

IntesisBox® **HI-AW-KNX-1**

User's Manual

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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 series.

Application's Program Version: 0.2

Reference: **HI-AW-KNX-1**

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1. Presentation



The HI-AW-KNX-1 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.

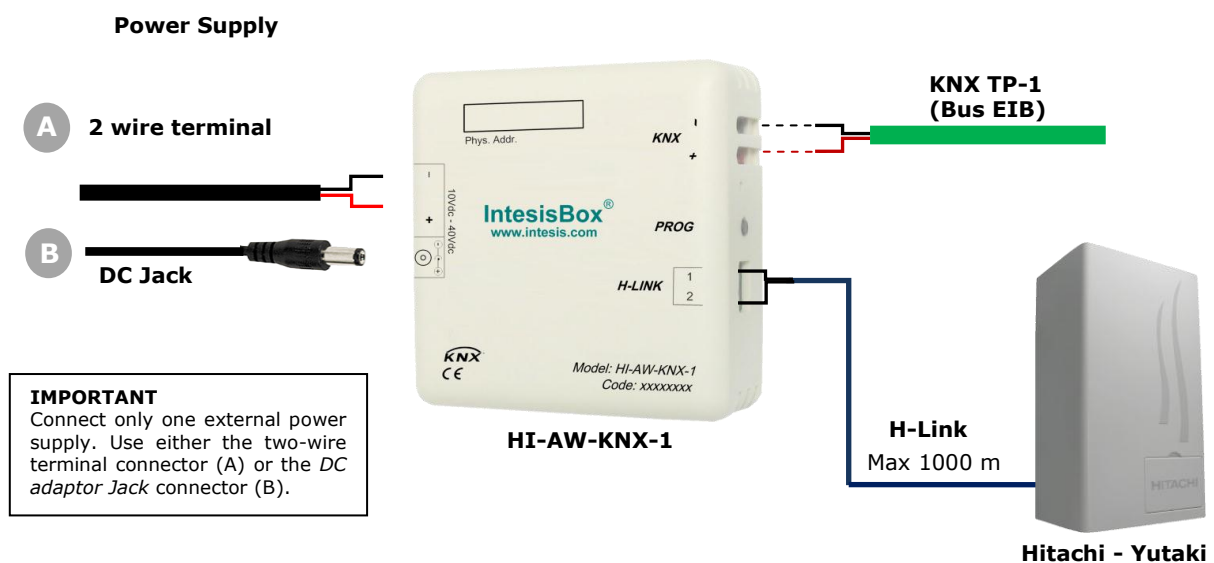
2. Connection

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 (connector H-Link) 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.

In order to plug the interface to the external power supply, two different methods are available. First one is using the external power supply provided with the interface using the DC JACK 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:

<http://www.intesis.com/down/eib/HI-AW-KNX-1.zip>

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 HI-AW-KNX-1 interface. This should be selected in the "Parameters" section on the ETS software.

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:

The screenshot shows the 'Settings' window in ETS. On the left is a sidebar with 'Settings' selected. The main area contains several configuration options with dropdown menus:

- Download latest database entry for this product and its User Manual from:
- System working mode:
- 2nd circuit (C2) is available:
- DHW is available (Domestic Hot Water):
- Swimming pool is available:
- Enable use of extra information objects (for status):

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:

- **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.

- **Change de Unit mode**

➡ 1: Control_ Unit Mode [DPT_1.100] - 0-Cool;1-Heat
 ➡ 33: Status_ Unit Mode [DPT_1.100] - 0-Cool;1-Heat

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.

- **Run or Stop the C1 Circuit**

➡ 2: Control_ C1 Run/Stop [DPT_1.010] - 0-Stop;1-Run
 ➡ 34: 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 4.2.1.

- **Anti-legionella System**

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

- ↕ 30: Control_AntiLeg Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ↕ 31: Control_AntiLeg Setpoint [DPT_9.001] - °C
- ↕ 64: Status_AntiLeg Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ↕ 65: Status_AntiLeg Setpoint [DPT_9.001] - °C

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.

- **KNX menu blocking**

- ↕ 32: Control_KNX Blocks/Enables Menu [DPT_1.003] - 0-Block;1-Enable
- ↕ 66: 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.

- **Errors and Alarms**

- ↕ 67: Status_Error/Alarm [DPT_1.005] - 0-No alarm;1-Alarm
- ↕ 68: Status_Error Code [2byte] - 0-No error/Any other see man.

Figure 4.7 Errors and alarms communication objects

These objects allows reading the system status indicating if any alarm or error is active (Status_Error/Alarm) and, in case it exist, it indicates which error is (Status_Error Code). See section 7 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.



Figure 4.8 Database and User Manual location

4.2.1 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).



Figure 4.9 System working mode parameter details

- 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.

■ 3: Control_ C1 Heat OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
 ■ 7: Control_ C1 Cool OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
 ■ 35: Status_ C1 Heat OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
 ■ 39: Status_ C1 Cool OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set

Figure 4.10 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.

■ 4: Control_ C1 Heat OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
 ■ 5: Control_ C1 Heat OTC Mode Grad [DPT_1.002] - 1-Set OTC Mode GRAD
 ■ 6: Control_ C1 Heat OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
 ■ 8: Control_ C1 Cool OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS

- ↕ 9: Control_ C1 Cool OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
- ↕ 10: Control_ C1 Thermo Setpoint [DPT_9.001] - °C
- ↕ 36: Status_ C1 Heat OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
- ↕ 37: Status_ C1 Heat OTC Mode Grad [DPT_1.002] - 1-OTC Mode GRAD is set
- ↕ 38: Status_ C1 Heat OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
- ↕ 40: Status_ C1 Cool OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
- ↕ 41: Status_ C1 Cool OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
- ↕ 42: Status_ C1 Thermo Setpoint [DPT_9.001] - °C

Figure 4.11 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).

- ↕ 12: Control_ C1 Water Heat Setpoint [DPT_9.001] - °C
- ↕ 13: Control_ C1 Water Cool Setpoint [DPT_9.001] - °C
- ↕ 44: Status_ C1 Water Heat Setpoint [DPT_9.001] - °C
- ↕ 45: Status_ C1 Water Cool Setpoint [DPT_9.001] - °C

Figure 4.12 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).

- ↕ 10: Control_ C1 Thermo Setpoint [DPT_9.001] - °C
- ↕ 11: Control_ C1 Ambient Temp [DPT_9.001] - °C
- ↕ 42: Status_ C1 Thermo Setpoint [DPT_9.001] - °C
- ↕ 43: Status_ C1 Ambient Temp [DPT_9.001] - °C

Figure 4.13 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.

4.2.2 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.

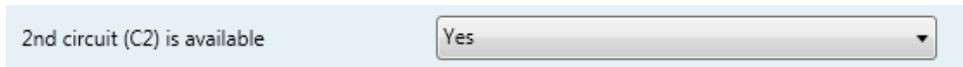


Figure 4.14 2nd circuit parameter detail

- 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:

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

Figure 4.15 2nd circuit Run/Stop communication objects

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:

- 15: Control_ C2 Heat OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
- 16: Control_ C2 Heat OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
- 17: Control_ C2 Heat OTC Mode Grad [DPT_1.002] - 1-Set OTC Mode GRAD
- 18: Control_ C2 Heat OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
- 19: Control_ C2 Cool OTC Mode Off [DPT_1.002] - 1-Set OTC Mode OFF
- 20: Control_ C2 Cool OTC Mode Points [DPT_1.002] - 1-Set OTC Mode POINTS
- 21: Control_ C2 Cool OTC Mode Fix [DPT_1.002] - 1-Set OTC Mode FIX
- 24: Control_ C2 Water Heat Setpoint [DPT_9.001] - °C
- 25: Control_ C2 Water Cool Setpoint [DPT_9.001] - °C
- 47: Status_ C2 Heat OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
- 48: Status_ C2 Heat OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
- 49: Status_ C2 Heat OTC Mode Grad [DPT_1.002] - 1-OTC Mode GRAD is set
- 50: Status_ C2 Heat OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
- 51: Status_ C2 Cool OTC Mode Off [DPT_1.002] - 1-OTC Mode OFF is set
- 52: Status_ C2 Cool OTC Mode Points [DPT_1.002] - 1-OTC Mode POINTS is set
- 53: Status_ C2 Cool OTC Mode Fix [DPT_1.002] - 1-OTC Mode FIX is set
- 56: Status_ C2 Water Heat Setpoint [DPT_9.001] - °C
- 57: Status_ C2 Water Cool Setpoint [DPT_9.001] - °C

Figure 4.16 2nd circuit Water Mode communication objects

- If **"Air"** mode is selected:
 - ➡ 22: Control_ C2 Thermo Setpoint [DPT_9.001] - °C
 - ➡ 23: Control_ C2 Ambient Temp [DPT_9.001] - °C
 - ➡ 54: Status_ C2 Thermo Setpoint [DPT_9.001] - °C
 - ➡ 55: Status_ C2 Ambient Temp [DPT_9.001] - °C

Figure 4.17 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.

4.2.3 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.

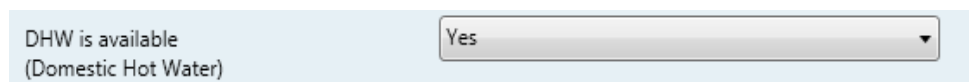


Figure 4.18 DHW Parameter detail

- 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 also to control its setpoint temperature.

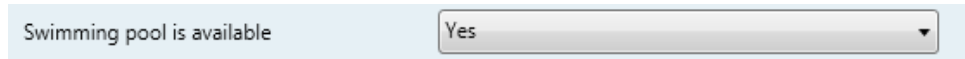
Through the Status_ DHW Temperature communication object, it is possible to read the instantaneous temperature of the DHW system.

- ➡ 26: Control_ DHW Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ➡ 27: Control_ DHW Setpoint [DPT_9.001] - °C
- ➡ 58: Status_ DHW Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ➡ 59: Status_ DHW Setpoint [DPT_9.001] - °C
- ➡ 60: Status_ DHW Temperature [DPT_9.001] - °C

Figure 4.19 DHW mode communication objects

4.2.4 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



A screenshot of a software interface showing a parameter labeled "Swimming pool is available" with a dropdown menu set to "Yes".

Figure 4.20 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.

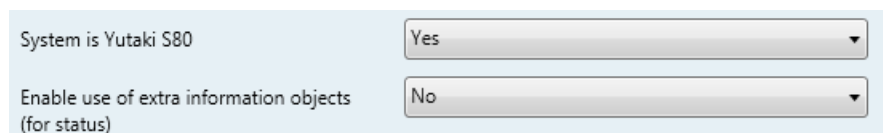
- ➡ 28: Control_ SwimPool Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ➡ 29: Control_ SwimPool Setpoint [DPT_9.001] - °C
- ➡ 61: Status_ SwimPool Run/Stop [DPT_1.010] - 0-Stop;1-Run
- ➡ 62: Status_ SwimPool Setpoint [DPT_9.001] - °C
- ➡ 63: Status_ SwimPool Temperature [DPT_9.001] - °C

Figure 4.21 Swimming pool mode communication objects

4.2.5 Enable use of 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 (then select **"No"**).



A screenshot of a software interface showing two parameters. The first is "System is Yutaki S80" with a dropdown menu set to "Yes". The second is "Enable use of extra information objects (for status)" with a dropdown menu set to "No".

Figure 4.22 Extra Information parameters detail

- If **"No"** is selected (the installed unit is not a Yutaki S80 model) communication objects providing extra information about the Yutaki S models will appear.

• Yutaki S Extra Information

- 69: Status_ Operation State Unit On/Off [DPT_1.001] - 0-Off;1-On
- 70: Status_ Operation State Cool Demand [DPT_1.001] - 0-Off;1-On
- 71: Status_ Operation State Cool Thermo [DPT_1.001] - 0-Off;1-On
- 72: Status_ Operation State Heat Demand [DPT_1.001] - 0-Off;1-On
- 73: Status_ Operation State Heat Thermo [DPT_1.001] - 0-Off;1-On
- 74: Status_ Operation State DHW [DPT_1.001] - 0-Off;1-On
- 75: Status_ Operation State SwimPool [DPT_1.001] - 0-Off;1-On
- 76: Status_ Operation State Alarm [DPT_1.005] - 0-No alarm;1-Alarm
- 77: Status_ Outdoor Ambient Temp [DPT_9.001] - °C
- 78: Status_ Second Ambient Temp [DPT_9.001] - °C
- 79: Status_ Water Inlet Temp [DPT_9.001] - °C
- 80: Status_ Water Outlet Temp [DPT_9.001] - °C
- 81: Status_ Defrost Operation [DPT_1.001] - 0-Off;1-On
- 82: Status_ Water Pump 1 Operation [DPT_1.001] - 0-Off;1-On
- 83: Status_ Water Pump 2 Operation [DPT_1.001] - 0-Off;1-On
- 84: Status_ Water Pump 3 Operation [DPT_1.001] - 0-Off;1-On
- 85: Status_ Disch. Gas Temp [DPT_9.001] - °C
- 86: Status_ Suct. Gas Temp [DPT_9.001] - °C
- 87: Status_ Gas Temp THMg [DPT_9.001] - °C
- 88: Status_ Liquid Temp THMI [DPT_9.001] - °C
- 89: Status_ Water Outlet Temp 3 [DPT_9.001] - °C
- 90: Status_ Outdoor AmbAvg Temp [DPT_9.001] - °C
- 91: Status_ Inv Oper Freq [DPT_14.033] - Hz
- 92: Status_ Indoor Exp. Valve Opening [DPT_5.001] - %
- 93: Status_ Outdoor Exp. Valve Opening [DPT_5.001] - %
- 94: Status_ Mixing Valve Position [DPT_5.001] - %
- 95: Status_ Compressor Run Current [DPT_9.021] - mA

Figure 4.23 Extra Information status communication objects

- If “Yes” is selected (the installed unit is a Yutaki S80 model), the Control_ Unit Mode and the Status_ Unit Mode communication objects will be hidden and new communication objects will appear providing extra and specific information for the Yutaki S80.

• Yutaki S80 Extra Information

- 96: Status_ Disch. Gas Temp R134A [DPT_9.001] - °C
- 97: Status_ Suct. Gas Temp R134A [DPT_9.001] - °C
- 98: Status_ Liquid Gas Temp R134A [DPT_9.001] - °C
- 99: Status_ Evap. Gas Temp R134A [DPT_9.001] - °C
- 100: Status_ Disch. Pressure R134A [DPT_14.058] - Pa
- 101: Status_ Suct. Pressure R134A [DPT_14.058] - Pa
- 102: Status_ Inv Oper Freq R134A [DPT_14.033] - Hz
- 103: Status_ Indoor Exp. Valve Open R134A [DPT_5.001] - %
- 104: Status_ Compressor Run Current R134A [DPT_9.021] - mA
- 105: Status_ Error Code R134A [1byte] - HI error code

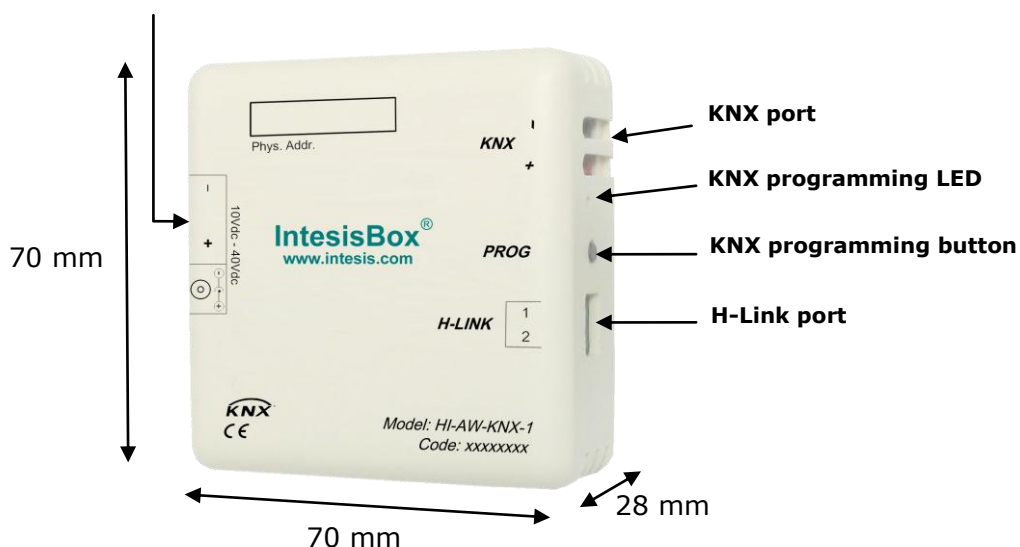
Figure 4.24 Extra Information for Yutaki S80 status communication objects

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

5. Technical Specifications

Enclosure	ABS (UL 94 HB) de 2,5 mm thick
Dimensions	70 X 70 X 28 mm
Weight	70g
Color	Ivory White
Power supply	29V DC, 6mA (KNX bus)
External Power Supply	10-40V DC, 100mA (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) 1 core: 0.5mm ² ... 2.5mm ² 2 cores: 0.5mm ² ... 1.5mm ² 3 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, non condensing
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



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

A list of Hitachi unit model references compatible with HI-AW-KNX-1 and their available features can be found in:

http://www.intesis.com/pdf/IntesisBox_HI-AW-xxx-1_AC_Compatibility.pdf

7. Error Codes

KNX Error Code	Remote Controller Error Code	Error Description
00	N/A	No errors
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
b1	b1	Error in Address/Refrigerant System Setting
EE	EE	Compressor Factor Alarm
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
76	76	Freeze Protection Stop by indoor liquid temperature thermistor
77	77	Open therm 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
65535	N/A	Communication error between HI-AW-KNX-1 interface and the Hitachi Unit

In case you detect an error code not listed, please contact your nearest Hitachi support center to get more information about the meaning of the error.

Appendix A – Communication objects description table

Control Objects

SECTION	OBJECT NUMBER	NAME	LONG.	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 bit	DPT_Heat/Cool	1.100		W	T		0 - Cool; 1 - Heat
Water Circuit (C1 and C2)	2/14	Control_ Cx ¹ Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
	3/15	Control_ Cx ¹ Heat OTC Mode Off	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode OFF
	4/16	Control_ Cx ¹ Heat OTC Mode Points	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode POINTS
	5/17	Control_ Cx ¹ Heat OTC Mode Grad	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode GRAD
	6/18	Control_ Cx ¹ Heat OTC Mode Fix	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode FIX
	7/19	Control_ Cx ¹ Cool OTC Mode Off	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode OFF
	8/20	Control_ Cx ¹ Cool OTC Mode Points	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode POINTS
	9/21	Control_ Cx ¹ Cool OTC Mode Fix	1 bit	DPT_Bool	1.002		W	T		1 - Set OTC Mode FIX
	10/22	Control_ Cx ¹ Thermo Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 0°C and 35°C)
	11/23	Control_ Cx ¹ Ambient Temp	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between -20°C and 40°C)

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

	12/24	Control_ Cx ¹ Water Heat Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 20°C and 80°C)
	13/25	Control_ Cx ¹ Water Cool Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 5°C and 21°C)
DHW	26	Control_ DHW Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
	27	Control_ DHW Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 30°C and 75°C)
Swimming pool	28	Control_ SwimPool Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
	29	Control_ SwimPool Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 24°C and 33°C)
AntiLeg	30	Control_ AntiLeg Run/Stop	1 bit	DPT_Start	1.010		W	T		0 - Stop; 1 - Run
	31	Control_ AntiLeg Setpoint	2 bytes	DPT_Value_Temp	9.001		W	T		°C (Between 50°C and 75°C)
KNX Block	32	Control_ KNX Blocks/Enables Menu	1 bit	DPT_Enable	1.003		W	T		0 - Blocks; 1 - Enables

Status Objects

SECTION	OBJETO NUMBER	NAME	LONG.	DATAPOINT TYPE		FLAGS				FUNCTION
				DPT_NAME	DPT_ID	R	W	T	U	
Mode	33	Status_ Unit Mode	1 bit	DPT_Heat/Cool	1.100	R		T		0 – Cool; 1 – Heat
Water Circuit (C1 y C2)	34/46	Status_ Cx ² Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	35/47	Status_ Cx ² Heat OTC Mode Off	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	36/48	Status_ Cx ² Heat OTC Mode Points	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode POINTS Set
	37/49	Status_ Cx ² Heat OTC Mode Grad	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode FIX Set
	38/50	Status_ Cx ² Heat OTC Mode Fix	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	39/51	Status_ Cx ² Cool OTC Mode Off	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode Off Set
	40/52	Status_ Cx ² Cool OTC Mode Points	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode POINTS Set
	41/53	Status_ Cx ² Cool OTC Mode Fix	1 bit	DPT_Bool	1.002	R		T		1 – OTC Mode FIX Set
	42/54	Status_ Cx ² Thermo Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	43/55	Status_ Cx ² Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	44/56	Status_ Cx ² Water Heat Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	45/57	Status_ Cx ² Water Cool Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
DHW	58	Status_ DHW Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	59	Status_ DHW Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	60	Status_ DHW Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C
Swimming pool	61	Status_ SwimPool Run/Stop	1 bit	DPT_Start	1.010	R		T		0 – Stop; 1 – Run
	62	Status_ SwimPool Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T		°C
	63	Status_ SwimPool Temperature	2 bytes	DPT_Value_Temp	9.001	R		T		°C

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

AntiLeg	64	Status_ AntiLeg Run/Stop	1 bit	DPT_Start	1.010	R		T	0 – Stop; 1 – Run
	65	Status_ AntiLeg Setpoint	2 bytes	DPT_Value_Temp	9.001	R		T	°C
KNX Block	66	Status_ KNX Block/Enable Menu	1 bit	DPT_Enable	1.003	R		T	0 – Block; 1 – Enable
Error and Alarms	67	Status_ Error/Alarm	1 bit	DTP_Alarm	1.005	R		T	0 - No Alarm; 1 - Alarm
	68	Status_ Error Code	2 bytes	Enumerated		R		T	0 – No error; Other values see 7
Extra Information	69	Status_ Operation State Unit On/Off	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	70	Status_ Operation State Cool Demand	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	71	Status_ Operation State Cool Thermo	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	72	Status_ Operation State Heat Demand	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	73	Status_ Operation State Heat Thermo	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	74	Status_ Operation State DHW	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	75	Status_ Operation State Swim Pool	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	76	Status_ Operation State Alarm	1 bit	DTP_Alarm	1.005	R		T	0 - No Alarm; 1 - Alarm
	77	Status_ Outdoor Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	78	Status_ Second Ambient Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	79	Status_ Water Inlet Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	80	Status_ Water Outlet Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	81	Status_ Defrost Operation	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	82	Status_ Water Pump 1 Operation	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	83	Status_ Water Pump 2 Operation	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	84	Status_ Water Pump 3 Operation	1 bit	DPT_Switch	1.001	R		T	0 - Off; 1-On
	85	Status_ Dish. Gas Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	86	Status_ Suct. Gas Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C

	87	Status_ Gas Temp THMg	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	88	Status_ Liquid Temp THMI	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	89	Status_ Water Outlet Temp 3	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	90	Status_ Outdoor AmbAvg Temp	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	91	Status_ Inv Oper Freq	2 bytes	DPT_Value_Frequency	14.033	R		T	Hz
	92	Status_ Indoor Exp Valve Opening	1 byte	DPT_Scaling	5.001	R		T	%
	93	Status_ Outdoor Exp Valve Opening	1 byte	DPT_Scaling	5.001	R		T	%
	94	Status_ Mixing Valve Position	1 byte	DPT_Scaling	5.001	R		T	%
	95	Status_ Compressor Run Current	2 bytes	DPT_Value_Cur	9.021	R		T	mA
Extra Information Yutaki S80	96	Status_ Dish. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	97	Status_ Suct. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	98	Status_ Liquid Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	99	Status_ Evap. Gas Temp R134A	2 bytes	DPT_Value_Temp	9.001	R		T	°C
	100	Status_ Disch. Pressure R134A	2 bytes	DPT_Value_Pressure	14.058	R		T	Pa
	101	Status_ Suct. Pressure R134A	2 bytes	DPT_Value_Pressure	14.058	R		T	Pa
	102	Status_ Inv Oper Freq R134A	2 bytes	DPT_Value_Frequency	14.033	R		T	HZ
	103	Status_ Indoor Exp Valve Open R134A	1 byte	DPT_Scaling	5.001	R		T	%
	104	Status_ Compressor Run Current R134A	2 bytes	DPT_Value_Cur	9.021	R		T	A
	105	Status_ Error Code R134A	2 bytes	Enumerated		R		T	0 – No error; Other values see 7