MIC-1816R

16-Bit, 1MS/s, DAQ Platform with ARM Cortex™-A9 i.MX6 1GHz

Features

- i.MX6 Quad - 4x Cortex-A9 processor
- Onboard 2G DDR3 memory design
- Build-in 4G EMMC NAND Flash for OS (Yotco only)
- Sampling rate up to 1MS/s
- 4 x IEPE input with preamp gain = 1,10,100
- 8 x Analog input with voltage or 4~20mA
- 2 x Analog outputs, up to 3 MS/s, 16-bit resolution
- Supports digital and analog triggers
- 16 x isolated digital input and 8 x isolated digital output
- 2 x 32-bit programmable counter/timers
- Onboard FIFO memory (4,000 samples)
- 2-port RS-232 with surge protection
- 1 x 10/100/1000 Base-T RJ-45 LAN ports
- 1 x USB 2.0 and 1 x USB 2.0 OTG
- 2 x CAN ports transmission speeds up to 1Mbps

Introduction

MIC-1816R is a RISC (ARM) based stand-alone automation controller integrates with data acquisition and signal conditioning to provide IEPE input, analog I/O, isolated digital I/O, and counter functions. This application ready controller also supports serial communication ports and several other networking interfaces to seamlessly enable integration and rapid system development.

Specifications

Analog Input

- **Channels**: 4-ch IEPE and 8-ch general AI (Voltage/ Current)
- **Resolution**: 16 bits
- **Sample Rate**: Single channel: 5 MS/s max.; Multiple channels: 1 MS/s max.

Note: The sampling rate of each channel is influenced by the number of used channels. For example, if 4 channels are used, the sampling rate will be 1MS/4 = 250 kS/s per channel.

- **Trigger Reference**: Analog triggers
- **Trigger Mode**: Start, Delayed Start Stop, Delayed Stop
- **FIFO Size**: 4,000 samples
- **Overvoltage Protection**: 30 Vp-p
- **Input Impedance**: Voltage : 1 MΩ Current : 500 Ω
- **Sampling Modes**: Software and external clock
- **Input Range**: Software programmable

Gain	0.5	1	2	4	8
Unipolar	NA	0~10	0~5	0~2.5	0~1.25
Bipolar	±10	±5	±2.5	±1.25	±0.625
Gain Error (%FSR)	0.0075	0.0075	0.0075	0.008	0.008

- **Current Input Range**: 4-20mA (according to voltage range 0~10 V)
- **Current Input Update Rate**: 20 KS/s
- **Current Input -3dB frequency**: 15 Hz
- **Analog Trigger Reference**: -10 ~ +10 V
- **Analog Tirrger Resolution**: 16 bits (0.3 mV/step)

Integrated Electronic Piezoelectric (IEPE)Excitation

- **Preamplifier Gain**: 1, 10, 100 switch selectable
- **AC Couple Upper Cut-Off Frequency**: Gain x1, x10(-5%) : 100KHz Gain x100(-1%) : 50KHz
- **AC Couple Lower Cut-Off Frequency (-3dB, 1MΩ)**: 0.58Hz
- **Accuracy**: < ±2% for all gain settings
- **Complicance**: > 24 V
- **Current**: 4 mA
- **Discharge Time Constant**: > 0.3 seconds
- **DC Offset**: < 30 mA

Analog Output

- **Channels**: 2-ch Voltage / Current-sink / Current-source (shared)
- **Resolution**: 16 bits
- **Sample Rate**: 3 MS/s max.
- **Output Range**: Software programmable
- **Voltage Output Range**: 0V~5V, 0V~10V, ±5V, ±10V
- **Current Output Range**: 4-20mA (according to voltage range 0~10 V)
- **Current Mode Update Rate**: 20 KS/s
- **Current Mode Accuracy**: Source : 0.15% FSR Sink : 0.05% FSR
- **Current Mode Loading**: Source : max. 600 Ω Sink : depends on external voltage
- **Current Sink Voltage**: Sink : max. 50 V_{DC}

Isolated Digital Input

- **Channel**: 8
- **Isolation Protection**: 2,500 V_{DC}
- **Interrupt Capable Channel**: 1
- **Digital Filter Channel**: 1
- **Opto-Isolator Response**: 100 us
- **Input Voltage**: Logic 0 : 2V max. Logic 1 : 5 ~ 50 V

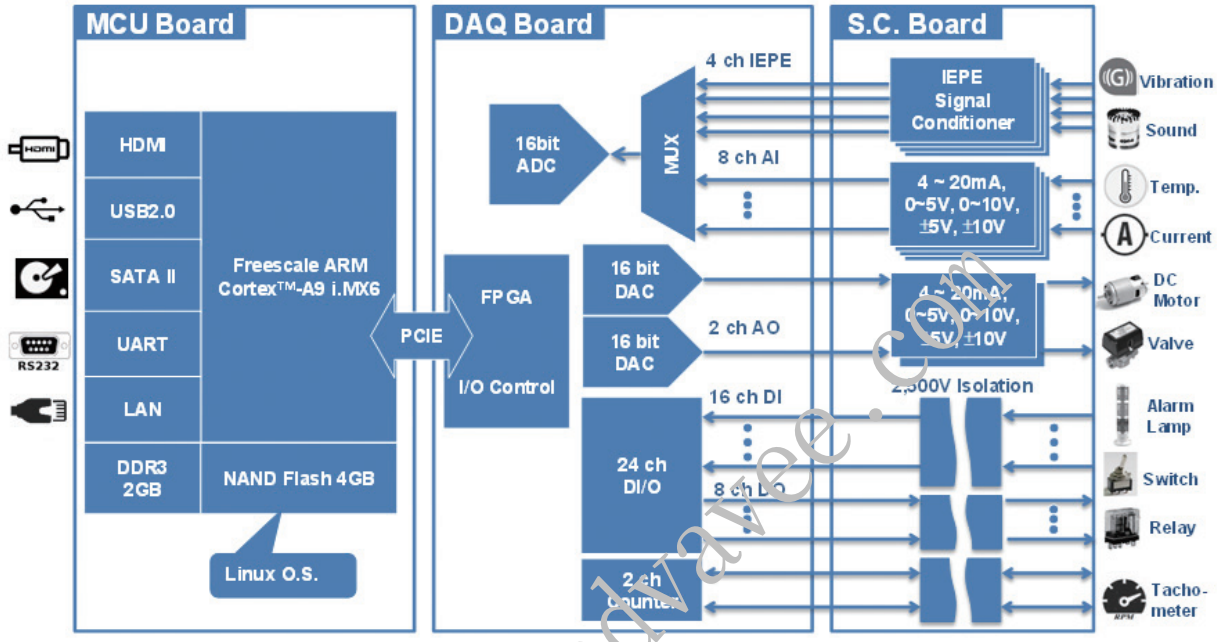
Isolated Digital Output

- **Channels**: 8 (NPN)
- **Isolation Protection**: 2,500 V_{DC}
- **Output Voltage**: 5 ~ 40 V_{DC}
- **Sink Current**: 500 mA max./channel
- **Opto-Isolator Response**: 100 µs

Counter

- **Channels**: 2
- **Resolution**: 32 bits
- **Compatibility**: 5 V/TTL
- **Isolation Protection**: 2,500 V_{DC}
- **Opto-Isolator Response**: 100 us

Block Diagram



General

- **Dimensions (W x H x D)** 165 x 65 x 130 mm (6.49" x 2.56" x 5.11")
- **Power Consumption** 15W
- **Power Requirements** Single 12V_{DC} power input
- **Weight** 2.4 kg (typical)
- **OS Support** Linux Ubuntu, Yotcc

RISC System Hardware

- **CPU** NXP ARM® Cortex™-A9 i.MX6 Quad 4 x processor
- **Memory** Onbard DDR3 2GB
- **Flash** 4 GB eMMC NAND Flash for O.S (Yotco only)
- **Ethernet** 1 x 10/100/1000 Mbps
- **USB** 1 x USB 2.0, 1 x USB 2.0 OTG
- **Serial Port** 2 x RS-232
- **CAN Port** 2 x 1 Mbps
- **Storage** 1 x SATA 2.5" SSD, 1 x SD slot

Environment

- **Storage Humidity** 5 ~ 95% RH, non-condensing
- **Operating Temperature** 0 ~ 50°C (32 ~ 122°F) @ 5 ~ 85% RH with 0.7m/s air flow
- **Storage Temperature** -20 ~ 80 °C (-4 ~ 176 °F)
- **Indicators** LEDs for Power, IDE and LAN (Active, Status)

Ordering Information

- **MIC-1816R-AE** 16-Bit, 1MS/s, DAQ Platform with ARM Cortex™-A9 i.MX6 1GHz

Optional Accessories

- **96PSA-A36W12R1-3** Adapter A/D 100-240V 36W 12V DC PLUG 90°
- **1700024849-01** Power Cord BSMI 3P 2.5A 125V 180cm
- **1700019146** Power Cord CCC 3P 2.5A 250V 183cm
- **1700001524** Power Cord UL 3P 10A 125V 183cm
- **1960077844N001** Table mount (130 x 175 mm)