

Setting Up the 7000 Series Remote Connection (LAN, USB, GPIB)

How to bring a 7000 Series phase noise analyzer online over Ethernet LAN, USBTMC or GPIB: direct connection with link-local addressing, a LAN with a DHCP server, a fixed IP address, and the driver options for USB and GPIB.

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CONTENTS

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Setting Up the 7000 Series Remote Connection 2 Introduction 3 Ethernet 4 Direct Connection Between Computer and PNT with Fixed or Fallback IP | <ul style="list-style-type: none"> 5 LAN with Router and DHCP Server (Dynamic IP Address) 6 LAN with Fixed IP Address 7 USBTMC Interface 8 GPIB Interface 9 Talk to an application engineer |
|--|--|

1 Setting Up the 7000 Series Remote Connection

This application note describes how to establish a remote connection to the BNC 7000 Series phase noise analyzer (models 7070, 7300 and 7340, referred to below as the PNT). It covers the three supported physical interfaces, Ethernet LAN, USBTMC and GPIB, along with the IP addressing settings needed to bring the instrument online.



PHOTO Figure 2. The 7000 Series signal source analyzer. The LAN, USB and optional GPIB ports are on the rear panel.

[Download the full note \(PDF\)](#)

2 Introduction

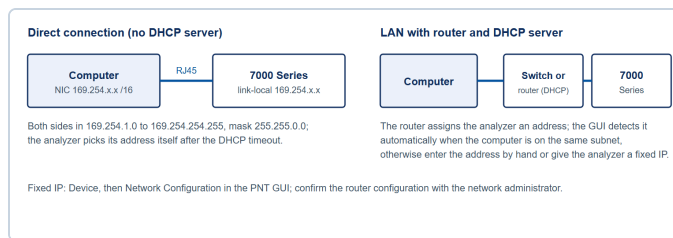
The 7000 Series supports two modes of operation.

- **User mode** via GUI (graphical user interface)
- **ATE mode** (control over SCPI commands)

In both modes, remote connection to the PNT is required. Three physical interfaces are supported:

- **Ethernet LAN**
- **USBTMC**
- **GPIB** (optional)

Depending on the requirements, one or several of the interfaces may be used. The following sections describe connecting the PNT to the physical interfaces.



■ **SCHEMATIC** **Figure 1.** The two Ethernet arrangements. Left, a direct link with both sides on link-local 169.254.x.x addresses; right, a LAN whose router assigns the analyzer an address by DHCP.

3 Ethernet

For speed and flexibility, we recommend communicating with the PNT over the Ethernet LAN interface. In its simplest form the network consists of only the PNT and one computer. More often the computer is already on a local area network (LAN), and the PNT is connected to that network through a switch or router. An RJ45 cable connects the PNT to the network, and each component of the LAN is identified by a unique Internet Protocol (IP) address.

4 Direct Connection Between Computer and PNT with Fixed or Fallback IP

If the PNT is connected directly to the computer, the two form a very small LAN with no DHCP server, and the addresses have to come from the two devices themselves.

By default the PNT requests its address by Dynamic Host Configuration Protocol (DHCP). When no DHCP server answers, it falls back after a timeout to a link-local address chosen automatically according to the Zeroconf standard, in the range **169.254.1.0** to **169.254.254.255** with network mask **255.255.0.0**; the exact address cannot be predicted in advance. Set the computer's network interface (NIC) so that it is in the same range: either a fixed address between **169.254.1.0** and **169.254.254.255** with mask **255.255.0.0**, or automatic addressing, in which case the computer assigns itself a link-local address of its own. The GUI then finds the PNT on the link. Alternatively, the PNT can be given a fixed IP address.

The following subsections describe connecting the PNT to the LAN with either a fixed or a dynamic IP address.

5 LAN with Router and DHCP Server (Dynamic IP Address)

Connect your PNT to the DHCP router with the provided Ethernet cable and wait for the router to assign an IP address.

Note

If the computer is in the same subnet, the GUI will automatically detect the instrument. Otherwise, the IP address will have to be manually configured.

6 LAN with Fixed IP Address

The PNT has to be configured to a fixed IP address, which is done in the PNT GUI:

1. On the screen, select **Device**.
2. Then select **Network Configuration**.

Ensure that the LAN router is configured correctly for this mode. If uncertain, contact the network administrator.

7 USBTMC Interface

The PNT uses native drivers from the IVI foundation to interface in the USBTMC mode. The drivers support two modes of communication, which are described in the following subsections.

VISA

The VISA drivers must be installed, such as NI VISA. The installed tools can then be used to communicate with the PNT.

BNC Remote Control API and COMM Library

The drivers for the graphical user interface (GUI) are automatically installed as part of the installation package. You can then use the remote control API (which is packed into a dll) or the BNC COMM library. Please contact BNC for the libraries and example programs.

8 GPIB Interface

The GPIB interface can be used with the common VISA tools, such as NI VISA, or the BNC COMM library. For additional information, please contact BNC.

9 Talk to an application engineer

Our engineers can help you match the interface to your test environment. Contact a BNC application engineer to walk through the LAN, USBTMC or GPIB configuration for your 7000 Series analyzer. You can also reach us at info@berkeleynucleonics.com or 800-234-7858.

Ask now →

Chat with our assistant and get an answer in seconds.

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