

D1 - Point Dendrometer

— handbook —

Potentiometer based point dendrometer brings the possibility of precise automatic measurement of the stem diameter changes $< 1 \mu\text{m}$ in user defined intervals. Point dendrometers enable the concurrent measurement of wood and bark changes separately and they are especially applicable to measurement of stems with irregular or very large perimeters. Sealed body and robust construction make the device resistant to extreme environmental conditions. Thermocouple placed in the bottom of the body enables the ambient temperature measurement and accurate correction to thermal-based deviations. Data-logger unit with high capacity lithium battery inside enables ~ 10 years of autonomous measurement with only minimal maintenance. Single-screw attachment to the stem avoids tensions in construction and incorrect measurements. D1 point dendrometers combine resistant construction and low price, facilitating measurements over large spatial scales in harsh environment.



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Specification

Span	8 890 μm
Resolution	0.27 μm
Linearity	< 5 %
Battery life	~ 10 years
Memory capacity	~ 14 years in 15 min intervals
Size of main body	25 x 113mm

Installation

Choose installation area, debark it and clean it. Choose appropriate installation area on the tree stem without knots or injuries. In case of thick secondary bark, remove it carefully using an appropriate tool (barking iron, sharp axe, knife) until living inner bark is visible (bark could be drilled out in case of the placement of the measuring point directly on the wood). Clear the installation area from remaining dirt.



Bore hole into the stem using drill bit and drill-guide. Place the upper drill-guide hole to the intended placement of the dendrometer measurement point and bore hole ≥ 40 mm in depth through the lower drill-guide hole using 4-5 mm drill bit (3/16"). Make sure that drilled hole is perpendicular to the tree stem surface.



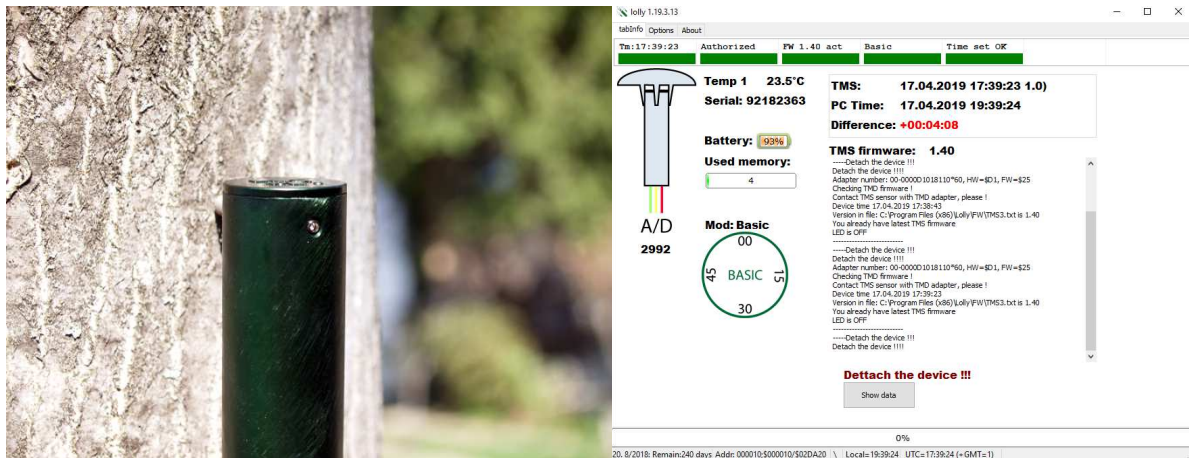
Drive the combine screw into the drilled hole. The metric-thread and the non-thread parts of the combine screw should be outside of the hole. You can use two nuts and wrench or screw-tight tool.



Install dendrometer. Put one hexagonal nut first and screw it to the end of the metric thread, then put the dendrometer as shown on figure. Do not squeeze dendrometer spring at this moment. Put second hexagonal nut, arrange dendrometer to final position and preload the dendrometer spring by one or two spins of the second (outer) nut. Tighten the first (inner nut) to dendrometer body by hand and tighten one of the nuts using wrench.



Check your installation. If you are not sure about preloading of the dendrometer spring, check it by using the Lolly manager (unticked all upper boxes in Option window). Optimal preload is between 200-1000 μm .



Hints

Resin ducts – be aware of placing the measuring point of dendrometer to or below the disrupt resin duct

Large trees – install more dendrometers from different sides of tree

Temperature – if it is possible, install from the side of the tree where sun is not shining the most of the day

Annual growth – note the span of dendrometer and compare it with annual growth of tree, check and reinstall dendrometer at least once a year

Check tree reaction – if the cambium is reacting excessively to the attaching screw of dendrometer, reinstall dendrometer over some period

Move the stainless steel rod – to clean it from dust every time the dendrometer is reinstalled