Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 6/14H/8

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.

Trakblaze Model Infinity In-motion Train Weighing Instrument

submitted by Trakblaze Pty Ltd
5 Mareno Road
Tullamarine VIC 3043

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 106, *Automatic Rail Weighbridges*, dated July 2004.

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 & variant 1 approved – certificate issued	8/11/24

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 6/14H/8' 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 Certificate No S1/0B.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

Special Conditions of Approval (pattern and all variants):

For this type of instrument, the ability to perform (and continue to perform) within specified maximum permissible errors can depend substantially on characteristics of the rail alignment and the stability of the material on which the rail sleepers rest (whether ballast, concrete footings or some other arrangement). However the National Measurement Institute is unable to clearly define particular requirements for material on which the rail sleepers shall rest.

It is the responsibility of the submittor to exercise control over any installation to ensure compliance with this approval and to ensure performance (and continued performance) within the appropriate maximum permissible errors.

The ability to perform within specified maximum permissible errors can also depend on characteristics of the rail vehicles being weighed (for example wagons with 'flat wheels', rubbing brakes or stiff couplings can be detrimental to performance). Consequently, rail operators have a responsibility to ensure adequate maintenance of the rail vehicles (otherwise maximum permissible errors may not be able to be met).

In the event of unsatisfactory performance, allowable accuracy classes or modes of operation may need to be altered, additional conditions imposed, or this approval may be withdrawn.

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

James Cantrill
A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 6/14H/8

1. Description of Pattern approved on 8/11/24

A Trakblaze model Infinity weighing instrument for the determination (by measurement of axle forces) of the total mass of a train, when weighed in motion.

Note: The system is not approved for wagon weighing – only total train weight values are approved for trade use.

The system is approved for inbound/outbound weighing only, where the empty train is weighed in one direction and the full train is weighed at the opposite direction.

The instrument is approved for class 1 or 2 train weighing, with a maximum wagon weight of up to 84 t, and a scale interval of at least 100 kg, over a speed range of 5 to 15 km/h.

1.1 Load Receptor

The Infinity LS system consists of a load receptor (Figure 1) incorporating two steel sleepers to each of which are fitted two Trakblaze model TB-INF-15t-130-0 double ended shear beam load cells (Figure 2) which support the rails.

In addition four Trakblaze model XZF-SS-20T lateral force sensors (Figure 3) are provided (inserted into holes drilled in the web of the rails), two at each end of the set of two sleepers fitted with load cells.

1.2. Track Switches

Four (4) Frauscher model RSR110 track switches (Figure 4) are provided and mounted as shown in Figure 1 and are inductively operated by the wheel flanges of the rail vehicles to sense the position of wheels of the rail vehicles. The track switches provide Trakblaze Infinity-LS software with logic signals to initiate the system, prevent the locomotive mass from being weighed, enable the instrument to determine the type of the wagon being weighed, monitor the train speed, and detect any reversal of train movement.

1.3. Controller

A Trakblaze model Infinity TB105-20-U2 controller is used. The controller receives input signals from the weighing transducers, track switches and lateral force sensors, and converts analogue signals from the TB-INF load cells to digital signals for communication to the Trakblaze Infinity software via Ethernet.

1.4. Power Supply

The weighing system operates from mains AC power (230 V AC, 50 Hz) and is powered by an uninterruptible power supply.

1.5. Interfaces

The instrument may be fitted with interfaces (including wireless) for the connection of auxiliary and/or peripheral devices. Any interfaces shall comply with clause 4.3.6 of document NMI R106 (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 in compliance with General Supplementary Certificate No S1/0B (in particular

in regard to the data and its format).

Indications other than the indications of measured mass (i.e. wagon and train weight information) displayed either on the indicator or on an auxiliary or peripheral device, are not considered to be approved under this certificate.

Instruments may be fitted with RS-232, Ethernet and switch inputs.

1.6. Software

The computing computer uses Trakblaze Infinity-LS designated v2.0.2 software to process the information provided by the load cells and lateral force sensors to determine weigh values. It also creates result files and total train weight reports, including indication of overspeed and underspeed conditions, the determination of unweighed and overweighed vehicles and to provide the operator interface. The personal computer is connected to a modem or network connection for the output of measurement reports.

The software version number can be seen by pressing “About” from the top menu bar.

1.7. Record

The system shall provide a record of measurement results. This may be provided by a personal computer (running Trakblaze Infinity-LS software).

The electronic record includes wagon identification, information to identify the particular weighing (e.g. date and time of weighing, or date and sequence number), speed and total train mass, and other error messages such as over-speed.

Note: Where an instrument is approved or verified for total train weighing only, the record should include a note “This instrument is restricted to total train weighing only”, or similar. In this case individual wagon mass values are not required to be included in the weighing report. However access to wagon weight values should be available for testing purposes.

1.8. Roll-back Detection

The system will stop registering weights when a roll-back of rail wagons occurs. The weighing process is only continued from the point reached before rollback commenced.

The record shall include a note “Rollback detected, train weight NOT FOR TRADE USE”, or similar.

1.9. Specifications

In-situ performance of the instrument will depend on site conditions and train configuration. It may therefore be necessary following in-situ testing (and in the light of results obtained) to restrict the range of operation in ways such as:

- Limiting the maximum or minimum wagon weights;
- Limiting the allowable speed range(s);
- A combination of both of the above.

Such restrictions shall be marked on the nameplate of the instrument and where operation occurs outside the acceptable range(s), weight values should not be

shown and an error message should appear (similar to an over-speed message as mentioned in ***1.7. Record*** above).

Instruments may have differing specifications as described above, but shall be within the limits shown below:

Accuracy class: train weighing	1 or 2
Maximum capacity	21.0 tonne per axle
Minimum capacity	5.1 tonne per axle
Scale interval	100 or 200 kg
Maximum wagon weight	84 tonne
Minimum wagon weight	20.4 tonne
Maximum operating speed	15 km/h or less
Minimum operating speed	5 km/h or more

Note: Configurations of any particular instrument shall be in accordance with the requirements of NMI R106 (e.g. in regard to the relationship between the above specifications) – in particular clauses 2.3 and 2.5.

1.10. Descriptive Markings and Notices

Instruments bear the following basic markings at each location having a weight indication or printing device (the values given are provided as an example only):

Manufacturer's name or mark	Trakblaze
Model designation	Infinity
Serial number of the instrument	…..
Pattern approval mark	NMI 6/14H/8
Accuracy class: train weighing	1 or 2
Maximum capacity	21 t per axle
Minimum capacity	5.1 t per axle
Scale interval	d = 100 kg or 200 kg
Maximum wagon weight	84 t
Minimum wagon weight	20.4 t
Maximum operating speed	v max = 15 km/h
Minimum operating speed	v min = 5 km/h
Maximum number of wagons per train (If less than 60 wagons)	n max …..

Note 1: The markings shall reflect details for which the particular installation has been verified. The maximum and minimum wagon weights and maximum and minimum operating speeds may vary from those shown in the specifications (***1.9 Specifications***) but shall be within the limits specified there, and will be dependent on the 'rail load cell' capacity specifications. For example, the maximum wagon weight will be related to the heaviest reference wagon used in verification testing.

Note 2: It is acceptable for more complex sets of markings to be provided. This may be necessary where (for example) it was necessary following in-situ testing to restrict operation to one speed range for wagon weighing and another speed range for train weighing. Such arrangements shall be clearly set out in the markings provided.

1.11. Verification Mark

Provision is made for the application of a verification mark.

1.12. Sealing Provision

Provision is made for calibration and set-up menus of the instrument to be secured with a passcode, without which alteration of these items is not possible.

In addition a non-resettable calibration counter ‘Last saved’ for each direction is incremented and with date and time stamp whenever any calibration adjustment or set-up parameter is altered. The values of the ‘Last saved’ at the time of verification shall be recorded on a destructible adhesive label attached to the instrument (so that any subsequent alteration to the calibration or parameters will be evident as the recorded value and the current calibration counter value will differ).

TEST PROCEDURE No 6/14H/8

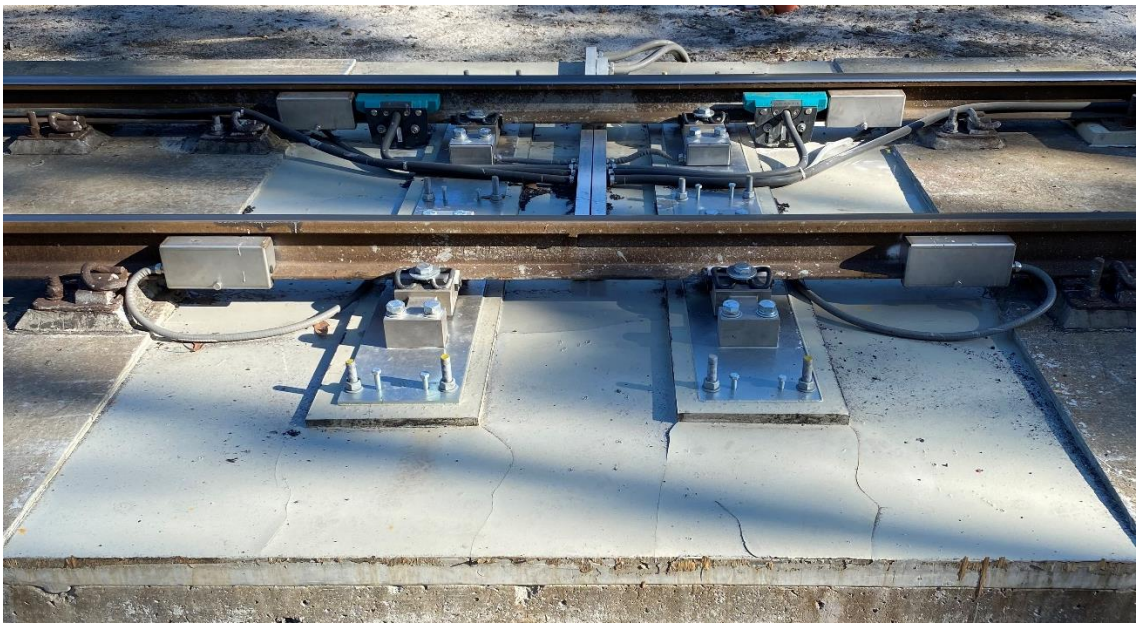
Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

Maximum Permissible Errors

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

FIGURE 6/14H/8 - 1

Trakblaze Model TB-INF-15t-130-0 load cell and Track Switch Mounting



Infinity LS System Load Receptor Incorporating Steel Sleepers and Lateral Force Sensors

FIGURE 6/14H/8 - 2

Trakblaze Model TB-INF-15t-130-0 Load Cells

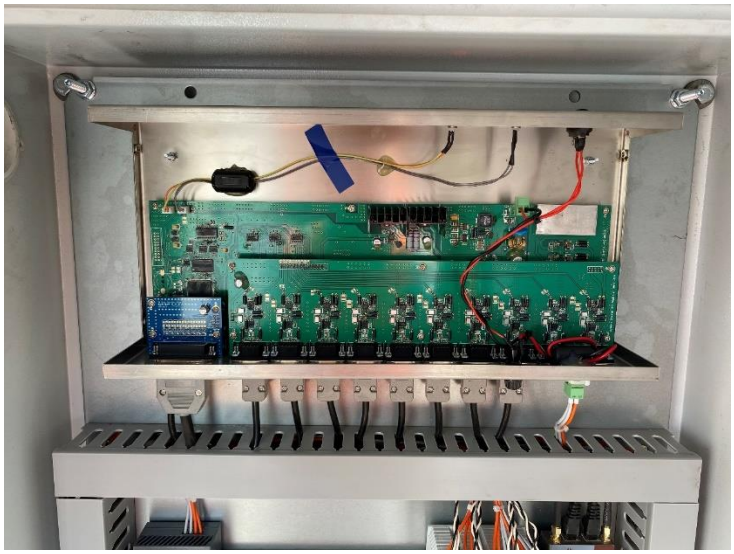
FIGURE 6/14H/8 - 3

Trakblaze Model XZF-SS-20T Lateral Force Sensor

FIGURE 6/14H/8 - 4

Frauscher Model RSR110 Track Switch

FIGURE 6/14H/8 - 5



Trakblaze Model Infinity TB105-20-U2 Controller Board

Electronics Cabinet

~ End of Document ~