Data Loggers

Name	Image	Specs	Cost	Specialty/ Purpose	Pros	Cons
Campbell Scientific: CR1000X		Scan rate: 1000Hz Resolution: 24 bit Storage: 72Mb (Additional 16Gb with memory card) Weight: 0.9 Kg Sensors: Analog, thermocouples, serial, SDI-12, pulse, and frequency sensors.	2,500 $	Multipurpose logger with specialty in temperature logging.	-55 to +80 ℃ operating range. Ethernet port for remote connection.	Requires Campbell Scientific proprietary software to program.
Onset HOBO: RX2100		Scan rate: 1 minute Resolution: 12 bit Storage: 16Mb Weight: 678 g Sensors: Analog (requires adapters), pulse, Onsets's proprietary "plug-and-play" sensors	1,500 $	Agricultural specialty with design based around field monitoring: soil temperature, moisture, and light intensity. Designed for long term data records.	-40 to +60 ℃ optimal operating range. Battery or solar power available. Weatherproof enclosure. Cellular antenna for remote connection.	Very low sampling rate. Mostly incompatible with non HOBO brand sensors.
MSR: MSR160		Scan rate: 1000 Hz - 1Hz Resolution: 12 bit Storage: 2 Mio(up to 2 million recordings) SD available. Weight: 80 g Sensors: Analog, 3-axis acceleration, attitude, pressure, humidity, temperature and light.	1,150 $	Designed with aviation in mind, ability to measure and log acceleration, attitude and parameters important to flying.	Small and lightweight. Waterproof. -20 to +65 ℃ operating range. Compatible with most OS.	Onboard sensors can only record at 1 Hz. Analog sensors sold separately.
Onset HOBO: UX120-006 M		Scan rate 1Hz Resolution: 16 bit Storage: 4Mb Weight: 107.5 g Sensors: 4-20mA, Current, Voltage, Air Velocity, Carbon Dioxide, Compressed Air Flow, Differential Pressure, Gauge Pressure, Kilowatts (kW), Temperature and Volatile Organic Comp.	$271	Building purpose monitoring applications. CO2 monitoring capabilities.	Can store 1.9 million measurements	1 Hz recording only. Only can receive four inputs.

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HOBO Water Level Data Logger U20L-01		Weight: 154g Logging interval: 1s to 18h Storage: 64 KB Resolution: 0.02 kPa, 0.1 degC Sensors: Absolute Pressure, Barometric Pressure, Temperature and Water Level	$527	Fresh and salt water environment	Long battery life	Small memory Slow response
HOBO MX2001 Bluetooth Data Logger		Storage: 256 KB Weight: 277.4g/ 216g Resolution: 0.1 degC Sensors: Absolute Pressure, Barometric Pressure, Differential Pressure, Temperature, Water Level and Water Temp	$1231	Outdoor and underwater environment	Quick response High resolution Wireless data offload 4 depth ranges	Vent-tube required Requires bluetooth low energy to offload data
HOBO Water Level Data Logger U20-001-01		Logging rate: 1s to 18h Weight: 216g/242g Storage: 256 KB Sensor: Absolute Pressure, Barometric Pressure, Temperature and Water Level	$857	Outdoor and underwater environments	High resolution 4 depth ranges easily deployed	Requires HOBOware Pro software
HOBO temperature data logger		Logging rate: 1s to 18 h Resolution: 0.04 degC Storage: 30000 measurements Weight: 25.5 g Sensors: temperature	$ 81	Indoor environment	Wireless data offload Water proof Easy to deploy	Temperature only 6 min response time

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CR6		Scan rate: 1000 Hz Resolution: 24 bit Storage: 72 MB Weight: 0.42 - 0.52 kg Sensors: compatible with nearly every sensor	~$3484 - $6813	Multipurpose data logger which can be used in extreme environments Can use digital, analog or smart sensors	Very compatible for sensors Has WiFi and radio transmission options (or physical connection) Temperature range -40°C to +70°C (standard)	Require additional antenna purchase Both WiFi and Radio option have a medium to short communication range
Delta-T GP2		Logging rate: 1 sec to 24 hr Resolution: Microvolt for analog sensors Storage: 2.5 million measurements Sensors: Supports nearly all analog sensors (can be customized)	$2328.00	Powerful and rugged field data logger Good for demanding research projects, environmental monitoring and varied control applications	Large storage capacity Long battery life (>310k reading, lasting 530 days) Weatherproof casing	Needs a wired connection to collect data Temperature range of -20°C to +60°C
Onsets HOBO MX1101		Logging Rate: 1 sec - 18 hr Resolution: 0.024°C at 25°C and 0.01%> RH Storage: 84000 measurements Weight: 56 g Sensors: Temperature and RH Battery Life: 1 year (at logging rate of 1 min)	$227.00	This data logger is for a indoor environment	-20 to 70°C operating range or 0 to 95% RH (non-condensing) Easy to deploy and offload using app	Drift of < 0.1C or 1% per year Accuracy of ± 0.21°C or 2% Must be in 30.5m line of sight to download data.
OM-EL-USB-1		Logging rate: 10 sec to 12 hr Resolution: 0.5°C Accuracy: ± 1°C Memory: 16,000 readings Weight: 43g Sensor: Temperature Battery life: 1 year (at 25°C with 1 min logging interval)	$149.74	Portable data logger for quick easy temperature measurements	Easy to use and download data Temperature range: -35 to 80°C	Slower logging rate Only measures temperature

Name	Image	Specs	Cost	Specialty	Pros	Cons
Campbell Scientific CR350		Scan Rate: 10 Hz ADC: 24 bit Storage: 50 MB serial flash Weight: 288 - 306 g Sensors: voltage, current, thermistors, RTDs, & frequency output sensors	$1,624.87	hydrological, meteorological, environmental, and industrial settings	Low power use Compatible with many sensors -40 to 70°C range	Not ideal for larger applications Restricted to non-condensing environments
dataTaker DT80		ADC (resolution): 18 bit Storage:10 mil data points Weight: 1.5 kg Sensors:temperature, voltage, current, resistance, RTDs, thermocouples, strain gauges, etc.	$2,870.00	geotechnical applications such as slope stability, subsidence, dam wall monitoring, tunnel and mining excavation, ground water, tunnel wall monitoring and site assessment	Increased sampling speed Large measurement range Build-in display	Bulky, not portable
HOBO RX3000		Logging Rate: 1s - 18h Storage: 32 MB Weight: 2.2 kg Sensors: transformers, air velocity, barometric pressure, etc.	$1857.00	crop management, environmental research, warehouse, cold chain, & greenhouse operations	Instant access to site-specific data Flexible support for a broad range of sensors	Not portable (not a compact data logger)
HOBO MicroRX Station		Logging Rate: 1 min - 18 hrs Storage:16 MB Weight:678 g Sensors:Soil moisture, temperature humidity, rainfall, evapotranspiration, etc.	$1447.00	Operates in outdoor water environments	Easy to deploy "Low-cost" field monitoring system	Uses solar panels - works well long term in well-lit areas only

Other data loggers

Holter monitor

Holter ECG Monitor Heart Rec ECO

FITAOS ECG Blood Oxygen Monitorin...
CA$80.01

Records heart rhythm, health data

Flight Data Recorder

A modern flight data recorder;

record instructions sent to any electronic systems on an aircraft

Voyage Data Recorder

The protective capsule of a voyage data recorder on M/V Barfleur

Record position, movement, physical status and command data of a vessel over the period

Members decisions

- Keith MSR160
- Josh   Delta-T GP2
- Janesha - Campbell Scientific CR350
- Hanrui   HOBO Water Level Data Logger U20-001-01

Group choice

Based on the scope of this course we chose Campbell Scientific CR350