

New

- SensorLook Centralized Monitoring System
  - Baking 40°C/60°C Dry Cabinet
- 
- <5%RH Dry Cabinet
  - 1~50%RH Dry Cabinet
  - Digital Nitrogen Controller
  - Alarm Hygrometer
  - Data Logger & Reader



Baking 40°C/60°C Dry Cabinet



Alarm Hygrometer



Nitrogen Controller



Dry Cabinet



SensorLook Network System



Data Logger



Since 1991

## Ace Dragon Corporation Presents The "Dr.Storage Series"

**Synonymous with humidity management excellence**

Established in 1991, Ace Dragon Corporation's HQ (R&D and manufacturing center) is located in the Hsinchu Science Park, which is the heart of Taiwan's high-tech hub, giving us access to the best engineers on the island.

Our total dedication to humidity management means that we can now offer an integrated solution that complies with J-STD-033B standard. Our pre-eminence in successfully helping thousands of electronic factories throughout Asia has enhanced their competitive edge through our outstanding Humidity Control System. We have also helped thousands of electronic factories worldwide to upgrade their product quality which secured those clients earning repeat orders worth multibillion US dollars.

Ace Dragon Corp. presents two new products to serve our clients,

1. Baking 40°C Dry Cabinet: this is a dry oven cabinet that can dry the Moisture Sensitive SMD packages and reset the floor life quicker.
2. SensorLook Centralized Monitoring system: The easy-to-use monitoring software records temperature and relative humidity of all Dr.Storage products.

To offer comprehensive services to our clients in China, sales offices and service stations were also set up in Shanghai, Kunshan, Suzhou, Beijing and Dongguan in 2002.

### ▶ our customers

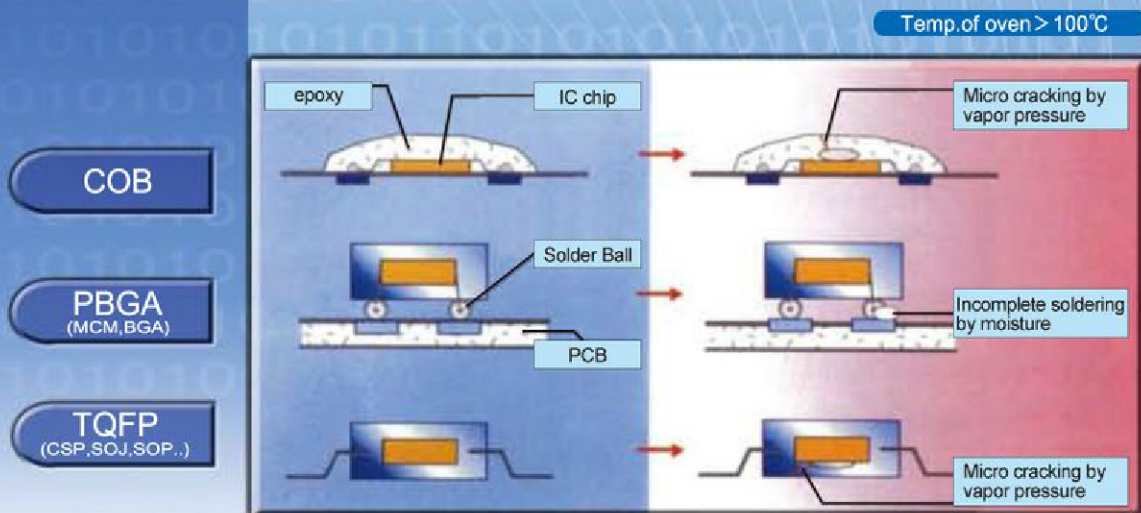
3M, ACER, Advanced Semiconductor, AIDC, Alcatel, American Power Conversion (APC), ASE Global, ASUS, AUO, Benchmark, BenQ, BOSCH, Bose, CAMPAL, Celestica, CHIMEI, Continental, Coretronic, CSIST, D-Link, El Microcircuits, ERICSSON, Flextronics, FPC, FOXCONN, General Dynamics, GIGABYTE, Harris Corp., HJTC, IBM, INER, Intel, Johns Hopkins University, Liteon, Media Tek, Micron, NASA, National Chip Implementation Center, National Research Council of Canada, Omron, Optimax, Panasonic, Philips, QSMC, Qualcomm, Quanta Computer, Quanta Storage, Samsung, Siemens, SMIC, SONY, SUNPLUS, TATA POWER, TPO, TSMC, Tyco, UMC, University of Texas, US Navy, UT Starcom, VLSIP, Wellypower, Wistron, ...etc.





## How does the Dr.Storage humidity control system improve manufacturing yield?

Following crack problems are caused by being lack of precise humidity control in manufacturing process.



### Use Dr.Storage Products to improve the manufacturing yield.

1. Dry Storage: moisture sensitive SMD packages are exposed in the air should be stored in Dr.Storage X2M or T40W series for resetting the floor life.

For example: if MSD parts of MSD Level 4,5 and 5a are exposed for less than eight hours, they can be stored in a dry cabinet for resetting the floor life. However, if their exposure time is longer than eight hours, the SMD packages should be stored at 40°C in a T40W series to reset the floor life.

2. Environmental Monitor: The temperature and humidity of production line should be kept stable. Adapt an Alarm Hygrometer HT-5B or HT-1B to alert the engineers when immediate action is needed. Furthermore, centralized net work monitoring function helps the engineers to manage many Alarm Hygrometers on a PC at the same time.

3. Data Recording: It is important to verify that the condition of storage complies with the J-STD-033B. Users can connect note book PC directly to the RS232 port on the cabinet to acquire the data or use our data logger to record the data. With our data recording function, historical fluctuation of relative humidity and temperature can be shown clearly on the graph.

The floor life of the Moisture Sensitive Devices can also be calculated in the software. This unique patented function can easily verify if the SMD packages are stored in proper condition. It is very convenient for those who carry out quality assurance procedures.



# How to choose a dry cabinet?



Following products are equipped with Humidity Manager V2 software to graph humidity and temperature curve.

## ▶ Step1: Select the type

Type	X2M	A1M	A20	T40W
Humidity Range	< 5%RH	1~50%RH	20~50%RH	40°C, < 5%RH
Control Mode	Automatic	Adjustable	Adjustable	Automatic
Humidity Management (RS232 port)	●	●	●	●
Baking and Drying	×	×	×	●
LED Display (precision: ±1.0°C, ±3.0%RH)	●	●	●	●
Alarm Setting (flash, buzz)	●	●	●	●
Slash Door (for memo cards)	●	●	×	●
Epoxy Paint (white)	×	×	●	×
Antistatic Paint (black)	●	●	×	●

## ▶ Step2: Select the size

Please choose the shape and size of cabinet on page 5, 6, 7 & 8.

## ▶ Step3: Select the options



1. Nitrogen Filling Module (QDN):  
The nitrogen will stop as soon as the relative humidity reaches preset digital value. So nitrogen can be dramatically saved. Nitrogen doesn't need to be pumped in continuously. (for X2M, A1M & A20 series)



2. Nitrogen Flow Meter (for X2M, A1M & A20 series)



3. Data Logger & Reader:  
It can collect the humidity and temperature data and graph.



4. Humidity Manager V3:  
MSD floor life calculation, H/T record and graph, text output, curve output.



5. SensorLook V2:  
Humidity and temperature curve, flash and buzz alarm, upper and lower limit setting, monitor 4 sensors at the same time.



6. Grid Shelf with Divider:  
(only for X2M-1200-6, A10M-1200-6 & A20-1200-4/6)

## ▶ Can not find suitable specification?

If you need other special requirement, please send us an e-mail with detail description. We will offer customized service to you.



1. Stainless steel cabinet (SUS#304) is widely adapted in clean room.



2. Slide-shelves, it is convenient for reaching the components.



3. HEPA Filtered Dry Cabinet


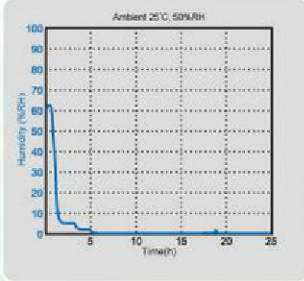
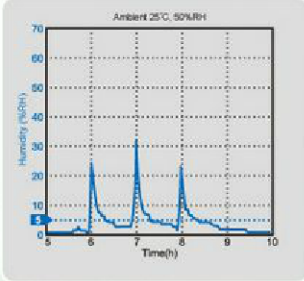


4. Feeder rack



Ultra-Low Humidity Storage Technology to comply with J-STD-033B.  
Best Drying, Storage and Monitoring Performance for MSD packages.

**X2M**  
**< 5%RH**

Control Panel	Humidity Range: < 5%RH	
 <p>Temperature display    Humidity display    RS232 port</p>	<p>&lt; Performance &gt;</p>  <p>Sample: X2M-1200-6</p>	<p>&lt; Door is opened 30 seconds and closed &gt;</p>  <p>X2M series always reach &lt; 5%RH within 30 minutes after the door is opened and closed.</p>



Insertion of memo cards for better material management



**X2M-157**

Capacity: 165L  
Shelves: 3 shelves  
External Dimension: W450xD452xH1045mm  
Internal Dimension: W448xD422xH870mm



**X2M-315**

Capacity: 332L  
Shelves: 3 shelves  
External Dimension: W905xD452xH1045mm  
Internal Dimension: W903xD422xH870mm



**X2M-575**

Capacity: 605L  
Shelves: 3 shelves  
External Dimension: W905xD800xH1045mm  
Internal Dimension: W903xD770xH870mm

**Do not require any Nitrogen!**



**X2M-200**

Capacity: 202L  
Shelves: 2 shelves  
External Dimension: W600xD672xH632mm  
Internal Dimension: W598xD642xH525mm



**X2M-400**

Capacity: 411L  
Shelves: 3 shelves  
External Dimension: W600xD672xH1275mm  
Internal Dimension: W598xD642xH1070mm



**X2M-600**

Capacity: 624L  
Shelves: 5 shelves  
External Dimension: W600xD672xH1815mm  
Internal Dimension: W598xD642xH1625mm



**X2M-1200-6**

Capacity: 1250L  
Shelves: 5 shelves  
External Dimension: W1200xD672xH1815mm  
Internal Dimension: W1198xD642xH1625mm

# A1M

1~50%RH

## Control Panel



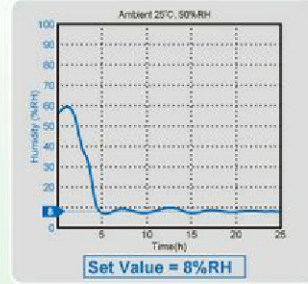
Temperature display

Humidity display

RS232 port

## Humidity Range: 1~50%RH

< Performance >



Sample: A1M-1200-6



Insertion of memo cards for better material management



### A1M-157

Capacity: 195L  
Shelves: 3 shelves  
External Dimension: W450xD452xH1045mm  
Internal Dimension: W446xD422xH870mm



### A1M-315

Capacity: 332L  
Shelves: 3 shelves  
External Dimension: W905xD452xH1045mm  
Internal Dimension: W903xD422xH870mm



### A1M-575

Capacity: 805L  
Shelves: 3 shelves  
External Dimension: W905xD800xH1045mm  
Internal Dimension: W903xD770xH870mm



### A1M-200

Capacity: 202L  
Shelves: 2 shelves  
External Dimension: W600xD672xH832mm  
Internal Dimension: W598xD642xH525mm



### A1M-400

Capacity: 400L  
Shelves: 3 shelves  
External Dimension: W600xD672xH1275mm  
Internal Dimension: W598xD642xH1070mm



### A1M-600

Capacity: 624L  
Shelves: 5 shelves  
External Dimension: W600xD672xH1815mm  
Internal Dimension: W598xD642xH1625mm



### A1M-1200-6

Capacity: 1250L  
Shelves: 5 shelves  
External Dimension: W1200xD672xH1815mm  
Internal Dimension: W1198xD642xH1625mm

# A20

20~50%RH

## Control Panel



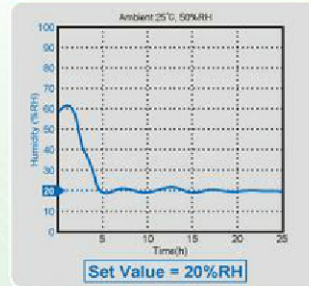
Temperature display

Humidity display

RS232 port

## Humidity Range: 20~50%RH

### < Performance >



Sample: A20-1200-6



### A20-200

Capacity: 202L  
Shelves: 2 shelves  
External Dimension: W600xD672xH632mm  
Internal Dimension: W598xD642xH525mm



### A20-157

Capacity: 165L  
Shelves: 3 shelves  
External Dimension: W450xD452xH1045mm  
Internal Dimension: W446xD422xH870mm



### A20-315

Capacity: 334L  
Shelves: 3 shelves  
External Dimension: W905xD452xH1045mm  
Internal Dimension: W903xD422xH870mm



### A20-575

Capacity: 607L  
Shelves: 3 shelves  
External Dimension: W905xD800xH1045mm  
Internal Dimension: W903xD770xH870mm



### A20-400

Capacity: 411L  
Shelves: 3 shelves  
External Dimension: W600xD672xH1275mm  
Internal Dimension: W598xD642xH1070mm



### A20-600

Capacity: 624L  
Shelves: 5 shelves  
External Dimension: W600xD672xH1815mm  
Internal Dimension: W598xD642xH1625mm



### A20-1200-6

Capacity: 1250L  
Shelves: 5 shelves  
External Dimension: W1200xD672xH1815mm  
Internal Dimension: W1198xD642xH1625mm



### A20-1200-4

Capacity: 1250L  
Shelves: 5 shelves  
External Dimension: W1200xD672xH1815mm  
Internal Dimension: W1198xD642xH1625mm

# T40W

40°C, <5%RH

## Control Panel



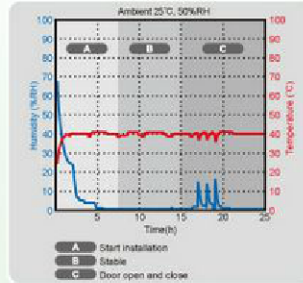
Temperature display

Humidity display

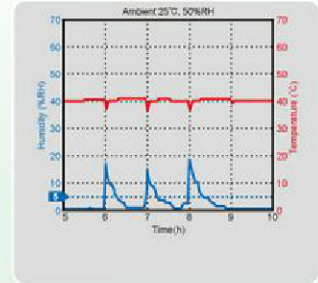
RS232 port

## Humidity Range: 40°C, <5%RH

### < Performance >



### < Door is opened 30 seconds and closed >



T40W series always reach <5%RH within 30 minutes after the door is opened and closed.

## Baking 40°C Dry Cabinet NEW

T40W series is a plug and play, fully auto dry oven cabinet which will be stable at 40°C and <5%RH. It is specially designed for SMD packages to comply with J-STD-033B.

- Wider application in resetting the floor life: Moisture sensitivity SMD packages which are exposed to the air and exceed the floor life should be stored in the T40W series for resetting the floor life. (see J-STD-033B table 4-1, 4-3)

For example: If MSD parts of MSD Level 4,5 and 5a are exposed for less than eight hours, they can be stored in a dry cabinet for resetting the floor life. However, if their exposure time is longer than eight hours, the SMD packages should be stored at 40°C in a T40W series to reset the floor life.

- Labor saving: SMD packages shipped in low temperature carriers may not be baked in a traditional high temperature oven with the temperature higher than 40°C, as it will cause deformation of the carriers. Storing in a T40W series, operators do not need to remove the SMD package to thermally safer carriers. It saves labor cost and eliminates the chance of damaging the carriers.



Memo Cards  
(slash cover sheet)



### T40W-240

Capacity: 126L  
Shelves: 2 shelves  
External Dimension: W600xD810xH680mm  
Internal dimension: W540xD540xH430mm



### T40W-480

Capacity: 302L  
Shelves: 3 shelves  
External Dimension: W600xD810xH1380mm  
Internal dimension: W540xD540xH1035mm



### T40W-600

Capacity: 395L  
Shelves: 5 shelves  
External Dimension: W600xD770xH1805mm  
Internal dimension: W540xD500xH1460mm



### T40W-1200-6

Capacity: 833L  
Shelves: 5 shelves  
External Dimension: W1200xD770xH1805mm  
Internal dimension: W1140xD500xH1460mm



# Alarm Hygrometer

Help Managing the Temperature and Humidity of production Line!



## Function

Alarm Hygrometer is installed at precisely controlled environment, such as storage room of precious collections, production line of high tech electronic components, optical and medical industries ...etc. It can not only display the temperature and relative humidity, but also alert the engineers to check and repair the facilities immediately by flash or buzzer alarm that is activated as soon as the temperature or relative humidity exceeds the preset tolerance. With this function, millions of dollars could be saved in time. To save monitoring manpower at a huge plant, 32 sets of HT series can be connected to a PC through intranet network. All of the data of temperature and relative humidity will be recorded and the fluctuation will be shown in the graph.



HT-1A/B

## Features

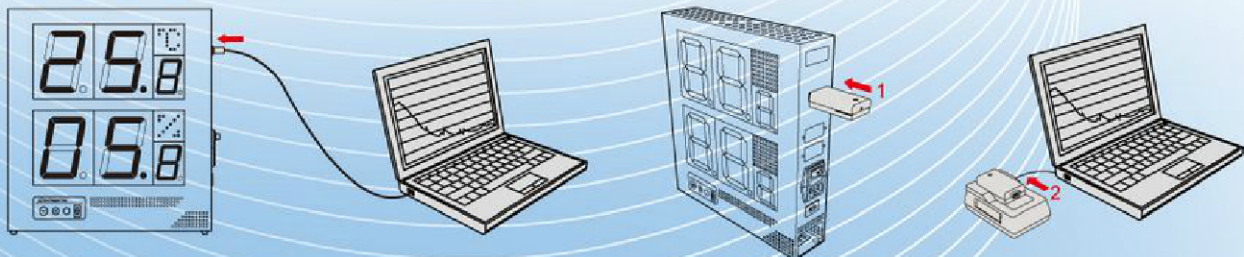
- **Calibration reminding:** In order to help complying with the regulation of ISO, a unique design of calibration expiration reminding function is offered in HT series. When the sensor runs over 365 days, the decimal point in the panel will be flashed for reminding the user.
- **Superior visibility:** Equipped with LED display, the perfect visibility can definitely avoid any ambiguous reading. It is important in many occasions.
- **Cost effective:** HT series is very cost effective compare to any existing similar hygrometer in the market.
- **Function upgrade:** Advanced functions such as data logger, flash alarm, setting of warning tolerance and central monitoring via intranet can be upgraded to meet the customer's requirement in the future.



HT-5A/B

■ Connected to a computer to record H/T graph.

■ Connected to a Data Logger(option) and download to PC.



Type	HT-1A	HT-1B	HT-5A	HT-5B
Operation Range	0-50°C, 0-90%RH	0-50°C, 0-90%RH	0-50°C, 0-90%RH	0-50°C, 0-90%RH
Precision	±1.0°C, ±3.0%RH(at 50%RH/25°C)	±1.0°C, ±3.0%RH(at 50%RH/25°C)	±1.0°C, ±3.0%RH(at 50%RH/25°C)	±1.0°C, ±3.0%RH(at 50%RH/25°C)
Resolution	0.1°C, 0.1%RH	0.1°C, 0.1%RH	0.1°C, 0.1%RH	0.1°C, 0.1%RH
Dimension	W220xD56xH90mm	W220xD56xH90mm	W310xD70xH320mm	W310xD70xH320mm
Weight	500g	500g	3kgs	3kgs
Power	100-240V, 50/60Hz	100-240V, 50/60Hz	110V/230V (select voltage in advance)	110V/230V (select voltage in advance)
Visibility Distance	6m	6m	30m	30m
Power Consumption (average)	2Wh	2Wh	12Wh	12Wh
Calibration Reminding	○	○	○	○
Alarm Setting (%RH)	×	○	×	○
Alarm Setting (°C)	×	○	×	○
Alarm Buzzer	×	○	×	○
Alarm Flash	×	○	×	○
Humidity Manager V2 (software)	○	×	○	×
Humidity Manager V3 (software)	△	○	△	○
SensorLock V2 (software)	×	△	×	△
Data Logger & Reader	×	△	×	△
RS232 Port	○	○	○	○
Calibration Report	○	○	○	○

○Standard △Option ×None



## Energy Saving N2 System

**60% saving**  
set value = 40%RH

NC-2 is used to control the filling of dry air into the cabinet. So the desired relative humidity in the cabinet can be reached. For example if 5%RH is the required condition, then the dry air will stop to fill while  $\leq 5\%RH$  is reached. The dry air can be nitrogen, CO<sub>2</sub> or inert gas. Nitrogen is the most frequently used dry air for a nitrogen cabinet. Traditional nitrogen cabinet allows the N<sub>2</sub> to fill all the time continuously. After NC-2 is adapted, over 30~60% of N<sub>2</sub> can be saved.

### Digital Nitrogen Controller

- **Energy Saving:** Dry air will no longer fill continuously.
- **Easy to install:** Any traditional nitrogen cabinet can be upgraded within 20 minutes by adding NC-2.
- **Data Recording:** It is important to verify that the condition of storage meets the regulation of J-STD-033B.
- **Calibration Reminding:** The drift effect of sensors might influence the accuracy. In order to help complying with the regulation of ISO, a unique design of calibration expiration reminding function is offered in this model.
- **Alarm Setting:** There are two ways of alarm - flash and buzz. Alarm will be activated when the relative humidity or temperature is higher than the setting of the upper limit. And the flash and buzz alarm can be activated by different delay time.



NC-2

### Energy Saving N2 Cabinet

Reduce N<sub>2</sub> Consumption! Increase Profit Forever!

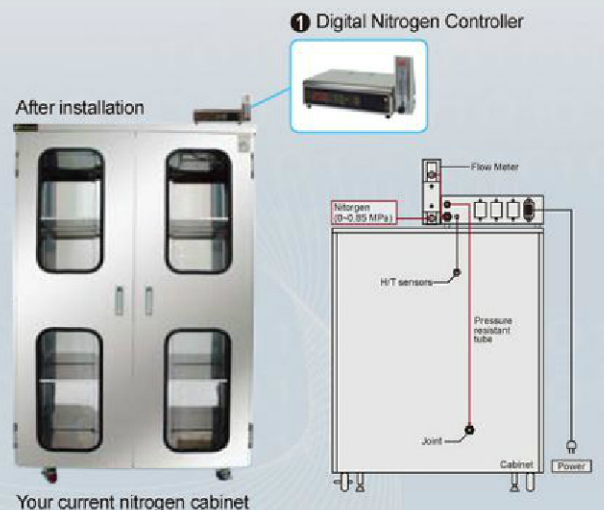
- N<sub>2</sub> filling will stop as soon as the pre-set relative humidity value is reached. Tremendous waste is saved by using our N<sub>2</sub> saving design.
- If you already have traditional N<sub>2</sub> cabinet, you can choose Digital Nitrogen Controller to modify your existing N<sub>2</sub> cabinet into an energy saving N<sub>2</sub> cabinet.

**A** Energy Saving Nitrogen Cabinet is equipped with modules as below.



We accept customized requirements or you can refer to page 4 and 5 to choose the size of cabinets.

**B** Digital Nitrogen Controller can be installed on the top of nitrogen cabinet.



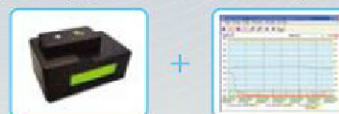
Your current nitrogen cabinet

#### Options

① Flow Meter will be installed outside of QDN.



② Data Logger & Reader with Humidity Manager V2.





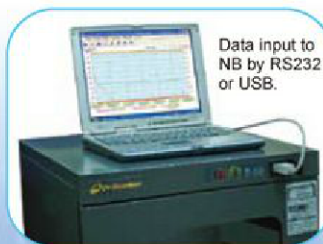
# H/T Monitoring System

We are the first supplier in the world to offer dry cabinet with H/T tracing function which allows the users to be aware of the storage condition for a period of time. Furthermore, it is easier to calculate the floor life of the MSD with Humidity Manager V3. The floor life is no longer a mysterious number by random guessing. We are the pioneer in offering Alarm Hygrometer which alerts the engineers immediately on unexpected ambient humidity or temperature changes. With above tools, the Quality Assurance department can save lots of the energy and money in humidity management.

## Humidity Manager V2



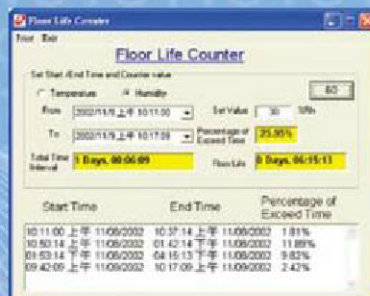
- Humidity and temperature monitoring software.
- User friendly.
- H/T Data acquisition: can acquire data directly from the controller with RS232 cable or from Data Logger & Reader.
- Data interval can be set from one second to 99 minutes.
- Software runs under Windows® operating system.



## Humidity Manager V3

### Dr.Storage Floor Life

- Humidity and temperature monitoring software.
- Automatically calculate the time intervals and percentage that exceed 10%RH or 5%RH which leads to the estimation of MSD floor life.
- With all of the functions of Humidity Manager V2.



How does MSD Floor Life counter-clockwise and reset to zero point?

- According to IPC/JEDED J-STD-033B standard. For moisture sensitivity Levels 2, 2a, 3 with floor life exposure not greater than 12 hours, a minimum desiccating period of 5X the exposure time is required to dry the SMD packages enough to reset the floor life.
- For moisture sensitivity Levels 4, 5, 5a with floor life exposure not greater than 8 hours, a minimum desiccating period of 10X the exposure time is required to dry the SMD packages enough to reset the floor life.

## Data Logger & Reader

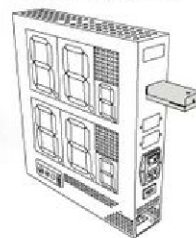
### The most efficient tools for temperature and humidity management

Data Logger can record H/T data and transfer the data to PC via Data Reader. Use Humidity Manager software to show the H/T curves.



- Memory: 3,900 records
- Dimension: W73\*D35\*H20mm ( Logger ), W120\*D75\*H50mm ( Reader )
- Display: LCD with back light
- Port to PC: USB 1.1

● Alarm Hygrometer



● Dry Cabinet



● PC



# SensorLook Centralized Monitor and Alert System

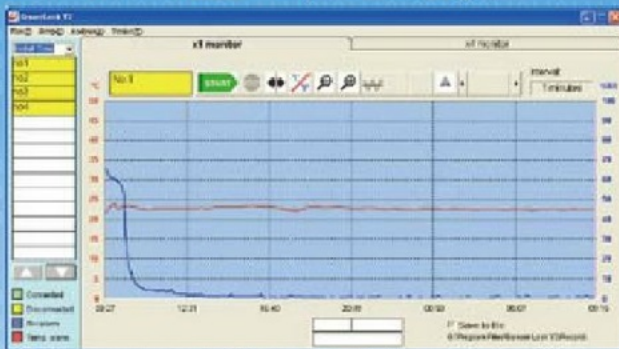
**NEW**

- SensorLook software is used to monitor different Dr Storage products at the same time
- Best humidity solution provider with quality assurance function.
- Can be extended to remote monitoring through Internet. (SensorLook V3)

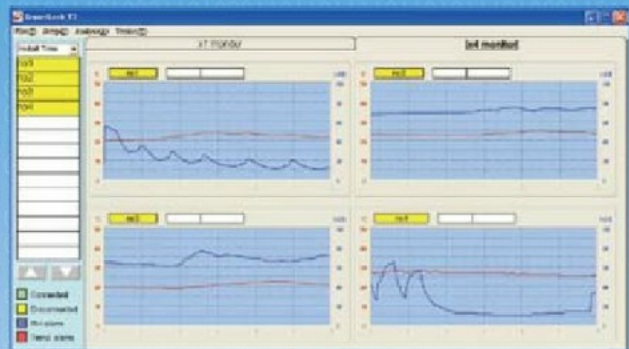
## SensorLook V2



■ The measurement data can always be shown as a graphic.



Full screen monitoring



4 screens monitoring

## Choose a package

Package 1			
Item	Specification		Amount
A	Wireless Transmitter		1-32
B	Receiver		1-32
C	PC +SensorLook software		1

Package 2			
Item	Specification		Amount
A	Wireless Transmitter		1-32
B	Receiver		1-32
C	SensorLook software		1