



Australian Government
Department of Industry, Science,
Energy and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Instrument Certificate of Approval

NMI 13/1/12

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 instrument herein described.

Hyne Model Perceptron Dimensional Measuring Instrument

submitted by Hyne & Son Pty Limited
160 Kent Street
Maryborough QLD 4650

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 recognising that the intending use of the instrument approved herein is such that it is not appropriate to apply the conditions of document NMI R 129, *Multi-dimensional Measuring Systems*, hence the maximum permissible errors have been selected to meet the particular use of this instrument.

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 – interim certificate issued	13/03/07

Document History (cont...)

Rev	Reason/Details	Date
1	Pattern approved – certificate issued	4/04/07
2	Pattern reviewed & updated – certificate issued	4/04/12
3	Pattern amended (1.4 Indicator) – certificate issued	11/11/21

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with approval number 'NMI 13/1/12' 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.

Special:

The approval is limited to the instrument (serial number 1) located at Hyne Timber Mill, Phone Road, Tuan Forest QLD.

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 13/1/12

1. Description of Pattern

**approved on 13/03/07
amended on 11/11/21**

A Hyne model Perceptron dimensional measuring instrument (Figure 1) which is approved for use for the determination of diameter and length of forest timber logs ('stems') while they are in motion.

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

1.1 Details

The pattern is approved for use for the determination of the linear dimensions of forest timber stems having centre diameters between 100 mm and 400 mm (with a scale interval of measurement (d) of 0.1 mm) and lengths between 2.4 m and 20 m, (with a scale interval of measurement (d) of 1 mm). (Note that the indicator may display to more decimal places than apply to the scale intervals.) The instrument is approved for use with a minimum belt speed of 100 m/min and a maximum belt speed of 130 m/min.

1.2 Scanner For Diameter Measurement

Four Perceptron (USNR) model C1000-X000-Y0466-Z1275 Digital Contour Sensors (Figure 1) are used to determine the cross-sectional diameter of each stem. Each sensor consists of a laser beam, a mirror and CCD image receiving matrix. The sensors are housed in a dark environment to limit external light influences. The sensors are positioned using a calibration cross (Figure 1) located in a repeatable position on the centreline of the sensors and the longitudinal axis of the chain. Mechanical and computer adjustments are used to correctly position the four sensors.

1.3 Length Measurement

The length is determined by an Allen Bradley model 42CME8EZBD4 Laser Sight Photo Switch Transmitter and model 42CMR8MPBD4 receiver that triggers a pulse encoder at the start of a stem and terminates at the end of the stem. The photoelectric transmitter and receiver are housed in the same location as the laser sensors. The pulse encoder is a BEI model H40A-500-ABZC-4469-LED-SC-S and is mounted directly to the head pulley of the transport chain.

1.4 Indicator

A Dell Precision 3930 personal computer or equivalent (*) using NSC_Scan version 7.xx software provides the indication of all data associated with the system measurements. The data from the laser sensors is captured and determines the diameter at the mid point of the stem length. The length information is also captured and is used with the mid point diameter as the inputs to a stem volume calculation using the Huber formulae.

The indicator displays images of each stem profile and provides diameter and length displays. Other data related to the measurements is also displayed.

- (*) 'Equivalent' is defined to mean other proprietary equipment of the same or better specifications requiring no changes to the software specified in this approval for satisfactory operation of the system.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Access to the calibration adjustments is restricted to authorised personnel.

1.7 Markings

The instrument carries the following markings:

Manufacturer's mark, or name written in full	Perceptron
Serial number of the instrument
Pattern approval mark	13/1/12
Maximum/minimum centre diameter	400/100 mm
Maximum/minimum length	20/2.4 m
Scale interval for diameter	$d = 0.1$ mm
Scale interval for length	$d = 1$ mm
Maximum belt speed m/min
Minimum belt speed m/min
Serial number of all scanners (#)
Serial number of photoelectric transmitter (#)
Serial number of photoelectric receiver (#)
Serial number of pulse encoder (#)

- (#) May be located on separate nameplates or tags to simplify component replacement, if required.

TEST PROCEDURE No 13/1/12

NOTE: This approval has been granted recognising that the intending use of the instrument approved herein is such that it is not appropriate to apply the conditions of document NMI R 129, *Multi-dimensional Measuring Systems*, hence the maximum permissible errors have been selected to meet the particular use of this instrument.

The instrument is tested using six (6) reference test pieces. These test pieces are constructed of steel tube of known length with a known diameter section in the centre of each test piece. The test pieces represent the range of sizes of logs being measured and are nominally:

- 100 mm diameter x 2400 mm long;
- 400 mm diameter x 5400 mm long;
- 315 mm diameter x 8500 mm long;
- 135 mm diameter x 12 200 mm long;
- 210 mm diameter x 19 000 mm long; and
- 160 mm diameter x 15 500 mm long.

Each test piece is measured for length and centre diameter prior to the commencement of the test using certified length measuring instruments.

The test pieces are driven back on the conveyor chain to a defined 'start' point for each test to ensure that they are at the correct operating speed before entering the scanner.

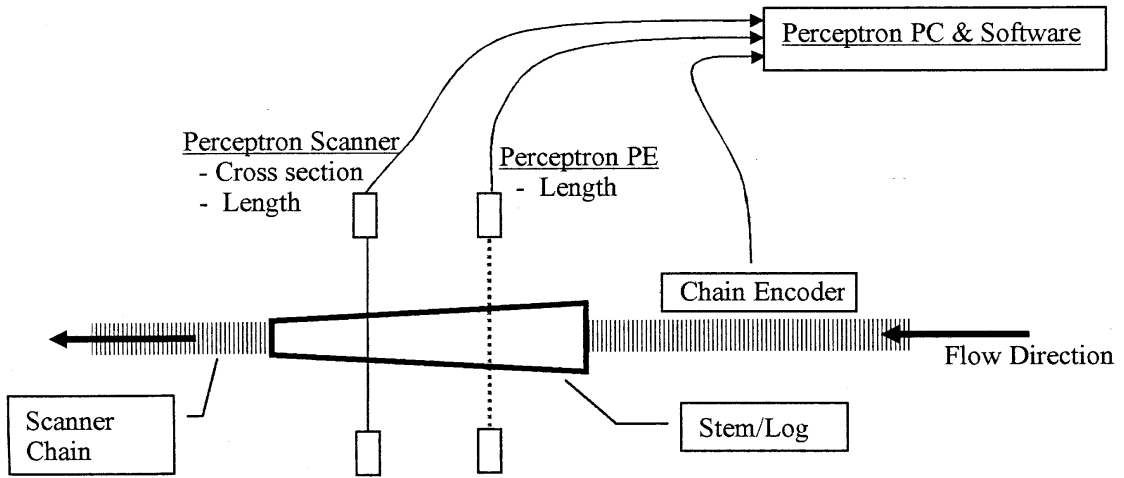
Note: Any alteration to the alignment either mechanical or electrical of the Perceptron sensors OR replacement as well as any adjustments/replacements of the photoelectric transmitter and receiver OR pulse encoder OR chain speed will be considered to have altered the calibration making the verification invalid.

Maximum Permissible Errors at Verification

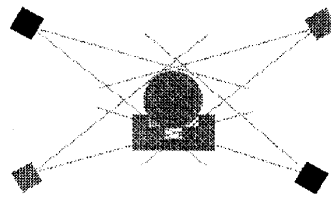
The maximum permissible errors are:

- ± 1 mm for diameter; and
- ± 10 mm for length

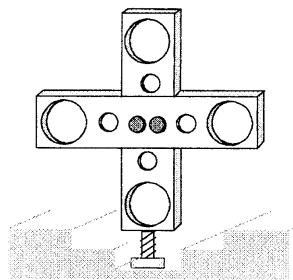
FIGURE 13/1/12 – 1



System Overview



Sensor Layout



Calibration Cross

Hyne Model Perceptron Dimensional Measuring Instrument

~ End of Document ~