

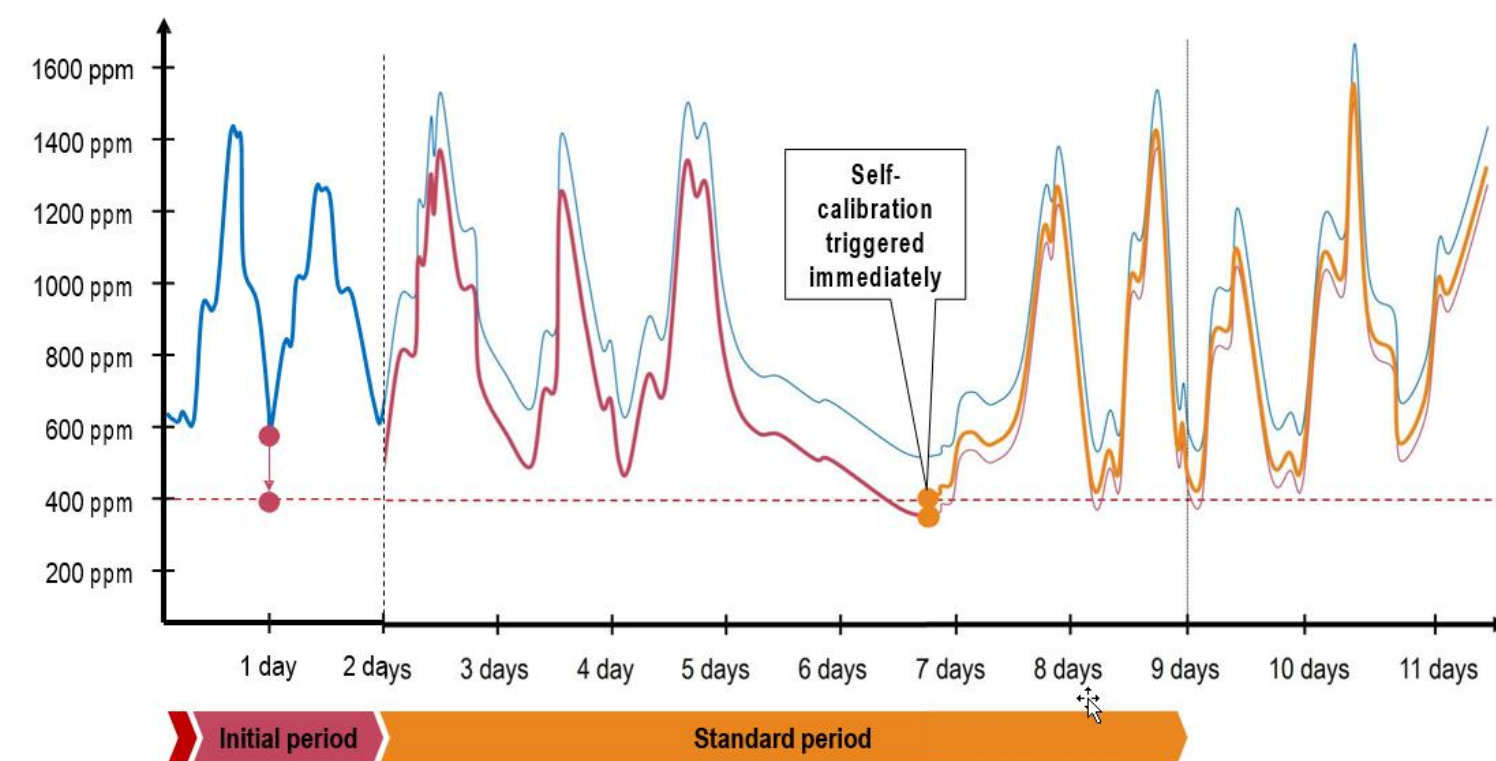


Room Measurement Range – CO2 Auto Calibration

Senticon
SENTIENT CONTROL SOLUTIONS

Automatic CO2 Self-Calibration: Why?

- QER10 CO2 sensor / QCR10 controller shipping, altitude difference and long-term drifts can result in CO2 signal offset
- Automatic CO2 Calibration restores the full accuracy of the device – enabled as default

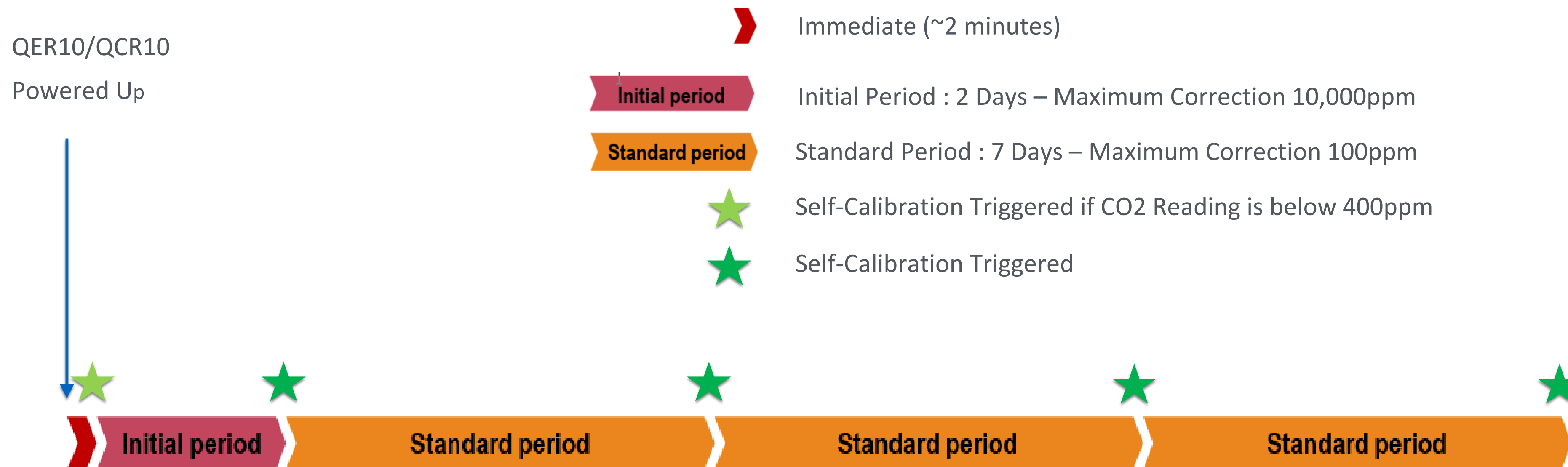


Additional Benefits:-

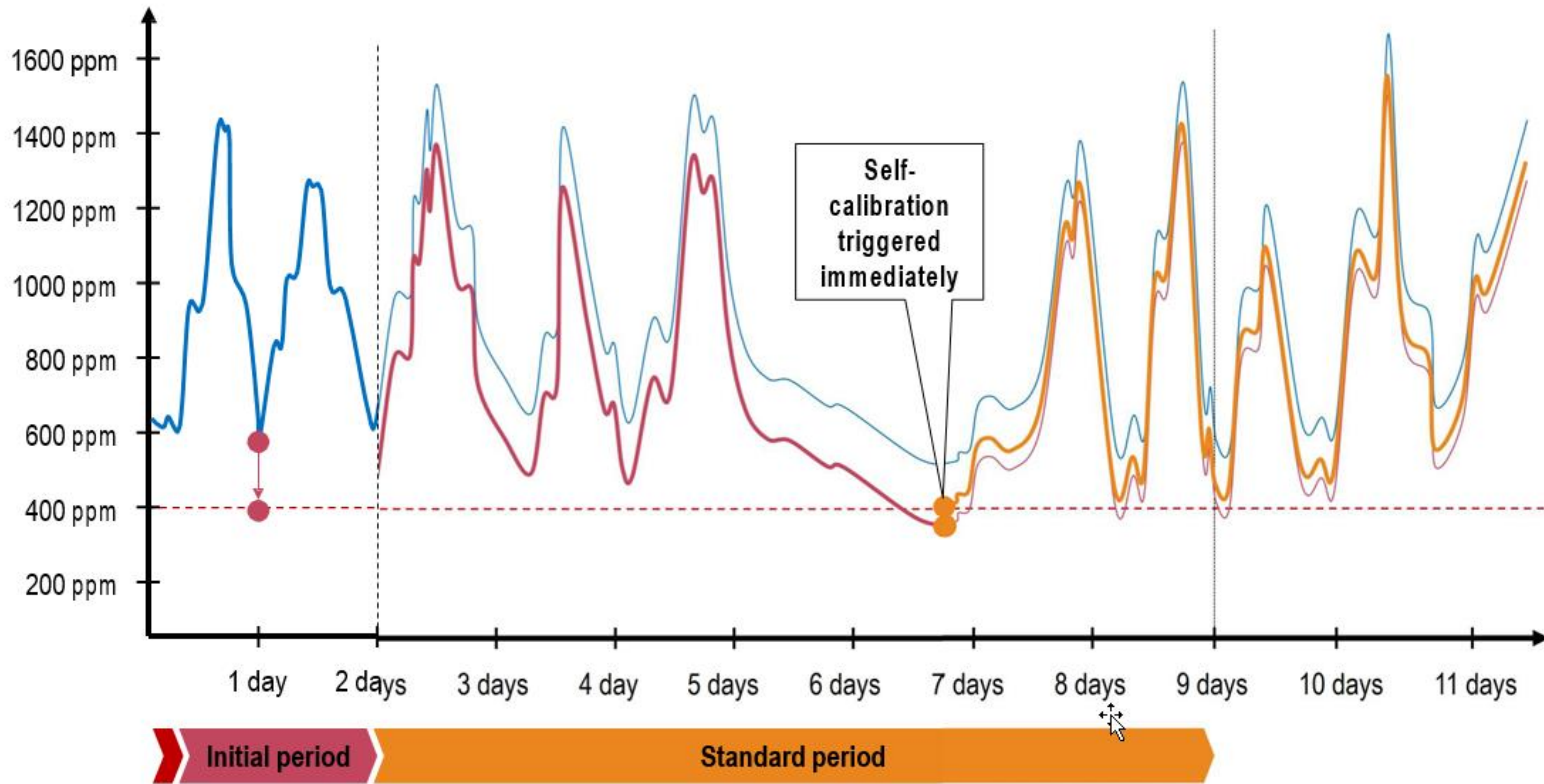
- Smallest device-to-device variation and highest accuracy
- CO2 output always above 400ppm
- “Insurance” against unanticipated events
- Mechanical Stresses
- Thermal Stresses
- Pressure-Change

Automatic CO2 Self-Calibration: Working Principle

- **Key assumption:** Lowest measured CO2 concentration corresponds to 400 ppm. This means that the sensor should measure fresh air (400ppm) at least once in 7 days period for Automatic Calibration to operate correctly.
- Self-calibration is triggered after predefined period → Minimal measured value is set to 400 ppm
- If CO2 reading is below 400 ppm for ~2 minutes, a self-calibration is triggered immediately
- When a self-calibration is triggered, the CO2 measurement is shifted with a time constant of ~60 seconds (smooth value change)

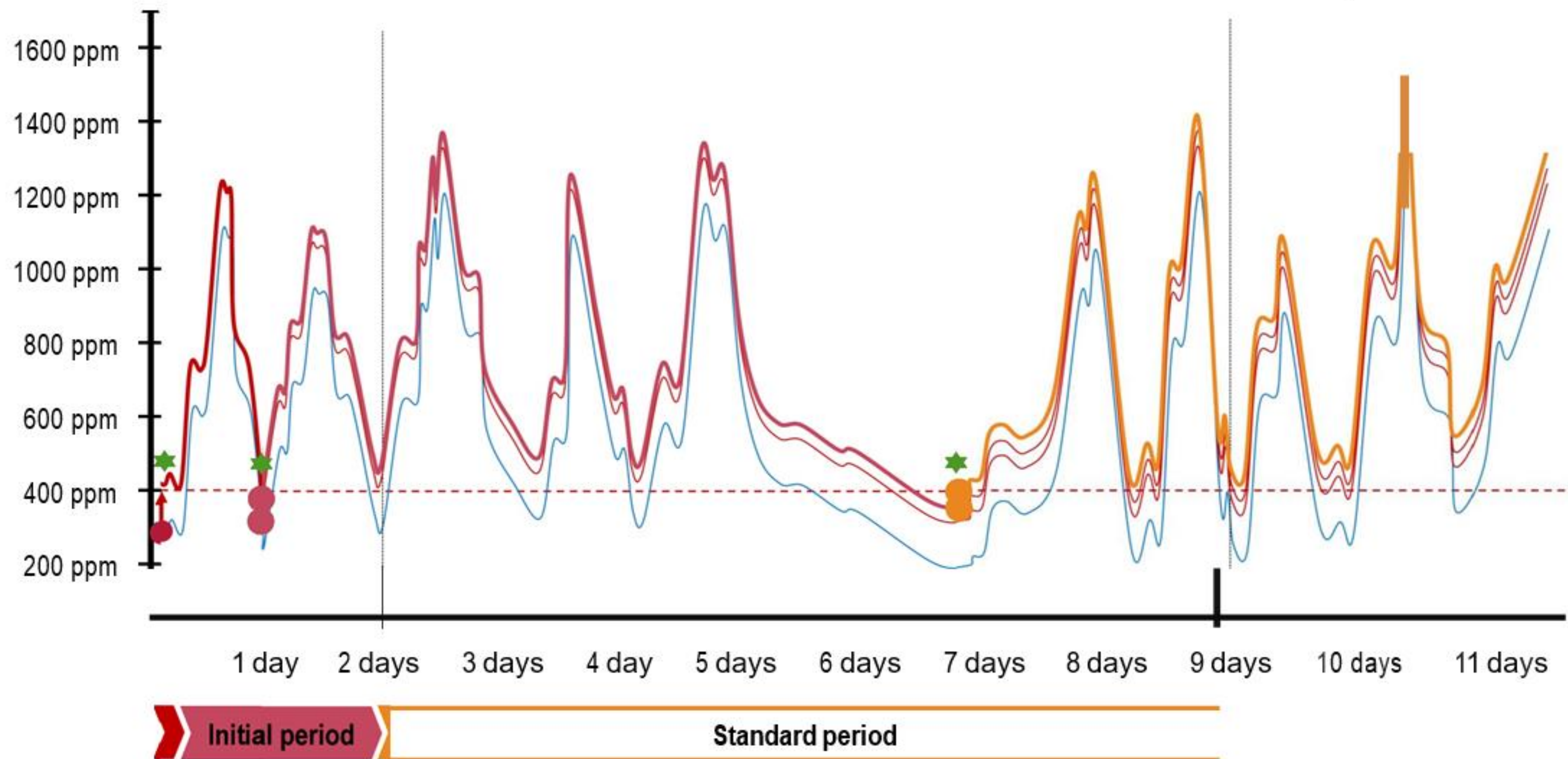


Automatic CO2 Self-Calibration Example 1



Automatic CO2 Self-Calibration Example 2

★ Self-Calibration Triggered Immediately



QER10/QCR10 CO2 Calibration: Available Settings

- Parameter *CO2 Auto-Calibration*: As default automatic self calibration is enabled (calibrates to 400ppm). By disabling automatic self-calibration the devices do not automatically self-calibrate. Apply *CO2 Calibration Persist* after the change.

Note: *Disable only if the room space does not receive fresh air.*

Manual Forced Calibration (recommended only advanced users)

- Used when a reference CO2 measurement level is known
- Set *CO2 Calibration Value* to the reference CO2 level
- Force CO2 Calibration*
- Apply *CO2 Calibration Persist*

CO2 Offset	CO2 Single Point Calibration Offset (adjusts CO2 reading the specified amount)	582	int16	-500..500 (x1)	-500..+500ppm (Default 0)	R/W
CO2 Auto-Calibration	Shows if the auto-calibration of the CO2 has been Activated	583	uint16	0..1	0 = Disabled 1 = Enabled (Default)	R/W
CO2 Calibration Value	Single Point Calibration Value for the CO2 Sensor. Note: Writing this value will reset the calibration settings of the sensor to the value set. Only recommended for advanced users.	584	uint16	350..3,000 (x1)	350..3,000ppm	R/W
Force CO2 Calibration	Forces CO2 Calibration to the CO2 Calibration Value. Use when CO2 level known e.g with calibration gas or outside air.	585	uint16	0..1	0 = None 1 = Force Calibration	R/W
CO2 Calibration Persist	Store CO2 Calibration Settings in the Permanent Memory	586	uint16	0..1	0 = None 1 = Save Data	R/W

