onset

temperature
humidity
DC voltage
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U30

HOBO
Remote Monitoring System

Indoor Monitoring 2008

HOBO
Data Loggers

onsetcomp.com

Welcome

Thank you for your interest in Onset, the world's leader in data logging solutions.

At Onset, we know how important your data is to you. Our products are designed from the ground up with quality and reliability foremost in mind.

In this catalog, you will find a wide range of data logging solutions, from our new web-based energy monitoring system to our Temp/RH LCD logger.

For the very latest product updates and detailed product specifications, please visit us on the web at onsetcomp.com.

ENERGY STAR PARTNER

NESEA Northeast Sustainable Energy Association

- **Small size for mounting anywhere**
- **Low cost lets you monitor many locations economically**
- **Internal sensors for easy deployment**

Memory:	52,000 measurements
Sample rate:	1 second to 18 hours, user-selectable
Battery life:	1 year (typical)—user-replaceable

Temperature

Measurement range:	-20° to 70°C (-4° to 158°F)
Accuracy:	±0.4°@ 25°C (±0.7°@ 77°F)
Resolution (10-bit):	0.1°@ 25°C (0.2°@ 77°F)
Response time:	10 minutes (to 90% in airflow of 1 m/s)

NIST-traceable temperature accuracy certificate available.

Relative Humidity (RH)

Measurement range:	25% to 95% RH
Accuracy:	±3.5% RH from 25% to 95% over range
Resolution (10-bit):	0.07% RH
Response time:	6 minutes (to 90% in airflow of 1 m/s)

HOBO U10 Model Comparison & Ordering Information

		Temperature HOBO U10 Logger	Temp/RH HOBO U10 Logger
Product Number		**U10-001**	**U10-003**
Price		**$59**	**$75**
Number of Channels		1	2
Internal Sensors	Temperature	yes	yes
	Relative Humidity	--	yes
Size	cm	6.0 x 4.7 x 1.9	6.0 x 4.7 x 1.9
	inches	2.4 x 1.9 x 0.8	2.4 x 1.9 x 0.8
Weight	grams	28	28
	ounces	0.9	0.9

Complete system requires logger and software.

Software and Communications

Software
HOBOware Pro Software (Windows®)   BHW-PC $99
HOBOware Pro Software (Mac®)   BHW-MAC $99
HOBOware Lite Software (Windows/Mac)   BHW-LITE $39
HOBOware includes USB interface cable

Optional Communications
HOBO U-Shuttle*   U-DT-1 $249
USB to Ethernet Server   SERVER-US-4 $145

Requires HOBOware Pro software, see pages 30 and 32 for details.

- **Large memory for long-term deployments or fast sampling**
- **Five models to choose from, with flexible measurement options**
- **Programmable as well as push-button start**

Memory:	43,000 measurements
Sample rate:	1 second to 18 hours, user-selectable
Battery life:	1 year (typical)—user-replaceable CE

Temperature

Measurement range:	-20° to 70°C (-4° to 158°F)
Accuracy:	±0.4°@ 25°C (±0.63°@ 77°F)
Resolution (12-bit):	0.03°@ 25°C (0.05°@ 77°F)
Response time:	6 minutes (to 90% in airflow of 1 m/s)

NIST-traceable temperature accuracy certificate available.

Relative Humidity (RH)

Measurement range:	5% to 95% RH
Accuracy:	±2.5% typical, 3.5% maximum, from 10 to 90% RH
Resolution (12-bit):	0.03% RH
Response time:	1 minute (to 90% in airflow of 1 m/s)

Light Intensity

Designed for general purpose indoor measurement of relative light levels

Range: 1 to 3000 footcandles (lumens/ft^2) typical
0-32,300 lumens/m^2 [0-3,000 footcandles (lumens/ft^2)]

External Input

External sensors for temperature, AC current, AC voltage, CO_2, 4-20 mA, 0-2.5 VDC (see sensors pages 8 and 9)

Input range:	0 to 2.5 VDC
Accuracy:	±2 mV, ±2.5% of absolute reading
Resolution (12-bit):	0.6 mV
Output power:	2.5 VDC at 2 mA, active only during measurements

HOBO U12 Model Comparison & Ordering Information

		Temperature HOBO U12	4 External HOBO U12	Temp/RH HOBO U12	Temp/RH/Light/ Ext HOBO U12	Temp/RH/2 Ext HOBO U12
Product Number		U12-001	U12-006	U12-011	U12-012	U12-013
Price		**$79**	**$99**	**$110**	**$125**	**$125**
Number of Channels		1	4	2	4	4
Internal Sensors	Temperature	yes	--	yes	yes	yes
	Relative Humidity	--	--	yes	yes	yes
	Light Intensity	--	--	--	yes	--
External Sensors		--	yes	--	yes	yes
Size	cm	5.8 x 7.4 x 2.2	5.8 x 7.4 x 2.2	5.8 x 7.4 x 2.2	5.8 x 7.4 x 2.2	5.8 x 7.4 x 2.2
	inches	2.3 x 2.9 x 0.9	2.3 x 2.9 x 0.9	2.3 x 2.9 x 0.9	2.3 x 2.9 x 0.9	2.3 x 2.9 x 0.9
Weight	grams	46	46	46	46	46
	ounces	1.6	1.6	1.6	1.6	1.6

Complete system requires logger and software.

Software and Communications

Software
HOBOware Pro Software (Windows®)   BHW-PC $99
HOBOware Pro Software (Mac®)   BHW-MAC $99
HOBOware Lite Software (Windows/Mac)   BHW-LITE $39
HOBOware includes USB interface cable

Optional Communications
HOBO U-Shuttle*   U-DT-1 $249
USB to Ethernet Server   SERVER-US-4 $145

Requires HOBOware Pro software, see pages 30 and 32 for details.

- **Sensors on this page can be plugged directly into the external input jacks of HOBO U12 Family loggers to expand the number of measurement options and applications.**
- **Accuracy specifications of external sensors reflect the combined performance of the logger and sensor.**

Air/Water/Soil Temperature Sensors

$28-$40 TMCx-HD
Sensor diameter:0.5 cm (0.2 in) diameter
Cable lengths: 0.3, 1.8, 6.1, 15.2 m (1, 6, 20, 50 ft) available

Range:	-40° to 100°C (-40° to 212°F) in air; -40° to 50°C (-40° to 122°F) in water or soil;
Accuracy:	±0.25°@ 25°C (±0.45°@ 77°F)
Resolution:	0.03°@ 25°C (0.05°@ 77°F)
Response time:	3 minutes (to 90% in airflow 1 m/s); 1 minute in water

Note: Sensor tip and cable immersion in fresh water up to 50°C (122°F) for one year; radiation shield (RS3) recommended for use in sunlight

Stainless Steel Temperature Probe

$75 TMC6-HC
0.3 cm diameter x 10.2 cm (0.12 in x 4 in) cable length: 1.8 m (6 ft)

10.2 cm (4 in) food-grade stainless-steel probe with pointed tip; 0.3 cm (0.12 in) diameter, 1.8 m (6 ft) cable

Range:	-40° to 100°C (-40° to 212°F) in air or water (tip only)
Accuracy:	±0.25°@ 25°C (±0.45°@ 77°F)
Resolution:	0.03°@ 25°C (0.05°@ 77°F)
Response time:	3 minutes (to 90% in air moving 1 m/s); 15 seconds in stirred water

NIST-traceable temperature accuracy certificate available.

4-20mA Cable

$22 CABLE-4-20MA
45.7 cm (18 in) cable with 8.9 cm (3.5 in) tinned braided wire leads

Range:	0 to 20.1 mA
Accuracy:	±0.02 mA, ±2.5% of reading
Resolution:	0.03% of full scale

Voltage Input Cable

$8 CABLE-2.5-STEREO
1.8 m (6 ft) cable with 1.27 cm (0.5 in) tinned braided wire leads

1.8 m (6 ft) cable with 1.27 cm (0.5 in) tinned braided wire lead
For voltage input specifications, refer to the external input specifications of the model you will be using.

AC Current

Ranges available (AC Amps):	0-20, 0-50, 0-100, 0-200, 0-600
Accuracy:	± 4.5% of full scale
Response time (from 10% to 90% of amplitude):	CTV-A, approximately 440 milliseconds CTV-B, approximately 200 milliseconds CTV-C, approximately 100 milliseconds CTV-D, approximately 450 milliseconds CTV-E, approximately 490 milliseconds
Input current:	*AC current, sine wave, single phase 50 Hz or 60 Hz, load power factor 0.5 to 1.0 lead or lag*
Voltage rating:	600 VAC UL listed
Operating range:	0° to 60°C (32° to 140°F) CTV-A, -B, -C 0° to 40°C (32° to 104°F) CTV-D, -E
Construction and operating environment:	Molded plastic housing for indoor use per UL508. All units have opening leg that snaps into place. The leg on CTV-D and E-units is removable.

CTV Sensors
$86-$109 CTV-x
Cable length: 1.8 m (6 ft)

AC Voltage
$135 T-CON-ACT-xxx
11.4 x 7.3 x 3.25 cm
(4.49 x 2.87 x 1.28 in)
300 g (10.6 oz)

Self-powered transmitter for monitoring sine wave, single-phase 60Hz AC voltage. Requires 4-20mA Input Cable for use with HOBO U12 loggers (CABLE-4-20mA)

Two ranges: 90 to 150 or 180 to 300 volts RMS with 0.1% of span

Carbon Dioxide
$465 TEL-7001
15.9 x 7.6 x 3.8 cm
(6.25 x 3 x 1.5 in)
304 g (10.7 oz)

Monitors and displays CO_2 and Temperature (CO_2 only recorded in U12) for Indoor Air Quality studies. Requires CO_2 cable for use with HOBO U12 loggers (CABLE-CO2 - cable length 8")

Measures 0 to 10,000 ppm CO_2 with 50 ppm or ±5% of reading outputs 0 to 2,500 ppm CO_2 to HOBO U12 loggers.

External Sensors & Cables Ordering Information

Air/Water/Soil Temperature Sensors

sensor with 0.3m (1ft) cable	TMC1-HD	$28
sensor with 1.8m (6ft) cable	TMC6-HD	$30
sensor with 6.1m (20ft) cable	TMC20-HD	$35
sensor with 15.2m (50ft) cable	TMC50-HD	$40
Stainless Steel Temp Probe	TMC6-HC	$75
4-20mA cable	CABLE-4-20mA	$22
Voltage input cable	CABLE-2.5-STEREO	$8

Split-core AC Current Sensors

0-20 Amps AC	CTV-A	$86
0-50 Amps AC	CTV-B	$86
0-100 Amps AC	CTV-C	$86
0-200 Amps AC	CTV-D	$109
0-600 Amps AC	CTV-E	$109
Telaire CO_2/Temp Monitor	TEL-7001	$465
CO_2 to logger cable	CABLE-CO2	$25

ConLab AC Voltage Transmitters

0 to 150 Volts AC	T-CON-ACT-150	$135
0 to 300 Volts AC	T-CON-ACT-300	$135

- **Real-time display of Temperature and Relative Humidity**
- **Alarm display and output ensure timely notification of out-of-range conditions**
- **Two models to choose from—Internal Temp/RH or External Temp/RH sensors**
- **Optional protective case for outdoor environments**
- **Optional Remote Alarm and Autodialer**
- **Fast data downloading via USB**

Memory:	43,000 measurements
Sample rate:	1 second to 18 hours
Battery life:	1-year (typical)—user-replaceable
Operating range:	-20° to 50°C (-4° to 122°F) 0 to 100% RH non-condensing

Weatherproof case required for outdoor use (U14-CASE-4x).
Internal Sensor version not suitable for outdoor use.

CE

Internal Temperature

Measurement range:	-20° to 50°C (-4° to 122°F)
Accuracy:	±0.2°C from 0° to 50°C (±0.36°F from 32° to 122°F)
Resolution (12 bit):	0.03°C @ 25°C (0.05° @ 77°F)
Response time:	15 minutes (to 90% in airflow of 1 meter/second)

Internal RH

Measurement range:	0 - 100% RH, -20° to 50°C (-4° to 122°F)
Accuracy:	±2.5% typical, 3.5% maximum, from 10 to 90% RH
Resolution (12 bit):	0.03% RH @ 25°C (77°F)
Response time:	2 minutes (to 90% in airflow of 1 meter/second)

External Temperature/ Temp/RH Sensors

Stainless Steel Temperature Probe
$90 S-TMB-M002*
$100 S-TMB-M006*
$115 S-TMB-M017*

Temperature

Measurement range:	-40° to 100°C (-40° to 212°F) for sensor tip only
Accuracy:	±0.2°C from 0° to 50°C (±0.36°F from 32° to 122°F)
Resolution (12-bit):	0.03°C @ 25°C (0.05° @ 77°F)
Response time:	2 minutes (to 90% in airflow of 1 meter/second)

Temperature

Measurement range:	-40° to 75°C (-40°F to 167°F)
Accuracy:	±0.2°C from 0° to 50°C (0.36°F from 32° to 122°F)
Resolution (12 bit):	0.03°C @ 25°C (0.05°F @ 77°F)
Response time:	5 minutes (to 90% in airflow of 1 meter/second)

External Temperature/ RH Probe
$175 S-THB-M002*
$185 S-THB-M008*

RH

Measurement range:	0 - 100% RH, -40° to 75°C (-40° to 167°F)
Accuracy:	±2.5% from 10 to 90% RH
Resolution (10 bit):	0.1% RH @ 25°C (77°F)
Response time:	10 minutes (to 90% in airflow of 1 meter/second) with protective cap

Last two digits of product number indicate sensor cable length (in meters).

Remote Alarm
$89 ARA

Auto Dialer
$169 AVD-45

**Protective Case
for LCD Logger**
$75 H14-CASE-4x
1.7 x 12.7 x 5.7 cm
(6.75 x 2.25 in)
315.2 g (11.2 oz)

Remote Alarm
• Adjustable audible alarm level (soft/loud)
• Self-test confirms proper indicator operation
• Two inputs provide alarm notification for separate zones
• 1 year battery life (typical)—user-replaceable
• Battery status indication

Auto Dialer
• Dials up to 4 different numbers
• Transmits either voice or numeric messages (for pagers)
• Automatically redials busy or unanswered numbers (up to 10 times for each number)
• AC powered (AC adapter included)
• Internal 9V alkaline battery provides 4 hours of stand-by power
• Works alone or in conjunction with remote alarm

Protective Case
• Tested to NEMA 4X (IP65) Standards
• External Temperature or Temperature/RH sensor and alarm
  relay cables feed through watertight grommets
• Easy data readout via removable watertight fitting with O-ring seal
• Hook and loop tape secures LCD logger inside case
• Materials: Polycarbonate body and cover—UV stabilized

Note: Protective Case is for use with the U14-002 HOBO LCD Data Logger with external input from remote Temperature or Temperature/RH sensors. Check the HOBO LCD Sensor specifications to assure that the unprotected external sensor is recommended for your operating environment.
NIST-traceable accuracy certification is available.

HOBO U14 Model Comparison & Ordering Information

Product Number		Internal Temp/RH U14-001	External Temp or Temp/RH External Sensors sold separately. See page 10. U14-002
Price		**$199**	**$159**
Number of Channels		--	--
Internal Sensors	Temperature	yes	--
	Relative Humidity	yes	--
External Sensor	Temperature	--	yes
	Relative Humidity	--	yes
Size	cm	5.8 x 7.4 x 3.8	5.8 x 7.4 x 3.8
	inches	2.3 x 2.9 x 0.85	2.3 x 2.9 x 0.85
Weight	grams	46	46
	ounces	16	16

Software and Accessories

HOBOware Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
HOBOware Lite Software (Windows/Mac)	BHW-LITE	$39
Two-Zone Remote Alarm	ARA	$89
Auto Dialer	AVD-45	$169
HOBO U-Shuttle	U-DT-1	$249
Protective Case for LCD Logger	H14-Case-4x	$75

- **High-accuracy J, K, S, T thermocouple recordings**
- **Automatic cold-junction compensation**
- **Accepts industry-standard subminiature thermocouple connectors**

Memory: 43,000 measurements
Sample rate: 1 second to 18 hours (user-selectable)
Battery life: 1-year (typical)—user-replaceable

$C\epsilon$

**Thermocouple Logger
HOBO U12 J,K, S, T
$119** U12-014
5.8 x 7.4 x 2.2 cm
(2.3 x 2.9 x 0.85 in)
46 g (1.6 oz)

Temperature	Temperature Ranges	Accuracy	Resolution (12-bit)
with J Thermocouple	0° to 750°C (32° to 1382°F)	±2.5˚C (±4.5˚F)	0.21° @ 375°C (0.38° @ 707°F)
with K Thermocouple	0° to 1250°C (32° to 2282°F)	±4.0˚C (±7.2˚F)	0.32° @ 625°C (0.58° @ 1157°F)
with S Thermocouple	-50° to 1760°C (-58° to 3200°F)	±6.0˚C (±11.0˚F)	0.44° @ 855°C (0.79° @ 1571°F)
with T Thermocouple	-200° to 100°C (-328° to 212°F)	±1.5˚C (±2.7˚F)	0.10° @ -50°C (0.18° @ -58°F)

Complete system requires logger and sensors.

Software and Communications

Software
HOBOware® Pro Software (Windows®)   BHW-PC $99
HOBOware Pro Software (Mac®)   BHW-MAC $99
HOBOware Lite Software (Windows/Mac)   BHW-LITE $39
HOBOware includes USB interface cable

Optional Communications
HOBO U-Shuttle*   U-DT-1 $249
USB to Ethernet Server   SERVER-US-4 $145

*Requires HOBOware Pro software, see pages 30 and 32 for details.

Beaded Thermocouple Probes on Spool Caddies
$15 TC6-J, TC6-K, TC6-T
1.8 m (6 ft)

Thermocouple Wire
$55 TCW100-J, TCW100-K, and TCW100-T
30.5 cm (100 ft.)

Probe and Wires   Exposed-junction thermocouple probes include 6 ft of insulated 30-AWG wire wound on an integrated spool caddy/subminiature connector

100' coils of insulated 24-AWG thermocouple wire

Temperature	Temperature Ranges	Accuracy
Type J TEFLON insulation:	0° to 250°C (32° to 482°F)	±2.2˚C (±4˚F)
Type K glass braid insulation:	0° to 285°C (32° to 545°F)	±2.2˚C (±4˚F)
	285° to 482°C (545° to 900°F)	±0.75%
Type T TEFLON insulation:	-200° to -65°C (-330° to -85°F)	±1.5%
	-65° to -130°C (85° to 270°F)	±1.0°C (±1.8˚F)
	130 to 180°C (270° to 356°F)	±0.75%

High-temperature Stainless Steel Probe — Type K
$39 TCP6-K12
30.5 cm (12 in)

Temperature Ranges	Accuracy
0° to 293°C (32° to 559°F)	±2.2˚C (±4˚F)
293° to 900°C (559° to 1650°F)	±0.75%**

** Percentage is of degrees above or below 0°C (32°F)

- 12in 304 stainless-steel probe; 3/16in diameter with isolated thermocouple
- 1in Handle with spring-type strain relief
- 6ft 19-AWG cable

Subminiature Thermocouple Connectors
$5 SMC-J, SMC-K, SMC-T

- Accept stranded or solid wire up to 20 AWG Internal silicone grommet for strain relief
- Captive cover screws
- Write-on window
- Type J, K, and T versions available

External Sensors & Cable Ordering Information

Type J, K, S, T, Thermocouple	U12-014	$119
Thermocouple Probes and Wires		
1.8 m (6 ft) Beaded Thermocouple with connector—Type J	TC6-J	$15
1.8 m (6 ft) Beaded Thermocouple with connector—Type K	TC6-K	$15
1.8 m (6 ft) Beaded Thermocouple with connector—Type T	TC6-T	$15
30.5 cm (12 in) Stainless-Steel Probe Thermocouple—Type K	TC6-K12	$39
30.5 m (100 ft) of 24-AWG Thermocouple wire—Type J	TCW100-J	$55
30.5 m (100 ft) of 24-AWG Thermocouple wire—Type K	TCW100-K	$55
30.5 m (100 ft) of 24-AWG Thermocouple wire—Type T	TCW100-T	$55

For ordering subminiature connectors, please refer to page 41 or visit onsetcomp.com.

- **Choice of four models that record state changes, lights on/off, motor run-times, and/or events**
- **Internal light, motor field, and magnetic reed switch sensors**
- **State and event channels with external inputs from relays or contacts**

Memory:	26,000 to 43,000 measurements (based on state-change interval)
Battery:	1-year (typical) – user-replaceable CE

State Logger

Options for monitoring:
- Internal magnetic reed switch and external magnet
- External input cable for monitoring DC voltages up to 15V contact closure, open collector output, or presence of positive DC
- Can be used with the CSV-A8 Current Switch for motor on/off

Spacing between magnet and logger: Open ≥ 0.75 in Closed ≤0.25 in
Contact closure resistance: Open > 300 k ohms Closed < 15 k ohms

Light On/Off Logger

Internal light sensor monitors on/off of fluorescent or incandescent lamps. The light sensitivity is peaked in the forward range and can be utilized to minimize the effect of other light sources when trying to determine the on/off state of a particular light source.

Light intensity threshold: 10 to 100 lumens/m^2 [0.93 to 9.3 footcandles (lumens/ft^2) (fluorescent light)], adjustable. For incandescent lamps the threshold is about ten times greater than above.

Motor On/Off Logger

Internal sensor monitors the AC field generated by motors, transformers, or a single wire carrying a large AC current. The logger can be conveniently mounted directly on a motor housing without requiring access to the motor internals. **Note that the logger must be mounted very close to the field source, as magnetic intensities fall off rapidly with increasing distance from their source.**

AC magnetic field threshold: 750 m Gauss @ 60 Hz (depending on distance and orientation)

1-Event/3-State Logger

Simultaneously monitors and logs state changes in up to three locations, as well as one time/date-stamped event
- Can be used with CSV-A8 Current Switch

Event channel (1)
External contact input: Passive relay switch or contact closure
Event resolution: 1 second
Minimum pulse length: 2.5 milliseconds
Maximum total cable: 32 m (105 ft) (if using state and event channels)
64 m (210 ft) (if using state channels only)

Contact closure resistance: Open > 300 k ohms
Closed < 10 k ohms

State channels (3)
External contact input: Passive relay switch or contact closure
Minimum duration: 1 second (open or closed)

AC Current Switch
$100 CSV-A8
5.9 x 5.1 x 2.3 cm
(2.32 x 2.0 x 0.92 in)

AC Current Switch

- Can be used with any state channel on U9-001 or U11-001 loggers
- Installs around a current-carrying wire to provide a relay signal indicating equipment on/off
- Adjustable threshold provides maximum application flexibility
- UL listed

Amperage range:	1.25 to 50 Amps continuous
Sensor supply voltage:	Induced from monitored conductor, with no external power required
Isolation:	600 VAC rms (max voltage when monitoring an uninsulated conductor)
Status output ratings:	N.O. 1.0A @ 30 VAC/DC max, not polarity-sensitive

HOBO State and On/Off Comparison & Ordering Information

		State HOBO U9	Light On/Off HOBO U9	Motor On/Off HOBO U9	3 State/1 Event HOBO U11
Product Number		U9-001	U9-002	U9-004	U11-001
Price		**$79**	**$70**	**$79**	**$119**
Number of Channels		1	1	1	4
Internal Sensors	State Open/Closed	yes	--	--	--
	Light On/Off	--	yes	--	--
	Motor On/off	--	--	yes	--
External Sensor	Motor On/Off	yes	--	--	yes
Size	cm	6.0 x 4.7 x 1.9	6.0 x 4.7 x 1.9	6.0 x 4.7 x 1.9	5.8 x 7.4 x 2.2
	inches	2.4 x 1.9 x 0.8	2.4 x 1.9 x 0.8	2.4 x 1.9 x 0.8	2.3 x 2.9 x 0.9
Weight	grams	25	25	29	50
	ounces	0.8	0.8	1	1.8

Complete system requires logger and software.

Software and Communications

Software
HOBOware Pro Software (Windows®)   BHW-PC $99
HOBOware Pro Software (Mac®)   BHW-MAC $99
HOBOware Lite Software (Windows/Mac)   BHW-LITE $39
HOBOware includes USB interface cable

Optional Communications
HOBO U-Shuttle*   U-DT-1 $249
USB to Ethernet Server   SERVER-US-4 $145

Requires HOBOware Pro software, see pages 30 and 32 for details.

- **Food-grade 316L stainless temperature loggers**
- **High-accuracy, extended temperature range**
- **Suitable for high pressure applications to 2200psi**
- **Fast readout via direct USB interface**
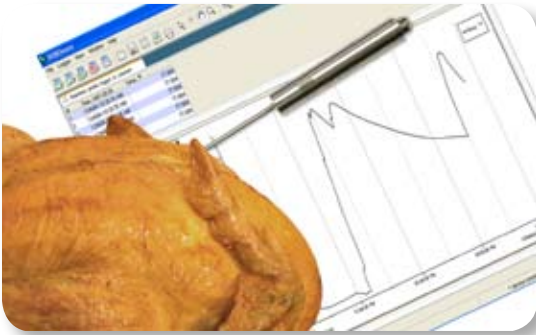
Memory:	43,000 measurements
Sample rate:	1 second to 18 hours, user-selectable
Battery life:	3-years (typical)—factory-replaceable $C\epsilon$

**HOBO U12 Stainless
Temperature Logger
$249** U12-015
101.6 x 17.5 mm diameter
(4.0 x 0.69 in diameter)

Temperature
Measurement

range:	-40° to 125°C (-40° to 257°F)
Accuracy:	±0.22°@ 25°C (±0.4°@ 77°F)
Resolution:	(12 bit): 0.02°@ 25°C (0.04°@ 77°F)
Response Time:	U12-015: 10 minutes
	(to 90% in airflow of 1 m/s)
	U12-015: 3.5 minutes
	(to 90% in water)

**HOBO U12 Stainless Temperature Logger
5 inch Probe
$339** U12-015-02
12.4 x 0.4 cm diameter
(4.9 x 0.16 in diameter)

U12-015-02: 2.25 minutes
(to 90% in airflow of 1m/s)
U12-015-02: 20 seconds
(to 90% in water)

NIST-traceable temperature accuracy certification available.

Software and Communications

Software

HOBOware Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
HOBOware includes USB interface cable	BHW-LITE	$39

Optional Communications

HOBO U-Shuttle*	U-DT-1	$249

Requires HOBOware Pro software, see pages 30 and 32 for details.

Complete system requires logger and software.

- **NEMA weatherproof enclosure for monitoring in condensing environments**
- **Four channels of external input allow monitoring of multiple parameters**
- **Accepts temperature, AC current, AC voltage, CO_2 or third-party sensors via 0-2.5 VDC or 4-20mA cables**

**HOBO U12
Industrial Logger
$199** U12-008
14.0 x 13.7 x 3.2 cm
(5.50 x 5.38 x 1.25 in)

Memory:	43,000 measurements
Sample rate:	1 second to 18 hours, user-selectable
Battery Life:	1-year (typical)—user-replaceable

CE

External Input	External sensors for temperature, AC current, AC voltage, CO_2, 4-20mA, 0-2.5 VDC (see page 8)
Input range:	0 to 2.5 volts DC
Accuracy:	±2mV ±2.5% of absolute reading
Resolution (12-bit):	0.6 mV
Output power:	2.5 volts DC at 2 mA, active only during measurements
Maximum recommended source impedence:	2.5k ohms

HOBO U12-008 Industrial Ordering Information

Air/water/soil temperature sensor			ConLab AC voltage transmitters (requires Input Cable CABLE-4-20mA)		
with 1' cable	TMC1-HD	$28	0 to 150 Volts AC	T-CON-ACT-150	$135
with 6' cable	TMC6-HD	$30	0 to 300 Volts AC	T-CON-ACT-300	$135
with 20' cable	TMC20-HD	$35			
with 50' cable	TMC50-HD	$40			
Stainless steel temp probe			DC Voltage input cable	CABLE-2.5-STEREO	$8
	TMC6-HC	$75	4-20mA input cable	CABLE-4-20mA	$22
Split-Core AC current sensors			Telaire CO_2/temperature	TEL-7001	$465
0-20 Amps AC	CTV-A	$86	CO_2-to-logger cable	CABLE-CO2	$25
0-50 Amps AC	CTV-B	$86			
0-100 Amps AC	CTV-C	$86			
0-200 Amps AC	CTV-D	$109			
0-600 Amps AC	CTV-E	$109			

NOTE: Inputs share a common ground.

Software and Communications

Software

|		
HOBOware® Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
HOBOware Lite Software (Windows/Mac)	BHW-LITE	$39
HOBOware includes USB interface cable		

Optional Communications

HOBO U-Shuttle*	U-DT-1	$249

*Requires HOBOware Pro software, see pages 30 and 32 for details.

Complete system requires logger, sensor and software.

- **Onset's most flexible logger records up to 15 channels**
- **The HOBO Energy Logger Pro accepts up to three two-channel modules and six plug-and-play Smart Sensors (some sensors measure more than one parameter)**
- **Provides 12v excitation for third-party sensors**
- **Pre-configured Smart Sensors for fast setup**
- **Signal conditioning modules retain configurations until you change them, providing plug-and-play convenience for commonly used sensors**
- **Flexible power options include battery operation or AC power adapter**
- **See onsetcomp.com for application and specific system diagrams**

HOBO Energy Logger Pro
$299 H22-001
15.4 x 9.4 x 5.1 cm
(6.06 x 3.69 x 2.00 in)
418.7 g (14.77 oz)

HOBOware® Pro Software provides easy logger launch, data readout, and plotting.

Temperature

Relative Humidity (RH)

AC Current (True RMS)

AC Voltage (True RMS)

DC Current

kW

kWh

Gauge Pressure

Differential Air Pressure

CO$_2$

Pulse inputs from

electric, gas or flow meters

Other third-party sensors via

4-20 mA/0-20 VDC

Solar Radiation

Wind Speed/Direction

Memory:	Up to 512,000 measurements, number varies based on sensor selection
Sample rate:	1 second to 18 hours, user-selectable
Battery life:	1-year typical, based on 75mA sensor excitation, 1 second-warmup time, and 10-minute logging interval—user-replaceable, AC adapter (optional)

Ideal for Building Commissioning
LEED Projects
Compressed Air Auditing
Energy Management & Facilities Management
HVAC/R Diagnostics
IAQ Projects
Chiller Optimization
M&V Projects
Performance Verification
Renewable Energy Installations

See pages 19 and 20 for external sensors and attachment accessories.

- **Two input channels of AC Current and/or Voltage**
- **Measures True RMS for accurate readings of sinusoidal and non-sinusoidal waveforms**
- **Range: 5mV to 512mV input**
- **Accuracy: ±0.3% of reading ±0.5% FSR**

**FlexSmart™
TRMS Module
$90** S-FS-TRMSA

**AC Voltage
$79** T-MAG-SPT-XXX

Ranges: 0-150, 0-300, 0-600 volts
Accuracy: ±1% (from 10% to 130% of rated voltage)

**AC Current
$50**-**$55** T-MAG-SCT-XXX

Ranges: 0-5, 0-20, 0-50, 0-100, 0-200, 0-600 Amps
Accuracy: ±1% (from 10% to 130% of rated current)

- **Two input channels of 0-20 mA and/or 0-20 VDC**
- **Provides 12V sensor excitation and user-configurable warm-up**
- **Accuracy: ±0.25% FS**

**FlexSmart™
Analog Module
$85** S-FS-CVIA

**kW Transducer
$815** T-VER-8044-100

Self-contained unit includes split-core AC current transformers and voltage leads to provide kilowatts of power
Range: 3 phase, 50/60 Hz, 480 VAC, 0 to 100 Amps
Accuracy: ±1% per ANSI C12.1
(from 10% to 100% of CT rating)

**Gauge Pressure
$190** T-ASH-G2-XXX

Ranges: 0-100, 0-200, 0-500 psig
Accuracy: ±1% of span from −20° to 85°C (-4° to 185°F)

**Differential Pressure
$165** T-SET-265-XXX

Range: 0-0.25in, 0-1in, 0-2.5in, 0-5in, 0-10in WC
Accuracy: ±1% FS

**Carbon Dioxide/Temp
$465** TEL-7001

Ranges: 0 to 4000 ppm CO_2 , 0° to 40°C (32° to 104°F)
Accuracy: ±50 ppm or ±5% of reading ; ±1°C (±2°F)
Requires CABLE-2070 for use with Analog Module.

**Duct-Mount
Humidity/Temp
$290** T-VAI-HMD-40Y

Ranges: 10 to 90% RH,
Temp: -10° to 60°C (14° to 140°F)
Accuracy: better than ±3% RH @ 25°C (77°F); ±0.3° temp
@ 25°C (±0.54°@ 77°F)

**Split Core DC
Current Transducer
$205** T-VER-H970-080

Ranges: 0-20/40/80 ADC slide switch selectable
Accuracy: ±3% FS combined linearity, hysteresis and
repeatability

- **Pulse Input Adapter is compatible with electronic switch closures, such as FET or open collector outputs, or CMOS-level logic signals**
- **Accepts both kWh transducers below, as well as flow meters, power meters, and gas meters with pulse outputs**
- **Maximum input frequency: 120 Hz**

Pulse Input Adapter
$69 S-UCC-M006

kW Transducer
$642-$849 T-VER-805X-XXX

Self-contained unit includes split-core AC current transformers and voltage leads to provide kilowatt hours of energy used. **Requires Pulse Input Adapter (S-UCC-M006).**

Ranges: 208 to 480 VAC, 300 Amps, 1-phase
208 to 480 VAC, 800 Amps, 3-phase

kWhTransducer
$270-$295 T-WNB-3X-XXX

Works with CTs (T-MAG-SCT-XXX) to provide True RMS kilo-watt hours of energy used, even for loads with non-sinusiodal waveforms. **Requires Pulse Input Adapter (S-UCC-M006).**

Ranges: 208/240 VAC and 480 VAC ±15% Delta and Wye systems
Accuracy: ±0.45% of reading ±0.05% FS through 25th harmonic

- **Plug-and-play Smart Sensors are automatically recognized by the logger**

Temperature/RH Smart Sensor
$175-$185 S-THB-M00x
cable lengths available
2 m, 8 m, (6.5 ft, 26 ft)

Ranges:	-40° to 75°C (-40° to 167°F)
	RH from -40° to 75°C (-40° to 167°F)
Accuracy:	±2.5% typical, 3.5% maximum, from 10 to 90% RH
Resolution:	0.02° @ 25°C (0.04° @ 77°F); 0.1% RH @ 25°C (77°F)
Response time:	Temp: 8 minutes, RH: 5 minutes
	(to 90% in airflow of 1 m/s)
Data channels:	2

Solar radiation shield (RS3) recommended for accurate temperature measurements in sunlight.

12-bit Temperature Smart Sensor
$90-$115 S-TMB-M0xx
2 m, 6 m, 17 m
cable lengths available
(6.5 ft, 20 ft, 56 ft)

Range: -40° to 75°C (-40° to 167°F)

Accuracy:	± 0.2° from 0° to 50°C (±0.36° from 32° to 122°F)
Resolution:	0.03° from 0° to 50°C (0.054° from 32° to 122°F)
Environment:	Sensor tip and cable rated for 1-year immersion in fresh water ≤ 50°C (122°F)
Response time:	< 2 minutes (to 90% in airflow of 1 m/s)

Solar radiation shield (RS3) recommended for accurate temperature measurements in sunlight.

AC Power Adapter
$25 P-AC-1

Switched supply powers HOBO Energy Logger Pro from AC power sources (100 to 240 VAC, 50 or 60 Hz).

HOBO Energy Logger Pro Ordering Information

HOBO Energy Logger Pro	H22-001	$299
FlexSmart™ TRMS Module	S-FS-TRMSA	$90
FlexSmart™ Analog Module	S-FS-CVIA	$85

Sensors
Smart Sensors (plug-and-play, no module required).
See pg 24 for additional weather-related Smart Sensor options.

12-bit Temperature *U.S. customers only*

2-m cable	S-TMB-M002	$90
6-m cable	S-TMB-M006	$100
17-m cable	S-TMB-M017	$115

12-bit Temp/RH

2-m cable	S-THB-M002	$175
8-m cable	S-THB-M008	$185

Pulse Input adapter	S-UCC-M006	$69

WattNode kWh
Pulse Input Adapter required.

Wye config 208/240	T-WNB-3Y-208	$270
Delta/Wye config 208/240	T-WNB-3D-240	$280
Delta/Wye config 480	T-WNB-3D-480	$295

Veris kWh
Pulse Input Adapter required.

1-phase, 300 Amp	T-VER-8051-300	$642
3-phase, 800 Amp	T-VER-8053-800	$849

True RMS Current and Voltage
FlexSmart TRMS Module required (Part #S-FS-TRMSA).
Magnelab Split-Core AC Current (also used with WattNode)

0-5 Amp	T-MAG-SCT-005	$50
0-20 Amp	T-MAG-SCT-020	$50
0-50 Amp	T-MAG-SCT-050	$50
0-100 Amp	T-MAG-SCT-100	$50
0-200 Amp	T-MAG-SCT-200	$50
0-600 Amp	T-MAG-SCT-600	$55

Magnelab AC Voltage

0-150 Volt	T-MAG-SPT-150	$75
0-300 Volt	T-MAG-SPT-300	$75
0-600 Volt	T-MAG-SPT-600	$75

Analog Input Sensors
These sensors require a FlexSmart Analog Module
(Part #S-FS-CVIA).

Veris kW	T-VER-8044-100	$815
Ashcroft Gauge Pressure		
100 psig	T-ASH-G2-100	$190
200 psig	T-ASH-G2-200	$190
500 psig	T-ASH-G2-500	$190
Setra Differential Air Pressure		
0.25 in WC	T-SET-265-R25	$165
1 in WC	T-SET-265-001	$165
2.5 in WC	T-SET-265-2R5	$165
5 in WC	T-SET-265-005	$165
10 in WC	T-SET-265-010	$165
Vaisala Duct-Mount RH/Temp		
	T-VAI-HMD-40Y	$290
Telaire CO_2/Temp	TEL-7001	$465
Cable CO_2/Temp to Module		
	CABLE-2070	$35
DC Current		
0-80 Amp	T-VER-H970-080	$205

Accessories

Mounting Feet Kit	A-H22-MOUNT-1	$6
DIN Mount Kit	A-H22-DINMOUNT-1	$16
AC power adapter	P-AC-1	$25

Smart Sensor Extension Cables
(total cable length of all sensor cables is 100 m (300 ft).

5-m length	S-EXT-M005	$25
10-m length	S-EXT-M010	$30
25-m length	S-EXT-M025	$40
1-to-2 Sensor Adapter*	S-ADAPT-5	$18

* When used with Smart Sensor Extension Cables, this allows a single smart sensor input to branch to two Smart Sensors.

Software and Communications

Software

HOBOware Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
Serial Interface Cable (Required)	CABLE-PC-3.5	$9
USB Serial Adapter	CABLE-USB232	$45

Optional Communications

HOBO U-Shuttle	U-DT-1	$249
Serial to Ethernet Server	SERVER-DS202	$135

*Requires HOBOware Pro software, see pages 30 and 32 for details.

Complete system requires logger, sensor and software.

- **Web-based energy and HVAC systems monitoring.**
- **All electronics are housed within an industrial-grade, tamperproof enclosure**
- **Set up is quick and easy with plug-and-play sensors**
- **Measures a wide range of energy and environmental parameters**
- **GSM Cellular, Wi-Fi and non-wireless options available**

Available models include:

HOBO® U30/GSM

- Internet access to real-time data
- Double weather proof, tamperproof enclosure
- Connect sensors, plug in battery, and go!

$799

HOBO® U30/Wi-Fi

- Connect sensors, plug in battery, and go!
- Ruggedized hardware, with integrated Wi-Fi
- Get notified of problems via cell phone or e-mail

$724

HOBO® U30/NRC

- Fast data offload via direct USB
- Optional analog inputs with sensor excitation

$420

Industrial-grade dependability

HOBO U30 Remote Monitoring Systems deliver high accuracy measurements you can count on — in even the harshest environmental conditions. All at a fraction of the cost of competitive solutions.

Incorporating patented technology, all of the systems' electronics are housed within a rugged double-weatherproof, tamperproof enclosure. This provides twice the protection and ensures years of reliable monitoring performance.

Fast, easy deployment

The systems' plug-and-play architecture enables any combination of Smart Sensors to be plugged in without extensive user programming, wiring, or calibration. Plug in your sensors, connect the battery, and you're streaming real time data!

Wide range of measurements

The HOBO U30 systems measure and record a wide range of parameters including:

- AC Voltage
- AC Amps
- DC Amps
- Temperature
- Temp/RH
- kW
- kWh
- Gauge Pressure
- Differential Air Pressure
- CO_2
- Pulse Inputs from electric, gas or flow meters
- DC voltage
- 4-20mA

An optional analog sensor port provides sensor power with user-selectable warm-up time

Learn More:

NEMA 6-rated tamperproof enclosure

Multiple power options
(solar or AC)

Plug and play sensor/logger architecture

Fully-integrated Wi-Fi or cellular communications

Built-in antenna
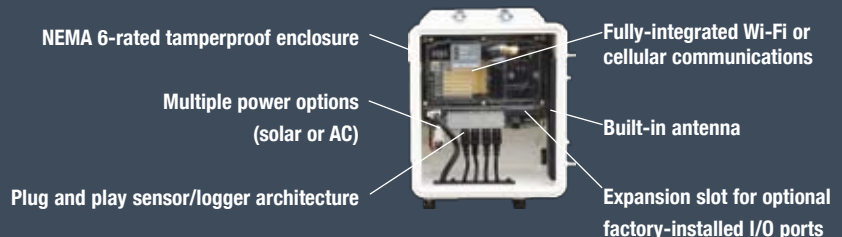
Expansion slot for optional factory-installed I/O ports

onset

HOBOlink™

HOBOlink is a web-enabled software designed for HOBO U30/GSM and Wi-Fi models. It allows you to easily access current and historical data, set alarm notifications, and relay activations, and manage and control your HOBO U30 Remote Monitoring Systems.

A secure web-based platform, HOBOlink provides users with password-protected accounts and 128-bit encrypted connection. You can keep your data entirely private, or make it accessible to others with a "Public Access" feature. Data can be provided in either text or HOBOware® Pro format.

Network Compatible

at&t

T· ·Mobile·
authorized dealer

HOBOlink can automatically notify you via cell phone text message or e-mail when conditions exceed user-defined limits or if there is a sensor failure or low battery.

Smart Sensors

Temperature/RH
$175-$185 S-THB-M00x
cable lengths available
2 m, 8 m, (6.5 ft, 26 ft)

Ranges:	-40° to 75°C (-40° to 167°F)
	RH from -40° to 75°C (-40° to 167°F)
Accuracy:	±2.5% typical, 3.5% maximum, from 10 to 90% RH
Resolution:	0.02° @ 25°C (0.04° @ 77°F); 0.1% RH @ 25°C (77°F)
Response time:	Temp: 8 minutes, RH: 5 minutes
	(to 90% in airflow of 1 m/s)
Data channels:	2

Solar radiation shield (RS3) recommended for accurate temperature measurements in sunlight.

12-bit Temperature
$90-$115 S-TMB-M0xx
2 m, 6 m, 17 m
cable lengths available
(6.5 ft, 20 ft, 56 ft)

Range:	-40° to 100°C (-40° to 212°F) for sensor tip only
Accuracy:	± 0.2° from 0° to 50°C (±0.36° from 32° to 122°F)
Resolution:	0.03° from 0° to 50°C (0.054° from 32° to 122°F)
Environment:	Sensor tip and cable rated for 1-year immersion
	in fresh water ≤ 50°C (122°F)
Response time:	< 2 minutes (to 90% in airflow of 1 m/s)

Solar radiation shield (RS3) recommended for accurate temperature measurements in sunlight.

Silicon Pyranometer
$199 S-LIB-M003
3 in 9.8 ft) Cable

Ranges:	0 to 1280 W/m^2
Spectral range:	300 to 1100 nm
Accuracy:	±10W/m^2 or ±5% whichever is greater in sunlight.
	Cosine corrected 0 to 80 degrees
Resolution:	1.25 W/m^2

Light sensor bracket (M-LBA) and light sensor level (M-LLA) recommended

Wind Speed & Direction
$520 S-WCA-M003
3 m (9.8 ft) Cable

	Speed	**Direction**
Range:	0 to 44 m/s (0 to 99 mph)	0-358°, 2° dead band
Accuracy:	Greater of ± 0.5 m/s (1.1 mph) or ±4% of reading	±5°
Resolution:	0.19 m/s	1.4 degrees
Starting threshold:	≤0.5 m/s, (1.1 mph)	
Data channels:	3 (average wind speed, direction, and highest 3 second gust)	

Survival to 54 m/sec (120 mph). Cross arm recommended for mounting. Grounding wire required for using this sensor with H21-002 Micro Station. Either the CABLE-HWS-G or CABLE-HWS-F can be used.

Sensors that require Pulse Input Adapter

kW Transducer
$642-$849 T-VER-805X-XXX

Self-contained unit includes split-core AC current transformers and voltage leads to provide kilowatt hours of energy used.
Requires Pulse Input Adapter (S-UCC-M006)

Ranges:	208 to 480 VAC, 300 Amps, 1-phase
	208 to 480 VAC, 800 Amps, 3-phase

kWhTransducer
$270-$295 T-WNB-3X-XXX

Works with CTs (T-MAG-SCT-XXX) to provide True RMS kilowatt hours of energy used, even for loads with non-sinusoidal waveforms.
Requires Pulse Input Adapter (S-UCC-M006)

Ranges:	208/240 VAC and 480 VAC ±15% Delta and Wye systems
Accuracy:	±0.45% of reading ±0.05% FS through 25th harmonic

Sensors that require optional Analog Sensor Port

Gauge Pressure
$190 T-ASH-G2-XXX

Ranges:	0-100, 0-200, 0-500 psig
Accuracy:	±1% of span from –20° to 85°C (-4° to 185°F)

Differential Pressure
$225 T-SET-265-XXX

Ranges:	0-0.25 in, 0-1 in, 0-2.5 in, 0-5 in, 0-10 in WC
Accuracy:	±1% FS

Carbon Dioxide/Temp
$465 TEL-7001

Ranges:	0 to 4000 ppm CO_2 , 0° to 40°C (32° to 104°F)
Accuracy:	±50ppm or ±5% of reading; ±1°C (±2°F)
	Requires CABLE-2070 for use with Analog Sensor Port.

kW Transducer
$815 T-VER-8044-100

Ranges:	3 phase, 50/60 Hz, 480 VAC, 0 to 100 Amps
Accuracy:	±3% per ANSI C12.1 (from 10% to 100% of CT rating)

DC Current Transducer
$205 T-VER-H970-080

The Veris Split Core DC Current Transformer (CT) provides accurate load level monitoring of DC current loads up to 80 amps. By combining a state of the art sensor with proven transducer circultry, the CT offers a single product solution that features factory-calibrated, switch-select able ranges of 0 to 20/40/80 amps for high resolution and maximum installation flexibility.

Sensors that require True RMS Module

TRMS Module
$100 S-FS-TRMSA-D

AC Voltage
$79
T-MAG-SPT-XXX

Ranges:	0-150, 0-300, 0-600 volts
Accuracy:	±1% (from 10% to 130% of rated voltage)

AC Current
$50-**$55**
T-MAG-SCT-XXX

Ranges:	0-5, 0-20, 0-50, 0-100, 0-200, 0-600 Amps
Accuracy:	±1% (from 10% to 130% of rated current)

Accessories

AC Power Adapter
$35 AC-U30

Input power requirements: 100 to 240VAC, 50 or 60 Hz

Provides a continuous change of the U30 battery.
(In the event of a power failure, the battery provides DC power to U30)

Technical Specifications

GSM Wireless Communication	Quad-Band GSM/GPRS 850/900/1800/1900 MHz
Wi-Fi Wireless Communication	2.412 - 2.484 GH$_3$ IEEE 802.11 b/g
Alarm Relay	User-configured as normally open, normally closed, or pulsed (30V, 1A Max)
Alarm Notification Latency	Logging interval plus 2 to 4 minutes (typical)
Certifications	FCC Certified. Check www.onsetcomp.com for the latest certification. $C\epsilon$
Smart-Sensor Inputs	5 or 10
Data Channels	Maximum of 15 (some sensors use more than one data channel)
Sensor Network Cable Length	100 m (328 ft) maximum
Normal Operating Range	-20 to 40°C (-4 to 104°F)
Extended Operating Range	-40 to 60°C (-40 to 140°F) see battery life, Note: the GSM module will not communicate below -30°C (-22°F)
Local Communication	USB
Data Storage Memory	512K bytes local storage in non volatile flash memory
Operational Indicators	LEDs show status of sensors, logging, alarms, and remote communication
Logging Interval	1 minute to 18 hours, user-specified
Station-to-Internet Upload Interval	10 minutes to 24 hours, user-specified
Power	An Onset solar panel (1.2 w, 3 w, 6 w) or AC adapter is required
Battery Type	4 Volt, 10 AHr, Rechargeable Sealed Lead Acid
Battery Life	Typical 3-5 years depending upon conditions of use. Regular operation outside of the normal operating range will reduce battery life to 1-2 years.
Environmental Rating	Weatherproof; tested to NEMA 6
Dimensions	17.8 H x 11.7 D x 19.3 W cm (7.0 H x 4 .6 D x 7.6 W inches)
Weight	2 kg (4.30 lbs)
Mounting	Up to 1.63 in (4.1 cm) mast or wall mount
Enclosure Access	Hinged door secured by two latches, which can be further secured with user-supplied padlocks

Optional Analog Sensor Port

Inputs	2 channels - User-configured as either 0-20 mA or 0-20 VDC
Sensor Power	Switched 12 VDC, up to 50 mA: user-selectable warm-up from 5 milliseconds to 2 minutes
Scaling	Linear scaling to user units
Accuracy	± 0.25% full scale

HOBO Remote Monitoring Systems with GSM Communications	GSM Cellular to Internet	U30-GSM	-___	-__	-S100	-___	$799
Sensor Port Options	No sensor port	000					included
	2-channel analog sensor port	VIA					$89
Smart Sensor Input Options	5 smart sensor inputs	05					included
	10 smart sensor inputs	10					$39
Battery Option	10 Ah rechargeable battery	S100					included
HOBOlink/T-Mobile Data Service*	10 minute calling (100MB)	102					$699/1yr
	20 calls per day (5 MB)	104					$420/1yr
	1 call per day (0.5 MB)	105					$240/1yr
HOBOlink/AT&T Data Service*	10 minute calling (50 MB)	202					$1020/1yr
	20 minute calling (20 MB)	203					$828/1yr
	20 calls per day (5 MB)	204					$540/1yr
	1 call per day (0.5 MB)	205					$300/1yr

See onsetcomp.com for the latest selection of service plans.
Early termination fees apply. A $200 fee will be assessed for terminating the service plan within 30 days. No refund will be applied for terminating the plan after 30 days.

HOBO Remote Monitoring Systems without remote communications	No remote communication	U30-NRC	-___	-__	-____	-000	$420
Sensor Port Options	No sensor port	000					included
	2-channel analog sensor port	VIA					$89
Smart Sensor Input Options	5 smart sensor inputs	05					included
	10 smart sensor inputs	10					$39
Battery Options	4.5 Ah rechargeable battery	S045					included
	10 Ah rechargeable battery required when using analog sensor port for sensor power	S100					$19
Data Plan	No data plan needed	000					N/A

HOBO Remote Monitoring Systems with Wi-Fi Communications**	Wi-Fi to Internet **	U30-WIF	-___	-__	-____	-___	$724
Sensor Port Options	No sensor port	000					included
	2-channel analog sensor port	VIA					$89
Smart Sensor Input Options	5 smart sensor inputs	05					included
	10 smart sensor inputs	10					$39
Battery Option	4.5 Ah rechargeable battery	S045					included
	10 Ah rechargeable battery required when using analog sensor port for sensor power	S100					$19
HOBOlink Data Service	10 minute upload (1 sec log)	001					$240/1yr
	10 minute upload (1 min log)	002					$120/1yr
	1 hr uploads (5 min log)	003					included

See onsetcomp.com for the latest selection of service plans.
**Pre-N routers are Preliminary and should not be used with U30 Wi-Fi Remote Monitoring Systems.*

Software (one required)	HOBOware Pro (Windows)	BHW-PC	**$99**
	HOBOware Pro (Mac)	BHW-MAC	**$99**

Power Source Options

1.2 Watt Solar Panel	for sunny locations and/or locations with low data transfer requirements (readout every 2 hours or longer)	SOLAR-1.2W	**$85**
3.0 Watt Solar Panel	for moderately sunny locations and/or medium data transfer requirements (such as hourly readout).	SOLAR-3W	**$129**
6.0 Watt Solar Panel	for cloudy locations and/or high data transfer requirements (faster than 15 minute readouts)	SOLAR-6W	**$149**
AC Power Adapter	(120V, 60Hz) for locations with AC power available the adapter is not weatherproof.	AC-U30	**$35**
AC Power Adapter (EU)	(240V, 50Hz) for locations with AC power available the adapter is not weatherproof.	AC-U30-EU	**$35**

Smart Sensors

Temperature		
2-m cable	S-TMB-M002	**$90**
6-m cable	S-TMB-M006	**$100**
17-m cable	S-TMB-M017	**$115**
Temp/RH		
2-m cable	S-THB-M002	**$175**
8-m cable	S-THB-M008	**$185**
Wind Speed/Directiion	S-WCA-M003	**$520**
Rain Gauge: (.01 in)	S-RGA-M002	**$389**
Rain Gauge: (0.2 mm)	S-RGB-M002	**$389**
Soil Moisture (ECHO 20)	S-SMA-M005	**$139**
Soil Moisture (ECHO 10)	S-SMB-M005	**$139**
Soil Moisture (ECHO 5)	S-SMC-M005	**$139**
Leaf Wetness	S-LWA-M003	**$105**
PAR	S-LIA-M003	**$210**
Solar Radiation	S-LIB-M003	**$199**
Barometric Pressure	S-BPB-CM50	**$249**
Pulse Input Adapter:		
-Electronic Switch	S-UCC-M006	**$69**
-Contact Closure	S-UCD-M006	**$69**

Sensors that requre Pulse Input Adapter

kWh		
Wye config 208/240	T-WNB-3Y-208	**$270**
Delta/Wye config 208/240	T-WNB-3D-240	**$280**
Delta/Wye config 480	T-WNB-3D-480	**$295**
Veris kWh		
1-phase, 300 Amp	T-VER-8051-300	**$642**
3-phase, 800 Amp	T-VER-8053-800	**$849**
Pulse Input Adapter	S-UCC-M006	**$69**

Sensors that require Analog Sensor Port

Ashcroft Gauge Pressure		
100 psig	T-ASH-G2-100	**$190**
200 psig	T-ASH-G2-200	**$190**
500 psig	T-ASH-G2-500	**$190**
Differential Air Pressure		
0.25 in WC	T-SET-265-R25	**$165**
1 in WC	T-SET-265-001	**$165**
2.5 in WC	T-SET-265-2R5	**$165**
5 in WC	T-SET-265-005	**$165**
10 in WC	T-SET-265-010	**$165**
CO_2/Temp	TEL-7001	**$465**
CO_2/Temp Port Cable	CABLE-2070	**$35**
kW	T-VER-8044-100	**$815**
DC Duct-Mount Temp/RH	T-VAI-HMD-40Y	**$290**
Amperage	T-VER-H970-080	**$205**

Sensors that require True RMS Adapter

TRMS Module	S-FS-TRMA-D	**$100**
AC Amperage		
0-5 Amp	T-MAG-SCT-005	**$50**
0-20 Amp	T-MAG-SCT-020	**$50**
0-50 Amp	T-MAG-SCT-050	**$50**
0-100 Amp	T-MAG-SCT-100	**$50**
0-200 Amp	T-MAG-SCT-200	**$50**
0-600 Amp	T-MAG-SCT-600	**$55**
AC Voltage		
0-150 Volt	T-MAG-SPT-150	**$79**
0-300 Volt	T-MAG-SPT-300	**$79**
0-600 Volt	T-MAG-SPT-600	**$79**

Tripod/Masts and Accessories

|		
2m Tripod with Mast (M-SKB recommended)	M-TPB	**$50**
Complete 2 Meter Tripod Kit	M-TPB-KIT	**$165**
3m Tripod with Mast (M-SKA recommended)	M-TPA	**$140**
Complete 3 Meter Tripod Kit	M-TPA-KIT	**$245**
3 m Mast	M-MPA	**$40**
1.5 m Mast	M-TPB	**$20**
Guy Wire Kit	M-GWA	**$35**
1/4 in. State Kit	M-SKB	**$10**
1/2 in. State Kit	M-SKA	**$25**
Grounding Kit	M-GKA	**$40**
(does not provide protection from direct lightning strikes)		
Mast Level	M-MLA	**$12**
(recommended for installing masts or tripods)		
Half Cross Arm	M-CAB	**$40**
(recommended for use with wind sensors)		
Solar Radiation Shield	RS3	**$59**
(for use with temperature and temp/RH sensors)		
Light Sensor Bracket	M-LBA	**$25**
(for mounting PAR and solar radiation sensors on masts or flat vertical surfaces)		
Light Sensor Level	M-LLA	**$30**
(recommended for installing PAR and solar radiation sensors)		
Smart Sensor Extension Cables		
(total cable length of all sensor cables is limited to 100 m (300 ft)		
5-m length	S-EXT-M005	**$25**
10-m length	S-EXT-M010	**$30**
25-m length	S-EXT-M025	**$40**
1 to 2 Sensor Adapter	S-ADAPT-5	**$18**
This allows a single Smart Sensor input to branch to two Smart Sensors.		
Weatherproof		
Connection Housing	S-EXT-CASE	**$20**
(required for outside connections)		
Cable Caddy	M-CDY	**$59**

- **Onset's most powerful software for logger launch, readout, data graphing, analysis, and data export**
- **Supports all HOBO U-Series loggers and Data Shuttles, HOBO Weather Station/Micro Station, and HOBO Energy Logger Pro loggers and HOBO Remote Monitoring System**
- **Data Assistants and Alarm and Readout Tool plug-in provide advanced data analysis and monitoring/notification of out-of-range conditions**
- **Available for PC or Mac**
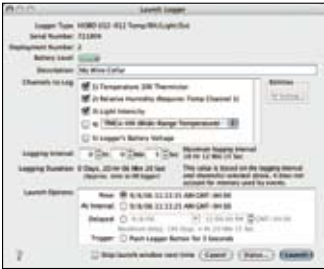
Easy logger setup – select launch parameters and go!
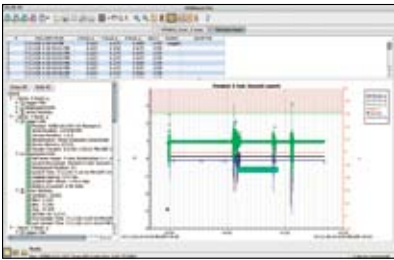
Powerful graphing features let you plot and filter data from multiple loggers or deployments. Save modified graphs for later viewing and further analysis/modification.
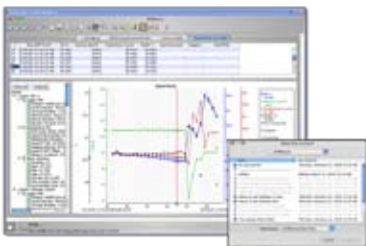
The Bulk Export Tool, available for free download at onsetcomp.com, makes it easy to export data from many logger data files at once.

Growing list of Data Assistants

- kWh Assistant—(included in HOBOware Pro Software) Uses a pulse series to provide Energy used per interval (kWh), Average Power per interval (kW), and Usage Cost.
- Pulse and Linear Scaling Assistants— (included in HOBOware Pro Software) easily converts data from third-party sensors with 4-20mA, DC voltage, or pulse outputs
- Grains Per Pound Assistant also known as Humidity Ratio or Mixing Ratio—provides a measurement of the mass in grains of H_2O in a pound of otherwise dry air ($29 web download).

HOBOware for Windows® System Requirements

- Microsoft Windows XP Professional or Home Edition, Windows 2000 Professional, Windows 2000 Server, Vista Pro, or Vista Home Premium
- Java Runtime Environment (JRE) version 1.5.0_15
- 256 MB system RAM (512 MB recommended)
- 3.5 MB free disk space after installing the Java Runtime Environment
- USB port required for U-Series loggers
- Serial port or USB Serial Adapter for HOBO Weather Station, Micro Station or HOBO Energy Logger Pro
- 800 x 600 (minimum) display resolution, 256 colors (1024 x 768 or greater recommended)

HOBOware for Mac® System Requirements

- Mac OS X versions 10.3.9 or 10.4.x and greater
- Java Runtime Environment (JRE) version 1.5.0_13
- 256 MB system RAM (512 MB recommended)
- 7 MB free disk space after installing JRE
- USB port required for U-Series loggers
- Serial port or USB Serial Adapter for HOBO Weather Station, Micro Station or HOBO Energy Logger Pro
- 1024 x 768 (minimum) display resolution

Software and Communications

Software

HOBOware Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
USB Serial Adapter	CABLE-USB232	$45
Serial Interface Cable	CABLE-PC-3.5	$9

HOBOware includes USB interface cable

- **Alarm notification via cell phone text message, pager or e-mail when conditions exceed user-defined limits**
- **User-selectable automatic data readout and storage from loggers onto a central computer, via e-mail as an attachment, or transfer to an FTP site**
- **User-defined delay filters out false alarms from momentary events**
- **Alarm notification when batteries or available memory get low, or when logger connection is broken**
- **Displays current logger readings**

Alarm and Readout Tool System Requirements

Parent Software
- HOBOware Pro (version 2.3.1 or higher)

Logger Ethernet Communication Requirements
- **HOBO U10 and U12 Loggers:** Each logger requires its own USB port on the computer or can connect remotely through an Ethernet network using a Keyspan USB Server (part# SERVER-US-4). Keyspan server connection limit is 12 remote USB ports at a time. Each logger requires a USB cable (CABLE-USBMB).
- **HOBO U9 and U11 Loggers:** Same requirements as above, but alarms are not supported for Event or State inputs.
- **HOBO Energy Logger Pro and Weather/Micro Station Loggers:** Each logger requires its own serial port on the computer or can connect remotely through a Ethernet network using a Tibbo Serial-Ethernet Server (part #SERVER-DS202). Each logger requires its own Tibbo Server and serial interface cable (part #CABLE-PC-3.5).

Notification and Storage Requirements

To receive alarm notifications via cell phone, pager or e-mail, you will need a continuous Internet connection with e-mail or SMTP service to send notifications, and one or more of the following:
- Text-message-enabled cell phone (to receive cell phone notifications)
- Alphanumeric pager (to receive pager notifications)
- E-mail account (to receive e-mail notifications)
- Local storage or FTP site (to store readout data)

Software and Communications

Software

HOBOware® Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
Real-Time Alarm Software Plug-in*	BHW-T-ALARM	$49
HOBOware includes USB interface cable		

Optional Communications

Tibbo Serial-Ethernet Server	SERVER-DS202	$135
Keyspan USB-Ethernet Server	SERVER-US-4	$145
USB Interface Cable	CABLE-USBMB	$9
One required for each HOBO U-Series Logger		
Serial Interface Cable	CABLE-PC-3.5	$9
One required for each HOBO Energy Logger Pro		
USB Serial Adapter**	CABLE-USB232	$45
Required for connecting HOBO Weather Station, Micro Station, and HOBO Energy Pro loggers to a computer USB port.		

Requires HOBOware Pro software, see pages 30 and 32 for details.
**USB Serial Adapter is not supported for use with Keyspan USB (Server-US-4).*

HOBOware Lite Software

- **Entry-level software for HOBO U-Series loggers**
- **Easy logger launch, readout, and data plotting**
- **Ideal for users looking to save money and who don't need all the features of HOBOware Pro**
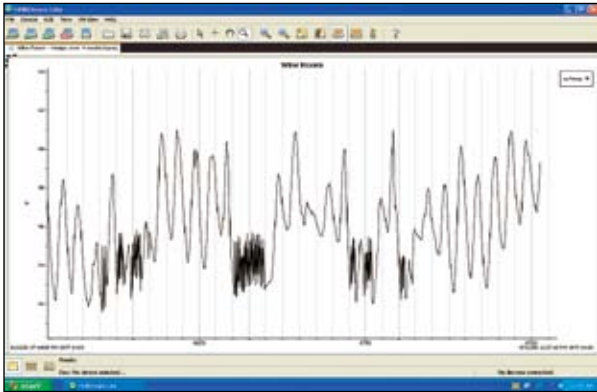
HOBOware Lite Software
$39
BHW-LITE

HOBOware Lite System Requirements:
Please refer to page 30 — requirements are the same as HOBOware Pro Software

HOBOware Pro vs HOBOware Lite

Features	HOBOware Pro	HOBOware Lite
Support for HOBO U-Series Loggers	•	•
Support for HOBO Weather Station, HOBO Micro Station	•	
Configure HOBO FlexSmart modules	•	
Support for HOBO U-Shuttle and HOBO Waterproof Shuttle	•	
Launch supported loggers	•	•
Launch time-saving options	•	
Graphing and analysis with ability to view multiple data files on one graph	•	•
Readout and open-file time-saving options	•	
Filters to extract key series information	•	•
Subset Statistics Tool	•	
Save (Project) Changes	•	•
Import ASCII text data	•	
Export ASCII text data	•	•
Check Logger Status	•	•
Includes Data Assistants for Linear Scaling,, Pulse Scaling and Grains Per Pound Assistant	•	
Ability to add Data Assistants (Grains Per Pound)	•	
Ability to add plug-in tools (Alarm and Readout Tool Software)	•	
Access remote loggers through Ethernet (requires supported Ethernet server)	•	•
HOBOware Setup Assistant	•	
Bulk Export Tool	•	
21 CFR Part 11 Secure Data Storage	•	

Ordering Information

HOBOware Lite Software (Windows®/Mac®)	BHW-LITE	$39

HOBOware includes USB interface cable
HOBOware Lite does not support Data Shuttles or Data Assistants

Keyspan USB Ethernet Server
$145 SERVER-US-4
12.7 x 7.6 2.5 cm
(5.0 x 3.0 x 1.05 in)

Tibbo Serial-Ethernet Server
$135 SERVER-DS202
60 x 40 30 cm
(2.4 x 1.8 x 1.2 in)
154g (5.4 oz)

USB to Ethernet
- Allows multiple HOBO data loggers to be connected over an Ethernet network
- Enables remote management and access to HOBO loggers deployed throughout a facility
- Allows connection of up to four loggers per server
- Onset's Alarm and Readout Tool plug-in to HOBOware Pro software (for PC or Mac) provides capabilities for alarm notification via email, pager, or cell phone text message when conditions exceed user-defined limits (see page 31)

Specifications
- RJ45 Ethernet connection, four USB logger ports
- 10/100 autosensing
- Network protocols supported: Static, DHCP, Zeroconfig

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Serial to Ethernet
- Enables a HOBO Energy Logger Pro to be connected to an existing Ethernet network
- Provides centralized access to data recorded by loggers throughout a facility
- Onset's Real-Time Alarm plug-in to HOBOware Pro software (for PC) provides capabilities for alarm notification via email, pager, or cell phone text message when conditions exceed user-defined limits (See page 31)

Specifications
- RJ45 Ethernet connection, RS232 serial port
- Network protocols supported: UDP, TCP, ARP, ICMP (PING), and DHCP CE, FCC-approved

Keyspan USB Ethernet Server

LAN

Tibbo Serial-Ethernet Server

LAN
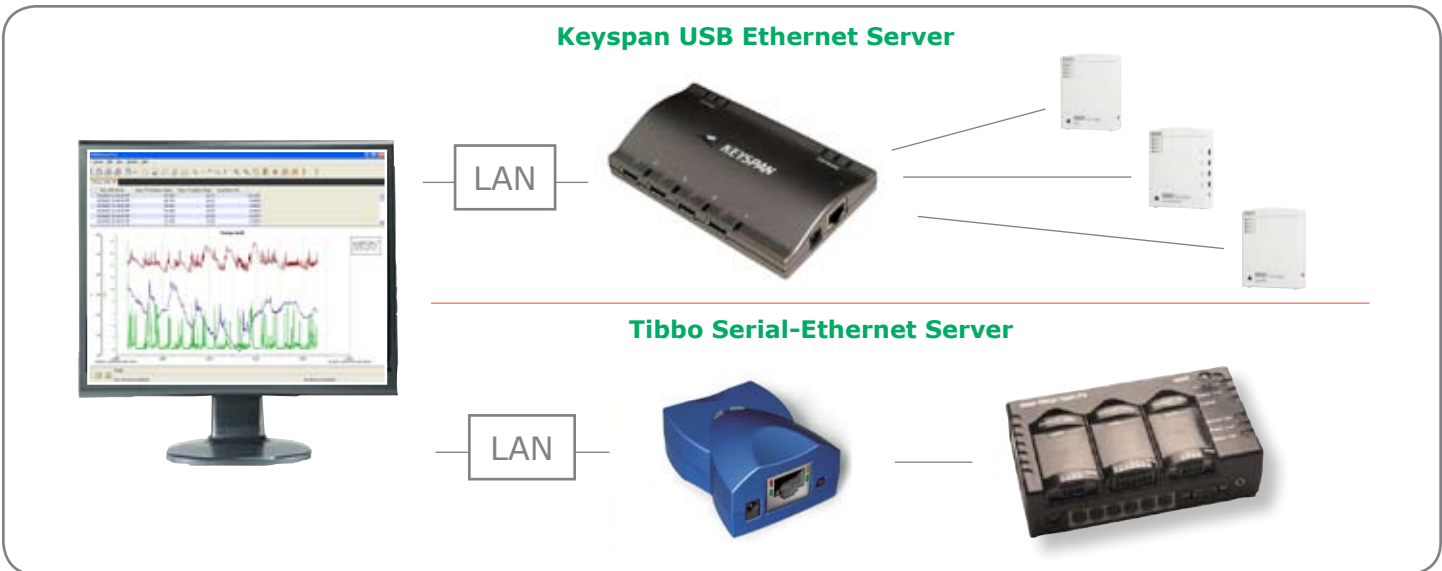
Communications Ordering

Optional Communications

Keyspan USB Ethernet Server	SERVER-US-4	$145
Tibbo Serial-Ethernet Server	SERVER-DS202	$135

Data Shuttles/Base Stations

Onset offers a range of data retrieval and communication options to make data offload from HOBO loggers fast and easy.

HOBO U-Shuttle
$249 U-DT-1
11.0 x 6.9 x 2.7 cm
(4.35 x 2.7 x 1.05 in)
153 g (5.4 oz)

- Enables convenient, easy data offload from HOBO U-Series and Energy Logger Pro data loggers (Base Station required for Optic USB loggers)
- Provides safe transport of data back to a PC or Mac
- Stores data from multiple data loggers
- LCD display provides current sensor readings (excluding HOBO U12 Family loggers), and battery and logger status
- Cable HOBO-SHTL and Cable USBMB included

Specifications:
4 MB non-volatile memory: 504 8K loggers, 63 64K loggers
Operating temperature range 0° to 50°C (32° to 122°F)
Battery life: 1-year (typical) — user-replaceable
Requires HOBOware Pro Software

HOBO Waterproof Shuttle
$219 U-DTW-1
15.2 x 4.8 cm
(6.0 x 1.9 in)
150 g (5.3 oz)

- Can be used either as a data shuttle or an Optic USB Base Station
- Supports all HOBO Optic USB loggers
- Outdoor or underwater data readout
- Convenient direct USB connection to host computer
- Waterproof to 20 m
- Checks and indicates its own battery status

Specifications:
4 MB non-volatile memory: up to 63 loggers
Operating temperature range 0° to 50°C (32° to 122°F)
Battery life: 1-year (typical) — user-replaceable
Requires HOBOware Pro Software

Optic USB Base Station
$110 BASE-U-4
15.2 x 4.8 cm
(6.0 x 1.9 in)
150 g (5.3 oz)

- Provides fast optical infrared (IR) communications for easy launch and readout of all HOBO Optic USB loggers
- Splash-resistant

Specifications:
Operating temperature range 0° to 50° C (32° to 122° F)
Cable length 183 cm (6 ft)
Offloads full 64K logger in 30 seconds

Pendant Base Station
$59 BASE-U-1
9.5 x 4 x 2.8 cm
(3.75 x 1.6 x 1.1 in)
45 g (1.6 oz)

- Provides fast optical infrared (IR) communications for easy launch and readout of all HOBO Pendant loggers
- Connects via USB cable to host computer while Coupler attaches the logger to Base Station
- Splash-resistant

Specifications:
Operating temperature range 0° to 50° C (32° to 122° F)
Cable length 183 cm (6 ft)
Offloads full 64K logger in 30 seconds

Ordering Information

Data Shuttle and Base Stations

HOBO Waterproof Shuttle with Couplers*	U-DTW-1	$219
HOBO U-Shuttle*	U-DT-1	$249
Pendant Base Station	BASE-U-1	$59
Optic USB Base Station with Couplers	BASE-U-4	$110

*Data Shuttles require HOBOware Pro for offload. See onsetcomp.com for specifications.*

HOBO Shuttle and Base Station Compatibility

		HOBO U-Shuttle Data Transporter	HOBO Waterproof Shuttle	Pendant Base Station	Optic USB Base Station
		U-DT-1	U-DTW-1*	BASE-U-1	BASE -U-4*
Price		$249	$219	$59	$110
Storage Capacity	504 loggers/8k memory	√	√		
	63 loggers/64k memory	√	√		
	7 loggers/512k memory	√			
HOBO U9		√			
HOBO U10		√			
HOBO U11		√			
HOBO U12 (12 -bit family)		√			
HOBO U12 Outdoor		√			
HOBO U12 Stainless		√			
HOBO Pendant loggers		√B	√	√	√
Pendant Event		√B	√	√	√
HOBO Water Level Loggers		√B	√		√
HOBO Water Temp Pro V2		√B	√		√
HOBO Pro V2		√B	√		√
TidbiT Temp V2		√B	√		√
Rain Gauge		√B	√	√	√
HOBO Weather Station		√			
HOBO Micro Station		√			
HOBO Energy Logger Pro		√			

Products with a "√B" require a base station for use with the U-Shuttle.
* Couplers are included.

- **Low-cost temperature with alarm indication or light intensity**
- **Waterproof housing for wet or underwater use**
- **Data readout in less than 30 seconds via fast Optic USB interface**

USB
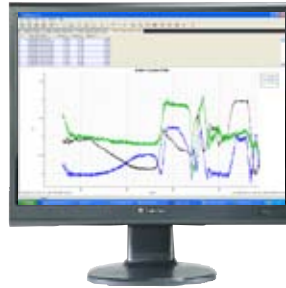
BASE-U-1

Pendant

BASE-U-1 is recommended with this logger.

HOBO Pendant

Memory:	UA-001-08 — 6,500 measurements
	UA-001-64 — 52,000 measurements
	UA-002-08 — 3,500 temperature & light measurements
	UA-002-64 — 28,000 temperature & light measurements
Sample rate:	1 second to 18 hours, user-selectable
Battery life:	1-year (typical)—user-replaceable

Temperature

Measurement range:	-20° to 70°C (-4° to 158°F) in air
	-20° to 50°C (-4° to 122°F) in water
Accuracy:	±0.47°@ 25°C (±0.85°@ 77°F)
Resolution (10-bit):	0.1°@ 25°C (0.2°@ 77°F)
Response Time:	15 minutes (to 90% in airflow of 1 m/s)
	5 minutes (to 90% in water)

NIST-traceable temperature accuracy certification available.

Light Intensity

Designed for general-purpose measurement of relative light levels

Range: 0-323,000 lumens/m^2 [0-30,000 footcandles (lumens/ft^2)]

HOBO Pendant G

Memory:	UA-004-64 — 64,000 1-axis measurement
	— 32,000 2-axes measurements
	— 21,333 3-axes measurements
Sample rate:	100 per second (100 Hz) to 18 hours, user-selectable
Battery life:	1-year (typical)—user-replaceable
Operating range:	-20° to 70°C (-4° to 158°F) in air
	-20° to 50°C (-4° to 122°F) in water

Acceleration

Measurement range:	± 3 G
Accuracy:	±2.5% FS @ 25°C (77°F)—Factory calibrated
Resolution (8-bit):	0.02 G

Tilt/Motion

Measurement range:	0° to 180° from vertical
Accuracy:	±4.3° @ 90° to ±22.3° @ 0° and 180°
Resolution (8-bit):	±4.3° @ 90° to ±13° @ 0° and 180°

HOBO Pendant Comparison & Ordering Information

Product Number		Temperature w/ Alarm Logger UA-001-08	Temperature w/ Alarm Logger UA-001-64	Temperature/ Light Logger UA-002-08	Temperature/ Light Logger UA-002-64	Acceleration/ Tilt/Motion UA-004-64
Price		**$39**	**$49**	**$39**	**$49**	**$69**
Number of Channels		1	1	2	2	3
Internal Sensors	Temperature	yes	yes	yes	yes	--
	Light Intensity	--	--	yes	yes	--
	Acceleration	--	--	--	--	yes
Size	cm	5.8 x 3.3 x 2.3	5.8 x 3.3 x 2.3	5.8 x 3.3 x 2.3	5.8 x 3.3 x 2.3	5.8 x 3.3 x 2.3
	inches	2.3 x 1.3 x 0.9	2.3 x 1.3 x 0.9	2.3 x 1.3 x 0.9	2.3 x 1.3 x 0.9	2.3 x 1.3 x 0.9
Hole in mounting bail	mm	3.2	3.2	3.2	3.2	3.2
	inches	0.13	0.13	0.13	0.13	0.13
Weight	grams	18	18	18	18	18
	ounces	0.6	0.6	0.6	0.6	0.6

Complete system requires logger, software and base station.

Software, Communications and Accessories

Software

HOBOware Pro Software (Windows®)	BHW-PC	$99
HOBOware Pro Software (Mac®)	BHW-MAC	$99
Pendant Base Station*	BASE-U-1	$59
HOBOware Lite	BHW-LITE	$39

Optional Communications and Accessories

HOBO U-Shuttle (requires Base Station)**	U-DT-1	$249
HOBO Waterproof Shuttle with Couplers**	U-DTW-1	$219
Solar Radiation Shield***	RS1	$75

  *HOBO Waterproof Shuttle or Optic USB Base Station (BASE-U-4) may be used instead of the Pendant Base Station. (See page 34-35 for details on Data Shuttles and Base Stations).

 **Requires HOBOware Pro software, see pages 30 and 32 for details.

*** Accurate temperature measurements in sun require a radiation shield.

- **Weatherproof housing for use in outdoor or condensing environments**
- **High-accuracy**
- **Replaceable RH sensor provides superior recovery from condensing conditions**
- **Small-diameter external sensor versions for measurements in tight spaces**
- **Optic USB interface for fast and reliable download**

BASE-U-4   **Coupler**   **Pro V2**

BASE-U-4 or U-DTW-1 is required with this logger (coupler is included with these).

Memory:	42,000 measurements
Sample rate:	1 second to 18 hours, fixed rate or multiple logging intervals
Battery life:	3 years (typical)—user-replaceable

Internal Temperature

Measurement range:	-40° to 70°C (-40° to 158°F)
Accuracy:	±0.18°@ 25°C (±0.32°@ 77°F)
Resolution (12-bit):	0.02°@ 25°C (0.04°@ 77°F)
Response time:	40 minutes (to 90% in airflow of 1 m/s)

Relative Humidity (RH)

Measurement range:	0 to 100% RH
Accuracy:	±2.5% typical, 3.5% maximum, from 10 to 90% RH
Resolution (12-bit):	0.03% RH
Response time:	U23-001: 10 minutes (90% in airflow of 1 m/s; RH change only)
	U23-002: 4 minutes (90% in airflow of 1 m/s; RH change only)

External Temperature

Measurement range:	U23-002: -40° to 70°C (-40° to 158°F)
	U23-003 & 004: -40° to 100°C (-40° to 212°F); sensor tip and cable immersion in fresh water up to 50°C (122°F) for one year
Accuracy:	±0.18°@ 25°C (±0.32°@ 77°F)
Resolution (12-bit):	0.02°@ 25°C (0.04°@ 77°F)
Response time:	U23-002: 5 minutes (to 90% in airflow of 1 m/s)
	U23-003 & U23-004: 3 minutes (to 90% in airflow of 1 m/s)
	30 seconds (to 90% in water)

NIST-traceable temperature accuracy certification service available.

HOBO Pro v2 Comparison & Ordering Information

		Internal Temp/RH HOBO Pro v2	External Temp/RH HOBO Pro v2	2x External Temp HOBO Pro v2	Temp/External Temp HOBO Pro v2
Product Number		U23-001*	U23-002*	U23-003	U23-004
Price		**$149**	**$179**	**$149**	**$129**
Number of Channels		2	2	2	2
Internal Sensors	Temperature	yes	--	--	yes
	Relative Humidity	yes	--	--	--
Integrated External Sensors	Temperature	--	yes	yes	yes
	Relative Humidity	--	yes	-	--
Size	cm	10.2 x 3.8	10.2 x 3.8	10.2 x 3.8	10.2 x 3.8
	inches	4.0 x 1.5	4.0 x 1.5	4.0 x 1.5	4.0 x 1.5
	probe	--	1 cm (0.38 in) diameter probe on 1.8 m (6 ft) cable)	0.5 cm (0.2 in) diameter probe on 1.8 m (6 ft) cable	0.5 cm (0.38 in) diameter probe on 1.8 m (6 ft) cable
Weight	grams	57	118	138	102
	ounces	1.5	3.1	3.7	2.7

Complete system requires logger, software and base station.
* Replaceable RH Sensors Available

Software, Communications and Accessories

Software
HOBOware Pro Software (Windows®)   BHW-PC $99
HOBOware Pro Software (Mac®)   BHW-MAC $99
HOBOware Lite Software   BHW-LITE $39
Optic USB Base Station** with Couplers   BASE-U-4 $110

Optional Communications and Accessories
HOBO U-Shuttle (requires Base Station)   U-DT-1 $249
HOBO Waterproof Shuttle with Couplers   U-DTW-1 $219
Solar Radiation Shield**   RS1 $75
U23-001 only   *M-RSA*   *$90*
Solar Radiation Shield***   RS3 $59
U23-002, 003, 004
Mounting Clamp   U23-RS-CLAMPKIT $5
(for mounting U23-001 and 004 in RS1 or M-RSA)
Replaceable RH Sensor for U23-001   HUM-RHPCB-1 $60
Replaceable RH Sensor for U23-002   HUN-RHPCB-2 $60
Replaceable RH Sensor Caps for U23-002 (5 pack)   HUM-RHCAP-2 $45

** HOBO Waterproof Shuttle can also be used as a Base Station (See page 34-35 for details).
***Accurate temperature and RH measurements in sun require a radiation shield. Use the RS1 for internal sensors and the RS3 for external sensors.

Description	Part Number	Price
NIST Traceable Setup/logger	NIST-SETUP	$30
NIST per-point/channel	NIST-TEMP-POINT	$30

Computer Interface Cables

	Part Number	Price
Interface cable for most PCs	CABLE-PC-3.5	$9
USB Cable for HOBO U-series	CABLE-USBMB	$9
USB Serial Adapter	CABLE-USB232	$45

Replacement Batteries

	Part Number	Price
Batteries for HOBO U9, U10, U11, U12, (box of 6)	HRB-TEMP	$12
Battery for HOBO Pro v2 (U23) (single)	HP-B	$12
Factory Battery Replacement for HOBO Stainless Temp Logger	HRB-TEMP	$100
Factory Battery Replacement for HOBO U12 Stainless 5 in Probe Temp Logger	HRB-TEMP	$136

Optic Base Station and Optic Shuttle Accessories

	Part Number	Price
Pendant Coupler (with BASE-U-1)	Coupler-UA	$15
Coupler for Pendant (with BASE-U-4)	COUPLER-2A	$10
Coupler for Pro v2 (U23)	COUPLER-2E	$10

NIST Certification: Test and certify the accuracy of new and previously purchased Onset temperature loggers using standards traceable to the U.S. National Institute of Standards & Technology (NIST). Each logger certified receives a certificate showing the logger's temperature accuracy versus a NIST-traceable standard. Depending on the product, available from -30 to 120ºC

Onset's NIST traceable certification complies with ISO 10012-1:1992 (E) requirements (excluding pressure calibration certificates). Onset also offers a Certificate of Compliance which certifies logger compliance with the specifications described in its product manual.

Subminiature Connectors for HOBO Thermocouple Logger

for Type J wire	SMC-J	$15
for Type K wire	SMC-K	$15
for Type T wire	SMC-T	$15

Additional Accessories

4-20 mA Cable for HOBO U12	CABLE-4-20mA	$22
Voltage Input Cable for HOBO U12 & HOBO State	CABLE-2.5-STEREO	$8
Radiation Shield(U23)	RS3	$59
Mounting Clamp (for mounting HOBO U23-001 in the RS1 & M-RSA ,U23-004)	U23-RS-CLAMPKIT	$5

Additional Replacement Parts

Replacement O-Ring Kit for U12-015 Stainless Temp		
EPDM	U12-015-ORING-E	$12
Viton	U12-015 ORING-V	$15
Replacement Parts Kit (U12/H8)	H8x4-BK	$27
Set of two U-bolts (U12-008)	U-Bolt-Kit	$5
Replacement RH Sensor for HOBO U23-001	HUM-RHPCB-1	$55
Replacement RH Sensor for HOBO U23-002/S-THB	HUM-RHPCB-2	$55
Replacement Sensor for HOBO H14-001	HUM-RHPCB-3	$50
Desiccant 1		
25 pack	U23, UA-001	$12
Desic-Pack	U12-001 Replacement Dessicant	$7

HOBOs for Outdoor Monitoring

Onset also manufactures a full line of weatherproof data loggers and sensors suitable for use in outdoor environments. Visit onsetcomp.com to see our full line of outdoor monitoring solutions.

HOBO Weather Station and Micro Station loggers offer easy configuration and dependable measurements at a reasonable cost and can be used alone or in conjunction with indoor energy monitoring loggers for renewable energy system site evaluations and verification.

Designed with a highly flexible system architecture, both the HOBO Weather Station and Micro Station products can accept pulse or analog inputs from a wide range of specialized third-party sensors—such as power meters and flow meters—as well as Onset's full suite of plug-in Smart Sensors.

Choose the 4-channel HOBO Micro Station for its compact size and low price, or the 15-channel HOBO Weather Station for maximum expandability.

HOBO Weather Station
$420 for logger
H21-001

Common Features

• Smart sensors simply plug in and are ready for logging—
   no calibration or complex wiring
• 1-year (typical)—user-replaceable batteries
• Large memory capacity (up to 512,000 measurements) for
   long-term deployments

HOBO Micro Station
$199
H21-002

Smart Sensors

Temperature
Temperature/RH
Rainfall
Wind Speed & Direction
Solar Radiation
PAR
Soil Moisture
Leaf Wetness
Barometric Pressure
4-20 mA Input Adapter
Voltage Input Adapter
Pulse Input Adapter

Stand-Alone Outdoor Loggers

HOBO Pro v2 data loggers (see pgs. 38-39 for detailed information) feature a weatherproof housing for use in outdoor or condensing environments. Ideal for use in rooftop HVAC and other monitoring applications, these loggers provide accurate, reliable measurements in tight spaces.

The HOBO Pendant Temp/Light Loggers (see pg. 36-37 for detailed information) are also weatherproof for tracking outdoor light.

Onset also offers a range of data loggers for underwater monitoring applications. Visit us at onsetcomp.com for available loggers.

HOBO Pro v2 Temperature/RH
$149
H23-001

About Onset

Onset Computer Corporation designs and manufactures data loggers and weather stations. Onset introduced its first data logger more than 25 years ago and revolutionized the portable data logging industry with the first temperature logger under $100 - the original HOBO data logger.

Today, more than one million HOBO data loggers are in use around the globe in a broad range of applications, from energy and HVAC/R systems monitoring to indoor air quality studies.

Onset offers a wide range of USB-based stand-alone data loggers for indoor, outdoor, and underwater monitoring applications.

The Onset Advantage

Reliable, Accurate Data

No matter what your application involves, at the end of the day it all comes down to the integrity of your data. HOBOs are known for providing the most reliable, accurate data under some of the world's toughest environmental conditions.

Simple, Cost-Effective Solutions

At Onset, we realize our customers – and their technology budgets – can vary widely. For that reason, our products are designed from the ground up with ease-of-use and affordability foremost in mind.

Application Expertise

With more than two decades of experience in solving data logging applications, Onset has developed applications expertise that is second to none. Whether you are an energy manager looking to track facility energy usage, or an industrial engineer who needs to verify process temperatures, chances are we've seen your application before and know what it takes to solve it.

World-Class Support

Our world-class Customer Service department is staffed by friendly, knowledgeable people who will listen carefully to your questions and guide you to the best possible solution.

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Data Loggers