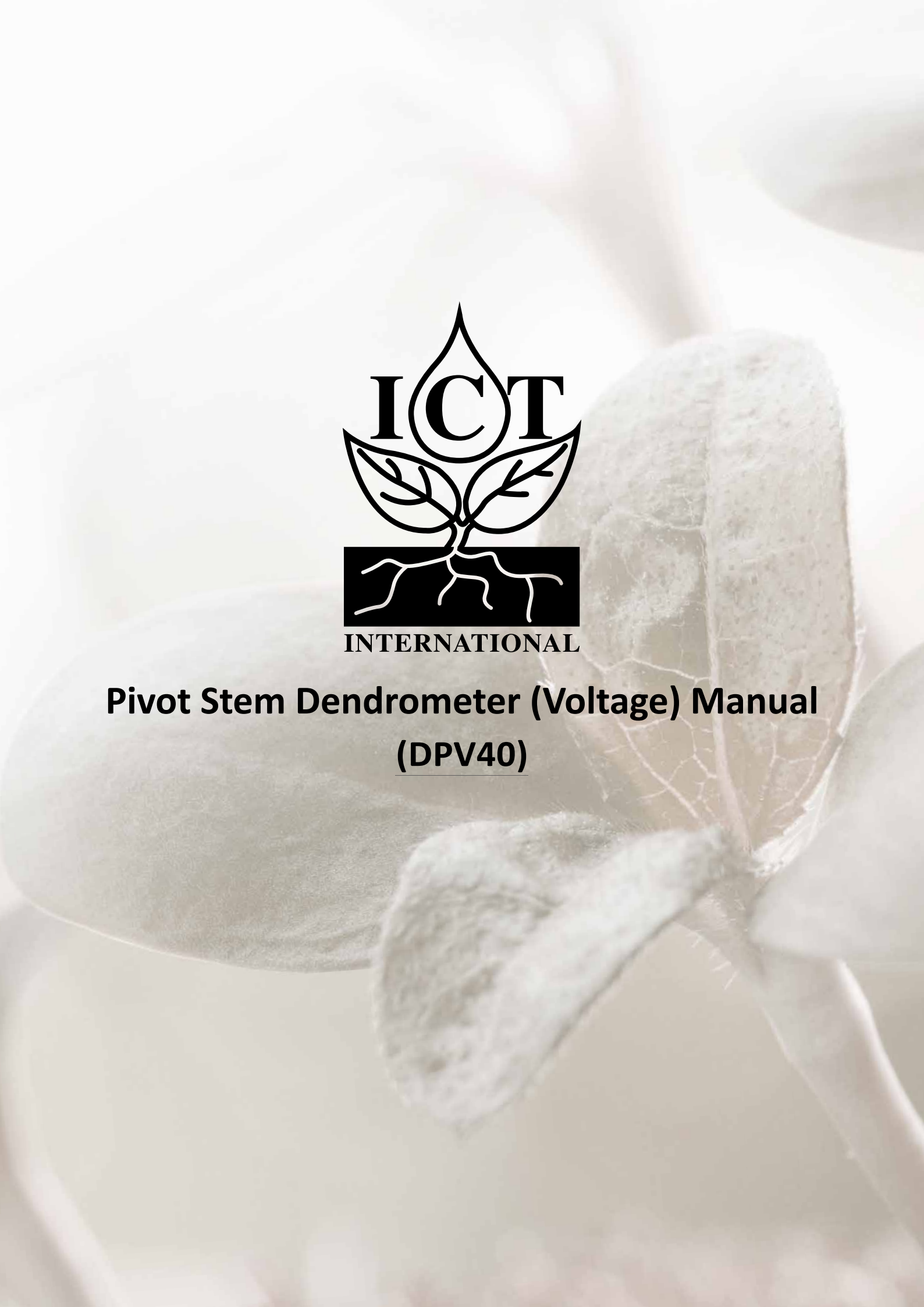


Pivot Stem Dendrometer (Voltage) Manual (DPV40)

Contents

1. Introduction

The DPV40 Pivot Stem Dendrometer is a pivot-based sensor for measurement of small stems, from 5mm to 40mm.

The DPV40 Pivot Stem Dendrometer is designed for the measurement of the diameter of small stems or branches between 5mm and 40mm. Required supply is 5 to 12 VDC, with a sensor output of 1000 to 1700 mV which can be converted to a raw stem circumference over the measurement range.

The sensor is designed with respect to easy and fast installation. It is fastened on the measured object by three pressure levers; the central jib turns the rotary position sensor proportionally to the object diameter. Adherence pressure is set as a compromise between the influence on plant tissues and installation stability. The bearing of the position sensor is carefully shaped for minimal effect of temperature and axial forces.

2. DPV40 Voltage Configuration

2.1 Calibration Script

The DPV40 pivot dendrometer is used to measure stem circumference changes over 5-40mm. The linear output, in milivolts, can be converted to a raw stem circumference over the 5-40mm scale by using the following script:

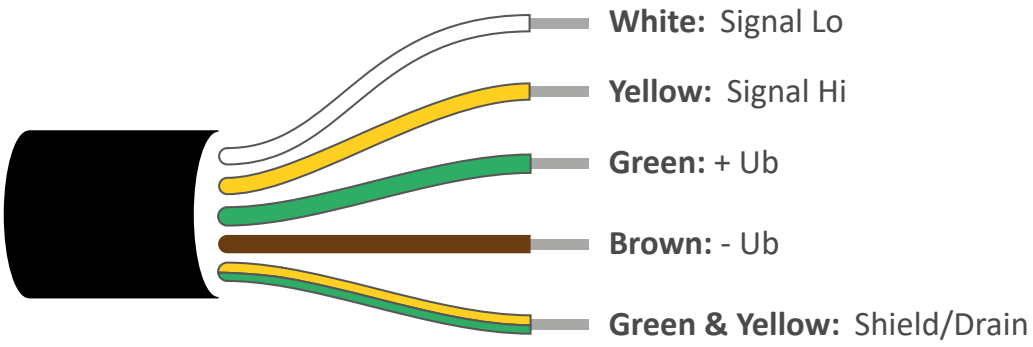
Raw [mm] = -57.2 + [mV]*0.0572

3. DPV40 Specifications

3.1 Electrical and Mechanical Specifications

Increment Sensor Type	Pivot
Measurement Range	5 to 40mm Circumference
Accuracy	> 0.5mm
Linearity	± 0.5% of full scale
Resolution	1.24 µm
Supply Voltage	5 to 12V DC
Current Consumption	20 µA - Idle; 6 mA - During Measurement
Tightening Strength	1.5 to 2N lateral levers, 2 to 3N central sensing jib
Temperature Measurement Accuracy	±0.2°C
Operating Environment	-40 to 60°C
Warm-up Time	300 ms
Connection	Three wire Escha M8 connector (male)
Mass	150g
Protection	IP67

3.2 Wiring Diagram



4. DPV40 Installation Process

4.1 Installation Process

The DPV40 unit is self-clamped to the tree trunk or stem by a spring-loaded clamping system following the instructions below.

Step 1: Opening & Positioning The Stem Within DPV40

Select the installation site. Open the DPV40 using the hand position as shown and position over the selected installation site.

Step 2: Releasing the DPV40 Springs To Clamp Back

Gently allow the springs to clamp back onto the installation site, as shown.

Step 3: Ensure Spacing

Ensure that the white body of the DPV40 sensor is not touching the stem so that the measurements remain unaffected.

Warranty & Service Terms

What is Covered

All products manufactured by ICT International are warranted to be free from defects in materials and craftsmanship for a period of one (1) years from the date of shipment from our factory. To be considered for warranty coverage an item must be evaluated either at our factory or by an authorized distributor.

What is Not Covered

The customer is responsible for all costs associated with the removal, re-installation, and shipping of suspected warranty items to our factory. The warranty does not cover equipment that has been damaged due to the following conditions:

1. Improper use or abuse.
2. Operation of the instrument outside of its specified operating range.
3. Natural occurrences such as lightning, fire etc.
4. Unauthorized modification.
5. Improper or unauthorized repair.

Who is Covered

This warranty covers the original purchaser of the product or other party who may own it during the warranty period.

What We Will Do

At no charge we will:

1. Either repair or replace (at our discretion) the item under warranty.
2. Ship the item back to the customer by the carrier of our choice. Different or expedited shipping methods will be at the customer's expense.

How To Return An Item

1. Please do not send any products back to ICT International until you have filled out an online RMA (Return Merchandise Authorization) and have been advised to return the item by our service team. The form can be found at http://www.ictinternational.com/support/rma-form/. We will use your RMA number for tracking of the service item.

2. Send all RMA sensors and meters back in the following condition: Clean the instruments exterior. Do not modify the sensors or wires, including splicing, cutting wire leads etc.

3. Please write the RMA number on the outside of the shipping container.

4. Return the item with freight pre-paid and fully insured to our factory address shown below. We are not responsible for any costs associated with the transportation of products across international borders.

5. Upon receipt, ICT International will determine the cause of failure. If the product is found to be defective in terms of operation to the published specifications due to a failure of product materials or craftsmanship, ICT International will repair or replace the items free of charge.

Repairs / Replacement

If it is determined that your product is not covered under warranty, you will be informed and given an estimated repair/replacement cost. The available remedy of defects under this warranty is for the repair or replacement of the original product, and ICT International is not responsible for any direct, indirect, incidental, or consequential damages, including but not limited to loss of income, loss of revenue, loss of profit, loss of wages, loss of time, loss of sales, accruement of debts or expenses, injury to personal property, or injury to any person or any other type of damage or loss.

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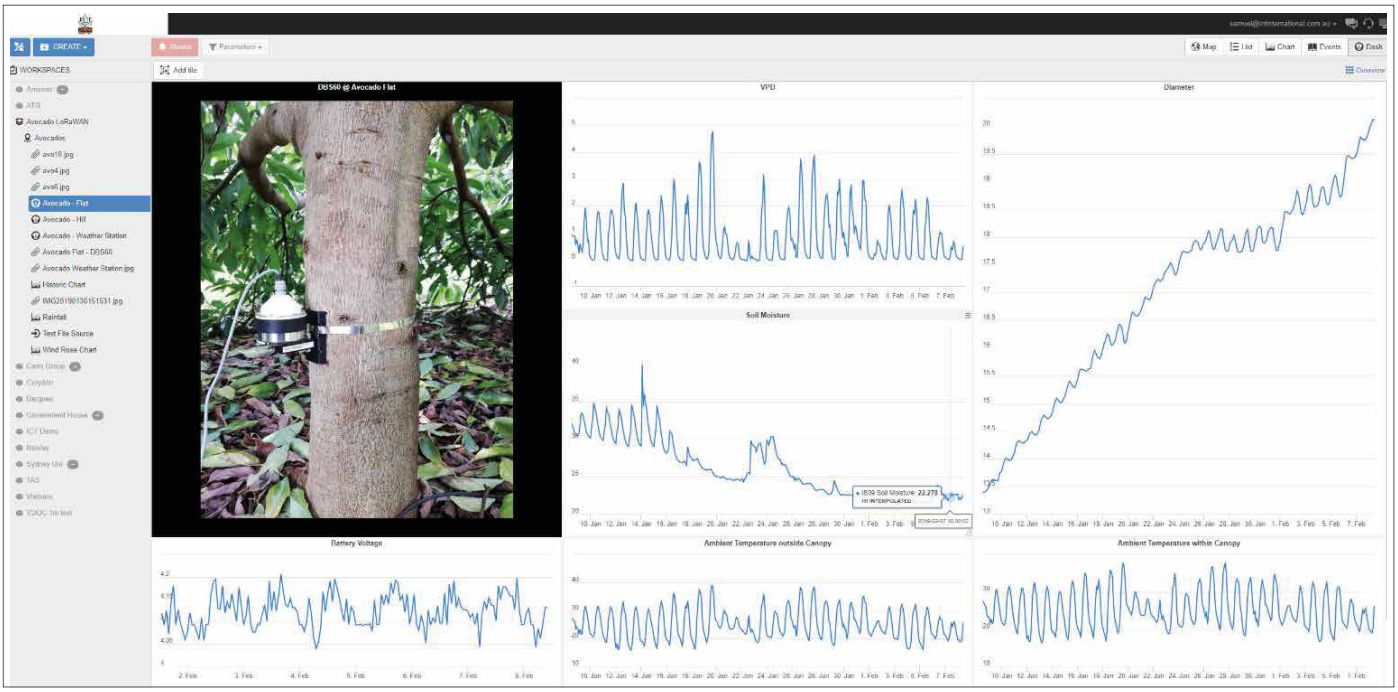
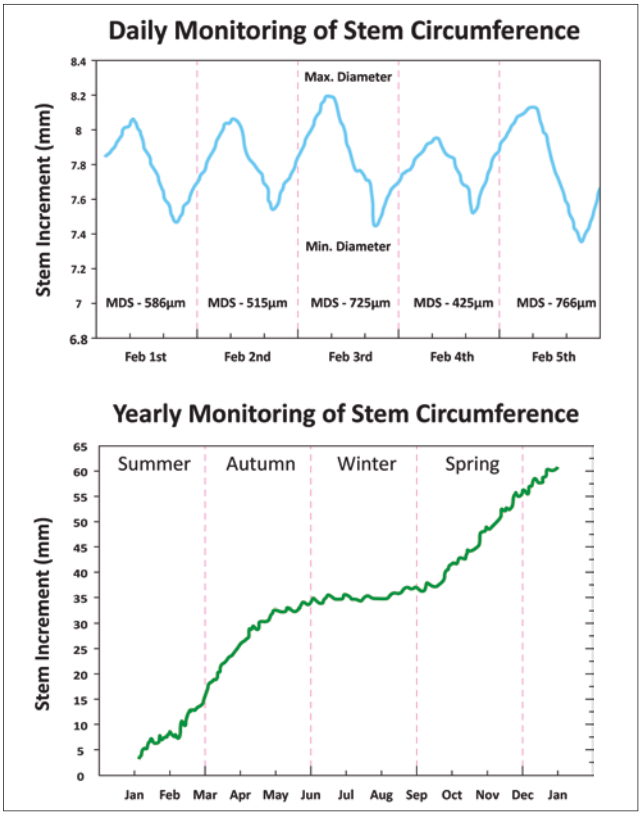
2. Features of DPV40 Voltage Dendrometer - 60mm



The DPV40 is ideally supported by the Dendrometer Meter (DEN1), a wireless, stand-alone logging instrument available from ICT International. The DEN1 can support up to 5 x DPV40 sensors. For complete monitoring solutions, the DPV40 is used in combination with the Sap Flow Meter (SFM1), Stem Psychrometer (PSY1), Light Sensor Meter (LSM1) or the ICT International automatic weather station.

2.1 Daily Monitoring

Maximum Daily Shrinkage i.e. The maximum daily stem diameter minus minimum daily stem diameter (see Figure right). Or monitoring the shrinking and swelling of a stem on a daily basis.



2.2 Monthly Monitoring

Monitor stem growth over a single or multiple growing seasons. Ideally suited to experimental treatments such as fertilisation treatments, pruning, thinning or drought treatments.

2.3 Yearly Monitoring

The DPV40 is manufactured from UV resistant plastic for many years of data collection. The figure (see right, bottom) is an example of 12 months of data set from an Acacia implexa growing near Armidale, NSW, Australia.

5.2 Optional Tool For Initial Tensioning

This new helps to install the sensor on stem. By blocking the sensor is blocked in a position suitable for comfortably inserting the tape below the bar. See pictures:

The tool fall down itself from pin after releasing the spring during setting the arrow on the scale.

Never set the arrow to zero; consider possible stem shrinkage..