The **GP1 Data Logger** is a compact, research grade data logger.

- High accuracy 7 channel data logger
- 600,000 readings
- Compatible with DeltaLINK-Cloud data viewing and sharing service

Overview

Depending on the combination of sensors and accessories used, the GP1 can take readings from:

- 2 ML3 or SM150T Soil Moisture Sensors (or other voltages)
- 2 Pressure transducer tensiometers
- 2 Temperature sensors (or 2 SM150Ts)
- 2 Pulse counters (for rainfall or water meter)
- 1 Delta-T WET sensor

The GP1 provides 2 differential voltage channels that are ideal for connecting ML3 and SM150T soil moisture sensors.

The two temperature channels are optimised for 10k thermistor probes and provide accurate temperature readings over the range-20 to +60°C. They can be used to log the temperature outputs from ML3 or SM150T sensors. Either channel can alternatively be used to log the soil moisture output from additional SM150T sensors.[2]

Ease of use

The GP1 is very simple to set up and maintain, particularly for outdoor data logging applications. Its small size and waterproofing (IP67) allow it to be fitted wherever is most convenient, and no secondary enclosures are required. The internal alkaline battery lasts for >1 year (when taking hourly readings from 2 moisture sensors, 2 temperatures and a rain gauge).

The GP1 can be fully configured, connections checked, data collected and readings displayed in the field using a notebook PC.

GP1 Sensor Capability

2 x Differential voltage channels

The GP1 provides 2 differential voltage channels that are ideal for connecting ML3 or SM150T soil moisture sensors. Each channel has an input range of -0.2 to +2.7 V and a resolution of 1 mV, enabling it to support a wide range of environmental sensors. Sensors can be powered by a configurable warm-up from either the switched battery power or from the +5 V reference.

2 x Counter channels

The GP1 includes one fast and one slow counter for connection to pulse output and contact closure sensors. The fast counter can record pulses up to 33 kHz and is suitable for most digital anemometers. Either counter can record switch closures up to 50 Hz and so is suitable for connection to a rain gauge or flow meter.

2 x Temperature channels

The two temperature channels are optimised for 10k thermistor probes and provide accurate temperature readings over the range -20 to +60°C. Either channel can alternatively be used with an SM150T Sensor in order to log moisture readings from additional soil moisture sensors.

1 x WET Sensor channel

The GP1 can connect to a Delta-T WET Sensor to provide readings of water content, electrical conductivity and temperature. Specialist calibrations are available for a range of horticultural substrates including mineral wool, peat based composts and coconut fibre (coir).

Bridge sensors, tensiometers

The optional GP-PBA-X50 precision bridge adapter board converts the input from a voltage channel into a precision bridge suitable for recording readings from a compatible pressure transducer tensiometer. It is possible to fit 2 PBA adapters into each GP1. Other pressure transducers and bridge sensors can also be used with the PBA adapter.

1 x Relay channel output

The GP1 has a highly versatile relay channel which can be controlled by multiple sensor thresholds, allowing researchers to set alarm conditions or to control and adjust experimental conditions. Both simple and highly complex control is possible.

Other Features

Communications: Data can be collected by a laptop via RS232, or via USB (USB to RS232 Adapter Cable type USB-RS232 required), or remotely using the modem options. Up to 10 GP1s can be networked together in order to share power and communications.

Reading frequency: The GP1 can be configured to record readings at any frequency from 1 second to 24 hours. All sensors are recorded at the same rate.

Power: The GP1 is very power efficient and a single 9 V alkaline battery will typically last for a full year when taking hourly readings. Alternatively it can be powered from an 11 to 24 V DC external power source or from a solar panel.

Configuring the GP1 with DeltaLINK: The free DeltaLINK software supplied with the GP1 enables full configuration, sensor checking (including real-time graphing) and data collection from the logger. Collected data can be graphed directly in DeltaLINK or imported into Excel using the data import wizard.

Memory: The GP1 stores over 600,000 readings in non-volatile flash memory ensuring data security in the event of a flat battery.

Sealing: The small (140 x 105 x 45 mm) enclosure is fully sealed to IP67, doing away with the need for an expensive additional enclosure for simple field applications. It is also easy to conceal if security is an issue.

Irrigation control

The GP1 Data Logger can use soil moisture to control irrigation directly (and/or rainfall and/or temperature), or act as a sophisticated interface between these sensors and many types of programmable timer.

Specialist configuration programs are provided for irrigation control.

NB: Our GP2 Data Logger (page 16) offers even more advanced irrigation control capabilities.

Data collection and remote communications
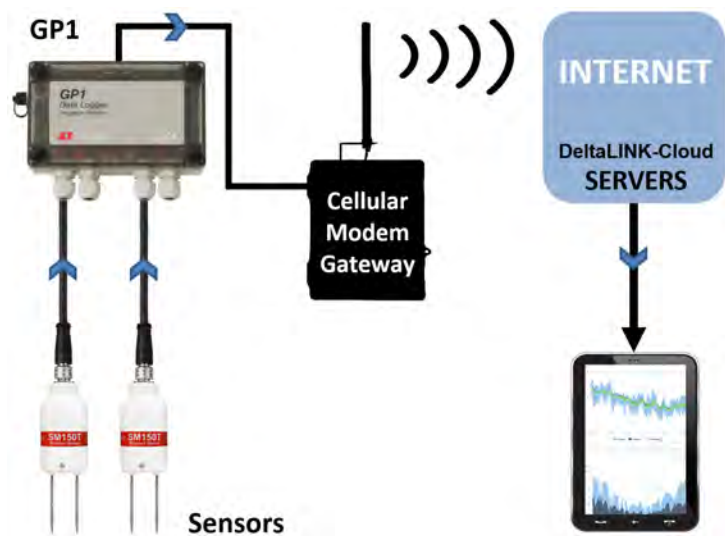
Data can be collected on-site by laptop via USB/RS232, or remotely using a modem gateway which uploads data automatically to DeltaLINK-Cloud (see page 19 for further details).

The WS-GP1, a complete GP1 based weather station is also available (image below)

For Information on our cloud-based data viewing and sharing service see page 19

Brief Specification (full specs on page 23)	
Voltage range	-0.2 to +2.7 V differential
Accuracy [1]	± (1.6 mV + 0.05% of reading)
Resolution	± 0.1 mV
Temperatures [2]	± 0.07°C, typical at 20°C (10k thermistor)
Pulse counters	1 x 50Hz, 1 x 33kHz max
Relay output	<30 V DC or <24 V AC, 1 A fuse (resettable)
Sensor excitation	Switched battery 5 to 9 V, 120 mA max or precision 5 V, 50 mA max
Reading storage	600,000 readings, typical
Connections	4 cable glands 5-way RS232 / external power connector
Environmental/ operating temperature	Water resistant to IP67 -20 to +60°
Size, weight	140 x 105 x 45 mm 280 g
Battery type, life	9 V 6LR61 (PP3), alkaline, ~1 year

[1] Accuracy applies over full -20 to 60°C.

[2] The 2 temperature channels can be configured as SM150T soil moisture inputs, but they provide only single-ended inputs so should not be used with long cables or in noisy environments. The accuracy figures quoted for GP1 soil moisture readings do not apply to these resistance channels when configured as soil moisture inputs.

Ordering Information	
GP1	Data logger including DeltaLINK software and RS232 cable.
Optional accessories	
DL-MKT	Mounting Plate suitable for GP1, GP2 and DL6. Comprises 320 x 190 mm stainless steel plate and fittings for mounting onto 51 mm tube or flat surface.
GP1-EPC1	External power cable (11 to 24 V DC source).
GP-PBA-X50	Precision bridge adapter. Max of 2 x GP-PBA-X50 per GP1.
USB-RS232	Adaptor Cable- connects to PC's USB port.
GP2-PSU	Mains power supply for GP1 and GP2 loggers (See page 17). Requires GP1-RSP-M8 cable.
GP1-RSP-M8	RS232 and power cable for GP1. Length 1 m.

Logger comparison table

	GP2	DL6	GP1	HH2 Meter
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)	6 voltage channels	2 voltage channels	1 water content sensor or 1 WET Sensor
		1 temperature	2 temperatures or 2 additional SM150T Sensors [3]	
	4 digital inputs as: Counters, (2 fast + 2 slow), Frequency, Digital state	1 counter	2 counters (33 kHz and 50 Hz)	
	1 Delta-T WET sensor channel			
	Serial input channel: 62 SDI-12 sensors or a single WET Sensor	-	1 WET Sensor	-
Control outputs	2 relay outputs expandable to 6 (1 A)	1 relay (1 A)	1 relay (1 A)	-
Readings stored	2.5 Million	16,000	600,000	1,500
Recording rate	1 second to 24 hours	1 second to 24 hours	1 second to 24 hours	-
Configuration	DeltaLINK	DeltaLINK	DeltaLINK	By keypad
Communication options	USB, RS232, ethernet or modem	USB [1], RS232, ethernet or modem	USB [1], RS232, ethernet or modem	RS232, USB [1]
Sensor excitation	Calibrated 3 V reference, +5 V and +12 V regulated, or 5 to 10.5 V (battery or external power), user selectable	1 switched logger power	1 switched logger power 1 5 V precision reference	1 switched battery
Power	6 AA alkaline batteries or external power 10-15 V DC	6 AA alkaline batteries	1 9 V 6LR61 (PP3) alkaline or external power 11-24 V	1 9 V 6LR61 (PP3) alkaline
Battery life [4] (dependent on usage)	>310k readings, lasting >530 days	>230k readings, lasting >400 days	>76k readings, lasting >130 days	~5k readings
Enclosure rating	IP65	IP67	IP67	IP54
Temperature range	-20 to +60°C	-10 to +50°C	-20 to +60°C	0 to +40°C
Display	-	-	-	2 line x 16 character
Size	225 x 185 x 75 mm	180 x 160 x 70 mm	140 x 105 x 45 mm	125 x 80 x 45 mm
Typical applications	• Demanding research projects • Environmental monitoring • Varied control applications	• Monitoring soil moisture profiles • Controlling irrigation	• Monitoring soil moisture • General data logging • Controlling irrigation	• Instantaneous reading of soil moisture / profiles / WET Sensor

Sensor compatibility (maximum number of sensors that could be connected[2])

		GP2	DL6	GP1	HH2 Meter
ML3		✓ (6) with temp / (12) without temp	✓ (1) with temp (5) excl. temp	✓ (2) with temp ✓ (4) excl. temp [3]	✓ without temp
SM150T		✓ (6) with temp / (12) without temp	✓ (1) with temp (5) excl. temp	✓ (2) with temp ✓ (4) excl. temp [3]	✓ without temp
PR2	**SDI-12**	(50) PR2/6 (62) PR2/4	-	-	✓
	Analog	(2) PR2/6 [5] (3) PR2/4 [5]	(2) PR2/6 (3) PR2/4	-	✓
WET Sensor		✓ (1)	-	✓ (1)	✓
EQ3		✓ 6 with temp / 12 without temp	✓ (1) with temp (5) excl. temp	✓ (2 as mV only)	✓ (mV only)
Temperature		✓ (12)	✓ (1)	✓ (2)	-
Tensiometers		✓ (12)	-	✓ (2) each requires GP-PBA-X50	-
Counters or Events		✓ (4) 2 fast 2 slow	✓ (1)	✓ (2) 1 fast 1 slow	-
Relay output		✓ (2) expandable to (6)	✓ (1)	✓ (1)	-

[1] With USB to RS232 Adapter Cable type USB-RS232.

[2] With appropriate expansion cards and power supply arrangements.

[3] Temperature channels provide only single-ended inputs so should not be used with long cables or in noisy environments when used with soil moisture sensors. The accuracy figures quoted for GP1 soil moisture readings do not apply to these resistance channels when configured as soil moisture inputs.

[4] Battery life is based on recording the soil moisture and temp outputs from 2 x SM150T Sensors logged every 10 minutes.
NB: For the DL6 Logger, data storage may be the limiting factor rather than battery life.

[5] Requires GP2-G5-LID Expansion Lid for analogue PR2