



KIPI-RC

KNX-IP Interface and Multiroom Climate Controller

ZSYKIPIRC

Application Program version: [1.2]

User Manual version: [1.2]_a

www.zennio.com

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DOCUMENT UPDATES

Version	Changes	Page(s)
[1.2]_a	Changes in the application program: <ul style="list-style-type: none">• Optimisation of the Hospitality Thermostat module	-
[1.1]_a	Changes in the application program: <ul style="list-style-type: none">• Optimisation of the Hospitality Thermostat and Heartbeat modules	-

1 INTRODUCTION

1.1 KIPI-RC

KIPI-RC 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**.

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.
- Up to **20 independent Hospitality thermostats**.
- **Heartbeat** or periodical “still-alive” notification.

1.2 INSTALLATION

1. Ethernet connector.
2. KNX line status LED.
3. Ethernet status LED.
4. -
5. -
6. KNX line connector.
7. Programming LED.
8. Programming button.
9. DIN rail clamp.
10. IP factory reset button.
11. Factory reset LED.

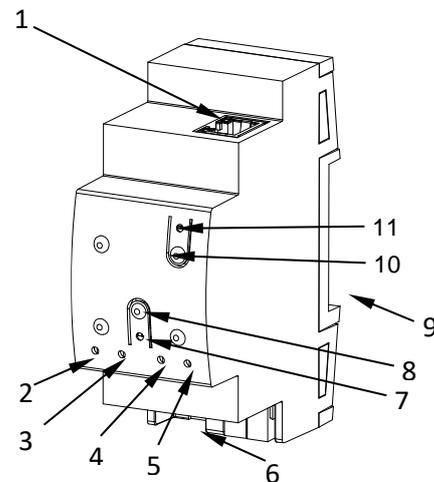


Figure 1 Element Diagram

Figure 1 shows a scheme with all the LED indicators and required connections. This device does not require an external power supply, it is powered through the KNX bus.

To couple a KNX twisted-pair (TP) line and a LAN, the KNX bus (6) and Ethernet (1) cables must be connected. After the connection, the device can be conveniently mounted on the DIN rail by the usual procedure

The programming button (8) shown in Figure 1 may be pressed to set KIPI-RC in **programming mode**. After a short press, the programming LED (7) will light in red.

Note: if the programming button is held while plugging the device into the KNX bus, the device will enter into **safe mode**. In such case, the LED will blink in red every 0.5 seconds.

The behaviour of the additional LEDs and the reset button will be described in sections 1.3 and 1.4.

For detailed information about the technical features of the device, as well as on security and installation procedures, please refer to the device **Datasheet**, bundled within the original packaging of the device and also available at www.zennio.com.

1.3 LED INDICATORS

KIPI-RC incorporates four LED lights on the top of the device that make it easy to monitor the status of the buses and to detect typical communication problems, as detailed next.



Figure 2 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).

1.4 HARD RESET TO FACTORY DEFAULTS

If “IP Factory Reset” button is **pressed for three seconds**, the device restores its default parameters (obtain an IP address via DHCP server, see section 2.2.1.1). This 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

2.1 KNX TO IP INTERFACE

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

On the other hand, KIPI-RC 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, an individual address should be assigned in order to download.

2.2 PROGRAMMER

KIPI-RC 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 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 simply select it in the ETS "Bus" tab under Connections → Interfaces.

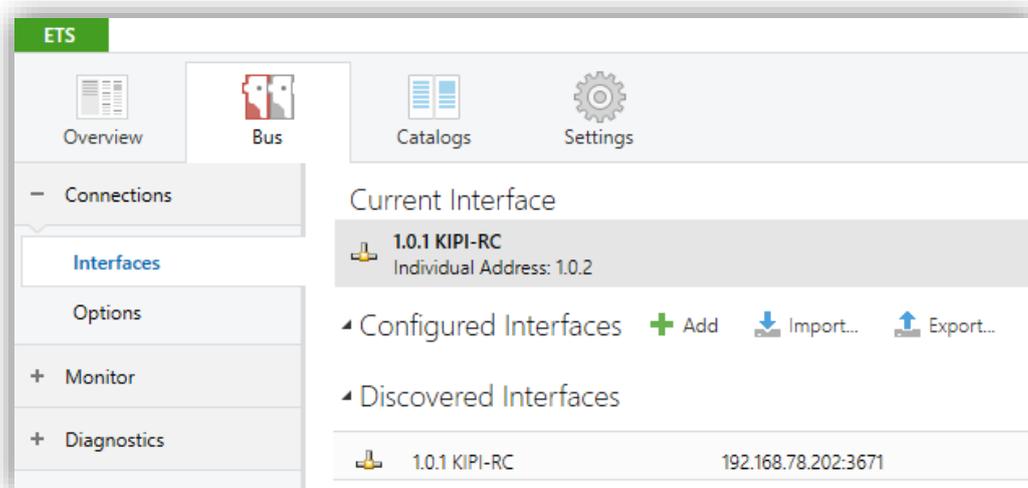


Figure 3. Selection of KIPI-RC in the Bus Connections tab in ETS.

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

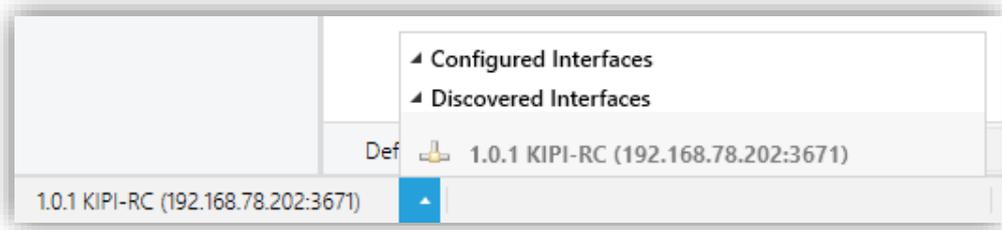


Figure 4. Selection of KIPI-RC in a ETS project.

Important: If the KIPI-RC 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).

2.2.1 PROPERTIES

Once the desire Interface **KIPI-RC** has been selected, its configuration will be carried out in the "IP" panel of "Properties" tab in ETS. The following sections provide a detailed explanation about each of the different configurable properties.

2.2.1.1 IP

In the ETS "Properties" "IP" panel how to set the IP address can be selected.

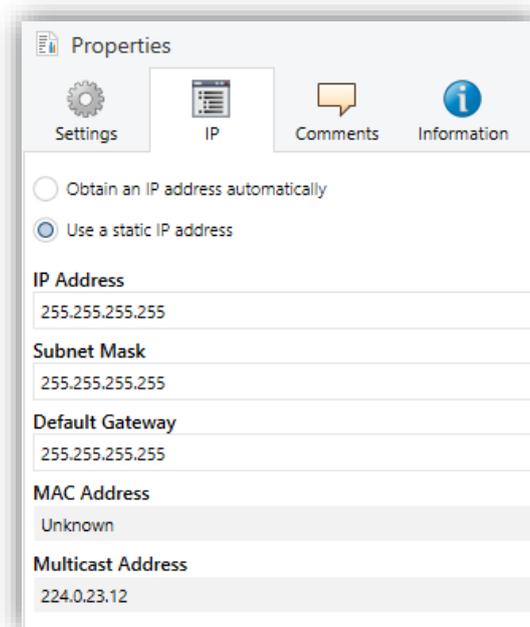


Figure 5 IP Configuration

- [Obtain an IP address automatically](#)¹. KIPI-RC will automatically take an IP address whenever there is a DHCP 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 will be observed.*

In addition, the following information will be shown:

- **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.

2.2.2 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 each line, it is necessary to select one **KIPI-RC** to perform the download.

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

Note: 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.

In "Settings" panel, in "Properties" of the line, the connection can be selected.

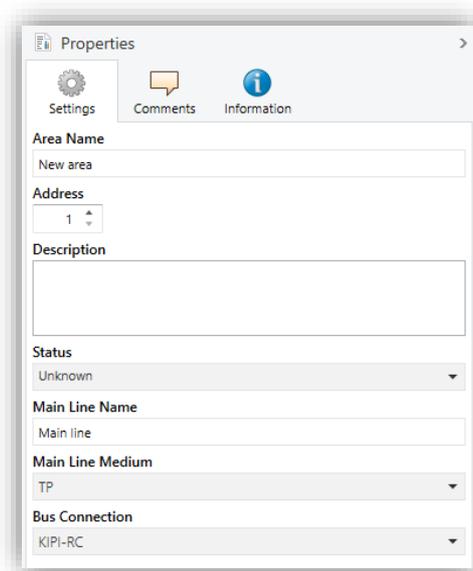


Figure 6 ETS5 parallel downloads configuration.

Note: once the connection has been selected, it will not be available for the other lines.

2.3 ADDITIONAL INDIVIDUAL ADDRESSES (TUNNELING ADDRESSES)

KIPI-RC 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.

Tunneling addresses are configured in ETS after adding the device to the project, in the same way as the physical address of the device, as shown in Figure 7:

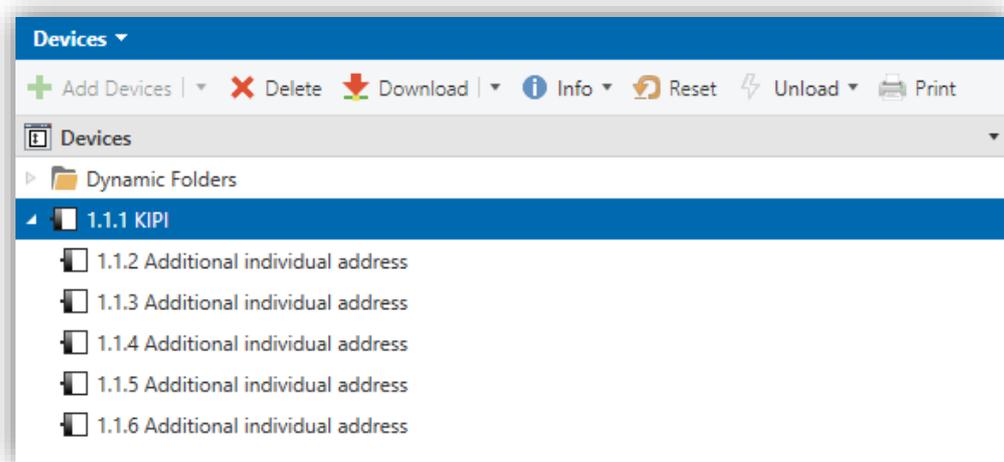


Figure 7 Set tunneling addresses.

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

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

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

2.4 MULTIROOM CLIMATE CONTROLLER

To begin with the parameterisation process of the **climate controller**, it is necessary, once the ETS program has been opened and the database of the product has been imported, to add the device to the topology of the desire project and enter the tab *Parameters*.

2.4.1 GENERAL

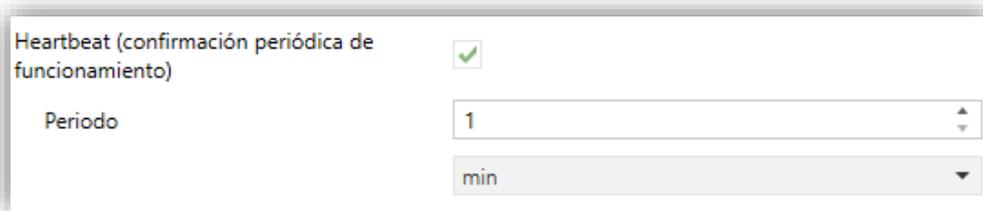
The "General" tab contains general settings. Most are checkboxes for enabling/disabling other functionalities.

Setting	Value / Status
Heartbeat (Periodic Alive Notification)	<input type="checkbox"/>
Minimum Time between Object Sendings	2 x 0.1s
Hospitality Thermostat 1	<input type="checkbox"/>
Hospitality Thermostat 2	<input type="checkbox"/>
Hospitality Thermostat 3	<input type="checkbox"/>
Hospitality Thermostat 4	<input type="checkbox"/>
Hospitality Thermostat 5	<input type="checkbox"/>
Hospitality Thermostat 6	<input type="checkbox"/>
Hospitality Thermostat 7	<input type="checkbox"/>
Hospitality Thermostat 8	<input type="checkbox"/>
Hospitality Thermostat 9	<input type="checkbox"/>
Hospitality Thermostat 10	<input type="checkbox"/>
Hospitality Thermostat 11	<input type="checkbox"/>
Hospitality Thermostat 12	<input type="checkbox"/>
Hospitality Thermostat 13	<input type="checkbox"/>
Hospitality Thermostat 14	<input type="checkbox"/>
Hospitality Thermostat 15	<input type="checkbox"/>
Hospitality Thermostat 16	<input type="checkbox"/>
Hospitality Thermostat 17	<input type="checkbox"/>
Hospitality Thermostat 18	<input type="checkbox"/>
Hospitality Thermostat 19	<input type="checkbox"/>
Hospitality Thermostat 20	<input type="checkbox"/>

Figure 8. General

The following parameters are shown:

- **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).



Heartbeat (confirmación periódica de funcionamiento)

Periodo

Figure 9. 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.*

- **Minimum Time between Object Sendings** [1...2...255] [x 0.1s]: time period between sendings to prevent bus overload when KIPI-RC 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.

2.4.2 HOSPITALITY THERMOSTAT

KIPI-RC 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, 70, 138, 206, 274, 342, 410, 478, 546, 614, 682, 750, 818, 886, 954, 1022, 1090, 1158, 1226, 1294	1 Bit	I	C - W - -	DPT_Switch	0/1	[HTx] [A] On/Off	0 = Off; 1 = On
3, 71, 139, 207, 275, 343, 411, 479, 547, 615, 683, 751, 819, 887, 955, 1023, 1091, 1159, 1227, 1295	1 Bit	O	C R - T -	DPT_Switch	0/1	[HTx] [A] On/Off Status	0 = Off; 1 = On
4, 72, 140, 208, 276, 344, 412, 480, 548, 616, 684, 752, 820, 888, 956, 1024, 1092, 1160, 1228, 1296	1 Byte	I	C - W - -	DPT_SceneControl	0-63; 128-191	[HTx] [A] Scene Input	Scene Value
5, 73, 141, 209, 277, 345, 413, 481, 549, 617, 685, 753, 821, 889, 957, 1025, 1093, 1161, 1229, 1297	2 Bytes	I	C - W T U	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [A] Temperature Source 1	External Sensor Temperature
6, 74, 142, 210, 278, 346, 414, 482, 550, 618, 686, 754, 822, 890, 958, 1026, 1094, 1162, 1230, 1298	2 Bytes	I	C - W T U	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [A] Temperature Source 2	External Sensor Temperature
7, 75, 143, 211, 279, 347, 415, 483, 551, 619, 687, 755, 823, 891, 959, 1027, 1095, 1163, 1231, 1299	2 Bytes	O	C R - T -	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [A] Room Temperature	Current Temperature
8, 76, 144, 212, 280, 348, 416, 484, 552, 620, 688, 756, 824, 892, 960, 1028, 1096, 1164, 1232, 1300	1 Bit	I/O	C R W - -	DPT_Heat_Cool	0/1	[HTx] [A] System Mode	0 = Cooling; 1 = Heating
9, 77, 145, 213, 281, 349, 417, 485, 553, 621, 689,	1 Bit	I/O	C R W - -	DPT_Heat_Cool	0/1	[HTx] [A] User Mode	0 = Cooling; 1 = Heating

757, 825, 893, 961, 1029, 1097, 1165, 1233, 1301							
10, 78, 146, 214, 282, 350, 418, 486, 554, 622, 690, 758, 826, 894, 962, 1030, 1098, 1166, 1234, 1302	1 Bit	I/O	CRW--	DPT_Switch	0/1	[HTx] [A] Force System Mode	0 = User Mode / Auto Change; 1 = System Mode
11, 79, 147, 215, 283, 351, 419, 487, 555, 623, 691, 759, 827, 895, 963, 1031, 1099, 1167, 1235, 1303	1 Bit	O	CR-T-	DPT_Heat_Cool	0/1	[HTx] [A] Mode Status	0 = Cooling; 1 = Heating
12, 80, 148, 216, 284, 352, 420, 488, 556, 624, 692, 760, 828, 896, 964, 1032, 1100, 1168, 1236, 1304	1 Byte	I	C-WTU	DPT_Scaling	0% - 100%	[HTx] [A] Fan Speed	0% - 100%
13, 81, 149, 217, 285, 353, 421, 489, 557, 625, 693, 761, 829, 897, 965, 1033, 1101, 1169, 1237, 1305	1 Bit	I	C-WTU	DPT_Enable	0/1	[HTx] [A] Fan: Manual/Automatic	0 = Manual; 1 = Automatic
	1 Bit	I	C-WTU	DPT_Enable	0/1	[HTx] [A] Fan: Manual/Automatic	0 = Automatic; 1 = Manual
14, 82, 150, 218, 286, 354, 422, 490, 558, 626, 694, 762, 830, 898, 966, 1034, 1102, 1170, 1238, 1306	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [A] On/Off Fancoil	0 = Off; 1 = On
15, 83, 151, 219, 287, 355, 423, 491, 559, 627, 695, 763, 831, 899, 967, 1035, 1103, 1171, 1239, 1307	1 Bit	I	C-W--	DPT_Reset	0/1	[HTx] [B] User Comfort Setpoint Reset	0 = Nothing; 1 = Reset
16, 84, 152, 220, 288, 356, 424, 492, 560, 628, 696, 764, 832, 900, 968, 1036, 1104, 1172, 1240, 1308	2 Bytes	I	C-WTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] User Setpoint Control	[-20°C, 100°C]
	2 Bytes	I	C-WTU	DPT_Value_Tempd	-671088.64° - 670433.28°	[HTx] [B] User Setpoint Offset	[-15°C, 15°C]
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--	DPT_Step	0/1	[HTx] [B] Step User Setpoint	0 = Decrease; 1 = Increase
18, 86, 154, 222, 290, 358, 426, 494, 562, 630, 698, 766, 834, 902, 970, 1038, 1106, 1174, 1242, 1310	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Comfort Setpoint (Cooling)	[-20°C, 100°C]
	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Comfort Setpoint	[-20°C, 100°C]
19, 87, 155, 223, 291, 359, 427, 495, 563, 631, 699, 767, 835, 903, 971, 1039, 1107, 1175, 1243, 1311	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Standby Setpoint (Cooling)	[-20°C, 100°C]

20, 88, 156, 224, 292, 360, 428, 496, 564, 632, 700, 768, 836, 904, 972, 1040, 1108, 1176, 1244, 1312	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Economy Setpoint (Cooling)	[-20°C, 100°C]
21, 89, 157, 225, 293, 361, 429, 497, 565, 633, 701, 769, 837, 905, 973, 1041, 1109, 1177, 1245, 1313	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Protection Setpoint (Cooling)	[-20°C, 100°C]
22, 90, 158, 226, 294, 362, 430, 498, 566, 634, 702, 770, 838, 906, 974, 1042, 1110, 1178, 1246, 1314	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Comfort Setpoint (Heating)	[-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	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Standby Setpoint (Heating)	[-20°C, 100°C]
24, 92, 160, 228, 296, 364, 432, 500, 568, 636, 704, 772, 840, 908, 976, 1044, 1112, 1180, 1248, 1316	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Economy Setpoint (Heating)	[-20°C, 100°C]
25, 93, 161, 229, 297, 365, 433, 501, 569, 637, 705, 773, 841, 909, 977, 1045, 1113, 1181, 1249, 1317	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Protection Setpoint (Heating)	[-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	O	CR-T-	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] Real Setpoint Status	[-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	O	CR-T-	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [B] User Setpoint Status	[-20°C, 100°C]
	2 Bytes	O	CR-T-	DPT_Value_Tempd	-671088.64° - 670433.28°	[HTx] [B] User Setpoint Offset Status	[-15°C, 15°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	CRWTU	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Seconds (0 = Disabled)
	2 Bytes	I/O	CRWTU	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Minutes (0 = Disabled)
	2 Bytes	I/O	CRWTU	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Transition Time: Comfort to Default Mode	Hours (0 = Disabled)
29, 97, 165, 233, 301, 369, 437, 505, 573, 641, 709, 777, 845, 913, 981, 1049, 1117, 1185, 1253, 1321	2 Bytes	I/O	CRWTU	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Seconds (0 = Disabled)
	2 Bytes	I/O	CRWTU	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Minutes (0 = Disabled)

	2 Bytes	I/O	CRWTU	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Transition Time: Standby to Economy	Hours (0 = Disabled)
30, 98, 166, 234, 302, 370, 438, 506, 574, 642, 710, 778, 846, 914, 982, 1050, 1118, 1186, 1254, 1322	2 Bytes	I/O	CRWTU	DPT_TimePeriodSec	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Seconds (0 = Disabled)
	2 Bytes	I/O	CRWTU	DPT_TimePeriodMin	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Minutes (0 = Disabled)
	2 Bytes	I/O	CRWTU	DPT_TimePeriodHrs	0 - 65535	[HTx] [C] Comfort Setpoint Reset Time	Hours (0 = Disabled)
31, 99, 167, 235, 303, 371, 439, 507, 575, 643, 711, 779, 847, 915, 983, 1051, 1119, 1187, 1255, 1323	1 Bit	I/O	CRW--	DPT_Occupancy	0/1	[HTx] [C] Presence Detector (Input)	0 = Not Occupied; 1 = Occupied
32, 100, 168, 236, 304, 372, 440, 508, 576, 644, 712, 780, 848, 916, 984, 1052, 1120, 1188, 1256, 1324	1 Bit	I/O	CRW--	DPT_Enable	0/1	[HTx] [C] Lock Presence Detection	0 = Unlocked; 1 = Locked
	1 Bit	I/O	CRW--	DPT_Enable	0/1	[HTx] [C] Lock Presence Detection	0 = Locked; 1 = Unlocked
33, 101, 169, 237, 305, 373, 441, 509, 577, 645, 713, 781, 849, 917, 985, 1053, 1121, 1189, 1257, 1325	1 Bit	I/O	CRW--	DPT_Bool	0/1	[HTx] [C] Sold/Unsold Room (Input)	0 = Unsold; 1 = Sold
34, 102, 170, 238, 306, 374, 442, 510, 578, 646, 714, 782, 850, 918, 986, 1054, 1122, 1190, 1258, 1326	1 Byte	I	C-W--	DPT_HVACMode	1=Comfort 2=Standby 3=Economy 4=Building Protection	[HTx] [D] Special Mode	1-byte HVAC Mode
35, 103, 171, 239, 307, 375, 443, 511, 579, 647, 715, 783, 851, 919, 987, 1055, 1123, 1191, 1259, 1327	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
36, 104, 172, 240, 308, 376, 444, 512, 580, 648, 716, 784, 852, 920, 988, 1056, 1124, 1192, 1260, 1328	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
37, 105, 173, 241, 309, 377, 445, 513, 581, 649, 717, 785, 853, 921, 989, 1057, 1125, 1193, 1261, 1329	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
38, 106, 174, 242, 310, 378, 446, 514, 582, 650, 718, 786, 854, 922, 990, 1058, 1126, 1194, 1262, 1330	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
39, 107, 175, 243, 311, 379, 447, 515, 583, 651, 719, 787, 855, 923, 991, 1059, 1127, 1195, 1263, 1331	1 Byte	O	CR-T-	DPT_HVACMode	1=Comfort 2=Standby 3=Economy	[HTx] [D] Special Mode Status	1-byte HVAC Mode

					4=Building Protection		
40, 108, 176, 244, 312, 380, 448, 516, 584, 652, 720, 788, 856, 924, 992, 1060, 1128, 1196, 1264, 1332	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [D] Comfort Mode Status	0 = Off; 1 = On
41, 42, 43, 44, 109, 110, 111, 112, 177, 178, 179, 180, 245, 246, 247, 248, 313, 314, 315, 316, 381, 382, 383, 384, 449, 450, 451, 452, 517, 518, 519, 520, 585, 586, 587, 588, 653, 654, 655, 656, 721, 722, 723, 724, 789, 790, 791, 792, 857, 858, 859, 860, 925, 926, 927, 928, 993, 994, 995, 996, 1061, 1062, 1063, 1063, 1129, 1130, 1131, 1132, 1197, 1198, 1199, 1200, 1265, 1266, 1267, 1268, 1333, 1334, 1335, 1336	1 Bit	I	C-W--	DPT_Window_Door	0/1	[HTx] [D] Window Status x (Input)	0 = Closed; 1 = Open
	1 Bit	I	C-W--	DPT_Window_Door	0/1	[HTx] [D] Window Status x (Input)	0 = Open; 1 = Closed
45, 113, 181, 249, 317, 385, 453, 521, 589, 657, 725, 793, 861, 929, 997, 1065, 1133, 1201, 1269, 1337	1 Bit	I/O	CRW--	DPT_Enable	0/1	[HTx] [D] Enable Window Status	0 = Disabled; 1 = Enabled
46, 114, 182, 250, 318, 386, 454, 522, 590, 658, 726, 794, 862, 930, 998, 1066, 1134, 1202, 1270, 1338	1 Bit	I/O	CRW--	DPT_Enable	0/1	[HTx] [D] Thermostat Lock	0 = Locked; 1 = Unlocked
	1 Bit	I/O	CRW--	DPT_Enable	0/1	[HTx] [D] Thermostat Lock	0 = Unlocked; 1 = Locked
47, 115, 183, 251, 319, 387, 455, 523, 591, 659, 727, 795, 863, 931, 999, 1067, 1135, 1203, 1271, 1339	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [D] Comfort Lower Limit	[-20°C, 100°C]
48, 116, 184, 252, 320, 388, 456, 524, 592, 660, 728, 796, 864, 932, 1000, 1068, 1136, 1204, 1272, 1340	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [D] Comfort Upper Limit	[-20°C, 100°C]
49, 117, 185, 253, 321, 389, 457, 525, 593, 661, 729, 797, 865, 933, 1001, 1069, 1137, 1205, 1273, 1341	1 Bit	I/O	CRW--	DPT_Switch	0/1	[HTx] [D] Hidden Offset On/Off	0 = Off; 1 = On

50, 118, 186, 254, 322, 390, 458, 526, 594, 662, 730, 798, 866, 934, 1002, 1070, 1138, 1206, 1274, 1342	2 Bytes	I/O	CRWTU	DPT_Value_Tempd	-671088.64° - 670433.28°	[HTx] [D] Hidden Offset Value	[-20°C, 100°C]
51, 119, 187, 255, 323, 391, 459, 527, 595, 663, 731, 799, 867, 935, 1003, 1071, 1139, 1207, 1275, 1343	1 Bit	O	CR-T-	DPT_Bool	0/1	[HTx] [D] Eco Mode Notification	0 = Out of eco range; 1 = Setpoint in Eco Range
52, 120, 188, 256, 324, 392, 460, 528, 596, 664, 732, 800, 868, 936, 1004, 1072, 1140, 1208, 1276, 1344	1 Byte	O	CR-T-	DPT_Scaling	0% - 100%	[HTx] [D] Eco Mode Ratio	Percentage of Time Working in Eco Range
53, 121, 189, 257, 325, 393, 461, 529, 597, 665, 733, 801, 869, 937, 1005, 1073, 1141, 1209, 1277, 1345	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [D] Eco Mode: Lower Limit (Cooling)	Lower Value for the Ecological Range
54, 122, 190, 258, 326, 394, 462, 530, 598, 666, 734, 802, 870, 938, 1006, 1074, 1142, 1210, 1278, 1346	2 Bytes	I/O	CRWTU	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [D] Eco Mode: Upper Limit (Heating)	Upper Value for the Ecological Range
55, 123, 191, 259, 327, 395, 463, 531, 599, 667, 735, 803, 871, 939, 1007, 1075, 1143, 1211, 1279, 1347	2 Bytes	O	CR-T-	DPT_Value_Temp	-273.00° - 670433.28°	[HTx] [D] Setpoint to Split	[-20°C, 100°C]
56, 124, 192, 260, 328, 396, 464, 532, 600, 668, 736, 804, 872, 940, 1008, 1076, 1144, 1212, 1280, 1348	2 Bytes	I	C-W--	DPT_Value_Humidity	-12% - 12%	[HTx] [F] Current Humidity	Humidity Sensor Value
57, 125, 193, 261, 329, 397, 465, 533, 601, 669, 737, 805, 873, 941, 1009, 1077, 1145, 1213, 1281, 1349	2 Bytes	I/O	CRWTU	DPT_Value_Humidity	-12% - 12%	[HTx] [F] High Humidity Alarm Threshold	Value of High Humidity Alarm Threshold
58, 126, 194, 262, 330, 398, 466, 534, 602, 670, 738, 806, 874, 942, 1010, 1078, 1146, 1214, 1282, 1350	1 Bit	I/O	CRWTU	DPT_Enable	0/1	[HTx] [F] Dehumidification Control	0 = Disabled; 1 = Enabled
59, 127, 195, 263, 331, 399, 467, 535, 603, 671, 739, 807, 875, 943, 1011, 1079, 1147, 1215, 1283, 1351	1 Bit	O	CR-T-	DPT_Bool	0/1	[HTx] [F] Dehumidification Status	0 = No Dehumidifying; 1 = Dehumidifying
60, 128, 196, 264, 332, 400, 468, 536, 604, 672, 740,	1 Bit	O	CR-T-	DPT_Alarm	0/1	[HTx] [F] High Humidity	0 = No Alarm; 1 = Alarm

808, 876, 944, 1012, 1080, 1148, 1216, 1284, 1352							
61, 129, 197, 265, 333, 401, 469, 537, 605, 673, 741, 809, 877, 945, 1013, 1081, 1149, 1217, 1285, 1353	1 Bit	I/O	CRWTU	DPT_Enable	0/1	[HTx] [F] Enable Apparent Temperature	0 = Room Temperature; 1 = Apparent Temperature
62, 130, 198, 266, 334, 402, 470, 538, 606, 674, 742, 810, 878, 946, 1014, 1082, 1150, 1218, 1286, 1354	1 Byte	O	CR-T-	DPT_Scaling	0% - 100%	[HTx] [Cooling] Control Variable	PI Control (Continuous)
63, 131, 199, 267, 335, 403, 471, 539, 607, 675, 743, 811, 879, 947, 1015, 1083, 1151, 1219, 1287, 1355	1 Byte	O	CR-T-	DPT_Scaling	0% - 100%	[HTx] [Heating] Control Variable	PI Control (Continuous)
64, 132, 200, 268, 336, 404, 472, 540, 608, 676, 744, 812, 880, 948, 1016, 1084, 1152, 1220, 1288, 1356	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Cooling] Control Variable	2-Point Control
	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Cooling] Control Variable	PI Control (PWM)
65, 133, 201, 269, 337, 405, 473, 541, 609, 677, 745, 813, 881, 949, 1017, 1085, 1153, 1221, 1289, 1357	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Heating] Control Variable	2-Point Control
	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Heating] Control Variable	PI Control (PWM)
66, 134, 202, 270, 338, 406, 474, 542, 610, 678, 746, 814, 882, 950, 1018, 1086, 1154, 1222, 1290, 1358	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Cooling] Additional Cool	Temp >= (Setpoint+Band) => "1"
67, 135, 203, 271, 339, 407, 475, 543, 611, 679, 747, 815, 883, 951, 1019, 1087, 1155, 1223, 1291, 1359	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Heating] Additional Heat	Temp <= (Setpoint-Band) => "1"
68, 136, 204, 272, 340, 408, 476, 544, 612, 680, 748, 816, 884, 952, 1020, 1088, 1156, 1224, 1292, 1360	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Cooling] PI State	0 = PI Signal 0%; 1 = PI Signal Greater than 0%
69, 137, 205, 273, 341, 409, 477, 545, 613, 681, 749, 817, 885, 953, 1021, 1089, 1157, 1225, 1293, 1361	1 Bit	O	CR-T-	DPT_Switch	0/1	[HTx] [Heating] PI State	0 = PI Signal 0%; 1 = PI Signal Greater than 0%



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