Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

Supplementary Certificate of Approval
NMI S625

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

Precia-Molen Model I400 D-M Digital Indicator

submitted by Precia SA
BP 106
07000 Privas
FRANCE

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 76, *Non-automatic weighing instruments, Parts 1 and 2*, dated July 2004.

This approval becomes subject to review on 1/09/18, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern & variants 1 & 2 approved – certificate issued	8/08/13
1	Variant 3 approved – certificate issued	15/05/14
2	Variant 4 approved – certificate issued	14/07/16
3	Variant 5 approved – certificate issued	25/01/18

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S625' and only by persons authorised by the submittor.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S625' in addition to the approval number of the instrument, and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to an instrument incorporating the pattern approved herein shall be within the limits specified herein and in any approval documentation for the other components.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0B.

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.

Darryl Hines

TECHNICAL SCHEDULE No S625

1. Description of Pattern approved on 8/08/13

A Precia-Molen model I400 D-M digital indicator (Table 1) which may be configured to form part of:

- A weighing instrument with a single weighing range of up to 6000 verification scale intervals; or
- A multi-interval weighing instrument with up to three partial weighing ranges (each with its own verification scale interval) in which case it is approved for use with up to 3000 verification scale intervals per partial weighing range.
- A multiple range weighing instrument with up to two weighing ranges, in which case it is approved for use with up to 6000 verification scale intervals per weighing range.

The model I400 D-M instrument is in a zinc plated steel rack style housing (Figure 1a) or may be in a stainless steel bench-top type housing and then it is known as a model I400 D-MS (Figure 1b). It has a dot matrix display for displaying metrological data and descriptive markings.

The instrument is powered by a standard 230 V AC mains power source.

The instrument is fitted with an integral type X241-TR analogue data processing module (measurement interface) for use with analogue load cells.

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

This approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

TABLE 1 – Specifications

Maximum number of verification scale intervals	6000 or 6000 per range
Minimum sensitivity	0.5 µV/scale interval
Excitation voltage	5 V DC
Maximum excitation current	86.21 mA
Fraction of maximum permissible error	$P_i = 0.4$
Minimum load cell impedance	58 Ω
Maximum load cell impedance	1245 Ω
Nominal load cell impedance	350 Ω
Measuring range minimum voltage	0 mV/V
Measuring range maximum voltage	12 mV/V
Maximum tare range	100%
Operating temperature range	-10°C to +40°C
Load cell connection	4 wire or 6 wire plus shield

1.1 Zero

Zero may be automatically corrected to within ±0.25*e* whenever the instrument comes to rest within 0.5*e* of zero or whenever power is applied (in the case of multi-interval or multiple range configurations *e* in this sentence refers to e_1).

The instrument has a semi-automatic zero-setting device (to set the instrument to within ±0.25*e* of zero) with a nominal range of not more than 4% of the maximum capacity of the instrument.

The instrument has an initial zero-setting device with a nominal range of not more than 20% of the maximum capacity of the instrument.

1.2 Tare

The instrument has a subtractive semi-automatic tare device of up to maximum capacity.

The instrument has a subtractive semi-automatic preset tare device of up to maximum capacity for single and multiple ranges, or up to the maximum of the lowest partial weighing range for a multi-interval instrument.

1.3 Display Check

A display check is initiated whenever power is applied.

1.4 Interfaces

The indicator may be fitted with interfaces for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 5.3.6 of document NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with Supplementary Certificate No NMI S1/0/B (in particular in regard to the data and its format).

Note particularly that this approval does not include the use of the indicator as an automatic weighing instrument, unless specifically mentioned in a certificate of approval for such an instrument.

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

Data derived from any analog output or interface shall not be used for trade use.

Interfaces of the following types may be fitted:

- RS232, RS232SPI, RS422, RS485 and CAN bus serial data interfaces
- Logical I/O
- 4-20 mA and 0-10 V
- Ethernet
- PROFIBUS board.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Descriptive Markings and Notices

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Precia-Molen
Model number	….....
Indication of accuracy class	(III)
Maximum capacity	*Max* ..... kg #1
Minimum capacity	*Min* ..... kg #1
Verification scale interval	*e* = ... kg #1
Maximum subtractive tare	*T* = - ….. kg #2
Serial number of the instrument	….....
Pattern approval mark for the indicator	S….

#1 These markings are also shown near the display of the result if they are not already located there.

#2 This marking is required if *T* is not equal to *Max*.

In addition, instruments not greater than 100 kg capacity shall carry a notice stating NOT TO BE USED FOR TRADING DIRECT WITH THE PUBLIC, or similar wording.

Notes:

(i) For multiple range instruments the markings shall be as above, with the exception that the maximum capacity, minimum capacity and verification scale interval for each range shall be marked, with an indication of the range to which they apply, as shown in the instrument display (e.g. 'Range 1')

Range	Range 1	Range 2	(*)
Max	…. kg	…. kg	
Min	…. kg	…. kg	
e =	…. kg	…. kg	

(*) The markings for each weighing range shall be clearly associated with an indication of the corresponding range (i.e. 'Range 1') to correspond to the weighing range designations shown in the instrument display.

(ii) For multi-interval instruments the markings shall be as above, with the exception that the 'Maximum capacity' and 'Verification scale interval' shall be marked for both interval ranges, e.g. as follows:

Maximum capacity	*Max* ...../..... kg
Verification scale interval	*e* = .../..... kg

1.7 Sealing Provision

The calibration and set-up modes of the indicator can be secured with a password and calibration/configuration event counter. To determine that the instrument is secured (i.e. a password has been set to restrict access to certain menu items), press the 'F10' button. If the display screen shows 'Main Menu', then the supervisor or engineer modes are active, and the instrument is NOT secured.

The non-resettable calibration/configuration event counter increments each time that any parameter or calibration is changed and saved, and the value of the event counter is displayed on the instrument display (Figure 2).

The value of the event counter at the time of verification shall be recorded on a destructive adhesive label applied to the instrument. Any subsequent alteration to the calibration or configuration will be evident as the recorded value and the current value will differ.

The instrument displays the software version numbers of the indicator ('terminal') and the measurement interface (transmitter) as shown in Figure 2. The approved versions are both in the form V3.xy, where V3 is the legally relevant component of the software while x and y each represent numbers between 0 and 255.

2. Description of Variant 1 approved on 8/08/13

The pattern (models I400 D-M and I400 D-MS) fitted with an integral type X241-PMNET digital data processing module (measurement interface), instead of the X241-TR module mentioned for the pattern. The indicator is to be used with compatible NMI-approved Precia-Molen digital load cells only.

3. Description of Variant 2 approved on 8/08/13

The models I400 D-M and I400 D-MS as described for the pattern and variant 1, but with the data processing unit (measurement interface) not fitted internally but instead it is in its own housing which is known as a model I400 TB transmitter (zinc plated) or model I400 TB-S transmitter (stainless steel). This is also known as a 'remote measurement interface' (Figure 3).

4. Description of Variant 3 approved on 15/05/14

The pattern and variants may be connected to up to 2 weighing platforms through two separate and identical measurement interface boards (Figure 4), or may be connected to up to 31 weighing platforms through a CAN field bus digital interface (Figure 5).

Selection of the platform to be displayed is pressing the button next to the 'balance' icon, identified by the number at the bottom of the display, e.g. '1' or '2' as shown in Figure 6. The instrument does NOT have a summing function.

The instrument shall display the required markings (e.g. maximum and minimum capacity, verification scale interval, and accuracy class) no matter which platform is selected.

5. Description of Variant 4 approved on 14/07/16

The Precia Molen model I410-D digital indicator(Figure 7) which is similar to the pattern and variants 1 to 3 but having a white display background colour and with (Figure 7) or without a Qwerty keyboard.

The instrument may also be in a table-top housing (model I410-D-T, Figure 8) or in a stainless steel housing (model I410-D-S, Figure 9).

The instrument is powered by a standard 230 V AC mains power source.

5.1 Software

The approved software versions are:

- V3.x.y for the indicator (terminal I410)
- V3.x.y for the analogue measurement interface (transmitter X241-TR)
- V1.x.y for the digital measurement interface (transmitter X241-PMNET)

5.2 Summing Facility

Up to four baseworks may be connected to a single I410 digital indicator. This will require a summation module X1104-TR. The X1104-TR may be fitted internally within I410 indicator or in its own housing which known as a model I400 TB transmitter (zinc plated) or model I400 TB-S transmitter (stainless steel).

When up to four baseworks are connected the following indications may be provided:

(a) Individual weight display

Selection of the platform to be displayed is pressing the button next to 'balance' icon, identified by the number at the bottom of the display, e.g. '1', '2', '3' or '4' as shown in Figure 6. Tare and zero operations may be applied to each individual basework/indication, as if they were separate instruments.

(b) Combined weight display

When two or more baseworks of the same configuration (maximum capacity and verification scale interval) are connected to a single I410 indicator it may also be possible to select a summation mode in which the combined weight on the platforms is displayed. The button next to the'balance' icon of the indicator is used to select this, e.g. when three baseworks are connected to the indicator, selection '4' is indicated rather than '1', '2' or '3'. The '4' indication represents the combined weight of platforms 1, 2 and 3. This has similarities to a summing indicator as described in General Supplementary Certificate of Approval No S1/0B however the feature has some significant differences. In particular, the combined weight function indication does not necessarily represent the mathematical sum of the values determined for each platform. This is because the combined weight function indication has its own maximum capacity (*Max*), minimum capacity (*Min*) and verification scale interval (*e*), and the indication is based on a separate determination of the weight value using these parameters.

Tare and zero operations may be applied to the combined basework/indication, as if it was a separate instrument.

Note however that applying a gross load above the maximum capacity (Max + 9e) of any one basework will not result in the combined weight display indication blanking or showing an error.

The instrument shall display the required markings (e.g. maximum and minimum capacity, verification scale interval, and accuracy class) no matter which platform is selected.

5.3 Notes regarding applicability of General Certificate of Approval No 6B/0

- The calculations of 6B/0 shall apply to each basework/indicator combination individually;
- In the case of individual basework/indicator combination, the maximum capacity of the load cells in any one basework shall exceed the maximum capacity of the combined weight function ($Max_{combined}$). This shall apply to the calculations of clause 6.2 of General Certificate No 6B/0.

- In the case of the combined weight function, the calculations of clauses 6.3 to 6.6 of General Certificate No 6B/0 shall apply, with the number of load cells being the total number in the baseworks; and
- The verification scale interval for the combined weight function shall not be less than the smallest scale intervals for any one basework, and shall be an integer power of 10 multiple of 1, 2 or 5 (i.e. ..., 0.1, 0.2, 0.5, 1, 2, 5, …).

  Note: As an example, of one possible configuration:

  Scale 1: Max = 50000 kg, e = 20 kg, Min = 400 kg

  Scale 2: Max = 50000 kg, e = 20 kg, Min = 400 kg

  Scale 3: Max = 100000 kg, e = 50 kg, Min = 1000 kg

5.4 Verification

The combined basework is treated as a separate instrument for the purpose of testing in accordance with the NITP 6.1-6.4.

An additional rolling load test shall be applied to the combined basework.

The instrument shall only be marked with one verification mark.

6. Description of Variant 5 approved on 25/01/18

The Precia Molen model BI410-D digital indicator which is similar to variant 4 with an alphanumeric keyboard but having a large ABS housing (Figure 10).

6.1 Interfaces

The indicator may be fitted with traffic management equipment and/or a printer.

Any interfaces shall comply with clause 5.3.6 of document NMI R76 (the basic intent of which is that it shall not be possible to alter weighing results via the interfaces).

Any measurement data output from the instrument or its interfaces shall only be used for trade in compliance with Supplementary Certificate No NMI S1/0/B (in particular in regard to the data and its format).

Indications other than the indications of measured mass (i.e. gross, tare, net, totals) displayed either on the indicator or on an auxiliary or peripheral device, are not for trade use.

TEST PROCEDURE No S625

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Maximum Permissible Errors

The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

Tests

For multi-interval and multiple range instruments with verification scale intervals of e_1, e_2 …, apply e_1 for zero adjustment, and maximum permissible errors apply e_1, e_2 …, as applicable for the load.

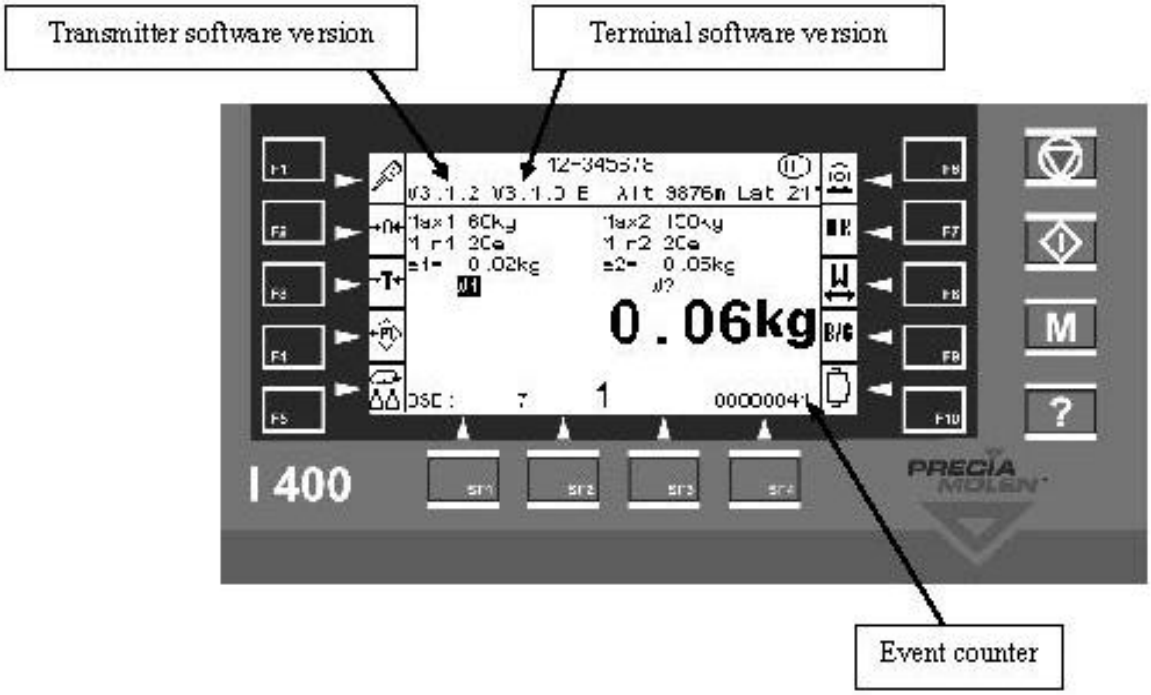
FIGURE S625 – 1

(a) Model I400 D-M (Plated Steel Rack Style Housing)

(b) Model I400 D-MS (Stainless Steel Bench-top Style Housing)

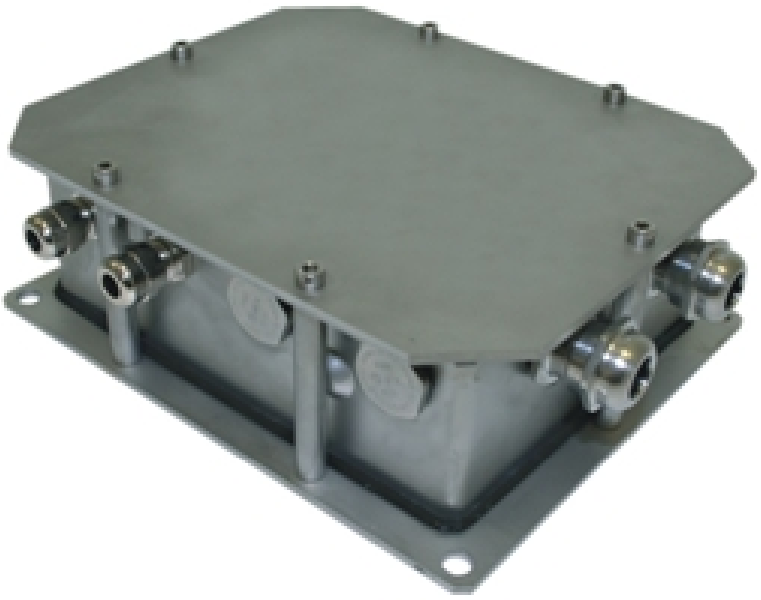
Precia-Molen I400 Series Digital Indicators

FIGURE S625 – 2



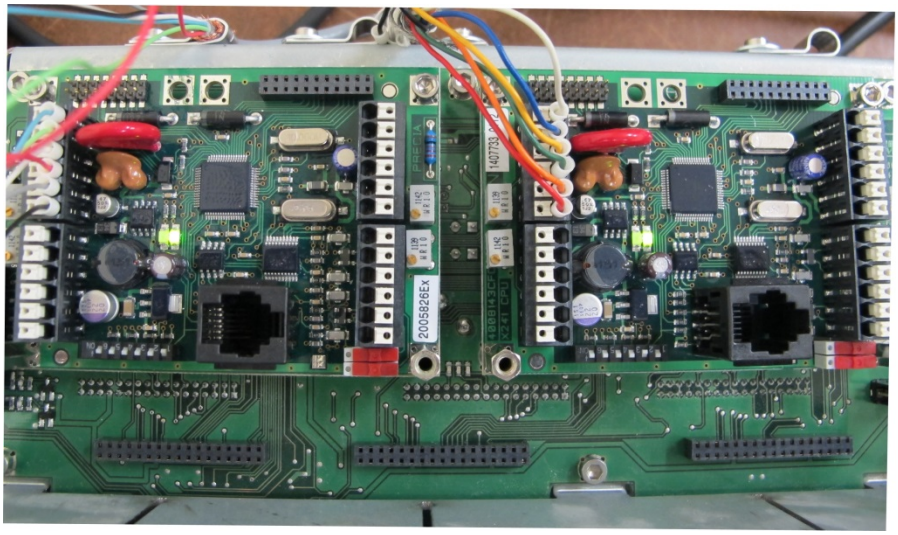
Typical Display of Information (incl. Software Versions and Event Counter)

FIGURE S625 – 3



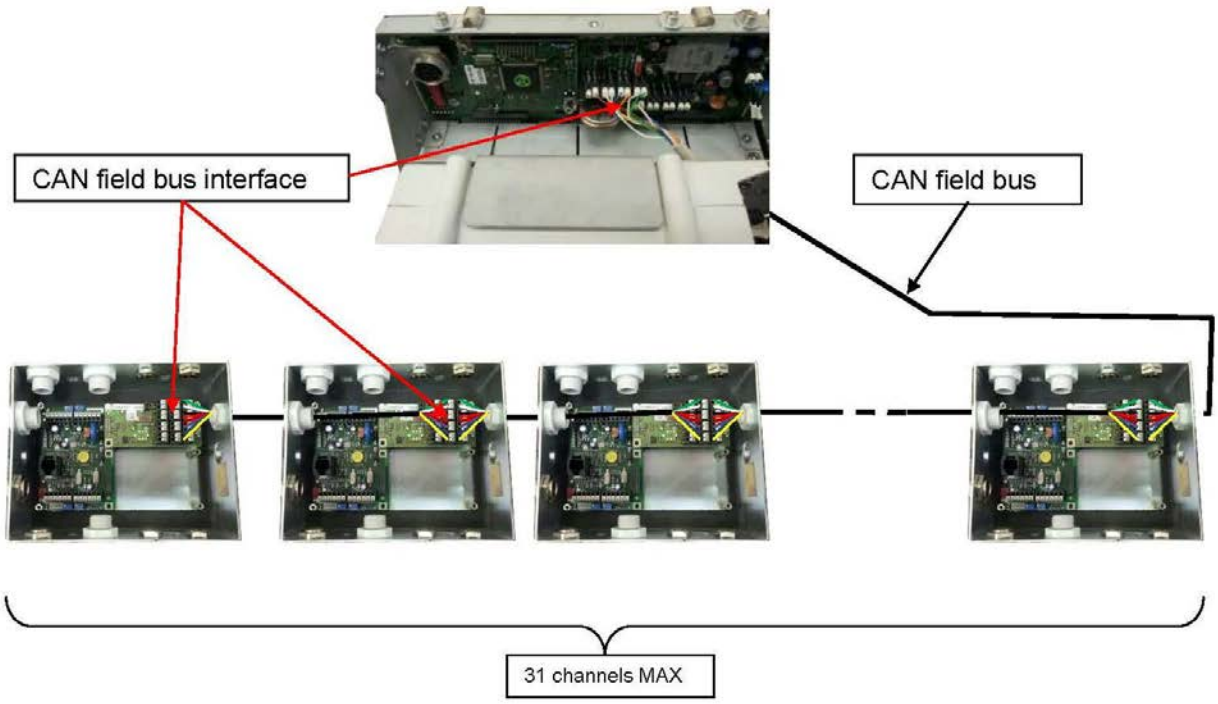
Precia-Molen I400 Series Transmitter (Remote Measurement Interface)

FIGURE S625 – 4



Measurement Interface Boards (Variant 3)

FIGURE S625 – 5



CAN Field Bus Digital Interface (Variant 3)

FIGURE S625 – 6

Displays From Two Platforms Connected to the Same Indicator (Variant 3)

FIGURE S625 – 7

Model I410-D (variant 4)

FIGURE S625 – 8

Model I410-D-T (variant 4)

FIGURE S625 – 9

Model I410-D-S (variant 4)

FIGURE S625 – 10

Model BI410-D (variant 5)

~ End of Document ~