

DataSheet

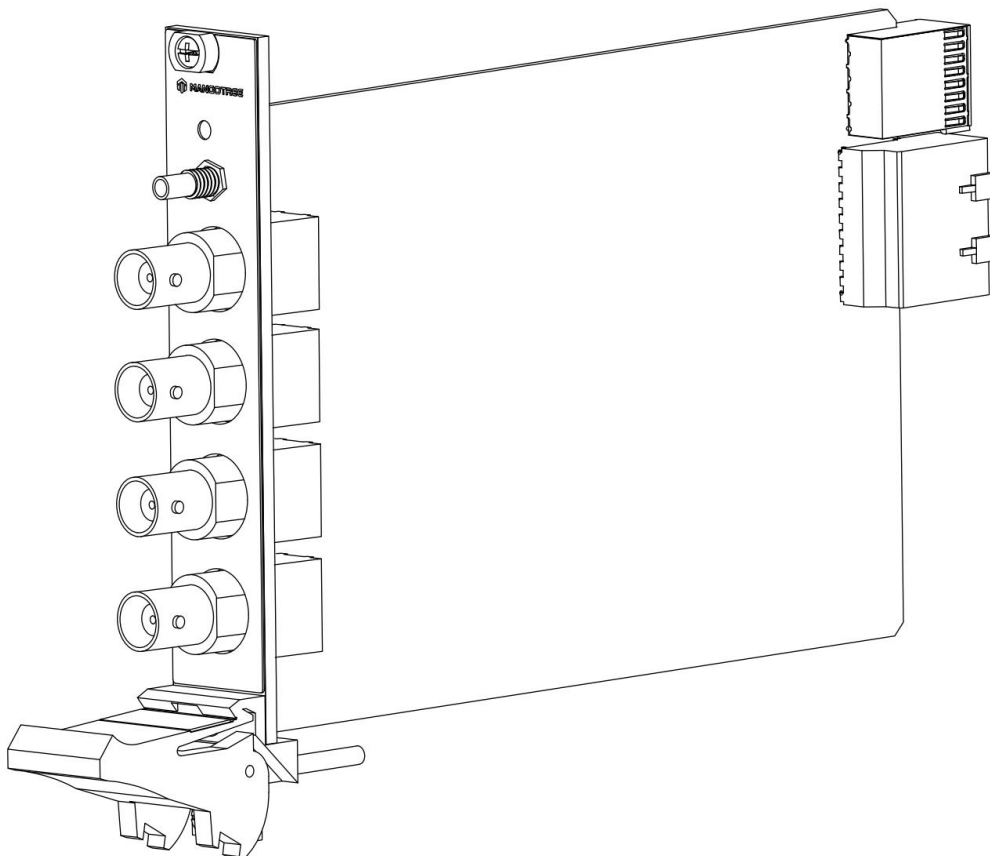
# MT-X610

2 AI, 2 AO,  $\pm 10$  V, 32 bit, 204.8kS/s/ch Simultaneous  
1 Trigger

This document contains the specifications for MT-X610. Specifications are typical at 25°C unless otherwise noted.



**Caution** Using the MT-X610 in a manner not described in this document may impair the protection the MT-X610 provides.



# Input Characteristics

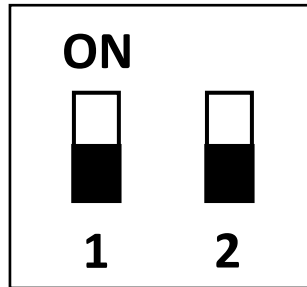
Number of channels	2 differential input channels
ADC resolution	32bits
Sampling mode	Simultaneous
Support Sample rate	204.8kS /s、 192kS/s、 102.4kS /s、 96kS /s
Input coupling	AC/DC (Hardware-selectable)
Input range	±10V
AC voltage full-scale range	
Minimum	±10Vpk
Typical	±10.05Vpk
Maximum	±10.15Vpk
IEPE excitation current	
Minimum	2.0 mA
Typical	2.1 mA
IEPE compliance voltage	24V maximum
Crosstalk (1 kHz)	> 110dB
Differential input impedance	22kΩ
Frequency response	±0.1dB@20Hz~20kHz
Total harmonic distortion(THD)	-115dB
Total harmonic distortion+Noise(THD+N)	-110dB

**Table 1.** AI Idle Channel Noise

Sample Rate (kS/s)	Idle Channel Noise	
	dBV <sub>rms</sub>	uV <sub>rms</sub>
51.2 kS/s	-117.9 dBV <sub>rms</sub>	9 uV <sub>rms</sub>
102.4kS/s	-114.7 dBV <sub>rms</sub>	13 uV <sub>rms</sub>
204.8kS/s	-112.3 dBV <sub>rms</sub>	17 uV <sub>rms</sub>

**Table 2. AC/DC Configuration**

Configuration	Dial Switch	
	S1	S2
DC Coupling	ON	OFF
AC Coupling	OFF	OFF
AC Coupling with IEPE	OFF	ON

**Table 3. Accuracy**

Measurement Conditions		Percent of Reading (Gain Error)	Percent of Range (Offset Error)
Calibrated	Maximum (-40 °C to 70 °C)	0.034%	±0.014%
	Typical (25 °C ±5 °C)	0.007%	±0.005%

## Output Characteristics

Number of channels	2 differential output channels
DAC resolution	32 bits
Sampling mode	Simultaneous
Support Sample rate	204.8kS /s、 192kS/s、 102.4kS /s、 96kS /s
Output voltage range	±10V
Output coupling	DC
Output impedance	50 Ω

**Table 1. Accuracy**

Measurement Conditions		Percent of Reading (Gain Error)	Percent of Range (Offset Error)
Calibrated	Maximum (-40 °C to 70 °C)	0.033%	0.015%
	Typical (25 °C, ±5 °C)	0.008%	0.006%

Crosstalk (1 kHz) >110dB

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Frequency response ±0.1dB@20Hz~20kHz

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**Table 2. AO Idle Channel Noise**

Sample Rate (kS/s)	Idle Channel Noise	
	dBV <sub>rms</sub>	uV <sub>rms</sub>
51.2 kS/s	-123.2 dBV <sub>rms</sub>	5 uV <sub>rms</sub>
102.4kS/s	-119.7 dBV <sub>rms</sub>	7.5 uV <sub>rms</sub>
204.8kS/s	-115.9 dBV <sub>rms</sub>	11.5 uV <sub>rms</sub>

Total harmonic distortion(THD) -115dB

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Total harmonic distortion+Noise(THD+N) -110dB

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External Digital Triggers

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Number of triggers 10

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Source TRIG, PXI\_TRIG<0..7>, PXI\_STAR

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## Power Requirements

Power consumption from chassis: 900mW maximum

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Thermal dissipation (at 70 °C) 930mW maximum

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# Safety Voltages

Connect only voltages that are within the following limits:

Channel-to-earth ground	±30 V maximum, Measurement Category I
Isolation	
Channel-to-channel	None
Channel-to-earth ground	None

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	500 m

Indoor use only.

# DAQMode Support

通用模式 (DAQMode=0) 包括: AI、AO、Counter、PWM、Encoder、Digital Input、Digital Output、Digital Waveform Input、Digital Waveform Output、Temperature。

通用模式适用所有的MT-DAQ设备, 该模式下用户可以开发使用设备数据手册中说明的全部功能, 不同设备支持的功能不同。本设备通用模式支持的功能如下表所示, 对应功能为绿色则支持, 红色则不支持。

本设备通用模式 (DAQMode=0) 支持的功能:

● AI	● AO
● Counter	● PWM
● Encoder	● Temperature
● Digital Input	● Digital Output
● Digital Waveform Input	● Digital Waveform Output

特殊模式包括: AI/AO同步 (AIO Sync)、编码器触发AI (Encoder Trigger AI)、AI触发编码器 (AI Trigger Encoder)、DI触发AI/AO同步 (DI Trigger AIO)、DI触发AI (DI Trigger AI)、DI触发AO (DI Trigger AO)。

如果需要使用特殊模式下的模式, 用户需要确认购买设备是否支持该模式, 本设备支持的特殊模式如下表所示, 对应模式为绿色则支持, 红色则不支持; Customer是定制DAQ模式, 正常用户无法使用。如果模式配置错误, 会导致设备无法正常运行。。

本设备支持的特殊模式:

● AO-Sync-AI (DAQMode=1)	● AI-Trigger-Encoder (DAQMode=2)
● Encoder-Trigger-AI (DAQMode=3)	● DI-Trigger-AI-Sync-AO (DAQMode=4)
● DI-Trigger-AI (DAQMode=5)	● DI-Trigger-AO (DAQMode=6)

# Config文本

MT-DAQ设备的开发和使用依赖于Config配置文本，只有正确配置该文本，才能保证设备的正常运行。不同型号的设备或板卡对应的配置参数是不同的。Python、LabVIEW和C#三种编程语言的Config配置文本完全相同。

通用Config配置文本通过MT-Master软件主页导出获得，用户可以根据实际设备或板卡的参数对配置文本进行修改配置，或者按照文本默认参数配置运行。

Config配置文本中的各项参数含义及其具体配置可以参考MT-DAQ上手指南，指南链接附于下文Support板块。

使用MT产品过程中如有任何疑问，可以通过访问官网：<http://www.mangotree.cn>联系专业客服咨询。



MangoTree官网



# Support

MT-Master上手指南:

<https://server.mangotree.cn:9900/WebFile/Downloads/上手指南/MT-Master/>



Master上手指南

MT-Master视频教程:

<https://server.mangotree.cn:9900/WebFile/Downloads/视频教程/MT-Master/>



Master视频教程

MT-DAQ上手指南:

<https://server.mangotree.cn:9900/WebFile/Downloads/上手指南/MT-DAQ/>



DAQ上手指南

MT-DAQ视频教程:

<https://server.mangotree.cn:9900/WebFile/Downloads/视频教程/MT-DAQ/>



DAQ视频教程

# Dimensions:(mm)

