Clockwise:

LMA-450, LMA-250, LMA-175L, LMA-75, LMA-125 Sensor Heads

NDT TECHNOLOGIES, Inc.

CC-04-USB Signal Console

SPECIFICATION SHEET

- USB Computer Interface.
- Integral 2-Channel Strip Chart Recorder with Auto Start/Stop circuitry and Distance Markers.
- Display of LMA, LF and Distance.
- Portable with Rechargeable High Capacity NiMH Batteries.
- External Battery Charger/Eliminator 120/240 VAC; 50/60 Hz.
- Housed in a weather-proof enclosure.
- Pit-Worthy, Rubber-Jacketed Connecting Cable - 25 feet long (any length available).
- Compatible with all Sensor Heads.
- Extra Chart Paper available.
- Data Acquisition output (D37F connector)
- Shipped in a rugged carrying case.

NDT TECHNOLOGIES, Inc.

Specifications

CC-04-USB Signal Console

Dimensions (LxWxH)	18" x 14" x 7" (457 x 355 x 178 mm)
Weight	22 lbs (10 kg).
Environmental Conditions	Dust proof, splash proof (oil and water), humidity to 95%. Operating temperature: 0°C to 55°C. Storage temperature: -40°C to 55°C.
Batteries	Rechargeable NiMH batteries. 8 hours of continuous operation. External battery charger.
Rope Distance Counter	Digital panel readout. Indicates distance along rope in m (or yard).
Rope Speed Indicator	Indicates rope speed in m/sec (or fpm).
Reset Push Button	Resets and initializes the system.
Balance Check Push Button	Checks proper system setup and operation.
Computer Interface	USB Port for connection to any computer, LED indicates status of USB connection.
Software	Compatible with the ***NDT_CARE™*** (Computer-Aided Rope Evaluation) Software Package including ***Signal Foundry™*** data acquisition software.
Strip Chart Recorder	Integrated two channel thermal/digital recorder. Signal amplitudes independent of rope speed. Distance event marker indicates every 1 m (or 1 yard) emphasizing every 10 m (or 10 yard) of rope inspected. Auto Start/Stop Switch allows automatic start or stop of the chart recorder when the rope under inspection starts moving or stops.
Data Acquisition Output Connector	D37F Connector for interface to external data display and acquisition devices such as external chart recorders or various data acquisition devices (optional).

NDT_CARE™ (**C**omputer-**A**ided **R**ope **E**valuation) and ***Signal Foundry™*** Software

NDT Technologies, Inc. has recently developed its **NDT_CARE Signal Foundry™** software package for the computer-assisted evaluation of wire rope. This program suite was designed for use in conjunction with the **LMA-Test (USB)™** electromagnetic wire rope inspection equipment.

The rope analysis system consists of two separate parts:
(1) The **Signal Foundry™** Data Acquisition hardware and software, and
(2) the **NDT_CARE™** software package for computer-assisted data analysis and chart evaluation.

Data Acquisition

For data acquisition, any Personal Computer can be connected to the CC-04-USB Signal Console with a USB cable via the USB Ports of the computer and the CC-04-USB console.

The **Signal Foundry™** software is then used by the computer for data acquisition and display. This program runs on any PC. It is pre-calibrated and pre-programmed for a wide variety of rope sizes and constructions. This feature, together with detailed prompting, allows automatic test setup and calibration -- at the push of one of the Function Keys (F1….F5) on the computer keyboard -- even by relatively unskilled operators.

Signal Foundry™ allows a real-time graphical display of data during acquisition and playback. The program allows scrolling, rescaling, stretching, and printing of the acquired charts during recording and playback.

The acquired data are stored in the Excel-compatible ASCII (*.txt) format, which is required by the **NDT_CARE™** software.

Wire Rope Evaluation Software

The **NDT_CARE™** software is available as an Excel Add-In. The Add-In is easy to use. It exploits the advanced charting and data processing features of **Excel**. Here are some highlights of the **NDT_CARE™** software.

1. A very special and proprietary feature is *Signal Enhancement*. This capability allows LMA (loss of metallic cross-sectional area) measurements with unprecedented accuracy. Previously, results at this accuracy level could only be obtained with annular coils that must be wrapped around the rope for each inspection. (An awkward procedure, which is impractical and unfeasible for actual field inspections). Our proprietary Signal Enhancement method offers an inspection accuracy that is equal to that of annular coils while, at the same time, retaining the usual and convenient "clamshell" design of our sensor heads. Please note that, especially after Signal Enhancement, our test results are more accurate by an order of magnitude than those of any of our competitors.

2. The program makes test results completely independent of rope speed, and it allows scaling and customized formatting of charts.

3. Test results can be displayed in the forward or reverse direction. This is useful for comparing results from subsequent inspections that were performed with the rope running in opposite directions.

4. An overview chart of the entire rope length on a single page allows easy identification of critical rope sections for a more careful evaluation.

5. The program's Post-Calibration feature offers an alternative approach to calibration. The Post-Calibration procedure is graphical and is performed by clicking-and-dragging on one of the charts.

6. The software allows baseline adjustment of the LMA trace. This is important when the inspection is started on a deteriorated section of the rope. The adjustment procedure is completely graphic and consists, essentially, of a click-and-drag operation on any one of the charts.

7. Using Excel VBA (Visual Basic for Applications), the user can write his or her own subroutines that are custom tailored to specialized requirements. This feature is particularly useful for research projects.

8. Using the chart formatting capabilities of Excel, the user can change the appearance of all charts as desired.

9. NDT_CARE™ 2.00

Many other features, too numerous to mention, are also available. For example, the test data can be compressed and/or sent by e-mail. Charts can be exported into word processor documents, data bases, presentation graphics, etc.

NDT TECHNOLOGIES, Inc.

LMA-125 WIRE ROPE INSPECTION SYSTEM

SPECIFICATION SHEET

LMA-125 Sensor Head

Features

- For the Nondestructive Inspection of wire ropes with diameters from 0 to 1¼ inch (32 mm).
- Rope Guide sizes available: ½ inch (13 mm) through 1 inch (25 mm).
- End Clamp Set available for ropes between 1 1/8 inch (29 mm) and 1¼ inch (32 mm).
- Speed and Distance wheel assembly. Calibrated for Yards or Meters
- Ruggedized construction with pit-worthy hardware and connectors.

NDT TECHNOLOGIES, Inc.

Specifications

The LMA-125 Wire Rope Inspection System consists of the following items:

Sensor Head Assembly comprising

- Magnet Assembly
- Sensor Assembly
- Distance Counter Wheel Assembly

Signal Console CC-04-USB including

- Signal Conditioning Circuitry
- Integrated Chart Recorder
- USB Port for interface with any computer
- Interface Circuitry and Connectors for both an external Chart Recorder and an external Data Acquisition System.

Accessories

- Connecting Cable, 25 ft. (7.6 m) length-standard (any length up to 1000 ft (305 m) available)
- Battery Charger (120/240 VAC, 50/60 Hz)
- Customized Carrying Cases
- Operation & Maintenance Manual
- Rope Guides (1 set supplied - any size) Other sizes available (optional)
- External Chart Recorder (optional)
- Data Acquisition System (optional)

Sensor Head

Dimensions (LxWxH) (without handles).....	10” x 6” x 3” (254 x 152 x 76 mm)
Weight.....	17 lbs. (8 kg)

Signal Console - CC-04-USB

Dimensions (LxWxH).....	16" x 13" x 7" (405 x 330 x 178 mm)
Weight.....	22 lbs (10 kg).
Power.....	Internal rechargeable batteries and/or 120/240 VAC, 50/60 Hz. Battery operation: 8 hours continuous.

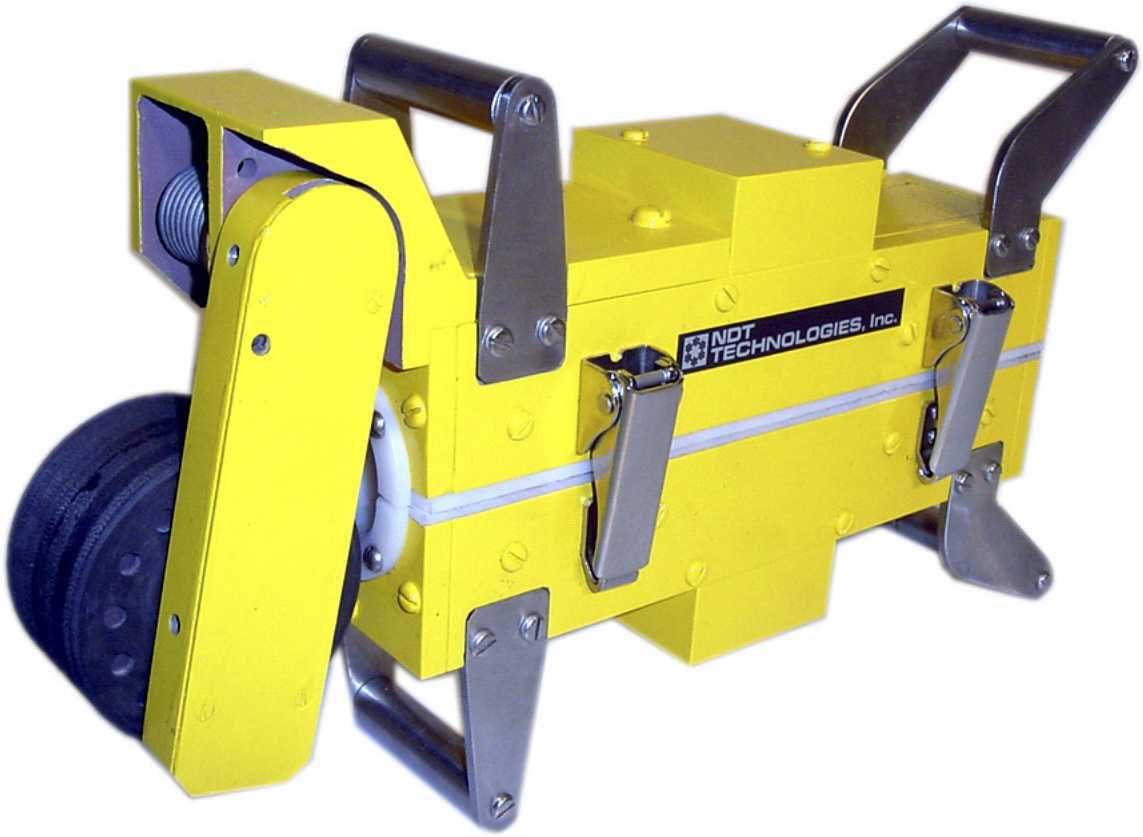
Performance

Rope Sizes.....	Up to 1 1/4 in. (32 mm)
Rope Speed.....	0.5 to 600 feet per minute (0.003 to 3 m/sec)
Test Signals.....	LF and LMA signal, amplitudes independent of rope speed.
Flaw Detection.....	Loss of metallic cross-sectional area (LMA): external and internal corrosion, wear, various changes of wire rope structure. Localized flaws (LF): broken wires and corrosion pitting.
Flaw Detectability.....	Flaw cross section: 0.1% of rope cross-sectional area. Quantitative flaw identification of loss of metallic cross-sectional area for flaws longer than 2" (50 mm), qualitative flaw identification for localized flaws.

LMA-175 L WIRE ROPE INSPECTION SYSTEM

SPECIFICATION SHEET

LMA-175 L Sensor Head



Features

- This Sensor Head is designed narrower to fit between tightly spaced ropes in-situ.
- For the inspection of wire ropes with diameters from 0 to 1¾ in. (45 mm).
- Rope Guide sizes available: ¾ in. (19 mm) through 1½ in. (38 mm).
- End Clamp Set available for ropes between 1½ in. (38 mm) and 1¾ in. (45 mm).
- Speed and Distance wheel assembly. Calibrated for Meters (or Yards).
- Ruggedized construction with pit-worthy hardware, connectors and carrying case.

NDT TECHNOLOGIES, Inc.

Specifications

The LMA-175 L Wire Rope Inspection System consists of the following items:

Sensor Head Assembly comprising
- Magnet Assembly
- Sensor Assembly
- Distance Counter Wheel Assembly

Signal Console CC-04-USB including
- Signal Conditioning Circuitry
- Integrated Chart Recorder
- USB Port for interface with any computer
- Interface Circuitry and Connectors for both an external Chart Recorder and an external Data Acquisition System.

Accessories
- Connecting Cable, 25 ft. (7.6 m) length-standard (any length up to 1000 ft (305 m) available)
- Battery Charger (120/240 VAC, 50/60 Hz)
- Customized Carrying Cases
- Operation & Maintenance Manual
- Rope Guides (1 set supplied - any size) Other sizes available (optional)
- External Chart Recorder (optional)
- Data Acquisition System (optional)

Sensor Head

Dimensions (LxWxH) (without handles)…….……	19.3"x 3.26 "x 6.9” (490 x 83 x 175 mm)
Weight…….……	35 lbs (16 kg)

Signal Console - CC-04-USB

Dimensions (LxWxH)……...	16" x 13" x 7" (405 x 330 x 178 mm)
Weight……	22 lbs (10 kg).
Power……	Internal rechargeable batteries and/or 120/240 VAC, 50/60 Hz. Battery operation: 8 hours continuous.

Performance

Rope Sizes……	Up to 1 3/4 in. (45 mm)
Rope Speed……..	0.5 to 600 feet per minute (0.003 to 3 m/sec)
Test Signals……...	LF and LMA signal, amplitudes independent of rope speed.
Flaw Detection……..	Loss of metallic cross-sectional area (LMA): external and internal corrosion, wear, various changes of wire rope structure. Localized flaws (LF): broken wires and corrosion pitting.
Flaw Detectability……	Flaw cross section: 0.1% of rope cross-sectional area. Quantitative flaw d identification of loss of metallic cross-sectional area for flaws longer than 2" (50 mm), qualitative identification for localized flaws.

LMA-300 WIRE ROPE INSPECTION SYSTEM

SPECIFICATION SHEET

LMA-300 Sensor Head

Features

- For the Nondestructive Inspection of wire ropes with diameters from 0 to 3¼ in. (83 mm).
- Rope Guide sizes available: 1 inch (25 mm) through 3¼ inch (83 mm).
- Speed and Distance Wheel assembly. Calibrated for Yards or Meters
- Ruggedized construction with pit-worthy hardware and connectors.

NDT TECHNOLOGIES, Inc.

Specifications

The LMA-300 Wire Rope Inspection System consists of the following items:

Sensor Head Assembly comprising

- Magnet Assembly
- Sensor Assembly
- Distance Counter Wheel Assembly

Signal Console CC-04-USB including

- Signal Conditioning Circuitry
- Integrated Chart Recorder
- USB Port for interface with any computer
- Interface Circuitry and Connectors for both an external Chart Recorder and an external Data Acquisition System.

Accessories

- Connecting Cable, 25 ft. (7.6 m) length-standard (any length up to 1000 ft (305 m) available)
- Battery Charger (120/240 VAC, 50/60 Hz)
- Customized Carrying Cases
- Operation & Maintenance Manual
- Rope Guides (1 set supplied - any size) Other sizes available (optional)
- External Chart Recorder (optional)
- Data Acquisition System (optional)

Sensor Head

Dimensions (LxWxH) (without handles)..... 13" x 5 " x 10" (330 x 127 x 254 mm)
Weight..... 56 lbs (25 kg)

Signal Console - CC-04-USB

Dimensions (LxWxH)..... 16" x 13" x 7" (405 x 330 x 178 mm)
Weight..... CC-04-USB, 22 lbs (10 kg).
Power..... Internal rechargeable batteries.
Battery operation: 8 hours continuous.

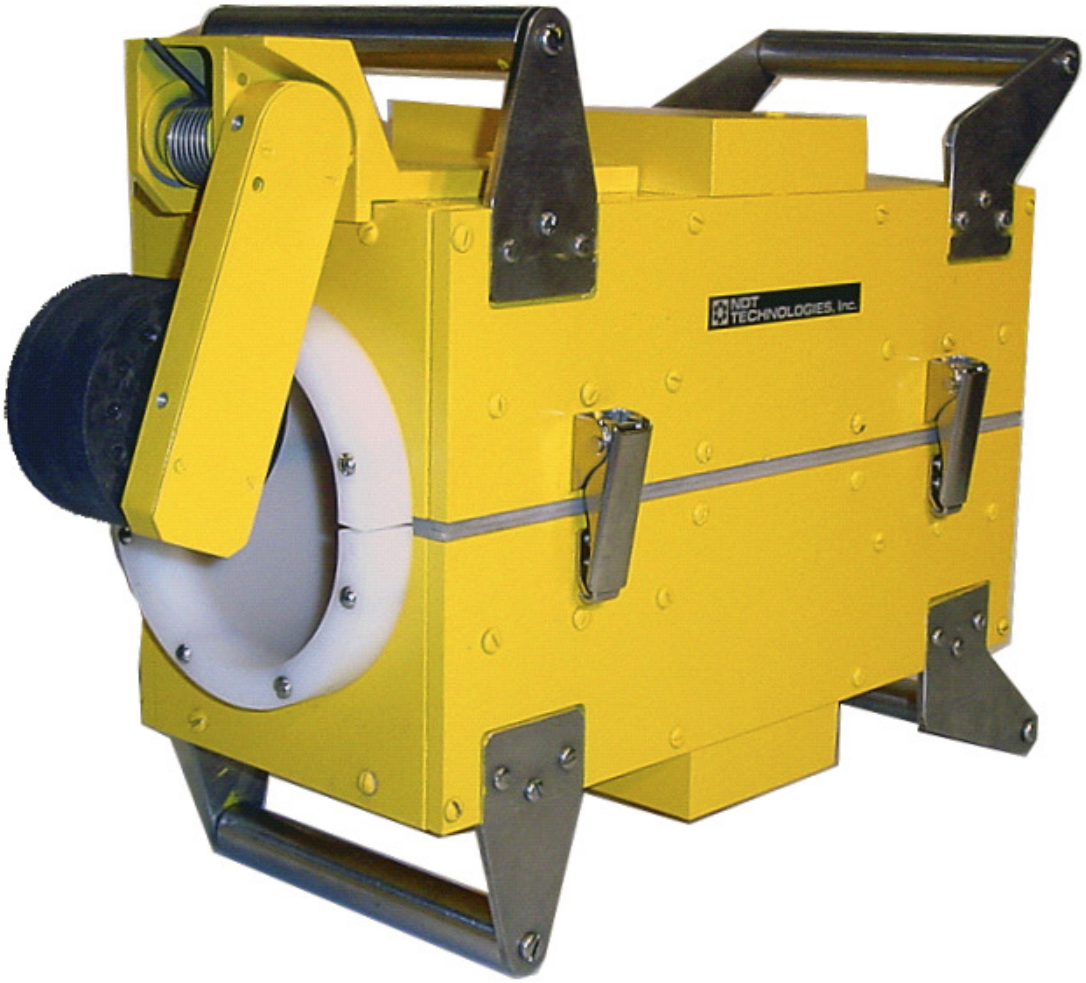
Performance

Rope Sizes..... 0 to 3¼ in (83 mm).
Rope Speed..... 0.5 to 600 feet per minute (0.003 to 3 m/sec)
Test Signals.....LF and LMA signal, amplitudes independent of rope speed.
Flaw Detection..... Loss of metallic cross-sectional area (LMA): external and internal corrosion, wear, various changes of wire rope structure.
Localized flaws (LF): broken wires and corrosion pitting.
Flaw Detectability.....Flaw cross section: 0.1% of rope cross-sectional area. Quantitative flaw identification of loss of metallic cross-sectional area for flaws longer than 2" (50 mm), qualitative flaw identification for localized flaws.

LMA-450 WIRE ROPE INSPECTION SYSTEM

SPECIFICATION SHEET

LMA-450 Sensor Head



Features

- For the non-destructive inspection of wire ropes with diameters from 0 to 4¾ inch (120 mm).

NDT TECHNOLOGIES, Inc.

Specifications

The LMA-450 Wire Rope Inspection System consists of the following items:

Sensor Head Assembly comprising

- Magnet Assembly
- Sensor Assembly
- Distance Counter Wheel Assembly

Signal Console CC-04-USB including

- Signal Conditioning Circuitry
- Integrated Chart Recorder
- USB Port for interface with any computer
- Interface Circuitry and Connectors for both an external Chart Recorder and an external Data Acquisition System.

Accessories

- Connecting Cable, 25 ft. (7.6 m) length-standard (any length up to 1000 ft (305 m) available)
- Battery Charger (120/240 VAC, 50/60 Hz)
- Customized Carrying Cases
- Operation & Maintenance Manual
- Rope Guides (1 set supplied - any size) Other sizes available (optional)
- External Chart Recorder (optional)
- Data Acquisition System (optional)

Sensor Head

Dimensions (LxHxW) (without handles) .....406 x 234 x 203 mm (16 x 9¼ x 8 inch)
Weight .....165 lbs (75 kg)

Performance

Rope Sizes ..... Up to 4¾ inch (120 mm).
Rope Speed..... 0.5 to 300 feet per minute (0.003 to 1.5 m/sec)
Test Signals ..... LF and LMA signals, amplitudes independent of rope speed.
Flaw Detection..... Loss of metallic cross-sectional area (LMA): external and internal corrosion, wear, various changes of wire rope structure. Localized flaws (LF): broken wires and corrosion pitting.
Flaw Detectability.....Flaw cross section: 0.1% of cross-sectional area.

LMA-75 WIRE ROPE INSPECTION SYSTEM

SPECIFICATION SHEET

LMA-75 Sensor Head

Features

- For the Nondestructive Inspection of wire ropes with diameters from 0 to 3/4 in (19 mm).
- Rope Guide sizes available: 3/8 in (10 mm), 1/2 in (13 mm), and 5/8 in (16 mm).
- Ruggedized construction with pit-worthy hardware and connectors.
- Shown with external latch protector.

NDT TECHNOLOGIES, Inc.

Specifications

The LMA-75 Wire Rope Inspection System consists of the following items:

Sensor Head Assembly comprising

- Magnet Assembly
- Sensor Assembly

Signal Console CC-04-USB including

- Signal Conditioning Circuitry
- Integrated Chart Recorder
- USB Port for interface with any computer
- Interface Circuitry and Connectors for both an external Chart Recorder and an external Data Acquisition System.

Accessories

- Connecting Cable, 25 ft. (7.6 m) length-standard (any length up to 1000 ft (305 m) available)
- Battery Charger (120/240 VAC, 50/60 Hz)
- Customized Carrying Cases
- Operation & Maintenance Manual
- Rope Guides (1 set supplied - any size) Other sizes available (optional)
- External Chart Recorder (optional)
- Data Acquisition System (optional)

Sensor Head

Dimensions (LxWxH) (without handles)..... 8" x 4.5 " x 1.5" (203 x 114 x 38 mm)
Weight..... 6 Lbs.(2.7 kg)

Signal Console - CC-04-USB

Dimensions (LxWxH)..... 16" x 13" x 7" (405 x 330 x 178 mm)
Weight..... CC-04-USB, 22 lbs (10 kg).
Power ..... Internal rechargeable batteries and/or 120/240 VAC, 50/60 Hz. Battery operation: 6-8 hours continuous.

Performance

Rope Sizes..... 0 to 3/4” diameter
Rope Speed..... 0.5 to 600 feet per minute (0.003 to 3 m/sec)
Test Signals..... LF and LMA signal, amplitudes independent of rope speed.
Flaw Detection..... Loss of metallic cross-sectional area (LMA): external and internal corrosion, wear, various changes of wire rope structure. Localized flaws (LF): broken wires and corrosion pitting.
Flaw Detectability..... Flaw cross section: 0.1% of rope cross-sectional area. Quantitative flaw identification of loss of metallic cross-sectional area for flaws longer than 2" (50 mm), qualitative flaw identification for localized flaws.

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