



Australian Government  
Department of Industry, Science,  
Energy and Resources

## National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

# Supplementary Certificate of Approval NMI S798

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.

Marel Model M2400-P03 Digital Indicator

submitted by Marel Australia Pty Ltd  
42 Borthwick Ave  
Murarrie QLD 4172

**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 October 2015.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

### DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern approved – certificate issued	02/12/21

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S798' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S798' in addition to the approval number of the instrument, and only by persons authorised by the submitter.

It is the submitter'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.

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

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.

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



**Darryl Hines**  
Manager  
Policy and Regulatory Services

TECHNICAL SCHEDULE No S798

**1. Description of Pattern** **approved on 02/12/21**

A Marel model M2400-P03 digital mass indicator (Figure 1) which may be configured to form part of:

- A class  $\text{III}$  weighing instrument with a single weighing range of up to 10 000 verification scale intervals; or
- A class  $\text{II}$  weighing instrument with a single weighing range of up to 1000 verification scale intervals.
- A class  $\text{III}$  multiple range weighing instrument with up to three weighing ranges, in which case it is approved for use with up to 10 000 verification scale intervals per weighing range.
- A class  $\text{II}$  multiple range weighing instrument with up to three weighing ranges, in which case it is approved for use with up to 1000 verification scale intervals per weighing range.

The changeover between weighing ranges is automatic.

The instrument has a stainless steel enclosure with a LCD display for display of the weight value.

The pattern may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices (see **clause 1.7** below).

TABLE 1 – Specifications

Maximum number of verification scale intervals	10000 (class $\text{III}$ ) 1000 (class $\text{II}$ )
Minimum sensitivity	0.25 $\mu\text{V}$ /scale interval
Excitation voltage	$\pm 3$ V DC
Maximum excitation current	70 mA
Fraction of maximum permissible error	$p_i = 0.5$
Minimum load cell impedance	87 $\Omega$
Maximum load cell impedance	1100 $\Omega$
Measuring range minimum voltage	-30 mV
Measuring range maximum voltage	+30 mV
Operating temperature range	-10°C to +40°C
Mains power supply	110-230 V AC, 50/60 Hz, or 12 to 24 V DC
Load cell connection	4-wire or 6-wire shielded
Maximum value of load cell cable length per wire cross section *	1077 m/mm <sup>2</sup> (6-wire only)

(\*) Additional connection cable between indicator and load cell or load cell junction box. In case a 4-wire connection is used, the load cells are connected directly without a junction box.

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.

## **1.1 Zero**

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

The instrument has a semi-automatic zero-setting device with a nominal range of not more than 4% of the maximum capacity of the instrument.

A zero-tracking device may be fitted.

## **1.2 Tare**

A semi-automatic tare device of up to the maximum capacity of the instrument may be fitted.

A pre-set subtractive tare device of up to the maximum capacity of the lowest weighing range of the instrument may be fitted.

## **1.3 Linearisation Facility**

Instruments are fitted with a linearisation correction facility having one correction point.

## **1.4 Display Check**

A display check is initiated whenever power is applied.

## **1.5 Power Supply**

The power supply may be either 110 – 230 V AC (mains power) or 12 - 24 V DC.

## **1.6 Additional Features**

Instruments may be fitted with printing, dual displays, and price computing. These functions are not approved for trade use.

Note: In particular circumstances (e.g. in regard to weighbridge or public weighbridge operation), Trade Measurement legislation or other NMI Certificates of Approval may impose requirements in regard to specific features, methods of operation, or records to be provided (and in what form).

Certain features of this instrument are able to be configured by the installer or user. Whilst NMI believes that an acceptable configuration can be achieved for typical basic modes of operation, it may also be possible for the instrument to be configured to produce unacceptable configurations, and use of some configurations may be inappropriate in different situations. It is the responsibility of the installer and user to ensure that the configuration is acceptable and meets relevant requirements for any particular situation.

## **1.7 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 General Supplementary Certificate of Approval No NMI S1/0B (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.

Instruments may be fitted with

- 2 x RS-232 serial data interfaces;
- 1 x Ethernet;
- 2 x USB interfaces;
- 4 x digital inputs/outputs; and
- 1 x CAN bus.

## 1.8 Data Storage Memory

Instruments may contain memory for the storage of weighing results.

For each weighing, weighing results together with identification including date and time are stored into the storage device.

The use of this feature for trade use is subject to the agreement of the applicable trade measurement authority. In any case, data from the storage device shall only be used for trade if the format of the output complies with General Supplementary Certificates of Approval S1/0/B.

## 1.9 Verification Provision


Provision is made for the application of a verification mark.

## 1.10 Software Version

The software includes firmware version and weighing module version.

The firmware version number is designated 1.yy-zz, where “yy” represents minor part which not affecting the legal measurement functionality, and “zz” represents minimal change and bug fixes.

The weighing module version is identified by a number 100.

The software version is displayed by pressing the  key, then pressing the ‘0’ key (Figure 2).



## 1.11 Sealing Provision

The instrument may be sealed via physical and/or software means.

### a) DIP switch S2-1 and S1 button sealing

Provision is made for the calibration to be sealed by means of setting the DIP switch S2-1 to the ‘ON’ position and then preventing access within the instrument housing. Note: If the DIP switch S2-1 is in the ‘ON’ position, the instrument will display ‘S2: SEAL switch is ON’ message during the initial power on display sequence as shown in Figure 3b.



Alternatively if the DIP switch S2-1 is in the ‘OFF’ position, the instrument can be sealed by setting the ‘Access control’ to ‘Locked’ and ‘Access configurable (S1 button)’ to ‘NO’ and then preventing access within the instrument housing.

The status can be viewed by pressing the  key and then the  key. The audit logs screen is displayed as shown in Figure 3c.

Sealing to prevent access within the instrument housing may be achieved by the use of one or more destructible adhesive labels at edges of the instrument housing as shown in Figure 3d.

b) Software sealing

Alternatively the instrument is sealed by recording the audit trail counters on verification.



Access to the calibration and metrological configuration must be protected by a passcode. The non-resettable event counters increment, each up to 999, each time any change to calibration 'CAL' or sealed configuration 'CON' parameters. The values of these event counters can be viewed by pressing the  key and then the  key. The audit logs screen is displayed as shown in Figure 3c.

The CAL xxx and CON yyy values shall be recorded on a destructible adhesive label attached to the instrument as shown in Figure 3d.

Any subsequent alteration to the calibration or configuration will be evident as the recorded value and the current counter value will differ.

**1.12 Descriptive Markings and Notices**

Instruments carry the following markings:

Manufacturer's mark, or name written in full	Marel ehf Iceland
Importer's mark, or name written in full	Marel Australia Pty Ltd
Model number	Marel M2400-P03
Indication of accuracy class	 or 
Maximum capacity	<i>Max</i> ..... kg #1
Minimum capacity	<i>Min</i> ..... kg #1
Verification scale interval	<i>e</i> = .... .. kg #1
Maximum subtractive tare	<i>T</i> = - ..... kg #2
Serial number of the instrument	.....
Pattern approval mark for the indicator	NMI S798
Pattern approval mark for other components	..... #3

- #1 These markings are shown in the electronic markings field above the display of the result.
- #2 This marking is required if *T* is not equal to *Max*.
- #3 May be located separately from the other markings.

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.

Note:

For multiple range instruments, 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, e.g.

Max/Min/e=d: > ...../...../..... kg  
 ...../...../..... kg  
 ...../...../..... kg

## TEST PROCEDURE No S798

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

### **Maximum Permissible Errors**

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

### **Tests**

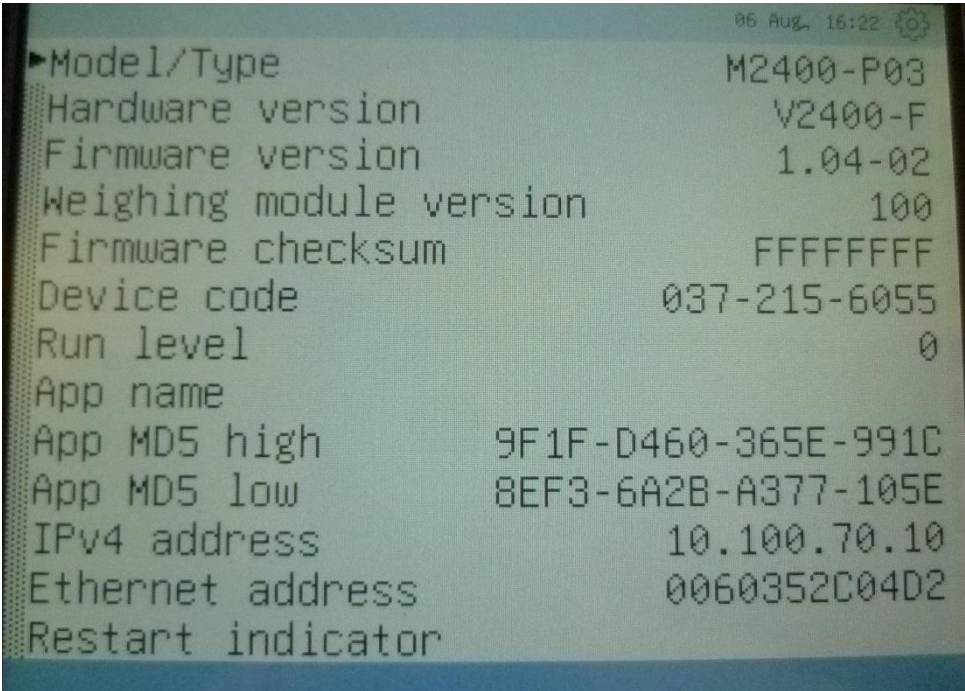
For multi-interval and multiple range instruments with verification scale intervals of  $e_1, e_2 \dots$ , apply  $e_1$  for zero adjustment, and maximum permissible errors apply  $e_1, e_2 \dots$ , as applicable for the load.

FIGURE S798 – 1



Marel Model M2400-P03 Indicator (Pattern)

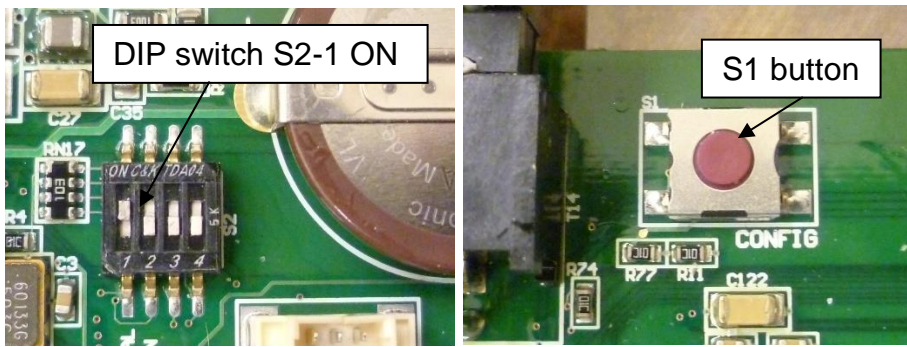
FIGURE S798 – 2



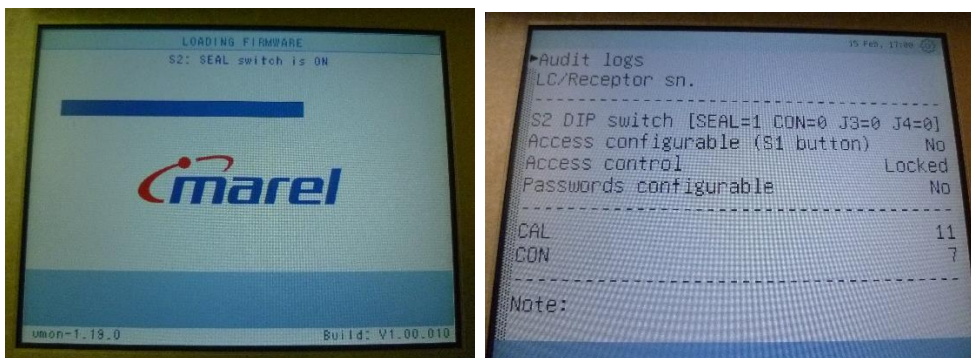
Software Version



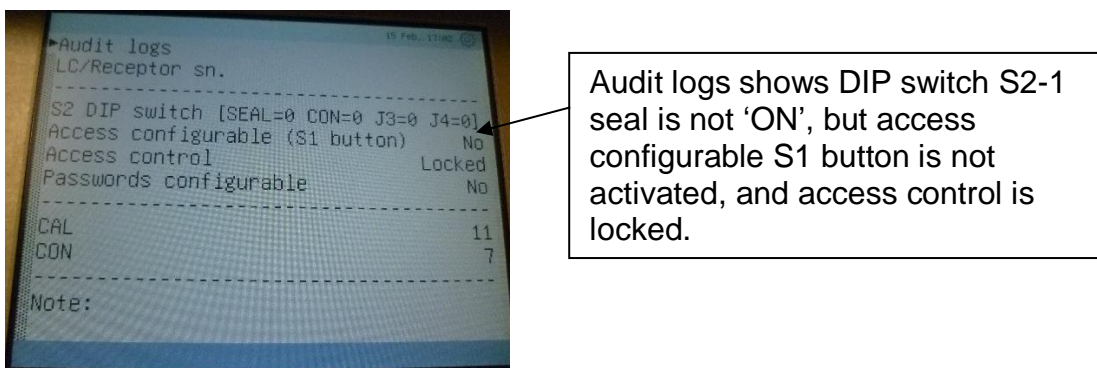
FIGURE S798 – 3



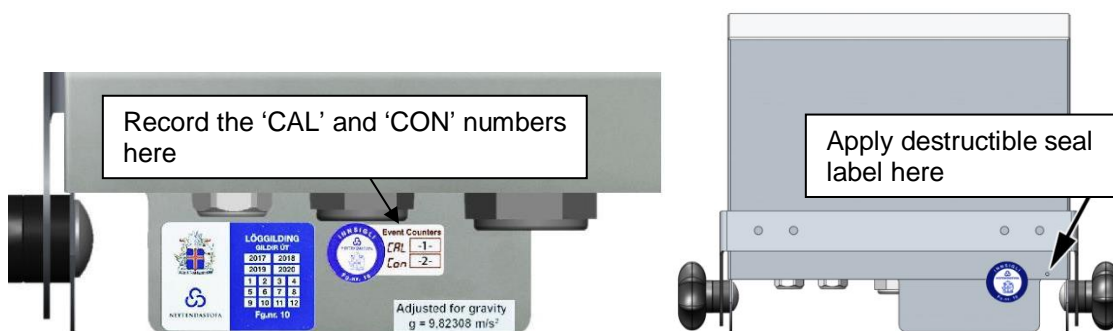
(a) Location of DIP Switch S2-1 and S1 Button



(b) DIP Switch S2-1 Seal Status



(c) Audit Logs With DIP Switch S2-1 in 'OFF' Position



(d) Event Counters Label and Seal Label

Typical Sealing Methods

~ End of Document ~