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Manual and configuration

# Enertex® ViTa KNX presence detector

For AluRa (JUNG A 55 series) and JUNG LS Design variants




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# 1. Important notes

- Electrical devices may only be installed and fitted by qualified electricians.
- Connecting KNX/EIB interfaces requires specialist knowledge acquired through KNX™ training.
- Failure to follow these instructions may result in damage to the device, fire or other hazards.
- These instructions are part of the product and must remain with the end user.
- The manufacturer is not liable for costs or damage incurred by the user or third parties through use of this device, misuse, connection faults, device faults or faults in participating devices.
- Opening the housing or making unauthorised modifications or alterations to the device voids the warranty!
- The manufacturer is not liable for use other than the intended use.

# 2. Support

For questions or problems regarding your Enertex® ViTa KNX presence detector, contact support@enertex.de.

On the KNX-User-Forum, you can contact our experts and obtain advice from experienced users and professionals.

Our YouTube channel provides videos about our products.

# 3. Parameter descriptions in ETS

Application parameter documentation is largely integrated directly into ETS. To display explanations and help texts, select the ViTa application in ETS and activate the Context help button in the context toolbar.

# 4. Connection instructions

## 4.1. Installation

Install the device as follows:

- Wall mounting with rocker operation: mounting height between 1.1 m and 1.4 m.
- Wall mounting for motion and presence detection only: mounting height between 0.6 m and 1.8 m.
- Ceiling mounting: possible in principle

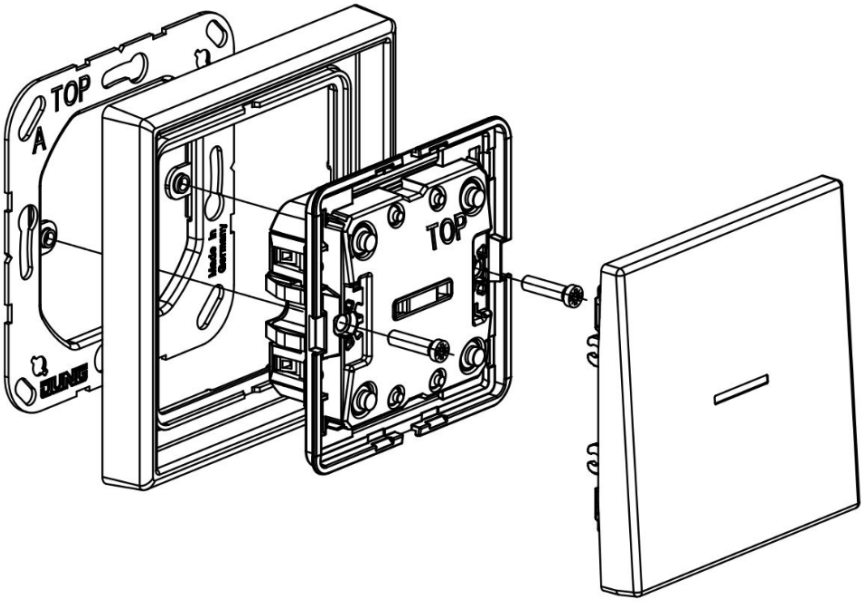



*Figure 1. Installation*

- Fit the mounting ring
- Connect the bus terminal (black/red) to the bus line.
- Optional: connect external contacts for the binary input or remote temperature sensor to the terminals (yellow/white)
- Fit the device, including frame and terminals, onto the mounting ring. Observe the markings TOP = top and A = front
- Optional: screw the device to the mounting ring. Tighten the plastic screws only lightly (see accessories)
- Snap the rockers into place. Compatible rockers must be ordered separately (see accessories)

### 4.1.1. Accessories

The devices can be fitted with one or two rockers in push-button configuration (not included). These JUNG rockers for the A or LS series are available separately from retailers.

JUNG refers to the viewing window as a “Kalotte”.
Plastic screws (JUNG no. S-NFB TSM ZN) can be used to secure the device to the mounting ring additionally.

### 4.1.2. Programming mode and factory reset

#### Programming mode

Programming mode is activated by pressing the top-left and bottom-right buttons simultaneously. In this state, the status LED remains continuously lit, regardless of the application loaded.

This button combination is valid only if no other buttons are pressed at the same time.

- Short press:
  If the button combination is released before 2.1 s have elapsed, programming mode is toggled on release.
- Long press:
  After 2.1 s, programming mode is toggled automatically, even if the buttons remain pressed.
- Lockout after automatic toggling:
  After the automatic toggle at 2.1 s, the function remains locked until both buttons have been fully released. This prevents another toggle on the release edge.

#### Factory reset

A factory reset is triggered using the same button combination (top left + bottom right).

Holding the combination for longer than 3.1 s activates the factory-reset window. From that point, keep the buttons pressed for a further 10 s. The communication software stack performs the factory reset when the buttons are subsequently released.

The practical minimum duration from the initial press is therefore approximately 13.1 s.
Once this minimum duration is reached, the red status LED starts flashing.

#### Robustness / protection against incorrect operation

If another button is pressed during the combination, the programming sequence is cancelled immediately. Recognition of the button combination then remains locked until both programming buttons have been fully released.

This prevents, for example, a fully depressed rocker from unintentionally triggering programming mode or a factory reset.

# 5. Operating principle

## 5.1. Overview

The Enertex® ViTa KNX presence detector is a radar-based presence and motion detector with three zones for each function. Each zone can be approximately assigned to a radial distance of the detected object.

In each zone, the presence detector distinguishes between fast detection of distinct movements, such as walking, and slower detection of much smaller movements, such as breathing. Fast motion detection distinguishes between movement towards the detector, movement away from it, or movement in either direction.

The name ViTa stands for vital motion detection and indicates that the presence detector has been optimised to detect human micro-vital movements such as breathing and pulse. This measurement enables reliable presence detection even when people are resting or sitting very still. The high-frequency detector operates in the 60 GHz band for this purpose.

Unlike conventional presence detectors, the ViTa KNX is highly sensitive both horizontally and vertically, above and below its mounting position. This makes it particularly suitable for stairwells and areas spanning several floors, as people are reliably detected as soon as they enter the stairwell. As a motion detector, it has an exceptionally wide detection angle of almost 180° horizontally and vertically. This makes the ViTa KNX particularly suitable for doorways: it responds immediately when the door opens and reliably switches on the light.

Motion is detected up to 10 m in front of the device; the effective range to the sides, above and below is up to 4 m. A standing person is reliably detected up to approximately 6 m, and a resting person up to 3 m.

When installed beside a passage, the motion detector can recognise entry into and exit from the detection area and provides corresponding communication objects (COs) for use as a passage counter.

The radar sensor can be completely disabled.

The device incorporates temperature, humidity and light sensors.

The device has two inputs that can be used either as binary inputs, for example for a window contact or push button, or as inputs for external temperature sensors.

The device is available for the Enertex AluRa frame range and the JUNG A 55 and LS series. With up to two rockers, it can also operate as a four-function manual KNX switch.

To ensure optimum sensitivity even in demanding environments, the ViTa can perform calibration. This can be initiated directly using a button in ETS or via a corresponding communication object (CO).

*Table 1. Device variants*

| Order number | Designation | JUNG series |
|---|---|---|
| 1181-02-AR | Enertex® ViTa KNX presence detector A | A series |

| Order number | Designation | JUNG series |
|---|---|---|
| 1181-02-LS | Enertex® ViTa KNX presence detector LS | LS series |

Note:

Button covers made of genuine metal are suitable only with limitations, as the metal reduces detection performance. With double rockers incorporating a viewing window, detection is reduced by approximately 40 %; with single rockers incorporating a viewing window, by approximately 33 %. Genuine metal covers without a viewing window are not recommended because they significantly restrict detection.

## 5.2. Function overview

The following functions are available:

- Push-button sensor with up to two mechanical rockers
- Integrated temperature and humidity sensor
- Integrated light sensor
- Radar-based motion and presence detection in three zones with a range of up to 10 m
- Support for up to eight logic functions
- Two external binary inputs, optionally usable for a remote temperature sensor (for example Albrecht Jung article no. FF NTC)
- Integrated bus coupling unit for power supply via the KNX bus; no additional power supply required
- Compatible with standard flush-mounting boxes

## 5.3. Motion and presence detector

### 5.3.1. Motion and presence

Motion detection responds quickly to distinct movements and can distinguish between movement towards the sensor and movement away from it. Detection of movement in either direction can also be selected in ETS.

Detecting micro-vital movements, such as those caused by breathing, requires a longer observation period. After a restart, the sensor must first settle. A calibration attempt started too early ends with an error; any existing valid calibration is retained.

Motion and presence detection are combined: motion on entering activates the channel. With a configured off-delay of more than 30 s, vital motion detection can keep an already active channel active even when people remain very still. Maximum sensitivity is reached with an off-delay of three minutes. An off-delay longer than three minutes does not increase sensitivity further.

### 5.3.2. Zones and detection areas

The integrated motion detector operates with three radial detection zones:

*Table 2. Approximate maximum detection range for motion and presence*

| Detection zone | Motion XMax ; Ymax | Presence XMax ; Ymax |
|---|---|---|
| Near | 1m; 0,5m | 1m ; 0,5m |
| Medium | 5m; 1,8m | 1,5 m ; 1,3m |
| Far | 10m; 6m | 3 m ; 2,5 m |

The zones form lobes around the device's installation position as shown in Figure 2. Sensitivity in the Z direction is approximately the same as in the Y direction. Unlike PIR sensors, for example, the ViTa also detects in the Z direction, above and below the sensor. The mounting height can therefore be chosen relatively freely.

The detection angle around the sensor is almost 180°. When used as a passage motion detector, motion is detected up to approximately 5 m in the medium zone and up to 10 m in the far zone. The range in the Z direction is approximately the same as in the Y direction (YMAX=ZMAX). All range specifications are approximate. Reflections from walls, large objects and similar factors can change the ranges.

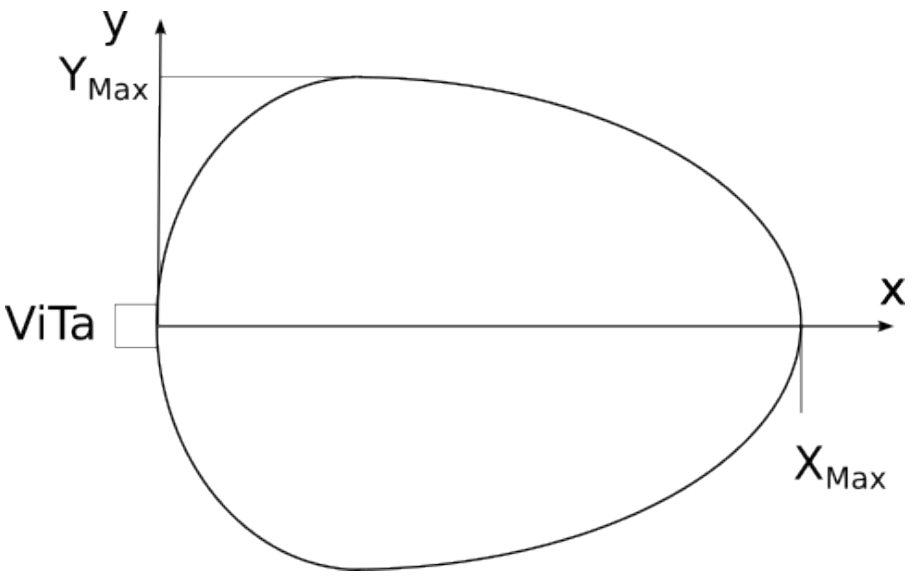



*Figure 2. ViTa radar detection lobe (top view)*

Table 2 provides an overview of the detection ranges.

Each zone becomes active from the distance specified in Table 2.

For each detection zone, a separate off-delay can be configured for the corresponding reporting CO: this is the delay before resetting after inactivity. A dead time after deactivation can also be configured, during which no new motion is detected. For each zone, up to four COs can transmit different values on activation and deactivation of detection, for example ON/OFF or 20 %/85 %.

An additional presence detection CO is independent of locking and brightness and can be used for straightforward commissioning.

### 5.3.3. Dimmer channels and the brightness threshold

When the ViTa controls a dimmer channel, the lighting may dim down slowly and with a delay after the off-delay has expired. During this transition, the lamp is technically still on even though the off-delay has already elapsed.

If a maximum brightness (upper brightness threshold) is configured, the detector may not trigger on renewed motion during this dimming phase. This is because the measured residual brightness exceeds the configured threshold and suppresses switching on again. The communication object Disable brightness threshold channel xx (for example CO 27) is available for this application.

This object can be linked to the dimmer's 1-bit status object.

The dimmer must be configured to send an OFF telegram (0) only when its dimming value has actually reached 0 %.

The resulting behaviour is as follows:

- During dimming down, between expiry of the off-delay and complete switch-off, the brightness threshold is disabled.
- On renewed motion, the detector triggers immediately, regardless of the remaining residual brightness.
- Once the dimmer is fully off (0 %), the normal brightness threshold logic becomes effective again.

This procedure ensures reliable switching on again, even with lights that fade out slowly.

### 5.3.4. Using multiple channels

The communication object Disable brightness threshold channel xx (for example CO 27) is also useful when using multiple channels.

Example installation:
A ViTa is installed below a mirror in a bathroom.

- Channel 1 is configured for the far zone without a direction restriction and controls the ceiling light.
- Channel 2 is configured for the near zone and approach only, and controls the mirror light. When the user approaches the mirror, the mirror light switches on.

Normally, the lighting is switched on depending on the measured brightness. For example, if the room is initially empty and dark, the ceiling light switches on when someone enters. Depending on the configuration, however, this additional light may prevent the mirror light from switching on because the brightness is now higher.

For this situation, use the mirror channel's Disable brightness threshold channel xx communication object and link it to the ceiling light's switching telegram. As soon as the ceiling light is switched on, the mirror channel's brightness threshold is disabled. This allows the mirror light to switch on despite the increased ambient brightness.

Individual brightness thresholds can thus be defined for different channels without channels that are

already on unintentionally preventing other channels from switching on.

### 5.3.5. Semi-automatic operation: manual ON, automatic OFF

In semi-automatic operation, the user switches on the lighting manually, for example using a light push button. The detector switches it off when, after previously detecting motion or presence, it no longer detects occupancy and the off-delay has expired. Renewed detection does not switch the light on automatically.

This behaviour can be implemented using the existing channel parameters: the detector sends only the deactivation telegrams. Internal detection remains active even if no telegram is sent on activation.

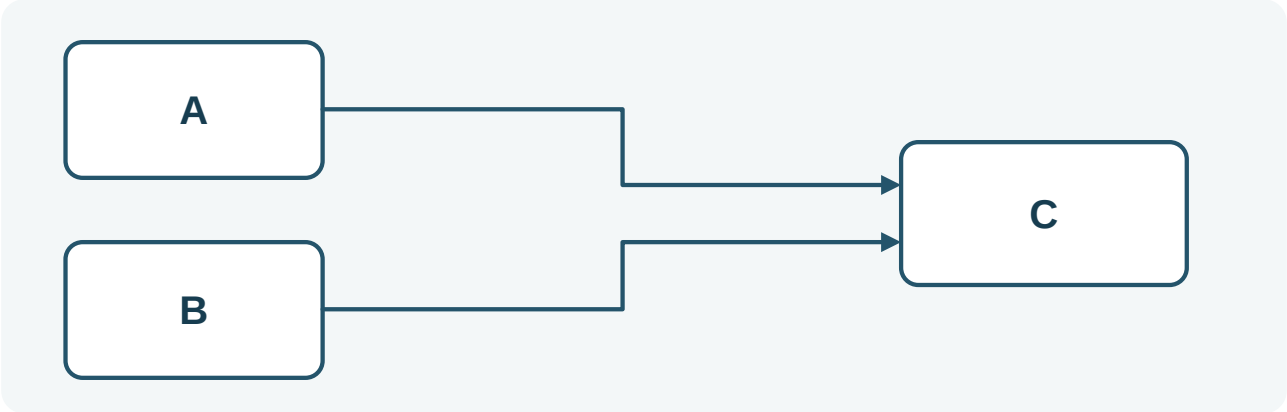



*Figure 3. Manual switching on and automatic switching off*

- A: light push button sending the user's ON telegram.
- B: detector sending the OFF telegram after presence ends and the off-delay expires.
- C: lighting switching actuator receiving both telegrams.

Link the push button's switching output and the detector channel's switching telegram to the same group address at the actuator's switching input. Use the configured channel telegram, for example CO 28 for telegram 1 of channel 1. The separate presence object, for example CO 25, reports status and is not connected to the switching input for this lighting control.

The following settings are suitable for a simple switching channel:

*Table 3. Semi-automatic operation settings*

| Setting | Value |
|---|---|
| Enable channel | Yes |
| Telegram 1 | Switching |
| Send on activation | No |
| Send on deactivation | Yes |
| Value on deactivation | 0 (OFF) |
| Send telegrams cyclically | No |
| Lower and upper brightness limits | Both 0 (disabled) |
| Other channel telegrams | No action, unless required |

Set the detection zone and off-delay to suit the application. Maximum sensitivity is reached with an off-delay of three minutes; longer off-delays do not increase sensitivity further. See also Section 5.3.1. The channel must be unlocked. For this example, set the locking and unlocking actions to *No action*.

If day and night are distinguished, apply *Send on activation: No* and *Send on deactivation: Yes*, with value 0, to both modes. Disable the brightness limits for both modes as well, so that manually switched-on lighting does not prevent internal channel activation. Leave cyclic transmission disabled to prevent repeated OFF telegrams in the inactive state from overriding manual switching on.

**Example:** the user enters an office and switches the light on at the push button. The detector recognises presence and keeps the channel internally active without sending ON. After the user leaves and the off-delay expires, it sends OFF. On the next entry, the light remains off until the user switches it on again.

Automatic switching off requires prior detection by the detector. With this configuration, a manual ON telegram alone does not start presence detection or the off-delay in the detector.

### 5.3.6. Master/slave operation

Several detectors can monitor an area together. The master outputs the channel telegrams, for example for lighting. Other detectors operate as slaves and report their detection to the master. The master takes account of both its own detection and received slave pulses.

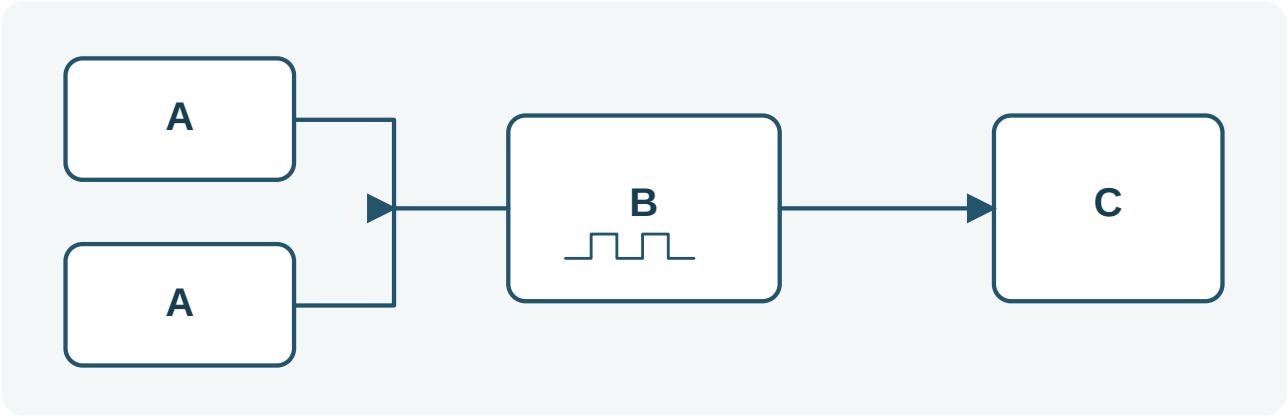



*Figure 4. Joint detection using multiple detectors*

- A: slave detectors sending a telegram with value 1 to the master on detection.
- B: master with its own detection and a common off-delay.
- C: controlled actuator, for example for lighting.

Each of the three channels has its own *Presence slave channel 1*, *Channel 2* or *Channel 3* input (CO 46, CO 47, CO 48). Link reports from the associated slaves to this master input using a shared group address. Set the remaining channel parameters, particularly off-delay, brightness limits and locking, at the master. The channel must be enabled.

Each newly received telegram with value 1 can activate the channel or restart the common off-delay. A stored value of 1 alone does not extend the delay. A telegram with value 0 does not end the running off-delay; without further detection, it expires normally. To report continuing presence, a slave must repeatedly send telegrams with value 1. Set the repetition interval shorter than the master's off-delay.

The slave output must provide value 1 when presence is detected; an inverted presence report is unsuitable. Do not connect the master's output to its own slave input, to avoid feedback.

The local movement direction setting restricts only the device's own detection. Slave pulses are processed even when the radar is disabled or settling. The master channel's brightness limits and lock remain effective for its regular channel telegrams. Pulses received during the dead time after unlocking are discarded; a new pulse is required after it expires.

**Example:** two slaves cover a corridor with bends. Both report to the lighting channel's slave input in the master. Each new report keeps the shared lighting active for the off-delay configured at the master. The end of one slave's report does not switch the lighting off prematurely.

The following settings illustrate a simple installation using channel 1 of all devices. The times are examples and must be selected to suit the application. For each detector's own detection, maximum sensitivity is reached with an off-delay of three minutes; longer off-delays do not increase sensitivity further.

### Master settings

*Table 4. Example master configuration*

| Setting | Value or procedure |
|---|---|
| Enable channel 1 | Yes |
| Motion detection | Desired zone for the device's own detection; *Off* if only slave reports are to be evaluated |
| Off-delay | For example 3 min; longer than each slave's cyclic repetition interval |
| Telegram 1 | Switching |
| Send on activation | Yes, value 1 (ON) |
| Send on deactivation | Yes, value 0 (OFF) |
| Send telegrams cyclically | For this example: No |
| Brightness limits and day/night | Set as required at the master; they determine output to the actuator |
| Other channel telegrams | No action, unless required |

The master channel must be unlocked. For detection exclusively via slaves, *Motion detection: Off* at the master is sufficient; its slave input remains functional. For semi-automatic operation, use the transmission conditions described in Section 5.3.5 instead.

### Settings for each slave

*Table 5. Example slave configuration*

| Setting | Value or procedure |
|---|---|
| Enable channel 1 | Yes |
| Motion detection and movement direction | Suitable for the respective slave's detection area |
| Value for presence | "1" when presence is detected |
| Off-delay | For example 1 min; suitable for the desired motion detection and presence retention |
| Send presence cyclically | For example every 20 s; shorter than the master's off-delay |
| Lower and upper brightness limits | Both 0 (disabled); for both operating modes if day/night distinction is used |
| Telegrams 1–4 | No action; the master controls the lighting |

At the slave, use the separate presence object of the selected channel (for channel 1: CO 25). It reports presence even if the channel telegrams are set to *No action*. The master makes the brightness decision. Disabling the slave's brightness limits ensures that its internal channel activation can occur independently of the lighting.

For retriggering, configure *Send presence cyclically*. *Send telegrams cyclically* applies to the other channel telegrams and does not replace this setting. Telegrams with value 1 are then sent repeatedly during presence; cyclic telegrams with value 0 after presence ends do not terminate the master's off-delay early.

The slave's off-delay keeps its own presence report active. Telegrams with value 1 sent during this period restart the master's off-delay. When selecting both times, therefore, account for the effect of the slave's off-delay on when the shared lighting switches off.

**Linking group addresses**

*Table 6. Example group address links*

| Group address (example) | Sending objects | Receiving object |
|---|---|---|
| 1/1/1 – Slave presence | Presence channel 1 (CO 25) of all slaves | Presence slave channel 1 (CO 46) of the master |
| 1/1/2 – Lighting | Switching channel 1, telegram 1 (CO 28) of the master | Lighting actuator switching input |

Do not assign the master's presence report to the slave presence group address. This prevents feedback via its own slave input.

During commissioning, test each slave individually: detection must reach the master and activate the lighting when the master's conditions are met. Further telegrams with value 1 must arrive while presence continues. Only when there is no local detection and no new slave pulses should the common off-delay expire and the master send OFF.

### 5.3.7. Calibration

The presence detector can be calibrated to optimise detection performance. Start calibration in the ETS presence detector parameter overview using the corresponding button. The device's physical address must have been programmed at least once beforehand.

Alternatively, calibration can be started from the bus via a trigger communication object (CO 50 "Calibration start"). A separate status object (CO 51 "Calibration status") sends the value 1 when calibration has completed successfully.

Writing the value 0 to (CO 50 "Calibration start") performs only a measurement, whose results are output as ASCII text on COs 52 and 53. When measurement starts, CO 52 reports "Start Meas."; when calibration starts (trigger=1), "Start cal." is output on the bus. These outputs are purely service and diagnostic functions and normally do not require attention.

Calibration adapts the sensor to the installation and its surroundings, optimising detection reliability and sensitivity. Calibration data is retained after a restart and when downloading the application.

The data is reset by a factory reset or explicitly using the corresponding function in the ETS application. A firmware update that changes radar processing may also invalidate existing calibration data. In this case, the device uses the default thresholds and must be recalibrated with the detection area

empty and still. Without valid calibration, the diagnostic objects report `no Cal.` in response to a read request.

Calibration procedure and conditions (ETS)

Calibration takes 140 seconds in total: a 20-second preparation period followed by 120 seconds of calibration measurement. It can only start once the device has been operating for at least 90 seconds. The detection area must remain empty and still throughout the procedure. On successful completion, the new calibration values are saved and used immediately. Calibration status can be queried via ETS; separate evaluation of the diagnostic objects is not necessary.

Error conditions

Calibration does not start or ends with an error message if:

- the minimum operating time of 90 seconds has not yet been reached,
- the radar signal becomes too strong during measurement, for example due to motion,
- a complete, valid measurement cannot be finished, or
- the calibration data cannot be stored reliably.

The error message on CO 52 indicates the cause and what to do next; see Section 6.4.3. Before trying again, leave the detection area and stop any moving objects. Contact service if errors recur.

No new calibration values are applied in the event of an error. A previously valid calibration remains active during operation. Special considerations for storage errors are described in Section 6.4.3.

Requirements for valid calibration

New thresholds are applied only if:

- the minimum operating time has been reached,
- environmental conditions remain stable throughout preparation and the subsequent measurement, with no people or moving objects in the detection area,
- the measurement can be completed fully and validly and the calibration data can be saved successfully.

Cyclic outputs via communication objects are purely service and diagnostic functions and normally do not require attention.

### 5.3.8. Passage counter

The application allows three objects to be enabled for counting movement towards and away from the sensor. For this purpose, install the sensor no more than 0.4 m from the passage as shown in Figure 5. The Enertex® ViTa KNX presence detector always monitors only the area in front of it. Detection of movement direction in the near zone triggers counters for entries, exits and the balance.

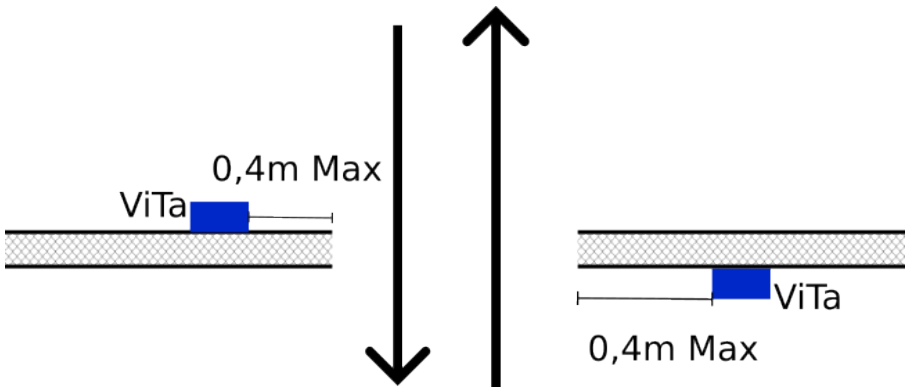



*Figure 5. Counting in the ViTa radar passage area*

The accuracy of this count is approximately 80 %.

### 5.3.9. Installation

The Enertex® ViTa KNX presence detector can be mounted to suit individual requirements. In particular, the mounting height can be chosen freely for presence detection. A height between 0.8 and 1.6 m is optimal. For temperature measurement, however, an offset relative to the standard height may be necessary.

Concealing the sensor behind the wall surface, without access to button operation or the other sensor functions, reduces its range by approximately 30 %. Detection of vital movements may be restricted even further. Calibration is recommended in this case. A test is always required to verify subsequent operation; no guarantee is provided.

Always screw the sensor firmly into place to prevent malfunctions.

### 5.3.10. Switching off the transmitter

A communication object (CO) can completely disable the radar if required.

### 5.3.11. Ambient brightness

Motion detection can optionally be combined with measured ambient brightness. This allows the brightness range within which detected motion triggers a report to be configured individually. Different parameter values can be defined for day and night operation.

Both a lower and an upper ambient brightness threshold are available. The telegrams configured in the application are output on detected motion only if the brightness is within this range. With the light sensor function enabled, the threshold applies to the brightness value adjusted according to the configuration. With the light sensor function disabled, the behaviour described in Section 5.3.13 applies.

The limits determine whether brightness permits activation of a previously inactive channel. If a channel is already active, exceeding the upper limit does not prevent its normal deactivation. The explicitly configured locking and unlocking actions described in Section 5.3.12 are independent of the brightness limits.

### 5.3.12. Locking and unlocking

The respective channel's lock object (for channel 1: CO 26) suppresses regular channel telegrams while locked. *Lock object polarity* determines whether value 1 or 0 locks the channel. The independent presence report remains available for diagnostics; locking does not switch off the radar sensor.

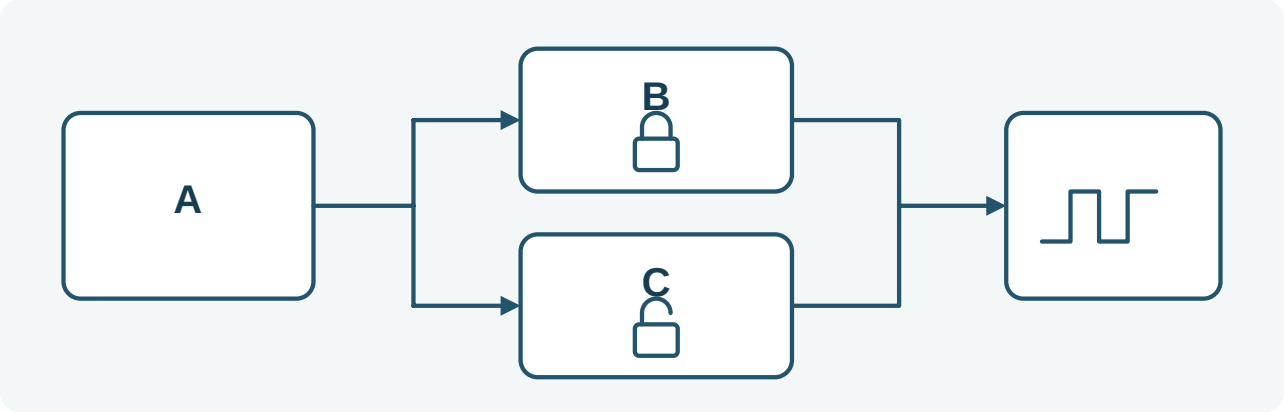



*Figure 6. Separate actions on locking and unlocking*

- A: telegram received by the lock object.
- B: locking with the action configured for it.
- C: unlocking with the action configured for it. The channel telegrams shown on the right depend on the respective configuration.

*Behaviour on locking* and *Behaviour on unlocking* are configured independently. Without day/night distinction, the following options are available:

- *No action*
- *Send activation telegrams*
- *Send deactivation telegrams*

With day/night distinction enabled, output can follow the current day/night state or explicitly use the activation or deactivation telegrams for day or night. Such explicit output does not change the current day/night state.

The selected action uses the channel's configured telegrams and their respective transmission permissions. It is performed independently of current detection and brightness limits. Receiving another telegram with the same lock or unlock value can also trigger the assigned action. *No action* suppresses this additional telegram output; normal processing of the lock object continues.

On unlocking, the channel's presence state is reset and reported. The configured *Dead time after lock* then applies. After this time expires, new detection or a new slave pulse is required for reactivation. Receiving an unlock value again also resets the channel and restarts the dead time.

**Example:** during cleaning, the lighting should remain on regardless of motion. Configure activation telegrams on locking and deactivation telegrams on unlocking. After unlocking and any configured dead time, the detector resumes normal control.

### 5.3.13. Brightness limits without the light sensor function enabled

The brightness limits of the presence detector channels remain effective even when the independent light sensor function is not enabled in ETS. The device continues to use the internally measured and smoothed brightness value. Enabling the light sensor function is therefore not a prerequisite for brightness checks in the detector channels.

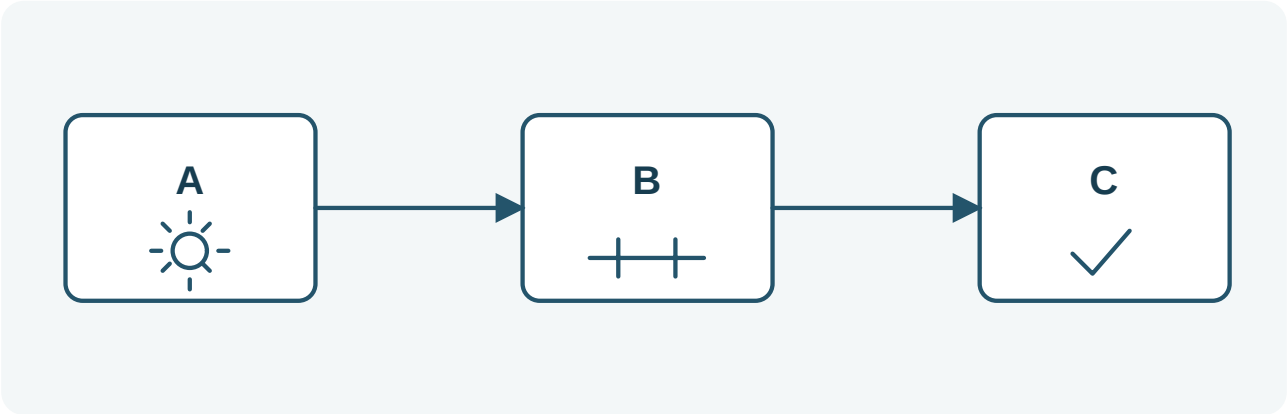



*Figure 7. Brightness-dependent enabling of a detector channel*

- A: internal brightness measurement.
- B: checking the brightness limits configured in the channel.
- C: enabling regular channel telegrams when brightness and detection conditions are met.

Without the light sensor function enabled, the basic internal measurement settings apply. Hidden settings for adjustment, custom scaling or mixing with external brightness are not applied. After changing whether the light sensor function is enabled, check the channel limits in the actual installation.

Different limits can be set for day and night. A limit set to 0 is disabled. For operation completely independent of brightness, disable both limits or use the channel's *Disable brightness threshold* object (for channel 1: CO 27). The presence object remains independent of this brightness check.

**Example:** brightness is not to be transmitted on the bus as a separate measured value, but the lighting channel should still switch on only when ambient brightness is sufficiently low. Leave the independent light sensor function disabled and set the desired upper brightness limit in the lighting channel.

### 5.3.14. Day/night switching

If switching between day and night operation via a communication object (CO) is enabled, telegram output depends on the current state of the day/night CO. When presence is detected in the detection area, telegrams are output according to the parameters configured for day or night operation.

Important: switching affects telegram output only when presence is actually detected in the monitored area. Without detected presence, no telegrams are output, even if the day/night CO is sent.

### 5.3.15. Interference with other radar (HF) sensors

Avoid mutual interference between multiple radar-based motion detectors in the same detection area. For example, if an Enertex MeTa² KNX and an Enertex ViTa KNX are in the same room, they should be

set to different detection zones. The radar frequency can be switched to one of five different ranges for this purpose. The sensor's detection range remains unchanged.

## 5.4. Alarm channel

The alarm channel of the Enertex® ViTa KNX presence detector detects movements exceeding a configurable count within a configurable time window. This channel logic reports motion as relevant only once the specified number of movements has been reached within the defined period.

This function makes motion detection more robust against random or brief disturbances, such as birds flying past a window or similar events unrelated to security. False alarms are significantly reduced and monitoring reliability is improved.

## 5.5. Rockers and buttons

### 5.5.1. Rocker covers

The devices can be fitted with one or two rockers in push-button configuration (not included). These JUNG rockers for the A or LS series are available separately from retailers.

*Table 7. Compatible rockers*

| Enertex order number | 1181-02-AR | | 1181-02-LS | |
|---|---|---|---|---|
| JUNG series | A series | | LS series | |
| | With viewing window | Without viewing window | With viewing window | Without viewing window |
| Single rocker | A 101 CO 5 xy | A 101 xy | LS 101 CO 5 xy | LS 101 xy |
| Double rocker | A 102 CO 5 xy | A 102 xy | LS 102 CO 5 xy | LS 102 xy |

A distinction must be made between rockers with and without a small central viewing window. Such a window provides a significantly stronger signal for light measurement.

### 5.5.2. Frames

A suitable frame is required in addition to the device and is not included. For the A series, the device is compatible with the Enertex® AluRa or a JUNG A-series frame. For the LS series, obtain a corresponding LS-series frame from a retailer.

*Table 8. Compatible frames*

| Enertex order number | 1181-02-AR | | 1181-02-LS |
|---|---|---|---|
| JUNG series | A series | | LS series |
| | Enertex® AluRa | JUNG A series | JUNG LS series |
| | 1178-0x-xy | AC 581 xy | LS 981 xy |
| | | AV 581 xy | LSD 981 xy |

| Enertex order number | 1181-02-AR | | 1181-02-LS |
|---|---|---|---|
| | | AS 581 xy | LSP 981 xy |
| | | A 5581 xy | LS 581 xy |

### 5.5.3. Operation

Manual operation of the device can be configured for rocker or individual button operation.

When the button function is selected, single-surface and two-surface operation are available. In single-surface operation, pressing the upper button behaves exactly like pressing the lower button. In two-surface operation, the button functions are completely independent. Up to four different button functions can therefore be configured.

### 5.5.4. Status LED

The status LED can be used flexibly, both as a separate LED indicator and to indicate rocker operation.

Operation indication

If the status LED is disabled, no operation feedback is displayed either.

- Duration:
  Operation is indicated for exactly one second.
- Trigger:
  The indication is triggered on each rising edge of a button press, regardless of whether the upper or lower button is pressed.
- Special case: status LED ON:
  If the status LED is ON via its communication object (CO), it is briefly switched off for 100 ms when a button is pressed. This confirms the operation to the user. After 100 ms, the LED returns to ON.

Behaviour in programming mode

- LED control:
  When the programming-mode buttons are operated, the LED is always switched on or reset to the value specified by the CO.

This behaviour ensures a clear and unambiguous status indication and feedback during user interaction.

## 5.6. Inputs

The device has two inputs on the rear. They can be used as binary inputs, for example to evaluate a window contact, or to evaluate operation of a conventional push button. Alternatively, each input can be used for a temperature sensor.

Edge evaluation for the inputs can be configured in the application. Any potential-free installation switch is suitable as the external contact of a binary input. The switching voltage is supplied by the

device.

## 5.7. Temperature measurement

The device has an internal sensor for measuring the current room temperature. After commissioning or a restart following a prolonged power interruption, the sensor requires approximately 30 minutes to settle before providing a stable, reliable temperature measurement. During this period, the displayed temperature may differ from the actual room temperature.

Note 1:

Use the temperature readings for control or display only after the settling period has elapsed. Take this into account particularly during commissioning or maintenance.

Note 2:

If the device restarts without a power interruption, or after only a very brief interruption, no settling process occurs.

## 5.8. Humidity measurement

The ViTa has an integrated humidity sensor. Air is a mixture of gases, including water vapour. The amount of water vapour it can contain is limited. In general, warmer air can contain more water vapour.

The measured relative humidity indicates the current water vapour content as a percentage of the maximum possible content. Since this maximum increases with temperature, relative humidity decreases as temperature rises, and vice versa. After a cold start, temperature measurement must first settle and compensate for the device's own heat. Humidity measurement therefore also requires approximately 30 minutes.

Measured values can be output directly to the bus via dedicated COs. Parameters define whether transmission is cyclic and/or on change. A threshold alarm with hysteresis also allows the value to be monitored.

## 5.9. Dew point

The device can calculate an approximate dew point. This is the temperature at which the current water vapour content reaches the maximum possible content (100 % relative humidity). The dew point is therefore the temperature at which moisture in a volume of air condenses and forms a film of water on solid surfaces when the air cools at constant pressure.

## 5.10. Light sensor

ViTa devices have a light sensor located centrally on the upper side of the device. The measurement is not calibrated and is intended as a qualitative indication only. There is no single brightness value for a room: it depends on factors such as installation position, furniture and placement of luminaires. The sensor's unit is lux. An illuminance of 1 lux corresponds to a luminous flux of 1 lumen falling uniformly

on an area of 1 $m^2$. Unlike lumens, lux takes into account the area over which the luminous flux is distributed. A candle produces approximately 12 lumens, giving approximately 1 lux at a distance of 1 m.

Light measurement provides values up to and above 30,000 lux only in direct sunlight and with rockers incorporating a small transparent viewing window.

Rockers with a viewing window (Figure 8) provide the highest light measurement accuracy and, in particular, make the status LEDs clearly visible.

The “Adjustment” parameter applies an offset, whereas scaling first multiplies the measured value. With the light sensor function enabled, the internal brightness value is calculated as follows. Any configured mixing with external brightness is taken into account additionally:

LightCO = (measured value × scaling) + adjustment



*Figure 8. Rocker with viewing window*

If a cover without a viewing window is selected, the sensor still receives residual light. Scaling in the application can be used to adjust the sensor accordingly.

The intensity of the measured residual light depends strongly on the frame colour: the darker the frame, the less light is detected. This can lead to greater measurement inaccuracies despite scaling. A black rocker without a viewing window no longer allows reliable or meaningful measurement.

The LED status indication can also distort the light measurement if its function is enabled.

Note:

A scaling factor greater than 20 causes a hardware switchover in the sensor to use the highest available measurement sensitivity. This setting is particularly recommended with dark rockers or without a viewing window in the button. In these cases, the incoming light is greatly reduced and the higher sensitivity is needed to obtain reliable readings.

Example: with a scaling factor of 20 and good illumination, the readings are generally the same as with a factor below 20. Under weak illumination, however, there is a difference: with a factor below 20, the reading may already be zero. With factor 20, the switchover still produces a non-zero value, allowing even small amounts of light to be detected.

## 5.11. Rocker and button functions

### 5.11.1. Switching

No separate feedback CO is provided for button functions. For a toggle function, use the KNX principle of a listening group address: link the status CO to the button's output. This allows the button to monitor its own switching state indirectly and provide toggling.

The button can also be configured to trigger up to four different COs depending on the number of short successive presses. The maximum permitted interval between presses is configurable in the application. With multiple presses, the action is always triggered on the falling edge, when the button is released.

The application also supports a long button press to trigger an additional, separate CO.

### 5.11.2. Dimming

Dimming supports short and long button presses. A short press sends only the switching command; a long press sends the relative dimming telegram. A press shorter than the "Time between switching and dimming" parameter always performs switching; a press equal to or longer than that time performs dimming.

### 5.11.3. Blinds

Two modes are available for blind operation:

- Short-time operation can be assigned to a short press and long-time operation to a long press.
- Short-time operation can be assigned to a long press and long-time operation to a short press.

### 5.11.4. Value transmitter (1 and 2 bytes)

The 1- and 2-byte value transmitter can output a fixed value and optionally allow adjustment by a long press. The following options are available for adjustment by a long press:

*Table 9. Starting value for long-press adjustment*

| | |
|---|---|
| As configured value | Each adjustment starts from the value assigned to a short press. |
| As value after last adjustment | The value of the last adjustment is stored in the device, shared by the upper and lower buttons of a rocker, and increased continuously. |
| As value from communication object | Each adjustment starts from the last value transmitted to the adjustment communication object. |

### 5.11.5. Controller operating mode

These parameters can be used to switch the controller's operating mode.

### 5.11.6. Recalling scenes

Scene control can optionally use a long press to store a scene. The duration of this long press is fixed at 3 seconds.

### 5.11.7. Colour control

RGB or HSV telegrams can be sent on operation.

## 5.12. Logic functions

The device provides up to eight logic functions for performing simple logical operations in a KNX installation. Logic functions can be interconnected by linking their input and output objects.

Up to two time functions can be configured independently for each logic output. They act exclusively on the “Switching” communication objects and delay the received object value depending on telegram polarity.

The logic module can therefore control timed sequences as well as logical operations.

# 6. ETS application

## 6.1. Specification

ETS: version 5.7.4 or later

## 6.2. Database file

The current ETS database file and product description are available at https://www.enertex.de/d-downloads.html.

## 6.3. Parameters

Where parameters are not self-explanatory, their descriptions are integrated into the ETS context help.

## 6.4. Communication objects

Note: depending on the configuration, some objects may not be available.

*Table 10. Communication objects*

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| 1 | Button 1 / rocker 1 (...) - output | Switching | 1-bit object for controlling a switching channel | 1 bit | 1.001 |
| | | Short-time operation | 1-bit object for short-time operation of a roller shutter/awning actuator | 1 bit | 1.007 |
| | | Value transmitter | The object adapts to the configured data type. Outputs a value. | 1 byte/ 2 bytes | 5.001<br>5.003<br>5.010<br>9.001 |

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| | | Scene | 8-bit object for controlling a scene auxiliary input | 1 byte | 18.001 |
| | | Operating mode | 8-bit object for controlling a controller auxiliary input | 1 byte | 20.102 |
| | | HSV colour | 3-byte HSV object for controlling a colour actuator | 3 bytes | 232.601 |
| | | RGB colour | 3-byte RGB object for controlling an RGB dimmer channel | 3 bytes | 232.600 |
| 2 | Button 1 / rocker 1 (...) - output | Long-time operation | 1-bit object for long-time operation of a blind actuator | 1 bit | 1.008 |
| | Button 1 / rocker 1 (...) - output | Switching, double press | 1-bit object for controlling a switching channel | 1 bit | 1.001 |
| | Button 1 / rocker 1 (...) - input | ON/OFF status | Switching status feedback for the toggle function | 1 bit | 1.001 |
| 3 | Button 1 (...) / rocker 1 (...) | Dimming | 4-bit object for controlling a dimming actuator | 4 bit | 3.007 |
| | Button 1 / rocker 1 (...) - output | Switching, triple press | 1-bit object for controlling a switching channel | 1 bit | 1.001 |
| 4 | Button 1 / rocker 1 (...) - output | Switching, quadruple press | 1-bit object for controlling a switching channel | 1 bit | 1.001 |
| 5 | Button 1 / rocker 1 (...) - output | Switching, long press | 1-bit object for controlling a switching channel | 1 bit | 1.001 |
| 6–10 | | | See CO 1 to CO 5: corresponding objects for button 2. | | |
| 11 | Status LED - input | Status LED | 1-bit CO for controlling the status LED | 1 bit | 1.001 |
| 12–21 | | | See objects 1–10: objects for buttons 3 and 4 / rocker 2 | | |
| 23 | Presence detector - input | Disable radar | 1-bit object for disabling the radar | 1 bit | 1.002 |
| 24 | Presence detector - input | Day (0) / night (1) | 1-bit object for setting the device to day or night mode | 1 bit | 1.024 |
| 25 | Presence detector - output | Presence channel 1 | 1-bit object indicating motion or presence detection independently of locking and brightness, for straightforward commissioning | 1 bit | 1.002 |
| 26 | Presence detector - input | Lock object channel 1 | Lock object for channel 1 | 1 bit | 1.003 |
| 27 | Presence detector - input | Disable brightness threshold channel 1 | 1-bit object for disabling the brightness threshold | 1 bit | 1.001 |
| 28 | Presence detector - output | Switching channel 1 | 1-bit object for controlling a switching channel | 1 bit | 1.001 |

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| | | Dimming channel 1 | 4-bit object for controlling a dimming actuator | 4 bit | 3.007 |
| | | Long-time operation channel 1 | 1-bit object for long-time operation of a blind actuator | 1 bit | 1.008 |
| | | Short-time operation channel 1 | 1-bit object for short-time operation of a roller shutter/awning actuator | 1 bit | 1.007 |
| | | Value transmitter channel 1 | The object adapts to the configured data type. Outputs a value. | 1 byte/ 2 bytes | 5.001<br>5.003<br>5.010<br>9.001 |
| | | Scene channel 1 | 8-bit object for controlling a scene auxiliary input | 1 byte | 18.001 |
| | | Operating mode channel 1 | 8-bit object for controlling a controller auxiliary input | 1 byte | 20.102 |
| | | Colour channel 1 | 3-byte colour object; RGB or HSV depending on configuration. | 3 bytes | 232.600 (RGB) + 232.601 (HSV) |
| 29–31 | | | See CO 28: corresponding objects for telegrams 2–4 of the channel. | | |
| 32–45 | | | See CO 25 to CO 28 and telegrams 2–4: corresponding objects for channels 2 and 3. | | |
| 46 | Presence detector – input | Presence slave channel 1 | Each new telegram with value 1 activates the channel or restarts its off-delay. Telegrams with value 0 do not end the off-delay. See Section 5.3.6. | 1 bit | 1.001 |
| 47 | Presence detector – input | Presence slave channel 2 | Each new telegram with value 1 activates the channel or restarts its off-delay. Telegrams with value 0 do not end the off-delay. See Section 5.3.6. | 1 bit | 1.001 |
| 48 | Presence detector – input | Presence slave channel 3 | Each new telegram with value 1 activates the channel or restarts its off-delay. Telegrams with value 0 do not end the off-delay. See Section 5.3.6. | 1 bit | 1.001 |
| 50 | Presence detector - input | Calibration start | Details of the function, sequence and diagnostic outputs are provided in Section 6.4.1. | 1 bit | 1.017 |
| 51 | Presence detector - output | Calibration status | Details of the function, sequence and diagnostic outputs are provided in Section 6.4.2. | 1 bit | 1.002 |
| 52 | Presence detector - output | Calibration Debug 1 | Details of the function, sequence and diagnostic outputs are provided in Section 6.4.3. | 14 bytes | 16.000 |
| 53 | Presence detector - output | Calibration Debug 2 | Details of the function, sequence and diagnostic outputs are provided in Section 6.4.4. | 14 bytes | 16.000 |

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| 65 | Input 1 (...) - output | Value | If input 1 on the rear of the device is configured as a push button, the CO is 1 bit and indicates the switch state.<br><br>If the input is configured to evaluate a remote temperature sensor, the CO is a 16-bit floating-point value representing the currently measured temperature. | 1 bit/ 2 bytes | 1.001<br>9.001 |
| 66 | Input 2 (...) - output | Value | If input 2 on the rear of the device is configured as a push button, the CO is 1 bit and indicates the switch state.<br><br>If the input is configured to evaluate a remote temperature sensor, the CO is a 16-bit floating-point value representing the currently measured temperature. | 1 bit/ 2 bytes | 1.001<br>9.001 |
| 70 | Alarm - output | Alarm | 1-bit CO triggered when the number of detected movements exceeds the configured count within the configured time window. | 1 bit | 1.005 |
| 71 | Alarm - input | Alarm lock object | Lock object for the alarm. | 1 bit | 1.003 |
| 72 | Alarm - input | Reset | 1-bit CO for resetting the alarm. | 1 bit | 1.015 |
| 74 | Brightness - input | External brightness | 16-bit floating-point object representing brightness from another KNX measurement point. | 2 bytes | 9.004 |
| 75 | Temperature - output | Actual temperature | 16-bit floating-point object outputting the mixed temperature calculated from all temperatures according to the settings on the Measured values tab. This temperature also serves as the controller's input value. | 2 bytes | 9.001 |
| 76 | Temperature - output | Internal temperature | 16-bit floating-point object outputting the currently measured internal temperature. | 2 bytes | 9.001 |
| 77 | Temperature - input | External temperature | 16-bit floating-point object representing a temperature from another KNX measurement point. | 2 bytes | 9.001 |
| 78 | Humidity - output | Internal humidity | 16-bit floating-point object outputting the currently measured internal relative humidity. | 2 bytes | 9.007 |
| 79 | Threshold alarm - output | Humidity alarm | 1-bit CO triggered when the configured threshold is exceeded. | 1 bit | 1.005 |
| 80 | Dew point - output | Dew point | 16-bit floating-point object outputting the current dew point. | 2 bytes | 9.001 |
| 81 | Threshold alarm - output | Dew point alarm | 1-bit CO triggered when the configured threshold is exceeded. | 1 bit | 1.005 |
| 82 | Brightness - output | Internal brightness | 16-bit floating-point object outputting the internally measured brightness. | 2 bytes | 9.004 |
| 83 | Threshold alarm - output | Brightness alarm | 1-bit CO triggered when the configured threshold is exceeded. | 1 bit | 1.005 |
| 84 | Brightness - output | Actual brightness | Mixed brightness from the internal and external brightness values according to the settings on the Measured values tab. | 2 bytes | 9.004 |

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| 85 | Passage counter - output | Incoming | 4-byte CO for the count of incoming people | 4 bytes | 13.001 |
| 86 | Passage counter - output | Outgoing | 4-byte CO for the count of outgoing people | 4 bytes | 13.001 |
| 87 | Passage counter - output | Difference | 4-byte CO for the difference between incoming and outgoing people | 4 bytes | 13.001 |
| 88 | Passage counter - input | Reset | 1-bit trigger for resetting the passage counters | 1 bit | 1.015 |
| 100 | Logic 1 (...) | Logic gate input 1 | 1-bit object as input 1 of a logic gate (1...8). The input state can optionally be inverted. This object is available only if the logic function type is set to “Logic gate” and input 1 is used. | 1 bit | 1.002 |
| | | Converter lock function | 1-bit object as the input of a converter. It is configurable whether the converter responds to both ON and OFF commands or processes only ON or only OFF telegrams. This object is available only if the logic function type is set to “Converter”. | 1 bit | 1.002 |
| | | Blocking element lock function | 1-bit object as the input of a blocking element. This object is available only if the logic function type is set to “Blocking element”. | 1 bit | 1.002 |
| | | Comparator input | 4-byte object as the input of a comparator. This object is available only if the logic function type is set to “Comparator” and the data format to “4-byte value -2147483648...2147483647 (DPT 13.001)”. | 4 bytes | 13.001 |
| | | Threshold switch input | 4-byte object as the input of a threshold switch. This object is available only if the logic function type is set to “Threshold switch” and the data format to “4-byte value -2147483648...2147483647 (DPT 13.001)”. | 4 bytes | 13.001 |
| 101 | Logic 1 (...) | Logic gate input 2 | 1-bit object as input 2 of a logic gate (1...8). The input state can optionally be inverted. This object is available only if the logic function type is set to “Logic gate” and input 2 is used. | 1 bit | 1.002 |
| | | Converter input | 1-bit object as the lock input of a converter. A locked converter no longer processes input states and therefore produces no new output values. The last value is retained and, if configured, transmitted repeatedly at cyclic intervals. Telegram polarity is configurable. This object is available only if the logic function type is set to “Converter”. | 1 bit | 1.002 |

| ID | Name | Object function | Description and enabling | Length | DPT |
|---|---|---|---|---|---|
| | | Blocking element input | 1-bit object as the lock input of a blocking element. A locked blocking element no longer passes input states to the filter and therefore produces no new output values. The last value is retained and, if configured, transmitted repeatedly at cyclic intervals. Telegram polarity is configurable. This object is available only if the logic function type is set to “Blocking element”. | 1 bit | 1.002 |
| 102 | Logic 1 (...) | Logic gate input 3 | 1-bit object as input 3 of a logic gate (1...8). The input state can optionally be inverted. This object is available only if the logic function type is set to “Logic gate” and input 3 is used. | 1 bit | 1.002 |
| 103 | Logic 1 (...) | Logic gate input 4 | 1-bit object as input 4 of a logic gate (1...8). The input state can optionally be inverted. This object is available only if the logic function type is set to “Logic gate” and input 4 is used. | 1 bit | 1.002 |
| 104 | Logic 1 (...) | Logic gate output | 1-bit object as the output of a logic gate (1...8). This object is available only if the logic function type is set to “Logic gate”. | 1 bit | 1.002 |
| | | Converter output | 1-byte object as the value output of a converter. This object is available only if the logic function type is set to “Converter”. | 1 byte | 5.001 |
| | | Blocking element output | 1-bit object as the output of a blocking element. This object is available only if the logic function type is set to “Blocking element”. | 1 bit | 1.002 |
| | | Comparator output | 1-bit object as the output of a comparator. The output object is fixed at 1 bit (DPT 1.002) and outputs the comparison result (ON = true / OFF = false). This object is available only if the logic function type is set to “Comparator”. | 1 bit | 1.002 |
| | | Threshold switch output | 1-bit object as the output of a threshold switch. The output object is fixed at 1 bit (DPT 1.002) and outputs the threshold evaluation result (ON = true / OFF = false). This object is available only if the logic function type is set to “Threshold switch”. | 1 bit | 1.002 |
| 105–139 | | | See CO 100–104: objects for logic functions 2–8 | | |

### 6.4.1. Calibration start

The following table explains CO 50.

| Aspect | Description |
|---|---|
| Value 1: start | Calibration starts once the device has settled for long enough (at least 90 s after startup). Otherwise, it aborts with an error status; CO 52 reports **`Cal: Wait 90s`**. Start again after at least 90 s of operation. Any existing valid calibration is retained. |
| Sequence | The total duration is 140 s: 20 s of preparation followed by 120 s of calibration measurement. Preparation is marked with **`W`** and is not part of the measurement duration. Once all measured quantities are available, CO 52 and CO 53 cyclically transmit diagnostic values at 10 s intervals. |
| Abort | Calibration is aborted if the signal is too strong, measurement data is missing, or a filter or storage error occurs. CO 52 reports the cause with guidance for the user (see CO 52); the application status indicates a limit error. New calibration values are not applied. The start object is set to 0 and transmitted. |
| Successful completion | The new calibration values are applied. CO 53 marks the calibration value output with **`CL`** and the threshold output following 1 s later with **`LI`**. The start object is set to 0 and transmitted. |
| Value 0: measurement mode | The fast diagnostic maximum and event flags are reset. CO 52 reports **`Start Meas.`**. Measurement and diagnostic values are then output on CO 52 and CO 53 at 10 s intervals for 60 s. This diagnostic mode does not start calibration. |

Calibration from older firmware using maximum-based calibration is incompatible with the new method. Until a new empty-room calibration is performed, the device uses default thresholds; CO 51 reports 0.

### 6.4.2. Calibration status

The following table explains CO 51.

| Aspect | Description |
|---|---|
| Values | 1: a valid calibration is stored or loaded.<br>0: no valid calibration is available. |
| After restart | The object is not sent spontaneously after the stored calibration data has been loaded. |
| Events | After calibration is saved successfully, 1 is transmitted. After calibration is deleted or becomes invalid, 0 is transmitted. Output is event-driven, not cyclic. |
| Diagnostics | The object describes the validity of the stored calibration. Calibration in progress or a limit error does not immediately change this state. A previously valid calibration can therefore still be indicated by 1 after a new calibration attempt fails. |

### 6.4.3. Calibration Debug 1

The following table explains CO 52. The service outputs refer to the far zone. Evaluation is not required for normal operation.

| Aspect | Description |
|---|---|
| Format | Text containing 14 characters (DPT 16.000). Shorter messages are padded with spaces on the right; these spaces are omitted from the examples. Levels are absolute Enertex-specific diagnostic values without additional display scaling. F is rounded to three digits (000 to 999), S and A to four digits (0000 to 9999). Larger values are limited to the respective display maximum. `---` or `----` indicates that no valid measurement is available. This limiting affects the display only. |
| Restart | At device startup, the firmware and radar identifiers are output once, for example `FW 3.001 R02`. The message uses 12 of the 14 characters and is replaced by subsequent diagnostic output. |
| Live output | `F045 H1 N1 R2` (example). `F045` means that the highest valid fast motion level within the output interval is 45. Brief peaks are retained until cyclic measurement output. During measurement or calibration, cyclic output normally occurs every 10 s. H/N/R describe the slow ranges; their meanings and codes are listed in Table 11. |
| Measurement intervals | The F maximum is reset when measurement or calibration starts and after each cyclic measurement output. The slow levels S and A on CO 53 show the last valid decision values. N/R are reset after cyclic output and at measurement start; a filter/processing reset also clears them. A read request on CO 53 displays the values without clearing the maximum or event flags. The CL and LI calibration blocks contain stored values or thresholds and are not treated as measurement maxima. Maximum tracking serves only the display and does not change detection. |
| Permission to maintain presence | A range is activated by its own ON threshold and released when it falls below its own OFF threshold. An activated range may only extend an already active detector channel whose off-delay exceeds 30 s. H therefore does not indicate a channel's switching state. N can indicate a brief activation even though H has already returned to 0. R can indicate a release even though the range has since been activated again. |
| Calibration and measurement mode | When started via CO 50 with value 1, `Start cal.` appears. With value 0, `Start Meas.` appears, followed by diagnostic values every 10 s for 60 s. If an error occurs, one of the following messages appears; they do not contain internal development data. |
| `Cal: Wait 90s` | The device is not yet ready. Wait at least 90 s after device startup and start calibration again. |
| `Cal: Signal!` | The radar signal was too strong during measurement. Leave the detection area, stop moving objects and start calibration again. This message does not distinguish between motion and other signal interference. |
| `Cal: Repeat` | A complete, valid calibration measurement could not be finished. Leave the radar switched on and start calibration again. Contact service if the error recurs. |
| `Cal: Storage` | The calibration data could not be reliably saved or reset. Repeat the procedure; contact service if the error recurs. A previously valid calibration remains active during operation, but its retention across a restart is not guaranteed after a storage error. |

| Aspect | Description |
|---|---|
| Read request | With valid calibration, a read request on CO 52 first outputs the calibration block, marked **CL** on CO 53. After 1 s, the threshold block follows with **LI**. Each block contains two text telegrams, one on Debug 1 and one on Debug 2. Further read requests during this sequence do not start a new output; read again after completion if necessary. For current measurements, read CO 53 instead. Reading does not change detection. |
| Calibration block CL | **F100S0100A0090** (example): F is the fast calibration value; S and A are the calibration values for the slow OFF thresholds. The corresponding slow ON calibration values are on Debug2. Calibration values come from the active stored data set. |
| Threshold block LI | **F152S0113A0097** (example): F is the effective fast motion threshold; S and A are the effective slow OFF thresholds. The slow ON thresholds are on Debug2. These thresholds include all safety and scaling factors. |
| No calibration | Without valid calibration, both diagnostic objects respond with **no Cal.**. Operation then uses default thresholds. |

S denotes the upper diagnostic range (micro-movements), A the lower diagnostic range (breathing range). These values do not prove any particular bodily movement or breathing. Local CFAR thresholds and CFAR parameters are not output.

*Table 11. Range codes in the Debug 1 live output*

| Field or code | Meaning |
|---|---|
| H | Currently activated slow ranges (permission to maintain presence). |
| N | Ranges newly activated since the last cyclic output. An activation that has already ended also remains recorded until output. |
| R | Ranges released since the last cyclic output by falling below their respective OFF thresholds. A subsequent reactivation does not clear this flag. |
| 0 | Neither range. |
| 1 | Lower range A only (breathing range). |
| 2 | Upper range S only (micro-movements). |
| 3 | Both ranges A and S. |
| - | The state is unavailable because valid slow measurements are missing. |

**Example:** in `F045 H1 N1 R2`, A is currently activated (`H1`) and was newly activated within the output interval (`N1`). S was released within the same interval (`R2`). In `F045 H0 N1 R1`, neither range is currently activated, but A was activated and released again between two outputs. Brief state changes thus remain visible in diagnostics.

H/N/R refer to the slow ranges. They show neither the lighting's switching state nor directly whether a room is empty or occupied. Actual channel telegrams additionally depend on detection, off-delay, locking and brightness conditions.

### 6.4.4. Calibration Debug 2

The following table explains CO 53. The information complements CO 52 and refers to the far zone.

| Aspect | Description |
|---|---|
| Purpose | Additional service and diagnostic outputs for calibration as text containing 14 characters (DPT 16.000), padded with spaces on the right if required. **SSSS** denotes the upper range (micro-movements), **AAAA** the lower range (breathing range). All levels are absolute four-digit diagnostic values without additional display scaling. Larger values are limited to **9999**; unavailable or outdated decision values appear as **----**. |
| During preparation | **SSSS:AAAA WCCC**, for example **0099:0123 W020**. CCC is solely the remaining preparation time. The 120 s calibration measurement starts afterwards. |
| During measurement | **SSSS:AAAA CCC**, for example **0099:0123 120**. CCC is the remaining measurement time in seconds (120 to 000). The readings are the last valid slow decision values, not final calibration values. |
| Without calibration in progress | **SSSS:AAAAESB**, for example **0099:0123ES-**. SSSS/AAAA are the last valid slow decision values from the same evaluation, not maxima of the output interval. Outdated or invalid values appear as **----**. The three status positions immediately follow the levels; their meanings are explained in Table 12. Brief drops below thresholds between telegrams are additionally indicated by release flag R on CO 52. |
| Calibration values | **SSSS:AAAA CL**, for example **0120:0100 CL**. Stored calibration values for both ON thresholds, output on a read request to Debug1. The OFF calibration values are in the associated Debug1 telegram. |
| Thresholds | **SSSS:AAAA LI**, for example **0142:0112 LI**. The effective ON thresholds follow 1 s after CL. The OFF thresholds are in the associated Debug1 telegram. |
| Read request on Debug2 | A read request on CO 53 produces current live outputs on both diagnostic objects: here, the last slow decision values and status characters; on CO 52, the fast maximum accumulated so far and H/N/R. Reading resets neither the fast maximum nor event flags. During calibration, its countdown replaces the status characters. A CL/LI output sequence already in progress is not interrupted; read again after completion if necessary. |
| No calibration | A read request on Debug1 without valid calibration outputs **no Cal.** on both diagnostic objects. |

*Table 12. Status characters in the Debug 2 live output*

| Position | Character | Meaning |
|---|---|---|
| 1 | E or - | At least one slow ON condition has been fulfilled since the last cyclic output (evidence). Event flag. |
| 2 | S or - | The slow internal presence state is currently valid, including its internal hold time (stable). Current state. |
| 3 | B or - | A fast motion trigger has occurred since the last cyclic output. Event flag. |

Unset characters appear as `-`. The former C for a separate spectral-maximum excitation is no longer used. If valid slow values are missing, positions E and S also appear as `-`; a stored fast trigger can still appear as B.

**Example:** `0099:0123ES-` shows upper level 99 and lower level 123. A slow ON condition was fulfilled within the output interval and the slow internal presence state is still valid. No fast motion trigger is recorded in this interval. S in the second status position is a state character and must be distinguished from the upper level field SSSS.

Slow detection only extends an already active channel with an off-delay exceeding 30 s. Internal state S and range activation H on CO 52 therefore do not equate to a switching telegram. The off-delay configured by the user runs separately.

# 7. Technical data

| | |
|---|---|
| Current consumption | Typ. 15 mA at 29 V<br><br>Type 5.1 connector |
| Proximity sensor / motion detector | 60 GHz radar with 10 CW modulation frequencies |
| Rockers | 2 mechanical rockers; individual button operation possible |
| Connections | 2 external temperature/binary inputs: supplied by the Enertex® ViTa presence detector |
| Housing | • Housing front suitable for JUNG LS Design or A series, depending on variant<br>• Plastic rear panel<br>• Fits a standard flush-mounting box<br>• Compatible frames: AluRa by Enertex Bayern GmbH, JUNG LS Design or A series |
| General | For use in dry indoor rooms only.<br><br>Ambient temperature: -5 ... +45 °C<br><br>Degree of protection IP20<br><br>Protection class III |
| Sensors | Temperature<br><br>Humidity<br><br>Light intensity<br><br>Motion and presence |