



# Technical Specifications

ultra-wave™

Ultrasonic Level System

**Non-contact ultrasonic level measuring device provides continuous measurement and monitoring of levels in multiple vessels containing bulk solids or liquids.**

The ultra-wave™ Ultrasonic Level System can monitor vessels with up to 16 transducers of various frequencies, and vessels of different heights and shapes. It is compatible with KM Sonocell and ultra-cel/™ transducers as well as transducers from other manufacturers, making it unsurpassed in capabilities. The system can accurately measure the level of many different materials like powders, solids, liquids and slurries. The range of KM sensors allows you to read levels from 1 foot to beyond 100 feet in solids. The ultra-cel/™ transducer has an **extremely narrow beam angle**, allowing it to be used in challenging applications. Additionally, the same unit does open channel flow and differential level measurements.

The ultra-wave™ includes KM's **Sentry™** DSP filter which provides stable, accurate readings under a variety of conditions. **Sentry™** digitally separates the vessel level from the dynamic conditions often experienced on most vessels.

The ultra-wave™ is easy to set up and can provide usable level information within minutes. Responses to simple Quick Config questions supplies the ultra-wave™ with the information needed to prepare and calibrate the system for your application. Later, a refinement of calibration parameters can be performed if necessary.

Plug-in option cards are available to interface the ultra-wave™ data to a variety of monitoring and control systems. Setpoint, current output, and point level input cards can be added to the ultra-wave™ for local control. Direct PLC interfaces are available for the Allen-Bradley RIO and Profibus RTU. Only KM offers common RS-422 compatibility throughout our product line, including our level and weight sensing products. You can build complete data measuring and monitoring systems using a building block approach, including connecting to other PLC interfaces using KM system components.



## Features & Benefits

### ORB enabled

KM's next generation communications interface.

### Quick Config

Adjusts systems parameters and pre-calibrates unit without special software.

### Modular Design

Configurable for number of sensors, relays, point level inputs, current loops, and PLC interfaces.

### Multiple Functions In One Unit

Mix level, flow and DLD functions, different distance ranges, and solid as well as liquid applications.

### Continuous Non-Contact Level Measurement

No contamination of material, no lost parts or cables, no material build-up on sensing face.

### Sentry DSP™

Provides stable and accurate reading under process conditions.

### Built-in Optically Isolated Serial Port

Versatile interfacing for data collection, servicing and building large multi-vessel communications systems.

### NEMA-4X Enclosure

ABS or optional stainless steel offers the right protection for your environment.

## Specifications

**Transducer compatibility:** Any frequency from 10 KHz to 45 KHz

**Display:** Large, back lit alphanumeric liquid crystal, two lines of 16 characters, user programmable IDs, selectable bar graph display or engineering units format

**Programming and Parameter Entry:** Integral 24-key sealed membrane tactile keypad

**Set-up:** Menu-driven prompts

**Memory:** Non-volatile RAM, common isolation parameter storage

**Built-in Serial Communication:** RS-422, (optical isolation standard), TTL, 300, 1200, 2400, 4800, 9600 or 19.2 K baud; designed for multi-drop single cable connection

### Option cards\*

**Scanner options:** For multiple channel expansion; available with 2, 4, 6, or 8 relays; first scanner card must be full 8 to use a second scanner card; maximum of two scanner cards per ultra-wave™.

**PLC Interface option:** Allen-Bradley RIO - 32 channel block transfer, 6 channel discreet transfers; Profibus-DP Slave

**Relay Output option:** Form "C" SPDT, programmable, 10 A 110 VAC, 8 A 230 VAC non-inductive, 10 A 30 VDC; available as plug in modules of 2, 4, 5 and 8 relays each

**Point Level Input:** 5V @ 5mA, voltage provided for contact inputs. This offers maximum protection for the process with fail-safe on disconnect. These point level input modules are compatible with the majority of the devices available on the market today.

**4-20 mA Output option:** Isolated 600 ohms maximum or externally powered to 1000 ohms, 12 bit resolution; available as plug in modules of 1, 2, 4 and 8 outputs with common isolation; must be installed in third option slot

**Combi-Card option:** One combi-card per unit; combinations are 2 relays, 1 current; 4 relays, 1 current; 2 relays, 2 currents; or 4 relays, 2 currents

\*A maximum of three plug-in option cards can be added

### Electrical:

**Voltages:** 100 VAC 50/60 Hz, 110/230 VAC (+/- 10%) 50/60 Hz or 24 VDC

**Power requirement:** 20 VA

### Environmental:

**Operating Temperature:** -5° to 122° F (-20° to 50° C)

**Humidity:** 1% to 95% (non-condensing)

**Enclosures:** NEMA 4X fiberglass reinforced polyester (FRP) with 24-key, sealed elastomer keypad, NEMA 4X stainless steel and optional mild steel NEMA-4 for CE version. Ultra-wave™ has NEMA 4X compression molded fiberglass, reinforced polyester and a silicon door gasket.

### Physical:

#### **Dimensions:**

*FRP:* 12.0 in. (305 mm) x 10.75 in. (273 mm) x 5.62 in (143 mm);

*Stainless Steel:* 12.0 in. (305 mm) x 10.0 in. (254 mm) x 6.0 (152 mm)

**Weight:** 12 pounds (5.45 kg)

**Approvals:** CE Mark; consult factory for details

### **Sonocell & ultra-cell™**

#### **Versatility and Durability:**

The Sonocell and ultra-cell™ transducers are components of the ultra-wave™. KM transducers are designed to perform in a wide-range of environments, including caustics and other demanding conditions. KM will design your system solution to include the appropriate transducer for your specific application and environment. You are assured of superior performance and long-term satisfaction. KM offers some of the most versatile and powerful transducers in the industry. Our transducers have an accuracy of 1% of rated span in approved bulk solids applications and 0.25% of rated span in approved liquid applications. Available in frequencies of 14khz, 22khz, 24 kHz and 43khz to fit a variety of materials and distances.

KM's Sonocell has a CPVC body with a TFE face and a Viton seal while the ultra-cell™ has a PVC body and face. They are mounted using a 1-inch NPT thread. For sanitary and hazardous bulk solids material, KM offers either a 304 stainless steel body with TFE or stainless face and a Viton seal. For hazardous liquids, KM offers the transducer mounted in an ANSI standard flange with a full seamless face of TFE.

The ultra-wave™ system can be supplied with external or internal optional temperature probes to correct for changes in the speed of sound when higher accuracies are required.

## TRANSDUCER SPECIFICATIONS

	NOMINAL RANGE LIQUIDS	NOMINAL RANGE SOLIDS	MINIMUM RANGE	TEMPERATURE RANGE	WEIGHT	FREQUENCY	BEAM ANGLE
SC43PT	25' (7.6m)	15'+(4.6m)	12" (305mm)	-40° to 180°F (-40° to 82°C)	1.2 lbs (0.5 kg)	43KHz	12° included
SC43ST	25' (7.6m)	15'+(4.6m)	12" (305mm)	-40° to 230°F (-40° to 110°C)	1.2 lbs (0.5 kg)	43KHz	12° included
SC43SS	25' (7.6m)	15'+((4.6m)	12" (305mm)	-40° to 230°F (-40° to 110°C)	1.2 lbs (0.5 kg)	43KHz	12° included
SC43TF	25' (7.6m)	Not applicable	12" (305mm)	-40° to 160°F (-40° to 71°C)	7.2 lbs (3.3 kg)	43KHz	12° included
SC22PT	50' (15.2m)	30'+(9.2m)	24" (610mm)	-40° to 180°F (-40° to 82°C)	3.1 lbs (1.4 kg)	22KHz	12° included
SC22ST	50' (15.2m)	30'+(9.2m)	24" (610mm)	-40° to 230°F (-40° to 110°C)	6.0 lbs (2.7 kg)	22KHz	12° included
SC22TF	50' (15.2m)	Not applicable	24" (610mm)	-40° to 160°F (-40° to 71°C)	7.3 lbs (3.3 kg)	22KHz	12° included
UC24	100' (30.5m)	50' grains 100' plastics	24" (610mm)	-40° to 160°F (-40° to 71°C)	13.0 lbs (5.9kg)	24 KHz	5° included
SC14PT	125' (38.1m)	100'+(30.5m)	36" (914mm)	-40° to 180°F (-40° to 82°C)	5.75 lbs (2.6 kg)	14KHz	12° included

**Transducer Selection by Product**



