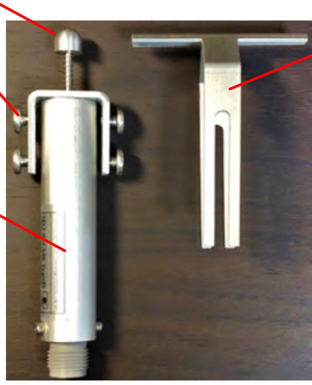
Dendrometer MIJ-02 LMS Manual

This manual explain how to install the MIJ-02 LMS.
Branches and trunks are relatively easy to install, but soft samples such as herbaceous stems require some ingenuity, so this manual will mainly explain the installation for stems first.



LMS Parts

<Installation for Stem>

Attach the hammer head to the stem. Cut the Ept Sealer to an appropriate length (1.5 rolls)and fix the hammer head and stem.

Be sure to wrap the Ept Sealer up and down to fix it as picture shown.Make sure the stem is along the groove of the hammerhead.

Finally, cable tie fneed to wrap from the top of the Ept Sealer.
At this time, lightly tighten so as not to hinder the growth of the stem.

Insert LMS body into the hammer head.

This is view from above, you can see that the contact head is in contact with the stem.
You can also see that the spring is not shrinking.

Push the LMS body toward the stem by 1 to 2 mm.
This process is important to apply initial tension.

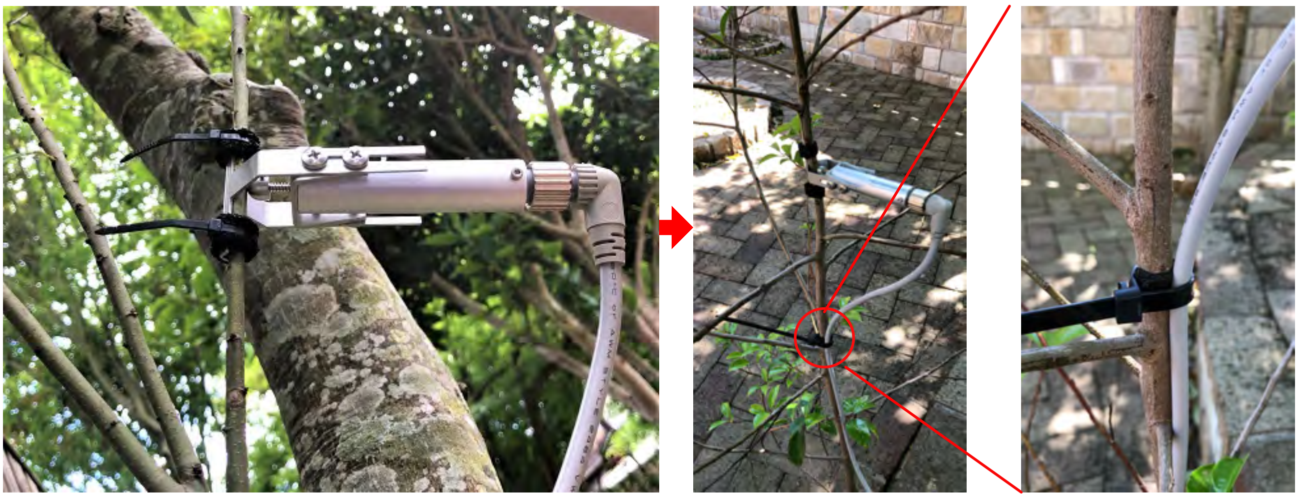
This photo is extremely shortened for the sake of explanation.
Originally, shrink it by about 1 to 2 mm.
Tighten the hammer head fixing screws with the spring shrinked as picture shown.

* Be sure to tighten all 4screws.

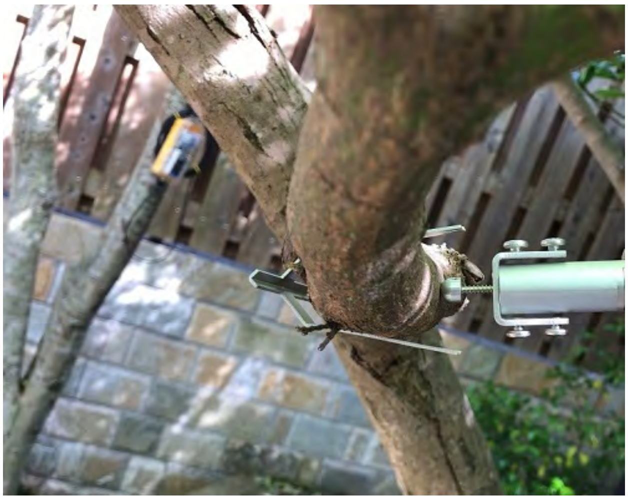
After installing the sensor, insert the splint into the ground and secure the cable to the splint.

Please use 2 cable tie to securecable to the splint.

<Installation for branch and trunk>



Unlike the stem, it can install without a splint. Installation method is same as stem installation so please see <installation for stem>.
Be sure to fix the top and bottom of the hammer head to the branch or trunk with the Ept Sealer and Icable tie.

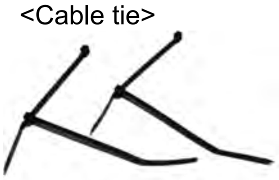


Note :
The above picture is a bad mounting example where the hammer head does not correspond to the diameter of the trunk. Be sure to use a dendrometer of the appropriate size.
Targets that cannot be measured by LMS can be handled by LMM or MIJ-02 Rotary.

<Installation for higher place>

If the branch or trunk you want to measure is in a high position, crawl the cable around the trunk to fix it, but if the cable is stretched too much, the sensor will be pulled when the branch shakes due to the wind.
It is important to loosen the cable near the sensor a little as shown in the figure. When fixing the cable to the trunk, fix it in two places with cable tie.

<Cable tie>



There is a limit to the length of the insulator, so if one is not enough, use a combination of two insulators.

MIJ-02 LMS/LMM Dendrometer Wiring

Connect the sensor to a data Logger.
Brown goes to Power port of datalogger
Blue goes to Signal out put + of datalogger
Black goes to Ground of datalogger

Datalogger should be used as single-end. If your datalogger is differential only, connect signal ground and power ground.

Regression Equation (Output)

dr=11000*(Vout/ Vpre) / (1+SQR2)
dr: Radius displacement, Vout: Output mV, Vpre: Power Voltage mV, SQR: Square root (or 1.41421)

For instance, if the datalogger power is 5V then Vpre will be 5000mV and the Vout will be the output that datalogger shows.

If the datalogger 5000mV power and the datalogger output is 1234mV then
dr=11000*(1234mV/5000mV) / (1+SQR2).
So the result will be 1124.506 micro meter

LMS Specification

Range	φ1.5mm~23mm
Output	Ratiometric (eg: When preheat 5V then output full scale is also 5V)
Resolution	0.911um/mV
Power	5VDC (<1mA at 5VDC)
Withstand Voltage	<18VDC
Sliding Resistance	<0.3N
Spring Constant	Standard (for wood) 0.3N/mm, Medium (for plants without wood)0.1N/mm
Linearity	±1%
Thermal Characteristic	＜-0.126um/DEG
Waterproof	IP67

LMM Specification

Range	φ18mm~50mm
Output	Ratiometric (eg: When preheat 5V then output full scale is also 5V)
Resolution	0.911um/mV
Power	5VDC (<1mA at 5VDC)
Withstand Voltage	<18VDC
Sliding Resistance	<0.3N
Spring Constant	Standard (for wood) 0.3N/mm, Medium (for plants without wood)0.1N/mm
Linearity	±1%
Thermal Characteristic	＜-0.126um/DEG
Waterproof	IP67