Temperatur-/Luftfeuchtigkeitsanzeige und Taupunkt, Kalibrierung und Montage

Temperature sensors are built into all devices in the Kentix Monitoring series. These are pre-calibrated before delivery.

Basically all devices for temperature measurement should be installed in a place where no heat radiation can affect the device. This includes solar radiation, heat generating devices such as lights or radiators. In addition, the temperature in rooms varies depending on the height at which the measuring sensor was installed. The higher the sensor is placed, the warmer it is. After the device has been in operation for 10 minutes, calibration can be performed.

⚠ After the final assembly all devices should be calibrated again. Instructions can be found in this FAQ entry: MultiSensor or AlarmManager shows deviating measured Values for Temperature and Humidity

Content of this FAQ entry:

Definitions

The values for relative humidity and dew point depend on the air temperature. For a better understanding of these relationships, the terms are explained again here.

Air Humidity

Absolute humidity: The air can only absorb a certain amount of water vapour. The maximum amount of possible water vapour in the air depends on the temperature. The higher the air temperature, the more humidity it can contain. If the temperature drops, the air can contain less humidity. The absolute air humidity is expressed in g/m³ (grams per cubic meter). At 10°C a maximum of 9.4g/m³ of water vapour is possible in the air. If the temperature is 20°C the maximum is 17.3g/m³. When the maximum amount of humidity is reached and further water vapour is added, the water begins to condense. The condensing water leads to mist or a water film on cooler surfaces such as room walls. If the maximum amount of water vapour in the air falls due to falling temperature, condensation (dew point) occurs.

Relative humidity is the percentage of how much the absolute humidity uses of the maximum of the air. It is given in percent. If the temperature rises without adding more humidity to the air, e.g. through evaporation, the relative humidity decreases because the air can absorb more water vapour due to the higher temperature. If the temperature decreases, the relative humidity increases because the air can absorb less moisture. If the value exceeds 100%, the water begins to condense and objects, walls etc. can become damp.

If the air has a temperature of 20°C it can contain up to 17.3g/m³. If the amount of water reaches that value the relative humidity would be 100%

Dew Point

The dew point indicates the temperature at which the absolute humidity of the air exceeds the maximum of the air and condensation occurs, or to put it differently: The dew point indicates the temperature at which the relative humidity exceeds 100%. For example, if the relative humidity is 90%, the air must be cooled down only slightly for condensation to start. For this reason, moisture often condenses on the window. The relative humidity of the room is already very high in this case. By cooling the air at the window it exceeds 100% relative humidity and the water condenses on the window pane.

Influence of the different construction methods

Due to the different construction of the devices, there may be small deviations of the measured values. On the one hand, this is due to the layout of the circuit board or where components such as the temperature sensor and the power supply are installed and, on the other hand, to the type of power supply (PoE, battery, PoE by PoE injector). Heat is also generated by converting the supply voltage to the operating voltage within a device.

The influence of internal components is shown in the table below:

Device	Effect of the sensible Heat
KMS LAN-RF	medium
KMS-LAN	medium
KMS-RF	low
KMS-Door	none
KMS-RF-BAT	none

KAM	medium

Installation and Air Flow

To keep influences on measured values as low as possible, the devices should be mounted free and with the X pointing downwards. This ensures that the heat generated in the device can be dissipated to obtain the most accurate measured values possible.

Air convection through the X must be ensured for all sensors and the AlarmManager. In the following picture you can see how the optimal air flow looks like. Ambient air (blue arrow) flows through the X into the device and to the temperature sensor and the warm air (red arrows) escapes through the side ventilation slots. In this way, measurement value deviations caused by the intrinsic heat of the device, among other things, are minimized.

Environmental Conditions and Installation Location

In addition to the previously mentioned causes for measurement value deviations, the installation location also has a major influence on the measured values determined.

For example, if the device is installed near a window, air conditioning, heating or ventilation, the measured values are also influenced. Heating, ventilation and air conditioning systems in particular can vary the value of the temperature, relative humidity and dew point.

The following points should be observed for mounting and the mounting location:

- The device should be protected from direct sunlight
- There should be enough distance to other heat sources (heating, light, production machines, ovens, TV, etc.)
- The unit should not be installed directly next to windows, air conditioning systems, humidifiers, ventilation outlets or similar
- All Kentix temperature measuring devices in a room should be mounted at the same height if possible
- The device should be installed with the X pointing downwards
- The air should circulate around and through the device so that waste heat and heat accumulation do not lead to incorrect measured values