

# Unimeter™ XQL

The Universal Instrument for  
Measurement and Control

# "One for all and all in One"

Versatile  
Powerful  
Simple

One instrument that talks to virtually  
any sensor and application.

One Instrument that gives 100%  
Process Control.



DESIGN AND MANUFACTURED  
IN AUSTRALIA

The most versatile  
controller ever developed.

Reduce operating costs -  
carry only one instrument  
for data measurement  
and control.

Best value/options for  
price.

Simple to use, easy to  
support.

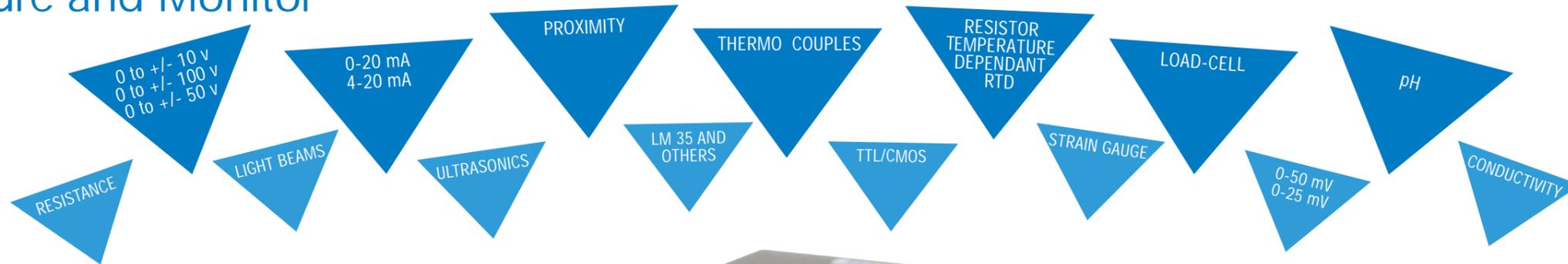
Powerful - hundreds of  
preset functions, with  
thousands of possible  
settings.

Add value with easy to  
use SCADA system.

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

# Pick a job... Select a sensor... Select a Unimeter™ Function... Fine-tune if necessary... Read or capture data... Analyze and use data... Job completed. [www.unimeter.com](http://www.unimeter.com)

## Process Measure and Monitor



### Features

- Over 230 measurement functions
- Continuous data logging
- Selectable displayed variables
- Control effort bar-graph
- Peak and value, sample and hold
- Back-lit LCD screen
- CE mark, C✓, Mil Spec
- QUADAC intelligence
- 10500 samples logged
- Built-in linearization
- Power Supply Outputs
- Linear/non-linear scaling functions

### Interfacing

- PC**
  - Programmable
  - SCADA System
  - Spreadsheets
  - Databases
  - Programming Tools
  - Download for time/date logging
- PLC**
  - Texas 505, V-memory 1024
  - Fuji NB
  - NHP-ML14
  - Siemens S7-200
- Under development**
  - Windows™ 2000
  - Modbus
  - Profibus
  - Devicenet
  - Fieldbus

### Measure and Monitor

- Voltage, current, temperature, Up/down, counting, rate weight, distance, frequency, batch control, flow, level pressure, speed, efficiency, resistance, timer, inverse rate/period, light beams, power, volume, thickness
- Standard Uses**
  - Signal Generator
  - Ammeter/Voltmeter
  - Mains Frequency Monitor
  - Power Factor Monitor
  - Electric Potentiometer
  - Flow Monitor

## Signal Conditioning and Control



# Multi-channel and Multi-function data acquisition module.

Easy to use SCADA System  
in Windows™ environment

## Uni-Mux XQL

- World Leading 'QUADAC' technology
- Single and dual channel programmable
- Single and multi channel response
- Up to 16 channel single ended inputs
- Cascade, giving up to 1008 individual logged channels

- PC Programmable with Uni-Link software
- Dozens of user selectable functions
- 50 mS conversion response time
- C language drivers available

Uni-Mux XQL is a multi-channel and multi-function data acquisition module incorporating single channel programmability for all available functions. Logs up to 10,500 readings continuously.

The module can be programmed to perform dozens of different functions on a channel by channel basis. The Uni-Mux is UNIMETER technology and provides all relevant UNIMETER features.

### Functions include:

Measurement of +/- 50mVdc, +/- 100mVdc, -1 to +5 Vdc, 4-20mA, 0-20mA, Type B, E, J, K, N, R, S and T thermocouples, RDT PT 100, LM 35 temperature sensors. All thermocouple functions are linearised and compensated for cold junction effects. Offset and span facilities are available. A 16 channel high speed digital input function is also selectable. Easy to use SCADA system.



**Supply:** 230/110 Vac, 50/60 Hz, +/- 15% 10-30 Vdc (optional supply)

**Input Format:** Universal user programmable input, includes: Thermocouples, RTD, 4-20 mA, 0-10 V, strain gauge, load cell, digital

**Input impedance:** 2000kOhms

**Input conversion:** QUADAC, 16 bits (20.5 bits floating)

**Conversion response:** 50mS typical

**Accuracy:** 0.1 F.S. (8 channels), 0.25% F.S. (16 channels)

**Calibration:** Auto recalibration, approx. every 10 to 60 seconds

**Span:** User programmable, 0.01% to 200% (8 channels only)

**Offset:** User programmable, +/- 50.00 (8 channels only)

**Power consumption:** 6 watts maximum

**Software:** UniSoft V6

**Communications:** RS 485, 2.4, 4.8, 9.6, 19.2, 38.4 kBaud

**Case:** DIN rail mounting, 100x75x110mm

**Connections:** Screw terminals

**Temperature range:** -10 to +50 Deg. C

**Humidity:** 0-95% (non condensing)

**EMC accreditation:** CE mark (Europe), C✓ (Australia)

**Mounting:** DIN Rail

# Additional UNIMETER™ Products

### Unimeter Digital Out - Setpoint Expander

Up to 8 digital outputs, 3amp 240Vac normally open contacts are provided by a single digital output Unimeter. This instrument is accessed from UniSoft V6 and its auxiliary function to carry out PLC like control of electrical motors and equipment.



Connected to a UNIMETER XQL or a UniMux XQL, the Digi-Out can provide up to 8 setpoints.

### Uni-Modem

The UniModem connects a remote or unmanned UNIMETER XQL installation to a computer, and allows access to the installation's data at any time. An alarm trigger can automatically dial back from the remote site and relay the data to a workstation or server. Multiple baud rates may be selected depending upon the quality of the phone lines. The kit includes a pre-configured RS232 modem, UniSoft V6 software and the UniSoft Adapter (RS485 to RS232).

### UniTrain

The UniTrain gives trainers and instructors a useful UNIMETER XQL configured to demonstrate its versatility with Function 48, K Type Thermocouple, Function 64, 0-10v Process Monitor, and Function 95, Rate Monitor. The internal circuitry of the module can be isolated from the UNIMETER XQL to allow it to be used as a standard "on-site" instrument. In this format it can accept external sensors. Training notes are supplied for programming these functions.



An advanced training exercise can be run to teach the programming and use of Special Functions such as set points and scaling. UniTrain is supplied with UniSoft V6.0 Software and a UniSoft Adapter (RS485 to RS232), so that instructors can demonstrate the use of a PC to capture and control data. Included are a set of 10 UNIMETER XQL manuals. UniTrain is housed in a robust, insulated carry-case, which can be connected directly to mains power.

### UniTest

Checking the performance of various sensors and instruments around a construction site, isolated plant or mine is made easy with the UniTest module.

A UNIMETER XQL is mounted in a robust and insulated carry case, has a set of captive terminals mounted below the back-lit LCD screen, is powered by a built-in, re-chargeable 12v DC battery and has a UniSoft Adapter (RS485 to RS232) and UniSoft V6 software for communication to a PC.

### UniSoft V6

**• Uni-Link**  
Easy to build and operate real-time SCADA System (Supervisory Control and Data Acquisition).

Link Unimeters and Uni-Muxes to MS™ Access database or MS™ Excel spreadsheet.

Build mimic panels and factory layouts.

### • Uni-Tools

- A toolbox of Windows™ based tools.
- Program the Unimeter
- Download logged data
- Set PID values easily.
- Set profile control and linear values



### • UniSoft Adapter

RS485 to RS232. Links the UNIMETER XQL or UNIMUX XQL to a PC

# Case Studies

[www.unimeter.com/casestudies.htm](http://www.unimeter.com/casestudies.htm)

UNIMETERs are used in all industry sectors: Food processing, breweries and wineries, petrochemical, water treatment, power generation, electroplating, sugar mills, saw mills, automotive, laboratories to submarines and warships; the list goes on and on...

These Case Studies demonstrate the incredible versatility provided by the UNIMETER XQL.

## Monitoring Beer Tank Capacity

In a brewery the UNIMETER XQL provides an accurate and reliable measurement system that allows the brewer to continuously monitor the tank volume and determine the number of kegs being filled. This application reduces the chance of under filling kegs and greatly improves the production lines efficiency. It replaces the laborious task of taking measurements manually.

## In a Brewery Monitoring Bottle and Can Height



A bottle and can filling line is integrated with a UNIMETER XQL connected to a magneto transducer. From the digital reading, the bottle or can height is determined. This value is then used to set the height of the filling nozzle in the line. The UNIMETER XQL has two set points. The production line becomes more versatile and easier to operate, as it does not have to be totally reset for new batches of different height containers.

*"Using the UNIMETER is quite simple. I've used them for measuring batches, weights, speeds, volumes... the list goes on and on"*

John Walker, Industrial Electrical Service Contractor, South Australia.

## Measuring Bottle Wall Thickness



A producer of natural health products uses UNIMETER XQLs to measure and monitor both mould temperature and bottle thickness in the production of their bottles and containers. This provides an accurate and easy to operate measurement system. The UNIMETER XQL's USER OFFSET and TARE functions allow for quick and easy calibration.

## Measuring Mould Temperature

A UNIMETER XQL is used to monitor the mould temperature of a bottle and/or container-manufacturing machine by using a thermocouple connected directly to the instrument's input terminals. The UNIMETER XQL provides an easy to use reliable monitoring system and has the ability to log data of up to 10,500 values at periods ranging from 1 second to 4.4 hours. It also provides up to two alarm points to warn of critical temperatures or activate/deactivate controlling operations. The UNIMETER also allows for thermocouple calibration and if necessary a 100-point linearization process is available.

## In a Bitumen Laying Truck to Control Hydraulic Pump Speed

There is a 10v DC version of the UNIMETER XQL, making its functions available for use with remote machines and devices, and motor vehicles. A manufacturer of bitumen trucks uses a UNIMETER XQL as a manual 4-20mA Pot. This is connected directly to a coil that drives a Hydraulic pump. Hence, by varying the current through the coil using the instrument's output, the operator can manually control the pump speed using the membrane keys on the UNIMETER XQL's front panel. Other potential UNIMETER XQL applications for specialist vehicles include; tank volume measurements, temperature, pressure, distance and speed monitoring.

## Weighing Coal on a Conveyor and Controlling its Speed

A UNIMETER XQL is used to monitor a load cell beneath a conveyor line for coal. Previously an old analog meter was used to perform this task. It was suitably replaced with the UNIMETER XQL that not only provides existing measurement functions but also data logging, digital communications and control. The flow of coal can be monitored and regulated to prevent overloading or damage to the conveyor line mechanisms. Optimal speed can be achieved with this form of computerized control. The UNIMETER XQL is connected to the Control Room computer using a single pair cable, the UniSoft Adapter (RS485 to RS232) and UniSoft V6 software. The data is provided in either a comma-separated file, or directly into MS Office 97 applications.

## Controlling the Milling of Coal Prior to Combustion



Coal used in power generation needs to be milled into a combustible state. It is an environment of dust, heat and vibration. Measurements on a mill are made primarily through a number of thermocouples directly connected to banks of UNIMETER XQLs. This information is linearized and calibrated to provide the correct sequence of switched outputs, which in turn controls the mill.

The UNIMETER XQL replaced old analogue switches. The installation provides a diagnostic auto-starting feature on the mill, moving through a sequence of starting steps. In this manner, each mill can be started at the push of a button. If the mill fails to start, critical factors are displayed on the front panel of each UNIMETER XQL. This reduces downtime as the problem can be easily identified. It is possible for all monitoring, control and diagnosis to occur remotely using the UniSoft Adapter (RS485 to RS232) and UniSoft V6 software, thus creating a safer work environment.

## Replacing Outdated Analogue Devices with a Smart Digital Instrument

UNIMETER XQLs can be used to monitor and maintain the speed of turbines. The speed measurement is taken from a sensor located inside the exciter (a separate generator used to excite fields in the coils of the main generator so as to initiate power generation). Replacing older and unreliable LED panel meters, the UNIMETER XQL's back-lit LCD screen displays values up to +/- 19,999. Accurate monitoring of the turbine speed can be achieved to help ensure optimal control of power generation. Set points within the UNIMETER XQL can be configured to send a control signal back to the turbine to sound alarms if the turbine speed exceeds a minimum or maximum range. The analog 4 to 20mA or 0 to 10Vdc outputs can even be used to maintain a desired speed.

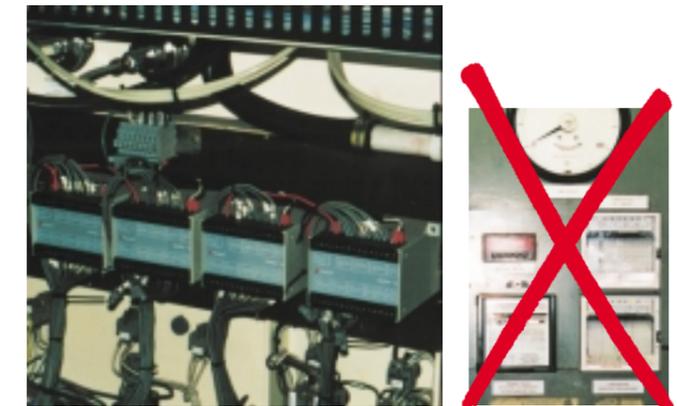
## Electroplating

*"The good thing about the Unimeter is it's ease of use with RS 485 and UniSoft software, which gives me easy re-programming for fine-tuning"*

Scott Dowling, Electrical and Maintenance Engineer, South Australia.

Scott is currently upgrading all electroplating facilities in his company's printed circuit board plant. He is using UNIMETER XQLs for all data acquisition of temperature, flow rate, tank levels, monitoring, and process control requirements. Benefits are achieved through the more effective use of labor, chemicals and power.

## Monitoring Sensors in a Water Treatment Plant



Power station operations require water free from impurities. Management of water treatment plants can be labor intensive, and breakdowns may lead to unacceptable downtime.

Data from around the plant is transferred via the UniMux XQL to the control room PC, with all data stored in MS Access and displayed in MS Excel. The Uni-Mux XQL is a 16 channel data acquisition module based on the UNIMETER XQL. It is cascadable, allowing for a large number of sensors and measurements to be monitored on one PC. Operating costs are impacted. Old style chart recorders are no longer needed, paper and its storage are gone, maintenance and monitoring costs are reduced and cleaning of the pipe work is more effective. Instead of having general staff manning the station, it can be monitored by one person via a PC. Appropriate staff need only be sent in when there is a problem. By continuous recording, the instrument's logging and reporting software alerts the operator to major problems.

# UNIMETER™ XQL

## Technical Specifications

**Supply:** 230/110 Vac, 50/60Hz, +/- 15%, (optional 10-30 Vdc)

**Input Format:** Universal user programmable input, includes: Thermocouples, RTD, 4-20 mA, +/- 10 V, +/- 0-100 mV, strain gauge, loadcell, proximity detector, encoders, pulse sources, TTL, CMOS, resistance and many more.

**Dual input:** A\*B, A/B, A+B, A-B, average of A and B

**Input impedance:** 2000 kOhms (Normal input) 1000kOhms (Dual input functions)

**Input Conversion:** QUADAC (16 bits with 20.5 bit floating)

**Linearization:** 100 points

**Conversion response:** 20 mS typical

**Accuracy:** Digital = 0.01% F.S., analog=0.1% F.S.

**Display update:** Various, function dependent, typical 700 mS

**Display type:** 5 digit LCD (back-lit), 0.00 to 19,999,

floating point, bargraph displays analog output

**Display filter:** Adjustable filter and averaging

**Calibration:** Auto re-calibration, approx. every 10 to 60 secs.

**Span:** User programmable to +/- full scale with auto offset

**Offset:** User programmable to +/- full scale

**Analog outputs:** Both 0-10 Vdc and 0-20 mA (4-20 mA), user programmable to any range, offset, span, inverted, PID control

**PID control:** On-off, full PID, 100-point profile, auto-tune: dead-band, manual o/p, setpoint hot-key, adjustable band, PC interface

**Relay setpoints:** 2 spdt, 3 amp, 240 Vac with 0-100% hysteresis and on-off delay, inverted, 0.00 to 19,999

**User power supply:** 5/10/15/24 Vdc, 50 mA user selectable

**RTD current supply:** 0.5 mA constant current

**Sample and hold:** Zero volt short circuit

PLC interface: Siemens S7-200, Texas 505, V-memory 1024, Fuji NB, NHP-ML 14

**Power consumption:** 6 watts maximum

**Software:** UniSoft V6.0. Includes UniTools, UniLink and Windows SCADA

**Communications:** RS 485, 2.4, 4.8, 9.6, 19.2, 38.4 kBaud "multi-drop"

**Protection:** Front panel - IP 65 with optional membrane

**Case:** Flame retardant ABS plastic

**Dimensions:** 97 x 50 x 148 mm, 1/8 DIN cutout 92.5 x 44.5mm

**Connections:** Screw terminals

**Temperature range:** -10 to 50°C

**Humidity:** 0.95% (non-condensing)

**EMC accreditation:** CE Mark (Europe), C✓ (Australia), Mil Spec

**Logging capacity:** 10,500 readings circular buffer

**Logging rate:** 1 second to 4.44 hours selectable

**Peak & trough:** Standard - hot key

Available from:



*"Market research suggests that we "kill off" the Duck in the Print Media. However, QUADAC still lives on the web."*

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