




# KD

## DIGITAL WEIGHT CONTROL MODULE

### applications

- Process Control
- Weighing Applications
- I.S. Hazardous Areas
- Laboratory Measurements
- Force, Torque or Pressure
- O.E.M. Requirements

### features

- 24-Bit A/D
- Analog or Digital Calibration
- *Hi-Res* 16-Bit Analog Output
- MODBUS® RTU Over RS 485
- RS 232 & 422/485 Interfaces
- USB Interface 
- 60,000 LED Display Digits
- 0.01% Accuracy Class
- Peak Hold
- Four Digital I/O
- DIN or Panel Mount

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KD4 Panel Mount w/ Display



KD3 DIN Rail w/ Display



The KD Series is a complete, high performance, multi-featured digital controller. This very versatile control module is designed as a companion instrument for load cells, force transducers, torque transducers, pressure transducers, weighing systems and virtually any bonded foil strain gage-based transducer. The display is an easy-to-read .55" bright red LED character display, with status annunciations. The 4-key touchpad makes setup and operation of the KD Series quick and simple. Optional *Innovation*® is an MS Windows-based software, providing an intuitive and convenient format for PC Control/Handshaking/Networking. The high internal resolution, programmable digital filtering and A/D conversion rate of 50 updates per second allows the user to readily configure the KD Series for a broad range of measurement tasks. Two calibration options are available: Digital (keypad entry), or analog (reference signal). Additionally, the 10-point linearization feature provides a means for optimizing measurement system accuracy. RS232/422/485 serial interfaces are supported. MODBUS® RTU protocol is standard. A high resolution, 16-bit D/A analog output is also standard with 0-5 VDC, 0-10 VDC or 4-20 mA user selectable formats. The digital I/O consist of two optically-isolated logic inputs and two optically-isolated logic outputs. Remote sensing is supported, which is particularly beneficial where long cable runs or Intrinsic Safety barriers are employed. The KD series operates on 18-28 VDC and provides 5 VDC excitation to the transducers. The durable ABS enclosures are DIN rail or panel mount configurations, and are rated IP20. The KD Series family of products include AC to DC power supplies, Network Gateway Controllers and Analog Transmitters. ProfiBus and DeviceNet communications protocols are available. The attributes of the KD Series are ideal for measurements in the laboratory, manufacturing, process applications, weighing situations, and for general measurement and control.

*Innovative Measurement Solutions*



### *operator interface*

Display:	LED; 6 Digit; Numeric; 7-Segment Digits; .55" High; Red
Status Annunciation:	4 (LED); Red; Indicate "SP1", "SP2", "NET", "Center of Zero"
Keypad:	4-Key; Tactile Feedback; Multi-function
Display Resolution:	60,000 dd (max.)
Display Increments:	1, 2, 5, 10, 20 or 50; Selectable
Decimal Point:	0.0, 0.00, 0.000; Selectable
Digital Filter:	Keypad Programmable; .1 to 25 Hz
Zero Tracking:	0, 1, 2, 3 or 4 digits; Selectable
Motion Detection:	0, 1, 2, 3 or 4 digits; Selectable
Operating Modes:	Net, Gross, Peak Hold, Mode 1, Mode 2
Calibration Method:	Digital; Keypad; Enter/Store Zero and span value; PC remote capable Analog; Requires reference signal source; Deadload method

### *function*

Linearity:	Better Than Or Equal To 0.01% Full Scale (FS)
Internal Resolution:	24-Bit A/D; >16,000,000 Graduations
Measurement Rate:	50 Updates Per Second
Signal Sensitivity:	.2 $\mu$ V/Graduation (maximum)
Span Range @ Full Scale:	-0.5 mV/V to +3.5 mV/V
Bi-Polar Range:	-3.9 mV/V to +3.9 mV/V
Excitation Voltage:	5 VDC (Nominal); Short circuit protected
Current Rating:	60 mA (Nominal); Up To 6 Summed 350 $\Omega$ Bridges
Power:	24 VDC $\pm$ 15%; 7.5 Watts
Warranty:	1 Year; Limited



### *analog output*

Type:	16-Bit D/A; > 65,000 Graduations
Output Formats:	0-10 VDC (10Kohm min load); 4-20 mADC (300 Ohm max load)
Software Selectable Parameters:	Output format; Full Scale and Zero Offset Values; Net, Gross, Peak or Test Modes

### *serial port*

Serial Port Interfaces:	Three Ports: 1) USB; 2) RS-232; 3) RS422 or RS485
Standard Baud Rates:	2400, 9600, 19,200 38,400 or 115,200 Baud; Full Duplex; Selectable
Standard Protocols:	ASCII; MODBUS <sup>®</sup> RTU, Continuous, Demand, Slave
Addresses:	Up to 32
Recommended Cable Lengths:	RS-232 is 50 ft. (max); RS-422 & RS-485 is 3200 ft (max)

### *I/O*

Logic Inputs:	Two; Opto-Isolated; 24 VDC PNP (requires external power source)
Logic Outputs:	Two; Opto-Relays; (maximum load 24 VDC/100 mADC each)

### *environmental*

Operating Temperature Range:	-10° To +50° C / 14 To 122°F
Storage Temperature Range:	-20° To +70° C / -4° To 158° F
Humidity Range:	0 To 85% RH; Non-condensing

### *enclosures*

Enclosure Construction:	DIN Rail (KD3) or Panel Mounting (KD4); NORYL Auto-extinguishing; IP20
Enclosure Dimensions:	KD3: 4.17" wide X 3.54" high X 2.28" deep KD4: 3.79" wide X 1.89" high X 6.3" deep
Wiring Connections:	Terminal Blocks; Pitch of 0.196"
Weight:	8 Ounces

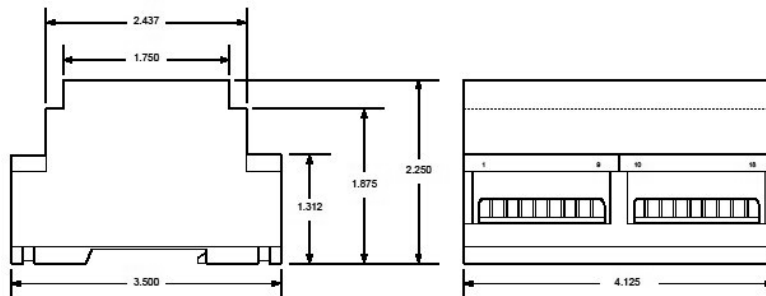


configuration using Innovation™ software

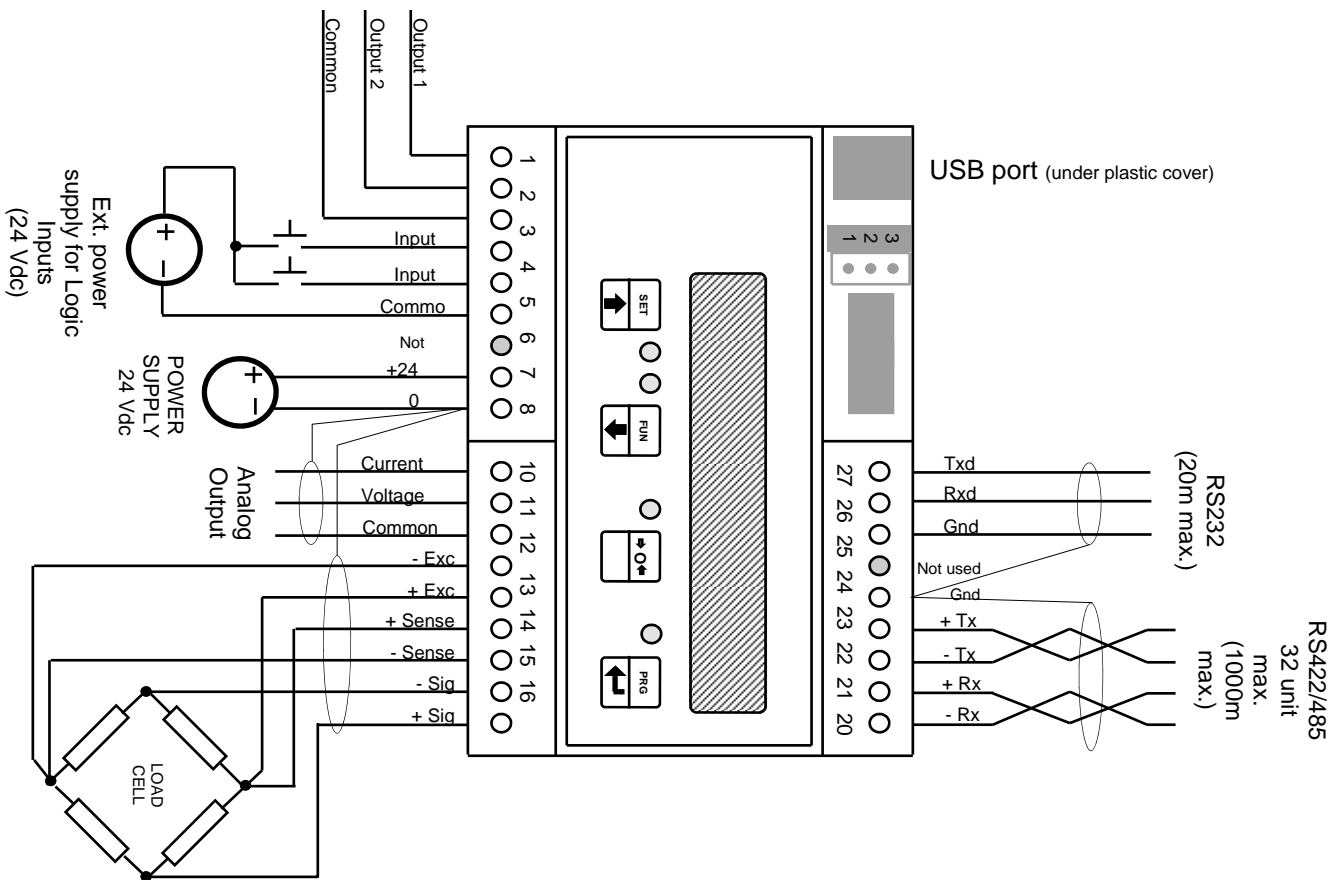
The KD Series can be configured by using the front panel keys to navigate through a series of menus, or by sending configuration and calibration data via the RS-232 port with Innovation™, an MS Windows based program provided for the KD Series on request. Innovation™ simplifies the configuration and calibration procedure and facilitates easy networking of up to (48) units.



enclosure dimensions

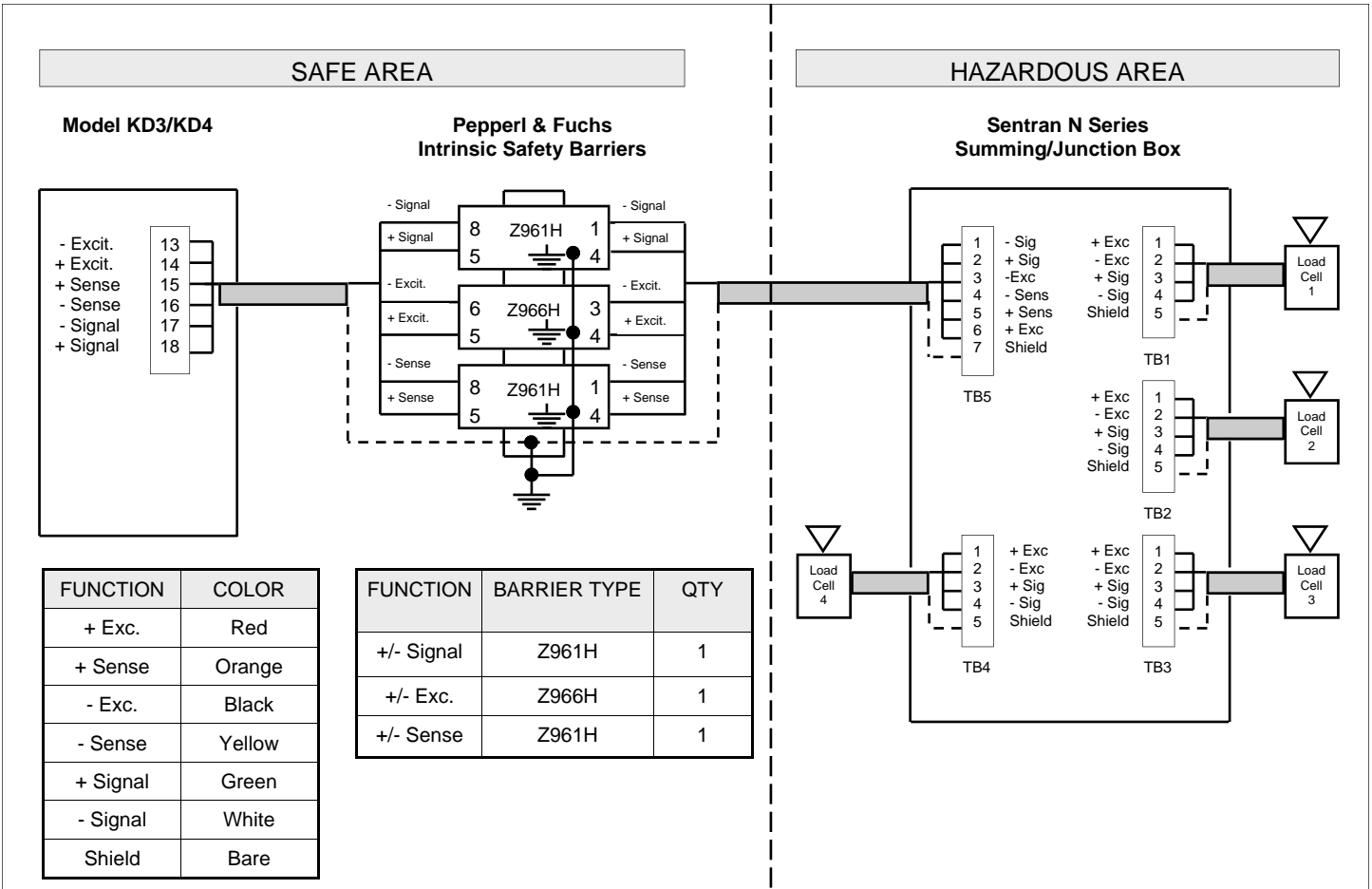


connections diagram





**hazardous area schematic**



**application information: remote sensing (6-wire) compensation**

Load cell output sensitivity will be affected by the addition or subtraction of resistance as measured at the end of the factory supplied cable and/or connector. Changes in this measured resistance most often occurs as the result of adding or subtracting cable length. Another common cause is the introduction of intrinsic safety barriers or similar resistive influences. Connection junctions introduced to the measurement circuit can introduce unwanted resistance, so take care in making these connections secure and clean.

- Resistance changes of 0.37% per 10 feet of 28 gauge cable can be expected.
- Resistance changes of 0.09% per 10 feet of 22 gauge cable can be expected.

The affects of these resistance changes can be virtually eliminated with the use of the Remote Sensing feature (6-wire) found in many better measurement amplifiers/indicators, such as the KD Series.

**commercial information**

- All reference information contained herein is subject to change without notice. Please consult Sentran, LLC for certified drawings and specifications as required.
- Do not exceed specified safe limits.
- Take notice! This product is intended to yield exceptional performance when used in accordance with prescribed procedures and purposes. Failure to use this product accordingly could result in diminished performance and/or failure leading to consequences dangerous to personnel.
- Application and use of this product is the sole responsibility of the user. Please contact Sentran, LLC for application assistance.