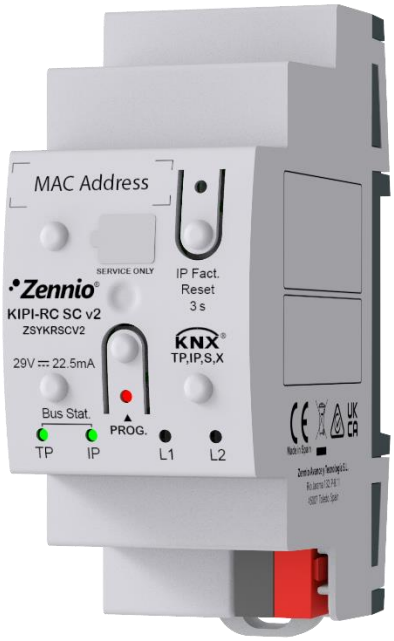

KIPI-RC SC v2

Secure KNX-IP Interface and Multiroom Climate Controller

ZSYKRSCV2

Application Program version: [1.4]
User Manual version: [1.4]_a

www.zennio.com

USER MANUAL

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1 INTRODUCTION

1.1 KIPI-RC SC V2

KIPI-RC SC v2 is the solution from Zennio for the **interconnection** of **KNX twisted-pair lines** and **Ethernet** medium and, likewise, for managing and controlling the climate of multiple hotel rooms (or any other type of guest rooms, e.g., residential or hospital rooms). To that end, it is possible to enable up to **twenty thermostats independently**.

In addition, KIPI-RC SC v2 can **synchronize the date and time with an NTP server** in order to send this information to the KNX bus and serve as the **clock master** of the installation.

To ensure the exchange of KNX data in both IP and TP medium, the KIPI-RC SC v2 has been provided with **KNX Secure**. For detailed information about the functionality and configuration of the KNX security, please refer to the specific user manual "**KNX Secure**", available in the KIPI-RC SC v2 product section of the Zennio web portal (www.zennio.com).

These are the most outstanding features of these two devices:

- Maximum APDU length of 254 bytes.
- Up to **5 parallel connections from ETS** for programming and monitoring (via group monitor).
- No external power required.
- **High capacity buffer** for the reception of telegrams from the Ethernet network.
- **4 lighting indicators (LEDs)**: two state indicators for the lines (bus and Ethernet), one more IP factory reset indicator, and one additional indicator for the programming mode.
- Installation **Clock master** functionality, synchronized with **NTP servers**.
- Up to **20** independent **Hospitality thermostats**.
- **Heartbeat** or periodical “still-alive” notification.

1.2 LED INDICATORS

KIPI-RC SC v2 incorporates four LED on the top of the device that make it easy to monitor the status of the bus, the IP connection and more, as detailed next.



Figure 1. LEDs

- **KNX Line Status LED (TP)**: shows the status of the primary bus.
  - OFF: error or KNX line not connected or not powered.
  - ON (green) = TP connection OK.

  Note: *the update of the LED status can be delayed a few seconds after the trigger event, e.g., after the disconnection of the main line.*

- **Ethernet Line Status LED (IP)**: shows the status of the secondary bus.
  - OFF: error or IP line not connected.
  - ON (green): Ethernet connection OK

- **Programming LED**:
  - OFF = normal operation.
  - ON (red) = programming mode active.

- **IP Factory Reset LED:**
  - OFF: normal operation.
  - ON (red): factory IP is restored (300 ms active).

Note: *LEDs L1 and L2 has no use.*

1.3 HARD RESET TO FACTORY DEFAULTS

If “IP Fact. Reset” button is **pressed for three seconds**, the device restores its default parameters (obtain an IP address via DHCP server, see section 0). Thus, if a device becomes inaccessible on the local network due to the loss of its IP configuration, the device can be located again. The default configuration will remain until a new download is made.

When a long press is detected, the associated LED will light up in red for 300 ms. After this time, LED will switch off again.

2 CONFIGURATION

After importing the corresponding database in ETS and adding the device into the topology of the desired project, the configuration process begins by entering the Parameters tab of the device.

2.1 KNX TO IP INTERFACE

KIPI-RC SC v2 is an interface device intended for the **interconnection between a KNX bus and an Ethernet network (LAN).**

On the other hand, KIPI-RC SC v2 can be allocated within the project topology in ETS, as any other device. This step can be omitted when it is going to be used as interface, because there is no need to modify the default configuration (see previous section). However, when requiring to modify any property of KIPI-RC SC v2, an individual address should be assigned in order to download.

2.1.1 PROGRAMMER

KIPI-RC SC v2 can be used in ETS as a **programming interface**. In addition to an IP address, they must be assigned a KNX individual address for this purpose.

Up to five simultaneous connections are allowed for performing downloads or for bus monitoring (via group monitor).

Note: *to detect the KIPI-RC SC v2 as a programmer in ETS, it needs to be connected to the same IP network as the PC*.

To use a device as a programmer:

- In **ETS6** must be selected from the drop-down list of “Connection bus”.

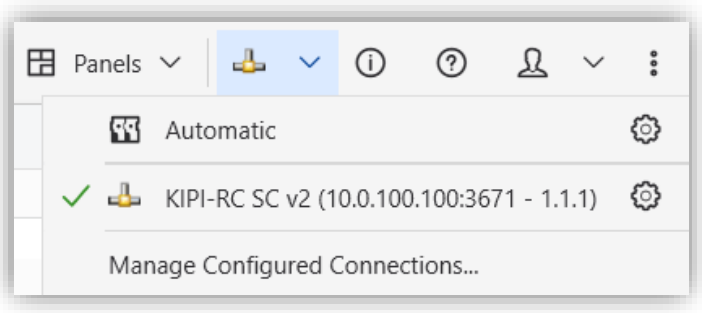

Figure 2. Selection of KIPI-RC SC v2 in the Bus Connection’s drop-down list in ETS6

- In **ETS5** select it in the ETS "Bus" tab under Connections → Interfaces.

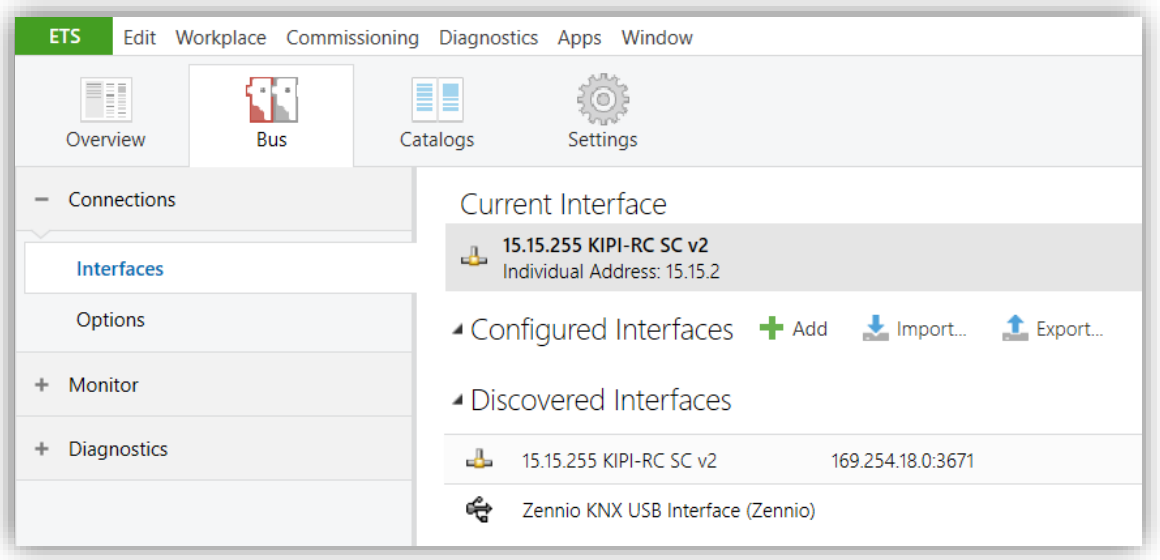

Figure 3. Selection of KIPI-RC SC v2 in the Bus Connection's tab in ETS5

Or by selecting it at the bottom left after opening a project in ETS.

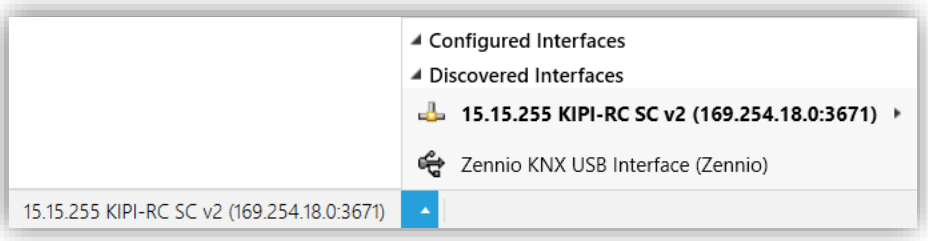

Figure 4. Selection of KIPI-RC SC v2 in a ETS project

Important: *If the KIPI-RC SC v2 is selected as the programming interface to program itself it is recommended to first perform individual address download and then application download, rather than complete download (complete download causes a device restart and therefore communication with ETS is lost and the download is cancelled).*

2.1.1.1 PROPERTIES

Once the desire Interface **KIPI-RC SC v2** has been selected, its configuration will be carried out in the "IP" panel of "Properties" tab in ETS:

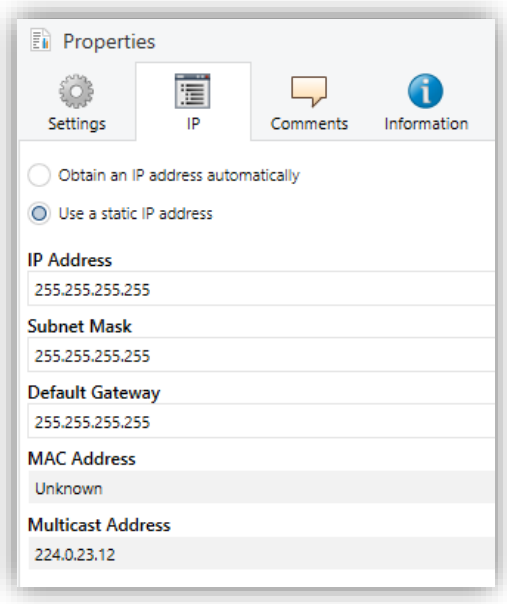

Figure 5. IP Configuration

- *Obtain an IP address automatically*[1]. KIPI-RC SC v2 will automatically take an IP address whenever there is a DCHP server in the local network to which it is connected.
- *Use a static IP address*. If DHCP protocol is not used, the following properties must be set manually:
  - **IP Address** [*0.0.0.0…255.255.255.255*]**.**
  - **Subnet Mask** [*0.0.0.0…255.255.255.255*]**.**
  - **Default Gateway** [*0.0.0.0…255.255.255.255*]**.**

  Note: *If a static IP is configured, it is important to make sure that no other device on the network has this IP assigned to it and that it does not belong to the DHCP range configured for the router, otherwise connection problems with the KIPI-RC SC v2 will be observed.*

In addition, the following information will be shown:

[1] The default values of each parameter will be highlighted in blue in this document, as follows: [*default / rest of options*].

- **MAC Address.**
- **Multicast Address** [*224.0.23.12*]: IP address (reserved by the IANA organization for the KNXnet/IP protocol) used by ETS in this case, for discovering the available KNX-IP interfaces within the same network.

Once these properties have been entered an ETS programming is required to download the configuration to the device.

2.1.1.2 PARALLEL DOWNLOADS

ETS offers the option to perform multiple parallel downloads within the same project. This option is only available for connections via a KNX-IP router or a KNX-IP interface. Certain conditions must be met:

- Each download must be performed on a different line.
- For the **ETS6** version, inside “Connection bus” it is necessary to select the option *Automatic*.

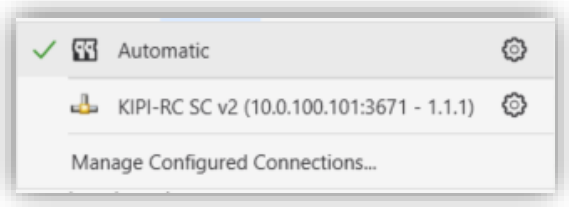

Figure 6. ETS6 parallel downloads configuration.

- For the **ETS5** version, for each line it is necessary to select one **KIPI-RC SC v2** to perform the download. It is configured in the line properties.

  Notes:

  - *There is a restriction: parallel downloads are **not available to download physical addresses**. When performing this type of downloads, the link device used by ETS is not the one configured for the line but the general one.*
  - *Once the connection has been selected, it will not be available for the other lines.*

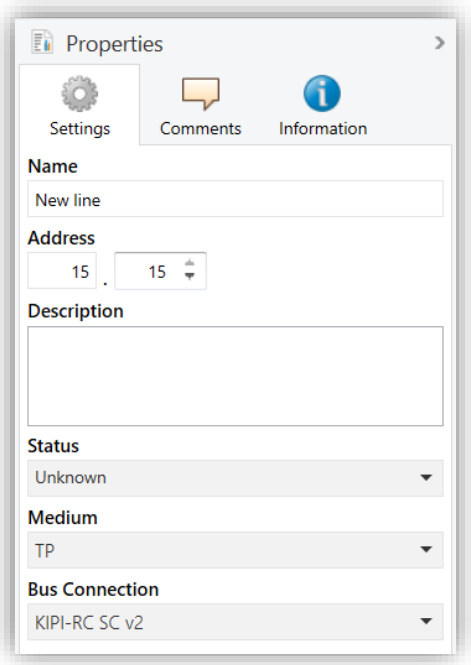

Figure 7. ETS5 parallel downloads configuration

2.1.2 ADDICIONAL INDIVIDUAL ADDRESSES (TUNNELING ADDRESSES)

KIPI-RC SC v2 requires a specific individual address when acting as a programming interface (*tunneling*) other than the address of the device itself. Up to five simultaneous connections are possible, which implies that up to five different individual addresses must be configured.

Although, by default, the physical address of KIPI-RC SC v2 is *15.15.255* and tunneling addresses are *15.15.250*, *15.15.251*, *15.15.252*, *15.15.253* and *15.15.254*, all of them can be configured in ETS after adding the device to the project, as shown in the following figure:

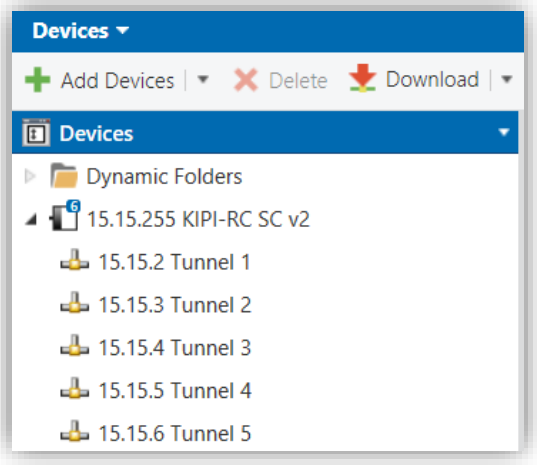

Figure 8. Set tunneling addresses

After the individual KIPI-RC SC v2 address has been set, the five tunneling addresses are automatically set with consecutive values. This can be changer at any time.

After configuration it is necessary to download physical addresses from ETS for the change to be effective.

Note: *KIPI-RC SC v2 tunnelling addresses must not match any of the addresses set to other devices on the system.*

2.2 GENERAL

The "General" tab contains general settings. Most are checkboxes for enabling/disabling other functionalities.

ETS PARAMETERISATION

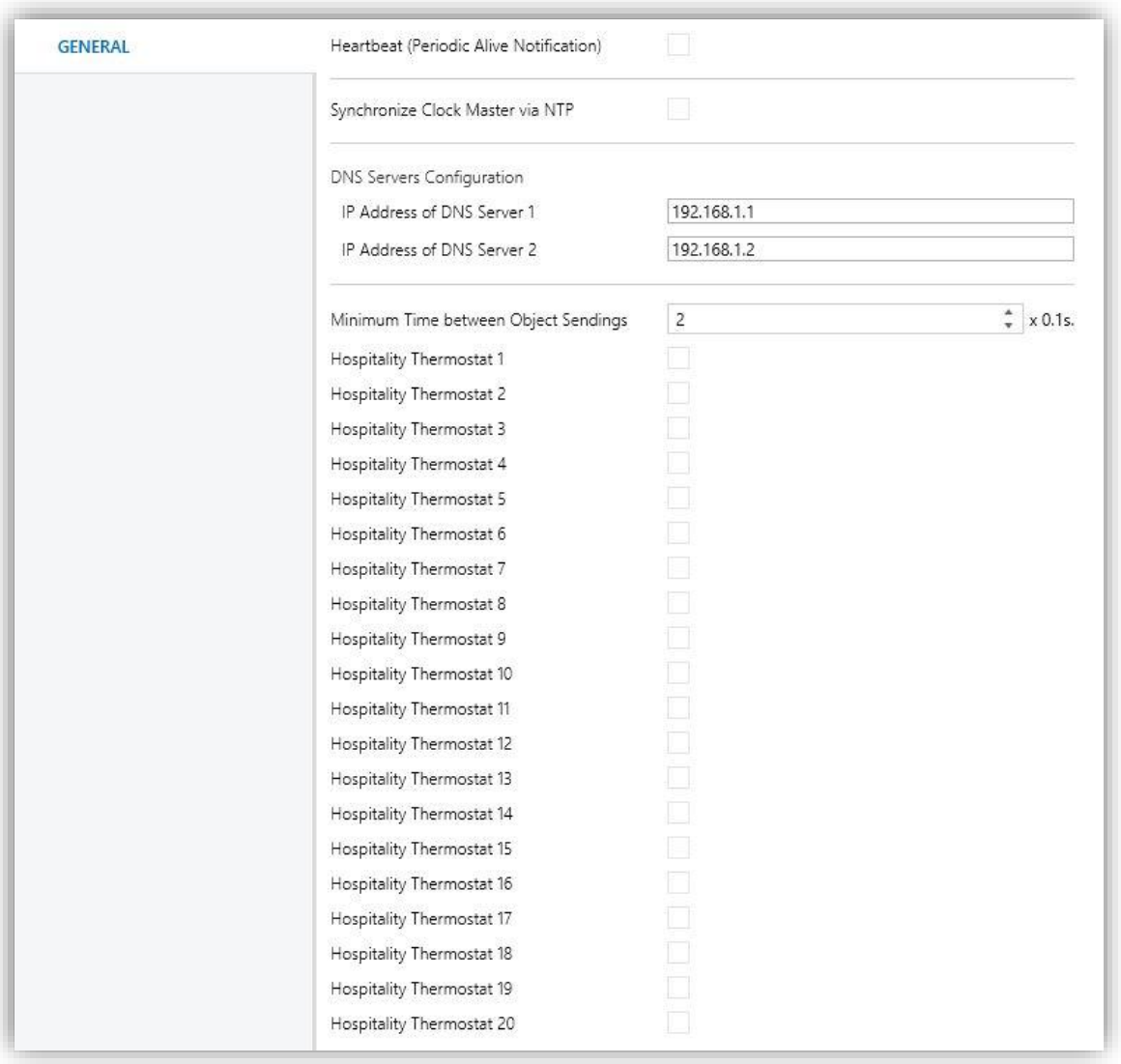

Figure 9. General

- **Heartbeat (Periodic Alive Notification)** [*disabled / enabled*]: incorporates a one-bit object to the project ("**[Heartbeat] Object to Send '1'**") that will be sent periodically with value "1" to notify that the device is still working (still alive).

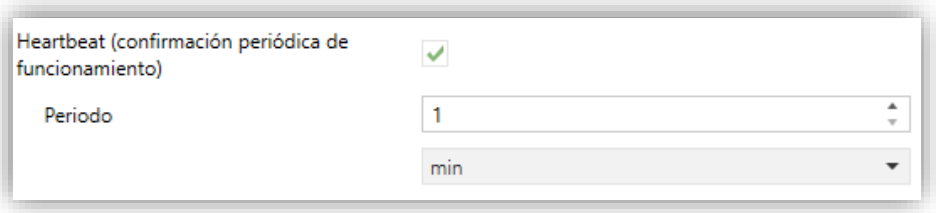

Figure 10. Heartbeat

Note: *the first sending after download or bus failure takes place with a delay of up to 255 seconds, to prevent bus overload. The following sendings march the period set.*

- **Synchronize Clock Master via NTP** [*disabled / enabled*]: enables or disables the "NTP" tab in the tree on the left. For more information, see section 2.3.

  Note: *This parameter must be enabled in the device that will be clock master so that there is only one in the installation.*

- **DNS Servers Configuration:** numeric text fields to enter the IP address of two DNS servers:

  - **IP Address of DNS Server 1** and **2** [*198.162.1.1*, *198.162.1.2*].

  Note: *The connection to the DNS server is necessary to ensure the correct functioning of the NTP servers (see section 2.3). As long as there is no connection to a DNS server, the date and time information will not be synchronized.*

- **Minimum Time between Object Sendings** [*1…2…255*] [*x 0.1s*]: time period between sendings to prevent bus overload when KIPI-RC SC v2 has to send a large number of objects after a restart (after download or bus failure).

- **Hospitality Thermostat x** [*disabled / enabled*]: enables or disables the "Thermostat Hospitality x" tab in the tree on the left. For more information, see section 2.4.

2.3 NTP CLOCK

KIPI-RC SC v2 can be configured as the installation master clock. It will send the date and time information to the rest of the devices of the installation. This information will be obtained from an NTP server.

Please refer to the specific manual "**NTP Clock**" (available under the KIPI-RC SC v2 product section at Zennio homepage, www.zennio.com) for detailed information about the functionality and the configuration of the involved parameters.

2.4 HOSPITALITY THERMOSTAT

KIPI-RC SC v2 includes **twenty instances of the Hospitality Thermostat**, which can be enabled and customised independently.

Please refer to the specific manual "**Hospitality Thermostat**" (available at the Zennio homepage, www.zennio.com) for detailed information about the functionality and the configuration of the involved parameters.

ANNEX I. COMMUNICATION OBJECTS

- "**Functional range**" shows the values that, with independence of any other values permitted by the bus according to the object size, may be of any use or have a particular meaning because of the specifications or restrictions from both the KNX standard or the application program itself.

Number	Size	I/O	Flags	Data type (DPT)	Functional Range	Name	Function
1	1 Bit		C - - T -	DPT_Trigger	0/1	[Heartbeat] Object to Send '1'	Sending of '1' Periodically
2	3 Bytes	O	C R - T -	DPT_Date	01/01/1990 - 31/12/2089	[NTP] Date	Current Date
3	3 Bytes	O	C R - T -	DPT_TimeOfDay	00:00:00 - 23:59:59	[NTP] Time of Day	Current Time
4	8 Bytes	O	C R - T -	DPT_DateTime		[NTP] Date and Time	Current Date and Time
5	1 Bit	I	C - W - -	DPT_Ack	0/1	[NTP] Sending Request	0 = No Action; 1 = Request Date and Time Sending
6, 74, 142, 210, 278, 346, 414, 482, 550, 618, 686, 754, 822, 890, 958, 1026, 1094, 1162, 1230, 1298	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [A] On/Off	0 = Off; 1 = On
7, 75, 143, 211, 279, 347, 415, 483, 551, 619, 687, 755, 823, 891, 959, 1027, 1095, 1163, 1231, 1299	1 Bit	O	C R - T -	DPT_Switch	0/1	[HTx] [A] On/Off Status	0 = Off; 1 = On
8, 76, 144, 212, 280, 348, 416, 484, 552, 620, 688, 756, 824, 892, 960, 1028, 1096, 1164, 1232, 1300	1 Byte	I	C - W - -	DPT_SceneControl	0-63; 128-191	[HTx] [A] Scene Input	Scene Value
9, 77, 145, 213, 281, 349, 417, 485, 553, 621, 689, 757, 825, 893, 961, 1029, 1097, 1165, 1233, 1301	2 Bytes	I	C - W T U	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [A] Temperature Source 1	External Sensor Temperature
10, 78, 146, 214, 282, 350, 418, 486, 554, 622, 690, 758, 826, 894, 962, 1030, 1098, 1166, 1234, 1302	2 Bytes	I	C - W T U	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [A] Temperature Source 2	External Sensor Temperature
11, 79, 147, 215, 283, 351, 419, 487, 555, 623, 691, 759, 827, 895, 963, 1031, 1099, 1167, 1235, 1303	2 Bytes	O	C R - T -	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [A] Room Temperature	Current Temperature
12, 80, 148, 216, 284, 352, 420, 488, 556, 624, 692, 760, 828, 896, 964, 1032, 1100, 1168, 1236, 1304	1 Bit	I/O	C R W - -	DPT_Heat_Cool	0/1	[HTx] [A] System Mode	0 = Cooling; 1 = Heating

13, 81, 149, 217, 285, 353, 421, 489, 557, 625, 693, 761, 829, 897, 965, 1033, 1101, 1169, 1237, 1305	1 Bit	I/O	**C R W - -**	DPT_Heat_Cool	0/1	[HTx] [A] User Mode	0 = Cooling; 1 = Heating
14, 82, 150, 218, 286, 354, 422, 490, 558, 626, 694, 762, 830, 898, 966, 1034, 1102, 1170, 1238, 1306	1 Bit	I/O	**C R W - -**	DPT_Switch	0/1	[HTx] [A] Force System Mode	0 = User Mode / Auto Change; 1 = System Mode
15, 83, 151, 219, 287, 355, 423, 491, 559, 627, 695, 763, 831, 899, 967, 1035, 1103, 1171, 1239, 1307	1 Bit	O	**C R - T -**	DPT_Heat_Cool	0/1	[HTx] [A] Mode Status	0 = Cooling; 1 = Heating
16, 84, 152, 220, 288, 356, 424, 492, 560, 628, 696, 764, 832, 900, 968, 1036, 1104, 1172, 1240, 1308	1 Byte	I	**C - W T U**	DPT_Scaling	0% - 100%	[HTx] [A] Fan Speed	0% - 100%
17, 85, 153, 221, 289, 357, 425, 493, 561, 629, 697, 765, 833, 901, 969, 1037, 1105, 1173, 1241, 1309	1 Bit	I	**C - W T U**	DPT_Enable	0/1	[HTx] [A] Fan: Manual/Automatic	0 = Manual; 1 = Automatic
	1 Bit	I	**C - W T U**	DPT_Enable	0/1	[HTx] [A] Fan: Manual/Automatic	0 = Automatic; 1 = Manual
18, 86, 154, 222, 290, 358, 426, 494, 562, 630, 698, 766, 834, 902, 970, 1038, 1106, 1174, 1242, 1310	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [A] On/Off Fancoil	0 = Off; 1 = On
19, 87, 155, 223, 291, 359, 427, 495, 563, 631, 699, 767, 835, 903, 971, 1039, 1107, 1175, 1243, 1311	1 Bit	I	**C - W - -**	DPT_Reset	0/1	[HTx] [B] User Comfort Setpoint Reset	0 = Nothing; 1 = Reset
20, 88, 156, 224, 292, 360, 428, 496, 564, 632, 700, 768, 836, 904, 972, 1040, 1108, 1176, 1244, 1312	2 Bytes	I	**C - W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] User Setpoint Control	[-20°C, 100°C]
	2 Bytes	I	**C - W T U**	DPT_Value_Tempd	-671088.64º - 670433.28º	[HTx] [B] User Setpoint Offset	[-15°C, 15°C]
21, 89, 157, 225, 293, 361, 429, 497, 565, 633, 701, 769, 837, 905, 973, 1041, 1109, 1177, 1245, 1313	1 Bit	I	**C - W - -**	DPT_Step	0/1	[HTx] [B] Step User Setpoint	0 = Decrease; 1 = Increase
22, 90, 158, 226, 294, 362, 430, 498, 566, 634, 702, 770, 838, 906, 974, 1042, 1110, 1178, 1246, 1314	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Comfort Setpoint (Cooling)	[-20°C, 100°C]
	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Comfort Setpoint	[-20°C, 100°C]
23, 91, 159, 227, 295, 363, 431, 499, 567, 635, 703, 771, 839, 907, 975, 1043, 1111, 1179, 1247, 1315	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Standby Setpoint (Cooling)	[-20°C, 100°C]
24, 92, 160, 228, 296, 364, 432, 500, 568, 636, 704,	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Economy Setpoint (Cooling)	[-20°C, 100°C]

772, 840, 908, 976, 1044, 1112, 1180, 1248, 1316							
25, 93, 161, 229, 297, 365, 433, 501, 569, 637, 705, 773, 841, 909, 977, 1045, 1113, 1181, 1249, 1317	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Protection Setpoint (Cooling)	[-20°C, 100°C]
26, 94, 162, 230, 298, 366, 434, 502, 570, 638, 706, 774, 842, 910, 978, 1046, 1114, 1182, 1250, 1318	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Comfort Setpoint (Heating)	[-20°C, 100°C]
27, 95, 163, 231, 299, 367, 435, 503, 571, 639, 707, 775, 843, 911, 979, 1047, 1115, 1183, 1251, 1319	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Standby Setpoint (Heating)	[-20°C, 100°C]
28, 96, 164, 232, 300, 368, 436, 504, 572, 640, 708, 776, 844, 912, 980, 1048, 1116, 1184, 1252, 1320	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Economy Setpoint (Heating)	[-20°C, 100°C]
29, 97, 165, 233, 301, 369, 437, 505, 573, 641, 709, 777, 845, 913, 981, 1049, 1117, 1185, 1253, 1321	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Protection Setpoint (Heating)	[-20°C, 100°C]
30, 98, 166, 234, 302, 370, 438, 506, 574, 642, 710, 778, 846, 914, 982, 1050, 1118, 1186, 1254, 1322	2 Bytes	O	**C R - T -**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] Real Setpoint Status	[-20°C, 100°C]
31, 99, 167, 235, 303, 371, 439, 507, 575, 643, 711, 779, 847, 915, 983, 1051, 1119, 1187, 1255, 1323	2 Bytes	O	**C R - T -**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [B] User Setpoint Status	[-20°C, 100°C]
	2 Bytes	O	**C R - T -**	DPT_Value_Tempd	-671088.64º - 670433.28º	[HTx] [B] User Setpoint Offset Status	[-15°C, 15°C]
32, 100, 168, 236, 304, 372, 440, 508, 576, 644, 712, 780, 848, 916, 984, 1052, 1120, 1188, 1256, 1324	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Seconds (0 = Disabled)
	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Minutes (0 = Disabled)
	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Hours (0 = Disabled)
33, 101, 169, 237, 305, 373, 441, 509, 577, 645, 713, 781, 849, 917, 985, 1053, 1121, 1189, 1257, 1325	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Seconds (0 = Disabled)
	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Minutes (0 = Disabled)
	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Hours (0 = Disabled)
34, 102, 170, 238, 306, 374, 442, 510, 578, 646, 714,	2 Bytes	I/O	**C R W T U**	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Seconds (0 = Disabled)

782, 850, 918, 986, 1054, 1122, 1190, 1258, 1326	2 Bytes	I/O	C R W T U	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Minutes (0 = Disabled)
	2 Bytes	I/O	C R W T U	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Hours (0 = Disabled)
35, 103, 171, 239, 307, 375, 443, 511, 579, 647, 715, 783, 851, 919, 987, 1055, 1123, 1191, 1259, 1327	1 Bit	I/O	C R W - -	DPT_Occupancy	0/1	[HTx] [C] Presence Detector (Input)	0 = Not Occupied; 1 = Occupied
36, 104, 172, 240, 308, 376, 444, 512, 580, 648, 716, 784, 852, 920, 988, 1056, 1124, 1192, 1260, 1328	1 Bit	I/O	C R W - -	DPT_Enable	0/1	[HTx] [C] Lock Presence Detection	0 = Unlocked; 1 = Locked
	1 Bit	I/O	C R W - -	DPT_Enable	0/1	[HTx] [C] Lock Presence Detection	0 = Locked; 1 = Unlocked
37, 105, 173, 241, 309, 377, 445, 513, 581, 649, 717, 785, 853, 921, 989, 1057, 1125, 1193, 1261, 1329	1 Bit	I/O	C R W - -	DPT_Bool	0/1	[HTx] [C] Sold/Unsold Room (Input)	0 = Unsold; 1 = Sold
38, 106, 174, 242, 310, 378, 446, 514, 582, 650, 718, 786, 854, 922, 990, 1058, 1126, 1194, 1262, 1330	1 Byte	I	C - W - -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[HTx] [D] Special Mode	1-byte HVAC Mode
39, 107, 175, 243, 311, 379, 447, 515, 583, 651, 719, 787, 855, 923, 991, 1059, 1127, 1195, 1263, 1331	1 Bit	I	C - W - -	DPT_Ack	0/1	[HTx] [D] Special Mode: Comfort	0 = Nothing; 1 = Trigger
	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [D] Special Mode: Comfort	0 = Off; 1 = On
40, 108, 176, 244, 312, 380, 448, 516, 584, 652, 720, 788, 856, 924, 992, 1060, 1128, 1196, 1264, 1332	1 Bit	I	C - W - -	DPT_Ack	0/1	[HTx] [D] Special Mode: Standby	0 = Nothing; 1 = Trigger
	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [D] Special Mode: Standby	0 = Off; 1 = On
41, 109, 177, 245, 313, 381, 449, 517, 585, 653, 721, 789, 857, 925, 993, 1061, 1129, 1197, 1265, 1333	1 Bit	I	C - W - -	DPT_Ack	0/1	[HTx] [D] Special Mode: Economy	0 = Nothing; 1 = Trigger
	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [D] Special Mode: Economy	0 = Off; 1 = On
42, 110, 178, 246, 314, 382, 450, 518, 586, 654, 722, 790, 858, 926, 994, 1062, 1130, 1198, 1266, 1334	1 Bit	I	C - W - -	DPT_Ack	0/1	[HTx] [D] Special Mode: Protection	0 = Nothing; 1 = Trigger
	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [D] Special Mode: Protection	0 = Off; 1 = On
43, 111, 179, 247, 315, 383, 451, 519, 587, 655, 723, 791, 859, 927, 995, 1063, 1131, 1199, 1267, 1335	1 Byte	O	C R - T -	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[HTx] [D] Special Mode Status	1-byte HVAC Mode
44, 112, 180, 248, 316, 384, 452, 520, 588, 656, 724, 792, 860, 928, 996, 1064, 1132, 1200, 1268, 1336	1 Bit	O	C R - T -	DPT_Switch	0/1	[HTx] [D] Comfort Mode Status	0 = Off; 1 = On

45, 113, 181, 249, 317, 385, 453, 521, 589, 657, 725, 793, 861, 929, 997, 1065, 1133, 1201, 1269, 1337	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 1 (Input)	0 = Closed; 1 = Open
	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 1 (Input)	0 = Open; 1 = Closed
46, 114, 182, 250, 318, 386, 454, 522, 590, 658, 726, 794, 862, 930, 998, 1066, 1134, 1202, 1270, 1338	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 2 (Input)	0 = Closed; 1 = Open
	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 2 (Input)	0 = Open; 1 = Closed
47, 115, 183, 251, 319, 387, 455, 523, 591, 659, 727, 795, 863, 931, 999, 1067, 1135, 1203, 1271, 1339	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 3 (Input)	0 = Closed; 1 = Open
	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 3 (Input)	0 = Open; 1 = Closed
48, 116, 184, 252, 320, 388, 456, 524, 592, 660, 728, 796, 864, 932, 1000, 1068, 1136, 1204, 1272, 1340	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 4 (Input)	0 = Closed; 1 = Open
	1 Bit	I	C - W - -	DPT_Window_Door	0/1	[HTx] [D] Window Status 4 (Input)	0 = Open; 1 = Closed
49, 117, 185, 253, 321, 389, 457, 525, 593, 661, 729, 797, 865, 933, 1001, 1069, 1137, 1205, 1273, 1341	1 Bit	I/O	C R W - -	DPT_Enable	0/1	[HTx] [D] Enable Window Status	0 = Disabled; 1 = Enabled
50, 118, 186, 254, 322, 390, 458, 526, 594, 662, 730, 798, 866, 934, 1002, 1070, 1138, 1206, 1274, 1342	1 Bit	I/O	C R W - -	DPT_Enable	0/1	[HTx] [D] Thermostat Lock	0 = Locked; 1 = Unlocked
	1 Bit	I/O	C R W - -	DPT_Enable	0/1	[HTx] [D] Thermostat Lock	0 = Unlocked; 1 = Locked
51, 119, 187, 255, 323, 391, 459, 527, 595, 663, 731, 799, 867, 935, 1003, 1071, 1139, 1207, 1275, 1343	2 Bytes	I/O	C R W T U	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [D] Comfort Lower Limit	[-20°C, 100°C]
52, 120, 188, 256, 324, 392, 460, 528, 596, 664, 732, 800, 868, 936, 1004, 1072, 1140, 1208, 1276, 1344	2 Bytes	I/O	C R W T U	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [D] Comfort Upper Limit	[-20°C, 100°C]
53, 121, 189, 257, 325, 393, 461, 529, 597, 665, 733, 801, 869, 937, 1005, 1073, 1141, 1209, 1277, 1345	1 Bit	I/O	C R W - -	DPT_Switch	0/1	[HTx] [D] Hidden Offset On/Off	0 = Off; 1 = On
54, 122, 190, 258, 326, 394, 462, 530, 598, 666, 734, 802, 870, 938, 1006, 1074, 1142, 1210, 1278, 1346	2 Bytes	I/O	C R W T U	DPT_Value_Tempd	-671088.64º - 670433.28º	[HTx] [D] Hidden Offset Value	[-20°C, 100°C]
55, 123, 191, 259, 327, 395, 463, 531, 599, 667, 735, 803, 871, 939, 1007, 1075, 1143, 1211, 1279, 1347	1 Bit	O	C R - T -	DPT_Bool	0/1	[HTx] [D] Eco Mode Notification	0 = Out of eco range; 1 = Setpoint in Eco Range
56, 124, 192, 260, 328, 396, 464, 532, 600, 668, 736,	1 Byte	O	C R - T -	DPT_Scaling	0% - 100%	[HTx] [D] Eco Mode Ratio	Percentage of Time Working in Eco Range

804, 872, 940, 1008, 1076, 1144, 1212, 1280, 1348							
57, 125, 193, 261, 329, 397, 465, 533, 601, 669, 737, 805, 873, 941, 1009, 1077, 1145, 1213, 1281, 1349	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [D] Eco Mode: Lower Limit (Cooling)	Lower Value for the Ecological Range
58, 126, 194, 262, 330, 398, 466, 534, 602, 670, 738, 806, 874, 942, 1010, 1078, 1146, 1214, 1282, 1350	2 Bytes	I/O	**C R W T U**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [D] Eco Mode: Upper Limit (Heating)	Upper Value for the Ecological Range
59, 127, 195, 263, 331, 399, 467, 535, 603, 671, 739, 807, 875, 943, 1011, 1079, 1147, 1215, 1283, 1351	2 Bytes	O	**C R - T -**	DPT_Value_Temp	-273.00º - 670433.28º	[HTx] [D] Setpoint to Split	[-20°C, 100°C]
60, 128, 196, 264, 332, 400, 468, 536, 604, 672, 740, 808, 876, 944, 1012, 1080, 1148, 1216, 1284, 1352	2 Bytes	I	**C - W - -**	DPT_Value_Humidity	-12% - 12%	[HTx] [F] Current Humidity	Humidity Sensor Value
61, 129, 197, 265, 333, 401, 469, 537, 605, 673, 741, 809, 877, 945, 1013, 1081, 1149, 1217, 1285, 1353	2 Bytes	I/O	**C R W T U**	DPT_Value_Humidity	-12% - 12%	[HTx] [F] High Humidity Alarm Threshold	Value of High Humidity Alarm Threshold
62, 130, 198, 266, 334, 402, 470, 538, 606, 674, 742, 810, 878, 946, 1014, 1082, 1150, 1218, 1286, 1354	1 Bit	I/O	**C R W T U**	DPT_Enable	0/1	[HTx] [F] Dehumidification Control	0 = Disabled; 1 = Enabled
63, 131, 199, 267, 335, 403, 471, 539, 607, 675, 743, 811, 879, 947, 1015, 1083, 1151, 1219, 1287, 1355	1 Bit	O	**C R - T -**	DPT_Bool	0/1	[HTx] [F] Dehumidification Status	0 = No Dehumidifying; 1 = Dehumidifying
64, 132, 200, 268, 336, 404, 472, 540, 608, 676, 744, 812, 880, 948, 1016, 1084, 1152, 1220, 1288, 1356	1 Bit	O	**C R - T -**	DPT_Alarm	0/1	[HTx] [F] High Humidity	0 = No Alarm; 1 = Alarm
65, 133, 201, 269, 337, 405, 473, 541, 609, 677, 745, 813, 881, 949, 1017, 1085, 1153, 1221, 1289, 1357	1 Bit	I/O	**C R W T U**	DPT_Enable	0/1	[HTx] [F] Enable Apparent Temperature	0 = Room Temperature; 1 = Apparent Temperature
66, 134, 202, 270, 338, 406, 474, 542, 610, 678, 746, 814, 882, 950, 1018, 1086, 1154, 1222, 1290, 1358	1 Byte	O	**C R - T -**	DPT_Scaling	0% - 100%	[HTx] [Cooling] Control Variable	PI Control (Continuous)
67, 135, 203, 271, 339, 407, 475, 543, 611, 679, 747, 815, 883, 951, 1019, 1087, 1155, 1223, 1291, 1359	1 Byte	O	**C R - T -**	DPT_Scaling	0% - 100%	[HTx] [Heating] Control Variable	PI Control (Continuous)

68, 136, 204, 272, 340, 408, 476, 544, 612, 680, 748, 816, 884, 952, 1020, 1088, 1156, 1224, 1292, 1360	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Cooling] Control Variable	2-Point Control
	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Cooling] Control Variable	PI Control (PWM)
69, 137, 205, 273, 341, 409, 477, 545, 613, 681, 749, 817, 885, 953, 1021, 1089, 1157, 1225, 1293, 1361	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Heating] Control Variable	2-Point Control
	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Heating] Control Variable	PI Control (PWM)
70, 138, 206, 274, 342, 410, 478, 546, 614, 682, 750, 818, 886, 954, 1022, 1090, 1158, 1226, 1294, 1362	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Cooling] Additional Cool	Temp >= (Setpoint+Band) => "1"
71, 139, 207, 275, 343, 411, 479, 547, 615, 683, 751, 819, 887, 955, 1023, 1091, 1159, 1227, 1295, 1363	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Heating] Additional Heat	Temp <= (Setpoint-Band) => "1"
72, 140, 208, 276, 344, 412, 480, 548, 616, 684, 752, 820, 888, 956, 1024, 1092, 1160, 1228, 1296, 1364	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Cooling] PI State	0 = PI Signal 0%; 1 = PI Signal Greater than 0%
73, 141, 209, 277, 345, 413, 481, 549, 617, 685, 753, 821, 889, 957, 1025, 1093, 1161, 1229, 1297, 1365	1 Bit	O	**C R - T -**	DPT_Switch	0/1	[HTx] [Heating] PI State	0 = PI Signal 0%; 1 = PI Signal Greater than 0%

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