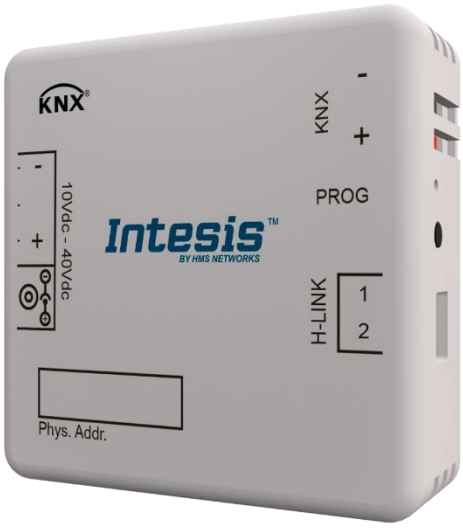
Interface for the integration of Hitachi's Air-to-Water units into KNX TP-1 (EIB) control systems

Compatible with Air-to-Water Yutaki S, Yutaki S Combi, Yutaki S80, and Yutaki M series

Application's Program Version: 1.2

USER MANUAL

Issue date: 07/2024 r2.5 ENGLISH



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ORDER CODE	LEGACY ORDER CODE
INKNXHIT001A000	HI-AW-KNX-1

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1. Presentation

The INKNXHIT001A000 gateways allows fully bidirectional monitoring and control of the Hitachi Air-to-Water systems from KNX installations.

The interface is compatible with all the models of the Yutaki S line commercialized by Hitachi.

General features:

- Reduced dimensions, easy and fast installation.
- Multiple control and status objects (bit, byte, characters…) with standard KNX datapoints.
- One status object available for each control object.
- Control on the A.W. unit based on the ambient temperature read from the unit itself or from the temperature read by any KNX thermostat.
- The Hitachi A.W. can be controlled simultaneously through the remote controller of the A.W. system or through the KNX bus.
- Total supervision and control of the Hitachi A.W. unit from KNX, including unit internal variables supervision, special modes control (such as Anti-legionella) and error alarm and codes too.

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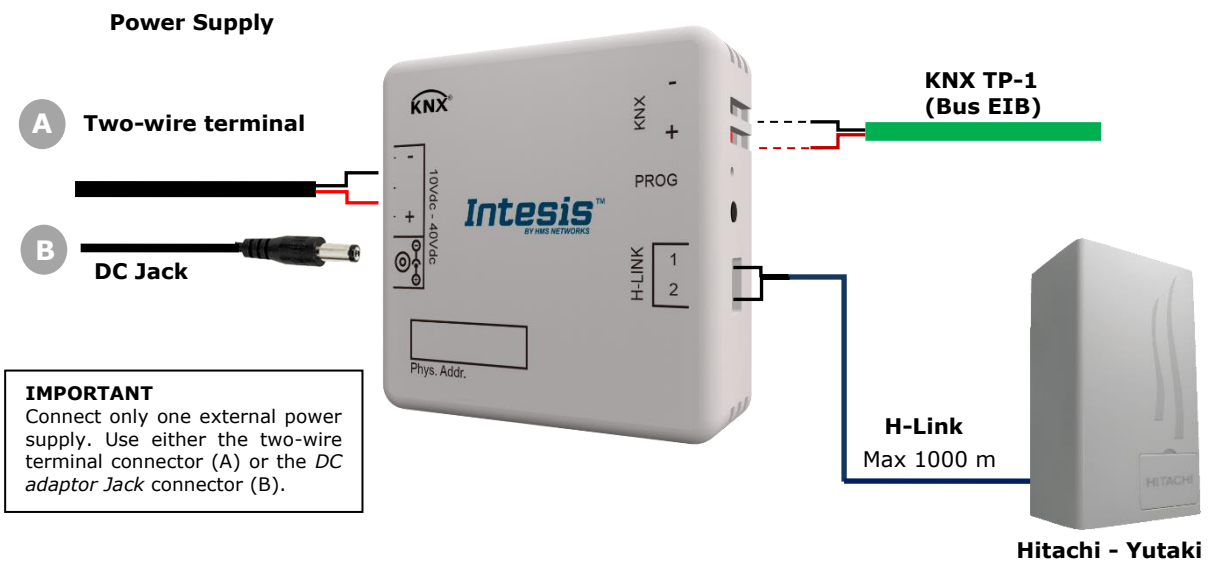
2. Connection

Connection of the interface to the AW indoor unit is by means of the cable supplied with the indoor unit to connect the remote controller. It must be connected to the interface in one side (H-Link connector) and to the internal electronic board of the Air-to-Water indoor unit in the other side.

Connection of the interface to the KNX bus is by means of the standard KNX bus connector also supplied with the interface.

There are two ways to connect the interface to an external power supply: plug the external power supply that came with the interface into the DC JACK connector or use a two-wire terminal connector.

Connections diagram:



3. Installation and setup

This is a fully compatible KNX device that must be configured using the ETS software.
The ETS database can be downloaded from:

https://www.hms-networks.com/p/inknxhit001a000-hitachi-air-to-water-to-knx-interface

Please, check the README.txt file located inside the zip file to find instructions for proper installation of the database.

⚠ ***IMPORTANT**: Do not forget to select the corresponding features of the Air-to-Water system connected to the INKNXHIT001A000 interface. This should be selected in the "Parameters" section on the ETS software.*

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4. ETS parameters and communication objects

4.1 *Default settings*

When importing the ETS database for the first time, the following menu appears, with these parameter values selected as default:

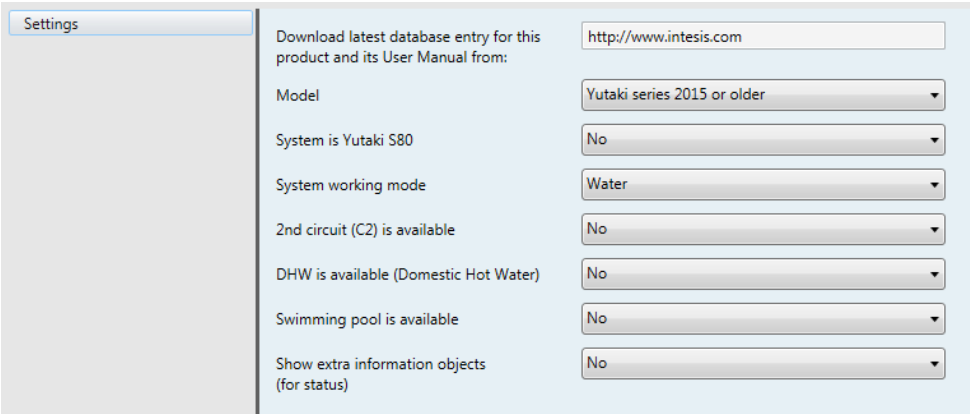

Figure 4.1 Parameter values by default

With this configuration is possible to control the system (Control_ objects) and monitoring it (Status_ objects) through the following communication objects:

4.1.1 Run or Stop the unit

0: Control_ Unit Run/Stop [DPT_1.010] - 0-Stop;1-Run

Figure 4.2 Run/Stop communication objects

This object allows to run or to stop the Hitachi unit features (C1, C2, DHW and/or SwimPool) at once. Sending a "0" value will turn them off, while sending a "1" value will turn them on.

4.1.2 Change the unit mode

1: Control_ Unit Mode [DPT_ 20.105] - 0-Auto;1-Heat;3-Cool
2: Control_ Unit Mode Cool/Heat [DPT_ 1.100] - 0-Cool;1-Heat
4: Control_ Unit Mode Heat [DPT_ 1.002] - 1-Set HEAT Mode
5: Control_ Unit Mode Cool [DPT_ 1.002] - 1-Set COOL Mode
46: Status_ Unit Mode [DPT_20.105] - 1-Heat;3-Cool
47: Status_ Unit Mode Cool/Heat [DPT_1.100] - 0-Cool;1-Heat
49: Status_ Unit Mode Heat [DPT_1.002] - 1-HEAT Mode is active
50: Status_ Unit Mode Cool [DPT_1.002] - 1-COOL Mode is active

Figure 4.3 Unit mode selection communication objects

This object allows changing the working mode of the Hitachi unit. Sending a "0" value the unit will turn into "Cool" mode, while sending a "1" value will make the unit turn into "Heat" mode.

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4.1.3 Run or Stop the C1 Circuit

6: Control_ C1 Run/Stop [DPT_1.010] - 0-Stop;1-Run
51: Status_ C1 Run/Stop [DPT_1.010] - 0-Stop;1-Run

Figure 4.4 C1 circuit Run/Stop communication objects

This object allows to run or to stop the Hitachi C1 Circuit (or C1 climate zone). Sending a "0" value will close the C1 circuit, while sending a "1" value will open the C1 Circuit.

More functions related with the C1 circuit and their communication objects can be seen in section 4.2.3.

4.1.4 Anti-legionella System

NOTE: The anti-legionella function is hidden to users by default. Installers can make it available if desired.

42: Control_ AntiLeg Run/Stop [DPT_1.010] - 0-Stop;1-Run
43: Control_ AntiLeg Setpoint [DPT_9.001] - ºC
93: Status_ AntiLeg Run/Stop [DPT_1.010] - 0-Stop;1-Run
94: Status_ AntiLeg Setpoint [DPT_9.001] - ºC

Figure 4.5 Anti-legionella sysmte communication objects

The Hitachi Yutaki S units include an Anti-legionella system. From the gateway, this function can be activated by sending a "1" value to the Control_ AntiLeg Run/Stop object and can be stopped by sending a "0" value to the same object.

It is also possible to send a value to set the temperature of the Anti-legionella system to this value. To do it so you have to use the Control_ AntiLeg Setpoint object.

⚠ **IMPORTANT:** Anti-legionella will set the water temperature to the setting value during the specified time. This temperature will be dangerous to the user and could burn him or her. Installer is responsible for configuring it properly, advising the user, and enabling the function.

4.1.5 KNX menu blocking

44: Control_ KNX Blocks/Enables Menu [DPT_1.003] - 0-Block;1-Enable
95: Status_ KNX Blocks/Enables Menu [DPT_1.003] - 0-Block;1-Enable

Figure 4.6 KNX menu communication objects

This object allows blocking or enabling the KNX menu from Hitachi's LCD panel. Sending a "0" value will block the Menu, while sending a "1" value will enable the Menu.

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4.1.6 Errors and Alarms

96: Status_ Error/Alarm [DPT_1.005] - 0-No alarm;1-Alarm

97: Status_ Error Code [2byte] - 0-No error/Any other see man.

Figure 4.7 Errors and alarms communication objects

These objects allow reading the system status indicating if any alarm or error is active (Status_ Error/Alarm) and, in case it exists, it indicates which error is (Status_ Error Code). See **Error codes** to get more information about the error codes.

4.2 *General dialog*

In the General Dialog (settings) tab, it is possible to enable, disable or modify the parameters shown in Figure 4.1. For instance, the first field is showing where you can download the database and the user manual from.

Download latest database entry for this product and its User Manual from:	http://www.intesis.com

Figure 4.8 Database and User Manual location

4.2.1 Model

This parameter enables or disables communication objects depending on the Yutaki model.

Model	Yutaki series 2015 or older

Figure 4.9 System working mode parameter details

- When selecting "**Yutaki series 2015 or older**", objects available will be related to Yutaki S and Yutaki S80 models from 2015 or before (default objects).

- When selecting "**Yutaki series 2016 or newer**", objects available will be related to Yutaki S, Yutaki S Combi, Yutaki S80 and Yutaki M models from 2016 or later.

4.2.2 System is Yutaki S80

This parameter enables specific objects for Yutaki S80 and filters objects that do not apply to the Yutaki S80.

System is Yutaki S80	Yes

Figure 4.10 System working mode parameter details

4.2.3 System working mode

This parameter enables or disables communication objects depending on the working mode selected: Water mode, Air, mode or Full (which includes both: Water and Air).

System working mode:	Full

Figure 4.11 System working mode parameter details

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- When selecting "**Water**" the interface will work for a water climate environment only. Water climate control and status objects will be available. Air climate control and status objects will be disabled.

OTC Mode

The OTC mode (*Output Temperature Compensation*) allows keeping the desired indoor temperature despite external temperature variations.

From the gateway, you can:

- Turn this function off by sending a "1" value to the Control_ C1 OTC Mode Heat/Cool Off communication object.

7: Control_ C1 Heat OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
11: Control_ C1 Cool OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
52: Status_ C1 Heat OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
56: Status_ C1 Cool OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set

Figure 4.12 OTC Mode Off communication objects

- Activate the different modes available for the calculus of the water temperature for the cooling or heating the facility where the unit is placed:
  - Points: User fixes 4 points that will create a line function that will depend on the current ambient temperature.
  - Gradients: In this case, the function used is not a line but a gradient. Only available for the Heat mode.
  - Fix: The temperature adjustment is only performed by a fixed value. This makes the unit to keep this fixed value all the time.

8: Control_ C1 Heat OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
9: Control_ C1 Heat OTC Mode Grad [DPT_1.002] - 1-Set OTC Mode GRAD
10: Control_ C1 Heat OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
11: Control_ C1 Cool OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
12: Control_ C1 Cool OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
13: Control_ C1 Cool OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
53: Status_ C1 Heat OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
54: Status_ C1 Heat OTC Mode Grad [DPT_1.002] - 1-OTC Mode GRAD is set
55: Status_ C1 Heat OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
56: Status_ C1 Cool OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
57: Status_ C1 Cool OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
58: Status_ C1 Cool OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set

Figure 4.13 OTC Mode type selection communication objects

Water mode temperatures

Using the following communication objects it is possible to control/monitorize water setpoint temperatures for the Heat and Cool modes (C1 Water Heat Setpoint and C1 Water Cool Setpoint).

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14: Control_ C1 Water Heat Setpoint [DPT_9.001] - ºC
15: Control_ C1 Water Cool Setpoint [DPT_9.001] - ºC
59: Status_ C1 Water Heat Setpoint [DPT_9.001] - ºC
60: Status_ C1 Water Cool Setpoint [DPT_9.001] - ºC

Figure 4.14 Water Mode temperatures communication objects

- When selecting "**Air**", the interface will work for an air climate environment only. Air climate control and status objects will be available. Water climate control and status objects will be disabled.

  Air mode temperatures
  With the communication objects corresponding to this mode enabled, control/monitoring of the setpoint temperature of the thermo (C1 Thermo Setpoint) and the ambient temperature provided by a thermostat not included in the Hitachi system (C1 Ambient Temp).

19: Control_ C1 Thermo Setpoint Temp [DPT_9.001] - ºC
20: Control_ C1 Ambient Temp [DPT_9.001] - ºC
64: Status_ C1 Thermo Setpoint Temp [DPT_9.001] - ºC
65: Status_ C1 Ambient Temp [DPT_9.001] - ºC

Figure 4.15 Air mode temperature communication objects

- When selecting "**Full**", the interface will work for an air and water climate environment. Air and Water climate control and status objects will be available.

NOTE: If Yutaki S80 is selected, some of this communication objects may not be present.

4.2.4 2nd circuit (C2) is available

This parameter enables or disables the Control_ and Status_ communication objects of a second circuit (or climate zone). In case the project is divided into 2 separated circuits this parameter needs to be selected to get control on each circuit independently.

2nd circuit (C2) is available | Yes

Figure 4.16 2nd circuit parameter detail

- When selecting **"No"**, the gateway will hide the 2nd circuit (C2) communication objects.
- When selecting **"Yes"**, the gateway will show the the 2nd circuit (C2) communication objects. Depending on the other selected parameters, some objects will remain hidden and some others will be shown.
  - Run and Stop status:

21: Control_ C2 Run/Stop [DPT_1.010] - 0-Stop;1-Run
68: Status_ C2 Run/Stop [DPT_1.010] - 0-Stop;1-Run

Figure 4.17 2nd circuit Run/Stop communication objects

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To activate or deactivate the 2nd circuit (C2) a "1" value or a "0" value needs to be sent respectively to the Run/stop communication object.

- If **"Water"** mode is selected:

21: Control_ C2 Run/Stop [DPT_1.010] - 0-Stop;1-Run
22: Control_ C2 Heat OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
23: Control_ C2 Heat OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
24: Control_ C2 Heat OTC Mode Grad [DPT_1.002] - 1-Set OTC Mode GRAD
25: Control_ C2 Heat OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
26: Control_ C2 Cool OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
27: Control_ C2 Cool OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
28: Control_ C2 Cool OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
29: Control_ C2 Water Heat Setpoint [DPT_9.001] - ºC
30: Control_ C2 Water Cool Setpoint [DPT_9.001] - ºC
34: Control_ C2 Thermo Setpoint [DPT_9.001] - ºC
35: Control_ C2 Ambient Temp [DPT_9.001] - ºC
68: Status_ C2 Run/Stop [DPT_1.010] - 0-Stop;1-Run
69: Status_ C2 Heat OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
70: Status_ C2 Heat OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
71: Status_ C2 Heat OTC Mode Grad [DPT_1.002] - 1-OTC Mode GRAD is set
72: Status_ C2 Heat OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
73: Status_ C2 Cool OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
74: Status_ C2 Cool OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
75: Status_ C2 Cool OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
76: Status_ C2 Water Heat Setpoint [DPT_9.001] - ºC
77: Status_ C2 Water Cool Setpoint [DPT_9.001] - ºC
81: Status_ C2 Thermo Setpoint [DPT_9.001] - ºC
82: Status_ C2 Ambient Temp [DPT_9.001] - ºC

Figure 4.18 2nd circuit Water Mode communication objects

- If **"Air"** mode is selected:

34: Control_ C2 Thermo Setpoint [DPT_9.001] - ºC
35: Control_ C2 Ambient Temp [DPT_9.001] - ºC
81: Status_ C2 Thermo Setpoint [DPT_9.001] - ºC
82: Status_ C2 Ambient Temp [DPT_9.001] - ºC

Figure 4.19 2nd circuit Air Mode communication objects

- If **"Full"** mode is selected, all communication objects present when selecting **"Water"** or **"Air"** will be enabled for this mode too.

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4.2.5 DHW is available (Domestic Hot Water)

This parameter enables or disables the Control_ and Status_ objects corresponding to the control and monitoring of a water tank or DHW system.

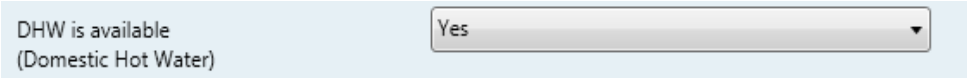


Figure 4.20 DHW Parameter detail

- When selecting **"No"**, the gateway will hide communication objects related with the water tank or the Domestic Hot Water system.

- When selecting **"Yes"**, the gateway will show the communication objects related with the water tank or the Domestic Hot Water system.

  Domestic Hot Water
  By means of Control_ DHW Run/Stop and Control_ DHW Setpoint, it is possible to turn on/off the DHW system and to control its setpoint temperature.

  Through the Status_ DHW Temperature communication object, it is possible to read the instantaneous temperature of the DHW system.

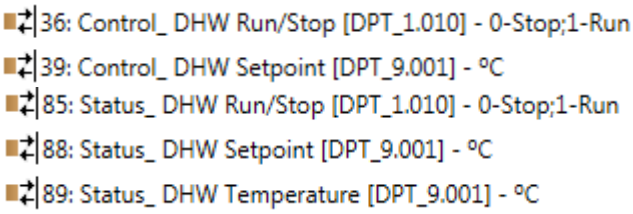


Figure 4.21 DHW mode communication objects

4.2.6 Swimming pool is available

This parameter enables or disables the Control_ and Status_ objects corresponding to the control and monitoring of a swimming pool system present in the project.

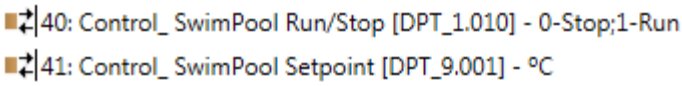
Figure 4.22 Swimming pool parameter details

- When selecting **"No"**, the gateway will hide communication objects related with the swimming pool.

- When selecting **"Yes"**, the gateway will show communication objects related with the swimming pool.

  Swimming pool
  By means of Control_ SwimPool Run/Stop and Control_ SwimPool Setpoint, it is possible to turn on/off the Swimming pool system and also to control its setpoint temperature.

  Through the Status_ SwimPool Temperature communication object, it is possible to read the instantaneous temperature of the Swimming pool system.



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90: Status_ SwimPool Run/Stop [DPT_1.010] - 0-Stop;1-Run
91: Status_ SwimPool Setpoint [DPT_9.001] - ºC
92: Status_ SwimPool Temperature [DPT_9.001] - ºC

Figure 4.23 Swimming pool mode communication objects

4.2.7 Show extra information objects (for Status)

These parameters enable or disable the Status_ communication objects related to the monitoring of extra information depending on the installed Hitachi model (Yutaki S or Yutaki S80).

- When selecting **"No"**, the gateway will hide communication objects related with the extra information provided by the Hitachi units.
- When selecting **"Yes"**, the gateway will offer you to select extra information for a Yutaki S80 model or the rest of Yutaki S models.

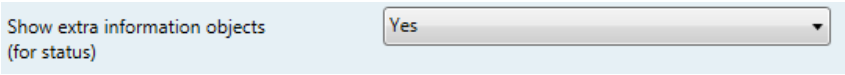

Figure 4.24 Extra Information parameters detail

Yutaki S Extra Information

98: Status_ Operation State Unit On/Off [DPT_1.001] - 0-Off;1-On
99: Status_ Operation State Cool Demand [DPT_1.001] - 0-Off;1-On
100: Status_ Operation State Cool Thermo [DPT_1.001] - 0-Off;1-On
101: Status_ Operation State Heat Demand [DPT_1.001] - 0-Off;1-On
102: Status_ Operation State Heat Thermo [DPT_1.001] - 0-Off;1-On
103: Status_ Operation State DHW [DPT_1.001] - 0-Off;1-On
104: Status_ Operation State SwimPool [DPT_1.001] - 0-Off;1-On
105: Status_ Operation State Alarm [DPT_1.005] - 0-No alarm;1-Alarm
106: Status_ Outdoor Ambient Temp [DPT_9.001] - ºC
107: Status_ Second Ambient Temp [DPT_9.001] - ºC
108: Status_ Water Inlet Temp [DPT_9.001] - ºC
109: Status_ Water Outlet Temp [DPT_9.001] - ºC

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110: Status_ Defrost Operation [DPT_1.001] - 0-Off;1-On
111: Status_ Water Pump 1 Operation [DPT_1.001] - 0-Off;1-On
112: Status_ Water Pump 2 Operation [DPT_1.001] - 0-Off;1-On
113: Status_ Water Pump 3 Operation [DPT_1.001] - 0-Off;1-On
114: Status_ Disch. Gas Temp [DPT_9.001] - ºC
115: Status_ Suct. Gas Temp [DPT_9.001] - ºC
116: Status_ Gas Temp THMg [DPT_9.001] - ºC
117: Status_ Liquid Temp THMI [DPT_9.001] - ºC
118: Status_ Water Outlet Temp 3 [DPT_9.001] - ºC
119: Status_ Outdoor AmbAvg Temp [DPT_9.001] - ºC
120: Status_ Inv Oper Freq [DPT_14.033] - Hz
121: Status_ Indoor Exp. Valve Opening [DPT_5.001] - %
122: Status_ Outdoor Exp. Valve Opening [DPT_5.001] - %
123: Status_ Mixing Valve Position [DPT_5.001] - %
124: Status_ Compressor Run Current [DPT_9.021] - mA

Figure 4.25 Extra Information for non Yutaki S80 status communication objects

Yutaki S80 Extra Information

135: Status_ Disch. Gas Temp R134A [DPT_9.001] - ºC
136: Status_ Suct. Gas Temp R134A [DPT_9.001] - ºC
137: Status_ Liquid Gas Temp R134A [DPT_9.001] - ºC
138: Status_ Evap. Gas Temp R134A [DPT_9.001] - ºC
139: Status_ Disch. Pressure R134A [DPT_14.058] - Pa
140: Status_ Suct. Pressure R134A [DPT_14.058] - Pa
141: Status_ Inv Oper Freq R134A [DPT_14.033] - Hz
142: Status_ Indoor Exp. Valve Open R134A [DPT_5.001] - %
143: Status_ Compressor Run Current R134A [DPT_9.021] - mA
144: Status_ Error Code R134A [1byte] - HI error code

Figure 4.26 Extra Information for Yutaki S80 status communication objects

For more details about the information provided by those comunication objects, please check the Hitachi user manual.

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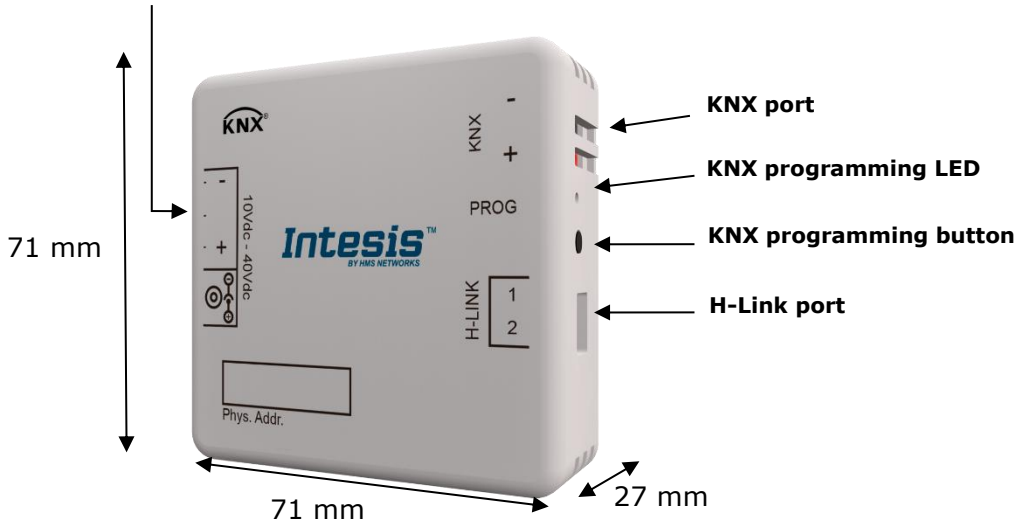
5. Technical Specifications

Housing	Plastic, type ABS (UL 94 V-0) 2,5 mm thick
Dimensions	71 X 71 X 27 mm (HxWxD)
Weight	70g
Color	White, RAL 9010
Power supply	29V DC, 6mA (KNX bus)
External Power Supply	10-40 VDC, 100 mA (**Recommended:** 12V DC, 100 mA) Must use a NEC Class 2 or Limited Power Source (LPS) and SELV rated power supply. Plug-in terminal block for power connection (2 poles).
Terminal wiring (for power supply and low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) One core: 0.2 mm²… 2.5 mm² Two cores: 0.2 mm²… 1.5 mm² Three cores: Not permitted
KNX port	1 x KNX TP1 (EIB) port opto-isolated. Plug-in terminal block (2 poles). TNV-1
H-Link port	Plug-in terminal block for H-Link bus connection (2 poles) with no polarity
LED indicators	1 x KNX programming.
Push buttons	1 x KNX programming.
Configuration	Configuration with ETS.
Operating Temperature	From 0°C to 40°C
Storage Temperature	From 0°C to 40°C
Operating Humidity	25-90% at 50°C, noncondensing
Isolation voltage	External Power Supply – KNX: 2500V
	External Power Supply – H-Link: 1500V
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) EN 61000-6-2; EN 61000-6-3; EN 60950-1; EN 50491-3; EN 50090-2-2; EN 50428; EN 60669-1; EN 60669-2-1

External Power Supply connection



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6. Compatible Air-to-Water (A.W.) units

A list of Hitachi unit model references compatible with INKNXHIT001A000 and their available features can be found in:

https://www.hms-networks.com/docs/default-source/products/intesis/manuals-and-guides---reference-guides/intesis_inxxxhit001a000_compatibility-list.pdf

7. Compatibility Notes

- The Central Operation option of the unit controller, which can be found in System Configuration - General Options, must always be set to Full.
- The indoor unit address should always be set to its default value of 0/0. This address can be changed by the remote controller or via DIP switches, so in case of communication problems make sure that the indoor unit address uses its default value.
- Some signals associated with specific features, such as Anti-Legionella or ECO mode, may not be usable depending on whether or not they are supported by the unit or the adaptor to which the gateway is connected. If supported, these signals must be enabled individually from the Remote Control.

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8. Error codes

8.1 *Intesis Codes*

Error Code	Error in Controller	Error Category	Error Description
-1 (65535)	N/A	Intesis AC Interface	Error in the communication of Intesis AC Interface or the Remote Controller with the AC Unit
0	N/A	Intesis AC Interface	No active error

8.2 *Error Codes object #97: Status_Error_Code.*

Error Code	Error in Controller	Error Category	Error Description
02	02		Activation of Outdoor Unit Protection Device (Except for Alarm Code 41, 42)
03	03		Transmission Error
04	04		Inverter Transmission Abnormality
05	05		Power Phase Detection Abnormality
06	06		Undervoltage, Overvoltage
07	07		Abnormal decrease of discharge gas superheat degree
08	08		Compressor-Top Temp Over-increase
11	11		Water inlet thermistor abnormally (THM_{WI})
12	12		Water outlet thermistor abnormally (THM_{WO})
13	13		Indoor Liquid Pipe Temp Thermistor Abnormality (THM_{L})
14	14		Indoor Gas Pipe Temp. Thermistor Abnormality (THM_{G})
15	15		Water outlet C2 thermistor abnormally (THM_{WO2})
16	16		Water DHWT thermistor abnormally (THM_{DHWT})
17	17		Swimming pool thermistor abnormally (THM_{SWP})
18	18		Water outlet boiler thermistor abnormally (THM_{WO3})
20	20		Compressor-Top Temp Thermistor Abnormality
21	21		2nd ambient thermistor abnormally (THM_{AMB2})
22	22		Outdoor Temp Thermistor Abnormality
24	24		Outdoor Heat Exchanger Liquid Pipe Thermistor Abnormality
31	31		Indoor/Outdoor Combination Setting Error
35	35		Indoor Unit Number Setting Error
38	38		Outdoor Protection Detection Circuit Abnormality
41	41		Cooling Overload
42	42		Heating Overload
47	47		Suction Pressure Decrease Prevention Activated
48	48		Inverter Current Sensor Abnormality
51	51		Overload Operation Protection Activation
53	53		Inverter Module Error
54	54		Inverter Fin Temp. Abnormality
55	55		Inverter Non-Operation
59	59		Inverter Fin Temp Thermistor Abnormality
70	70		Hydraulic alarm
71	71		Water Pump Feedback
72	72		Thermostat Heater Alarm
73	73		Mixing over-temperature limit protection for Mixed circuit
74	74		Unit over-temperature limit protection
75	75		Freeze Protection by Cold water inlet, outlet temperature detection

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Error Code	Error in Controller	Error Category	Error Description
76	76		Freeze Protection Stop by indoor liquid temperature thermistor
77	77		Opentherm Communication failure
78	78		RF Communication failure
79	79		Unit Capacity setting Error
80	80		LCD H-link transmission error
81	81		Incorrect PCB operation
177	b1		Error in Address/Refrigerant System Setting
238	EE		Compressor Factor Alarm

8.3 *Error Codes object #144: Status_Error_Code_R134A.*

Error Code	Error in Controller	Error Category	Error Description
101	101		Activation of high pressure switch
102	102		Activation of protection control for excessively hitgh pressure
103	103		Activation of low pressure switch
104	104		Activation of low control
105	105		Excessively low pressure difference
106	106		Excessively high discharge gas temperature
107	107		Excessively low temperature of heating exchanger refrigerant inlet
108	108		Excessively low suction gas temperature
109	109		Activation of freeze protection control (water inlet)
110	110		Activation of freeze protection control (water outlet)
111	111		Cooler water failure
112	112		Condensor water failure
113	113		Excessively high water temperature
121	121		Failure of water inlet temperature thermistor
122	122		Failure of water outlet temperature thermistor
123	123		Free
124	124		Failure of refrigerant evaporating temperature thermistor
125	125		Failure of ambient Inverter E.BOX temperature thermistor
126	126		Failure of discharge gas temperature thermistor
127	127		Failure of refrigerant liquid temperature thermistar
128	128		Failure of suction gas temperature thermistor
129	129		Failure of discharge gas pressure sensor
130	130		Failure of suction gas pressure sensor
131	131		Free
132	132		Tranmission error between Inverter PCB and Main PCB
133	133		Transmission error between Main PCBs
134	134		Abnormality of Power Supply Phase
135	135		Incorrect PCB Setting
136	136		Incorrect PCB operation
151	151		Excessively low voltage or excessively high voltage for the inverter
152	152		Abnormal operation of the current sensor
153	153		Activation of protection for inverter instantaneous over current
154	154		Transistor module protection activation
155	155		Increase in the inverter fin temperature
156	156		Free
157	157		No feed back signal from water pump

In case you detect an error code not listed, contact the technical support service from the HVAC Manufacturer for more information on the error meaning.

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Appendix A – Communication objects description table

Control Objects

SECTION	OBJECT NUMBER	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
				DPT_NAME	DPT_ID	R	W	T	U	
Run/Stop	**0**	Control_ Unit Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
Mode	**1**	Control_ Unit Mode	1 byte	DPT_HVACContrMode	20.105		W	T		0 - Auto; 1 – Heat; 3 - Cool
	2	Control_Unit Mode Cool/Heat	1 bit	DPT_Heat/Cool	1.100		W	T		0 - Cool; 1 – Heat
	3	Control_Unit Mode Auto	1 bit	DPT_Bool	1.002		W	T		1 – Set Auto Mode
	4	Control_Unit Mode Heat	1 bit	DPT_Bool	1.002		W	T		1 – Set Heat Mode
	5	Control_Unit Mode Cool	1 bit	DPT_Bool	1.002		W	T		1 – Set Cool Mode
Water Circuit (C1 and C2)	**6/21**	Control_ Cx[1] Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
	7/22	Control_ Cx[1] Heat OTC Mode Off	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode OFF
	8/23	Control_ Cx[1] Heat OTC Mode Points	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode POINTS
	9/24	Control_ Cx[1] Heat OTC Mode Grad	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode GRAD
	10/25	Control_ Cx[1] Heat OTC Mode Fix	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode FIX
	11/26	Control_ Cx[1] Cool OTC Mode Off	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode OFF
	12/27	Control_ Cx[1] Cool OTC Mode Points	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode POINTS

[1] X can be 1 or 2 depending on which circuit is being controlled.

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	13/28	Control_ Cx[1] Cool OTC Mode Fix	1 bit	DPT_Bool	1.002		W	T		1 – Set OTC Mode FIX
	14/29	Control_ Cx[1] Water Heat Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 20°C and 80°C)
	15/30	Control_ Cx[1] Water Cool Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 5°C and 21°C)
	16/31	Control_ Cx[1] ECO Mode	1 bit	DPT_Bool	1.002		W	T		0 – Comfort Mode; 1 – ECO Mode
	17/32	Control_ Cx[1] ECO Heat Offset Temperature	2 bytes	DPT_Value_Temp	9.001		W	T		°C
	18/33	Control_ Cx[1] ECO Cool Offset Temperature	2 bytes	DPT_Value_Temp	9.001		W	T		°C
	19/34	Control_ Cx[1] Thermo Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 0°C and 35°C)
	20/35	Control_ Cx[1] Ambient Temp	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between -20°C and 40°C)
DHW	**36**	Control_ DHW Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 – Run
	37	Control_ DHW Boost	1 bit	DPT_Bool	1.002		W	T		1 – Request
	38	Control_ DHW High Demand Mode	1 bit	DPT_Bool	1.002		W	T		0 - Standard; 1 – High
	39	Control_ DHW Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 30°C and 75°C)
Swimming pool	**40**	Control_ SwimPool Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 – Run
	41	Control_ SwimPool Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 24°C and 33°C)
AntiLeg	**42**	Control_ AntiLeg Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 – Run
	43	Control_ AntiLeg Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 50°C and 75°C)
KNX Block	**44**	Control_ KNX Blocks/Enables Menu	1 bit	DPT_Enable	1.003		W	T		0 – Blocks; 1 – Enables

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Status Objects

SECTION	OBJECT NUMBER	NAME	LENGTH	DATAPOINT TYPE		FLAGS				FUNCTION
				DPT_NAME	DPT_ID	R	W	T	U	
Run/Stop	**45**	Status_ Unit Run/Stop	1 bit	DPT_Start	1.010	R		T		0 - Stop; 1 - Run
Mode	**46**	Status_ Unit Mode	1 byte	DPT_HVACContrMode	20.105	R		T		0 - Auto; 1 – Heat; 3 - Cool
	47	Status_Unit Mode Cool/Heat	1 bit	DPT_Heat/Cool	1.100	R		T		0 - Cool; 1 – Heat
	48	Status_Unit Mode Auto	1 bit	DPT_Bool	1.002	R		T		1 – Set Auto Mode
	49	Status_Unit Mode Heat	1 bit	DPT_Bool	1.002	R		T		1 – Set Heat Mode
	50	Status_Unit Mode Cool	1 bit	DPT_Bool	1.002	R		T		1 – Set Cool Mode
Water Circuit (C1 and C2)	**51/68**	Status_ Cx[2] Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	52/69	Status_ Cx[2] Heat OTC Mode Off	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	53/70	Status_ Cx[2] Heat OTC Mode Points	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode POINTS Set
	54/71	Status_ Cx[2] Heat OTC Mode Grad	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode FIX Set
	55/72	Status_ Cx[2] Heat OTC Mode Fix	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	56/73	Status_ Cx[2] Cool OTC Mode Off	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	57/74	Status_ Cx[2] Cool OTC Mode Points	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode POINTS Set
	58/75	Status_ Cx[2] Cool OTC Mode Fix	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode FIX Set
	59/76	Status_ Cx[2] Water Heat Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	60/77	Status_ Cx[2] Water Cool Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	61/78	Status_ Cx[2] ECO Mode	1 bit	DPT_Bool	1.002	R		T		0 – Comfort; 1 – ECO
	62/79	Status_ Cx[2] ECO Heat Offset Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	63/80	Status_ Cx[2] ECO Cool Offset Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	64/81	Status_ Cx[2] Thermo Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	65/82	Status_ Cx[2] Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C

[2] X can be 1 or 2 depending on which circuit is being observed.

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	66/83	Status_ Cx[2] Wireless Setpoint Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	67/84	Status_ Cx[2] Wireless Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
DHW	**85**	Status_ DHW Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	86	Status_ DHW Boost	1 bit	DPT_Bool	1.002		W	T		0 – Not requested; 1 – Requested
	87	Status_ DHW High Demand Mode	1 bit	DPT_Bool	1.002		W	T		0 - Standard; 1 – High
	88	Status_ DHW Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	89	Status_ DHW Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
Swimming pool	**90**	Status_ SwimPool Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	91	Status_ SwimPool Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	92	Status_ SwimPool Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
AntiLeg	**93**	Status_ AntiLeg Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	94	Status_ AntiLeg Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
KNX Block	**95**	Status_ KNX Block/Enable Menu	1 bit	DPT_Enable	1.003	R		T		0 – Block; 1 – Enable
Error and Alarms	**96**	Status_ Error/Alarm	1 bit	DTP_Alarm	1.005	R		T		0 - No Alarm; 1 - Alarm
	97	Status_ Error Code	2 bytes	Enumerated		R		T		0 – No error Other values - See **Error codes**
Extra Information	**98**	Status_ Operation State Unit On/Off	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	99	Status_ Operation State Cool Demand	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	100	Status_ Operation State Cool Thermo	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	101	Status_ Operation State Heat Demand	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	102	Status_ Operation State Heat Thermo	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	103	Status_ Operation State DHW	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	104	Status_ Operation State Swim Pool	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	105	Status_ Operation State Alarm	1 bit	DTP_Alarm	1.005	R		T		0 - No Alarm; 1 - Alarm
	106	Status_ Outdoor Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C

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Extra information	**107**	Status_ Second Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	108	Status_ Water Inlet Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	109	Status_ Water Outlet Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	110	Status_ Defrost Operation	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	111	Status_ Water Pump 1 Operation	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	112	Status_ Water Pump 2 Operation	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	113	Status_ Water Pump 3 Operation	1 bit	DPT_Switch	1.001	R		T		0 - Off; 1-On
	114	Status_ Dish. Gas Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	115	Status_ Suct. Gas Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	116	Status_ Gas Temp THMg	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	117	Status_ Liquid Temp THMI	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	118	Status_ Water Outlet Temp 3	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	119	Status_ Outdoor AmbAvg Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	120	Status_ Inv Oper Freq	2 bytes	DPT_Value_Frequency	14.033	R		T		Hz
	121	Status_ Indoor Exp Valve Opening	1 byte	DPT_Scaling	5.001	R		T		%
	122	Status_ Outdoor Exp Valve Opening	1 byte	DPT_Scaling	5.001	R		T		%
	123	Status_ Mixing Valve Position	1 byte	DPT_Scaling	5.001	R		T		%
	124	Status_ Compressor Run Current	2 bytes	DPT_Value_Cur	9.021	R		T		mA
	125	Status_ Water Flow	2 bytes	DPT_Flow_Rate_M3_H	13.002	R		T		m^3/h
	126	Status_ Water Pump Speed	1 byte	DPT_Scaling	5.001	R		T		%
	127	Status_ Unit model Yutaki S	1 bit	DPT_Bool	1.002	R		T		1 – Model is Yutaki S
	128	Status_ Unit model Yutaki S Combi	1 bit	DPT_Bool	1.002	R		T		1 – Model is Yutaki S Combi
	129	Status_ Unit model Yutaki S80	1 bit	DPT_Bool	1.002	R		T		1 – Model is Yutaki S80
	130	Status_ Unit model Yutaki M	1 bit	DPT_Bool	1.002	R		T		1 – Model is Yutaki M
	131	Status_ PCB Software Version	2 bytes	DPT_Version	217.001	R		T		Software version

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Extra information	**132**	Status_ LCD Software Version	2 bytes	DPT_Version	217.001	R		T		Software version
	133	Status_ Instant Capacity	2 bytes	DPT_Active_Energy_kWh	13.013	R		T		kWh
	134	Status_ Unit Power Consumption	2 bytes	DPT_Active_Energy_kWh	13.013	R		T		kWh
Extra Information Yutaki S80	**135**	Status_ Dish. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	136	Status_ Suct. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	137	Status_ Liquid Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	138	Status_ Evap. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	139	Status_ Disch. Pressure R134A	2 bytes	DPT_Value_Pressure	14.058	R		T		Pa
	140	Status_ Suct. Pressure R134A	2 bytes	DPT_Value_Pressure	14.058	R		T		Pa
	141	Status_ Inv Oper Freq R134A	2 bytes	DPT_Value_Frequency	14.033	R		T		HZ
	142	Status_ Indoor Exp Valve Open R134A	1 byte	DPT_Scaling	5.001	R		T		%
	143	Status_ Compressor Run Current R134A	2 bytes	DPT_Value_Cur	9.021	R		T		A
	144	Status_ Error Code R134A	2 bytes	Enumerated		R		T		0 – No error Other values - see **Error codes**

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