

Annex 1 to the EU type examination certificate N°: N-02/2007 revision 3**1 Design of instrument****1.1 Hardware****1.1.1 Description of the main hardware**

Hardware type: Cargoscan embedded processor, CS0045 CPU/RF Board

1.1.1.1 Construction

The CSN840 Pallet is an electronic multi-dimensional measuring instrument for measuring the length (L), width (W) and height (H) of a non-motion object placed on the platform underneath the instrument. The reported dimensions represent the length, width and height of the smallest hexahedron that can fully contain the object as the object rests on the measuring platform. The instrument is used to measure goods/parcels in combination with systems for determining, shipping and storage charges for the objects based on their dimensions.

The CSN840 Pallet comprises three CSN840 dimensioning heads, which are mounted in an equilateral triangle configuration above the measuring platform. One of the three CSN840 dimensioning heads is configured as Master and the two others as Slaves. The mounting configuration ensures that the three CSN840 together get a full view of the top and all sides of the Objects without any shadowing effects, and in this way enables the instrument to measure objects of irregular shapes. Each CSN840 dimensioning head consists of a laser diode based Rangefinder, a scanning polygon and a CPU. (See figure 4, 5 and 6)

The laser diode sends a beam of light to the spinning polygon mirror, which generates a fan of laser beam array of the light down to the measuring platform. The reflected light is sent back up to the photo-detector in the rangefinder.

The rangefinder measures the amount of time the light uses for travelling down to the objects and back to the range finder.

The CPU compares the light ray travel time information and creates an intensity image and a three dimensional image by mapping the individual light ray information. These images are analysed by the CPU in the Master CSN840 in order to determine the dimensions of the objects on the measuring platform.

The dimensions and additional data for each object are output to the host and the display ports.

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The measurand sensor is a laser transmitter/receiver with electronics that measures the travelling time of the laser light between the sensor and the object to be measured.

1.1.1.3 Indication device

The instrument shall be equipped with one of the following indicating devices to be used as the instrument primary indicator. The indicator shall display the measurement results, i.e. length (L), width (W), height (H), unit of measurement and, if applicable, any status codes for the measurement.

If Tare function is ON, the bottom lines show the letter "t" and the Tare value used in the measurements (the units is cm).

Option 1: display CS2200

The Cargoscan CS2200 display shall be connected to the display port (D1). See Figure1.



Figure 1: Cargoscan CS220 Display. Left: No Tare value. Right: Tare value=14.4cm

Option 2: OctoCSM display

The Cargoscan OctoCSM display software, in combination with a standard graphics display (VGA or equivalent). This software may be installed on the internal computer of the instrument or run on an external computer connected to the **CSN840** instrument via Ethernet. The details on the layout of this display, and the procedure for verification and sealing of the display is found in the Certificate of the display (see certificate TC7413 issued by NMI).

Option 3: Display or printout of alibi memory storage

In applications where the customer is not present during the measurement process, the printout or display of the content of the alibi memory storage can be used for documenting the measurement results instead of an online display. In such cases, the alibi memory storage shall have a test certificate documenting the compliance with MID, OIML R129 and Welmec software guide 7.2 (see test certificate TC7060 issued by NMI).

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- OIML R129 (Edition 2000): Multi-dimensional measuring instruments
- WELMEC Guide 7.2 :2015 Software Guide (Measuring Instruments Directive 2014/32/EU)
- Operator Guide and Sealing Procedure CSN840 Pallet, version 1.1.1 or newer.

1.1.2 Description of optional hardware and integrated equipment not subject to the MID**Optional hardware:**

Bar Code Reader, keyboard, mouse and/or graphics display may be connected to the instrument. These devices are used for input/output of data to non-legally relevant software.

1.2 Software**1.2.1 Legally relevant software, including the protective software interface**

Software: Cargoscan SAU software and Cargoscan DIM software

- Version number 1.6.x (x=2 or larger)
 - Functional checksum 0xECA0
- Version 1.7.x (with Tare function) where X can be any number from 0 and upwards.
 - Functional checksum 0x7FFA

1.2.2 Allowed functions subject to the MID.**Zeroing**

Software download of approved software for zeroing of the instrument.

Tare Function:

Tare function is a function that is used when the object to be measured is placed on an elevated platform such as a pallet, and this platform shall not be included in the measurement. The Tare function raises the reference plane to the top level of this platform/pallet such that only the object resting on this surface is included in the measurement. The Tare function is activated by giving a non-zero Tare value with the measurement command. The Tare value is the height (in cm) of the platform/pallet above the reference plane (floor/pallet scale). The CSN840 reports the net dimensions of the object and the Tare value used with the measurement. The Tare function is active for one measurement at a time.

The operator must determine the correct Tare value to be used by measuring the height of the pallet/platform with appropriate means.

Alibi memory for long time storage:

Alibi memory software for long time storage of measurement data may be installed on the instrument computer, or on an external computer connected to the instrument. This software must

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comply with directive 2014/32/EU and WELMEC Software guide 7.2, and a valid Certificate documenting such compliance shall be available to the inspector during verification and sealing of the instrument.

1.2.3 Allowed functions not subject to the MID.

Cargoscan CSX software for collecting weight and bar code data for the measured object and merging these data with the object dimensions may be installed on the instrument computer. This application has a graphical user interface for the operator, and a data communication interface for transmitting measurement data to remote systems

2 DESCRIPTION OF THE SEALING PROVISIONS

The instrument shall be sealed to protect current set-up data.

When sealing is on, any change to a legally relevant parameter will increment the Event Counter, and the change will be recorded in the Audit Trail.

It is possible to perform tests, look at all parameters and change non-legal relevant parameters without incrementing any Event Counters or Audit Trails.

Software sealing of the instrument is described in details in the document "CSN840 conformity assessment and sealing procedure.

2.1 Electronic Sealing function:

This function can be turned ON or OFF. When ON legal relevant parameters cannot be changed. When OFF, legal relevant parameters may be changed, but any such change will be recorded in the Audit Trail and the Event Counter will be incremented.

The Event Counter and Audit Trail are turned ON automatically when the Sealing Function is turned ON for the first time. After that, it is not possible to turn off the Event Counter and/or the Audit Trail. The Sealing Function is protected with a password. This password shall be restricted in order to avoid unauthorized or accidental access to the system setup.

2.2 Event counter

This is a 4 digit counter that is incremented +1 every time a legal relevant parameter is changed. Such changes are only possible when the sealing is OFF. The value of the Event Counter shall be recorded during sealing of the instrument. This value shall be filled in to the conformity assessment record, and transcribed to any instrument record/label prescribed by local regulations.

2.3 Audit Trail

This is a text file stored inside the flash memory of the instrument in which any change to a legal relevant parameter is recorded. Changes to non-legal relevant data are not recorded. No users have access to this file for deleting or editing.

2.4 Sealing Status

The instrument shall be regarded as sealed and not tampered with if the Event Counter displays the same value as recorded during sealing, and all the physical seals and the name plate remain intact.

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2.5 The procedure for conformity assessment and sealing of CS2200

2.5.1 Sealing of Cargoscan CS2200 display

Press "VER" button and check that the following is shown

S	E	A	L	S
8	4	0	.	3

where

<s> is either '-' or 'o':

'-': Not sealed.

'o': Sealed.

Do not approve the instrument unless 'o' is displayed

Press "VER" button again and check that the following is shown

U				n
r	a	b	c	d
F	x	x	x	x
E	d	d	d	d

where,

U <n> : Unit number (1,2 or 3)

r <a.b.c.d> : System software version, e.g. 1.6.5

Check chapter 1.2 in this certificate for approved versions

F <xxxx> : Functional checksum of the installed software.

Check chapter 1.2 in this certificate for approved checksum

E<dddd> : Current value of the Event Counter.

During first time conformity assessment of the instrument, the value of the Event is recorded. This value must also be written on a sticker which is attached to the instrument housing, the display or the stand or other appropriate part of the instrument. The print must be non-erasable and the sticker must be secured with a MT or CSN sealing label. Other methods for recording the value of the Event Counter may be required by national regulations.

Press "VER" button to cycle between the Unit number 1, 2 and 3.

Check that the same software and same Functional Checksum is displayed for all three units.

NOTE:

The Event Counter may be different for each unit. This value must be recorded for each unit.

During inspection of a sealed instrument, compare the displayed value of the Event Counter with the value recorded last time the instrument was sealed. Each unit must be checked. The instrument can be regarded as sealed if the displayed value of the Event Counter is identical to the recorded value, and the recorded value has not been tampered with.

The displayed information will stay for 60 seconds or until "SCAN" button is pressed (which will bring the display back to normal mode).

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The OctoCSM user interface consists of a graphics display and keyboard/mouse. In some applications, a touch screen is used instead of the keyboard/mouse.

The user interface of OctoCSM is shown in figure 2. The yellow field in the upper left corner shows the Certificate number of the OctoCSM software. Check that this number corresponds to the number on the Certificate (certificate no. TC7413 issued by NMI) supplied with the instrument. Record this number on the checklist.

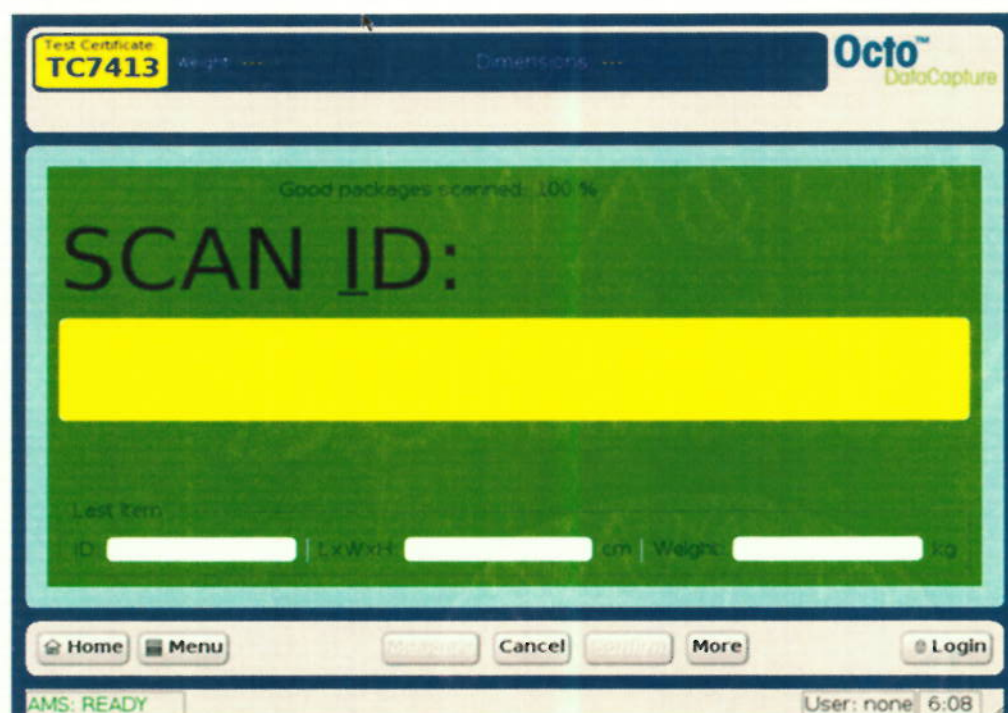


Figure 2: OctoCSM user interface. Upper part of the screen shows the legal relevant section, which is covered by the Certificate TC7413 issued by NMI. The lower $\frac{3}{4}$ part of the screen shows the user interface, which is user configurable

Click on the OctoCSM logo in the upper right corner of the display. This will open the version information page on which version information, checksums and other key information is shown. Under each headline on this page, confirm that the version number, checksums and other information given on this page correspond to the information in the certificates supplied with the instrument.

2.7 Alibi memory system

If the system is connected to an Alibi Memory System (AMS) for long-term data storage, check the CSN840 EU Type Examination Certificate and AMS Certificate. Check that the AMS system (by clicking on OctoCSM) is compatible with the CSN840, and that the AMS is installed and labeled in accordance to the requirements.

Check that the SW-version number and the functional checksum matches the approved versions listed in the AMS Certificate. This information will be shown on the version info pages of the CSM display. The version number of CS2200 will be shown by pressing "VER button".

The version number of dimensional meter and AMS is shown on OctoCSM permanently.

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If there are no references to AMS on this information page, an Alibi storage is not installed on the CSM computer.

2.8 Physical sealing

Every unit in the system must be sealed with sealing stickers as shown in figure 3. Make sure that the stickers overlap both the cover and the casing so that the cover cannot be opened without tearing the stickers. Clean and degrease the surface if necessary before affixing the sealing stickers.

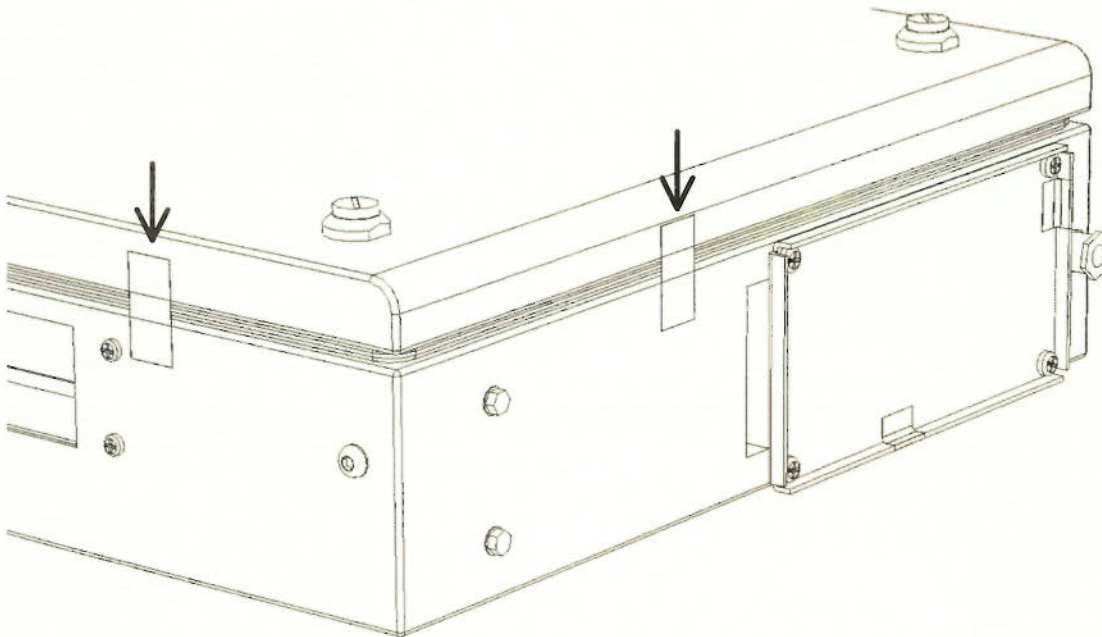


Figure 3: Location of physical sealing stickers on the top cover of each of the CSN840 units in the system.

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The CSN840 Pallet measures objects of any shape, colour and surface texture. However, the following restrictions applies:

- Maximum and minimum measurement sizes of object;
- Only one object at a time can be measured;
- A stable positioning of the object is essential for a correct measurement. Therefore, the objects must be placed with its largest and most stable side down. In addition, the measuring platform must be stable and free from vibration.
- Transparent objects and objects packed in thick, transparent wrapping material (e.g. "bubble" plastic) are not suited for this type of measuring.
- Mirror type surfaces (e.g. chrome and high gloss metal surfaces) are not suited for this type of measuring. However, the instrument can measure objects covered with shiny sealing tape and glossy plastic wrapping.
- The entire object has to be within the scan area. If any part of the object is outside the measuring area, an error message is generated.

An error message code will appear if measuring fails, indicating a reason for the failure.

3.1.1.2 Requirements to measuring platform

The quality and installation of the measuring platform may have significant influence on the measurement accuracy. Therefore, the following recommendations for the platform and its surroundings applies:

- The platform must be stable and undisturbed during the measurement.
- The stand/mounting structure of the frame with the three CSN840 should be stable and undisturbed during measurement.
- Dull (non-glossy) surface on the measuring platform is recommended, but not mandatory.
- Flat and/or corrugated surface is allowed.
- Rollers, balls and caster deck surface is allowed.

3.1.2 Instructions for correct operation**3.1.2.1 Start up**

- Turn the instrument on with the on/off switch. The CSN840 will power up and start a self-test.
- After the self-test is finished successfully, the scanning will start and the instrument is ready for measurement.

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3.1.2.2 Measurement

- Place the object to be measured on the platform. Always place the most stable surface down.
- No other items than the object to be measured shall be in the area of measurement (Such as the arm of the operator).
- Press the SCAN button, or start the measurement via the host interface.
- The results of measurement are output on the host port and/or the display port. The display port is marked as D1. The Host port is configurable to be any of the RS232 ports or the NET ports in the system.
- If Tare is used, the correct Tare value shall be found by measuring the height of the pallet/platform with a tape measure or equivalent with an accuracy of <2mm. The instrument accepts Tare values with up to two decimals (0.01 cm).

3.1.2.3 Error messages

If the measurement is not successful, an error message will show up on the display together with the measurement result, to indicate that the result may be incorrect. The numerical error code of the error message indicates why the measurement failed and possible causes of the failure, such as:

- The object is outside the area of measurement.
- The object is reflecting too much or too little light.
- The object outside minimum and maximum dimensions set for the instrument.
- Data missing.

Some packaging materials are difficult to measure correctly. For limitations, see paragraph 3.1.1 Object requirements of this annex to certificate N-02/2007.

3.1.3 Information to ensure consistent production.

The instrument should be produced according to this certificate.

3.2 Metrological characteristics of the measuring instrument

Accuracy Class	: MPE = 1d for H, W and L
Scale Interval	: d = 20 mm
Minimum object size	: H = 10d, W = 10d and L = 10d
Maximum object size	: H = 260, W = 250 and L = 2500 [cm]
Tara range	: T ≤ Maximum height
Maximum net height	: = Maximum gross height – Tare value

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Voltage	: 230V/ 50Hz or 115V/60Hz
Laser type	: Visible red: Class 2: (not eye safe for continuous viewing).
Principle of measurement	: Optical (Visible Laser Rangefinder)
Control system	: Linux
Database	: Proprietary

3.3.2 Environments / influence quantities

- climatic : Operational temperature : -10 to +40 [°C]
Non-condensing, closed location
- mechanic : Class M2
- electromagnetic : Class E2

3.3.3 Adjustments

The instrument must be installed and calibrated according to the manufacturer's specifications before verification testing and sealing. After being sealed, any calibration or adjustment cannot be performed without breaking the seals.

Zeroing, in order to readjust the zero height level, is allowed on a sealed instrument.

3.3.4 Equipment for the control of the instrument

Control of the instrument shall be carried out using appropriate test objects of various sizes and of stable dimensions as described in OIML R129 11.1.4.2 and 11.2

The following manual shall always be available:

"CSN840_site_Verify_and_seal_Procedure".

4 INTERFACES AND COMPATIBILITY CONDITIONS

- Display port – Cargoscan CS2200 display
 - o Output: Measurement data in digital format.
 - o Input: Closed shell input of commands from CS2200 display
 - o Physical connector: D1
- VGA port
 - o Output: of video graphics in VGA format
 - o Input: None
 - o Physical connector: VGA

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- Host port
 - o Output. Output of measurement data in digital format
 - o Input: Closed shell input of commands
 - o Physical connectors: One of the following ports can be selected during configuration: Ser 1, 3, 4, Net 1, 2. No reconfiguration allowed after sealing.
- Host View port
 - o Output: Same as Host port
 - o Input: No inputs allowed
 - o Physical connectors: One of the following can be selected during configuration: Ser 1, 3, 4, Net 1, 2. No reconfiguration allowed after sealing.
- Console Port
 - o Non-privileged access to operating system of embedded computer. For viewing of setup and for changing of non-legally relevant setup parameters
 - o Physical connectors: D1, Net 1, Net 2, VGA+USB/PS2. Requires a PC with HyperTerminal, Telnet or equivalent software, or a keyboard and VGA monitor. Console access is possible through any of these ports at all times
- Web Server Interface
 - o Access to embedded web server for instrument setup and calibration. Limited functions available (closed shell). After sealing of the instrument, all changes are recorded in the audit trail, and the internal, non-resettable event counter is incremented by 1 for each change.
 - o Physical connectors: Net 1, Net 2. Requires a PC with standard web browser.

5 MARKINGS

A product label, in conformance to Directive 2014/32/EU, shall be attached to the enclosure of the instrument

The Conformity marking shall be according to Article 20, 21 and 22

Information to be born by and to accompany the instrument shall be according to Directive 2014/32/EU Annex I, §9

- Number of the EC-type examination certificate
- Manufacturer
- Make and model
- Serial number
- Date manufactured
- Accuracy
- Scale interval
- Minimum object size
- Maximum object size
- Maximum Tare range

CSN840 shall be accompanied by information on its operation in conformance to Directive 2014/32/EU Annex I, §9.3

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The following information shall be available for the operator (i.e. on a plate mounted to or nearby the instrument or in an operating manual:

WARNING:

1. CSN840 cannot measure the following objects/cargo:
 - √ Objects wrapped in transparent "bubble" plastic
 - √ Objects with mirror type metal surfaces
2. **ALWAYS** place the object with the most stable surface down to ensure correct measurement.

6 LIST OF DRAWINGS TO THE ANNEX1 TO THE CERTIFICATE

Figure 4: Drawing showing the dimensions of CSN840: Mechanical Layout of system (side view).

Figure 5: Example of the CSN840 Pallet

Figure 6. Laser beam fan of the CSN840

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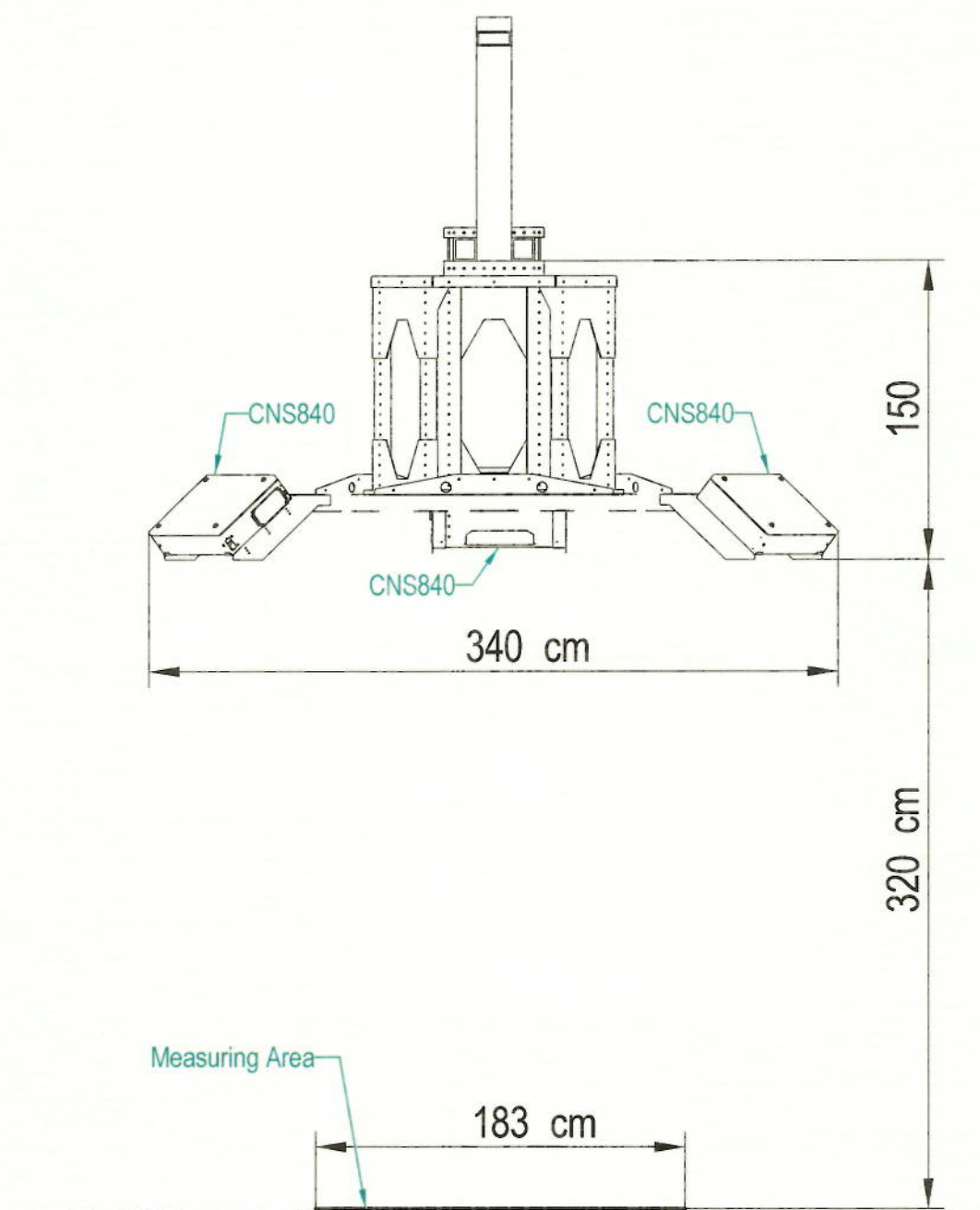


Figure 4: Drawing showing the dimensions of CSN840: Mechanical Layout of system (side view). Dimensions in mm. Mounting height is 600mm higher than tallest object to be measured. Illustrated system can measure objects of height 2600mm

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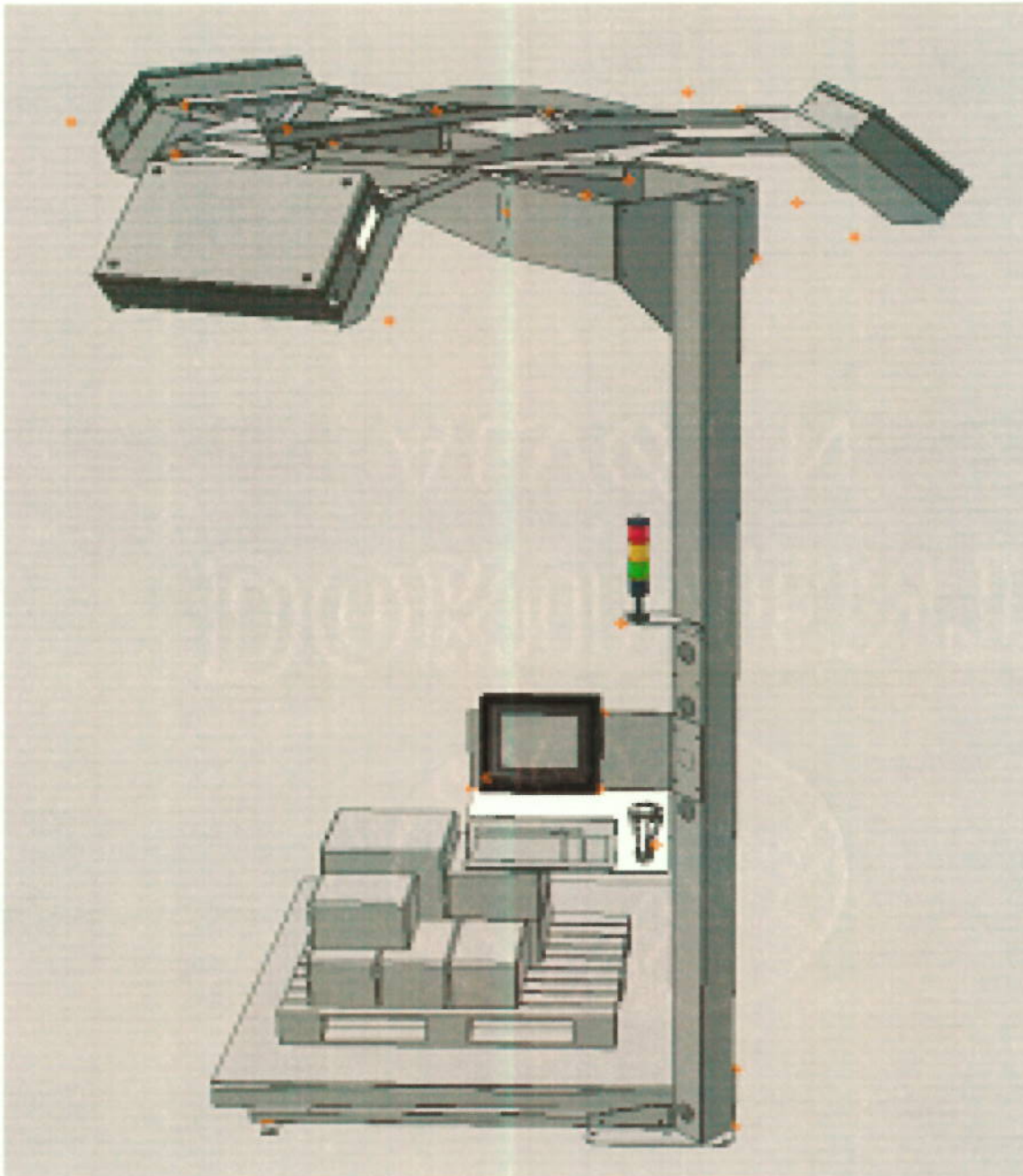


Figure 5: Example of the CSN840 Pallet shown in a typical setup over a floor scale with operator workstation with bar code reader and with traffic light for signalling to the pallet truck driver.

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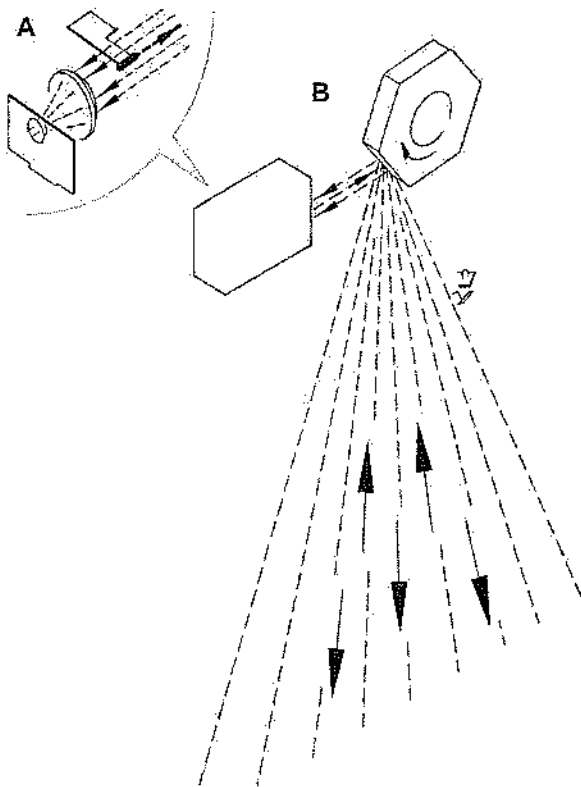


Figure 6: Laser beam fan of the CSN840

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7 CERTIFICATE HISTORY

Issued number	Date	Internal reference number	Description
N-02/2007	02.04.2007	06/0608 is the project number and 4258 is the application number	Type examination first issued
N-02/2007 Revision 1	01.12.2008	08/612 is the project number and 4333 is the application number	Modification to the following sections: - section 3.2 to permit higher measuring range. New range is H = 260, W = 250 and L = 250 [cm] - section 1.1.1.3 to permit a new option for display unit
N-02/2007 revision 2	15.10.2015	2015/7997	Modification to the following sections: -section1.1.1.3 Indication device: indication of tare value permitted. - Section 1.2.1 Legally relevant software: New version of software included. -section 1.2.2 Allowed functions: Tare function is added. - Section 2 description of sealing: it is added more description to the different modules. -section 3.2 Metrological characteristics: Maximum tare value is added. Annex2: The annex2 is deleted and the contents of it is moved to annex1.
N-02/2007 revision 3	22.08.2017	2017/4545	Renewal of the EUTEC.