OFFSET CALIBRATION

TECHNICAL NOTE

OFFSET ADJUSTMENT & OPERATING MODES

The **QM-10.6-01** module features an internal, protected micro-button located on the connector side of the housing. It can be accessed directly through a dedicated opening without removing the black cover. To prevent accidental activation, a special pusher tool must be used to press the button.

BUTTON PRESS INDICATOR

Due to the miniature size of the button, a built-in red LED illuminates continuously while the button is being pressed to confirm solid mechanical contact. If the red LED flickers unpredictably, it indicates contact bounce; in this case, release and press the button again firmly.

Operating functions:

- Short press: triggers a one-time manual offset correction.
- Long press (over 1 second): switches between the two distinct operating modes.

MODE 1: Normal operation (one-touch manual offset cancellation)

In this mode, the module operates at fixed gain levels with a static offset. Pressing the button triggers an immediate routine to cancel the output offset.

VISUAL FEEDBACK: A successful manual calibration is confirmed by the status LED blinking rapidly 4 times.

CRITICAL NOTICE: The detector must be completely shielded from any radiation/light during this process. If the detector is exposed to light while pressing the button, the offset calibration will be incorrect.

MODE 2: Continuous offset tracking (auto-correction)

When activated, the system dynamically monitors the output voltage and automatically compensates for thermal or environmental offset drifts.

VISUAL FEEDBACK: Active continuous tracking is indicated by the status LED blinking at a steady 1 Hz frequency.

OPERATING CONDITIONS: This mode is active only when the instantaneous output voltage remains within a +/-100 mV window. If the voltage exceeds +/-100 mV, tracking pauses, but the Mode 1 remains fully functional and available.

BANDWIDTH & DC LIMITATION: When tracking is active, the module does not operate down to absolute DC. The lower bandwidth limit shifts, resulting in a total bandwidth of 0.01 Hz to 1 MHz. If a clean, uninterrupted DC signal is required, this mode should be kept off.

QUANTIZATION & STEP BEHAVIOR: The tracking algorithm has an activation threshold of +/-4 mV, and adjustments are made in discrete, step-like increments of approximately 3 mV. These tiny voltage steps are normal system behaviour and must not be interpreted as actual input signal changes.

TRACKING SPEED & THERMAL BASELINE: The auto-correction is a slow process, adjusting at a rate of 1 step (~3 mV) per 10 seconds. For instance, a large thermal drift of 50 mV will take approximately 160 seconds to fully normalize.

OPERATIONAL BEHAVIOR EXAMPLE: If a constant hot object is placed in the detector's field of view for an extended period, the tracking mode will eventually interpret it as the new "cold" baseline. Consequently, when the hot object is removed, the output voltage will temporarily swing negative until the processor steps the output back to zero.