

MIC-1810**Intel® Core™ i3-6100U/Celeron® 3955U****Embedded Automation Computer****Startup Manual****Packing List**

Before you begin installing your card, please make sure that the following items have been shipped:

1. 1 x MIC-1810 system
2. 1 x MIC-1810 startup manual
3. Terminal blocks: 1 x 2-pin, 1 x 16-pin, 1 x 24-pin, 3 x 10-pin

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

Caution: BATTERIES ARE AT RISK OF EXPLODING IF INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.

Attention: DANGER D'EXPLOSION SI LA BATTERIE EST INEXACTEMENT REMPLACÉE. REMPLACEZ SEULEMENT AVEC LA MÊME CHOSE OU LE TYPE ÉQUIVALENT RECOMMANDÉ PAR LE FABRICANT, JETTENT LES BATTERIES UTILISÉES SELON INSTRUCTIONS DE S SELON FABRICANT DES'.

Note: For driver download, please search for below products on support portal.
System:
MIO-5272U-U0A1E for MIC-1810-U0A1E
MIO-5272U-U3A1E for MIC-1810-U3A1E
DAQ board: MIC-1810 / MIOE-3810

For more information about this or other Advantech products, please visit our website at

<http://www.advantech.com>

<http://www.advantech.com/Products>

For technical support and service, please visit our support website at

<http://support.advantech.com.tw/support/default.aspx>

This manual is for the MIC-1810 Series Rev. B1.

Part No. 2001181002
Printed in Taiwan

Edition 3
November 2020

Specifications**System**

- 6th generation Intel® Core™ i processor

Memory

- 4GB SODIMM DDR3L 1600

Graphics

- Intel® HD Graphics 520/510, supports DirectX12

Serial Ports

- 2 x RS-232 via COM1/COM2

Ethernet

- **Interface:** 10/100/1000 Mbps
- **Controller**
LAN1: Intel i219
LAN2: Intel i210

Storage

- **Internal SSD Bay:** 1 x 2.5" SSD bay

Front I/O

- **Display:** 1 x VGA/HDMI
- **USB:** 2 x USB 3.0, 2 x USB 2.0

Power Requirement

- **Power Type:** 2-pin Phoenix Connector
- **Input Voltage:** 10~36V_{DC}

Miscellaneous

- **Power Switch**
Orange: System standby
Green: System boot

Table Mount (Optional)

- **P/N:** 1960099348N001
- **Dimensions (W x L):** 220 x 156 mm

Environment

- **Operating Temperature:** -20~60 °C with 0.7m/S air flow and 1 x industrial SSD
- **Relative Humidity:** 95% @ 40 °C (non-condensing)

Physical Characteristics

- **Dimensions (W x H x D):** 200 x 156 x 56 mm
- **Weight:** 2.41kg (5.3lb)

DAQ Specifications

The MIC-1810 system features a built-in data acquisition module (MI0e-3810).

Analog Input

Channels	16 single ended/8 differential						
Resolution	12 bits						
Built-In Memory	4K samples						
Sampling Rate	Single channel	500 KS/s					
	Multi channels	800 KS/s					
Input Range and Gain List	Gain	0.5	1	2	4	8	
	Unipolar	NA	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25	
	Bipolar	+/-10V, 0-20mA and 4-20mA	±5	±2.5	±1.25	±0.625	
Drift	Gain	0.5	1	2	4	8	
	Zero	25 ppm/°C					
	Span	15 ppm/°C					
Input Signal Bandwidth (-3dB)	Gain	0.5	1	2	4	8	
	BW (MHz)	1	1.6	1.2	1.2	1.2	
Max. Input Voltage	± 15 V						
Input Impedance	1G Ω / 2pF						
Sampling Mode	Software or external						
Trigger Mode	Start trigger, Delay trigger start, Stop trigger, Delay trigger stop						
Accu-racy	DC	INLE: ± 1 LSB (with manual calibration)					
		DNLE: ± 1 LSB (with manual calibration)					
		Offset error: - Current Measurement: ±2.5µA - Voltage Measurement: ±0.5mV					
		Gain	0.5	1	2	4	8
		Gain Error (%FSR)	Current: 0.05 Voltage: 0.1	0.1	0.2	0.2	0.4
		Channel Type	Single ended/differential				
	AC	SNR: 68 dB					
		ENOB: 10.5 bits					
External Digital Trigger	Low: 0.8 V max.; High: 2.0 V min.						
	Minimum pulse width: 50 ns						
External Analog Trigger	Range: -10 ~ 10 V						
	Resolution: 12 bits (4.88 mV/step)						

DAQ Specifications (Cont.)

Analog Output

Channels	2		
Resolution	12 bits		
Memory Size	4K samples		
Update Rate	500 KS/s		
Output Range	Internal Reference	0 ~ 5 V, 0 ~ 10 V, ± 5 V, ± 10 V	
	External Reference	Reference Input $-10 \leq x \leq 10$ V	Maximum Range $0 \sim x$ V $-x \sim x$ V
	Unipolar Bipolar		
Accuracy	Relative	± 1 LSB	
	Differential Non-Linearity	± 1 LSB (monotonic)	
Slew Rate	20 V/us		
Gain Error	Adjustable to zero		
Drift	30 ppm/ Ω		
Driving Capability	5 mA		
Update Mode	Static update, waveform		
Output Impedance	Max. 0.1 Ω		

Isolated Digital Input

Channels	16
Input Voltage Level	Wet Contact: Low: 0~3V _{DC} High: 10~30V _{DC} Dry Contact: Low: Connect to GND High: Open
Input Resistance	3 k Ω
Isolation Protection	2500V _{DC}
Response Time	100 μs

Isolated Digital Output

Channels	8
Output Voltage	5~40V _{DC}
Output Type	Sink (NPN)
Sink Current	350mA max./channel @ 25 $^{\circ}C$ 250mA max./channel @ 60 $^{\circ}C$
Isolation Protection	2500V _{DC}
Response Time	100 μs

DAQ Specifications (Cont.)

Counter

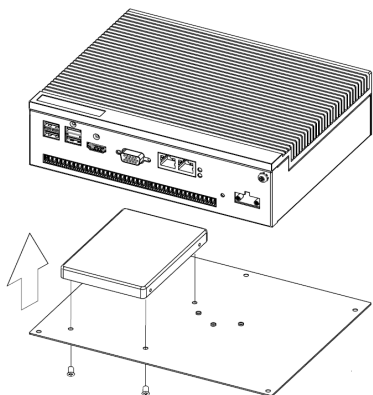
Counter chip	N/A	
Channels	2 channels (independent)	
Resolution	32 bits	
Compatibility	TTL level	
Base Clock	Internal 20 MHz or external clock (10 MHz max.), selectable via software	
Input Frequency	Max. 10 MHz	
Clock Input	Low	0.8 V max.
	High	2.0 V min.
Gate Input	Low	0.8 V max.
	High	2.0 V min.
Counter Output	Low	0.8 V max. @+15mA
	High	2.0 V min. @-15mA
Error in Advanced Functions	Frequency Measurement	0.1% when the input signal frequency is ≥ 40 KHz
	Pulse Width Measurement	0.1% when the input signal frequency is ≤ 40 KHz
	Pulse Output	Within 2% when the output frequency is > 1 MHz
	PWM Output	Within 2% when the output frequency is > 1 MHz

*For full specification, please refer to the user manual

Installation Procedures

HDD Installation

1. Unscrew the 4 screws and remove the rear cover.
2. Unscrew the 4 screws affixing the SSD to the rear cover.
3. Replace the SDD with an HDD.
4. Affix the HDD to the rear cover using the 4 screws.
5. Reconnect the SATA and power cables and replace the rear cover. Secure in place using the 4 screws.

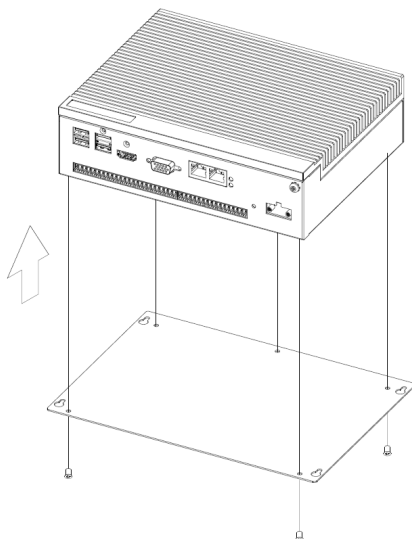


Installation Procedures (Cont.)

Table Mount Installation

MIC-1810 can be integrated with a table mount for easy operation. To prevent the system from overheating, the side of the system with the heat sink must be facing upward.

1. Unscrew the 4 screws affixing the rear cover in place.
2. Align the screw holes of the rear cover with the screw holes of the table mount. Secure the system to the rear cover and table mount using the 4 screws.

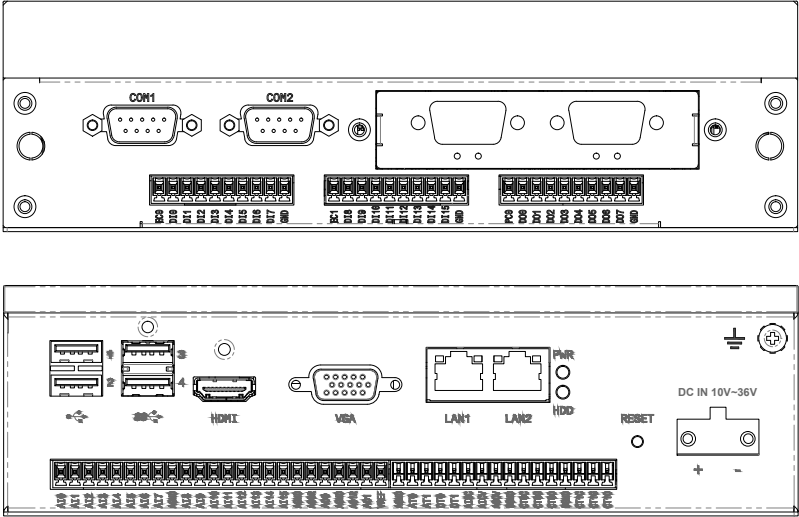


Declaration of Conformity

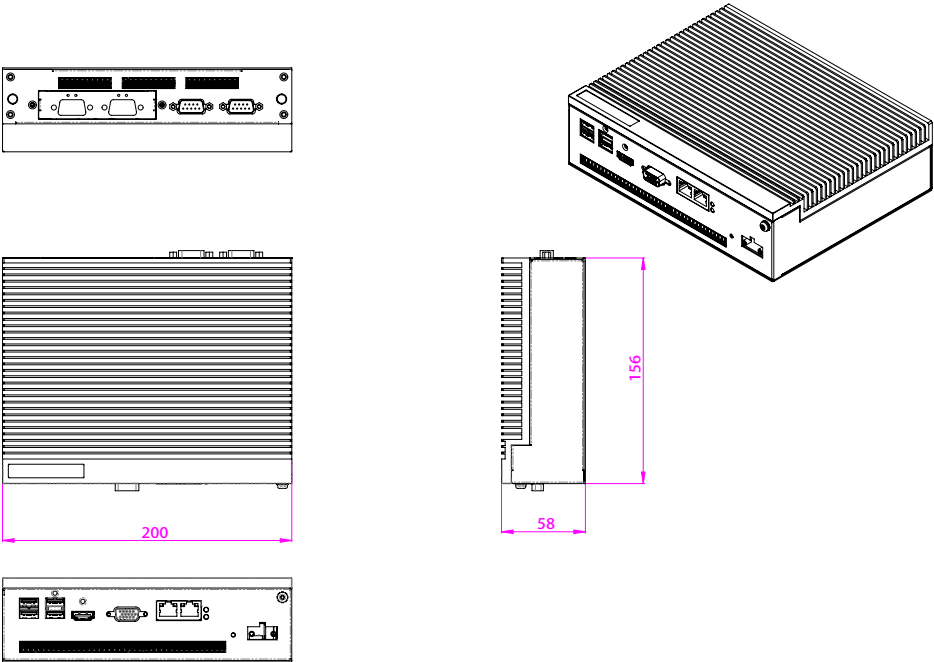
This device complies with the requirements in Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. The device must not cause harmful interference.
2. The device must accept any interference received, including interference that may cause undesired operation

System I/O Interface



System Dimensions



MIC-1810

Intel® Core™ i3-6100U/ Celeron 3955U 微型计算机

快速入门手册

包装清单

安装板卡之前，用户需确认包装中含有本设备以及下面所列各项：

1. 1 x MIC-1810系统 x 1
2. 1 x MIC-1810快速入门手册
3. 1 x MIC-1810用户指南
4. 端子块：1 x 2-pin, 1 x 16-pin, 1 x 24-pin, 3 x 10-pin

如果其中任何一项缺失或损坏，请立即与经销商或销售代表联系。

注意： 如果电池更换不正确，将有爆炸的危险。因此，只可以使用制造商推荐的同一种或者同等型号的电池进行替换。请按照制造商的指示处理旧电池。

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LA MÊME CHOSE OU LE TYPE ÉQUIVALENT RECOM-
MANDÉ PAR LE FABRICANT, JETTER LES BATTERIES
UTILISÉES INSTRUCTIONS DE S SELON FABRICANT
DES' .

Note: 请在技术支持专区搜索以下产品名称以便下载驱
动。
系统：
MIO-5272U-U0A1E for MIC-1810-U0A1E
MIO-5272U-U3A1E for MIC-1810-U3A1E
DAQ 板：MIC-1810 / MIOE-3810

如需了解有关产品及研华其它产品的详细信息，请访问我们的网站：

<http://www.advantech.com>

<http://www.advantech.com/Products>

如需技术服务与支持，请访问我们的技术支持网站：

<http://support.advantech.com.tw/support/default.aspx>

本手册适用于MIC-1810系列Rev. B1。

Part No. 2001181002
台湾印刷

第三版
2020年11月

产品规格

处理器系统

- Intel第六代Core i处理器

内存

- 4GB SODIMM DDR3L 1600

显示

- Intel® HD Graphics 520/510, 支持DirectX12

串行端口

- 2 x RS-232 from COM1/COM2

以太网

- 端口：10/100/1000 Mbps
- 控制器
LAN1: Intel i219
LAN2: Intel i210

存储

- 内置2.5" SSD磁盘盒：1

前部I/O

- 显示：1 x VGA/HDMI
- USB：2 x USB 3.0, 2 x USB 2.0

电源需求

- 电源类型：2 针凤凰接头
- 输入电压：10~36 V_{DC}

其它

- 电源开关
(橙色：系统待机/绿色：系统电源启动)

桌面安装 (可选)

- P/N: 1960099348N001
- 尺寸 (W x L) : 220 x 156 mm

环境

- 工作温度：
-20~60 °C, 0.7m/S气流：带1 x工业SSD
- 相对湿度：95% @ 40 °C (非凝结)

物理特性

- 尺寸 (W x H x D) : 200 x 156 x 56 mm
- 重量：2.41kg (5.31lb)

DAQ规格

DAQ系统内置数据采集模块M10E-3810。

模拟量输入

通道		16路单端/8路差分						
分辨率		12 bits						
内置内存		4K采样数						
采样速率		单路	500 KS/s					
		多路	800 KS/s					
输入范围和增益列表		增益	0.5	1	2	4	8	
		单极	NA	0 ~ 10	0 ~ 5	0 ~ 2.5	0 ~ 1.25	
		双极	+10V, 0-20mA 4-20mA	±5	±2.5	±1.25	±0.625	
偏移		增益	0.5	1	2	4	8	
		零	25 ppm/° C					
		量程	15 ppm/° C					
输入信号带宽 (-3dB)		增益	0.5	1	2	4	8	
		BW (MHz)	1	1.6	1.2	1.2	1.2	
最大输入电压		±15 V						
输入阻抗		1G Ω /2pF						
采样模式		软件或外部						
触发模式		启动触发, 延迟启动触发, 停止触发, 延迟停止触发						
精度		DC	INLE: ±1 LSB (需手动校准)					
			DNLE: ±1 LSB (需手动校准)					
			偏移误差: - 电流测量: ±2.5 μA - 电压测量: ±0.5mV					
			增益	0.5	1	2	4	8
			增益误差 (%FSR)	电流: 0.05 电压: 0.1	0.1	0.2	0.2	0.4
			通道类型	Voltage: 0.1				
		AC	SNR: 68 dB ENOB: 10.5 bits					
外部数字量触发		低: 最大0.8V; 高: 最小2.0V						
		最小脉冲宽度: 50 ns						
外部模拟量触发		范围: -10 ~ 10V						
		分辨率: 12 bits (4.88 mV/step)						

DAQ规格（续）

模拟量输出

通道	2		
分辨率	12 bits		
内存容量	4K采样数		
更新速率	500 KS/s		
输出范围	内部电压位准	0 ~ 5 V, 0 ~ 10 V, $\pm 5\text{ V}$, $\pm 10\text{ V}$	
	外部电压位准	参考输入 -10 $\leq x \leq 10\text{ V}$	最大范围 0 ~ x V -x ~ x V
	单极 双极		
精度	相对	$\pm 1\text{ LSB}$	
	差分非线性	$\pm 1\text{ LSB}$ (单调)	
转换速率	20 V/us		
增益误差	可调至0		
偏移	30 ppm/ Ω		
电流推动能力	5 mA		
输出模式	静态输出、周期波形输出		
输出阻抗	最大0.1 Ω		

隔离数字量输入

通道	16		
输入电压	Wet Contact: Low: 0~3V _{DC} High: 10~30V _{DC} Dry Contact: Low: Connect to GND High: Open		
输入阻抗	3 k Ω		
隔离保护	2500V _{DC}		
响应时间	100 $\mu\text{ s}$		

隔离数字量输出

通道	8		
输出电压	5~40V _{DC}		
输出类型	Sink (NPN)		
汇电流	350mA max./channel @ 25° C 250mA max./channel @ 60° C		
隔离保护	2500V _{DC}		
响应时间	100 $\mu\text{ s}$		

DAQ规格（续）

计数器

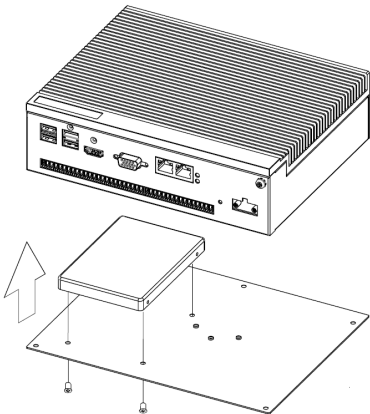
计数器芯片	N/A	
通道	2 通道（独立）	
分辨率	32 bits	
兼容性	TTL电平	
基准时钟	内部20MHz或外部时钟（最大10 MHz）. 可通过软件选择	
输入频率	最大10MHz	
时钟输入	低	最大0.8 V
	高	最小2.0 V
门输入	低	最大0.8 V
	高	最小2.0 V
计数器输出	低	最大0.8 V @+15mA
	高	最小2.0 V @-15mA
高级功能误差	频率测量	0.1%，输入信号频率 ≥ 40KHz
	脉冲宽度测量	0.1%，输入信号频率 ≤ 40KHz
	脉冲输出	小于2%，输出频率 > 1MHz
	PWM输出	小于2%，输出频率> 1MHz

请参考用户手册查看完整规格。

简易安装指导

HDD安装

1. 卸下4颗螺丝后移除底盖。
2. 从底盖上卸下用于固定SSD的4颗螺丝。
3. 插接SATA线缆/电源线后放回后盖并用4颗螺丝固定。

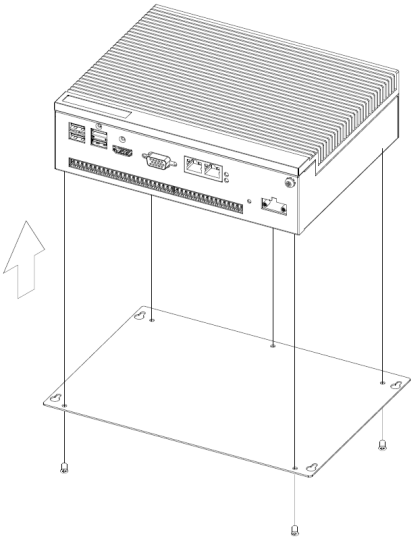


简易安装指导（续）

桌面安装

MIC-1810支持桌面安装。为避免系统过热，散热片一侧必须朝上放置。

1. 卸下4颗螺丝。
2. 底盖对齐后使用4颗螺丝进行固定完成桌面安装。

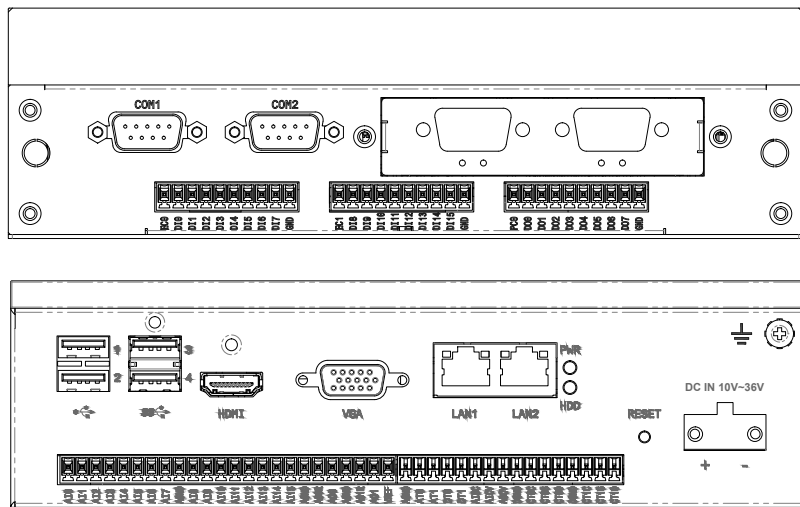


符合性声明

本品符合FCC规则第15款限制。操作符合下列两种情况：

1. 此设备不可产生干扰，
2. 本设备必须接受任何收到的干扰，但干扰可能导致意外操作。

系统I/O接口



系统尺寸

