

EVALUATION CERTIFICATE

No. 0200-WL-08648

Object name	SmartCAN
Object type	Non-automatic weighing transmitter
Issued by	FORCE Certification EU - Notified Body No. 0200
In accordance with	EN 45501:2015, OIML R76:2006 and WELMEC Guide 8.8:2017 on metrological aspects of non-automatic weighing instruments.
Fractional factor (p_i)	0.5 (refer to 3.10.2.1 of EN 45501:2015).
Issued to	Cardinal Scale Manufacturing Company 102 East Daugherty Street, Webb City, Missouri 64870, USA
Manufacturer	Cardinal Scale Manufacturing Company.
In respect of	Non-automatic weighing transmitter.
Characteristics	Suitable for a non-automatic weighing instruments with the following characteristics: Weighing range: Single-interval. Accuracy class: III or IIII Verification scale interval: $e_i = \text{Max}_i/n_i$ Maximum number of verification scale intervals: $n_i = \leq 6000$ (Class III) / ≤ 1000 (Class IIII) Minimum input voltage per VSI: $0.5 \mu\text{V}$ The essential characteristics are described in the annex.
Description and documentation	The non-automatic weighing transmitter is described and documented in the annex to this certificate.
Remarks	Summary of tests involved: See the annex to this certificate.

This evaluation certificate cannot be quoted in an EU type examination certificate without permission from the holder of the certificate mentioned above.

The annex comprises 9 pages.

Issued on **2020-07-03**

FORCE Certification references:

Task no.: 119-35654.90.10 and ID no.: 0200-WL-08648

Signatory: Jens Hovgård Jensen

Descriptive annex

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1. Name and type of instrument

The non-automatic weighing transmitter is designated SmartCAN. It is an analogue data processing device intended for connection to one or more analogue load cells in a modular non-automatic weighing instrument.

The transmitter is intended for connecting to a digital electronic indicator (digital terminal) with a CAN bus interface.

The name of the transmitter may be followed by alphanumeric characters for technical, legal or commercial characterization of the unit.

2. Description of the construction and function

2.1 Construction

The weighing transmitter is specified in Section 3.1.

2.1.1 Enclosures

The SmartCAN is available in an enclosure made of either stainless-steel or polycarbonate plastic housing

The stainless-steel housing is equipped with up to 5 cable glands for loadcell and interface cables.

The plastic housing is equipped with up to 13 cable glands for loadcell and interface cables.

2.1.2 Electronics

The transmitter contains an A/D circuitry per load cell input. The electronics can have from 4 and up to 10 separate load cell inputs. The circuitry provides an excitation voltage of 10VDC (± 5 VDC) to the load cell.

The electronics is powered by 12 to 24 VDC from the CAN bus. Optionally can the unit be powered from a 24 VDC power supply for 100-240 VAC 50/60Hz positioned inside the housing.

The electronics contains a microprocessor with FLASH memory. All instrument calibration and metrological data are stored in a non-volatile memory but can also be stored in the indicator.

The transmitter has no keyboard or display.

2.2 Software

The software version of the SmartCAN is displayed during the power up sequence of the indicator.

The software version is built in the form of x.y.z where x designates the legal revision number and y and z is not under legal control.

The released version is 1.y.z

3. Technical data

The weighing instrument is composed of separate modules, which are set out as follows:

3.1 Weighing transmitter

The weighing transmitter has the following characteristics:

Type:	SmartCAN
Accuracy class:	III and IIII
Weighing range:	Single-interval
Maximum number of Verification	
Scale Intervals (n_i):	≤ 6000 (class III), ≤ 1000 (class IIII)
Fractional factor:	$p_i = 0.5$
Minimum input voltage per VSI:	$0.5 \mu\text{V}$
Excitation voltage:	10 VDC nominal
Number of load cell input channels:	4 or 10
Analogue range:	1 to 30 mV
Circuit for remote sense:	active
Minimum input impedance:	350 ohm
Maximum input impedance:	1100 ohm
Mains power supply:	100 to 240 VAC (50/60 Hz) or 12-24 VDC
Operational temperature:	-10°C to $+40^\circ\text{C}$
Peripheral interface:	Set out in Section 4

3.1.1 Connecting cable between the transmitter and load cell

3.1.1.1 4-wire system

Cable between transmitter and load cell(s):	4 wires (no sense), shielded
Maximum length:	The certified length of the load cell cable, which shall be connected directly to the transmitter.

3.1.1.2 6-wire system

Cable between transmitter and load cell(s):	6 wires (sense), shielded.
When sense circuitry is used is maximum cable length between transmitter and an eventual load cell with sense or a junction box:	172 m/mm^2 .

3.2 Load cells

3.2.1 General acceptance of analogue load cells

Any analogue load cell(s) may be used for instruments under this certificate of type examination provided the following conditions are met:

- 1) There is a respective Part / Evaluation / Test Certificate (EN 45501) or an OIML Certificate of Conformity (R60:2000 or R60:2017) issued for the load cell by a Notified Body responsible for type examination under Directive 2014/31/EU
- 2) The certificate contains the load cell types and the necessary load cell data required for the manufacturer's declaration of compatibility of modules (WELMEC 2:2015), and any particular installation requirements). A load cell marked NH is allowed only if humidity testing to EN 45501 has been conducted on this load cell.
- 3) The compatibility of load cells and indicator is established by the manufacturer by means of the compatibility of modules form, contained in the above WELMEC 2 document, or the like, at the time of EC verification or declaration of EC conformity of type.
- 4) The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

4. Interfaces

4.1 Load cell interface

The transmitter has one and up to 10 load cell interfaces for 4 or 6 wire load cell connection.

In case a load cell is not mounted the input shall be disabled by a jumper

4.2 Communication and I/O interfaces

The weighing transmitter has a CAN bus interface for communication with the digital terminal.

The system has the possibility to connect one or several SmartCAN's to the same digital terminal.

5. Conditions for use

The use of the SmartCAN Transmitter in an automatic weighing instrument is not covered by this Evaluation certificate.

6. Location of seals and inscriptions

Configuration and calibration of the SmartCAN is performed from the indicator. Sealing shall follow the instructions for the indicator.

The enclosure of the SmartCAN shall be sealed by wire and seal or tamperproof labels

Seals shall bear the verification mark of a notified body or alternative mark of the manufacturer according to ANNEX II, module D and F respectively of Directive 2014/31/EU.

7. Tests

The SmartCAN transmitter has been tested according to EN 45501:2015, OIML R76-1:2006 and WEL-MEC 2.1:2001 annex 5.

The tested SmartCAN had the following software version number: 1.0.15

Examination / tests

Temperature tests: 20/40/-10/5/20 (tested at minimum input-voltage sensitivity)
Temperature effect on no-load indication
Temperature effect on span
Repeatability
Warm-up time
Voltage variations
Electrical bursts ^{*)}
Electrical surge ^{*)}
ESD
Immunity to radiated electromagnetic fields
Immunity to conducted electromagnetic fields
Damp heat, steady state
Span stability
Examination of construction

^{*)} Performed with severity level raised to the values for electromagnetic class E2.

The test item fulfilled the maximum permissible errors at all tests.

8. Documentation

Contents of the technical documentation held by the notified body:

8.1 Product specification

- Manual
- Schematics
- PCB layout

8.2 Test & Examination report

OIML R76 report no. 119-35654.10.

9. Pictures



Figure 1 SmartCAN intended for up to 10 load cells



Figure 2 SmartCAN intended for up to 10 load cells with the optional power supply



Figure 3 SmartCAN intended for up to 4 load cells



Figure 4 Enclosures for 4 and 10 LC systems



Figure 5 Sealing of enclosure for 4 LC system with tamperproof label



Figure 6 Sealing of enclosure for 4 LC system with wire and seal



Figure 7 Sealing of enclosure for 10 LC system with tamperproof label



Figure 8 Sealing of enclosure for 10 LC system with wire and seal