MXD75

Multi-parameter Monitor

Installation Guide

Preface

Product warranty

The MXD75 has a warranty against defects in materials and workmanship for three years from the date of shipment. During this period Quadbeam Technologies will, at its own discretion, either repair or replace products that prove to be defective. The associated software is provided 'as is' without warranty.

Limitation of warranty

The foregoing warranty does not cover damage caused by accidental misuse, abuse, neglect, misapplication or modification.

No warranty of fitness for a particular purpose is offered. The user assumes the entire risk of using the product. Any liability of Quadbeam Technologies is limited exclusively to the replacement of defective materials or workmanship.

There are no user serviceable parts, including fuses etc., within the unit. Any attempt to dismantle the instrument will invalidate the warranty.

Disclaimer

Quadbeam Technologies Ltd reserves the right to make changes to this manual or the instrument without notice, as part of our policy of continued developments and improvements.

All care has been taken to ensure accuracy of information contained in this manual. However, we cannot accept responsibility for any errors or damages resulting from errors or inaccuracies of information herein.

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Third edition: June 2013

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Manufacturing Standards

Electromagnetic compatibility

This instrument has been designed to comply with the standards and regulations set down by the European EMC Directive 2004/108/EC using BS EN 61326-1: 2013

Safety

This instrument has been designed to comply with the standards and regulations set down by the European Low Voltage Directive 2006/95/EC using BS EN 61010-1: 2010

Quality

This instrument has been manufactured under the following quality standard:

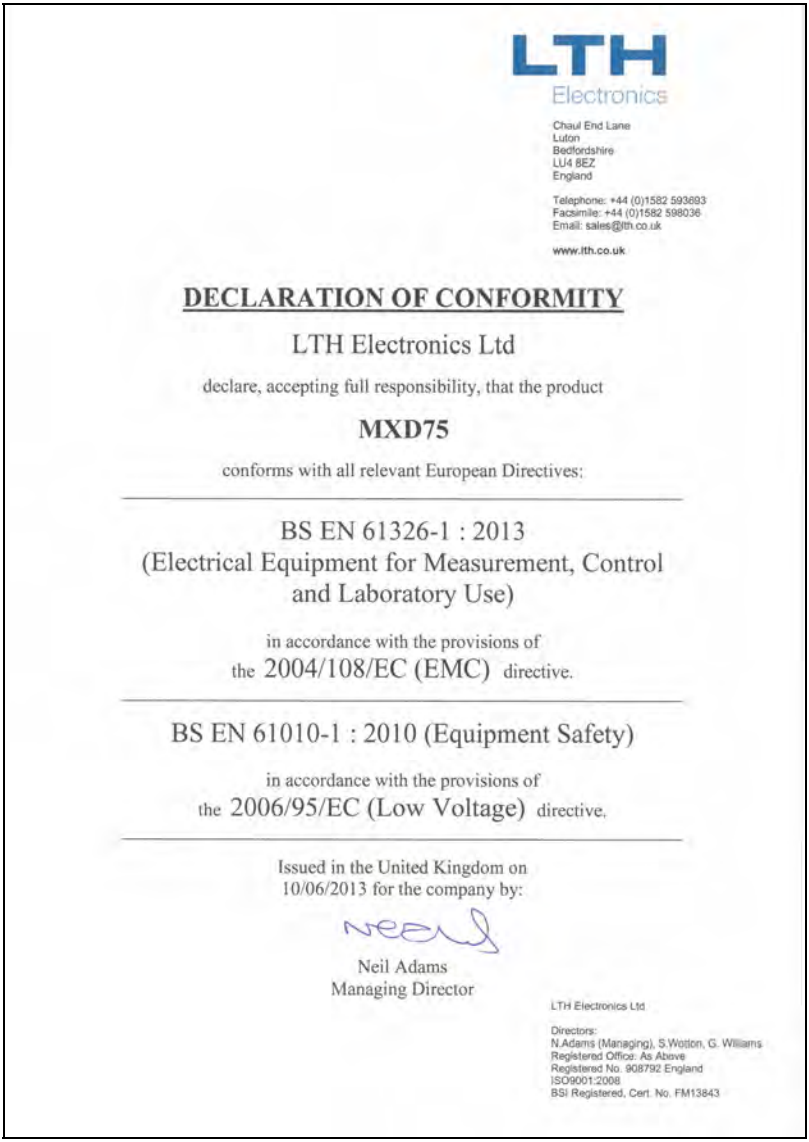
ISO 9001:2008. Certificate No: FM 13843

Note: The standards referred to in the design and construction of Quadbeam Technologies products are those prevailing at the time of product launch. As the standards are altered from time to time, we reserve the right to include design modifications that are deemed necessary to comply with the new or revised regulations.

Disposal

As per directive 2002/96/EC, please observe the applicable local or national regulations concerning the disposal of waste electrical and electronic equipment.

Declaration of Conformity



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DECLARATION OF CONFORMITY

LTH Electronics Ltd

declare, accepting full responsibility, that the product

MXD75

conforms with all relevant European Directives:

BS EN 61326-1 : 2013
(Electrical Equipment for Measurement, Control and Laboratory Use)

in accordance with the provisions of
the 2004/108/EC (EMC) directive.

BS EN 61010-1 : 2010 (Equipment Safety)

in accordance with the provisions of
the 2006/95/EC (Low Voltage) directive.

Issued in the United Kingdom on
10/06/2013 for the company by:

Neil Adams
Managing Director

LTH Electronics Ltd

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Registered Office: As Above
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ISO9001:2008
BSI Registered, Cert. No. FM13843

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Contents

Preface 1
Contents 5
Introduction 7
MXD75 Instrument Specification 9
Installation – Safety & EMC 11
Noise suppression 12
MXD75 Add-in Cards Installation 13
Installation – MXD75 19
Pipe Mounting 20
MXD75 Basic Connections 23
- Supply Voltage Connections 24
- Sensor Connections 24
- Current Output Connections 25
- Relay Connections 26
- Digital Inputs 27
- SD Card Interface 28

Guarantee and Service 29
Index 32

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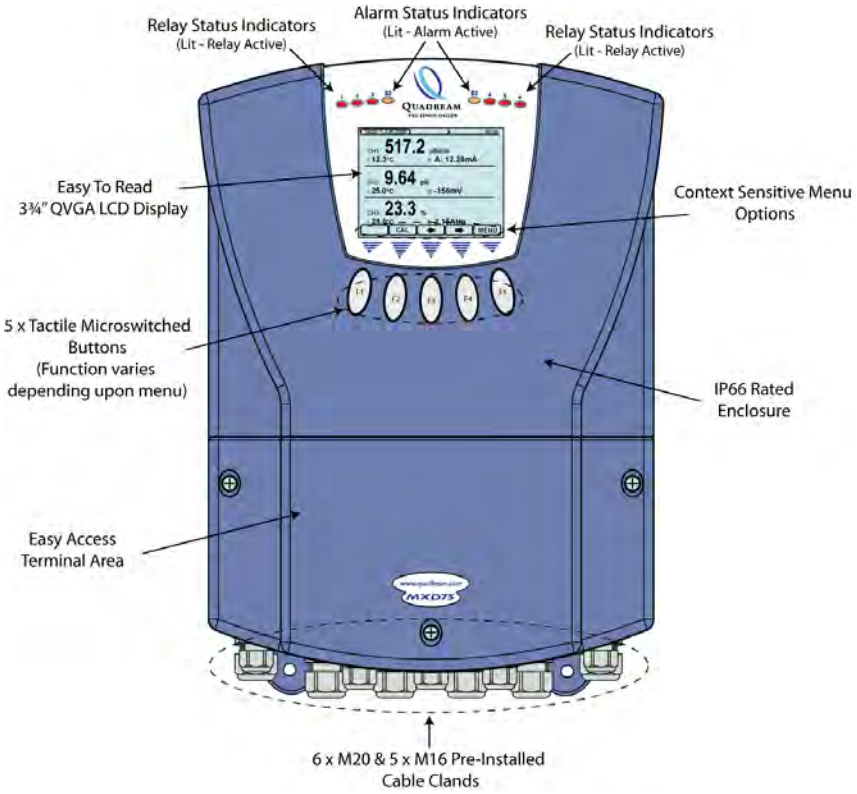
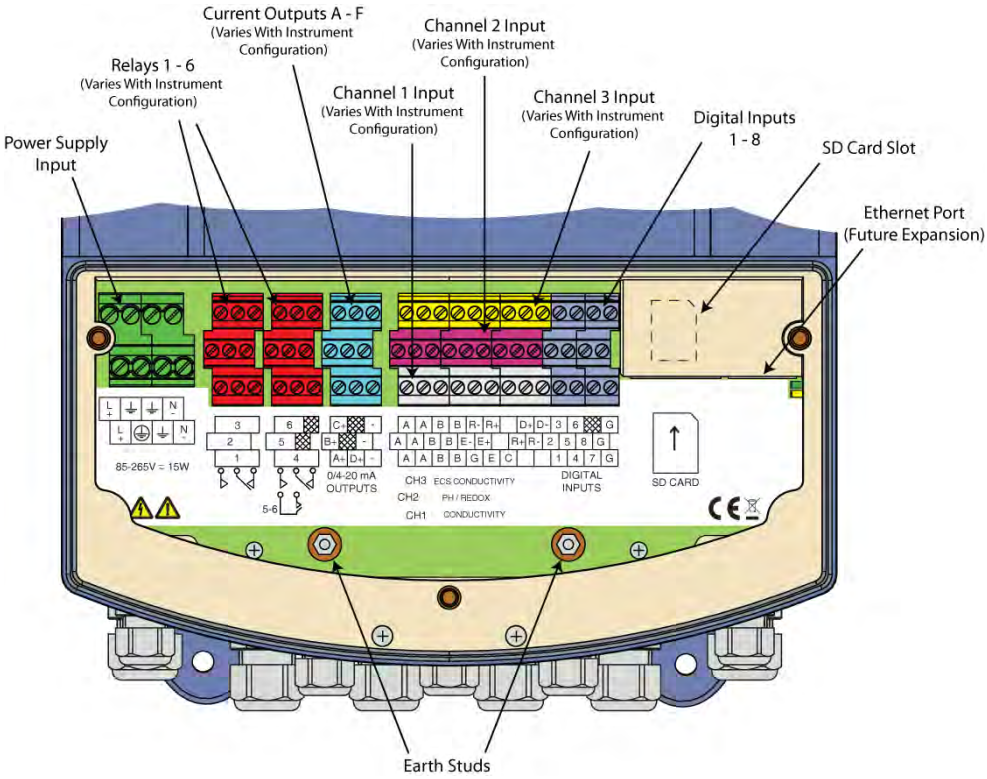
Introduction

The MXD75 is a microprocessor controlled multi-parameter instrument that can be installed with a user selected combination of up to 3 Sensor Input Cards. The instrument may be subsequently modified to meet changing requirements by the installation of additional, or different, cards and the attachment of the appropriate sensor(s).
Utilising a multifunction easy to read QVGA LCD the instrument displays readings and provides feedback to the operator on the status of the sensors and instruments outputs.
In addition the instrument features, depending upon configuration, up to six control relays and up to six 0/4 – 20mA current outputs. These can be used to provide fully configurable control, alarm and feedback.
Finally the instrument also features an SD card interface which enables the user to backup and restore instrument settings, copy settings between instruments, log the sensor readings (optional extra) and to upgrade the instrument's software.



MXD75 Overview



MXD75 Termination Overview

MXD75 Instrument Specification

Input Expansion Slots	3 slots, user configurable with any combination of available input add-in cards.
Output Expansion Slots	1 slot, user configurable with an additional output option add-in card.
Ambient Operating Temperature	-20°C to +50°C (-4°F to +122°F) for full specification.
Display	3 ¾" QVGA back lit LCD module.
Buttons	5 tactile feedback, micro-switched, silicone rubber.
Alarm LED's	2 Yellow LED's located above the main display area for instrument's alarm status, lit = active.
Digital Inputs	8 contact closures for remote activation of user defined operations. Can be configured to operate in either normally open or normally closed modes.
Current Output Options	1 as standard, expandable up to a total of 4 or 6 depending on the number of relays.
Current Output Specification	Each selectable 0-20mA or 4-20mA into 750 ohms max, fully isolated to 2kV. Expandable up to 5% of any operating range and offset anywhere in that range.
Current Output Adjustment	±0.01mA, 3 point 0-4-20 mA for remote monitor calibration.
Setpoints and Control Relays Options	2 change over relays as standard, expandable up to a total of either 4 change over relays, or 4 change over relays + 2 normally open relays depending on the number of current outputs.
Setpoints and Control Relays Specification	Fully configurable setpoints with volt free contacts for each relay. Rated at 5A @ 30V DC / 5A @ 250V AC.
Setpoint LED's	6 Red LED's located above main display area for setpoint status indication, lit = relay energised.

Setpoint Modes	On/Off, Time Proportioning, Pulse Proportioning, Band and Latch. Delay timer adjustable from 00:00 to 59:59 mm:ss. Hysteresis 0 to 9.9%. Dose alarm timer, with supplementary initial charge function. Both adjustable from 00:00 to 59:59 mm:ss. Adjustable cycle time and proportional band in proportional modes.
Setpoint Cleaning	Cleaning mode with adjustable duration (max 10m) and interval times (max 24h), auto offline function with recovery timer.
Setpoint Alarm	Unit or channel alarm mode, whereby the relay can be energised under certain set conditions.
SD Card Interface	Enables backing up and restoring of instrument configuration, log the sensor readings (optional extra) and on site upgrading of instrument software. SD, SDHC and SDXC-FAT32 cards supported.
EMC	2004/108/EC using BS EN 61326-1: 2013.
Low Voltage Directive	2006/95/EC using BS EN 61010-1: 2010.
Power Supply	Universal 80-265V AC or DC, 15W max. LV Option 18 – 32 V AC or DC, 20W max.
Instrument Housing	UL 94-V0 PC/ABS.
Ingress Protection Rating (IEC 60529 Protection Rating)	IP66.
Weight	Maximum 2.7 kilograms (instrument only).
Dimensions	331 x 242 x 110 mm (H, W, D) excluding mounting brackets.

Installation – Safety & EMC

This chapter describes how to install the instrument and how to connect the unit to a power source and auxiliary equipment.

Although today's electronic components are very reliable, it should be anticipated in any system design that a component could fail and it is therefore desirable to make sure a system will **fail safe**. This could include the provision of an additional monitoring device, depending upon the particular application and any consequences of an instrument or sensor failure.

Wiring Installation

The specified performance of the instrument is entirely dependent on correct installation. For this reason, the installer should thoroughly read the following instructions before attempting to make any electrical connections to the unit.

CAUTION ! : ALWAYS REMOVE THE MAIN POWER FROM THE SYSTEM BEFORE ATTEMPTING ANY ALTERATIONS TO THE WIRING. ENSURE THAT BOTH POWER INPUT LINES ARE ISOLATED. MAKE SURE THAT THE POWER CANNOT BE SWITCHED ON BY ACCIDENT WHILST THE UNIT IS BEING CONNECTED. FOR SAFETY REASONS AN EARTH CONNECTION MUST BE MADE TO THE EARTH TERMINAL OF THIS INSTRUMENT.

LOCAL WIRING AND SAFETY REGULATIONS SHOULD BE STRICTLY ADHERED TO WHEN INSTALLING THIS UNIT. SHOULD THESE REGULATIONS CONFLICT WITH THE FOLLOWING INSTRUCTIONS, CONTACT QUADBEAM TECHNOLOGIES OR AN AUTHORISED LOCAL DISTRIBUTOR FOR ADVICE.

To maintain the specified levels of Electro Magnetic Compatibility (EMC, susceptibility to and emission of electrical noise, transients and radio frequency signals) it is essential that the types of cables recommended within these instructions be used. If the installation instructions are followed carefully and precisely, the instrument will achieve and maintain the levels of EMC protection stated in the specification. Any equipment to which this unit is connected must also have the same or similar EMC control to prevent undue interference to the system.

❖ Terminations at the connectors should have any excess wire cut back so that a minimal amount of wire is left free to radiate electrical pick-up inside or close to the instrument housing.

❖ The terminal cover of the surface mount unit must be correctly re-assembled and securely fastened to maintain a continuous electro-magnetic shield around the instrument.

❖ **N.B.** The use of CE marked equipment to build a system does not necessarily mean that the completed system will comply with the European requirements for EMC.

Noise suppression

In common with other electronic circuitry, the instrument may be affected by high level, short duration noise spikes arising from electromagnetic interference (EMI) or radio frequency interference(RFI). To minimise the possibility of such problems occurring, the following recommendations should be followed when installing the unit in an environment where such interference could potentially occur.

The following noise generating sources can affect the instrument through capacitive or inductive coupling.

- Relay coils
- Solenoids
- AC power wires, particularly at or above 100V AC
- Current carrying cables
- Thyristor field exciters
- Radio frequency transmissions
- Contactors
- Motor starters
- Business and industrial machines
- Power tools
- High intensity discharge lights
- Silicon control rectifiers that are phase angle fired

The instrument is designed with a high degree of noise rejection built in to minimise the potential for interference from these sources, but it is recommended that you apply the following wiring practices as an added precaution. Cables transmitting low level signals should not be routed near contactors, motors, generators, radio transmitters, or wires carrying large currents.

If noise sources are so severe that the instrument's operation is impaired, or even halted, the following external modifications should be made, as appropriate:

- Fit arc suppressors across active relay or contactor contacts in the vicinity.

- Run signal cables inside steel tubing as much as is practical.

- Use the internal relays to switch external slave relays or contactors when switching heavy or reactive loads.

- Fit an in-line mains filter close to the power terminals of the instrument.

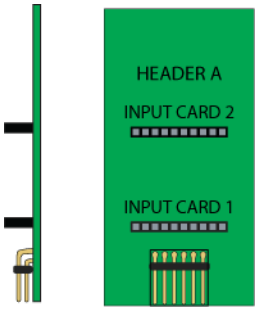
- In cases of very high background RF and HF noise environments, Quadbeam Technologies can supply a length of proprietary RF suppressing mains cable.

MXD75 Add-in Cards Installation

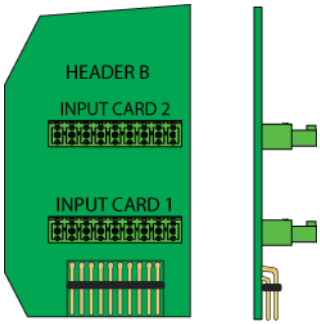
The MXD75 is designed to be expandable by the use of add-in cards; these add-in cards can take the form of either a sensor input add-in card or an output option add-in card. The MXD75 can be fitted with up to 3 sensor input cards and 1 output option card. The sensor input cards are designated Input Card 1, Input Card 2 and Input Card 3. On the instrument display these are designated Channel 1, Channel 2 and Channel 3.

L Electrostatic precautions must be taken when handling the Add-in cards.

Input cards 1 & 2 are installed via the use of headers A and B (supplied with instrument).

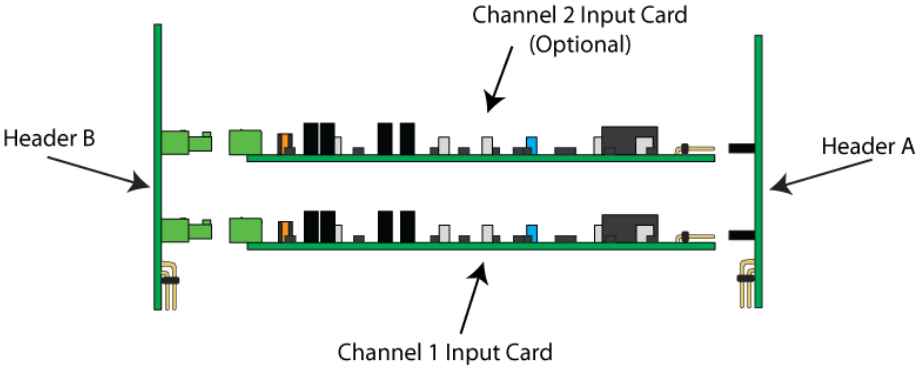


Header A

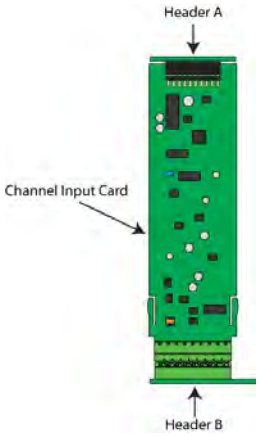


Header B

Insert the required input cards between the headers as shown in the following two diagrams, ensuring that the connectors are correctly aligned with the headers on the input cards.

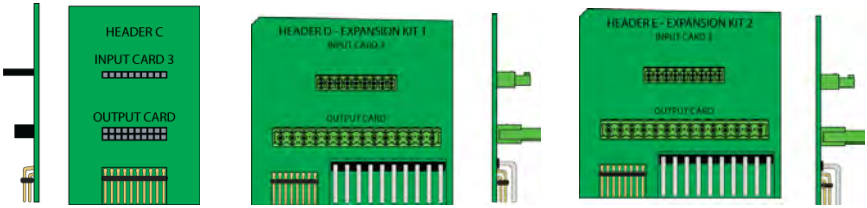


Input Card 1 & 2 Installation Side View



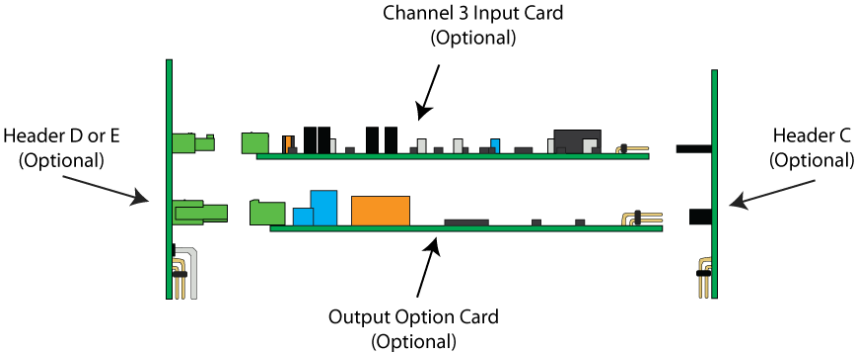
Input Card 1 & 2 Installation
Top View

Input card 3 and the output option card are installed via the use of header C and either header D or E depending on the configuration of the output option card. (N.B. header's C, D and E are not supplied with the standard instrument and must be purchased separately if upgrading the unit after initial purchase).

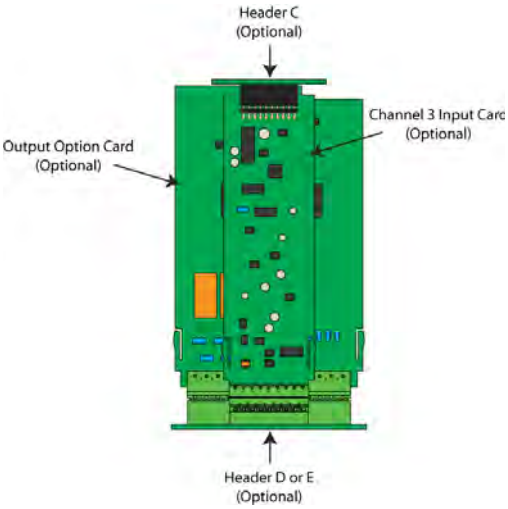


Header C Header D Header E

Insert the required input card or output option card between the headers as shown in the following two diagrams, ensuring that the connectors are correctly aligned with the headers on the cards.



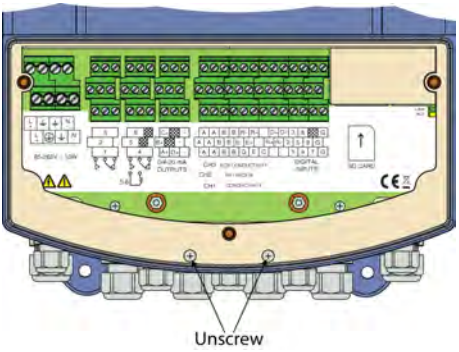
Input Card 3 & Output Option Card Installation Side View



Input Card 3 & Output Option Card Installation Top View

To install the cards and headers into the instrument, first remove the terminal cover.

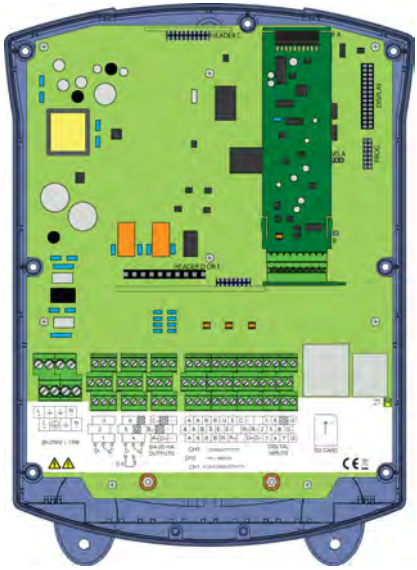
Then remove the two revealed screws at the bottom of the case.



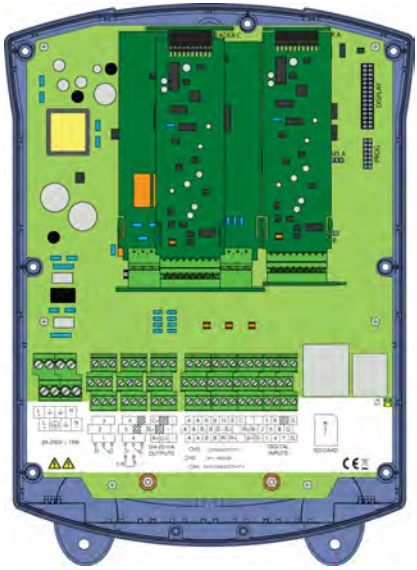
Then on the underside of the case remove the remaining seven screws. N.B. Do not lose the o-rings which may come off when removing the screws.

The headers with the cards attached must then be inserted into the instrument's main board connectors. Match the header's name with corresponding text on the board, as shown in the following figure. Care must be taken to align the header board with the dotted outline on the main board.

Once inserted the instrument should look as follows

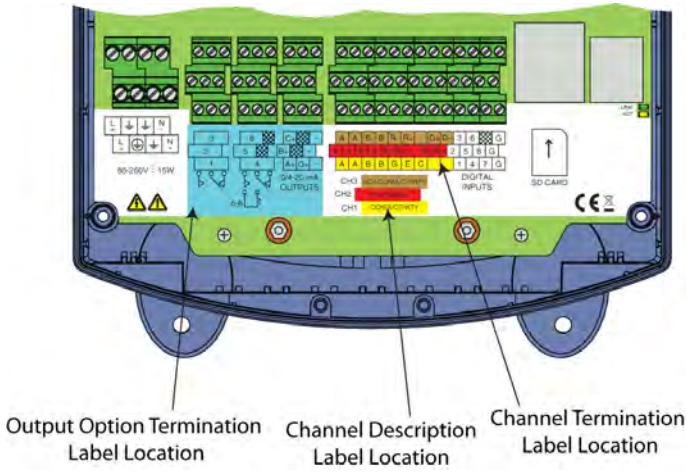


With Input Card 1 and 2

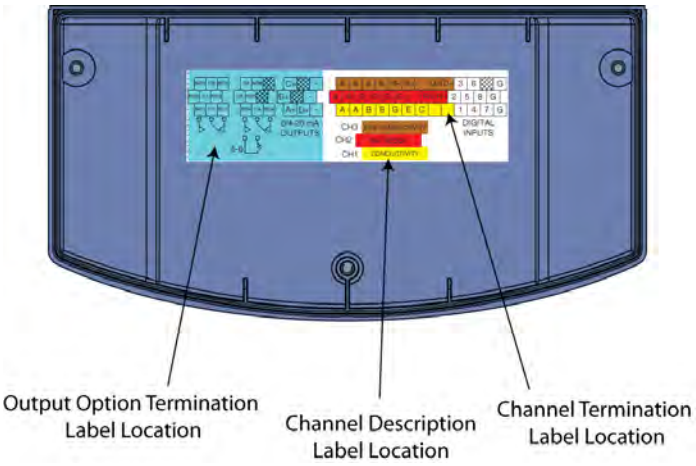


With Input Card 1, 2, 3 and Output Option Card

Now attach the supplied connection labels to the terminal area label and inside the terminal cover as shown.



Supplied Terminal Label Locations



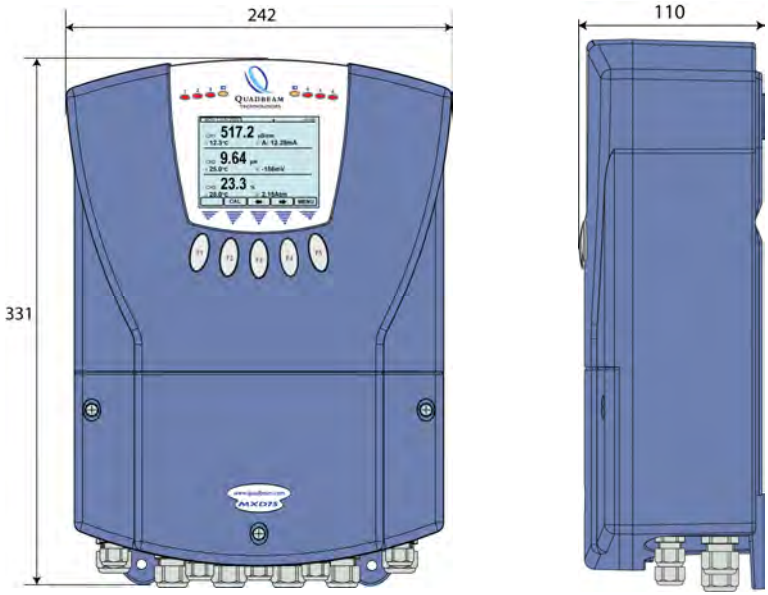
Supplied Terminal Cover Label Locations

Next reassemble the instrument case, ensuring all of the o-rings are in place on the back of the case and all of the screws are re-inserted. Connect the power (see Supply Voltage Connections section) and check that all of the new cards have been recognised by the instrument.

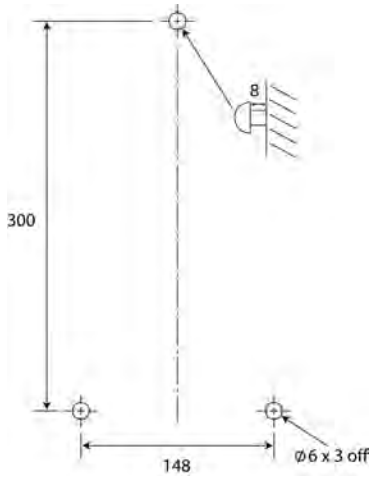
Now consult the appropriate wiring section for details of how to connect the sensors and outputs.

Installation – MXD75

The MXD75 Surface mount instrument is designed for fixing to a wall or other flat surface. Three 6.5mm diameter holes are provided for this purpose. Note that fasteners are not provided.



MXD75 Overall Dimensions

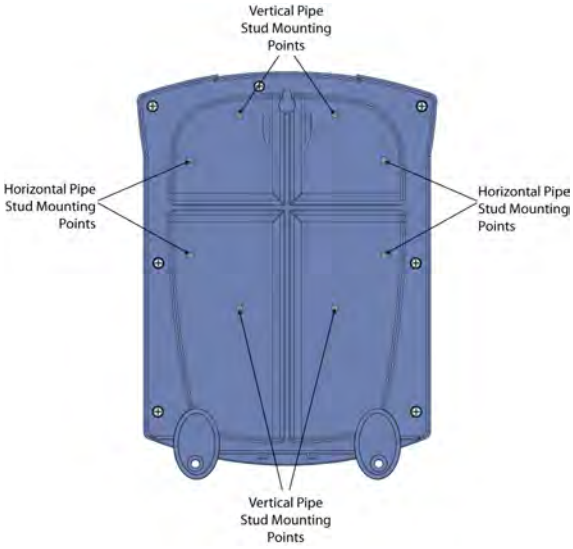


Drill Hole Dimensions

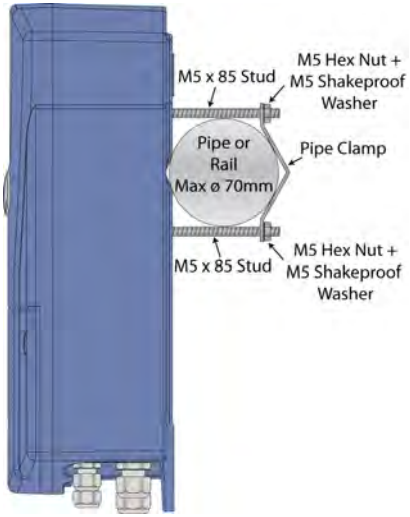
- Use No. 10 x 1¼ inch round head screws or similar for mounting.
- Ensure top screw head is 8mm proud.
- Care must be taken when fitting the unit on uneven walls or surfaces. Do not over stress the mounting lugs.
- Over tightening the mounting screws could also break the lugs.

Pipe Mounting

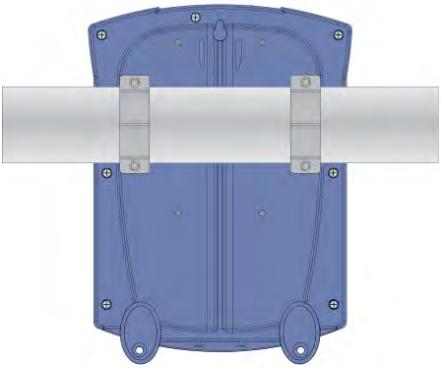
The handrail & pipe-mounting kit is designed for fixing to a vertical or horizontal handrail or pipe, of 25 – 70 mm outside diameter.



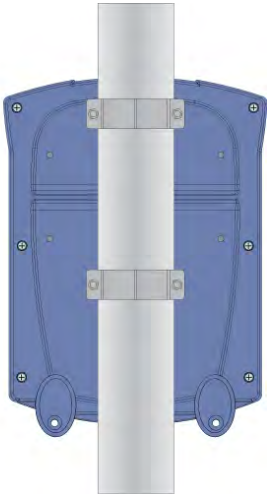
The instrument is then clamped using the mounting kit as follows.



Note: Care should be taken not to over tighten mounting, as damage may result to enclosure.



Horizontal Mounting



Vertical Mounting

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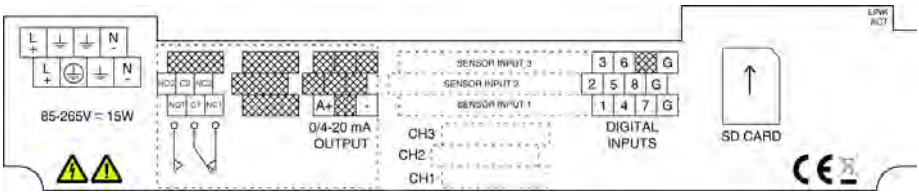
MXD75 Basic Connections

Having ensured that the main power is isolated from the instrument, remove the terminal cover by releasing the three front screws. (The terminal cover is the small cover at the bottom of the front panel). Once the cover has been removed the following terminal arrangement should be visible. N.B. the appearance of the label will vary depending upon which options are installed in the instrument.

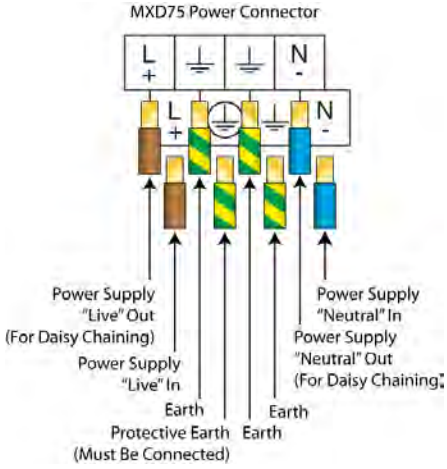


MXD75 basic terminal label

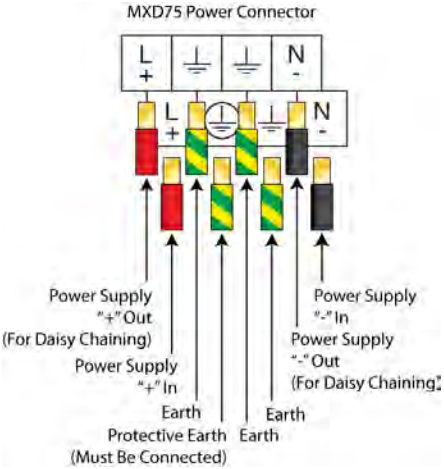
The cables should be fed through the cable glands. After each cable has been attached, pull most of the cable slack back through the cable gland to prevent any unwanted RF energy from being radiated inside the housing. Make sure not to strain the cable within the instrument. Tighten the cable gland onto the cable so that it grips sufficiently to seal and to prevent the cable from being pulled back through the gland.

Supply Voltage Connections

The MXD75 can be powered from either an AC or DC supply voltage. The unit provides two terminals for each of the input connections ("Live" & "Neutral" for an AC input**,** or **+** & **-** for a DC Input), plus an "Earth" terminal. This allows the supply to be "daisy chained" to the relay contacts and/or other instruments. The instrument uses a universal power supply that accepts a wide range of voltage and frequency inputs**. Refer to the label adjacent to the power supply terminals for the input voltage limits. Exceeding these limits may damage the instrument.**



85-265V AC/DC
Power Connections



18-32V AC/DC
Power Connections

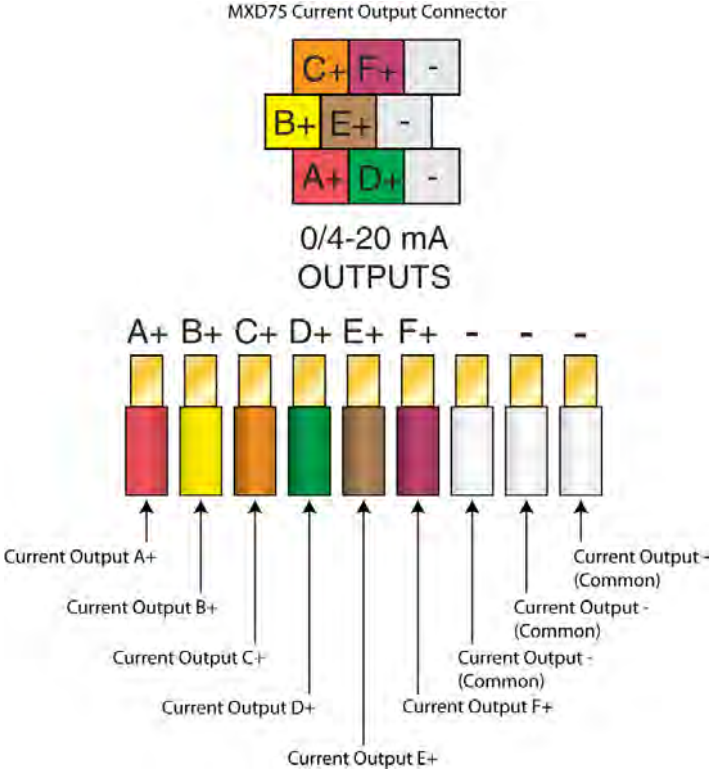
The power supply should be taken from an isolated spur and fused to a maximum of 3 Amps. If the relays require greater current, then a separate 5A fuse will be required. The incoming Earth connection must be connected to the "Protective Earth" terminal.

Sensor Connections

For information regarding connecting the various compatible sensors to the unit see the wiring section in the input card's accompanying handbook.

Current Output Connections

The MXD75 can be supplied with up to 6 current outputs designated A to F, which can terminate into a load resistance not exceeding 750Ω. For best noise immunity use a screened twisted pair cable, with the screen connected to Earth at one end. Use a sufficiently large cable to avoid a high resistance in the overall current loop.

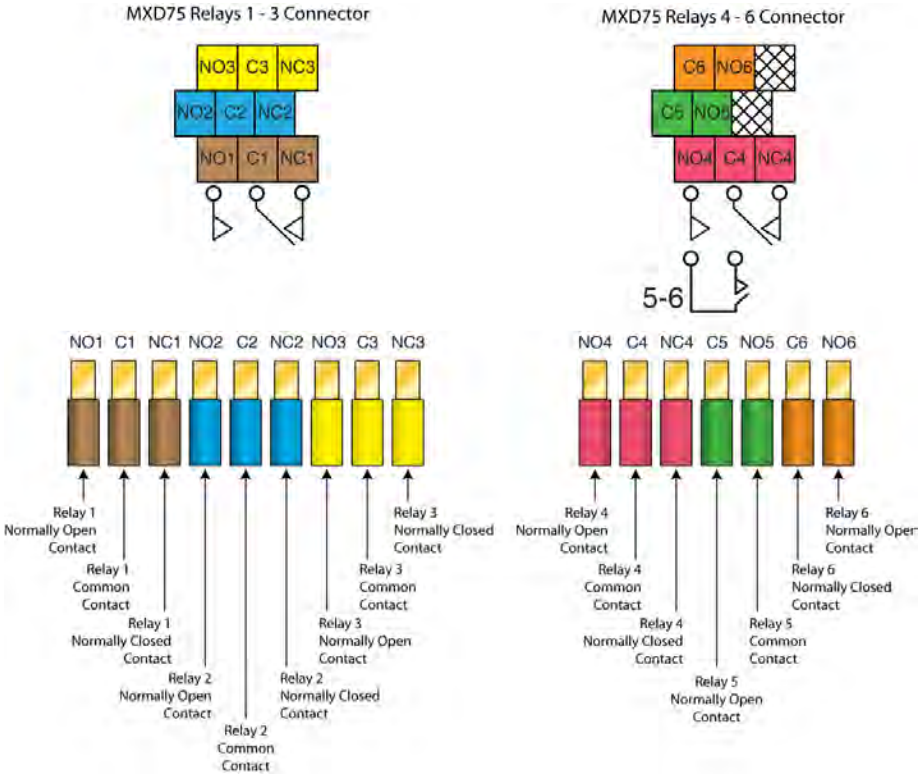


MXD75 Surface Mount Current Output Connection Detail.

(N.B. Available Current Outputs Varies Depending Upon Instrument Configuration)

Relay Connections

The MXD75 can be supplied with up to 6 relays designated 1 to 6, 1 to 4 are change over relays while 5 to 6 are normally open relays. The relay contacts are connected to the terminals only and are electrically isolated from the instrument itself. **They must be connected in series with a 5 Amp fuse.** A contact arc suppressor may be required to prevent excessive electrical noise, depending upon the load. To switch more than 5 Amps will require a slave relay. For convenience, the power can be looped across from the supply connections.

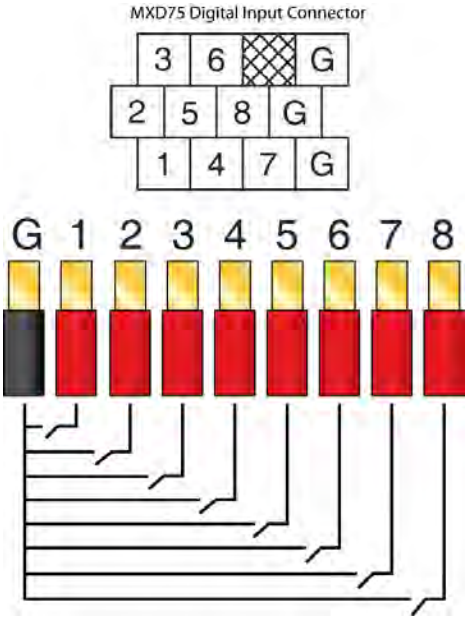


MXD75 Surface Mount Relay Connection Details.

(N.B. Available Relays Varies Depending Upon Instrument Configuration)

Digital Inputs

The MXD75 features 8 digital inputs, which can be used to initiate a user configurable instrument operation by use of a volt free link, switch or relay. The instrument can be configured to initiate the appropriate action when the contact either closes or opens.

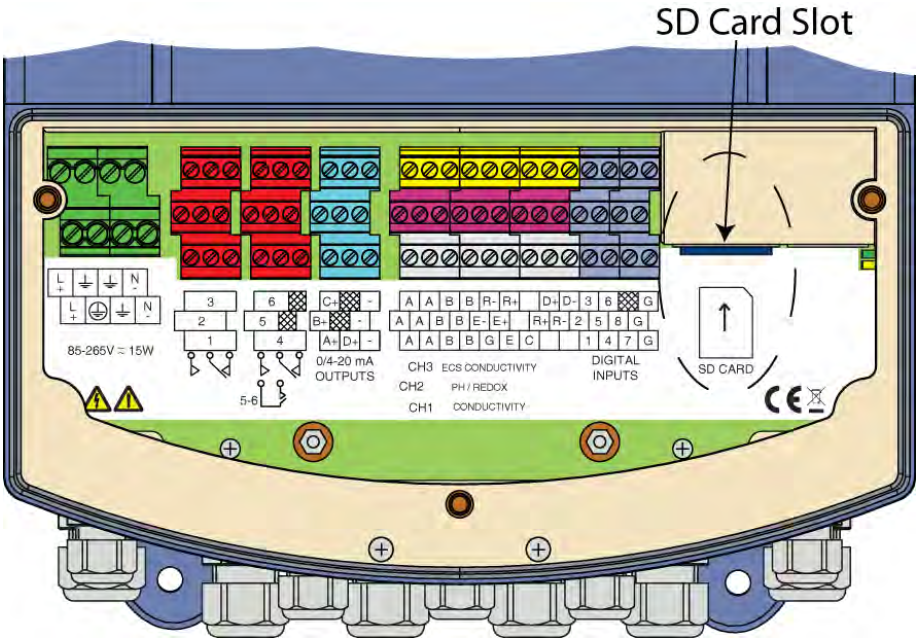


MXD75 Surface Mount Instrument Digital Inputs Connection Detail.

SD Card Interface

The MXD75 features a SD card interface which is compatible with SD, SDHC and SDXC formatted cards (N.B. SDXC cards may need formatting by the MXD75 before use – see user interface guide). The card can be removed whilst the instrument is on but only when the disk icon is not shown at the top of the display.

To insert the card ensure that the corner notch is on the top right of the card, and then just push it all the way in to the socket. To remove the card push it up then release and the card should then come out of the socket. N.B. When removing, it may be required to pull the card out of the last bit of the socket.



Guarantee and Service

Products manufactured by Quadbeam Technologies Ltd are guaranteed against faulty workmanship and materials for a period of three years from the date of despatch, except for finished goods not of Quadbeam Technologies manufacture, which are subject to a separate agreement.

All sensors made by Quadbeam Technologies Ltd are thoroughly tested to their published specification before despatch. As Quadbeam Technologies have no control over the conditions in which their sensors are used, no further guarantee is given, although any complaints concerning their operation will be carefully investigated.

Goods for attention under guarantee (unless otherwise agreed) must be returned to the factory carriage paid and, if accepted for free repair, will be returned to the customer's address free of charge. Arrangements can also be made for repair on site, in which case a charge may be made for the engineer's time and expenses.

If any services other than those covered by the guarantee are required, please contact Quadbeam Technologies direct.

N.B. Overseas users should contact their Quadbeam Technologies nominated representative. Special arrangements will be made in individual cases for goods returned from overseas.

Index

C

Connections 23
- Digital Inputs 27
- MXD75 23
- Relays 23, 26
- Sensors 24
- Supply Voltage 24

Current Outputs 9

D

Digital Inputs 9

Dimensions 10, 19

E

Email 1

EMC 2

EMI 12

F

Fax 1

Fuse 24

G

Guarantee 29

I

Installation 11
- Add-in Cards 13
- MXD75 13

Interference 12

L

LCD 9

LED 9

LVD 2

M

Mounting 19

N

Noise Suppression 12

O

Output Option Card 14

P

Pipe-Mounting 20

Power Supply 10

Q

Quality 2

R

Relays 9

S

Safety 2

SD Card 28

Sensor Input Card 7, 13

Service 29

Specification 9

Standards 2

T

Telephone 1, 34

Terminal Cover 15

Termination Overview 8

W

Warranty 1

Weight 10

Wiring 11

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