A-T Controls, Inc.

MIGHTY CONTROLLER

MVC Series

- Compact Design
- High Resolution Analog (16 bit)
- Touchscreen Interface
- Embedded Position Sensor
- DCS and Modbus Compatible
- Universal Power Supply

DESCRIPTION

The Mighty Controller is a rugged next generation edge computing device targeted at device OEMs and system integrators who want to modernize their approach to local system controls. Offering vast connectivity through multiple industry standard communication protocols and flexible iGPIO®, the Mighty Controller can take the place of entire control cabinets in a fractional footprint. This allows system integrators to migrate solutions from a traditional hand-wired PLC cabinet to an embedded instrument, yielding better quality, performance, efficiency, and marketability.

Innovative Technology

A-T Controls' proprietary iGPIO® technology is the pinnacle of industrial I/O flexibility. iGPIO® allows developers to programmatically assign any industrial signal type to each of the Mighty Controller's **24** physical terminal points. Each terminal point supports 0-5V, 0-10V, 0-20mA, 4-20mA, and 24V digital input and output signal types. Signal types are entirely software configurable, and no external resistors or alternate wiring is required.

MVCG2 Digital Controller

MIGHTY CONTROLLER

FEATURES

- High contrast OLED Touchscreen Display
- 16 bit Analog Channels
- Industry standard communication protocols
- 24 point iGPIO®
- ARM Cortex processor
- 1GB onboard flash
- Dedicated secondary I/O microprocessor
- Extremely wide temperature range
- Universal Isolated Power Supply

APPLICATIONS

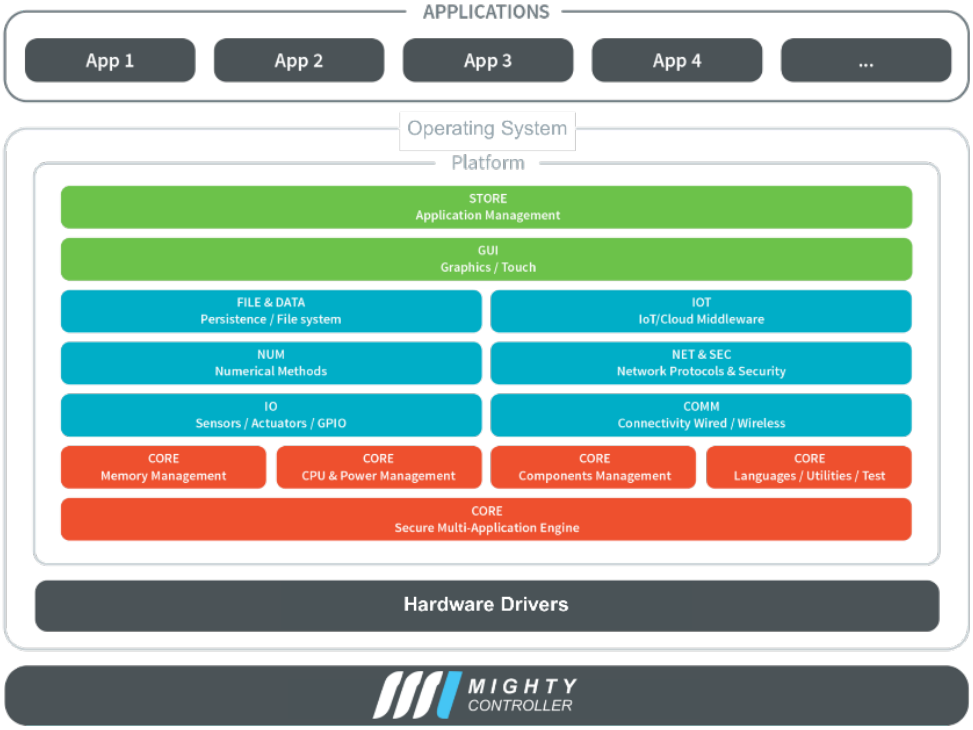
- Pressure Control
- Flow Control
- Temperature Control
- Emissions Detections
- Process monitoring
- Condition monitoring
- Predictive Maintenance
- Optimization

STANDARDS

- IEC 61010-1

MIGHTY CONTROLLER

SOFTWARE



The Mighty Controller operates on the Smart-Device/App-Store principle. Apps are field downloadable from the A-T Controls website and can also be pre-installed at the factory. Users may choose to develop their own applications. For this, the Mighty Controller includes a complete IIOT-ready operating system, supporting factory and field programmability. By leveraging this extensive built-in framework, users can quickly and easily build application level software, without suffering through monotonous middle and low-level firmware.

The Mighty Controller's sophisticated OS provides and environment that facilitates rapid software concept-to-deployment. The OS is supported by an ultra-high-performance ARM Cortex based computation engine which far surpasses the capabilities of traditional PLC and RTU architectures. This allows the controller to easily compute sophisticated algorithms, so far unachievable by traditional PLC's, including Machine Learning and Statistical modeling.

ARM POWERED

A single application or multiple apps may run on the Mighty Controller simultaneously. Each app may share data with other apps internally, and the apps may control interrelated or completely segregated processes. It is possible to consolidate several discrete controllers and instruments with only 1 Mighty Controller running multiple apps to support the overall application. When more I/O is required, simply daisy-chain multiple Mighty Controllers together through an inter-device communication link.

Specifications

ELECTRICAL

Parameter	Description	Value	Units
Input Voltage	Allowable power supply voltage ranges	10 - 40 VDC 100 - 340 VDC 85-265 VAC (50/60Hz)	Volts
Supply Input Isolation	Power Supply Input Isolation Resistance (High Voltage Only)	100 MΩ	MΩ
		500 VDC	Volts
		25°C / 70% RH	%RH
Surge Protection	EMC Immunity Details	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, heavy industry level (surge L-N:1KV) criteria A, 500mA Fused	kV mA
Power	Maximum power consumed during operation	15 W	Watts

TERMINALS

Parameter	Power Terminal	Control Terminals
Wire Size	14-22 AWG (18 AWG recommended)	16-30 AWG (20 AWG recommended)
Voltage Rating	300 Vrms	300 Vrms
Current Rating	25A	8A
Pitch	5.0 mm	3.5 mm
Screw Torque	3.0 lb-in	2.0 lb-in

DISCRETE I/O

Parameter	Description	Value	Units
Input Quantity	Number of discrete inputs	24	ea.
Output Quantity	Number of discrete outputs	24	ea.
Input Types	Input hardware type	24VDC Sinking or Open Drain	Volts
Output Types	Output hardware type	24VDC Sourcing	Volts
Input Impedance	Nominal impedance to ground	4.7kΩ	kΩ

ANALOG I/O

Parameter	Description	Value	Units
Input Quantity	Number of discrete inputs	24	ea.
Output Quantity	Number of discrete outputs	24	ea.
Input /Output Types	Input and output signal type	0-5V, 0-10V, 0-20mA, 4-20mA	mA
Input Resolution	Smallest measurable analog increment.	0.0015% of Full Scale	%
Output Resolution	Smallest producible analog increment.	0.0015% of Full Scale	%

OPTIONAL I/O CONFIGURATIONS

Type	Description
PARV	(8) DI, (2) AI, (1) AO, (4) Relay, (1) Serial 485
Gas Analyzer	(8) gas analyzer inputs
Condition Monitoring	(4) IEP accelerometer inputs, (4) 4-20mA Inputs, (4) RTD, (4) DO, (1) Serial 485
Other	Consult Factory

ENVIRONMENTAL

Parameter	Description	Value
Material	Housing materials	Polycarbonate
		Copper Free Aluminum
		316 Stainless Steel
Temperature	Operating temperature range	-40°C to 80°C
Altitude		2,000 m
Humidity	Relative Humidity	10% to 90% RH (Noncondensing) Note 1
		10% to 85% RH (Noncondensing) Note 2
Ingress Protection	Environmental rating	IP40, for Indoor use, Note 3
		NEMA 4X, IP66/68, for Outdoor use
		NEMA 4X, IP66/68, for Outdoor use

COMMUNICATOR

Parameter	Description	Value
Ports	Number of hardware ports	Various (Consult Generation Table)
Physical Layer	Wired / Wireless physical connections	Various (Consult Comparison Table)
Virtual Layer	Communication Protocol	Various (Contact Factory)

Note 1: Rated at 25°C
Note 2: 85% Rated at 40°C
Note 3: Must be installed in an enclosure to achieve higher overall IP rating

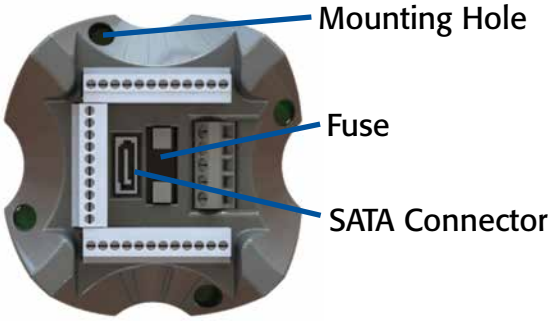
MIGHTY CONTROLLER

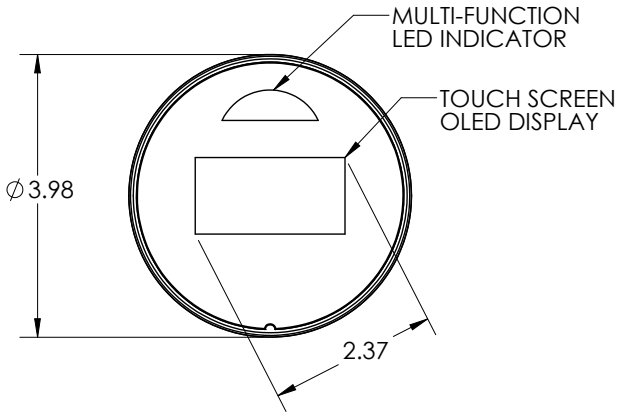
COMPARING MODELS

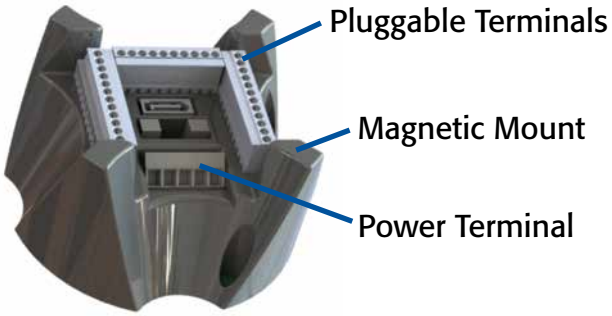
	MVCG1	MVCG2	MVCG3
Enclosures	Aluminum Instrument Stainless Instrument	Aluminum Instrument Stainless Instrument Polycarbonate DIN Rail	Aluminum Instrument Stainless Instrument Polycarbonate DIN Rail Aluminum Positioner
Weather Rating	IP68	IP68 or IP40	IP68 or IP40
Locations	Safe Areas (CA-US/CE/KCC/EAC)	Safe Areas (CA-US/CE/KCC/EAC) Class 1 Div 1 (US)	Safe Areas (CA-US/CE/KCC/EAC) Class 1 Div 1 (US) Class 1 Zone 1 (Global)
Onboard Sensors	NA	Accelerometer | Humidity | Temperature	Accelerometer | Humidity | Temperature
IO Points	15	up to 24	up to 24
IO Configuration	**Fixed** IN: (6) DI, (2) 4-20mA OUT: (4) RLY, (1) 4-20mA, (2) DO	**Fixed** (Consult factory for options) **Programmable** Any terminal point may be configured as any of the following types: 24V DI, 24V DO sink/source, 4-20mA, 0-20mA, 0-5V, 0-10V AI/AO sink/source	**Fixed** (Consult factory for options) **Programmable** Any terminal point may be configured as any of the following types: 24V DI, 24V DO sink/source, 4-20mA, 0-20mA, 0-5V, 0-10V AI/AO sink/source
Wired Connectivity	Modbus Master USB	Modbus Master/Slave USB Others by request	Modbus Master/Slave USB Profibus DP Slave Ethernet TCP/IP, IP Modbus TCP Others by request
Wireless Connectivity	NA	NA	WiFi, Bluetooth, Others by request
Local Interface	LCD Touchscreen	High-Contrast OLED Touchscreen Programmable RGB LED Indicator	High-Contrast OLED Touchscreen Programmable RGB LED Indicator
Temperature Range	-20°C to +56°C	-40°C to +80°C	-40°C to +80°C
Power	85Vac - 240Vac 50/60Hz	85Vac - 265Vac 50/60Hz 100Vdc - 340Vdc 10Vdc - 40Vdc	85Vac - 265Vac 50/60Hz 100Vdc - 340Vdc 10Vdc - 40Vdc
Memory	NA	125MB	Max 2GB SD Card
Software	Factory Programmable Single App	User Programmable Multiple Apps	User Programmable Multiple Apps App Store Integration
Expansion	NA	Daisy-chain multiple MVCs for IO expansion	Daisy-chain multiple MVCs for IO expansion

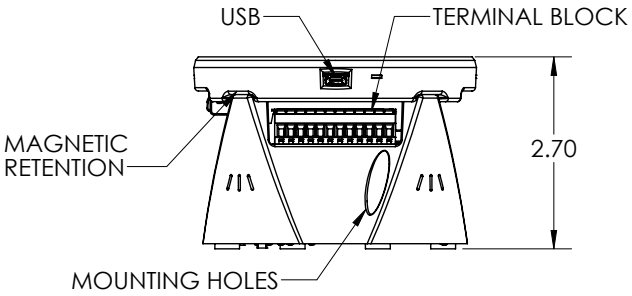
Mechanical Details

STANDARD POLYCARBONATE ENCLOSURE







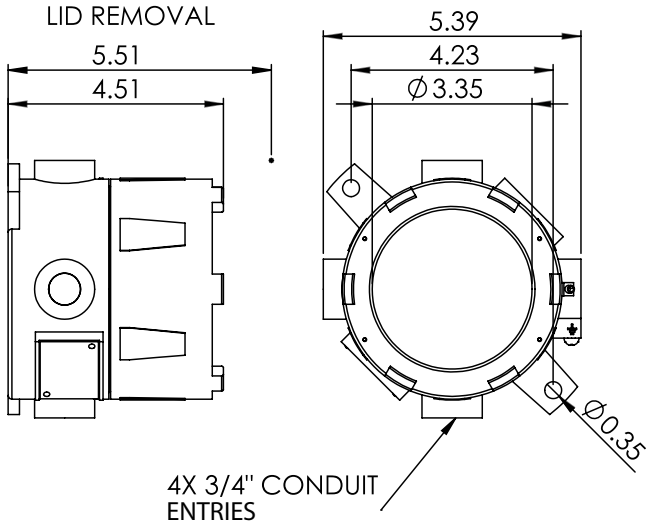


Bill of Materials

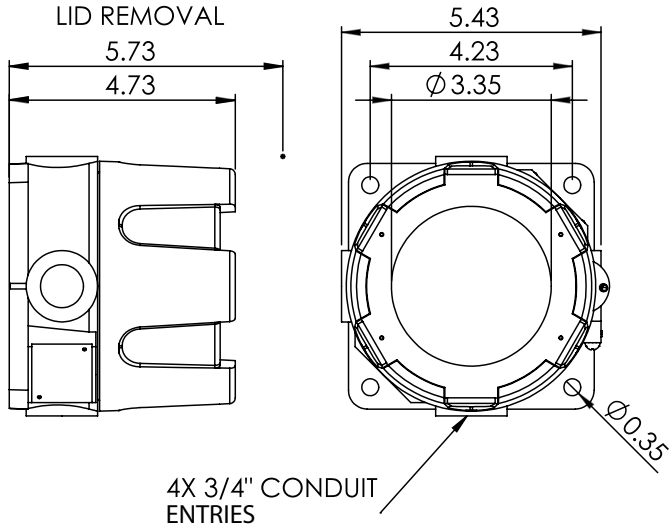
SPECIFICATIONS	STANDARD	OPTIONS	
Enclosure Material	PC+ABS Blend	Aluminum	316 Stainless Steel
Operating Temperature	-40°C to 80°C	-40°C to 80°C	-40°C to 80°C
Ratings	IP40	NEMA 4X, IP66/IP68	NEMA 4X, IP66/IP68
Altitude	2,000 m	2,000 m	2,000 m

Dimensions

STAINLESS



ALUMINUM



STAINLESS STEEL ENCLOSURE

ALUMINUM ENCLOSURE

MIGHTY CONTROLLER

How to Order

Sample Part Number:

MVCG2 - 1104__

Series	
MVCG1	Generation 1 MVC Digital Controller
MVCG2	Generation 2 MVC Digital Controller *(standard)*

Enclosure	
1	PolycarbonateDIN Rail Mount *(standard)*
2	Epoxy Coated Aluminum Window Instrument Enclosure
3	316 Stainless Steel Window Instrument Enclosure
4	Epoxy Coated Aluminum Positioner

Certifications / Type	
1	**Standard:** Safe areas - cTUVus, CE, CB Scheme, NEMA 4X, IP66/68
2	**Explosion Proof :** *(call factory)* CSA, ATEX & IECEx Explosion Proof Certified NEMA 4X, IP66/68

I/O Configuration	
0	iGPIO® - (24) Industrial General Purpose Input/Output, (2) Serial 485
1	PARV - (8) DI, (2) AI, (1) AO, (4) Relay, (1) Serial 485
2	Gas Analyzer - (8) gas analyzer inputs, (1) Serial 485
3	Condition Monitoring - (4) IEPE accel, (4) 4-20mA, (4) RTD , (4) DO, (1) Serial 485

Call Factory for additional I/O Configurations

Factory-Installed Apps		
0	No pre-installed apps	*standard*
1	API Gas Lift Kick-Off Controller	
2	Gas Lift Optimizer	
3	PARV	
4	Remote I/O	

Call Factory for additional software options

Miscellaneous Options		
Blank	No Options	*Standard*
1	Local Hand Control	*with 3-position maintained selector switch*
2	Local Hand Control	*with 2 indicator lamps and (1) 3-position switch*

Call for Options

Example:

MVCG2-1104: MVC Series Mighty Digital Controller, 2nd generation, standard polycarbonate DIN rail mountable enclosure, rated for safe areas, cTUVus, CE, CB Scheme, Type 4X, IP66/68, factory installed Remote I/O App

MVCG2-20210511

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A-T Controls, Inc.
9955 International Blvd. P: 513 - 247 - 5465 sales@atcontrols.com
Cincinnati, Ohio 45246 F: 513 - 247 - 5462 www.atcontrols.com