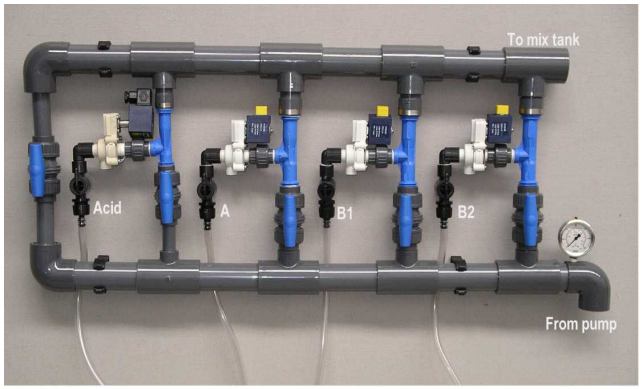
NutriDose II *i*

The NutriDoseII *i* controls in-line injection in a multi-zone fertigation system. The main controller is used in conjunction with other modules to allow the system to be configured to best suit the growers needs.
A **smart environment sensor module** is available to provide data for triggering irrigations. Based around a solar integrator, this module monitors solar irradiance, air temperature, relative humidity and uses these factors to modify the solar integration rate. This means that if the environment is very sunny, very hot and very dry then the watering frequency will be at maximum whilst for dull, humid, cool conditions it will be at a minimum. For outside use the Autogrow weather station can provide additional information such as wind velocity and rainfall to further modify integration rates and reset the integration counters of outside zones if rainfall exceeds a set limit.

Ten station, expansion modules are also easily added to provide from 10 to 30 irrigation stations.

During the evening, night and early morning, irrigations may be triggered on a time-of-day basis whilst during the sunny part of the day triggering may be by means of a solar integrator. For example, a user may set the system to irrigate all zones at 6pm, 10:30pm, 3:15am, 7:30am, 7:45am and then switch to the solar integrator time zone in which each station has its own solar integration trigger. This allows crops that require frequent irrigations to be mixed with those that only require infrequent watering. In addition, each irrigation station has its own EC and pH value allowing quite different crops to be catered for.



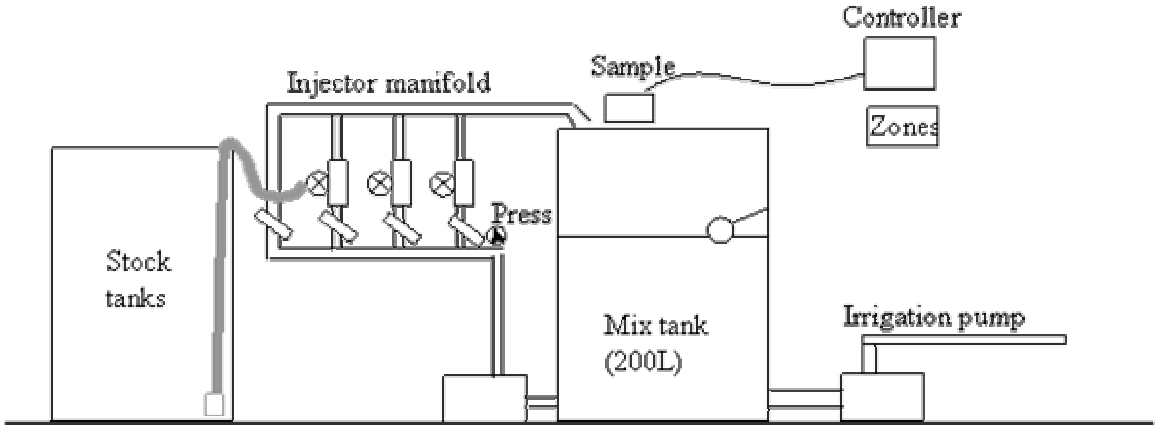
Typical injection manifold

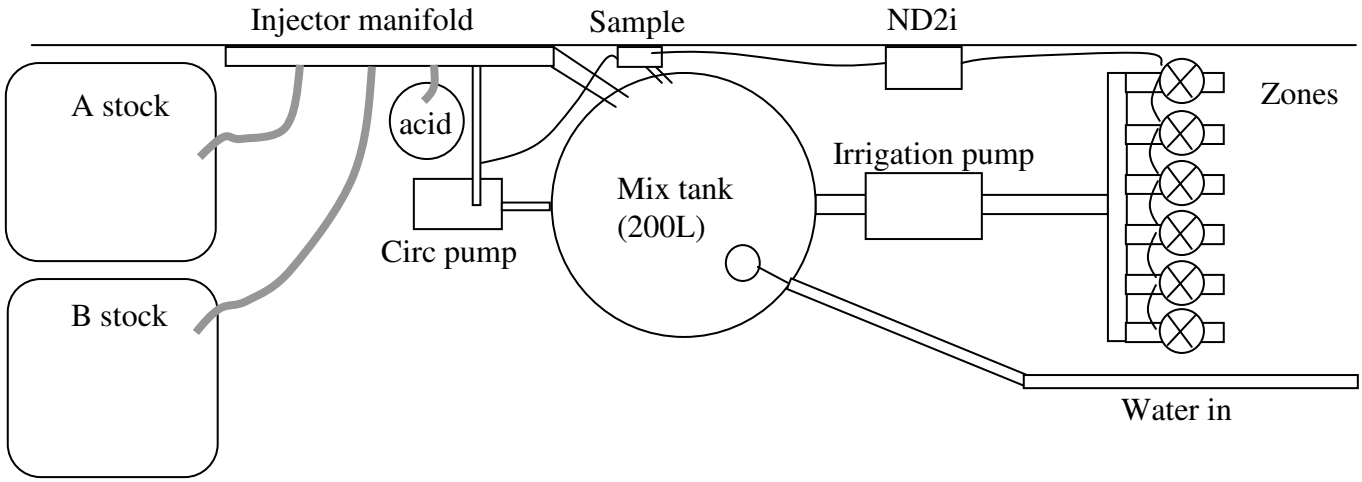
'Each irrigation station can have its own solar (modified) trigger point and when reached an irrigation occurs. Injection can be by pulse-proportional solenoid valves (PWM) into venturi injectors or direct into an in-line mixing vessel, by proportional injection pumps (0..10V), pulse frequency pumps or by proportional valve (0..10V) into a venturi. All switched outputs are 24V AC which is the industry standard.

Finally, each station can be dosed from one of two different sets of stock solution tanks. This allows two different nutrient recipes to be selected from. In many cases a

vegetative mix and a generative mix will be available to suit both mature and immature crops. Alternatively, a different mix may be used for day-time or night-time waterings.

The controller uses a modified PID algorithm to achieve accuracy and is self learning so that when any zone is irrigated, the initial settings are based on what was learned during the previous run.



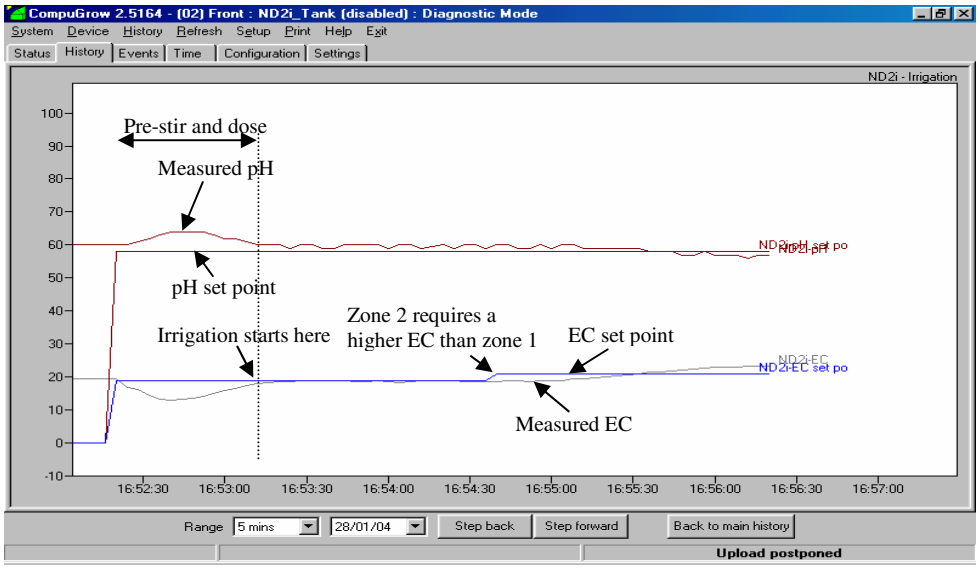


This is a complex controller with a large number of settings. Although it is quite possible to set it up from the local display panel it is certainly much easier to set it from the PC. The PC also logs data, such as EC, pH, Temperature, Air temperature, relative humidity, solar PPFD (PAR), solar integration and if you have the outside mini-weather station it will also log windspeed and rainfall. The logged data is displayed graphically using a very simple interface that makes use of a pop-up calendar to select the period that you wish to view.

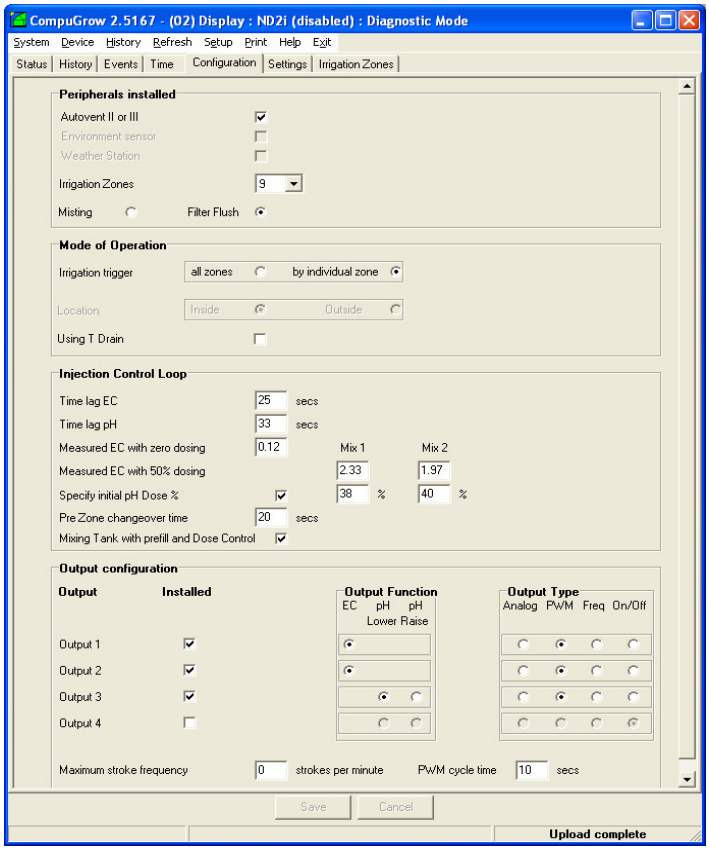
Events, such as the times of irrigations, are also captured by the PC and are displayed in a table format The PC can be positioned close to the controller or up to 1.2Km away using low cost computer network cable (CAT5 cable). If the PC is connected to the local

telephone network then it is possible to access the data and make setting changes from anywhere in the world by using remote access software such as PCAnywhere.

In addition, the Autogrow help desk can use PCAnywhere to access your PC to provide assistance with settings and also perform simple diagnostics.



Typical irrigation response as logged by the Compugrow software provides excellent ability to check and fine tune the injection settings



Left:
Typical Configuration screen for the ND2i

Specification

Measurements

Units selectable between EC and CF; °C and °F, USA/ European date format
EC 0.0mS/cm to 10.0mS/cm, accuracy 0.1mS/cm
pH 2.0 to 10.0 pH; accuracy 0.1 pH
Temperature -20 to 99 °C ; accuracy 0.5 °C

Enviro sensor and/or weather station
Temperature accuracy 0.5 °C
RH 3% up to 95% then 5%
Solar PAR or total energy +/- 5%

Outputs

All outputs are 24V AC
Dosing and pump outputs 48VA inrush, 24VA continuous
Zone valves 12VA
Zones expandable by adding 10 way zone expanders up to 30 zones total
Zones may be used for drip tape drainage (to stop dripping at low points)
Zones may be allocated to inside or outside
System runs up to 32 solar integrators (from one or two sensors), one for each zone and one day integration for inside and one for outside.
Solar integration rate may be modified for temperature and humidity (and wind and rain for outside zones)
Zones may be allocated to inside or outside allowing one controller to service a mix of inside and outside zones with very different requirements.
Tank fill can be selected to occur at end of irrigation or before start of irrigation
Main pump can be selected to be used for stir cycle or a circulation pump may be used

Each zone can have a duration from 00:00 mins:secs to 99:59 mins:secs
Up to 8 time-of-day triggers (for all zones) – individual zones can be set to skip triggers
Unlimited solar integration triggers by zone. Each zone can have wide range of solar triggers (from a few minutes to many days to suit crops from tomatoes to orchards)
Two different fertilizer mixes can be selected from or water only for each zone.
Each zone can have a different EC and pH