2023 Oregon Vaccine Thermometer Guide

Current requirements

VFC- and VAP-participating clinics are required to maintain one *primary* calibrated, digital data logger for every vaccine storage unit, and at least one *backup* calibrated, digital data logger for each clinic site. These loggers must:

1) Be digital data loggers (paper-based wheel loggers are not acceptable)
2) Have a temperature display easily read from the outside of the unit
3) Have a buffered temperature probe (glycol, glass beads, or similar) for vaccine kept at refrigerated or regular freezer temperatures. Ultra-cold temperature data loggers will use air probes or probes designed specifically for ultra-cold temperatures.
4) Be able to display a minimum and maximum temperature since the logger was last checked

In addition to the above requirements, we strongly recommend data loggers have:

1) A manual min/max reset button
2) An alarm for out-of-range temperatures
3) A recommended uncertainty of +/-0.5° C (+/-1° F)
4) Have a low battery indicator
5) Memory storage for at least 4,000 readings
6) The ability to set the logging interval to 30 minutes or less (we recommend a 15-minute interval)

Calibration

All digital data loggers used for vaccine monitoring must be calibrated once every 24-36 months, or according to the manufacturer's recommendation. At a minimum, the calibration certificate must include:

- Model/Device Name or Number
- Serial Number
- Date of Calibration (Report or Issue Date)
- Instruments Passed Testing (Instrument is within tolerance)

Sample of ILAC-accredited Oregon calibration laboratories

Control Solutions
www.vfcdataloggers.com
PJLA Certificate #78234
35851 Industrial Way, Suite D
St Helens, OR 97051
Phone: (888) 311-0636

Cal-Cert Company
www.cal-cert.com
IAS Certificate #CL-108
6709 SE Lake Rd
Portland, OR 97222
Phone: (800) 356-4662

JJ Calibrations, Inc.
www.jjcalibrations.com
A2LA Certificate# 723.01
7007 SE Lake Rd
Portland, OR 97267
Phone: (503) 786-3005

Micro Precision Calibration, Inc.
www.microprecision.com
A2LA Certificate# 935.18
7925 SW Nimbus Ave, #28D
Beaverton, OR 97008
Phone: (503) 746-5845

Quality Control Services, Inc.
www.qc-services.com
A2LA Certificate# 1550.01
2340 SE 11th Ave
Portland, OR 97214
Phone: (503) 236-2712

Calibrated back-up digital data logger

In 2015, CDC made it a requirement that all participating clinics maintain a calibrated, back-up digital data logger. Back-up loggers must meet the same specifications as primary data loggers. Back-up loggers have many uses and are essential to safeguarding your vaccine supply. Uses include:

1) Replacement logger while your primary unit is being calibrated
2) Backup reading when you suspect primary data logger malfunction
3) Temperature tracking during vaccine transport

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Qualities to look for in a digital data logger:

Continuous monitoring

Oregon VFC/VAP requires the use of a continuous monitoring digital data logger. This is a logger with the ability to record/graph temperatures over time. Do not confuse a high/low recording thermometer with a continuous monitoring digital data logger. High/low units offer only basic information about the warmest and coldest temperature reached. By comparison, continuous data loggers give you the ability to store ***all*** past temperatures (on your computer) for future reference.

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Ambient air vs. buffered probe

Thermometer units using an external buffered probe more accurately reflect vaccine temperatures over ambient air models. A study conducted by the National Institute of Standards and Technology (NIST) has shown that:

> ***"A glycol-filled bottle approximates the thermal mass and properties of liquid vaccine, producing measurements representative of actual vaccine temperatures." (2011 National Immunization Conference, Washington D.C.)***

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Alarm (high/low)

Choose a unit that allows you to set a high and low alarm (preferably audible). With this functionality, your clinic will be alerted any time your refrigerator or freezer temperature goes outside of the recommended range.

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Display (min/max)

A large, easy to read display is extremely useful when monitoring vaccine. Avoid loggers that use confusing symbols or icons and those with small, hard to read displays. Your logger should have the ability to display (and reset) min/max temperatures between readings. Many newer logging systems 'display' on your computer.

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Accuracy

When choosing a thermometer, look for high accuracy, **+/-1°F (+/-.5°C).** This information should be contained in the Certificate of Traceability and Calibration Testing (also known as a Report of Calibration). Contact the manufacture directly if this information is not listed in the product description.

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Low battery indicator

Notification of low battery status is essential for accurate vaccine temperature recording. Such notification gives you advanced warning and ensures that vaccine monitoring is not interrupted or incomplete.

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Logging Interval

Logging intervals are the amount of time your logger is delayed between samples. A fifteen-minute interval results in a temperature sample being taken every fifteen minutes. Look for digital data loggers that offer a range of logging interval settings. We recommend you set your data logger to a 15 minutes interval.

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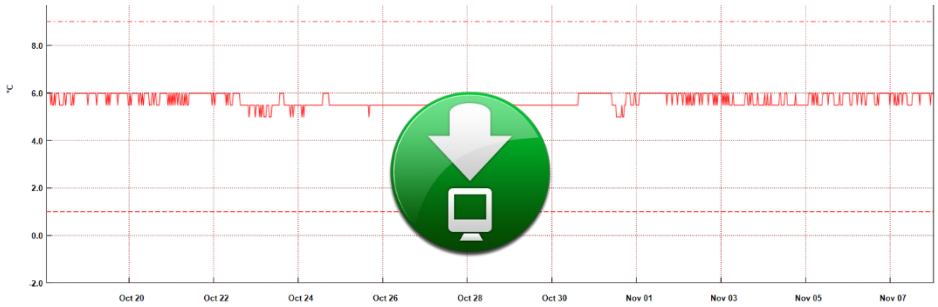
Software

Some digital units do not include free graphing software and will require an additional purchase. Refer to the manufacturer or distributor for full details on your chosen unit.



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Wireless and cloud-based systems

Relative newcomers to the field of continuous temperature monitoring, Wi-Fi and Ethernet based systems are quickly gaining in popularity. While more costly than stand-alone units, the increase in convenience and accessibility makes them a smart purchase. Some of the newer systems send temperature data directly to a cloud storage site which can be accessed, in real-time, from any computer in the world. Real-time feedback is especially useful when addressing time-sensitive vaccine excursions. Clinics will likely need a competent IT staff person (or tech savvy employee) to help implement such a system.

A brief disclaimer

As a state agency, we can't endorse any specific brand or product. The terms & conditions of your purchase are between you and your vendor.

Equipment Options

Not long ago, medical clinics had few options when it came to inexpensive, digital data loggers. Fortunately, there are now a myriad of respected manufacturers offering continuous monitoring equipment. Because of this, it would be nearly impossible to keep an exhaustive, updated list of every VFC/VAP qualified logger option. Instead, we offer this overview of the *types* of loggers to consider during your search.

The Oregon Immunization Program is here to help! Don't hesitate to contact our VFC/VAP Help desk (971-673-4832) with any question you have about this requirement or logger options you are considering.

Distributors

You have many options when it comes to purchasing your loggers. Below are a few of the most popular online vendors:

- **Control Solutions (an Oregon-based company):** www.VFCdataloggers.com
- **Supply Link:** www.supply-link.co
- **CAS Dataloggers:** www.dataloggerinc.com
- **TheDataLoggerStore.com:** www.microdaq.com
- **ThermoWorks:** www.ThermoWorks.com

Basic stand-alone loggers

These simple and inexpensive loggers come in many shapes, sizes and styles. They're often simple to use and easy to set-up. Some manufacturers offer units that allow dual (freezer and refrigerator) temperature monitoring in one unit. They work by storing continuous temperature data via built-in memory or external media card. This stored data can then be downloaded to your computer for review and backup.

Popular units in this category include:

- **LogTag TRED30-16R:** Temperature Recorder with 30-day Summary Display and Remote Probe. www.logtagrecorders.com/products/tred30-7.html

- **Lascar EL-USB-TP-LCD:** Thermocouple Data Logger with LCD and USB Interface.
  www.lascarelectronics.com/temperaturedatalogger.php?datalogger=462
- **Lascar EL-GFX-DTP:** Dual Channel Temperature Probe Data Logger with Graphic Screen.
  www.lascarelectronics.com/temperaturedatalogger.php?datalogger=463

Wi-Fi and Ethernet loggers

Wireless systems offer a step up in convenience and monitoring. The biggest advantage of wireless logging is the ability to monitor multiple refrigerators and freezers from a single computer (or internal network) in real-time. These systems save staff from having to manually disconnect and download temperatures or change out paper wheels on a weekly basis. **Please note: a wireless system does not relieve you from the requirement for once-daily min/max checks. These daily readings need to come from your primary monitoring system, not a secondary (local) thermometer.**

Popular units in this category include:

- **Lascar EL-WiFi-TP (and TP+):** WiFi Thermocouple Temperature Data Logging Sensor.
  www.lascarelectronics.com/temperaturedatalogger.php?datalogger=433
- **Accsense:** Vaccine Storage Temperature Monitoring Kit.
  www.accsense.com/products/monitoring-systems/vaccine-storage-temperature-monitoring-kit/
- **SensoScientific B10-202:** Wireless Temperature Monitoring System.
  www.sensoscientific.com/vaccine-vfc/
- **InTemp:** Multiple logger options using Bluetooth Low Energy (BLE) to communicate with mobile devices.
  https://www.onsetcomp.com/intemp/products/cx-storage-series/
- **AccuTherm Smartlog:** Multiple loggers can be wirlelssly connected to a color touch-screen main module.
  http://www.thermcoproducts.com/SmartLOG-2021-Wireless-VFC-DDL.html

Enterprise-level monitoring systems

These monitoring/tracking solutions are targeted at large healthcare organizations, medical groups, hospitals and research facilities. They are distinct in their ability to scale and expand as needed. If your organization is growing fast, consider upgrading to one of these unified and scalable temperature monitoring system.

Popular units in this category include:

- **Accsense:** Continual Cloud-Based Monitoring System. http://accsense.com/products/monitoring-systems/
- **Temptrak:** 24/7 Remote Environmental Monitoring. https://www.cooper-atkins.com/products/temptrak-wifi-hardware/
- **Aeroscout:** Single, Unified Wi-Fi-based Solution for Monitoring. https://www.stanleyhealthcare.com/hospitals-clinics/rtls/aeroscout[1]temperature-and-environmental-monitoring
- **PharmaWatch:** 24/7 Real-time Monitoring of Temperature, Humidity, CO2 and Differential Pressure. https://www.pharmawatch.com/pharmawatch/
- **SmartTemps:** Real-time temperature management. http://www.smart-temps.com/web/healthcareindex.cfm

COVID-19: Ultra-Low Temperature Digital Loggers

Pfizer's new COVID vaccine requires consistent ultra-low (UL) storage conditions. Traditional digital loggers are not designed to perform at these extreme temperatures. Fortunately, several manufacturers make loggers specifically for UL conditions.

Products to consider:

- **InTemp CX600/700 Series:** Stand-alone logger with a built-in probe that can measure temperatures as low as -95°C (-139°F) for the CX600 series and as low as -200°C (-328°F) for the CX700 series. https://www.onsetcomp.com/intemp/products/cx-storage-series/

- **LogTag TREL-30-16:** This Ultra-low logger from the familiar LogTag family is designed for freezing temperatures and boasts a range of -90 to 40C. https://logtagrecorders.com/products/trel30-16/
- **SenseAnywhere AiroSensor:** The new AiroSensor is specifically designed for ultra-low temperature monitoring. The attached PT100 probe has a range of -200 to 200C. https://www.senseanywhere.com/products/airosensor-with-pt100/

Extras!

The following section was created to showcase additional equipment, add-ons and services you may want to consider when assessing your vaccine storage and monitoring needs. These options are in **no way required** to participate in VFC; they are merely being offered as a resource for those who are interested.

Alarm phone dialers

Now a relatively old technology, these units still have a place in clinics with limited internet connectivity or recurrent power outages. They are sold by several manufacturers with varied models, styles and prices from which to choose. Designed to call predetermined phone numbers when temperatures go out of range, they're a simple and reliable alarm option. Keep in mind, the system is only useful if it's accurate. Make sure the temperature is set to mirror your calibrated continuous logger.

Popular units in this category include:

- **Sensaphone 400 Monitoring System:** www.sensaphone.com/products/sensaphone-400-monitoring-system.php
- **TemperatureGuard:** https://www.temperatureguard.com/monitors-alarms