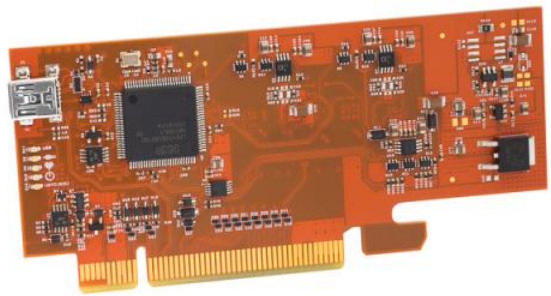


Overview

The Acroname 18-channel MTM Analog I/O Module (MTM-DAQ-2), part of Acroname's MTM (Manufacturing Test Module) product series, is a ruggedized software-controlled analog measurement (ADC) and voltage source (DAC) module. The MTM-DAQ-2 allows MTM system designers to easily and modularly add analog voltage measurement and sources to their test system designs.

Ideal for use in high-reliability manufacturing or development testing environments, all features of the MTM-DAQ-2, including analog inputs, analog outputs, digital IO, and I²C communication channels are electrically protected for ESD strikes, overvoltage, over-current and short circuit conditions.

Built using Acroname's industry-proven and well-adopted BrainStem® technology, resources on the MTM-DAQ-2 are controlled via Acroname's powerful and extensible BrainStem® software APIs.

Typical applications include:

– Manufacturing functional testing
– Validation testing
– Automated test development
– Embedded system development

Features

– 16 differential bi-polar 16-bit analog inputs (ADC) with programmable gain
– 2 bipolar 12-bit analog voltage sources (DAC) with programmable gain
– 1 BrainStem I²C FM+ (1Mbit/s) bus
– 2 overvoltage, short-circuit and over-current protected digital GPIOs

Description

The MTM-DAQ-2 module is a key component for manufacturing test and R&D of devices requiring precision voltage measurements. For more information on the MTM platform architecture, please refer to www.acroname.com.

The MTM-DAQ-2 implements an on-board BrainStem controller running a RTOS (Real-Time Operating System), which provides a USB host connection, Independent operating capability and the BrainStem interface, for control of the MTM resources identified in this datasheet.

The MTM-DAQ-2 primarily provides 16 channels of 16-bit, differential analog voltage measurements with two independent ADCs. Each channel has individually programmable gain allowing for selectable input ranges of ±10.24V, 0-10.24V, ±5.12V, 0-5.12V, ±2.56V, 0-2.56V, ±1.28V, 0-1.28V and ±0.64V. Two of the differential channels have selectable input ranges of ±10.24V, ±5.12, ±2.56V, ±1.28V, ±1.024V, ±640mV, ±512mV, ±256mV, ±128mV, and ±64mV. Further, the MTM-DAQ-2 provides two 12-bit, buffered-output analog DAC channels with selectable ranges of 0-2.048V, 0-4.096V, and ±10.24V. All of these features are easily controlled via the BrainStem API.

Within the MTM platform architecture, the MTM-DAQ-2 module can operate either independently or as a component in a larger network of MTM modules. Each MTM-DAQ-2 is uniquely addressable and controllable from a host by connecting via the on-board USB connection, the card-edge USB input or through other MTM modules on the local MTM/BrainStem I2C bus.

Acroname's BrainStem™ link is established over the selected input connection. The BrainStem link allows a connection to the on-board controller and access to the available resources in the MTM-DAQ-2. The MTM-DAQ-2 can then be controlled via a host running BrainStem APIs or it can operate independently by running locally embedded, user-defined programs based on Acroname's BrainStem Reflex language in the RTOS.

IMPORTANT NOTE:

The MTM-DAQ-2, like all MTM modules, utilizes a PCIe connector interface but is for use strictly in MTM-based systems – it should never be installed in a PCI slot of a host computer directly. Insertion into a PC or non-MTM system could cause damage to the PC.

Absolute Maximum Ratings

Stresses beyond those listed under ABSOLUTE MAXIMUM RATINGS can cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under RECOMMENDED OPERATING CONDITIONS is not implied. Exposure to absolute-maximum rated conditions for extended periods affects device reliability and may permanently damage the device.

Parameter	Minimum	Maximum	Units
Input Voltage, V_{supply}	6.0	12.0	V
$A_{IN\text{-}nP}$, $A_{IN\text{-}nN}$ to GND, n=[0-15]	-40	40	V
Any I2C pin to GND	0.0	5.5	V
A_{out_n} to GND	-12	12	V

Table 1: Absolute Maximum Ratings

The MTM system is designed to be used in a system where V_{supply} is the highest voltage connected to all MTM modules. Each module is designed to withstand V_{supply} continuously connected to all IOs, excepting those specified above, including accidental reverse polarity connection between V_{supply} and ground (0V). As with all products, care should be taken to properly match interface voltages and ensure a well-architected current-return path to ground. As with all devices utilizing USB interfaces, care should be taken to avoid ground loops within the USB subsystem. When using the USB interface, ground must be at 0V potential to avoid damaging connected host systems.

Handling Ratings

Parameter	Conditions/Notes	Minimum	Typical	Maximum	Units
Ambient Operating Temperature, T_A	Non-Condensing	0.0	25.0	70.0	°C
Storage Temperature, T_{STG}		-10.0	-	85.0	°C
Electrostatic Discharge, V_{ESD}	IEC 61000-4-2, level 4, contact discharge to edge connector interface	0.0	-	±8000	V

Table 2: Handling Ratings

Recommended Operating Ratings

Values presented apply to the full operating temperature range.

Parameter	Conditions/Notes	Minimum	Typical	Maximum	Units
Input Voltage, V_{supply}		6.0	-	12.0	V
$A_{IN\text{-}nP}$, $A_{IN\text{-}nN}$	For *n* = [0-15]	-10.24	-	10.24	V
$A_{OUT\text{-}nP}$	For *n* = [16-17]	-10.24	-	10.24	V

Table 3: Recommended Operating Ratings

Block Diagram

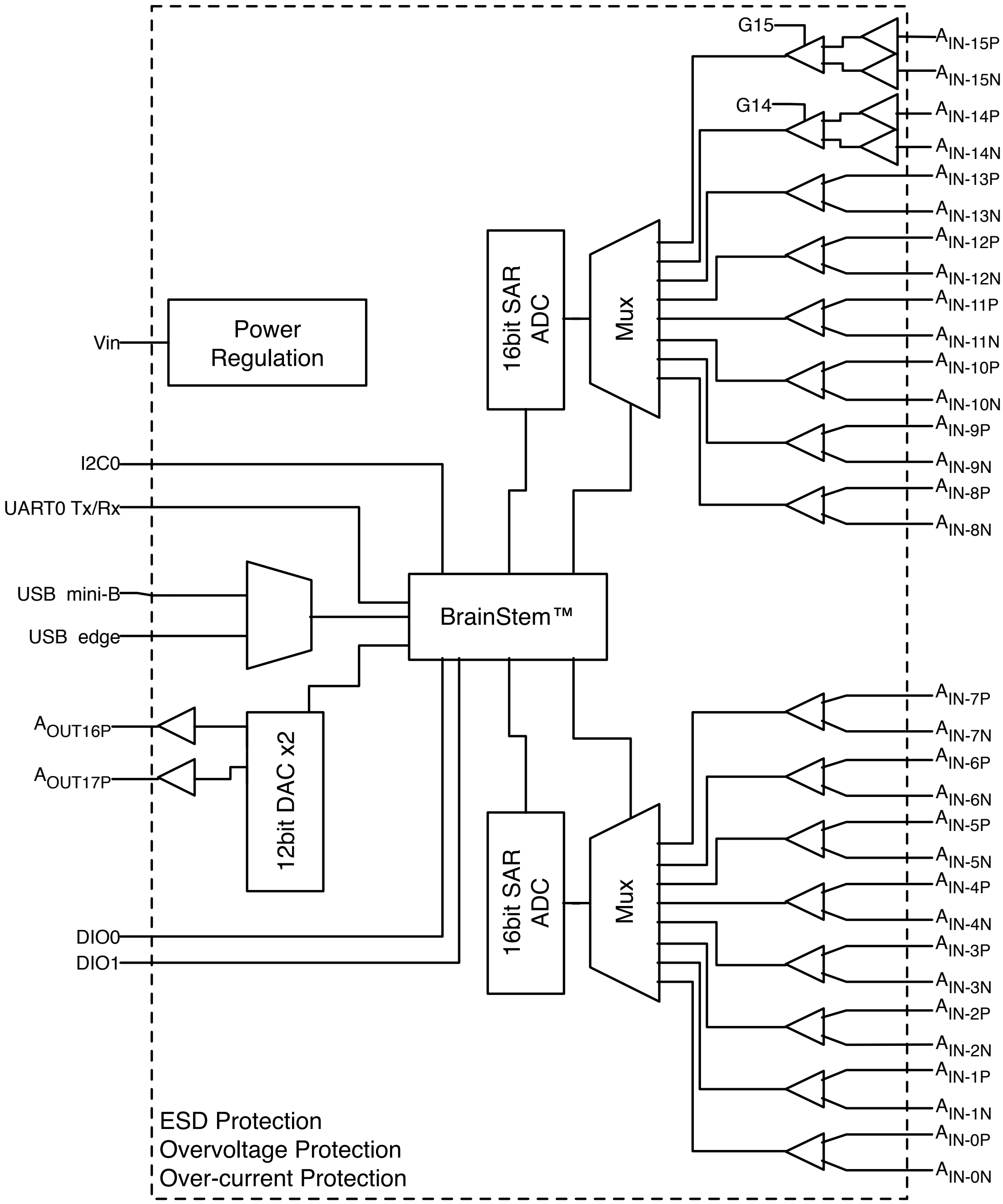


Figure 1: MTM-DAQ-2 Block Diagram

Typical Performance Characteristics

Values presented apply to the full operating temperature range.

Parameter	Conditions/Notes	Minimum	Typical	Maximum	Units
Base Current Consumption, I_{supply}	Input voltage = 6V Input voltage = 12V	225 120	250 140	275 160	mA
Reset Low Threshold		-	1.2	-	V
I2C SDA, SCL Pins		0.0	3.3	5.0	V
Z_{id}, Input Differential Impedance	n = [0…15]		20 || 1		GΩ || pF
Z_{ii}, Input Common-mode Impedance	n = [0…15]		10 || 5		GΩ || pF
Input Bias Current, I_B	n = [0…15]	-	35	65	nA
Full-scale Analog Input Measurement Resolution *n* = [0…13]	Input range = ±10.24V	-	313	-	μV
	Input range = 0-10.24V	-	156	-	μV
	Input range = ±5.12V	-	156	-	μV
	Input range = 0-5.12V	-	78	-	μV
	Input range = ±2.56V	-	78	-	μV
	Input range = 0-2.56V	-	40	-	μV
	Input range = ±1.28V	-	40	-	μV
	Input range = 0-1.28V	-	20	-	μV
	Input range = ±0.64V	-	20	-	μV
	Input range = 0-0.64V	-	10	-	μV
Full-scale Analog Input Measurement Resolution *n* = [14,15]	Input range = ±10.24V	-	313	-	μV
	Input range = ±5.12V	-	156	-	μV
	Input range = ±2.56V	-	78	-	μV
	Input range = ±1.28V	-	40	-	μV
	Input range = ±0.64V	-	20	-	μV
	Input range = ±1.024V	-	32	-	μV
	Input range = ±512mV	-	16	-	μV
	Input range = ±256mV	-	8	-	μV
	Input range = ±128mV	-	4	-	μV
	Input range = ±64mV	-	2	-	μV
Full-scale Analog Input Measurement Error *n* = [0…15]	Input range = ±10.24V	-1.0	-	1.0	mV
	Input range = ±5.12V	-1.0	-	1.0	mV
	Input range = ±2.56V	-1.0	-	1.0	mV
	Input range = ±1.28V	-1.0	-	1.0	mV
	Input range = ±0.64V	-1.0	-	1.0	mV

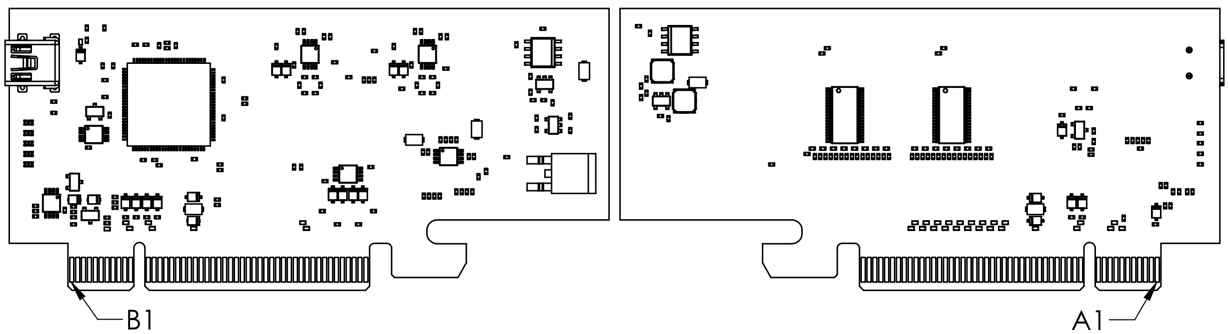
	Input range = ±1.024V	-1.0	-	1.0	mV
	Input range = ±512mV	-1.0	-	1.0	mV
	Input range = ±256mV	-1.0	-	1.0	mV
	Input range = ±128mV	-1.0	-	1.0	mV
	Input range = ±64mV	-0.2	-	0.2	mV
Full-scale Analog Output Range Resolution *n* = [16,17]	Output range = ±10.24V	-	5000	-	μV
	Output range = 0-4.096V	-	1000	-	μV
	Output range = 0-2.048V	-	500	-	μV
Full-scale output range error *n* = [16,17]	Output range = ±10.24V	-40	-	40	mV
	Output range = 0-4.096V	-2.0	-	2.0	mV
	Output range = 0-2.048V	-2.0	-	2.0	mV
Analog Output Sink Current		-	-	-15.0	mA
Analog Output Source Current		-	-	12.0	mA
Digital Output V_{HI}		-	3.3	-	V
Digital Input Logic High, V_{IH}		2.15	-	-	V
Digital Input Logic Low, V_{IL}		-	-	1.1	V
Digital Output Drive Current	Output high; short to GND Output high into 2.97V	- -	20.0 3.15	30.0 -	mA
Digital Output Sink Current	Output low; short to V_{supply}	-	-20.0	-30.0	mA
Digital Output Short Duration	Output high	-	Infinite	-	hours
Digital Output Overvoltage	V_{supply} on pin	-	Infinite	-	hours
Digital Output Sink Current		-	-	-20.0	mA
Digital Output Source Current	<10% voltage drop (V_{output} >= 2.97V)	-	-	3.15	mA
Digital Input Resistance	Configuration mode set to both Input and High-Z	-	4.25	4.45	MΩ
Digital Input Leakage Current	Configuration mode set to both Input and High-Z	-	110	-	uA

Table 4: Typical Performance Characteristics

Pinout Descriptions

WARNING: Acroname's MTM line features a PCIe connector that is common in most desktop computers; however, they are NOT intended nor designed to work in these devices. Do NOT insert this product into any PCIe slot that wasn't specifically designed for this product! Failure to follow this warning WILL result in damage to this product and any device you connect it to.

The MTM edge connector pin assignments are shown in the following table. Please refer to Table 3: Recommended Operating Ratings for appropriate signal levels.



Pins Common to all MTM Modules

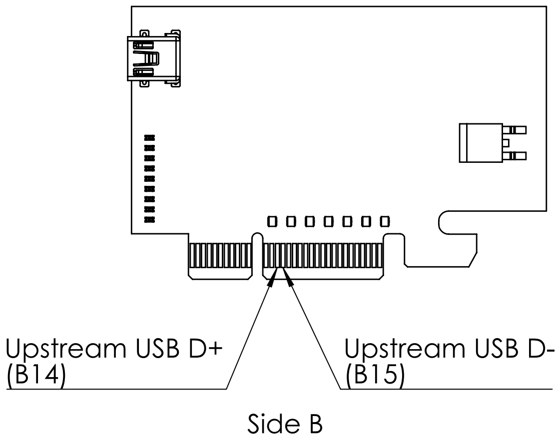
Edge Connector Side A	Edge Connector Side A Description	Edge Connector Side B	Edge Connector Side B Description
1	GND	1	Input Voltage, V_{supply}
2	GND	2	Input Voltage, V_{supply}
3	GND	3	Input Voltage, V_{supply}
4	GND	4	Input Voltage, V_{supply}
5	Reset	5	Input Voltage, V_{supply}
6	GND	6	Reserved, Do Not Connect
7	GND	7	Reserved, Do Not Connect
8	I^{2}C0 SCL	8	GND
9	I^{2}C0 SDA	9	GND
10	GND	10	Reserved, Do Not Connect
11	GND	11	Reserved, Do Not Connect
12	Module Address Offset 0	12	Module Address Offset 2
13	Module Address Offset 1	13	Module Address Offset 3

Pins Specific to MTM-DAQ-2

Edge Connector Side A	Edge Connector Side A Description	Edge Connector Side B	Edge Connector Side B Description
14	Reserved, Do Not Connect	14	USB Upstream Data +
15	Reserved, Do Not Connect	15	USB Upstream Data -
16:17	Reserved, Do Not Connect	16:17	Reserved, Do Not Connect
18	Digital IO 1	18	Digital IO 0
19	Analog CH0 Positive Input	19	Analog CH1 Positive Input
20	Analog CH0 Negative Input	20	Analog CH1 Negative Input
21	Analog CH2 Positive Input	21	Analog CH3 Positive Input
22	Analog CH2 Negative Input	22	Analog CH3 Negative Input
23	Analog CH4 Positive Input	23	Analog CH5 Positive Input
24	Analog CH4 Negative Input	24	Analog CH5 Negative Input
25	Analog CH6 Positive Input	25	Analog CH7 Positive Input
26	Analog CH6 Negative Input	26	Analog CH7 Negative Input
27	Analog CH8 Positive Input	25	Analog CH9 Positive Input
28	Analog CH8 Negative Input	26	Analog CH9 Negative Input
29:33	Reserved, Do Not Connect	29:33	Reserved, Do Not Connect
34	Analog CH10 Positive Input	34	Analog CH11 Positive Input
35	Analog CH10 Negative Input	35	Analog CH11 Negative Input
36	Analog CH12 Positive Input	36	Analog CH13 Positive Input
37	Analog CH12 Negative Input	37	Analog CH13 Negative Input
38	Analog CH14 Positive Input	38	Analog CH15 Positive Input
39	Analog CH14 Negative Input	39	Analog CH15 Negative Input
40	Analog CH16 Positive Output	40	Analog CH17 Positive Output
41:49	Reserved, Do Not Connect	41:49	Reserved, Do Not Connect

Upstream USB Connectivity Options

All MTM modules with upstream USB connections (excluding MTM-EtherStem) have two methods for connection via USB: through the Mini-B connector, or through pins B14 and B15 of the PCIe edge connector (below). The upstream mode defaults to AUTO, which prioritizes based on the presence or absence of VBUS at the Mini-B connector.



Module Hardware and Software Default Values

The MTM-DAQ-2 module utilizes a subset of BrainStem entity implementations that are specific to the hardware's capabilities. Table 5: MTM-DAQ-2 Hardware and Software Default Values details the BrainStem API entities and macros used to interface to the MTM-DAQ-2 module. For C and C++ developers, these macros are defined in `aMTMDAQ2.h` from the BrainStem development package. For Python development, the module `MTM-DAQ-2` class defines the extent of each entity array.

While the BrainStem API entities define the full potential functionality of a given interface, not all features are supported by the MTM-DAQ-2 module. Table 5: MTM-DAQ-2 Hardware and Software Default Values defines each of the options implemented with each entity, which varies by entity index. Calling an unsupported entity option will return an appropriate error (e.g.: `aErrInvalidEntity`, `aErrInvalidOption`, `aErrMode`, or `aErrUnimplemented`) as defined in `aError.h` for C and C++ and the `Result` class in Python.

Parameter	Index	Macro Name or Implemented Options	Notes
Module Definitions:			
Module Base Address	10	aMTMDAQ2_MODULE_BASE_ADDRESS	See aMTMDAQ2.h
Entity Class Definitions:			
`analog` Entity Quantity	18	aMTMDAQ2_NUM_ANALOGS	
`digital` Entity Quantity	2	aMTMDAQ2_NUM_DIGITALS	
`i2c` Entity Quantity	1	aMTMDAQ2_NUM_I2C	
`Store` Entity Quantity	2	aMTMDAQ2_NUM_STORES	
`system` Entity Quantity	1		
`timer` Entity Quantity	8	aMTMDAQ2_NUM_TIMERS	

Table 5: MTM-DAQ-2 Hardware and Software Default Values[1]

[1] Refer to `aMTMDAQ-2.h` within the BrainStem Development Kit download for actual file.

Capabilities and Interfaces

The MTM-DAQ-2 module software is built on Acroname's BrainStem technology. The module adheres to the BrainStem protocol on I^2C and uses BrainStem software APIs. For the most part, functionality that is unique to the MTM-DAQ-2 is described in the following sections; refer to Table 6: Supported MTM-DAQ-2 BrainStem Entity API Methods for a complete list of all available API functionality. All shortened code snippets are loosely based on the C++ method calls – Python and Reflex are virtually the same. Please consult the BrainStem Reference for implementation details[2].

System Entities

Every BrainStem module includes a single System Entity. The System Entity allows access to configuration settings such as the module address, input voltage, control over the user LED and many more.

Saving Entity Settings

Some entities can be configured and saved to non-volatile memory. This allows a user to modify the startup and operational behavior for the MTM-DAQ-2 away from the factory default settings. Saving system settings preserves the settings to become the new default. Most changes to system settings require a save and reboot before taking effect. Use the following command to save changes to system settings before reboot:

```
stem.system.save()
```

Saved Configurations	
Software Offset	I2C Rate
Router Address	I2C Pullup State
Heartbeat Rate	Boot Slot

Store Entities

Every BrainStem module includes several Store entities and on-board memory slots to load Reflex files (for details on Reflex, see BrainStem Reference online http://acroname.com/entities/index.html). One Reflex file can be stored per slot. Store[0] refers to the internal memory, with 12 available slots, and store[1] refers to RAM, with 1 available slot.

Analog Entities

The MTM-DAQ-2 has sixteen (16) analog inputs (ADC) and two (2) analog outputs (DAC) all controlled by the analog entity. Each analog is controllable via software and is independently current-limited for both source and sink currents. The analog inputs are connected to a 16-bit ADC, and return a voltage value in microvolts.

Analog[0…13] are fully-differential with individually selectable input ranges of ±10.24V, 0-10.24V, ±5.12V, 0-5.12V, ±2.56V, 2.56V, ±1.28V, 0-1.28V, and ±0.64V.

```
stem.analog[0].setRange(analogRangeP10V24N
10V24)
v = stem.analog[0].getVoltage()
```

Analog[14, 15] are fully differential and have the bipolar ranges above and the additional ranges of ±1.024V, ±512mV, ±256mV, ±128mV, ±64mV.

```
stem.analog[14].setRange(analogRangeP0V064
N0V064)
v = stem.analog[14].getVoltage()
```

Analog[16, 17] are analog outputs with individually selectable ranges of 0-2.048V, 0-4.096V, and ±10.24V. The outputs are connected to a 12-bit DAC and take a voltage setpoint in microvolts. These outputs default to having their outputs disabled, so setEnable(1) must be called before their voltage will be present on their respective pins.

```
stem.analog[16].setRange(analogRangeP4V096
N0V0)
stem.analog[16].setVoltage(voltage)
stem.analog[16].setENABLE(1)
```

Digital Entities

The MTM-DAQ-2 has two (2) digital input/outputs (DIO) controlled by the digital entity. Each DIO is controllable via software and is independently current limited for both source and sink currents.

All DIO are input and output capable.

```
stem.digital[0].setConfiguration(mode)
stem.digital[0].getConfiguration(mode)
```

The *mode* parameter is an integer that correlates to the following:

- 0 (digitalConfigurationInput)
- 1 (digitalConfigurationOutput)
- 4 (digitalConfigurationHiZ)

If a digital pin is configured as output mode, setting the digital logic level:

```
stem.digital[0].setState(level)
```

If a digital pin is configured as input mode, reading the digital logic level:

```
stem.digital[0].getState(level)
```

If a digital pin is configured in HighZ mode its internal circuitry has been disconnected to create a high impedance. There are no functions that can act on this configuration.

Digital	Input	Output	HighZ	RCServo
DIO0	Yes	Yes	Yes	None
DIO 1	Yes	Yes	Yes	None

I^2C Entities

The MTM-DAQ-2 includes access to a single I^2C bus operating at a set 1Mbit/s rate.

NOTE: The 1Mbit/s bus, while user-accessible, is also used for primary BrainStem communication so there may be other, non-user-initiated traffic as well, particularly with linked BrainStem units.

The maximum data size for individual `read` and `write` operations on an I^2C bus through the BrainStem API is 20 bytes. Sending more than 20 bytes of information has to be done as an iterated sequence. For example, sending 2 bytes (0xBEEF) through the I^2C bus to a device with an address 0x42 would be written:

```
stem.i2c.write(0x42, 2, 0xBEEF)
```

Reading 2 bytes of data from a device with an address 0x42 would be written:

```
stem.i2c.read(0x42, 2, buffer)
```

Where *buffer* would be a char array in C++.

Each I^2C bus also includes, as a convenience, software-controllable 330Ω pull-up resistors on the SDA and SCL lines, disabled by default. When using the MTM-DAQ-2 in a linked system (communicating over the 1Mbit/s bus), only a single set of pull-ups along the bus should be enabled in order for the I^2C bus to work properly (if more than one set is enabled, the lines cannot be pulled low for communication). Similarly, when using a single MTM device to communicate with an external device over the I^2C bus, either the internal pull-ups can be enabled, or external hardware pull-ups added.

```
stem.i2c.setPullUp(bEnable)
```

The *bEnable* parameter is an integer that correlates to the following:

- 0 (I^2C pull-ups off)
- 1 (i2cSetPullup)

MTM-DAQ-2 Supported Entity Methods Summary

Detailed entity class descriptions can be found in the BrainStem Reference (http://acroname.com/entities/index.html). A summary of MTM-DAQ-2 class options are shown below. Note that when using Entity classes with a single index (aka, 0), the index parameter can be dropped. For example:

```
stem.system[0].setLED(1) → stem.system.setLED(1)
```

Entity Class	Entity Option	Variable(s) Notes
digital[0-1]	setConfiguration	
	getConfiguration	
	setState	
	getState	
i2c[0]	write	
	read	
	setPullup	Disabled by default. I2C communication requires a single set of pull-ups enabled across the bus.
analog[0-15]	getVoltage	
	getValue	
	setRange	
	getRange	
analog[16-17]	setVoltage	
	getVoltage	
	setValue	
	getValue	
	setRange	
	getRange	
	setEnable	
	getEnable	
store[0-2]	getSlotState	
	loadSlot	
	unloadSlot	
	slotEnable	
	slotDisable	
	slotCapacity	
	slotSize	
system[0]	save	
	reset	
	setLED	
	getLED	

	setBootSlot	
	getBootSlot	
	getInputVoltage	
	getVersion	
	getModuleBaseAddress	
	getModuleSoftwareOffset	
	setModuleSoftwareOffset	
	setHBInterval	
	getHBInterval	
	getRouterAddressSetting	
	getModule	
	getSerialNumber	
	setRouter	
	getRouter	
	getModel	
timer[0-8]	getExpiration	
	setExpiration	
	getMode	
	setMode	

Table 6: Supported MTM-DAQ-2 BrainStem Entity API Methods[2]

[2] See BrainStem software API reference at https://acroname.com/reference/ for further details about all BrainStem API methods and information.

LED Indicators

The MTM-DAQ-2 board has a number of LED indicators to assist with MTM system development, debugging, and monitoring. These LEDs will be shown in the diagrams below (TBD).

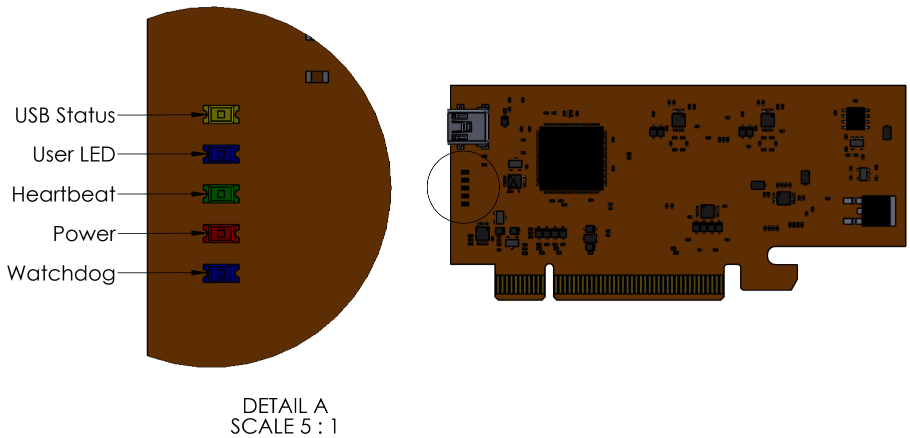
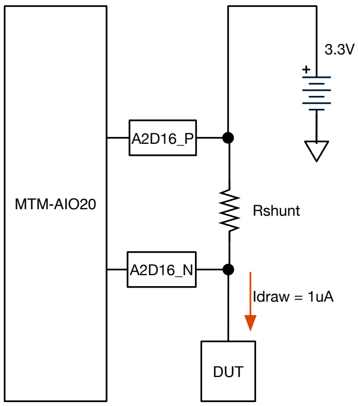


Figure 2: MTM-DAQ-2 LED Indicators

Application Examples



A2D Range	A2D LSB	Rshunt
±2048uV	62.5pV	62.5uΩ
±20.48mV	62.5nV	625mΩ
±204.8mV	6.25uV	6.25Ω
±1.024V	31.25uV	31.25Ω
±2.048V	62.5uV	62.5Ω

Figure 3 Measuring 1uA current consumption.

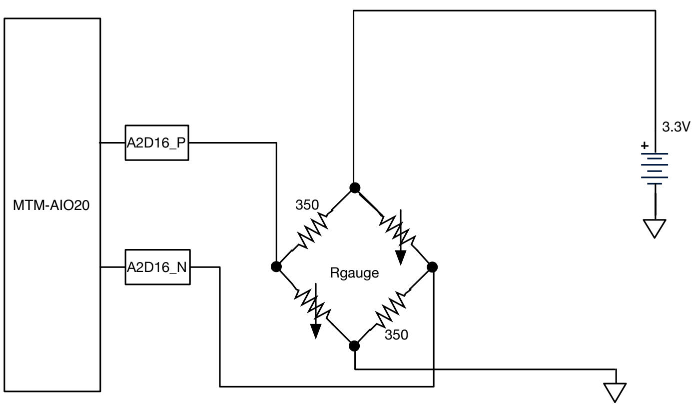


Figure 4 Strain Gauge Interface.

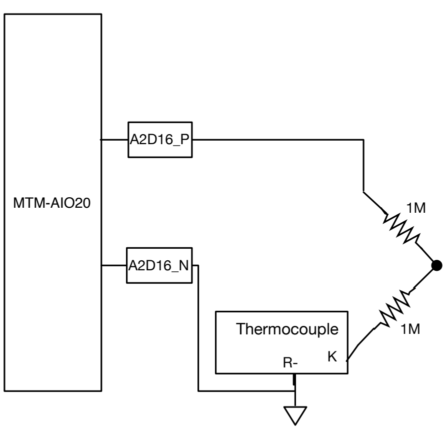


Figure 5 K-Type Thermocouple Interface.

Edge Connector Interface

All MTM products are designed with an edge connector interface that requires a compatible edgeboard connector on the carrier PCB. Acroname recommends the through-hole PCI-Express (PCIe) Vertical Connector. The connectors can be combined with an optional retention clip, as shown below.

MTM Product	Manufacturer	Manufacturer Part Number	Description
MTM-Relay	Amphenol FCI Samtec	10018784-10203TLF PCIE-164-02-F-D-TH	PCI-Express 164-position vertical connector
MTM-DAQ-2	Amphenol FCI Samtec	10018784-10202TLF PCIE-098-02-F-D-TH	PCI-Express 98-position vertical connector
MTM-IO-Serial	Amphenol FCI Samtec	10018784-10202TLF PCIE-098-02-F-D-TH	PCI-Express 98-position vertical connector
MTM-PM-1	Amphenol FCI Samtec	10018784-10201TLF PCIE-064-02-F-D-TH	PCI-Express 64-position vertical connector
MTM-USBStem	Amphenol FCI Samtec	10018784-10201TLF PCIE-064-02-F-D-TH	PCI-Express 64-position vertical connector
MTM-EtherStem	Amphenol FCI Samtec	10018784-10201TLF PCIE-064-02-F-D-TH	PCI-Express 64-position vertical connector
All Models	Amphenol FCI	10042618-003LF	PCI-Express Retention Clip (optional)

Table 7: PCI-Express Edge Connectors for MTM Products

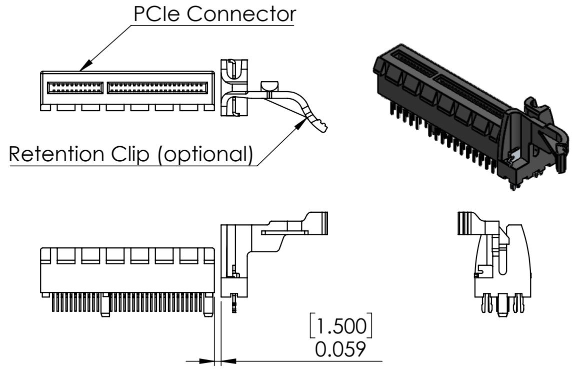


Figure 6: PCIe Vertical Connector with optional Retention Clip

MTM Edge Connector Specifications	Description
Contact Finish	Gold
Card Thickness	0.0625" [1.59mm]
Number of Rows	2
Number of Positions	Variable (see Table 7: PCI-Express Edge Connectors for MTM Products)
Pitch	0.039" (1.00mm)

Table 8: MTM Edge Connector Specifications

Amphenol FCI Drawings and Layout: http://portal.fciconnect.com/Comergent//fci/drawing/10018784.pdf

Amphenol FCI Product Specification: http://portal.fciconnect.com/res/en/pdffiles/Specs/gs-12-233.pdf

Samtec Product Catalog: http://suddendocs.samtec.com/catalog_english/pcie.pdf

Mechanical

Dimensions are shown in inches [mm]. 3D CAD models are available through the MTM-DAQ-2 product page's Downloads section.

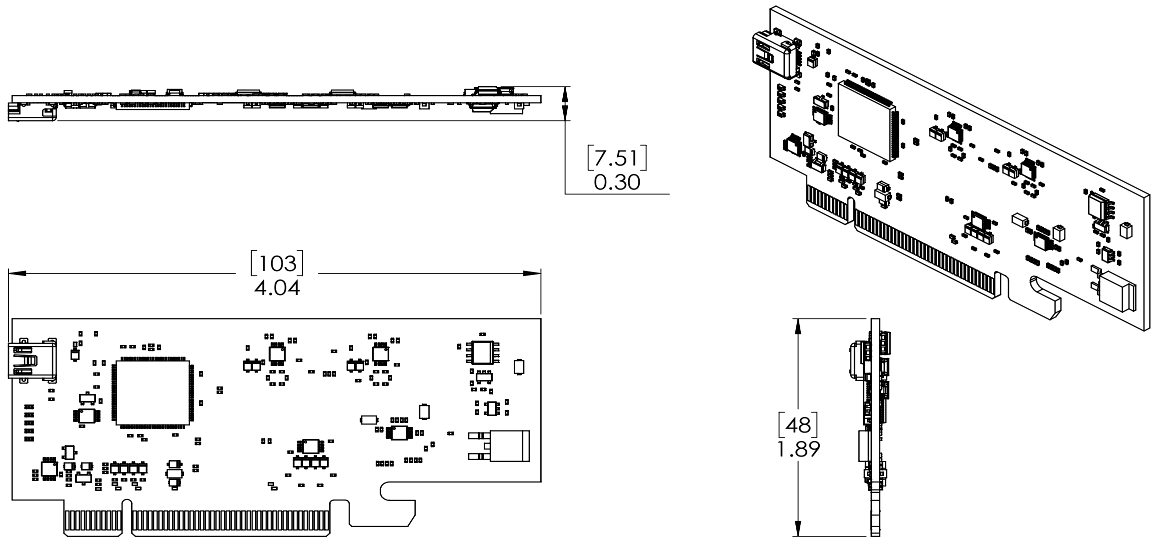


Figure 7: MTM-DAQ-2 Mechanical

Module Address Hardware Offset Configuration

A hardware offset is one of two ways to modify the devices Module/I2C address. For detailed information on BrainStem networking see the reference guide.

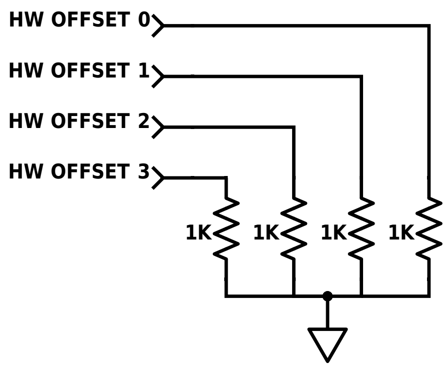


Figure 8: Module Address Hardware Offset

Document Revision History

All major documentation changes will be marked with a dated revision code

Revision	Date	Engineer	Description
1.0	September, 2018	LCD	Initial Release
1.1	September, 2018	JLG	Update analog[16-17] entities and spec table
1.2	October, 2019	GCF	Updated DAQ 1 to DAQ 2 typos Fixed #define reference names Fixed table 7