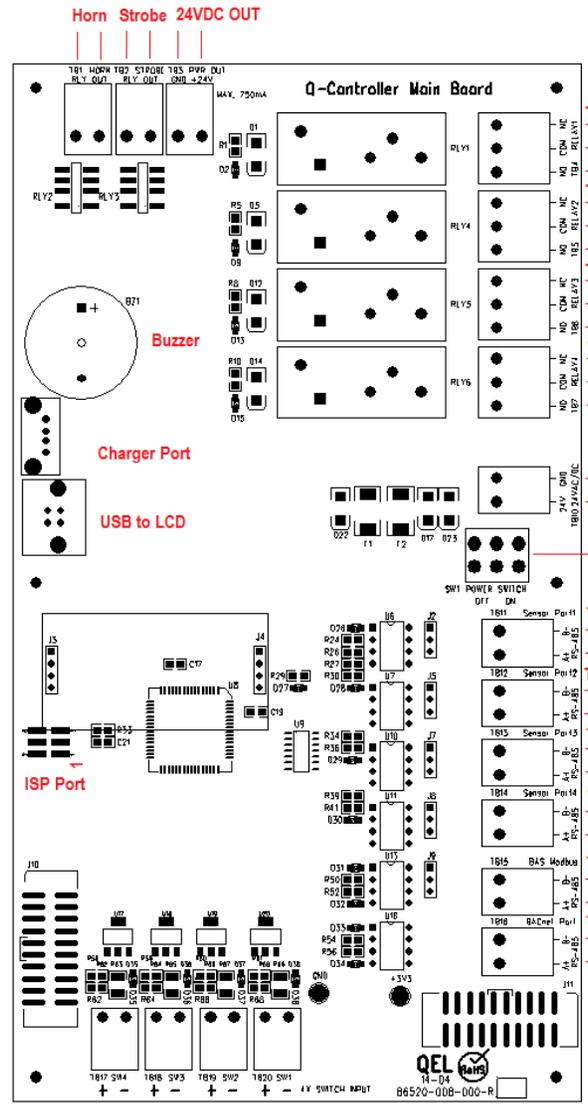
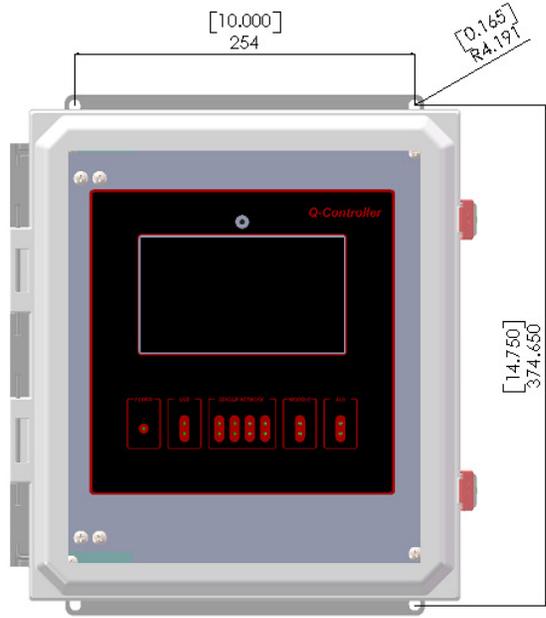


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REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APPROVED
1041	A	FIRST RELEASE	2015-02-05	XY



- 4 Relay Output**
- TB4 Relay1 NO: Normally Open
- NC
- COM
- TB5 Relay2 NC: Normally Closed
- NC
- COM
- TB6 Relay3
- NC
- COM
- TB7 Relay4
- NC
- COM
- TB10 24VAC Power In
- 24V 24VDC
- Power Switch
- TB11 B-
- A+
- TB12 B-
- A+
- TB13 B-
- A+
- TB14 B-
- A+
- TB15 B- RS-485 Modbus
- A+
- TB16 B- RS-485 for BACnet/IP Module
- A+
- Switch4
- Switch1
- TB17 TB18 TB19 TB20 4 Switch Input



UNLESS OTHERWISE SPECIFIED:		NAME	DATE	QUATROSENSE ENVIRONMENTAL LTD.
DIMENSIONS ARE IN INCHES		XY	15-02-09	
TOLERANCES:		TITLE:		
FRACTIONAL ±		Q-Controller		
ANGULAR: MACH ± BEND ±		Installation Drawing		
TWO PLACE DECIMAL ±		SIZE DWG. NO. REV		
THREE PLACE DECIMAL ±		B 86550-002-000 A		
INTERPRET GEOMETRIC TOLERANCING PER:		SCALE: 1:4 WEIGHT: SHEET 1 OF 7		
MATERIAL		COMMENTS:		
FINISH		NEXT ASSY USED ON APPLICATION DO NOT SCALE DRAWING		

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

Specification:

Power Supply Voltage: 24VDC nominal, range 18 to 30VDC
 24VAC nominal, range 15 to 24VAC 50/60HZ
 Note: Input Power is half-wave rectifier circuit, it can be either floating or grounded. You will damage devices if you mix half wave and full wave rectifiers on the same AC source. Use extreme caution when sharing a common AC source. Sharing a common DC source is less problematic.

Current: Q-Controller: max. 0.75 A (fuse protected)
 Strobe & Horn: max. 0.75 A (fuse protected)

Total actual power is dependent on the system design. The power may be supplied to sensors and modules or each may have separate power supplies. Each type of sensor varies in its power requirements.

Note: No external over-current protection is required. Over-current protection is provided by means of fuses F1 and F2. See fuse specification below.

Fuse F1, F2 on Main Board: Polyswitch 750mA
 Polyswitch device resets after the fault is cleared and power to the circuit is removed

Power Switch Slide switch on circuit card (SW1). This switch disconnects power to the main circuit cards and LCD display.

NOTICE: A switch or circuit breaker must be provided in the installation, which can remove power from the Q-Controller in case of emergency or any other related requirement.

Since the Q-Controller enclosure can be locked to prevent unwanted tampering, the internal power switch is not guaranteed to be accessible.

Feeding the Q-Controller power from a rack main switch or from a switch in a distribution box is adequate.

Enclosure UL 508 Type 1, 2, 3, 4, 4X, 12 and 13
 CSA Type 1, 2, 3, 4, 4X, 12 and 13
 NEMA Type 1, 2, 3, 4, 4X, 12 and 13
 IEC 60529, IP66
 Flammability V-0 per UL 94
 UV rating (f1) per UL746C

Environmental conditions Location: Indoor use only
 Altitude: Up to 2 000 m
 Temperature: 5 °C to 50 °C
 Relative Humidity: 80 % for temperatures up to 31 °C decreasing linearly to 50 % at 40 °C.
 Pollution Degree: 3, in accordance with IEC 664.
 Installation Categories (Overvoltage Categories) II

Display & Keypad 7 inch LCD touchscreen display delivers 800 x 480 resolution and offers a capacitive multi-touch TN panel for easily navigate screen

Panel Indicators 15 Status LEDs
 Power Status
 USB TX/RX status
 4 RS-485 port TX/RX Status for Sensor Network
 1 RS-485 port TX/RX Status for Modbus
 1 RS-485 port TX/RX Status for BACnet Module or AUX

On-Board Relays 4 pluggable Relays SPDT, Dry contacts
 Resistive load:
 10A at 250VAC
 10A at 30VDC
 Inductive load:
 7.5A at 250VAC
 5A at 30VDC

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		DIMENSIONS ARE IN INCHES				
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		FRACTIONAL ±		CHECKED		
		ANGULAR: MACH ± BEND ±		ENG APPR.		
		TWO PLACE DECIMAL ±		MFG APPR.		
		THREE PLACE DECIMAL ±		Q.A.		SIZE DWG. NO. REV B 86550-002-000 A
		INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:		
		MATERIAL				SCALE: 1:4 SHEET 2 OF 7
		FINISH				
NEXT ASSY	USED ON					
APPLICATION		DO NOT SCALE DRAWING				

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

NOTE: Input Power is half-wave rectifier circuit, it can be either non-grounded or grounded. You will damage devices if you mix half wave and full wave rectifiers on the same AC source. Use extreme caution when sharing a common AC source. Sharing a common DC source is less problematic.

Power Supply General Guideline:

- Q-Controller uses half-wave rectifier only
- Q5 TB5 is half-wave rectifier
- Q8 TB6 is half-wave rectifier
- All I/O boxes are half-wave rectifier
- It is okay to connect multiple devices to the same AC transformer and share signal commons if
 - Every device uses a half-wave rectifier
 - And the same AC lead on every device is used for common
- If the power supply is 24VAC, no matter it is GROUNDED (one side of AC is connected to ground), or FLOATING (neither side of AC is connected to ground), the polarization is important, make sure the Neutral or the same AC lead is connected to the GND of TB10. Make sure the same AC lead is connected to ground in all devices that share the AC source. Treat AC like DC for purposes of watching polarity in this case.
 - For Q5, the TB5 of Q5 can only be connected to the same AC source
 - For Q8, the TB6 of Q8 can only be connected to the same AC source
 - For I/O boxes, they can be directly connected to the same AC source
 - For other devices, only the device with half-wave rectifier can be connected to the same AC source. If it doesn't have, or any doubt exists, provide a dedicated isolated transformer to the device
- If the power supply is 24VDC, all the devices can be powered by the same DC source.
- Whenever you have different devices from different manufacturers, be careful to separate those devices that utilize a Full-wave rectifier from those using a Half-wave rectifier. When any doubt exists, provide a separate transformer. The small expense of an additional transformer or two will more than make up for all of the time and money spent on troubleshooting
- It is necessary to bear in mind the actual installation when sizing the transformer. The installation requirements can run theoretically from only 15 VA to over 200 VA. These systems ranging from a single controller, a few electrochemical sensors to a full 128 Combustible sensors with several remote relay modules.
- It is always best to allow some safety margin in designing power supplies, and 25% to 50% allowance for startup surges and future requirements is recommended.

QEL supplies one standard transformer

M-Transformer 120 to 24 VAC 200 VA

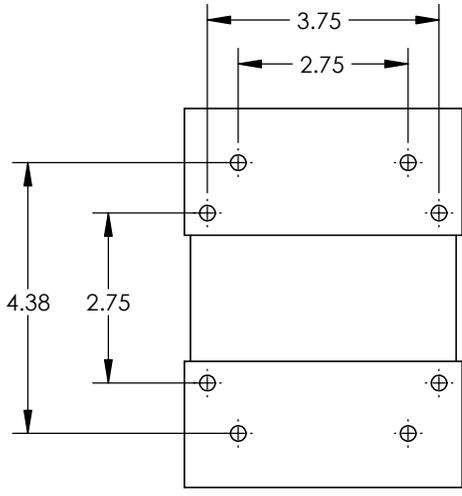
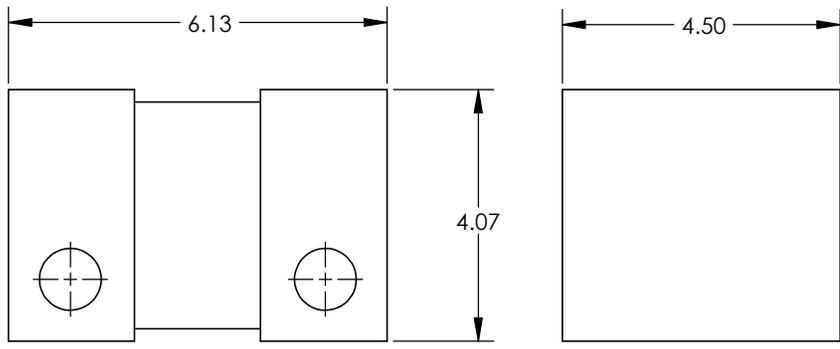
**Specification:
(Continued)**

On-Board Switch Inputs:	4 channel switch inputs The switch can be Q-Switch or any ON-OFF switch
On-Board Buzzer	100 dBA at 10 cm, 3700 Hz Continuous
Horn & Strobe	Two relay dry contact are for Horn and Strobe Dedicated 24VDC terminals are supplied for connection to standard strobe and horn set. Maximum of 750mA on the 24VDC power supply
Remote Devices	4x RS-485 Ports with QEL Controller Protocol - Available transmitter: Q5, Q8, QIRF... - Available I/O box: 8CH-AI-Box, 8CH-AO-Box, 4CH-BI-Box, 4CH-Relay-Box
Modbus Slave Port	RS-485 port Responds as a Modbus Slave using RTU protocol. Q-Controller supplies read status information only
BACnet Port	RS-485 port Connect to QEL BACnet/IP module

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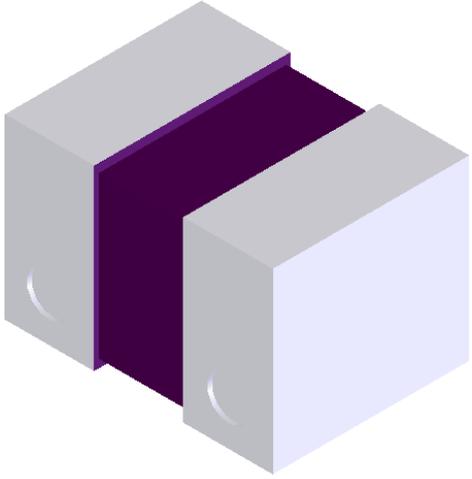
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		ANGULAR: MACH ± BEND ±		MFG APPR.		
		TWO PLACE DECIMAL ±		Q.A.		TITLE:
		THREE PLACE DECIMAL ±		COMMENTS:		Q-Controller Installation Drawing
		INTERPRET GEOMETRIC TOLERANCING PER:				SIZE DWG. NO. REV
		MATERIAL				B 86550-002-000 A
		FINISH				SCALE: 1:4 1 SHEET 3 OF 7
NEXT ASSY	USED ON	APPLICATION		DO NOT SCALE DRAWING		

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**BOTTOM VIEW
MOUNTING HOLES**

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



**QEL M-TRANSFORMER
DIMENSIONS AND SPECIFICATIONS**

**NOTE;
INDOOR TYPE ENCLOSED TRANSFORMER**

**PRIMARY 120VAC 60Hz
SECONDARY 24VAC
POWER 250VA**

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		ANGULAR: MACH ± BEND ±		MFG APPR.		SIZE	DWG. NO.
		TWO PLACE DECIMAL ±		Q.A.		B	86550-002-000
		THREE PLACE DECIMAL ±		COMMENTS:		REV	A
		INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:1 1 SHEET 4 OF 7	
		MATERIAL					
NEXT ASSY		USED ON					
		FINISH					
APPLICATION		DO NOT SCALE DRAWING					

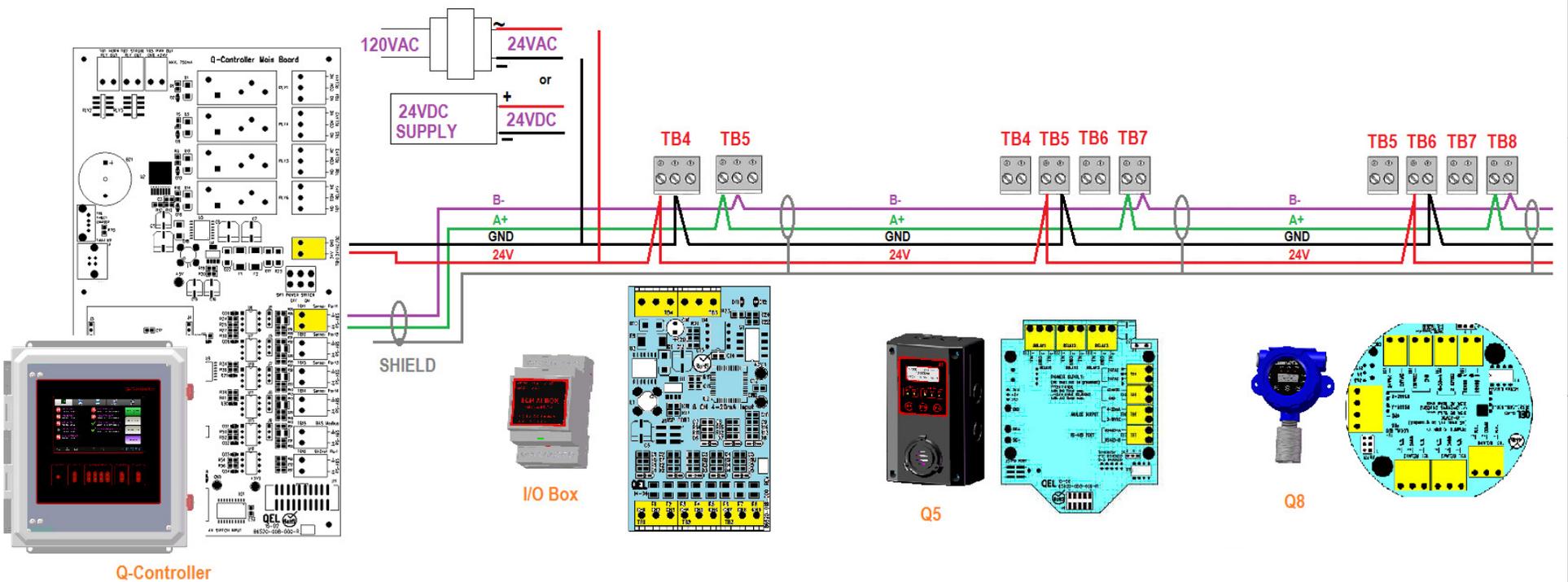
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Recommend Connection for New Installations

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



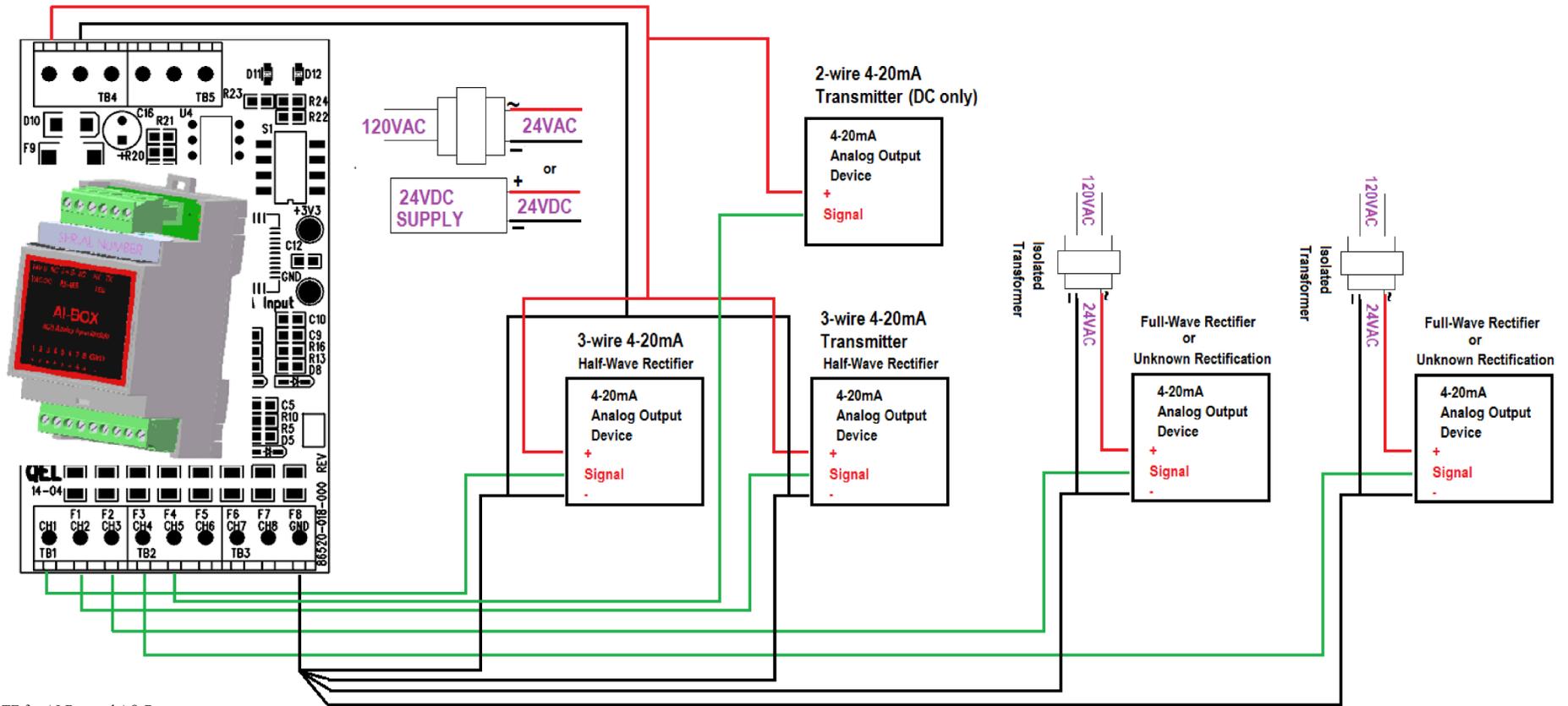
- Note:
1. The power supply can be 24VAC or DC as every device uses a half-wave rectifier in the drawing
 2. The power negative may be grounded or floating
 3. Don't mix full wave rectifiers device with this system
 4. RS-485 cable should be wired from one sensor to another without tees or stub. Power cable does not matter
 5. Before power up, the polarity of the 24VAC power supply should be checked carefully, reversing polarity on the network will cause the RS-485 driver chips blow up

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	QUATROSENSE ENVIRONMENTAL LTD
		DIMENSIONS ARE IN INCHES				TITLE: Q-Controller Installation Drawing
		TOLERANCES:				
		FRACTIONAL: ±				
		ANGULAR: MACH ± BEND ±				
		TWO PLACE DECIMAL ±				SIZE DWG. NO. REV
		THREE PLACE DECIMAL ±				B 86550-002-000 A
		INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:4 SHEET 5 OF 7
		MATERIAL				
		FINISH				
NEXT ASSY	USED ON					
		APPLICATION				
		DO NOT SCALE DRAWING				

AI-BOX Connection

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



NOTE for AI-Box and AO-Box:

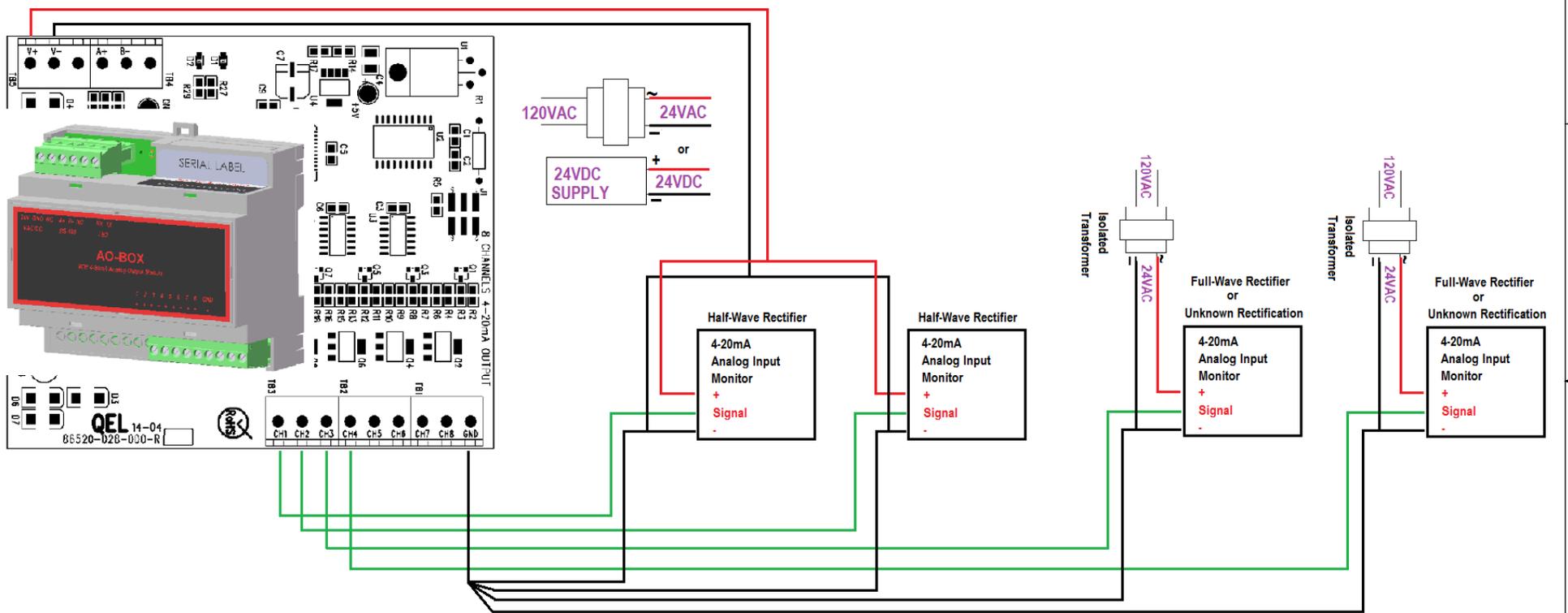
- All I/O boxes are non-isolated devices with a half-wave rectifier on the 24VAC/DC power input terminal. Therefore, to prevent equipment damage, multiple devices that are powered by a common 24VAC transformer must use common device power connections (e.g. 24VAC input power to other device power inputs, and ground to other device grounds), or dedicated isolated transformers must be provided for each non-isolated device.
- The AI-Box 24VAC/DC input power ground and analog input signal returns are common.
- The AO-Box 24VAC/DC input power ground and analog output signal returns are common.
- If it is known that the connected analog device is half-wave rectified, it can share the same AC power supply with the AI-Box and AO-Box.
- If the rectification of the other device is unknown, it is recommended that a separate transformer is used to power other device.

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		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	CHECKED		
		INTERPRET GEOMETRIC TOLERANCING PER:	ENG APPR.		
		MATERIAL	MFG APPR.		
NEXT ASSY	USED ON	FINISH	Q.A.		COMMENTS:
APPLICATION		DO NOT SCALE DRAWING			SIZE B DWG. NO. 86550-002-000 REV A SCALE: 1:4 WEIGHT: SHEET 6 OF 7

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

AO-BOX Connection



NOTE for AI-Box and AO-Box:

- All I/O boxes are non-isolated devices with a half-wave rectifier on the 24VAC/DC power input terminal. Therefore, to prevent equipment damage, multiple devices that are powered by a common 24VAC transformer must use common device power connections (e.g. 24VAC input power to other device power inputs, and ground to other device grounds), or dedicated isolated transformers must be provided for each non-isolated device.
- The AI-Box 24VAC/DC input power ground and analog input signal returns are common.
- The AO-Box 24VAC/DC input power ground and analog output signal returns are common.
- If it is known that the connected analog device is half-wave rectified, it can share the same AC power supply with the AI-Box and AO-Box.
- If the rectification of the other device is unknown, it is recommended that a separate transformer is used to power other device.

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		TOLERANCES:		CHECKED				Q-Controller	
		FRACTIONAL: ±		ENG APPR.				Installation Drawing	
		ANGULAR: MACH ±		MFG APPR.				SIZE	
		BEND ±		Q.A.				DWG. NO.	
		TWO PLACE DECIMAL ±		COMMENTS:				86550-002-000	
		THREE PLACE DECIMAL ±						REV	
		INTERPRET GEOMETRIC TOLERANCING PER:						A	
		MATERIAL						SCALE: 1:4	
		FINISH						SHEET 7 OF 7	
NEXT ASSY		USED ON							
APPLICATION		DO NOT SCALE DRAWING							