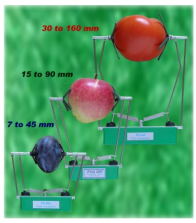
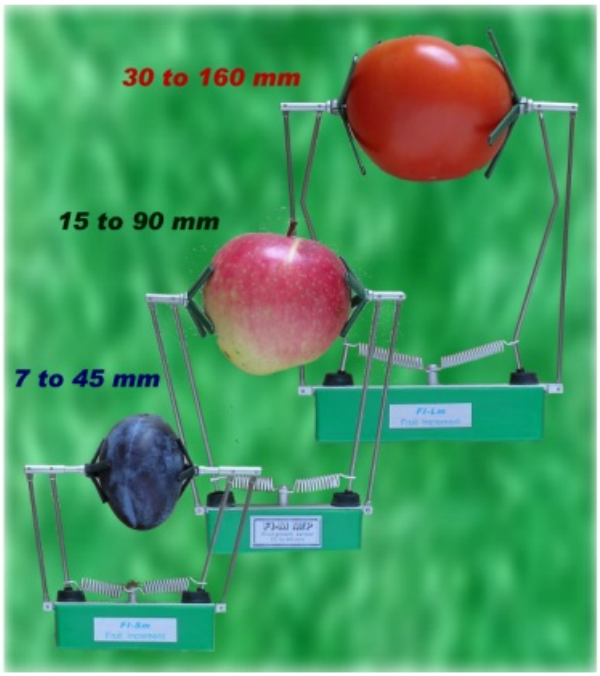


Bio Instruments FI-ST-485M Fruit Growth Sensors and System for Monitoring Growing Plants User Guide

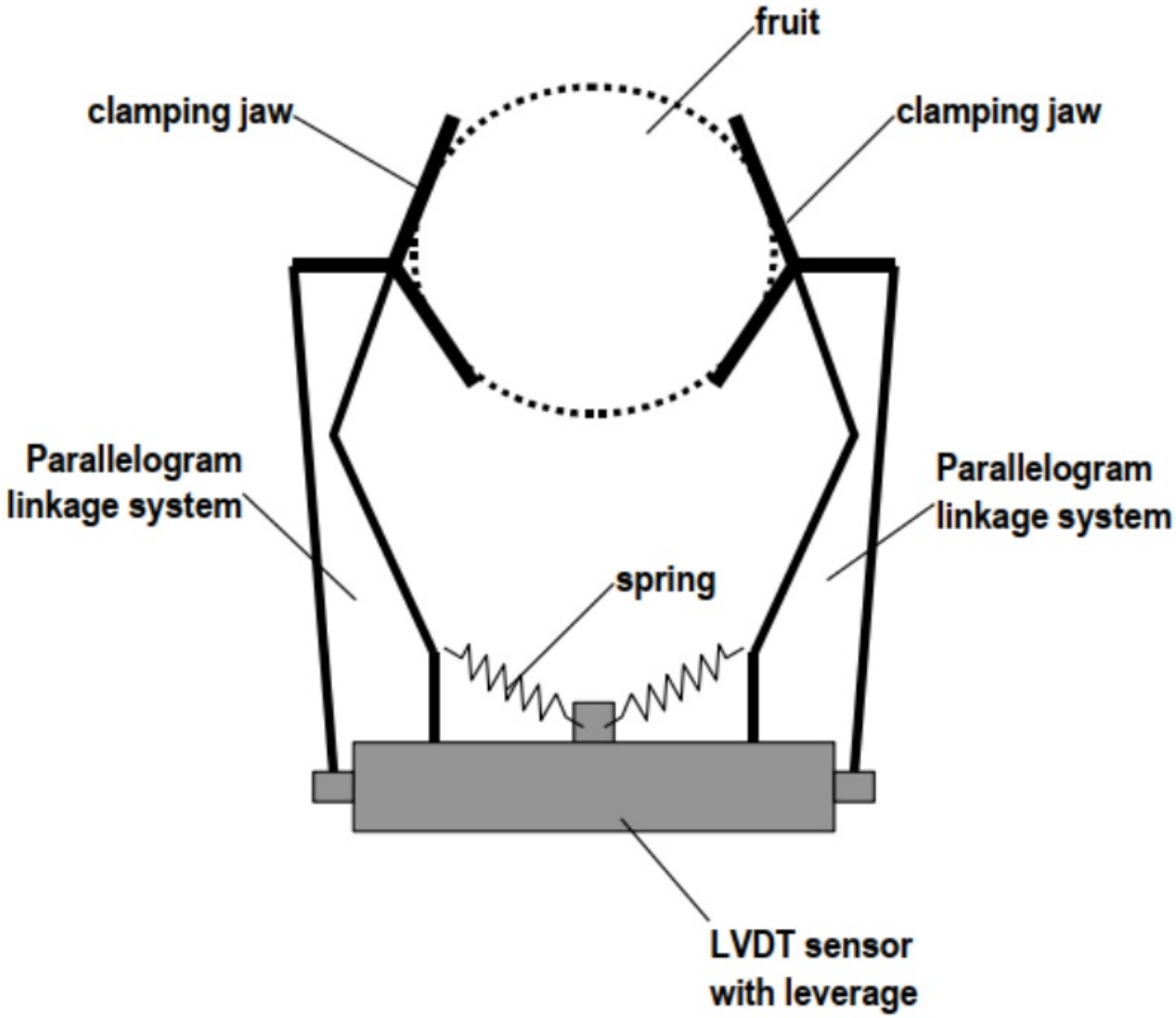
Bio Instruments FI-ST-485M Fruit Growth Sensors and System for Monitoring Growing Plants



Contents

Introduction

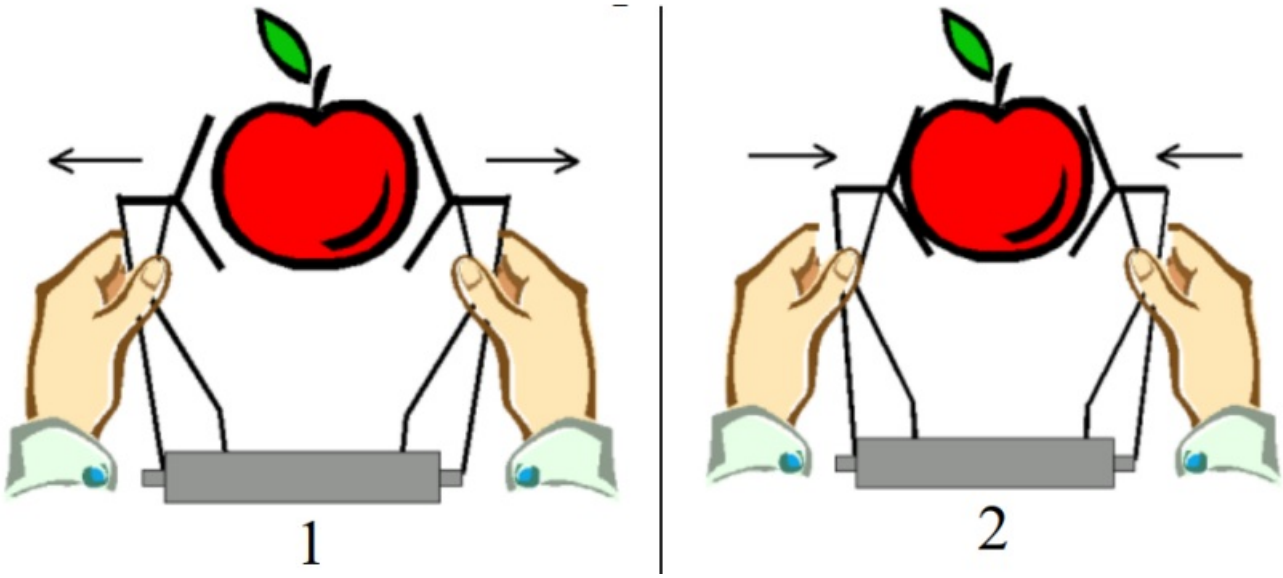
A series of absolute displacement sensors provides recording both size and growth rate of intact rounded (like tomato and apple) and oblong (like cucumber and banana) fruits in three diameter ranges within 7 to 160 mm. Original parallelogram design of moving arms provides firm and straight positioning of the sensor on a fruit under study. The FI-type sensor consists of an LVDT transducer mounted in a special clip, and a DC powered signal conditioner.



Interface: RS-485.
Protocol: Modbus RTU.

Installation

- Choose a fruit for attaching the sensor.
- Move clamping jaws apart so as the sensor can hold the fruit in the desired position.
- Check if the sensor holds the fruit firmly and cannot easily slide down with application of gentle force.
- Secure the sensor’s cable on a stem to prevent occasional movement of the sensor.
- Check the position of the sensor regularly.



Connection

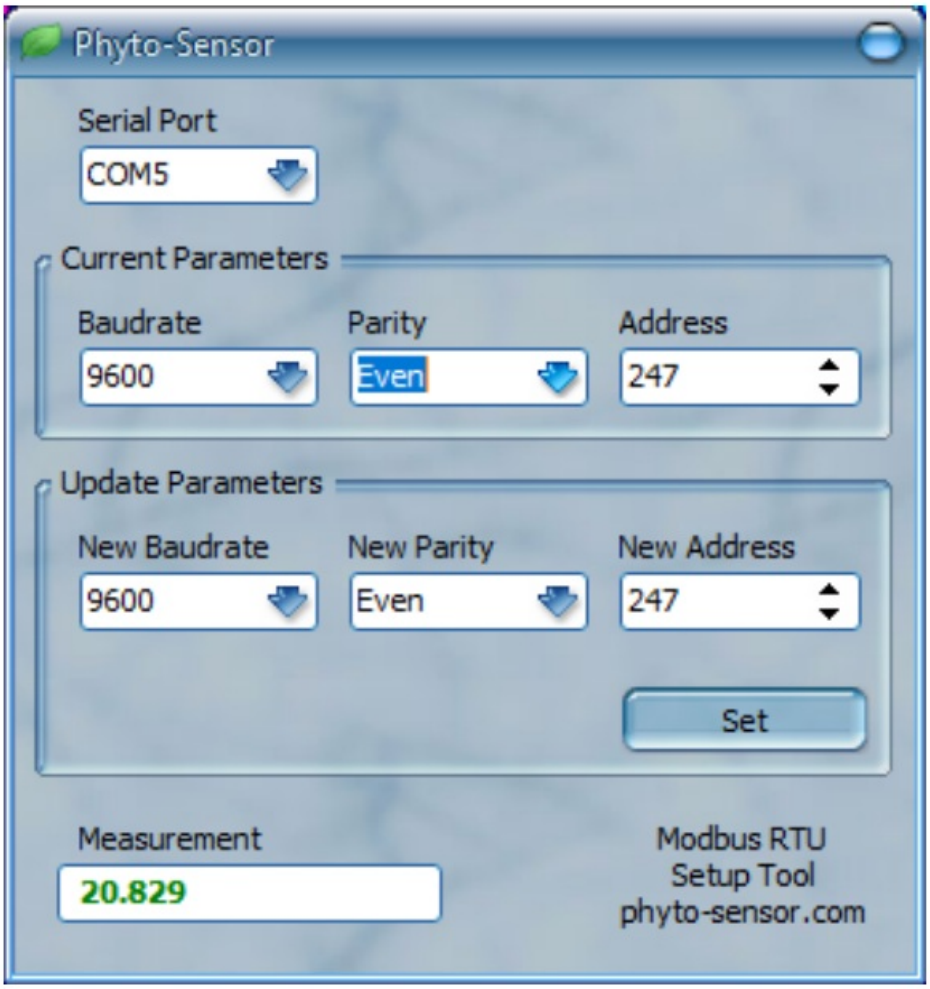
The sequence and correctness of the connection must be observed!
Connection order

1	Black	Ground
2	Yellow	Output RS485-B
3	White	Output RS485-A
4	Red	Power 5 to 24 Vdc

Important notes:

1. The sensors interface meets the requirements of the EIA RS-485 (TIA-485) standard, and shall be connected accordingly. It is important to note that the termination resistor is not internally installed in the sensor.
2. The EIA RS-485 Specification labels the data terminals as “A” and “B”, but many manufacturers label their terminals as “+” and “-“. It is commonly accepted that the “-” terminal should be connected to the “A” line, and the “+” terminal to the “B” line. Reversing the polarity will not damage a 485 device, but it will not communicate.
3. For proper functioning ground wires of all devices connected to RS-485 bus must be interconnected together. In case of using a separate power supply, its ground (“minus”) terminal must be connected to the ground line of the bus.
4. Please connect ground wires before all other connections.

Set Modbus RTU address



phyto-sensor.com/download/MbRTU_DAST

1. Download, extract and run the Modbus RTU Device Address Set Tool by using the above-mentioned link.
2. Connect the sensor to the PC via RS-485 adapter.
3. Power the sensor on.
4. Specify the RS-485 adapter's serial port.
5. Enter a desired address in 'New Address' field and press 'Set' button. The factory default address is 247.
6. The sensor will start to measure.
7. Power off the sensor.

Data reading

Baud Rate = 9600, 8 bit, parity: Even, 1 stop bit (default settings).
Protocol : Modbus RTU.
Modbus register map

Register address	Modbus function P rotocol address	Type Access	Parameter	Default
30001	3 0x0000	UINT16 r	**Measured value** Value is stored with a scaling of 1:100 (e .g.: 3050 is equivale nt to 30.5 mm)	N/A
30101	3 0x0064	FLOAT r	**Measured value** Ordering the bytes i n a “C D A B” seque nce known as a “wo rd swap” (e.g.: the n umber 30.5 [00 00 F 4 41] represented a s [F4 41 00 00])	N/A
40001	4 0x0000	UINT16 r/w	**Slave-ID**	247
40002	4 0x0001	UINT16 r/w	**Baudrate** 0: 1200bps 1: 2400bps 2: 4800bps 3: 9600bps 4: 19200bps 5: 38400bps	3
40003	4 0x0002	UINT16 r/w	**Parity** 0: No parity bit 1: Even parity 2: Odd parity	1

Power supply

The sensor is to be powered from an external regulated power supply with 5 to 24 Vdc @ 5 mA output voltage.

Specifications

Measurement range	FI-S	7 to 45 mm
	FI-M	15 to 90 mm
	FI-L	30 to 160 mm
Temperature effect	< 200 ppm FS/ °C	
Output	RS-485 Modbus	
Output auto update time	5 s	
Excitation time	200 ms	
Supply voltage	5 to 24 Vdc	
Current consumption	5 mA max	
Operating temperature	0 to 50°C	
Protection index	IP64	
Cable length between probe and si gnal conditioner	0.5 m	

Customer Support

If you ever need assistance with your sensor, or if you just have questions or feedback, please e-mail at support@phyto-sensor.com. Please include as part of your message your name, address, phone, and fax number along with a description of your problem.

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Documents / Resources

	Bio Instruments FI-ST-485M Fruit Growth Sensors and System for Monitoring Growing Plants [pdf] User Guide FI xT-485M, FI ST-485M, FI MT-485M, FI LT-485M, FI ST-485M Fruit Growth Sensors and System for Monitoring Growing Plants, Fruit Growth Sensors and System for Monitoring Growing Plants, FI ST-485M Fruit Growth Sensors and System