



A weatherproof data logger with built-in temperature and relative humidity sensors; the relative humidity sensor provides superior durability in humid environments.

Features:

- Weatherproof housing for use in outdoor or condensing environments
- High accuracy
- Relative humidity sensor provides fast response and superior recovery from condensing conditions
- Small-diameter external sensor versions for measurements in tight spaces
- Optic USB interface for fast and reliable download
- Compatible with HOBOWare and HOBOWare Pro software for logger setup and graphing & analysis (HOBOWare Pro is required when using the U-DTW-1 Waterproof Shuttle)

Technical Specifications:
Temperature Sensor

Operation Range	: U23-001A internal sensor: -40 to 70°C (-40 to 158°F)
U23-002A external temperature sensor	: -40 to 70°C (-40 to 158°F)
U23-003 and U23-004 external sensors	: -40 to 100°C (-40 to 212°F), with tip and cable immersion in fresh water up to 50°C (122°F) for one year
Accuracy	: U23-001A and U23-002A: $\pm 0.25^{\circ}\text{C}$ from -40 to 0°C (± 0.45 from -40 to 32°F), $\pm 0.2^{\circ}\text{C}$ from 0 to 70°C (± 0.36 from 32 to 158°F)
U23-003 and U23-004	: $\pm 0.21^{\circ}\text{C}$ from 0° to 50°C ($\pm 0.38^{\circ}\text{F}$ from 32° to 122°F); see Plot A
Resolution	: U23-001A and U23-002A: 0.04°C (0.072°F)
U23-003 and U23-004	: 0.02°C at 25°C (0.04°F at 77°F); see Plot A
Response Time (Typical to 90%)	: U23-001A internal sensor: 10 minutes in air moving 1 m/sec
U23-002A external temperature sensor	: 3 minutes, 45 seconds in air moving 1 m/sec
U23-003 and U23-004 external sensors	: 3 minutes in air moving : 1 m/sec; 30 seconds in stirred water
Drift	U23-001A and U23-002A: $< 0.01^{\circ}\text{C}$ (0.018°F) per year U23-003 and U23-004: $< 0.1^{\circ}\text{C}$ (0.18°F) per year

Relative Humidity Sensor (U23-001A, U23-002A only)

Operation Range	: 0 to 100% RH, -40° to 70°C (-40° to 158°F)
	Exposure to conditions below -20°C (-4°F) or above 95% RH may temporarily increase the maximum RH sensor error by an additional 1%
Accuracy	: $\pm 2.5\%$ from 10% to 90% RH typical to a maximum of $\pm 3.5\%$ including hysteresis at 25°C (77°F); below 10% and above 90% $\pm 5\%$ typical
Resolution	: 0.05%
Response Time (Typical to 90%)	: U23-001A: 40 minutes in air moving 1 m/sec with protective cap
U23-002A	: 15 seconds in air moving 1 m/sec
Drift	: $< 1\%$ per year typical

Logger

Operation Range	: -40° to 70°C (-40° to 158°F)
Real-time Clock	: ±1 minute per month 0° to 50°C (32° to 122°F)
Battery	: 1/2 AA, 3.6 Volt lithium, user-replaceable (HP-B)
Battery Life (Typical Use)	: 3 years with 1 minute or greater logging interval
Memory (Non-Volatile)	: 64K bytes memory (approx. 21,000 temperature and RH measurements)
Materials	: All models: ASA styrene polymer housing and mounting clamp; polypropylene protective cap; Buna-N o-ring(s); U23-001A, U23-002A only
	: ASA styrene polymer RH sensor cap; modified hydrophobic polyethersulfone membrane
Cables	: U23-001A: No cables U23-002A
	: One 184 cm (6 ft) PVC cable; sensor diameter 1 cm (0.38 in.) U23-003
	: Two 184 cm (6 ft) PVC cables; sensor diameter 0.5 cm (0.20 in.) U23-004
	: One 184 cm (6 ft) PVC cable; sensor diameter 0.5 cm (0.20 in.)
Environmental Rating	: Electronics housing is NEMA 6P equivalent (tolerant of brief submergence); Units with RH sensors are NEMA 4 equivalent (splash-resistant)
Launch Modes	: Immediate start; delayed start
Logging Interval	: Fixed-rate or multiple logging intervals, with up to 8 user-defined logging intervals and durations; logging intervals from 1 second to 18 hours
Offload Modes	: Offload while logging; stop and offload
Battery Indication	: Battery voltage can be viewed in status screen and optionally logged in datafile. Low battery indication in datafile.
Weight	: U23-001A: 57 g (1.5 oz); U23-002A: 118 g (3.1 oz); U23-003: 138 g (3.7 oz); U23-004: 102 g (2.7 oz)
Dimensions	: Housing measures 10.2 × 3.8 cm (4.0 × 1.5 in.)
NIST Certificate	: Temperature certificate available for additional charge