

# **Uni-Mux XQL**

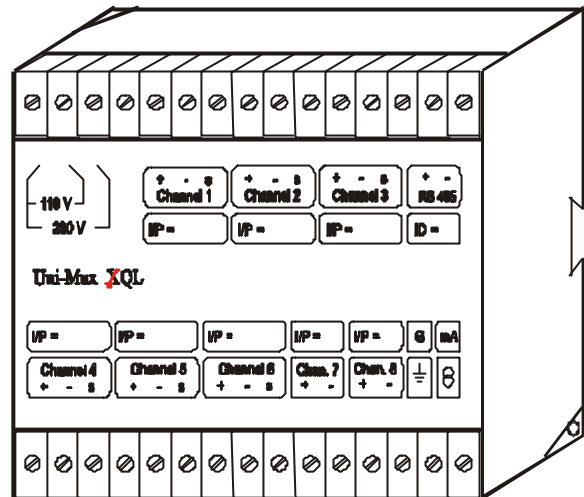
**Multi-Channel Data Acquisition Module**



# Uni-Mux XQL

## Multi-Channel Data Acquisition Module

- \* 8 channel differential inputs.
- \* 16 channel single ended inputs.
- \* User programmable via P.C. software.
- \* Data Logs the last 10,500 readings
- \* Single or multi channel serial response.
- \* 25 user programmable functions.
- \* 50 ms/channel conversion response.



### General Description

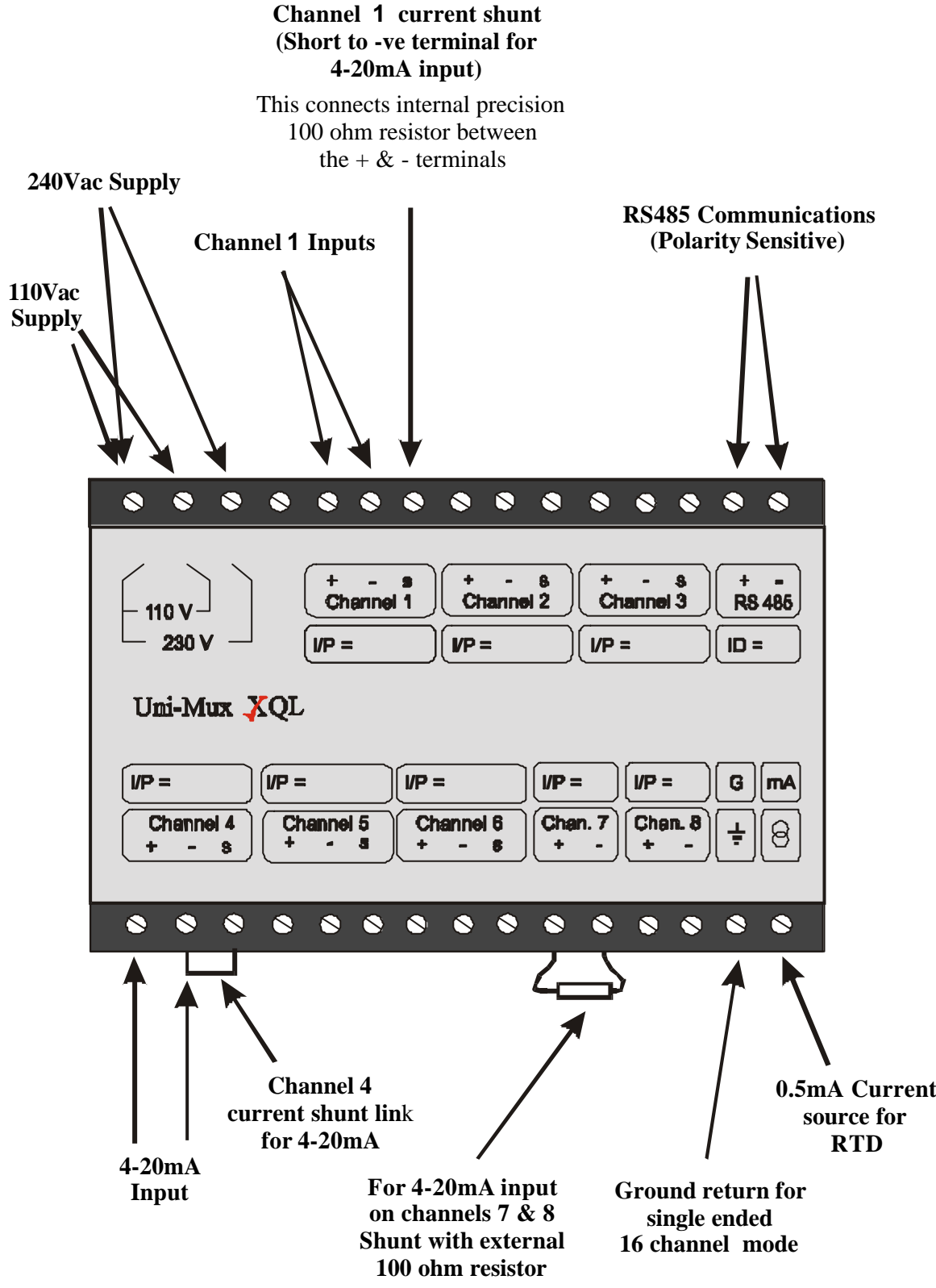
Uni-Mux XQL is a multi-channel, multi-function data acquisition module with simple user interface via a PC. Each channel (or pair of channels in 16 channel mode) can be user programmed to any of 24 different functions. This will allow the user to mix inputs such as voltage, current or temperature on the same module.

The Uni-Mux XQL logs the last 10,500 readings in a circular buffer. The logging time interval and the selection of which channels are logged can be easily set up via UniTools. Logging times from 1 second to 4.44 Hours per reading (or set of readings if logging multiple channels) can be set. Channels to be logged can be either channel 1, 1-2, 1 to 4 or 1 to 8. Downloaded data is saved by UniTools in a comma separated text file, ready for insertion into any spreadsheet.

Serial communications are via an isolated RS 485 port and can be programmed for single, or multi-channel response. The Uni-Mux XQL is fully compatible with UniLink, UniTools and all other SCADA systems with Unimeter drivers. Up to 63 Uni-Mux and other Unimeter devices can co-exist on the same RS485 line, allowing for hundreds of channels of input to a SCADA system. Uni-Mux, Unimeters, Digital-In and Digital-Out units can be combined to give full control from the PC, including remote site SCADA if connected via a Unimodem.

**The Uni-Mux XQL module functions include measurements of +/- 0-50 mVdc, +/- 0-100 mVdc, -1 to +5 Vdc, 4-20mA, 0-20mA, Type B,E,J,K,N,R,S, and T thermocouples, RTD, PT100 and LM 35 temperature sensors. All thermocouple functions are linearised and compensated for cold junction effects. The 8 differential channels can be spanned and offset as required.**

# Face Panel Layout:



# Technical Specifications:

<b>Supply:</b>	<b>230 / 110 Volts, 50/60 Hz.</b>
<b>Optional Supply:</b>	<b>10 - 30 Volts dc.</b>
<b>Input Format:</b>	<b>Universal, user programmable.</b>
<b>Input Impedance:</b>	<b>2000 kohms (8 channels) 1000 kohms (16 channels).</b>
<b>Input Over-range:</b>	<b>100 % continuous.</b>
<b>Conversion:</b>	<b>QUADAC,16 bit resolution, 50 ms per channel.</b>
<b>Accuracy:</b>	<b>0.1% F.S. (8 channels) 0.25% F.S. (16 channels).</b>
<b>Calibration:</b>	<b>Auto calibration, approx. every 100 seconds.</b>
<b>Span Adjustment:</b>	<b>User programmable, 0.01% to 200% (8 channel only).</b>
<b>Offset Adjustment:</b>	<b>User programmable, +/- 50.00 (8 channel only).</b>
<b>Power Consumption:</b>	<b>6 watts max.</b>
<b>Software:</b>	<b>UniLink, UniTools, UniSoft, third party SCADA</b>
<b>Communications:</b>	<b>RS 485 with AS 4000 adapter to P.C. RS 232.</b>
<b>Baud Rate:</b>	<b>2400 / 4800 / 9600 / 19 200 / 38 400 baud.</b>
<b>Case:</b>	<b>DIN rail mounting. (2U Rack mounting optional).</b>
<b>Dimensions:</b>	<b>100 mm x 73 mm x 110 mm deep.</b>
<b>Connections:</b>	<b>Screw terminals.</b>
<b>Temperature Range:</b>	<b>-10 to 50 degrees C.</b>
<b>Humidity:</b>	<b>0 to 95 % R.H. ( non condensing ).</b>
<b>Weight:</b>	<b>750 grams.</b>

## EMC ( Electromagnetic Compatibility )

The Uni-Mux XQL has been tested and complies with the European Electromagnetic Compatibility directive and carries the CE marking. Testing and compliance is to: EN 55022: (CISPR 22: 1993)\* Class A, EN50082-1: 1992, IEC 801-2: 1991, IEC 801-3: 1984, IEC 801-4: 1988.

\* Tested in accordance with the terms of the NATA registration. All external wiring to sensors and RS485 must be twisted pair and shielded. The shield must be connected to an effective external RF ground. Other EMC suppression methods, like ferrite beads may be used where necessary on external wiring.



Please visit the following internet site for information on the full range of Unimeter products, and for any update information on the Uni-Mux:

**[www.unimeter.com](http://www.unimeter.com)**

## Functions:

30:	Temperature - E type Thermocouple	Deg F (Linearised)	
31:	Temperature - J type Thermocouple	"	"
32:	Temperature - K type Thermocouple	"	"
33:	Temperature - S type Thermocouple	"	"
34:	Temperature - T type Thermocouple	"	"
41:	Temperature - RTD PT100 Sensor	"	"
43:	Temperature - B type Thermocouple	"	"
44:	Temperature - R type Thermocouple	"	"
45:	Temperature - N type Thermocouple	"	"
46:	Temperature - E type Thermocouple	Deg C	"
47:	Temperature - J type Thermocouple	"	"
48:	Temperature - K type Thermocouple	"	"
49:	Temperature - S type Thermocouple	"	"
50:	Temperature - T type Thermocouple	"	"
54:	Temperature - LM35 Sensor	"	"
56:	Temperature - RTD PT100 Sensor	"	"
58:	Temperature - B type Thermocouple	"	"
59:	Temperature - R type Thermocouple	"	"
60:	Temperature - N type Thermocouple	"	"
62:	0-100mV DC Voltmeter		
64:	0-5V DC Voltmeter, Auto Range (Default Function)		
78:	0-20mAdc Ammeter		
81:	4-20mAdc Monitor		
93:	16 CHANNEL DIGITAL MODE (0vdc=Off, +5vdc =On)		
159:	Loadcell Monitor (0-50mVdc)		

# Programming the UniMux XQL Settings:

- 1 **Install UniTools and the RS485 Comms driver on your PC**
- 2 **Connect the AS4000 to the PC & connect it's Power supply**
- 3 **Wire the UniMux XQL to the AS4000 matching polarity +ve to +ve. (Note: Connect 1 device only at a time until the IDs and the Baudrates have been set up - to avoid more than 1 device on the same RS485 line with the same ID).**
- 4 **Power up the UniMux (Caution: if the UniMux is MAINS POWERED all electrical safety precautions must be adhered to, and only Qualified personnel should connect the mains wiring).**
- 5 **Run UniTools - For UniTools help, press the 'F1' key at any time.**
- 6 **Set the Comms properties by clicking 'Properties'. The UniMux has the default properties of: ID 1, 2400Baud.**
- 7 **Click 'Get Value' to ensure UniTools is communicating with the UniMux. A value should be displayed in the 'Value' text box. If this doesn't happen, a message (eg: "No Response") will be displayed - check the above connections.**
- 8 **When the UniMux XQL and UniTools are communicating, click 'Program' to program the UniMux XQL. UniTools will automatically load the existing UniMux settings.**
- 9 **Modify the settings as you wish and click on 'Transmit' to send them to the UniMux.**  
**The program settings can be saved to a file for later use.**

## UniMux XQL Settings:

**ID:** 1 to 63. Must be Unique for each Unimeter device on the same RS485 line.

**Baudrate:** The Communication speed - 2400, 4800, 9600, 19200, 38400 baud

**Input Mode:** 8 channel analog double ended, or 'balanced' (this is the best mode for common mode noise rejection), 16 channel analog single ended ('unbalanced'), or 16 channel digital (0 / 5 V, On / Off).

**Comms Mode:**

This allows the UniMux to be set up to either simulate 8 (or 16) Unimeters (which uses 8 (16) IDs), or to be used in single ID mode with all channels sharing the same ID. This single ID mode is the most used option. The Unimeter simulation mode is for old style software packages (Unisoft) or for after market SCADA programs which use Unimeter drivers.

## **UniMux XQL Settings (continued):**

- High Security:** Only available in Unimeter simulation mode - it adds an additional checksum to the returned Unimeter value.
- Functions:** Select the required function to suit the Input sensor and type of task.
- Offset:** Provides an internal offset (Normally zero) for the returned value. (Limits are -50.0 to +50.0). This is better done in UniLink if it is being used.
- Span:** The returned value is the measured value multiplied by this amount. (Default is 1.0, Limits are 0.01 to 2.00). This is better done in UniLink if it is being used.

### **Logger Settings: (Not available in 16 channel modes)**

#### **Sample Rate:**

Time period, in seconds, between logged samples. After you change this value you should reset the logger memory. Valid settings are from 1 second to 16000 (4.44 hours).

#### **Channels Logged:**

Sets the UniMux XQL to log the specified channels, Channel 1, channels 1 & 2, channels 1 to 4 (inclusive), channels 1 to 8 (inclusive). After you change this value you should reset the logger memory.

### **Cold Junction Span: (Thermocouple Functions only)**

This is a fine adjustment to take into account the actual temperature of the UniMux XQL terminals. This is where the 'Cold Junction' measurement occurs.

### **Factory Calibration values:**

These are for information only, and are not user accessible. They represent the internal calibration values which were set in the UniMux XQL during factory calibration.

### **Status:**

The UniMux XQL Version number is displayed in this text box when the UniMux XQL is connected. You can also obtain this number by clicking 'Get Version' on the main UniTools screen.

# Software:

## Uni-Link 'Window SCADA'

The Manufacturer has created a SCADA and MIS package for the Unimeter range which is the first D.I.Y solution for SCADA and MIS implementation. The software has been 'piggy-backed' onto Microsoft® Access™ and Excel™ and takes data into these packages in real time. The user can control and monitor any local or remote plant from within the Windows 95/98/2000 platform. The system is able to data log and display hundreds of channels per second directly into the Access database and display user selected graphs in Excel in real time also. Many SCADA systems and other Windows programs can be run at the same time. Uni-Link can be user installed, modified and expanded to virtually unlimited proportions, using friendly 'Wizards'. Factory drawings, 'Mimic' panels and graphics can be pasted into the system. The system is based on the standard Uni-Bus RS 485 two wire multi drop system, which communicates with up to 63 devices (500 channels if the devices are Uni-Mux XQL in 8 channel mode). Uni-Link is also suitable for automating the information collection process for accounting and statistical purposes. Other Active-X Automation controllers and Visual basic applications can use the Uni-Link functions (eg: 'Get a Value'). For additional information and demo software contact '[www.unimeter.com](http://www.unimeter.com)'.

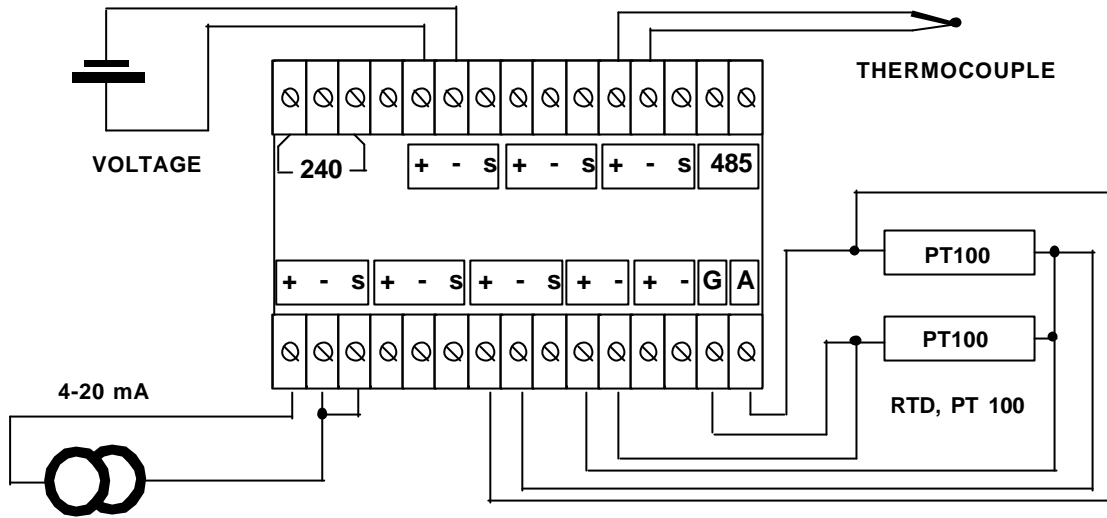
## UniTools Software

UniTools software has been developed as a programming tool for the Uni-Mux XQL, Unimeter, and the Uni-Modem. The software is a tool to configure all functions and features of these devices. UniTools can monitor values from any of the Universal Instrument family. The Uni-Mux XQL and UnimeterXQL logged data readings can be downloaded with UniTools into a comer separated text file (suitable for importing into any spreadsheet application).

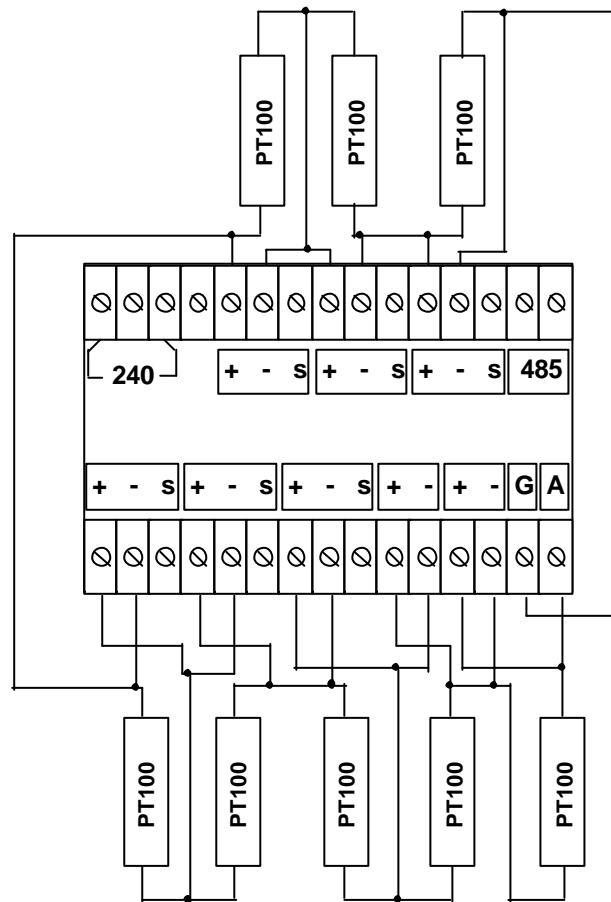
## Unisoft - DOS Software

This software package allows the user to receive values from up to 63 Unimeters via a single twisted pair of wires (or 63 Uni-Mux XQL channels). The values gathered from these Instruments may be displayed in real time on Graphs and Bar-graphs. Further, the user can choose to record or Data Log up to 63 Instruments for display, analysis, reading or printing at any time after the recording. Unisoft is DOS based software and requires 386 or better hardware. The Uni-Mux XQL must be in 'simulated Unimeter' mode (each channel is assigned a different ID) to respond to this package.

# Typical Connections:

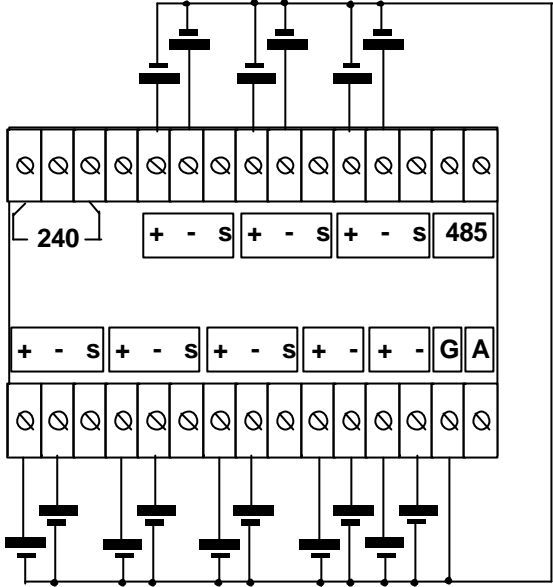


**Mixed Function Inputs**

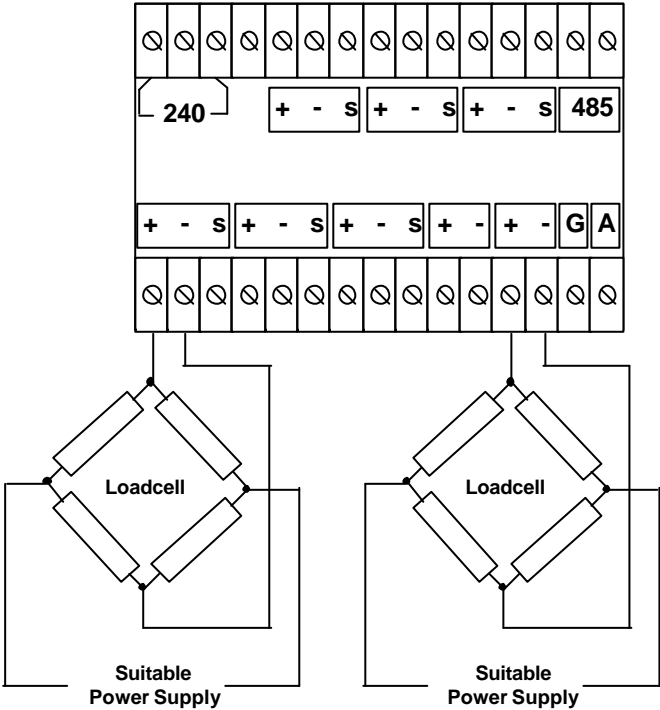


**8 Channel RTD Inputs**

# Typical Connections:



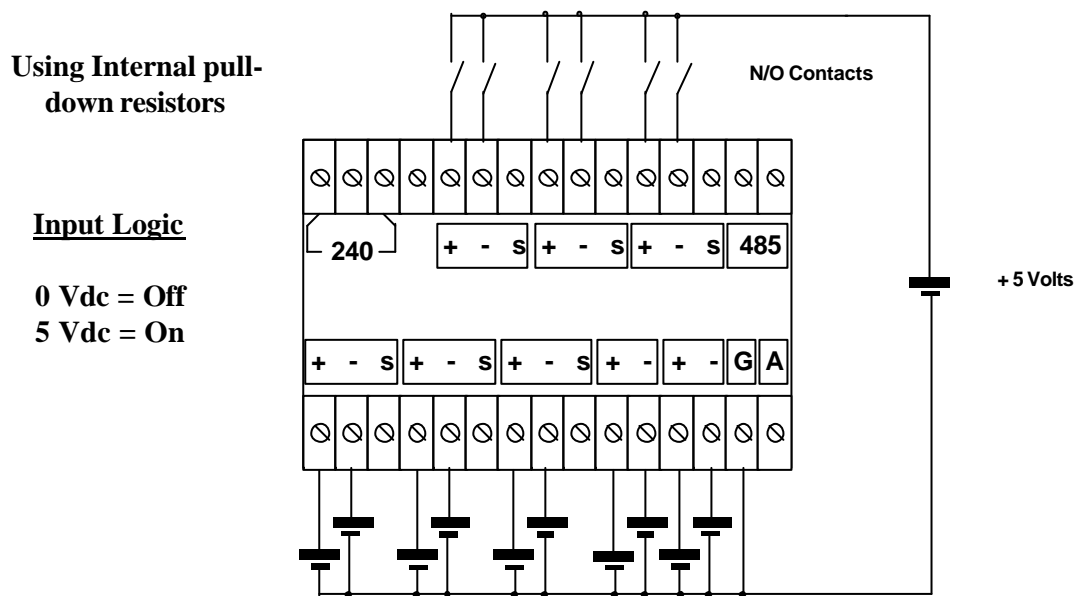
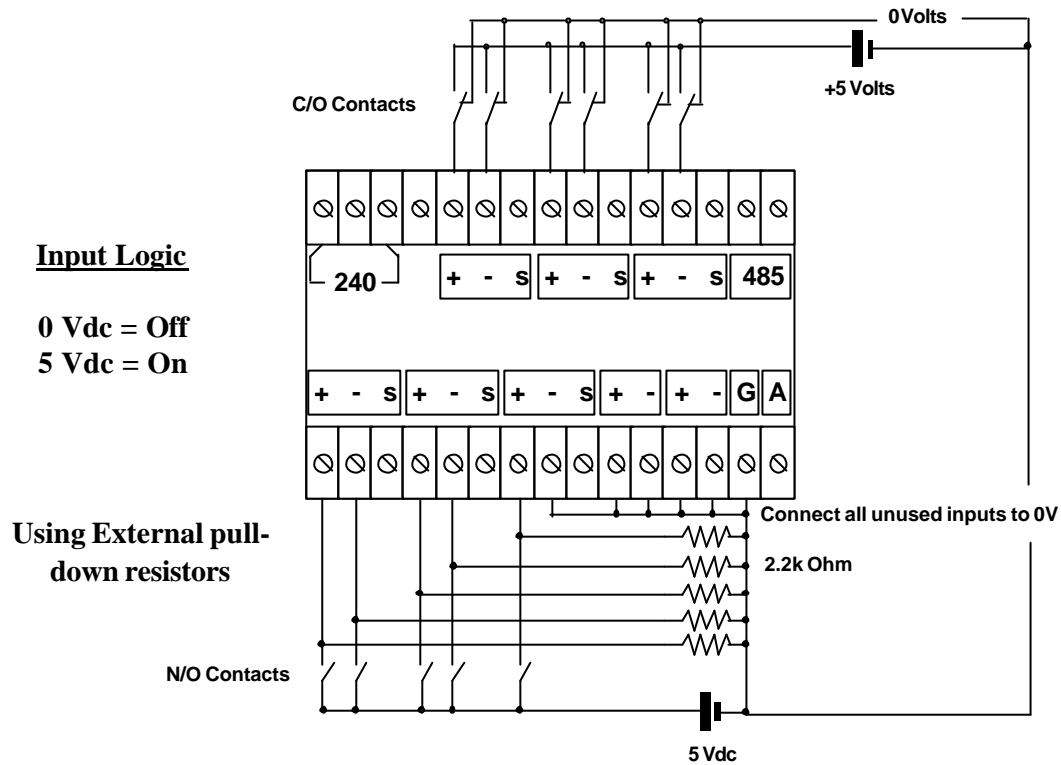
**16 Channel Inputs**



**Loadcell Inputs**

# F 93: 16 Channel Digital (On/Off) mode:

In this mode, the UniMux XQL senses 5 Vdc digital signals. 0V is shown as OFF, and 5V is shown as ON. The inputs cannot be left floating, and must be tied to 0V or 5V. Pull - down resistors can be used, or the Uni\_Mux XQL can be factory altered to include these Pull down resistors inside (if this is done, the normal analog input modes are not available on that unit).



**16 Digital Inputs**



## **WARNING**

**Extreme care must be taken with high voltage connections to ensure your safety and the safety of others. Local electricity and wiring codes must be adhered to. Qualified personnel only should connect any mains wiring.**

Any high voltage connected to any of the Uni-Mux XQL low voltage terminals can result in permanent damage to the instrument.

The Manufacturer is continually striving to improve the performance of the Uni-Mux XQL and as such reserves the right to change any or all specifications given in this manual at any time without notice.

## **COPYRIGHT**

All software, hardware and associated documentation are Copyright protected by International Law and may not be copied for any purpose other than backup procedures, archival purposes or transfer to hard disk for a single use application.

## **DISCLAIMER OF WARRANTY AND PERFORMANCE**

All Software and Firmware supplied by the Manufacturer and its associated agents and distributors are provided on an 'as is' basis without warranty of any kind. The Manufacturer further disclaims all implied warranties of any kind without limitations with regard to applications, usability or suitability for any particular purpose. The entire risk arising out of the use or performance of the Software, Firmware and Hardware products and associated documentation remains with the user.

The manufacturer, distributor and the supplier of the Unimeter range of products shall not be liable or responsible for any direct or consequential loss or damage, due to use or application of the Unimeter range of products, of any kind.

Whilst every care has been taken with the preparation of this manual, we cannot guarantee all settings in all cases. It is possible some Functions and or Special Functions may have application limitations not detailed in this manual.

Please check our web site for the latest news, omissions and errors:

**[www.unimeter.com](http://www.unimeter.com)**



