Gateway Mode
Remote Access the XL2 Sound Level Meter

This document describes how to remotely access the XL2 Sound Level Meter via the NTi Audio Gateway.

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Configuration in NoiseScout Gateway Mode
Minimum Requirements

- XL2 Sound Level Meter
- NetBox - Communication Hub for XL2
- Computer with internet connection

First Steps

- Login at My NTi Audio [https://my.nti-audio.com](https://my.nti-audio.com).
- Register the NetBox using the Serial Number on the front of the NetBox (format xxxxx-xxxxx).
- Login at [https://www.noisescout.com](https://www.noisescout.com) using your personal My NTi Audio username and password.
  - The NetBox is listed under "My Noise Monitors".
- Switch the Noise Monitor to "Gateway" Mode. (Ensure that the Noise Monitor is not assigned to a Location in Managed Mode.)

List of your registered Noise Monitors on the dashboard of www.noisescout.com
Connecting the remote XL2 Sound Level Meter

- Connect the XL2 Sound Level Meter to the NetBox.
- Connect mains power to the NetBox.

  The NetBox and XL2 power up within approx. two minutes.

- Press the “Visit” button in the dashboard.
- Enter your personal My NTi Audio password again.

  The browser window “Noise Monitor Status” is displayed.

- Control the remote XL2 from the browser.

- Select the Status View or XL View
Settings

Select “Settings” in the menu.

- **Time Zone**
  Set your time zone.

- **Daily Timetable**
  Activate the Daily Timetable for repeated measurements. For 24-hour measurement, choose the same Start and Stop time. In this case, the measurement stops 20 seconds before the Stop time and begins again exactly at the Start time.

  If, for example, measurement is set between 7:00 and 22:00, you can check the “Sleep when idle” checkbox to reduce power consumption during the time when no measurements are taking place. The XL2 turns itself off and wakes up again shortly before the next measurement Start time (prerequisite: XL2 serial number ending with “E0”).

  Using the “Digital I/O Adapter PCB” (an XL2 accessory) the XL2 can also turn off the NetBox, making power consumption negligible during idle periods.

- **Weather Logging**
  Choose when you would like weather station data to be logged.

- **Guest Link**
  Activate a view-only Guest link if required. Third parties can then view the ongoing measurement, but not change the settings. The last part of the link name can be edited.

- **XL View**
  Choose the level and limits for the XL View - Big Screen. Levels that exceed the limits are shown in a warning amber or an alarming red.

  Click “Status” to return to the measurement.
Direct File Access to the XL2

- Install your favorite SFTP client software on your computer (such as WinSCP, https://winscp.net or similar).
- Enter these settings in the SFTP client software:
  - Host: xl2gateway.nti-audio.com
  - Username: <xxxxxx-xxxxxx> (NetBox serial number)
  - Password: <your my.nti-audio.com password>
  - Port: 22

The direct file access to the XL2 is enabled

- Download the required data for
  - completed measurements from the folder “Projects”
  - any ongoing measurements from “Projects/.Unsaved/SLM”

How to Setup an automated Data Download via FTP

Commercial programs like WatchFTP, www.watchftp.com, can be used to automatically access and download the available data from the XL2 and delete the data from the XL2 SD-Card if required. This solution allows you to download the data files from many remote noise monitors to your local drive.

Programming your own Remote Application

You may program a customized measurement application for remote sound level monitoring, audio analysis or automated measurement tasks.

All remote measurement commands are available once the Remote Measurement Option is installed on your XL2. The measurement data may be captured in real time into a PC application, e.g. C# or LabView.

See the Remote Measurement Manual for more details.
Connecting the XL2 within a local Network

The XL2 may also be remotely operated within a local network using the IP address of the connected NetBox.

- Verify the IP address by selecting the Status Symbol on the top line of the XL2 display.
- Confirm your selection with the enter button.

   The XL2 displays the IP address of the NetBox within the local network.

- Type this IP address into your preferred browser.
- Enter your personal My NTi Audio password.

   “Noise Monitor Status” is displayed in the browser window.

File Access to the XL2 within a local Network

- Install your favorite SFTP client software on your computer (such as WinSCP, https://winscp.net or similar).
- Enter these settings in the SFTP client software:
  - Host: <IP address of the NetBox>
  - Username: ftpuser1
  - Password: <your my.nti-audio.com password>
  - Port: 22

   The direct file access to the XL2 is enabled

- Download the required data for
  - completed measurements from the folder “Projects”
  - any ongoing measurements from “Projects/.Unsaved/SLM”

Connecting the XL2 in an Intranet without Internet

- Follow the chapter “First Steps” in this Quick Guide for the initial configuration.
- In case a precise XL2 clock is required with GPS time synchronization, then an NTP server (Network Time Protocol) is required. The NetBox connects to the following NTP servers:
  - 0.debian.pool.ntp.org
  - 1.debian.pool.ntp.org
  - 2.debian.pool.ntp.org
  - 3.debian.pool.ntp.org
This communication has to be re-routed to an existing server. Debugging the NTP is supported by the result of the “ntpq -pn” command (https://linux.die.net/man/8/ntpq) available using sftp.

Sample output of the NtpqResult File:

<table>
<thead>
<tr>
<th>remote</th>
<th>refid</th>
<th>st t</th>
<th>when</th>
<th>poll</th>
<th>reach</th>
<th>delay</th>
<th>offset</th>
<th>jitter</th>
</tr>
</thead>
<tbody>
<tr>
<td>127.127.28.0</td>
<td>.GPS.</td>
<td>0 l</td>
<td>-</td>
<td>16</td>
<td>0</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>*213.172.105.106</td>
<td>213.172.96.14</td>
<td>2 u</td>
<td>93</td>
<td>128</td>
<td>377</td>
<td>9.094</td>
<td>0.439</td>
<td>0.095</td>
</tr>
<tr>
<td>+5.34.248.225</td>
<td>251.4.108.178</td>
<td>3 u</td>
<td>85</td>
<td>128</td>
<td>377</td>
<td>1.459</td>
<td>0.490</td>
<td>0.067</td>
</tr>
<tr>
<td>+5.34.248.224</td>
<td>251.4.108.178</td>
<td>3 u</td>
<td>10</td>
<td>128</td>
<td>377</td>
<td>1.337</td>
<td>0.157</td>
<td>0.190</td>
</tr>
</tbody>
</table>
Connecting a GPS Receiver

The XL2 Analyzer can synchronize the start time precisely with a GPS signal. The measurement start matches the GPS time with an accuracy of +/- 0.7 ms (+/- 32 samples @ 48 kHz).

This requires the specially-adapted GPS Receiver, NTi Audio # 600 000 357. Connect the GPS Receiver to the NetBox using one of the USB inputs, and to the XL2 RCA input. The NetBox detects the GPS Receiver automatically and the GPS location data is presented on the website.

Connection Diagram:

The incidents table lists the actual status of measurement start synchronization with GPS:
- XL2 measurement started … synced to GPS
- XL2 measurement started … NOT(!) synced to GPS

The initial detection of the correct GPS time is listed in the incidents table
- XL2 GPS Info: XL2 synched to GPS

The actual status of the time synchronization is noted in the status table
- Unlocked
- Locked
- Locked (xx:xx:xx ago)
  (with xx:xx:xx indicating the duration since the last successful GPS time synchronization)
**Status View with GPS and Wind Data**

### Status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>XL2</strong></td>
<td></td>
</tr>
<tr>
<td>GPS SYNC</td>
<td>Locked</td>
</tr>
<tr>
<td>SD Card</td>
<td>70.2% free of 7.5 GB</td>
</tr>
<tr>
<td>Daily Timetable</td>
<td>is not active</td>
</tr>
</tbody>
</table>

**NetBox**
- **Info**: 3HNINN-JR5US / FW2.30
- **Date/Time**: 2020-01-23 16:35:22 (Europe/Berlin)
- **UpTime**: 1:13:50
- **DC In**: 11.91 V
- **Temperature**: 1°C

**Network**
- Ethernet / 100%

**GPS**
- 47.174374° 9.513030° 447m (3D lock)
- [Show on Google](https://www.google.com/maps/place/47.174374%2C9.513030/)

**Weather**
- Logging
- Current Wind: 0.3 m/s @ 121°

### Incidents in the past week

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Incident</th>
<th>add. Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020-01-23 15:12:59</td>
<td>Weather Device detected</td>
<td>Vaisala SN R3741016 Found</td>
</tr>
<tr>
<td>2020-01-23 15:12:59</td>
<td>XL2 GPS Info</td>
<td>XL2 synced to GPS</td>
</tr>
</tbody>
</table>
Connecting a Weather Station

Rain, strong wind and the wind direction can influence the measured outdoor sound pressure level. Connect a weather station to your noise measurement station to simultaneously record the noise level and the weather data. Depending on the weather station model used, air pressure, temperature, air humidity, rain, wind speed and wind direction are documented. NoiseScout supports the Vaisala models WXT532, WXT533 and WXT536.

The weather station is connected to the NetBox via a 1.4 m USB cable. Alternatively, the weather station can also be purchased with a 10 m cable and the WSP152 surge protector to bridge longer distances between the weather station and the NetBox. The connection from the WSP152 to the NetBox is again with the 1.4 m USB cable.

Which weather stations are supported?

NoiseScout supports Vaisala models WXT532, WXT533 and WXT536 (www.vaisala.com).

- WXT532: Wind
- WXT533: Rain and wind
- WXT536: Air pressure, temperature, humidity, rain, and wind

Which weather data can be recorded?

- Wind speed in [m/s] or [mph]
- Wind direction in [°]
- Rain intensity [mm/h] or [in/h]
- Hail intensity [hits/cm²h] or [hits/in²h]
- Temperature [°C] or [°F]
- Relative humidity [%]
- Air pressure [hPa]
The following settings for weather data logging are supported:

- off: no weather data logging
- on: continuous weather data logging
- with XL2: log weather data when XL2 is measuring

<table>
<thead>
<tr>
<th>Weather Logging</th>
</tr>
</thead>
<tbody>
<tr>
<td>o off</td>
</tr>
<tr>
<td>o on</td>
</tr>
<tr>
<td>✗ with XL2</td>
</tr>
</tbody>
</table>

Weather Logging Settings
Archiving Completed Measurements

By connecting a USB mass storage device (SSD, HDD, Stick) to the NetBox, the data storage capacity of the XL2 can be expanded by up to 2 terabytes.

Completed measurements are then automatically archived from the XL2 SD-card to the external storage.

The external storage can, as with the XL2, be accessed via a secure FTP connection. The data is downloaded from the external storage up to four times faster than with direct access to the SD-card of the XL2.

Formatting the Storage Device

The storage device must be FAT32-formatted. To format you can use a tool such as “fat32format”:
http://www.ridgecrop.demon.co.uk/index.htm?fat32format.htm
Archiving

Completed measurement files are moved to the external storage device. The files are deleted from the XL2 only after they are successfully copied. The archiving status is shown on the Status Page of the NetBox website.

The “Daily Timetable” allows you to schedule a daily measurement period. This is described in the “Settings” section on page 5.

In case of power failure, the data generated in the “RESTORE_AFTER_POWERFAIL” folder is also archived.

Removing the External Storage Device

In principle, the storage medium may be removed at any time without risk of data loss. However, we recommend that you wait until any active archiving has been completed.

Naming Conventions in the Archive

Data is stored by XL2 serial number, year and month. When controlled by the Daily Timetable, a folder is created for each day.

If several measurements are started per day while archiving is switched on, the XL2 assigns the same file name several times because past measurements have already been archived. In this case, file names in the archive are supplemented with an additional extension:

- 2020-01-29_SLM_000.XL2.171123
- 2020-01-29_SLM_000_123_Log.txt.171123
- 2020-01-29_SLM_000_123_Report.txt.171123
- 2020-01-29_SLM_000_Audio_FS131.7dB(PK)_00.wav.171123
- 2020-01-29_SLM_000_RTA_3rd_Log.txt.171123

Such measurements can be grouped with “Sort by extension”.

Remote Access via sFTP

During remote access, the external storage medium can be accessed through the name UsbDrive_xx.
Sleep when idle (for Power Save)

The XL2 can switch itself and the NetBox off during non-measurement times. This reduces the power consumption of the entire system to a few mA (prerequisite: XL2 serial number ends with “E0”).

The power supply to the NetBox must be routed via Out4 of the “Digital IO Adapter” (NTi Audio # 600 000 380) and “Sleep when idle” must be activated in the settings.

Pin4on.txt

If the XL2 finds a file with the name Pin4on.txt on the SD card when starting, it closes the relay to Out4. This starts the NetBox. The NetBox automatically installs Pin4on.txt on the XL2, but when starting up for the first time it may be necessary to create the file manually (the content of the file is irrelevant).

Note:

“Sleep when idle” can also be deactivated in the customer portal my.nti-audio.com. You can thus prevent a NetBox from being switched off again after the next time it wakes up.
Manual Override

By using the power button on the XL2 to turn it on, the “Sleep when idle” settings can be manually reset. The system remains on for a period of 5 minutes before the settings in “Sleep when idle” are considered again.

⚠️ Do not manually turn the XL2 off when “Sleep when idle” is active. Otherwise the system will remain turned off until it is manually turned on again.

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Warning against manually switching off
Server Verification

SFTP protocol versions use different host keys. When your SFTP client connects to the server for the first time you may be asked to trust the host key. To confirm that you are actually connected to the correct server (xl2gateway.nti-audio.com), your SFTP Client should show one of the following fingerprints:

## Table of Key Fingerprints confirming the trusted Connection

<table>
<thead>
<tr>
<th>Algorithm</th>
<th>Key length [bit]</th>
<th>Key Fingerprint</th>
</tr>
</thead>
</table>

Troubleshooting

The root directory of your login contains the subdirectory /NetBox. This contains the XL2 root directory of the SD card.

- **NetBox offline**
  In case the NetBox is not connected to the server, the /NetBox directory contains a file named “NetBox is Offline.txt”.

- **XL2 not connected**
  In case the XL2 is not connected to the NetBox, the /XL2 subdirectory contains a file named “XL2 not mounted.txt”. Verify that your XL2 is powered on, an SD-Card is inserted in the XL2 and the XL2 is connected via USB to the NetBox.

During ongoing measurements, all data is stored in temporary files in the folder “/Projects/.unsaved/SLM/”. As soon as the measurement is completed these files are moved to the current Project folder and renamed to their given filename. Reading the temporary files provides access to the latest measurement data. Kindly be aware of the following details:

- There might be a delay between the time that values are measured and the time that the data is available in the temporary file.
- Due to latency in writing, you may possibly miss the last 10 seconds of audio data.