

# DIGITAL INDICATORS & CONTROLLERS



**ELECTRO-  
NUMERICS, INC.**



## INTRODUCTION

The **ULTRA SERIES** Digital Panel Meters manufactured by Electro-Numerics, continues a two decade tradition of high quality, accurate and economical indicators for many digital display applications. The **ULTRA SERIES** features a wide selection of signal inputs and outputs via plug-in modules. A rugged panel mount 1/8 DIN case with screw terminal connections for signal and power is standard. The versatility of the **ULTRA SERIES** allows you to configure an indicator to match your signal and control requirements. Modular design allows many combinations of signal input, control outputs, analog outputs and number of digits of display. Electro-Numerics and its distributors are available to assist you in specifying the correct **ULTRA SERIES** configuration for your application.

*Use the Ordering Guide on pages 9 & 10 and follow **STEPS 1 thru 4** below to determine the exact meter configuration for your application.*

## STEP 1

### MAIN MODULES

**Choose a Main Module to provide the counts of resolution that you require. Three types are offered. Each type may be either ac or dc powered.**

All main modules feature large bright 0.56" LED digits. Plug-in positions are provided for one (required) Signal Conditioner Module, one (optional) Analog Output Module and one (optional) Setpoint Control Output Module.

Main Modules also contain the ac or dc power supply to power the meter and to provide excitation voltage outputs where applicable. These modules provide screw terminal connections for the ac power and signal input. Dual 18 pin edge-card connection is provided for all other inputs and outputs. Main Modules are housed in a standard 1/8 DIN size plastic panel mount case with mounting hardware included. The mounting bezel features an attractive satin black finish and a red acrylic silkscreened LED lens.

The following chart shows the six models of Main Modules and the various combinations of number of digits (resolution) and meter power.

	1,999 Counts	19,990 Counts	9,999 Counts
115Vac	UA0	UB0	UC0
230Vac	UA1	UB1	UC1
9-32Vdc	UA2	UB2	UC2

The **ULTRA SERIES** utilizes seven -segment bright red-orange LED digits. These high quality digits provide for wide angle viewing and maximum viewing distance for all applications.

Meter power may be 115 or 230Vac, 47 to 400Hz or 9 to 32Vdc ( isolated).

### **Models UA0, UA1 & UA2 3 1/2 Digit (1,999 count)**

These models provide a full scale display of **1999** counts. Decimal points, negative sign and right-hand digit on/off are programmable by display board jumpers.



**Models UB0, UB1 & UB2**  
**3 1/2 Digit Plus Dummy Zero (19,990 count)**

These models provide a full scale display of **19,990** counts. The right hand non-changing dummy zero may be programmed on or off. With the dummy zero on, the display has an effective count by 10 capability. In addition, decimal points and negative sign may be programmed by display board jumpers.



**Model UC0, UC1 & UC2**  
**4 Digit (9,999 count)**

These models provide a full scale display of **9,999** counts. Decimal points and negative sign may be programmed by display board jumpers.

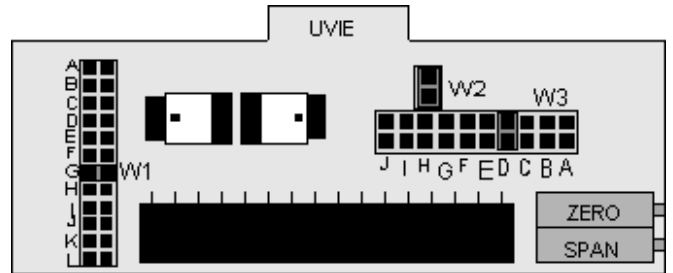


## STEP 2

### SIGNAL CONDITIONER MODULES

**Choose a signal conditioner input module to match the signal input that you will provide to the meter.**

The **ULTRA SERIES** accepts a variety of signal inputs by providing a selection of input modules to match your signal source. These input modules plug-in and provide zero and span adjustment potentiometers accessible by removing the window. Signal input connections are made via a screw terminal barrier strip at the rear of the meter.



### UVI DC VOLTAGE INPUT

With this input module installed, the meter will accept four voltage ranges distributor selectable by jumper. The negative sign is automatic if selected. Signal inputs are bi-polar and single ended.

Voltage Range	Resolution	Input Impedance	Accuracy
<b>Model UA &amp; UB</b>			
1 (+/-199.9mV)	100uV	>1Mohm	+/-0.05% Rdg
2 (+/-1.999V)	1mV	1 Mohm	+/- 1 Count
3 (+/-19.99V)	10mV	1 Mohm	
4 (+/-199.9V)	100mV	1 Mohm	
<b>Model UC</b>			
1 (+/-99.99mV)	10uV	>1Mohm	+/-0.05% Rdg
2 (+/-999.9mV)	100uV	1 Mohm	+/- 2 Counts
3 (+/-9.999V)	1mV	1 Mohm	
4 (+/-99.99V)	10mV	1 Mohm	

### UCI DC CURRENT INPUT

This module provides six dc current ranges distributor selectable by an internal shunt resistor. For current inputs greater than 1.999A an external shunt resistor is used with a UVI dc voltage input module and the signal input calibrated for either 50mV or 100mV.

Current Range	Resolution	Input Impedance	Accuracy
<b>Model UA &amp; UB</b>			
1 +/-19.99uA	10nA	10 kohm	+/-0.05% Rdg
2 +/-199.9uA	100nA	1 kohm	+/- 1 Count
3 +/-1.999mA	1uA	100 ohm	
4 +/-19.99mA	10uA	10 ohm	
5 +/-199.9mA	100uA	1 ohm	
6 +/-1.999A	1mA	0.1 ohm	
<b>Model UC</b>			
1 +/-9.999uA	1nA	10 kohm	+/-0.05% Rdg
2 +/-99.99uA	10nA	1 kohm	+/- 1 Count
3 +/-999.9uA	100nA	100 ohm	
4 +/-9.999mA	1uA	10 ohm	
5 +/-99.99mA	10uA	1 ohm	
6 +/-999.9mA	100uA	0.1 ohm	

### UAV AC AVERAGE VOLTAGE INPUT

This input module full-wave rectifies and averages the ac sinusoidal input signal and displays the RMS result in five distributor selectable ranges. This module should be used to measure sine wave signals only. For non-sine waves, use True RMS Voltage Module UTV.

Voltage Range	Resolution	Input Impedance	Accuracy
<b>Model UA &amp; UB</b>			
1 199.9mV	100uV	1.1 Mohm	+/-0.1% Rdg
2 1.999V	1mV	1.1 Mohm	+/- 1 Count
3 19.99V	10mV	1.0 Mohm	47Hz to 1kHz
4 199.9V	100mV	1.0 Mohm	
5 650V	1V	10 Mohm	
<b>Model UC</b>			
1 99.99mV	10uV	1.1 Mohm	+/-0.1% Rdg,
2 999.9mV	100uV	1.1 Mohm	+/- 10 Count
3 9.999V	1mV	1.0 Mohm	47Hz to 1kHz
4 99.99V	10mV	1.0 Mohm	
5 650.0V	100mV	10 Mohm	

### UAI AC AVERAGE CURRENT INPUT

The UAI input module provides seven current ranges by distributor installation of an internal shunt resistor. For current inputs greater than 5A an external current transformer (C.T.) is used. This module should be used to measure sine wave signals only. For non-sine waves, use True RMS Current Module UTI.

Current Range	Resolution	Input Impedance	Accuracy
<b>Model UA &amp; UB</b>			
1 19.99uA	10nA	10kohm	+/-0.1% Rdg
2 199.9uA	100nA	1 kohm	+/- 1 Count.
3 1.999mA	1uA	100 ohm	47Hz to 1kHz
4 19.99mA	10uA	10 ohm	
5 199.9mA	100uA	1 ohm	
6 1.999A	1mA	0.1 ohm	
7 5.00A	10mA	0.01 ohm	
<b>Model UC</b>			
1 9.999uA	1nA	10 kohm	+/-0.1% Rdg,
2 99.99uA	10nA	1 kohm	+/- 1 Count.
3 999.9uA	100nA	100 ohm	47Hz to 1kHz
4 9.999mA	1uA	10 ohm	
5 99.99mA	10uA	1 ohm	
6 999.9mA	100uA	0.1 ohm	
7 5.000A	1mA	0.01 ohm	

### UTV TRUE RMS VOLTAGE INPUT

This input module accepts true RMS voltage inputs for sinusoidal and non-sinusoidal complex waveforms with crest factors up to 2:1 at full scale. The inputs can be ac or dc coupled. With ac coupling, the ac component of the signal can be measured from 47Hz to 5000Hz. With dc coupling, the ac and dc components can be measured to display total RMS from 9Hz to 5000Hz.

Voltage Range	Resolution	Input Impedance	Accuracy
<b>Model UA &amp; UB</b>			
1 199.9mV	100uV	1.1 Mohm	+/-0.1% Rdg
2 1.999V	1mV	1.1 Mohm	+/- 1 Count
3 19.99V	10mV	1.0 Mohm	47Hz to 1kHz
4 199.9V	100mV	1.0 Mohm	
5 650V	1V	10 Mohm	

	Voltage		Input	
	Range	Resolution	Impedance	Accuracy
<b>Model UC</b>				
1	99.99mV	10uV	1.1 Mohm	+/-0.1% Rdg,
2	999.9mV	100uV	1.1 Mohm	+/- 10 Count
3	9.999V	1mV	1.0 Mohm	
4	99.99V	10mV	1.0 Mohm	
5	650.0V	100mV	10Mohm	

### UTI TRUE RMS CURRENT INPUT

This module accepts true RMS current inputs for sinusoidal and non-sinusoidal complex waveforms with crest factors up to 2:1 at full scale. Seven current ranges are provided by distributor installation of an internal shunt resistor. For current inputs greater than 5A an external current transformer (C.T.) is used.

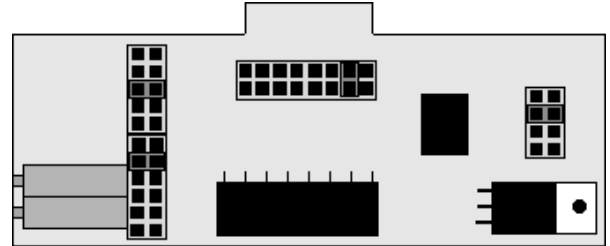
	Current		Input	
	Range	Resolution	Impedance	Accuracy
<b>Model UA &amp; UB</b>				
1	19.99uA	10nA	10 kohm	+/-0.1% Rdg
2	199.9uA	100nA	1 kohm	+/- 1 Count.
3	1.999mA	1uA	100 ohm	From 1% to
4	19.99mA	10uA	10 ohm	100% of Full
5	199.9mA	100uA	1 ohm	Scale.
6	1.999A	1mA	0.1 ohm	
7	5.00A	10mA	0.01 ohm	
<b>Model UC</b>				
1	9.999uA	1nA	10 kohm	+/-0.1% Rdg
2	99.99uA	10nA	1 kohm	+/- 10 Count
3	999.9uA	100nA	100 ohm	From 1% to
4	9.999mA	1uA	10 ohm	100% of Full
5	99.99mA	10uA	1 ohm	Scale
6	999.9mA	100uA	0.1 ohm	
7	5.000A	1mA	0.01 ohm	

### F FREQUENCY / RATE & TACHOMETER INPUT

This input module will accept frequency or pulse inputs. Common applications are measurement of flow using a turbine flowmeter and RPM using a magnetic pickup or proximity sensor. Zero and span scaling adjustments provide display in engineering units. Signal inputs may be dc or ac coupled and hysteresis of 100mV or 10mV may be specified.

SPEC.	UA & UB	UC
<b>Full Scale Input:</b>	100Hz to 20kHz = 1,999	100Hz to 20kHz = 9,999
<b>Max. Input Voltage:</b>	150Vrms	150Vrms
<b>Accuracy:</b>	+/-0.1% F.S. +/-1 count	+/-0.1% F.S. +/-2 counts
<b>Min. Measurable Frequency:</b>	10Hz	50Hz

The minimum signal input depends on the frequency input range. At 100Hz the minimum input is 15mV p/p while at 20kHz, the minimum is 90mV p/p. If desired, the minimum input can be set to greater than 100mV p/p.



### UTJ, UTK & UTT THERMOCOUPLE TEMPERATURE INPUT

These input modules will accept signals from types J, K, or T Thermocouples. Each module can be specified for calibration in °F or °C. Thermocouple calibration curves match NBS, IPTS68. Open sensor indication is provided. These temperature modules may be used with either the UA or UC main modules. They are not recommended for use with the UB (dummy zero) main modules.

#### UTJ Temperature Module

This input module is compatible with type J (Iron-Constantan) thermocouples with a maximum lead resistance of 500 ohms.

SPEC.	UA	UC
<b>Range °C:</b>	-40 to 760°C	-40.0 to 760.0°C
<b>°F:</b>	-40 to 1400°F	-40.0 to 999.9°F
<b>Resolution:</b>	1°C / °F	0.1°C / °F
<b>Accuracy:</b>		
(0 to 277°C)	+/-1.2°C	+/-1.2°C
(32 to 530°F)	+/-2.4°F	+/-2.4°F

### UTK Temperature Module

This input module is compatible with type K (Chromel-Alumel) thermocouples with a maximum lead resistance of 395 ohms.

SPEC.	UA	UC
<b>Range °C:</b>	-40 to 1260°C	-40.0 to 999.9°C
<b>°F:</b>	-40 to 1999°F	-40.0 to 999.9°F
<b>Resolution:</b>	1°C /°F	0.1°C /°F
<b>Accuracy:</b>		
(0 to 277°C )	+/-1.8°C	+/-1.8°C
(32 to 530°F)	+/-3.0°F	+/-3.0°F

### UTT Temperature Module

This input module is compatible with type T (Copper-Constantan) thermocouples with a maximum lead resistance of 200 ohms.

SPEC.	UA	UC
<b>Range °C:</b>	-184 to 371°C	-184.0 to 371.0°C
<b>°F:</b>	-300 to 700°F	-300.0 to 700.0°F
<b>Resolution:</b>	1°C /°F	0.1°C /°F
<b>Accuracy:</b>		
(-58 to 93°C )	+/-1.0°C	+/-1.0°C
(-74 to 200°F)	+/-1.5°F	+/-1.5°F

### URT, URX RTD TEMPERATURE INPUT

These input modules accept signals from Resistance Temperature Devices (RTD's). Two separate modules are provided for resolutions of 0.1 °F /°C and 1 °F /°C. Signal inputs must be from 100 ohm platinum RTD's with a temperature coefficient of 0.00385°C. Open sensor indication is provided. These temperature modules may be used with either the UA or UC main modules. They are not recommended for use with the UB (dummy zero) main modules.

#### URT Temperature Module 0.1° Resolution

SPEC.	UA	UC
<b>Range °C:</b>	-199.9 to 199.9°C	-99.99 to 99.99°C
<b>°F:</b>	-199.9 to 199.9°F	-99.99 to 99.99°F
<b>Excitation:</b>	42uA (20 kohm range) to 4.2mA	
<b>Accuracy:</b>	+/-0.05% Rdg, +/-1 count	

### URX Temperature Module 1° Resolution

SPEC.	UA	UC
<b>Range °C:</b>	-200 to 830°C	-200.0 to 830.0°C
<b>°F:</b>	-328 to 1526°F	-328.0 to 999.9°F
<b>Excitation:</b>	0.42mA	0.42mA
<b>Accuracy:</b>	+/-0.3°C, +/-0.2%Rdg +/-0.5°F, +/-0.2%Rdg	

### URS 2 OR 4 WIRE RESISTANCE INPUT

This input module allows the meter to measure the resistance of an external device or circuit. Four distributor programmable ranges are provided. Open sensor indication is standard. This resistance module may be used with either the UA or UC main modules. They are not recommended for use with the UB (dummy zero) main modules.

SPEC.	UA	UC
<b>Resistance</b>		
<b>Range:</b>	0 to 19.99 ohm	0 to 9.999 ohm
	0 to 199.9 ohm	0 to 99.99 ohm
	0 to 1999 ohm	0 to 999.9 ohm
	0 to 19.99 kohm	0 to 9.999 kohm
<b>Excitation:</b>	0.42mA	0.42mA
<b>Accuracy:</b>	+/-0.05% Rdg, +/-1 count	

### UPO 3-WIRE RATIO (POT) INPUT

This input module acts as a pot follower signal conditioner providing a display of 0 to 100.0%. The module supplies a 4V excitation output and zero and span adjustments accessible by removing the window. The zero control provides an adjustment range of 5 to -10% of reading. The span control provides adjustments from -5 to 10% of reading.

SPEC.	UA	UC
<b>Range:</b>		
1k Pot	0 to 100%	0 to 100.00%
5k Pot	0 to 100%	0 to 100.00%
<b>Accuracy:</b>	+/-0.05% Rdg, +/-1 count	

STEP 2 CONT.

### P PROCESS SIGNAL INPUT

The process input module is a multifunction board which provides broad range scaling and zero offset for both voltage and current inputs. This module will accept the common 4/20mA, 0/20mA, 10/50mA, 0/5V, 1/5V, 0/10V and 1/10V process loop signals. The input range must be specified at time of ordering. User scalable zero and span are provided. Zero is adjustable up to 100% of the full scale range.

SPEC.	UA/UB	UC
<b>Range:</b>		
+/-1.0mA to	-1999 to 1999	-9999 to 9999
+/-50.0mA	-19990 to 19990	
+/-0.5V to	-1999 to 1999	-9999 to 9999
+/-20.0V	-19990 to 19990	
<b>Impedance:</b>		
Current Input:	500 ohm to 10 ohm	
Voltage Input:	100 kohm to 1.0 Mohm	
<b>Accuracy:</b>	+/-0.05% Rdg,	+/-0.05% Rdg,
	+/-1 count	+/-2 count

### E PROCESS SIGNAL INPUT WITH EXCITATION OUTPUT

This strain gauge module provides the same features as the **P** Process Input Module plus an **excitation output**. This output voltage may be used to power a transducer or transmitter. Two levels of excitation voltage are distributor selectable. All range specifications for the **P** Process Input Module are the same for this module.

Excitation Voltage Output:  
 10Vdc @ 50mA maximum or  
 15Vdc @ 25mA maximum

### S STRAIN GAUGE/ LOAD CELL INPUT

This input module accepts low level millivolt output signals from pressure transducers and load cells. User adjustable scaling is provided plus an excitation output voltage of 1 to 10Vdc at 30mA. Zero and span adjustments are provided for user scaling. Differential signal input is provided as well as automatic excitation power supply adjustment to compensate for signal drift due to temperature

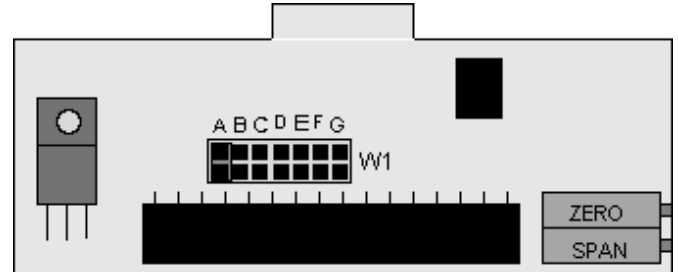
variations. When connected in a six wire configuration, sense leads compensate for hookup wire resistance.

SPEC.	UA/UB	UC
<b>Range:</b>		
+/-2mV to	-1999 to 1999	-9999 to 9999
+/-500mV	-19990 to 19990	
<b>Excitation:</b>		
	1 to 10Vdc at 30mA (adjustable)	
<b>Accuracy:</b>		
	+/-0.05% Rdg,	+/-0.05% Rdg,
	+/-1 count	+/-2 count

## STEP 3

### ANALOG OUTPUT MODULES

If required, choose an Analog Output Module to provide an output voltage or current proportional to the displayed readings. Seven types are offered.



### J, K, L, M, Y & N ANALOG OUTPUTS

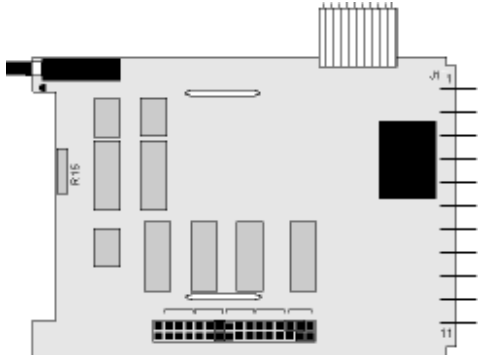
Each **ULTRA** meter provides a standard analog voltage output (**H**) of 1mV per count displayed (UA & UB) or 1mV per 2 counts displayed (UC) at 2mA maximum current. Six optional analog output configurations are also available with the addition of an Analog Output Module. These Analog Output Modules allows scaling of zero and full scale to match the displayed reading.

- J** 0 to 5Vdc, 12Vdc compliance voltage
- K** 0 to 10Vdc, 12Vdc compliance voltage
- L** 0 to 1mA sink or source, 12Vdc compliance voltage
- M** 4/20mA sink or source, 12Vdc compliance voltage
- Y** 4/20mA sink, ext. driven, 40Vdc compliance voltage
- N** 0 to 1mA sink, ext. driven, 40Vdc compliance voltage

# STEP 4

## CONTROL (SETPOINT) OUTPUT MODULES

If required, choose a Control Output Module to provide single or dual setpoint control.



### X & R CONTROL OUTPUTS

The **ULTRA SERIES** can provide single (X) or dual (R) setpoint controller options. Both have form C relays with a load rating of 10A @ 240Vac or 10A @ 30Vdc (resistive). Each setpoint is screwdriver adjustable by a front panel mounted potentiometer. A push button switch allows the setting to be displayed. Models without dummy zero have LED's located behind the window. These LED's give a visual indication of the state of each relay. At time of ordering, the setpoints can be specified to operate in the following modes.

#### Latched or Non-Latched Operation:

The relays can be configured with none, one or both relays in the latched state. When latched, the relays remain energized until the front panel pushbutton(s) are pushed or an external reset switch is actuated.

#### Ganged or Non-Ganged Operation:

The relays can be configured to operate together (ganged) or independently (non-ganged). When ganged, the High setpoint cannot be set below the Low setpoint. When non-ganged, the High setpoint can be set anywhere within the range of the meter.

#### Hysteresis Control:

With hysteresis, the High relay is activated at the High setpoint position and deactivated at the Low setpoint position. The Low relay is activated at the Low setpoint

position and deactivated at the High setpoint position. The amount of hysteresis can be set by internal adjustment.

#### Two or Three Position Control:

This configuration provides a dead zone between the High and Low setpoints. The High relay activates when the signal goes above the High setpoint. The Low relay activates when the signal goes below the Low setpoint. The two relays can be connected to two or three loads with a dead zone between the setpoints.

#### Failsafe Control:

This configuration activates both relays when the signal is between the setpoints. When the signal goes above the High setpoint, the High relay de-activates. When the signal goes below the Low setpoint, the Low relay de-activates. Should power be lost to the meter, both relays are de-activated.

## GENERAL SPECIFICATIONS

The following general specifications apply to all models in the **ULTRA SERIES**.

### Conversion Characteristics:

Type ..... Dual slope, average value  
Read Rate ..... 3 Readings per second (UA & UB)  
2.5 Readings per second (UC)

### Display:

Type ..... LED, 0.56 inch (14.2mm), 7 segment  
Color ..... Red-Orange  
Overrange:  
UA & UB ..... Three least significant digits blanked  
UC ..... Display blinks  
Decimal points . . . . . Selectable behind the window or at connector J1

### Power:

ac Voltage ..... 115 or 230Vac, +/- 15%, 47 to 400Hz  
dc Voltage ..... 9 to 32Vdc isolated  
Power ..... 5 watts max.

### Environmental:

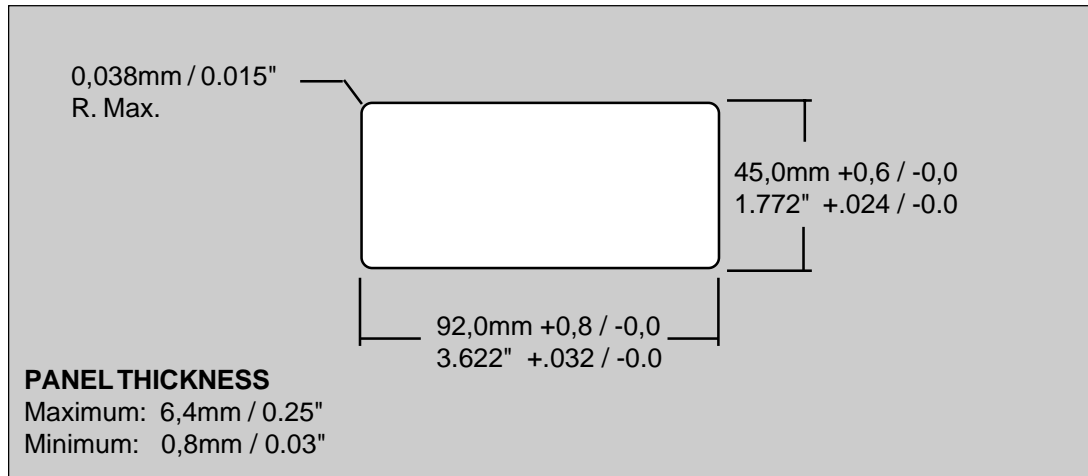
Operating Temperature ..... -10°C to +60°C  
Storage Temperature ..... -40°C to +85°C  
Relative Humidity ..... 95% to 40°C (non-condensing)

### Mechanical:

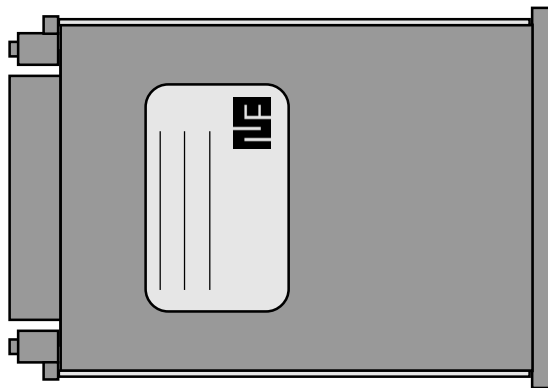
Panel Cutout 1/8 DIN (45 x 92mm)  
Dimensions ..... See **Dimensions and Mounting** Page 8.  
Case ..... 94V-0 UL-rated polycarbonate, black



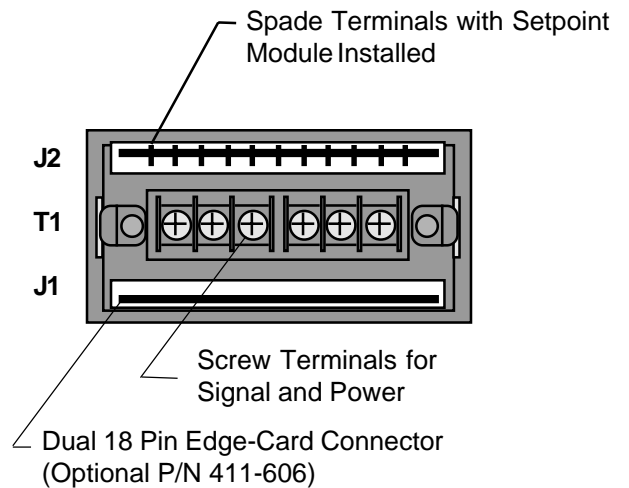
# DIMENSIONS AND MOUNTING



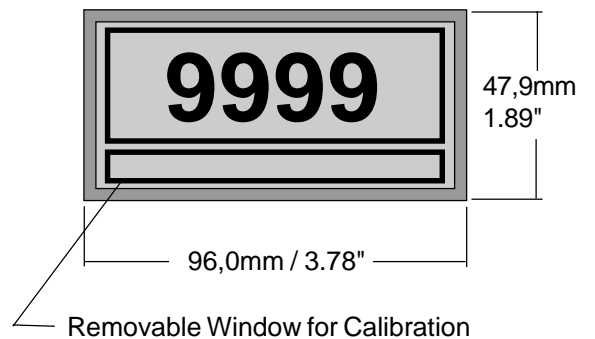
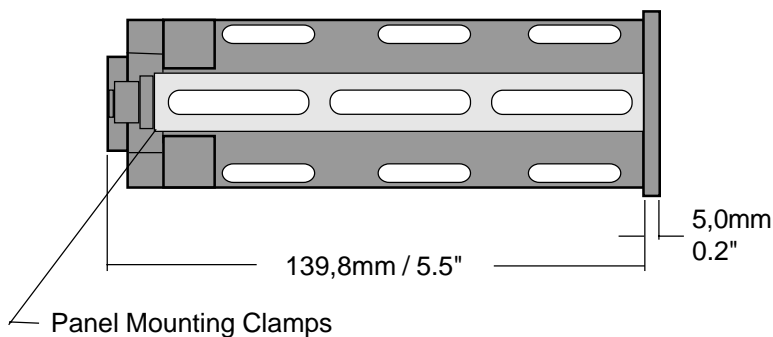
## PANEL CUTOUT



**TOP VIEW**



**REAR VIEW**



# ORDERING GUIDE

## ULTRA SERIES

Select one box from each highlighted category depending on your requirements for Resolution, Power, Analog Output, Control Output and Signal Input.

Examples: 1) **UA 0 Y H UTJ2**  
 2) **UC 2 H R S**  
 0mV = 0000, 30mV = 500.0  
 Excitation = 10Vdc

### DISPLAY RESOLUTION

- UA** 1999 / -1999 (3 1/2 Digit)
- UB** 19990 / -19990 (3 1/2 Digit Plus Dummy Zero)
- UC** 9999 / -9999 (4 Digit)

### DISPLAY TYPE & METER POWER

- 0** LED & 115Vac (47 - 400Hz)
- 1** LED & 230Vac (47 - 400Hz)
- 2** LED & 9 to 32Vdc (Isolated)

### ANALOG OUTPUTS

- H** Standard Analog Output
- J** 0 TO 5Vdc, 12Vdc Compliance Voltage
- K** 0 TO 10Vdc, 12Vdc Compliance Voltage
- L** 0 TO 1mA Sink or Source, 12Vdc compliance Voltage
- M** 4/20mA Sink or Source, 12Vdc Compliance Voltage
- Y** 4/20mA Sink Only, Externally Driven, 40Vdc Maximum Compliance Voltage
- N** 0 to 1mA Sink Only, Externally Driven, 40Vdc Maximum Compliance Voltage

### CONTROL (SETPOINT) OUTPUTS

- H** None
- X** Single Setpoint With 10A Form-C Relay
- R** Dual Setpoints With 10A Form-C Relays

### SIGNAL CONDITIONING INPUTS

- H** None

### DC VOLTAGE

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UVI</b> 1	+/-199.9mV	+/-199.90mV	+/-99.99mV
<input type="checkbox"/> 2	+/-1.999V	+/-1.9990V	+/-999.9mV
<input type="checkbox"/> 3	+/-19.99V	+/-19.990V	+/-9.999V
<input type="checkbox"/> 4	+/-199.9V	+/-199.90V	+/-99.99V

### DC CURRENT

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UCI</b> 1	+/-19.99uA	+/-19.990uA	+/-9.999uA
<input type="checkbox"/> 2	+/-199.9uA	+/-199.90uA	+/-99.99uA
<input type="checkbox"/> 3	+/-1.999mA	+/-1.9990mA	+/-999.9uA
<input type="checkbox"/> 4	+/-19.99mA	+/-19.990mA	+/-9.999mA
<input type="checkbox"/> 5	+/-199.9mA	+/-199.90mA	+/-99.99mA
<input type="checkbox"/> 6	+/-1.999A	+/-1.9990A	+/-999.9mA

### AC AVERAGE VOLTAGE

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UAV</b> 1	199.9mV	199.90mV	99.99mV
<input type="checkbox"/> 2	1.999V	1.9990V	999.9mV
<input type="checkbox"/> 3	19.99V	19.990V	9.999V
<input type="checkbox"/> 4	199.9V	199.90V	99.99V
<input type="checkbox"/> 5	650V	650.0V	650.0V

### AC AVERAGE CURRENT

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UAI</b> 1	19.99uA	19.990uA	9.999uA
<input type="checkbox"/> 2	199.9uA	199.90uA	99.99uA
<input type="checkbox"/> 3	1.999mA	1.9990mA	999.9uA
<input type="checkbox"/> 4	19.99mA	19.990mA	9.999mA
<input type="checkbox"/> 5	199.9mA	199.90mA	99.99mA
<input type="checkbox"/> 6	1.999A	1.9990A	999.9mA
<input type="checkbox"/> 7	5.00A	5.000A	5.000A

Note: Range 7 can be used with a 5A output current transformer for higher current measurements.

### TRUE RMS VOLTAGE

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UTV</b> 1	199.9mV	199.90mV	99.99mV
<input type="checkbox"/> 2	1.999V	1.9990V	999.9mV
<input type="checkbox"/> 3	19.99V	19.990V	9.999V
<input type="checkbox"/> 4	199.9V	199.90V	99.99V
<input type="checkbox"/> 5	650V	650.0V	650.0V

### TRUE RMS CURRENT

	<b>UA</b>	<b>UB</b>	<b>UC</b>
<input type="checkbox"/> <b>UTI</b> 1	19.99uA	19.990uA	9.999uA
<input type="checkbox"/> 2	199.9uA	199.90uA	99.99uA
<input type="checkbox"/> 3	1.999mA	1.9990mA	999.9uA
<input type="checkbox"/> 4	19.99mA	19.990mA	9.999mA
<input type="checkbox"/> 5	199.9mA	199.90mA	99.99mA
<input type="checkbox"/> 6	1.999A	1.9990A	999.9mA
<input type="checkbox"/> 7	5.00A	5.000A	5.000A

Note: Range 7 can be used with a 5A output current transformer for higher current measurements.

### FREQUENCY / RATE

	UA	UB	UC
<input type="checkbox"/> F	1,999	19,990	9,999

Customer Supplied Information:

- 1) Minimum frequency and minimum display.
- 2) Maximum frequency and maximum display. (maximum frequency = 20kHz).
- 3) Counts of hysteresis.

### THERMOCOUPLE TEMPERATURE

	UA	UC
<input type="checkbox"/> UTJ	1 -40 to 760°C	-40.0 to 760.0°C
	2 -40 to 1400°F	-40.0 to 999.9°F
<input type="checkbox"/> UTK	1 -40 to 1260°C	-40.0 to 999.9°C
	2 -40 to 1999°F	-40.0 to 999.9°F
<input type="checkbox"/> UTT	1 -184 to 371°C	-184.0 to 371.0°C
	2 -300 to 700°F	-300.0 to 700.0°F

Thermocouple modules are not recommended for use with UB (Dummy Zero) main modules.

### RTD TEMPERATURE

	UA	UC
<input type="checkbox"/> URT	1 +/-199.9°C	+/-99.99°C
	2 +/-199.9°F	+/-99.99°F
<input type="checkbox"/> URX	1 -200 to 830°C	-200.0 to 830.0°C
	2 -328 to 1526°F	-328.0 to 999.9°F

RTD modules are not recommended for use with UB (Dummy Zero) main modules.

### RESISTANCE

	UA	UC
<input type="checkbox"/> URS	1 0 to 19.99 ohm	0 to 9.999 ohm
	2 0 to 199.9 ohm	0 to 99.99 ohm
	3 0 to 1999 ohm	0 to 999.9 ohm
	4 0 to 19.99 kohm	0 to 9.999 kohm

Resistance modules are not recommended for use with UB (Dummy Zero) main modules.

### 3-WIRE POTENTIOMETER

	UPO 1	UPO 2
UA	1000 = 1 kohm	1000 = 5 kohm
UB	10000 = 1 kohm	10000 = 5 kohm
UC	9999 = 1 kohm	9999 = 5 kohm

### PROCESS SIGNAL

	UA	UB	UC
<input type="checkbox"/> P	+/-1,999	+/-19,990	+/-9,999

Customer Supplied Information:

- 1) Minimum input voltage or current and minimum display.
- 2) Maximum input voltage or current and maximum display.
- 3) Decimal point position.

### PROCESS SIGNAL WITH EXCITATION OUTPUT

	UA	UB	UC
<input type="checkbox"/> E	+/-1,999	+/-19,990	+/-9,999

Customer Supplied Information:

- 1) Minimum input voltage or current and minimum display.
- 2) Maximum input voltage or current and maximum display.
- 3) Decimal point position.
- 4) Excitation voltage output, 10Vdc or 15Vdc.

### STRAIN GAUGE

	UA	UB	UC
<input type="checkbox"/> S	+/-1,999	+/-19,990	+/-9,999

Customer Supplied Information:

- 1) Minimum input voltage and minimum display.
- 2) Maximum input voltage and maximum display.
- 3) Decimal point position.
- 4) Excitation voltage output, 1 to 10Vdc.

## ACCESSORIES

- 1) **411-606 Connector:**  
This dual 18 pin edge-card connector fits the PCB fingers at position J1.
- 2) **HW04 Environmental Cover Kit:**  
This kit consists of a polycarbonate bubble window, gasket and screws. It is designed to mount to the panel and completely cover the meter bezel and window.

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