Sensaphone®

APPLICATION NOTE

Application:
Laboratory Equipment Monitoring

Functions:
Temperature Monitoring, Alarm Notification, Data Logging

Sensaphone Model:
Sensaphone SCADA 3000

Who needs Laboratory Equipment monitoring?

Individuals or organizations that handle or store expensive and environmentally-sensitive products, such as:

- Municipal Health Departments
- Pharmaceutical Companies
- Blood and Organ Banks
- R&D facilities required to record and maintain strict environmental test conditions
- Medical Research Labs, etc.

Who specifies laboratory monitoring equipment?

Manufacturers and distributors of lab equipment (freezers, refrigerators, incubators, ovens, etc.), heating and air conditioning contractors, and security companies.

Why is SCADA 3000 a good choice for laboratory equipment monitoring?

A typical research center has many laboratories scattered throughout the facility. SCADA 3000 I/O expansion modules offer a flexible and affordable way to add additional monitoring points. (See the following Case Study.)

Most laboratory applications involve some sort of temperature monitoring, and SCADA 3000 offers a wide variety of ways to monitor temperature:

- 10K Thermistors
- 4-20mA sensors
- Thermocouples

Also, the SCADA 3000 Thermocouple module is capable of monitoring the extreme temperature environments found in laboratory applications.

Case Study

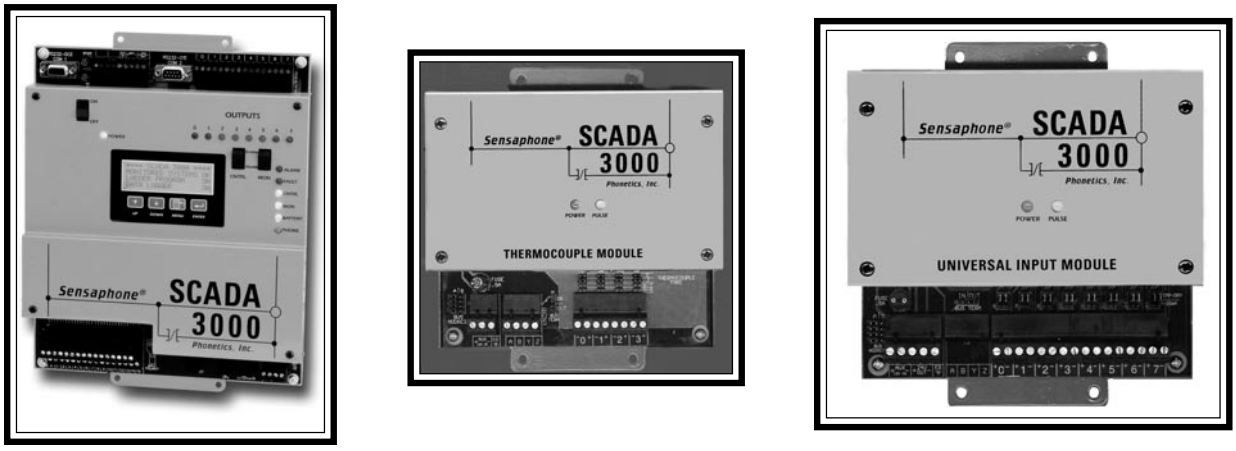
In-Vitro Technologies, Inc. (IVT), a contract research facility located in Baltimore, MD, is using the Sensaphone SCADA 3000 to monitor incubators, refrigerators and ultra-low temperature freezers. IVT provides professional contract research services to the pharmaceutical industry. They also provide fresh and cryo-preserved animal and human cellular products to the industry.

IVT makes use of SCADA 3000's I/O expansion modules to monitor numerous environmental chambers located in several separate laboratories.

Using 4-20mA signals, two Universal Input expansion modules monitor temperatures and carbon-dioxide (CO_2) concentrations in IVT's cell-culture incubators.

A pair of SCADA 3000 Thermocouple modules monitor ultra-low temperature (-80°C) storage freezers.

Another Thermocouple module is used to monitor the temperatures of +4°C refrigerators and -20°C storage freezers.



The SCADA 3000 *Main Unit, Thermocouple, and Universal Modules*

In-Vitro Technologies makes unique use of the SCADA 3000's flexible remote I/O configuration. At their installation, none of the I/O on the SCADA 3000 main unit is used, all sensors are wired to remote I/O expansion modules. The SCADA 3000 main unit is mounted on the wall in the hallway of the facility, and the I/O expansion modules are located in the various labs next to the equipment they're monitoring. This simplifies the wiring of the thermocouple and

4-20mA sensors because they don't need to be run all the way back to the SCADA 3000 main unit. I/O module data is carried back to the SCADA 3000 main unit by a single 4-wire cable. (See diagram following)

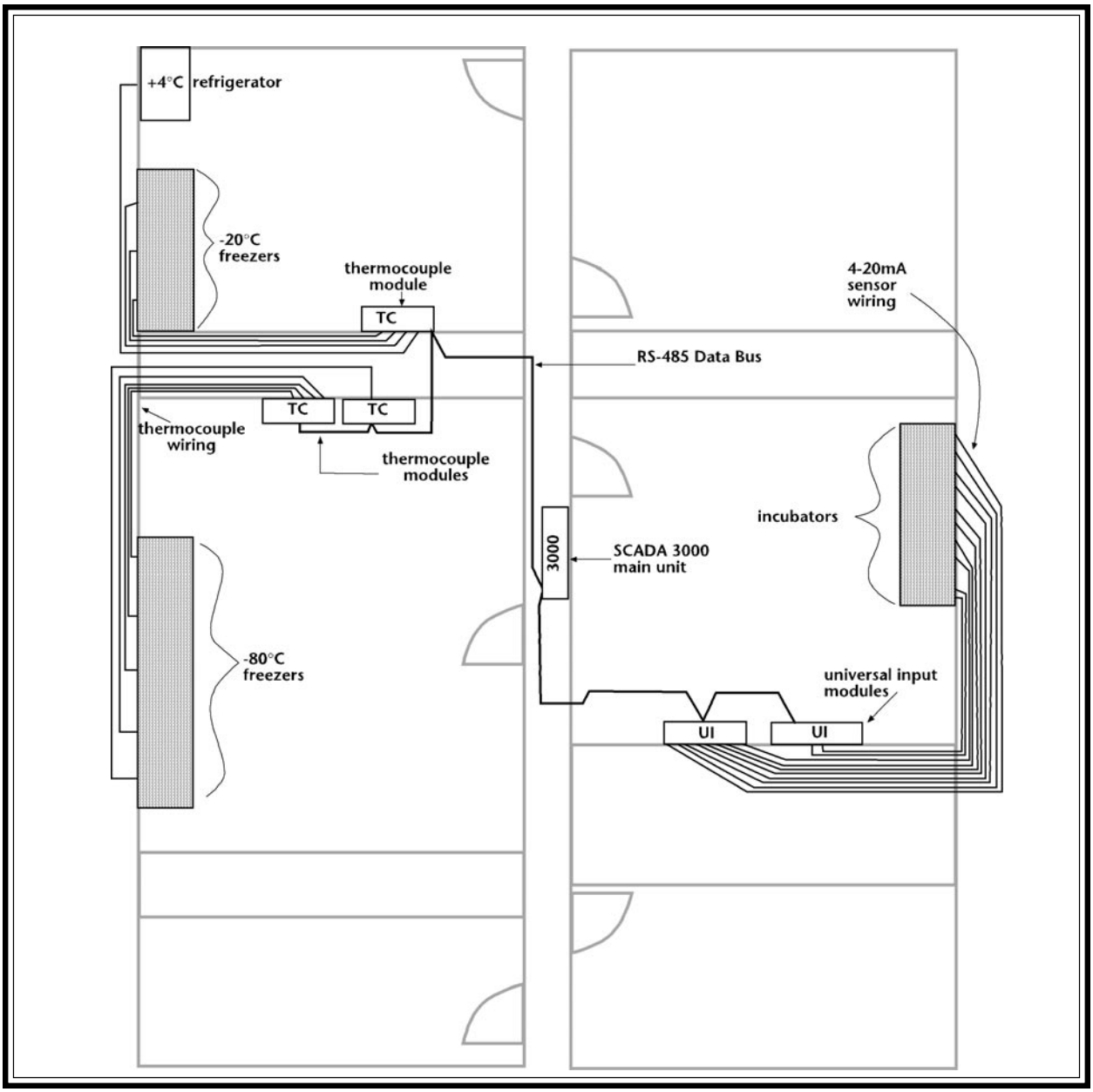


Diagram of IVT floor plan showing I/O expansion module location & cable runs

Due to the cost and temperature-sensitive properties of the materials used at In-Vitro Technologies, temperatures and CO_2 concentrations in all storage areas must be strictly maintained. SCADA 3000 keeps watch over these critical environments and will make alarm telephone calls if any condition doesn't stay within its programmed limits.

In the event of an alarm, the SCADA 3000 is programmed to dial 2 phone numbers, In-Vitro Technologies' main office and a numeric pager carried by the product division group leader. The SCADA 3000's programmable call-zone feature is being used to ensure that the alarm information is sent to the proper place as quickly as possible. During business hours

(8-5 Monday thru Friday), the IVT main office gets called first, with a voice alarm message. If the alarm is not acknowledged, SCADA 3000 will call the pager and leave its phone number for a callback acknowledgment. If an alarm occurs when the office is closed, SCADA 3000 skips the office call and dials directly to the pager.

The SCADA 3000's built-in LCD display is programmed to provide a continuously scrolling display of all the freezer, refrigerator, and incubator conditions. This lets lab technicians see, at a glance, the condition of any monitored device, anywhere in the building.

Sensaphone® SCADA 3000

HARDWARE CONFIGURATION

16 Universal Inputs:
- Contact closures
- Thermistors
- 4-20mA Analog
- 0-5 Volt Analog
- Run time accumulation

8 Outputs:
- Latching 2 amp relays
- LED status indication

2 RS232 ports:
- Local programming
- Data radio communications

RJ11 Phone interface for optional voice and data communications

LCD:
- 4 by 20 character scrolling display
- User customized content for local viewing

FEATURES:

Data Logging:

Fully user programmable built-in data storage for logging I/O points or calculated variables

Event Logging:

Internal tracking of all significant alarms and events

Ladder Logic Programming:

Standard ladder programming included for true PLC-type control

Visual ladder editor is part of free software package

C-Programming:

Built-in C-compiler, allowing complex calculations

C-program is capable of running on a schedule, independent of ladder program

PID:

Eight PID loops are built-into internal programming

Any I/O points are selectable to function in PID calculations

AGA Gas Flow Calculation

Options:

Input/Output Options (expandable to 144 points):
- •Universal inputs (same as 16 already built-in)
- •High Speed pulse count inputs, up to 10kHz
- •Thermocouple inputs: Types J,K,R,S,T and E
- •Relay Outputs
- •Analog Outputs (4-20mA)
- •Annunciator Panel

Communication Options:
- Phone modem – allows modem, fax, and pager communications
- Voice module – allows custom voice messages over standard phone lines

Power Supply Options:
- Hard-wired power supply for 110 or 220 VAC operation
- Plug-in power supply for 110 or 220 VAC operation
- Standard battery backup
- Extended battery backup

SOFTWARE:

Included in the purchase price, it provides the capability to program units, develop ladder programs, develop C-programs, retrieve and analyze the data and event loggers plus print all necessary reports.
- Automatically polls for data using phone lines or radio modems.
- Performs all standard SCADA functions with customized on-screen graphics
- True 32-bit code for Windows® 95 or Windows® NT