Opti Monitoring Installation Guide

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Opti Monitoring Installation Guide

Materials		
Tools	**Opti Monitoring Components**	**Installer Supplied Components**
❏ Small flathead screwdriver ❏ Regular flathead screwdriver ❏ Wire strippers ❏ Wrench	❏ Opti Monitoring Panel ❏ Enclosure Pole Mount Kit ❏ Battery ❏ Solar Power Kit ❏ Sensors ❏ Cord Grips (1 per sensor & 1 for solar) ❏ 22 AWG communication cable	❏ Support pole or wall to mount to ❏ Hose clamps for solar panel ❏ Conduit (if applicable)

Fig. 1: Opti Monitoring Panel with battery installed (left), Opti Monitoring Panel pole mount kit (right)

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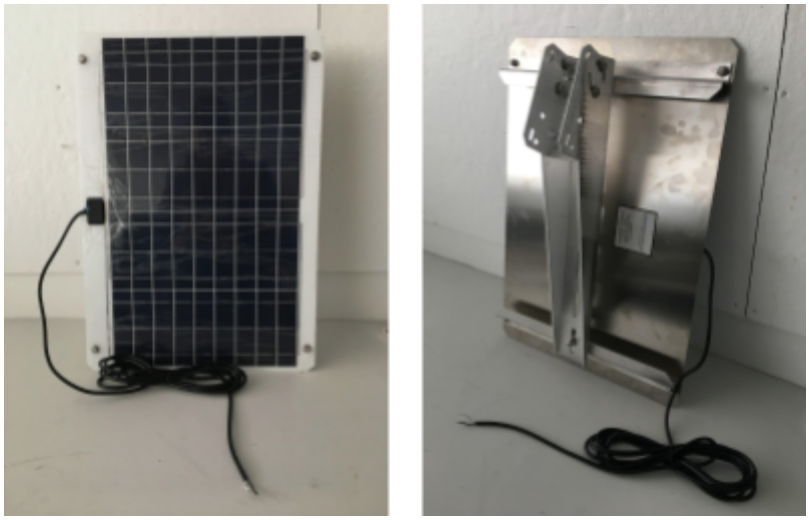

Fig. 2: BSP30-12-LSS solar panel (left), with mount kit installed (right)

Installation Instructions

1. Mount Opti Monitoring Panel using pole mount kit. Remove the battery from the panel to reduce the weight while mounting the panel.
    a. Attach strut channel, horizontally, to the Opti Monitoring Panel using provided bolts. Hose clamps will slip in behind the two strut channel washers.

Fig 3: Set-up for the back of the panel. Hose clamps wrap around strut nuts.

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b. Attach the hose clamps to the pole.

Fig 4: Hose clamps wrapping around pole to attach panel

2. Mount solar panel facing south using the solar panel mount kit. Panel should be inclined at the angle of your site's latitude (e.g. 42° in Boston) from horizontal, unless nearby shade requires a different orientation. To secure the solar pane, screw the long bar into the back of the solar panel, using the two holes at the top and bottom. The solar panel must be oriented with the short ends at the top/bottom of the mount. Place bolts in the quarter circles in the mount at various points to adjust angle. As before, use hose clamps to attach the solar panel to the pole.

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Fig 5: Opti Monitoring Panel and solar panel attached to a pole

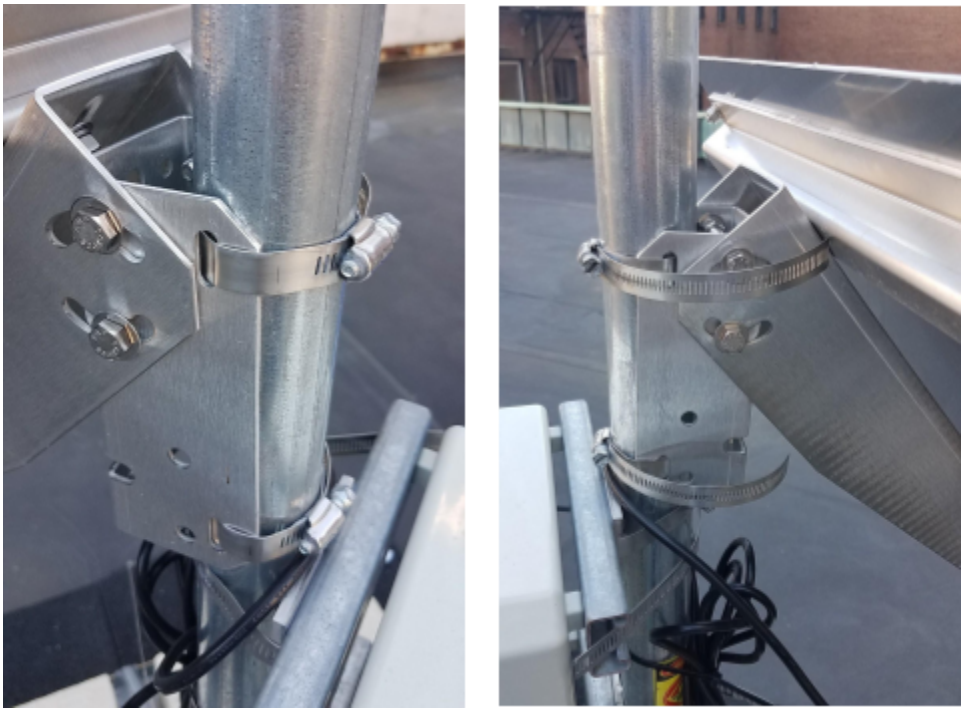

Fig 6: Solar panel mount close-up

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Fig 7: Close-up of panel mount

3. Ensure power switch on the Opti Monitoring Panel is set to OFF
4. Remove the coin cell tab on the Opti Monitoring Panel, making sure the coin cell remains in place in the holder (this may have been previously completed by Opti).

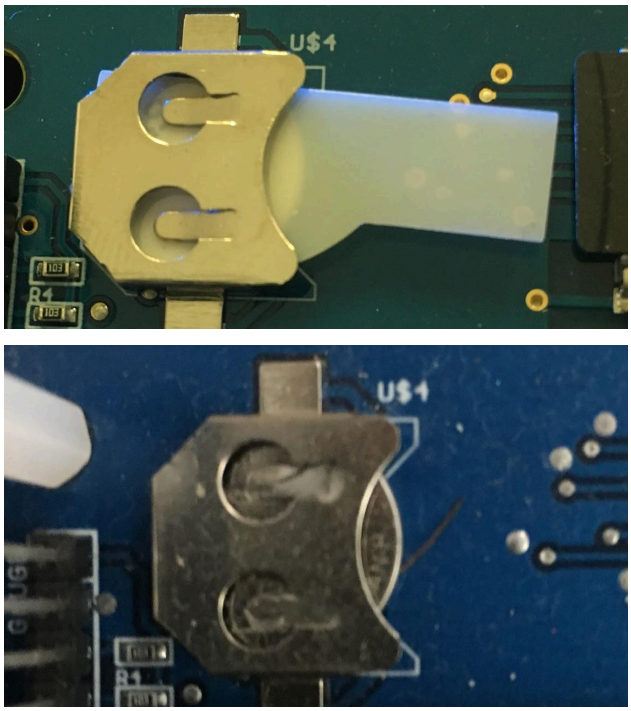

Fig 8: Coin cell before and after removing tab

5. Install sensors and
    a. pull through conduit (if applicable) to the Opti Monitoring Panel
    b. feed sensor wire ends through cord grips (if applicable) and tighten down both sides of the cord grips.

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Fig 9: Cord grips tightened down

6. Insert sensor wires into screw terminals. See Wiring Guide. Tighten down screw terminals so that you can tug on the wires and they stay in the terminals.
7. If installation includes a Water Level Sensor, ensure pressure reference device or desiccant is attached to the vent tube and located inside the enclosure. If there is any moisture in the end of the vent tube, cut the tube below the water drop, then attach the pressure reference device.
8. Wire Solar Power into the terminal blocks in the top left corner inside the Opti Monitoring Panel. Check the label on the back of the solar panel to confirm wire colors:

Label:	**V+**	**V-**
Wire Color:		

9. Secure battery with strap.
10. Attach red battery lead to red battery terminal (+), and black battery lead to black battery terminal (-).

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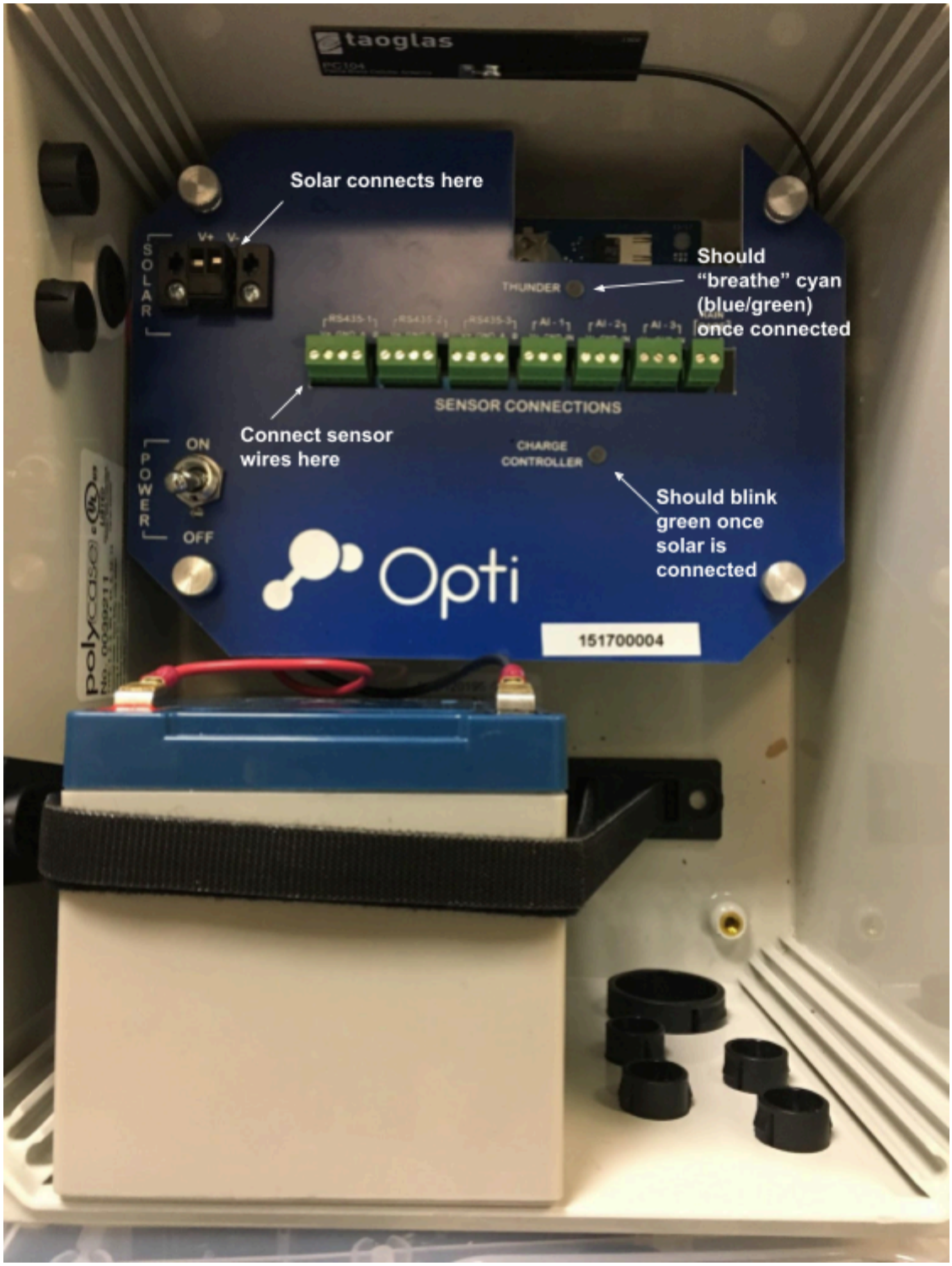

Fig 10: Interior of Opti Monitoring Panel

11. Turn power ON

12. Verify that the OptiThunder cellular gateway is connected to the cloud (LED should be "breathing" cyan).

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13. Verify the charge controller is charging the battery. The LED should blink green every 4-5 seconds, or faster. If the blinking is every 8-10 seconds, check that the solar power connection is fully seated in the panel. If it is still not charging, call Opti support.
14. Double check that cord grips and/or conduit connections are tight. Attach the Opti Monitoring Panel cover securely.
15. Verify with Opti support that data is being reported to the Opti Platform, and take any field measurements needed for calibrations. Send Opti photos of the installation site for the online dashboard.

Startup Information

When the Opti Monitoring Panel is turned on, the two indicator lights inside provide information about the state of the system.

OptiThunder Cellular Gateway ("OptiThunder"): After turning the device on, the Opti Cellular Gateway light will blink green while it is obtaining the connection to the cellular network, and then "breathe" cyan once it is connected to the cloud. This looks like the LED is gently becoming dimmer and brighter (not blinking).

- Blinking Green indicates the device is attempting to connect to the network.
- Breathing Cyan indicates a working connection to the cloud.
- Blinking Blue indicates a problem connecting to the cellular network. Reset the device.
- Breathing Magenta indicates that the device is in safe mode and needs new firmware. Contact Opti.

Charge Controller: The charge controller has a red/green LED.

- Green: Charge controller is working
    - Blinking, 8-10 sec between blinks: Charge controller is working, battery is connected properly, solar panel not connected.
    - Blinking, 4-5 sec between blinks. Charging, low current.
    - Blinking fast. Charging
    - Solid green: Battery fully charged
- Red: Error
    - Count the sets of blinks, contact Opti for troubleshooting assistance.
    - 2 blinks: Overheating
    - 3 blinks: Overload - can be caused by changing the solar panel connections while the controller is operating. Try power cycling the Opti Monitoring Panel.
    - 4 blinks: Battery voltage too low. Either wait for the battery to charge sufficiently through the trickle function, or charge by other means.

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Once the battery is installed and power is ON, the Opti Monitoring Panel will send the first message to the cloud. Data will begin to appear on the dashboard. Data will be transmitted every 5 minutes. If a wiring change is made, cycle power by turning the switch to OFF, waiting a few seconds, then turning it back ON. This will initiate a message, avoiding the five minute wait.

Note that the battery is shipped charged, the Opti Monitoring Panel will turn on once it is connected to the battery and the switch is set to ON.

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Sensor Wiring Guide

Modbus Sensors			
In-Situ Sensors		**APG Sensors**	
V+		V+	
GND		GND	
A		A	
B		B	
Rainwise MK-III-MB		**INW Sensors**	
Opti Monitoring Panel	**Rainwise Weather Station**		
V+	V+DC	V+	
GND	GND	GND	
A	B (+)	A	
B	A (-)	B	
Analog Sensors			
Decagon 10HS		**Sequoia LISST-ABS**	
V+		V+	
GND	Bare wire	GND	
SIG		IN	
Pulse Sensors			
Texas Electronics Tipping Bucket		**Davis Rain Collector II**	
1		1	
2		2	