



Australian Government
Department of Industry,
Innovation and Science

National Measurement Institute

Supplementary Certificate of Approval NMI S723

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.

A Transponder Technologies Model T50 Calculator/indicator for Bulk Loading Systems

submitted by Transponder Technologies Pty Ltd
2 Hamra Drive,
Export Park
Adelaide Airport SA 5950

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 117 Measuring Systems for Liquids Other than Water, dated June 2011.

This approval becomes subject to review on **1/10/21**, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	15/07/16
1	Pattern approved –certificate issued	20/10/16

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S723' 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.

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

A handwritten signature in black ink, appearing to read 'A Rawlinson', with a horizontal line underneath.

Dr A Rawlinson

TECHNICAL SCHEDULE No S723

1. Description of Pattern **approved on 20/10/16**

A Transponder Technologies model T50 calculator/indicator bulk loading system (Figure 1) for use in liquid-measuring and flow control systems incorporating NMI-approved flowmeters.

1.1 Field of Operation

The field of operation is determined by the following characteristics:

- Environmental class -10°C to 55°C
- Liquid density range 600.0 kg/m³ to 999.9 kg/m³
- Liquid temperature -10°C to 55°C
- Input power supply 204 V to 264 V AC
- Maximum input frequency 1,500 Hz per channel (two channel input)
- Accuracy class Class 0.5

1.2 key Features

The model T50 bulk loading system (BLS) comprises the following devices:

- T50 BLS Control Unit, which is the main control/calculator device of the system constructed in two versions, either with or without an external User Interface comprising a display, a keypad, an iButton™ reader and Start/Stop buttons. The version with the user interface components is the T50 BLS Load Control Unit and the version without the user interface components is the T50 BLS Expansion Control Unit.
- T50 BLS Control Unit power supply, which is the electrical input power conditioning device and electrical control interface between the T50 BLS control module and liquid pumping units and flow control valves.

The T50 BLS control module comprises the following components:

- TT model T5b calculator;
- TT model T5 Temperature Probe Interface Card (optional);
- The following optional user interface components:
 - Dot matrix liquid crystal display;
 - 16-button keypad with the following keys:
 - 10 numeric keys 0 to 9;
 - 4 specific purpose keys “NO”, “YES”, “CLR” and “ENT”;
 - 2 general purpose keys “*” and “#”;
 - iButton™ reader;
 - “START/RESUME” and “STOP/PAUSE” buttons.

The T50 BLS Control Unit provides the following main functions of the system:

- Monitoring of the state of liquid overflow prevention devices;
- Monitoring of the state of static ground verification devices;
- Control of the flow of liquid through one or two flowmeters (loading-arms) via electronic switching circuits in the T50 BLS Power Control & Supply Unit device, which can control either:
 - Two-stage solenoid control valves; or

- Variable flow control valves;
- Measurement of the flow of liquid through one or two flowmeters.

When fitted with the optional user interface components, the T50 BLS Load Control Unit also provides the following functions systems:

- Configuration of system parameters, including:
 - Volume increments (i.e. number of displayed decimal places);
 - Liquid density;
 - Control valve operation (i.e. 2-stage or variable flow control operation);
- Identification of the system user and/or tanker to be filled;
- Selection of a pre-set volume of liquid to be delivered;
- Displaying of the following system parameters during an active delivery:
 - Delivered volume;
 - Flowrate;
 - Liquid temperature;
 - Residual volume (i.e. volume remaining to be delivered until pre-set volume is delivered);
 - State of control valve during delivery;
 - Non-resettable total volume delivered through a flowmeter (displayed at the end of a delivery).

The displaying of system parameters can be scrolled automatically during an active delivery or manually selected by the user.

The maximum value of delivery volume, and pre-set volume, amount is 99,999 litres.

The maximum value of non-resettable total volume 99,999,999 litres.

Multiple T50 BLS Control Units can be linked to increase the number of sets of flowmeters/loading-arms controlled by the system to greater than two up to a maximum of twenty sets.

Software version TRA01580

1.3 Checking Facilities

The display incorporates a checking facility (message CRC) to ensure that display data is received accurately from the T5b calculator. Litre quantities are displayed with a character height of 15 mm. A display segment test is performed at the start of the delivery.

The T5b calculator monitors the presence and correct transmission of signal from the measurement transducer, and in the event of detecting a fault the instrument indicates an error code and has provision for deactivating the control valves to stop the delivery.

If a delivery is in progress when power fails the system records the amount delivered at the point of power failure.

The delivery will stop if the liquid temperature is measured outside of the allowable range.

1.4 Configuration

The parameters and modes of operation of the instrument are set via two configuration switches marked 'SW1' and 'SW2' mounted on the processor board (Figures 2 and 3). Switch SW2 must be sealed.

The following functions/settings are available:

- FActr – meter calibration adjustment
- PCut – full flow to low flow switching for pre-set delivery
- S FLO – time out before start of delivery
- E FLO – time out when flow stopped
- Sd – submersible pump delay
- CFg a – mode of operation – e.g. pump communication protocol, pulser type
- CFg b – mode of operation – e.g. monitor gas detection, back light intensity
- CFg P – mode of operation – stand-alone
- codE – software version number
- PricE – unit price setting
- cdE – displays diagnostic message
- Pu nu – pump number
- Id En – identifier for use with Itotes mode

1.5 Unit Price Setting

Unit price is changed by means of a parameter push-button (marked 'SW1') which is located in the calculator processing circuit board. The unit price may also be changed remotely when interfaced to a compatible Commission-approved fuel dispenser selfservice control device.

1.6 Calibration Adjustment

The instrument incorporates an electronic calibration facility for adjusting the calibration of the measurement transducer and is accessible via the calibration push-button 'SW2' on the calculator processing board. Switch SW2 must be sealed.

The range of the calibration factor is 0.0001 to 99.9999 and is used by the calculator to multiply the number of pulses received from the measurement transducer. To adjust the calibration of the measurement transducer, the calibration factor is determined using the following equation:

$$\text{new calibration factor} = \text{current factor} \times (\text{measured volume}/\text{displayed volume})$$

The calibration factor can be viewed and changed as follows:

- (a) Ensure that the nozzle is hung up.
- (b) Use the push-button switch SW2 to indicate the calibration parameter 'FActr' in the price display and the actual factor is indicated in the volume display.
- (c) Press and release switch SW2 in quick succession, until the desired decimal place is reached.
- (d) Holding down the push-button will cause the selected digit to increment; when the desired digit is displayed, release the push-button.
- (e) Repeat steps (c) and (d) until the desired calibration factor is displayed.

1.7 Pulse Generator

The system operates with any Compatible (#) NMI-approved pulse generators that produce signal frequencies below the maximum permissible 1.5 kHz.

- (#) 'Compatible' is defined to mean that no additions/changes to the hardware/software specified in this approval are required for satisfactory operation of the system.

1.8 Power Supply

The instrument requires a Transponder Technologies power supply unit (Figure 4) which converts the 240 V AC power supply to the required voltage for the T50 calculator/indicator.

1.9 Provision for Verification Mark

Provision is made for the application of a verification mark.

1.10 Provision for Sealing

The electronic calibration switch SW2 located on the calculator processing board (Figures 2 and 3) has provision for sealing with lead and wire.

1.11 Descriptive Markings and Notices

Instruments are marked with the following data, together in one location:

Manufacturer's name or mark	Transponder Technologies Pty Ltd
Model number	T50
Serial number
Pattern approval number	NMI S723
Year of manufacture
Environmental class	N

The minimum measured quantity specified for the fuel dispenser is marked on the face of the indicator in the form 'Minimum Delivery 2 L'.

TEST PROCEDURE No S723

Instruments shall be tested in conjunction with any tests specified in the approval documentation for the instruments 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 Schedule 1 of the *National Trade Measurement Regulations 2009*.

Tests

The software version number can be viewed using the push-button marked SW1 to display 'codE' in the price display and the volume display shows the version number.

FIGURE S723 – 1



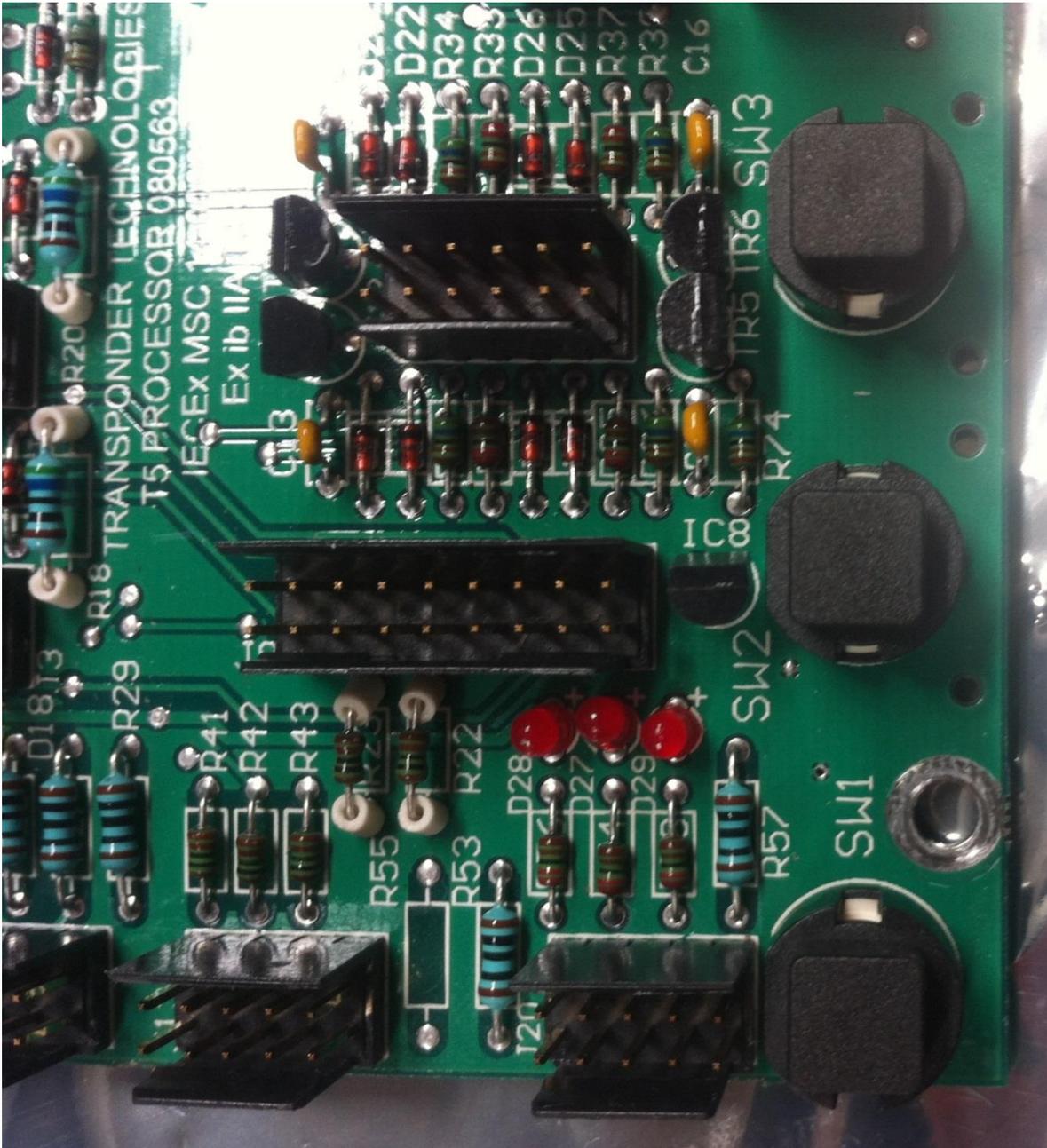
Transponder Technologies Model T50 Calculator/indicator for Bulk Loading Systems – The Pattern

FIGURE S723 – 2



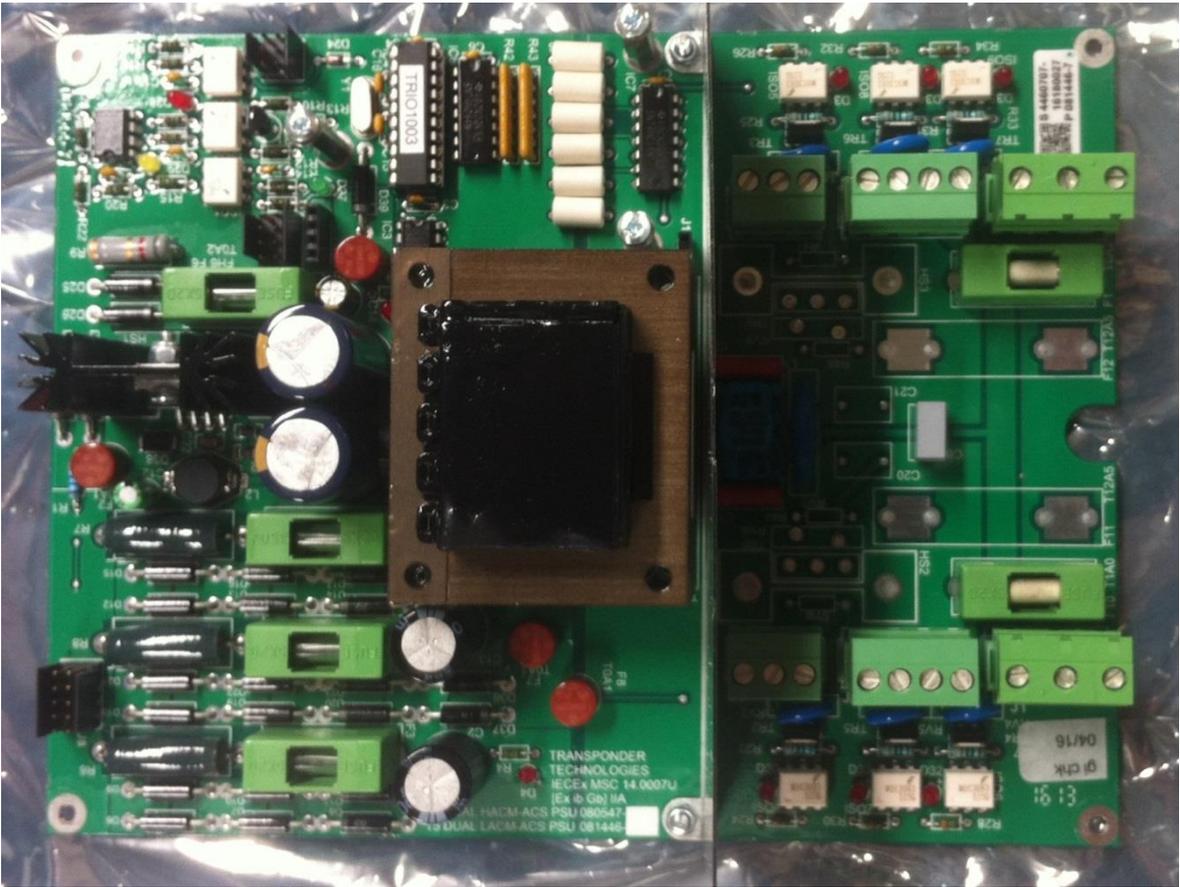
Transponder Technologies Model T5 Calculator/Indicator Processor Board

FIGURE S723 – 3



Please supply a photo of Configuration Switches – SW2 to be Sealed (pattern)

FIGURE S723 – 4



Please supply a photo of Transponder Technologies Model T5 Calculator/Indicator Power Supply Unit (pattern)

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