

Krautkramer CL 400

Ultrasonic Precision Thickness Gauge

Base Instrument Package:

CL 400 Precision Thickness Gauge
 "AA" Size Alkaline Batteries (5 ea.)
 AC Power Supply
 Plastic Carry Case
 2-Point Check Block (uncertified)
 XL Couplant Sample, 4 Ounce
 Firmware Upgrade CD-ROM
 Operating Manual
 Operating Instruction Card
 Certificate of Conformity
 (No Deletions to Above)

Options:

AS OPT - A-Scan Option
 DR OPT - Data Recorder Option
 RS OPT - Remote Send Option

Accessories:

TGDLPC Serial PC Cable
 PRTCBL-842 Parallel Printer Cable
 PRTCBL-518 Serial Printer Cable
 SSC-113 Soft Carry Case
 UltraMATE® Windows™ Data Management Software

Technical Data

Units:

Inch or millimeter

Measuring Range:

.005" to 30.00" (0.13 to 762 mm); depends on material, probe, surface condition and temperature

Measuring Resolution:

English Units – 0.0001, 0.001, 0.01 inches
 Metric Units – 0.001, 0.01, 0.1 mm

Material Velocity Range:

0.03937 to 0.78736 in/μs
 1000 to 19999 m/s

Receiver:

Bandwidth of 1.5 to 28 MHz at -3 dB
 Automatic Gain Control (85 dB range)

Update Rate:

4 Hz powered by batteries or 8 Hz powered by AC
 8 Hz update / 32 Hz measurement in MIN CAP or MAX CAP mode (available only with A-Scan option)

Display Type:

High Resolution: ¼ VGA, 240 x 320 Pixels,
 Graphic Waveform LCD, 2.8" x 3.8"
 (72 x 96 mm) active area, backlight, adjustable contrast

Thickness Value Display:

5 digit 1.5" (38.1 mm) high TK ONLY VIEW
 5 digit 0.44" (11.1 mm) high with display of A-Scan)

Display of Last Reading:

Solid filled digits indicate coupled condition
 HOLD/BLANK – Selectable when uncoupled condition
 HOLD – Last reading displayed as hollow digits
 BLANK – dashes displayed

Setups:

11 Standard Setups for contact, delay and bubbler probes
 20 Custom Setups with 1 to 16 character alphanumeric name

Alarm Settings:

Minimum and Maximum Alarms - Red LED
 Range 0-20 inch (0-508 mm); Alarm bar displayed when both alarms are set

Power Requirements:

5 ea. Standard, AA size Alkaline, NiCad or NiMH rechargeable batteries
 AC Power Adapter Auto-sensing 100-240VAC
 47-63 Hz

Battery Life (operating time):

Approximately 40 hours (using premium Alkaline batteries) with auto shut off

Multilingual Operation:

i.e. English, French, German, Italian, Russian, Slovakian and Spanish

I/O Port:

Bi-directional RS232

Temperature Range:

Operating: +32° to +120°F (0° to + 50°C)
 Storage: +10° to +120°F (-10° to + 50°C)

Weight:

2.3 lbs. (1.0 kg) with batteries

Size:

5.5" H x 7.5" W x 2.2" D
 (140 mm x 191 mm x 56 mm)

GE imagination at work



A-Scan Option

Display Views:

Select from TK ONLY; TK + A-Scan; MIN + A-Scan; MAX + A-Scan; DIFF and % RR

Measurement Modes:

Contact probes: Initial Pulse to 1st and Multi-Echo
 Delay and Immersion probes: Interface to 1st, Multi-Echo and Automatic

A-Scan Range:

Selectable 0.15 to 30.0 inches (3.0 to 750 mm)

IF Tracking:

On or Off (delay probes only)

Gate Position:

Start, Width and Thresholds Settings for the A-GATE, B-GATE and I-GATE are adjustable in all MEASURE MODES except AUTO

Filter:

0.6 to 28 MHz; 0.2 to 7 MHz; 8 to 17 MHz; 19 to 26 MHz

Damping:

Default setting of 50 Ohm and Special Setting of 500 Ohm (Special settings can be modified upon request)

Gate Arming:

FLANK for all Measurement modes and PEAK also available for Multi-Echo Mode

Detection:

Selectable AFTER ARM or BEFORE ARM Zero Crossing

Gain:

Default setting of AGC but Manual adjustment in 1 dB or 6 dB increments

Nominal Value:

Offset programmable: 0-20 inches (0-508 mm)

RF Trace:

Selectable RF, Negative Half-Wave or Positive Half-Wave

Data Recorder

Memory Capacity:

250 files containing 10,000 readings or 880 readings with A-Scan attachments

File Structures:

Grid created from instrument keypad and Custom Linear created with UltraMATE®

File Naming:

1 to 25 character alphanumeric name

Optional Software:

UltraMATE® and UltraMATE® Lite

CL 400 Compatible Transducer Specifications

Model	Probe Type	Nominal Frequency	Contact Diameter	Measuring Range (Steel unless noted)
A2 DFR & CLF4	Standard Delay Line	15 MHz	0.30 in. (7.6 mm)	0.007 to 1.0 in. (0.18 to 25.4 mm)
Alpha 10/.25	Standard Delay Line	10 MHz	0.30 in. (7.6 mm)	0.010 to 1.0 in. (0.25 to 25.4 mm)
Alpha 2F & CLF5	Fingertip Contact	10 MHz	0.38 in. (9.5 mm)	0.060 to 10.0 in. (1.52 to 254 mm)
Alpha DFR-P	Plastics, Delay Line	22 MHz	0.30 in. (7.6 mm)	0.005 to 0.15 in. (0.13 to 3.8 mm) Note: In plastics
Mini-DFR	Thin Range Delay Line	20 MHz	0.19 in. (4.8 mm)	0.005 to 0.2 in. (0.13 to 5.1 mm)
K-Pen	Pencil Probe	20 MHz	0.065 in. or 0.090 in. (1.7 or 2.3 mm)	0.008 to 0.175 in. (0.20 to 4.4 mm)
CA211A	Standard Contact	5 MHz	0.75 in. (19.1 mm)	0.060 to 20.0 in. (1.52 to 508 mm)
Bubbler IPS	Immersion	15 MHz	0.20 in. (5.1 mm)	0.008 to 1.0 in. (0.20 to 25.4 mm)
G35MN	Standard Delay Line for thin materials	35 MHz	0.33 in. (8.5 mm)	0.005 to 0.08 in. (0.12 to 2 mm)
K1SC DLY	Standard Delay Line for attenuative materials	1 MHz	1.14 in. (29 mm)	0.200 to 2.0 in. (5 to 50 mm)
CA214 DLY	Standard Delay Line	5 MHz	0.49 in. (12.5 mm)	0.040 to 2.0 in. (1 to 50 mm)