

MINDER – The Complete Plant Monitoring System

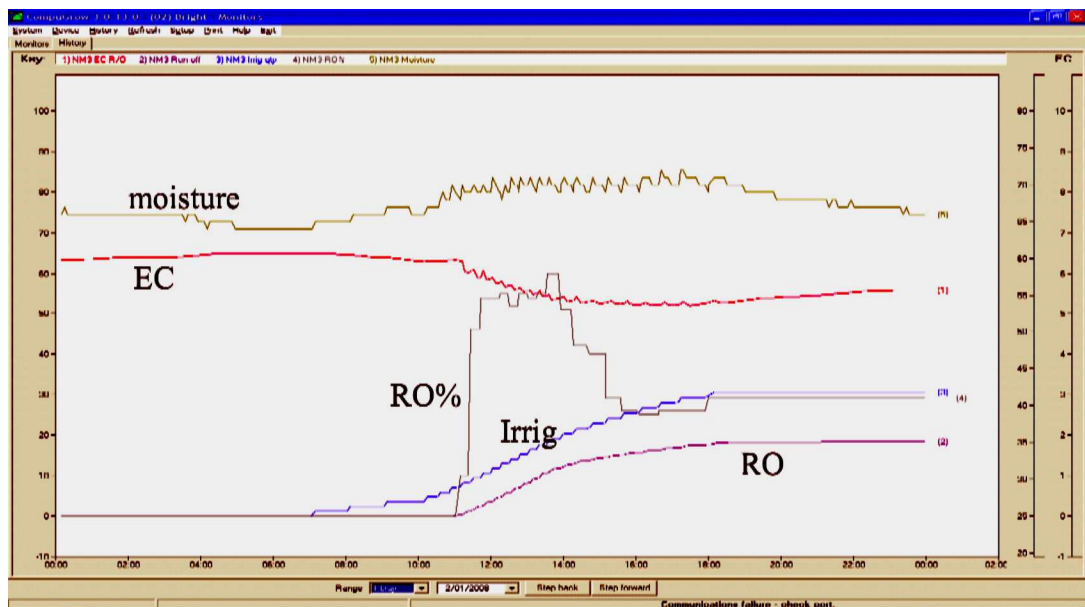
The award* winning *Minder* logs important growing information to the PC. This information is then displayed graphically so that trends etc can easily be spotted. It also allows alarms to be set so that if anything goes wrong you will soon be notified.



The base unit comes with a variety of sensors to monitor a wide variety of parameters. The root zone sensors are conveniently connected to the minder via a Root-Zone interface box. This can be positioned at some distance from the Minder enabling the Minder to be mounted in the aisle, at the end of a row with the sensor box 5 or 10m into the row where the sampling is possibly more representative of conditions throughout the greenhouse. A CAT5 plug-in patch cable is used to connect these items together. Similarly, environmental conditions can be monitored using an aspirated environment sensor

The following sensors may be connected

- Root zone Moisture and Temperature
- Run-off Quantity, EC and pH - Irrigation quantity
- Irrigation Quantity, EC and pH
- Climate temperature, RH, CO₂ and solar energy (Joules and PAR)

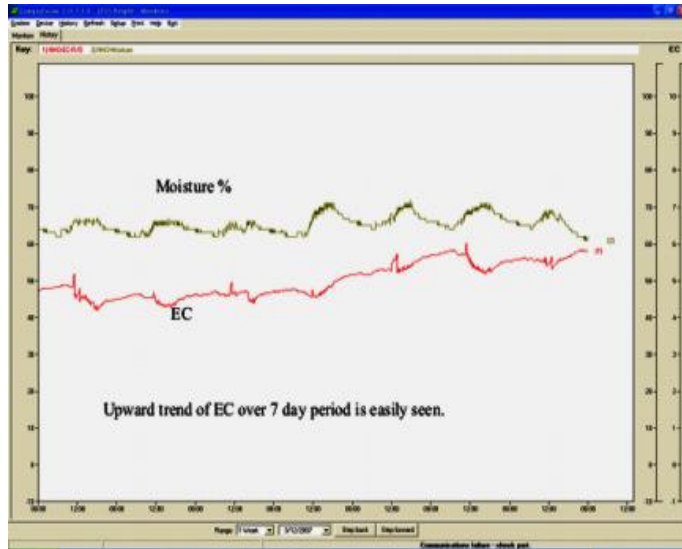


Together, these measurements give a complete picture of what is happening at one of the plants most important places; it's root zone together with information on its irrigation requirements and environmental conditions.

Important ratios

In addition to displaying the values read from the sensors, important ratios are automatically

calculated and displayed. For example, the runoff to irrigation quantity ratio is calculated and displayed as a percentage. This is done for both the last complete irrigation and the total for the day so far. The ratio of actual irrigation quantity to the expected quantity (based on solar integral) is also displayed. Temperature integral for the last period (eg 7 days) is also calculated together with the solar integral for the same period. These figures can be used to determine the expected yield. All data is stored on the PC hard drive and is available for export to a spreadsheet for further evaluation.



Collection point



Moisture sensor

Advanced alarms

For many growers, time specific events are more important than simple alarms based only on a minimum or maximum value. Knowing whether "runoff" has occurred by 11:00am or whether EC has been brought down by mid-day is more critical than simple numeric values. The minder has the ability to set up complex alarms based on values or ratios together with a holding time and a time-of-day period. Furthermore, these alarm rules can be given various priority levels allowing say a warning to be issued at 10:30am followed by a loud alarm at 11:00am if runoff has not been achieved. Paging to a cell phone is also supported ensuring you will never miss an alarm event.

General

Many growers pay a lot of attention to the EC and pH of the water that is fed to the plant but little attention to what is actually in the root zone and what is running out at the bottom. These latter values are much more important than the input values. By adjusting things like the watering start/stop times, watering quantity, watering interval (solar trigger count) and the root-zone EC it is possible to have considerable control over the plant and to "steer" the crop to be more or less vegetative or generative. This is often called "balancing" the crop. To do this properly, the grower needs really good information and this is exactly what the MINDER provides.

If your PC ever goes off-line the MINDER will continue to log data for 25 days. As soon as the PC is reconnected the locally stored data is automatically up-loaded.

Hopefully, the run-off will be cleaned and re-used but if any is allowed to escape into the environment - eg sprayed over pasture etc, this monitoring system can be used to provide permanent records.