

# Krautkramer DM4 and DM4 DL

Thickness Gauges for Corrosion Inspection



GE imagination at work



# “D-Meters” have user preferred features for general-purpose and corrosion thickness gauging applications

### Inspection preferred features:

Don't let the small size and few keys fool you. The DM4 and DM4 DL are powerful measurement tools with MODE SELECT to activate the following features:

- **DIF**, Differential mode displays the  $\pm$  difference between the actual thickness reading and a user set nominal value.
- **THK**, Normal Thickness Measurement and 1-Point calibration mode displays and holds measured thickness reading until another measurement is made. Fast, 1-Point thickness calibration is performed in THK mode.
- **2-Pt**, Two Point Calibration mode allows calibration to two known thicknesses of the material to satisfy special application requirements.
- **VEL**, Material Sound Velocity mode enables display of the instrument's current calibrated velocity and simple calibration when a material's velocity is known.
- **MIN**, Minimum Capture mode displays the minimum thickness detected in a series of readings.
- **Backlight mode** allows the user to select OFF, ON, or AUTOMATIC to suit inspection area lighting conditions.
- **GAIN** mode allows the user to manually adjust the operating gain of the instrument by selecting automatic (AUTO), low (LO), medium (MED), or high (HI) to satisfy the application.
- **HI/LO Alarm Limits** mode alerts the user when a thickness reading is less than or greater than a user set minimum/maximum thickness value.

### Built to last

The DM4 and DM4 DL are designed for dependable performance in harsh industrial environments. Reliability and low, infrequent service costs are ensured by a sealed membrane switch keypad, impact-resistant housing, gasket seal, single printed circuit board, and a full two-year warranty on parts and labor.

The batteries are contained in a gasket sealed, isolated battery compartment eliminating contamination or physical damage to the electronics from moisture, dirt, or battery leakage.

### Small, comfortable and convenient package

- Fits comfortably in the palm of the hand for one-thumb operation.
- Lightweight 9 oz. (255 g) - no operator fatigue for tireless use.
- Rubber Field Case provides extra protection and practical options for user comfort and convenience.



### Simple, reliable operation

- Automatic Probe Zero for fast calibration and simple use. Probe Zero is continuously updated during use to ensure reliable measurements by compensating for probe wear, expansion, or contraction. No action is required of the user and probe zero blocks are eliminated.
- Only 5 keys (DM4) and 9 keys (DM4 DL) control all functions.
- Standard AA alkaline batteries provide up to 200 hours of use. No special battery packs or battery chargers are required.
- Big digits on high-contrast backlit display are easily read from any angle under all lighting conditions.
- Instrument features can be tailored (activated/deactivated) to meet the requirements of the job and preference of the user from the front panel keypad.
- Single key press “DUAL-MULTI” mode key for measuring equipment with protective coatings. Measure and display only the base material.
- Works with a wide variety of dual element thickness gauge probes designed to solve the widest variety of applications.
  - Low frequency probes for hard to penetrate materials.
  - High frequency probes for thin materials
  - WR “wear resistant” probes for abrasive surface conditions.
  - Small contact diameter probes for OD pitted areas and complex geometries.

## The DM4 and DM4 DL thickness gauges provide testing even through coated materials

The DM4 and DM4 DL are capable of measuring through coatings (paint) without the coating layer being included in the digital thickness reading. Simply press the DUAL MULTI key and read the remaining metal thickness without the time and expense of removing protective coatings and reapplying. The DUAL MULTI, dual-element/multiple echo measurement mode is “unique” to the DM4 and DM4 DL handheld digital thickness gauges. The same dual-element probes that provide best results on internally corroded/eroded structures and general thickness applications in the standard thickness mode are used. No special probes, switching of probes, or complicated operation or interpretation is necessary.

If multiple backwall echoes are not possible on your application, the coupling indicator will not illuminate, the display will blank, and the red LED will flash. Then, a simple press of the DUAL MULTI key will return the

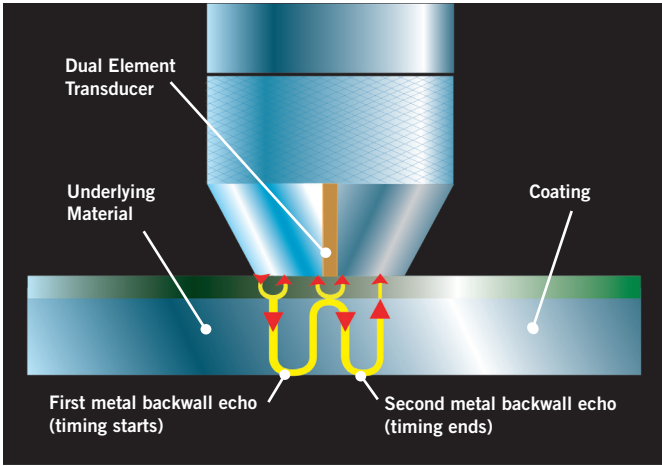
instrument to the standard thickness mode. Whether or not to remove paint is then a decision that will need to be made.

### Measure on rough and corroded surfaces

The DUAL MULTI mode is also a good method to use to overcome coupling prob-

lems and errors encountered when measuring on rough and corroded surfaces. The heavier couplant layer that is typically required to obtain measurements on rough surfaces is not included in the digital thickness reading. Surface preparation is eliminated or minimized.

## DUAL MULTI through coating thickness measurement



## Intelligent transducers to handle wide range of applications

- **DIALOG Intelligent Transducers** are automatically recognized by the instrument for the benefits of quick setup, best performance, and test documentation. These new probes have an internal memory chip which is programmed with performance parameters, documentation information (probe model and serial number), and in some cases application specific information to solve special measurement needs.
- **HT400 High-Temperature Probe** provides **Stable Readings on Hot Surfaces** for inservice inspection of steam and process equipment up to 400° F (204° C) without cooling the probe. An armored probe cable with protective stainless jacket for high-temperature applications and quick-change extension tubes for reaching through access-holes in insulation are available options.
- **General-Purpose Probes** for most frequently encountered applications (i.e. process piping and equipment, tubular goods, plate, boiler tubes, pressure vessels, storage tanks, ship hulls, etc.)
- **Remote SEND Probes** with built-in membrane switch SEND key for quick and easy data logging.
- **Thin Materials Probes** for thin-wall, small diameter tubes and sheets, plus detection of pitting corrosion and extreme wall loss.
- **High-Penetration Probes** for coarse-grain or highly attenuative materials (i.e. castings, non-metals like plastics, FRP & rubber,).
- **Small 3mm and 5mm Footprint Probes** to measure in the bottom of external pits, small diameter piping and tubing, and areas of limited access.
- **Wear-Resistant Probes** provide longer service life on small diameter curved parts, rough surfaces, and with the Minimum Capture Mode of DM4/DM4 DL.

# Powerful and flexible inspection data management

## Fast, error-free data logging and reports

- 5390 reading sequential data logger on-board the DM4 DL
- Multiple files - data can be stored in 1 to 999 user selectable files
- Obstruct (OBST) can be stored to identify inaccessible locations
- Fast direct printing of DM4 DL data files in 80-column format using serial printers. File header information and basic statistics are selectable for the report
- User selectable BAUD rate for flexible RS232 communications
- UltraMATE® Lite Software simplifies transfer of stored data to a PC
- Exports data in ASCII delimited format for use with spreadsheet programs for further analysis and calculations
- DM4 DL is compatible with our Thickness Data Management software programs
- No loss of memory when batteries are removed - 10 year memory retention
- UltraMATE® Windows™ 95/NT Software provides color reports, histograms, copy & paste to MS-Word and EXCEL, compare files, and an auto-connect feature

The DM4 DL and UltraMATE® software empowers the user to easily manage stored data within the DM4 DL, transfer it to the computer, view, manage and print comprehensive reports. The simple copy-paste capability gives the user the ability to take data directly to any Windows™ spreadsheet application for customization and further analysis.

```

-----File Header-----
P.C. File Name      :                               1.utm
Gauge File Name    :                               1
Description         :
Memo Comment       :
Creation Date       :                               01/01/1997
Date Last Saved    :                               07/09/1998

Probe              :                               Cal. Stnd
Temp. Comment     :                               Company
Inspector          :                               Instrument S.N.
Instrument Type    :                               DM4 DL                               00007WWF

Min. Alarm Val.   :                               0.000   Max. Alarm. Val. :                               0.000
% Loss Alarm Val. :                               0.00   % Growth Alarm Val. :                               0.00
Abs. Loss Alarm Val. :                               0.000   Abs. Growth Alarm Val. :                               0.000
Units              :                               INCH   Velocity (in/s) :                               0.0000

-----File Statistics-----
Number of Readings :                               44   Number of Emplies :                               0
Number of Obsructs :                               0   Number of Attachments :                               0

Range              :                               1.723   Mean              :                               0.295
Median             :                               0.932   Standard Deviation :                               0.250

Minimum Value      :                               0.070
Minimum Value Loc. :                               4
Maximum Value      :                               1.793
Maximum Value Loc. :                               28

Minimum Value Alarms :                               0   Maximum Value Alarms :                               0
Percent Loss Alarms :                               0   Percent Growth Alarms :                               0
Absolute Loss Alarms :                               0   Absolute Growth Alarms :                               0
% and Abs. Loss Alarms :                               0   % and Abs. Growth Alarms :                               0
    
```

	Thickness	Flags	Cmts
1	0.361		
2	0.272		
3	0.185		
4	0.070		
5	0.378		
6	0.183		
7	0.185		
8	0.244		
9	0.271		
10	0.317		
11	0.189		
12	0.286		
13	0.265		
14	0.187		
15	0.311		
16	0.075		
17	0.381		
18	0.379		
19	0.384		

Data as displayed in UltraMATE®

	Thickness	Flags	Cmts
1	0.361		
2	0.272		
3	0.185		
4	0.070		
5	0.378		
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7	0.185		
8	0.244		
9	0.271		
10	0.317		
11	0.189		
12	0.286		
13	0.265		
14	0.187		
15	0.311		
16	0.075		
17	0.381		
18	0.379		
19	0.384		
20	0.389		
21	0.285		
22	0.277		
23	0.244		
24	0.072		
25	0.244		
26	0.255		
27	0.189		
28	1.793		
29	0.190		
30	0.073		
31	0.241		
32	0.324		
33	0.202		
34	0.308		
35	0.072		
36	0.186		
37	0.380		
38	0.378		
39	0.376		
40	0.377		
41	0.379		

Printed report direct from UltraMATE®

	A	B	C
1		Thickness	
2	1	0.361	
3	2	0.272	
4	3	0.185	
5	4	0.07	
6	5	0.378	
7	6	0.183	
8	7	0.185	
9	8	0.244	
10	9	0.271	
11	10	0.317	
12	11	0.189	
13	12	0.286	
14	13	0.265	
15	14	0.187	
16	15	0.311	
17	16	0.075	
18	17	0.381	
19	18	0.379	
20	19	0.384	

Data as displayed in MS Excel

