



# MACView®

## ETHYLENE ANALYSER

**The concept for safe storage of flower bulbs and guaranteed energy savings**

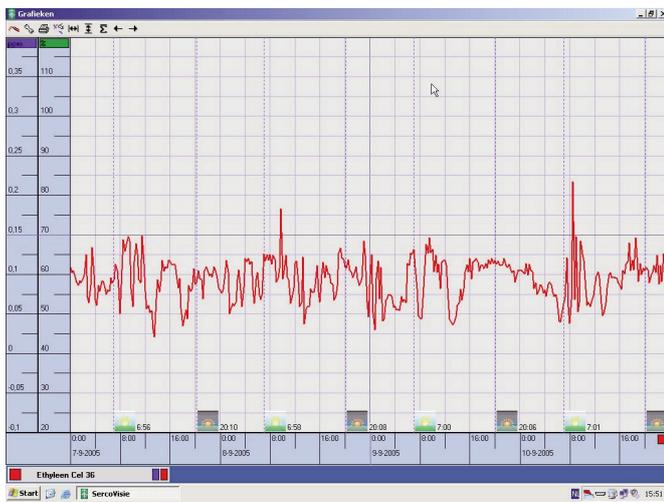
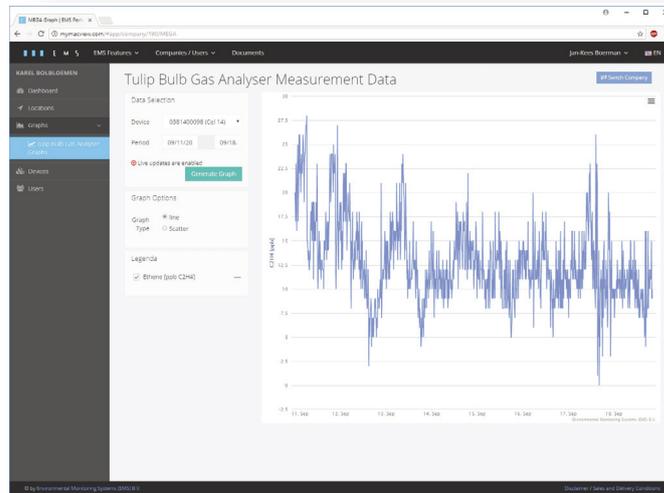
### **Energy savings and quality improvement**

Ethylene (ISO-name ethene), is produced from sick or "sour" tulip bulbs and is very harmful for tulip bulbs during the storage period: Too high concentrations of ethylene results in gum, weight loss, tearing up, and flower dehydration. From fear of ethylene inside the storage there are mostly too high ventilation rates used then strictly necessary. This consumes too much energy and leads to dehydration of the tulip bulbs. The MACView®-Ethylene analyser measures ethylene with high accuracy and is reliable, even at very low concentrations. By connecting the ethylene measurement signal to a climate computer, the ethylene concentrations are stored inside the climate computer and the valve for ventilation is automatically controlled. By this principle there is not more ventilated than necessary. Energy savings are done and quality loss is prevented. During the storage season and after this period, the ethylene concentration history can be analyzed easily. This information is very important to guarantee the quality of the outstanding storage. The MACView®-Ethylene analyser is paid back in a few years, only based on energy savings. Added is the quality improvement with guaranteed safe ethylene concentrations with a minimum of weight loss.



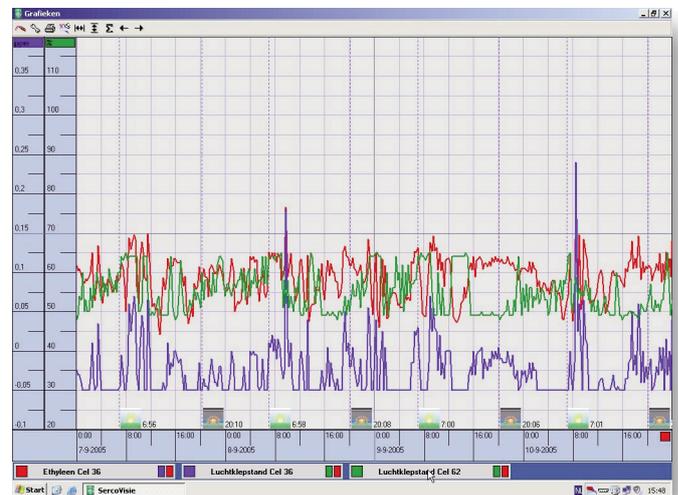
## MACView®-Ethylene Analyser screenshots:

### Graphics and history



### Realtime status and trendlines of ethylene

### Ethylene concentrations and control by valves



### MACView®-Ethylene Analyser

EMS has developed the MACView®-Ethylene Analyser special for the market of flower bulbs. The MACView®-Ethylene Analyser is a high precision measurement device for the measurement of harmful ethylene gas in storage rooms of flower bulbs. The MACView®-Ethylene Analyser shows measured values of ethylene concentration on the display, the internet portal as well on the climate computer. The analyser has a alarm controls a relays or send a signal by a analog output. De levels on which the relays must be switched can be adjusted in the menu.

### Ventilation

To prevent accumulation of ethylene in normal situations the advice is to use a standard defined 100 m<sup>3</sup> air per m<sup>3</sup> bulbs per hour. This advice gives a protection of a maximum of 5% sick bulbs. By measuring the ethylene concentration it is not possible to ventilate more then strictly necessary. The analog output of the MACView®-Ethylene Analyser can

be connected directly to the climate computer, a frequency converter or a valve control.

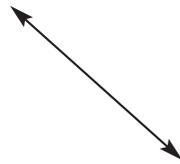
### Web portal

The MACView®-Ethylene Analyser can be used without a climate computer to analyze the measured concentrations. The data is send by WiFi or GPRS/UMTS or Ethernet cable to the webportal. The data is stored and can be exported if necessary. The concentrations measured in ppb (parts per billion) can be compared easy to the maximum allowed concentrations that tulip bulbs may be exposed.

### Alarms

The connection to a climate computer is the best choice to maintain the quality continuously. The climate computer is able to find the optimum control between measured values and valves. If there is no climate computer, the analog output and relays inside the analyser can be used to control alarms and valves directly.

The MACView®-Ethylene Analyser can be connected to every climate computer resulting in higher quality of the flowerbulbs and measurable energy savings



Computer /  
Database

With the ethylene analyser a dangerous situation can be triggered by use of a relays. The relays can be adjusted in the menu. Applications are many. A acoustic signal or flashlight can be used to warn the user.

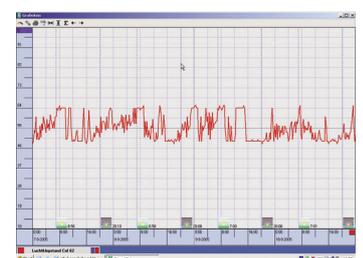
**Research PPO (Wageningen University)**

PPO (Applied Research Plant & Environment, department Flower bulbs) has done a lot of research to the effects on tulip bulbs and the use of the ethylene analyser. Research by PPO proves that:

- Ethylene, produced from sick or sour tulip bulbs is very harmful during storage: It results in gum, weight loss, tearing up, and flower dehydration.
- Fear of ethylene often becomes more ventilated than necessary. This takes a lot of energy and leads to excessive drying of the bulbs.
- The EMS-ethylene Analyser is precise and reliable, even at extreme low concentrations in the ppb range.
- By coupling the ethylene signal to the climate computer, ethylene values in the storage are measured and stored and the ventilation valve is controlled.
- Due to this, there will never be more ventilated than necessary improving the balance between the removal of ethylene, energy savings and quality loss.

- During storage and afterwards, pressing the button can reveal the cell's ethylene history. This information is very valuable for ensuring high quality storage and serves as an important selling point for high quality flower bulbs.
- The ethylene meter pays itself back in a few years, only because of the energy savings achieved. In addition, the financial benefit of guaranteed storage with safe ethylene levels and a minimal weight loss is realized.

Many thanks to the cooperation with PPO Lisse The Netherlands



# TECHNICAL SPECIFICATIONS

## MACView®-Ethylene Analyser

|                                       |  |
|---------------------------------------|--|
| <b>Type</b>                           | MACView®-Ethylene Analyser, based on the latest sensor technology  |
| <b>Sensor types</b>                   | Ethylene sensor and Actellic-detection for the detection and control of chemical measurement to prevent harmful effects due to aggressive chemicals like Actellic              |
| <b>Interface to climate computers</b> | 4-20mA for ethylene signal, adjustable, potential free digital input for signal to climate computer "Start gassing" or "Standby"<br>Choice digital RS232 or RS485 output to PC |
| <b>Material of the housing</b>        | Stainless steel, protection degree IP65  |
| <b>Norm and standards</b>             | NEN-EN-IEC 61000-6-1 to 4, CE  |
| <b>Program types</b>                  | Measurement, dosing, standby and flushing  |
| <b>Signals / alarms</b>               | ppb hysteresis adjustable by relays (programmable by function)<br>analog output 4-20mA (programmable by function), several status signals, power, failure, Relays 1            |
| <b>Logging data</b>                   | Internal database with date- and time for up to 6700 records, read out by portal software  |
| <b>Service connection</b>             | RS 232 interface   |
| <b>Supply</b>                         | 230 VAC 30W  |
| <b>Working temperature</b>            | -10 + 60 degree. Celsius, relative humidity 5 to 95%, non-condensing   |
| <b>Software</b>                       | Delivered with a remote connection of choice, by internet Web-Portal<br>WiFi, GPRS/UMTS or Ethernet UTP cable  |
| <b>User interface</b>                 | Menu with graphical display and backlight  |
| <b>Dimensions</b>                     | W 525 x H 250 x d 154 mm   |
| <b>Mounting</b>                       | System can be mounted against a wall or top of a ceiling by attachment-tabs  |
| <b>Manufacturer</b>                   | Environmental Monitoring Systems (EMS) B.V. The Netherlands  |

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