

ULT Freezer external monitoring: 4-20mA

When your life's work is stored in a freezer, knowing the safety of your samples is incredibly important. It is recommended to have external monitoring on the device to alert you if any issues. There are several types of remote alarms: dry contacts, RS232 or RS485, Wi-Fi, independent probes, and 4-20mA. While each of these methods has its benefits, often the easiest to use is the most basic of systems is the 4-20mA.

Key takeaways/benefits/separating features

- 4-20mA output is a basic monitoring function for equipment.
- For ULT freezers, the 4-20mA is a monitor for the internal cabinet temperature of the unit.
- 4-20mA derives from a range of currents from 4mA to 20mA that correspond to a given temperature range (see supporting documentation sheet) depending on the sensor being used for the measurement inside the cabinet.
- Often times 4-20mA is coupled with remote alarm (dry) contacts. If this is the case, the user will have a temperature reading as well as a unit alarm state.
- Both the 4-20mA and remote alarm contacts can be hooked up into a building management system (BMS) which is routinely used by larger installation sites which manage multiple units.
- On Thermo Scientific™ Ultra-Low Temperature Freezers, the 4-20mA and remote alarm contacts are located on the rear of the unit next to the electrical breaker switch.

- The product user manual provides specifics on the given connections.
- There are different types of 4-20mA connections depending on what kind of circuit they are being attached to:
 - Loop powered 4-20mA: In a loop powered circuit both the voltage that supplies the sensor power and the current signal output from the sensor are contained within a single circuit (or loop) which is connected to the monitoring system. No additional or outside power source is required.
 - Self-powered or externally powered 4-20mA: In a self-powered or externally powered system, the 4-20mA signal receives power from either the equipment like the ULT freezer or a direct voltage source (wall outlet). The current signal in this case is separate from the supply voltage. Thermo Scientific ULT freezers come standard with a self-powered 4-20mA.
 - Thermo Scientific also offers other 4-20mA accessories which can be used independent of the freezer itself.

In review

4-20mA can be connected in seconds and provided a wealth of information to a monitoring system. Just knowing the temperature of the freezer without having to stand at the unit's display can ease the mind of a worried scientist. Thermo Scientific provides multiple forms of remote monitoring capability on each cold storage device. We want your focus on your work – not your freezer.

Find out more at thermofisher.com/ult