

# 8800 MiniTower Control Electronics

The 8800 controller is a class-leading, fully digital dynamic controller that utilizes Instron® core technologies and is capable of running static and high-frequency dynamic tests. Found at the heart of Instron's servohydraulic testing systems, the 8800 controller provides full system control, machine safety, transducer conditioning, and data acquisition, as well as acts as the foundation for the user interface to the testing machine.

## Features

- Dedicated materials testing hardware and firmware-based controller developed through decades of research, development, and continuous use
- Continuous synchronous data acquisition and loop closure rates of 10 kHz
- Up to 24-bit data resolution across the entire span of each transducer provides maximum data quality
- Automatic identification and calibration of all compatible transducers prevents configuration errors and simplifies setup
- Specimen Protect function helps to avoid damage of specimen and fixtures during test setup and end of test
- Continuous update of PID control terms with Adaptive Control - optimizes the control parameters throughout a test to suit the changing stiffness characteristics of the specimen
- Expandable architecture; extensive analog and digital channel capabilities



## Handset and Frame Controls

The handset, frame controls, and emergency stop button make up the hardware interface that is rigidly mounted to the testing machine. Their functionality includes switching the machine into low power or high power mode; offering fast or fine positioning of the actuator; and where fitted, opening and closing of hydraulic grips. Uniquely, the 8800MT offers additional protection by locking out the actuator and grip controls when a waveform is running, or when in load/strain control.

## Console Software

Console Software is the main user interface to the 8800 controller. Running on a PC, it allows all controller functions to be viewed and configured including control-loop optimization, setting of operational limits, and running of simple cyclic tests. Console provides the foundation for running more demanding tests in application software such as WaveMatrix®, Bluehill®, or specific software, such as the Low Cycle Fatigue or Fracture Mechanics suite.



# Specifications

## Configuration

Axes of control	-	1-2
Sensor conditioning channels	-	Up to 8
Channels as Standard	-	Position and Load
Spare Channel Slot for	-	Strain 1 and Strain 2 or any other compatible sensors
Control Loop Type	-	Type PID (Proportional, Integral, Derivative), Lag, Feed Forward (2 Term), Notch (4 Term) and External Compensation Input (e.g. Acceleration or Pressure Feedback)
Control Loop Update Rate	-	10 kHz
Auto Loop Shaping	-	Position, Load, and Strain
Adaptive Loop Shaping	-	Continually Updated PID Terms at 1 kHz
Low Power "Specimen Loading Mode" Feature	-	Maximum Actuator Velocity Limited by Control System

## External Inputs and Outputs

Analog Input	-	1 off Per Axis, +/-10V Scalable
Analog Outputs	-	4 off Per Axis, +/-10V with 20% Over-Range, Zero Suppressed and Scalable. Selectable from Feedback Signals, Demand Error, etc
Digital Inputs	-	4 off, Programmable, Low Level Opto Isolated Optional: 4 off 24V Inputs
Digital Outputs	-	4 off, Programmable, Low Level Opto Isolated for High-Speed Switching Optional: 4 off 24V, 1A Outputs for High Power Switching

## Waveform Generation

Frequency Range	-	0.00001 to 1,000 Hz
Resolution	-	32-bit
Waveforms	-	Sine, Triangle, Square, Haversine, Havertriangle, Havesquare, Ramp, Dual Ramp, Trapezoidal, and Random

## Signal Conditioning

Compatible Transducer Types	-	Resistive Bridges (e.g. Strain Gauged Load Cells and Extensometers), AC Devices (e.g. LVDT) and DC (e.g. Pre-Conditioned Devices)
Transducer Recognition / Calibration	-	Automatic with Instron® Devices, Manual with Others
Data Acquisition Rate	-	10 kHz
Resolution	-	19-bit (1k Hz Bandwidth) 24-bit (1 Hz Bandwidth via a Digital Readout)

## System Measurement Accuracies (with Instron Transducers)

Position	-	±0.2% of Transducer Full Travel Under Normal Operating Conditions
Load	-	±0.002% of Load Cell Capacity or 0.5% of Indicated Load, Whichever is Greater - Meets or Surpasses ISO7500-1 Class 0.5, ASTM E 4, EN10002-2 Class 0.5, JIS (B7721, B7733) Down to 1/250th of Full Scale.
Strain	-	±0.005% of Transducer Capacity or ±0.25% of Reading ±Transducer Accuracy, Whichever is Greater. Meets or Surpasses ISO9513 Class 0.5, 1, 2, ASTM E 83 Class B1, B2, C, D, EN 10002-4 Class 0.5, 1, 2 and JIS7741 Grade 0.5, 12 Depending on the Extensometer Used.

## General Specifications

Weight (Fully Populated)	kg	14
	lb	31
Height	mm	450
	in	17.7
Width	mm	198
	in	7.8
Depth	mm	475
	in	18.7
Electrical Supply	-	90-132 and 180-264V 45-65 Hz Single Phase (Auto Switching)
Power Consumption	-	600 VA Maximum
Environmental Conditions	°C	10 to 38, Humidity 10 to 90% Non-Condensing
	°F	50 to 100, Humidity 10 to 90% Non-Condensing



3D View (All Measurements in mm)

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