

# 4-CHANNELS ANALOG/DIGITAL UNIVERSAL INTERFACE

# **EM KNT 002**





# **INSTRUCTIONS MANUAL**



# **General Description**

The universal interface EM KNT 002 is equipped with 4 independent channels Analog/Digital which may be used depending on the parameterization by the ETS4 software.

- Binary inputs: They can be connected to pusbutton, a switch or a conventional binary sensor potential-free.
- Analog inputs: They can work as temperature sensor by connecting a temperature sensor. Then the temperature of the room can be controlled (maximum 4 temperature sensors can be connected).
- Thermostat: It can be configured and enabled 4 independent thermostats.

In this way, the 4 channels of this device can be used as an interface for pushbuttons or switches (for binary inputs reading) or for analog inputs reading (temperature sensors) and as independent thermostat (this function is independent of the quantity and type of inputs Analog/Digital are configured.

Each one of the 4 channels can work as:

- Switch: to turn the light ON and OFF.
- Switch and Dimmer: to turn ON/OFF and dim the light.
- Multiple Switch: to turn ON/OFF the light depending of the number of pressings.
- Sequential Switch: to do sequential switching ON/OFF.
- Blinds/Shutters Control: to move the blinds/shutters by pushbutton or switches.
- Scenes Control: to save and recover a light scene.
- Values Sending: to send different measures or values, for example the light level, temperature...
- Impulse Counter: it allows, for example, counting the number of operations.
- Temperature sensor: sends the temperature value of the room. We can connect 4 temperature sensors.
- Thermostat: It can be configured and enabled 4 independent thermostats. Furthermore it is independent of the quantity and type of inputs Analog/Digital are configured.

In the table below is shown the color assignment of each wire:

Channel D	Black - 1
Channel C	Grey - 2
Channel B	Browm - 3
Channel A	Red - 4
Inputs Common	Orange - 5
Inputs Common	Yellow - 6

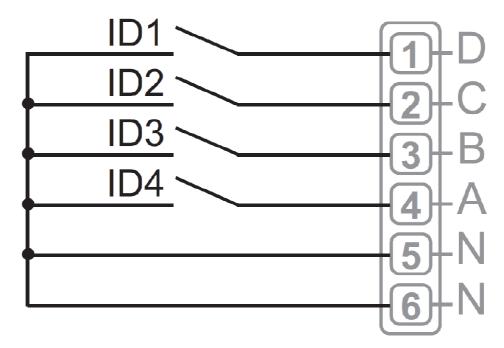
# **Technical Data**

Power supply	21 ~ 32V <sub>DC</sub> (via Bus)
Power consumption	< 10mA
Inputs / Outputs	4 (individually configurable)
Commissioning	ETS4
Wires length	~ 30cm
Line length	< 10 m
BUS connection	By the supplied KNX connecting terminal
Input polling Voltage	20V <sub>DC</sub>
Input Current	0,5mA
Output Voltage	5Vdc
Output Current	<2mA
Safety	Short-circuit, Overload and wrong polarity
Dimensions	38 x 42 x 15mm
Ambient temperature	-5ºC ~ +45ºC
Type of protection	IP20 (EN60529)
Safety class	III
Mounting	Flush mounting universal box
According to the Standard	EN50090-2-2, EN50428 and EN50491
Certification	EIB/KNX

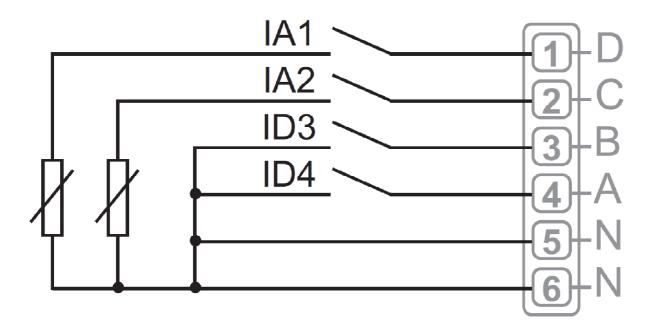
# Installation

This interface can be used as analog inputs or digital (binary) inputs:

Wiring diagram as 4 binary inputs with pushbuttons or switches (Channels A, B, C and D):



Wiring diagram as 2 analog inputs with temperature sensors (Channels C and D) and 2 binary inputs with pushbuttons or switches (Channels A and B).



# **DíNUY**

# **Project Development and Commissioning**

The communication objects are identical for the 4 channels. Furthermore we can configure and enable the independent thermostat function (maximum 4 independent thermostats).

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Aradii Aparatos Elimina Test Project EMKNT002 Elimina Elimina Funciones Topología Topología Todos los Aparatos Todos los Aparatos 4 FOLD UNIVERSAL A	<ul> <li>Mostrar Cambios Parametros p</li> <li>Dispositivo: 4 FOLD UNIVERSAL AN</li> <li>Channel A</li> <li>CONFIGURATION</li> <li>Channel C</li> <li>CONFIGURATION</li> <li>Channel D</li> <li>CONFIGURATION</li> <li>THERMOSTAT</li> <li>Configuracion</li> </ul>		Switch Not assigned Switch Switch Dimmer Switch secuential Shutter/Blind Control Scene Fixed value/Forced Counter Temperature Sensor ON No		
Buscar 👂 🗘 🖒 0/0 🏶 🗸	Objetos de Grupo / Parámetros /	Puesta en marcha /			
Direcciones de Grupo 🔻				A ¥	⊡ ∿" ×

#### **Channels Functions:**

Not assigned	There is not assigned any function
Switch	Switch ON or OFF
Switch Dimmer	Switch ON/OFF or Dim
Switch multiple	Switch ON or OFF depending on the number of actions
Switch sequential	Switch ON or OFF sequentially
Shutter/Blind	Move UP or DOWN shutters or blinds
Control Scene	Save and recover Scenes
Fixed value/Forced	Send specific values
Counter	Count input pulses
Temperature sensor	Send the temperature value of the room.

# <u>DíNUY</u>

**Thermostat Function:** It can be configured and enabled 4 independent thermostats. It is independent of the quantity and type of inputs analog/digital are configured.

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🕂 Añadir Aparatos 👻 👗 Eliminar	Mostrar Cambios Parámetros p	or defecto		Buscar	P 7
<ul> <li>Añadir Aparatos          <ul> <li>Eliminar</li> <li>Test Project EMKNT002</li> <li>Edificios</li> <li>Funciones</li> <li>Topología</li> <li>Direcciones de Grupo</li> </ul> </li> <li>Todos los Aparatos</li> <li>Todos los Aparatos</li> </ul>	Mostrar Cambios Parámetros p Dispositivo: 4 FOLD UNIVERSAL AN Channel A Channel B Channel C Channel D THERMOSTAT Configuracion Thermostat 1 Set point cooling 1 Cooling regulation mode 1 Thermostat 2 Set point cooling 2		Yes Yes Yes Yes	Buscar	
Buscar ♀ < ▷ 0/0 ♣ ♥	Cooling regulation mode 2 Thermostat 3 Set point cooling 3 Cooling regulation mode 3 Thermostat 4 Set point cooling 4 Cooling regulation mode 4	Puesta en marcha /			
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# **4 INDEPENDENT CHANNELS FUNCTIONS**

# 1 - "Switch" Function

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Test Project EMKNT002	Dispositivo: 4 FOLD UNIVERSAL A	NALOG INTERFACE			
Edificios	<ul> <li>Channel A</li> <li>CONFIGURATION</li> </ul>	Function of channel A	Switch	•	
Topología	<ul> <li>Channel B</li> <li>Channel C</li> </ul>	Debounce time	10mSec.	•	
<ul> <li>Todos los Aparatos</li> <li> </li> <li></li></ul>	<ul> <li>Channel D</li> <li>THERMOSTAT</li> </ul>	Distinction between SHORT and LONG action	No	•	
		Cyclic transmision?	NO	•	
		Action on Closing the contact	TOGGLE	•	
		Action on the Opening contact	NONE	•	
		Transmist State on Bus voltage recovery?	Yes	•	

# 1.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Distinction between SHORT and LONG action

It allows discriminating between a long and a short action. Thus, if the distinction is made, could run two different actions depending on the duration of the operation.

#### - If NO distinction is made between a short and a long action:



# Cyclic transmission

It allows sending the communication object "Switch Telegram" cyclically, at set time intervals.

It is possible to select "NO" sending it cyclically, to send always ("YES"), regardless of the value of the communication object, or depending on the object ("If OFF state" or "If ON state").

In case of selecting the "cyclic transmission" it will be necessary to choose its frequency through the parameter "Cycle base time" and "Factor". The time between two transmissions will be the multiplication of the two parameters.

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Ardour Aparatos  Ardour Aparatos  Terminal  Test Project EMKNT002  Edificios  Funciones  Topología  Direcciones de Grupo  Todos los Aparatos  Funciones  Funciones  Ardour Aparatos  Ardour Ardour Aparatos  Ardour Aparatos  Ardour Ardou	Mostar cambles Parameters  Dispositive: 4 FOLD UNIVERSAL AI     Channel A     CONFIGURATION     Channel B     Channel C     Channel D     THERMOSTAT	NALOG INTERFACE Function of channel A Debounce time Distinction between SHORT and LONG action Cyclic transmision? Action on Closing the contact Action on Openig the contact Cycle base time	Switch 10mSec. No "If ON state" NO "If OFF state" "If ON state" YES 1 Sec.	• • • •	
		Factor (Total time = Base x Factor)	7		

#### Action on Closing the contact

Defines the action to be done when the contact is closed. The value of the object can be: "ON", "OFF", "TOGGLE" or "NONE".

#### Action on Opening the contact

Defines the action to be done when the contact is open. The value of the object can be: "ON", "OFF", "TOGGLE" or "NONE".

#### Transmit State on Bus voltage recovery

After a recover from a failure in the Bus supply, it is possible to configure whether the current state of the object "Switch Telegram" is sent again.

# - If distinction is made between a short and a long action:

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

#### Long action after...

Sets the duration of the action from which is interpreted as long ("Long action"). Configurable from 0.3s up to 4s.

#### Long action

Sets the value of the object after a long action. The value of the object can be: "ON", "OFF", "TOGGLE" or "NONE".

#### Short action

Sets the value of the object after a short action. The value of the object can be: "ON", "OFF", "TOGGLE" or "NONE".

#### Number of objects for SHORT/LONG operation

If this option is enabled the short action works with an object and the long action with another. If not, both actions work on the same object.

# <u>Dínu'í</u>

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Test Project EMKNT002	Dispositivo: 4 FOLD UNIVERSAL A	NALOG INTERFACE		
🕅 Edificios 🎬 Funciones	Channel A     CONFIGURATION	Function of channel A	Switch	•
Topología	<ul> <li>Channel B</li> <li>Channel C</li> </ul>	Debounce time	10mSec.	•
<ul> <li>Todos los Aparatos</li> <li>Todos los Aparatos</li> </ul>	<ul> <li>Channel D</li> <li>THERMOSTAT</li> </ul>	Distinction between SHORT and LONG action	Yes	•
		Number of objects for SHORT/LONG operation	1	•
		Contact type	Normally OPENED	•
		Long action after	1 Sec.	•
		Long action	TOGGLE	•
		Short action	TOGGLE	•

# 1.2 – <u>Communication Objects</u>

	Número 4	Nombre	Función del Objeto	Descripción	Direcciones de Gru	1		0	W	T		Tipo de Datos	Prioridad
Todos los Aparatos	L. DAWNSHOUSE	a prosta necessaria.	The control too he over the over the control of the	Descripcion	Direcciones de Gru	Longit		R	0.550	1	U	1.0.00000000000000000000000000000000000	11122242412161255
P Carpetas Dinámicas	■‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	-	W	-		enable	Baja
1.1.1 4 FOLD UNIVERSAL IN		INPUT A	Switch Telegram A			1 bit	С	R	W	Т	U	on/off	Baja
	87 3	INPUT A (via BUS)	Info Switch			1 bit	С	-	W	-	51	on/off	Baja

# 2 - "Switch Dimmer" Function

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Todos los Aparatos     Carpetas Dinámicas      L1.1 4 FOLD UNIVERSAL IN	Dispositivo: 1.1.1 4 FOLD UNIVERSAL Channel A		Switch Dimmer 10mSec. Normally OPENED Dimming and Switch	•		
Buscar ♀ < ▷ 0/0 ♣ •	Objetos de Grupo / Parámetros	Long action after Short action Action on Long operation	1 Sec. TOGGLE Brighter/Darker	•		

# 2.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.



# **Dimming Functionality**

Allows selecting if it is only necessary to dim the lighting ("Only Dimming") or dimming and switching ("Dimming and Switch").

If "Dimming and Switch" is selected, the lighting is dimmed with long actions and it is switched on/off with short press.

#### - Selecting "Only Dimming":

#### Action on operation

Allows selecting the action after a short or long press: "Brighter/Darker" (each press changes the dimming direction), "Dim Brighter" (upward dimming) or "Dim Darker" (downward dimming).

# - Selecting "Dimming and Switch":

# Long action after...

Sets the duration of the action from which is interpreted as long ("Long action"). Configurable from 0.3s up to 4s.

# Short action

Sets the value of the object after a short action. The value of the object can be: "ON", "OFF", "TOGGLE" o "NONE".

#### Action on long operation

Allows selecting the action after a short or long press: "Brighter/Darker" (each press changes the dimming direction), "Dim Brighter" (upward dimming) or "Dim Darker" (downward dimming).

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Todos los Aparatos	Número +	Nombre	Función del Objeto	Descripción	Direcciones de Gru	Longit		R	W	τι	I Tipo de Datos	Prioridad
🗭 Carpetas Dinámicas	<b>■</b> ‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	12	W	a a	enable	Baja
1.1.1 4 FOLD UNIVERSAL IN	∎‡ 1	INPUT A	Switch Telegram A			1 bit	С	R	W	τu	on/off	Baja
	■‡ 2	INPUT A	Dimming Control Telegram	1		4 bits	С	R	W	T U		Baja
	≣‡ 3	INPUT A (via BUS)	Info Switch			1 bit	С	2	W	2 2	on/off	Baja
scar 🔎 < 🗅 0/0 🌞 -	Objetos de Gr	upo / Parámetros /	Puesta en marcha									



# 3 - "Switch Multiple" Function

	Proyecto)				II - *	⊟ <i>.</i>
🕂 Añadir Aparatos 👻 🦂 Eliminar	🕴 Mostrar Cambios Parámetros p	sor defecto			Buscar	P 7
Todos los Aparatos	Mostrar Cambios - Parametros   Dispositivo: 1.1.1 4 FOLD UNIVERSAL II     Channel A     CONFIGURATION     Channel B     Channel C     Channel C     Channel D		Switch multiple 10mSec. Normally OPENED 0.5 Sec. 4 ON ON ON		Brazen	
Buscar 👂 💧 0/0 🔹 🕇		Switch 4 Operation	ON	•		

# 3.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

#### Maximum time between two operations

Defines the maximum time between two consecutive actions of the same sequence.

Adjustable from 0,5s and 3s.

<u>Number of operations</u> Number of actions which compose a sequence. Adjustable from 2up to 4.

#### Switch 1...4 operation

Operation that will be done by each of the consecutive actions. The value of the object can be: "ON", "OFF" or "TOGGLE".

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🖸 Todos los Aparatos	Número 4	Nombre	Función del Objeto	Descripción	Direcciones de Gru	Longit		R	W	T	U Tipo de D	atos Priorida
🗭 Carpetas Dinámicas	<b>■</b> ‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	12	W	12	- enable	Baja
1.1.1 4 FOLD UNIVERSAL IN.		INPUT A	Switch Telegram A			1 bit	С	R	W	Т	U on/off	Baja
	■≓ 2	INPUT A	Switch Telegram A-2			1 bit	С	R	W	Т	U on/off	Baja
	<b>≣</b> ‡  3	INPUT A	Switch Telegram A-3			1 bit	С	R	W	Т	U on/off	Baja
	∎‡ 4	INPUT A	Switch Telegram A-4			1 bit	С	R	W	Т	U on/off	Baja



# 4 - "Switch Sequential" Function

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<ul> <li>Dodos los Aparatos</li> <li>Carpetas Dinámicas</li> <li>L1.1 4 FOLD UNIVERSAL IN</li> </ul>	<ul> <li>Channel B</li> <li>Channel C</li> <li>Channel D</li> </ul>	INTERFACE function of channel A Debounce time Contact type Number of Objects	Switch secuential		
Buscar 🔎 🔿 🗇 0/0 🏶	Objetos de Grupo / Parámetros /	Puesta en marcha			

#### 4.1 - Parameters

# Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

# Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

#### Number of objects

Sets the maximum number of levels. Adjustable from 2 up to 5.

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P Carpetas Dinámicas	■‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	4	W	12	-	enable	Baja
1.1.1 4 FOLD UNIVERSAL IN	<b>≝</b> ‡ 1	INPUT A	Switch Telegram A			1 bit	С	R	W	Т	U	on/off	Baja
	■≓ 2	INPUT A	Switch Telegram A-2			1 bit	С	R	W	т	U	on/off	Baja
	≣⊉ 3	INPUT A	Switch Telegram A-3			1 bit	С	R	W	Т	U	on/off	Baja
	■≓ 4	INPUT A	Switch Telegram A-4			1 bit	С	R	W	т	U	on/off	Baja
	≝⊉ 5	INPUT A	Switch Telegram A-5			1 bit	С	R	W	т	U	on/off	Baja
	■‡ 6	INPUT A (via BUS)	Increment/Decrement A			1 bit	С	R	W	Т	U	up/down	Baja



# 5 - "Shutter/Blind" Function

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Todos los Aparatos     Carpetas Dinámicas     Indiana Ind	Dispositive: 1.1.1 4 FOLD UNIVERSAL I Channel A CONFIGURATION Channel B Channel C Channel C	VTERFACE Function of channel A Debounce time Contact type Functional construction Shutter Functionality Long action after	Shutter/Blind         10mSec.         Normally OPENED         1 Push button         Short=Stepping, Long=Moving         1 Sec.		
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#### 5.1 - Parameters

# Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

## Functional construction

To define the type of operation being carried out and with which mechanism will be done.

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	<ul> <li>Channel B</li> <li>Channel C</li> <li>Channel D</li> </ul>	Function of channel A Debounce time Contact type Functional construction Shutter Functionality Long action after	Shutter/Blind         10mSec.         Normally OPENED         1 Push button         1 Switch MOVING         2 Push button         2 Switch MOVING         2 Push button STEP         2 Push buttom MOVE		
0/0 ***	Objetos de Grupo / Parámetros / I	Puesta en marcha /		 	

#### 1 Push button

Pushbutton control.

#### Shutter functionality

Permits choosing the operation depending on the action (short or long).

- Short=Stepping → The shutter is raised or lowered one step. Each press changes the movement direction. After a "Moving" done after a long press, a short press will do a "Stop".
- Long=Moving  $\rightarrow$  The shutter is raised or lowered completely or until a short press is done. Each press changes the movement direction.
- Short=Moving  $\rightarrow$  The shutter is raised or lowered completely or until a short press is done. Each press changes the movement direction.



- Long=Stepping → The shutter is raised or lowered one step. Each press changes the movement direction. After a "Moving" done after a short press, a long press will do a "Stop".
- Up-Stop-Down-Stop → The following process is done cyclically with each short or long action: "Move Up"
   → "Stop" → "Move Down" → "Stop"...

#### Long action after...

Sets the duration of the action from which is interpreted as long ("Long action"). Configurable from 0.3s up to 4s.

#### 1 Switch MOVING

The shutter is raised or lowed depending on the position of the switch. The possible actions are: "Move Up" or "Move Down".

#### 2 Push button

The shutter will be controlled with two pushbuttons, each one in a different cannel (A...D), so it must be configured independently.

#### Action on Short operation

Defines the operation to be done with a short action. The value of the object can be: "Step Up" or "Step Down".

#### Action on Long operation

Defines the operation to be done with a long action.

The value of the object can be: "Move Up" or "Move Down".

#### Long action after...

Sets the duration of the action from which is interpreted as long ("Long action"). Configurable from 0.3s up to 4s.

#### 2 Switch MOVING

The shutter will be controlled with two switches, each one in a different cannel (A...D), so it must be configured independently.

#### Action on Long operation

Defines the operation to be done with a long action.

The value of the object can be: "Move Up" or "Move Down".

# 2 Push button STEP

The shutter will be controlled with two pushbuttons, each one in a different cannel (A...D), so it must be configured independently.

#### Action on Short operation

Defines the operation to be done with a short action.

The value of the object can be: "Step Up" or "Step Down".

# 2 Push button MOVE

The shutter will be controlled with two pushbuttons, each one in a different cannel (A...D), so it must be configured independently.

#### Action on Long operation

Defines the operation to be done with a long action.

The value of the object can be: "Move Up" or "Move Down".



# 5.2 – <u>Communication Objects</u>

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Todos los Aparatos	Número +	Nombre	Función del Objeto	Descripción	Direcciones de Gru	Longitud	С	R	W	Т	U	Tipo de Datos	Prioridad
👂 🗭 Carpetas Dinámicas	<b>■</b> ‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	12	W	12	2	enable	Baja
1.1.1 4 FOLD UNIVERSAL IN	<b>■</b> ‡ 1	INPUT A	Step Telegram A			4 bits	С	R	W	Т	U	blind control	Baja
	■‡ 2	INPUT A	Move Telegram A			1 bit	С	R	W	Т	U	up/down	Baja

# 6 - "Control Scene" Function

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<ul> <li>▲ Todos los Aparatos</li> <li>▷ Carpetas Dinámicas</li> <li>▷ 1.1.1 4 FOLD UNIVERSAL IN</li> </ul>	Dispositivo: 1.1.1 4 FOLD UNIVERS Channel A CONFIGURATION Channel B Channel C Channel C Channel D	AL INTERFACE function of channel A Debounce time Contact type Type of Scene control Scene number Action on Short operation Store scene	Control Scene 10mSec. Normally OPENED 8 Bit scene 1 Recall NO		
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# 6.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

#### Type of scene control...

Sets if the scene control will be done by 5 separated objects or by 8 bits.

# Scene number

Assigns the number of scene to the channel that is being configured (1 - 63).

Action on Short operation

Defines the operation to be done with a short action.

The value of the object can be: "Recall" or "Ignore".

# Store scene

Which action saves the current scene:

- NO: it does not do anything.
- o On LONG operation: with a long action.
- with OBJECT value=1: if the object "Store Scene object" receives the value "1" the scene is saved.
- On Long operation if OBJECT value=1: if the object "Store Scene object" receives the value "1", after the next long action the scene is saved.

#### Long action after...

Sets the duration of the action from which is interpreted as long ("Long action").

Configurable from 0.3s up to 4s.

# 6.2 – <u>Communication Objects</u>

Añadir Aparatos 🥆 🧎 Elimina	r 🚺 Nueva	Carpeta Dinámica							_			Buscar	Q
Todos los Aparatos	Número 🔺	Nombre	Función del Objeto	Descripción	Direcciones de Gru	Longitud	C	R	W	Т	U	Tipo de Datos	Prioridad
🖗 Carpetas Dinámicas	■‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	12	W	12	2	enable	Baja
11.1 4 FOLD UNIVERSAL IN	<b>=</b> ₹  1	INPUT A	8 Bit scene			1 Byte	С	R	W	Т	U	scene control	Baja

# 7 - "Fixed value/Forced" Function

Dispositivos 🔻 (Nuevo	Proyecto)				21 A.V	⊟ ×
🕂 Añadir Aparatos 👻 뵭 Eliminar	n 🕴 Mostrar Cambios - Parámetro:	s por defecto			Buscar	P 7
Anadir Aparatos     Eliminar     Di Todos los Aparatos     P Carpetas Dinámicas     I 11.1 4 FOLD UNIVERSAL IN	Mostrar Cambios Parametros  Dispositivo: 1.11 4 FOLD UNIVERSAL  CONFIGURATION  Configuration  Configuration  Channel B  Channel C  Channel D		Fixed value/Forced       10mSec.       Normally OPENED       Yes       1 Bit       0	• • • •	0434.02	μ Ţ
Buscar 🔎 🔿 אין	Objetos de Grupo / Parámetros /	Value type on LONG operation Bit value Long action after / Puesta en marcha /	1 Bit 0 1 Sec.	•		

# 7.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

#### Contact type

Allows selecting if it is a normally open ("Normally OPEN") or closed ("Normally CLOSED") contact.

## Distinction between SHORT and LONG action

It allows discriminating between a long and a short action. Thus, if the distinction is made, could run two different actions depending on the duration of the operation.

#### Value type on operation

Determines the sent data type:

- 1 Bit  $\rightarrow$  Bit value: 0 or 1
- 2 Bit  $\rightarrow$  Bit value: 00...11 (0, 2 or 3)
- 1 Byte  $\rightarrow$  Bit value: 0...255
- 2 Bytes signed → Bit value: -32768...+32768
- 2 Bytes unsigned → Bit value: 0...65535
- 2 Bytes Floating → Bit value: -99,99...+99,99
- 4 Bytes unsigned → Bit value: 0...4294967295

#### Value type on SHORT operation

Determines the sent data type with a short action:

- 1 Bit  $\rightarrow$  Bit value: 0 or 1
- 2 Bit  $\rightarrow$  Bit value: 00...11 (0, 2 or 3)
- 1 Byte  $\rightarrow$  Bit value: 0...255
- 2 Bytes signed  $\rightarrow$  Bit value: -32768...+32768
- 2 Bytes unsigned → Bit value: 0...65535
- 2 Bytes Floating → Bit value: -99,99...+99,99
- 4 Bytes unsigned → Bit value: 0...4294967295

#### Value type on LONG operation

Determines the sent data type with a long action:

- 1 Bit  $\rightarrow$  Bit value: 0 or 1
- o 2 Bit → Bit value: 00...11 (0, 2 or 3)
- 1 Byte → Bit value: 0...255
- 2 Bytes signed  $\rightarrow$  Bit value: -32768...+32768
- 2 Bytes unsigned → Bit value: 0...65535
- 2 Bytes Floating → Bit value: -99,99...+99,99
- 4 Bytes unsigned → Bit value: 0...4294967295

#### Long action after...

Sets the duration of the action from which is interpreted as long ("Long action"). Configurable from 0.3s up to 4s.

#### 7.2 – <u>Communication Objects</u>

Añadir Aparatos 👻 🧍 Elimin	ar 👫 Nueva	Carpeta Dinámica	m				0	15	10		10	Buscar	ρ
Todos los Aparatos	Número *	Nombre	Función del Objeto	Descripción	Direcciones de Grupo	Longitud	C	R	W	T	U	Tipo de Datos	Prioridad
🔎 Carpetas Dinámicas	■‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	-	W	1	14	enable	Baja
1.1.1 4 FOLD UNIVERSAL IN.	1	INPUT A	Bit Value Telegram A on operation			1 bit	С	R	W	Т	U	state	Baja
	∎‡ 2	INPUT A	Bit Value Telegram A on LONG operation			1 bit	С	R	W	т	U	state	Baja

DíNUY



# 8 - "Counter" Function

Dispositivos 🔻 (N	Nuevo Proyecto)			10 A X	
🕂 Añadir Aparatos 🔻 🥂 Elir	minar 🕴 Mostrar Cambios - Parametros p	or defecto		Buscar	P 7
Anddr Aparatos     Todos los Aparatos     Carpetas Dinámicas     T1.1.1 4 FOLD UNIVERSAL	Dispositivo: 1.1.1 4 FOLD UNIVERSAL IN Channel A		Counter 10mSec. Yes 8 0 Normally OPENED	603C07	
Buscar P 0/0 +	😻 🎽 Objetos de Grupo 📝 Parámetros 🖉	Puesta en marcha /			

# 8.1 - Parameters

#### Debounce time

Sets the time of suppression of rebounds when there is a switching. It prevents multiple unwanted actions caused by the rebound at the moment of closing its contact.

Adjustable from 10ms up to 160ms.

# Transmit State on Bus voltage recovery

After a recover from a failure in the Bus supply, it is possible to configure if the current state of the object "Bit Value Telegram on operation" is sent again.

#### Data counter width

Determines the size of the data in bits: 8, 16 or 32.

#### Start value (0-255)

Initial value of the counting process.

### Contact type

Sets if are accounted the openings ("Normally CLOSED") or closings ("Normally OPEN").

- Añadir Aparatos 🥆 🧎 Elimina	r 👫 Nueva	Carpeta Dinámica										Buscar	Q
I Todos los Aparatos	Número +	Nombre	Función del Objeto	Descripción	Direcciones de Grupo	Longitud	С	R	W	T	U	Tipo de Datos	Prioridad
Carpetas Dinámicas	<b>■</b> ‡  0	INPUT A (via BUS)	Disable Channel A			1 bit	С	<u>.</u>	W	<u>.</u>	12	enable	Baja
1.1.1 4 FOLD UNIVERSAL IN	■# 1	INPUT A	Counter Direction			1 bit	С	R	W	Т	U	up/down, open/	c Baja
	∎‡ 2	INPUT A	Reset Counter			1 bit	С	R	W	т	U	reset	Baja
	<b>≣</b> ‡ 3	INPUT A	Request Counter			1 bit	С	R	W	Т	U	trigger	Baja
	■‡ 4	INPUT A	Counter (0-255)			1 Byte	С	R	W	т	U	counter pulses (	) Baja



#### 9 – Temperature sensor Function

#### 9.1 - Parameters

When you choose this type of analog input, you can configure different parameters of temperature sensor.

Raíz del Proyecto 🔻			3	$\star  \star  =  {}_{\mathcal{C}^{\mathbf{X}}}  \times $
🕂 Añadir Aparatos 🔻 👗 Eliminar	r 🕴 Mostrar Cambios Parámetros p	or defecto		Buscar 🔎 🍸
Test Project EMKNT002     Edificios	Dispositivo: 4 FOLD UNIVERSAL AN	IALOG INTERFACE	Temperature Sensor	•
Eunciones Topología	CONFIGURATION  Channel B  Channel C	Base time to send temperature	1 Min.	•
<ul> <li>Todos los Aparatos</li> <li> 4 FOLD UNIVERSAL A</li> </ul>	<ul> <li>Channel D</li> <li>THERMOSTAT</li> </ul>	Factor time to send temperature (Total time = Base x Factor) ( 0=Disable send)	7	
		Temperature variation to send	5 x 0,1°C (0=Dis	able)
		Protection alarms	Overheating	•
		Overheating temeprature	45 • [x	
		Hyisteresis	0 (x 0	,1°C]
		"Temperature functionality" enabled after bus recovery voltage?	Yes	•
		Temperature sensor calibration value	0 • [x 0	,1°C]
Buscar 🔎 🔷 🗅 0/0 🏶 🗸	Objetos de Grupo / Parámetros /	Puesta en marcha		
Direcciones de Grupo 🔻			đ	▲▼ ⊕v <sup>3</sup> ×

#### Base time to send temperature

Temperature sending period. You can select between 1 second, 10 seconds, 1 minute, 10 minutes and 1 hour. This time period is multiplied by the "time factor" that goes from 0 to 255. So we select a cycle time for periodically sending the currently measured temperature value to the KNX bus. If this parameter is set 0, periodically sending temperature value will be disabled.

#### Temperature variation to send

Send with a temperature change. Set if you want to be sent to the KNX bus current temperature measurement in the event that the offset to the last measurement in degrees exceeds the quantity specified in this parameter (for example >  $0.5 \degree C$ ). This is independent of the temperature sending period before. You can choose in this box between  $0.5 \degree C$  and  $20 \degree C$  of temperature variation. If this parameter is set 0, sending temperature value will be disabled.

#### Protection alarms

Temperature protection. Parameter that lets you to activate protection in case of:

- Overheating.
- Overcooling.
- Overheating and overcooling.

#### Overheating/Overcooling temperature

You need to define the temperature in Celsius degrees of overheating or overcooling or both.

#### Hysteresis

It is related to the overheating or overcooling temperature. Is a hysteresis value in tenths of a degree to prevent successively sending the object when the room temperature keeps moving around the parameterised temperature limit.

#### "Temperature functionality" enabled after bus recovery voltage

Determines if we enable the object temperature function object when return the KNX bus voltage.

# Temperature sensor calibration value

This option is provided to perform a permanent correction (between -50 and +49 tenths of a degree) over the measurements received from the sensor, in case the installer has an evidence of a deviation between them and the actual temperature of the room.

#### 9.2 – Communication Objects

Raíz del Proyecto 🔻					□ ▲ ▼	
🕂 Añadir Aparatos 👻 👗 Elimin	ar 🛛 👫 Nueva	Carpeta Dinámica 🎽 Dividir Proyecto		_	Buscar	P 7
Test Project EMKNT002	Número 🔺	Nombre	Función del Objeto	Descripci	Direcciones de Gru	Longit
Edificios	■‡ 0	Disable Object Temperature functionality (	Channel A 1=Disable 0=Enable			1 bit
🕍 Funciones	■2 1	OUTPUT A	Temperature Value			2 Bytes
🔟 Topología	■≵ 2	OUTPUT A Sensor not connected	0=Sensor ok 1= Sensor not connec	ted		1 bit
📰 Direcciones de Grupo	<b>■</b> ‡  3	OUTPUT A Overheating	1= Overheationg; 0= No Overheat	ng		1 bit
Todos los Aparatos	∎‡ 4	OUTPUT A Overcooling	1= Overcooling; 0= No Overcoolin	g		1 bit
Buscar ♀ < ▷ 0/0 *	<ul> <li>Objetos de Gru</li> </ul>		<u> </u>			•
Direcciones de Grupo 🔻					□ ▲ ▼	₽⊻×

# **THERMOSTAT FUNCTION**

# 1 – ETS Parameterization window

We will describe a number of basic concepts related to the thermostat setting. You can configure up to 4 independent thermostats:

aíz del Proyecto 🔻				
- Añadir Aparatos 🥆 👗 Elimina	r 🛛 🕴 Mostrar Cambios Parámetros p	oor defecto		Buscar 🔎 🌱
Test Project EMKNT002	Dispositivo: 4 FOLD UNIVERSAL AN	ALOG INTERFACE		
Edificios     Funciones     Topología     Direcciones de Grupo	Channel A CONFIGURATION Channel B Channel C	Enable Thermostat 1 functionality? Enable Thermostat 2 functionality?	Yes No	•
Todos los Aparatos	<ul> <li>Channel D</li> <li>THERMOSTAT</li> </ul>	Enable Thermostat 3 functionality?	No	<b>•</b>
	Configuracion Thermostat 1 Set point heating 1 Heating regulation mode 1	Enable Thermostat 4 functionality?	No	•

# Mode:

You have to set the operating mode of the thermostat, you can choose between:

- Cooling thermostat.
- Heating thermostat.
- Cooling and heating thermostat.

Depending on the mode selected the thermostat will act in situations of only cooling, only heating or both..

Raíz del Proyecto 🔻				□ ▲ ▼	
🕂 Añadir Aparatos 🔻 👗 Elimina	r 📑 Mostrar Cambios Parámetros p	or defecto		Buscar	P 7
<ul> <li>Añadir Aparatos          <ul> <li>Eliminal</li> </ul> </li> <li>Test Project EMKNT002         <ul> <li>Edificios</li> <li>Funciones</li> <li>Topología</li> <li>Direcciones de Grupo</li> </ul> </li> <li>Todos los Aparatos</li> <li> <ul> <li>Todos los Aparatos</li> </ul> </li> </ul>	<ul> <li>Mostrar Cambios Parámetros p</li> <li>Dispositivo: 4 FOLD UNIVERSAL AN</li> <li>Channel A CONFIGURATION</li> <li>Channel B</li> <li>Channel C</li> <li>Channel C</li> <li>Channel D</li> <li>THERMOSTAT Configuracion</li> <li>Thermostat 1 Set point heating 1 Heating regulation mode 1</li> </ul>		heating thermostat         Absolute set point mode         24         Enable         Disable         One Source	Buscar • • • (x 1° C] • •	
Buscar ♀ < ▷ 0/0 * ▼	Objetos de Grupo / Parámetros /	Thermostat always on? State after bus recovery voltage Enable Turn on the thermostat when especial commands arrive? Send Thermosta mode after bur recovery voltage? Puesta en marcha	No Off Enable No	•	

#### Set point mode:

The set point temperature value can be:

- Absolute set point mode: This method permits a total control of the value of the desired temperature in the room, as the thermostat regulates the temperature stays depending on the set point temperature you are instructed at every time. A set point on the special Comfort mode is defined, from which the set points of other special modes are defined: Standby, Economic and cooling or overheating protection mode.
- **Relative set point mode:** This method, which is intended for systems with greater complexity permits controlling the target temperature in relative terms, so that is, be defined by basic temperature set point parameter and every one of the set points of the modes is established by an offset relative to this base temperature, both for cooling and for heating.



#### Special modes

If we choose the absolute set point mode, we have to define the value of these special modes::

Raíz del Proyecto 🔻				1 × × 4	e <sup>n</sup> ×
🕂 Añadir Aparatos 👻 👗 Eliminar	Mostrar Cambios Parámetros p	or defecto		Buscar	<u></u>
<ul> <li>Test Project EMKNT002         <ul> <li>Edificios</li> <li>Funciones</li> <li>Topología</li> <li>Direcciones de Grupo</li> </ul> </li> <li>Todos los Aparatos</li> <li>Todos los Aparatos</li> </ul>	Dispositivo: 4 FOLD UNIVERSAL AN Channel A CONFIGURATION Channel B Channel C Channel D THERMOSTAT Configuracion Thermostat 1 Set point heating 1 Heating regulation mode 1		22 -40 -60 8	<ul> <li>▼ [x 1°C]</li> <li>▼ [x 0,1°C]</li> <li>▼ [x 0,1°C]</li> <li>▼ [x 1°C]</li> </ul>	
Buscar 🔎 <> 0/0 🛠 🗸	Objetos de Grupo / Parámetros /	Puesta en marcha /			

- **Comfort Mode:** The temperature should be adjusted to a suitable value to achieve the comfort of users that are inside the room. This mode is normally activated when the room is being used.
- **Standby Mode:** This value is set by a offset relative to absolute set point for comfort mode defined by working mode parameterized (Cool, heat or both, in which case it is necessary to define a Comfort set point for heating and one for cooling). This mode is typically used when the room will be empty for a short period of time.
- **Economy Mode:** This value is set by a offset relative to absolute set point for comfort mode defined by working mode parameterized (Cool, heat or both, in which case it is necessary to define a Comfort setpoint for heating and one for cooling). This mode is typically used when the stay will be conditioned to be empty for longer periods of time, for example, when people won't come back to use the room until the next day.
- **Protection Mode:** This value will be activated in case of abnormal climate conditions, from excessive heat or cold, mainly due to some abnormal external environment (such as a breaking of a window) or because the stay will remain empty for a long time. The thermostatic control is activated only if the thermostat is ON and with protection mode ON and when the temperature of the room is actually above or below the set point values parameterized protection, preventing excessive energy consumption.

#### Initial set point after bus recovery voltage

In this box you must enter the initial set point, which is the desired temperature that is to have the room to return KNX bus voltage.

#### Enable window protection

In this box you enable or disable protection mode when an abnormal situation, for example, an opening or window breakage. It is a protection preferentially to other modes, so any special mode can be activated until the window state to pass the value "0".

#### Enable 1 bit mode objects

The thermostat EM KNT 002 will always be running in some way (Protection, Economy, Standby or Comfort). The thermostat is located on one of the modes depending on the HVAC required.

Mode switching can also be made through individual 4 objects mode, the working operation may be set by parameter. Is this box you can choose how the switching are used between the 4 modes (Protection, Economy, Standby or Comfort):

- Trigger: activating one special mode requires sending the value "1" through the object corresponding to that mode. Sending one "0" will have no effect.
- Switch: activating one special mode requires sending the value "1" through the object corresponding to that mode provided that there are no other mode objects with a higher priority and with value "1" at the same time (therefore, the value "0" completely deactivates a mode). The priority order of the special modes is as follows: 1- Protection / 2- Comfort / 3- Standby / 4- Economy. Sending one "0" will have no effect.

You may also be known at all times the current mode of working operation associated with a state object. In turn manual mode changes may be made by writing the value associated with the mode being activated in the communication object enabled for it.

Dis	Dositivo: 4 FOLD UNIVERSAL AN	IALOG INTERFACE	
4	Channel A CONFIGURATION	Mode	heating thermostat
⊳	Channel B	Set point mode	Absolute set point mode
⊳	Channel C		· · · · · · · · · · · · · · · · · · ·
⊳	Channel D	Initial set point after bus recovery voltage	24 💽 [x 1° C]
4	THERMOSTAT		
	Configuracion	Enable window protection	Enable 🔹
	Thermostat 1		
	Set point heating 1	Enable 1bit mode objects?	Switch mode
	Heating regulation mode 1		Disable
	5 5	Reference temperature source	Switch mode
			Tigger mode

#### Reference temperature source

In this box you active proportion for the reference temperature. The reference temperature is the actual ambient temperature registered in the room at a certain time. It will be used as reference when making changes to automatic mode. This temperature can be provided by an external KNX device capable of measuring temperatures. It will also be used as reference temperature a mixture of temperatures measured from two different sources (either from the internal probe incorporating some devices or from two external sources):

Reference temperature source	One Source 🗸
Thermostat always on?	One Source Two sources 75%(1) - 25%(2)
State after bus recovery voltage	Two sources 50%(1) - 50%(2) Two sources 25%(1) - 75%(2)

#### Thermostat always on:

In this box allows you to choose whether we want the thermostat is always ON "YES" or if it will turn ON to some external events "NO". If you choose "NO" 2 new configuration tabs will be displayed:

- State after bus recovery voltage:
  - o ON.
  - o OFF.
  - o Last state.
- Enable Turn ON the thermostat when especial commands arrive:
  - o Enable.
  - o Disable.

Thermostat always on?	No	
State after bus recovery voltage	Off	
Enable Turn on the thermostat when especial commands arrive?	Off On Last state	
Send Thermosta mode after bur recovery voltage?	No	
Puesta en marcha 🦯		

Send thermostat mode after bus recovery voltage:

In this box you indicate if you want "YES" or "NO" send thermostat mode after KNX bus recovery voltage.

#### Regulation mode screen to thermostatic control in the installation

Using this screen you can choose the control method for regulating the installation of thermostatic control (for heating or cooling or both). In this example we will do to heat.

We can choose between 2 points with hysteresis control or PI (Proportional Integral control). For each of them, you can establish a forwarding period, in minutes, of the variable associated control (writing a value different than 0 in the "forwarding period" field). This forwarding period only applies when the thermostat is turned on.

- Two-points hysteresis control

			1 · · ·	е <sup>ж</sup> ×
Mostrar Cambios Parámetros p	or defecto		Buscar	<u> </u>
Dispositivo: 4 FOLD UNIVERSAL AN	IALOG INTERFACE			
<ul> <li>Channel A</li> <li>CONFIGURATION</li> </ul>	Regulation mode	two points with hysteresis control	•	
<ul> <li>Channel B</li> <li>Channel C</li> </ul>	Upper hysteresis	10	[x 0,1°C]	
<ul> <li>Channel D</li> <li>THERMOSTAT</li> </ul>	Lower hysteresis	10	[x 0,1°C]	
Configuracion Thermostat 1	forwarding period (0=Disable)	0	💌 [x 1 min]	
Set point heating 1 Heating regulation mode 1				



# - Proportional-Integral control (PI)

Mostrar Cambios Pa	arámetros por defecto	Busca
Dispositivo: 4 FOLD UN	IVERSAL ANALOG INTERFACE	
<ul><li>Channel A</li><li>Channel B</li></ul>	Regulation mode	PI control
<ul><li>Channel C</li><li>Channel D</li></ul>	PWM type	PWM(1 bit)
<ul> <li>THERMOSTAT</li> <li>Configuracion</li> </ul>	PI cycle time	PWM(1 bit) 1 byte (%)
Thermostat 1 Set point heating	Proportional band	5 (x 1°C)
Heating regulation		31
	Maximum integral component (%)	21

# 2 – Communication Objects

👫 Nueva	Carpeta Dinámica 🚔 Dividir Proyecto		_	Buscar	م	5
Número 🔺	Nombre	Función del Objeto	Descripci	Direcciones de Gru	Longit.	
<b>≵</b> 0	Disable Object Temperature functionality Cha	nnel A 1=Disable 0=Enable			1 bit	
₹1	OUTPUT A	Temperature Value			2 Bytes	
₽ 2	OUTPUT A Sensor not connected	0=Sensor ok 1= Sensor not connected			1 bit	
<b>₽</b> 3	OUTPUT A Overheating	1= Overheationg; 0= No Overheating			1 bit	
₹ 4	OUTPUT A Overcooling	1= Overcooling; 0= No Overcooling			1 bit	
28	[T1] On/Off (Status)	1= On; 0= Off			1 bit	
₽ 29	[T1] On/Off	1= On; 0= Off			1 bit	
<b>≵</b> 30	[T1] Set point information	Set point actual			2 Bytes	
≵ 31	[T1] Set point input	Set point			2 Bytes	
<b>2</b> 32	[T1] Output	Output (% Proportional -Integral)			1 Byte	
₹ 34	[T1] Temperature sensor 1	Input temperature sensor 1			2 Bytes	
<b>≵</b> 36	[T1] Special mode info	2 byte mode info			2 Bytes	
₽ 37	[T1] Special mode input 1byte	1 byte mode hvacmode			1 Byte	
₽ 38	[T1] Special mode Economyc	0= Off ; 1=on			1 bit	
≵ 39	[T1] Special mode Stanby	0= Off ; 1=on			1 bit	
₹ 40	[T1] Special mode Protection	0= Off ; 1=on			1 bit	
₽ 41	[T1] Special mode Confort	0= Off ; 1=on			1 bit	
₹ 44	[T1] Windows alarm 1	0= No alarm ; 1= Alarm			1 bit	
₽ 45	[T1] Windows alarm 2	0= No alarm ; 1= Alarm			1 bit	
<b>7</b> 46	IT11 Windows alarm 3	0= No alarm · 1= Alarm			1 hit	