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V 3112

EU-TYPE EXAMINATION CERTIFICATE

Number: TCM 111/21 - 5806

In accordance: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer:
NDC Technologies Inc.
8001 Technology Blvd.
Dayton
45424 Ohio
USA

For: length measuring instrument

type: LS 9500-403

Operating Speed:	0 m/min < S ≤ 2000 m/min
Minimum length (Lm):	≥ 400 mm
Scale interval:	= 1 mm
Accuracy class:	I, II, III

Valid until: 7 April 2031

Document No: 0511-CS-A015-21

Description: Essential characteristics, approved conditions and special conditions, if any, are described in this certificate.

Date of issue: 8 April 2021

Certificate approved by:

Český metrologický institut
-3-

RNDr. Pavel Klenovský

1 Introduction

This pattern of length measuring instrument, designated the LS 9500-403 system, is a mains powered (110-230 VAC) industrial, laser-based measurement instrument for the determination of the length of rope-type materials (e.g. cables, bands etc.) during feed motion of the product to be measured.

2 Functional Destription

2.1 Mechanical

The LS 9500 system, incorporates a LaserSpeed Pro 9500 laser head-works coupled to a DataPro 1000 (DP1000) data processor and indicator unit. The DP 1000 displays the velocity and length of the material moving under the beam of the laser, and has output alarms which are used to monitor the length and signal quality. The DP1000 may be connected to a PCL (printer control language) supported printing device, which will print Date, Time and Measure length.
Due to the nature of the laser-based measurement, there is no physical contact with the material.
The LS Pro 9500 is classified as a class III b laser device.

2.2 LS Pro 9500

The LS Pro 9500 gauge has the ability to measure in both positive and negative directions, as well as zero-speed. The LS Pro 9500 is designed to work in applications where the material to be measured stops and reverses direction, or moves very slowly. The LS Pro 9500 can also measure material moving at speeds up to 2000 m/min.
The LS Pro 9500 is provided with a 24 Vdc supply by the DP 1000 unit via the 25 pin cable, which has a maximum length of 50 metres.

2.3 DP 1000

The DP1000 is a data processor and indicator designed for length and line speed applications. It displays the velocity and length of the moving material.
The DP1000 shows the measured length, product line speed, and Quality Factor at a given point in time. It has tolerances for the quality factor and length and can trigger relay alarms. It also can print the current length out the serial port or to a printer on command and/or at a user configured frequency. The quality factor value is relative to the "reflected" signal received by the LS Pro 9500 and sent to the DP 1000.
The DP1000 can store 90 days of length data, with date and time, which can be downloaded via an Ethernet communications interface.
The DP 1000 is mounted into an industry standard 19" rack mount cabinet. The front panel of the cabinet is fitted with a mains supply ON/OFF pushbutton and a laser shutter interlock key to control the operation of the device. The legend on the cabinet indicates which position corresponds to "Laser On" and "Laser Off."
The key is removable only in the "Laser Off" position.

2.3.1 Access levels

- level 0 at connection/power up (with no log in), access to view the Data Pages and the Status Pages only.
- level 1 –User (e.g. line operator) - access to view the Data Pages, Status Pages plus the Main Setup Menu/Pages. Only parameters that that do not affect the values displayed or recorded by the instrument can be changed. The type of parameters that can be changed are tolerances for the quality factor, length relays, machine number, product number.
- level 2 –Supervisor – access to view DataPro 1000 screens i.e. Data Pages, Status Pages, Main Setup Menu/Pages and Global Setup Menu/Pages. In addition to level 1 the items that can be changed are the formatting of the reports.

2.4 Input/Output connections

2.4.1 The rear of the DP 1000 has connections for:

- mains power,
- DB25 communication and power to the LS Pro 9500 (25 pin)
- DB9 RS-232 output, data request and transmit (9 pin)
- USB to printer
- RJ-45 Ethernet, data request and transmit

- DB25 (User Connection) RS-232, Relay output, Digital Input (25 pin)

2.4.2 The top of the LS Pro 9500 has connections for:

- Communication (to DP1000) and power to the LS Pro 9500 (25 pin)

The following are not used, and are closed and secured:

- Serial output (9 pin) - RS-422 Transmit/Receive (from LS Pro 9500 to host - host to LS Pro 9500)
- M12 Connector – Ethernet Transmit/Receive (from LS Pro 9500 to host/switch - host/switch to LS Pro 9500)

3 Principle of operation

LaserSpeed utilizes dual-beam interferometer technology to provide velocity readings. The measured velocity is integrated over time to measure the length of moving objects. The opto-electronic portion of the LS Pro 9500 generates a laser beam that is split and then crossed in space. The two crossing beams interact, producing a fringe pattern that is orthogonal to the plane of the beams.
Light is scattered when material passes through the measurement region. This scattered light is collected by the gauge and converted to electrical signals. The frequency of the electrical signal contains information with regards to the velocity of the material. The signal processor converts the electrical signals to frequency information that is directly proportional to the velocity of the material moving through the laser beams. The signal processor converts the frequency information into velocity information and updates user outputs.
In order to determine if there is an object in the measurement area, the gauge measures the amount of reflected laser light and the result.

The LS Pro 9500 has the following characteristics:

Operating Speed (S): 0 m/min < S $\leq$ 2000 m/min

Minimum length (Lm): $\geq$ 400 mm

Scale interval: = 1 mm

Accuracy class: I, II or III

Standoff Distance: 300 mm +/- 17,5 mm

Measurement Depth of Field: 35 mm

Gauge Power: 120 V, 4 A

Lower & Upper temperature limits: 5 °C to 40 °C

Climatic Environment: Closed, Non-condensing

Mechanical Environment: M3

Electromagnetic Environment: E2

The LS Pro 9500 has the following system specification:

Maximum Laser Power	0,050 watt
Laser Wavelength	0,785 micrometers
Laser Spot Size (Elliptical)	3 x 1,5 mm
Beam Divergence	0,5 milliradians
Pulse Rate	Continuous wave
Maximum radiance (power divided by spot-size area)	0,050 Watt/0,141372 cm² [0,3536 W/cm²]

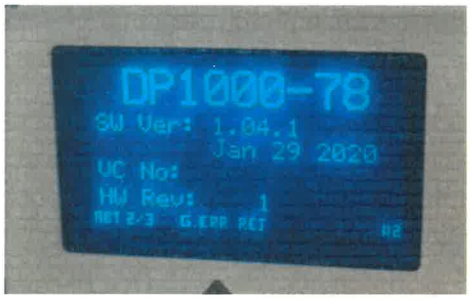
Software

Software type

Risk class [**B**]	P ☒	U ☐	L ☐	T ☐	S ☐	D ☐	Ix ☐ [1-6] _

Software identification

The LaserSpeed Pro 9500: SW version: **LS9KVC**
The DataPro1000S: W version: **1.04.1**
The version of legally relevant software of the DataPro1000 is possible to show on the display after press the button menu under the item "About". The version of legally relevant software of the LaserSpeed Pro 9500 is imprinted on the nameplate.

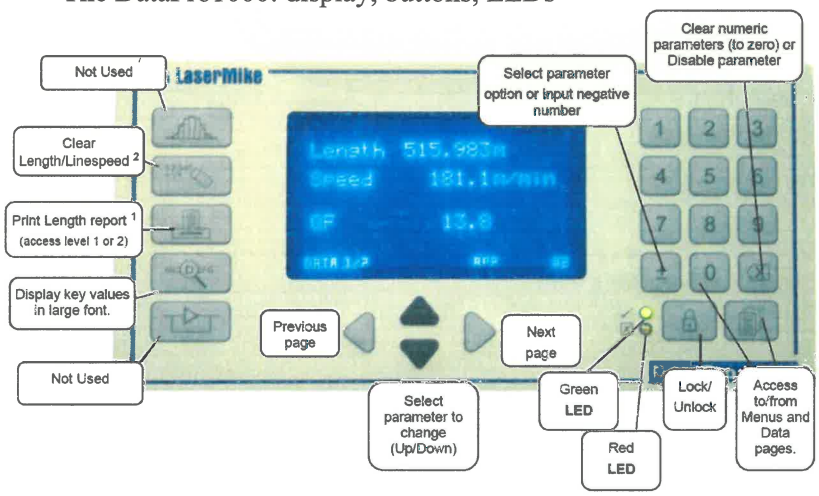


Integrity software verification

Both legally relevant software are protected with HW seals. The measurement data and specific device parameters are protected with HW jumper (PTBLOCK feature) and terminal cover sealing

Software environment short description

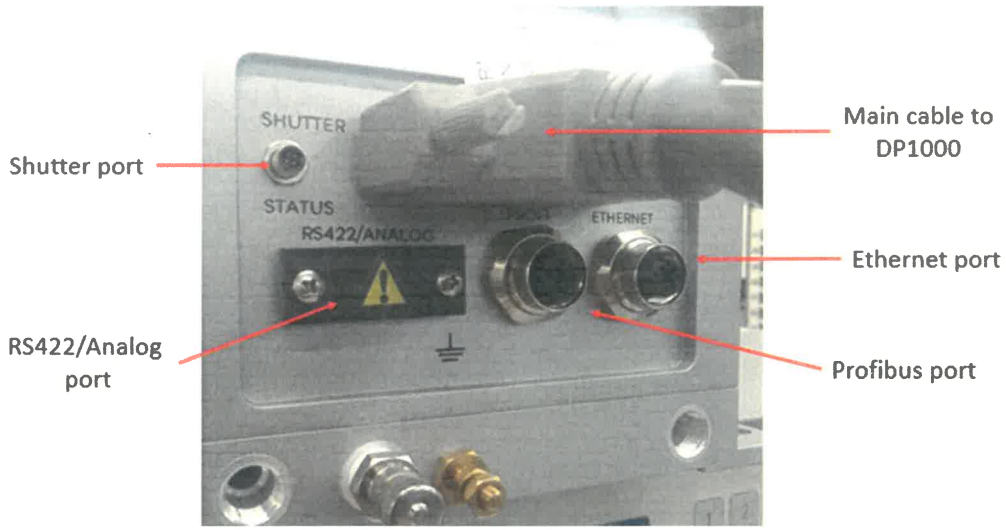
- User interfaces:
  - The LaserSpeed Pro 9500: LED indicators.
  - The DataPro1000: display, buttons, LEDs



- Communication interfaces:
  - The LaserSpeed Pro 9500: MAIN (connector DB25pins) is sealed, Ethernet, Profibus, RS-422/ANALOG, Shutter port.
  - The DataPro1000: MAIN (connector DB25) is sealed, Laser Safety plug, User port DB25 connector (5x digital inputs, 3x relay outputs), Ethernet, USB, RS-232.

Complete results of SW validation are given in the protocol No. 6011-PT-SW008-21.

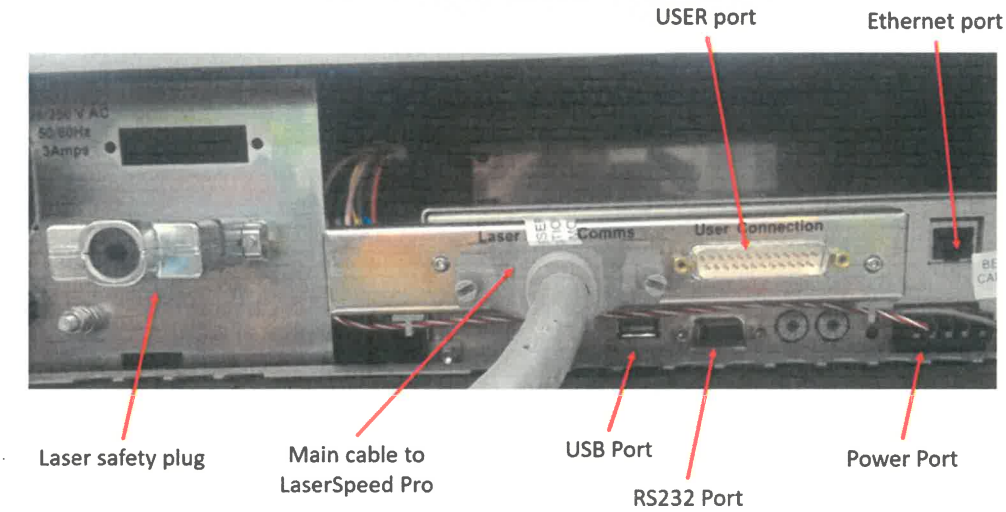
Laserspeed Pro Connection Ports



Description of Ports:

1. **Main Cable**: Main cable between LaserSpeed and DP1000. Supplies power, communications, and input/output functions.
2. **Ethernet Port**: On standard LaserSpeed this is an alternate communications port. On MID system after PTBLOCK is enable can only be used to monitor status outputs from LaserSpeed.
3. **Profibus Port:** On standard LaserSpeed this is an alternate communications port. On MID system after PTBLOCK is enable can only be used to monitor status outputs from LaserSpeed.
4. **RS422/Analog:** On standard LaserSpeed this is an alternate communications port. On MID system after PTBLOCK is enable can only be used to monitor status outputs from LaserSpeed.
5. **Shutter Port:** Passive port to monitor the position of the laser safety shutter. Part of laser safety.

DP1000 Ports



Description of Ports:

1. **Laser Safety plug:** Laser Safety mechanism. When installed allows the key switch on front of box to control the laser safety shutter. When not installed the laser will not turn on.
2. **Main Cable:** Main cable to the LaserSpeed Pro. Supplies power, communications, and input/output functions

3. **User Port:** Allows user access to the input/output functions of the LaserSpeed.
4. **Ethernet Port:** Can be used to monitor data output from the DP1000
5. **USB Port:** Used to connect an external printer
6. **RS232 Port:** Used to monitor data output for DP1000
7. **Power Port:** Supplies power to the DP1000

4 Peripheral devices and interfaces

4.1 Interfaces

The DP 1000 has the following interfaces:

- 4 internal dry contact relay outputs for alarm outputs indicators
- 5 opto-isolated digital inputs that can be used to:
    - End of Reel Report (printed report).
    - Transmit Length over RS-232 and Ethernet.
    - Transmit Length with headers over RS-232 and Ethernet.
    - Transmit Stored Data over Ethernet.
    - Externally control the Length Reset feature of the LS9000.

4.2 Peripheral devices

The instrument may be connected to any peripheral device with Parts Certificate that has been issued by a Notified Body responsible for Module B under Directive 2014/32/EU and bears the CE marking of conformity to the relevant directives or to a peripheral device without Parts Certificate under the following conditions:

- it bears the CE marking for conformity to the EMC Directive;
- it is not capable of transmitting any data or instruction into the measuring instrument, other than to release a printout, checking for correct data transmission or validation;
- it prints measurement results and other data as received from the measuring instrument without any modification or further processing; and
- it complies with the applicable requirements of Paragraph 8.1 of Annex I.

A computer with an RS-232 serial port, using the "LaserTrak Software" or directly using the serial commands listed in the Communication Protocol section, can be used to check the configuration and setup of the gauge. The settings in the LaserSpeed are fixed at the factory and are read-only. They can not be changed using any of the above methods.

5 Marking

The instrument bears the following marking:

- CE marking
- Supplementary metrology marking
- Notified body identification number
- Accuracy class
- Manufacturers mark or name and post address
- Type examination certificate number
- Operating Speed (S)
- Minimum length (Lm)
- Scale interval

6 Location of seals and verification marks

Set-up data is stored within the non-volatile memory of the DP1000.

The 'CE' marking, supplementary metrology marking and certificate number are located on the DP1000. The markings shall be impossible to remove without damaging them.

The markings and inscriptions shall fulfil the requirements of Paragraph 9 of Annex I of the Directive 2014/32/EU.

Components that may not be dismantled or adjusted by the user will be secured by either a wire and seal or tamper evident label and securing mark.

The LaserSpeed Pro 9500 and the DataPro 1000 are both fitted with a tag, which bear the same serial number to identify the units as a "system". The tag shall be impossible to remove without damaging it.

7 Alternatives

Having a length measuring instrument designated the LS 9500-406, with following characteristics:
Standoff Distance: 600 mm +/- 25 mm
Measurement Depth of Field: 50 mm
Gauge Power: 240 V, 4 A

Having a second DB25 connection fitted to the rear of the DP 1000. This allows for connection of the DP 1000 to a peripheral device, as detailed in section 4.2.1, a typical application of which is for use in providing information regarding the monitoring of system functions such as product speed. The connector is labelled "USER PULSE OUTPUT".

Having the Safety Key Switch on the front panel wired to the rear panel to allow the customer to break the signal to shut off the laser for safety. When this circuit is broken, the system will require 8 seconds to reactivate the laser after the circuit is reset. This is wired to the "USER CONNECTIONS".

Having the LaserSpeed Pro 9500 (LS Pro 9500) laser head-works and DataPro 1000 (DP1000) mounted into a safety cabinet (see Figure 5).
A 2 segment light is mounted onto the top of the cabinet:

- The RED segment will illuminate when the Laser is in operation
- The YELLOW segment will illuminate when the Quality Factor (QF) falls below the acceptable value (i.e.15)

Each door of the cabinet is fitted with a contact switch. If the door is opened the switch will operate a relay that stops the product feed and close the mechanical shutter of the laser stopping any measurement.

When the doors are closed the mechanical shutter of the laser will open, the product feed will start and the measurement will continue.

The self centring product guides, fitted inside the cabinet, are set manually according to product and size.

Having alternative positions for the verification marks, as shown in Figure 4a.

The connection between LaserSpeed Pro 9500 and the DataPro 1000 must be marked on both sides.

8 Illustrations

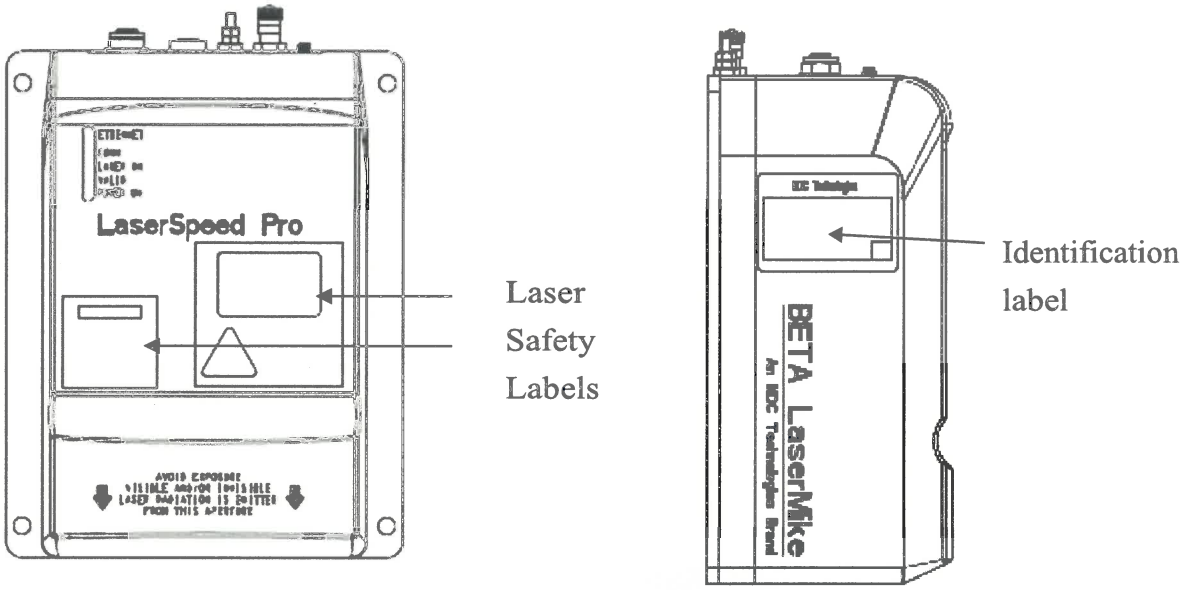


Figure 1 LS Pro 9500

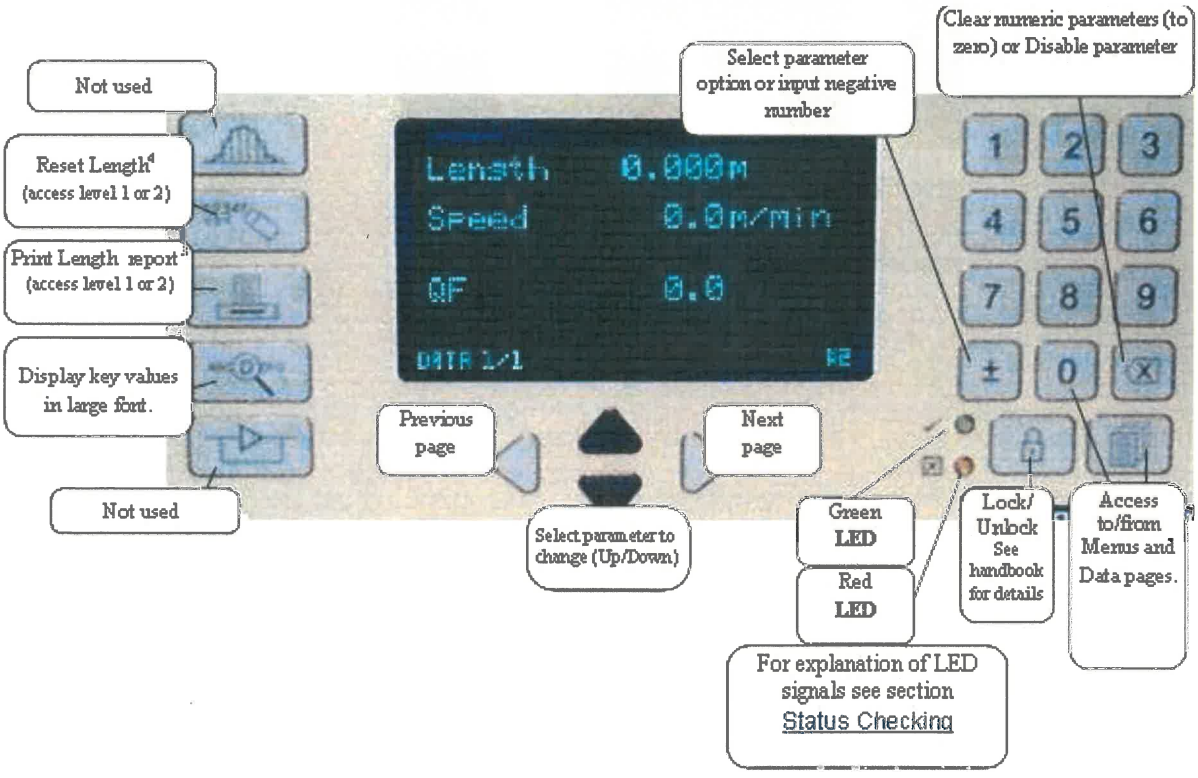


Figure 2 DP 1000 front panel

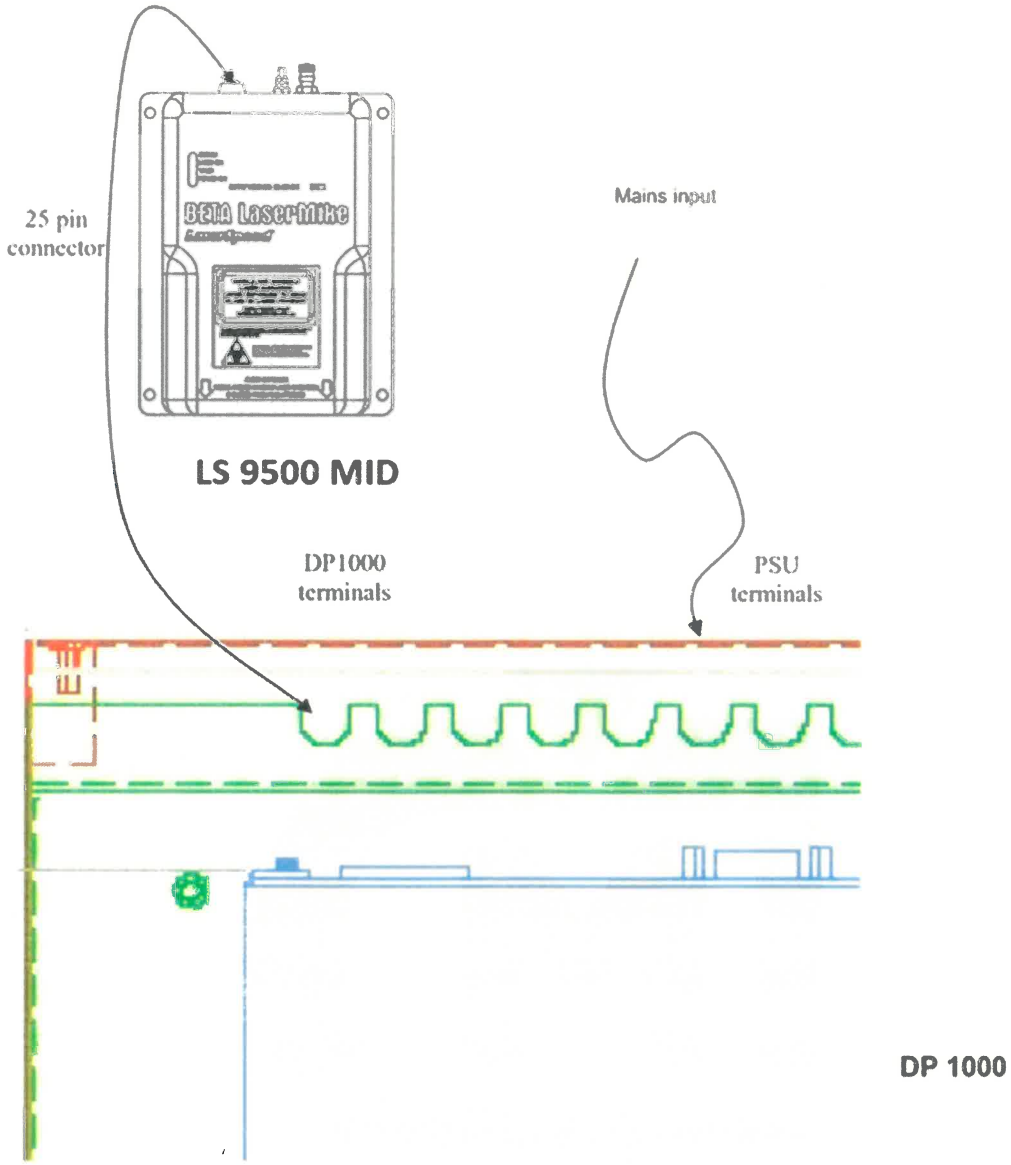


Figure 3 Schematic of connection

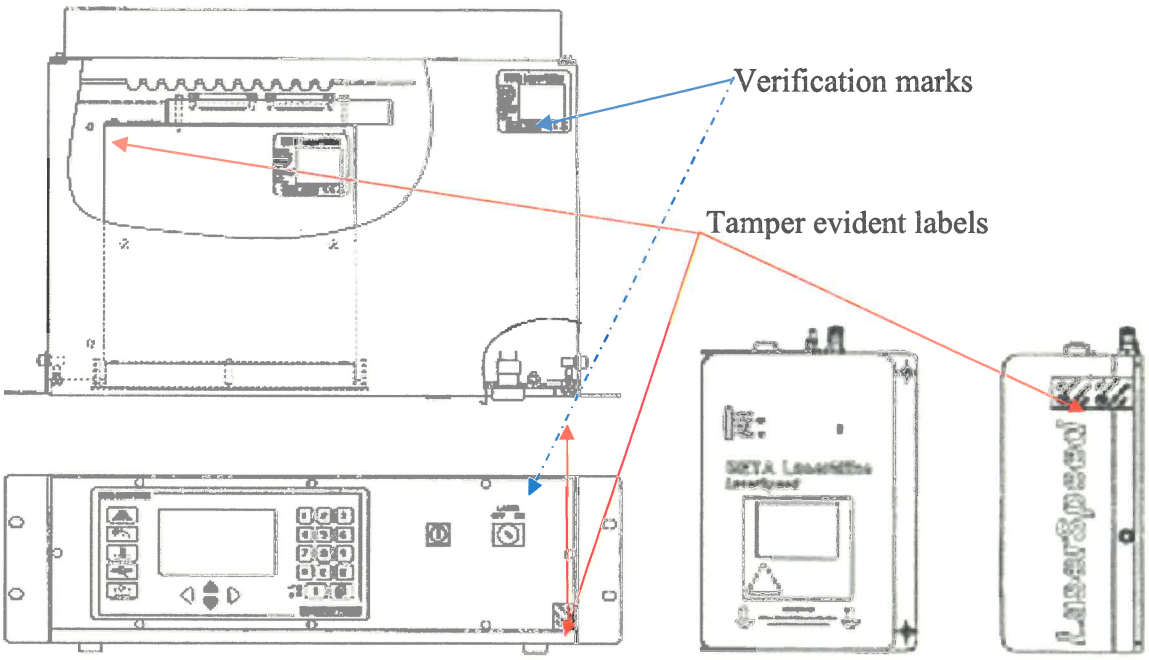


Figure 4 Position of verification marks and tamper evident labels

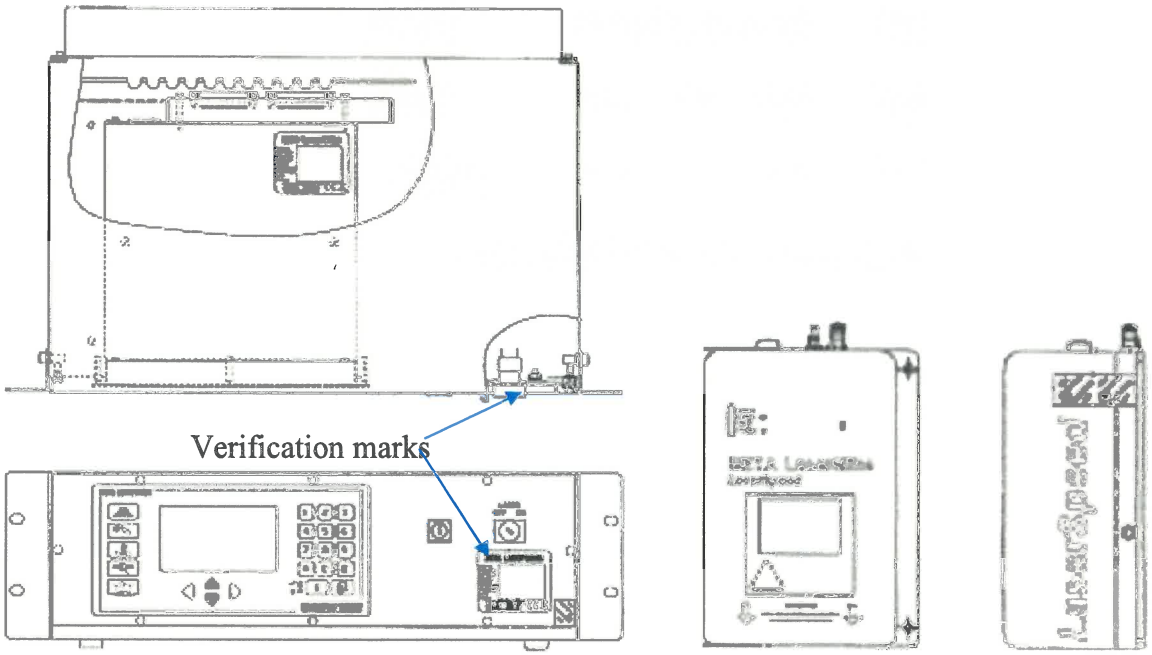


Figure 4a Alternative position of verification marks

Figure 5 Safety cabin

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V 3112

CERTIFICATE OF QUALITY SYSTEM

No: 0513-SJ-A002-21

FOR PRODUCTION, FINAL PRODUCT INSPECTION AND TESTING

according to module D of Directive 2014/32/EU

Issued: with Directive 2014/32/EU of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (implemented in Czech Republic by Government Order No. 120/2016 Coll.).

Manufacturer: NDC Technologies Inc.
8001 Technology Blvd.
Dayton
45424 Ohio
USA

Eligible for: **declaration of conformity to type based on quality assurance of the production process according to Module D of Directive 2014/32/EU of the European Parliament and of the Council.**

for measuring instruments:

Name	*Type*	*No. of certificate*
length measuring instrument	LS 9500-403	TCM 111/21 - 5806

Design of security marks: Seal

BETA LASERMIKE
CALIBRATION VOID
IF REMOVED

Obligations of the holder of this certificate is a legal binding force compliance with the principle use of the certificate.

Date of issue: 23 June 2021

Český metrologický institut

Certificate approved by:

RNDr. Pavel Klenovský