Panasonic

FAQs

(Frequently Asked Questions)

INFRARED GRIDEYE SENSOR

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A. Questions & Answers

Which aperture (if used within a housing) should be used?

A thin plate which is transparent for infrared beam of 5-13 µm has to be selected. Several materials like Silicon with optical filter, Polyethylene (PE), Ge, ZnS or others can be chosen.

What are the performance differences between normal-, stand-by- and sleep mode?

Normal mode: Frame rate can be 1 frame/s or 10 frames/s

Stand-by mode: Frame rate is same than Normal Mode but temperature register is only updated every 10 or 60 sec

Sleep mode: Temperature register is not updated

Reading and writing is possible while all 3 modes!

Is GridEYE able to measure temperatures higher/ lower than mentioned in the specification?

In principle yes, but it depends on the sensor temperature (ΔT to thermistor). Furthermore the accuracy of temperature will be worse than specified in the datasheet.

Is it possible to place an additional lens in front of GridEYE in order to change the Field of View (FOV) or detection distance?

An infrared image is formed on the sensor surface through the Silicon lens. This sensor is placed on the focal point of the lens and only parallel infrared beam can be detected. If an additional lens is placed on front of the sensor, the focal point is changed and the infrared image is out of focus. A changed field of view means another focal point. In this case the height of GridEYE and the lens shape have to be changed. Please contact your local sales representative to evaluate if a special type is possible.

What is the worst case temperature difference (ΔT) between two pixels if the same temperature is measured over all pixels?

Worst case ΔT= typ. 5°C. If one pixel has the tolerance of +2,5°C and the other pixel has some noise with -2,5 °C the temperature difference could be typ. 5°C.

What is the set up time after starting the GridEYE sensor?

We recommend waiting at least 15 s, because this is the time GridEYE needs to stabilize the Output

## What ist the set up time after "Initial Reset" (GridEYE always powerd on)

We recommend waiting 50ms, because this the time GridEYE needs to enable the communication.

What is the benefit of 1 frame/s compared with µ-controller calculation?

The C-code volume of µ-Controller can be reduced.

What is the difference between 1 frame/s and 10 frames / s?

The GridEYE ASIC has internally always 10 frame /s. 1 frame /s is the average of 10 frames / s
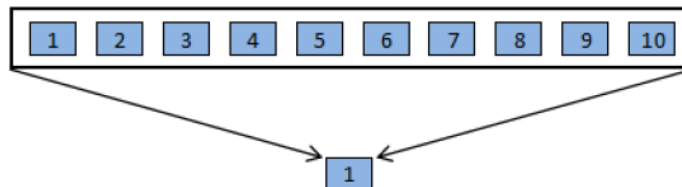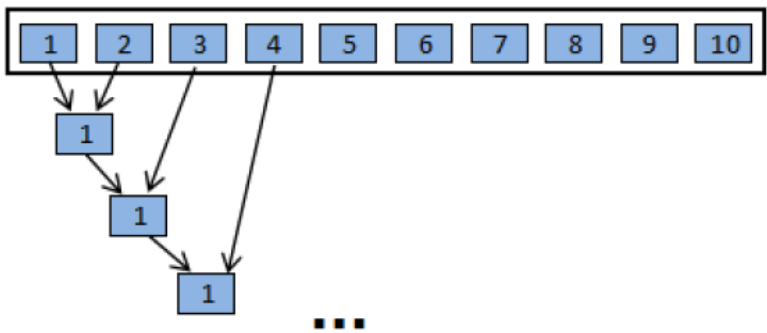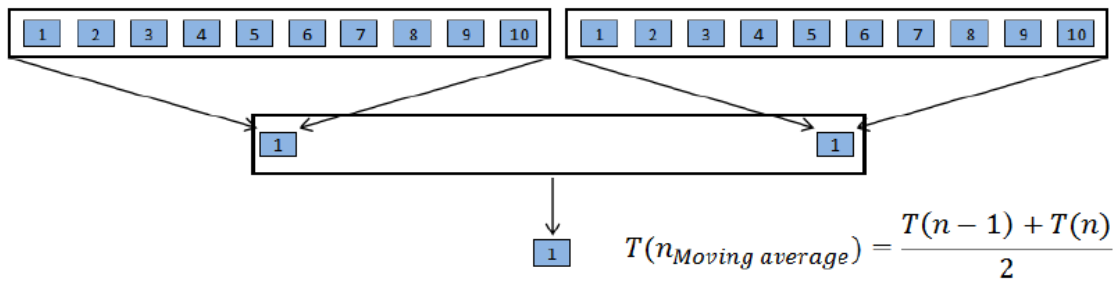

What is the benefit between 1 frame/s compared to 10 frames/s?

The noise level is reduced. The noise level will only be about 1/3 compared with 10 frames /s.

What does "Moving average" mean?

Moving average means an average value of actual frame (T(n)) and one former frame (T(n-1)).

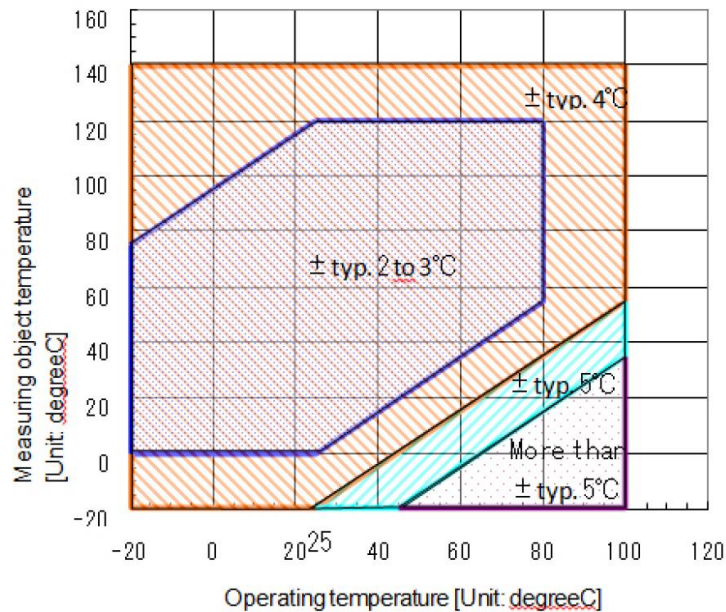$$T(n_{Moving\ average}) = \frac{T(n-1) + T(n)}{2}$$

The noise level will decrease to $\frac{1}{\sqrt{2}}$.

Is the typ. power consumption different with different frame rates?

No, the typ. power consumption is always the same.

What is the relation between accuracy, operating temperature and measuring object temperature?

Condition:
    frame rate: 1 fps
    moving average: Yes

Is it possible to calibrate the GridEYE sensor?

Yes, it is. You have to take a heat source with same defined temperature over all pixels of GridEYE. Then you have to measure and to calculate the Offset to this defined temperature for every pixel. Then you can add or subtract this Offset to the corresponding pixel temperature value in your µController algorithm.

For Example:

Defined temperature over all pixels: 30° C

Pixel 1 value: 29,5 ° C _ Offset: -0,5° C _ Add in algorithm 0,5° C to value of pixel 1

Pixel 2 value: 30,25 ° C _ Offset: +0,25° C _ Subtract in algorithm 0,25° C to value of pixel 2 and so on

What is the relation between accuracy, operating temperature and measuring object temperature after calibration?

Is there any temperature influence between the pixels?

Condition:
frame rate: 1 fps
moving average: Yes
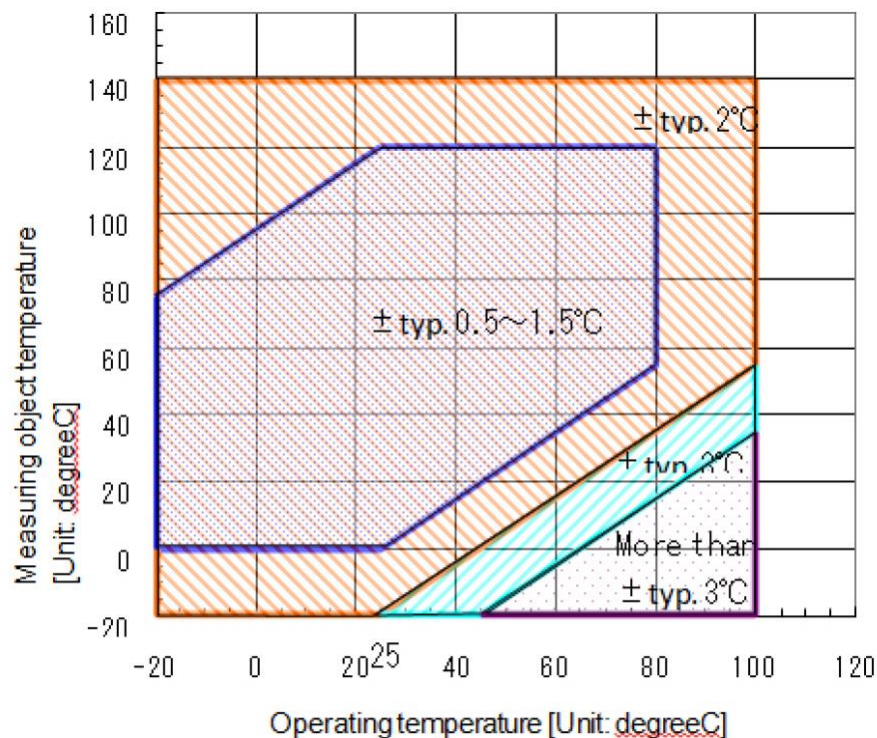
Is there any temperature influence between the pixels?

No, there is no influence between neighbouring absorber.

Is it possible to use the sensor outside?

Yes, but difficult. Due to many heat sources such as sun, vehicles, hot wind etc. it is difficult to detect the desired object(s). Furthermore the C-algorithm will be more complicated.

What is the IP protection level of GridEYE?

The GridEYE is according to IP65 equivalency.

What is the MSL Level of GridEYE?

GridEYE will be delivered in a moisture-proof package and is comparable to MSL Level 3. After the moisture-proof package is unsealed, the sensors should be mounted at 30°C / 60% R.H.

What is the MSL Level of GridEYE?

within 7 days. If the sensors are to be left in storage for a considerable period after moisture-proof package has been unsealed, we recommend to keep them in another moisture-proof bag containing silica gel (within 3 months at the most)

What is the recommended wavelength of GridEYE?

The lens and the optical filter of GridEYE form a band-pass characteristic for wavelengths between 5 and 13μm.

Is there a C-code example available?

Yes, please refer to Design Guide Lines.

Is there an evaluation kit available?

Yes. Please contact your local sales representative.

Which possibilities does GridEYE sensor provide?

GridEYE sensor is a Thermopile array sensor. It can detect moving and motionless objects as well as the moving direction of an object. It can support the user at the temperature distribution or at measuring the thermal aging. For further application please contact your local sales representative.

What are the differences between Pyro-electric, Thermopile single element and Thermopile Array (GridEYE)

Detection / Type	Moving object	Motionless object	Moving direction	Temperature measuring	Thermal image
Pyroelectric	Possible	Impossible	Impossible	Impossible	Impossible
Thermopile (Single element)	Possible	Impossible	Impossible	Possible	Impossible
Thermopile IR array	Possible	Possible	Possible	Possible	Possible

What is the pixel size in relation to detection distance?
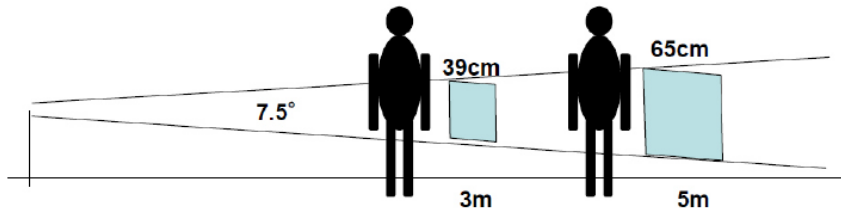
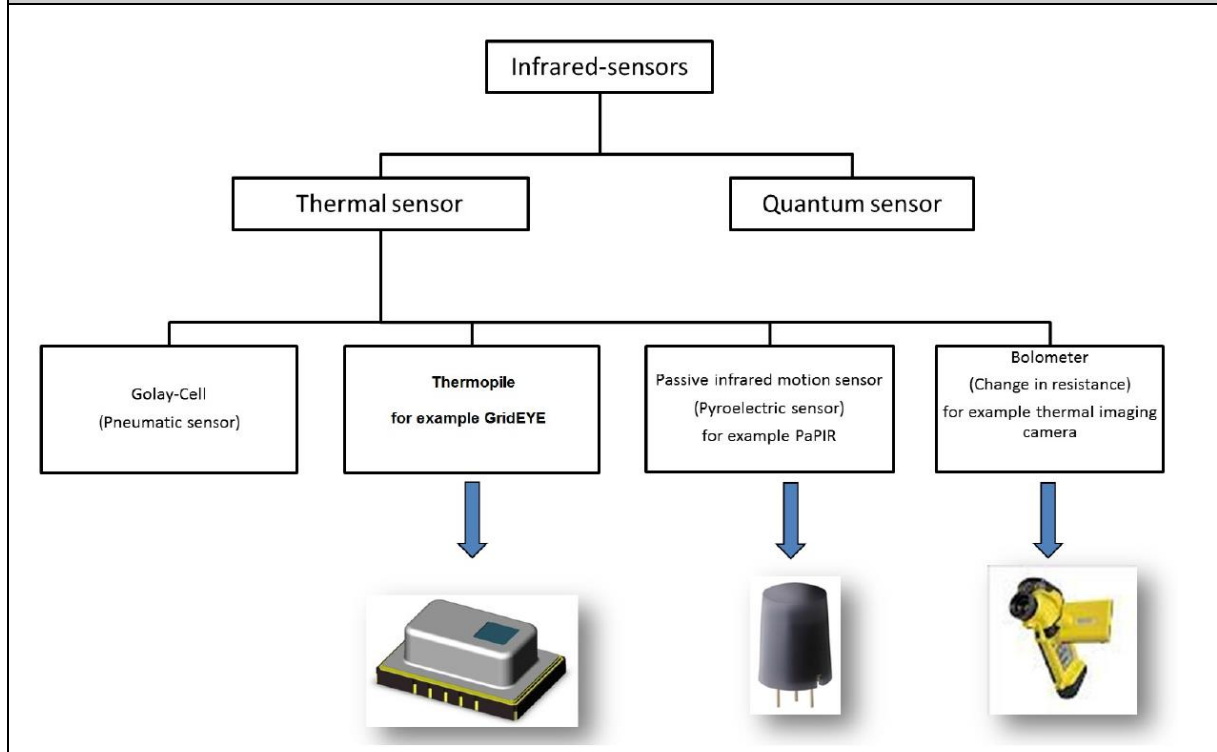**Human Detection: Relation between human body, pixel size and detection distance**
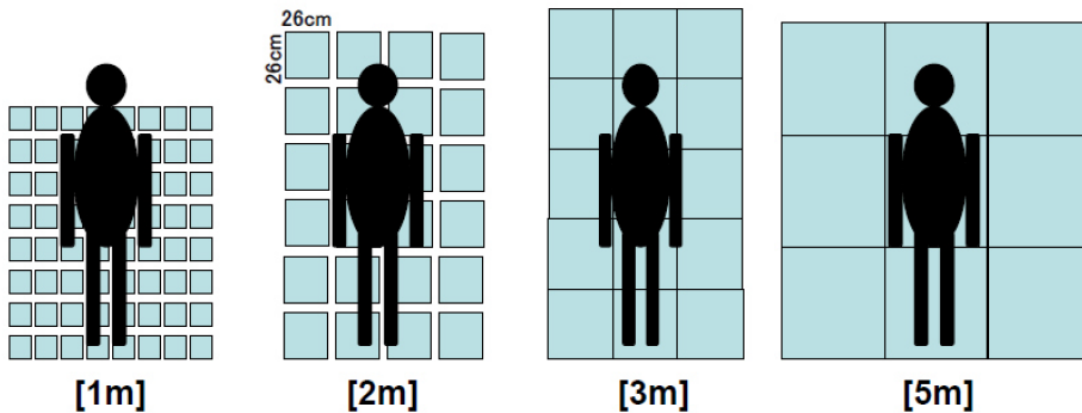
What does "Dual Use" mean?

Goods and technologies are considered to be dual-use when they can be used for both civil and military purposes. Please refer to: http://en.wikipedia.org/wiki/Dual-use_technology

Which type of sensor family is GridEYE?


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                        Infrared-sensors
                    ┌───────────┴───────────┐
              Thermal sensor           Quantum sensor
        ┌───────────┴───────────┐   ┌───────────┴───────────┐
   Golay-Cell          Thermopile   Passive infrared        Bolometer
   (Pneumatic sensor)  for example  motion sensor           (Change in resistance)
                       GridEYE      (Pyroelectric sensor)    for example thermal
                                    for example PaPIR        imaging camera
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What are the main differences between High gain and Low gain types?

High-Gain	Low-Gain
Specified temperature of measuring object: 0°C-80°C	Specified temperature of measuring object: 0°C-100°C
Typ. Accuracy ±2,5°C	Typ. Accuracy ±3°C
Operating temperature 0°C-80°C	Operating temperature -20°C-100°C