

REVISIONS

ECN	REV.	DESCRIPTION	DATE	APPROVED
886	D	CHANGE F1 TO F5 TO 2A SLOW BLOW	2008/12/02	XY

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		Y. DUBE	03-02-11
TOLERANCES:		DRAWN	BC
FRACTIONAL: ±		CHECKED	BC
ANGULAR: MACH: ±		ENG APPR:	
DECIMAL: ±		MFG APPR:	
THREE PLACE DECIMAL: ±		Q. A.	
INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:	
MATERIAL:			
FINISH:			
USED ON:			
APPLICATION:			
DO NOT SCALE DRAWING			

**QUATROSENSE ENVIRONMENTAL LTD**  
**REV** **D**  
**84350-002-000**  
**M-CONTROLLER INSTALLATION DRAWING**  
 SIZE: 1:2 | WEIGHT: SHEET 1 OF 6

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24VDC EXTERNAL STROBE

24VDC EXTERNAL HORN

MOUNTING HOLES

RELAYS 3 x DPDT

PANEL FUSE 2 AMPS SLOW BLOW

POWER ON/OFF

24VAC/DC POWER IN

INDIVIDUAL CHANNEL FUSES 2 AMPS SLOW BLOW

REMOTE DEVICE PORTS RS-485 24VAC/DC POWER 4 PORTS

RS-422 MODBUS SLAVE PORT

8 ANALOG INPUT 4-20mA WITH COMMON

RJ-11 COMPUTER CONNECTION

OPTIONAL ANALOG OUTPUT 8 CHANNELS 4-20mA WITH COMMON GROUND, ISOLATED

2 x 16 ALPHANUMERIC DISPLAY

8.10 (206mm)

10.10 (256.5mm)

BUZZER

2.00" DEPTH (50.8mm)

INDICATOR LEDES

LOCKING DOOR LATCH

16 BUTTON KEYPAD

M-CONTROLLER

QUATROSENSE ENVIRONMENTAL LTD. GAS MONITORING SYSTEM



## Specifications

### Power Supply:

Voltage 24V +/- 4V AC or DC  
AC Supply Non-Grounded (Floating)

### Amps:

Controller: 1.0A  
Strobe & Horn 0.5A  
Max Load per channel 2.0A  
Max Allowed through controller 10A

Total actual power is dependent on the system design. Power may be supplied to sensors and relay modules through the M-Controller or each may have separate power supplies. Each type of sensor varies in it's power requirements.

Enclosure: NEMA 1, steel, epoxy painted black

Keypad 4 x 4 tactile & audible keypad

Display 2 x 16 character display c/w backlight

Panel Indicators 5 Status LED's (Red)

On-Board Relays 3 Relays DPDT, Dry contacts  
5 amp resistive 240VAC, 30 VDC  
3.7 amp inductive 240VAC, 30 VDC

Horn & Strobe 24VDC terminals are supplied for connection to standard strobe and horn set. 6 watts each.

### On-Board Buzzer

90 db at 30 cm, 2700 Hz  
Buzzer 1: Continuous  
Buzzer 2: Double-tap Intermittent  
Buzzer 3: Intermittent 50% duty cycle

### Remote Devices

4 Ports  
24VAC/DC  
RS-485

### Modbus Slave

Port RS-422  
Responds as a Modbus Slave using RTU protocol. M-Controller supplies read status information only.

### RS-232 Interface

RJ-11 Telephone jack.  
Disables the RS-422 port. Can be used for MODBUS RTU.  
Primarily used for uploading and downloading large configuration databases.

### Analog Inputs

Standard 8 channels of analog 4-20 milliamp inputs with one common. Input resistance is 110 ohms.  
Voltage drop generated is 4 ma => .44V, 20 ma => 2.2V

### Analog Output

Optional added circuit card to support 8 channels of 4-20 milliamps. The signals may be isolated as group by using a separate isolating transformer (supplied by others) as necessary.

REV. NO.		DESCRIPTION		DATE		APPROV.	
		SEE SHEET ONE					

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DIMENSIONS ARE IN INCHES		Y. DUBE		03-02-11			
TOLERANCES:		DRAWN		CHECKED			
FRACTIONAL: ±		ENG APPR:		MFG APPR:			
ANGULAR: MACH: ±		G. A.		COMMENTS:			
HOLE POSITION: ±							
THREE PLACE DECIMAL: ±							
INTERPRET GEOMETRIC TOLERANCING PER:							
MATERIAL							
FINISH							
NEXT ASSY		USED ON					
APPLICATION							
DO NOT SCALE DRAWING							
TITLE:		M-CONTROLLER		INSTALLATION DRAWING		REV	
SIZE		DWG. NO.		REV		D	
SCALE: 1:2		WEIGHT:		SHEET 3 OF 6			

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ZONE		REV.	DESCRIPTION	DATE	APPV
			SEE SHEET ONE		
REVISIONS					

**BUZZER**

- 01 - +24
- 02 - BUZZER\_DRIVER

**STROBE**

- 03 - STROBE\_DRIVER
- 04 - +24

**HORN**

- 05 - HORN\_DRIVER
- 06 - +24

**RELAYS**

- 07 - NO
- 08 - NO
- 09 - COMMON
- 10 - COMMON
- 11 - NC
- 12 - NC
- 13 - NO
- 14 - NO
- 15 - COMMON
- 16 - COMMON
- 17 - NC
- 18 - NC
- 19 - NO
- 20 - NO
- 21 - COMMON
- 22 - COMMON
- 23 - NC
- 24 - NC

**POWER IN**

- 25 - NEG/GND 24VAC/VDC
- 26 - POS 24VAC/VDC

**SENSORS PORTS**

A, B = RS-485 CONNECTIONS

- 27 - A
- 28 - 24VDC/VAC
- 29 - B
- 30 - GND/VAC
- 31 - A
- 32 - 24VDC/VAC
- 33 - B
- 34 - GND/VAC
- 35 - A
- 36 - 24VDC/VAC
- 37 - B
- 38 - GND/VAC
- 39 - A
- 40 - 24VDC/VAC
- 41 - B
- 42 - GND/VAC

**TB11**

- 43 - TX-
- 44 - TX+
- 45 - RX-
- 46 - RX+

**4-20mA INPUT PORT**

- 47 - COMMON
- 48 - COMMON
- 49 - CH8
- 50 - CH7
- 51 - CH6
- 52 - CH5
- 53 - CH4
- 54 - CH3
- 55 - CH2
- 56 - CH1
- 57 - NC
- 58 - COMMON
- 59 - RX
- 60 - TX
- 61 - COMMON
- 62 - NC

**RJ-11 LAPTOP**

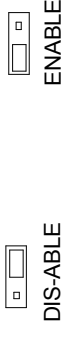
- 57 - NC
- 58 - COMMON
- 59 - RX
- 60 - TX
- 61 - COMMON
- 62 - NC

**4-20mA OUTPUT OPTION PORT**

- 01 CH1
- 02 CH2
- 03 CH3
- 04 CH4
- 05 CH5
- 06 CH6
- 07 CH7
- 08 CH8
- 09 COMMON RETURN
- 10 24 VAC/VAC
- 11 NEG/GND VDC/VAC

NOTE:  
A 120 OHM END-OF-LINE IMPEDANCE MATCHING RESISTOR MUST ALWAYS BE USED WHEN A PORT IS AT ONE END OF THE COMMUNICATION LINE AND NEVER WHEN THE PORT IS IN AN INTERMEDIATE POSITION

120 OHM RESISTORS ARE ENABLED ON BOARD FOR EACH PORT:



NOTE THAT THE RS-422 PORT E. HAS AN END-OF-LINE RESISTOR ONLY ON THE RECEIVE LINES

POWER SUPPLIES FOR REMOTE DEVICES: THE CONTROLLER DOES NOT CONDITION THE POWER OUTPUT TO REMOTE DEVICES (E.G. SENSORS). E.G. IF 24 VAC FLOATING IS SUPPLIED TO THE CONTROLLER THEN THAT POWER IS SUPPLIED TO THE SENSORS UNCHANGED EXCEPT FOR THE FUSE. I.E. THE REMOTE DEVICES ARE SIMPLY CONNECT TO THE POWER SUPPLY IN PARALLEL.

UNLESS OTHERWISE SPECIFIED:		NAME	DATE	QUATROSENSE ENVIRONMENTAL LTD.
DIMENSIONS ARE IN INCHES	DRAWN	Y. DUBE	03-02-12	TITLE: M-CONTROLLER INSTALLATION DRAWING
TOLERANCES: FRACTIONAL: ± ANGULAR: MACH ± THREE PLACE DECIMAL ±	CHECKED			
INTERPRET GEOMETRIC TOLERANCING PER:	ENG APPR.			SIZE DWG. NO. REV B 84350-002-000 D
	MFG APPR.			
	Q. A.			SCALE: 1:2 WEIGHT: SHEET 5 OF 6
	COMMENTS:			
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	NEXT ASSY	USED ON		

8	7	6	5	4	3	2	1	REVISIONS				
								ZONE	REV.	DESCRIPTION	DATE	APPV.
										SEE SHEET ONE		

8	7	6	5
Device	Power Requirements Amps at 24VDC	Quantity	Total Power Requirements
M-Controller- Standard	0.65		
Optional 4-20 Output	0.25		
M-Relay- 5 Amps c/w 2 Relays	0.10		
c/w 4 Relays	0.15		
c/w 6 Relays	0.20		
c/w 8 Relays	0.25		
M-Relay- 10 Amps c/w 2 Relays	0.12		
c/w 4 Relays	0.20		
c/w 6 Relays	0.28		
c/w 8 Relays	0.36		
External Strobe 0.3A Max			
External Horn 0.3A Max			
Remote Transmitters			
M-18	0.080		
M-17	0.100		
M-5	0.080		
M-6	0.26		
M-20	0.100		
QTS-1810	0.125		
QTS-1710	0.125		
QTS-6000	0.25		
QTS-8000 Combustibles	0.200		
QTS-8000 Electrochemical	0.150		
<b>Total</b>			
<b>Safety Margin @ 25%</b>			
<b>Grand Total</b>			

The M-Controller power supply Voltage requirements are nominally 24 VDC or 24VAC. This increases flexibility in the field and reduces costs, especially in those areas where 24 VAC power is available as standard. In those situations where 24 VAC/DC is not already available it is necessary to purchase a power supply e.g. a standard transformer. Note that the AC power must be non-grounded (i.e. Floating).

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 with no external relays to a full 32 QTS-8000 Combustible sensors with several remote relay modules.

The accompanying table allows the user to calculate power requirements for the system as an aid in sizing the transformer or power supply. Note the addition of a line at the bottom for 25% oversizing. 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.

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FRACTIONAL ±	CHECKED			M-CONTROLLER
ANGULAR: MACH ±	ENG APPR.			INSTALLATION DRAWING
THREE PLACE DECIMAL ±	MFG APPR.			SIZE DWG. NO.
INTERPRET GEOMETRIC TOLERANCING PER:	Q. A.			<b>B</b> 84350-002-000
MATERIAL	COMMENTS:			REV
FINISH				<b>D</b>
USED ON				SCALE: 1:2
APPLICATION	DO NOT SCALE DRAWING			WEIGHT:
				SHEET 6 OF 6