

# IMACS2

The Ultimate Third Generation Integrated Multi-Axis Control System (IMACS)



The 3rd generation IMACS2 Integrated Multi-Axis Control & Data Acquisition System builds on 30 years' experience as leading manufacturer and trusted partner of advanced dynamic testing systems for asphalts and other pavement materials.

# A pioneering tradition

**Users really matter**  
Easy-to-set-up and easy-to-use system designed around your needs by our global team of experts.



# Next Generation IMACS2

## More than you'll ever need

### We've listened to feedback about your needs and wishes

and have adopted the most advanced electronic technologies to develop a superior controller that provides the ultimate in testing machine control and powerful data-acquisition that is flexible yet easy to use.

## The most advanced controller and data acquisition system in our industry

**Ultimate precision** — most advanced control & data acquisition with industry leading 24-bit resolution and up to 200kHz sample rate

**Smart 'Plug and Play' transducers** — quick, easy and avoids set-up errors

**Dependable** —  
Touch Screen control

**Breathe new life into any legacy testing system**  
a genuinely universal multi-purpose controller



**Closer analysis** with powerful advanced data processing

**No compromise** on specification or selection of components

**Worry-free seamless migration** — compatible with UTS and UTS Neutron

**Designed for the future**  
and expandable in every way

Whether you are performing cutting-edge research on new materials or routine materials quality tests, optimum control and test precision are essential.

By harnessing the latest advances in electronics and employing ingenious hardware and software design, our unique controller will address all your testing needs in terms of performance, accuracy and flexibility.

# Optimum control and test precision

With IMACS2, you can be assured that your tests will be performed with minimum variability, precisely to specification and results are totally accurate with no peak, trough or failure point being missed.



# Designed for the future and expandable in every way

The platform is extremely powerful and will allow you to regularly add new functions that will be made available to the users ensuring the controller is always up-to-date with the very latest technology and innovations.

Right-now, in spite of its cutting-edge performance, we are only using a small portion of its power.



## Continuing our pioneering tradition of innovation and cutting-edge design

Derived from the acclaimed trusted and well-loved IPC Global IMACS controller heritage, you can have total confidence in the new world-class IMACS2's control and data-acquisition.

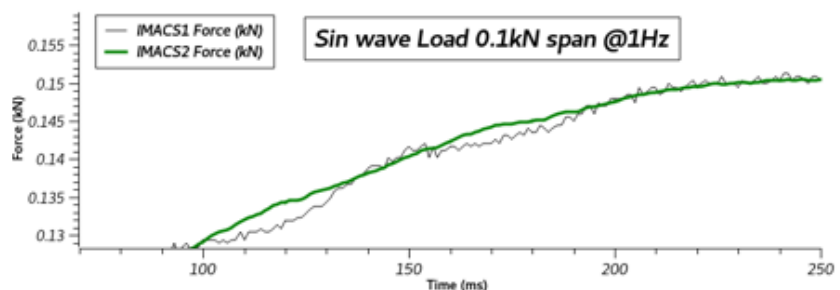
## Exceptional performance — peace of mind from complete confidence in test and results

- Sampling rates up to the industry maximum 200kHz provide optimum test control for perfect wave-shape fidelity.

- **Industry leading 24 bit resolution**, essential to obtain the maximum benefit from the extremely high sample rates, ensures complete confidence in results, especially at high frequency tests.
- **5 to 25kHz control loop closure** gives exceptional waveshape fidelity minimizing test variability.
- In-built color display

The above provides a level of control, waveform fidelity and purity of data that is second to none.

The potential for further development is virtually unlimited.





# Acquisition and Control Channels

**Flexibility**  
Up to 20 ADC channels

**Accuracy and repeatability**  
24-bit Sigma-Delta ADC

**Waveshape fidelity**  
Up to 200 kHz acquisition rate

**Wide-range compatibility**  
+10V , -10V Input range

**Easy to use**  
Auto-calibration routines

**Precise actuation control**  
Up to 25 kHz control loop rate

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Max. Channels	20
Channels Per Axis	4
Number of Axis (default + opt)	2 + 3
<b>1</b> PC Communications	Gigabit Ethernet
<b>2</b>	USB
<b>3</b> External Communications	RS485 / RS232
<b>4</b> Interfaces	CAN / Ethernet
<b>5</b> Digital Inputs	8
<b>5</b> Digital Outputs	8

## Dependable and user-friendly



### Data safety confidence

An innovative double control facility (local via color touch screen display) and remote (via PC) will be available to allow users to set-up tests directly on the controller as well as from a PC ensuring valuable test continuity in event of PC disconnection.

### Easy-to-use system

Designed around the user's needs reducing learning curve and simplifying testing procedures.

### Future-ready

Internet remote connection, ready for advanced 4.0 connectivity for any future need.



## Superior storage

The multiple data storage options include internal storage for data protection, USB ports and ethernet.

## Smart remote connectivity and support



Using the ethernet, the system can seamlessly connect to your network and be accessed remotely for system diagnostics, training, advanced support and firmware updates.



## Maximum flexibility

To further maximize the systems versatility, IMACS2 has been designed with the most comprehensive and advanced array of external interfaces giving you the ability to interface with and control almost any system, including:

- Gigabit and 100Mb ethernet
- USB, RS232/485
- CAN bus
- GPIO
- ESTOP
- HDMI
- Servo valve outputs
- solenoid outputs
- Servo motor control
- Encoders and more!



# Online Connectivity Industry 4.0 ready



## Remote technical support

Allows remote access to the machine for diagnostics and advanced customer support

Tuning of the system according to the specific test and material

Checking the correct settings



## Firmware upgrade to the latest release



## Cloud backup and storage \*



## Interface with laboratory information management system (LIMS)\*

\* Check with our product specialists for specific details, capabilities and availability.



# IMACS2 specifications

## CONTROL AND DATA ACQUISITION

ADC Resolution	24 bit
Sampling Rate (ks per sec)	5kHz up to 200kHz
Oversampling	Up to x64
DAC Resolution	16 bit
Control Loop Frequency (kHz)	5kHz – 25kHz
Max. Channels	20
Channels Per Axis	4
Number of Axis (standard + opt)	2 + 3
PC Communications	Gigabit Ethernet USB
External Communications Interfaces RS485 / RS232	
CAN / Ethernet	
Digital Inputs	8
Digital Outputs	8
Plug and Play Transducers	yes
Touchscreen LCD Display	yes
HDMI Output	yes
USB Host	yes
Encoder Input	yes
PWM / Stepper Motor Control	yes
Solenoid Outputs	10 — 2 per axis
SD Card	yes
Internet remote connection	yes

## EXTERNAL INTERFACES

Gigabit Ethernet — UTS/UTS Neutron interface
10/100Mb Ethernet — Internet access, Data share (e.g., Remote Diag, Upgrades)
RS232/RS485 — Serial extender and controller (e.g., climatic chambers)
CAN bus — Generic peripheral extender (e.g., Hydraulic board)

## ISOLATED GENERAL-PURPOSE I/O & ESTOP

Opto-Isolated GPIO
Standard DB25 connector
8 Input (PNP/NPN)
8 Output (Open collector)
General IO Extender
ESTOP loop
External Emergency button
Hydraulic Fault detection
Instantaneous power cut
Safety feature

## PLUG & PLAY TRANSDUCERS

Automatic transducer recognition
Automatically uploads calibration files (prevent human error)
Compatible with existing IPC Global In-line signal conditioners (ILC)
Allows calibration editing (if necessary)

# IMACS2 specifications

## EMBEDDED GRAPHICAL USER INTERFACES MOTOR & POWER CONTROL

Servo ValveOutput

- 2 x 16 bit DAC per axis
- 0-24 V drive, up to 3Amps

Hydraulic/ElectroMechanic (EmS)/Pneumatic UTM

Solenoid Outputs

- 2 x Relay switch per axis
- Up to 2 Amps

ON/OFF Controller (DC Motor)

Servo Motor controller

- 2 x Independent PWM driver (Step, Enable, Direction)

Encoder input

- 2 x Quadrature (A, B, Home)

Data storage — Multiple internal/external logging possibilities. Easy to use storage facilities.

Embedded Local Storage (up to 4GB)

SD card slot

USB Host port (USB Stick, Hard Drives, etc.)

Internet data sharing

Remote management

## IMACS2 SUPPORTS OUT-OF-THE-BOX CONNECTION TO THE CONTROLS UPDATE CENTER

Available network interfaces:

- 10 / 100Mbit Ethernet
- USB Tethering (e.g., smartphone)
- WiFi \* (e.g., USB dongle)

Remote management

Secure internet connection for:

- Device authentication
- Factory-authenticated setup
- System diagnostics

Integrated diagnostic facilities (e.g., logs, safety checks)

Advanced Customer Support

Direct contact with Controls' support team

Firmware upgrade

Always updated with new features and bug-fix releases

\* Special feature available on application.

## IPC Global Customer Care

IPC Global is the Advanced Pavement Testing Division of CONTROLS. As one of the longest established manufacturing companies in the world of Construction Materials Testing solutions, we are dedicated to supplying high quality, accurate, affordable, easy to use systems.

As a valued customer of CONTROLS, you will receive continuous, expert support and advice for your IPC Global equipment. Furthermore, we can offer full installation and training in the correct operation of your equipment.

For support from our expert Customer Care Team, contact your local CONTROLS office / distributor or email [customercare@controls-group.com](mailto:customercare@controls-group.com).

For more information, please visit [www.controls-group.com](http://www.controls-group.com).

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