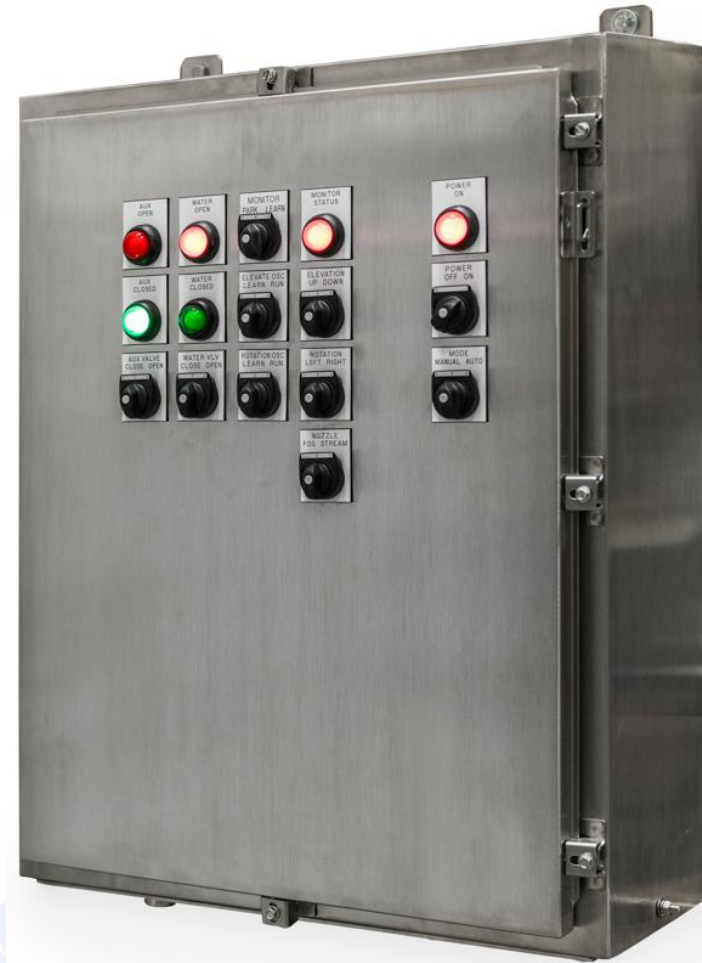




MICP™ INSTALLATION, OPERATION, & MAINTAINENCE MANUAL

Monitor Interface Control Panel

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II. General

A. Symbols used in this manual.



- Indicates a hazardous situation which, if not avoided, **WILL** result in death or serious injury.



- Indicates a hazardous situation which, if not avoided, **COULD** result in death or serious injury.



- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



- Addresses practices not related to personal injury.

B. Product Safety and Warnings



Important:

Before installing and operating this equipment, read & study this manual thoroughly. Proper installation is essential to safe operation. In addition, the following points should be adhered to ensure the safety of equipment and personnel.



- It is the responsibility of the user to make the required penetrations into the Monitor Interface Control Panel (MICP) for the mains supply, cabling for monitor motors, and interface to any operator controls. The installer must select at a minimum IP66 ATEX certified Ex ec IIB+H2 cable glands (Europe) or NEMA 4 cable gland fittings and follow the manufacturer's installation instructions to ensure a watertight penetration.
- It is the responsibility of the user to ensure that cable glands and/or conduit fittings are selected and installed to maintain the applicable hazardous area rating.
- (Europe only) It is the responsibility of the user to ensure that cable glands and/or conduit fittings are selected and installed to maintain a 360° electrical bond between the cable outer screen and the enclosure to maintain EMC immunity.
- The Conquest G2 system is not to be aimed at or operated in the direction of personnel.
- Do not stand or place any part of your body in front of the nozzle when operating. Do not adjust the pattern sleeve manually when flowing water.

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NOTICE

NOTICE

NOTICE

- Read and follow the operating instructions before use.
- To be installed only by those trained and knowledgeable in electrical and mechanical equipment installation.
- To be operated only by those trained and knowledgeable in the intended use of the monitor and all operating controls.
- To be maintained only by those trained and knowledgeable in the maintenance and repair of the monitor and all operating controls.
- In consideration of the approvals granted by Intertek, no substitution of components is authorized without their final approval.
- Aim the unit in a safe direction before pumping water through it. (i.e. Away from power lines).
- Do not use the electric controls when the hand wheels are being used or are in position for use.
- Keep all personnel out of the Danger Zone, in front of the outlet of the monitor when the water source is attached. Dangerous flow velocities can cause serious injury.
- Sensors and/or Programmable Logic Controllers, if incorporated in the system, may cause the unit to operate without a voluntary action.
- The Monitor Interface Control Panel (MICP™) is not for use in locations more restrictive than Ex II 3G Ex ec IIB+H2 T5 Gc (-40° C ≤ Ta ≤ 60° C) Zone 2, Zone 1 or NEC Class I, Div. 2, Groups B C & D.
- To avoid fire hazard, use only the fuse type and rating specified in this manual.
- Disconnect power and disable water flow, if applicable, before maintenance.
- Before opening the enclosure door or performing any service, turn off power at the mains disconnect feeding power to the Monitor Interface Control Panel (MICP™) to eliminate any possibility of shock while servicing in the enclosure. Follow all local lock-out, tag-out procedures.
- Class 1 equipment - This unit must be connected to Earth.
- The monitor contains moving parts. Keep hand, finger, and objects away from pinch points.
- Ensure that the nozzle knurled manual-locking handle is **not** tightened during electric operation.
- Ensure that the MICP enclosure door is always kept closed and securely latched to eliminate any water and dust intrusion.
- Replace the identification tags if they should become worn or damaged.

C. About this manual

This manual describes the Style 3688 Conquest G2™ Monitor Interface Control Panel (MICP™) for use with Style 3688 Conquest G2™ Industrial Monitor and Style 5188/5189 Conquest G2™ Nozzle. The Conquest G2™ Industrial Monitor system is a fixed site, electrically operated, gas mitigation and/or fire suppression device designed to flow water up to 2000 GPM at a pressure of up to 200 PSI monitor inlet pressure. Horizontal and vertical movement are accomplished via DC gear motor assemblies controlled by a proprietary motor drive board which interface to a three-axis proprietary CAN Interface Board. Reference the customer order and packing slip to determine equipment supplied.

WARNING

- Read and follow the operating instructions before use.

WARNING

- To be installed only by those trained and knowledgeable in electrical and mechanical equipment installation.

WARNING

- To be operated only by those trained and knowledgeable in the intended use of the monitor and all operating controls.

WARNING

- To be maintained only by those trained and knowledgeable in the maintenance and repair of the monitor and all operating controls.

Each section provides detailed information necessary for the installation and operation of the Conquest G2™ Monitor Interface Control Panel (MICP™). To ensure proper and safe installation, pay special attention to all warnings and important notes that appear in this manual. All installation, operation, and maintenance on the Conquest G2™ Monitor Interface Control Panel (MICP™) must be performed by **qualified** personnel.



Qualified personnel are described as follows:

Installation: Trained and knowledgeable in electrical and mechanical equipment installation.

Operation: Trained and knowledgeable for the intended use of the monitor and all operating controls.

Maintenance: Trained and knowledgeable in electrical and mechanical equipment maintenance and repair.

Each Conquest G2™ Industrial Monitor System is comprised of three (3) main components:

- Monitor Assembly (Style 3688)
- Nozzle Assembly (Style 5188 or 5189)
- Monitor Interface Control Panel (MICP™) (Style 3688)

All Style/Serial numbers for Conquest G2™ systems begin with 3688 and is followed by 4 additional digits. Ex: 36880100. The last 4 digits are used to associate the system with a specific customer order and to distinguish it from all other systems.

III. Compliance

A. European Directives and Standards

The Conquest G2™ MICP™ system has been designed to meet, and conforms to, the following European directives and standards:

- Atex Directive 2014/34/EU
- EN60079-0:2018 Explosive Atmosphere – General Requirements Zone2
- EN60079-7:2015/A1:2018 Explosive Atmosphere – Equipment Protected by Increased Safety “e” Zone2
- EN60079-7:2012 Explosive Atmosphere – Equipment Protected by Increased Safety “i” Zone2
- EN60079-7:2010 Explosive Atmosphere – Equipment Protected by Increased Safety “n” Zone2
- EN60079-31:2014 Explosive Atmosphere – Equipment Dust Ignition Protected by Increased Safety “t” Zone2
- EN60079-1:2015 Explosive Atmosphere – Equipment Protected by Flameproof Enclosure “d” Zone1
- EN60079-31:2009 Explosive Atmosphere – Equipment Dust Ignition Protected by Enclosure “t” Zone2

B. IECEx Conformance

The Conquest G2™ MICP™ has been designed to meet, and conforms to, the following IECEx directives and standards.

- IECEx Directive IEC 61010-1:2010 Ed.3+C1:C2 General Requirements Zone1/Zone2

C. ATEX Conformance

The Conquest G2™ MICP™ has been designed to meet, and conforms to, the following ATEX directives and standards.

- EN60079-0:2018 Explosive Atmosphere - Equipment General Requirements Zone 2
- EN60079-7:2015 Explosive Atmosphere - Equipment protection by Increased Safety "e" Zone 2
- EN60079-11:2012 Explosive Atmosphere - Equipment protection by Increased Safety "i" Zone 2
- EN60079-15:2010 Explosive Atmosphere - Equipment protection by Increased Safety "n" Zone 2
- EN60079-31:2014 Explosive Atmosphere - Equipment Dust ignition protection by Enclosure “t” Zone 2
- EN60079-1:2014 Explosive Atmosphere - Equipment protection by Flameproof Enclosures "d" Zone 1
- EN60079-31:2009 Explosive Atmosphere - Equipment Dust ignition protection by Enclosure "t" Zone 1
- EN60079-0:2018 Explosive Atmosphere - Equipment General Requirements -Zone 1

D. CSA Conformance

The Conquest G2™ MICP™ system has been designed to meet, and conforms to, the following CSA directives and standards.

- CSA C22.2#61010-1-12:2012 Ed.3+UL; U2; A1 General Requirements
- CSA C22.2#60079-0:2019 Ed.4 General Requirements Zone2
- CSA C22.2#60079-7:2016 Ed.2 Equipment protection by Increased Safety "e" Zone2
- CSA C22.2#60079-31:2015 Ed.2 Equipment Dust Ignition protection by enclosure "t" Zone2
- CSA C22.2#213:2017 Ed.3 Nonincendive Electrical Equipment for use in Class I and II, Div.2 and Class III, Div.1 and II Hazardous locations Zone2
- CSA C22.2#60079-0:2019 Ed.4 General Requirements Zone1
- CSA C22.2#60079-1:2016 Ed.3 Equipment protection by Flameproof enclosure "d" Zone1
- CSA C22.2#60079-31:2015 Ed.2 Equipment Dust Ignition protection by enclosure "T" Zone1

E. UL Conformance

The Conquest G2™ MICP™ system has been designed to meet, and conforms to, the following UL directives and standards.

- UL61010-1:2012 Ed.3+R:19Jul2019 General Requirements
- UL50:2015 Ed.13+R:15Oct2020 Enclosure for Electrical Equipment, Non-Environmental Considerations
- UL60079-0:2019 Ed.7+R:15Apr2020 General Requirements Zone2
- UL60079-7:2017 Ed.5+R:03Jun2021 Equipment protection by Increased Safety "e" Zone2
- UL60079-31:2015 Ed.2 Equipment Dust Ignition protection by enclosure "t" Zone2
- UL 121201:2017 Ed.9+R:01Apr2021 Nonincendive Electrical Equipment for use in Class 1 and II, Div.2 and Class III, Div.1 and 2 Hazardous locations Zone2
- UL60079-0:2019 Ed.7+R:15Apr2020 General Requirements Zone1
- UL60079-1:2015 Ed.7 Equipment protection by Flameproof enclosure "d" Zone1
- UL60079-31:2015 Ed.2 Equipment Dust Ignition protection by enclosure "t" Zone1
- UL508A:2018 Ed.3+R:28Jul2022 Industrial Control Panels Ordinary locations

F. IP 66 Conformance

The Conquest G2™ MICP™ system has been designed to meet, and conforms to, the following IP 66 directives and standards.

- IEC60529:2013 Ed.2.2 IP66 Testing

G. NEMA 4 Conformance

The Conquest G2™ MICP™ system has been designed to meet, and conforms to, the following NEMA 4 directives and standards.

- UL 50:2015 Ed.13+R:15Oct2020 Enclosures for Electrical Equipment, Non-Environmental Considerations

Visit <https://www.akronbrass.com/about-certifications> to view certifications.

IV. Technical Specifications

A. Monitor Interface Control Panel (MICP™):

Monitor Interface Control Panel (MICP™) Overview

- **Uses:**
 - Fire Suppression
 - Gas Mitigation
 - LNG Tank Cooling
 - Waste to Heat Transfer
 - Washdown applications
- **Construction:** 316L Stainless Steel increased safety enclosure
- **Compliance:** ATEX, IECEx, Nema 4x, IP66 rated, Class I, Div. II Hazardous Area locations
- **Enclosure Sizes:**
 - **Fire Suppression** 24"H x 24" W x 8" D
 - **Gas Mitigation** 30"H x 24" W x 8" D
- **Input Power:**
 - 120Vac - 50/60Hz
 - 220Vac - 50/60Hz
- **Power Consumption:**
 - 2A Max @ 120VAC
 - 1A Max @ 220VAC
- **Temperature Range:**
 - -40°F to +140°F
 - -40°C to +60°C
- **Internal Control Power:**
 - 24VDC - 20A Max
- **Monitor Control:**
 - Proprietary CAN Interface Board
- **Environmental Equipment Specification Ratings:**

Description	Rating
Environment	Indoor or outdoor
Altitude	≤ 5000 m
Temperature	-40 °C ... 60 °C
Relative Humidity	≤ 100 % (at 25 °C, non-condensing)
MICP Mains supply voltage fluctuation	100 V AC ... 240 V AC -15 % ... +10 %
Overvoltage Category	II (≤ 5000 m)
Pollution Degree	2

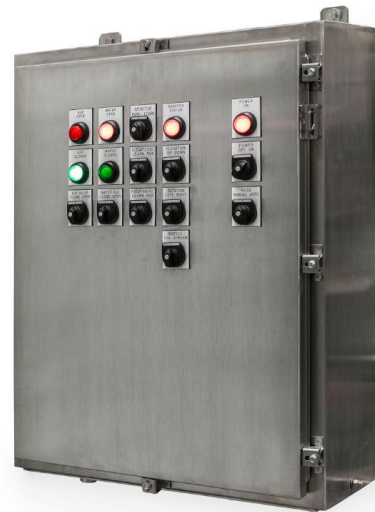


Gas Mitigation MICP™

Monitor Interface Control Panel (MICP™) Operator Devices

- **Standard Device Operators on ALL versions:**
 - **Power Off/On** (2-position maintained switch)
 - **Power On** (indicator light)
- **Optional Device Operators available:**
 - **Local/Remote Mode** (3-position spring return to center switch)
 - **Park/Learn** (3-position spring return to center switch)
 - **Up/Down** (3-position spring return to center switch)
 - **Left/Right** (3-position spring return to center switch)
 - **Stream/Fog** (3-position spring return to center switch)
 - **Oscillate Rotation Axis** (3-position spring return to center switch)
 - **Oscillate Elevation Axis** (3-position spring return to center switch)
 - **Monitor Oscillating** (Indicator light)
 - **Water Valve Open/Close** (3-position spring return to center switch)
 - **Water Valve Open** (Indicator light) *
 - **Water Valve Closed** (Indicator light) *
 - **Aux Valve Open/Close** (3-position spring return to center switch)
 - **Aux Valve Open** (Indicator light) *
 - **Aux Valve Closed** (Indicator light) *

* Activated by valve limit switches or downstream press switches



Gas Mitigation MICP™

Monitor Interface Control Panel (MICP™) Sub Panel

- **Fire Suppression** panel components supplied on **ALL** units:
 - Proprietary CAN Interface Board
 - Mains Power fuses
 - 24VDC, 20A Power Supply.
 - Spring loaded field connection terminal blocks.
- **Optional Internal components:**
 - Red Lion Media Converter (2) Copper (1) Fiber-Optic
- **Gas Mitigation** panel components supplied on **ALL** units.
 - Proprietary CAN Interface Board
 - Mains Power fuses
 - 24VDC, 20A Power Supply.
 - Spring loaded field connection terminal blocks.
- **Optional Internal components:**
 - Redundant 24VDC Power Supply
 - Fiber optic media converter for Modbus TCP/IP Ethernet connection
 - Red Lion Media Converter (2) Copper, (1) Fiber-Optic
 - Red Lion DLR Media Converter – (4) Copper, (2) Fiber-Optic
 - Rockwell ETAP Media Converter – (1) Copper, (2) Fiber-Optic
 - Electro-mechanical Relays.
 - Fused terminal blocks for field interface.



Gas Mitigation MICP™ Sub Panel

Monitor Interface Control Panel (MICP™) Control

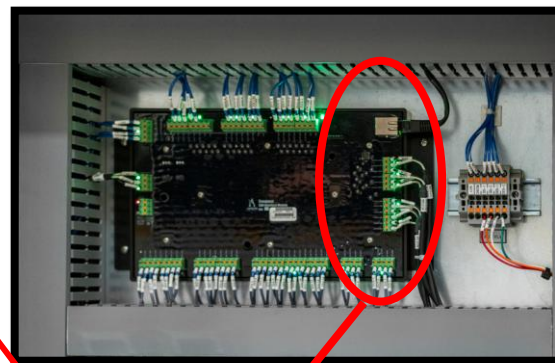
- **Monitor Interface Control Communication protocol.**

- Ethernet port utilizing Modbus TCP/IP Protocol for DCS, PLC or HMI interface.

- **Isolated 4-20Ma Monitor Analog Control Interface:**

- **(3) 4-20mA Isolated Analog Outputs**
Monitor Feedback Position for Elevation, Rotation, and Nozzle motors. *
- **(3) 4-20mA Isolated Analog Inputs**
Position Setpoint Control for Elevation, Rotation, and Nozzle motors.

* Feedback Position is updated continuously regardless of MICP™ operating mode.



B. Conquest G2 Style 3688 Monitor Overview:

Style 3688 Conquest G2™ Industrial Monitor

- **Uses:**
 - Fire suppression
 - HF Acid Gas Mitigation
 - LNG Tank Cooling
 - Waste to Heat
 - Washdown Applications
- **Features:**
 - Manual override clutch handwheels
 - Manual only version available (151lbs)
 - Proprietary motor drive board design featuring setpoint & feedback for rotation and elevation position (patent pending)
 - 24 volt DC motors
 - 360° horizontal range of travel (adjustable physical hard stops are available at +/-47°, +/-92°, +/-137°) Permanent physical hard stops are installed at +/-182°
 - -62°/+92° vertical range of travel
 - J1939 CAN network interface for power & communication
 - Horizontal and vertical oscillation
 - Includes 50ft DeviceNet© cable for MICP™ connection.
- **Physical Dimensions:**
 - Weight 195lbs

**For mechanical operating parameters,
See STYLE 3688 Conquest G2™ Industrial Monitor
INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS**

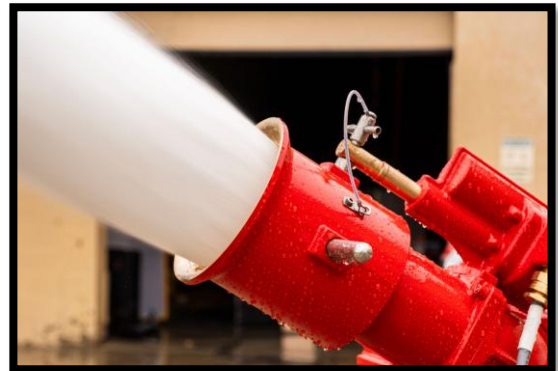


C. Conquest G2 Style 5188/5198 Nozzle Overview:

Style 5188 Conquest G2™ Industrial Automatic Baffle Nozzle

Style 5189 Conquest G2™ Industrial Fixed Baffle Nozzle

- **Uses:**
 - Fire suppression
 - HF Acid Gas Mitigation
 - LNG Tank Cooling
 - Waste to Heat
 - Washdown Applications
- **Features:**
 - Manual only version available
 - Proprietary motor drive board design featuring setpoint & feedback for nozzle position (patent pending)
 - 24 volt DC motor
 - Straight stream to full fog (Wide fog 140°)
 - J1939 CAN network interface for power & communication



**For mechanical operating parameters,
See STYLE 5188 Conquest G2™ Industrial Automatic Baffle Nozzle/STYLE 5189 Conquest G2™ Industrial Fixed Baffle Nozzle
INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS**

D. Nameplates:

The MICP™ each have an informational nameplate attached.

Conquest G2™ Style 3688

MICP™ Nameplate
ATEX, IECEx
ZONE 2

North America
CLASS I, DIV.2
CLASS I, ZONE 2
CLASS II, DIV.2
CLASS II, ZONE 22

CSA
CLASS I, ZONE 2
CLASS II, ZONE 22

		CONQUEST G2		STYLE 3688	
P/N: XXXXXXXXXX		S/N: XXXXXXXXXX		YEAR: XXXX ANNEE: XXXX	
INPUT VOLT: 100-240	VAC VA: 300	FREQ: 50/60 Hz.	SCCR: 5kA	MASS: XXXX Kg.	
WARNING: DO NOT OPEN ENCLOSURE OR CHANGE FUSES WHEN ENERGIZED. AVERTISSEMENT: NE PAS OUVRIR LE BOÎTIER NI CHANGER LES FUSIBLES LORSQU'IL EST SOUS TENSION. READ OPERATING INSTRUCTIONS BEFORE USE LIRE LES INSTRUCTIONS D'UTILISATION AVANT UTILISATION					
TYPE 4X (-40°C ≤ Ta ≤ 60°C) IP66					
  SEE QAN		CLASS I DIVISION 2 GROUPS B C & D T5 CLASS I ZONE 2 Ex ic ec nC IIB+H2 T5 Gc CLASS II DIVISION 2 GROUPS E F & G T5 CLASS II ZONE 22 Ex tc IIIC T5 Dc			
II 3G Ex ic ec nC IIB+H2 T5 Gc II 3D Ex tc IIIC T5 Dc		CSA: CLASS I ZONE 2 Ex ic ec nC IIB+H2 T5 Gc CSA: CLASS II ZONE 22 Ex tc IIIC T5 Dc Certificate No. ETL25ATEX0554 Certificate No. IECExETL25.0022			
					

Conquest G2™ Style 3688

MICP™ Nameplate
ATEX, IECEx
ZONE 1

North America
CLASS I, DIV.1
CLASS I, ZONE 1
CLASS II, DIV.1
CLASS II, ZONE 21

CSA
CLASS I, ZONE 1
CLASS II, ZONE 21

		CONQUEST G2		STYLE 3688	
P/N: XXXXXXXXXX		S/N: XXXXXXXXXX		YEAR: XXXX ANNEE: XXXX	
INPUT VOLT: 100-240	VAC VA: 300	FREQ: 50/60 Hz.	SCCR: 5kA	MASS: XXXX Kg.	
WARNING: DO NOT OPEN ENCLOSURE OR CHANGE FUSES WHEN ENERGIZED. AVERTISSEMENT: NE PAS OUVRIR LE BOÎTIER NI CHANGER LES FUSIBLES LORSQU'IL EST SOUS TENSION. READ OPERATING INSTRUCTIONS BEFORE USE LIRE LES INSTRUCTIONS D'UTILISATION AVANT UTILISATION					
TYPE 4X (-20°C ≤ Ta ≤ 60°C) IP66					
  SEE QAN		CLASS I DIVISION 1 GROUPS B C & D T5 CLASS I ZONE 1 Ex db IIB T5 Gb CLASS II DIVISION 1 GROUPS E F & G T5 CLASS II ZONE 21 Ex tb IIIC T5 Db			
II 2G Ex db IIB T5 Gb II 2D Ex tb IIIC T5 Db		CSA: CLASS I ZONE 1 Ex db IIB T5 Gb CSA: CLASS II ZONE 21 Ex tb IIIC T5 Db Certificate No. ETL25ATEX0559X Certificate No. IECExETL25.0028X			
					

E. External Equipment Protection – Mains Supply:

	All power wiring to the Monitor Interface Control Panel must be installed in accordance with all local and national electrical codes.
	Ensure that all appropriate penetration practices are followed to maintain the required rating for the hazardous locations per Section III Compliance.
	It is the responsibility of the installer to ensure that all applicable electrical codes have been met and all hazardous locations per Section III Compliance requirements are met.

The mains supply to the MICP™ **MUST** be powered through a separate customer supplied circuit breaker. The mains protective device **MUST** be equipped with lockout/tagout capability to ensure safe maintenance practices. Installation of mains supply must be performed by qualified personnel only.

F. Equipment Protection – Internal fuse replacement:

	Disconnect and lock out Mains Power before working on any electrical components or replacing MICP™ internal fuses.
	Risk of fire or personal injury! Replace internal fuses with the same type and rating.

Fuse(s) for the MICP™ are located inside on the lower left bottom din rail. All fuses are 600VAC Class CC time delay fuses. To avoid a potential fire or personal injury, replace the internal fuses with the same type and rating listed in Table F-1. Disconnect MICP™ power before replacing internal fuses.

Mains Voltage	Fuse I.D.	Fuse Holder Location	Fuse Rating	Mfg.	Catalog #
120VAC	F1	Mounted on DIN Rail	2A	Bussmann/ Mersen	FNQ-R-2 ATQR-R-2
220VAC	F1	Mounted on DIN Rail	1A	Bussmann/ Mersen	FNQ-R-1 ATQR-R-1
	F2	Mounted on DIN Rail	1A	Bussmann/ Mersen	FNQ-R-1 ATQR-R-1

Fuse Replacement – Table F-1

V. Installation

A. Enclosure Installation

- The MICP™ enclosure is typically located within 50ft of the Conquest G2™ Industrial Monitor at the base of the riser or tower where the monitor is mounted.
- Install the MICP™ enclosure approximately 3-4 feet (.91 to 1.22m) above grade in the vertical position making sure not to obstruct the Power Off/On selector switch.



Secure the Monitor Interface Control Panel to a load bearing structure only.

Gas Mitigation MICP™

- The MICP™ enclosure has four (4) mounting pads with .44" (11.18mm) diameter holes. See **Figure A-1**
- Mounting hole centers are 18" (457.20mm) horizontal by 32.13" (816.1mm) vertical. See **Figure A-1**
- Use (4) 316 S.S. 3/8" or M10 mounting bolts to secure the MICP™ enclosure. See **Figure A-1**
- Please refer to project supplied drawings for further details.

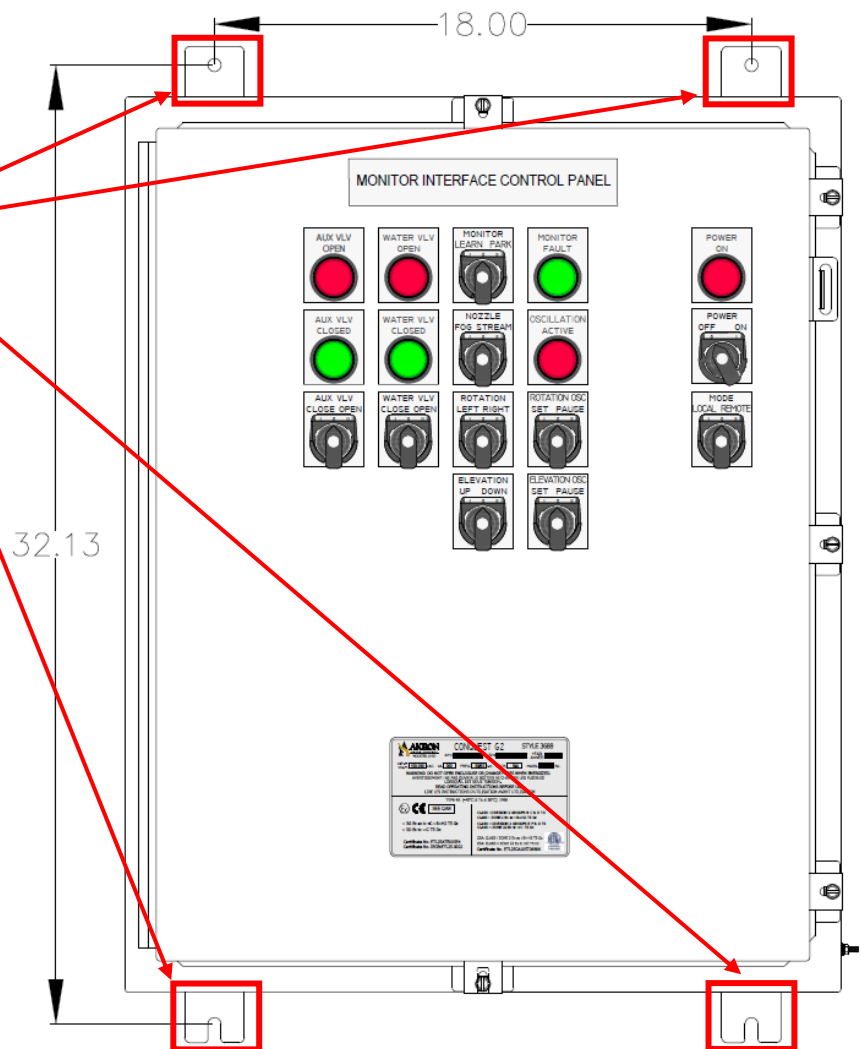


Figure A-1

Fire Suppression MICP™

- The MICP™ enclosure has four (4) mounting pads with .44" (11.18mm) diameter holes. See **Figure A-2**
- Mounting hole centers are 18" (457.20mm) horizontal by 25.25" (641.35mm) vertical. See **Figure A-2**
- Use (4) 316 S.S. 3/8" or M10 mounting bolts to secure the MICP™. See **Figure A-1**
- Please refer to project supplied drawings for further details.

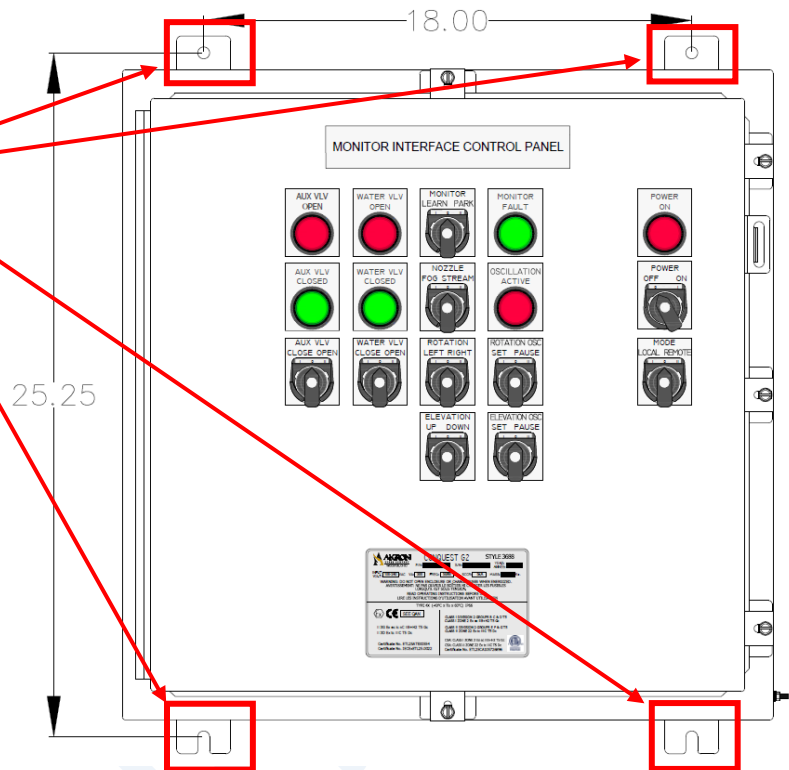


Figure A-2

B. Main Power Connection

	All power wiring to the Monitor Interface Control Panel must be installed in accordance with all local and national electrical codes.
	Ensure that appropriate penetration practices are followed to maintain the required rating for hazardous locations per Section III. Akron Brass does not supply any penetrations.
	Use hubs and glands appropriate for the hazardous classification per Section III. It is the responsibility of the installer to ensure that all applicable electrical codes have been met.

- Install conduit from the customer supplied main power breaker to the MICP™ enclosure. Conduit and penetrations are the responsibility of others and not supplied by Akron Brass.
- Pull (3) conductors for single-phase supply 120V/220VAC-50/60Hz. Wire should be sized to supply a minimum of 500 VA. See MICP™ Fuse and Wiring Section **Table B-1**.
- Connect the power conductors to the appropriate fuse blocks inside the MICP™ enclosure.
- A mains supply ground connection (PE) at the MICP™ internal ground stud is required.
- Refer to the wiring diagram **Figure B-1 & Figure B-2** for required power field connections.
- Refer to project supplied drawings for further details.

Incoming 120/220VAC Line-Neutral

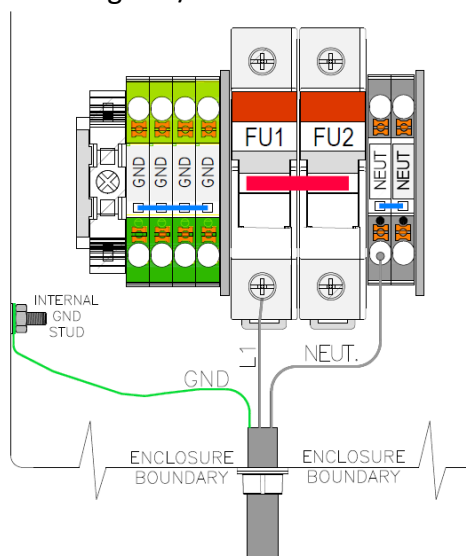


Figure B-1

Incoming 220VAC Line-Line

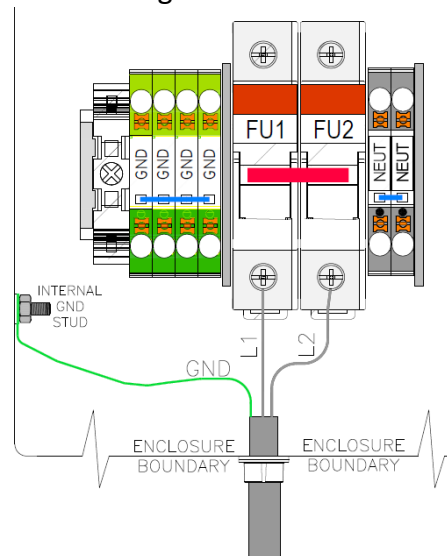


Figure B-2

Main Power - Panel	Panel Connections	Fuse	Description	Part No.
120-VAC 50/60Hz Single Phase	Figure B-1 L1, Neut, & Gnd #14ga.Min-#6ga.Max	F1	Class CC, Time Delay, 600VAC, 2 Amp	FNQ-R-2/ ATQR-R-2
220-VAC 50/60Hz Single Phase Line-Neutral	Figure B-1 L1, Neut, & Gnd #14ga.Min-#6ga.Max	F1	Class CC, Time Delay, 600VAC, 1 Amp	FNQ-R-1/ ATQR-R-1
220-VAC 50/60Hz Single Phase Line - Line	Figure B-2 L1, L2, & Gnd #14ga.Min-#6ga.Max	F1	Class CC, Time Delay, 600VAC, 1 Amp	FNQ-R-1/ ATQR-R-1
		F2	Class CC, Time Delay, 600VAC, 1 Amp	FNQ-R-1/ ATQR-R-1

Table B-1 – Connection & Fuse Information

C. Grounding and Bonding

	The MICP must be connected to Earth ground to ensure safe operation and to avoid equipment damage!
	Do not remove the ground connection! If the ground connection is removed, certain fault conditions in the system can result in full line voltage between chassis and earth ground. Severe injury or death can result if the chassis and earth ground are touched simultaneously.
	An internal chassis ground stud has been provided at the bottom of the enclosure for Mains Power Connection on the inside of the MICP enclosure. An external ground stud is also available on the outside of the enclosure. The ground stud is identified by a  ground symbol and must be connected to Earth. The ground conductor must be connected first and with a separate nut if the connection point is used for other bonding purposes.

D. Monitor CAN Communication connection.

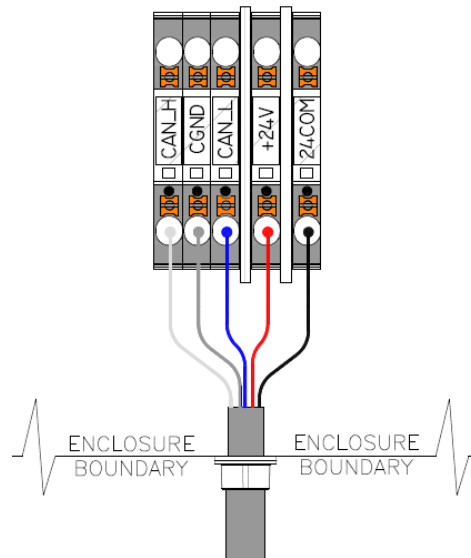


Figure D-1

The 50ft. supplied DeviceNet™ cable is the only field connection that is required for the Conquest G2™ Industrial Monitor. Minimum field connections are required to provide the maximum control benefits.

The Conquest G2™ Industrial Monitor supplied 50ft DeviceNet® cable is field terminated at the CAN communication terminal strip at the bottom of the MICP™ enclosure as shown in Figure D-1.

If required, the DeviceNet® cable can be shortened during installation. If shortened, prepare the DeviceNet® cable power & communication per Figure D-2:

- Strip approx. 3" of the outer jacket from the end of the cable, leaving no more than approx. 0.25" of the braided shield exposed.
- Strip approx. .3" of the insulation from the end of each of the insulated conductors.
- Optional: Tin the last 0.25" of the bare conductors or crimp a suitable ferrule on the conductors.



Figure D-2

- The Conquest G2™ Industrial Monitor integrated 50ft cable is a Trex-Onics® DeviceNet™ Flex-Net Cable, 18/1PR for power + 15/1PR for communication, 300V, 0.475" cord diameter, type PLTC, FT4 Flame Rating.
- If the MICP™ is to be located further than 50 feet from the Conquest G2™ Monitor, please contact Akron Brass Engineering.

E. Conduit and Cable Glands

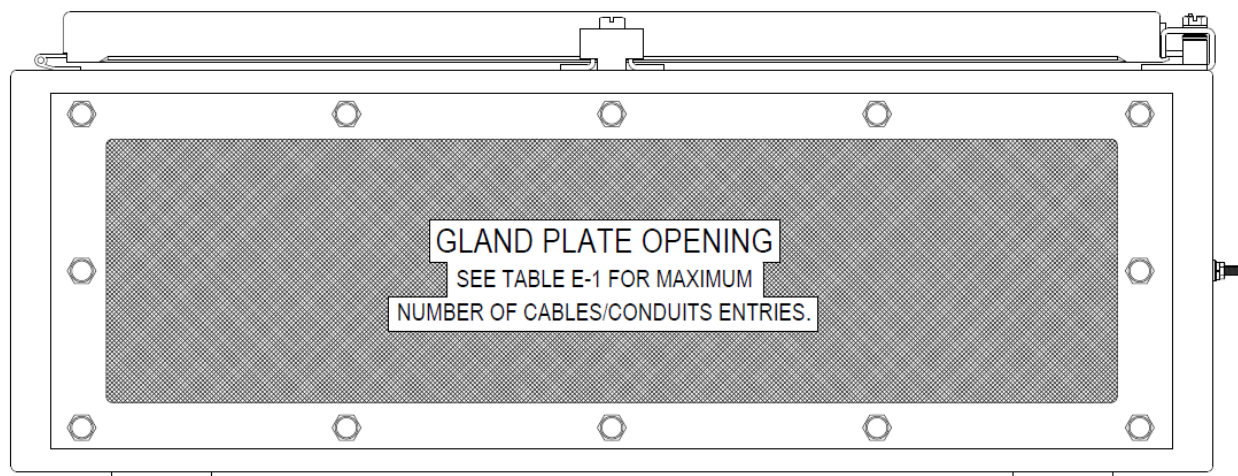


Figure E-1

The MICP™ enclosure is supplied with a removable bottom gland plate for ease of field installed conduit and cable glands penetrations. Akron Brass does not supply any enclosure penetrations.

It is the responsibility of the user to make the required penetrations into the MICP™ for the mains supply, Monitor interface, and interface to any operator controls. The installer must select at a minimum IP54 ATEX certified Ex ec IIC cable glands (Europe) or NEMA 4 cable gland fittings and follow the manufacturer's installation instructions to ensure a watertight penetration.

Reinstall the Bottom Gland Plate with the HHFT ¼" x 20 x ¾" SS316 bolts that are provided with the Gland Plate. To maintain enclosure rating torque bolts to 78.8 in-lbs. The gland plate gasket is constructed from 1/8" Bisco silicone with Acrylic PSA. Penetrations are the responsibility of the end user.

Maximum number of penetrations allowed are shown in **Table E-1**.

Table E-1		
Size NPT	Size Metric	Maximum Number of Entries
½	M16	64
¾	M20	39
1	M25	33
1 ¼	M32	16
1 ½	M40	14
2	M50	6
2 ½		5

A. Fire Suppression System



1. Overview

The Fire Suppression MICP™ is the proprietary interface between an operator and the Conquest G2™ Industrial monitor. The Fire Suppression MICP™ provides for multiple control points without the need for additional 3rd party components within the Fire Suppression MICP™. The optional component offered for the Fire Suppression MICP™ system allows for fiber-optic ethernet communication while maintaining the hazardous area ratings and certifications.

The Conquest G2™ Industrial Monitor contains (3) proprietary motor control boards for Elevation, Rotation and Nozzle. In Remote Mode each motor control board closes the servo control loop which eliminates the requirement for PID functionality within the external plant interface.

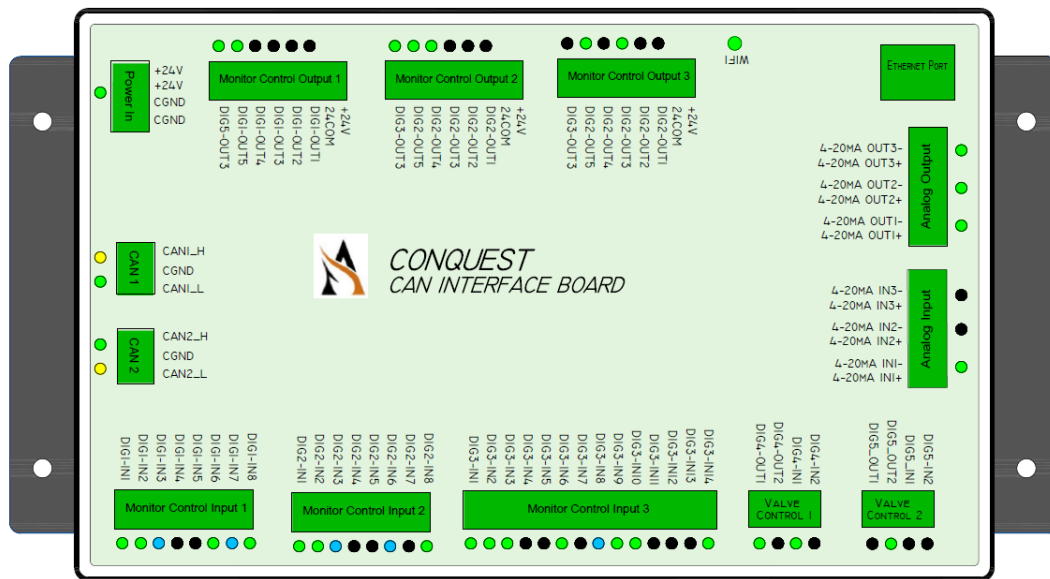
The Conquest G2™ Industrial Monitor continuously sends position feedback regardless of the Fire Suppression MICP™ operating mode thru both the analog output and Ethernet Modbus TCP/IP connection*.

*-Fiber optic connection is available for Ethernet Modbus TCP/IP network cable runs over the maximum copper distance of 300ft (90m).

The Fire Suppression MICP™ enclosure is powered from a separate AC voltage mains supply between 100VAC – 240VAC 50/60Hz. The Fire Suppression MICP™ contains a single 24VDC power supply, proprietary CAN Interface Board, mains power fuses and a wide range of configurable field terminals.

The Fire Suppression MICP™ offers an optional fiber optic media converter for Ethernet Modbus TCP/IP connection, electro-mechanical relays, and fused terminal blocks for field interface. The optional components are configured as required.

2. CAN Interface Board



The CAN Interface Board is a proprietary interface board for the Conquest G2™ Industrial Monitor, which provides for multiple control functions, either by hardwired control devices (operator device panel, wireless control device, HMI, or PLC interface), analog 4-20mA control and/or Ethernet Modbus TCP/IP.

The CAN Interface Board provides the CANBUS J1939 interface for Conquest G2™ Industrial monitor and nozzle proprietary motor controller boards which makes field connection of the Conquest G2™ Monitor DeviceNet® cable into the MICP™ enclosure easy and straightforward.

The CAN Interface Board provides built-in Wi-Fi communication for system configuration. The Wi-Fi communication can be turned off & on when utilized to eliminate the possibility of accidental usage during normal operation.

The CANBUS Interface Board has built-in webpages for G2™ system configuration which utilizes many common internet browsers.

The CANBUS Interface Board includes the following I/O:

- Group 1 Digital I/O (Local Mode only- 1st Priority)
- Group 2 Digital I/O (Local Mode only- 2nd Priority)
- Group 3 Digital I/O (Local Mode only- 3rd Priority)
- Group 4 Digital I/O (Active in all operating modes)
- Group 5 Digital I/O (Active in all operating modes)
- 4-20ma Analog Inputs (Remote Control Position Set Points)
- 4-20ma Analog Outputs (Position Feedback – Active in all operating modes)
- Ethernet Direct Digital Control (DDC) via Modbus TCP/IP protocol

a) Group 1 & 2 Digital Inputs

Groups 1 & 2 Digital Inputs are tri-state inputs utilizing both +24Vdc and -24Vdc activation to allow for (2) functional inputs per (1) input terminal, thus allowing (16) functions within (8) physical input terminals.

Input Group #1 & #2 Functions:

- Learn/Park
- Rotation Left (CCW)/Right (CW)
- Water Open/Close
- Rotation Oscillate Learn/Run
- Elevation Up/Down
- Nozzle Stream/Fog
- Aux Valve Open/Close
- Elevation Oscillate Learn/Run

b) Group 3 Digital Inputs

Group 3 Digital Inputs are typical single point 24VDC sinking inputs for (1) functional input per (1) input terminal, thus allowing (14) functions for (14) physical terminals. *

Input Group #3 Functions:

- Park
- Rotation Left
- Rotation Right
- Nozzle Fog
- Water Valve Open
- Water Valve Close
- Rotation Oscillate (Tri-State)
- Elevation Up
- Elevation Down
- Nozzle Stream
- Local/Remote Mode (Tri-State)
- Aux Valve Open
- Aux Valve Close
- Elevation Oscillate (Tri-State)

* - (3) Tri-State inputs available.

c) Group 1, 2 & 3 Digital Outputs

Group 1, 2 & 3 Digital Outputs are internally fused sinking outputs rated for 3A @24Vdc.

Output Group #1, #2 & #3 Functions:

- Water Open Indicator
- Aux Open Indicator
- Oscillation Status
- Water Close Indicator
- Aux Close Indicator

d) Group 4 Digital I/O outputs

Group 4 Digital I/O outputs are internally fused sinking outputs rated for 3A @24Vdc.

Group 4 Digital I/O Functions:

- Water Open limit switch
- Water Open Valve Output
- Water Close limit switch
- Water Close Valve Output

e) Group 5 Digital I/O outputs

Group 5 Digital I/O outputs are internally fused sinking outputs rated for 3A @24Vdc.

Output Group #5 Functions:

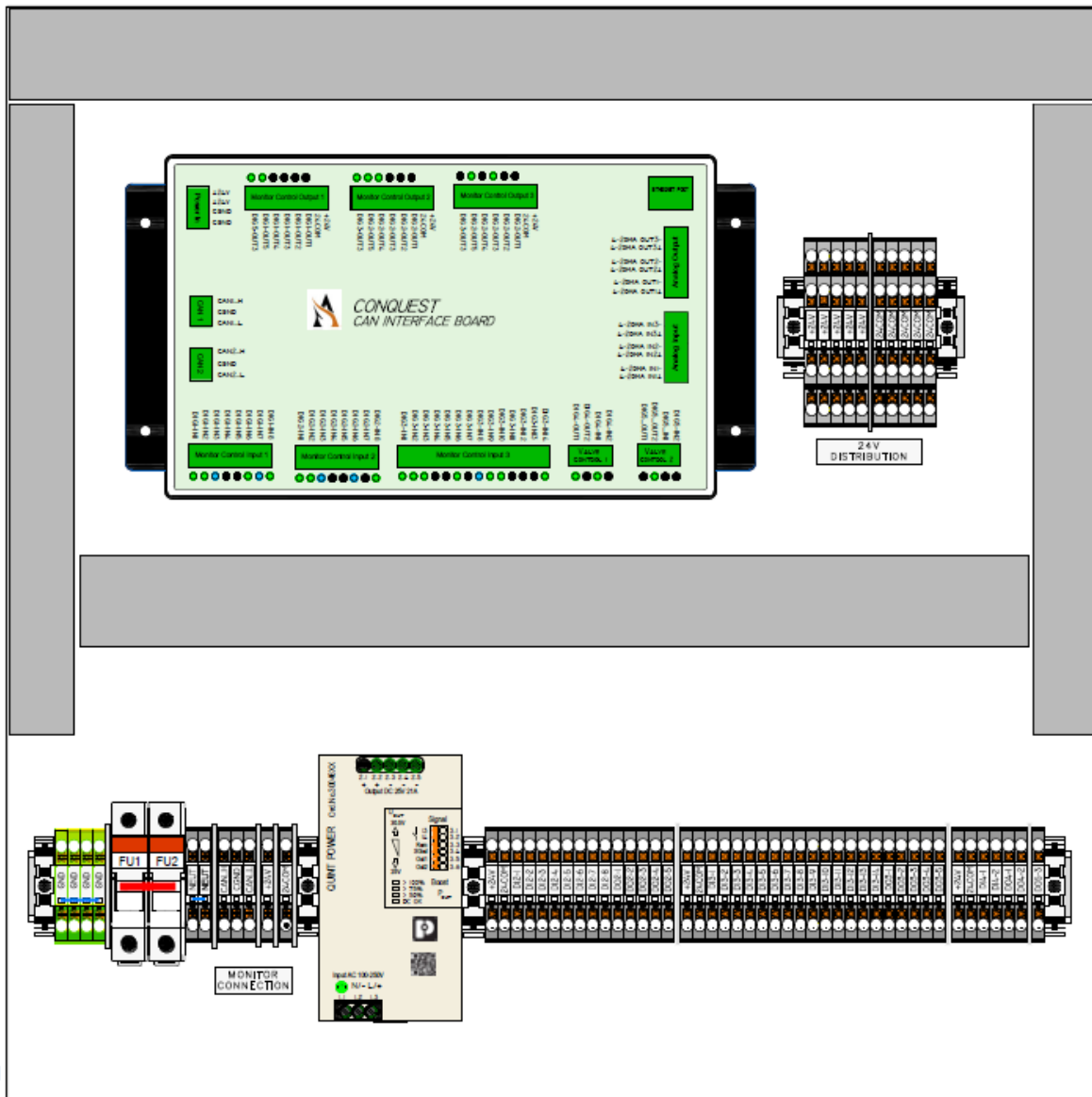
- Aux Open limit switch
- Aux Open Valve Output
- Monitor Fault Status
- Aux Closed limit switch
- Aux Close Valve Output

- f) 4-20ma Isolated Analog Inputs
 - (3) 4-20ma Isolated Analog Inputs for Remote Setpoint Position Control
 - Analog Input #1 - Elevation Position Setpoint. (Max Range -60° to +90°)
 - Analog Input #2 - Rotation Position Setpoint. (Max Range -180° to +180°)
 - Analog Input #3 - Nozzle Position Setpoint. (Max Range 0-100 %)
- g) 4-20mA Isolated Analog Outputs
 - (3) Isolated 4-20mA Analog Outputs for Position Feedback – Always active regardless of operating mode
 - Analog Output #1 - Elevation Position Feedback. (Max Range -60° to +90°)
 - Analog Output #2 - Rotation Position Feedback. (Max Range -180° to +180°)
 - Analog Output #3 - Nozzle Position Feedback. (Max Range 0-100 %)

The isolated Analog Outputs are factory set for loop power from the CAN Interface Board. External loop power can be configured utilizing the on board Wi-Fi and built in webpages.

See Section 4- MICP Operating Mode for further details on I/O operations.

3. Fire Suppression Sub Panel Components Overview



- Mains Power fuses (see figures B-1 & B-2)
- 24VDC, 20A Power Supply.
- Proprietary CAN Interface Board
- Spring loaded terminals for Conquest G2™ Monitor CANBUS field connections. (see figure C-1)
- Spring loaded terminals for field connections.
- Optional Components:
 - Fiber optic media converter for Modbus TCP/IP Ethernet connection
 - Red Lion Media Converter (2) Copper, (1) Fiber-Optic

Rev.3



1. Overview

The Gas Mitigation MICP™ is the proprietary interface between an Operator and the Conquest G2™ Industrial monitor. The Gas Mitigation MICP™ provides for multiple control points and communication interfaces integrated into the CAN interface board which eliminates the need for additional 3rd party components within the Gas Mitigation MICP™. The Gas Mitigation MICP™ offers optional components that allow for system customization while maintaining the hazardous area ratings and certifications.

The Conquest G2™ Industrial monitor contains (3) proprietary motor control boards for Elevation, Rotation and Nozzle. In Remote Mode each motor control board closes the servo control loop which eliminates the requirement for PID functionality within the external plant interface.

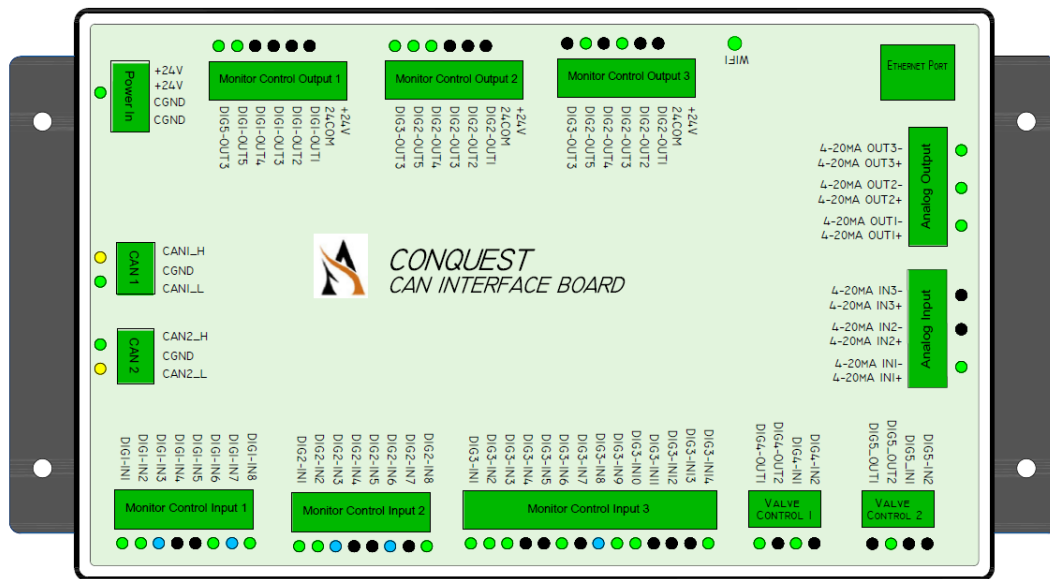
The Conquest G2™ Industrial Monitor continuously sends position feedback regardless of the Gas Mitigation MICP™ operating mode thru both the analog output and Ethernet Modbus TCP/IP connection*.

*-Fiber optic connection is available for Ethernet Modbus TCP/IP network cable that runs over the maximum copper distance of 300ft (90m).

The Gas Mitigation MICP™ is powered from a separate AC voltage mains supply between 100VAC – 240VAC 50/60Hz. All Gas Mitigation MICP™ contains a single 24VDC power supply, proprietary CAN Interface Board, mains power fuses and a wide range of configurable field terminals.

The Gas Mitigation MICP™ offers optional fiber optic Media Converters for spanning tree protocol (STP), device level ring (DLR) or ATEX/IECEx Zone2 rated device for Ethernet Modbus TCP/IP connection, electro-mechanical relays, and fused terminal blocks for field interface. The optional components can be configured as required.

2. CAN Interface Board



The CAN Interface Board is a proprietary interface board for the Conquest G2™ Monitor, which provides for multiple control functions and communication interfaces, either by hardwired control devices (operator device panel, wireless control device, HMI or PLC interface), analog 4-20mA control and/or Ethernet Modbus TCP/IP.

The CAN Interface Board provides the CANBUS J1939 interface for Conquest G2™ monitor and nozzle proprietary motor controller boards which makes field connection of the Conquest G2™ Monitor DeviceNet® cable into the MICP™ enclosure easy and straightforward.

The CAN Interface Board provides built-in Wi-Fi communication for system configuration. The Wi-Fi communication can be turned off & on when utilized to eliminate the possibility of accidental usage during normal operation.

The CAN Interface Board has built-in webpages for Conquest G2™ system configuration which utilizes many common internet browsers.

The CAN Interface Board includes the following I/O:

- Group 1 Digital I/O (Local Mode only- 1st Priority)
- Group 2 Digital I/O (Local Mode only- 2nd Priority)
- Group 3 Digital I/O (Local Mode only- 3rd Priority)
- Group 4 Digital I/O (Active in all operating modes)
- Group 5 Digital I/O (Active in all operating modes)
- 4-20ma Analog Inputs (Remote Control Position Set Points)
- 4-20ma Analog Outputs (Position Feedback – Active in all operating modes)
- Direct Digital Control (DDC) via Ethernet Modbus TCP/IP protocol

a) Group 1 & 2 Digital Inputs

Groups 1 & 2 Digital Inputs are tri-state inputs utilizing both +24Vdc and -24Vdc activation to allow for (2) functional inputs per (1) input terminal, thus allowing (16) functions within (8) physical input terminals.

Input Group #1 & #2 Functions:

- Learn/Park
- Rotation Left (CCW)/Right (CW)
- Water Open/Close
- Rotation Oscillate Learn/Run
- Elevation Up/Down
- Nozzle Stream/Fog
- Aux Valve Open/Close
- Elevation Oscillate Learn/Run

b) Group 3 Digital Inputs

Group 3 Digital Inputs are typical single point 24VDC sinking inputs for (1) functional input per (1) input terminal, thus allowing (14) functions for (14) physical terminals. *

Input Group #3 Functions:

- Park
- Rotation Left
- Rotation Right
- Nozzle Fog
- Water Valve Open
- Water Valve Close
- Rotation Oscillate (Tri-State)
- Elevation Up
- Elevation Down
- Nozzle Stream
- Local/Remote Mode (Tri-State)
- Aux Valve Open
- Aux Valve Close
- Elevation Oscillate (Tri-State)

*- (3) Tri-State inputs available.

c) Group 1, 2 & 3 Digital Outputs

Group 1, 2 & 3 Digital Outputs are internally fused sinking outputs rated for 3A @24Vdc.

Output Group #1, #2 & #3 Functions:

- Water Open Indicator
- Aux Open Indicator
- Oscillation Status
- Water Close Indicator
- Aux Close Indicator

d) Group 4 Digital I/O outputs

Group 4 Digital I/O outputs are internally fused sinking outputs rated for 3A @24Vdc.

Group 4 Digital I/O Functions:

- Water Open limit switch
- Water Open Valve Output
- Water Close limit switch
- Water Close Valve Output

e) Group 5 Digital I/O outputs

Group 5 Digital I/O outputs are internally fused sinking outputs rated for 3A @24Vdc.

Output Group #5 Functions:

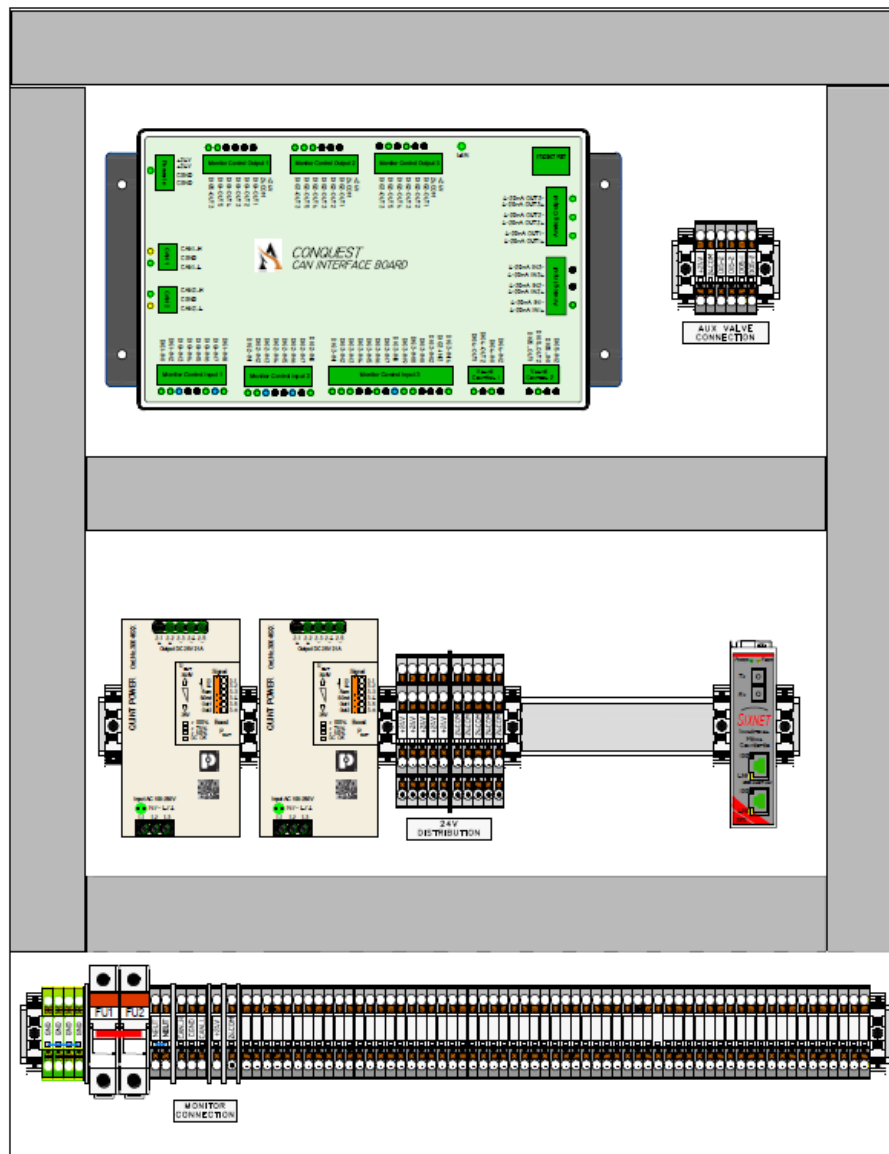
- Aux Open limit switch
- Aux Open Valve Output
- Monitor Fault Status
- Aux Closed limit switch
- Aux Close Valve Output

- f) 4-20ma Isolated Analog Inputs
 - (3) 4-20ma Isolated Analog Inputs for Remote Setpoint Position Control
 - Analog Input #1 - Elevation Position Setpoint. (Max Range -60° to +90°)
 - Analog Input #2 - Rotation Position Setpoint. (Max Range -180° to +180°)
 - Analog Input #3 - Nozzle Position Setpoint. (Max Range 0-100 %)
- g) 4-20mA Isolated Analog Outputs
 - (3) Isolated 4-20mA Analog Outputs for Position Feedback – Always active regardless of operating mode
 - Analog Output #1 - Elevation Position Feedback. (Max Range -60° to +90°)
 - Analog Output #2 - Rotation Position Feedback. (Max Range -180° to +180°)
 - Analog Output #3 - Nozzle Position Feedback. (Max Range 0-100 %)

The isolated Analog Outputs are factory set for loop power from the CAN Interface Board. External loop power can be configured utilizing the on board Wi-Fi and built in webpages.

See Section 4- MICP Operating Mode for further details on I/O operations.

3. Sub Panel Components Overview



- Mains Power fuses (see figure B-1 & B-2)
- Redundant 24VDC, 20A Power Supplies.
- Proprietary CAN Interface Board
- Spring loaded terminal for Conquest G2™ Monitor CANBUS field connections. (see figure C-1)
- Spring loaded terminal for field connections.
- Optional Components:
 - Fiber optic media converter for Modbus TCP/IP Ethernet connection
 - Red Lion Media Converter (2) Copper, (1) Fiber-Optic
 - Red Lion DLR Media Converter – (4) Copper, (2) Fiber-Optic
 - Rockwell ETAP Media Converter – (1) Copper, (2) Fiber-Optic
 - Electro-mechanical Relays.
 - Fused terminal blocks for field interface.

4. The MICP™ Operating Modes

The MICP™ system has (3) independent operating modes for controlling the Conquest G2™ Industrial Monitor.

- Local Mode
- Remote Mode
- Direct Digital Control (DDC) Mode

The MICP™ Local or Remote mode is determined by a hardwired input applied on Group 3 Digital Input 8. The operating mode is latched internally within the CAN Interface Board, if the input signal is removed, the MICP™ will remain in the last operating mode selected.

- Applying -24VDC will place the MICP™ into Local mode.
- Applying +24VDC will place the MICP™ into Remote mode.

a) Local Mode

Local mode is activated by applying – 24VDC to Group 3 Dig Input 8 thru either an operator device mounted on the MICP™ enclosure door, a remote operator device, a wireless remote device, or a customer supplied remote PLC/DCS input.

Once in Local mode, the CAN Interface Board Digital Input Groups 1, 2 & 3 are active*.

*-The priority of the input groups is factory set and can be changed by utilizing the onboard Wi-Fi and integrated webpages.

Groups 1 & 2 Digital Input function

Group 1 & 2 Digital Input #1	Placing -24VDC will Learn a new park position
	Placing +24VDC will send the monitor to the Park position
Group 1 & 2 Digital Input #2	Placing -24VDC will jog the Elevation axis Up
	Placing +24VDC will jog the Elevation axis Down
Group 1 & 2 Digital Input #3	Placing -24VDC will jog the Rotation axis Left
	Placing +24VDC will jog the Rotation axis Right
Group 1 & 2 Digital Input #4	Placing -24VDC will jog the nozzle axis towards Fog
	Placing -24VDC will jog the nozzle axis towards Stream
Group 1 & 2 Digital Input #5	Placing -24VDC will Open valve 1
	Placing +24VDC will Close valve 1
Group 1 & 2 Digital Input #6	Placing -24VDC will Open valve 2
	Placing +24VDC will Close valve 2
Group 1 & 2 Digital Input #7	Placing -24VDC will Set /start the Elevation axis oscillation
	Placing +24VDC will Pause /resume the Elevation axis oscillation
Group 1 & 2 Digital Input #8	Placing -24VDC will Set the Rotation axis oscillation
	Placing +24VDC will Pause /resume the Rotation axis oscillation

Groups 3 Digital Input function

Group 3 Digital Input #1	Placing +24VDC will send the monitor to Park position
Group 3 Digital Input #2	Placing +24VDC will jog the Elevation axis Up
Group 3 Digital Input #3	Placing +24VDC will jog the Elevation axis Down
Group 3 Digital Input #4	Placing +24VDC will jog the Rotation axis Left
Group 3 Digital Input #5	Placing +24VDC will jog the Rotation axis Right
Group 3 Digital Input #6	Placing +24VDC will jog the Nozzle towards Fog
Group 3 Digital Input #7	Placing +24VDC will jog the Nozzle towards Stream
Group 3 Digital Input #8	Placing -24VDC will activate Local Mode
	Placing +24VDC will activate Remote Mode
Group 3 Digital Input #9	Placing -24VDC will Set /start the Elevation axis oscillation
	Placing +24VDC will Pause /resume the Elevation axis oscillation
Group 3 Digital Input #10	Placing -24VDC will Set /start the Rotation axis oscillation
	Placing +24VDC will Pause /resume the Rotation axis oscillation
Group 3 Digital Input #11	Placing +24VDC will Open valve 1
Group 3 Digital Input #12	Placing +24VDC will Close valve 1
Group 3 Digital Input #13	Placing +24VDC will Open valve 2
Group 3 Digital Input #14	Placing +24VDC will Close valve 2

- **Group 1 & 2 Digital Input #1.** The Conquest G2™ Monitor, including the nozzle axis, can be sent to a programmed “Park” position. Park is a predetermined position that can be taught while in the Local mode.
 - Applying -24VDC Programs the Conquest G2™ Monitor PARK position.
 - Applying +24VDC Moves the Conquest G2™ Monitor to the programmed PARK position.
- **Group 3 Digital Input #8.** The MICP™ operating mode is determined by a hardwired input. The operating mode is latched internally within the CAN Interface Board, if the input signal is removed, the MICP™ will remain in the last operating mode selected.
 - Applying -24VDC places the Conquest G2™ Monitor into the Local mode.
 - Applying +24VDC places the Conquest G2™ Monitor into the Remote mode.
- **Groups 1 & 2 Digital Inputs #5 & #6.** Valve control inputs are always active regardless of the MICP™ operating mode.
- **Groups 3 Digital Inputs #11, Input #12, Input #13 & Input #14.** Valve control inputs are always active regardless of the MICP™ operating mode.
- **Group 1 & 2 Digital Input #7.** The Conquest G2™ Elevation oscillates on the vertical axis.
 - Applying -24VDC will Set/Start the Elevation axis oscillation.
 - Applying +24VDC will Pause/Resume the Elevation axis oscillation.
- **Group 1 & 2 Digital Input #8.** The Conquest G2™ Rotation oscillates on the horizontal axis.
 - Applying -24VDC will Set/Start the Rotation axis oscillation.
 - Applying +24VDC will Pause/Resume the Rotation axis oscillation.

- **Group 3 Digital Input #9.** The Conquest G2™ Elevation oscillates on the vertical axis.
 - Applying -24VDC will Set/Start the Elevation axis oscillation.
 - Applying +24VDC will Pause/Resume the Rotation axis oscillation.
- **Group 3 Digital Input #10.** The Conquest G2™ Rotation oscillates on the horizontal axis.
 - Applying -24VDC will Set/Start the Elevation axis oscillation.
 - Applying +24VDC will Pause/Resume the Rotation axis oscillation.

The Conquest G2™ Elevation and Rotation axis can be oscillated simultaneously or individually between 2 selectable end points within the minimum and maximum operating limits. The endpoints are selected on the fly and can easily be changed during oscillation. The oscillation end points are maintained during a power cycle of the MICP™ panel.

Group 4 Digital Input/Output

Group 4 Digital Input #1	Valve 1 Closed Limit Switch
Group 4 Digital Input #2	Valve 1 Open Limit Switch
Group 4 Digital Output #1	Valve 1 Closed Output
Group 4 Digital Output #2	Valve 1 Open Output

Group 5 Digital Input/Output

Group 5 Digital Input #1	Valve 2 Closed Limit Switch
Group 5 Digital Input #2	Valve 2 Open Limit Switch
Group 5 Digital Output #1	Valve 2 Closed Output
Group 5 Digital Output #2	Valve 2 Open Output

Groups 4 & 5 Digital Outputs #1 & #2

The CAN Interface Board valve outputs are individually rated @3 amps to drive valve outputs with recoverable short circuit protection. The CAN Interface Board Groups 4 & 5 digital outputs are designed to activate either a single solenoid, a dual solenoid, or a motorized valve actuator. Groups 4 & 5 digital outputs are factory set for momentary single activation for valve open and valve closed. Groups 4 & 5 digital outputs can be configured for maintained outputs by utilizing the onboard Wi-Fi and integrated webpages.

b) Remote Mode

Remote mode is activated by applying +24VDC to Group 3 Digital Input 8 either thru an optional operator device on the MICP™ enclosure door, a remote operator device, a wireless remote device, or by a customer supplied remote PLC/DCS input.

Digital Input Groups 1,2 & 3 on the CAN Interface Board are **disabled** when in Remote Mode. *

*** The Water & Aux valve inputs remain active regardless of mode.**

Remote mode allows for continuous closed loop control of the Conquest G2™ Industrial Monitor from either a PLC, HMI, DCS Control or customer plant computer via hardwired 4-20mA control.

Each axis on the Conquest G2™ Industrial Monitor (Elevation, Rotation and Nozzle) have a proprietary motor control board that closes the servo loop for each axis based upon the 4-20mA setpoint position. The 4-20mA setpoint position is used for Absolute Position of the Conquest G2™ Industrial Monitor.

Analog Input #1	Elevation Axis Absolute Position Setpoint (-60° to +90°) 4-20mA
Analog Input #2	Rotation Axis Absolute Position Setpoint (-180° to +180°) 4-20mA
Analog Input #3	Nozzle Axis Absolute Position Setpoint (0% to 100%) 4-20mA

The CAN Integrated board 4-20mA inputs have individual isolation and reverse polarity which eliminates the need for 3rd party isolation hardware.

The Conquest G2™ Industrial Monitor continuously sends position feedback regardless of the MICP™ operating mode thru the analog output. The 4-20mA feedback position is the Absolute Position of the Conquest G2™ Industrial Monitor.

Analog Output #1	Elevation Axis Position Feedback (-60° to +90°) 4-20mA
Analog Output #2	Rotation Axis Position Feedback (-180° to +180°) 4-20mA
Analog Output #3	Nozzle Axis Position Feedback (0% to 100%) 4-20mA

The Monitor servo position feedback loop is closed internally within each motor control board.

c) Direct Digital Control Mode

Direct Digital Control mode (DDC mode) allows the Conquest G2™ Industrial Monitor and customer supplied valves to be operated from a remote PLC, DCS or HMI interface via the CAN Interface board Ethernet port which utilizes Modbus TCP/IP protocol. Optional Fiber-optic Media Converters are available for field connection.

When in DDC mode the digital and analog inputs can be enabled/disabled to allow the Conquest G2™ Industrial Monitor to be operated from only one location via the Ethernet port.

Any function that can be performed in the Local or Remote modes can be performed when utilizing Modbus TCP/IP control.

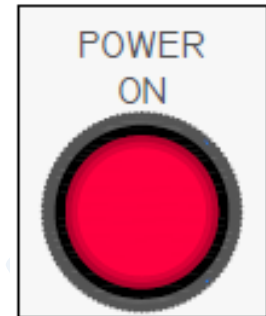
For further information on CAN Interface Board Modbus TCP/IP Mapping

See Modbus Configuration/Interoperability Guide for MMB SCL V3 DOCUMENT Version 1.6

5. MICP™ Operating Devices

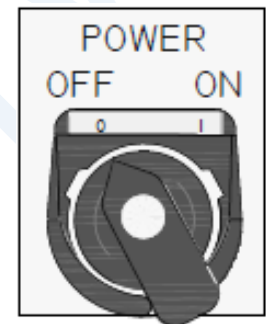
- a) Standard Operating Devices, supplied on all enclosures.

Power On Lt - Illuminated when 24VDC control power is active.



Power On Light

Power On/Off - Turn Power On selector switch to the ON position. The 24VDC power supply will activate, the G2™ CAN Interface Board will power up and establish communication with the Conquest G2™ monitor.

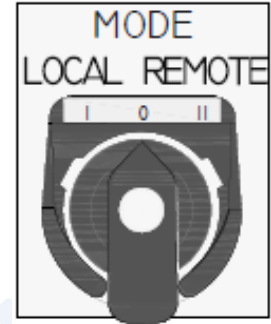


Maintained 2-position selector switch.

b) Optional Operating Devices

Local Mode – When the MICP™ is in Local mode, the Conquest G2™ Industrial Monitor is controlled from either the operator devices on the front door, a local control panel, or a wireless monitor control device.

Remote Mode – When the MICP™ is in Remote mode, the Conquest G2™ Industrial Monitor is controlled from either the 4-20Ma analog isolated inputs or the Ethernet port on the G2™ CAN Interface Board.



3-Position spring return to center selector switch.

Park Mode – Momentarily turn the selector switch towards the **Park** position. The Conquest G2™ Industrial Monitor will automatically move to the predefined **Park** position. The CAN Interface board latches the input, the Conquest G2™ Industrial Monitor will move to the pre-programmed position automatically.

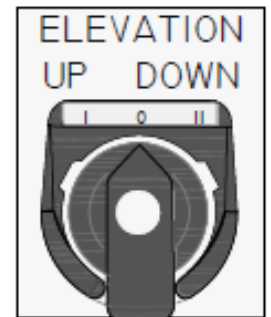
Learn Mode – Move the Conquest G2™ Industrial Monitor to the new Park position using the **Up/Down, Left/Right, Jog/Stream** operator devices. Once at the new Park position, momentarily turn the selector switch towards **Learn** to teach the new Park position.



3-Position spring return to center selector switch.

Up – Turn and hold the selector switch towards the **Up** position, the Conquest G2™ Industrial Monitor will jog up at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.

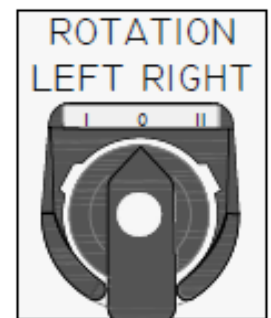
Down – Turn and hold the selector switch to the **Down** position, the Conquest G2™ Industrial Monitor will jog down at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.



3-Position spring return to center selector switch.

Left – Turn and hold the selector switch towards the **Left** position, the Conquest G2™ Industrial Monitor will jog **CCW** at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.

Right – Turn and hold the selector switch to the **Right** position, the Conquest G2™ Industrial Monitor will jog **CW** at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.



3-Position spring return to center selector switch.

Fog – Turn and hold the selector switch towards the **Fog** position. The Conquest G2™ Industrial Monitor will jog towards wide fog at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.

Stream – Turn and hold the selector switch towards the **Stream** position. The Conquest G2™ Industrial Monitor will jog towards narrow stream at the predefined speed until either the selector switch is released or the preprogrammed softstop is activated.

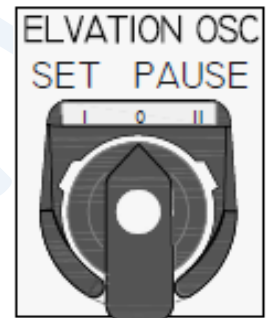


3-Position spring return to center selector switch.

Set/Start – Turn and hold the selector switch towards the **Set/Start** position. The Conquest G2™ Industrial Monitor will move towards the Up position. Once the desired Up position is achieved, release the selector switch, the monitor will now automatically move towards the Down position. Turn and hold the selector switch towards the **Set/Start** position again until the desired down position is achieved. Release the selector switch, the monitor will now automatically oscillate between the two end points until the selector switch is turned toward the **Pause/Resume**.

Pause/Resume – While the Conquest G2™ Industrial Monitor is oscillating turn the selector switch to the **Pause/Resume** position to Pause the G2™ monitor elevation oscillation cycle. Once Paused, turn the selector switch towards **Pause/Resume** to start the elevation oscillation cycle again.

To cancel the active Elevation Oscillation cycle, activate either the Up or Down inputs, activate the Remote mode or cycle MICP™ power.

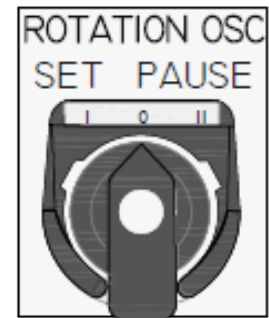


3-Position spring return to center selector switch.

Set/Start – Turn and hold the selector switch towards the **Set/Start** position. The Conquest G2™ Industrial Monitor will move CW. Once the desired CW position is achieved, release the selector switch, the monitor will automatically reverse and move CCW. Turn and hold the selector switch towards the **Set/Start** position again until the desired CCW position is achieved. Release the selector switch, the monitor will automatically oscillate between the two end points until the selector switch is turned toward the **Pause/Resume**.

Pause/Resume – While the Conquest G2™ Industrial Monitor is oscillating turn the selector switch to the **Pause/Resume** position to pause the Conquest G2™ Industrial Monitor rotation oscillation cycle. Once Paused, turn the selector switch towards **Pause/Resume** to start the rotation oscillation cycle.

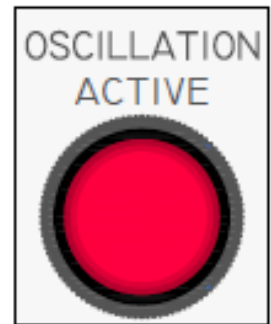
To cancel the active rotation oscillation cycle, activate either the Right or Left inputs, activate the Remote mode or cycle MICP™ power.



3-Position spring return to center selector switch.

Oscillation Active Lt - Illuminated when either the Elevation or Rotation axis is actively moving during oscillating.

If the Oscillation is paused, or cancelled light will be turned off.



Oscillation Active Light

Water Vlv Close – Momentarily turn the selector switch towards the **Close** position. The Water Vlv Close output will be activated.

Water Vlv Open – Momentarily turn the selector switch towards the **Open** position. The Water Vlv Open output will be activated.

Water Vlv outputs are factory set for momentary single activation for valve open and valve closed. Water Vlv outputs can be configured for maintained outputs by utilizing the onboard Wi-Fi and integrated webpages.

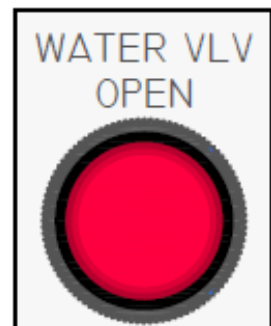


3-Position spring return to center selector switch.

Water Vlv Open Lt- Illuminates when either the water valve open output is activated, or the water valve open limit switch is activated.

The light can be programmed to either activate from the water valve output or the water valve open limit switch.

The activation point can be changed by utilizing the onboard Wi-Fi and integrated webpages.

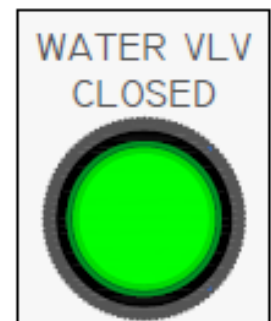


Water Valve Open Light

Water Vlv Closed Lt Illuminates when either the water valve close output or the water valve close limit switch is activated.

The light can be programmed to either activate from the water valve output or the water valve closed limit switch.

The activation point can be changed by utilizing the onboard Wi-Fi and integrated webpages.

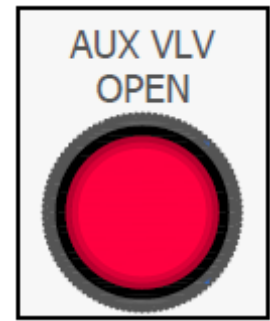


Water Valve Closed Light

Aux Vlv Open Lt - Illuminates when either the water valve open output or the aux valve open limit switch is activated.

The light can be programmed to either activate from the water valve output or the aux valve limit switch.

The activation point can be changed by utilizing the onboard Wi-Fi and integrated webpages.

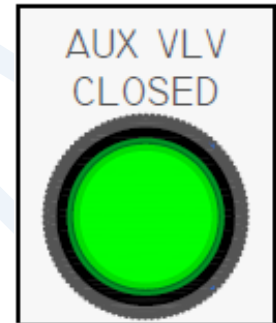


Aux Valve Open Light

Aux Vlv Closed Lt - Illuminates when either the water valve close output or the aux valve close limit switch is activated.

The light can be programmed to either activate from the aux valve output or the water valve limit switch.

The activation point can be changed by utilizing the onboard Wi-Fi and integrated webpages.

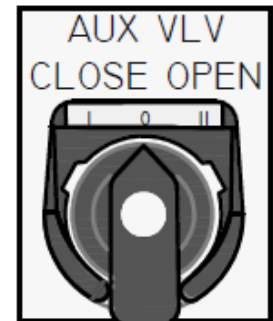


Aux Valve Closed Light

Aux Vlv Close – Momentarily turn the selector switch towards the **Close** position. The Water Vlv Close output will be activated.

Aux Vlv open – Momentarily turn the selector switch towards the **Open** position. The Water Vlv Open output will be activated.

Aux Vlv outputs are factory set for momentary single activation for valve open and valve closed. Aux Vlv outputs can be configured for maintained outputs by utilizing the onboard Wi-Fi and integrated webpages.



3-Position spring return to center selector switch.

VII. Maintenance

A. Monitor Interface Control Panel

The MICP™ system by design is a low maintenance, high reliability item that is self-contained and industrial rated, very little maintenance is required. The following steps can be implemented to ensure a long life.

- Visually inspect the interior of the MICP™ to ensure no water penetration or condensation is present.
- Inspect the field terminals to ensure good connection.
- Inspect the field penetrations to ensure the seal and rating are maintained.
- Maintain good housekeeping around the MICP™ enclosure.

B. Cleaning MICP™ enclosure

The MICP™ system can be cleaned by using a moistened soft cloth or sponge. Do not apply high pressure water or any cleaning solution to the MICP™ enclosure.

VIII. Troubleshooting

A. Incoming Power connection diagram

Incoming 120V/220V Line-Neutral

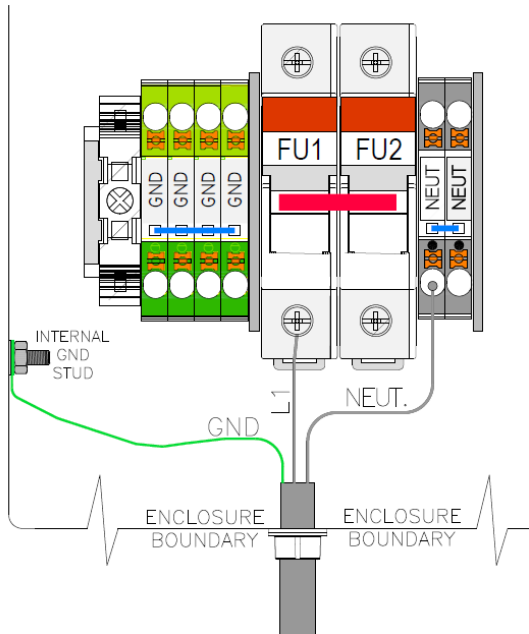


Figure B-1

Incoming 220V Line-Line

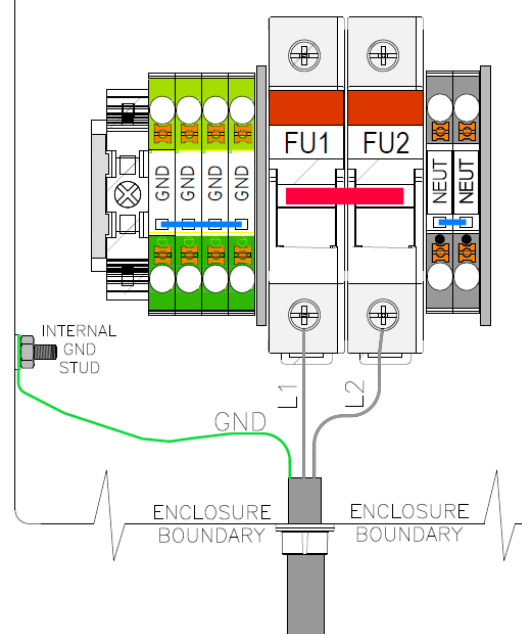
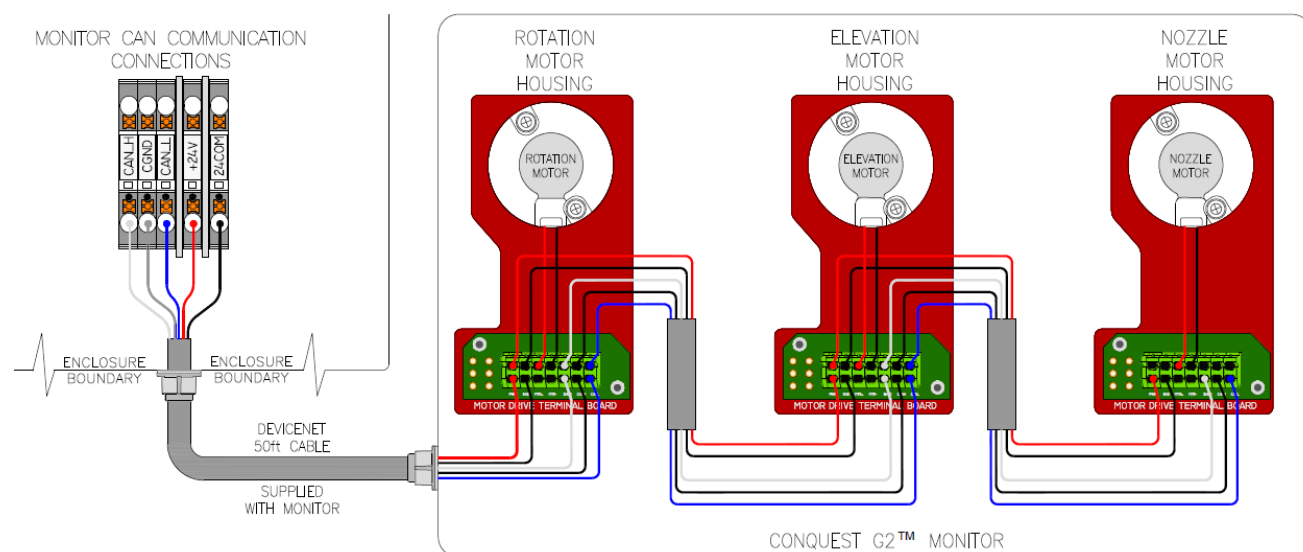


Figure B-2

The standard Conquest G2™ MICP is wired and fused for mains power incoming power 120VAC Line-to-Neutral (Figure B-1). Optional Conquest G2™ MICP mains power for incoming power 220VAC Line-to-Neutral (Figure B-1) or incoming power 220VAC Line-to-Line (Figure B-2) are available upon request.

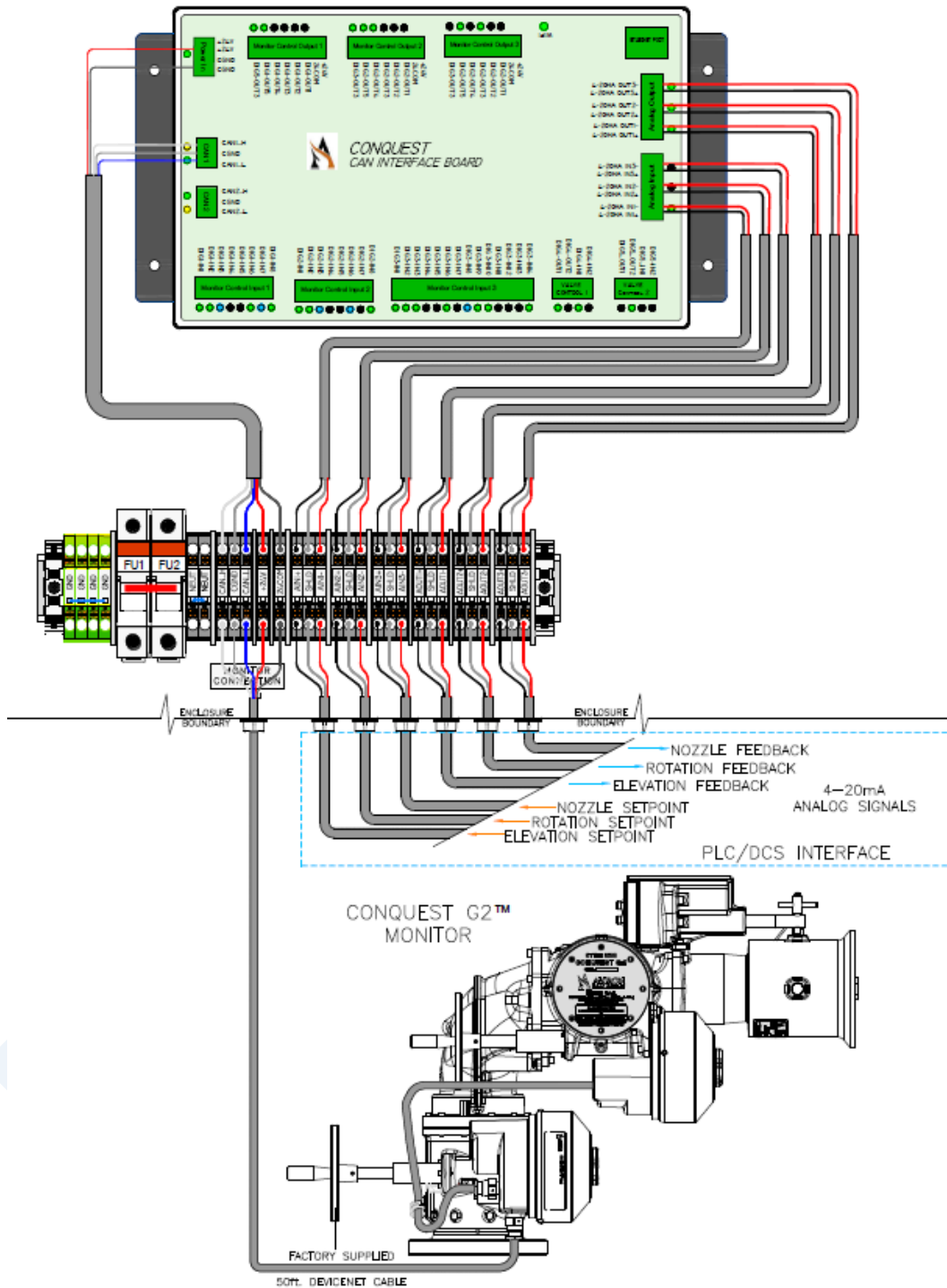
See Section V. Installation & Commissioning Section B. for detailed installation information and connections.

B. Conquest G2™ Monitor CANBUS Interface diagram.



The Conquest G2™ Industrial Monitor is supplied with an integrated 50ft. Trex-Onics® DeviceNet™ Flex-Net Cable that supplies both Power & Communication to the Conquest G2™ Industrial Monitor from the MICP™ enclosure. The 50ft. DeviceNet™ cable is the only field connection required for the Conquest G2™ Industrial Monitor. All Conquest G2™ Industrial Monitors are programmed and fully tested before shipment.

C. MICP Remote Mode Field Interface diagram.

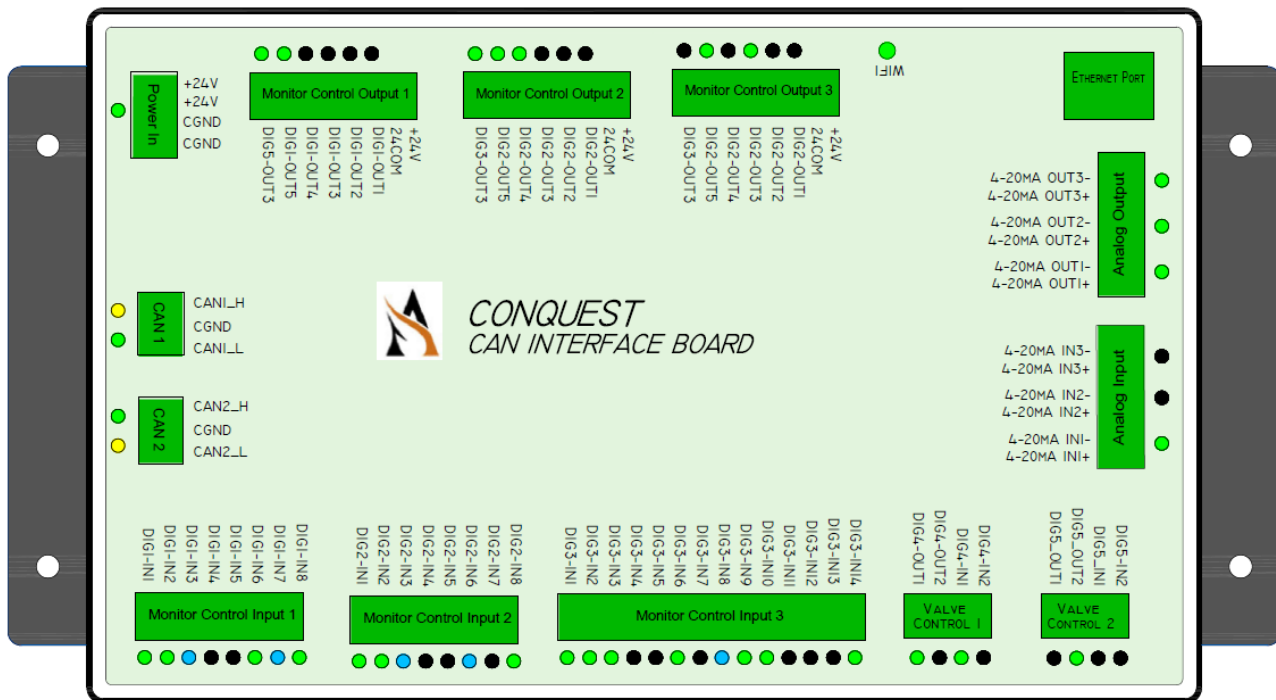


The Analog connections should utilize 2-conductor shielded cable with the shield connected to ground terminal at only one end.

- The Analog Inputs are looped powered from the customer.
- The Analog Outputs are looped powered from the MICP™ enclosure.

The isolated Analog Outputs are factory set for loop power from the CAN Interface Board. External loop power can be configured utilizing the on board Wi-Fi and built in webpages.

D. CAN Interface Board overview.



The CAN Interface Board provides all the digital inputs and digital outputs needed to monitor and operate the Conquest G2 Industrial Monitor system along with customer supplied water and aux (foam) valves.

The CAN Interface Board provides 4-20mA analog inputs for position setpoint and analog outputs for position feedback of the Conquest G2 Industrial Monitor.

The CAN Interface Board provides the CANBUS J1939 interface for Conquest G2™ Industrial Monitor proprietary motor controller boards which makes field connection of the Conquest G2™ Monitor DeviceNet® cable into the MICP™ enclosure easy and straightforward.

The CAN Interface Board provides built-in Wi-Fi communication for system configuration. The Wi-Fi communication can be turned off & on when utilized which eliminates the possibility of accidental usage during normal operation.

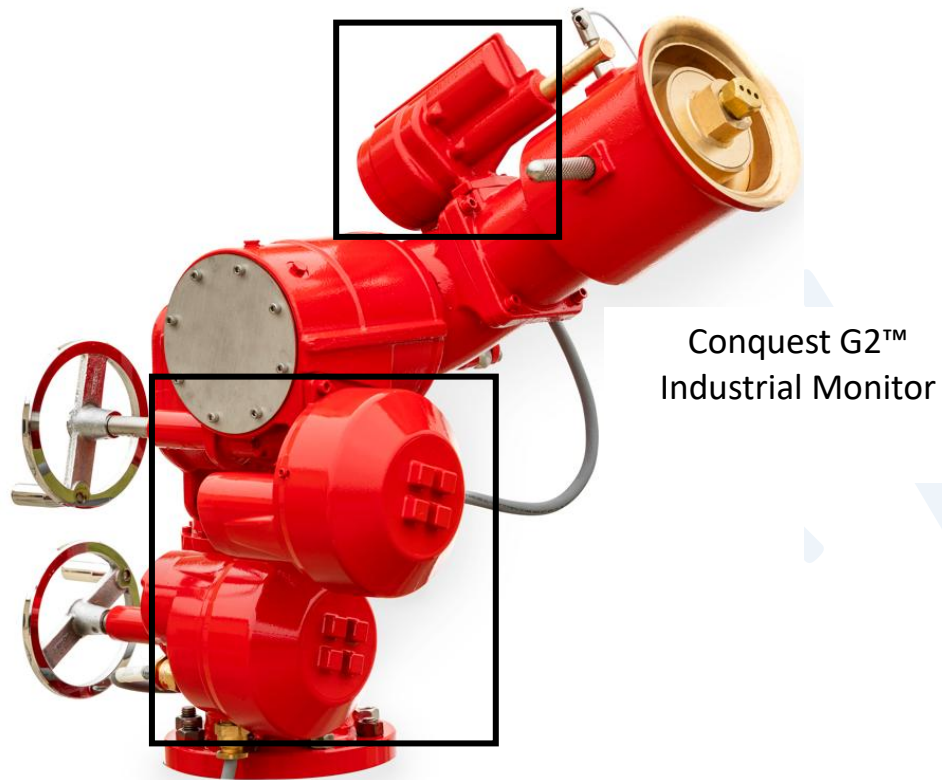
The CAN Interface Board has built-in webpages for Conquest G2™ system configuration which utilizes many common internet browsers.

E. CAN interface board LED status indication.

The CAN Interface board **WiFi LED** is used as the Monitor Status LED when the WiFi mode is not enabled.

Color	Indication	Description	Corrective Actions
Green	Solid	The monitor is connected and in normal (Local) mode.	The Interface board may be put in Remote mode with Input 8 on group 3 momentarily connected to +24V.
Yellow	Solid	The Interface board is paired with a monitor that is not connected to the CAN network.	Connect monitor to the Interface board CAN network.
Yellow	Slow Blink	The connected monitor is in extended (Remote) mode.	The Interface board may be put in Local mode with Input 8 on group 3 momentarily connected to Ground.
Yellow	Blinking Code	The connected monitor is in config mode.	The monitor may be learning the Park position, wait until finished. Otherwise, cycle monitor power.
Red	Solid	The Interface board is not paired with a monitor.	Assert Stream and Fog inputs on Input Group 3 for more than 10 seconds with powered monitor connected to Interface board CAN network, then cycle power on Interface board.
Red	Blinking Code	The connected monitor is in fault mode.	Check monitor fault code and correct fault.

F. Conquest G2 Monitor motor housing.

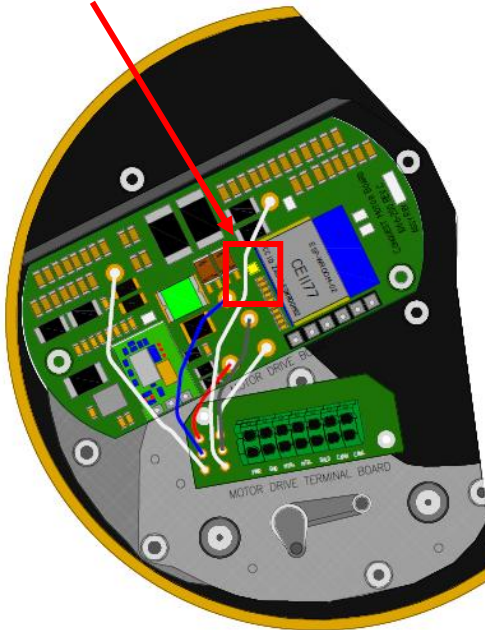


Every Conquest G2™ Industrial Monitor motor board is calibrated and paired to the MICP™ at the factory. The motor housings are locked down prior to shipment and should not require any field connections or calibration. The space inside the motor housing is limited, which creates the possibility of wires inside the housing, or the PC board itself, which could be damaged by removing and replacing the covers.



Motor housing removal should only be performed by factory trained personnel only.

G. CAN interface board LED indication.



Motor housing removal should only be performed by factory trained personnel only.

The Conquest motor board Wi-Fi LED is used as the Status LED when the WiFi mode is not enabled.

Green	Solid	The monitor is in normal (Local) mode.	
Yellow	Solid	The motor drive board is in factory test mode.	Press Stream for about 3 seconds until LED is blinking red and green. -Move monitor until number of green blinks matches the board axis location. - Press Fog for about 3 seconds until the board resets. - Calibrate the axis.
Yellow	Slow Blink	The monitor is in extended (Remote) mode.	
Yellow	Blinking Code	The monitor is in config mode.	Check setup code and configure accordingly.
Red	Slow Blink	The monitor or motor drive board is stowing or deploying	Wait until monitor stows or deploys. If the monitor axis is not moving, the motor control may not be properly tuned. Check the motor tuning parameters using the board application WiFi.
Red	Blinking Code	The monitor or motor drive board is in fault mode.	Check fault code and correct fault.
Red/Green	Alternating one red and one green	The motor drive board will configure as a rotation board.	Holding Fog for about 3 seconds will make the board a rotation motor drive board.
Red/Green	Alternating one red and two green	The motor drive board will configure as an elevation board.	Holding Fog for about 3 seconds will make the board an elevation motor drive board.
Red/Green	Alternating one red and three green	The motor drive board will configure as a nozzle board.	Holding Fog for about 3 seconds will make the board a nozzle motor drive board.

H. Monitor faults.

Fault Code	Description
1-1	Rotation sensor fault: on 3688 monitor this generally means that the rotation axis did not properly calibrate.
1-2	Elevation sensor fault: on 3688 monitor this generally means that the elevation axis did not properly calibrate.
1-7	Rotation hard stop fault: Rotation axis unexpectedly stopped
1-8	Elevation hard stop fault: Elevation axis unexpectedly stopped
4-1	Rotation axis offline: Elevation or Pattern motor drive is not communicating with the rotation axis.
4-2	Elevation axis offline: Rotation motor drive is not communicating with the elevation axis.

Notes

[illegible]