Evolution Diligence EV Data Loggers

COMARK

The Comark Diligence EV range includes ten data loggers that can handle almost every requirement.





Applications include the food industry, building services, scientific experiments, production processes, monitoring PLC and other control systems, heating, ventilating and air conditioning systems. All loggers feature:

- Tough moulded cases, dust and waterproof to IP67 standards
- Large memory capacity of up to 16000 readings
- Ability to log over multiple periods
- Windows™ based Evolution software, for fast, effective data download and analysis
- LED indication of active logging and alarm conditions, plus audible alarm warning
- LCD on selected models, for instant checks on readings and alarms
- Single button control of all main functions
- Choice of single or multi-sensor temperature models
- Ability to scroll display between readings from all sensors in use (N2012, N2013 and N2014 only)
- Long battery life, up to five years

1 *N2001/N2011

- One channel, internal temperature sensor
- LCD on N2011

2 *N2002/N2012

- Five channels, one internal temperature sensor and up to four external thermistor sensors using the N2000BOX multi-link
- LCD on N2012
- Lumberg connector for direct probe connection or multi-link

3 *N2003/N2013

- Two channels, internal temperature and external humidity sensors
- LCD on N2013

4 *N2004/N2014

- Three channels, with up to three external type K or T thermocouple probes using the adaptor cables
- Additional ambient temperature measurement from PK31L or PT31L probes or the adaptor cables
- Can also measure from a single thermistor probe
- Lumberg connector for direct probe connection or multi-link
- Adaptors – N2000ADP/K, type K or N2000ADP/T, type T for up to three probes with sub-miniature connectors
- LCD on N2014

5 *N2005/N2015

Logger features:

- Measurement range 4 to 20mA
- Lumberg 6-pin socket for sensor connection via ADP50 connection lead
- Programmable selection of measurement parameters, temperature, humidity, pressure, flow, pH, current, voltage and user definable
- LCD on N2015

Evolution software features, specific to N2005/N2015:

- Selection of resolution between 0 and 4 decimals (on PC and printouts)
- Freeform text of up to eight characters for user definable measurement units
- Description of logging run and channel names
- Selection of over range and under range points
- Selection of scale high and low values equating to 20mA and 4mA

DILIGENCE EV KITS AND ACCESSORIES

A selection of logger kits is available. Please refer to the Comark price list.

***N1SW** Evolution software.
Please refer to page 17 for details.

***N2000INT** PC interface for programming loggers and downloading data.

***N2000BOX** Multi-link to connect external probes to N2002 or N2012.

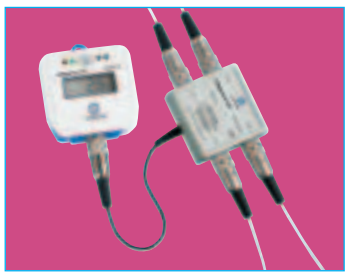


N2000INT

***N2000ADP/K** Adaptor cable to connect up to three type K thermocouple probes to N2004 or N2014.

***N2000ADP/T** Adaptor cable to connect up to three type T thermocouple probes to N2004 or N2014.

***ADP50** Connection lead with Lumberg plug and 200mm wire with stripped and tinned ends, for N2005 or N2015.



N2000BOX

Evolution Diligence EV Data Loggers

COMARK



Sensor Type	
N2001, N2011, N2002, N2012, N2003, N2013	Thermistor
N2004, N2014	Type K or T thermocouple
Measurement Range	
N2001, N2011, N2002, N2012 internal sensor	–40°C to +70°C
N2002, N2012 external sensor	–40°C to +150°C
N2003, N2013	
Temperature	–20°C to +60°C
Humidity	0 to 97% RH non condensing
N2004, N2014	
Type K	–200°C to +1372°C
Type T	–200°C to +400°C
Thermistor	–40°C to +70°C
N2005, N2015	4 to 20mA
Scales	
Temperature	°C, °F
Humidity	RH or DP
Display Resolution	
Temperature	0.1° (N2014 only, 1° below –100° and above +1000°)
Humidity	0.1% RH
N2015 only	4 digits 1 decimal place (software allows 0 to 4 decimals in logged data*)
System Accuracy	
Temperature N2001, N2011, N2002, N2012, N2003, N2013	
–25°C to +50°C	±0.5°C
–40°C to +80ºC	±1°C
+80ºC to +150°C	±2°C (typical)
Humidity N2003, N2013	
–20°C to +60°C	±3% RH
Instrument Accuracy at +20°C ambient	
N2004, N2014	±0.5°C ±0.3% of reading
N2005, N2015	±0.3% of full scale
Memory 32K	Samples
1 channel	16000
2 channels	8000
3 channels	5300
4 channels	4000
5 channels	3200
Logging Frequency	Programmable between 1 second and 99 hours
Ambient Storage	–40°C to +70°C
Battery Type	1 x AA size 3.6V replaceable lithium battery, part number A17476
Battery Life	Up to 5 years
Case Material	ABS
Environmental Protection to IP67, EN 60529, IEC 529	YES
LED indication	Red = alarm, Green = logger active

**Software selection of decimals will affect recorded values, e.g. selection of 0 decimals = a value of ±32000 and a selection of 4 decimals = a value of ±3,2000*

Evolution Logging Thermometers

COMARK

Evolution logging thermometers combine the freedom of a fully portable hand held instrument with the versatility of a high specification data logger. There are two logging modes to maximise applications.





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Walkabout logging mode enables the temperatures of many different points, such as refrigerators, freezers, cooking surfaces, cooked, chilled and frozen food, and locations in factories, laboratories, storage facilities and heating systems to be logged.

- Up to 99 temperature locations
- Locations can be identified by description and code number using the software
- Readings identified by location code, date and time
- Maximum and minimum alarm temperatures can be set for each location, with audible warning
- Specific routes can be pre-programmed via the software

Static logging mode enables multiple readings from a single temperature point, ideal for monitoring processes, experiments and key production points. Logging can be programmed from the keypad or the software.

- Logging can be programmed from the software to start and stop at pre-set dates and times
- The logging interval can be set from 1 second to 99 hours
- Logging can continue when memory is full using the wraparound facility
- Operator, batch or company identification can be programmed for each logging run
- Logging can be restricted to specific days of the week using the software, to save memory
- Maximum and minimum alarm levels, with audible and displayed warnings
- Alarm indicators can be programmed to continue or to reset automatically when temperature readings return within the programmed levels
- Different alarm levels can be set on each channel (N1001 only)

Recorded data can be printed out or downloaded to a PC for later analysis and storage, making written records a thing of the past. Both instruments use the proven Windows™ based, Evolution software package and feature:

- IRDA direct programming or downloading with suitable computers and printers
- Programming of logging tasks from the keypad or via the software
- Unrivalled data display from the triple-reading LCD
- Programmable high and low alarms
- Selectable auto switch off to save battery power

❶ *N1092 FOOD THERMOMETER

Combines type T thermocouple and thermistor sensor compatibility for fast response and accuracy required by food hygiene regulations.

- Measurement range covers freezers to cooked food applications
- Lumberg connector for improved prevention of food and liquid ingress and more secure probe connections

❷ *N1001 INDUSTRIAL THERMOMETER

WATERPROOF IP67

- Eight thermocouple compatibility for maximum applications.
- Twin input channels for single or two channel differential temperature measurement
- Logging from either or both channels
- Industry standard sub-miniature probe connector

KITS AND ACCESSORIES

For kit details please refer to the Comark price list.

N1092KIT

N1001KIT

***CRS/4** Protective rubber slip-on boot.

LC98 Large size carrying case.
(CRS/4 and LC98 shown on page 10)

***N1SW** Evolution software.
Please refer to page 17 for details.

***CR1** Computer and printer interface for N1001 and N1092, used where an infra red port for direct data transfer is not available. Accepts instruments with or without the CRS/4 rubber boot fitted.



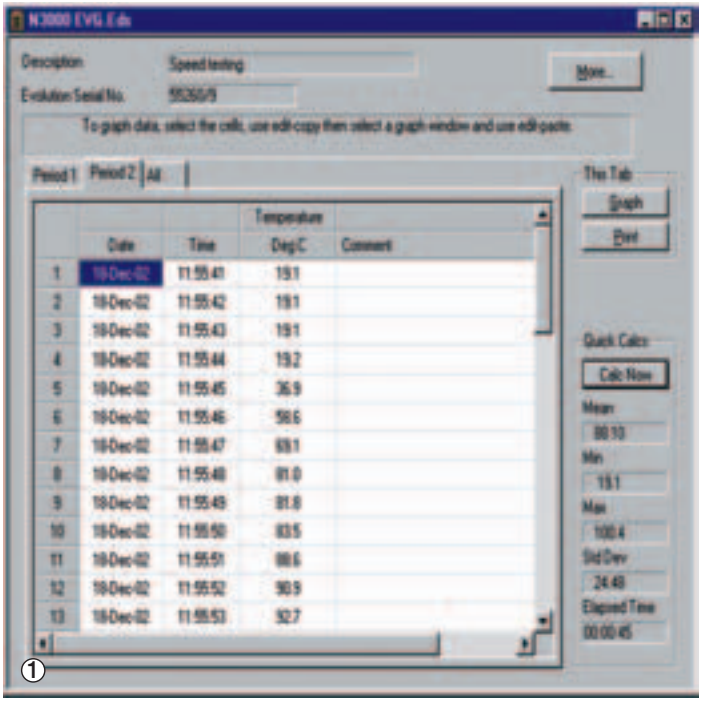
CR1 Interface

	N1092	N1001
Sensor Type	Thermistor and type T thermocouple	Thermocouple types K, N, T, J, R, S, E, B
Scales	°C/°F	°C/°F/K
Measurement Range		To thermocouple limits#
Thermistor	–80°C to +150°C	–
Type T Thermocouple	–200°C to +400°C	–
Resolution	0.1°	0.1° below +1000°C, 1° above (autoranging)
System accuracy at +23°C		
Thermistor		
0°C to +70°C	<±0.3°C	–
–25°C to +110°C	<±0.5°C	–
Type T* Thermocouple		
0°C to +70°C	±0.5°C	±0.5°C
Communications	Infra red interface	
Logging Memory	Up to 1569 samples	
Environmental Protection to IP67, BS EN60529, IEC 529	YES	
Operating Temperature Range	–25°C to +50°C	
Battery Type	2 x IEC LR6, size AA	
Battery Life	300 hours	

** Typical accuracy at +23°C with a Comark probe #For thermocouple limits see Page 27 (flap)*

Click on www.technical-sys.com for complete product information

Evolution Software



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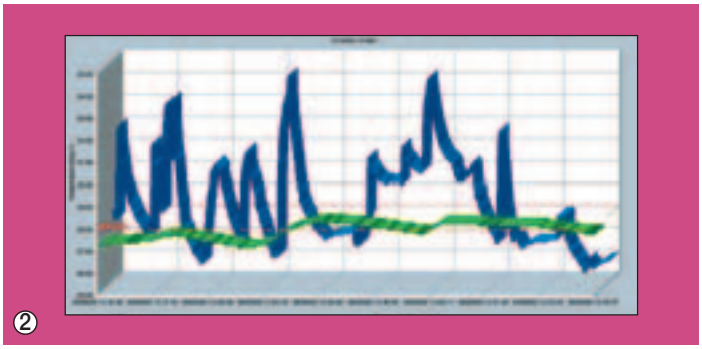
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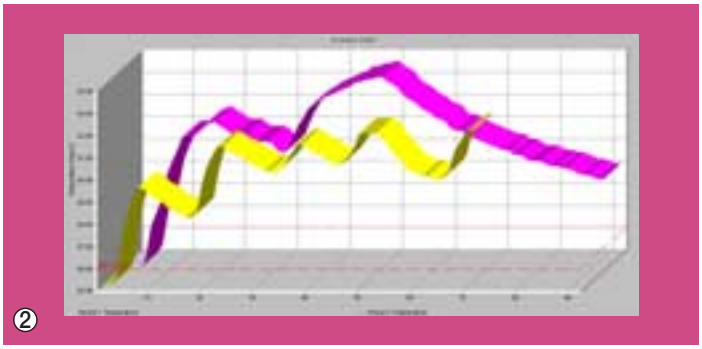
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The Windows™ based Evolution software, order code N1SW, enables instruments to be programmed from a PC and stored data to be displayed or printed in tabular or graphical form.

The multilanguage software supplied on CDROM supports the N3014 Graphic Monitor, Diligence EV data loggers and Evolution logging thermometers.

Programming capabilities include:

- Setting times for logging to start and stop
- Daily logging on selected days of the week to optimise the use of available memory
- Selection of the logging interval to suit almost any logging task
- Extension of logging periods through the memory wraparound facility, which enables new data to be saved over the oldest stored readings
- Adjustable high and low alarm levels
- Password protection of logging parameters and logged data
- Saving programmed logging configurations until needed
- Data presentation as spreadsheet style reports or graphs
- Extensive graphing options, including the ability to merge information from more than one data file onto one graph to show long-term trends and changes
- Merging information from more than one data file into a single file for analysis
- Sorting information, such as date, time and temperature to suit requirements
- Freeform text column to allow descriptions of data to be added to data files
- "Quick" calculations of mean, maximum, minimum, standard deviation and elapsed time for a whole data file
- Calculation of the duration of alarm conditions
- Alarm time delay, to prevent false alarms during normal operations such as fridge or freezer defrost cycles

① Display showing tabular data
② Displays showing graphical data