DANAK
PROD Reg. nr 7026

FORCE Certification

EVALUATION CERTIFICATE

No. 0200-WL-03389

Object name **EM100-C**

Object type **Analog data processing device for automatic catchweighing instruments**

Issued by **Force Certification A/S**

Issued in accordance with the requirements in WELMEC Guide 8.8:2017" Guide on General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments".

In accordance with OIML R51:2006, OIML D11:2013, WELMEC Guide 2.8:2012 and WELMEC Guide 8.8:2017.

Issued to **Flintec UK Ltd.**
W4/5 Capital Point
Capital Business Park
Wentloog, Cardiff CF3 2PW
United Kingdom

Manufacturer Flintec, Katunayake, Sri Lanka

In respecr of An analog data processing device tested as a module for a weighing instrument.

Characteristics Suitable for automatic catchweighing instruments with the following characteristics:

Weighing range:	Single-interval or multi-range or multi-interval
Accuracy class:	XIII or XIIII or Y(a) or Y(b)
Number of VSIs:	$n \leq 10{,}000$
Minimum input voltage per VSI:	$\geq 0.3\ \mu V$

The essential characteristics are described in the annex.

Description and documentation The weighing indicator is described and documented in the annex to this this certificate.

Remarks Summary of tests involved: see annex.
This evaluation certificate cannot be quoted in an EU type examination certificate without permission of the holder of this certificate mentioned above.

The annex comprises 5 pages.

Issued on **2018-06-14** **Signatory: J. Hovgård**

FORCE Certification references:
Task no.: 117-29767 and ID no.: 0200-WL-03389

Descriptive annex

1. Name and type of instrument

The analog data processing device is designated EM100-C and suitable to be incorporated in an automatic catchweighing instrument, class XIII or XIIII or Y(a) or Y(b), with single-interval, multi-range or multi-interval.

2. Description of the construction and function

2.1 Construction

The electronic device consists of a single circuit board, SMD populated and housed in a tinned mild steel shielding enclosure.

The top of the enclosure carries a non-detachable inscription plate. Through the enclosure below the circuit board are two connectors, one for load cell connection and for power and i/o.

The load cell connector consists of 12 terminals, as dual row pins 2.54 mm pitch: 6 terminals for the load cell wires, and 6 terminals for the cable shield / ground.

The power and I/O connector consists of 20 terminals, as dual row pins 2.54 mm pitch: 4 terminals for power supply, 4 terminals for logic level I/O and 8 terminals for serial communication in form of RS485, RS232 and CANopen.

All instrument calibration and metrological setup data are held in the non-volatile memory.

Identification

The model number may be viewed by sending "FPN" to the unit, which responds with 'P:xxxxxxx'. The tested model number is 'P:EM100-C'

The serial number of the unit may be viewed by sending "RS" to the unit, which responds with 'S+xxxxxxxx'.

Software

The software version may be viewed by sending "FFV' to the unit, which responds with 'Vxx.yy'. The tested software version is: 'V01.01'.

Access to metrological characteristics and span adjustment

Access to the configuration and calibration facility is achieved by sending a Traceable Access Code (TAC), which is a non-volatile number that automatically incremented each time the calibration modus is left by the operator. The TAC may be reviewed by sending CE to the unit, which responds the status code as CExxxxx. The code increments up to 65535.

Securing of metrological characteristics and span adjustment

Access to the configuration and calibration facility is secured by the TAC.

2.2 Function.

The EM100-C is a microprocessor based electronic digitising unit for a load cell signal, which enables the production of a weight indicating instrument that requires the external connection of strain gauge load cells and a weight display unit. Furthermore, the weight information may be transmitted to peripheral equipment for recording, processing, or display. The EM100-C digitising unit is available for operation from a coarsely regulated DC-supply 9 - 32 VDC

The primary groups of functions provided are as follows,

- Power monitoring
- System diagnostics
- Calibration functions
- Motion detection functions
- Filter settings
- Taring & Zeroing functions
- Output configuring
- Auto transmit
- External input/output control
- Setpoint controlled logic output
- Communication set-up
- Identification number
- Legal setup consecutive number
- Save calibration and setup parameters
- Trigger functions
- Re-trigger functions

The legally functions provided are,

- Initial zero-setting
- Semi-automatic zero-setting
- Zero tracking
- Semi-automatic subtractive tare
- Preset tare
- Automatic tare
- Event counter (TAC)

3. Technical data

3.1 Analog Data Processing device

Type:	EM100-C load cell digitizing unit.
Accuracy class:	XIII or XIIII or Y(a) or Y(b)
Weighing range:	Single-interval, multi-range or multi-interval
Maximum number of verification scale intervals (n):	10,000 per interval/range
Minimum input voltage per VSI (e_i):	0.3 µV
Maximum capacity of interval (Max_i):	$n_i \times e_i$
Initial zero-setting range:	20 % of Max
Maximum tare effect:	100 % of Max
Fractional factor (p_i):	0.5
Excitation voltage:	5 VDC
Minimum input voltage from load cell:	0 mV
Maximum input voltage from load cell:	15 mV
Circuit for remote sense:	Active (see below)
Minimum input impedance:	58 Ohm
Maximum input impedance:	1100 Ohm
Load cell linearization feature:	None
Connecting cable to load cell(s):	See Section 3.1.1
Maximum time between automatic zero-setting:	21 minutes for e ≥ 0.3 µV 75 minutes for e ≥ 1.0 µV
Minimum warm-up time:	15 minutes for e ≥ 0.3 µV 8 minutes for e ≥ 1.0 µV
Supply voltage:	9 - 32 VDC, not to be supplied from DC Mains
Operating temperature range:	Min / Max = -15 °C / +55 °C
Peripheral interface(s):	See Section 4

3.1.1 Connecting cable between the indicator and the junction box for load cell(s), if any

3.1.1.1 4-wire system

Maximum length	The certified cable length for the load cell.
Line	4 wires, shielded

3.1.1.2 6-wire system

Line	6 wires, shielded

Option 1:

Maximum length	1132 m/mm^2
Maximum resistance per wire	19.1 Ohm

In case the (n) for the weighing instrument is less than (n_{max}) mentioned above, the following applies:

Option 2:

Coefficient of temperature of the span error of the indicator: Es = 0.003 % / 25°K
Coefficient of resistance for the wires in the J-box cable: Sx = 0.0012 % / ohm

L/A_{max} = 295.86 / Sx * (emp / n - Es) [m / mm^2] in which emp = p'i * mpe * 100 / e

From this, the maximum cable length for the weighing instrument may be calculated with regard to (n) for the actual configuration of the instrument.

Reference: WELMEC 2.1, annex 5.

4. Interfaces

4.1 Load cell interface

Refer to Section 3.1.1.

Any load cell(s) can be used for instruments under this certificate provided the following conditions are met:

- There is an part, evaluation or test certificate (EN 45501) or respective an OIML Certificate of Conformity (R60:2000 or R60:2017) issued for the load cell by a Notified Body responsible for type examination under the Directive 2014/31/EU.
- 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 performed.
- 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.
- The load transmission must conform to one of the examples shown in the WELMEC 2.4 Guide for load cells.

4.2 Peripheral interfaces

Serial I/O interface

EM100-C has three serial interfaces,

- RS485
- RS232
- CANopen

Logic Level Inputs and Outputs

EM100-C has two logic level inputs and two open-drain outputs

The peripheral interfaces are characterised "Protective interfaces" according to paragraph 8.4 in the Directive.

5. Conditions for use

The model number (returned by command FPN) shall be 'EM100-C'.

The software version (returned by command FFV) shall be V01.xx, where xx ≥ 01.

6. Tests

The EM100 load cell digitising unit has been tested according to EN 45501:2015, OIML R76-1:2006, WELMEC 2.1:2001 annex 5 and OIML D11:2013 for electromagnetic class E2.
The test results have afterwards been re-examined against the requirements in MID - Directive 2014/32/EU Annex I and Annex VIII (MI-006) chapter 1 and 2, OIML R51:2006, and WELMEC Guide 2.8:2012. The software has been examined against the requirements in WELMEC Guide 7.2:2015.

The tested EM100 has the following version number:

Hardware (model): EM100-C
Software: 'V01.01'

Examination / tests

Temperature tests: 20/55/-15/5/20 (tested at minimum input-voltage sensitivity)
Temperature effect on no-load indication
Temperature effect on span
Repeatability
Tare
Warm-up time
Voltage variations
Short time power reductions
Electrical bursts
Surge
Electrostatic discharges
Immunity to radiated electromagnetic fields
Immunity to conducted electromagnetic fields
Damp heat, steady state
Span stability
Examination of construction
Maximum load cell cable length and impedance of cable to load cell

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

7. Documentation

Contents of the technical documentation held by the notified body:

7.1 Product specification

- Manual
- Schematics
- PCB layout

7.2 Test & Examination report

OIML R76 report no. DANAK-1918640
OIML R51 report no. DANAK-1918823