DICKSON

SM300/SM320/SM325/SM420 & TM320/TM325

Midsize Display Loggers Operation

Contents:

TM320
Self Contained Temperature & Humidity Logger

TM325
Remote Probe Temperature & Humidity Logger

SM300
Self Contained Temperature Data Logger

SM320
2 Channel Temperature Logger (Internal & Remote K-TC)

SM325
2 K-TC Channel Temperature Data Logger

SM420
High Accuracy Temperature Logger with Platinum RTD Probe

Rev. 08/06

All models shown with optional memory card

Product Applications

Dickson's series of Temperature / Temperature and Humidity Data Loggers with Jumbo Display offer all of the key features you've been looking for including: High/Low Alarm, Min/Max Display, Super high-speed USB 2.0 Connectivity, One Step Data Transfer using removable SD FLASH memory cards, and much more! Our High Accuracy SM300, TM320 and TM325 models offer ±0.8°F temperature accuracy. All of these features combined with Dickson quality and accuracy will make this your most valuable temperature and humidity monitoring tool.

Featuring our fastest data download ever! Download data in just seconds, using new USB port compared to 1.5 minutes using standard serial port. Or, leave the logger in the field and use memory cards to transfer data to your PC.

SM300, TM320
- Monitoring Human Comfort
- Recording Storage Conditions of Materials Including Pharmaceuticals, Food and Chemicals
- Monitoring Critical Equipment and Computers
- Evaluating Conditions in Coolers and Storage Rooms

TM325
- Monitoring HVAC/R Systems
- Recording Conditions in Clean Rooms
- Monitoring Walk in Freezers and Refrigerators
- Monitoring Incubators and Chambers
- Remote probe is perfect for hard to reach locations!

SM320 & SM325
- Monitoring HVAC/R Systems
- Evaluating Conditions in Freezers and Ovens
- Monitoring Temperatures in Autoclaves, Baths and Incubators
- Monitoring Conditions in Clean Rooms
- Remote probe is perfect for hard to reach locations and extreme temperatures!*

*Using optional A203 remote K-Thermocouple probe

SM420
- ±0.5°F Temperature Accuracy
- Critical Storage in Freezers, Incubators, & Autoclaves
- Process Evaluations in Labs

Useful Features

- ±0.8°F Temperature Accuracy (SM300, TM320, & TM325)
- Removeable FLASH memory card
- Available: Extreme temperature range (-300 to +2000°F) models SM320 & SM325
- Temperature and humidity remote probe model TM325
- Huge digital display (0.9" numerals) with minimum and maximum displayed at the touch of a button
- Optional AC adapter
- Stores 32,000 sample points

Rev. 08/06

Product Specifications

	SM300	SM320
Operating Range (unit):	-4 to +158°F (-20 to +70°C) (non-condensing)	-4 to +158°F (-20 to +70°C) (non-condensing)
Internal Temp. Sensor:	Thermistor	Thermistor
Internal Temp. Accuracy:	±0.8°F (±0.5°C)	±1.8°F (±1°C)
External Temp. Sensor:		Thermocouple
External Temp. Range:		-300 to +2000˚F (-184 to +1093˚C)
External Temp. Accuracy:		±1.8°F (±1°C) (unit)

	SM325	SM420
Operating Range (unit):	-4 to +158°F (-20 to +70°C) (non-condensing)	
External Temp. Sensor:	(2) Thermocouple	Platinum RTD Probe
External Temp. Range:	-300 to +2000˚F (-184 to +1093˚C)	-50 to +350˚F (-45 to +176˚C)
External Temp. Accuracy:	±1.8°F (±1°C) (unit)	±0.5°F (±0.28°C)

	TM320	TM325
Operating Range (unit):	-4 to +158°F (-20 to +70°C) (non-condensing)	-4 to +158°F (-20 to +70°C) (non-condensing)
Internal Temp. Sensor:	Thermistor	
Internal Temp. Accuracy:	±0.8°F (±0.5°C)	
External Temp. Sensor:		Thermistor
External Temp. Range:		-30 to +2000˚F (-184 to +1093°C)
External Temp. Accuracy:		±0.8°F (±0.5°C)
R/H Sensor Type:	Capacitive	Capacitive
% R/H Accuracy:	±2% @ 73°F, 0 to 95%	±2% @ 73°F, 0 to 95%

Common Product Specifications (SM300/320/325 & TM320/325)	
IP Rating	IP20
Storage Capacity:	32,000 sample points (div. x 2)
Resolution:	0.1°F
Dimensions:	4.0" x 3.0" x 1.6" (10.2cm x 7.7cm x 3.9cm)
Display:	LCD 4 Digit
Alarms:	High/Low Audible Alarm
Battery/Life:	4 "AA" batteries; 6 months
Download:	USB, Serial, or Memory Card
Minimum Version Dicksonware™ Required:	8.0

Rev. 08/06

Operating Instructions

Note: The loggers have a continuous display that cannot be disabled. Dual variable models such as the TM320/TM325 and SM325 will toggle between Temperature and Humidity or two Temperature readings automatically. The SM320/325 models will read PROB on the display if the Thermocouple is not connected.

Save
Pressing this button will download any data stored in the logger to the removeable memory card. STORE will appear on the display momentarily and the counter will start counting down from 100. DO NOT remove the memory card until STORE is no longer in the display and the counter has reached zero.

Alarm
Pressing this button will silence the alarm. Holding this button down for about 5 secounds will toggle between Fahrenheit and Celsius. (Alarm parameters can only be set in DicksonWare™.)

MIN/MAX
Pressing this button will start the Min/Max display cycle.

Clearing MIN/MAX Values
Holding the "MIN/MAX" and "ALARM" buttons down together until "clr" appears on display will clear the stored minimum and maximum values. The Min and Max displayed by the logger will be the minimum and maximum values sensed since it was last cleared.

Note: DicksonWare™ will show the minimum and maximum values of the downloaded data. These could be different than that displayed on the unit itself. For

Example: Your logger is set for a 2 minute sample which is good for about 11 days. After 5 days you clear MIN/MAX. After another 6 days you download the logger. The Min/Max displayed by the logger will be the MIN/MAX for the last 6 days. The MIN/MAX shown by DicksonWare™ will be the Min/Max for the last entire 11 days. Dew point MIN/MAX in the TM320 and TM325 models are not updated unless dew point is enabled. (See Software Setup Instructions)

Battery Replacement
To replace the batteries (4 "AA" alkaline) remove the screw on the back of the case.

Getting Started

- Install the DicksonWare™ Software.
- Connect the cable (supplied with the software) to the logger and to a working serial or USB port on your computer.
- Click the Setup button. When the setup window appears, all fields should be automatically filled in, this will confirm that DicksonWare has recognized the logger. Should all fields remain blank, refer to "No Communication" in the Trouble Shooting section of this manual. Once DicksonWare™ recognizes the logger, press the Clear button. This will delete all data currently stored.

Note: Make sure thermocouple probes are connected for SM320/SM325 models.

- The logger is now sampling and ready for use. The default sample interval is 1 minute. You may choose to change Default settings for sample interval and start-date and time. When changing these settings, the logger will automatically go through the clear process to accept your changes.

Note: To achieve longer battery life during operation, use a less frequent sample rate, disconnecting the unit form the USB port when not downloading data, limiting the frequency of memory card transfers, and NOT inserting the memory card unless downloading.

Rev. 08/06

DicksonWare™ Software Specifications

- Microsoft Windows® compatible
- Allows for simple viewing and zooming of logged data
- Easy set-up of Dickson Data Loggers including:
  - User selectable sample intervals from 10 seconds to 24 hours
  - Display temperature in °C or °F
  - Delayed logger start times
  - Logger data capacity can be set to wrap data or stop when full
  - Allow for real time monitoring and graphing.
  - Effortless exporting of data and graphs to other software
  - Data can be viewed in tabular (numeric/table) or graphical formats
  - Fast downloading of logged data - 30 seconds (typical) from full logger
  - Even shows battery power status for battery operated loggers

Specifications:

Compatible With: Microsoft Windows® 95, 98, 2000, NT & XP
PC Requirements: PC with 386 MHz or better microprocessor, 4 M RAM, 1 free COM (serial) port, CD drive
Cable Type/Length: 9 pin male D-shell to male 2.5mm stereo plug, 6' long
Computer Interface: RS-232 COM (serial) port
DicksonWare™ Version Required (minimum): See Specific Model for Version Requirement

DicksonWare™ SECURE Software Specifications

To ensure the authenticity, integrity and confidentiality of data, 21CFR Part 11 requires that electronic records adhere to certain criteria. DicksonWare™ SECURE software collects data from our validated data logger, creates detailed graphs and reports and contains the following features that comply with 21CFR11:

- Password protection
- Electronic signature consisting of User ID and Password
- Collected data encrypted in secure files
- Audit trail capability to identify date, time, user and action

For a complete 21CFR11 compliant package, order the following:

	Description	Order #
1.	Appropriate Validated data logger	
2.	DicksonWare™ SECURE Software & Serial or USB Download Cable	**A025 or A026**
3.	Certificate of Validation/logger	**N520**
4.	Choose One Calibration Option Listed Below:	
	NIST Traceable Calibration 3-pt. (new unit)	**N300**
	NIST Traceable Calibration 1-pt. (new unit)	**N100**
	A2LA Accredited Calibration 3-pt. (new unit)	**N400**

Note: SW400 Calibration Software may not be used with DicksonWare™ SECURE software.
Prices are subject to change without notification.

Specifications:

Compatible With: Windows® 95, 98, 2000, NT & XP
PC Requirements: 386MHz processor or higher, 4MB RAM, 1 free COM (serial) port, CD drive
Cable Type/Length: A025: 9 pin male D-shell to male 2.5mm stereo plug, 6" long;
A026: USB male series "A" plug to 5-pin male series "B" mini plug, 6' (2 meters)
Operating Range: -20 to +135˚F, 0 to 95%RH (non-condensing)
Computer Interface: RS-232 COM (serial port)

Rev. 08/06

	Order #
DicksonWare™ Software and USB Download Cable	A016
DicksonWare™ Software and Serial Download Cable	A015
DicksonWare™ SECURE Software and USB Download Cable (21CFR11 Compliant)	A026
DickosnWare™ SECURE Software and Serial Download Cable (21CFR11 Compliant)	A025
Logger Calibration Software*	SW400

Calibrations	Order #
NIST Traceable Calibration 3-pt (new unit)	N300
NIST Traceable Calibration 1-pt (new unit)	N100
A2LA Accredited Calibration 3-pt. (new units)	N400
Certificate of Validation	N520

Cases	Order #
Locking Wall Mount Case - Small	A715
Carrying Case	A708

Cables	Order #
50' Cable - For remote connection of logger to PC (serial)	X050
25' Cable - For remote connection of logger to PC (serial)	X025
Extra 6' Serial Download Cable	A060
Extra 6' USB Download Cable	A061

Other	Order #
Card Reader w/ FLASH Memory Card	A220
Extra FLASH Memory Card	A210

*SW400 not for use with DicksonWare™ SECURE (A025/A026)

Frequently Asked Questions

Sample Interval: The Sample Interval determines how frequently the data logger will save a reading. Using DicksonWare™ Software, the user can set a Sample Interval ranging from 10 seconds to 24 hours in 10 second increments. A temperature logger with data storage of 32,512 set at a 10 second Sample Interval will record for 3.75 days, while the same logger set at a 1 minute Sample Interval will record for 22.5 days.

Data Storage: Data Storage is the number of Sample Points a data logger can hold. You will find models that range from 7,680 samples to 32,512. A temperature logger with Data Storage of 32,512 and a sample interval set at 30 seconds would record for 11.25 days, while a temperature logger with Data Storage of 7,680 and the same sample interval would record for only 2.6 days.

Does it have to stay connected to a PC in order for it to work? No. Unless you're viewing data in real-time you only connect the logger to a PC when you want to view / retrieve data.

What happens when all the storage space is taken up? Do I have to throw it away? After you have downloaded the data, you simply "clear" the logger and it is ready to log more data.

What happens if I leave it monitoring somewhere too long? The Data Loggers have two user selectable modes, Stop and Wrap. In Stop mode, they will quit logging data when the memory is full. In Wrap mode, the Logger will begin to overwrite the oldest data in its memory.

Where can I put them? Depending on the Dickson model, just about anywhere. We have waterproof units, stainless steel models, units with probes, and units that handle extreme temperatures. Our wide selection of instruments should fit about any application.

What is the biggest advantage of a Data Logger? Its data is "logged", stored on a microchip inside the Data Logger. Data in electronic memory takes advantage of the power of a PC and software.
* Store the data as you would store any document on your PC.
* Retrieve archived data as easily as opening a file on your PC.
* Share the data as you would any PC file, email, copy and paste.
* Data can be imported into spreadsheet software and word processing documents.
* Easily import data from multiple data loggers onto a single graph.

How are they mounted? The smallest ones, about the size of a pager, can be wall-mounted with Velcro or simply set anywhere you need to monitor. The larger units have keyhole slots for wall mounting and can also stand on their own.

Calibration Services - New Units

N100 - NIST Traceable Calibration 1-Point: Includes documentation to one Dickson pre-selected point on new units only.

N300 - NIST Traceable Calibration 3-Point: Includes documentation of three Dickson pre-selected points (a high, medium, and low) on new units only.

N400 - Deluxe A2LA Accredited NIST Traceable Calibration 3-Point: ISO Guide 25/A2LA Documentation of 3 pre-selected points of as found data before and after calibration for Dickson temperature and/or humidity instrumentation on new units only.

N995 - NIST User Selected Temperature Points: Documentation of one customer specified point. Should be selected in addition to one of the above calibration options.

The Importance and Benefits of Regular Calibrations

Once you begin to use your precision Dickson instrumentation, regular calibrations are necessary to ensure accurate readings.

The following Calibration Services are available:

N150 - NIST Traceable Calibration 1-Point: Includes documentation to one Dickson pre-selected point after re-calibration.

N350 - NIST Traceable Calibration 3-Point: Includes documentation of three Dickson pre-selected points (a high, medium, and low) after re-calibration.

N450 - Deluxe A2LA Accredited NIST Traceable Calibration 3-Point: ISO Guide 25/A2LA Documentation of 3 pre-selected points of as found data before and after calibration for Dickson temperature and/or humidity instrumentation.

N995 - NIST User Selected Temperature Points: Documentation of one customer specified point. Should be selected in addition to one of the above calibration options.

Why should I recalibrate my instrumentation?
Over time dirt, dust and normal handling can throw your precision instrumentation out of calibration. Regular calibrations ensure that you receive the most accurate readings possible.

How often should I recalibrate my instrumentation?
Depending on the environment your instrument is used in and how often it is handled you will want to recalibrate your instrument every 6 to 12 months. Instruments in environments where there are extreme temperatures, wide temperature ranges, humidity or pressure variations, high condensation, dirt, dust and other debris will require calibration at least every 6 months. Instruments that are frequently moved or in locations with heavy machinery that cause vibrations should also be calibrated at least every 6 months.

Why should I return my instrument to Dickson for calibration?
Dickson calibrates your instrument at the factory using proprietary production/calibration software that guarantees proper calibration.

Our Capabilities
Dickson is the first manufacturer of humidity and temperature instrumentation to receive A2LA accreditation. We are also NIST Traceable; our procedures conform to MIS-STD-45662A, ANSI/NCSL 2540-1-1994, ISO/IEC Guide 25 and ISO10012. We are experts in the manufacture and calibration of humidity and temperature instruments.

Fast Service: Our turnaround time is 3 days or less so you receive not only expert service but fast service as well.

Easy: We make it easy for you! No phone calls for Return Authorization Numbers are required. We remind you when your instrument is due for calibration. You simply send in the completed Calibration Order Form with your unit for calibration with freight prepaid to Dickson.

Rev. 08/06

Troubleshooting

No communication - Serial Connection

- Verify that you have the correct version of DicksonWare™ software installed on your PC. Version 8.0 or higher is required for models SM300, SM320, SM325, TM320 and TM325.
- Verify that the correct COM port is selected: From the main Dicksonware screen, click on Logger then Communication, a black dot will appear next to the selected COM port. You may need to select a different COM port. Should you get an error message stating that "Device Is Already Open", this could mean that you have the proper COM port selected, but another device, or it's software, has it allocated. Palm pilots, for example, will cause this problem, in which case the port is not actually "available" and you may have to disable that device.
- You may need to relocate the download cable to another serial port on the back of the PC and possibly try changing the COM port again in DicksonWare™.
- If communication has not been established with the previous steps, you may need to open the logger and press the reset button and then try all COM port and cable combinations again.
- If possible, try another PC
- Make sure the USB is unplugged, and that "USB" is NOT checked in File > Preferences > Serial.

No Communication - USB Connection

- Make sure that "USB" is selected under File > Preferences > Serial.
- Unplug USB cable and plug back in.
- Remove all power to the logger (this will not cause the unit to lose any data within the logger, but you will have to start the unit logging again using DicksonWare™) unplug the USB cable, power the logger back on, then reconnect the USB cable.
- If the logger was used in a moist or humid environment Condensation may have formed on the unit. Place unit in a warm dry environment for 24 hrs. Clear memory and try again. These loggers are designed for use in a non-condensing environment. If the environment creates condensation, try placing the unit (temperature only models) in a small sealed plastic bag to protect it from condensation.
- If possible, try another PC, and/or another USB port.
- If the logger appears to be frozen or non operational, try the following: Open the unit by removing the screw on the back of the case and remove and reinstall or replace the batteries.

NOTE: Removing the battery will not erase any stored data

Unit will not turn on or frozen display

- Unit may be "locked up", try removing the battery and then replacing after a few moments.
- Battery may be to low or dead, replace batteries

The display reads Prob on RF (remote probe)

- (This would be for SM320 and SM325's only), it means that the unit does not recognize the external probe, check to see that it is connected properly. If it is connected properly, there may be a weak internal connection and should be returned.
- Is there an extension cable being used? It could be defective. Omit the extension cable and try another

Rev. 08/06