

# Temperature Monitoring?

**New** Diligence EV models now offer a wider temperature range than ever before!

The Diligence EV range now includes two new, four-channel loggers to measure from external Type K or T thermocouple probes.

## Key features of N2004 and N2014

- Can measure from up to 3 external thermocouple probes
- Can also measure ambient temperature when using the thermocouple adaptor cables, or the PK31L or PT31L probes connected directly to the logger
- Can also measure from a single thermistor probe
- Programmable selection of thermocouple types K or T
- Lumberg socket for direct connection of a single probe: type K, T or thermistor
- Cables for connection of up to three thermocouple probes with sub-miniature connectors
- Wide measurement range from  $-200^{\circ}\text{C}/-328^{\circ}\text{F}$  to thermocouple limits\*
- Instrument accuracy  $\pm 0.5^{\circ}\text{C}/0.9^{\circ}\text{F} + 0.3\%$  of reading at  $+20^{\circ}\text{C}/+68^{\circ}\text{F}$
- Display resolution on N2014 of  $0.1^{\circ}\text{C}/\text{F}$  from  $-100^{\circ}\text{C}/\text{F}$  to  $<1,000^{\circ}\text{C}/\text{F}$
- New penetration probes, type K – PK31L and type T – PT31L

\*Type T:  $+400^{\circ}\text{C}/+750^{\circ}\text{F}$ , Type K:  $+1372^{\circ}\text{C}/+2500^{\circ}\text{F}$

2 YEAR WARRANTY

IP67 WATERPROOF

N2004 Up to 3 external thermocouple probes via N2000ADP/T or N2000ADP/K cables, or a single thermocouple or thermistor probe

N2014 As N2004 plus LCD display for temperature readings and alarm indication

## Diligence Ev

The range at a glance

The Comark Diligence EV range now includes **eight models**, with the addition of the **N2004** and **N2014** thermocouple loggers. (For details of the full range please see the separate leaflet; code C127) The Diligence EV range covers almost every requirement, including temperature, from thermistor sensors and type K or T thermocouples, and humidity. Specifications include:-

- Tough, moulded cases, dust and waterproof to IP67 standards
- Large memory capacity of up to 16,000 readings
- Ability to log over multiple periods
- Windows™ based Evolution software, for fast, effective data download and analysis
- Computer interface, N2000INT, compatible with all models
- LED indication of active logging and temperature or humidity alarm conditions
- LCD displays on selected models, for instant checks on current readings and alarms
- Additional bleeper warning of temperature or humidity alarm conditions
- Single button control of all main functions
- Choice of single or multi-sensor temperature models
- Ability to scroll between readings from all sensors in use on LCD display
- Choice of measurement ranges suitable for food, pharmaceutical and general industrial manufacture and processing
- Wide range of Comark temperature probes
- Long battery life, up to five years



## Evolution Software

The N2004 and N2014 thermocouple loggers are fully programmable from the proven Evolution software and this can also be used to store and present logged data.

# COMARK

Comark™  
Kane - May™

  
COMARK

The N2004 and N2014 can be used with a wide range of Comark thermocouple and thermistor probes. Direct connection requires a Lumberg type connector and connection via the N2000ADP/K or N2000ADP/T cables requires a sub-miniature connector. A small selection of probes is presented here and details on the full range can be obtained from the Comark Sales Office or your distributor.

Probe Chart									
Code	Probe Type	Sensor °C/°F	Connector	Temp Range	Response Time (secs)†	Stem Length (mm)	Stem Dia (mm)	Lead Length (m)	Lead Material
PK31L	Penetration	K	L	-100°C/-148°F to +250°C/+482°F	2.0	75	3.3	1.0	FEP
PT31L	Penetration	T	L	-100°C/-148°F to +250°C/+482°F	2.0	75	3.3	1.0	FEP
PX31L	Penetration	PST	L	-40°C/-40°F to +150°C/+302°F	2.0	75	3.3	1.0	FEP
PT24L	Food penetration	T	L	-100°C/-148°F to +250°C/+482°F	2.0	100	3.3	0.7	PTFE
PT24L/C	Food penetration	T	L	-100°C/-148°F to +250°C/+482°F	2.0	100	3.3	1.0	PVC
PK24M	Standard / heavy duty	K	M	-50°C/-58°F to +250°C/+482°F	2.0	100	3.3	1.0	PVC
PT22M	Standard / heavy duty	T	M	-100°C/-148°F to +250°C/+482°F	2.0	100	3.3	1.0	PVC
SK29M	Pipe probe	K	M	-50°C/-58°F to +100°C/212°F	10.0	-	-	2.5	PVC
SK31M	Self adhesive patch	K	M	-50°C/-58°F to +250°C/+482°F	0.5	-	-	1.0	PTFE
SK32M	Patch probe	K	M	-50°C/-58°F to +250°C/+482°F	0.5	-	-	1.0	PTFE
ST23L	Between pack probe	T	L	-40°C/-40°F to +70°C/+158°F	5.0	-	-	1.0	PTFE
ST24L	Between pack probe	T	L	-40°C/-40°F to +70°C/+158°F	5.0	-	-	3.0	PTFE
ST38L	Pallet probe	T	L	-100°C/-148°F to +250°C/+482°F	4.0	250	8 x 2	1.0	PVC
AT22L	Fast response flexible	T	L	-100°C/-148°F to +250°C/+482°F	2.0	-	-	1.0	PTFE
AK28M	Flexible thermocouple	K	M	-100°C/-148°F to +250°C/+482°F	0.5	-	-	1.0	PTFE
AK29M	Flexible thermocouple	K	M	-100°C/-148°F to +250°C/+482°F	0.5	-	-	5.0	PTFE
AK33M	Flexible thermocouple	K	M	-100°C/-148°F to +600°C/1112°F	0.5	-	-	1.0	FG
IT21L	Deep fat food	T	L	-200°C/-328°F to +400°C/+750°F	1.0	500	3.0	0.7	PTFE
IT23M	Weighted milk dip	T	M	-40°C/-40°F to +150°C/+302°F	2.0	90	-	2.0	PTFE
IT23L	Weighted milk dip	T	L	-40°C/-40°F to +150°C/+302°F	2.0	90	-	2.0	PTFE
IX23L	Weighted milk dip	PST	L	-40°C/-40°F to +150°C/+302°F	5.0	90	-	2.0	FEP

†The time constant is the time taken for the probe to reach 63% of the value of the temperature change. Multiply x 3 for the time taken to achieve 95% and by 5 for 99%. Thermocouples:- Tolerances relate to BS EN60584-2 (1993), Class A. All dimensions are in mm. PST = Thermistor sensor, L = Lumberg connector and M = Sub-miniature connector.

Technical Specifications	
Sensor Type	Type K and T thermocouple, thermistor
Measurement Range	Type K -200°C/-328°F to +1,372°C/+2,500°F Type T -200°C/-328°F to +400°C/+750°F Thermistor (from cold junction in connector of PK31L/PT31L probes and N2000ADP/K or N2000ADP/T adaptors) -40°C/-40°F to +70°C/+158°F
Scales	°C or °F
Resolution	Display (N2014) -100°C/F to <1,000°C/F below -100°C/F and above 1,000°C Software and printed results ≤ +300°C/+572°F > +300°C/+572°F full range
Instrument Accuracy, full range	+20°C/+68°F ambient ±0.5°C/0.9°F + 0.3% of reading -20°C/-4°F to +40°C/+104°F ambient ±0.5°C/0.9°F + 0.5% of reading -40°C/-40°F to +70°C/+158°F ambient ±1.0°C/1.8°F + 1.0% of reading -20°C/-4°F to +40°C/104°F ±0.3°C/0.6°F thermistor -40°C/-40°F to +70°C/+158°F ±0.5°C/0.9°F thermistor
Memory 32K	1 channel 16,000 samples 2 channels 8,000 samples 3 channels 5,300 samples 4 channels 4,000 samples
Communications	via infra-red interface
Download Time	3 minutes for 10,000 readings (typical)
Logging Frequency	Programmable between 1 second and 99 hours
Ambient Storage	-40°C/-40°F to +70°C/+158°F
Logging Start	Programmable date and time or manual start from instrument multi-function button
Software	Windows™ based Evolution software requiring Windows 95, 98 or NT operating systems
Battery	1 x AA size 3.6V replaceable lithium battery, part number A17476
Battery Life	Up to 5 years
Case Material	ABS
Environmental Protection	IP67, EN60529, IEC529
LED Indication	Red = alarm, green = logger active
Dimensions	L 88mm/3.5" (including fixing lug) W 80mm/3.1" D 35mm/1.4"
Weight	N2004 111gms/3.9oz N2014 119gms/4.2oz

Diligence EV Thermocouple Data Logger Accessories		
<b>N2000INT</b> Interface for programming and downloading	<b>N1SW</b> Evolution Windows™ software	<b>N2000ADP/K (Type K) and N2000ADP/T (Type T)</b> Adaptor cable to connect up to 3 sub-miniature connector probes to one logger

## WARRANTY

All Comark instruments have a minimum one year warranty unless otherwise stated. The warranty period for temperature probes is for six months and all other probes and electrodes are unwarranted because the conditions of use are beyond our control. The Comark warranty covers manufacturing defects and component failure and applies worldwide. The warranty does not affect your statutory rights.

In line with our policy of continuous development we reserve the right to alter any product specifications without notice.

All products marked \* are manufactured by Comark Limited to the highest quality standard, in accordance with the company's certification under ISO 9001



CERTIFICATE No. FM12129  
ISO 9001



0451



# COMARK

a VIDA GROUP company

**Comark Limited**  
Gunnels Wood Road, Stevenage,  
Hertfordshire SG1 2TA England  
Tel: 01438 (+44 1438) 367367  
Fax: 01438 (+44 1438) 367400

Email enquiries UK and Ireland:  
salesuk@comarkltd.com  
Email enquiries International:  
salesint@comarkltd.com

**Comark Instruments Inc.**  
9710 SW Sunshine Court,  
Beaverton, OR 97005, USA.

Tel: (503) 643 5204  
Fax: (503) 644 5859  
Email: sales@comarkUSA.com

Website: [www.comarkltd.com](http://www.comarkltd.com)

©1372/EN © Comark Limited.  
J30005