

# DataSheet

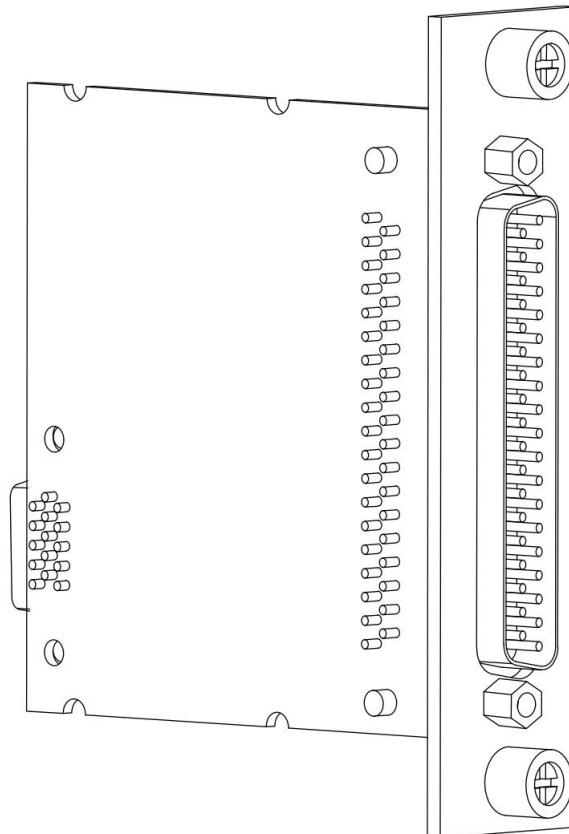
# MT-E721

8 RTD, 15 Bit, 50S/s/ch Simultaneous, PT100/PT1000,3/4-wire

This document contains the specifications for MT-E721.Specifications are typical at 25°C unless otherwise noted.



**Caution** Using the MT-E721 in a manner not described in this document may impair the protection the MT-E721 provides.



# MT E Series Overview

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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

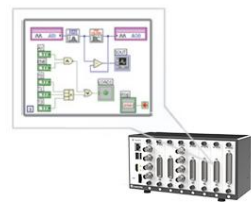
## LabVIEW Professional Development System for Windows

- 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



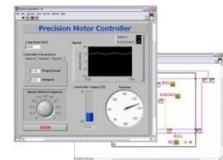
## LabVIEW FPGA Module

- 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

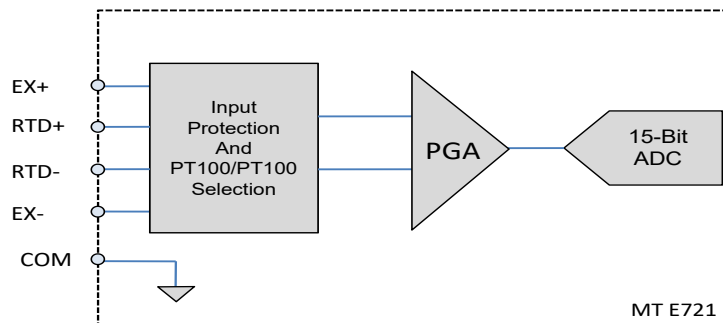


# MT-E721 Connectivity

Pin definition of DSUB connector and Spring Terminal connector.

EX4+	20	1	EX0+
RTD4+	21	2	RTD0+
RTD4-	22	3	RTD0-
EX4-	23	4	EX0-
EX5+	24	5	EX1+
RTD5+	25	6	RTD1+
RTD5-	26	7	RTD1-
EX5-	27	8	EX1-
COM	28	9	COM
COM	29	10	COM
EX6+	30	11	EX2+
RTD6+	31	12	RTD2+
RTD6-	32	13	RTD2-
EX6-	33	14	EX2-
EX7+	34	15	EX3+
RTD7+	35	16	RTD3+
RTD7-	36	17	RTD3-
EX7-	37	18	EX3-
		19	NC

# MT-E721 Circuitry



Each RTD channel is filtered and then sampled by a 15-bit ADC.

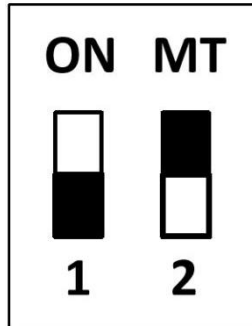
RTD channels share a common ground, COM, that is isolated from other modules in the system.

# PT100/PT1000 Type

**MT-E721 PT100/PT1000 Configuration**

Configuration	Dial Switch	
	S1	S2
PT100	ON	OFF
PT1000	OFF	ON

### Example: E721 with PT1000

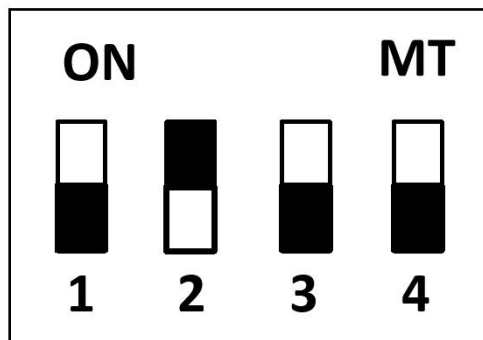


## 3-Wire/4-Wire Sensor

### MT-E721 3-Wire/4-Wire Sensor Configuration

Configuration	Dial Switch			
	S1	S2	S3	S4
3-Wire	ON	OFF	OFF	ON
4-Wire	OFF	ON	OFF	OFF

### Example: E721 with 4-Wire



## MT-E721 Specifications

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



**Caution** Do not operate the MT-E721 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.

## Input Characteristics

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Number of channels	8 analog input channels
ADC resolution	15 bits

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Type of ADC	Delta-Sigma
Sample mode	Simultaneous
RTD Type	PT100/PT1000(Fixed)
RTD Measurements	3-Wire or 4-Wire(Fixed)
Measurement temperature range	-200°C to +850°C

Conversion time(simultaneously sampled)

Timing Mode	Conversion Time(ms)	Sample Rate (S/s)
Continuous conversion(60Hz)	16.7	59.8
Single conversion(60Hz)	52	19.2
Single conversion (50Hz)	62.5	16
Continuous conversion (50Hz)	20	50

Total Accuracy	0.5°C (0.05% of Full Scale)
Common-Mode Rejection	90 dB
50/60 Hz Noise Rejection	82 dB
Input protection	±45V
Input noise	150 uV RMS

## Power Requirements

Power consumption from chassis	517mW maximum
Thermal dissipation (at 70 °C)	1480 mW maximum

## Safety Voltages

Connect only voltages that are within the following limits:

### MT-E721 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

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 <sub>rms</sub> , 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-E721 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

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Master视频教程

# Dimensions:(mm)

