HAROGIC SA/NX SERIES

Quick Start Guide

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:::HAROGIC

Contents

1. Introduction for the Quick Start Guide

This Quick Start Guide provides users with basic instructions on how to operate the instruments and how to acquire documents and help. HAROGIC SA/NX series real time spectrum analyzers are complex systems thus it is highly recommended that you fully study the documents and related videos from HAROGIC to perform a perfect measurement. Chapter 2 contains the user documentation introduction for HAROGIC SA/NX series and the way to find the documentation. Please read this chapter carefully when you use HAROGIC SA/NX series for the first time.

Before starting to operate the instrument, please connect it to the host (PC, embedded systems etc.) and install the driver. You can find guide on how to connect HAROGIC SA series instrument in Chapter 3. For HAROGIC NX series connection guide, please refer to Chapter 4.

After driver installation and instrument connection, you can further read Chapter 5 for SAStudio4 application manual and Chapter 6 for API programming guide.

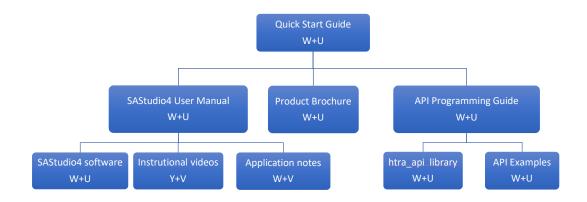# 2. Introduction for HAROGIC documentation and service

Figure 1 overview for HAROGIC documentations

Notes: W for HAROGIC official website; U for flash disk; Y for YouTube official platform; V for HAROGIC official WeChat account.

Table 1 main topics covered in HAROGIC documentations

Documentation	Main topics
Quick Start Guide	• Overview of all HAROGIC documentations • HAROGIC instruments connection guide • Driver installation guide • Introduction for SAStudio4 and API
SAStudio4 User Manual	• Overview the measurement capability of SAStudio4
SAStudio4 Software	• Software for all HAROGIC products.
Instructional video & Application notes	• Examples for analysis modes in SAStudio4 step-by-step.
Product Brochure	• Technical specifications for HAROGIC instruments.
API Programming Guide	• Secondary development guide for HAROGIC SA/NX series • Introduction for structure of API • Information for every API and related functions
htra_api library & API Examples	• Library for secondary development and the related examples for library functions.

3. SA series (USB interface)

3.1 Inputs and outputs (SAN-45, SAN-60, SAM-60 M3, SAM-80)

Figure 2 schematic diagram of SAM-60 MK3H physical interfaces.

1	RF input	4	Power port (Type-C, 5V2A)
2	RF output	5	Data port (Type-C, USB3.0 recommended)
3	Reference clock input	6	MUXIO interface (Type-C)

3.2 Inputs and outputs (SAE-90, SAE-200, SAN-400)

Figure 3 schematic diagram of SAE-200 physical interfaces.

1	RF input	5	MUXIO interface (board to wire connector)
2	Analog IF output	6	Cooling vent
3	Reference clock input	7	data port (Type-C, USB3.0 recommended)
4	Reserved	8	power port (Type-C, 5V2A)

3.3 Accessories

Power adaptor x1   Type C cable x2   Flash disk x1

3.4 Physical connecting to host

1: Connect the power adapter to the power port of the instrument with Type-C cable. There is no power on/off button in SA instruments, the instrument will be automatically started when powering on.

2: Connect the data port of the SA instrument to the computer or embedded device with Type-C cable.

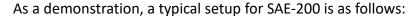3: Connect antenna (user prepared) or RF cable (user prepared) to the RF input of the SA instrument.

As a demonstration, a typical setup for SAE-200 is as follows:

Figure 4 schematic diagram for a typical setup of SAE-200.

3.5 Installing USB driver

Before using a SA instrument on a host computer for the first time, the USB driver with appropriate version must be installed. Please find the driver installation package for specific operating system version in the flash disk or official website www.harogic.com and install the driver following the guide below.

1: please check the operating system and bit number of your PC and choose the
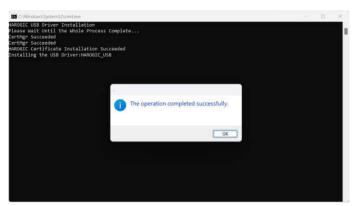
corresponding driver installation package.

2: Run the Install_Driver.bat file as administrator as shown in the following figure.

3: After the driver is successfully installed, the result is as shown in the following figure.

4: After successful installation, you can view the newly installed instrument in device manager, as shown in the following figure:

4. NX series (Ethernet interface)

4.1 Inputs and outputs (NXM-60, NXM-80)

Figure 5 schematic diagram of NXM-60 physical interfaces.

1	Reference clock input	10	4G antenna input
2	RF output	11	Reserved
3	RF input	12	Reserved
4	USB2.0 host (Type-C)	13	Reserved
5	GNSS antenna input	14	Power on/off
6	Trigger output	15	HDMI output
7	Trigger input	16	Power port (Type-C, USB-PD)
8	Reserved	17	100M LAN connector
9	MUXIO interface (board to wire connector)	18	1000M LAN connector

4.2 Inputs and outputs (NXE-90, NXE-200, NXN-400)

Figure 6 schematic diagram of NXE-200 physical interfaces.

1	RF input	9	Analog IF output
2	USB2.0 host (Type-C)	10	Reserved
3	MUXIO interface (board to wire connector)	11	Reserved
4	GNSS antenna input	12	Power on/off
5	Trigger output	13	HDMI output
6	Trigger input	14	Power port (Type-C, USB-PD)
7	External reference input	15	100M LAN connector
8	4G antenna input	16	1000M LAN connector

4.3 Accessories

Power adaptor x1   Type C cable x2   Flash disk x1
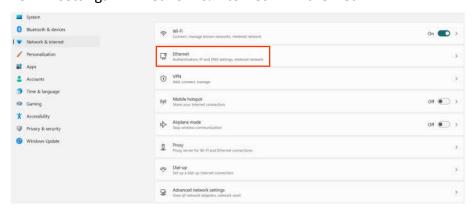
4.4 Physical connecting to host

1: Connect the power adapter to the power port of the instrument with Type-C cable.

2: Press the power button on the front panel of the instrument.

3: Connect either the 1000M LAN connector or 100M LAN connector of the NX instrument to the host or network device with RJ-45 cable (user prepared).

4: Connect antenna (user prepared) or RF cable (user prepared) to the RF input of the NX instrument.

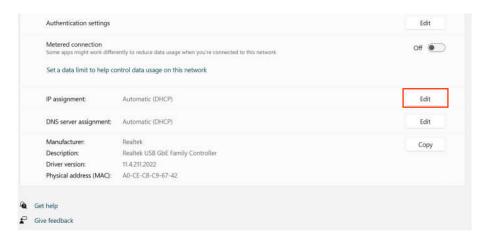## 4.5 Configurating the IP address of the host

NX series products are with a default IP address. The IP address and network settings of the host should be set to match the default IP address of the instrument for the first time.

The IP address of the instrument and the host should be in the same network segment.

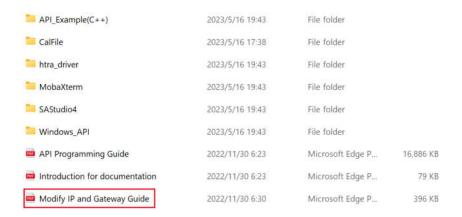1: PC ⟶ settings ⟶ Network & internet ⟶ Ethernet.

2: Ethernet ⟶ IP address ⟶ edit.

3: Choose "manual" to configure IP address, open IPv4. Then set the IP address and subnet mask (the IP address is consistent with the IP address on product), as shown in the following figure.

If you want to change the IP address of the instrument, please refer to the documentation with name of "Modify IP and Gateway guide" in the flash disk.
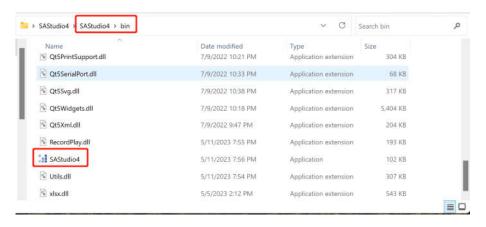
5. SAStudio4 Quick Start

SAStudio4 is an application software developed by HAROGIC for spectrum and signal analysis. It features with the clear UI logic and convenient operation. All HAROGIC instruments including SA/NX series are compatible with this software. The SAStudio4 has four analysis modes which are designed for different applications.
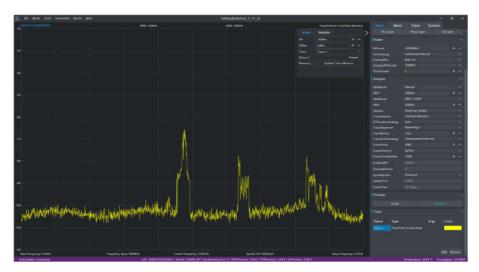
Table 2 main analysis mode

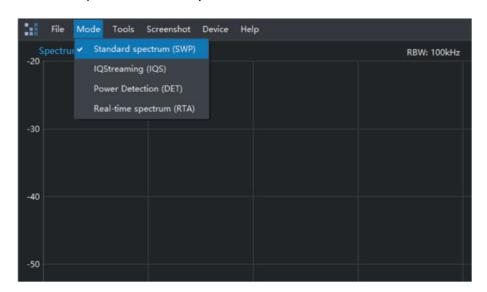| Modes	Measurement capability		
SWP	Panoramic spectrum	Harmonic, Spurious	Phase noise
	Spectrum monitoring	Channel power	OBW, ACPR
IQS	Time domain graph	IQ record	FM/AM demodulation
	Users' application		
DET	Pulse signal observation	Power-time viewing	
RTA	Burst signal observation	Stealth signal discovery	Spectrum dynamic observation

Please follow the guide below to use SAStudio4.

1: For HAROGIC SA series, please ensure the physical connection (3.4) and USB driver installation (3.5) have been completed. For HAROGIC NX series, ensure the physical connection (4.4) and IP configuration (4.5) have been completed.

2: Find the SAStudio4 folder in the flash disk and copy it to the hard disk of the host (SSD is strongly suggested). Open the folder SAStudio4/bin and double click the SAStudio4.exe to execute the software.

The main interface of SAStudio4 is shown in the following figure.

3: Click "Mode" in the menu bar and select the analysis mode you need. SAStudio4 starts up in SWP mode by default.

4: Configure parameters according to your measurement target and finish the test. The detailed guide could be found in SAStudio4 application user manual.

6. Programming with the API

The secondary development is supported employing API for the HAROGIC SA/NX series to achieve users' specific requirements. The Windows and Linux operating systems and C++, C, C#, QT, MATLAB by MathWorks, LabView by NI programming environment is supported.

The API dynamic link library and the documentation "API Programming Guide"

are provided in the flash disk. Before proceeding with secondary development, please give an overview of the API Programming Guide and review it as needed during the development process. Choosing analysis mode and setting the parameters according to the application goals helps to quickly build robust and efficient programs and obtain more accurate measurement results. The following is an illustration of the secondary development process using the C++ environment under Windows operating system as an example.

In Windows operating system, please follow the steps below to create a project and complete the programming environment configuration (Visual Studio 2019 by Microsoft).
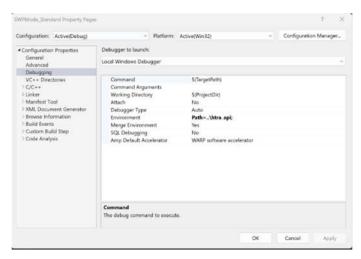
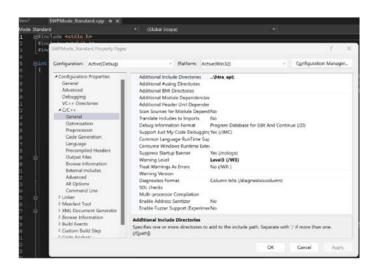1: Open Visual Studio 2019 and Create a new Project, as shown in the following figure.

2：After creation, place the \Windows_API\x86\htra_api folder in the USB provided by manufacturer under the project level directory, as shown in the following figure.
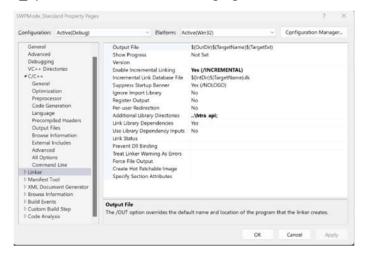

3: Double-click to open SWP.sln, create a new SWP.cpp file in the source file, and then click Project > Properties in the menu bar above, and set the environment in Configuration Properties > Debugging to Path=. \htra_api, as shown in the following figure.

4: Set Additional Include Directories in Configuration Properties > C/C++ > General to . \htra_api, as shown in the following figure.
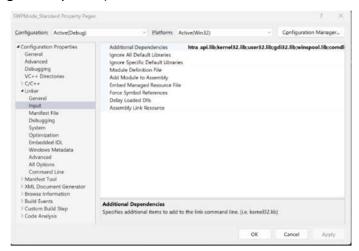

5: Set the additional library directory in Configuration Properties > Linker > General to . \htra_api, as shown in the following figure.

6: Add htra_api.lib to Additional dependencies in Configuration Properties > Linker > Input, as shown in the following figure. (C/C++ project is configured and ready

for programming development)

API related examples is provided in the flash disk, please refer to the examples for quickly starting the development according to your target. The detailed information about API could be found in API Programing Guide.

7. Contacting Customer Support

We have a highly qualified customer support team, contact our customer support center where and when you need it. We work with you to find a solution for your query on any aspect of operation of HAROGIC products. Contact our customer support center by official website or the following code.

Welcome to **HAROGIC**® Official website at www.harogic.com for more information

WhatsApp official account

Service Mail: info@harogic.com

Service Phone: +86-13912971535

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