

Flow4™ Sap Flow Logger - Irrigation Control

Flow4-IS, Irrigation Scheduler, is a stand alone water balance measurement system for irrigation automation based on plant transpiration. Four Dynagage sap flow sensors read crop water consumption. These measurements are compared to rainfall, soil moisture and irrigation water supplied. The water balance or water deficit then determines the amount of water to be replenished at a predetermined interval. The system informs the grower to manually apply a specific volume for the area intended, or the Flow4 may automatically open irrigation valves until the water balance is replenished.

The internal logger collects the sap flow rates, rainfall, and irrigation history retrieval by PC or remote radio link. Flow4 makes water-efficient crop management easy and precise.

Features

- High performance irrigation and water balance logging
- Measures: Plant transpiration, rainfall, soil moisture
- Monitors water applied to crop irrigation zones
- Four Dynagage sensors - expert weighted averages
- History data accessed easily by friendly menu software
- Number of plants per field, plant size automatically factored
- Irrigation adjusted for system inefficiency and evaporation
- Communication interface to any Windows based PC

Setup and Control Software

Software to install and configure your Flow4 system is as easy as pointing and clicking on the icon for that function. Each plant-sensor has automatic diagnostics, with check marks to indicate all is well. Click on "setup" and the menu choices are clearly indicated graphically.

After setup is complete, the PC may be disconnected and Flow4 does the rest. By direct communication to FL4 in greenhouses and with remote radio MODEM, PC software displays plant sap flow rates, rain, total irrigation, and the water balance on graphs as well as bar charts. Separate menus adjust the crop-field description, logger settings, and show overall system status. No other system has these unique features.

Flow4-DL Datalogger is a stand alone water balance measurement system. Four Dynagage sap flow sensors are recorded with all sensor signals, sap flow, and the weighted average for four plants.

Optional sensors for rainfall, soil moisture or solar radiation are recorded at each logging interval. The Flow4-DL stores the irrigation and watering history for direct or remote retrieval. When a PC connects to the Flow4-DL, the detailed log of sensor results may be transferred to spreadsheet files for analysis.

- 12,250 Records
 - 14 days of hourly logs
- Daily water balance log - 1 year
- Automatic zero - No calibration
- Easily portable
- Solar power optional
- Sensor range 5 - 50 mm (2") dia.
- Battery backup, fail-safe memory



Flow4 contains a datalogger with 17 input channels, two pulse inputs, voltage regulators and communications in single instrument.

Ordering Information

FLOW4-DL Sap flow datalogger. For logging real-time sap flow, soil moisture and rainfall. Monitors (4) Dynagage sap flow sensors, (4) 25ft. cables, weatherproof enclosure, RS232 cable (15 ft), setup/data retrieval software, 5 Ah battery and 120/220 V charger, pole mounting kit, U bolts.

FLOW4-IS Automatic irrigation, water balance System. Same as above with irrigation alarm-valve control output, 24 Vac relay, and external sensor cables.

Dynagage Sap Flow Sensors

SGC50	Stem Gage 2" (50 mm)
SGC40	Stem Gage 1-1/2" (40 mm)
SGC25	Stem Gage 1" (25 mm)
SGC19	Stem Gage 3/4" (19 mm)
SGC16	Stem Gage 5/8" (16 mm)
SGC13	Stem Gage 1/2" (13 mm)
SGC10	Stem Gage 3/8" (10 mm)
SGC9	Stem Gage 0.35" (9 mm)
SGC5	Stem Gage 0.2" (5 mm)

Sensors supplied with reflective bubble shield, installation kit and how-to manual.

ELC-XX Extra length sensor cables in addition to standard 25', xx-ft. Maximum 100 ft.

TE525-L25 Tipping bucket rain gage

ML2-4 Theta Soil Moisture sensor

Digital Flow Meters with Calibration

FL4-FLM2	Flow Meter, 2" pipe
FL4-FLM6	Flow Meter, 6" with saddle mount

Irrigation Valves - Schedule 80 PVC

FL4-V1	Relay operated valve 1" PVC pipe
FL4-V2	Relay operated valve 2" PVC pipe



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Specifications

Datalogger

Proprietary embedded microprocessor at 4 Mhz clock, 27 kb of data storage, 4 kb non-volatile memory, 28 kb program memory.

Sensor Inputs

Dynagage sap flow sensors (4)

12 differential inputs: range +/- 2.5 mV, 0.1 uV res. 4 inputs: range 0-10 V, 1.0 mV res.

Auxiliary sensor range 0 - 2.5 V., 0.1 mV resolution.

Rain gage dry contact closure.

Flow meter dry contact or solid state 0-12 V. 7 KHz maximum pulse rate. All inputs are over-voltage and lightning surge protected.

Sensor Cables

Four each, 8 conductor, 25 ft (7.6 m) to Dynagage. All external inputs are provided with connectors.

Control Output - Flow4-IS only

Valve control relay, 15 A @28 Vac maximum.

Communication Port

RS-232, 4,800 Baud, 15 ft. cable (5 m).

AC Outlet Adapter

Switching regulator, 3.6 A @15 V dc; 120/240 Vac, 50-60 Hz., 6 ft extension (1.8 m).

Battery Power - Voltage Requirements

Sealed lead-acid, 12 V, 5 Ah. Working range 10-15 V. Absolute minimum - 6 V. to keep logger memory backup.

System Current

50 mA without sensors maximum fuse current 3.15 A, 250V, (5x20 mm).

Enclosure Dimensions

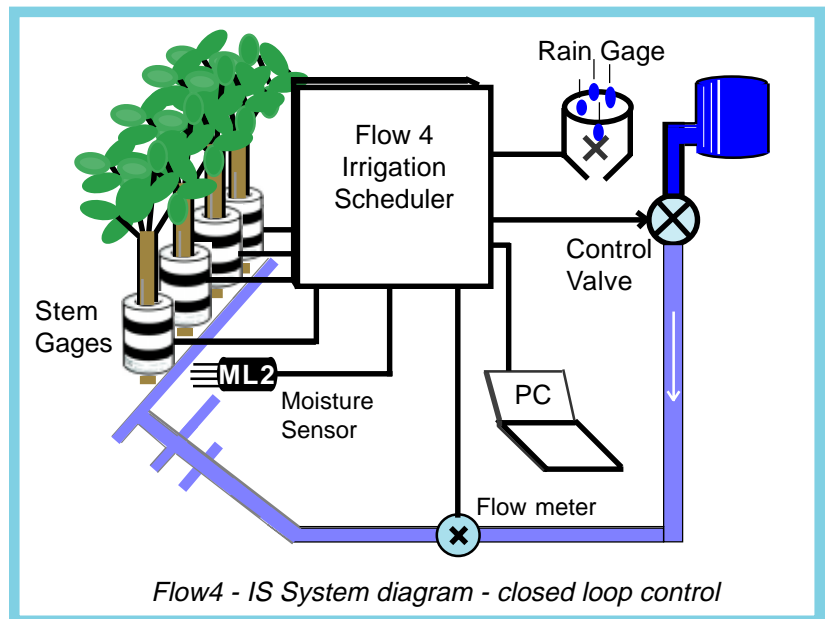
6.5" x 11.75" X 13.5" (16.5 x 30 x 34.3 cm)

Weight

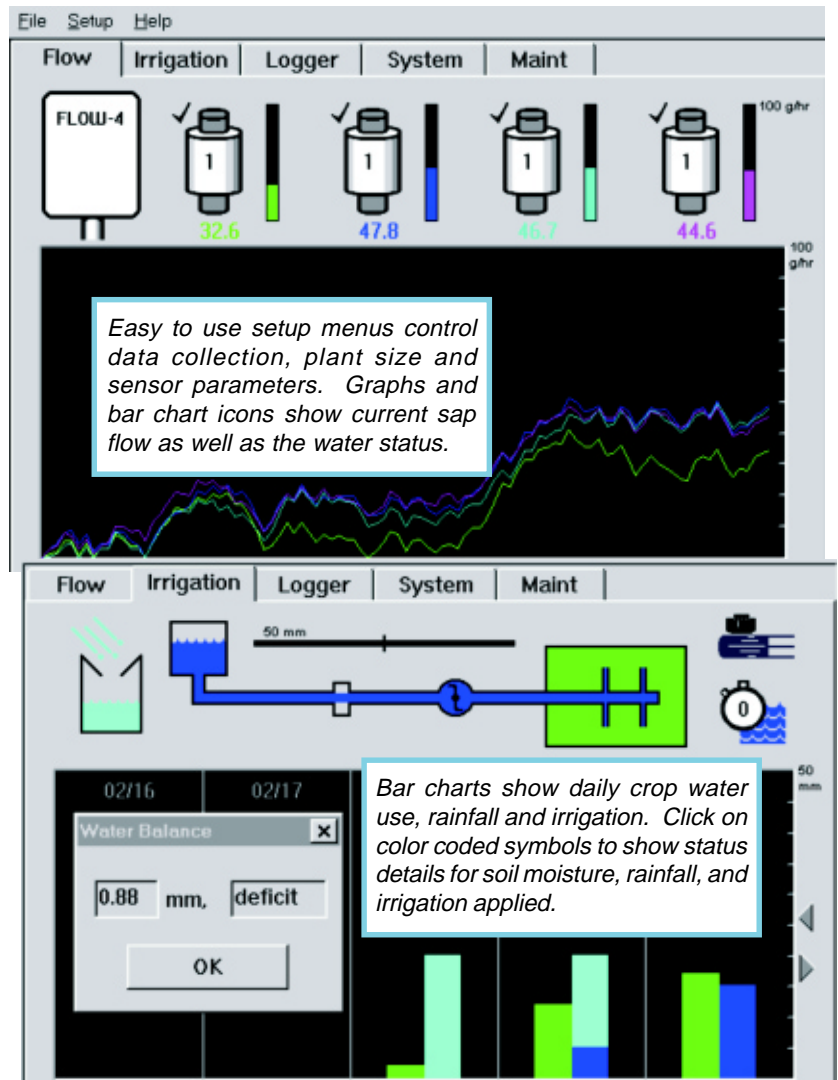
15 lb (7 kg)

Ratings

NEMA 1, 2, 3 rain tight. CSA, UL listed.



Flow4 - IS System diagram - closed loop control



DYNAMAX