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# Nomad Data Logger

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## GP-HR

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### GENERAL Purpose Nomad Logger

The Nomad GP-HR is a multi purpose Data Logger that can be configured to accept input from a wide variety of sensors.

It features three channels that can be used with analogue sensors to measure Temperature, Pressure, Humidity, Light, Wind Direction, Voltage and Current as well as a Digital pulse channel for Rainfall, Wind speed, Pulse Count, Flow and Frequency measurements up to 60 kHz.



### FEATURES

- ◆ **Stainless steel case.**
- ◆ **IP66 rating.**
- ◆ **5 year battery life.**
- ◆ **Start modes;**
  - on date/time.
  - immediately.
- ◆ **Stop modes;**
  - on date/time.
  - when memory is full.
  - loop around. (continues logging).
- ◆ **Up to 32000 readings can be stored.**
- ◆ **Sampling rate from 1 sec to 10 hrs in 1 second increments.**
- ◆ **Interrogation over phone lines using a standard modem link.**
- ◆ **Dial a pocket pager on an alarm condition.**

### STANDARD PROBES

**Standard, probes and sets of probes, ready for plugging into the logger. Other combinations available.**

- \* **One temperature**
- \* **Two temperature**
- \* **Three temperature**
- \* **Separate temperature and humidity**
- \* **Combined temperature and humidity**
- \* **Separate temperature and pressure**
- \* **Combined temperature and pressure**
- \* **Separate temperature and light/solar energy**
- \* **Separate temperature and anemometer (wind speed)**
- \* **Three 4~20 mA inputs**

### FOUR CHANNEL LOGGER

**Select any, up to four of the following channels**

- ◆ **Three analogue input channels**  
*To log any combination of;*
  - Temperature
  - Humidity
  - Pressure
  - Light
  - Wind Direction
  - Soil Moisture Tension
  - Voltage
  - Current
- ◆ **One digital pulse input channel**  
*To log;*
  - Rainfall
  - Wind speed
  - Flow
  - Counter (up to 65535)
  - Frequency (up to 60 Hz)
- ◆ **Internal temperature sensor channel**  
The internal sensor may activated to log the ambient temperature of the logger.

### Putting into service.

1. From the SWDL-HRC101 OmniLog software and Down Load cable kit, plug the Down Load cable into a spare serial port on your PC, and load the OmniLog software. The OmniLog has an excellent "Help". This will need to be read to enable successful operation of the OmniLog Data Management Program and gain familiarisation of the many advanced features available.
2. Connect the Nomad Logger. Under healthy circumstances, a "Logger Control" screen will load. If the "Logger Control" screen does not load, click on the button labelled "Connect to a Logger for the first time". The OmniLog will run a test on the serial ports and advise if the port the logger is connected to is not available, in which case, plug the logger into an available port. (Refer to "Help" for further assistance.)
3. On the "Logger Control" screen, click on "Channel and Probe Setup" button, and check the Battery Condition, plus other configurations if connecting to the pH-HR or mV-HR loggers.

## GP-HR 6 Pin Connector:

Probes are connected to the Nomad GP-HR Datalogger via a 6 pin Switchcraft Plug. The probe or probes require a 6 pin Male InLine Plug, Switchcraft Part Number EN3C6M

## Identifying the Pins

There is a small index mark (Dot) next to Pin 1 on both Plugs and Sockets. You may need a magnifying glass to see this.

Looking at the rear (solder end) of the 6 pin Male InLine Plug with the Key way to the top: Pin 1 is Top Left, Pin 2, 3, 4, and 5 are the next pins in an anticlockwise direction, Pin 6 is in the middle.

## Pin Functions

- Pin 1 Supply +3.6 volts see note
- Pin 2 First Analog Input
- Pin 3 Second Analog Input
- Pin 4 Third Analog Input
- Pin 5 Fast Pulse Input
- Pin 6 Common Ground



**Note:** The Supply voltage is derived directly from the logger battery and will therefore decrease during the life of the battery. The supply voltage is switched ON 10mSec before data acquisition and is switched OFF again after data acquisition.

## Electrical Characteristics of the Analogue Inputs:

The three analogue channels have identical characteristics. Each channel can operate in two modes, Absolute and Radiometric. The mode of operation is determined by the probe type selected for that channel.

The probe type is selected using the Channel and Probe Setup Tab of the Logger Control Screen in the Omnilog Software. Using this software, a different Probe can be selected for each Channel.

Temperature (Thermister) , Pressure and Humidity probes are typically Radiometric. Voltage and current inputs are Absolute.

- Input voltage in Radiometric mode 3.6 Volts Nominal see note
- Input voltage in Absolute mode 2.048Volts
- Maximum voltage input 5 Volts
- Maximum current from pin 1 5mA
- Input Leakage Current 0.1uA

**Note:** The maximum readable voltage in radiometric mode should be derived from the logger supply (Pin 1) and will therefore decrease over the life of the battery to a minimum of 2.7 Volts.

## Specifications:

### Internal Temperature Sensor

There is an internal temperature sensor that can be configured on any of the channels including the Fast Pulse Digital channel.

### Total Readings

- 8 bit Mode
  - 1 channel 32000 readings
  - 2 channel 16000 readings
  - 3 channel 10666 readings
  - 4 channel 8000 readings
- 12 Bit Mode
  - 1 channel 16000 readings
  - 2 channel 8000 readings
  - 3 channel 5222 readings
  - 4 channel 4000 readings

Note: Channels can be configured in any combination of 8 bit & 12 bit modes.

### Start Modes

- Start immediately
- Start on date / time.

### Logging Modes – Each channel can be set to log any combination of:

- Point readings (actual)
- Average readings (since last sample)
- Maximum readings (since last sample)
- Minimum readings (since last sample)

### Resolution

- 12 bit Analog to Digital Converter.
- Data can be saved in 8 bit mode to conserve memory space

### Weight

- 130gm (4.5oz)

## Electrical Characteristics of the Fast Pulse Input:

The fast pulse input can be used in two modes. Counter or Frequency.

Counter mode is used for functions such as rainfall.

Frequency Mode is used for wind speed or flow sensors.

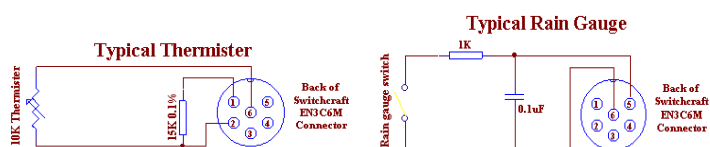
The mode of operation is determined by the probe type selected for that channel. The probe type is selected using the Channel and Probe Setup Tab of the Logger Control Screen in the Omnilog Software.

- Maximum Count Per Logging Period 65535
- Maximum Frequency with logging period set to 1sec 60kHz
- Preferred Switch Input Type Normally Open
- Preferred Digital Input Type Normally High
- Minimum High Period 1uSec
- Minimum Low Period 1uSec
- Input Impedance 470kOhm
- Preferred voltage input 3.6 Volts
- Maximum voltage input 5.0 Volts

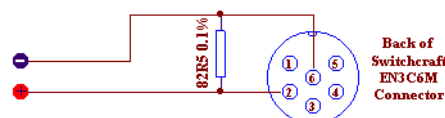
**Note:** This input has been primarily designed for switch connection ( eg Tipping Bucket Rain Gauge) It has an internal 470kohm resistor pull-up to the internal 3.6 Volt battery. Any device that holds this input low will cause a constant battery draw of 7.7uA that will shorten the battery life by up to 3 months.

Warning - Due to the fast response time of this input, debounce will normally be required for switch inputs.

## Some Typical Configurations



## Typical 4-20mA Input



### External Sensor Connector

- 6 pin Switchcraft Socket
- Weatherproof
- IP66

### Factory replaceable Battery

- Five year life
- The data is retained in the case of battery failure.

### Battery life indication

- Status and Start Logger screens of the Omnilog software have a battery status monitor

### Alarms

- Two independent Alarms
- Triggered on any combination of six user configurable alarm conditions.
- Alarm 1 can be configured to dial a pocket pager.
- Alarms can be visually checked using the Omnilog Software.

### Stop Modes

- Stop when memory is full.
- Stop on date / time.
- Loop around (continues logging)

### Sample Interval

- Is user selectable from 1 second to 10 hours in 1 sec increments.

### Operating Conditions

- 30°C to +70°C (-22°C to +158°F)
- Outdoor use. IP66
- Time accuracy: ± 5 seconds per day at 20°C (68°F)

### Size

- 19.05 mm x 170 mm (0.75" x 6.75")