16 Channel 100KHz Isolated ADC Module

KEY FEATURES AND BENEFITS

• Fully isolated high speed ADC module
• 100 KHz, 16-bit ADC
• 8 differential channels or 16 single ended channels
• On card PGA with gain of 1, 10, 100 or 1000
• On card scan RAM of 512 bytes for flexible channel sequence
• Optional signal conditioning plug on flexibility for individual channels for attenuation, current voltage conversion and passive filter blocks
• On card 1K sample FIFO RAM
• On card current value table for all channels
• Programmable scan rates by means of NCO of upto 100KHz
• Windows 2000 drivers provided
• RT Linux drivers provided

APPLICATIONS

• Automatic test equipment
• Data acquisition system
• Industrial automation & control

DESCRIPTION

DP-MM-1105 is an optically isolated, 100 KHz, 16-bit ADC input module based on M-Module standard. It can be used as an input module in any type of bus system i.e. cPCI, PCI, VME, etc. Appropriate host M Module carrier cards are available in 3U and 6U formats.

The module can be configured as either 16 single-ended channels or 8 differential channels. The inputs are scanned using a protected multiplexer providing input protection up to ± 42V. The normal input range is ±10Volts. A programmable gain amplifier (PGA) with gain settings of 1, 10, 100 & 1000 allows smaller signal ranges down to ± 10mVolts to be acquired.

ISOLATION

Digital isolation techniques are used for field to system isolation. Opto couplers are used to isolate the ADC section from the digital system. A DC-DC converter powers the isolated ADC circuits. This allows the complete accuracy of the ADC to be available avoiding accuracy loss inherent to analog isolation. External power supply can be used in lieu of the on-board DC-DC converter. This is a factory configurable option.

SAMPLING

The sampling rate is generated by a numerically controlled oscillator (NCO). The sampling rate is programmable from 10µs to 100s in steps of 1µs. The external pacer input may also be used to control the sampling rate.

SCANNING, TRIGGER & STORAGE

A scan list can be programmed on the 512 entry Scan RAM. The channels enabled for scanning and their sequence are programmable in the Scan RAM. The sampling can be initiated either by external trigger or software trigger. The scanning as per the scan list can be carried out in a number of modes.

Single Scan mode scans once, and awaits the next trigger. Continuous scan mode repeats the scan after the end of the last scan without any delay. The end of the last scan list acts as the trigger for the start of the next scan list. In Timed mode, the scanning is repeated after a programmable delay. The delay can be programmed between 0 to 6.5s in steps of 100µs. In counted scan mode, the scan list is repeated for a programmed number of scans from 1 to 1000 times.

A buffered input is available which can be used either as external trigger or as a pacer.

A 1Kx24bit FIFO provides 16-bit data along with the channel number and gain. In addition to the FIFO, the module provides a current value table for all channels. This table is automatically up-dated by the ADC module on conversion of each channel.

An on-board EEPROM holds all the M-Module identification details such as Sync Code, Module Number, Revision Number, Module Characteristics and Calibration data.

SIGNAL CONDITIONING

Signal conditioning to the inputs can be provided using a small on-board adapter. The optional signal conditioning module can be configured as a passive filter or current to voltage converter or attenuation resistor implementation.

SOFTWARE SUPPORT

The module is supplied complete with device drivers in Windows 2000 and RT Linux. Please contact factory for support in any other operating system such as VxWorks, QNX, INTime, Lynx etc.
**INPUT**

- No. of channels: 8 voltage inputs differential or 16 voltage inputs single ended
- Resolution: 16-bit
- Precision: 0.01% with calibration
- Impedance to ground: >10MΩ / < 100pF
- Input impedance: >10MΩ
- Input protection: ±42V
- Common mode rejection: >80dB

**A/D conversion time**:
- 5μsec (max)
- Throughput: 100kHz
- Programmable gain factor: 1, 10, 100 or 1000
- Miscellaneous:
  - External trigger (isolated, rising-edge sensitive) external pacer input
  - Peripheral connection: via front panel on a shielded 'D' type Connector
  - M-Module characteristic: A08, D32, INTA, IDENT
  - Isolation: 500V DC channel to system
  - Settling time (0.01% Accuracy):
    - 140μsec for gain = 100, voltage swing = -100mV to +100mV
    - 1300μsec for gain = 1000, voltage swing = -10mV to +10mV

**SPECIFICATIONS**

**CONNECTORS**
- 25 Pin D sub connector

**MECHANICAL**
- 148.3mm x 52.9mm M modules

**ENVIRONMENT**
- Commercial and Rugged versions

**ORDERING INFORMATION**
- 0 - on-board DC-DC converter
- 1 - without on-board DC-DC converter
- 0 - Voltage Input
- 3 - Current Input
- 6 - Filter Input
- 3 - Commercial version
- 6 - Rugged version

**BLOCK DIAGRAM OF DP-MM-1105**

**NOTE:**
1) Trigger / Pacer input ground reference is w.r.t. field ground
2) External circuits may take power up to 10mA from the DC-DC converter source