

## Introduction

The UTM materials testing system is a completely integrated apparatus allowing you to specify the load frame capacity, data acquisition system with test software, and hydraulic or pneumatic loading system best suited to your testing programme. This is carefully integrated into a total testing package with advanced user-friendly test software to make reporting test results a fast, efficient and easy process.

## Our design philosophy

Our innovative approach to system design has allowed us to produce more advanced, cost-effective designs without degrading system performance.

## Control and Data Acquisition (IMACS)

A major advantage of using a separate control and data acquisition system, (the Integrated Multi-Axis Control System or IMACS for short) as distinct from a "plug-in" card in a PC is that the control and data

acquisition functions are fully integrated. This is important with very fast real-time systems, where it is essential to have very accurate timing control of the signal waveform, control of the machine loading and collection of data.

In the IMACS controller this is achieved by a very fast digital signal processing unit, which provides all necessary control features and generates the wave-form functions.

This is synchronised with the data acquisition functions, where all transducer readings are taken in parallel, at precisely the same time.

An extremely useful feature of the IMACS controller is its ability to generate virtually any required wave-form. All of the usual sine, haversine, square, ramp, triangular, etc. wave-forms are readily available, but it is also possible to input any wave-forms, which can be defined in up to 512 points and include them in the library.

If necessary, changing from one computer to another is done easily and quickly without the need to remove and install the acquisition card.

## Specifications

### System parameters

- RS 232 communications port at 115 kb/s or USB communications port at 10 Mb/s
- 12 digital inputs
- 8 digital outputs
- 19" enclosure has capacity for up to 4 I/O modules, configurable as acquisition, split axis-acquisition/control or dual axis control
- Flash based firmware allows field updates of all modules

### I/O module

- 8 low noise "normalised" analog input channels
- Up to 20 bit auto-ranging data acquisition
- 4x oversampled data acquisition for low noise performance
- Data acquisition speeds of up to 5 kHz, simultaneous for all channels
- Up to 2 axes servo control
- Up to 3 analog inputs can be used for feedback for each axis
- Analog inputs can have "real-time" 43 point linearisation applied



### Main features

- Provides real-time computer control of all IPC testing machines
- Integrated, channel acquisition and control functions at speeds of up to 5 kHz
- Expandable up to 8 control axes and 32 channel acquisition
- Up to 20 bit auto-ranging data acquisition
- Normalised analog channel inputs allow any transducer to be plugged into any channel
- Selectable software noise filtration



The Integrated Multi-Axis Control System provides the user with leading-edge performance, delivering unparalleled levels of control and the ultimate in flexible data acquisition for servo testing machines.

- Analog inputs are software selectable for x1, x4, x16 or auto gain ranges
- Analog inputs are auto calibrating on power-up
- 2-channel, 16 bit digital to analog output
- Analog output channels provide flexible driver configuration (bipolar, unipolar, current or voltage)
- 2 solenoid driver outputs per module.

### Normalised Transducers

An important feature of the IPC system is that transducers are not tied to a specific signal conditioner channel within the IMACS controller. In fact they are not necessarily tied to a specific IMACS controller. This has been achieved by "normalising" the transducers, i.e. adjusting them so they all present the same input voltage range to the signal conditioners. To do this, signal conditioning modules are fitted in-line with the connection leads of the transducers, thus providing all the necessary amplification

and matched signal filtering to convert individual transducers to a standard output level. Signal conditioner supply voltages are provided by the IMACS controller.

Another significant benefit of this approach is that transducers may be calibrated or replaced independently of the IMACS controller to meet certification requirements. As transducer technology evolves, this also provides a means to substitute newer, more accurate devices without internal modifications to the IMACS controller.

*Note. For more information and details on the installed software see page 16*

