

HYGROLOG[®] NT

HYGROCLIP[®]

Humidity goes Digital



The New Generation of Humidity/Temperature Loggers

- FDA CFR 21 Part 11 / GAMP 4 compliant
- Data retrieval via Bluetooth
- Virtually unlimited Flash Card memory
- Integrated display
- Highly precise and stable measurements
- Wide range of interchangeable humidity/temperature probes
- Wide range of configurations and options
- Robust IP65 housing
- Battery operated with rechargeable option
- Useful mounting accessories
- User friendly HW4 software

rotronic[®]

LEADING IN HUMIDITY MEASUREMENT

ROTRONIC AG • Grindelstrasse 6 • CH-8303 Bassersdorf • Tel. +41 1 838 11 44 • Fax +41 1 837 00 73
ROTRONIC UK LTD • Unit 1A, Crompton Fields • Crawley, West Sussex, RH10 9EE • Tel. +44 1293 57 10 00 • Fax +44 1293 57 10 08

www.rotronic-humidity.com

The new generation of **humidity/temperature loggers**

The HygroLog NT-Series is a completely new range of instruments. Our customer's requirements and suggestions have significantly influenced the product's development. Key criteria were:

- Compliance with FDA CFR 21 Part 11 and GAMP 4
- Improved measurement performance, flexibility and traceability
- Compatibility with the latest IT technologies
- Easy to use
- Simplified display of measurement data
- Support in process validation.

The loggers are the most advanced instruments currently available. They provide a number of unique features that no other logger system includes. Using flash card memory, their logging capacity is virtually limitless, and the state-of-the-art digital electronics takes measurement performance to a higher standard. Data may be stored in two different ways: in simple text mode or in protected mode, readable only by HW4. In text mode, 25,000 data records may be recorded per MB; in protected mode, 47,000 records per MB. The standard flash card supplied is 16Mb. Each data set contains date, time, humidity and temperature values and a calculated value if the logger is programmed to do so. Digital data communication guarantees best possible performance, so accuracy of data transfer is absolute, and calibration can be maintained using digital probe interchangeability. Should you need to change the logger's application, a range of alternative probe types can be connected without further need for reconfiguration.

FDA CFR 21 Part 11 and GAMP4 compliance

The loggers record all events such as battery change, operator manipulation or the change of a flash card. With this feature, referred to as the audit trail, the loggers fulfil the demands of the pharmaceutical, chemical and food industries. The HygroLog NT Series and associated software are FDA CFR 21 Part 11 and GAMP4 compliant.

Active support for validation processes

HygroLog NT logger not only meets with FDA CFR 21 Part 11 and GAMP4 compliance, but also supports the user in validation of processes and procedures. In combination with newly developed HW4 software, the logger documents all relevant events, system and configuration changes automatically. Events records are automatically generated and include an electronic signature, from which documentation can be assigned to every user. Furthermore, significant software or operating problems are also recorded. This saves a lot of work for the administrator, and at the same time maintains traceability.

Various models and a wide range of options make the HygroLog NT loggers suitable for almost any application in industry, research, HVAC and commerce.

Common features:

- Flash Card memory for virtually unlimited logging capacity
- Data retrieval by card reader, PDA, PC with HW4 or docking station
- 16 MB Flash Card included; expandable up to 1 GB
- Digital signal processing for maximum precision
- Real-time clock
- Logging interval selectable from 5 s to 24 h
- Operation with batteries (including rechargeable types)
- Battery life > 1year, depending on programming and options
- Logging mode selectable: Start/Stop, text/protected mode
- Operating range: 0...100 %rh; -30 ...70 °C; with display -10...50 °C
- Accuracy: probe dependent (except NT1: ± 2 %rh/0.4 K)
- LED status indicator and audible alarm (beeper)
- Optional display and keypad for measurement values, status, operation, adjustment and data display
- HygroLog NT2 and NT3 may be equipped with an optional Bluetooth interface





HygroLog NT1

Data logger with integrated humidity/temperature probe

HygroLog NT1 is the entry level model. With an integrated probe, it is suitable for monitoring of:

- Living and working spaces
- Museums, galleries and churches
- Clean rooms and laboratories
- Warehouses and production plants

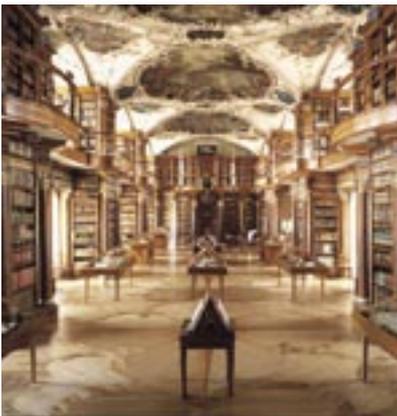
and for any other environments where temperature and humidity must be recorded!

The aesthetic housing is well suited for use in public areas, and may be specified either with or without the digital display/keypad option that enables direct configuration and data display. This option also allows the battery status to be checked without interruption of the logging process. When used with a docking station, the logger can be wall-mounted and secured with a padlock.

The use of Flash Card Memory allows for great flexibility in data storage and evaluation, data is retained even when the battery is changed. For example, when used in transportation monitoring, only the memory card needs to be returned to the sender, and the logger can be re-used for the next task once equipped with a fresh card. A real-time clock guarantees the exact time and date of measurement is recorded, and an integrated LED indicator and an audible alarm (beeper) give the user immediate indication of logger status.

Depending on the application requirement, logging intervals can be set between 5 seconds and 24 hours. Data can be logged either in text or binary mode. In binary mode, data can only be read by HW4 software and is therefore protected against manipulation. The HygroLog NT1 has wide operating ranges of 0...100%rh and -30...+70°C (display version -10...+60°C) with accuracies of ± 2 %rh and ± 0.4 K.

Up to four additional HygroClip digital probes for humidity and temperature can be connected using the optional DS docking stations, which also feature two digital inputs suitable for monitoring doors etc. The docking station is also available in a four Pt100 temperature probe input version.



Museums, libraries and art galleries

Measurement accuracy

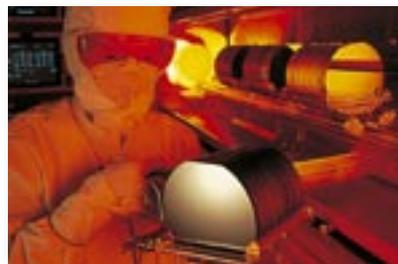
ROTRONIC sensors are class leading in terms of accuracy and long-term stability. HygroLog NT features digital data processing, which provides compensation of potential error components such as linearity and temperature coefficients.

Precision and stability

The digital electronics of the HygroLog NT and HygroClip probes are much more stable than analogue devices, being less susceptible to temperature variations. Because a 1 is always a 1 and a 0 always a 0, accuracy of data transmission is absolute.



Store rooms and warehouses



Clean rooms



Transportation



HygroLog NT2

Interchangeable probe

HygroLog NT2 is equipped with an interchangeable HygroClip S probe that can be used either fully integrated inside the logger housing, or used in an extended position (see picture below). Operation in the extended position significantly reduces the measurement response time. In addition, a number of application specific probes can be connected; these can be interchanged quickly and easily. Up to four additional HygroClip digital probes for humidity and temperature can be connected via the optional docking station, which also features two digital inputs suitable for monitoring doors etc. The docking station is also available in a four Pt100 temperature probe version.

Typical applications are in the paper, HVAC, pharmaceutical and chemical industries. Scientific and meteorological applications in the remote locations will also benefit from the virtually unlimited storage capacity and simple data retrieval options.

Key HygroLog NT2 Features:

- Remote connection interface (e.g. for status control by a second logger)
- Virtually unlimited storage capacity (up to 1 GB) with Flash Card memory
- Data retrieval by card reader, PDA, PC with HW4 or docking station
- Optional Bluetooth interface for data retrieval and programming
- Battery operated with rechargeable option
- Battery life > 1year, depending on battery and options
- Logging mode selectable: Start/Stop, text/protected mode
- Logger operating range: 0...100 %rh; -30 ...70 °C (display -10...60 °C)
- Measurement range: -50...200 °C (probe dependent)
- Accuracy: up to ± 1 %rh with SCS certificate (probe dependent)
- LED status indicator and acoustic alarm (beeper)
- Optional display and keypad for indication of measurement values, status, programming and calibration.



FDA CFR 21 Part 11 / GAMP4 compliant

Compliance with FDA CFR 21 Part 11 and GAMP4, standards for security of electronic data, is essential particularly in the pharmaceutical and chemical industries. The HygroLog NT loggers and HW4 software are fully compliant to both.



Traceable to national standard

All ROTRONIC probes can be delivered with SCS certificates. These are accepted by 45 signatory countries worldwide under mutual recognition agreements.



Public buildings



Drying processes



Science and meteorology



HygroLog NT3

Datalogger for up to three interchangeable probes

Main Features:

The features of HygroLog NT3 are basically identical to those of the HygroLog NT2; with the possibility to connect up to three probes directly. Each probe may be selected and programmed individually. The logger can be mounted onto the docking station, which allows connection of four additional probes, thereby forming a powerful combination for many measurement tasks:

Whether in pharmaceutical, paper, chemical and food industries, or in meteorology, the HygroLog NT is perfectly suited for recording data precisely, economically and with traceability.



NT3 shown with docking station

Application Flexibility

Measurement change? Need dew point instead of %rh? Or perhaps the mixing ratio?

The HygroLog NT can be easily programmed using HW4 software according to your needs. Thanks to a wide probe range, ROTRONIC can supply the measurement solution for almost any humidity/temperature application.

Need to expand the system? Are multiple measurement points? The HygroLog NT can be networked with up to 64 other instruments. User friendly HW4 PC-software features live data logging and monitoring as well as extensive functions for graphs, statistical analysis and alarming (E-Mail, SMS, visual and audible alarms via a PC). With the desk stand NT-Desk, logger and docking station may be put on your desktop.



Calibration

HygroClip interchangeable probes can be calibrated whilst connected to the HygroLog NT. A calibration device and humidity reference are of course required, and ROTRONIC humidity standards provide accurate values for relative humidity in the range of 0.5...95 %rh (see ordering information for the standards that are available). Each set of humidity standards consists of five ampoules of the same value and is supplied with an internationally recognised SCS* certificate that defines the resulting humidity value and the uncertainty. The standards fulfil the requirements of the ISO 9001 quality management system.



Calibration Devices

ROTRONIC calibration devices completely enclose the probe and the humidity standard in order to prevent external influences on the reference. Different models are available for HygroClip probes: ER-15 for probes with 15 mm diameter, ER-05 for probes with 5mm diameter.



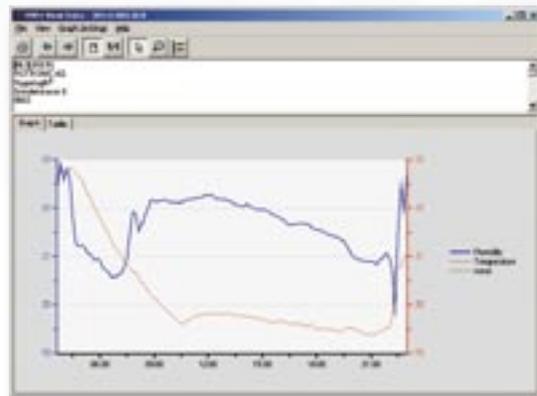
* SCS – Swiss Calibration Service

HW4 Software

ROTRONIC HW4 software is a new development based on the Microsoft.net platform. Two versions are available: HW4 Standard and HW4 Professional. The standard version is designed for single users, and the professional edition is made for multiple users and for management by an administrator. HW4 Professional is fully FDA CFR 21 Part 11 and GAMP4 compliant. The HW4 Professional software is largely self validating. Relevant protocols are automatically generated, which saves a lot of work for administrators and users.

HW4 Software FDA CFR 21 Part 11 Compliant

Products for human consumption that are exported to the USA are subject to regulation by the FDA, the American Food and Drug Administration, which is responsible for the validation of production processes in the food, pharmaceutical, and chemical industries. These stringent regulations relate to electronic records and signatures. When following FDA regulations, electronic records and signatures are equivalent to hard-copy documents and signatures.



GAMP4

The European Community guidelines for Good Automated Manufacturing Practice (GAMP) are the standard rules for the manufacturing practice and importation of pharmaceutical products used in the EC. They are of the same importance for the European market as the FDA rules are for the American market.

Validation

Manufacturers of pharmaceutical, food and chemical products are obliged to validate, document and archive the process-variables associated with products that are subject to FDA and GAMP rules. The regulations regarding the use of electronic records and signatures are outlined in CFR 21 Part 11. The following conditions must be fulfilled:

- User and administrators of electronic records must be unambiguously identified and authenticated.
- Electronic records must allow clear conclusions of the documented process. Every change must be recorded for the duration of the monitoring.
- The electronic signature must be inseparable from the record and clearly identify the originator.

FDA and GAMP requirements are not fulfilled until the user has documented the processes in the system specifications. For this purpose, the user must bear the responsibility for data archiving (backup). This means that the data recorded by the logger must be transferred to a safe medium. Furthermore, all data should be printed out and signed by the person responsible.



ROTRONIC HW4 software is fully compliant with all these requirements and additionally offers some important benefits:

- Operation in user-mode or administrator mode
- Limitless networkable and configurable in virtual Network
- Up to seven probes per logger can be managed, individually programmed and visualized
- Statistical functions and overlaying of graphs
- Probe adjustment possible with the logger (depending on model)
- Data access with HW4 Explorer (similar to Windows)



Ordering Information

Optional Docking Stations

The HygroLog NT docking stations provide a wide range of additional features to supplement the HygroLog NT, including a mechanical support when wall mounting, additional probe connection options and alternative interface formats. They are IP65 rated, include connector covers with storage recesses, have a power supply connection point and can be padlocked for security.



ORDER INFORMATIONS					
Logger Type					
HygroLog NT1	Logger with 1 integrated probe				
HygroLog NT1-D	Logger with 1 integrated probe, with display / keypad				
HygroLog NT2	Logger for 1 interchangeable probe (order separately)				
HygroLog NT2-D	Logger for 1 interchangeable probe, with display / keypad				
HygroLog NT2-D-BT	Logger for 1 interchangeable probe, with display / keypad and Bluetooth interface				
HygroLog NT3	Logger for up to 3 interchangeable probes				
HygroLog NT3-D	Logger for up to 3 interchangeable probes, with display / keypad				
HygroLog NT3-BT	Logger for up to 3 interchangeable probe with display / keypad and Bluetooth Interface				
HygroLog xxx-xx-xx-CL	Logger including HygroClip S probe (except HygroLog NT1)				
Docking Stations					
DS-NT1	Basic station for wall mounting with connector for power adaptor				
DS-NT2	With RS232 and RS485 interface				
DS-NT3	With USB and RS485 interface				
DS-U-1	With RS232 and RS485 interface, connectors for 4 digital or analogue probes and 2 digital inputs				
DS-U-2	With USB and RS485 interface, connectors for 4 digital or analogue probes and 2 digital inputs				
DS-PT-1	With RS232 and RS485 Interface, 4 Pt100 connectors and 2 digital inputs				
DS-PT-2	With USB and RS485 Interface, 4 Pt100 connectors and 2 digital inputs				
NT-Desk	Desktop stand for all HygroLog NT docking stations				
Accessories					
HW4-E	Standard software for programming and administration				
HW4-P	Professional software for programming and administration, with additional validation functions, FDA CFR21/11 and GAMP4 compliant				
HygroData-NT-E	PC access-set with standard software, DS-NT2, data cable for HygroLog NT				
HygroData-NT-P	PC- access-set with professional software, DS-NT2, data cable for HygroLog NT				
AC1211	Mains adaptor (12 VDC/200 mA) with outlet adaptor for US- and UK- type outlets				
AC-NT16MB	Flash Card 16 MB, industrial type -40...85 °C				
AC-NT32MB	Flash Card 32 MB, industrial type -40...85 °C		AC-NT64MB	Flash Card 64 MB, industrial type -40...85 °C	
15.08.6212	Flash Card reader with USB cable and driver				
11.01.6218	RS232 data cable, length 1.8 m, from docking station to PC				
11.02.9018	Standard USB cable, type A-B, length 1.8 m				
AC1614/02	RS485 cable for HygroLog NT, for cabling via junction box				
AC-NTREM	Remote cable for loggers without display / keypad (Not NT1)				
Probes					
Hygroclip S	Standard module, (Ø 15 mm) range: -45...85 °C, ± 1.5 %rh, ± 0.3 K @ 23 °C				
HygroClip S1	Standard Modul, (Ø 15 mm) range: -45...85 °C, ± 1.0 %rh, ± 0.2 K @ 23 °C				
HygroClip SC05	Miniature cable probe (Ø 5 mm, 2m cable) range: -40...+100 °C, ±1.5 %rh, ±0.3 K @ 23 °C				
HygroClip HK40	High temperature probe, (Ø 15 mm) range: -50...+200 °C, ±1.5 %rh, ±0.3 K @ 23 °C				
Further probes for different applications are available					
Calibration Devices					
ER-15	Calibration device for probes with Ø15 mm			ER-05	Calibration device for probes with Ø 5 mm
Humidity Standards in Packs of 5 with SCS Certificate					
EA00-SCS	Humidity standard 0.5 %rh	EA20-SCS	Humidity standard 20 %rh	EA65-SCS	Humidity standard 65 %rh
EA05-SCS	Humidity standard 5 %rh	EA35-SCS	Humidity standard 35 %rh	EA75-SCS	Humidity standard 75.3 %rh
EA10-SCS	Humidity standard 10 %rh	EA50-SCS	Humidity standard 50 %rh	EA80-SCS	Humidity standard 80 %rh
EA11-SCS	Humidity standard 11.3 %rh	EA60-SCS	Humidity standard 60 %rh	EA95-SCS	Humidity standard 95 %rh

Specifications HygroLog NT series



FEATURE	HYGROLOG NT1	HYGROLOG NT2	HYGROLOG NT3
Logger			
Humidity/temperature sensor	Integrated probe	ROTRONIC HygroClip series	
Max. probes direct to logger/docking station	1 / 4	1 / 4	3 / 4
Operating range electronics			
Humidity	0...100 %rh		
Temperature	-30...70 °C, with display -10...60 °C		
Operating range			
Alkaline batteries	-10...50 °C (factory standard)		
Lithium batteries	-30...70 °C		
Measuring range	-30...70 °C	probe dependent, from -50...200 °C	
Precision at 23 °C	±2 %rh / 0.5 K	best ±1 %rh / 0.2 K with SCS certificate	
Suitable probes	Integrated	HygroClip & Pt100 probes (docking station)	
Log interval	Selectable from 5 s to 24 h		
Memory modes	Start/Stop, text mode, protected mode		
Alarm indicators	Optical indicator (LED, red /green), beeper		
Optional output signals Logger	none	Bluetooth	
Dimensions Logger	156 x 109 x 42 mm		
Housing material	ABS		
Sensor protection	Integrated	Wire mesh filter	
Power supply (recommended)	9 V battery ≥ 500 mAh		
Battery life	> 1 year with 1 HygroClip probe, 15 minute memory interval, no display		
Display (optional)	LCD full graphic display		
Weight Logger	Approx. 300 g		
Memory specification			
Memory media	Flash Card 16 MB included. Possible up to 1 GB		
Memory capacity text mode	400,000 records with 16 MB card		
Memory capacity protected mode	752,000 records with 16 MB card		
Functions			
Event Logging	All operator actions, alarms, programming		
Audit trail	Fully FDA CFR 21 Part 11 /GAMP4 compliant		
Menu	Operator guidance, simple programming, data retrieval		
Probe adjustment	Factory adjustment only	Adjustment possible with probe in logger	
Remote function	N/A	Display of measurement values on a second HygroLog NT for devices without display	
Docking Stations			
Standard connections	Power adapter, RS232, RS485, USB via docking station (model dependent)		
Protection rating /Theft protection	IP65 / Integrated in docking station		
Dimensions and weight	113 x 70 x 39 mm / Approx. 175 g / Desk stand 145 x 140 x 125 mm, approx. 350 g		
System requirements for HW4 (minimum values)	Pentium 2 with min. 450 MHz, Min. 128 MB RAM, Min. 50 MB free hard disk, VGA or SVGA monitor Operating systems: Windows 98SE, XP, NT4, with service pack 6a or higher Windows 2000-family with service pack 2 or higher, Windows Server 2003 or higher Standard software: HW4-E Professional software: HW4-P		

