# Dual-Tipping Bucket PIERS Gauge

# Dual-Tipping Bucket + Parsivel² disdrometer PIERS Gauge



PIERS0002 (Haywards Lott site, Wallops PRF)

- Two **Met One Instruments Precipitation Gauges** - self-emptying, dual chambered tipping bucket, 12 inch funnel diameter, 0.01 inch per tip

- **Sutron Xlink Datalogger/transmitter**



PIERS0001 (WFF Pad, Wallops PRF)



PIERS0028 (2023 GPM/IMPACTS, Storrs CT)

- Two **Met One Instruments Precipitation Gauges**

- **OTT Parsivel²** is a laser disdrometer that captures both the size and speed of falling particles

- **Sutron Xlink Datalogger/transmitter**

WFF NASA GPM GV Instrument Suite is at work on a snowy & windy night of Jan 23, 2023!



PIERS0027 (2023 GPM/IMPACTS, Storrs CT)

## Power supply

**Dual-Tipping Bucket**

12V/7Ah battery and 25W solar panel

**Dual-Tipping Bucket + OTT Parsivel² disdrometer**

12V/100Ah battery and 100W solar panel

## Sutron Xlink 500

- Xlink 500 – datalogger with built-in cell modem, design to collect, store and transmit sensor data
- Low power consumption, compact, operating temp -40C to +70C, custom programing with Python scripts

### Electrical/Data Interface

- 12V Battery and Solar Panel Inputs (1)
- Two tipping buckets data inputs (2)
- 4G Cell Antenna (3)
- Main Switch (4)
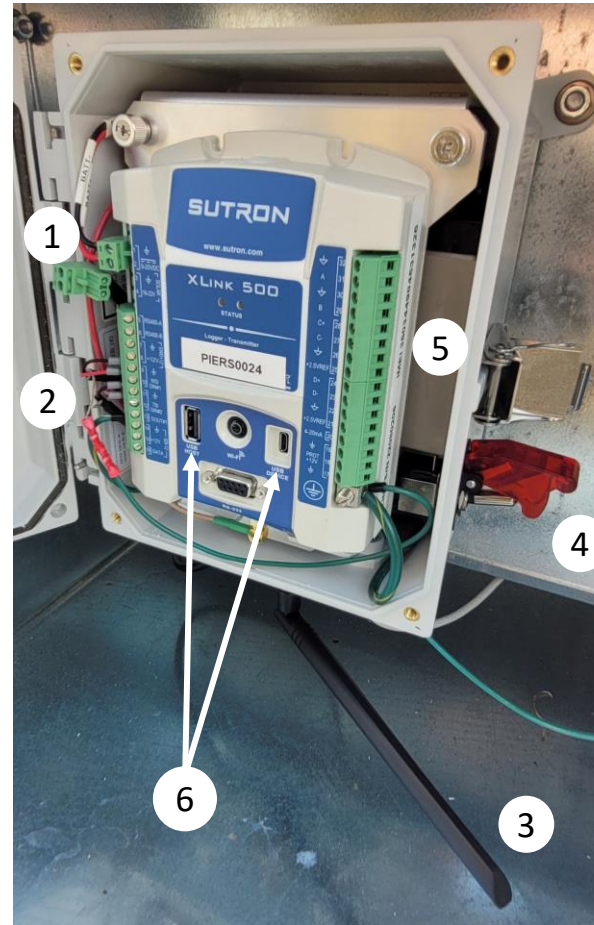- 12V/7Ah battery – Dual TB only (5)

Ideally it would be nice to have a SIM card before the gauge gets deployed to give us some time to work on configuring and testing out the comms and dataflow

### NASA Wallops GPM PRF
https://wallops-prf.gsfc.nasa.gov/Gauge/index.php



## Data Dissemination

- 4G Cell Modem. Verizon 4G/5G SIM card with static IP address

- Normally cell signal strength of at least 2 bars (cell phone) is enough for successful data transfer

- Two-way communication - configuration file and data acquisition/transmission python scripts get uploaded remotely

- Network: currently is setup to use ftp protocol for data transmission and proxy ftp server. Working with OTT on implementation of SSH protocol

- Configurable data transmission interval with resolution of 1 min

### 2023 GPM/IMPACTS Deployment at UConn in Storrs, CT
https://wallops-prf.gsfc.nasa.gov/Field_Campaigns/IMPACTS_2023/

**Current Report Date: 02/12/2023**
**Report generated 02/12/2023 @ 10:00:05 Local (02/12/2023 @ 15:00:05 UTC)**

| GaugeID | Site Name | Packets | Mean Voltage | Mean RSSI | # Tips_A | # Tips_B | Accum_A [in] | Accum_B [in] | Bias [%] |
|---|---|---|---|---|---|---|---|---|---|
| PIERS0001 | WFF_Pad | 60/96 | 12.92 | -86.47 | 22 | 21 | 0.22 | 0.21 | 4.55 |
| PIERS0002 | Haywards_Lott | 60/96 | 12.86 | -79.80 | 12 | 12 | 0.12 | 0.12 | 0.00 |
| PIERS0004 | Somerset_Rd | 60/96 | 12.73 | -75.80 | 12 | 12 | 0.12 | 0.12 | 0.00 |
| PIERS0005 | American_Legion | 60/96 | 12.87 | -57.50 | 12 | 12 | 0.12 | 0.12 | 0.00 |
| PIERS0006 | Doc_Johnson | 60/96 | 12.85 | -76.07 | 13 | 13 | 0.13 | 0.13 | 0.00 |
| PIERS0007 | LeVecque | 60/96 | 12.87 | -85.93 | 21 | 22 | 0.21 | 0.22 | -4.76 |
| PIERS0021 | How_Sweet_it_is | 60/96 | 12.87 | -59.00 | 7 | 7 | 0.07 | 0.07 | 0.00 |
| PIERS0024 | Silva_Rd | 60/96 | 12.78 | -85.67 | 19 | 19 | 0.19 | 0.19 | 0.00 |