SPRAGUE INSTRUMENTS

User Manual

Wireless Cable Tension Meter

Model: Gripper CTR-GAWL-150

PN# 1345-001 Wireless

26 Nov 2020

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Introduction

This document describes about the SPRAGUE Instrument's Wireless Cable Tensiometer (Gripper CTR-GAWL-150) specifications and user instructions.

Overview

Tensiometer is wireless strain measuring instrument. It uses Bluetooth technology for communication between the sensor and display unit. Sensor unit measures tension in cable which gets displayed on the display unit.

It consists of 2 Parts

- Display unit
- Sensor unit

Contents in the Box

- Display Unit
- Sensor unit
- Batteries for Display and Sensor unit
- 5V Adapter
- User Manual

Descriptions

Display Unit

1. Temperature indication
2. Tension Reading
3. Power ON/OFF Button
4. Cable Size/Up Navigation Button
5. Tension Unit Selection/ Left Navigation Button
6. Settings/Down Navigation Button
7. Charging Port
8. Charge Indication
9. Zero Set/Right Navigation Button
10. OK Button
11. Display Backlight ON/OFF Button
12. Tension Unit
13. Sensor Signal Strength
14. Cable Size Selected
15. Temperature unit

Sensor Unit

Sensor Top View

Sensor Bottom View

1. Power Button
2. Connectivity Indication
3. Charge Indication

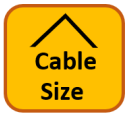
Specifications

Property	Details
Scale Range	10 to 150 Pounds
Scale Resolution	1 Pound
Scale Tolerance	+/- 2% of Full scale
Unit of Measurement	Metric – Kg, ^{0}C lbs – lb , ^{0}F
Number of Calibrations	15
Supported Cables Sizes	1/16, 1/32, 1/8, 5/32, 3/16 inches
Ambient Temperature	Selectable ^{0}C and ^{0}F
Operating Temp Range	14 to 100 F (-10 to 40 C)
Storage Temperature	-4 to 122 F (-20 to 50 C)
Operating Modes	Measurement / Calibration / Firmware Update
Humidity	5 to 95 %
Communication	BLE 4.2 (Between Display Unit & Sensor Unit)
Wireless Range	10 meters
Display Unit	
• Display	160 x 128 Dot Matrix LCD
	Back light ON/OFF option
• Charging	5V DC / Charge status Indicator
	1900mAH – Li Po Rechargeable Battery
	~10000 Reading in single charge with back light OFF
	~3000 Reading in single charge with back light ON
• Sleep mode	Activated of 5 Mins of inactivity
• Dimension	164x80x29mm
• Weight	160gm(approx.)
• Housing	ABS Plastic

Sensor Unit	
• Charging Voltage	5VDC / Charge Status Indicator
• Power	500mAH – Li Po Rechargeable Battery
	~4000 Reading in Single Charge
	Sleep mode after 5 mins idle time
• Dimension	105x40x27mm
• Weight	240gm(approx.)
• Housing	Cast Iron

Operations

Display units Buttons

Buttons	Naming	Functions
	Power ON/OFF Switch	• Press to ON • Hold 3 Secs to OFF
	Tension Unit Selection/Left Navigation Switch	• Toggle lbs/Metric units for Tension and Temperature • Back Button / Navigate Left direction
	Display Backlight ON/OFF Switch	• Turn display backlight ON/OFF
	Zero/Right Navigation Switch	• Set Zero load offset • Navigate Right direction
	Cable Size/Up Navigation Switch	• Select Cable Size (supported sizes 1/16, 1/32, 1/8, 5/32, 3/16 inches) • Navigate Upward direction
	Settings/Down Navigation Switch	• Go to Settings • Navigate downward direction
	OK Switch	• Confirmation for user action/settings

Battery Charging (Display & Sensor Units)

Both Meter and Sensor unit uses rechargeable battery which can be charged through 5V@1A adapter.

Charge Status Led Indications (Display & Sensor Units)

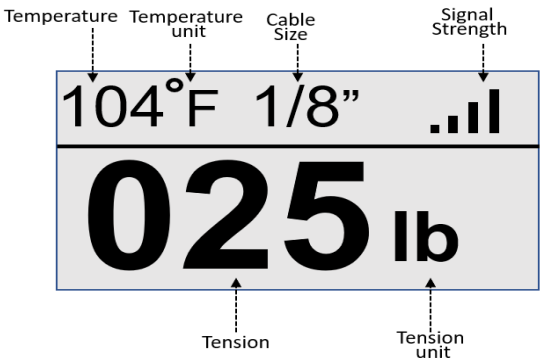
Charge Status are indicated using dual color Led indications. For this Green and Blue color led are used. Status of charge can be described using following table.

State	LED
Charge in Progress	Blue LED
Charge Complete	Green LED

Meter Reading

For start system operation, Power ON/OFF button need to be single pressed. On meter unit, display will pop up with welcome screen for few seconds. LCD backlight will be ON by default. If required, it can be turned OFF by pressing Backlight ON/OFF button

After that it displays following if Sensor is switched ON, it displays temperature, cable size, Sensor Signal Strength and tension based on data received from sensor

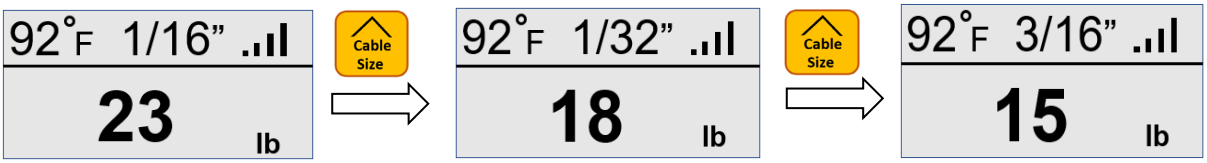


Sensor Unit Power ON

- For start system operation, Power ON/OFF button need to be single pressed
- Green led will turn on and it will start transmitting tension data
- It will remain ON until not turned off

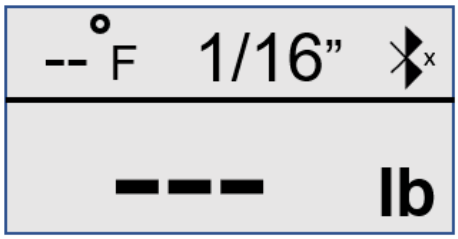
Cable Size Selection Procedure

- Desired cable size can be selected by single press on Cable Size Selection button.
- It will change from one cable size to the other on subsequent Cable size key press as shown.
- Supported cable diameter sizes are 1/16, 1/32, 1/8, 5/32, 3/16 inches.
- Each cable size calibration needs to be done independently.



Sensor Out of Range

- In case sensor is placed out of range or if it is turned OFF, it will display following



Over Temperature Shutdown

- In case sensor unit temperature reaches beyond 60° Celsius/ 140° Fahrenheit, sensor unit will go into shutdown.

Tension/Temperature Unit selection

- Meter supports both lbs unit (lb. for tension and degree Fahrenheit for temperature) and metric unit (kg for tension and degree Celsius for temperature measurement).
- Pressing it will change from lbs to metric or metric to lbs when pressed

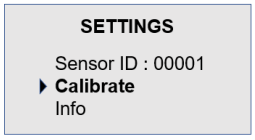
Zero load Setting

- Zero load can be set using Zero button. Once set to zero, tension value read will get set to 0lb

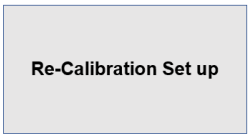
Calibration Procedure

Meter needs to be calibrated for each cable sizes and different weights before they can be used. Following procedures describes the process of calibration

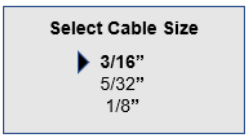
- Going to Settings menu- Press Settings buttons
- Display shows settings options as below. Use Up/Down button to select 'Calibrate'. It will get highlighted in Bold with arrow pointing to it.



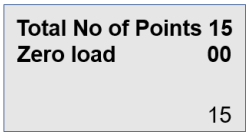
- Press OK(Confirmation) button to enter Calibration process. It will ask for password to enter calibration.
- Password is a 5-digit numerical number, whenever user provide the correct password it allows to re-calibrate.
- User can use up and down navigation buttons to enter password. Password value for each digit will increment on up button press and decrement on down button press.
- To select the next digit, press the right navigation button. User needs to enter 5 digits password in total one by one.
- Once password is entered correctly, it displays following for 2sec



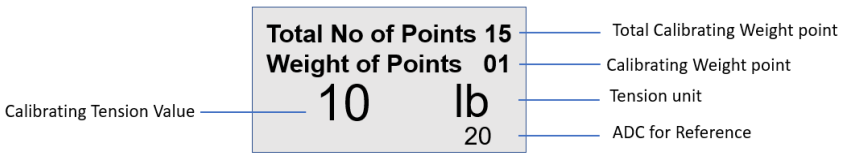
- Select desired rope size. Use Up/Down buttons to navigate to desired cable size



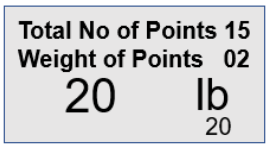
- Then it displays following.



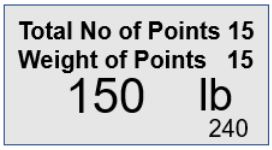
- Press OK button to start calibration process for weight 10lb. It shows below (naming conventions marked for clarification)



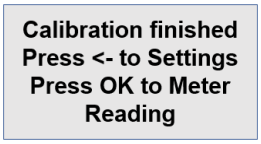
- Add 10lb load. When ADC reference value is stable, press OK. This will confirm 10lb load is calibrated. Weight point will change to 2 which corresponds 20lb.
  Add Weight 20lb for calibration



- When ADC value gets stable, press OK button. This will complete calibration for weight 20lb. Weight point will change to 3. Add weight for 30 lb and press Ok button.
- Continue procedures i.e. add weight and press OK button till weight of point 15 (for 150lb)



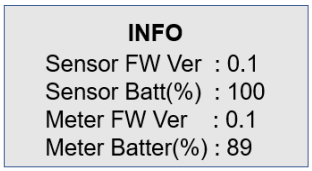
- When calibration is done for 150lb, Press OK to check measurement or left navigation button for going back to setting menu.



- When Ok button is pressed, calibration procedure is completed.
- For calibrating other cable sizes, above procedures need to be followed i.e. starting calibration from 10 lb and ending at 150lb.

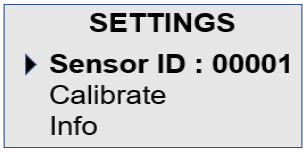
Device Info

For getting device info, press Settings button->Navigate downward to select ‘Info’ and press OK. It displays meter and Sensor Board Firmware version as well as Battery Voltage.



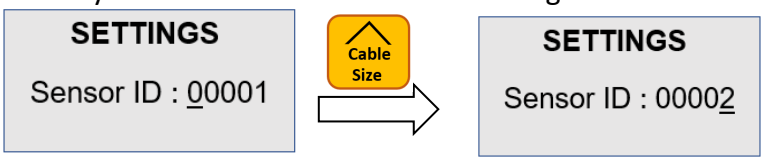
Setting Sensor ID

- Sensor ID can be set by pressing Setting button. Use Up/Down navigation key to select Sensor ID option (it will get highlighted and arrow will point to it). Now Press OK to enter Sensor ID settings



- Use Left/Right Navigation key to point to the digit to be set. Selected digit will get underlined.

- Use Up/Down key to set the desired value for the digit selected.



- . Finally Press OK. Set id will be displayed as shown (sensor ID set to 00002)