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CAMBRIDGE ACCUSENSE, INC.

# T.I.M.E.

*Thermal Instrumentation for Measurement & Evaluation*

***A cost-effective, accurate, and efficient solution to an old problem***

Multipoint measurement of airflow velocity as well as air and surface temperature analysis are crucial steps in the new product development process. These procedures, however, have traditionally been inexact, labor-intensive, repetitive, and tedious. T.I.M.E., the Cambridge AccuSense analysis and evaluation product line, has been designed to reduce cost, increase efficiency, improve accuracy, and compress testing and evaluation time.



Instead of moving a hand-held probe from location to location to measure the airflow or thermal characteristics of a particular environment, T.I.M.E. now allows you to perform simultaneous monitoring of airflow velocity and of air and surface temperature at multiple locations. The information is recorded real-time, and can be analyzed and manipulated as the measurements are being taken. The complete T.I.M.E. system consists of two multi-channel measuring instruments — the ATM-24, an airflow and air temperature monitor which utilizes the AccuSense line of CAFS sensors, and a thermocouple monitor, the TCM-24. AccuTrac, the powerful Windows-based software package designed by Cambridge AccuSense, is used by both the ATM-24 and TCM-24.



*The above photo shows the traditional method of measuring airflow. It is tedious, inaccurate, and measures only one point at a time.*

Now, you can develop a complete thermal and airflow map of your product or system by obtaining simultaneous airflow and temperature as well as surface temperature measurements. Up to 4 multi-channel instruments can be linked to obtain real-time, multipoint measurements, while the AccuTrac software allows you to display, save, review, graph, and print the acquired data, without ever having to export the information to another program.



*T.I.M.E. allows you to profile your entire system within minutes. "What-if" scenarios can be run quickly and easily.*

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## *ATM-24 Airflow and Air Temperature Monitor*



The Cambridge AccuSense ATM-24 eliminates the tedious, time-consuming and costly task of manual data recording. Design can be verified and, if necessary, modified, based on complete, accurate and real-time data. Even measurements from locations that are physically difficult to access and sensitive to intrusions are now available. The ATM-24 gathers all the necessary data from your prototype for system and transmits it to a computer for on-line or future analysis. The ATM-24 was created to accept up to 24 CAFS probes, with the ability to connect multiple ATM's to a computer.

### KEY FEATURES

- Non-intrusive sensors
- Real-time data
- Simultaneous, multipoint measurements, accepts up to 24 CAFS sensors
- Multiple COM ports can link up to 4 ATM's or TCM's
- User defined sampling times from 1 second to 30 minutes
- Displays in metric or Imperial units
- No field calibration necessary



The CAFS probes can be easily mounted in restricted locations such as printed circuit boards. *For more information on the CAFS probes, see the attached data sheet*

## *TCM-24 Thermocouple Monitor*



Developed to complement the T.I.M.E. line of thermal analysis and evaluation technology, the Thermocouple Monitor (TCM-24) can also be used as a stand-alone multipoint measurement instrument, allowing its users to obtain a temperature gradient of their product. Besides improving testing accuracy and efficiency, the TCM-24 provides increased flexibility by allowing user-defined sampling times, as well as a measurement range from –150°C to 150°C.

### KEY FEATURES

- Multipoint, simultaneous measurements, accepts up to 24 thermocouples
- Real-time data
- Available for K, J, or T type thermocouples
- Multiple COM ports can link up to 4 ATM's or TCM's
- User defined sampling times from 1 second to 30 minutes
- Displays in metric or Imperial units
- No field calibration necessary
- Universal external power supply with input range of 90-265 VAC, 47-64 Hz included
- 61 meters (200 feet) of thermocouple is included

## *T.I.M.E. Specifications*

| | UNITS | ATM-24 | TCM-24 | CAFS ELECTRONICS | CAFS PROBE HEAD |
|---|---|---|---|---|---|
| **Absolute Maximum Storage/Operating Temperatures** | $^{o}$C | 70 | 70 | 70 | 100 |
| **Absolute Minimum Storage/Operating Temperatures** | $^{o}$C | -20 | -20 | -20 | -40 |
| **Operating Temperature for Optimal Accuracy** | $^{o}$C | 20-25 | 20-25 | 20-25 | -5 to 70 |
| **Relative Humidity (non-condensing)** | %RH | 5 to 95 | 5 to 95 | 5 to 95 | 5 to 95 |
| **Warm-up Time After Power Up** | Min | 0 | 15 | 0 | 0 |
| **Supply Voltage** | V | 5 $\pm$5% | 5 $\pm$5% | 5 $\pm$5% | 5 $\pm$5% |
| **Current Consumption** | mA | 500 | 500 | 180 | N/A |


CAMBRIDGE ACCUSENSE, INC.

Cambridge AccuSense, Inc.
1000 Mt. Laurel Circle
Shirley, MA 01464 U.S.A.
Phone: 1-800-313-9271 or 978-425-2090
Fax: 978-425-4062

*Email*
Sales: sales@accusense.com
Tech Support: tech@accusense.com
Please visit our www site at: http://www.accusense.com


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# CAFS SERIES OF PLUG-IN PROBES

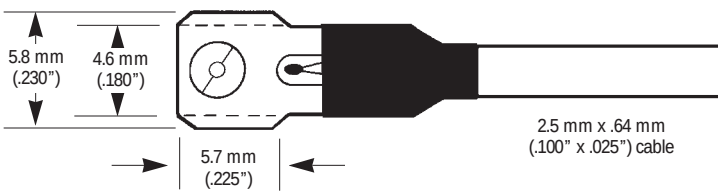
## for use with the Cambridge AccuSense ATM-24



*The miniaturization of the probe head and its separation from the rest of the circuitry make the CAFS especially suitable for measuring hard-to-reach locations.*

## GENERAL SPECIFICATIONS

- Temperature accuracy: ±0.5˚C if flow > .3m/s (60 fpm)
  +4˚C if flow < .3 m/s (60 fpm)
- Measurement range: -5 to 70˚C
- Airflow accuracy: ±10% of reading, or +/- 5 fpm
- Standard cable lengths of 2 meters, 5 meters and 10 meters




## ORDERING INFORMATION

Part Number Scheme

**CAFS – X – X – X**

- Leave blank for 2m length (standard)
- 5 m
- 10 m (Shielded cable only)

- Leave blank for standard Teflon® cable
- S – Shielded Teflon® cable

- 220 .75 – 5 m/s (150 - 1000 fpm)
- 300 .15 – .75 m/s (30 - 150 fpm)
- 400 5 – 15 m/s (1000 - 3000 fpm)
- 500 12.5 – 25 m/s(2500 - 5000 fpm)

## KEY FEATURES

- Unimpaired access to tight locations
- Improved measurement accuracy
- Easy to install
- Low intrusion
- Multi-point measurement
- Rugged construction
- Probe interchangeability
- Immediate return on investment

The CAFS Series of plug-in probes is specially designed to address the weaknesses of traditional single-point probes. They offer:

**Access** — The probe and cable design allows you to acquire measurements even from such hard-to-reach locations as between semiconductor devices, on printed circuit boards, and inside ducts and plenums.

**Accuracy and ease-of-use** — Because the CAFS probes can be mounted at exact locations, the resulting measurements are both precise and repeatable.

**Multipoint Measurement Capability** — The simultaneous use of multiple probes with the ATM-24 allows you to have a "snapshot" of the entire environment at any given time.

**Low Intrusion** — The low profile head causes little distortion of the true air velocity picture.

**Ruggedness** — Solid-state construction makes the CAFS resistant to the rigors of laboratory and field use without loss of accuracy.

**Interchangeability** — The on-line circuitry normalizes the performance of each sensor, providing the advantage of interchangeability on the ATM-24.

**Value** — The CAFS' ability to perform simultaneous measurements when used with the ATM-24 increases testing efficiency and dramatically decreases cost of operation.

*Cambridge AccuSense is committed to continuous improvement of its products. All specifications listed here are subject to change without notice.*


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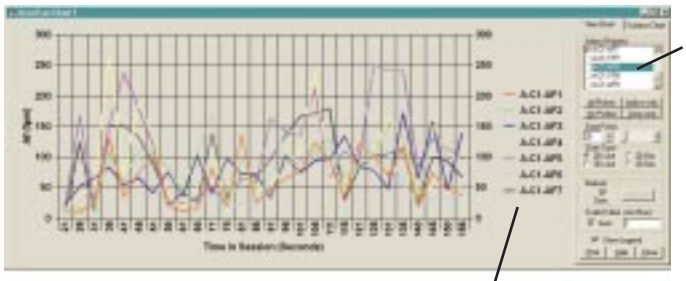
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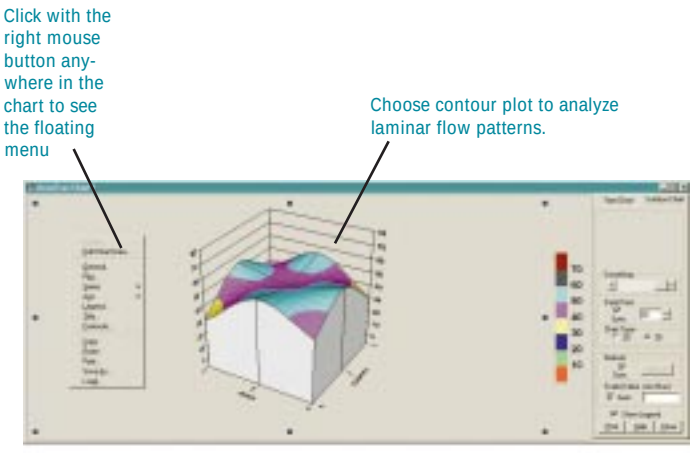


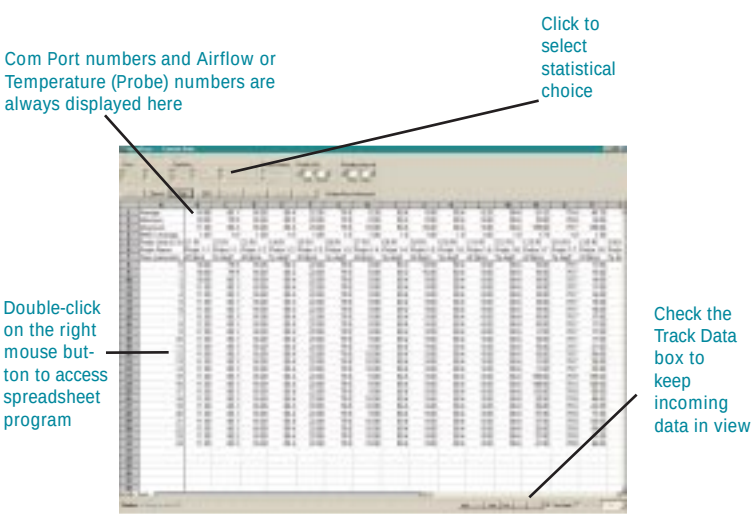
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# AccuTrac Software rev 4.0

*Developed by Cambridge AccuSense for use with the ATM-24, TCM-24, FVA Series and Quattro Flow Velocity Analyzers.*




The Windows™-based AccuTrac Software package from Cambridge AccuSense turns your PC into a powerful test and analysis center. Airflow, temperature and surface temperature data acquired by any Cambridge AccuSense instrument can now be displayed, saved, reviewed, graphed and printed without having to export the information to another program.

The user-friendly AccuTrac increases measurement versatility, reduces testing time and improves testing flexibility. AccuTrac allows you to connect up to four instruments. However, users can choose whether all data are to be viewed and graphed real-time, or saved and reviewed later. Increased flexibility is also achieved by viewing any number of samples. Files are saved in Excel spreadsheet format for use with other programs.

The latest AccuTrac version communicates directly with the ATM-24, TCM-24, FVA & Quattro Flow to automatically set up sampling times and measurement units, eliminating the need to set parameters in another terminal program. System requirements are Pentium 166 processor, 24 MB of RAM, 15MB of free disk space and CD ROM to install.

## KEY FEATURES

- All-in-one package — no need to export data to other programs. Print graphs at any time during the test, or cut and paste into other programs. Full spreadsheet and graphing program included.
- Real-time graphing— analyze information as measurements are being taken.
- Wide analytical range — statistical options include average, min/max, and standard deviation and root mean square.
- Power — access multiple graphs simultaneously, go back to saved files as needed to view other probes or to re-examine test data.
- Data protection — immune to power interruptions, logged data is automatically saved as measurements are being taken.
- Versatility — Automated or manually-set axis control, data viewing and sensor labelling.
- Efficiency — graph all the various statistical measurements.
- User-friendly — Simply click on a probe to automatically graph its data.

For more extensive technical information on this software or other AccuSense products including the ATM-24, TCM-24, FVA and the Quattro Flow, please call our sales department.


**Cambridge AccuSense, Inc.**

1000 Mount Laurel Circle
Shirley, Massachusetts 01464
Tel: 978-425-2090 Fax: 978-425-4062
http://www.accusense.com



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