

# Krautkramer CL 5

## Ultrasonic Precision Thickness Gauge



# Maximum precision – easy to handle and robust

## The compact solution offering a full range of functionality

The CL 5 precision thickness gauge offers a full range of functionality in an easy to use, compact and rugged package. 3 soft keys directly under the display activate the functions shown on the display menus. 4 Directional keys helps making menu changes and navigation of the text entry screen simple and efficient. The graphical display presents the user with 6 different operation modes. The user can select from, Normal, Min. Scan, Max. Scan, Diff/Rate of Reduction, Thk+A-Scan (option) or Velocity (option). The CL 5 utilizes a programmable data recorder for easy set up of data files from the PC. The SD Card memory system places all the data recording and set-up information on a removable SD memory card. The files are formatted allowing drag &

drop files when plugged directly into the PC. Other data such as digital photographs can also be stored on the same SD card.

The CL 5 allows direct connection to the PC using serial or USB port.

## Performance and Flexibility

The CL 5 Velocity option gives the user an added measurement mode used for determining the velocity of a known thickness of material. Material thickness can be entered manually via the CL 5 keyboard or a digital caliper can be connected allowing the thickness value to be send electronically from the caliper to the CL 5. The user simply places the probe on the part and the CL 5 displays the material velocity of the test object. Both the thickness and the velocity value can be stored in the data recorder and downloaded to the PC.

## Simple Operation

The CL 5 is a very easy instrument to operate. The MODE key progresses the user through a series of selection and set up menus and back to the measurement mode. One press of the MODE key displays a table of standard probes and up to 5 special setups. Another press of the MODE key displays a set up menu where the user can easily scroll through the menu, see the current settings and make fast changes to any of the displayed settings.

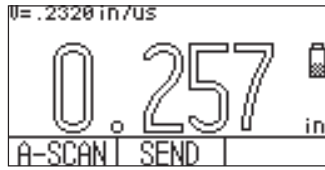
A supervisor lock-out function enables a knowledgeable user to set up all the specific measuring functions and settings of the CL 5 and lock the settings so critical settings can not be changed by a lower level user.

Additional advantages offered by this compact, multifunctional instrument include:

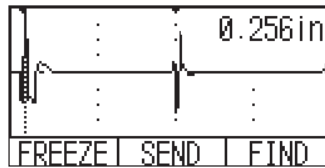
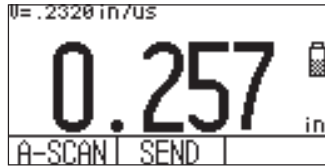
- Enhanced measurement performance produces highly stable and repeatable thickness values
- Six measurement and display modes: Normal, Minimum Capture, Maximum Capture, Differential and Rate of reduction, Velocity (with CL 5V option) and Thickness + A-Scan (with Live A-Scan option).
- Snapshot A-Scan on all models
- Hollow/Fill thickness digits showing coupling or non-coupling status
- Visual LED alarm to alert user when measurement are exceeding the user selectable limit values
- Customer parameter set-ups for special configurations and quick instrument set-up
- Flexible power system via standard AA batteries or rechargeable battery pack system
- Multi-language user interface
- Automatic ultrasonic performance (gain and gate controls)
- Wide variety of standard probes



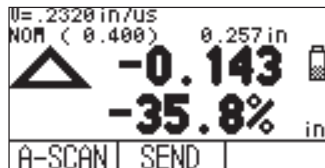
# CL 5 – Simply reliable, reliably simple



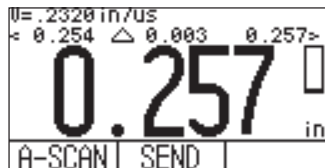
Filled digits indicate successful coupling



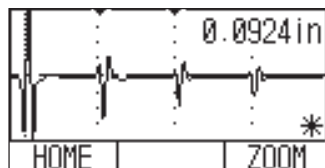
Live A-Scan for more precise evaluations



Rate of reduction



Minimum Capture mode



Snapshot A-Scan

PANEL 3579			
	A	B	C
1	0.0250	0.0240	0.0226
2	0.0217	0.0217	EMPTY
3	EMPTY	EMPTY	EMPTY
HOME SEND			

Data Recorder

## The Live A-Scan option: CL 5AS

The optional Live A-Scan feature gives the user a real time view of the echoes being digitally measured by the CL 5. Viewing the live a-scan can aid users when attempting to properly align the probe and the test object to achieve the best measurement values. Viewing the live a-scan enables the user to ensure the proper echoes are being measured and the digital value is correct.

## The Data Recorder option: CL 5DR

The Data Recorder option permits the quick and easy storage of thickness values in file form. Fully user-programmable, it stores up to 10,000 measured values or as many as 500 values with attached A-Scan.

The programmable data recorder allows creation of data recorder files directly from the CL 5 keypad, or from the PC using the flexible UltraMATE® or UltraMATE® Lite software program. The data recorder supports the use of alphanumeric file names, standard linear and grid files and custom linear files.

Extended file types store the thickness values, velocity settings and other critical data for each measurement point. The CL 5 and UltraMATE® thus make for perfect test data management.

## CL 5 applications

The CL 5 is an easy-to-use precision thickness measuring solution for components used in the automotive, aviation and aerospace industries, in particular, such as:

- Cast and stamped metal components, e.g. made of aluminum, steel, copper, bronze
- Machined workpieces
- Chemically milled components
- Metal strips, metal plates
- Plastics and composites
- Glass

The instrument can be held in one hand or placed on flat workpieces, making the CL 5 the most compact way of testing your material for the required thickness or checking for sheet corrosion.



# Technical Data

## Measuring Range

.005" to 20.00" (0.13 to 500 mm):  
depends on material, probe, surface  
condition and temperature

## Units and Measuring Resolution

Inch – 0.0001, 0.001, 0.01  
Millimeter – 0.001, 0.01, 0.1

## Material Velocity Range

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

## Receiver

Bandwidth of 1.0 to 16 MHz at –6 dB

## Update Rate

User selectable 4 or 8 Hz, up to 32 Hz  
in Min Cap or Max Cap mode

## Display Type

Graphical LCD 64 × 128 pixels  
2.25 × 2.56 inches (40 × 57 mm)  
with backlight and adjustable contrast

## Thickness Display

5 digit display with 0.75" height digits  
in standard mode and 0.25" height  
digits in Thickness + A-Scan mode,  
solid or hollow digits coupling indicator,  
A-Scan view – R.F. mode only

## Display Modes

Thickness (incl. Snapshot A-Scan),  
Thickness + Live A-Scan (optional),  
Minimum Capture, Maximum Capture,  
Differential and Rate of reduction,  
Velocity mode (optional)

## Supervisor Lockout

Alphanumeric password lockout for  
calibrations, set-up and Data Recorder

## I/O Port

Bi-directional serial RS-232:  
baud rate 1200, 9600, 57600 and  
115200

## Data Recorder

Programmable Data Recorder  
120 files max. on each 64 MB SD card

## File Formats

Grid created from instrument keypad.  
Grid and Custom Linear files accepted  
from UltraMATE® software.

## Power Supply

3 ea. AA batteries (Alkaline, NiMH  
or NiCad) or custom rechargeable  
battery pack

## Environmental Sealing

Impact resistant, dust and splash proof  
gasket sealed case

## Weight

0.92 lbs. (420 g) with batteries

## Size

7.1" H × 3.7" W × 1.8" D  
(180 mm × 94 mm × 46 mm)

## Temperature Range

Operating: –10° to +60 °C  
Storage: –20° to +70 °C

## Operating Languages

English, German, French, Spanish,  
Italian, Russian, Japanese, Chinese

## Application Software

UltraMATE® Lite and UltraMATE®

## Base Instrument Package

CL 5 precision thickness gauge  
Lithium poly battery pack  
AC power supply  
Plastic carry case  
Wire stand  
XL couplant sample, 4 oz.  
Firmware upgrade CD-ROM  
Operating manual  
Operating instructing card  
Certificate of Conformity

## Options

CL 5AS OPT – Live A-Scan option  
CL 5DR OPT – Data Recorder option  
CL 5V – Velocity option

## Accessories

PCCBL-690 USB PC cable  
PCCBL-419 serial PC cable  
Li-135 Lithium poly battery pack  
AC-296 AC power supply  
UltraMATE® Lite or UltraMATE®  
Data Management software

## CL 5 Compatible Transducer Specifications

Model	Probe Type	Nominal Frequency	Contact Diameter	Measuring Range (in mild steel unless noted)
Alpha 2 DFR / CLF4	Standard Delay Line	15 MHz	0.30 inch (7.6 mm)	0.005 to 1.0 in (0.18 to 25.4 mm)
Alpha 2 F / CLF5	Fingertip Contact	10 MHz	0.38 inch (9.5 mm)	0.060 to 10.0 in (1.52 to 254 mm)
Mini DFR	Thin Range Delay Line	20 MHz	0.19 inch (4.8 mm)	0.005 to 0.2 in (0.13 to 5.1 mm)
Alpha DFR-P	Delay Line for plastic materials	22 MHz	0.30 inch (7.6 mm)	0.005 to 0.15 in (0.13 to 3.8 mm) in plastic materials
K-Pen	Delay line Pencil Probe	20 MHz	0.065 or 0.090 inch (1.7 or 2.3 mm)	0.008 to 0.175 in (0.020 to 4.4 mm)
CA211A	Standard Contact	5 MHz	0.75 inch (19.1 mm)	0.060 to 20.0 in (1.52 to 508 mm)

Special application probes available upon request.