

UPS HSR Measurement-Rate Guidance

Avoiding timing irregularities when recording pressure and temperature

APPLICATION NOTE

UPS HSR

Overview

The UPS HSR can record both pressure and temperature measurements. These measurements use a shared digital communication interface and are scheduled over the same communication path; they are not transmitted as two completely independent data streams.

When pressure and temperature measurements are requested at the same time, the interface must service both requests. This increases the communication load and can delay the next pressure result. During high-speed pressure logging, this may appear in the recorded data as:

- an occasional longer interval between pressure readings;
- a repeated or apparently flat pressure value;
- a short timing irregularity or 'blip'; or
- a recorded acquisition rate that temporarily differs from the configured rate.

These effects do not necessarily indicate a fault with the sensor.

The effect of the PC and software

The timing accuracy of the recorded data also depends significantly on the performance of the host PC and the software being used. The PC, USB interface, drivers, operating system and logging application must all receive, process and record the incoming data. A slower or heavily loaded PC may introduce additional delays, particularly when other programmes, background services or system-maintenance tasks are running.

Consequently, the configured measurement interval should not be regarded as an absolute guarantee that every recorded data point will be separated by exactly that interval. The actual timing may be affected by both:

- the scheduling of pressure and temperature measurements within the UPS HSR; and
- the ability of the PC and software to receive and record the data consistently.

For the most reliable results, use a suitably specified PC, minimise unnecessary background activity and ensure that the logging software and drivers are fully up to date.

Important: different intervals can still coincide

Selecting different measurement intervals reduces the likelihood of every reading being requested together, but it does not guarantee that the two measurement schedules will never coincide.

For example:

Measurement	Interval	Equivalent rate
Pressure	0.01 seconds	100 readings per second
Temperature	0.1 seconds	10 readings per second

Although the intervals are different, 0.1 seconds is exactly ten times 0.01 seconds. Consequently, a temperature reading is scheduled at the same time as every tenth pressure reading.

Pressure	0.01	0.02	0.03	...	0.09	0.10
Temperature	—	—	—	...	—	0.10

At each coincidence, the communication interface must handle both measurement requests. This can cause a delay in the pressure data and may result in a longer-than-expected gap or an apparent irregularity in the pressure record.

Recommended configuration

For applications where high-speed pressure measurement is the priority:

- Set the pressure interval to the rate required by the application.
- Set the temperature interval independently and make it as slow as practical.
- Do not assume that simply using two different intervals will eliminate timing interactions.
- Use a suitable, adequately performing PC with minimal background activity.
- Test the chosen configuration using the actual PC, software and logging conditions before relying on the data for critical measurements.

If temperature data is not required, set the temperature measurement interval to the longest practical period, or disable temperature measurement where this is supported. Please note that temperature correction will not be updated or applied while temperature readings are not being taken.

Summary

The UPS HSR shares communication capacity between pressure and temperature measurements. When both measurements are scheduled together, pressure readings may be delayed temporarily. The consistency of the final recorded data can also be affected by the performance and workload of the PC and logging software.

For reliable high-speed pressure logging, temperature should normally be recorded at a considerably lower frequency than pressure, while still being measured often enough for the temperature-correction requirements of the application. The complete system—including the UPS HSR, PC, drivers and software—should be tested under the intended operating conditions.

Technical guidance: Always validate measurement settings with the intended sensor, PC, software and operating conditions before using the data for critical decisions.