

HITACHI

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TECHNICAL BULLETIN

SUBJECT

**Product News: Launching of HARC-BX E
Packaged LON Gateway for BMS**

DATE: AUG-03

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1. This technical bulletin introduces the new adapter for open network utilized in building management systems (HARC-BX E)
2. The details are indicated in the description.

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1- Description

1.1 Applicable Products

SET FREE SERIES
UTOPIA G7 SERIES
DC INVERTER

1.2 Features

1.2.1 Connection to Open Network

It is able to connect the above products to Open Network which is rapidly used, by using **HARC-BX E**: LonWorks[®] Network ^(*).....HARC-BX E

The above products are connectable to LonWorks[®] Network by using Standard Network Variable Types (SNVT ^(*))

1.2.2 Easy Installation by Using H-LINK Transmission and Gateway System.

- HARC-BX E has adapted a gateway system which can be connected to multiple H-LINK transmission lines so that the wiring work has been minimized.
- HARC-BX E is used within the specified total length of H-LINK transmission line. HARC-BX E can be installed in a field-supplied control panel.

(*) Lon Works[®] is the Register Trade Mark of Echelon Corporation in U.S.A. and other countries.

(*) SNTV: Standard Network Variable Types

2- Sales date

October 2003

**Hitachi Air Conditioning Products Europe, S. A.
Barcelona (Spain)**

No

EG-A3070

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3- Standard Specification of HARC-BX E

3.1 Hardware

Item	Specification
Transceiver	FTT-10A (LonWorks Network Transceiver)
Outer Dimension	285 (H) x 128.5 (W) x 240(L) (mm)
Power Source	AC220V/240V ± 10% 50/60Hz
Applicable Ambient Condition	<ul style="list-style-type: none"> Ambient Temperature: 0~45°C Ambient Humidity: 10~80% Rh (no dewing)
Color	Silver / Black
Material	Aluminum / Resin
Mounting	<ul style="list-style-type: none"> Mounting on the wall
Notes	1.HARC-BX E is exclusively used inside of the control board which can protect it from rain and dusts. 2.System operation of LonWorks Network is beyond Hitachi's warranty. 3.Do not use HARC-BX E with other control products at the same time.

3.2 Software

	Specification		
	Standard	Option A	Option B
Model	HARC-BX E	HARC-BX E(A)	HARC-BX E(B)
Connectable Units	HITACHI AIR CONDITIONERS with H-LINK SYSTEM		
Connection Method to Upper System	Connection by SNVT(Standard Network Variable Type) to LonWorks Network		
Quantity of Connection (1 Control Board)	64 Indoor Units (8 Indoor Units/Control Board)	64 Indoor Units (8 Indoor Units/Control Board)	32 Indoor Units (4 Indoor Units/Control Board)
Control Item at Upper System	<ul style="list-style-type: none"> On/Off Order Operation Mode Setting Temperature Setting On/Off Order 	<ul style="list-style-type: none"> On/Off Order Operation Mode Setting Temperature Setting Fan Speed Setting R.C.Sw Permission/Prohibition On/Off Order 	<ul style="list-style-type: none"> On/Off Order Operation Mode Setting Temperature Setting Fan Speed Setting Louver Position Setting R.C.Sw Permission/Prohibition On/Off Order
Monitoring Item at Upper System	<ul style="list-style-type: none"> On/Off State & Alarm Operation Mode State Temperature Setting Individual Thermostat State 	<ul style="list-style-type: none"> On/Off State & Alarm Inlet Air Temperature 	<ul style="list-style-type: none"> On/Off State & Alarm Operation Mode State Temperature Setting Fan Speed Setting Louver Position Alarm Code Inlet Air Temperature Outlet Air Temperature Outdoor Air Temperature
R.C.SW Type	PC-P1H/PC-2H2		

3.3 "xif" files

"xif" files are available in HITACHI for the 3 operation modes of HARC-BX E: standard, option (A) and (B)
 Note: "xif" files contain the data configuration of the Hitachi Air Conditioning according to LON specifications

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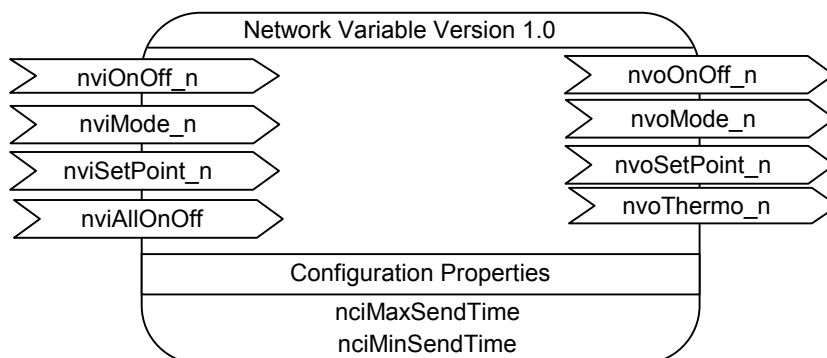
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4- Details of Connection Specification

4.1 Standard type

Object Figure . . . This shows SNVT (Standard Network Variable Type) which corresponds to the Unit connected to LonWorks Network for easy reference. (n : indication of the Indoor Unit)

Standard type (able to connect to 8 of the Indoor Units per Control Board)



② SNVT Details

No.	Name of Variable	SNVT Type	VALUE/STATE	Remarks
1	ON/OFF Order nviOnOff_n	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	Provide an interval of each SNVT each 5 sec. or more for ON/OFF order operation mode and temp. setting.
2	Setting of Operation Mode nviMode_n	SNVT_hvac_mode	1: Heating (HVAC_HEAT) 3: Cooling (HVAC_COOL) 5: Dry(HVAC_PRE_COOL) 9: Fan (HAVC_FAN_ONLY)	
3	Temperature Setting nviSetPoint_n	SNVT_temp_p	1700~3000 (17~30°C)	
4	All ON/OFF Order nviAllOnOff	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	
5	ON/OFF State & Alarm Notification nvoOnOff_n	SNVT_state	bit 0 : 0 (STOP) / 1 (RUN) bit 1: 0 (Normal), 1= (/ Alarm)	Notification after Change Operation State of the Unit. (approx.80seconds* ¹ after ordering)
6	Operation Mode State Notification nvoMode_n	SNVT_hvac_mode	1: Heating (HVAC_HEAT) 3: Cooling (HVAC_COOL) 5: Dry (HVAC_PRE_COOL) 9: Fan (HAVC_FAN_ONLY)	Notification after Operation Change of the Unit. (approx. 80seconds* ¹ after ordering)
7	Temperature Setting Notification nvoSetPoint_n	SNVT_temp_p	1700~3000 (17~30°C)	Notification after Temp. Setting Change of the Unit. (approx. 80seconds* ¹ after ordering)
8	Individual Thermostat State Notification nvoThermo_n	SNVT_state	0 : Thermo- OFF, 1 : Thermo- ON	

*1 : The communication of HARC → Unit → HARC takes a long time.

Note : In case of not connecting to the Indoor Unit, output variables respond to the requirement of the data with "0".

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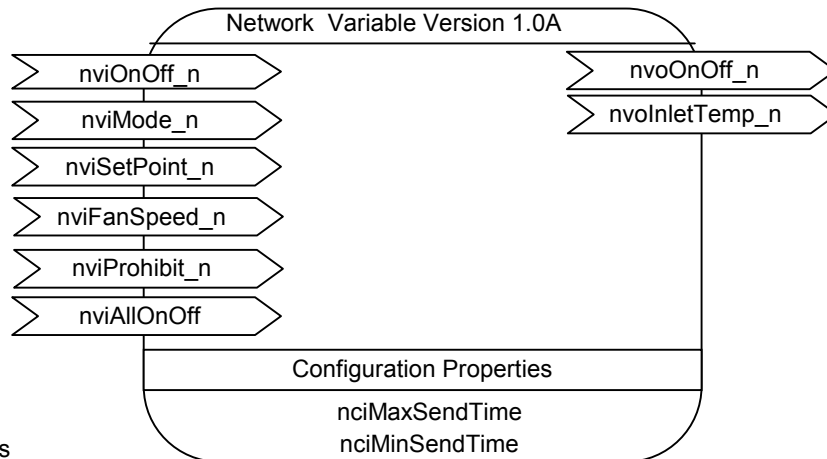
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4.2 Option A

Object Figure . . . This shows SNVT (Standard Network Variable Type) which corresponds to the Unit connected to LonWorks Network for easy reference. (n : indication of the Indoor Unit)

- Option A type (able to connect to 8 of the Indoor Units per Control Board)



② SNVT Details

No.	Name of Variable	SNVT Type	VALUE/STATE	Remarks
1	ON/OFF Order nviOnOff_n	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	Provide an interval of each SNVT each 5 sec. or more for ON/OFF order operation mode and temp. setting.
2	Setting of Operation Mode nviMode_n	SNVT_hvac_mode	1: Heating (HVAC_HEAT) 3: Cooling (HVAC_COOL) 5: Dry(HVAC_PRE_COOL) 9: Fan (HAVC_FAN_ONLY)	
3	Temperature Setting nviSetPoint_n	SNVT_temp_p	1700~3000 (17~30°C)	
4	Fan Speed Setting nviFanSpeed_n	SNVT_switch	Value 1:Low 2:Middle 3:High State 0:Fixing	
5	R.C.Sw Permission/Prohibition nviProhibit_n	SNVT_switch	Value 0:Fixing State 0:R.C.Sw Permission 1: R.C.Sw Prohibition	
6	All ON/OFF Order nviAllOnOff	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	nviAllOnOff simultaneously controls the targeted indoor units (max. 8 units) to stop or start at 1SNVT by each control PCB.
7	ON/OFF State & Alarm Notification nvoOnOff_n	SNVT_state	bit 0 : : 0 (STOP) / 1 (RUN) bit 1: 0 (Normal), 1= (/ Alarm)	Notification after Change Operation State of the Unit. (approx.80seconds* ¹ after ordering)
8	Indoor Unit Inlet Temperature nvolnletTemp	SNVT_temp_p	-6200 ~ 12700 (-62 ~ 127°C)	

*1 : The communication of HARC → Unit → HARC takes a long time.

Note : In case of not connecting to the Indoor Unit, output variables respond to the requirement of the data with "0".

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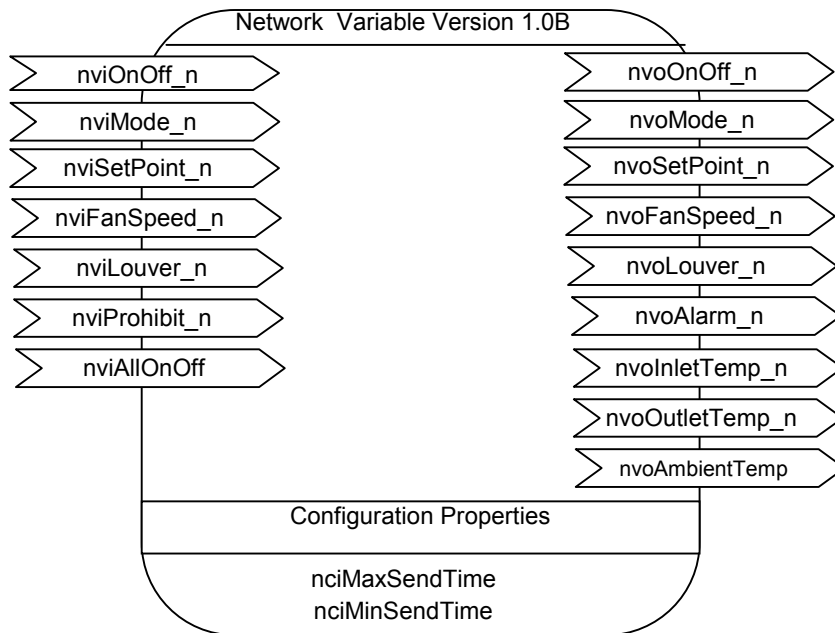
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4.3 Option B

Object Figure . . . This shows SNVT (Standard Network Variable Type) which corresponds to the Unit connected to LonWorks Network for easy reference. (n : indication of the Indoor Unit)

Option B type (able to connect to 4 of the Indoor Units per Control Board)



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② SNVT Details

No.	Name of Variable	SNVT Type	VALUE/STATE	Remarks
1	ON/OFF Order nviOnOff_n	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	Provide an interval of each SNVT each 5 sec. or more for ON/OFF order operation mode and temp. setting.
2	Setting of Operation Mode nviMode_n	SNVT_hvac_mode	1: Heating (HVAC_HEAT) 3: Cooling (HVAC_COOL) 5: Dry(HVAC_PRE_COOL) 9: Fan (HAVC_FAN_ONLY)	
3	Temperature Setting nviSetPoint_n	SNVT_temp_p	1700~3000 (17~30°C)	
4	Fan Speed Setting nviFanSpeed_n	SNVT_switch	Value 1:Low 2: Middle 3:High State 0:Fixing	
5	Louver Position Setting nviLouver	SNVT_switch	Value 0:20, 1:25, 2:30, 3:35, 4:45, 5:55, 6:70, 7:AutoLouver State 0:Fixing	
6	R.C.Sw Permission/Prohibition nviProhibit_n	SNVT_switch	Value 0:Fixing State 0:R.C.Sw Permission 1: R.C.Sw Prohibition	
7	All ON/OFF Order nviAllOnOff	SNVT_switch	Value 0: Fixing States: 0 (STOP), 1 (RUN)	nviAllOnOff simultaneously controls the targeted indoor units (max. 4 units) to stop or start at 1SNVT by each control PCB.
8	ON/OFF State & Alarm Notification nvoOnOff_n	SNVT_state	bit 0 : 0 (STOP) / 1 (RUN) bit 1: 0 (Normal), 1= (/ Alarm)	Notification after Change Operation State of the Unit. (approx.80seconds*1 after ordering)
9	Operation Mode State Notification nvoMode_n	SNVT_hvac_mode	1: Heating (HVAC_HEAT) 3: Cooling (HVAC_COOL) 5: Dry (HVAC_PRE_COOL) 9: Fan (HVAC_FAN_ONLY)	
10	Temperature Setting Notification nvoSetPoint_n	SNVT_temp_p	1700~3000 (17~30°C)	
11	Fan Speed State nvoFanSpeed_n	SNVT_Switch	Value 1:Low 2:Middle 3:High State 0:Fixing	
12	Louver Position nvoLouver_n	SNVT_Switch	Value 0:20° 1:25° 2:30° 3:35° 4:45° 5:55° 6:70° 7:AutoLouver State 0:Fixing	
13	Alarm Code	SNVT_str_asc	Alarm Code shown on Remote Control Switch	
14	Indoor Unit Inlet Temperature nvoInletTemp	SNVT_temp_p	-6200 ~ 12700 (-62 ~ 127°C)	
15	Indoor Unit Outlet Temperature nvoOutletTemp	SNVT_temp_p	-6200 ~ 12700 (-62 ~ 127°C)	
16	Outdoor Air Temperature nvoAmbientTemp	SNVT_temp_p	-6200 ~ 12700 (-62 ~ 127°C)	1SNVT by Control PCB

*1 : The communication of HARC → Unit → HARC takes a long time.

Note : In case of not connecting to the Indoor Unit, output variables respond to the requirement of the data with "0".

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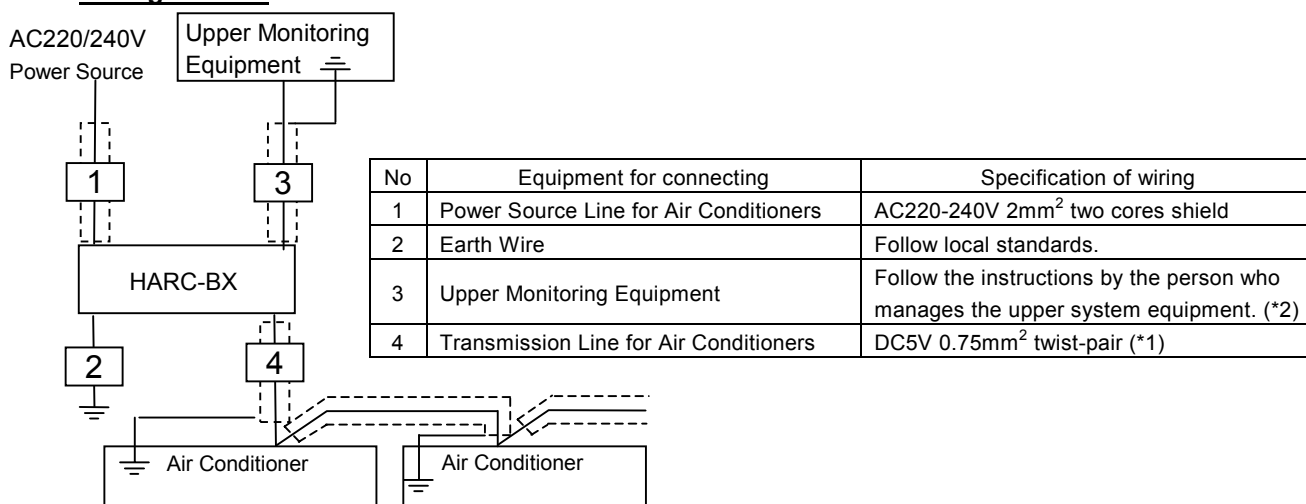
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5- Electric Wiring

- Follow the local regulation when electrical wiring is performed.
- Provide an electric leakage breaker according to the local regulations.
- Perform this work by certified reasons.
- It is required to perform the following wiring.
 - Power Source wiring for HARC-BX E
 - Transmission wiring to Air Conditioner
 - Transmission wiring to Upper Monitoring Equipment

Wiring Method



(*1) Recommended Cable Types

	Japan Cable Industrial Associations	Hitachi Cable Co., Ltd.	Japan Cable Co., Ltd.	integral power consumption
Non-shielded	JKEV	KPEV	KNPEV	KPEV
Shielded (Copper Foil)	JKEV-S	KPEV-S	KNPEV-S	KPEV-S
Shielded(Twisted)	JKEV-SB	KPEV-SB	KNPEV-SB	KPEV-SB

(*2) LONWORKS Network Cable

- Use the cable that is recommended by Echelon Co. and follow the instruction of the manufacturer who produces the Upper Monitoring equipment.
- If it is use a shielded cable for upper monitoring system connection it shall be connected the shield to the ground through metal film resistance having 470kΩ, 1/4W , and accuracy of 10% or lower. Do not use a single core cable.

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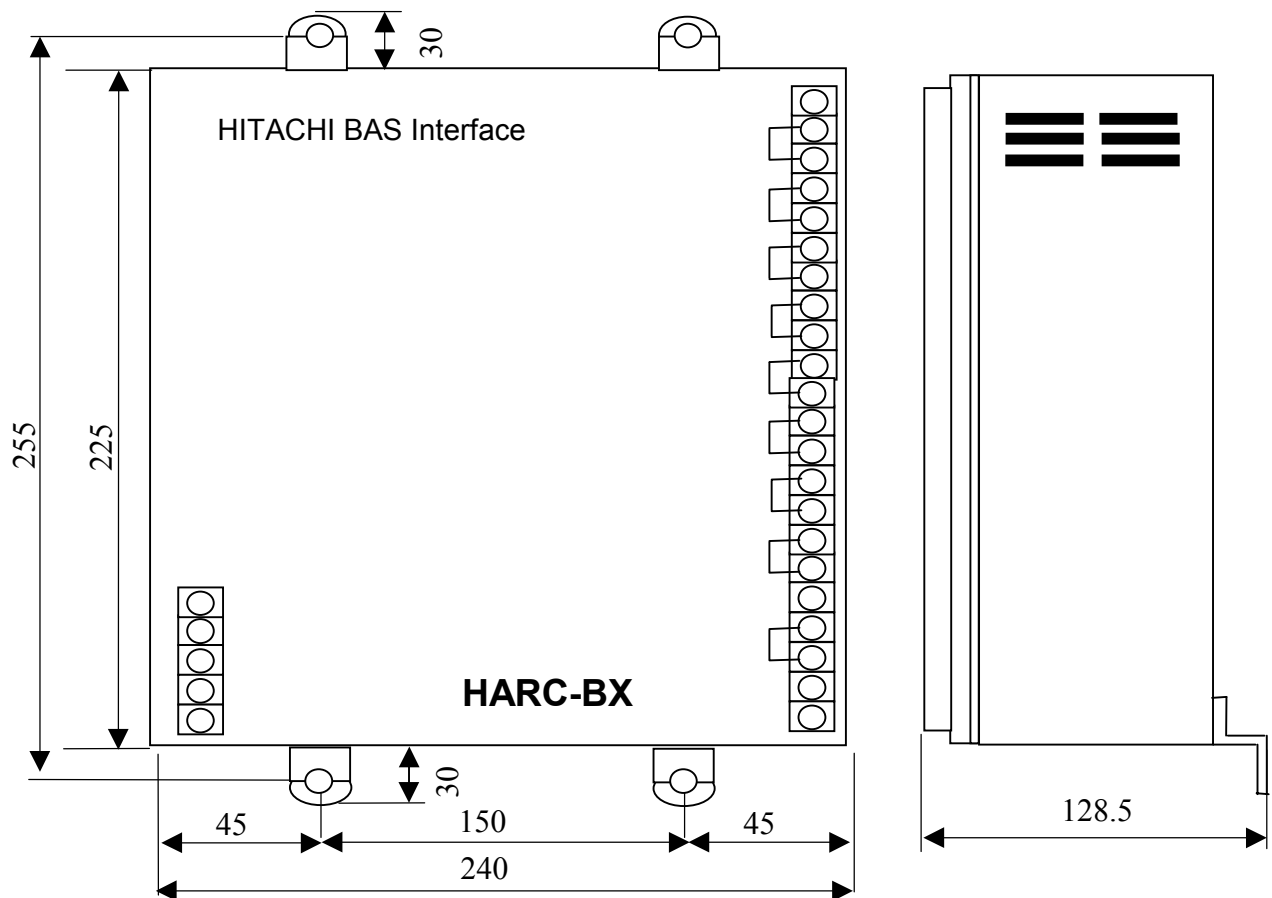
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6- Dimensions



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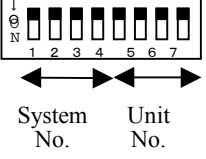
7. Setting & Test Run

7.1 Setting of Dip Switch

- 1) Setting Dip Switch before power supply.
- 2) Remove the front board to set Dip Switch.
- 3) Dip Switch setting for each PCB is different.
- 4) Setting for 8 Pins Dip Switch (S201)



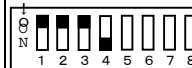













Setting of 8 Pins Dip Switch (S201) are determined by the system numbers and the unit numbers of the applicable indoor units to which the PCB controls.

Setting procedure for the system number and the unit number are as shown in the table below.

8 Pins Dip Switch Set up (S201)	Description
	<p>Setting of 8 pins DSW (S201) are determined by the system numbers and the unit numbers of the applicable indoor units to which the PCB controls.</p> <p>In case of the standard specification and option A specification, PCB will control 8 units from the system No. and unit No, which have been set. For instance, if system No.1 along with unit 1 is set, relevant PCB will control unit No.1 to 8 from system No.1. The unit No. should be set from either of No. 1 or 9.</p> <p>In case of option B, PCB will control 4 units from the system and unit numbers, which have been set. For instance, if system No.1 along with unit No. 1 is set, relevant PCB will control unit No. 1 to 4 from system No.1. The unit No. should be set from either of No.1, 5, 9 or 13.</p>

Setting for the required system numbers are described in the table below.

Setting Procedure of System Number

System No.	Setting Pin No.1 to No.4	System No.	Setting Pin No.1 to No.4	System No.	Setting Pin No.1 to No.4	System No.	Setting Pin No.1 to No.4
1		5		9		13	
2		6		10		14	
3		7		11		15	
4		8		12		16	

Next, setting for the required unit numbers are described below.

Setting Procedure of Unit Number

Unit No.	Setting Pin No. 5 to No.8	Unit No.	Setting Pin No. 5 to No.8	Unit No.	Setting Pin No. 5 to No.8	Unit No.	Setting Pin No. 5 to No.8

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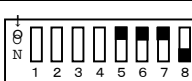
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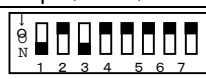
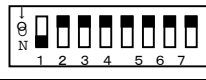
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1		5		9		13	
---	---	---	---	---	--	----	---

5) Setting of 8 Pins Dip Switch (S202)

Setting of 8 Pins Dip Switch (S202) is set up depending to the PCB quantity for each H-LINK circuit.

8 Pins Dip Switch Set up (S202)	
	Set only 1 PCB among other PCBs in a single H-LINK.
	Set the rest of the PCB other than the above.

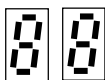
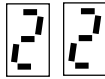
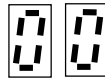
7.2 Test Run

- 1) Check if all procedures for "Wiring Connection" and "Dip Switch Set up" are completed.
- 2) Turn ON the Power supply according to the following procedure.
 - 1 Switch ON the packaged air conditioners.
 - 2 And then, Switch ON the HARC-BX E.

3) Check the connection of HARC-BX E.

The 7-Segment display will change as described in the table below, after switching ON HARC-BX E

Check the 7-Segment display.

Step	7-Segment Display	Status	Remarks
1	—	Power Source OFF	
2		End of system initialization	
3		Under Checking of Package Air Conditioner, Remote Control Switch Group Connection Quantity	
4		Normal Transmission Between HARC-BX E, and Package Air Conditioner are undertaking.	

4) Check how many numbers of identified Indoor unit.

The amounts of Indoor unit, which HARC-BX E has identified will display on the 7-Segment after pressing the PUSH SWITCH (PSW [M.CLR]) on HARC-BX E with indicating "00" on the 7-Segment display. (Check if the amounts of actual Indoor units are identical to these.)

5) After indoor units quantity have been recognized, check the system numbers and unit numbers of the indoor units, which HARC-BX E has identified.

Switch ON the Pin No. 2 of 8 Pins Dip Switch (S202). All the system numbers and unit numbers of the recognizable indoor units will display on the 7-Segment after pressing the PUSH SWITCH (PSW[M.CLR])

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on HARC-BX E. If the multiple indoor units are identified, the system numbers and unit numbers of the identified indoor units will be sequentially displayed by every pressing of PUSH SWITCH (PSW[CLR]). The system numbers will display on the left side of 7-Segment and the unit numbers will display on the right side. (Check if quantity of actual indoor units is identical to these.)

Setting of 8 Pins Dip Switch (S202)



7-Segment Display	Description	7-Segment Display	Description	7-Segment Display	Description	7-Segment Display	Description
	System No. 1 or Unit No. 1		System No. 5 or Unit No. 5		System No. 9 or Unit No. 9		System No. 13 or Unit No. 13
	System No. 2 or Unit No. 2		System No. 6 or Unit No. 6		System No. 10 or Unit No. 10		System No. 14 or Unit No. 14
	System No. 3 or Unit No. 3		System No. 7 or Unit No. 7		System No. 11 or Unit No. 11		System No. 15 or Unit No. 15
	System No. 4 or Unit No. 4		System No. 8 or Unit No. 8		System No. 12 or Unit No. 12		System No. 16 or Unit No. 16

6) Switch OFF the Pin No. 2 of 8 Pins Dip Switch (S202) after completing all the checking. Test Run has completed.

Setting of 8 Pins Dip Switch(S202)



7.3 Abnormal Indication

1) Abnormality will be identified with 7-Segment Display of HARC—GW.

7-Segment Display	Phenomenon	Content of Abnormality	Remarks
	Abnormality in Initial Connection	No Remote Control Switch Group was found (failure to conform the connection)	
	Transmission Abnormality in Entire Remote Control Switch Group	No response for 70 seconds after the remote control switch group has been conformed.	

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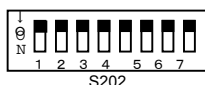
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8. Maintenance and Service

8.1 Self-Inspection for HARC-BX E

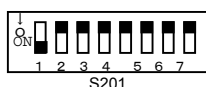
Self-Inspection to identify the abnormality of HARC-BX E can be conducted by the following procedures.

- (1) Turn ON the power supply with leaving 8 Pins DSW [S202] OFF. (The 7-Segment shows "88" and is lit OFF.)

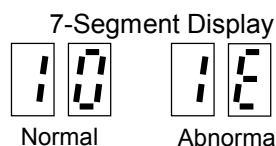
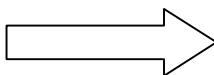


8 Pins DSW

- (2) Turn ON only No. 1 pin of 8-pin DSW [S201] .



8 Pins DSW

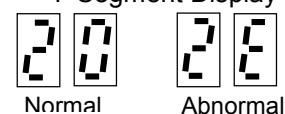
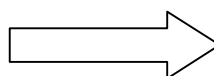


- (3) Turn OFF No. 1 pin of 8 pins DSW [S201], and turn ON only No. 2 pin.

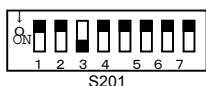
(This work should be conducted with setting End Terminal Resistance on H-link additionally.)



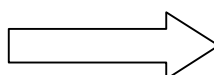
8 Pins DSW



- (4) Turn OFF No. 2 pin of 8 pins DSW [S201], and turn ON No. 3 pin.

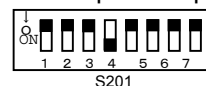


8 Pins DSW

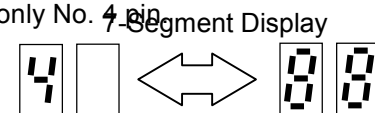
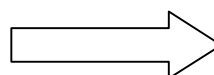


The total number of pins that have been set ON from No. 1 to NO. 5 out of 8 Pins DSW [S202] will appear on the right side of display, and "3" on the left side of display.

- (5) Turn OFF No. 3 pin of 8 pins DSW [S201], and turn ON only No. 4 pin.



8 Pins DSW



The above indication will be repeated.

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8.2 Trouble Shooting

The following table indicates possible trouble-shooting upon the abnormal operation in the unit. Ensure that power supply is switched OFF before starting the check.

No.	Phenomenon	Items to be checked	Action
1	HARC-BX E does not activate even though power supply is ON. (No indication on the 7-Segment)	Check if power cable is connected.	Connect power cable.
		Check if power is supplied.	Power source voltage should be measured. If the voltage measure shows out of normal range of $100\sim 240\pm 10\%$ [V], wire systems and wiring procedures should be inspected and examined.
		Check if Power Supply Display (PWRs ON).	Lighting OFF indicates that there is a possibility of the failure of internal power source. Contact your nearest service centre.
		Check if power supply terminal screws are loosed.	Ensure to tighten firmly.
		Check if LED (PWR or transmission display is lit)	Check the transmission circuit of air conditioners by the self-inspection function. And check the circuit if transmission circuit in packaged air conditioners is operating normally.
		Check if LED (LON or transmission display is lit)	Check the upper transmission circuit by self-inspection function. And check the circuit if upper transmission circuit is operating normally.
		Check if LED (LON or transmission display is blinking on the regular intervals (1 to 2sec.))	Blink indicates that there is a possibility of the failure of internal power source. Contact to your nearest services centre.
2	<ul style="list-style-type: none"> HARC-BX E does not identify the air conditioner even though power is ON. ("11" displayed on the 7-Segment) After the indication of "00" on the 7-Segment with check mode, the quantity of actual air conditioners did not identical to these addresses. 	Check if Dip Switches on HARC-BX E are set correctly.	Dip Switch should be re-set according to section 4.1 in the installation maintenance manual and operation manual for how to set HARC-BX E Dip Switch.
		Check if the system and address of the air conditioner are set correctly.	Address should be re-set according to section 4.2 in the installation, maintenance & operation manual.
		Check if transmission cable between units is OK	Connection of wire should be examined.
		Check if manufacturer's specified transmission cable connected with air conditioners is used.	Use Twist pair cable (0.75mm ²).
		Check if transmission cable connected with air conditioners is wired along the power source wire.	Provide a space of at least 150mm between wires.
		Check if end terminal resistance and quantity on transmission cable between units are set correctly.	Only 1 end resistance should be set in one system. (Resistance between wire is approx. 150Ω)
		Check if transmission circuit is operating normally upon the self-inspection.	End resistance should be set to the transmission wire of air conditioner.
		Check if the power supply of air conditioners is ON.	Air conditioner should be turned ON.
		Check if transmission cable between units is OK	Connection of wiring should be examined.
		Check if H-LINK for transmission display is ON.	Check transmission circuit of air conditioner by self-inspection. And check if transmission circuit of air conditioners is operating normally.
		Check if LED (H-LINK) for transmission display is OFF.	Check transmission circuit of air conditioner by self-inspection. And check if transmission circuit of air conditioners is operating normally.
3	7-Segment indicates "44".	Check if manufacturer's specified transmission cable connected with air conditioners is used.	Use Twist pair cable (0.75mm ²).
		Check if transmission cable connected with air conditioners is wired along power source wire.	Provide a space of at least 150mm between wires.
		Check if end terminal resistance and quantity on the transmission cable between units are set correctly.	Only 1 end resistance should be set in one system. Resistance between wire will be approx. 150Ω)
		Check if transmission circuit is operating normally upon the self-inspection.	End resistance should be set to the transmission wire of air conditioners side.
		Check if the power supply of air conditioners is ON.	Air conditioners should be turned ON.
		Check if manufacturer's specified transmission cable connected with air conditioner is used.	Use Twist pair cable (0.75mm ²).
		Check if transmission cable connected with air conditioner is wired along power source wire.	Provide a space of at least 150mm between wires.
		Check if end terminal resistance and quantity on the transmission cable between units are set correctly.	Only 1 end resistance should be set in one system. Resistance between wire will be approx. 150Ω)

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Check if transmission circuit is operating normally
upon the self-inspection.

End resistance should be set to the transmission
wire at the air conditioner side.

8.3 Periodical Inspection

The unit should be periodically inspected in order to ensure dependable performance and long life operation.

(1) Ambient Conditions

- Inspect that the internal temperature of cabinet panel is not abnormally too high.
- Inspect that the temperature of unit case is not abnormally too high.
- Inspect and remove any dusts, fine metal powder and lubrication.

(2) Displays

- Check that power supply display LED (PWR) is lit.
- Check that transmission display LED (H-LINK, LON) shows ON/OFF.
- Check if 7-segment shows other digits than "00".

(3) Mounting and connected Part

- Check to ensure that the mounting screws, power supply, transmission cable screws are tightened firmly.
- Check to ensure that the other screws are tightened firmly.

⚠ WARNING ● Do not use the cleaning agent containing acid compound such as thinner for cleaning.
If used, it may cause of discoloration of the coating surface and melting of plastic case.

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9- LonWorks Vocabulary

Echelon	The American company who developed LONWORKS (The logo is a register trade mark of Echelon Co.
Functional Profile	Network Variables Protocol according to products or Product Category Water chillers, fan coils. etc. are specified by LONMARK and opened
FTT-10A	echelon Co. Free topology transceiver Model.
LNS	echelon Co Network Established tool.
LONMARK	The mark for the product certified regarding interoperability. In case that the products of the affiliated company of LONMARK are designed on the basis of the product specification and guideline, LONMARK INTEROPERABILITY ASSOCIATION gives permission of using the logo of LONMARK.(The logo is a register trade mark of echelon Co.
LonMaker for Windows	Network Establishing Tool by LNS and VISIO(Microsoft CAD software) As it is supporting the main SNVT, it can be used as checking of communication and binding tool. (It may be indicated as LM4W.)
LONMARK INTEROPERABILITY ASSOCIATION	The original association that was established for accelerating development and use for interoperable control network products.
LonPoint	OEM product of echelon Co. It is used for input and output the conversion contact points due to handling DI,DO,AI,AO as LON.
LONTALK	Communication Protocol that is used for LONWORKS. (Term of the line of communication)
LONWORKS	<u>Local Operating NetWORKS</u> (The logo is a register trade mark) Distributed control Network that was developed by echelon Co..
NEURON	Programming Language that is used for NEURON CHIP.
NEURON CHIP	Microcomputer chips equipped with transceiver, CPU, Memory and Timer, I/O which is core for LON Node.
NEURON ID	Specific ID Number that is written on the NEURON CHIP
nvo, nvi	Network Variable Output, Input. Output data from Node : nvo, Input data from Node: nvi
SCPT	<u>Standard Configuration Property Type</u>
SNVT	<u>Standard Network Variable Type</u> . Variables that are defined by LONMARK to able to be interoperability between units.
XIF	External Interface File (Text file having the extension ".XIF". Description on Specification of External Interface of Device supplied by Hitachi Air Conditioning Products Europe, S.A.
Event Driven	It generates an event and send Data when there is a change of state (value changes over the set value.)
Service Pin	One of the switch on the NEURON CHIP This is used for installation and maintenance.
Node	Component part of LON Network. computer terminal. It is HARC in HITACHI.
Bind	to set data sending address by every Network variables.
Free Topology	Wiring System in the node which supports Star Type, Bus Type and Loop Type
Polling	Sending the data at a certain Frequency.

Refer to the following homepages on the information of LONWORK.

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