



Delta-T Devices

The WS-GP2 Weather Station is ideal for research and environmental monitoring applications

Based on the versatile GP2 Data Logger and Controller, users can select the optimal configuration of sensors, power options and communications.

- Unattended weather recording at remote and exposed sites
- Wide choice of sensors
- GPRS modem communications
- Free use of DeltaLINK-Cloud data sharing service
- SDI-12 capability



GP2 Data Logger & Controller

Applications

- | | |
|-----------------------------|--------------------------|
| • Meteorology | • Water resource studies |
| • Climate change monitoring | • Waste management |
| • Environmental compliance | • Crop trials |
| • Eco-physiology | • Agro-meteorology |

WS-GP2 Weather Station



Free Online
Data Viewing and Sharing

DeltaLINK-Cloud
www.deltalink-cloud.com



More information inside

WS-GP2 Weather Station
with optional modem box

Standard Sensors include:

- Rain
- Solar radiation
- Wind speed and direction
- Soil temperature
- Relative humidity
- Air temperature

Flexibility

The GP2 Logger has the power and flexibility to handle almost any environmental sensor, which means the weather station can be as simple or as complex as your application requires. Even after installation, it's easy to expand or adapt the system - by adding solar power, for example. Optional sensors include barometric pressure, soil moisture, soil EC, UV, PAR, albedo, net radiation, total and diffuse radiation, evaporation and surface wetness.

Storage, communication & power

The GP2 can store 2.5 million readings (typical) in FLASH memory. Data can be collected by laptop via USB/RS232 or remotely using the GPRS modem options (see right).

The GP2 has 6 alkaline AA internal batteries as standard with external battery and solar power options available. Up to 7 GP2s can share power and communications using an M12 cabling network.

Advanced features and customisation

For researchers interested in evapotranspiration, degree days, disease prediction, wind chill factor, dew point, PID control or other custom algorithms the GP2's advanced features open up exciting possibilities.

Analog inputs can be fully customised: each channel can have its own input type and recording parameters. DeltaLINK software gives the user control over reading frequency, thresholds and units, and provides recording options for average, min and max, plus specialised wind options - including wind rose, gusts and wind averaging (with direction and vector average).

Users can add their own custom sensor types to the sensor library, exploiting the GP2's detailed configuration options. The GP2 provides 4 input ranges down to microvolt resolution with adaptive auto-ranging, excellent analog accuracy, and configurable sensor excitation - enabling it to support nearly all analog sensors. There is also an SDI-12 Sensor library (see back page for more SDI-12 details).

Calculations based on the measurements from several input channels can be recorded and displayed as additional virtual channels (calculated measurements).



GPRS remote communications

There are two options for providing GPRS modem communications with the WS-GP2

DeltaLINK-Cloud GPRS options

The GPRS-DLC-BX1/SP and GPRS-DLC-BX1/B systems provide a GPRS Modem gateway which upload your logger's status and data automatically to DeltaLINK-Cloud (a free online data viewing and sharing service). Direct connection between DeltaLINK and your logger will be made available on DeltaLINK-Cloud from September 2016, adding the following capabilities: program, start/stop logging, modify program settings, set the logger's clock or delete a dataset.

The GPRS-DLC-BX1/SP and GPRS-DLC-BX1/B systems include an enclosure, battery, quad band modem, smart SIM, 10Ah battery, cables, antenna and mounting kit for fixing to masts or poles (42-51 mm dia.). In addition, the GPRS-DLC-BX1/SP version includes a 30W solar panel with brackets for mast/pole fixing. Please note that the logger (ordered separately) has to be mounted outside the modem box. A line rental and data package are also required to complete the system and must be ordered separately. To ensure your modem system exactly meets your needs, please request a quotation.



GPRS-DLC-BX1/SP and GPRS-BX1/SP Modem Box

GPRS options without DeltaLINK-Cloud access

For customers who would prefer not to use the free DeltaLINK-Cloud service, or whose local GPRS service cannot be accessed by the Delta-T Smart SIM, we can supply the GPRS-BX1/B and GPRS-BX1/SP modem systems. They only provide access via DeltaLINK PC software and not DeltaLINK-Cloud. All DeltaLINK functionality is available as detailed above (for the GPRS-DLC-BX1/SP and GPRS-DLC-BX1/B systems).

These systems are supplied without a SIM and come with modems that require a fixed IP address. In all other respects the hardware is identical to the GPRS-DLC-BX1/SP and GPRS-DLC-BX1/B systems. Please note that to activate the system customers need to obtain their own SIM card and to make arrangements with a network provider. (The SIM must have fixed IP address and be GPRS enabled).

Other GPRS options

Modems and accessories can be ordered separately if required. This makes it possible, for example, to specify the M-ENCL-B2, a large lockable enclosure that can accommodate the data logger as well the modem and battery - providing additional security and storage. A 10 Ah battery (LBAT4) and 30W solar panel (SOL-4 Kit) can be ordered to provide remote site power. For DeltaLINK-Cloud access, the system should be completed with an MD-GPRS-DLC Modem Gateway. Alternatively, an MD-GPRS-1 Modem should be included.

To ensure your modem system exactly meets your needs, please request a quotation: email: sales@delta-t.co.uk

WS-GP2 Weather Station

Data Packages and SIMs

To connect the modem gateway to DeltaLINK-Cloud, customers will need to purchase a data package. Data packages provide access to GPRS services worldwide.

Typical data capacity requirements:

* Weather Station sending 10k data recordings/day – 35 MB per year (typical light usage)

* Weather Station sending 20k data recordings/day – 70 MB per year (typical medium usage)

* Network of 6 x GP2s sending 35k data recordings/day – 140 MB per year (very high usage)

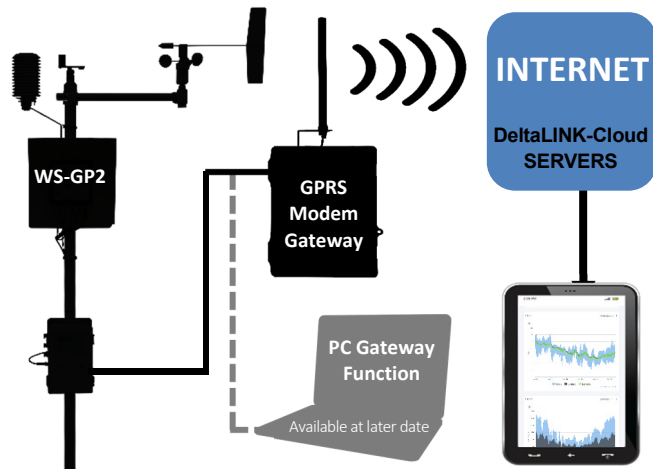
For most applications we would initially propose a 35 MB package.

Data packages have to be purchased in advance of activation. Please note that they are not time limited – if the annual line rental is paid, unused capacity is never cancelled.

Line rental: The line rental must be paid annually to guarantee continuity of service. The cost is very low, and up to 3 years rental may be purchased in advance.

No coverage? For the small number of countries not covered by DeltaLINK-Cloud we can supply conventional GPRS communications (see GPRS options without DeltaLink-Cloud access).

Contact our sales team at sales@delta-t.co.uk for more information or a data package quotation.



DeltaLINK-Cloud is a **free** online data viewing and sharing service for Delta-T data loggers and weather stations. Collect, view and share your sensor data with ease. Anywhere. Anytime.

DeltaLINK-Cloud is a secure cloud-based connectivity, data management and automatic data retrieval solution. The website allows a user to monitor the status of their devices, graph and export the uploaded data and share access to data with project collaborators/stakeholders. All website functionality comes for free and is accessible from most modern internet capable devices (phones, tablets and computers).

FREE Service

- Remote data monitoring
- Share data and collaborate
- Automatic upload
- Flexible charting and reporting
- Smart SIM card provided
- Secure and encrypted
- Multi-language (Fr, De, Es, 中文)

Visit the DeltaLINK-Cloud Information page at:
www.delta-t.co.uk/deltalink-cloud.asp

Weather Station TESTIMONIALS

"We have two Delta-T weather stations in Kazakhstan that have been working in extreme environmental conditions for many years: +40 to -30 C and dusty."

Prof. T W Tanton
Head of Environmental Research Group,
Southampton University

"Just to let you know that all of the Delta-T Devices weather stations we ordered have been working sweetly and are very durable against extremely strong gusts. A colleague came to visit the other day and now wants to order the same brand."

Shiyu Jiang, Research Assistant
Architectural Science Group,
Cardiff University

"We have 6 weather stations in the field. We ordered another 2 earlier this year. The 6 stations in the field have run constantly for several years and are robust and very reliable. We would have no hesitation in recommending Delta-T as a supplier of weather monitoring equipment."

Mr John Swaney
Scottish Agricultural College

SDI-12 enabled

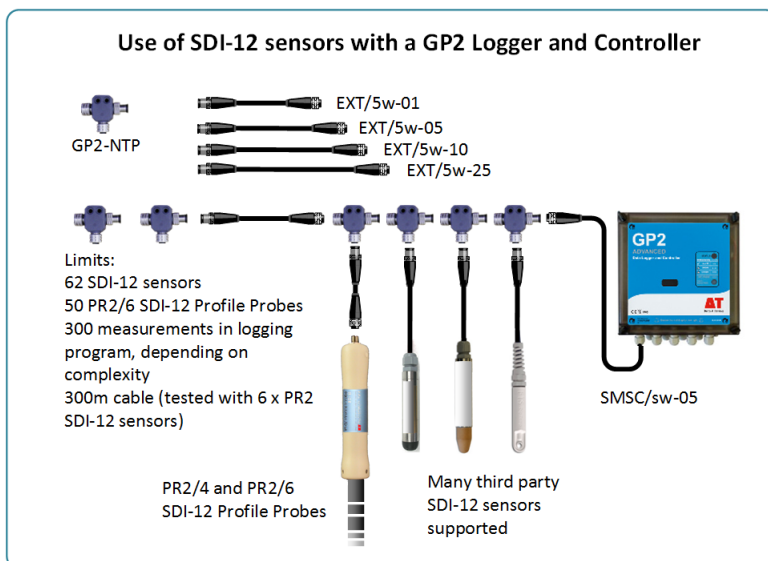
The GP2 Data Logger now comes with SDI-12 capability as standard which greatly increases the capacity of the WS-GP2 for those wanting to add additional sensors to their WS-GP2 system.

An SDI-12 sensor library containing SDI-12 sensor configurations and installation notes for widely used SDI-12 sensors is available for download from www.delta-t.co.uk.

SDI-12 is seamlessly integrated into the GP2 Program Editor, simplifying the construction of sophisticated calculations and other operations from SDI-12 measurements.

- **Huge additional input capacity for SDI-12 sensors**
- **Existing analog and digital channels remain available***
- **Highly flexible logger + sensor networks**
- **Easy point and click configuration; firmware handles scheduling and issuing commands**
- **Real time, on-demand readings for diagnostics and reassurance**

* Delta-T WET Sensor channel not available with SDI-12



WS-GP2 Specifications

GP2 Data Logger - Brief Specs

	Specification	Range / Note
Analog accuracy	-0.17 to +2.7V	0.005% + 115µV
	±23mV	0.022% + 12µV
		at 25°C
Accuracy other	-0.17 to +2.7V	0.04% + 150µV
	±23mV	0.08% + 27µV
Accuracy other	See detailed specification in GP2 User Manual	
Readings	2.5 million (approximately)	depends on program settings
Logging frequency	1s to > 24 hours	
Logging status	Flashing LED	
Environmental	-20°C to +60°C, IP65	
Power	6 AA alkaline batteries or external power 10-15V DC	
Input connections	12 differential (or 24 single-ended) analog inputs configurable as: Voltage, Resistance (12 3-wire or 24 2-wire), Bridge (12), Potentiometer (12)	
	4 digital inputs as: Counters, (2 fast + 2 slow), Frequency, Digital state	
	1 Delta-T WET sensor channel	
	OR 1 x SDI-12 digital bus Interface	
	Unlimited virtual channels	

WS-GP2 Sensors - Brief Specs

	Specification	Range / Note
Wind speed AN-WD2 (combined wind sensor)		
Range	0 to 75m.s ⁻¹	
Accuracy	± 0.1m.s ⁻¹	Up to 10m.s ⁻¹
	± 1.1% of reading	Over 10m.s ⁻¹
Starting threshold	0.4m.s ⁻¹	-30°C to +70°C if icing minimal
Wind direction AN-WD2 (combined wind sensor)		
Accuracy	± 4°	mechanical: 0 to 360°
		electrical: 0 to 356°
Starting threshold	0.4m.s ⁻¹	-30°C to +70°C if icing minimal
Rainfall RG2+BP		
Sensitivity	0.2mm per tip	up to 360 mm.hr ⁻¹
Humidity RHT2nl (combined air temp sensor)		
Accuracy	± 2% RH	5 to 95% RH
	± 2.5% RH	<5% and >95% RH
Air temperature RHT2nl (combined RH sensor)		
Accuracy	± 0.1°C	0 to 70°C
Solar radiation ES2		
Absolute accuracy	± 5%	At 20°C (optimal conditions)
Linearity	± 1%	0 to 2 kW.m ⁻²
Soil temperature ST1		
Accuracy	± 0.2°C	-10 to +65°C
Mast M2-FSG		
2m mast	With cross arm, stakes, steel guy wires, baseplate and logger canopy	