

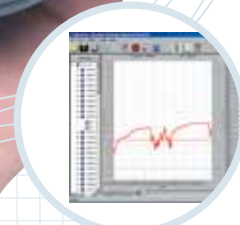
MicroLog Solution

General data logger



External sensor input

Thermal portable
printer - simply scan
MicroLog's infrared
beam



MicroLab software
automatically saves and
produces daily status
reports

The *MicroLog* solution family offers two low-cost portable data loggers:

Temperature and Temperature/RH PLUS external sensors

- 8 year legacy of customer satisfaction, reliability and application experience
- Up to 3 parameters: Temp, RH and external sensors
- Accurate, portable 8-bit (*MicroLog*) and 10-bit (*MicroLogPRO*) data loggers
- All data viewing, export, and printing is done via two function keys
- View up to 30 days min/max history on LCD screen
- Water and dust proof (IP65/NEMA 4)
- Infrared communication to portable thermal printer
- Records months of data – up to 16,000 or 54,000 samples
- External sensors include: Temperature, pH, 4-20 mA, 0-10 V and more
- 4-20 mA and 0-10 V inputs allow for connection with any industry standard sensors
- Sensor values are displayed in their own units on the LCD
- *MicroLab* analysis software enabling powerful monitoring and data analysis capability

Compact 8-bit Data Logger



A compact 8-bit data logger capable of recording data for months, even long-term shipping and storage. All data viewing, data export, and printing is done via two function keys.

- External input enables additional data collection from a variety of external sensors
- View up to 30 days min/max history
- Built-in quality sensors for temperature and humidity
- Programmable sampling rate
- Records months of data - up to 16,000 samples
- Low and high alarm level programming

Compact 10-bit Data Logger



The 10-bit *MicroLogPRO* has all of the benefits of the 8-bit *MicroLog* in addition to the following enhancements:

- Higher sampling resolution for more accurate readings
- Increased memory - 52,000 samples
- Enhanced 4 digit LCD

External Sensors



Temperature DT132 (2.5m); DT093 (8m)

MicroLog Range: -50 to 100 °C
 MicroLogPRO Range: -50 to 110 °C
 MicroLog Resolution: <1 °C
 MicroLogPRO Resolution: <0.3 °C



DT168 pH Adapter & Electrode

Range: 1 to 14 pH
 MicroLog Resolution: 0.116 pH
 MicroLogPRO Resolution: 0.02 pH



DT140 Voltage Adaptor

Range: 0 to 10 V
 MicroLog Resolution: 0.05 V
 MicroLogPRO Resolution: 0.01 V



DT139 Current Adapter

Range: 4 to 20 mA
 Resolution: ±0.1 mA

For full sensor specifications please visit our Web pages www.fouriersystems.com

MicroLog Solution Case Study



Company:

Company: Exporter Greenwings and Wageningen

Industry: Agro technologists - Cut flowers exporter Holland to Japan

Challenge:

High temperature and humidity levels during worldwide export journeys of up to a week reduce quality and humidity, causing botrytis.

Requirements:

Tracking and tracing system charting delivery from supplier to customer and determine where obstacles occur to enable proactive, preventative measures.

Solution:

MicroLog humidity and temperature data logger monitor the journeys' climate conditions and help structurally reduce

quality loss of the flowers by developing a quality progress report.

Method:

MicroLog data loggers are attached to the flowers, measuring temperature and humidity every 30 minutes. Upon arrival in Japan, the data loggers are removed by the customer and mailed back to Greenwings in attached envelopes. The data on the data loggers is then uploaded via an Internet site to a central database.

To receive more case studies on multiple applications visit www.fouriersystems.com



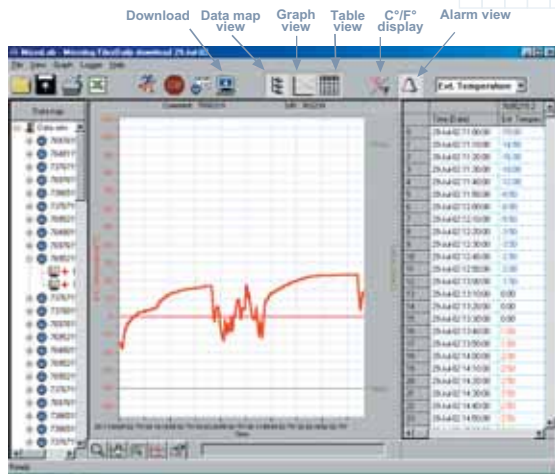
MicroLog Solution

MicroLab Software

MicroLab Features

- Downloads from MicroLog
- Graph & table displays
- Alarm levels per MicroLog displays
- Ability to set-up MicroLog
- Sensor definition
- Comments for each data logger
- Automatic data saving
- Daily status reports in various formats

Data can be clearly identified according to the ID number of the logger it came from and the threshold relevant to that logger. MicroLab automatically saves the data and produces daily status reports of your environment.



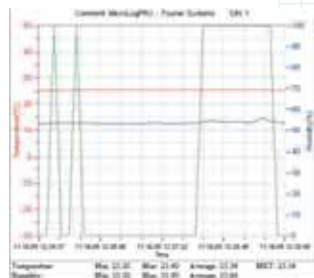
Data Management

Data records can be exported to Excel or CSV file format using the Export to Excel feature

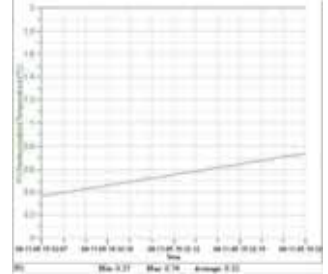


Data Analysis

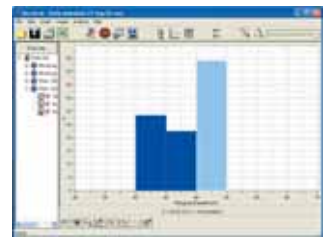
Mean kinetic temperature, an expression of cumulative thermal stress in different temperatures during storage, transportation and distribution.



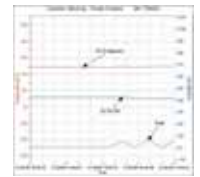
Pasteurization provides analysis for the most common methods of pasteurization in Industry: High Temperature Short Time (HTST); Ultra Pasteurization (UP) and Ultra High Temperature (UHT) pasteurization.



Histogram provides a graphical view of historical results presented according to defined parameters of periods of time and percentage levels. This provides a level of analysis which can be tailored to specific environment needs for an immediate picture. For example, this can be used in a museum environment where the percentage of time the humidity reached certain levels can be viewed.



Annotation feature enables text marks to be placed on the graph at relevant points where certain information needs to be highlighted.



GMT Recording

Setting data recording to meet with GMT - Greenwich Mean Time for use in international environments, particularly export and import.



DatPass 21 CFR Part 11 Compliance

All MicroLab software when used in conjunction with DatPass software provides FDA Title 21 CFR Part 11 compliance. The software not only stores the data of each MicroLog but can also set the MicroLog alarm level, sampling rate and all other necessary parameters.





MicroLog Solution

Specifications

MicroLog Solution Models		Output	MicroLab Software
MicroLog EC600	Temperature plus external sensor	<ul style="list-style-type: none"> • MicroLog Display: 2 digit 7-segment LCD • MicroLogPRO Display: 4 digit 7-segment LCD with decimal point 	<ul style="list-style-type: none"> • Runs on Windows® 95/98/2000/XP/Vista • Fast data download from the MicroLog • Graphic visualization of the MicroLog data • Data displayed in graphs and tables • Data Export to EXCEL • Graphic analysis tools such as Markers, Zoom • Data Map allowing the users to easily see many MicroLog data loggers in one screen • MicroLog SETUP windows, for setting up the MicroLog sample rate, sensors and alarm level • MicroLog sensor calibration • Display of MicroLog battery level • Showing daily reports of a fleet of data loggers • Visual alarm levels on the graph and table
MicroLog EC650	Temperature, relative humidity plus external sensor		
MicroLogPRO EC700	Temperature plus external sensors	Communication <ul style="list-style-type: none"> • MicroLog IR - interface to portable HP printer • RS232 communication to the PC with 19,200 kbps with MicroLog and MicroLogPRO • USB 1.1 (MicroLogPRO) 	
MicroLogPRO EC750	Temperature & humidity plus external sensors		
Built-in Sensors		Memory <ul style="list-style-type: none"> • MicroLog: 16,000 samples • MicroLogPRO: 1 sensor - 52,000 samples 2 sensors - 26,000 samples 3 sensors - 16,000 samples 	
MicroLog Temperature			
Range:	-30 to 50 °C	Power Supply <ul style="list-style-type: none"> • Internal lithium battery: 3.6 V TL5902 • Battery life: Approximately 2 years (depending on sampling rate) 	
Resolution:	0.5 °C		
Accuracy:	0.6 °C	Sampling Rate User defined: From 1 every 10 seconds to 1 every two hours	
MicroLog Humidity			
Range:	10 to 90 %	Dimensions <ul style="list-style-type: none"> • Thickness: 22.9 mm • Diameter: 72 mm • Weight: 55 gr 	
Resolution:	0.5 %		
Accuracy:	± 3 %	Standards <ul style="list-style-type: none"> • Water and dust proof IP65 standard compliance, for EC600 and EC700 models • CE and FCC standard compliance • FDA Title 21 CFR Part 11 Compliance 	
MicroLogPRO Temperature			
Range:	-40 to 80 °C	Ordering Information	
Resolution:	0.2 °C (-40 to -20 °C) 0.1 °C (-21 to 50 °C) 0.2 °C (51 to 80 °C)		
Accuracy (all ranges):	±0.2 °C	AC004 Infrared printer for data print-out	
Software calibration is possible		11199 Calibration certificate	
MicroLogPRO Humidity		PC-KIT PC Kit (MicroLab Software CD and Com. Cable)	
Range:	5 to 95 %	PC-KIT-750-USB PC Kit for EC750 (MicroLab software CD and Mini USB Com. Cable)	
Resolution:	0.1 %	SFTMCL025A DatPass for MicroLab (DatPass software CD and USB security dongle)	
Accuracy:	±2 %		
Software calibration is possible			

Microlog & MicroLogPRO Comparison Table

	MicroLog		MicroLogPRO	
	EC600	EC650	EC700	EC750
Sampling resolution	8-bit		10-bit	
Internal range	-30 to 50 °C/-22 to 122 °F		-40 to 80 °C/-40 to 176 °F	-40 to 80 °C/-40 to 176 °F (T), 0 to 100 % (RH)
Temperature accuracy	±0.6 °C / ±1.08 °F		±0.2 °C / ±0.36 °F	
Humidity accuracy	N/A	±3 %	N/A	±2 %
Resolution	0.5 °C (-30 to -29 °C)/0.9 °F (-22 to -20 °F) 0.4 °C (-28 to -22 °C)/0.76 °F (-18 to -7 °F) 0.3 °C (-21 to 22 °C)/0.54 °F (-5 to 71 °F) 0.4 °C (23 to 32 °C)/0.76 °F (73 to 89 °F) 0.5 °C (33 to 39 °C)/0.9 °F (91 to 102 °F)	0.5 %	0.2 °C (-40 to -20 °C)/0.36 °F (-40 to 4 °F) 0.1 °C (-21 to 50 °C)/0.18 °F (-5 to 122 °F) 0.2 °C (51 to 80 °C)/0.36 °F (123 to 176 °F)	0.1 %
Memory capacity	1 sensor - 16,000 samples 2 sensors - 8,000 samples 3 sensors - 5,312 samples		1 sensor - 52,000 samples 2 sensors - 26,000 samples 3 sensors - 16,000 samples	
Sampling rate	Minimum - 1 per 10 seconds Maximum - 1 per 2 hours			
LCD display	Two digit, 7-segment LCD		Four digit, 7-segment LCD with decimal point	
LCD units/icons	°C, °F, % RH, Ext		°C, °F, % RH, pH, V, mA, AL-H, AL-L	
RS-232	Cable connection to the PC with 19,200 kbps			
USB - optional	N/A	N/A	USB 1.1 Option for quantities over 200 units with low water & dust protection	USB 1.1
Infrared printout	Minimum, maximum and duration up to 30 days Wireless report to portable thermal printer HP82240B		Minimum, maximum and duration up to 30 days OR Real-time data print-out up to last 128 values OR Wireless report to portable thermal printer HP82240B	
Power supply	Internal Lithium battery 3.6 V, 1/2 AA, 1.2 AH			
Battery life	Approximately 24 months (may vary with number of sensors connected and the sampling rate settings)			
Dimensions	72 mm diameter, 22.9 mm thickness			
Weight	55 g		55 g	