Australian Government
Department of Industry and Science

National Measurement Institute

# Supplementary Certificate of Approval

# NMI S472

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.

Systec Model IT3000 Digital Indicator

submitted by Scale Components Pty Ltd
4 Dan Street
Slacks Creek QLD 4127

**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 1/09/16, and then every 5 years thereafter.

DOCUMENT HISTORY

| Rev | Reason/Details | Date |
|---|---|---|
| 0 | Pattern & variants 1 & 2 approved – interim certificate issued | 14/08/06 |
| 1 | Pattern & variants 1 & 2 approved – certificate issued | 13/10/06 |
| 2 | Pattern amended (ADC/ADM module) – variant 3 approved – certificate issued | 25/01/07 |
| 3 | Pattern & variants 1 to 3 reviewed & amended (address) – variant 4 approved – certificate issued | 30/04/11 |
| 4 | Pattern & variants 1 to 4 updated – variant 5 approved – certificate issued | 21/07/15 |

# CONDITIONS OF APPROVAL

## General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S472' and only by persons authorised by the submittor.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S472' 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.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificates No S1/0/A or 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*.

**Mario Zamora**

TECHNICAL SCHEDULE No S472

## 1. Description of Pattern approved on 14/08/06

A Systec model IT3000 digital mass indicator (Table 1 and Figure 1) which may be configured to form part of:

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

The changeover between weighing ranges is automatic.

The instrument has a liquid crystal display (LCD) including provision for display of the weight value and for two lines of alphanumeric information/menus.

A display in the form W*x.y* (where *x* and *y* are numbers) appears at the top left of the indication.

- The number *x* designates the basework/indication that has been selected for display. As only one basework may be connected the display will always read 'W1'.
- The number *y* designates the weighing range in which the instrument is operating for the particular basework/indication selected (e.g. 'W1.2' indicates that the instrument is displaying the weight on 'scale 1', and is in the second range). The number y only appears when the instrument is configured as a multiple range instrument.
- When operating in 'Online' mode where the weighing terminal is remotely controlled from a PC via serial interface #1, the indication will change from 'W1' to 'O1'.
- During Printout and data transmission the indication on the display will change from 'W1' to 'P1'

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 for models IT3000, IT1000, IT3000D, & IT3000Ex (Pattern & Variants 1 to 4)

| | |
|---|---|
| Maximum number of verification scale intervals | 6000 or 6000 per range |
| Minimum sensitivity | 0.33 μV/scale interval |
| Excitation voltage | 5V DC |
| Maximum excitation current | 238 mA |

### 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 multiple range configurations *e* in this sentence refers to $e_1$). This feature may, or may, not be enabled.

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 provision for subtractive semi-automatic and pre-set tare devices of up to maximum capacity (except for instruments configured as multi-interval instruments, in which case the maximum pre-set tare value is $Max_1$).

Pre-set tare values may be stored and recalled, and may be associated with product or item look-up tables.

### 1.3 Display Check

A display check is initiated whenever power is applied.

Software identification information is displayed immediately following start-up.

### 1.4 Power Supply

The instrument is available in two power supply versions:

(a) The IT3000 AC version operates from mains AC power (110-240V AC nominal).

(b) The IT3000 DC version operates from a 12 – 30 V DC supply and converts it (and incorporates filters to protect against disturbances) to provide suitable DC power.

### 1.5 Linearisation Facility

Instruments are fitted with a linearisation correction facility having up to six correction points.

### 1.6 Load Cell Connection (ADC) Module

The indicator's scale interface is provided via an analog to digital converter (ADC) module (which plugs into the main board of the indicator). The ADC module may also be known as an ADM module.

Note: The ADC/ADM module also contains a memory device so that calibration parameters of the platform can be stored. However it should be noted that if the indicator is replaced or repaired, then reverification of the instrument is required.

### 1.7 Data Storage Memory

The indicator 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 Nos S1/0/A or No S1/0B.

### 1.8 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 shall only be used for trade if the data and its format comply with Supplementary Certificates Nos S1/0/A or No S1/0B.

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:

- Serial RS 232, RS 485 (2-wire) or RS 485 (4-wire) interfaces for the connection of peripheral devices.
- Digital inputs and digital outputs (opto-isolated) for control purposes.
- Analog outputs (voltage or current).
- A keyboard and/or barcode/identification tag reading equipment may be connected to the indicator for convenient data entry. Relevant functions (such as tare and zero setting) may be possible via corresponding remote commands.
- Interfaces compatible to various control/communication protocols (e.g. Ethernet, Fieldbus, Profibus, DeviceNet and Interbus).

Note: Suffixes to the model numbers refer to indicators fitted with certain integrated communication protocols, namely IT3000P features a Fieldbus interface, and model IT3000E features an Ethernet interface.

### 1.9 Additional Features

The indicator may incorporate software (which may require additional license codes from the manufacturer to be enabled) intended by the manufacturer for particular applications. The software and related hardware may include process control related aspects, and utilise features such as set point facilities; product flow control and stopping/starting; databases to store order or product information, recipes, client data, counting facilities, ability for programming sequences of operations, etc.

In addition, the instrument may have facilities for a number of dialogue (menu access) and function keys to be programmed to perform various functions. Any use of this feature shall be implemented so as not to cause confusion with the normal weighing results.

However this approval relates only to use for trade of the instrument (incorporating the indicator) as a non-automatic weighing instrument, in which static weighing (gross or net) of product on the weighing platform (hopper/tank, etc.) is carried out. In particular, **the approval does not extend to, nor provide any endorsement by the National Measurement Institute, of the additional software or functionality.** The additional functions (other than the indications of measured mass – i.e. gross, tare, net – displayed either on the indicator or on an auxiliary or peripheral device) are not approved for trade use.

The IT3000 indicator may be provided with certain other features and pre-set operational arrangements (by way of additional software packages), as indicated below:

(a) IT COUNT
(b) IT TRUCK
(c) IT FILL
(d) IT CHECK
(e) IT TRUCK ONLINE
(f) IT BASIC/COUNT

These software packages may utilise features such as:

- Set point facilities and operations (under/over limits etc.).
- Facilities for entering/initiating set points, zero setting, tare (pre-) setting, or printing
- Function keys programmed to perform various functions.

**Notes:** The use of the abovementioned features may or may not be appropriate in different situations. The acceptability in any particular situation must be assessed in-situ and may require consultation with the appropriate trade measurement authority. In some situations it may be necessary for a print-out of the weighing result to be produced for the method of operation to be considered acceptable. In such situations General Supplementary Certificates Nos S1/0/A or S1/0B should be consulted.

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.

### 1.10 Sealing Provision

Provision is made for the calibration adjustments to be sealed by the use of at least two destructible adhesive labels one at each side of the instrument case.

The calibration parameters are stored within the ADC/ADM module. The ability to change these parameters is inhibited when the jumper ‘W1’ on the ADC/ADM module is in the protected location.

The position of the jumper on the ADC/ADM can be checked by either.

(a) Opening the indicator casing, and checking that the jumper on the ADC/ADM module is in the protected location (connecting pins 1 and 2, as shown in Figure 2); or

(b) Without opening the indicator casing, and then using the following procedure:

  (i) Power-up the indicator (switch power off and then on). The indicator shows details regarding software version and application operating mode for approximately 3 seconds each.

  (ii) Whilst this information is displayed press the 'info' key to access service mode. Use the 'info' key to scroll to select the 'Service: Calibrate' group and select it with the ↵ key.

  (iii) If the jumper 'W1' is in the protected location, the display will indicate 'Calibration Locked' (alternatively 'Setup ADC …' will be displayed). Switch the power off to return to step (i) above.

Once it has been ensured that the status is 'Calibration Locked', a destructible adhesive label can be placed over the join on each side of the indicator casing to seal the calibration parameters.

Note: Simply checking that the casing has the destructible adhesive labels does not determine that the calibration parameters are sealed.

### 1.11 Markings and Notices

Instruments carry the following markings:

| | |
|---|---|
| Manufacturer's mark, or name written in full | Systec Systemtechnik and Industry Automation, Germany |
| Name or mark of manufacturer's agent | Scale Components |
| Indication of accuracy class | (III) |
| Maximum capacity (for each range) | *Max* ..... kg #1 |
| Minimum capacity (for each range) | *Min* ..... kg #1 |
| Verification scale interval (for each range) | *e* = ..... kg #1 |
| Maximum subtractive tare | *T* = - ..... kg #2 |
| Serial number of the instrument | ……. |
| Pattern approval mark for the indicator | NMI S472 |
| Pattern approval mark for other components | ..... #3 |

#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*.

#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.

For multi-interval and multiple range instruments the markings shall be as above, with the exception of the following (examples are for instruments with two partial ranges):

(i) For multi-interval instruments;

| | |
|---|---|
| Maximum capacity | *Max ...../.....* kg #1 |
| Verification scale interval | *e* = *...../.....* kg #1 |

(ii) 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, as shown in the instrument display (e.g. '1', '2')

| Range | 1 | 2 |
|---|---|---|
| *Max* | …. kg | …. kg |
| *Min* | …. kg | …. kg |
| *e* = | …. kg | …. kg |

### 1.12 Verification Provision

Provision is made for the application of a verification mark.

## 2. Description of Variant 1 approved on 14/08/06

A Systec model IT1000 digital indicator which features a basic weighing terminal with reduced application programs and a simplified keypad interface (Figure 3).

## 3. Description of Variant 2 approved on 14/08/06

A Systec model IT3000D indicator (configurable to form single range, multiple range or multi-interval instruments – see clause **1. Description of Pattern**) which is approved only for use with compatible NMI approved Revere Transducers digital load cells. In this case, the maximum number of verification scale intervals (VSI) applicable is determined by the number of VSI given in the approval documentation for the load cells used.

### 3.1 Sealing Provision

Sealing arrangements are similar to those described for the pattern (model IT3000 – see clause **1.10 Sealing Provision**) except that the jumper 'W1' is located on the main indicator board (Figure 4) because the model IT3000D does not have the ADC/ADM module.

## 4. Description of Variant 3 approved on 25/01/07

A Systec model IT3000Ex digital mass indicator which is similar to the pattern but is fitted with a Systec model ADM3000 Exi intrinsically safe analog to digital converter (ADC/ADM) module.

Specifications are as shown in Table 1 for the pattern, except that the maximum excitation current is 57.1 mA.

The IT3000Ex is available in versions for power to be supplied by mains AC (230 V AC nominal), 24 V DC or 12 V DC.

## 5. Description of Variant 4 approved on 30/04/11

A Systec model IT3000D indicator (configurable to form single range, multiple range or multi-interval instruments – see clause **1. Description of Pattern)** which is approved only for use with compatible NMI approved Flintec digital load cells (e.g. as described in the documentation of approval NMI No S522). In this case, the maximum number of verification scale intervals (VSI) applicable is determined by the number of VSI given in the approval documentation for the load cells used.

Sealing arrangements are similar to those described for the pattern (model IT3000 – see clause **1.10 Sealing Provision**) except that the jumper 'W1' is located on the main indicator board (Figure 4) because the model IT3000D does not have the ADC/ADM module.

## 6. Description of Variant 5 approved on 21/07/15

A Systec model IT3000M digital mass indicator (Table 2 and Figure 5) which is similar to the pattern and may be configured to form part of:

- A class (III) weighing instrument with a single weighing range of up to 10 000 verification scale intervals; or
- A class (IIII) weighing instrument with a single weighing range of up to 1000 verification scale intervals.
- A class (III) 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 10 000 verification scale intervals per partial weighing range; or
- A class (IIII) 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 1000 verification scale intervals per partial weighing range.
- A class (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 (IIII) 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.

TABLE 2 – Specifications for model IT3000M (Variant 5)

| | |
|---|---|
| Maximum number of verification scale intervals | 10 000 (class III)<br>1000 (class IIII) |
| Minimum sensitivity | 0.33 µV/scale interval |
| Excitation voltage | 5 V DC |
| Maximum excitation current | 116 mA |
| Fraction of maximum permissible error | $p_i = 0.5$ |
| Minimum load cell impedance | 43 Ω |
| Maximum load cell impedance | 3300 Ω |
| Measuring range minimum voltage | 0 mV |
| Measuring range maximum voltage | 15 mV |
| Maximum tare range | -Max |
| Operating temperature range | -10°C to +40°C |
| Load cell connection | 4 or 6 wire plus shield |

Instruments may be powered by either mains supply (110 – 240 V AC) or 12 – 30 V DC.

### 6.1 Software Version

The software is identified by a checksum number 15487782 and designated version V4.x.y, where 'x.y' refers to the identification of non-legally relevant software.

The instructions for accessing the software id are as follows (starting from the normal weighing mode):

- Press the 'F' and '8' key simultaneously to enter Supervisor Mode.
- Press the 'Info' key repeat until 'Software ID' is displayed.
- Press the 'Enter' key and then the software ID information is displayed.

### 6.2 Digital Load Cell Connection

The SysTec models IT3000M may be used with compatible NMI approved Flintec digital RC3 load cells.

The maximum number of scale intervals (VSI) applicable is determined by the number of VSI given in the approval documentation for the load cells used.

## TEST PROCEDURE

Instruments should be tested in conjunction with any tests specified in the approval documentation for the instrument to which the pattern is connected, as appropriate, and 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 the *National Trade Measurement Regulations 2009*.

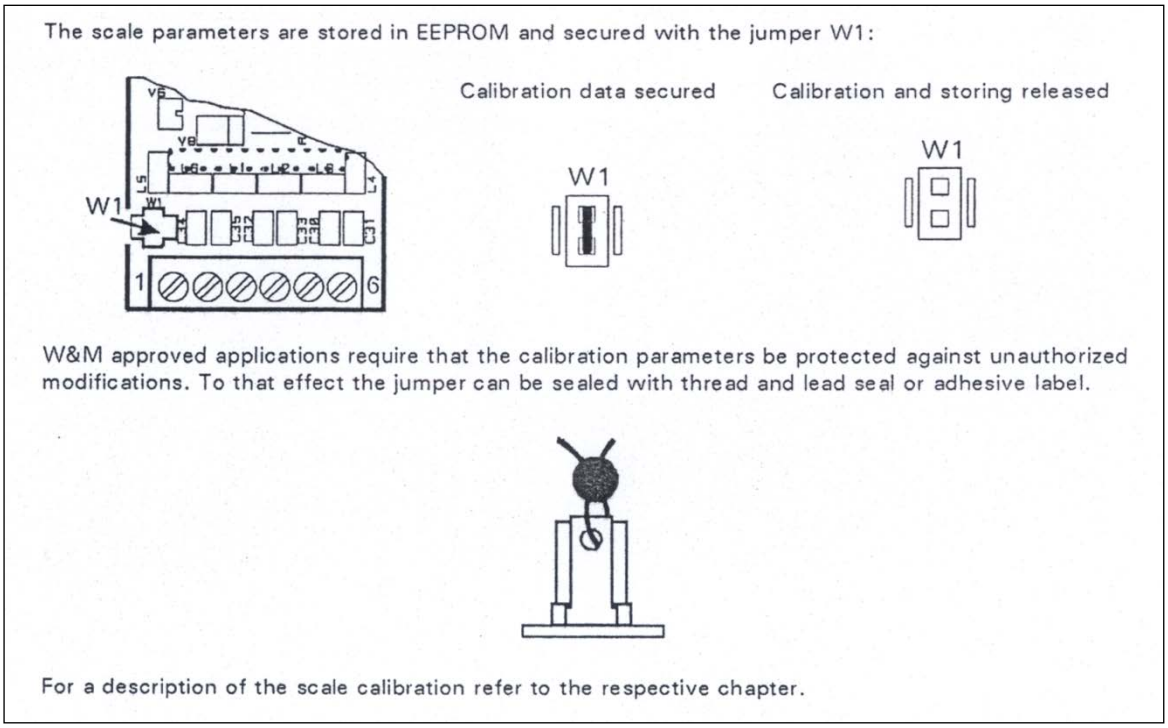
For multi-interval and multiple range instruments with verification scale intervals $e_1$, $e_2$, …, apply $e_1$ for zero adjustment, and for maximum permissible errors apply $e_1$, $e_2$, …, as applicable for the load.

FIGURE S472 – 1



Systec Model IT3000 Digital Indicator – Desk and Panel Mount Versions

FIGURE S472 – 2

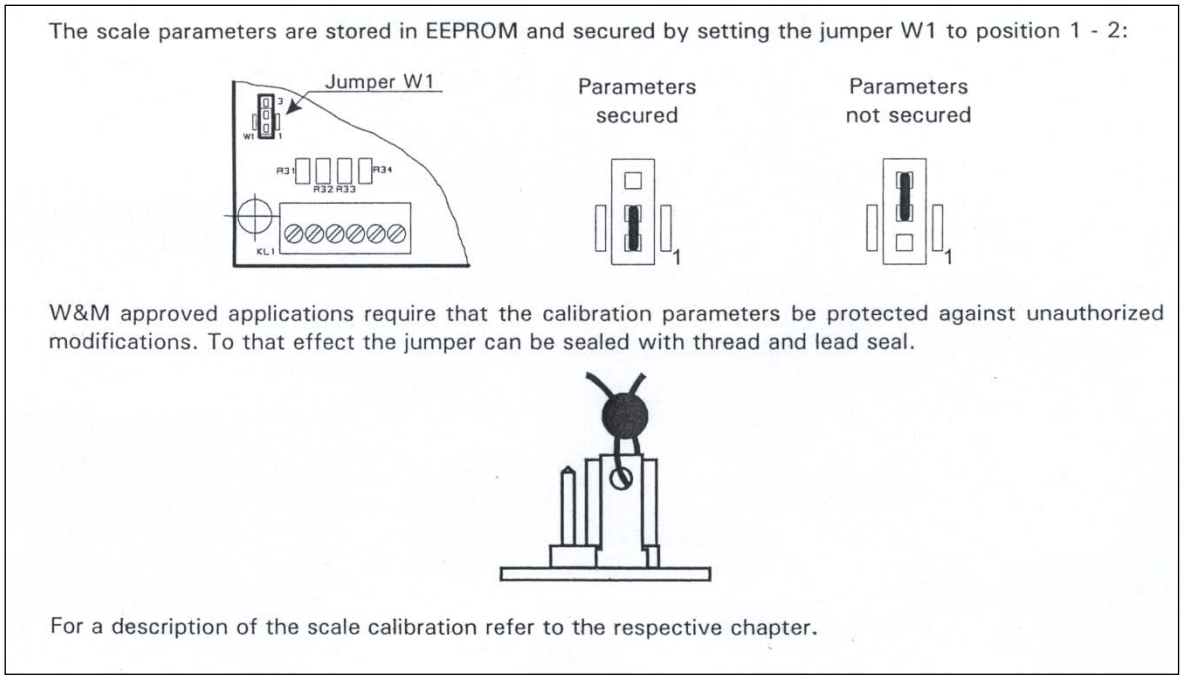



Showing Jumper W1 Sealing – Models IT3000/IT1000 (Pattern & Variant 1)

FIGURE S472 – 3


Systec Model IT1000 Digital Indicator (Variant 1)

FIGURE S472 – 4




Showing Jumper W1 Sealing – Model IT3000D (Variant 2)

FIGURE S472 – 5


Systec Model IT3000M Digital Indicator (Variant 5)

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