

NOMAD 2 Data Logger for Wind Resource Assessment



Field Friendly

We know field visits have to be made in the cold, wind, and snow. NOMAD 2's vacuum fluorescent display (VFD) option gives a clear bright readout in temperatures down to -40°C and in full sunshine. The LED "heartbeat" provides assurance of normal operation independent of the display. The breakthrough integrated shelter box design uses innovative mini-rack mounting for power and communications components, so installations are easy to maintain. Field-proven lightning protection circuitry is built in, reducing the number of connections to wire. Larger, color-coded cage-clamp terminals make wiring faster and easier, even with gloves on. A built-in serial port lets you use NOMAD Desktop on site. No laptop? NOMAD 2's easy-to-use front panel and menuing system tells you everything you need to know. Reprogram the logger in seconds by uploading a configuration from your Compact Flash card.

Smart Power Management

NOMAD 2 will run on two standard 9V alkaline batteries for six months. If that isn't enough, add internal 12V batteries to run longer, even with your preferred transducers and remote communications gear. NOMAD 2 manages transducer power and sensor excitation to get the most out of whatever batteries you use. Add a solar package for perpetual operation. A built-in relay provides control for your needs, including sensor heating for icing conditions.

The NOMAD 2 data logger offers advanced functionality and simplified installation while reducing system costs. With its advanced low-power circuitry, real-time operating system, and Windows™-compatible Compact Flash Cards, NOMAD 2 collects and secures the data you need.

More Sensor Inputs

Connect up to 12 anemometers or other frequency or state devices to the NOMAD 2, including rain gauges, energy meters, and relays. Another 8 analog inputs connect directly to wind vanes, thermistors, and transducers measuring air pressure, electric power, sound level, or anything else that concerns you at your wind site. Get remarkable $\pm 0.02\%$ accuracy on counter inputs and $\pm 0.2\%$ accuracy on analog inputs. Connect most transducers and sensors with no need for extra modules.

Get Your Data Your Way

NOMAD 2 makes it easier than ever to get your data. Whether your connection is GSM, CDMA, AMPS, satellite, or landline, NOMAD 2 will answer your call and send you e-mail. Robust Compact Flash cards provide solid-state storage and can be read by any PC using off-the-shelf readers. NOMAD 2 comes with NOMAD Desktop™ software to check in on your logger and see real time values with the Zoom feature. Refine study parameters by uploading a new configuration to NOMAD 2 remotely - NOMAD Desktop's advanced database system will keep all your data organized and labeled.

Weatherproof

The NOMAD 2 data logger is designed to withstand the harshest of climates in its lockable steel shelter box. The wide-temperature display, batteries, and data cards allow the data logger to operate fully from -40° to 185°F (-40° to 85°C).

From Second Wind

Second Wind has over 20 years experience making equipment for wind prospectors. From the award winning AL-2000 data logger to the trend setting NOMAD data logger, Second Wind products have a track record of reliability and versatility. NOMAD 2 draws on Second Wind's experience at wind prospecting sites from Antarctica to Sub-Saharan Africa. NOMAD Desktop software brings the power and flexibility of Second Wind's Advanced Distributed Monitoring System (ADMS) for windfarms to your desktop, providing powerful analytical tools previously unavailable without customer programming. Count on Second Wind to make it easy for you.

NOMAD 2 Specifications

Sensor Inputs

- 12 Counter Inputs:**
- Configurable for AC & pulse anemometers, other frequency-output devices, and high/low digital or relay state signaling
 - Frequency range DC to 2 kHz
 - High display resolution with low frequency anemometers
 - Input high/low threshold configurable for 0V or 3V
 - Configurable filtering for low frequency devices
 - 1-second count integration, $\pm 0.02\%$ accuracy
- 8 Analog Inputs:**
- Configurable range of 0 to 2.5V or 5V
 - 12-bit analog to digital conversion
 - 1-second sampling, $\pm 0.2\%$ accuracy
 - Direct interface to potentiometer wind vanes, 10k thermistors, and analog-output transducers
- Fault Detection:**
- Feedback input from 2.5V+ excitation output for wiring and device fault detection
- Internal Temperature:**
- 1-second sampling, $\pm 2^\circ\text{C}$ accuracy
- Power Supplies:**
- Measurement of two 9V batteries and 12V power
 - 1-second sampling, $\pm 0.1\text{V}$ accuracy

Outputs

- 2.5V+ Excitation:**
- 2.5V+ smart-switched excitation distributed to all input terminal blocks for energy-conserving measurement of potentiometers and thermistors
 - Calibrated to $\pm 5\text{mV}$, 25 ppm/ $^\circ\text{C}$, 250 mA max
- 12V Transducer Power:**
- 12V+ smart-switched transducer power output distributed to all input terminal blocks for energy-conserving operation of electronic transducers
 - 1 Amp maximum
- 12V Modem Power:**
- 12V+ configurable switched modem power output for energy-conserving operation of cellular & other modems
 - 1 Amp maximum
- Relay Output:**
- For de-icing or other control applications
 - SPST dry contact, 1 Amp maximum, AC or DC
 - Modbus-controlled

Power Supply

- 9 Volt Batteries:**
- 2 parallel standard 9V batteries in sliding receptacles
 - Up to 6 months operation with alkaline, up to one year with lithium (-40°C) batteries that have no shipping restrictions
- 12 Volt Power:**
- 12V (10-18V DC) input for internal primary or rechargeable batteries, external DC power supply, or regulated solar panel
 - Two-screw removable internal mounting for lead-acid batteries for higher power transducer, controls, and communication gear, standard sizes up to 20 AH, extreme environment sizes up to 8 AH
- Solar:**
- Optional on-board solar charging regulator/controller

Serial Ports

- Local Port:**
- 3 independent RS232C serial ports, up to 115 kBaud
 - Direct straight-cable connection to laptop or PC
 - Standard pinout DB9, DCE
- Remote Port:**
- Connects to modem, radio, or asynch network adapter
 - Auto-wakeup Rx input
 - Internally connected for SWI-supplied modem options
 - Field-wireable terminals for customer-installed devices
- Device Port:**
- Connects to and logs from communicating transducers including multifunction Phaser[®] power transducers & ultrasonic anemometers
 - Pollable Modbus RTU for SCADA and other general applications

ESD Protection

- All inputs, outputs, and serial port signaling transient and fault protected
- No additional lightning protection needed

User Interface

- Local Display:**
- 4 x 20 alphanumeric character display, LCD or VFD
 - Configurable smart-switched power
 - Automatic temperature-compensating LCD contrast
- Keypad:**
- 7-key sealed membrane keypad
- Remote Interface:**
- Full display, configuration, data transfer, & firmware upgradability by local port or modem connection to any PC via NOMAD Desktop[™]
- Status Light:**
- Heartbeat LED indicates operational status independent of display

Input and Data Processing

- Wind Speed:**
- Slope & offset scaling, auto-zeroing for counter inputs
- Wind Direction:**
- Modulo 360° and true vector processing
 - Deadband location correction
- Temperature:**
- Thermistor linearization to device accuracy ($\pm 0.1^\circ\text{C}$)
- Math Functions:**
- Average, standard deviation, maximum, time of maximum, minimum, time of minimum, total, cycles, sample value
- Recording Intervals:**
- 1 minute, 10 minutes, hourly, or daily in any combination for all inputs and math functions

Data Storage

- Media:**
- Industry/consumer standard Compact Flash, up to 256MB
 - Read/write-able by any notebook or desktop PC via PCMCIA adapter or any USB-type Compact Flash adapter
 - Full -40° to 85°C operation rated devices available
- Formats:**
- Card directory & file formats are fully Windows[™] compatible
 - Any FAT (PC) formatted Compact Flash card fully usable
 - Data written to daily files in named monthly subdirectories
 - Each datum in standard IEEE floating point format, indexed for positive database ID independent of file name/location
 - Each datum time-stamped in Universal Time (UT/GMT), configurable for time zone & daylight savings offsets
- Transfer:**
- Files transferable by card removal, local serial connection, remote dial-up connection, or as e-mail attachments

Physical

- Operating Temp:**
- -40° to 85°C all specifications (Vacuum Fluorescent Display)
- LCD Temperature:**
- LCD operates from -20° to 70°C , storage -30° to 80°C
- Internal RT Clock:**
- ± 1 minute/month accuracy, internet time-server adjustable
 - Backed up by socketed 2032 Lithium coin cell (10 year life)
- Wire & Cabling:**
- 12 six-screw, 0.2" (5mm) cage clamp style terminal blocks
 - Signal, ground, excitation, switched & unswitched 12V power distributed to each of 8 terminal blocks
 - Standard SMA-F bulkhead connector for external antennas
 - Four 3/4" npt/pg21 knockouts for cable & conduit installation
- Enclosure:**
- Integrated waterproof instrument enclosure, wire and cable junction box, and lockable rain shed
 - Upper section NEMA4/IP66 (watertight), lower section NEMA3R (rain tight) or NEMA4 with cable glands
 - 16 ga. steel, 14 ga. mounting flanges, TGIC powdercoated
 - 14 x 12 x 5.5 inches (350 x 300 x 140mm), 20 lbs. (9 kg)
 - Mini-rack mounting for internal modem options
 - Swing-out panels for modem and 12V battery access
 - Surface, truss-tower, or tube-tower mounting
 - Single no-tools padlockable hasp closure

Available Options

- Vacuum Fluorescent Display
- GSM/GPRS, CDMA, and AMPS cellular modems
- Satellite modem (Iridium)
- Landline telephone (POTS) modem
- Integrated solar charging systems, including charge regulator, panel, mounting brackets, and lead-acid batteries