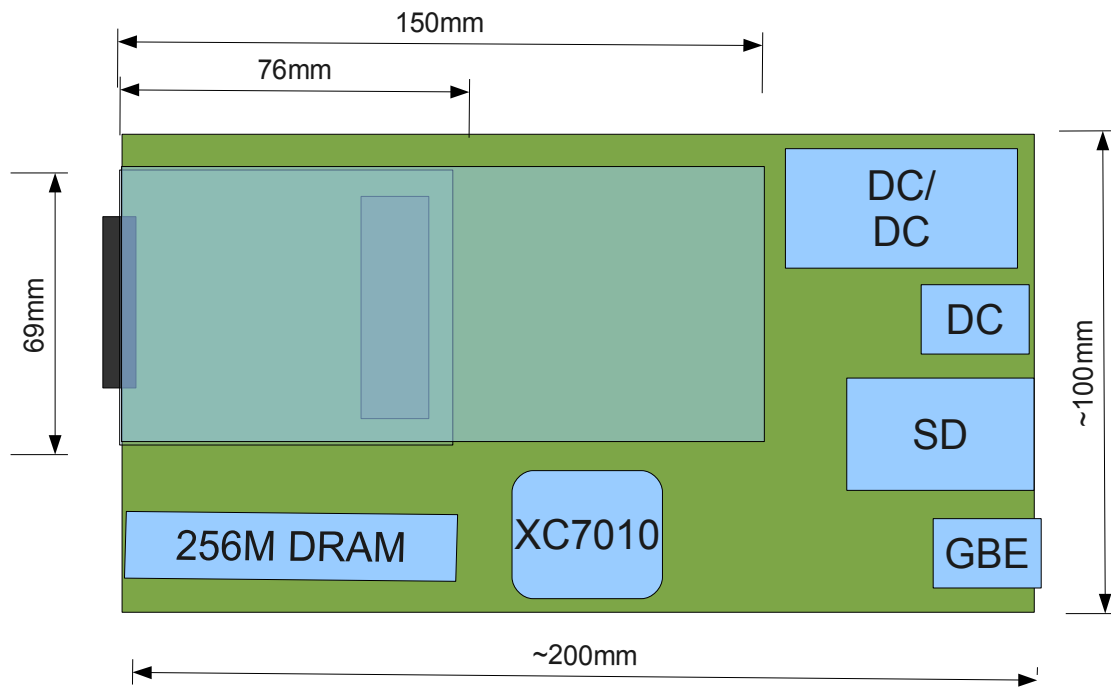
## 2 Physical

### *FMC Module*



## 2.1 Example: Fitted to ACQ1001 Carrier

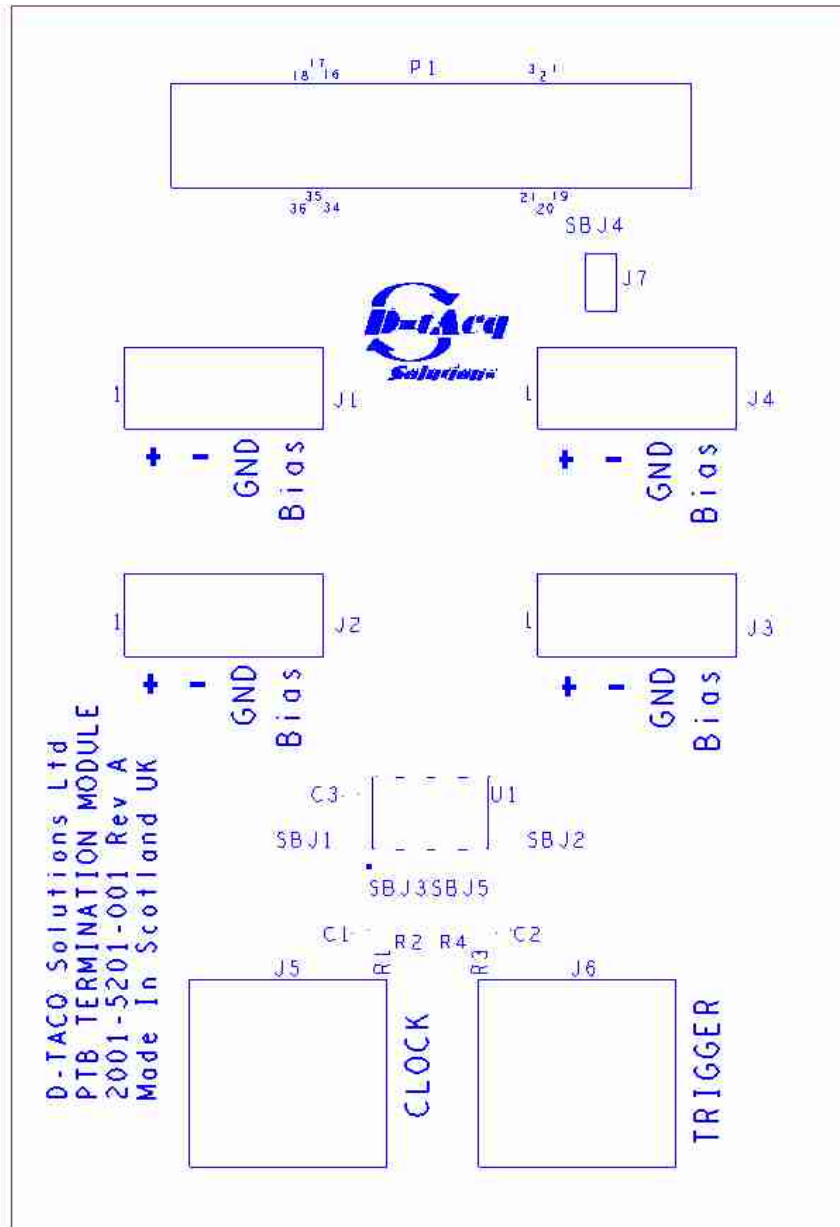
Carrier accomodates 1 x *FMC* eg *ACQ420FMC* or an extended size module.



## 2.2 ACQ420TERM01 Termination – Physical:

Optional DIN-RAIL termination accessor with 4 pin pluggable terminal blocks and opto-isolated CLK, TRG on BNC.

125.4mm



## 3 Interface Specification.

### 3.1 Front Panel Connector

- 36 Pin MDR (Centronics) 3M D10236-55G3PL,
- mating part 3M 10136-6000EL
- Compatible DIN-RAIL module *ACQ420TERM01* available.

#### 3.1.1 Pinout.

Pin	Function	Pin	Function
1	EXT_CLK1	19	ACCESSORY_PRESENT
2	0VD	20	0VD
3	EXT_TRIG1	21	0VD
4	0VD	22	0VD
5	+12V	23	+5VA
6	+12V	24	+5VA
7	0VA	25	0VA
8	CH_4_BIAS	26	CH_4_GND
9	CH_4+	27	CH_4-
10	0VA	28	0VA
11	CH_3_BIAS	29	CH_3_GND
12	CH_3+	30	CH_3-
13	0VA	31	0VA
14	CH_2_BIAS	32	CH_2_GND
15	CH_2+	33	CH_2-
16	0VA	34	0VA
17	CH_1_BIAS	35	CH_1_GND
18	CH_1+	36	CH_1-

## 4 ACQ420FMC Electrical Specification.

#	Parameter	Value
1	Number of Channels	4
2	Sample Rate	500 [1000/2000] kHz, per channel simultaneous
3	Resolution	16 bits [18 bit]
4	Coupling	DC, Differential Input
5	Input Impedance	100K, [1G $\Omega$ option]
6	Input Voltage Range	$\pm 10$ , $\pm 5$ , $\pm 2.5$ , $\pm 1.25$ V software selectable ranges. High Gain Option, 4 ranges: 0, 20, 40, 60 dB
7	Input Voltage Withstand	$\pm 30$ V
8	Offset Error	0.01% FS
9	Gain Error	0.01% FS
10	INL	$\pm 0.5$ LSB
11	DNL	$\pm 0.5$ LSB
12	CMRR	>80dB FS @ 1 kHz
13	THD	-100 dB
14	SINAD	-93 dB*
15	SFDR	100 dBc*
16	SNR	94 dB* * Typical values measured at full scale with a 9.76kHz input
17	Full Power BW	1 MHz
18	Small Signal BW	2 MHz
	Crosstalk	<90 dB @ 1 kHz FS Input
	Temperature Stability	<25 ppm/C



## 5 ACQ1001 FMC Carrier Specification.

#	Parameter	Value
1	Formfactor	approx 200mm x 100mm
2	Power source	External DC 12V, 1A
3	Power Consumption	12W Max
4	SOC Type	Z7010, dual-core ARM A9, Gigabit Ethernet
5	FPGA Resource	80 DSP Slices, 100 GMAC/s
6	FMC Socket	Standard FMC, Low Pin Count LPC Fits D-TACQ Extended modules
7	DRAM	256MB, soldered
8	Data IO	RS232,SD Card, USB OTG
9	Signal IO	CLK, TRG inputs, two digital outputs SMA or LEMO
10	Digital Expansion	PIM Socket
11	Digital IOS	10 on 10 way ribbon header.