QUANTIFIED
sensor technology

Product catalog

Product Catalog 2024-4

Software

Integration with InSight

Via Quantified's online platform InSight you can visualize and/or download sensor data, create sensor groups, and set push notifications. There are 3 subscription types: Green, Silver and API-only:

Q-Insight Green
- up to 100 FireFlies
- up to 10 users
- 9 months data storage

Q-Insight Silver
- up to 500 FireFlies
- up to 25 users
- up tp 500 push notifications per day
- 24 months data storage (extension upon request)

API-only
- up to 500 FireFlies
- 2 weeks data storage (extension upon request)

Quantified Mobile App

The Quantified App enables you to visualize sensor data on your phone or tablet. You can download the app for free for your Apple or Android device via the links below.

[Download the Quantified App in the App Store (iPhone)](#)

[Download the Quantified app on Google Play (Android)](#)

Integration with other platforms

Instead of using InSight, it is possible to connect your Quantified sensors to a data platform developed by one of our partners. You can use the Application Programming Interface (API) for this. We can arrange this connection for you: please feel free to contact us to discuss the options.

Hardware

Starter kit	Article number
	FF02SK

The Starter kit includes a complete wireless sensor system and is an affordable introduction to Quantified. The package contains:

- 3 FireFly sensors with all options (FF02)
- 1 indoor Gateway wifi/internet (Gin)
- 3 Smart Clips (SCang, SCII, or SCWm)
- 1 USB charger (FFCh001)
- 1 year access to the Insight data platform, or API access to a third-party platform
- 1 year data subscription for the 3 sensors

External sensors from the catalog can be added to the starter kit as desired.

FireFly sensor node

The FireFly sensor is a wireless sensor module with a rechargeable battery in a robust housing. The sensor configuration can be put together as desired. A range of external sensors and actuators can be connected via the waterproof connector.

FF02 sensor node		
dimensions & weight	**Ingress Protection (IP)**	**sampling interval**
l x w x h = 35 x 40 x 110 mm³; weight: 127 g	IP 67 connector with cap	5 min.
Lora frequencies		**battery charge interval**
868 MHz (EU, Africa) 869.0 – 869.4 MHz (Morocco) 915 MHz (Australia, America's)		9 months (meas. interval 5 min.) 12 months (meas. interval 10 min.)

FF02 options		
air temperature	**relative humidity**	
range: - 15 … + 65 ºC	range: 20 … 90%	accuracy: ± 1,5%
accuracy: ±0,5 ºC	range: 90 … 100%	accuracy: ± 2,5%
resolution: 0.01 ºC	resolution: 0.01%	
GPS	**PAR**	**barometric pressure**
accuracy: ±5 meter	± 5% (calibrated for the solar spectrum)	range: 0 … 500 Pa
		accuracy: ±0.5 Pa
		resolution: 0.01 Pa

Infrared Thermometer
connects to a FireFly

Article number
FFPIRT

The Infrared Thermometer enables non-contact surface temperature measurements to be taken of for example plant leaves. The thermometer has a large measuring range and a high accuracy of up to 0.3 ºC. The device is used to detect plant stress.

FFIRT sensor	
dimensions & weight	**ingress protection**
l x D = 350 mm x 20 mm bending radius: ≥ 25 mm weight: 65 g	IP67

IR temperature		
accuracy	**object temperature**	**notes**
±0.3 ºC	+22 .. +40 ºC	at an operating
±0.5 ºC	0 .. +60 ºC	temperature of
±2.0 ºC	–70 .. +200 ºC	0 .. +50 ºC
measurement range: –70 .. +200 ºC		—
resolution: 0.02 ºC		—
field of view: 35º		at 50% signal
distance to spot ratio: 1 : 1.59		
object emissivity: 1.00		—
spectral response: 550 .. 1400 nm		—
operating temperature		
–15 .. +60 ºC		

| Poseidon WET sensor | Article number |
| connects to a FireFly | FFWETPos |
| | 1, 2 or 3 probes |

The Poseidon WET sensor measures the permittivity*, the electro-conductivity (EC), and the temperature of the soil or substrate. There is a single, a double and a triple version available. This makes it possible to monitor the transport of water and nutrients through the soil. The (multi-) Poseidon can be connected to a FireFly.

*The relationship between permittivity and Volumetric Water Content (VWC) strongly depends on the soil type. We recommend irrigating based on the measured permittivity. If desired, the Poseidon can be calibrated to display VWC for your specific substrate.

relative permittivity	EC	temperature
range: 0 … 50	range: 0 … 10 000 dS/m	range: -40 … +80 °C
accuracy: < 3%	accuracy: ± 3%	accuracy: ±0.5°C
resolution: 1%	resolution: 10 dS/m	resolution: 0.1°C
probe pins	**measuring principle**	**ingress protection**
stainless steel, length: 7 cm, width: 2.5cm	Time Domain Reflectometry (TDR) 50 MHz	IP67
cable knibble protection		**probe cables**
length 0.5 m flexible and removable		2 m per probe

Smart Gutter	Article number
connects to a FireFly	FFSG
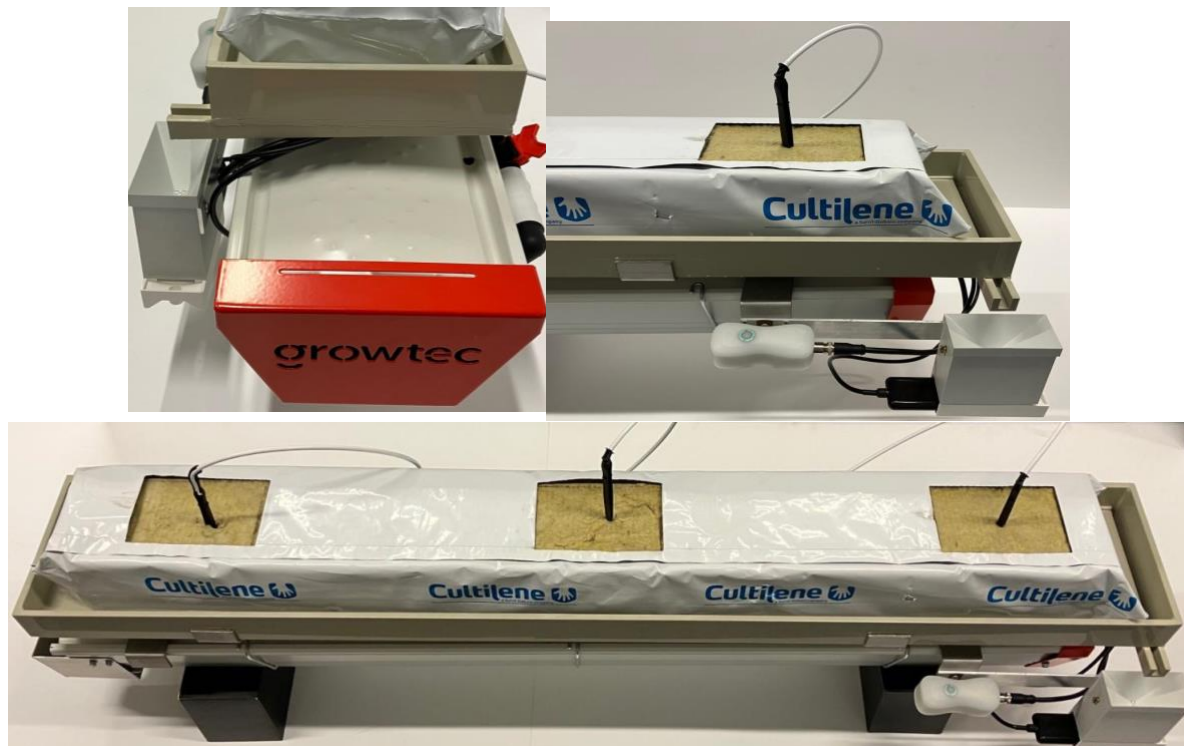
The Smart Gutter has been developed to optimize cultivation on substrate mats. By measuring substrate weight, drain volume, drain EC and temperature every five minutes, the grower gains insight into the water and nutrient requirements, and the increase in biomass. This 'laboratory for substrate cultivation' can be further expanded if desired with a Poseidon for measurements in the substrate mat.

FFSG		
drain volume	**EC**	**temperature**
maximum flow rate 1 ml/s	range: 0 … 10 000 dS/m	range: −40 … +80 ºC
accuracy: ±5%	accuracy: ±3%	accuracy: ±0.5ºC
resolution: 5 ml	resolution: 10 dS/m	resolution: 0.1ºC
load range	**weight temperature range**	**standard dimensions**
max. load: 40 kg	accurate range: −10 … +40 ºC	inner dimensions gutter: L x w x h: 1350x200x42 mm^3
accuracy: ±0.04% of max. load	operating range: −20 … +60 ºC	inner size foot brackets: 218 mm
reolution: 1 g		weight 8 kg
	material	**ingress protection**

	frame: stainless steel gutter: polypropylene	IP61

Drain/dripper sensor	Article number
connects to a FireFly	FFDS

The drain/dripper sensor is a tipping bucket sensor for measuring drain volume. The sensor is connected to a FireFly.

FFDS		
drain/dripper volume	**dimensions**	
maximum flow rate 1 ml/s	funnel surface: 50 mm^2	
accuracy: ±5%	height: 100 mm	
resolution: 5 ml	weight: 150 gr	
options		
EC sensor	**thermometer**	**dimensions**
range: 0 … 10 000 dS/m	range: -40 … +80 ºC	funnel surface: 50 mm^2
accuracy: ± 3%	accuracy: ±0.5ºC	height: 125 mm
resolution: 10 dS/m	resolution: 0.1ºC	weight: 200 g
Connector cable	**dripper holder / clip**	**ingress protection**
length: 0.5 m	For dripper diameter < 5mm	IP-61

H-Frame scale (6, 8, 12, 24, 40, 80 kg)
connects to FireFly
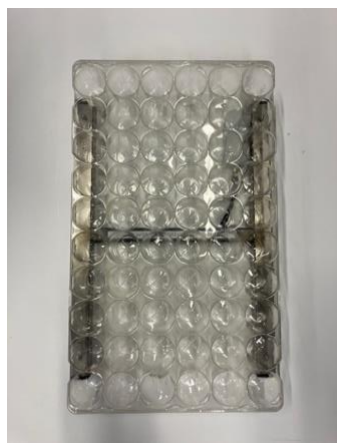
The H-frame scale is a stainless steel scale developed to support water management for crops in propagation trays and small- to medium-sized pots. The scale is available in various dimensions and measuring ranges, and can be connected to a FireFly.

FFHFS		
maximum load	**operating temperaturet**	**dimensions**
6, 8, 12, 24, 40, of 80 kg	accurate range: -10..+40 ºC	l × w × h: 520 × 560 × 50 mm^3 weight: 2550 g
accuracy: ±0.04% of full scale resolution: 1 g	absolute range limits: -20..+60 ºC	*other dimensions available upon request*
	material	**ingress protection**
	stainless steel	IP65

Standing scale (9, 18, 30, 60, 90 kg) connects to a FireFly	**Article number** FFSS 6..90

m < 30 kg

m ≥ 30 kg

The standing scale can be used to weigh medium to large pots, to support irrigation and/or determine biomass. The scale is available in a square or round version, with a measuring range of 10, 20, 30, 60 or 90 kg. The scale is connected to a FireFly and can be tared by resetting the FireFly.

FFSS		
weight	**temperature**	**Dimensions**
max. load: 9, 18, 30, 60, 90 kg	accurate range: -10..+40 ℃	square scale: l x h = 250 x 50 mm max. load: 10kg round scale: d x h = 300 x 80 mm^2 max. load 30, 60 or 90 kg
accuracy: ±0.04% of full scale	absolute temperature limits: -20..+60 ℃	
resolution: 1 gram		
connector cable		**ingress protection**
0,5 m		IP 61

Hanging scale (5, 10, 30 or 50 kg)	Article number
connects to a FireFly	FFSH 5..50

The hanging scale can be used to weigh hanging objects, for example a pot or a gutter. The scale is supplied in various measuring ranges, can be connected to a FireFly, and is tared by resetting the FireFly.

FFSH		
measuring range	**operating temperature**	**dimensions**
5, 10, 30, 50, 100 kg	accurate range: -10 … +40 ºC	d x h = 70 x 150 mm²
accuracy: ±0.07% of full scale	absolute temperature limits: -20 … +60 ºC	
resolution: 1 g		
connector cable		**ingress protection**
length 0.5 m		IP-67

Macro Solar Chimney (for ventilated temperature and relative humidity measurements with the Firefly)	Artikelnummer
	FFMSC

The Macro Solar Chimney is a passively ventilated housing for the FireFly. In environments with high irradiation (direct growth or sunlight), this housing ensures a more accurate measurement of temperature and relative humidity. When using the Macro Solar Chimney, the PAR measurement is not usable because the light sensor is shielded.

The Smart Clip (FFSCMSC) can be used to mount the FireFly in the Macro Solar Chimney.

FFMSC		
	dimensions and weight	mounting
	h × d = 500 x 125 mm^2 weight = 250 g	tie-wrap

Solar Chimney	Article number
connects to a FireFly	FFSC

The Solar Chimney is designed for more accurate temperature and relative humidity measurements under high (solar) radiation. The radiation generates a natural airflow through the chimney, allowing ventilated air temperature and relative humidity measurements. The FireFly platform sensor is connected via the connector cable and handles the data transfer. There are several mounting options to choose from.

FFSC		
air temperature	**relative air humidity**	
range: 0 … + 65 ºC	range: 20 … 90%	accuracy: ± 1.5%
accuracy: ± 0,3 ºC	range: 90 … 100%	accuracy: ± 2.5%
resolution: 0,01 ºC	resolution: 0.01%	
connector cable	**dimensions**	**Ingress Protection**
length 0.5 m	h x d = 80 x 550 mm^2	IP-61
mounting options		
rope mount (FFSC A): hangs on a hook	pole mount (FFSC B): standing; height 40..75 mm	wire/rod mount (FFSC C) wire diameter: 2 mm rod diameter: 5..7 mm

Weather station	Article number
	FFWS

The Weather station combines a pluviometer with an accurate ventilated air temperature and relative humidity sensor, anemometer and a PAR sensor. A GPS module and a stainless steel pole are optional..

air temperature (ventilated)	relative air humidity (ventilated)	PAR-light
see specifications Solar Chimney (FFSC)	see specifications Solar Chimney (FFSC)	see specifications FF02
pluviometer		
see specifications pluvio meter (FFPL)		

Pluviometer		Article number
connects to a FireFly		FFPL

The pluviometer consists of a funnel with anti-bird spikes and a drain/dripper sensor. The pluviometer measures precipitation in mm and can be connected to a FireFly.

precipitation	dimensions	
range: 0 .... 100 mm / hour	funnel surface: 200 mm^2	
accuracy: ±2%	height: 350 mm (including bird spikes), diameter: 165 mm	
resolution: 0.2 mm	weight: 550 gr.	
connector cable		**ingress Protection**
length 0.5 m		IP-67

Poseidon City	**Article number**
connects to a FireFly	FFWETPosCity1, 2 or 3

The Poseidon City sensor housing has been specially designed for the use of Poseidon sensors in public green areas. This allows a FireFly with one or more Poseidons to be placed underground and therefore invisible. The housing also provides protection against mechanical and chemical weed control. The photos show a Poseidon Triple City; a version with a single or double Poseidon is also available.

T-profile probe	Article number
connects to a FireFly	FFTP

The T-Probe measures the temperature of the soil at different depths up to 80 cm. The sensor is also suitable for measuring temperature profiles in liquids and slurries. The T-Probe is supplied in the desired length. The T-probe can be connected to a FireFly.

temperature	temperature level options	probe dimensions
range: -40..+125 ℃	every 10 cm, max. 8 levels	10..80 cm
accuracy: ±0.25 ℃	maximum depth 80 cm	diameter: 7mm
resolution: 0.125 ℃		weight: 200..550 g
probe material	**connector cable**	**ingress protection**
carbon fiber	length: 0.5 m	IP-67

Fluid pressure sensor	Article number
connects to a FireFly	FFPS

The liquid pressure sensor measures the pipe pressure in, for example, water pipe and fertigation systems. The pressure sensor is mounted with a straight G 1/2 inch male thread.

pressure	mechanical connection	dimensions
range: 0..10 bar	connection: G ½ B	hoogte: 68 mm
accuracy: ±2 %	material: RVS	diameter: 29 mm
pressure limit: 20 bar		drukopening 3.5 mm
connector cable		**ingress protection (IP)**
length 0.5 m		IP-67

Potato Guard
connects to a FireFly

Article number
FFPG

TThe Potato Guard measures real-time weight loss of seed potatoes during storage. This measurement helps you set the climate and ventilation parameters, which minimize mass and quality loss during storage. The Potato Guard is buried at the storage top. For deeper measurements an optional lid can be used.

Basic system
Weighing basket comprisong inner and outer bucket with load cells (~60 kg sample)
FireFly for outflowing ventilation air above the storage (FF02)
Battery charger for the FireFly sensors (FFCh001)

Optional
protective cover, additional FireFly for inflow/recirculation, weatherstation, temperature for measurements up to 1 m in the storage.

The potato Guard is sent by courier and can be operational within 10 minutes (excluding placing/filling the weighing basket in the storage).

sample weight	material	
max. load 60 kg	stainless steel	
accuracy: ±40 g (-10 ... +40 ºC)		
FF02 platform sensor node		
dimensions & weight	Ingress Protection (IP)	sampling interval
h x d = 700 x 500 mm^2 weight = 7.5 kg	IP-67 (with connector cap)	5 min. longer intervals on request
Lora frequencies		battery charge interval
868 MHz (EU & Africa) 915 MHz (Australia & America's)		±6 months, 5 min. interval ±9 months, 10 min. interval
air temperature	relative air humidity	
range: -40..+ 65 ºC	range: 20..90%	accuracy: ± 1.5%
accuracy: ±0.5 ºC	range: 90..100%	accuracy: ±2.5%

Gateway Indoor, LAN	Article number
	Gin

The indoor LAN gateway receives LoRa messages from the FireFly sensors and sends the data to the database via the internet. A single gateway can process signals from up to 100 FireFlies. The Gin gateway is suitable for indoor use, and connects to your local internet via Wi-Fi or Ethernet (wired).

frequency	range	network connections
868 MHz (EU, Africa) 915 MHz (Americas, Australia)	indoor w. obstacles: 0.4..1 km urban area 1...3 km direct line of sight: 2..10 km	ethernet, wifi

operating temperature	operating moisture	power supply
-40..+80 ºC	extended < 80% rH	standard USB-C
	peak < 95% rH	
	accessories included	ingress protection
	Lora antenna, USB-C cable	IP-30

Gateway Indoor, 4G	Article number
	Gin4G

The indoor 4G gateway receives LoRa messages from the FireFly sensors and sends the data to the database via the internet. A single gateway is sufficient to process data from up to 100 FireFlies. This Gin4G gateway is suitable for indoor use, connects via a 4G connection. You can also connect to your local internet via Wi-Fi or Ethernet (wired)

frequency	range	network connections
868 MHz (EU + Africa) 915 MHz (Americas and Australia)	indoor w. obstacles: 0.4..1 km urban area 1...3 km direct line of sight: 2..10 km	4G, ethernet, wifi
operating temperature	**operating moisture**	**power supply**
-40..+80 ºC	extended < 80% rH	230 V
	peak < 95% rH	
GSM	**accessories included**	**ingress protection**
LTE cat 4 (4G) ann hspa+ (3G)	GPS & Lora antenna 220V adapter	IP-30

Gateway Outdoor, LAN	Article number
	Gout

The outdoor LAN gateway receives LoRa messages from the FireFly sensors and sends the data to the database via the internet. A single gateway is sufficient to process data from up to 100 FireFlies. The Gout gateway is suitable for outdoor use, and connects to your local internet via Wi-Fi or Ethernet (wired).

frequency	range	network connections
868 MHz (EU, Africa) 915 MHz (Americas, Australia)	indoor w. obstacles: 0.4..1 km urban area 1...3 km direct line of sight: 2..10 km	ethernet, wifi
operating temperature	**operating moisture**	**power supply**
−40..+80 °C	100% rH	230 V
	accessories included	**ingress protection**
	230V power adapter gateway mounting bracket	IP-67

Gateway Outdoor, 4G	**Article number**
	Gout4G

The outdoor 4G gateway receives LoRa messages from the FireFly sensors and sends the data to the database via the internet. A single gateway is sufficient to process data from up to 100 FireFlies. This Gout4G gateway is suitable for outdoor use and connects via a 4G connection. You can also connect to your local internet via Wi-Fi or Ethernet (wired)

frequency	range	network connections
868 MHz (EU, Africa) 915 MHz (Americas, Australia)	indoor w. obstacles: 0.4..1 km urban area 1...3 km direct line of sight: 2..10 km	4G, ethernet, wifi
operating temperature	**operating moisture**	**power supply**
-40..+80 ºC	100% rH	230 V
GSM	**accessories included**	**ingress protection**
LTE cat 4 (4G) en HSPA+ (3G)	Lora antenna; 230 V adapter; brackets for pole mounting	IP-67

Smart Clip, magnetic	Article number
	FFScMagnetic

Smart clip for attaching the FireFly to steel or iron objects

Plastic base	Article number
	FFPB

Plastic base (15 x 10 cm) for vertical fixation of a fiberglass stick (6mm diameter). To be used in combination with FFSCang Smart clip. Options for stick position: center on foot or on end of foot.

Smart Clip, wire or stick mount	Article number
	FFSCang

The clip can be used to mount the FireFly to a wire with a diameter of 2..3.5 mm or a pole with a diameter of 6..7 mm.

Smart Clip, vertical mount	Artikelnummer
	FFSCMSC

The clip allows the FireFly to be installed vertically hanging with a hook on a wire with a diameter of up to 6 mm. This clip is used, among other things, for mounting in the Macro Solar Chimney
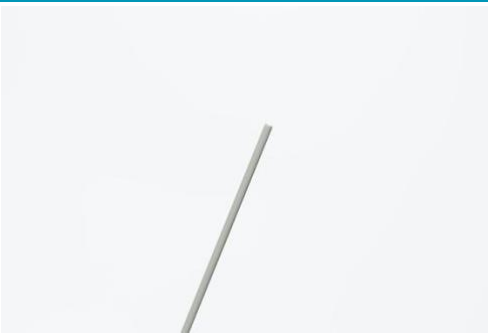
Smart Clip, wall mount	Article number
	SCWm

With this clip the FireFly can be attached to a vertical wall. Screw hole diameter 6 mm.

FireFly USB charger	Article number
	FFCh001

Attention: do not charge batteries outside the temperature operating range!

The battery charger will charge the Firefly battery in 4-6 hours.

operating temperature	charge current	ingress protection
range: + 15 ºC … + 20 ºC	max. 0.5 A	IP-50

Magnetic Reset pin	article number
	RP

Magnet on a Quantified key cord for resetting the FireFly sensor.

Fiberglass rod white	Article number
	FGR75

Fiberglass pole to mount the FireFly sensor using a (FFSCang) Smart Clip. Length 0.75 m, diameter 6 mm.

Warranty and service

Please visit our website for the product manuals and a CE declaration of conformity. We offer a 1.5-year warranty on our products, provided normal use and handling, in accordance with instructions provided in the manual. Devices that fail during normal use within the warranty term will be replaced free of charge. Repair of damage caused by improper use is not covered by the warranty and will be repaired in consultation at a market rate.