

Application Note: Medical Incubators

Product Range: **Wireless Equipment List (Per Freezer):**

- A1-01a Sensor Pod
- A1-10 Sensor Pod

Per wireless system:

- B1-06 Gateway

Application: **Monitoring Medical Incubators**

Remote Monitoring of Medical Incubators for Temperature and CO₂ Level

Background:

Medical Incubators must hold valuable samples for a long period of time under precisely controlled conditions.

The Problem:

If a problem occurs while samples are under incubation, the samples are lost and the time the samples were in incubation is lost.

The Solution:

Many Grant customers monitor incubators to alert them if conditions inside the incubator go out of range.



Grant Instruments (Cambridge) Ltd
Shepreth, Cambridge, SG8 6GB, England
Tel: +44(0) 1763 260 811, Fax: +44(0) 1763 262 410
www.grant.co.uk

01/10/2009

The above is a photo of a medical incubator during installation of a Grant Monitoring System. The single pod can be used to monitor temperature and CO₂ levels for two incubators.

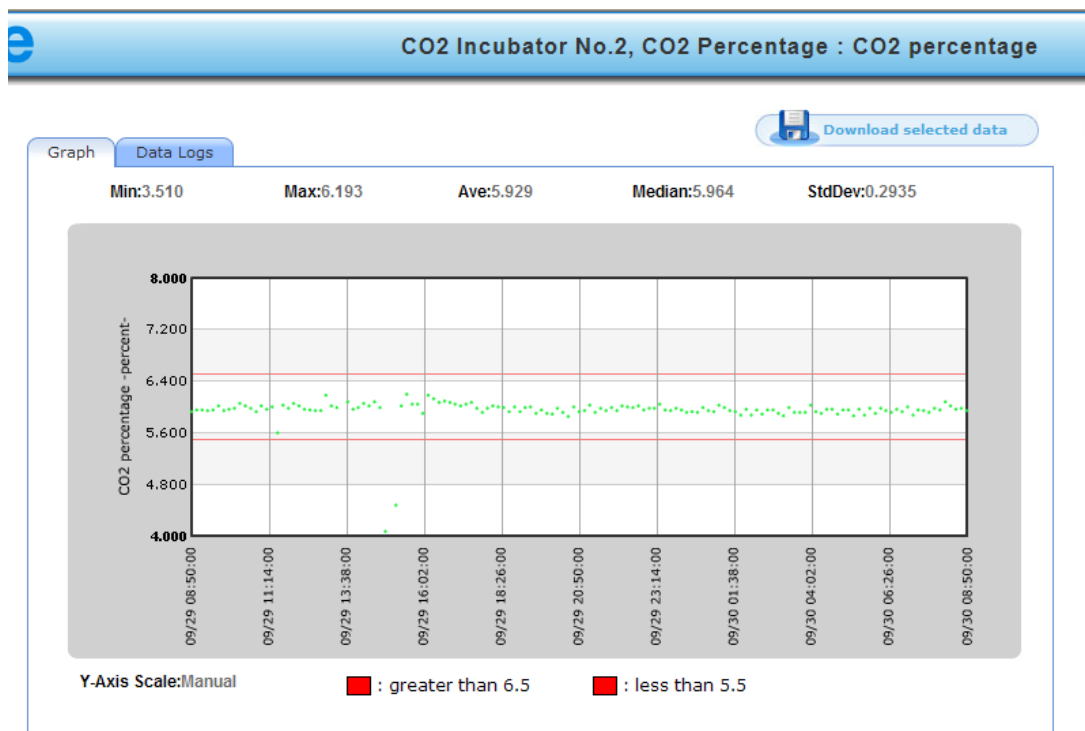
Incubators are typically operated at a constant 37°C and 5% CO₂. Deviations from these levels can cause serious problems, and often, recording of incubator conditions is required by regulators.

Grant monitoring can save significant time and money while increasing confidence in the test results.

Three methods of monitoring can be used with incubators:

- 1) Direct monitoring, independent of the incubator itself
- 2) Monitoring of the analog outputs of the incubator, using the incubator sensors
- 3) Monitoring of the alarm state of the incubator, using the incubator sensors

In the first case, independent temperature and CO₂ sensors must be installed within the incubator work space. In the second and third cases, the incubator must be equipped with the appropriate outputs (often an option card from the incubator manufacturer) and a cable from the incubator to the Sensor Pod must be used.



The above graph shows CO₂ level data for an incubator.

Note: That while the CO₂ content dropped to near-zero during a loading operation, the alarm was not triggered due to the correct setting of the filter.



Multiple incubators can be monitored from a single screen, along with freezers, refrigerators and cryogenic freezers, if required.

Link Quality	100.00 %			
Supply Voltage	4.89 Volts			
Temperature	4.74 C			
-80 Freezer (not on-line yet)	09/30/09 09:00:00 AM			
Ambient Temperature	19.86 C			
Link Quality	100.00 %			
Probe Temperature	19.50 C			
Supply Voltage	4.89 Volts			
CO2 Incubator No.1, CO2 Percentage	09/30/09 09:00:00 AM			
CO2 percentage	5.83 %			
Link Quality	100.00 %			
Supply Voltage	4.87 Volts			
CO2 Incubator No.1, Temperature	09/30/09 08:50:00 AM			
Link Quality	100.00 %			
Supply Voltage	4.80 Volts			
Temperature	37.10 C			
CO2 Incubator No.2, CO2 Percentage	09/30/09 08:50:00 AM			
CO2 percentage	5.94 %			
Link Quality	100.00 %			
Supply Voltage	4.91 Volts			
CO2 Incubator No. 2, Temperature	09/30/09 09:00:00 AM			
Link Quality	100.00 %			
Supply Voltage	4.89 Volts			
Temperature	36.96 C			

These incubators are monitored using method (1) described above – direct sensors. The sensors are ordered alphabetically – changing their names would allow a consistent order to the readings.

The Benefits:

With the Grant monitoring system the customer is able to monitor the temperature and CO₂ levels of the incubator, when these are falling out of range, alarms can be set up to send via email or voice mail alerting of a possible problem.

In doing this it makes it possible to check the incubators before the samples has been destroyed, hence saving the cost of the time running the test and saving the samples in the incubator.



Grant Instruments (Cambridge) Ltd
Shepreth, Cambridge, SG8 6GB, England
Tel: +44(0) 1763 260 811, Fax: +44(0) 1763 262 410
www.grant.co.uk

01/10/2009