4 Quick Start Guide

NOTE 3: This manual includes hyperlinked instructional videos to complement each major section for both practical operation and software function. These videos are located on the ICT YouTube site www.ictinternational.com/videos.html you will require internet access to view the videos whilst reading the manual. Alternatively, the videos are supplied on a DVD together with the manual when you purchased the SFM1 Sap Flow Meter. Videos on DVD can be supplied by ICT upon request.

4.1 Charge the SFM1 Internal Battery

The SFM1 is a self-contained instrument that incorporates a lithium polymer battery. Before using the instrument, this battery MUST be charged. To choose from a range of charging options see Connecting a Power Supply to the Instrument

NOTE 4: A unique power-bus plug design was developed by ICT to simplify the electrical wiring process. It minimises the need for custom tools in the field requiring only that the outer cable sheath be stripped back to expose the copper wire. No other tools are required as all necessary components and fixings are fully incorporated into the instrument design. Retaining straps ensure the power-bus plugs do not separate from the instrument when removed from the power-bus during wiring preparation and connection of external power.

4.2 Install the SFM1 Software & USB Driver

Insert the supplied CD into the computer. The CD will auto-run to present a menu. Choose install software; see - Software & USB Driver Installation for details.

4.3 Turn the Instrument On

The SFM1 can either be turned on manually by pressing the power button (see - Turn the Instrument On) or automatically by connecting an external power supply (see – Charging - Powering the Instrument).

4.4 Connect to the Instrument

Connect the USB cable to the instrument. The SFM1 will automatically be detected by the computer, the same as any USB device. Double click the SFM icon on the Desktop to open the software and click the icon “Connect to SFM”, then search for and select the named instrument from the connections Window. See section Communications - Connect to the Instrument for details.

4.5 Perform a Verification Test

Before installing or commencing a large field campaign it is recommended that a performance verification test be conducted on the SFM1 Sap Flow Meter. This is best done using the Test Block (SFM-TB) which is designed to return a known sap velocity.

4.6 Install the Sap Flow Meter

Installation of an SFM1 Sap Flow Meter is not quick! Care must be taken in the preparation of the stem surface to remove loose fibrous bark to provide a reference point to work from. The depth of bark and sap wood thickness must be determined to enable correct placement of the measurement needles in the tree. Finally, drilling must be done slowly and carefully to ensure straight parallel holes are produced so as not to affect the physics of the underlying Heat Ratio Method theory. See Install the Sap Flow Meter for details.

4.7 Set the Logging Interval

The SFM1 Sap Flow Meter has a minimum temporal logging resolution of 10 minutes. This limit is imposed by the thermodynamics of heat movement through a woody matrix. After inputting a pulse of heat into the stem, it must be allowed time to dissipate before applying another pulse of heat. Failure to do so may result in an accumulation of heat in the stem that will introduce error into your results.

NOTE 5: Additional (more frequent) logging intervals are provided for researchers who wish to specifically investigate the time interval required for heat dissipation in specific species, under specific conditions at different Pulse Energy settings. See Measurement Control for details

4.8 Download Data

Data can be downloaded in a number of ways. The simplest is to click the green Download Data icon on the main window under Instrument Information. If a data file exists on the Micro SD card then a Windows Explorer window automatically loads providing a choice of directories to save the data file to. Alternatively, the Micro SD card can be physically removed and read by a computer. See Download Data for details.

4.9 Analyse Data

Data can be saved in either a Comma Separated Values (*.CSV) file format in Sap Flow Reporting Option or a Binary (*.BIN) file format in Needle Temperature reporting mode. Both file formats are supported in the SFT Sap Flow Tool Software that was specifically designed and developed for data analysis, processing and interpretation of Heat Ratio and Heat Field Deformation Sap Flow Data. ICT recommends SFT software for all Sap Flow Data analysis and all technical support is provided using SFT Software.