

SERVICE TOOLS V.3

Technical Catalogue

H-LINK Data Logger



Technical catalogue

General features	1
Installation	2
Operation	3
Troubleshooting	4



The specifications in this manual are subject to change without previous notification to ensure that HITACHI can offer the latest innovations to its customers. HITACHI does not assume any responsibility for possible damage caused by the use of this software. The damage caused to persons or material damage related directly to the use of this software is specifically excluded.

Contents

1.	Gen	General features 2		
	1.1.	H-LINK data logger	4	
	1.2.	HC-A160USB	4	
	1.3.	CSNET WEB & Service Tools v2 connection compatible	4	
	1.4.	Based on Java Technology	4	
	1.5.	New Features	5	
		1.5.1. Direct H-LINK Communication 1.5.2. Compatibility with Chiller, Package & Yutaki 1.5.3. CSNET WEB / Service Tools v2 Compatible 1.5.4. CSNET WEB / Service Tools v2 Auto configuration function 1.5.5. Units Remote Control 1.5.6. Optional functions configuration 1.5.7. H-LINK analyzer 1.5.8. H-LINK quality analyzer 1.5.9. Report 1.5.10. Multiple Screen Option	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
2.	Insta	allation	6	
	2.1.	Security summary	6	
	2.2.	Identifying the elements	6	
	2.3.	Dimensional data	7	
	2.4.	Description of the parts	7	
	2.5.	Specifications	8	
	2.6.	Installation	9	
		2.6.1. Electrical connections 2.6.2. Installation procedure	9 9	
	2.7.	Configuring the hardware	10	
	2.8.	Configuring the software 2.8.1. Java installation 2.8.2. Software installation 2.8.3. Usage HC-A160USB as a license key	10 10 11 12	
3.	Оре	eration	13	
	3.1.	Getting the data	13 13 14 15	
	3.2.	Saving/Restoring configuration	16	
	3.3.	Defining the test	16 17	
	3.4.	Viewing the data	19	
		3.4.1. Log panel	19 20 21 26	
	3.5.	Exporting the data	28	

3.6. Units control	29
3.7. H-LINK Analyzer	31
3.7.1. H-LINK line tab	32
3.7.2. Byte analysis tab	33
3.7.3. Messages tab	34
3.7.4. Units usage tab	35
3.7.5. Error detector tab	36
4. Troubleshooting	37
4.1. LEDS	37
4.2. Unit alarms	37
4.2.1. Unit alarm codes	_37
4.2.2. Alarm notification if connected to the installation	37

1. General features

1.1. H-LINK data logger

Service Tools v3 is an online H-LINK data logger that is connected directly to the H-LINK communication of the building.



Storing the H-LINK data allows a direct analysis of the communication, helping to find problems, and giving the maximum of the information about the units.

1.2. HC-A160USB

The HC-A160USB hardware is the gateway supplied with the Service Tools v3 in order to be connected to the H-LINK line. This hardware works as software key, this means that without this device connected on the computer, the software will not be started.

1.3. CSNET WEB & Service Tools v2 connection compatible

Service Tools v3 software can get the information from a CSNET WEB or Service Tools v2. Using that, the software can collect data without being connected online.

1.4. Based on Java Technology

Service Tools uses JAVA technology to control and monitor remotely operation of the installation. If you want the Service Tools application to run in a PC, it must have JAVA J2SE Runtime Environment installed. Service Tools is supplied with a CD-ROM to ensure simple installation.

1.5. New Features

1.5.1. Direct H-LINK Communication

Getting the information directly from the H-LINK gives extra information about the communication. It could be helpfully to find installation problems.

1.5.2. Compatibility with Chiller, Package & Yutaki

Service Tools v3 improves package system compatibilities of Service Tools v2, adding all the new units. Service Tools v3 adds also Chiller & Yutaki-S compatibility.

1.5.3. CSNET WEB / Service Tools v2 Compatible

In case of an existing CSNET WEB or Service Tools v2 on the installation, Service Tools v3 can connect to them through an Ethernet connection due to get the data.

In that case, test could continue without the Service Tools v3 running, and the data could be loaded on a following connection. It could be helpfully in cases of long tests where user does not want to place its computer on the field.



If there is a CSNET WEB connected to the H-LINK, HC-A160USB must be connected in monitoring mode to allow the H-LINK compatibility between them.

1.5.4. CSNET WEB / Service Tools v2 Auto configuration function

The auto configuration function check all the H-LINK addresses finding the units connected. On the previous version this function was called from the CSNET WEB Software, now it could be done from the Service Tools v3.

1.5.5. Units Remote Control

Service Tools v3 adds the option to control the units remotely, helping the user to evolve its test without moving away of his computer.

1.5.6. Optional functions configuration

In case of being connected to the H-LINK through the HC-A160USB to a packaged system, it could be configured the optional functions from the Service Tools v3, avoiding the user to go to each unit to configure them.

1.5.7. H-LINK analyzer

H-LINK analyzer is an integrated tool that checks the H-LINK messages in order to give information about how it is working. It helps marking possible errors on that communication.

1.5.8. H-LINK quality analyzer

The H-LINK quality analyzer shows using an icon the quality of the H-LINK connected to the HC-A160USB. This analysis is not done with the messages of the H-LINK, it measures analogically the communication, marking if there are low measures that could be caused for noise on the line or for messages without enough power that could mean an H-LINK communication longer than the allowed length.

1.5.9. Report

Service Tools v3 allows reporting the data logged, exporting each of its screens in different ways. H-LINK analyzer information could be exported too.

1.5.10. Multiple Screen Option

Service Tools v3 allows the split of the information in two screens, this is so useful in case of labs that use this functionality to split the graphic in one screen and the values table in the other.

2. Installation

2.1. Security summary

Caution

Read this manual carefully before performing installation work.

Read the Operation Manual in order to configure the air conditioning units.

Attention

Do not install SERVICE TOOLS in places... :

- with vapour, oil or dispersed liquids.
- with heat sources nearby (sulphuric surroundings).
- where accumulation, generation or leaks of inflammable gases has been detected.
- that are near the sea, in saline, acid or alkaline surroundings.



Attention

Install SERVICE TOOLS away from possible sources of electromagnetic waves.

2.2. Identifying the elements

Before installation check that the following items are in the box.

Figure	Quantity	Description
	1	HC-A160USB is the H-LINK interface that is connected to the computer using USB. Note: HC-A160USB works also as a key for the program. The usage of Service Tools v3 requires always an HC A160USB connection. It is required even for file opening or reading H-LINK data from CSNET WEB.
N	1	USB Cable to connect HC-A160USB to the computer.
<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>	1	Installation Document to explain how to start.
HETACHI Incide for taxe	1	CD-ROM with the supplied software and the Technical Catalogue.

SERVICE TOOLS V3

Technical catalogue

HITACHI Inspire the Next

2

2.3. Dimensional data

The dimensional data values are in millimeters.





2.4. Description of the parts



Nr.	Connector	Specifications
1	H-LINK Connector	Direct connection to the H-LINK of the installation.
2	USB connector	Connection through USB cable between the device and the computer.

2.5. Specifications

Hardware Specifications

Components	Specifications
Power supply	5V DC Supplied from USB connection
Consumption	0,5W
Outer dimensions	90 x 40 x 20 mm (Height x Width x Depth)
USB Connection	Standard 2.0
Weight	40g
Ambient temperature	0~40 °C
Humidity	40~70%

Specifications for communication with the units

Elements	Specifications
Communication with	H-LINK (H-LINK II Compatible)
Communication cable	Twin wire, without polarity
Communications system	Half-duplex
Communication method	Asynchronous
Speed of transmission	9600 Bauds
Length of wiring	1000 m maximum (total length)
Number of units	Up to 64 outdoor units and 160 indoor units, 1 Yutaki or up to 8 water chillers (1)

Specifications for computer that runs the software

Elements	Specifications
Computer	Processor at 1000 MHz, 256 MB RAM, 200 MB free hard disc space. Windows 2000 or higher. Java Runtime Environment Versión 6 Update 6 (2) or higher installed (included in the CD-ROM).

(1) Either compact units, Yutaki or water chillers only can be connected in an H-LINK communication line. Mixed connection between them is not permitted. Yutaki-M is not allowed.

(2) Java(R) is a registered trade mark of Sun Microsystems.

Technical catalogue

2.6. Installation

When unpacking the machine, check that it has not suffered damage during transport.

2.6.1. Electrical connections

In order to run, HC-A160USB will have to be connected to the computer (USB) and to the transmission line with the air conditioners (H-LINK).

Nr.	Connection	Cable Specifications
1	Transmission cable for the units (H-Link)	Twin core twisted pair cable 1P-0.75 mm ² . Non-polar. Shielded, earthed at one end. In order to choose the type of cable, refer to the Outdoor Unit Installation and Operation Manual.
2	USB	Standard mini USB 2.0 cable.



Air Conditioning Units

i Note:

In case of reading data from a CSNET WEB the computer must be connected to the same Ethernet (LAN) than the CSNET WEB, and the H-LINK line will be connected to the CSNET WEB and it must be not connected to the HC-A160USB.

Check the CSNET WEB installation and operation manual for connection information.

2.6.2. Installation procedure

Installing the HC-A160USB is really easy. Perform the following procedure:

- Plug the USB cable between your computer and the HC-A160USB. The small connector is plugged in the HC-A160USB and the other one to your computer.
- 2) Connect the H-LINK line to the H-LINK connector on the HC-A160USB.

Attention:

- Before applying power and turning on HC-A160USB you must ensure that:
 - 1. All the units and refrigerant circuits are under power and are running correctly.
 - 2. All H-Link connections have been set up.

Any unit that is not connected or is not under power when turning on HC-A160USB, will not be recognised and will have to be configured later.



- The communication cable should be as short as possible. Keep a distance of more than 150 mm from other power cables. Don't wire them together (although they may intersect). If they must necessarily be installed together, take the following measures to avoid noise:
- Protect the communication cable with a metal tube which is earthed at one end.
- For communications, use shielded wire which is earthed at one end.

2.7. Configuring the hardware

Hardware has not an especial configuration. During the software installation, drivers will be configured automatically for it.

2.8. Configuring the software

Following steps explain how to install and configure the software to run in your computer.

2.8.1. Java installation

If a version of Java is installed in the computer with a version equal or higher than version 6 Update 6, is not needed to follow these steps.

1) Run the Service Tools CD-ROM.

2) Select the link "Java Installer".

C Hitachi Service Topols CD-1 × +	
C C C file///W/DES-CONTROL/SERVICE%20TOOLS/SERVICE%20TOOLS%203.0/CD%200ficial/HTML/index.html	44
НІТАСНІ	
Inspire the Next	
HITACHI Service Tools (HC-A160USB)	
Software	
Service Tools v3 Installation	
To execute the Service Tools includer is required to have Java Installed on your computer. Execute the <u>Javas Installer</u> to install Java on your computer.	
Documentation	
Service Tools Technical Catalogue	
To mad the documentation you need Adobe Reader, well <u>www.htdptp.com</u> to download and restat the testest version available	
8 HTACH. Al optio reserved.	

3) This process will take a few minutes. When Java installer is opened, you need to read the license agreement and accept it. If you do not accept the license agreement you cannot continue with the installation. After that, Java will be installed automatically. If you do not know whether you have Java installed, run this file and the program will check for Java on your computer. If it is installed, the program will ask you to reinstall it, to which you can select "no" or continue to reinstall Java. If you do not have it installed, you can select "yes" and proceed with the installation.

Technical catalogue

2.8.2. Software installation

- 1) Run the Service Tools CD-ROM.
- 2) Select the link "Service Tools v3 Installation".



3) If HC-A160 is connected remove it.

I

4) The Service Tools installer will start. This installer gives some configuration options, as the creation of shortcuts or copying the technical catalogue.

Check the components y you don't want to install	ou want to install and uncheck the components . Click Next to continue.
Select components to install:	Service Tick Tick POF files Start Heru Shortouts Desktap Shortout
Space required: 8.5MB	
Cancel Multium Initia	i Sestan v2.56 Next >

Pressing "Next" button it will ask for the destination folder.

Service Tools 3.0 Setup: Installation Folder	hard and and a
Setup will install Service Tools 3.0 in the following different folder, click Browse and select another for the installation.	folder. To install in a older. Click Install to start
Destnation Folder	
E- provident destruction and a	Browse
Space required: 8.5MB Space available: 127.9GB	
Cancel multicity transit System vot.46	Back Install

When "Install" button is pressed the installation proceeds.

Attention

Administrator rights are required to a correct installation of the Service Tools and its drivers.

5) Depending of the configuration of your user access control of Windows, it will appear an alert message saying that it is not possible to check the editor of the controller.

Allow anyway the installation of that controller or it will not be correctly installed.

6) Connect the HC-A160USB.

2.8.3. Usage HC-A160USB as a license key

HC-A160USB works as a license key, it means that Service Tools v3 will never start if HC-A160USB is not connected. With one HC-A160USB connected is allowed to open more than one Service Tools software to open multiple files, but it will not work reading from two H-LINK to one HC-A160USB, in this case the second software will find the device busy. Starting Service Tools, it will appear the following window while it is detecting the HC-A160USB.



3. Operation

3.1. Getting the data

After starting the program, it is necessary to choose the way to get the data of the system. It exists 3 ways to do it:

- USB Connection: H-LINK got directly from HC-A160USB.
- Ethernet connection: Ethernet connection to a CSNET WEB.
- Open: opens an existing Service Tools file.

Select the desired one on the file menu:



3.1.1. Connecting through USB/H-LINK

After selecting this option, it will appear the following dialog:

USB Connection Dialog							
Connection:							
HC-A160USB port: COM3							
Select connection mode: Control							
Configuration file:							
Load a configuration data Use file autoconfiguration							
Select Configuration File:							
config.hsc Select							
Destination file:							
Select Destination Path:							
20120201_1752_data.hsv Select							
Connection Configuration:							
Remember the connection configuration							
Ok Cancel							

On that dialog user can see the COM port that is using for the USB/H-LINK connection.

The connection mode specifies if HC-A160USB is allowed to send H-LINK messages. This setting is important because in case of other central control as CSNET WEB, it could appear incompatibilities. To avoid these incompatibilities with central controls, set the connection mode as "Monitoring". "Control" model allows HC-A160USB to send information through the H-LINK bus including setting orders to the units

Page 13

Technical catalogue



User can select a configuration file to be loaded and have his usual software configuration.

By selecting "Use file autoconfiguration" it will take the unit detected from the configuration file. This solution allows user to avoid the autoconfiguration step.

User can specify the destination file where all the recorded data will be stored.

To remember the data on this dialog, it is necessary to select the "Remember the connection configuration" combo box.

After pressing "Ok" it will appear an auto configuration dialog in order to search which units are connected. For further information look at the auto configuration chapter.

3.1.2. Connecting to a CSNET WEB

After selecting this option, it will appear the following dialog:

Connection;						
Address	192.168.0	192.168.0.3				
Port	8080					
.ner	brotaller					
Paseword		•				
Configuration I	Ne:					
Load a cor	nfiguration data					
Select Configu	ration File:					
config.hec		Select				
Sestination file	4					
Select Destina	tion Path:					
data.hsv		Select				
Connection Co	niferrations					
2 Remember	r the connection	configuration				

On that dialog, user must fill the CSNET WEB IP, Port, Username and Password.

The destination path is the place where Service Tools v3 file will be stored with the recorded data.

User can select a configuration file to be loaded and have his usual software configuration.

To remember the data on this dialog, it is necessary to select the "Remember the connection configuration" combo box.

After pressing Ok button, software will try to connect to the CSNET WEB.

If there is an existing test running, it will ask for resume it or to stop it.



i Note:

Yutaki & Chillers have not compatibility to keep the test running without Service tools v3 working. Use Service tools v2 or CSNET WEB to see the data stored as Historical Data.

Stopping the test it will stop the existing one before continuing.

In case of continuing the test, it will appear a dialog asking for which period of time user needs to read.



After connecting to the CSNET WEB, in the System tab will appear all the units available.

Press "Start Saving" to start getting data from the CSNET WEB. In case that it was loaded an existing test, this will be currently running.

Unit	Version Number	Type	Recording As	Service	Senal Number	Model Name	Location
Installation							
000	200	RAS-0 (SF)	OU Default	103			
- 🔊 IU 0, 10		0-0.0 (0)	StdIndoor				
- 🖶 IU 0, 11		0-0.0 (0)	StdIndoor				
U 0U 1	200	RAS-4 (INV)	OU Default	1			
- 🐠 IU 1, 0		RCI-4.0 (HR)	StdIndoor				ES-R.C1-4.0
U 0U 2	200	RAS-8 (INV)	OU Default	100			
- 🐼 1U 2, 4		RP1-2.0 (UTO)	StdIndoor				
🖝 1U 2, 13		RPI-2.0 (UTO)	StdIndoor				IVX-RPI-2.0
- 🕼 1U 2, 14		RCI-3.0 (UTO)	StdIndoor				IVX-RPI-2.0
📾 IU 2, 34		RPC-2.0 (UTO)	StdIndoor				IVX RPC.2.0
- U S	90	RAS-4 (SF)	RAS-XXFSVN (90)	123			
40 1U 3, 0		RCI-2.0 (SF)	StdIndoor				F5V-R:C1-2.0
- 📣 IU 3, 1		RCI-2.0 (SF)	StdIndoor				FSV-RCI-2.0
CU 11	200	RAS-20 (SF)	OU Default	103			
- 🚇 IU 11, 8		RPF-1.5 (SF)	StdIndoor				FSXN-RPF-1.5
🗩 IU 11, 15		RCI-1.0 (19)	StdIndoor				PSXN-RPFI-1.0
- 🚇 IU 11, 29		RPK(RPC)-1.5 (SF)	StdIndoor				FSXN-RPK-1.5
AP 1U 11, 38		RPI-0.8 (SF)	StdIndoor				F5XN-RPIM-0.8
- 🖝 IU 11, 43		RPI-5.0 (SF)	StdIndoor				FSXN-RPI-5.0
📣 IU 11, 58		RPC-2.0 (SF)	StdIndoor				FSXN-RPC-2.0
- 🐼 IU 11, 59		9-8.0 (SF)	StdIndoor				FSXN-RPI-8.0
4 IU 11, 60		RCI-1.5 (SF)	StdIndoor				PSXN-RCIM-1.5
- 🐼 IU 11, 61		RCI-2.0 (SF)	StdIndoor				FSXN-RCIM-2.0
🖝 IU 11, 63		RPK(RPC)-3.0 (5F)	StdIndoor				
0U 13	99	RAS-0 (SF)	StdOutdoor	100			
🖶 IU 13, 14		0.0.0 (0)	StdIndoor				RAC
			Start Saving	Stop Saven	0		

To stop the test, press "Stop Saving".

3.1.3. Opening a file

Service Tools is compatible with the following files:

- Service Tools v3 File (.hsv)
- Service Tools v2 File (.st2)

Once the data is read, operation works as it is explained on the following chapters, the unique point not available comparing with other getting data options is the control tab. This is obviously because is reading data from a file, not connected to the units and as consequence, it is impossible to manage them.

3.2. Saving/Restoring configuration

On the file menu, user can find "Load Configuration" and "Save Configuration" that are used to save and load the configuration files where user has his patterns and his configurations of the view menu.



Closing Service Tools asks also about save this file

These files can be loaded automatically from connection to USB/Ethernet option.

Attention:

The file includes the current units detected, that could be used when connecting through USB to avoid the auto configuration precess.

3.3. Defining the test

Once the user is connected using HC-A160USB or CSNET WEB, it can select the units that would receive Service information on the system panel.

Installation U 0 0 U 0, 10 U 0, 11 U 0, 11 U 0, 11 U 0, 11 U 0, 12 U 0, 12 U 1, 0 U 2, 14 U 1, 2, 15 U 1, 2, 16 U 1, 16 U	200 200 200	RAS-0 (SF) 0-0.0 (0) RAS-4 (INV) RCI-4.0 (HR) RAS-0 (INV) RPI-2.0 (JTO) RPI-2.0 (JTO) RCI-3.0 (JTO)	OU Default Stdindoor OU Default Stdindoor OU Default Stdindoor Stdindoor	2		ES-R.CI-4.0	
CU 0 TU 0, 10 TU 0, 11 TU 0, 11 TU 1, 0 TU 2, 14 TU 2, 14 TU 2, 24 TU 2, 24 TU 2, 24 TU 2, 24 TU 2, 24 TU 3, 0	200 200 200	RAS-0 (SF) 0-0.0 (0) RAS-4 (INV) RCI-4.0 (HR) RAS-6 (INV) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	OU Default Stdindoor Stdindoor OU Default Stdindoor OU Default Stdindoor Stdindoor			ES-RC1-4.0	
TU 0, 10 TU 0, 11 U 0, 11 U 0, 11 U 0, 11 U 0, 1 U 1, 0 U 2, 4 TU 2, 4 TU 2, 14 TU 2, 24 U 2, 24 U 0, 3	200	0-0.0 (0) 0-0.0 (0) RAS-4 (D/V) RCI-4.0 (HR) RAS-6 (D/V) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	Stdindoor Stdindoor OU Default Stdindoor OU Default Stdindoor Stdindoor			ES-RCI-4.0	
10 0, 11 00 1 00 1 00 2 00 2 00 2 00 2 00 2 00 2 00 2 00 2 00 3 00 3 00 3 00 3 00 3	200	0-0.0 (0) RAS-4 (DNV) RCI-4.0 (HR) RAS-8 (DNV) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	StdIndoor OU Default StdIndoor OU Default StdIndoor StdIndoor	2		ES-RCI-4.0	
OU 1 OU 1 OU 2 OU 3	200	RAS-4 (D/V) RCI-4.0 (HR) RAS-6 (D/V) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	OU Default StdIndoor OU Default StdIndoor StdIndoor			ES-RCI-4.0	
U 1, 0 U 2, 0 U 2, 4 U 2, 14 U 2, 14 U 2, 14 U 3, 34 U 3, 0	200	RCI-4.0 (HR) RAS-0 (INV) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	StdIndoor OU Default StdIndoor StdIndoor	12		ES-RC1-4.0	
CU 2 CU 2, 4 CU 2, 13 CU 2, 14 CU 2, 15 CU 2, 14 CU 2, 15 CU 2, 14 CU 2, 15 CU 2, 15 CU 2, 14 CU 2, 15 CU 2, 15 CU 2, 15 CU 2, 15 CU 2, 16 CU 2, 16 C	200	RAS-0 (INV) RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	OU Default StdIndoor StdIndoor	10			
→ 10 2, 4 → 10 2, 15 → 10 2, 14 → 10 2, 24 → 10 2, 34 → 10 3, 0		RPI-2.0 (UTO) RPI-2.0 (UTO) RCI-3.0 (UTO)	StdIndoor StdIndoor				
10 2, 13 10 2, 14 10 2, 14 10 2, 34 U 3, 34		RPI-2.0 (UTO) RCI-3.0 (UTO)	StdIndoor				
→ 10 2, 14 → 10 2, 34 → 10 3 → 10 3, 0		RCI-3.0 (UTO)				IVX-RPI-2.0	
← 1U 2, 34 - Щ OU 3 - ▲ 1U 3, 0			StdIndoor			IVX-RPI-2.0	
0U 3 40 1U 3, 0	A 101	RPC-2.0 (UTO)	StdIndoor			IVX RPC.2.0	
400 IL) 3, 0	90	RAS-4 (SF)	RAS-XXESVN (90)	175			
		RCI-2.0 (SF)	StdIndoor			F5V-RC1-2.0	1
- 🐼 IU 3, 1		RCI-2.0 (SF)	StdIndoor			FSV-RCI-2.0	
0U 11	200	RAS-20 (SF)	OU Default	1073			
- A IU 11, 8		RPF-1.5 (SF)	StdIndoor	1.00		FSXN-RPF-1.5	
📾 IU 11, 15		RCI-1.0 (19)	StdIndoor			PSXN-RPFI-1.0	
- 🖝 IU 11, 29	1	RPK(RPC)-1.5 (SF)	StdIndoor			FSXN-RPK-1.5	
A 1U 11, 38		RPI-0.8 (SF)	StdIndoor			F5XN-RPIM-0.8	1
- 🖶 IU 11, 48		RPI-5.0 (SF)	StdIndoor			FSXN-RPI-5.0	1
A IU 11, 58		RPC-2.0 (5F)	StdIndoor			FSXN-RPC-2.0	
- 🐼 IU 11, 59		9-8.0 (SF)	StdIndoor			FSXN-RPI-8.0	
40 IU 11, 60		RCI-1.5 (SF)	StdIndoor			FSXN-RCIM-1.5	14
- 🖝 IU 11, 61		RCI-2.0 (SF)	StdIndoor			FSXN-RCIM-2.0	
🖝 IU 11, 63		RPK(RPC)-3.0 (5F)	StdIndoor				
0U 13	99	RAS-0 (SF)	StdOutdoor	100			
📣 IU 13, 14		0.0.0 (0)	StdIndoor			RAC	1
			Start Saving	Stop Salve	0		

On the "Recording As" column is where user can specify which kind of unit is being recorded in order to analyze well the H-LINK data. Service Tools will suggest the best ones.

Technical catalogue



The "Service column" is important because without selecting it, units will be stored as standard indoor, outdoor, chiller or Yutaki. When it is marked it asks for service extra data, having a complete information for the units.

Attention:

If one test is done without Service check marked, when file will be opened, the pattern assigned will be forced as the standard one..

In case of reading the data through CSNET WEB, the units with the service box selected will specify which units will be on the running test while user is not connected. That means that when user reads an existing test, the selected units will be the ones appearing.

3.3.1. Auto configuration

In case of using a CSNET WEB to get the data, it is possible that some unit will not be detected if it has been connected after getting system data. To reload the system data, CSNET WEB has a special action called Auto Configuration.



In case of recording through HC-A160USB the auto configuration dialog will appear at the beginning as soon as it detects the units connected, but it will be able to be executed being the test stopped.

After pressing Auto Configuration option on the tools menu, it will appear the following dialog:

🐨 USB Auto Configuration Dialog								
Select the Auto Configuration type:								
Normal Auto Configuration (Recommended)								
Select installation type:								
Package 👻								
Choose the type of units detection:								
Keep all 👻								
Special Configuration (For some units)								
Mark unit the existing unit (Address must be 0):								
Yutaki-S								
Start Cancel								

Select Normal Auto Configuration if you want to reload the information of a compact unit or a chiller one.

In case that working through the HC-A160USB, it will be asked also for specify if the installation type is Chiller or Packaged.

On the combo box, select if you want to delete all units, delete not found ones or keep all current units.

If there is a Yutaki-S connected, user must select the special configuration, and select Yutaki-S checkbox.

C USB Auto Configuration Dialog									
Select the Auto Configuration type:									
Normal Auto Configuration (Recommended)									
Select installation type:									
Package 🗸									
Choose the type of units detection:									
Keep all 🗸									
Special Configuration (For some units)									
Mark unit the existing unit (Address must be 0):									
Vutaki-S									
Start Cancel									

It will create a configuration considering that Yutaki-S has the address 0.

Make sure that this is the address of the unit.

After pressing start, Auto configuration will start, and it can take a few minutes. A progress bar will show the current state of auto configuration. Do not close the dialog.

3.4. Viewing the data

There are 3 ways to see the data, as a log, as unit state instant information and as a graphic.

3.4.1. Log panel

Log panel lets user to scroll the information having different time instants.

The Log view displays information about an outdoor unit and an indoor unit using tables.

Each column gives information on the unit log and each row show these logs at a specific moment in time.

ile Export To	als View H	rip								
Outdoor: 2	-	-		-1		to Update 04/0	04/2011 15:18:	51		
Time	Code	та	Te	cc	Td	Pd	Px.	Hz	Current	
15:18:51	2	27 °C	25 °C	0	84 °C	12.8MPa	1.28 MPa	0	0	I.
15:17:51	2	26 °C	25 °C	0	87 °C	12.8MPa	1.28 MPa	0	0	
15:16:51	2	24 °C	25 °C	0	91 ℃	12.8MPa	1.28 MPa	0	0	
15:15:51	2	24 °C	25 °C	0	92.ºC	12.8MPa	1.28 MPa	23	6	-
15:14:51	2	26 °C	24 °C	0	87 °C	12.8MPa	1.28 MPa	31	6	
15:13:51	2	26 °C	23 °C	0	77 °C	12.8MPa	1.25 MPa	31	7	
15:12:51	2	26 °C	24 °C	0	73 °C	12.8MPa	1.28 MPa	31	3	1
15:11:50	2	26 °C	26.9C	0	76 °C	12.8MPa	1.28 MPa	0	0	
			COMPANY STAT		640 - 14	1	2			1
indoor: 4 🜩										
Time	On/Off	Mode	Tset	Fan	L.Auto	Louver	Central	On/Off (Unit)	Mode (Unit)	F
15:18:51	1	2	23 °C	U	0	0	0	1	Z	1
15:17:51	1	2	23 °C	U	0	0	0	1	2	
15:16:51	1	2	23.9C	â	0	0	0	1	2	
15:15:51	1	2	23.90	8	0	0	0	1	2	
15:14:51	1	2	23 °C	8	0	0	0	1	2	
15:13:51	1	2	23 °C	8	0	0	0	1	2	
15:12:51	1	2	23 °C	8	0	0	0	1	2	
15:11:50	1	2	23 °C	u	0	0	0	1	2	
			ter en en en				MI CA D			
	-	11000	1 Party and a second							

Using the outdoor unit or indoor unit button, you can select the unit that you want to see in the tables.

Using arrows button you can move through the recorded time, and if it is currently recording, pressing auto update checkbox it will keep always the last update on the tables.

3.4.2. State panel

State panel lets user to see the information of the outdoor and all the indoors units connected to it.

The rows give information about the different variables, and each column on the indoor panel, refers to each indoor unit.

itdoor: 2 💌	-				- 2	Auto Update	04/04/2011 15:18:51	
Nutdoor			Indoor					
Item	Value		Item	4	14	24	34	
Code	2		On/Off	1	0	0	Q	
Та	27 °C		Mode	2	15	16	16	
Te	25 °C		Tset	23 °C	26 °C	26 °C	26 °C	
cc	a		Fan	8	8	8	8	
Td	84 °C		L.Auto	0	0	0	0	
Pd	12.0MPa		Louver	0	0	0	0	
Ps	1.28 MPa		Central	0	0	0	0	
Hz	0	E.	On/Off (Unit)	1	0	0	0	
Current	0		Mode (Linit)	2	15	16	16	
EVQ1	100		Fan (Unit)	9	0	0	0	
EVO2	255		Tin	22 °C	31 °C	25 °C	24.9C	
EVØ3	255		Tout	19 °C	27 °C	22 °C	23 °C	
JU Qty	+		11	0 °C	25 °C	21 °C	21 °C	
Capacity	64		Tg	15 °C	25 °C	21 °C	20 %C	
Single Phase	0		Trem	-62 °C	-62 °C	-62 °C	-62 °C	
* 134.		1.1						

Using the outdoor unit button, you can select the unit that you want to see on the tables.

Using arrows button you can move through the recorded time, and if it is currently recording, pressing auto update checkbox it will keep always the last update on the tables.

3.4.3. Graphic panel



Graphic panel is the place where data is showed as a current line chart.

On that panel you can find zoom buttons to accurate the part of the graphic that is being displayed, and different panels that allow to select different patterns to visualize the data.

뒨

The panels could be minimized by pressing the following button:

But they will be minimized also if user clicks on each place of the zooms vertical tab, but not on the zoom buttons.

By pressing on the popup button:

The panels will be opened as an independent dialog, allowing to hide completely or to be used for example on a 2 screens computer:



3.4.3.1. Zooms

There are different zooms explained on the following table:

lcon	Explanation
3	Increase the zoom considering the point when user will make click.
R	Decrease the zoom when user clicks.
₫ Ø	Zoom related to the X axe (time). Time scale is the only one that will change.
G,	Display the selected zone.
C)	Return the scale to 1 pixel for each data register.
	Return the scale to 1 and fit the axes on the beginning of the record.
Ø	Return the scale to 1 and fit the axes on the end of the record.

3.4.3.2. Unit selection

On the unit selection tab user can select which units will be painted in the graphic and which patter will follow.



3.4.3.3. Patterns selection

Patterns Selection allows user to create and customize different patterns.

User can add, copy, remove or edit a pattern, but the ones that comes by default can not be removed.



On each pattern user can select which variables are visible, the color and stroke that the variable will use to be painted, and the reference axis in order to scale it.

User can add more variables from the combo box on the bottom of the panel.

Setting the axis as "Alone" it will show the current variable on an independent and reduced graphic as showed on the following example.



3.4.3.4. Axis selection





Related with X axis, user can select the beginning of the recorded time displayed and the maximum, and in case that this will be higher than the available resolution to show on the screen width, it will activate the X Scroll in order to move through the time.

Day selection combo box lets the user move fast to the starting day point on the time scroll.

About Y axes, this graphic allows until 6 Y axes with different scales. They must be added on the Y axes table, and for each one user can specify an ID name that will be painted, the color and the following values related with the scale:

- Min. and Max.: minimum and maximum points from where graphic paints.
- AMin. and AMax .: graphic calculates maximum and minimum to use it to paint.
- Step: steps increase that are being painted on each Y axis tick.
- AStp.: software will auto calculate the step increase.

3.4.3.5. Values viewer

Values tab is a table where is showed the different variables painted, describing the name, the color and the stroke. To use it, it must be selected the "Enable Cursors" checkbox, and after that, drag the cursors to the time range that you want to calculate values.



This table shows in C1 the values in the position of the left cursor and in C2 the same from the one on the right. On data viewing button, it can be selected the data displayed on the table:

- Line & Color
- Minimum value
- Maximum value
- Average
- Difference

3.4.4. View menu

On the menu, it exists a view menu that allows the user to customize the data viewing. That menu has 3 submenus where user can configure different settings. The submenus are:

- Values: Configuration about how the data is displayed
- Graphic: Configuration about graphic display
- Tooltips: Enable or disable the variables tooltips information.

3.4.4.1. Values menu

Values menu lets the user configure two options that are:

- Show units: to show the unit of the values. For example, temperatures can be together of its unit °C.

- **Show as text**: it shows the meaning of the values. For example, the mode value heat can be showed in the tables as "1" or as "Heat".

Hitachi Service Tools v3.0									
File Export To	ols View Help								
255	abc Values	• 🗸	Show As Text						
240 -	ጅ Graphic	•	Show Units						
225 -	BC Tooltips	•		1					
210 -									

3.4.4.2. Graphic menu

Graphic menu lets the user set different settings about how the graphic is displayed.

🗾 Hitachi S	Service 1	Fools	v3.0				
File Export	Tools	View	Help				
255		abc °C	Values	Ł			
240 -			Graphic	ł		Show Grid	
225 -		abc	Tooltips	1	✓	Grid For First Axis Only	
210 -					7	Paint Day Change	
195 -					•	raine bay change	

Graphic menu lets the user configure the following options:

- Show grid: it creates a grid extending the ticks on the Y axes.
- Grid for first axis only: the grid will be created using only the first axis.
- **Paint day change**: it paints a gray line on the graphic where day change.

Example of a graphic with a grid on the first axis:



Technical catalogue

3.4.4.3. Tooltips menu

Tooltips menu lets the user enable or disable the tooltips that appear over the variable names giving and extended name that describes better the variable meaning.

ſ	J Hitachi Service Tools v3.0									
	File Export	Tools	View	Help						
	255		abç °C	Values	×					
	240			Graphic	Ł					
	225 -		abc	Tooltips	1	 Enable Variables Tooltips 				
	210 -									

3.5. Exporting the data

In the menu it exists the option to export, where user can choose between which of the data wants to export. After that, it will appear a dialog where it must be selected the type of exportation file.

Unit State Export Window		 23
Select the export option:		
	PDF	

i Note:

Not all the types of destination file are available for each one of the panel that can be exported.

3.6. Units control

Unit control tab is only enabled when Service Tools v3 is connected through HC-A160USB or CSNET WEB because it allows controlling the units.

By default, control activation checkbox is not selected, and without being selected, units will not be able to be managed from Service Tools v3, and units data on this table will not be updated.

After activating the control, it will appear the data table filled.

On that data user can see the basic control information, and if it is some unit in error, it will be showed in red colour.

บเบ	On/Off	Mode	Temp	Fan	Louver	Central	Alarm		Continued Exercitions
2 4	Stop	Cool	23 °C	Medium	Pos. 1	0	0	-	Temperature:
2 13	Stop	Fan	23 °C	Medium	Auto	0	0	11	
2 14	Stop	Fan	23 °C	Medium	Auto	0	0		
Z 34	Stop	Fan	23 90	Medium	Auto	0	0	1) 🐟 🔅 🔸
5 0	Run	Cool	12.9C	Medium	Pos. 1		0		Laver:
3 1	Run	Cool	22.9C	Medium	Pos, 1	0	0	1	
11 8	Stop	Fan	23 °C	Medium	Post. 1	8	0		
11 15	Stop	0	0 °C	0	Pps. 1	0	61	8	
11 18	Step	0	970	9	Pos. 1	0	61		Mode T(PC) Fan Louise
11 28	Stop	Fan	23 °C	Medum	Pos. 2	0	0		1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
	Stop	Pen	23.90	Network	Pes 3				
11 48	Stop	Fan	23 %	Medium	Auto	0	0		
11 58	Stop	Fan	23 °C	Medium	Post. 5	0	0		
11 59	Stop	Fan	23 °C	Medium	Pos. 1	0	0		
	Run	Cool	23 9C	Medium	Pos. 2	0	0		
11 60		Cost	23 °C	Medium	Pos. 2	0	0		
11 60 11 61	Run								2 units selected. Canciel Seriel Order

To send an order to the units, user may select the destination units on the table.

It allows multiple selections using control or mouse dragging. Once the units will be selected, on the left of the cancel button will appear the number of units selected.

After that, user can send the items on the panel that will change unit's state. The items not changed will not be modified on the units.

i Note:

Chiller is only controllable through CSNET WEB connection Yutaki is not controllable remotely

To help user knowing that some alarm is currently active, control icon will switch to red color:



In case of using a HC-A160USB to read the data, if user is connected to package units, it will be available the option to configure the optional functions.

U	IU	On/Off	Mode	Temp	Fan	Louver	Central	Alarm		Order Setting Optional Functions
	4	Stop	Cool	23 °C	Medium	Pos. 1	0	0	1	B1: Removal of Heating Temperature Compensation:
1	13	Stop	Fan	23 °C	Medium	Auto	0	0	11	Standard (Set Temp. +49C) •
ć.	14	Stop	Fan	23 °C	Medium	Auto	0	0		82: Ceculation Function at Heating Thermo-Offi
	34	Stop	Fan	23 °C	Medium	Auto	0	0	1	Not available 🔹 💌
1	0	Run	Cool	12 °C	Nedun	Pos. 1	0	- 0	1	84: Period for Filter Sign:
	1	Run	Cool	22.9C	Medium	Pos. 1	0	0	1	Standard +
i	8	Stop	Fan	23 °C	Medium	Pos. 1	8	0	11	B5: Fixing of Operation Mode:
i.	15	Stop	0	0*0	0	Pps. 1	0	61	E	Not available •
	18	Stee	0	0 =	0	Pos. 1	0	61	11	B6: Fixing of Setting Temperature:
	28	Stop	Fan	21.90	Medium	Pos. 7	0	0	11	Not avalable
		Stee		11.00		Cost 1				87: Fixing of Cooling Operation:
	48	Stee	Ean	23.90	Medium	Auto	0	0	11	rest avalative
-		Ehm	East	33.65	Made	Boxt. E	0	0	1	B8: Automatic Cool/Heat Operation:
-	10	Ehro	Eve	11.00	Marken	Fort 1	0	0		Fight av anadoe
	39	sup	Fan	23 %	Precium	P99- 1	0		13	B9: Fixing Fan Speed:
1	60	KUN	Cool	23.92	Medum	POS. 2	0	0		Feot av anace
1	01	Run	Cool	23.90	Medium	POS. 2	0	0		2 units selected. Cancel Senid Order
1	12	Stop	.9	0.	0	P05-1	0		*	
tup	dated: 1	11:28:20								Control activation

i Note:

Configuration of optional functions works only with H-LINK2 units



3.7. H-LINK Analyzer

The H-LINK Analyzer is a powerful tool that helps user to have knowledge about possible errors and about what is happening in the communication line.

It is represented in two parts:

- H-LINK Quality Icon
- H-LINK Analyzer dialog.

When connection is done by HC-A160USB, it appears an icon that gives information about the quality of the H-LINK signal. It measures if it has registered information under the H-LINK voltage allowed values.



It is useful because if it is not in green, it can mean that:

- H-LINK is so busy.
- H-LINK line is over 1000 meters.
- H-LINK has sound problems.

The H-LINK Analyzer can be found in the Tools menu, and analyzes the messages of the H-LINK to generate the information. Report button allows user to export the data showed.

i Note:

H-LINK Analyzer is only available when it is reading the data through HC-A160USB or when it is reading a Service Tools v3 file.

Technical catalogue

3.7.1. H-LINK line tab

The first tab, gives information about the H-LINK line capacity, showing a graphic between 2 instants of time.

Service Tools 3: H-LINK Analyzer							
Opening File:							
C:\Users\asaez\Desktop\st3\data (2).hsv							
H-LINK Line Bytes Analysis Messages Retries Error Detector							
H-LINK Capacity:							
Capacity (%) 100 90 80 70 60 50 40 30 20 100 0 Time							
U From: 04/05/2011 15:01:57 To: 04/05/2011 15:02:18							
Report Close							

3.7.2. Byte analysis tab

C: \Users\asaez\Desktop\st3\data (2).hsv						
H-LIN	Line Bytes Analysis Messages Retries Error Detector					
Descri	ption of data transmited:					
Data	Туре					
Inv.	0% (0)					
Unk.	0% (31)					
ACK	0% (0)					
Valid	99% (136602)					
. (0 10 20 30 40 50 60 70 80 90 100 Bytes(%)					
Total E	Bytes: 136633 bytes Average Speed: 1350 bps					
Time Sample: 1113 seconds Speed / 96Kb: 14.1%						

Second tab creates an analysis about the percentages of bytes that are of each kind.

The different types of bytes are:

- Inv.: Invalid bytes. It does not have the correct format.
- Unk.: Unknown bytes. They can come from an incorrect format message or maybe sound on the line.

- ACK: Acknowledge bytes. They are from a message that happened when units ask again for information. They can mean that units have to ask so much.

- Valid: they are normal messages. In a normal H-LINK they must have the higher percentage, far from the other types.

This tab also gives the following items:

- Total bytes: number of bytes of that test.
- Time sample: test time length.
- Average speed: communication speed of the line.
- Speed / 96kb: percentage that gives a relation of usage related to the H-LINK maximum communication of 96kb.

3.7.3. Messages tab

Messages tab gives a description of the direction of the messages between Central Control (Cen), Outdoor unit (OU) and Indoor Unit (IU).

Service Tools 3: H-LINK Analyzer								
Opening File:								
C: \Users\asaez\Desktop\st3\data (2).hsv								
H-LINK Line Bytes Analysis Messages Retries Error Detector								
Messages Distribution:								
Message Direction								
Cen->OU 13% (721)								
OU->Cen 14% (756)								
IU->Cen 44% (2316)								
Cen->IU 22% (1143)								
OU->IU 0% (44)								
IU->OU 4% (215) Messages(%)								
Total Messages: 5195 Indoor / Central Ratio: 2.03								
Indoor / Outdoor Ratio: 4.89 Outdoor / Central Ratio: 0.95								
Report Close								

It also calculates the ratio between those types of messages, and gives the total number of messages. For Chiller and Yutaki the information is the same, but it is adapted.



3.7.4. Units usage tab

This tab shows a description for each unit, the retries percentage of the messages sent in each direction to the Central control (Cen), Outdoor unit (OU) and Indoor unit (IU).

~	Service Tools 3: H-LINK Analyzer									
Of C	Dpening File: C:\Users\asaez\Desktop\st3\data (2).hsv									
	H-LINK Line Bytes Analysis Messages Retries Error Detector									
	OU	IU	OU->IU	IU->OU	IU->Cen	Cen->IU				
	2	4	0,00%	1,80%	8,90%	0,00%	-			
	2	14	0,00%	0,00%	7,20%	0,00%				
	2	24	0,00%	0,00%	9,38%	0,00%	Ε			
	2	34	0,00%	0,00%	5,83%	0,00%				
	3	0	0,00%	0,00%	11,81%	0,00%				
	3	1	0,00%	0,00%	8,13%	0,00%				
	11	8	0,00%	0,00%	2,59%	1,75%				
	11	18	0,00%	0,00%	2,54%	0,00%				
	11	28	0,00%	0,00%	1,72%	0,00%				
	11	20	0.009/	0.009/	2 260/	1 750/	-			
			Report	Close						

When the percentage gets higher, the value on the cell gets redder, showing the highest values that can be units with problems. This value is only a reference because it is related to the size of the installation. ጘ

3.7.5. Error detector tab

This tab put the times, seconds and percentage of time that one unit is in communication error. It paints the errors in red to help user to view them.

~	Service Tools 3: H-UNK Analyzer								
Op	Opening File:								
C:	\Users\asaez\[
Н	H-LINK Line Bytes Analysis Messages Retries Error Detector								
	OU	IU	Seconds in	Times in Error	Time Perce				
	2	4	0	0	0,00%	-			
	2	14	0	0	0,00%	-			
	2	24	0	0	0,00%	E			
	2	34	0	0	0,00%				
	3	0	0	0	0,00%				
	3	1	30	1	2,70%				
	11	8	29	1	2,61%				
	11	18	0	0	0,00%				
	11	28	0	0	0,00%				
	- 11	20	20	1	0.619/	-			
			Report	lose					

i Note:

Communication errors can happen, this tab only helps to see those errors, and after that evaluate if they are so much or not.

4. Troubleshooting

4.1. LEDS

HC-A160USB has 3 LEDS to help user to have a visual knowledge about what is happening in the hardware. This 3 LEDS are:

Nr.	Connection	Cable Specifications
1	Power	Green
2	H-LINK Communication	Yellow
3	USB Communication	Yellow



4.2. Unit alarms

4.2.1. Unit alarm codes

Refer to the unit installation and operation manual to know the code of the alarm that is showed.

4.2.2. Alarm notification if connected to the installation

If user has enabled the control of the units and some of them has an alarm, it will be marked the unit line in red, but if user is not looking to control tab, it will change the control tab icon, adding a red line on it to notify alarms:





Hitachi Air Conditioning Products Europe, S.A. Ronda Shimizu, 1 - Polig. Ind. Can Torrella 08233 Vacarisses (Barcelona) Spain

Printed in Spain