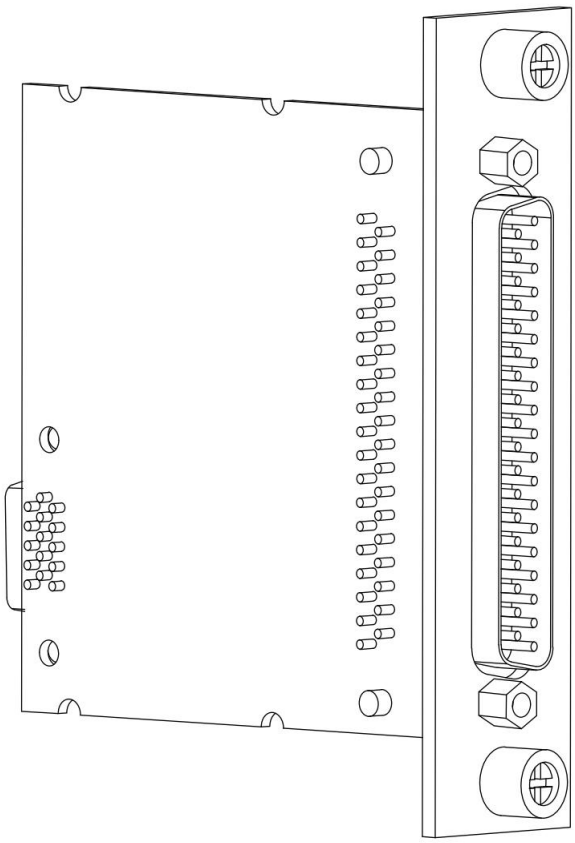
DataSheet

MT-E711

16 AI Differential/16 AI Single-Ended, ±10 V, 16 Bit, 200kS/s/ch Simultaneous

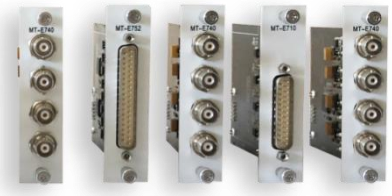
This document contains the specifications for MT-E711.Specifications are typical at 25°C unless otherwise noted.

Caution Using the MT-E711 in a manner not described in this document may impair the protection the MT-E711 provides.



MANGOTREE

MT E Series Overview



MT provides more than 20 E Series modules for measurement, control, and communication applications. E Series modules can connect to any sensor or bus and allow for high-accuracy measurements that meet the demands of advanced data acquisition and control applications.

- Measurement-specific signal conditioning that connects to an array of sensors and signals
- Isolation options such as bank-to-bank, channel-to-channel, and channel-to-earth ground
- -40 °C to 70 °C temperature range to meet a variety of application and environmental needs
- Hot-swappable

The majority of E Series modules are supported in both RobustRIO and FlexDAQ platforms and you can move modules from one platform to the other with no modification.

RobustRIO

RobustRIO combines an open-embedded architecture with small size, extreme ruggedness, and E Series modules in a platform powered by the Redefinable I/O (RIO) architecture. Each system contains an FPGA for custom timing, triggering, and processing with a wide array of available modular I/O to meet any embedded application requirement.

FlexDAQ

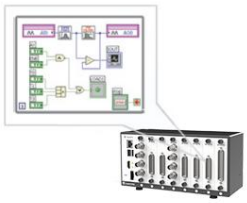
FlexDAQ is a portable, rugged data acquisition platform that integrates connectivity, data acquisition, and signal conditioning into modular I/O for directly interfacing to any sensor or signal. Using FlexDAQ with LabVIEW, you can easily customize how you acquire, analyze, visualize, and manage your measurement data.

Software

LabVIEW Professional Development System for Windows

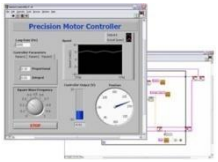
- Use advanced software tools for large project development
- Use advanced measurement analysis and digital signal processing
- Take advantage of open connectivity with DLLs, ActiveX, and .NET objects
- Build DLLs, executables, and MSI installers

LabVIEW FPGA Module



- Design FPGA applications for MT RIO hardware
- Program with the same graphical environment used for desktop and real-time applications
- Execute control algorithms with loop rates up to 300 MHz
- Implement custom timing and triggering logic, digital protocols, and DSP algorithms
- Incorporate existing HDL code and third-party IP including Xilinx IP generator functions

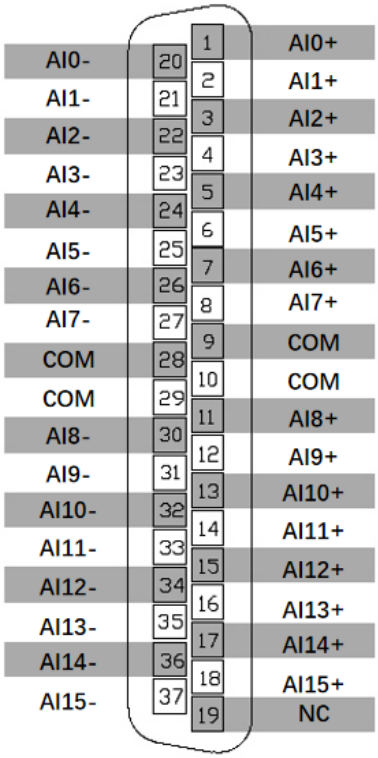
LabVIEW Real-Time Module



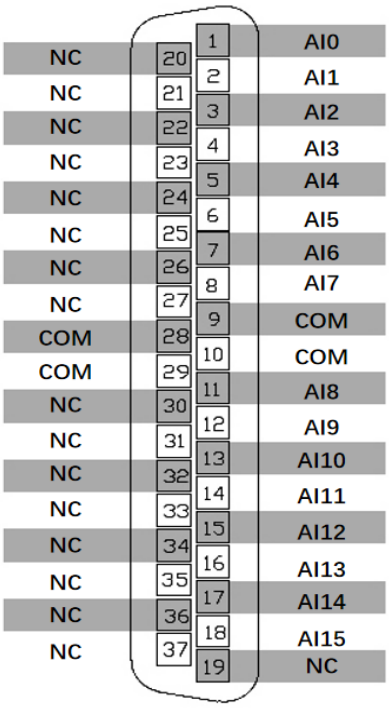
- Design deterministic real-time applications with LabVIEW graphical programming
- Take advantage of built-in PID control, signal processing, and analysis functions
- Automatically take advantage of multicore CPUs or set processor affinity manually
- Take advantage of real-time OS, development and debugging support, and board support

MT-E711 Connectivity

Pin definition of DSUB connector and Spring Terminal connector.

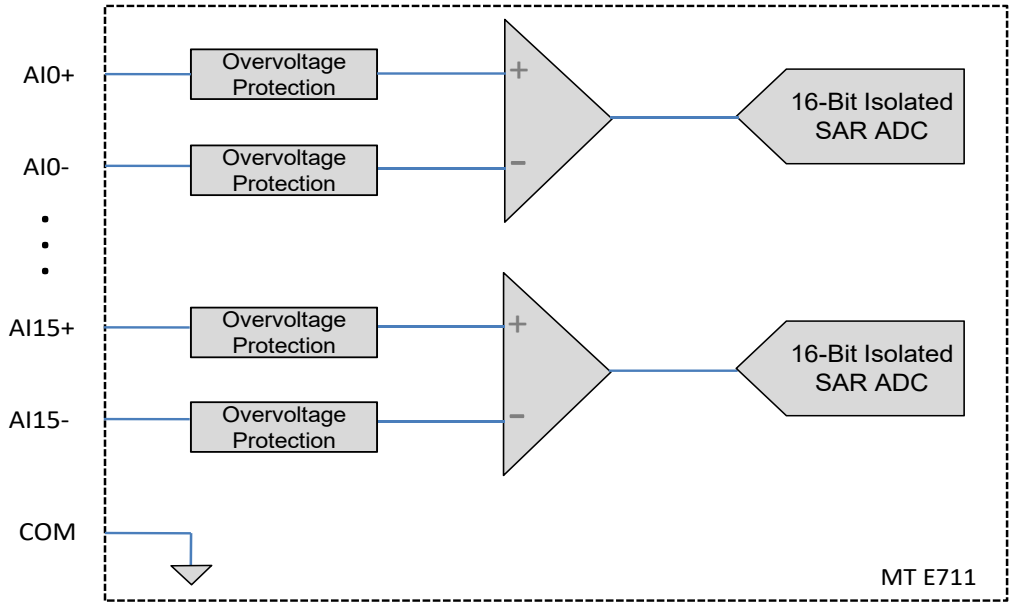


16 AI Differential

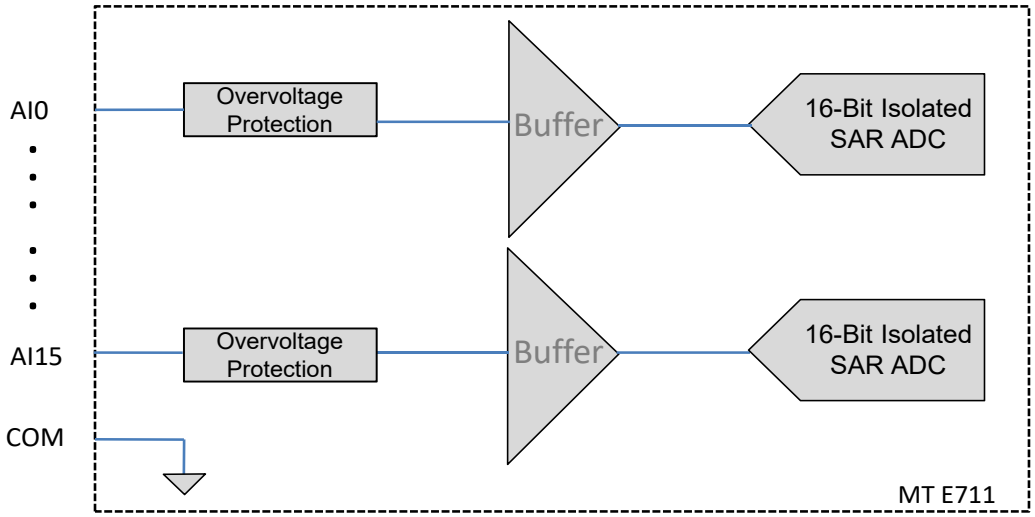


16AI Single-Ended

MT-E711 Circuitry



16 AI Differential



16AI Single-Ended

Input signals on each channel are buffered, conditioned, and then sampled by an ADC.

Each AI channel provides an independent signal path and ADC, enabling you to sample all channels simultaneously.

MT-E711 Specifications

The following specifications are typical for the range -40 °C to 70 °C unless otherwise noted.

⚠ **Caution** Do not operate the MT-E711 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to MangoTree for repair.

⚠ **Caution** The input terminals of this device are not protected from electromagnetic interference. As a result, this device may experience reduced measurement accuracy or other temporary performance degradation when connected cables are routed in an environment with radiated or conducted radio frequency electromagnetic interference. To limit radiated emissions and to ensure that this device functions within specifications in its operational electromagnetic environment, take precautions when designing, selecting, and installing measurement probes and cables.

Input Characteristics

Number of channels	16 differential/16 single-ended channels
ADC resolution	16 bits
Type of ADC	Successive approximation register (SAR)
Input range	±10V
Input Voltage Ranges	
Measurement Voltage(AI+ to AI-)	
Minimum(V)	±10.2V
Typical(V)	±10.4V
Maximum	±10.6V
Overvoltage protection	±30 V
Conversion time	5 μs minimum
Sample rate	200 kS/s maximum per channel

Table 1. Accuracy

Measurement Conditions		Percent of Reading (Gain Error)	Percent of Range (Offset Error)
Calibrated	Maximum (-40 °C to 70 °C)	0.142%	±0.070%
	Typical (23 °C ±5 °C)	0.010%	±0.007%

Stability	
Gain drift	4.5 ppm/°C
Offset drift	10 µV/°C
CMRR	120 dB minimum
-3 dB bandwidth	10 kHz
Input impedance	>1 GΩ
Crosstalk	-90 dB
Total Harmonic Distortion(THD)	-107dB
No missing codes	15 bits
DNL	±0.5LSB
INL	±0.5LSB

Power Requirements

Power consumption from chassis	1130mW maximum
Thermal dissipation (at 70 °C)	1550 mW maximum

Safety Voltages

Connect only voltages that are within the following limits:

MT-E711 with DSUB Safety Voltages

Channel-to-COM	±30 V maximum
Isolation	

Channel-to-COM	None
Channel-to-earth ground	
Continuous	60 VDC, Measurement Category I
Withstand up to 2,000 m	1,000 Vrms, verified by a 5 s dielectric withstand test

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

CE Compliance CE

This product meets the essential requirements of applicable European Directives, as follows:

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 2014/34/EU; Potentially Explosive Atmospheres (ATEX)

Shock and Vibration

To meet these specifications, you must panel mount the system.

Operating vibration	
Random (IEC 60068-2-64)	5 g_{rms}, 10 Hz to 500 Hz
Sinusoidal (IEC 60068-2-6)	5 g, 10 Hz to 500 Hz
Operating shock (IEC 60068-2-27)	30 g, 11 ms half sine; 50 g, 3 ms half sine; 18 shocks at 6 orientations

Environmental

Refer to the manual for the chassis you are using for more information about meeting these specifications.

Operating temperature	-40 °C to 70 °C (IEC 60068-2-1, IEC 60068-2-2)
Storage temperature	-40 °C to 85 °C (IEC 60068-2-1, IEC 60068-2-2)
Ingress protection	IP40
Operating humidity (IEC 60068-2-78)	10% RH to 90% RH, noncondensing Storage
humidity (IEC 60068-2-78)	5% RH to 95% RH, noncondensing Pollution
Degree	2
Maximum altitude	
For MT-E711 with DSUB	2,000 m

Indoor use only.

Support

MT-RIO上手指南：

http://server.mangotree.cn:9900/WebFile/Downloads/上手指南/MT-RIO/

RIO上手指南

MT-RIO视频教程：

http://server.mangotree.cn:9900/WebFile/Downloads/视频教程/MT-RIO/

RIO视频教程

MT-Master上手指南：

http://server.mangotree.cn:9900/WebFile/Downloads/上手指南/MT-Master/

Master上手指南

MT-Master视频教程：

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Master视频教程

Dimensions:(mm)