
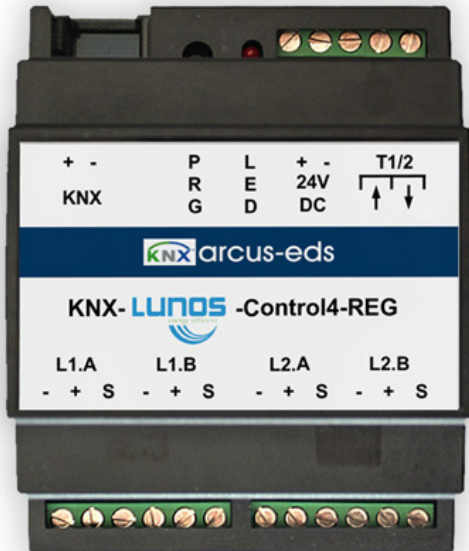


Domestic ventilation with heat recovery - KNX-LUNOS-CONTROL4

KNX-LUNOS-CONTROL4-IW	KNX-LUNOS-CONTROL4-REG
65001002	65001004
	
Flush assembly in the dry indoor area IP20	DIN rail mounting in the dry indoor area 4 units , IP20

Content	
Device description	Application description
ETS Parameters and objects	Technical specifications
Commissioning	Imprint

1. Device description



The KNX-LUNOS-Control4 module enables control of the decentralized Ventilation devices from Lunos (www.lunos.de) via the KNX-BUS.

- Ventilation devices of the series e2 , ego and nexxt with heat recovery
- Ventilation devices Silvento (FK, EC, 30/60/100), Ra 15-60, ACM-Modul or 0..12V as pure exhaust air fans.

Up to 4 ventilation devices can be operated with a module. Several modules are networked via the KNX bus to enable a coordinated operation. Direct control of the ventilation devices can be carried out via the existing button / switch inputs.

The devices have an integrated KNX bus coupling unit and require an auxiliary voltage. KNX sensors are set up using the ETS (Tool Software) with the associated application program. The device is delivered unprogrammed.

Connection variants	
1x e2	
2x e2 same type	both pairs run synchronously
1x e2 + 1x exhaust fan	
1x e2 + 2x exhaust fan same type	both fans run synchronously
1x ego	
2x ego	both pairs run synchronously
1x ego + 1x exhaust fan	
1x ego + 2x exhaust fan same type	both fans run synchronously
1x nexxt	
2x nexxt	both run synchronously
1x nexxt + 1x exhaust fan	
1x nexxt + 2x exhaust fan same type	both fans run synchronously
1x exhaust fan	
2x exhaust fan same type	both fans run synchronously

1.1 KNX-LUNOS-CONTROL4-IW for inwall mounting

KNX-LUNOS-CONTROL4-IW	
Protection class	IP20
Operating voltage	KNX 21 .. 32V DC
Auxiliary voltage	24-32V/20W DC
KNX load	10mA
Ambient temperature	storage -20 .. +85°C operation -5 .. +45°C

KNX-LUNOS-CONTROL4-IW	
Dimensions	50 x 50 x 20mm (B x H x T) 58mm Diagonal
Article number	65001002
ETS-Application	Arcus_Lunos_Ex_v5.knxprod

1.2 KNX-LUNOS-CONTROL4-REG for DIN-rail mounting

KNX-LUNOS-CONTROL4-REG	
Protection class	IP20
Versorgungsspannung	KNX 21 .. 32V DC
Hilfsspannung	24-32V/20W DC
KNX Last	10mA
Ambient temperature	storage -20 .. +85°C operation -5 .. +45°C
Dimensions	DIN-rail housing 4 Units (72 mm)
Article number	65001004
ETS-Application	Arcus_Lunos_Ex_v5.knxprod

Under no circumstances may the modules be connected to mains voltage potential.

No mains voltage potential may be carried in the flush -mounted socket used.

The installation may only be carried out by a specialist.

The KNX module **KNX-LUNOS-Control4-iW** has in a plastic housing that can be used in a standard flush-mounted socket. A standard cover is used to cover the flush -mounted box. If there is sufficient mounting depth, a button / switch can also be used whose potential-free contacts are connected to the button / switch inputs of the module.

The KNX module **KNX-LUNOS-CONTROL4-REG** has a plastic housing with 4 division units for assembly on a DIN-rail.

2. Application description



2.1 Mode of operation and areas of application

The KNX-LUNOS-Control4 module enables control of the decentralized ventilation devices of the company Lunos (www.lunos.de) via the KNX-BUS.

- Ventilation devices of the series **E2** , **Ego** and **NEXXT** with heat recovery
- Ventilation devices **Silvento (FK, EC, 30/60/100)**, **Ra 15-60**, **ACM-Modul** or **0..12V** As pure exhaust air fans

Up to 4 ventilation devices can be operated with a module. Several modules can be networked via the KNX bus to enable a coordinated operation in a master/slave network. The supply voltage of the fans E² and Ego is generated in the module from an external auxiliary voltage.

Direct control of the ventilation devices can be carried out via the existing button / switch inputs. The KNX module KNX-LUNOS2-Control4 is commissioned via the ETS in connection with the associated Application program. The devices are unprogrammed in the delivery state. All functions are parameterized and programmed via the ETS.

2.2 Functions

- Voltage supply of the fans from low voltage 24..32VDC
- Operation of 2 pairs of fans (4 fans) with one module
- Several modules cascable (Master/Slave -operation)
- Control of the fan stages and directions as well as heat recovery
- Manual setting of the fan stages via button / switch inputs or KNX telegrams
- Control of fan speed and heat recovery depending on:
 - Air humidity relative (inside) for moisture removal
 - Air humidity absolutely (inside / outside) for basement drying
 - Temperature (inside) for building protection
 - Temperature (inside / outside) to optimize heat recovery
 - Temperature (inside / outside / should) for heating / cooling support
 - CO2 concentration
- The values temperature (inside / outside), humidity and CO2 concentration must be provided from other KNX components (For example SK10-THC for the outdoor area , SK30-THC-CO2 for indoor use).
- Supply air operation to support separate exhaust air devices
- Exhaust air operation (in combination and individually)
- Compensation of line resistances (in the event of large line lengths) possible
- Operation in HVAC mode according to KNX standard
- Operating modes:
 - Comfort mode (HVAC)
 - Standby mode (HVAC)

- Night(Eco) mode (HVAC)
- Temperature protection operation (HVAC)
- Intense ventilation (Extended HVAC mode)
- Calm mode (Off) (Extended HVAC mode)
- Summer mode (switch control object)
- Night mode (switch control object)

All HVAC-modes are freely configurable in the expert settings

- Ventilation:
 - Stage 0..3
 - Summer mode (switch control object)

All stage settings can be freely configured in the expert settings.

- Automatic filter change alert when the changing/cleaning time is reached
- The filter change has to be acknowledged to reset the filter change alarm
- Instead of a second pair of fans, a suitable Silvento exhaust fan can also be used

3. Parameters and Objects



Functional blocks		
Configuration	HVAC setup	HVAC modes
Ventilation mode setup	Ventilation modes	Fans
System	Exhaust	Potential free contacts
Lead temperature	Lead humidity	Lead CO2
Priorities of objects		

3.1 Functional block configuration

Configuration	Configuration	Basic/Master
Lead Temperature	Fan Type	E ²
Lead Humidity	Operation Setup	<input checked="" type="radio"/> HVAC Mode <input type="radio"/> Ventilation Mode
Lead CO2	DPT for Stagecontrol	<input type="radio"/> Fan Scale [0-100%] <input checked="" type="radio"/> Fan Stage [0-3]
Dry Contacts (Pushbutton)	Lead Functions	
Fan	Temperature	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
System	Humidity	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
	CO2	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
	Dry Contacts	
	Selection	Pushbutton
	General Overwrite	
	Timeout [min]	30

Functional block configuration - Parameters

- **Configuration**

- Basic/Master
Standard setting for stand-alone application with all the usual default settings
- Basic/Master + Exhaust Standard setting for stand-alone application with all the usual default settings.
The pair 2 is operated in exhaust air mode.

- Basic/Slave
Minimum configuration, the module is controlled by another module (in master mode).
- Basic/Slave + Abluft
As Basic/Slave, the pair 2 is operated in exhaust air mode.
- Expert/***
Like basic configurations, but with additional parameters (functional block HVAC).
- **Fan type**
 - E² (NEO / SHORT / USA / SHORT USA / MINI / 60)
 - EGO
 - NEXXT
- **Operating modes**
 - HVAC mode Operation via HVAC-compliant data points
 - Ventilation mode Operation via fan levels 0 .. 3
- **DPT for ventilation control**
 - Fan scale [0..100%]
KNX compliant
 - Fan stages [0-3]
- **Lead functions** Only in the .../master ... configurations
 - Temperature
 - Inactive/Active
(de)activates the lead temperature calculation
 - Humidity
 - Inactive/Active
(de)activates the lead humidity calculation
 - CO₂
 - Inactive/Active
(de)activates the lead CO₂ calculation
- **Potential free contacts**
 - Inactive
 - Push button
Integration of an external pair of contact as push button
 - Switch
Integration of an external pair of contact as a switch
 - Switch without internal use Integration of an external pair of contact as a switch for any use in the KNX system
- **Standard running time** [min] only in the basic/master ... configuration
 - 0 .. 240
Standard running times for manual changes to the HVAC operating modes. After this time, it will be switched back to the standard operation mode.
0 means infinite running time.

3.2 Functional block HVAC

This parameter block is only active if an Expert/Master configuration is selected and HVAC mode is active.

Configuration	Default Mode	Standby
HVAC Settings		
Comfort Mode	Overwrite 1-3	
Standby Mode	Priority	<input checked="" type="radio"/> Equal <input type="radio"/> Hierarchically 1-3
Eco/Night Mode	OW 1 Mode	Intense Ventilation
Protection Mode	Timeout [min]	30
Intense Ventilation Mode	OW 2 Mode	Silence
Temperature Reduction Mode	Timeout [min]	30
Silence Mode	OW 3 Mode	Comfort
	Timeout [min]	30

Functional block HVAC - Parameters

- **Default operation mode**

- Comfort
- Standby
- Eco/Night
- Building protection

Determines which operating mode is chosen if automatic HVAC mode not used.

Default: Standby

- Force objects 1 - 3

- **Priority**

- Equal

When setting „Equal“ is chosen the new operating mode becomes active immediately, the other two force objects are deactivated.

- Hierarchical 1-3

In the hierarchical setting, operating mode 1 has the lowest and operating mode 3 the highest priority.

See also 3.14 priorities

- **Operation mode 1**

- Comfort
- Standby

- Eco/Night
- Building protection
- Intense ventilation
- Temperature reduction
- Silence mode
Determines which operating mode is selected with object 3.
Default: Intense ventilation
- **Running time** [min] (For operating mode 1)
 - 0 .. 240 Time control Object 3:
After 1 .. 240 minutes, the control goes back to the default operation.
0 means without automatic timeout
- **Operation mode 2**
 - Comfort
 - Standby
 - Eco/Night
 - Building protection
 - Intense ventilation
 - Temperature reduction
 - Silence mode
Determines which operating mode is selected with object 4.
Default: Silence mode
- **Running time** [min] (For operating mode 1)
 - 0 .. 240 Time control Object 4:
After 1 .. 240 minutes, the control goes back to the default operation.
0 means without automatic timeout
- **Operation mode 3**
 - Comfort
 - Standby
 - Eco/Night
 - Building protection
 - Intense ventilation
 - Temperature reduction
 - Silence mode
Determines which operating mode is selected with object 5.
Default: Intense ventilation
- **Running time** [min] (For operating mode 1)
 - 0 .. 240 Time control Object 5:
After 1 .. 240 minutes, the control goes back to the default operation.
0 means without automatic timeout

Functional block HVAC - KNX-Objects

Obj	IO	Name	Function	Datapoint type
0	Input	Operation mode	The HVAC operating mode is set centrally or via a switching clock	DPT 20.102
1	Input	Force mode	Overlays automatic mode for the parameterized time	DPT 20.102
2	Input	Night mode	Overlays automatic mode (without automatic process)	DPT 1.003

Objects in configuration Basic/Master

Obj	IO	Name	Function	Datapoint type
3	Input	Intense ventilation	Overlays automatic mode with Intense ventilation	DPT 1.003
4	Input	Silence	Overlays automatic mode with Silence mode	DPT 1.003
5	Input	Comfort	Overlays automatic mode with Comfort mode	DPT 1.003

Objects in configuration Expert/Master

Obj	IO	Name	Function	Datapoint type
3	Input	HVAC operation mode 1	Overlays automatic mode with HVAC operation mode 1	DPT 1.003
4	Input	HVAC operation mode 2	Overlays automatic mode with HVAC operation mode 2	DPT 1.003
5	Input	HVAC operation mode 3	Overlays automatic mode with HVAC operation mode 3	DPT 1.003

3.3 Functional block HVAC operation mode

This functional block is only active if an Expert/Master configuration is selected and HVAC mode is active.

Configuration	Fan Stage	Stage 2
- HVAC Settings	Lead Controlled	
Comfort Mode	Lead Temperature	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Standby Mode	Protection	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Eco/Night Mode	Lead Humidity	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Protection Mode	Humidity Removal	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Intense Ventilation Mode	Lead CO2	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Temperature Reduction Mode	Sommer Mode	by Object
Silence Mode	Interval Mode	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Lead Temperature		

Functional block HVAC operation mode - Parameters

- **Comfort mode** and
- **Standby mode** and
- **Eco-/Night mode** and
- **Building protection** and
- **Intense ventilation** and
- **Temperature reduction** and
- **Silence**
 - **Fan stage**
 - Stage 0..3
Selected fan stage in this operating mode.
 - **Lead Temperature**
 - Inactive/Active
Switching summer operation / heat recovery depending on the inside / outside / target temperature
 - **Building protection**
 - Inactive/Active
Temperature protection, shutdown if the internal temperature is too low.
 - **Lead humidity**

- Inactiv/Active
Increase in the fan level at a high relative air humidity.
- **Humidity reduction**
 - Inactiv/Active
Moisture protection, basement ventilation depending on the absolute inner moisture and absolute exterior moisture.
- **Lead CO2**
 - Inactiv/Active
Increase of the fan level with low air quality.
- **Summer mode**
 - Inactiv
No summer operation mode
 - Via object
Switching summer operation mode via object 9
 - Continuous operation
Summer operation static
- **Interval operation**
 - Inactiv/Activ
Switch the fans in intervals for a fixed time.

3.4 Functional block fan stage setup

This parameter block is only active if an Expert/Master configuration is selected and ventilation mode is active.

Configuration	Default Mode	Stage 1
- Ventilation Settings		
Setup	Overwrite 1-3	
Stage Off	Priority	<input checked="" type="radio"/> Equal <input type="radio"/> Hierarchically 1-3
Stage 1	OW 1 Mode	Stage 3
Stage 2	Timeout [min]	30
Stage 3	OW 2 Mode	Off
Lead Temperature	Timeout [min]	30
Lead Humidity	OW 3 Mode	Stage 2
	Timeout [min]	30

Functional block fan stage - Parameters

- **Standard operation mode**

- Stage 0/Off
- Stage 1
- Stage 2
- Stage 3

Defines which stage is chosen in standby (0 on object 0).

Default: Stage 1

- Force objects 1 - 3

- **Priority**
- Equal

When setting „Equal“ is chosen the new operating mode becomes active immediately, the other two force objects are deactivated.

- Hierarchical 1-3

In the hierarchical setting, operating mode 1 has the lowest and operating mode 3 the highest priority.

See also 3.14 priorities

- **Operating mode 1**

- Stage 0/Off
- Stage 1

- Stage 2
- Stage 3
 - Determines which operating mode is selected with object 3.
 - Default: Stage 3
- **Run time** [min] (für Operating mode 1)
 - 0 .. 240 Time control for Object 3:
 - After 1 .. 240 minutes, the control goes back to the default operation.
 - 0 means without automatic timeout
- **Operating mode 2**
 - Stage 0/Off
 - Stage 1
 - Stage 2
 - Stage 3
 - Determines which operating mode is selected with object 4.
 - Default: Stage 0/Off
- **Run time** [min] (für Operating mode 2)
 - 0 .. 240 Time control for Object 4:
 - After 1 .. 240 minutes, the control goes back to the default operation.
 - 0 means without automatic timeout
- **Operating mode 3**
 - Stage 0/Off
 - Stage 1
 - Stage 2
 - Stage 3
 - Determines which operating mode is selected with object 5.
 - Default: Stage 2
- **Run time** [min] (für Operating mode 3)
 - 0 .. 240 Time control for Object 5:
 - After 1 .. 240 minutes, the control goes back to the default operation.
 - 0 means without automatic timeout

Functional block fan stage - KNX-objects

Obj	IO	Name	Function	Datapoint type
0	Input	auto fan stage	The fan stage is set centrally or via a switching clock	DPT 5.100 oder 5.001
1	Input	Stage overlay	Overlays automatic mode for the parameterized time	DPT 5.100 oder 5.001

Objects in configuration Basic/Master

Obj	IO	Name	Function	Datapoint type
3	Input	Overlay Stage 3	Overlays automatic mode with Stage 3	DPT 1.003
4	Input	F Stage Off	Overlays automatic mode with Stage 0/Aus	DPT 1.003
5	Input	Overlay Stage 2	Overlays automatic mode with Stage 2	DPT 1.003

Objects in configuration Expert/Master

Obj	IO	Name	Function	Datapoint type
3	Input	Overlay 1	Overlays automatic mode with Operating mode 1	DPT 1.003
4	Input	Overlay 2	Overlays automatic mode with Operating mode 2	DPT 1.003
5	Input	Overlay 3	Overlays automatic mode with Operating mode 3	DPT 1.003

3.5 Functional block fan stage operating modes

This functional block is only active if an Expert/Master configuration is selected and ventilation mode is active.

Configuration	Lead Controlled	
– Ventilation Settings	Lead Temperature	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Setup	Protection	<input type="radio"/> Inactive <input checked="" type="radio"/> Active
Stage Off	Lead Humidity	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Stage 1	Humidity Removal	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Stage 2	Lead CO2	<input checked="" type="radio"/> Inactive <input type="radio"/> Active
Stage 3	Sommer Mode	by Object ▼
Lead Temperature	Interval Mode	<input checked="" type="radio"/> Inactive <input type="radio"/> Active

Functional block fan stage operating modes - Parameters

- **Stage 0/Off** and
- **Stage 1** and
- **Stage 2** and
- **Stage 3**
 - **Fan stage**
 - Stage 0..3
Chosen fan stage in this operating mode.
 - **Lead temperature**
 - Inactive/Active
Switching summer operation / heat recovery depending on the inside / outside / target temperature
 - **Building protection**
 - Inactive/Active
Temperature protection, shutdown if the internal temperature is too low.
 - **Lead humidity**
 - Inactive/Active
Increase in the fan level at a high relative air humidity.
 - **Humidity reduction**
 - Inactive/Active
Moisture protection, basement ventilation depending on the absolute inner moisture and

absolute exterior moisture.

- **Lead CO2**

- Inactive/Active

Increase in the fan stage at a high relative CO2 concentration.

- **Summer mode**

- Inactiv

No summer mode

- With object

Switching summer operation via object 9

- Continuous operation

Summer mode active

- **Interval operation**

- Inactiv/Activ

Switch the fans in intervals for a fixed time.

3.6 Functional block fans

Configuration	Overwrite	No Pairs
+ Ventilation Settings	Reversion Time	
Lead Temperature	If you change these settings, the achievable efficiency is no longer guaranteed	
Lead Humidity	Summer Mode	1 h
Lead CO ₂	Stage 1	70 s
Fan	Stage 2	70 s
	Stage 3	70 s

Functional block fans - Parameters

- **Manual Fan stage active for**
 - No pair
 - Pair 1
 - Pair 2
 - Both pairs

Sets objects 6 / 7 / 8 active for the choosen pairs
Default: Both pairs
- **Run time [min]**
 - 0 .. 240

Time control for Object 3:
After 1 .. 240 minutes, the control goes back to the default operation.
0 means without automatic timeout

These parameters are only active in the Expert/Master mode

- **Reversing times**
 - **Stage 1** and
 - **Stage 2** and
 - **Stage 3** and
 - **Summer mode**
 - 40 seconds to 2 hours in steps

If the default settings are changed, the accessible heat recovery is not guaranteed

Functional block fans - KNX-objects

Obj	IO	Name	Function	Datapoint type
6	Input/Output	Fan stage	Manual stage input Actual stage output *)	DPT 5.001 oder 5.100
7	Input/Output	Fan stage manual override	IO manual override active	DPT 1.012
8	Input	Fan stage manual +/-	Input for manual stage up/down	DPT 1.007
9	Input	Summer mode	Input for summer operation without heat recovery	DPT 1.001

- *) DPT depends on setting for „DPT for fan modes“
- Fan level [0-100%]
 - Fan stage [0-3]

3.7 Functional block system

Configuration	Hight above sea level [m]	50
+ HVAC Settings	Cable Resistance	
Lead Temperature	Fan 1 [mOhm]	0
Lead Humidity	Fan 2 [mOhm]	0
Lead CO2	Fan 3 [mOhm]	0
Fan	Fan 4 [mOhm]	0
System	Flow Rate	
	Stage 1	15 m ³ /h
	Stage 2	25 m ³ /h
	Stage 3	38 m ³ /h
	Exhaust/Supply-Request	
	Pair 1 -- Pair 2	Exhaust -- None
	Flow per Fan	38 m ³ /h

Functional block system - Parameters

- **Altitude above sea level**
 - 0 .. 2000 Necessary for the calculations of the absolute humidity from the relative humidity
- **Cable resistance** Fan 1 / 2 / 3 / 4 [mOhm]
 - 0 .. 2000

In the case of large cable lengths between the fan and the Control4, the control voltage is overlaid with an error voltage. This error can be compensated for. Therefore the resistance of a single wire must be entered.
- **Intervall period --- Active time**
 - 1 h --- 15 min
 - 4 h --- 30 min
 - 12 h --- 60 min

Within the interval period, it is ventilated for the duration of the active time. This Applies to any operating state for interval operation.
- **Flow rate**
 - Depending on the fan type

For Each of the 3 System stages a flow rate can be set.

For configurations without exhaust air

- **Exhaust/supply request Pair 1 -- Pair 2**

- None -- None
- Exhaust -- None
- Supply -- None
- Exhaust -- Exhaust
- Supply -- Exhaust
- Supply -- Supply

The selected couples can be switched to the exhaust/supply operation via object 21 input, air request XX.

For configurations with exhaust air

- **Exhaust/supply request Pair 1**

- None
- Exhaust
- Supply

The selected couples can be switched to the exhaust/supply operation via object 21 input, air request XX.

- **Air throughput per fan [m³/h]**

- 5 .. 100

This setting serves the air volume adjustment.

Selectable throughput depends on the selected ventilator type.

Functional block system - KNX-objects

Obj	IO	Name	Function	Datapoint type
19	Input	Exhaust request	Switching input to use the fan pair 2 as an exhaust air device	DPT 1.001
20	Input	Exhaust lock	Switching input to deactivate the basic ventilation function	DPT 1.001
21	Input	Air request E2 bzw EGO	Switches the selected fan pair into the output/supply air operation	DPT 1.001
22	Input	Supply request	Switching output to set external fans into the supply air operation	DPT 1.001

Obj	IO	Name	Function	Datapoint type
25	Input	System lock	Blocks all fans and functions	DPT 1.001
28	Output	Filter change	One of the fan pairs has reached the maximum time without a filter change *)	DPT 1.005
29	Input	Filter change acknowledge	After changing/cleaning the filter, this must be acknowledged here *)	DPT 1.016
30	Input/Output	Time control	Runtime control **)	DPT 7.000

*) Object 28 can be reset for a short time via the object itself or in the long term via object 29.

***) Every action associated with a timeout writes its timeout on this object. Writing to this object leads to the change of the timeout parameter of this action. The timeout must be changed within 60 seconds. If this time has expired the desired operating mode must be selected again.

Slave-Configurations

Obj	IO	Name	Function	Datapoint type
26	Input	Slave Stage	Synchronization and grouping of several modules to a ventilation system	DPT 5.001 oder 5.100
27	Input	Slave Direction	Synchronization and grouping of several modules to a ventilation system	DPT 1.012

Master-Configurations

Obj	IO	Name	Function	Datapoint type
26	Output	Slave Stage	Synchronization and grouping of several modules to a ventilation system	DPT 5.001 oder 5.100
27	Output	Slave Direction	Synchronization and grouping of several modules to a ventilation system	DPT 1.012

3.8 Functional block exhaust

This function block is only available if a configuration with a exhaust air option is selected.

Configuration	Time Settings	
+ HVAC Settings	Lag Time [min]	15
Lead Temperature	Lead Time	2 min
Lead Humidity	Interval period --- Active time	Static
Lead CO2	Exhaust Type	
Exhaust	Selection	Silvento FK
Fan	Basic Flow [m ³ /h]	30 m ³ /h
	Active Flow [m ³ /h]	60 m ³ /h

Functional block exhaust - Parameters

- Lag time
 - 0 .. 60 Minutes

After the lag time, the fan pair 2 goes back to basic air exhaust mode.
- Lead time
 - 0 Seconds bis 5 Minutes

If the input is active, the fan pair 2 goes into the exhaust air operation after the lead time, Object 22 is activated.
- Active time --- interval period
 - Continuous operation
 - 1 min -- 5 min
 - 2 min -- 5 min
 - 1 min -- 15 min
 - 2 min -- 15 min
 - 5 min -- 15 min
 - 1 min -- 30 min
 - 2 min -- 30 min
 - 5 min -- 30 min
 - 10 min -- 30 min

During the interval period, the exhaust fan is active for the duration of the active time.
- Selection fan type

- Silvento FK
- Silvento EC
- RA 15-60
- Silvento 30 / 60 / 100 by ACM Module
- AB 30 / 60 by ACM Module
- Custom. 0-12V

The Silvento FK, RA15-60 and the ACM module with RA15-60 voltage control have fixed fan levels. For other fans the characteristic line is required.(See below).

- Air flow for basic ventilation

Specifies the air flow of fan pair 2 in basic ventilation (input, exhaust request = 0) The selectable throughput depends on the chosen fan type.

- Air flow for exhaust request

Specifies the air flow of fan pair 2 with active exhaust air. The selectable throughput depends on the chosen fan type.

Functional block exhaust - KNX-objects

Obj	IO	Name	Function	Datapoint type
19	Input	Exhaust request	Switching input to use the fan pair 2 as an exhaust air device	DPT 1.003
20	Input	Exhaust Lock	Switching input to deactivate basic exhaust flow	DPT 1.003
22	Output	Abluftanforderung	Switching output to switch external fans into supply air operation	DPT 1.003

Selection fan type - Custom 0-12V

Is only required if an external vent/flap control is used with voltage input.

(Parameters: fan type = user-defined 0-12V)

For three stages, the support values for the volume flow and the associated control voltage must be known. Level 3 speaks 100%. Values that deviate from the support values can be selected under volume flow. Different values can be selected. In this case, the flow is linear interpolated.

Lead Temperature	Exhaust Type	
Lead Humidity	Selection	Custom 0-12 V
Lead CO2	Basic Flow [%]	0
	Active Flow [%]	100
Exhaust	Fan Characteristic	
Fan	Stage 1	
System	Flow [m ³ /h]	15
	Exhaust [mV]	1570
	Supply [mV]	0
	Stage 2	
	Flow [m ³ /h]	30
	Exhaust [mV]	3560
	Supply [mV]	0
	Stage 3	
	Flow [m ³ /h]	60
	Exhaust [mV]	8150
	Supply [mV]	0

3.9 Functional block potential free contacts

This functional block is only available if the potential free contacts are activated as buttons.

Configuration	Time Settings	
+ HVAC Settings	Debounce Time [ms]	10
Lead CO2	Double Press	500 ms
	Long Press	800 ms
Dry Contacts (Pushbutton)	Switch Settings	
Fan	Short Function	Speed Up/Down
System	Timeout [min]	1
	Long Function	Off
	Timeout [min]	0
	Double Function	Intense Ventilation
	Timeout [min]	1

Functional block potential free contacts (Push buttons) - Parameters

Time settings

- **Double activity**
 - 0 .. 2 Seconds
Within this time, two button presses are considered a double impulse and can be assigned to other functions. A single impulse can only be recognized as individual impulse after this time, so there is a possibly disturbing delay if this time is chosen too long.
- **Long activity**
 - 0 .. 2 Seconds
After this time, a push of a button is recognized as a long push of a button and can be assigned to other functions.

Push button settings

- **Short function**
 - without function
 - Step +/-

- Off
 - Night
 - Intense ventilation
 - Exhaust request
- This function is carried out in response to a short key press.
Default: Step +/-

- **Timeout [min]**

- 0 .. 240
- Duration for short function, after that the selected function is deactivated

- **Long function**

- without function
 - Step +/-
 - Off
 - Night
 - Intense ventilation
 - Exhaust request
- This function is carried out in response to a long key press.
Default: Normal operation/Fan off

- **Timeout [min]**

- 0 .. 240
- Duration for long function, after that the selected function is deactivated

- **Double function**

- without function
 - Step +/-
 - Off
 - Night
 - Intense ventilation
 - Exhaust request
- This function is carried out in response to a double key press.
Default: Intense ventilation/Normal mode

- **Timeout [min]**

- 0 .. 240
- Duration for double press function, after that the selected function is deactivated

- **Debounce time [ms]**

- 2 .. 100
Depending on the button used, longer debounce times may be necessary if double actuations are mistakenly displayed

Functional block potential free contacts (Push buttons) - KNX-Objects

Obj	IO	Name	Function	Datapoint type
23	Output	Short function	Switching output 0/1 if the button inputs are pressed short	DPT 1.001
24	Output	Long function	Switching output 0/1 if the button inputs are pressed long	DPT 1.001

Functional block potential free contacts (Switches) - Parameters

Switch settings

With switch 1 is chosen between manual and automatic mode. In manual mode, the fan stages are selected via switch 2 as follows.

- **Function switch 2 [OFF]**

- Off
- Fan stage 1
- Fan stage 2
- Fan stage 3

In the case of switch position [off], the set fan level is switched on.

- **Function switch 2 [ON]**

- Off
- Fan stage 1
- Fan stage 2
- Fan stage 3

In the case of switch position [on], the set fan level is switched on.

- **Debouncing time [ms]**

- 2 .. 100

Depending on the switch used, longer debounce times may be necessary if double actuations are mistakenly displayed.

Functional block potential free contacts (Switches) - KNX-objects

Obj	IO	Name	Function	Datapoint type
23	Output	Switch 1	State switch 1, for further evaluations	DPT 1.001
24	Output	Switch 2	State switch 2, for further evaluations	DPT 1.001

3.10 Functional block lead temperature

This functional block is only available if the temperature lead function is activated.

The dynamic cycle time is only active in expert mode.

Configuration	Temperature Settings	
+ HVAC Settings	Protection [°C]	8
Lead Temperature	Gap [°C]	0
Lead Humidity	Lock Control Behaviour	<input checked="" type="radio"/> Slave <input type="radio"/> Master

Functional block Lead temperature - Parameters

- **Frost protection [°C]**
 - 5 .. 16
If the indoor temperature is below this temperature, the ventilation is completely switched off to avoid frost damage at winter temperatures and a lack of heating
- **Temperature distance [°C]**
 - 0 .. 10
If the distance between the outdoor and indoor temperature is larger than this temperature distance, the device tries to achieve the target temperature by switching between summer mode and heat recovery. This supports both heating and cooling systems in the transition period. A larger distance prevents conflicts with the control of the heating/cooling circuit.
- **Behavior of locking control**
 - Slave/Master
Behavior of the object "Lead temperature active"
 - Slave: Object is input and is blocked with a 0
 - Master: Object is output und locks the heating/cooling

Functional block lead temperature - KNX-objects

	IO	Name	Function	Datapoint type
10	Input	Indoor temperature	Input for interior temperature measurement of another KNX device	DPT 9.001
11	Input	Outdoor temperature	Input for outside temperature measurement of another KNX device	DPT 9.001
12	Input	Temperature setpoint	Input for temperature setpoint value from another KNX device, usually connected to the setpoint of the heating factor.	DPT 9.001
13	Input	Lead temperature enable	The lead calculation of the fan level through the temperatures can be deactivated with a "0".	DPT 1.003

3.11 Functional block lead humidity

This functional block is only available if the humidity lead is activated.

Configuration	R. Humidity Thresholds	
+ HVAC Settings	TH 1 [%]	48
Lead Temperature	TH 2 [%]	53
Lead Humidity	TH 3 [%]	58
Lead CO2	TH 4 [%]	62
Dry Contacts (Pushbutton)	Abs. Humidity -- Humidity Removal	
Fan	Minimum Gap (*0.1) [g/kg] (Outside/Inside)	5

Functional block lead humidity - Parameters

Relative humidity limit values:

- **limits 1/2/3/4 [%]**

- 0 .. 90%

When the switching point X is exceeded, fan level (X-1) is switched on, provided that it or a higher one is not already active. To switch off, the next smaller level must be undercut again. If the outdoor humidity is available, the fan will be deactivated as soon as the absolute exterior humidity is greater than the absolute inner humidity.

Absolute humidity - dehumidification

- **Minimum distance (*0.1)(Outdoor/Indoor)**

- 0 .. 20 [g/kg]

In the basement drying function, the ventilation should be deactivated if the absolute exterior humidity is not at least around the parameterized distance below the absolute inner humidity.

Functional block lead humidity - KNX-Objects

	IO	Name	Function	Datapoint type
14	Input	Indoor humidity	Input for indoor humidity from another KNX device	DPT 9.008
15	Input	Outdoor humidity	Input for outdoor humidity from another KNX device	DPT 9.008
16	Input	Lead Humidity enable	The lead calculation of the fan level through the humidity can be deactivated with a "0".	DPT 1.003

3.12 Functional block lead CO2

This functional block is only available if the CO2 lead function is activated.

Configuration	CO2 Thresholds	
+ HVAC Settings	TH 1	800 ppm
Lead Temperature	TH 2	1000 ppm
Lead Humidity	TH 3	1500 ppm
	TH 4	2000 ppm

[Lead CO2](#)

Functional block lead CO2 - Parameters

- **limits 1/2/3/4**

- 700 .. 4000 ppm

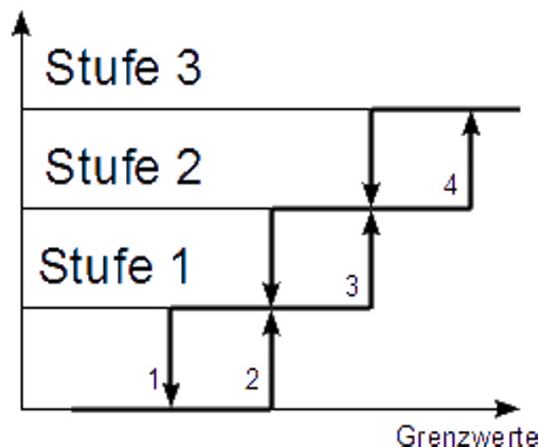
When the switching point X is exceeded, fan level (X-1) is switched on, provided that it or a higher one is not already active. To switch off, the level next to smaller levels must be fallen below again.

Functional block lead CO2 - KNX-Objects

	IO	Name	Function	Datapoint type
17	Input	CO2 (Air quality)	Input for CO2 (air quality) from another KNX device	DPT 9.008
18	Input	Lead CO2 enable	The lead calculation of the fan level through the CO2 concentration can be deactivated with a "0".	DPT 1.003

3.13 Limit values for fan levels in CO2 and humidity lead calculation

The 3 fan levels are switched over 4 limit values. Fan level 1 is only activated when the limit value 2 is reached, but the limit value 1 has to be fallen below again. The same applies accordingly to the higher fan levels. If this or a higher fan level is already active, exceeding a limit has no effect.



3.14 Priorities of the used objects

The objects that influence the fan control have a order in which they are weighted. If in HVAC mode:

- 1.) **System lock** (Object-25)
- 2.) **Supply air/exhaust air request** (Object-21) if supply/exhaust air request is active
- 3.) **Slave operation** (Object-26) wenn im Slave-Betrieb
- 4.) **HVAC mode manual operation** (Object-7) *
- 5.) **HVAC mode calculated** from leads and set HVAC modes
- 6.) **HVAC mode 1** (Object-3) *
- 7.) **HVAC mode 2** (Object-4) *
- 8.) **HVAC mode 3** (Object-5) *
- 9.) **HVAC night mode** (Object-2) *
- 10.) **HVAC manual mode** (Object-1) *
- 11.) **HVAC automatic mode** (Object-0)

12.) if **Object 0 == 0** then **Standard HVAC Mode as set in Settings 3.2**

If in Stages mode:

- 1.) **System lock** (Object-25)
- 2.) **Supply air/exhaust air request** (Object-21) if supply/exhaust air request is active
- 3.) **Slave operation** (Object-26) wenn im Slave-Betrieb
- 4.) **Fan stage manual operation** (Object-7) *
- 5.) **Fan stage calculated** from leads and set stage
- 6.) **Stage mode 1** (Object-3) *
- 7.) **Stage mode 2** (Object-4) *
- 8.) **Stage mode 3** (Object-5) *
- 9.) **Stage night mode** (Object-2) *
- 10.) **Stage manual mode** (Object-1) *
- 11.) **Stage automatic mode** (Object-0)
- 12.) if **Object 0 == 0** then **Standard Stage as set in Settings 3.4**

In the event of changes in the objects marked with *, the objects are reset with higher priority in order to get a reaction of the system, except for conditions 1) -3) that always have priority.

Control examples:

With the following operating order:

HVAC-Automatic -> HVAC-Night-mode -> HVAC-Operation-mode-1

initially HVAC operation mode 1 is active, after reset (or timeout) the HVAC night operation is active again.

In this order

HVAC-Automatic -> HVAC-Operation-mode-1 -> HVAC-Night-mode

The night operation deletes operating type1, after resetting the night operation, the control goes into the HVAC automatic operation.

Master-slave-operation:

A control unit that works in master operation mode can control several devices in slave operation mode. The direction and level information is placed via the object-26 IO-Master/slave. If the fan A runs in the master device in air-supply mode, A also runs in the slave device in the air-supply. If only one fan is connected, one device must be operated on connection A and one at the connection B. It is always to be ensured the balance between supply air and exhaust air devices (same number A and B slots), otherwise the required air exchange and the desired heat recovery will not be reached.

Filter cleaning alert:

Depending on the speed of the fan, cleaning or changing the fan filter is regularly necessary. After reaching the planned running time, a signal for the change request is issued on the object-27 (filter change). This can be acknowledged on the Object-27 with "off", but then reports after 24 hours again. This is intended as a reminder function. After cleaning or change, the signal can be sent to object-28 (filter change receipt), then the running time count begins from zero.

4. Technical specifications



KNX-Lunos-Control4-IW	
Operating voltage	KNX Busvoltage 21 .. 32VDC
Power consumption (KNX)	ca. 120mW (@ 24VDC)
Bus voltage connection	KNX-2-pol Clamp (red / black)
Auxiliary voltage	24V .. 32VDC 20W max. (5W / 10W / 15W / 20W @ 1..4 fans)
Connection AUX-voltage	WAGO-Clamping block (yellow / white)
Electrical efficiency of module	92% (With maximum power)
Button / switch input	3mA Potential -free / debounced
Busoppler	integrated
Ambient temperature	storage -20 .. +85°C operation -5 .. +45°C
Humidity	up to 90% not condensing
Power reduction	Automatically from 75 ° C modul temperature
Commissioning with	ETS Arcus_Lunos_Ex_v5.knxprod
Protection class	IP20
Installation of KNX module	Standard Inwall (60/68) mm
Housing of KNX module	Plastic black
Dimensions of KNX module	(50 x 50 x 20) mm (B x H x T) 58mm Diagonal
Article number	65001002

KNX-Lunos-Control4-REG	
Operating voltage	KNX Busvoltage 21 .. 32VDC
Power consumption (KNX)	ca. 120mW (@ 24VDC)
Bus voltage connection	KNX-2-pol Clamp (red / black)
Auxiliary voltage	24V .. 32VDC 20W max. (5W / 10W / 15W / 20W @ 1..4 fans)
Connection AUX-voltage	WAGO-Clamping block (yellow / white)
Electrical efficiency of module	92% (With maximum power)
Button / switch input	3mA Potential -free / debounced
Busoppler	integrated
Ambient temperature	storage -20 .. +85°C operation -5 .. +45°C
Humidity	up to 90% not condensing
Power reduction	Automatically from 75 ° C modul temperature
Commissioning with	ETS Arcus_Lunos_Ex_v5.knxprod
Protection class	IP20
Installation of KNX module	din-rail assembly
Housing of KNX module	Plastic black
Dimensions of KNX module	Standard DIN-rail-housing 4TE (72 mm)
Article number	65001004

For suitable ventilation devices with heat recovery as well as pure exhaust air devices, see [Lunos Homepage \(www.lunos.de\)](http://www.lunos.de).

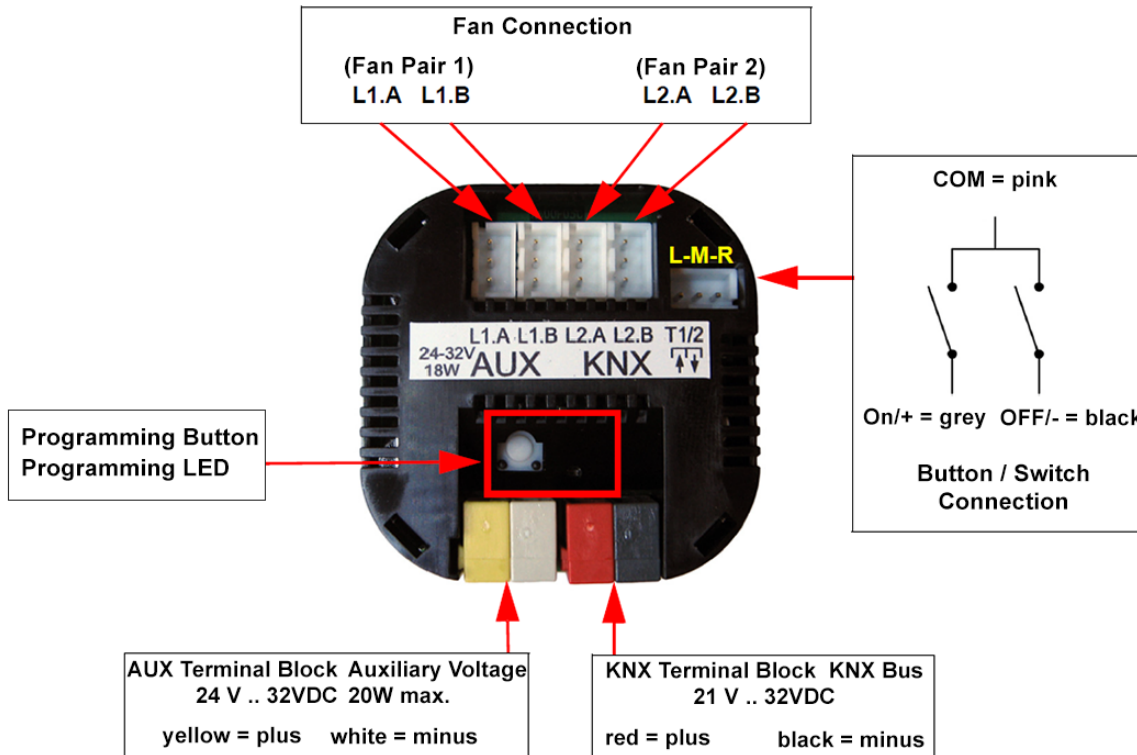
4.1 Available KNX-Objects in HVAC-mode

Number	Name	Object Function	Length	Data Type	C	R	W	T	U
0	Input, Operation Mode	HVAC Mode	1 byte	HVAC mode	C	R	W	-	U
1	Input, Force Operation Mode	HVAC Mode	1 byte	HVAC mode	C	R	W	-	U
2	Input, Night Mode	HVAC Mode	1 bit	enable	C	R	W	-	U
3	Input, Force Overwrite 1 Mode	HVAC Mode	1 bit	enable	C	R	W	T	U
4	Input, Force Overwrite 2 Mode	HVAC Mode	1 bit	enable	C	R	W	T	U
5	Input, Force Overwrite 3 Mode	HVAC Mode	1 bit	enable	C	R	W	T	U
6	IO, Fan Stage	FAN Control	1 byte	8-bit unsigned value	C	R	W	T	U
7	IO, Manual Overwrite	FAN Control	1 bit	enable	C	R	W	T	U
8	Input, Fan Stage Up/Down	FAN Control	1 bit	step	C	R	W	-	U
9	Input, Summer Mode	FAN Control	1 bit	enable	C	R	W	-	U
10	Input, Temperature Inside	Lead Temperature	2 bytes	temperature (°C)	C	R	W	-	U
11	Input, Temperature Outside	Lead Temperature	2 bytes	temperature (°C)	C	R	W	-	U
12	Input, Temperature Setpoint	Lead Temperature	2 bytes	temperature (°C)	C	R	W	-	U
13	Input, Lead Temperature Enable	Lead Temperature	1 bit	enable	C	R	W	-	U
14	Input, Humidity Inside	Lead Humidity	2 bytes	humidity (%)	C	R	W	-	U
15	Input, Humidity Outside	Lead Humidity	2 bytes	humidity (%)	C	R	W	-	U
16	Input, Lead Humidity Enable	Lead Humidity	1 bit	enable	C	R	W	-	U
17	Input, CO2 Inside	Lead CO2	2 bytes	parts/million (ppm)	C	R	W	-	U
18	Input, Lead CO2 Enable	Lead CO2	1 bit	enable	C	R	W	-	U
19	Input, Exhaust Request	Exhaust/Supply Contr...	1 bit	enable	C	R	W	-	U
20	Input, Exhaust Lock	Exhaust/Supply Contr...	1 bit	enable	C	R	W	-	U
21	Input, Air Request E ²	Exhaust/Supply Contr...	1 bit	enable	C	R	W	-	U
22	Output, Exhaust Request	Exhaust/Supply Contr...	1 bit	enable	C	R	-	T	-
23	Output, Short Pressed	Dry Contacts	1 bit	switch	C	R	-	T	-
24	Output, Long Pressed	Dry Contacts	1 bit	switch	C	R	-	T	-
25	Input, System Lock	System	1 bit	enable	C	R	W	-	U
26	Output, Master/Slave Mode	System	1 byte	percentage (0..100%)	C	R	W	T	U
27	Output, Master/Slave Direction	System	1 bit	invert	C	R	W	T	U
28	Output, Filter Change Request	System	1 bit	alarm	C	R	W	T	U
29	Input, Filter Change Acknowledge	System	1 bit	acknowledge	C	R	W	T	U
30	IO, Timeout Control	System	2 bytes	time (min)	C	R	W	T	U

5. Commissioning



5.1 KNX-LUNOS-CONTROL4-IW



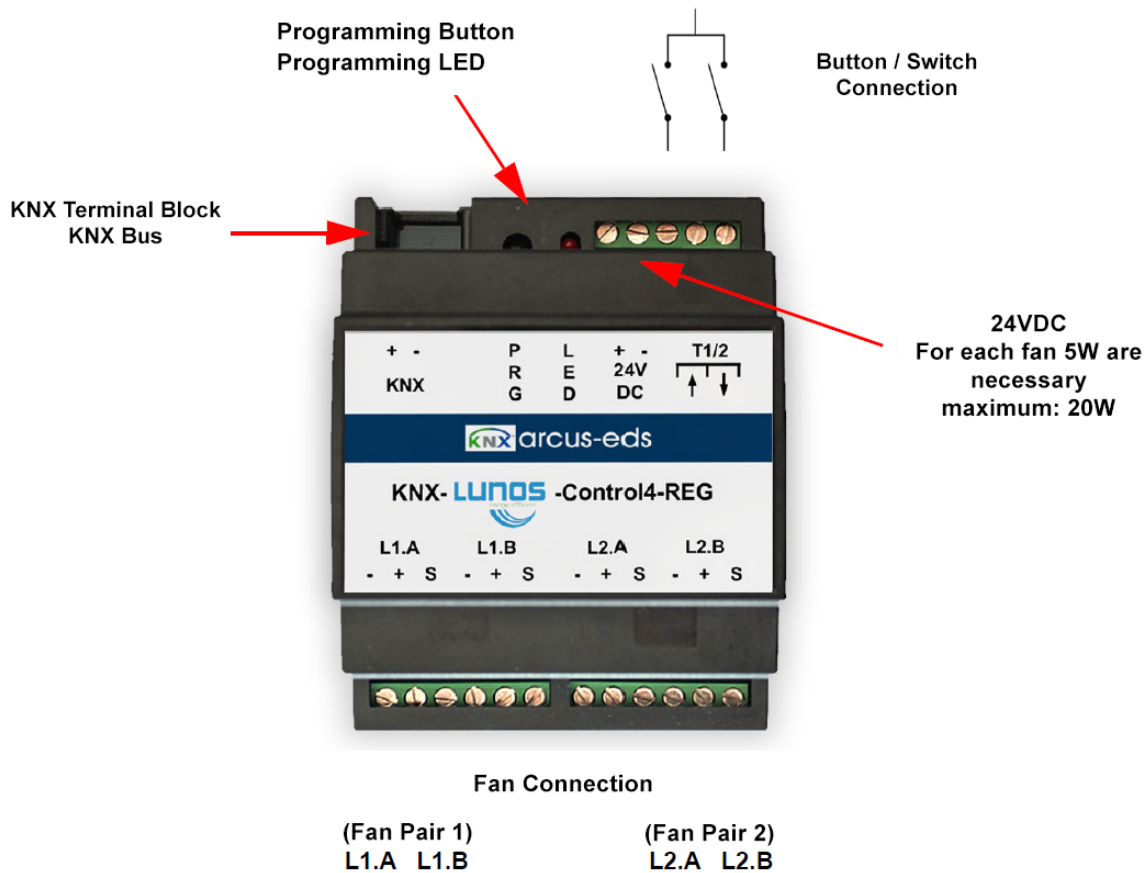
The KNX clamp is connected to the KNX bus via the supplied terminal block (red (+) / black (GND)). The auxiliary voltage is connected via the supplied terminal block (yellow (+) / white (GND)). The fans are mounted according to the lunos specification and connected via the supplied pre-terminated connector. Optionally, potential-free button / switch can be connected via the supplied connector.

Under no circumstances may the module be connected to mains voltage potential. No mains voltage potential may be carried in the flush-mounted socket used. Installation may only be carried out by a specialist.

The pre-assembled connector must be connected to the cables of the fans as follows

	Fan connection	ACM-Module connection
violet	violet	0-10V
red	red	+12V
blue	blue	GND

5.2 KNX-LUNOS-CONTROL4-REG



The KNX clamp is connected to the KNX bus via the supplied terminal block (red (+) / black (GND)). The auxiliary voltage is connected via a screw clamp. The fans are mounted according to the lunos specification and connected via the screw terminals. Optionally, potential-free button / switch can also be connected via screw terminals.

Under no circumstances may the module be connected to mains voltage potential. The installation may only be carried out by a specialist.

5.3 Connection options for different lunos fan types

Fan-type	L1.A	L1.B	L2.A	L2.B	
NEXXT	X		X		
E²	X	X	X	X	pairwise
EGO S1[R]	X		X		
EGO S2[L]		X		X	
Silvento (FK, EC, 30/60/100)			X	X	
RA 15-60			X	X	

Fan-type	L1.A	L1.B	L2.A	L2.B	
ACM-Modul or 0..12V			X	X	

It is important to ensure that with E² the same number of exhaust-(A) and supply air fans (B) are always connected across installation..

5.4 Behavior in the event of voltage recovery

All changes made to the settings and the values changed via the KNX bus are retained in the event of a bus voltage loss.

5.5 Resetting the device and deleting the program

In order to delete the programming (project planning) or to put the module back into the delivery state, it must be switched without supply (disconnecting the AUX-Supply clamp). Now keep the programming button down while connecting the AUX-Supply clamp and wait until the programming LED lights up (approx. 1-2 seconds). Now you can let go of the programming button and the module is ready for a new project planning. If you let go of the programming button too early, repeat the procedure.

6. Imprint



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Responsible for the content: Hjalmar Hevers, Sascha Bergmann

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Manufacturer



Arcus-EDS GmbH

Rigaer Str. 88

10247 Berlin

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