LINEAR ACOUSTIC®

THE TELOS ALLIANCE

LQ-1000 Loudness Quality Monitor
User Manual

Update for LQ-1000
SW version 3.14.82 and Later
March.2016

L16/1/18049

1 Warranty Information

DISCLAIMER OF WARRANTIES: Linear Acoustic products are warranted against defects in material and workmanship for a period of 2 years from the date of purchase. **THERE ARE NO OTHER IMPLIED OR EXPRESS WARRANTIES AND NO WARRANTY FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

If the date the customer's notice of warranty claim is received by Linear Acoustic (such date the "**Warranty Claim Notice Date**") is within the first 90 days following the Receipt Date, Linear Acoustic will pay the costs of shipping such warranted Product to and from the end user's location, and the cost of repair or replacement of such warranted Product.

If the Warranty Claim Notice Date occurs after the first 90 days following the Receipt Date and before the end of the second (2nd) year, the customer will pay the freight to return the warranted Product to Linear Acoustic. Linear Acoustic will then, at its sole discretion, repair or replace the warranted Product and return it to the end user at Linear Acoustic expense.

In each of the above, the unit is to be returned directly to Linear Acoustic with a return authorization (RA) number clearly marked on the packaging. Please note, this RA number must be present or package will be refused and returned to sender.

The end user will in all cases be responsible for all duties and taxes associated with the shipment, return and servicing of the warranted Product.

No distributor, dealer, or reseller of Linear Acoustic products is authorized under any circumstances to extend, expand or otherwise modify in any way the warranty provided by Linear Acoustic, and any attempt to do so is null and void and shall not be effective as against Linear Acoustic or its Affiliates.

Out of warranty units returned to the factory for repair may be subject to a $500 evaluation fee, which must be prepaid prior to shipping the unit to Linear Acoustic. If no repairs are required, the $500 fee will be retained by Linear Acoustic as an evaluation charge. If repairs are required, the $500 fee will be applied to the total cost of the repair.

All requests for repairs MUST include the unit serial number to ensure quick and accurate service.

DEFECTS CAUSED BY UNAUTHORIZED MODIFICATIONS, MISUSE OR ACCIDENTS, UNAUTHORIZED CUSTOMER REPAIRS, OR ANY FURTHER DAMAGE CAUSED BY INADEQUATE PACKAGING FOR SERVICE RETURN ARE NOT COVERED BY THIS WARRANTY.

PLEASE SAVE THE SHIPPING CARTON AND ALL PACKING MATERIALS. FAILURE TO RETURN UNIT IN ORIGINAL SHIPPING CARTON AND PACKING MATERIALS WILL·RESULT IN A CHARGE FOR NEW SHIPPING MATERIALS.

LIMITATION OF PERIOD OF ACTION ON CONTRACT: No action, regardless of form, arising out of the transactions under this agreement may be brought by buyer, its successors, agents and/or assigns, more than two years from date of purchase.

LIMITATION OF LIABILITY: It is understood and agreed that the liability of Linear Acoustic whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the cost of repair or replacement of the defective components and under no circumstances shall Linear Acoustic® be liable for incidental, special, direct, indirect or consequential damages, or loss of use, revenue or profit even if Linear Acoustic® or its agents have been advised, orally or in writing, of the possibility of such damages.

This product may contain technologies from Audyne Inc., and is manufactured under license.

Manufactured under license from Dolby Laboratories. Dolby and the double-D symbol are trademarks of Dolby Laboratories.

Linear Acoustic, the "LA" symbol, UPMAX, AEROMAX, AERO.10, AER0.100, AERO.1000, AERO.2000, MT2000, and CrowdControl, are trademarks or registered trademarks of Linear Acoustic Inc. All other trademarks remain the property of their respective owners.

2 Regulatory Notices and Fusing Information

Regulatory Notices and Fusing Information

2.1 FCC
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

2.2 Canada
This Class A digital apparatus complies with Canadian ICES-003.

2.3 UL

⚠ WARNING: Troubleshooting must be performed by a trained technician. Do not attempt to service this equipment unless you are qualified to do so.

Check that the correct fuses have been installed. To reduce the risk of fire, replace only with fuses of the same type and rating.

Exposed portions of the power supply assembly are electrically "hot". In order to reduce the risk of electrical shock, the power cord MUST be disconnected when the power supply assembly is removed.

The ground terminal of the power plug is connected directly to the chassis of the unit. For continued protection against electric shock, a correctly wired and grounded (earthed) three-pin power outlet must be used. Do not use a ground-lifting adapter and never cut the ground pin on the three-prong plug.
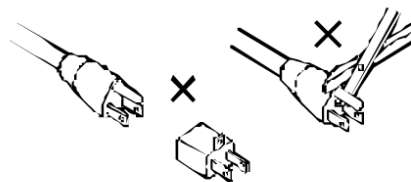
2.4   UK

As the colours of the cores in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core that is coloured green and yellow must be connected to the terminal in the plug identified by the letter E or by the earth symbol or coloured green or green and yellow.
- The core that is coloured blue must be connected to the terminal that is marked with the letter N or coloured black.
- The core that is coloured brown must be connected to the terminal that is marked with the letter L or coloured red.
- This apparatus must be earthed.

2.5   EU

This equipment complies with the EMC requirements of EN55103-1 and EN55103-2 when operated in an E2 environment in accordance with this manual.

IMPORTANT SAFETY NOTICE

This unit complies with the safety standard EN60065. The unit shall not be exposed to dripping or splashing and no objects filled with liquid s, such as coffee cups, shall be placed on the equipment. To ensure safe operation and to guard against potential shock hazard or risk of fire, the following must be observed:

- Ensure that your mains supply is in the correct range for the input power requirement of the unit.
- Ensure fuses fitted are the correct rating and type as marked on the u nit.
- The unit must be earthed by connecting to a correctly wired and earthed power outlet.
- The power cord supplied with this unit must be wired as follows:

Live—Brown Neutral—Blue Earth—Green/Yellow

IMPORTANT – NOTE DE SECURITE

Ce materiel est conforme à la norme EN60065. Ne pas exposer cet appareil aux claboussures ou aux gouttes de liquide. Ne pas poser d'objets remplis de liquide, tels que des tasses d e café, sur l'appareil. Pour vous assurer d'un fonctionnement sans danger et de prévenir tout choc électrique ou tout risque d'incendie, veillez à observer les recommandations suivantes.

- Le selecteur de tension doit être placé sur la valeur correspond ante à votre alimentation réseau.
- Les fusibles doivent correspondre à la valeur indiquée sur le materiel.
- Le materiel doit être correctement relié à la terre.
- Le cordon secteur livré avec le materiel doit être cablé d e la manière suivante:

Phase—Brun Neutre—Bleu Terre—Vert/Jaune

WICHTIGER SICHERHEITSHINWEIS

Dieses Gerät entspricht der Sicherheitsnorm EN60065. Das Gerät darf nicht mit Flüssigkeiten (Spritzwasser u sw.) in Berührung kommen; stellen Sie keine Gefäße, z.B. Kaffeetassen, auf das Gerät. Für das sichere Funk tionieren des Gerätes und zur Unfallverhütung (elektrischer Schlag, Feuer) sind die folgend en Regeln unbedingt einzuhalten:

- Der Spannungswähler muß auf Ihre Netzspannung eingestellt sein.
- Die Sicherungen müssen in Typ und Stromwert mit den Angaben auf dem Gerät übereinstimmen.
- Die Erdung des Gerätes muß über eine geerdete Steckdose gewährleis tet sein.
- Das mitgelieferte Netzkabel muß wie folgt verdrahtet werd en:

Phase—braun Nulleiter—blau Erde—grün/gelb

NORME DI SICUREZZA – IMPORTANTE

Questa apparecchiatura è stata costruita in accord o alle norme di sicurezza EN60065. Il prodotto non deve essere sottoposto a schizzi, spruzzi e gocciolamenti, e nessun tipo di oggetto riempito con liquidi, come ad esempio tazze di caffè, deve essere appoggiato sul dispositivo. Per una perfetta sicurezza ed al fine di evitare eventuali rischi di scossa êlettrica o d 'incendio vanno osservate le seguenti misure di sicu rezza:

- Assicurarsi che il selettore di cambio tensione sia pos izionato su l valore corretto.
- Assicurarsi che la portata ed il tipo di fusibili siano quelli prescritti dalla casa costru ttrice.
- L'apparecchiatura deve avere un collegamento di messa a terra ben eseguito; anche la conness ione rete deve
- avere u n collegamento a terra.
- Il cavo di alimentazione a corredo dell'ap parecchiatu ra deve essere collegato come segue:

Filo tensione—Marrone Neutro—Blu Massa—Verde/Giallo

AVISO IMPORTANTE DE SEGURIDAD

Esta unidad cump le con la norma de seguridad EN60 065. La unidad no debe ser expuesta a goteos o salpicaduras y n o deben colocarse sobre el equipo recipientes con liquidos, como tazas de cafe. Para asegurarse un funcionamiento s eguro y prevenir cualquier pos ible p eligro de descarga o riesgo d e incendio, se han de ob servar las siguientes precauciones:

- Asegúrese que el selector de tensión esté ajustado a la tensión correcta para su alimentación.
- Asegúrese que los fusibles colocados son del tipo y valor correctos, tal como se marca en la unidad.
- La unidad debe ser puesta a tierra, con ectándola a un conector de red correctamente cableado y puesto a tierra.

- El cable de red suministrad o con esta unidad, debe ser cableado como sigu e: Vivo—Marrón Neutro—Azu l Tierra—Verde/Amarillo

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VIKTIGA SÄKERHETSÅTGÄRDER!

Denna enhet uppfyller säkerhets standard EN60065. Enheten får ej utsättas för yttre åverkan samt föremål innehållande vätska, s åsom kaffemuggar, får ej placeras på utrustningen." För att garantera säkerheten och gardera mot eventuell elchock eller brandrisk, måste följande obs erveras :

- Kontrollera att spänningsväljaren är in ställd på korrekt nätsp änning.
- Konrollera att säkringarna är av rätt typ och för rätt strömstyrka så som anvisn ingarna på enheten föreskriver.
- Enheten måste vara jordad genom anslutning till ett korrekt kopplat och jordat el-uttag.
- El-sladden som medföljer denna enhet måste kopplas enligt foljande:

Fas—Brun Neutral—Blå Jord—Grön/Gul

BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:

Deze un it voldoet aan de EN60065 veiligheids-standaards. Dit apparaat mag niet orden blootgesteld aan vocht. Vanwege het risico dat er druppels in het apparaat vallen, dient u er geen vloeistoffen in bekers op te plaatsen. Voor een veilig gebruik en om het gevaar van electris che sch okk en en het risico van brand te vermijden, dienen de volgende regels in acht te worden genomen:

- Controleer of de spanningscaroussel op het juiste Voltage staat.
- Geb ruik alleen zekeringen van de aangeg even typen en waarden.
- Aan sluiting van de unit alleen aan een geaarde wandcon tactdoos.
- De n etkabel die met de unit wordt geleverd, moet als volgt worden aan gesloten:

Fase—Bruin Nul—Blauw Aarde—Groen/Geel

2.6 Fusing Information

WARNING: To reduce the risk of fire, replace fuses only with the same type and rating.


This product uses a universal switching power supply that handles the full range of nominal mains voltages between 90 and 264 VAC and any frequency between 50 Hz and 60 Hz.

The Main fuse rating is T 1A L (1 Amp, 250 V, 20 mm, time-lag, low breaking capacity) for all operating voltages. To check the main external fuse:

⚠️ WARNING: Power to the unit must be off when the following steps are performed. Ensure that the main power cable to the unit is not connected to a power source.

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1. Open the fuse compartment door in the AC power input housing with a small flat blade screwdriver. Carefully pull out the fuse carrier.
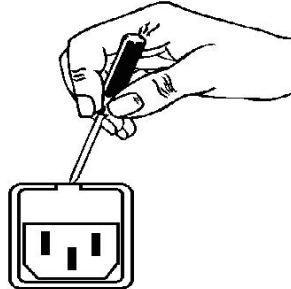
2. Check that the replacement fuse has the correct rating. The fuse carrier must be inserted into the compartment carefully. Do not force the carrier into the compartment or both could be damaged.

3. Snap the fuse compartment door closed.

The switching power supply contains a separate internal fuse. Most fault conditions should be protected by the main fuse.

If you find it necessary to replace the internal fuse, be certain to replace it with a fuse of the same type and rating as printed on the switching power supply board.

2.7 Notice

All versions, claims of compatibility, trademarks, etc., of hardware and software products not made by Linear Acoustic which are mentioned in this manual or accompanying material are informational only. Linear Acoustic makes no endorsement of any particular product for any purpose, nor claims any responsibility for operation or accuracy. We reserve the right to make improvements or changes in the products described in this manual which may affect the product specifications, or to revise the manual without notice.

2.8 Updates

The operation of this product is determined largely by software. From time to time we may release new versions to add features and fix bugs. Check the Linear Acoustic web site for the latest information.

2.9 Feedback

We welcome feedback on any aspect of this product or this manual. In the past, many good ideas from users have made their way into software revisions or new products. Please contact us with your comments.

2.10 Service

You must contact Linear Acoustic before returning any equipment for factory service. We will need your unit's serial number, located on the back of the unit. Linear Acoustic will issue a return authorization number which must be written on the exterior of your shipping container. Please do not include cables or accessories unless specifically requested by the Technical Support Engineer. Be sure to adequately insure your shipment for its replacement value. Packages without proper authorization may be refused. US customers, please contact Linear Acoustic Technical Support at +1 (717) 735-3611. All other customers should contact local representative to make arrangements for service.

2.11 Support

For any billing or non-emergency technical questions please call our main office at +1 (717) 735-3611 between the hours of 9:00am – 5:00pm Eastern time, Monday through Friday.

24/7 after-hours support is provided **for off-air emergencies** by calling +1 (717) 735-3611 and listening to the entire message for instructions and prompts.

Our Fax number is +1-717-735-3612.

Technical support via e-mail is available at support@linearacoustic.com

All product questions or inquiries, please email sales@linearacoustic.com

The Linear Acoustic web site has a wealth of information which may be useful for product selection and support. The URL is www.linearacoustic.com. Registered users of the website can download user manuals and software updates at any time.

3 Contents

4 Overview

4.1 New Features

Starting with software version 3.14.82 and firmware version 0x10001119 many new features have been brought to the LQ-1000® making the industry's finest loudness quality monitor even better.

New features include:
- Easier navigation and configuration from the front panel.
- Menu selection of ITU or EBU metering.
- Logging of primary 5.1 program plus downmix plus stereo program 2.
- Logging of stereo program 1 and program 2 for stereo only applications.
- Front panel configuration of IP, NTP, and HTTP.
- Multiple meters can be displayed on front panel simultaneously.
- Four customizable front panel buttons and eight GPIs.
- NfRemote, our IP-based remote control, provides configuration of all I/O and other parameters including metering configurations
- Remote audio monitoring over IP
- Multiple simultaneous IP connections
- 13 different meters are available

    Note!

    The latest software and firmware upgrade for LQ-1000 Loudness Quality Monitors is **applicable ONLY to units with serial number 34-1000 and higher**.

This new LQ-1000 user manual is divided into 9 sections. This introduction is Section 4. Section 5 is a quick start guide. Section 6 will familiarize the user with the new front panel menu and displays. Section 7 will explain how to install and use NfRemote for the LQ-1000. Section 8 is a reference guide to all of the menus, submenus, and controls in the LQ-1000. Section 9 contains specifications and information about the physical I/O.

4.2 Using This Guide

This user guide is intended to be read while in front of a running LQ-1000 unit. It is most helpful if the source that will be measured is actually connected to the LQ-1000. Doing this provides feedback to the user via the meters and IP audio monitoring while configuration changes are being made.

To make learning your way around the new LQ-1000 interface as useful and rewarding as possible there is some information that you should have at hand:

- The IP address and subnet mask assigned to the LQ-1000.

- Any gateway and DNS information for the network to which it will be connected.

- NTP server address(s).

- The IP address of the PC that will be used to connect to the LQ-1000.

- What sources will be connected to the LQ-1000.

- Where the audio program(s) are embedded within the SDI source.

- What outputs of the LQ-1000 (if any) will be connected.

Having this information will allow you to configure the unit for use as you learn to navigate the LQ-1000 using both the front panel and NfRemote.

Note!

The new software versions **REQUIRE A PASSWORD** to operate. Saving an empty password field (or restoring a configuration that does not have a password) will prevent any further access to the unit and will require a return trip to the factory.

If you have not already done so please register on the Linear Acoustic website: www.linearacoustic.com. There is a login button, on the right side of the page, below the splash screen. Click the Log In button and follow the instructions there. One benefit of registering is that there are software and manual updates as well as Application Notes, White Papers, videos and other information available on-line.

4.3 Definitions

"AES" is sometimes used in the manual as an abbreviation for AES digital audio bitstream and sometimes for an unbalanced AES-3 interface.

"Client" is sometimes used to mean the PC or laptop that is running the NfRemote application. It is the same as "host".

"DARS" is a digital audio reference signal. This is an AES digital audio signal and can be silent or can contain audio bits. A timing reference is derived from the AES signal's timing. **This is not word clock.**

"Host" is the PC or laptop that is running NfRemote. It is the same as "client".

5 Quick Start

We know that many of our clients already know their way around the front panel interface and NfRemote. If all you need is a quick guide to start measuring an SDI source immediately then this is the place to start.

5.1 Getting Started

5.1.1 Power

Apply AC power to the LQ-1000®. There is no On/Off switch. Apply power to turn it on and remove power to turn it off. Simply removing power will not harm the unit.

5.1.2 IP Connection

Connect your PC to the LQ-1000 using an Ethernet cable. A crossover cable is not required. Be sure to connect to the Ethernet port and not the Reserved port.

5.1.3 LQ-1000 IP address

The IP address of the LQ-1000 will appear in the front panel display below the password entry. Assign an address to your PC that is in the same subnet. Alternately you can plug both your PC and the LQ-1000 into a DHCP router. DHCP is enabled from the factory.

> *Note!*
>
> If the LQ-1000 shows an IP address of 127.0.0.1 it is not connected to a valid Ethernet port. Check the Ethernet cabling and ports on the PC or switch.
>
> If the LQ-1000 shows an IP address of 169.x.x.x it is connected to a valid Ethernet port but it cannot a fetch a DHCP address. Check the configuration of the DHCP router and the port the LQ-1000 is connected to

A fixed IP address of your choice can be set from the front panel. Instructions for this are in the next section.

5.1.4 Configuration

Section 8 contains a description of the menus and settings in the LQ-1000. The configuration of each setting is given from the highest level menu down to the lowest menu and the selection. They all take the form of:

System > Hardware I/O > Input Source 1/2: SDI 1/2

If you need more detailed assistance to navigate the menus then look at:
1. Section 2 for a walkthrough of the front panel controls.

2. Section 3 for a walk through of NfRemote.

6 Front Panel Navigation

6.1 Navigation

The LQ-1000 now has a full function IP remote control in addition to the front panel controls. We think that the IP remote is both faster and easier to use but familiarity with the front panel control will allow users to unlock the unit and make changes without a network connection or PC. Following are a few lessons on how to use the new front panel menu structure.

The lessons follow the steps needed to put the unit into operation when it is received or upgraded from a previous version and will get you started!

The right, left, up, and down arrow keys and the rotary encoder navigate LQ.1000's menu system:

Figure 6-1 Menu navigation keys

- ► **Next**   Takes you into the selected menu; same as "**Enter**" ("Right" in the text)

- ◄ **Prev.**   Takes you back the same path; same as "**Back**" or "**Esc**" ("Left" in the text)

- ▲▼ Scrolls through screen parameters ("Up" and "Down" in the text)

- The rotary encoder adjusts the selected parameter ("Rotary" in the text).

In describing the use of the front panel controls, phrases like "Use the Up/Down arrows to highlight System" will be used. For instance: "Use the Up/Down arrow keys to highlight (put the yellow border around) the menu selection 'System', then press the right arrow."

After the first few examples the step by step instructions will be shortened to "Select "System" and click right".

Further into the manual these step by step instructions will be shortened to:
System > IP Options > IP Configuration > Use DHCP > Click to enable.

This means select System, press Right, then select IP Options and Press Right, then select IP Configuration and press Right, etc. It is assumed that the starting point is always the top level, i.e. the main menu.

6.2 Front Panel Menus

LQ-1000's menus are hierarchical and follow logical signal processing flows. When a parameter is changed from its stored value it is displayed in yellow until the change is saved. When it is saved, it returns to white.

 LQ-1000 employs "breadcrumbs" in the menus so you will always know where you are in the menu hierarchy. The top of each menu displays the breadcrumbs to the current menu position. For example, Figure 6-2 shows the menu position as:

Figure 6-2 Menu breadcrumbs

System > Hardware I/O Setup
The menu also displays pop up tips and hints to explain a function or why it is inactive. For example, Figure 6-3 below shows why the "Update Time" field is grayed out and inactive. You will see this if you navigate to any grayed out selection and press the Right arrow key. You can also see these tips by pointing to the drop down symbol on a menu item.
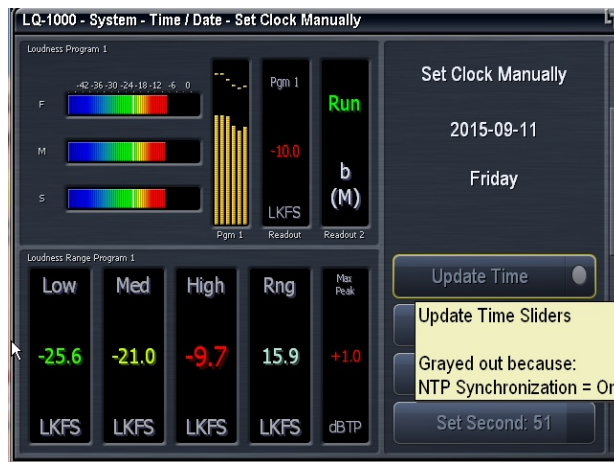
Figure 6-3 Menu pop-up Help

6.3 Unlock the Front Panel

When the unit is powered up you will see two meters on the left and the password lock screen on the right. There is a blank password entry field at the top.

1. If it is not highlighted with a yellow border use the Up/Down arrows to highlight the empty password field and then press the Right arrow. An ASCII entry screen will appear. Figure 6-4, below.

Figure 6-4 Front Panel lock screen

2. Use the Rotary to highlight the numeric keyboard selection [123] and press the Right arrow

3. Use the Rotary to highlight each character in the password and press the Right arrow after each selection. The **factory password is 1234**. The password will appear at the top.
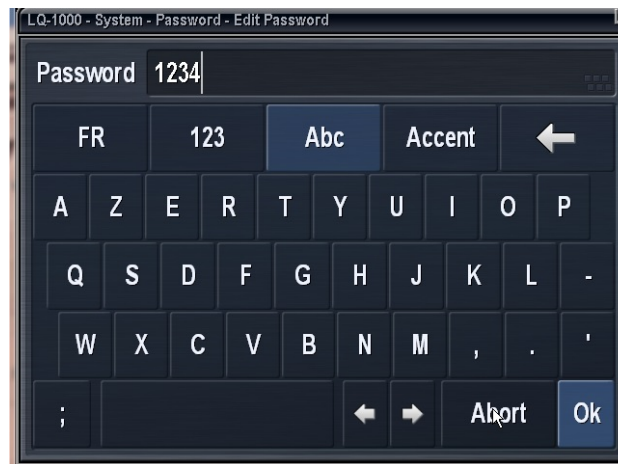
Figure 6-5 Front Panel lock screen

4. The LQ-1000 MUST have a password. Erasing the password and saving the configuration, rebooting the unit, or losing power will require the unit to be sent back to the factory to be unlocked! If you change the password keep your password in a safe place. See section 6.9.1 to enter a new password.

5. Use the Rotary to highlight OK and press the Right arrow.

6. The screen is now back on the password screen. Use the Down arrow to highlight Unlock and press Right arrow. The main menu screen is now visible. See Figure 6-6, below.

Figure 6-6 Front Panel Main Menu

6.4 Adjust Menu Size

1. Use Up/Down arrows to highlight "Display Options" at the bottom of the main menu and press Right arrow.

2. Use Up/Down arrows to highlight the Menu Options selection at the bottom of this menu and press Right arrow

3. In this menu you can use the Up/Down arrow keys to select:
    a.   Split Position and use the Rotary to, maximize the size of the menu area and the text on the screen.
    b.   Menu Items and use the Rotary to set the text size in the menu window.
    c.   These adjustments will make navigating the menus easier.

4. See Figure 6-7, below
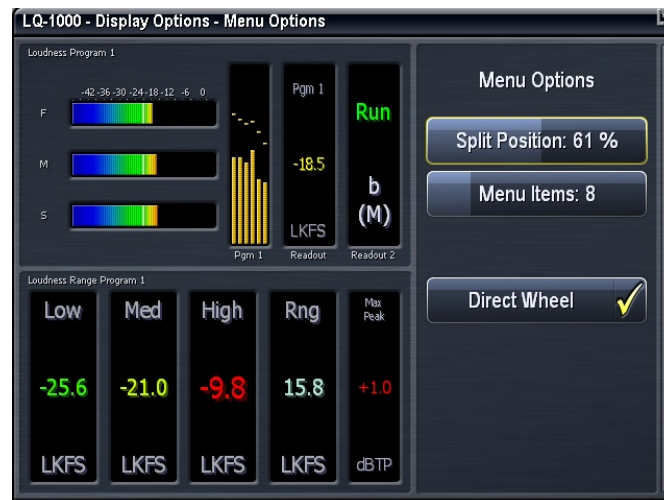
Figure 6-7 Menu Size Adjust

6.5 Ethernet Setup

Although initially configured for DHCP (a network router will automatically assign the LQ100 an IP address), DHCP can be disabled and a static IP address can be entered. We recommend setting a static IP so that NfRemote and any PCs that need to access configuration, metering, control, or logs will always find the LQ-1000 at the same IP address.

To enter a static IP address:

1. Press Left arrow several times to navigate back to the LQ-1000 main menu.

2. Use Up/Down arrow keys to highlight System and press Right Arrow

3. On System screen use Up/Down arrows to highlight IP Options and press Right arrow.

4. Use Up/Down arrows to highlight IP Configuration and press Right arrow.

5. Use Up/Down arrows to highlight Use DHCP and the press Right arrow to
    remove arrow to remove check mark. See Figure 6-8, below.
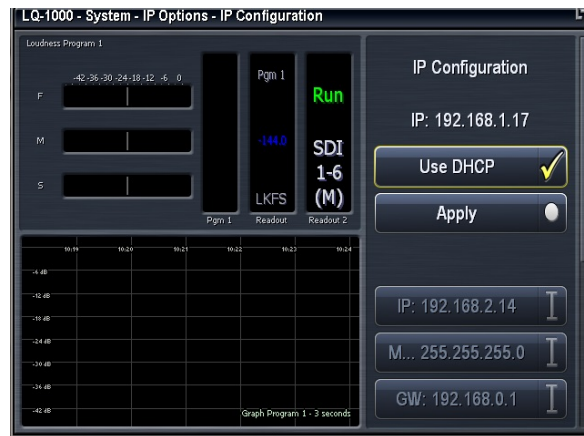
Figure 6-8 DHCP On/Off

To set a fixed IP address:

1. Use Up/Down arrows to highlight IP and press Right arrow. The alpha
    numeric entry appears. Use the Rotary to select the numeric keyboard
    [123] and press Right.

2. Use the Rotary to select each numeral and decimal point in the IP address
    you want to assign to the AERO.2000. Press Right after each entry until
    the IP address is entered.

3. Use Rotary to highlight OK and press Right. See Figure 6-9, below

Figure 6-9 IP address edit

4. To exit the alpha numeric entry window at any time, without saving changes,
    use Rotary to highlight Abort and press Right arrow.
5. Do not enter leading zeros. Enter 192.168.1.10, Not .001.010

6. Repeat the IP address setting process to enter the subnet mask, gateway, and DNS addresses. You can also enter the location of the unit (a room or rack ID for instance).

7. Always enter a Gateway address even if a gateway is not used. 1 in the last octet of the address is usually reserved for a gateway address. For example: 192.168.1.1

8. When all the entries are made use Up/Down arrows to highlight Apply and press Right Arrow.

9. Note the path shown at the top of the front panel display.

6.6 HTTP Setup

The LQ-1000 has a built-in HTTP server. The HTTP server provides access to:

- Logs of LKFS (LUFS) readings
- IP based commands to control the unit remotely
- A manually controlled LKFS log
- A copy of the latest NfRemote application.

Only computers that have their IP addresses in the HTTP white list, found in HTTP Access, can access the unit's HTTP server. We recommend that an IP address **in the same subnet as the LQ-1000 IP address** be immediately entered in the white list and stored in a safe place. A computer can be connected directly to the LQ-1000 Ethernet port using an ordinary Ethernet cable. By setting the computer's IP address and subnet mask to the same IP and subnet mask stored in the white list the computer can access the LQ-1000 HTTP server. This access can even allow you to recover from a lost password! To enter addresses in the HTTP white list:

1. From the LQ-1000 main menu use Up/Down arrows to highlight System and press Right arrow.

2. Use Up/Down arrows to highlight IP Options and press Right arrow.

3. Use Up/Down arrows to highlight HTTP Access and press Right arrow.

4. Use Up/Down arrows to highlight IP 1 and press Right arrow. The alpha numeric entry opens.

5. Using the same process used to set the IP address (above) set a white list IP address and subnet mask for your PC/laptop.

An example of a valid White List entry is 192.168.1.200/255.255.255.0. The subnet and subnet mask must be the same as the LQ-1000 IP address assignment but must NOT be the same address. The addresses of any PCs that will access the logs, control the LQ-1000 using commands over IP, or is permitted to download the NfRemote software can be entered in the white list up to a total of 8 addresses. Wild cards can also be used to allow an entire subnet access. Example: 192.168.1.*

6.7 Front Panel Displays

The front panel display can be customized, and can contain up to six meters of the same or different types. The display can also be set to "Meters Only" mode so the menus are temporarily hidden. Of course, display resolution may limit the number of active front panel meters, but all six will look fine when displayed on a monitor using the VGA output. Use Left arrow to navigate to the front panel main menu.

1. Select Display Options and press Right.

2. Use Up/Down to move to top of menu.

3. Select Memory Slot 1 and press Right.

4. Use Up/Down arrows to highlight a memory slot and press Right. A check mark will appear next to your selection.

5. Press Left and then Down to highlight meter 1:

6. Press Right and use Up/Down arrows to select a meter type.

7. The first selection is a choice of which program output to monitor. Program 1 Dmx (downmix), Program 2, Instrumentation, or Off.

8. Press Right to see the selections and select Program 1. A check mark will appear. Press Left to exit.

9. Use Down to select what to meter for Program 1.   Press Right to see the choices. LM Program 1 (loudness meter), Graph Program 1, LRA program 1.

10. Use Up/Down to select LM Program 1. A check mark will appear. Press Left to exit.

11. Press Left again to return to the meter selection screen.

12. Select meter 2 and Right to select a source. Select Program 1, and press Right to select. Then press Left to exit.

13. Use Down arrow to select a meter type, Right to see selections. Down arrow to highlight Graph Program 1. Left to exit. See Figure 6-10.
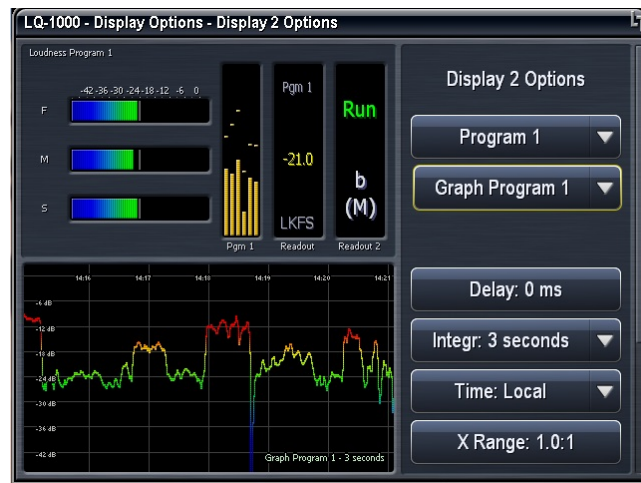
Figure 6-10 Program 1 Graph Meter

1. Note that the parameters to configure the graph appear in the menu below the Graph selection.

2. Left to exit to Display options menu.

3. Use Up/Down keys to highlight Fullscreen Mode and press Right. See figure 6-11, below.

4. Click Left arrow to exit fill screen mode.

Figure 6-11 Full screen front panel view6.

6.8 Other Important Setup Parameters

6.8.1 Password

Note!

A password must ALWAYS be set in the LQ-1000. The factory set password is 1234. If you choose to change the password keep it in a

safe place. If the password is lost or removed the unit must be sent back to the factory to recover front panel and remote control of the unit.

Press Left arrow several times to return to main menu.

1. Select System and press Right.

2. Select Password and press Right.

3. Select Password **** and press Right.

4. Use the alpha numeric pad to enter a new password. Use rotary to select OK and press right to save.

Make sure you save your new password somewhere safe!!

6.8.2 Reference

The AERO.2000 can be referenced to:

• AES DARS (or any AES signal applied to the Ref In connector);

• AES In 1

• SDI

• Internal 48 kHz (standalone use only).

To set the reference input:

Press Left several times until the LQ-1000 main menu is reached.

1. System > Hardware I/O Setup > Clock Ref and Right to enter menu.
2. Select a clock ref and Right to check mark the selection. Clock sources are: Internal 48KHz, AES Ref In, AES in 1, SDI.
3. Use Left to exit to main menu.

Figure 6-14 shows the clock reference set to SDI. Note again the menu path displayed at the top.

See section 7.5 for additional information.
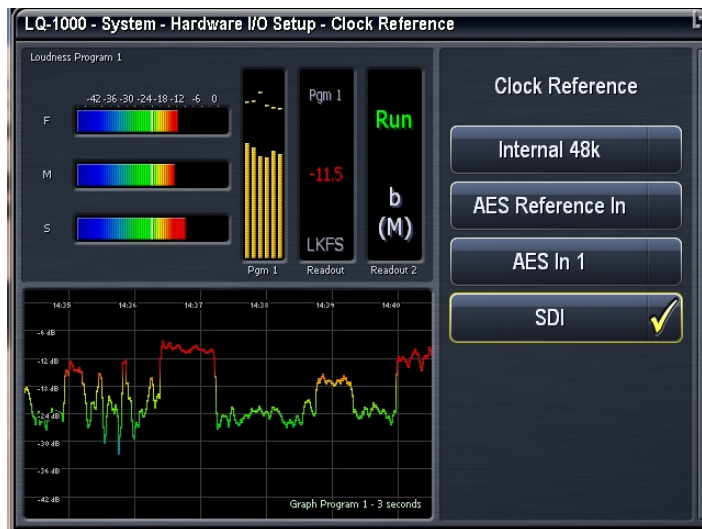
Figure 6-14 Clock Reference set to SDI

6.8.3 Audio Input Select

There are 13 audio input pairs to LQ-1000:

- 8 audio pairs embedded in an SDI input.

- 4 unbalanced AES digital audio inputs. (unbalanced 75ohm BNC connection).

- 1 AES Ref input (unbalanced 75ohm BNC connection).

A Dolby E, Dolby Digital (AC-3) or Dolby Digital Plus bitstream can be the program source on any embedded or AES digital audio input. A Dolby encoded bitstream cannot be connected to the AES Ref input.

Note!

When the input source is a Dolby encoded bitstream **the SRC Bypass must be enabled.** To do this select System > H/W I/O > SRC Bypass. Click to turn indicator yellow.

An example input configuration follows. In the example the source is SDI with LPCM audio embedded on pairs 1, 2, 3, and 4 (channels 1/2, 3/4, 5/6, and 7/8.) Channels 1 to 6 are the 5.1 and channels 7/8 are SAP (or other 2 channel audio program). From LQ-1000 main menu:

1. System > Hardware I/O Setup and press Right.

2. Use Up/Down to select Input 1/2 and press Right.

3. Select SDI 1/2 and press Left.

4. Repeat steps 2 and 3 for Inputs 3/4, 5/6, and 7/8 selecting SDI 3/4, 5/6 and 7/8, respectively.
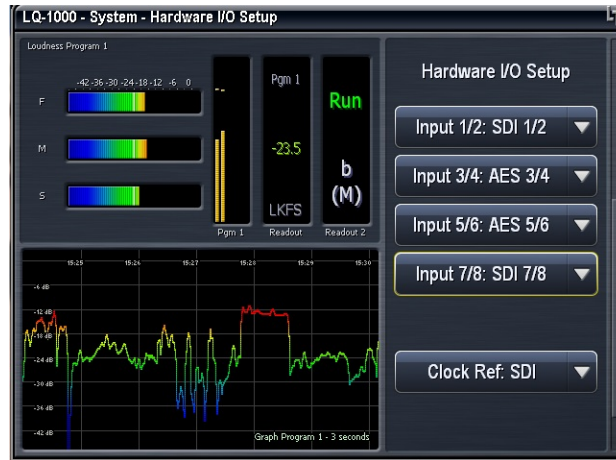
Figure 6-15 Input selection

6.9 Front Panel Navigation- Conclusion

We hope that after following along with the preceding front panel configurations that using the front panel is now a familiar task.

Here are two tips to remember when working from the front panel:

- If you ever get lost in the menu structure, pressing the Left arrow key several times will always take you back one menu level at a time and eventually to the top level of the menus.

- Remember that your location in the menu is always shown at the top of the front panel display.

The next section describes how to configure the LQ-1000 using NfRemote, a comprehensive remote control application.

Section 8 contains description of all of the LQ-1000 settings.

7 NfRemote and Configuration

The NfRemote IP remote interface software is an MS Windows client application that can be installed on most recent MS Windows desktop, laptop, or tablet PCs running Windows XP, Vista, 7, 8, and 10. Touchscreen support is provided for touch-sensitive devices.

All of the LQ-1000 parameter adjustments that can made using the front panel controls can also be made using the NfRemote client. The remote has additional capabilities:

- Streaming audio back over the local network to the host computer. Audio can be monitored pre and post processing and at several points internal to the LQ-1000. Audio can also be recorded to the host PC.

- System I/O presets can be saved to the host PC and restored from the host PC.

- The entire LQ-1000 configuration can be saved to, and restored from, the host PC.

- Presets and configurations can be shared between LQ-1000 units.

- Six meter configurations, each unique to a given PC, can be saved to the local PC and recalled at the push of a button.

- Multiple NfRemote sessions can be run on a single PC for metering and control of multiple LQ-1000 units.

- Multiple PCs can connect to LQ-1000 simultaneously for both metering and setup

7.1 Getting Connected

To begin using NfRemote connect your PC to the LQ-1000, either directly or on a network. If you have just started the LQ-1000 you will see the unlock screen. You do not have to unlock the front panel to use NfRemote. The current IP address of the unit is shown on the front panel unlock screen.

Note!

If the LQ-1000 IP address is 127.0.0.1 this indicates that there is not a valid IP connection to the LQ-1000.

If the LQ-1000 shows an IP address of 169.x.x.x it is connected to a valid Ethernet port but it cannot a fetch a DHCP address.

7.1.1 Downloading NfRemote From the LQ-1000 HTTP server

These instructions assume that the IP address of the PC being used has been entered in the LQ-1000 white list. If this has not been done, see section 6.6.

Make sure that your PC is in the same subnet as the LQ-1000 and connect to the LQ-1000 HTTP server using any browser. To do this enter the LQ-1000's IP address in the browser followed by the HTTP server's port number, 7380.

- In some browsers you simply enter the address and port of the LQ-1000: For example: 192.168.1.102:7380.
- In MS Internet Explorer you must enter: http://192.168.1.102:7380, replacing 192.168.1.102 with your LQ-1000's IP address.

Click on the NfRemote link in the HTTP server home page and save NfRemote.exe to your PC. Locate the exe on your PC and launch the installer and select **Install** from the menu. Go to 7.1.3

7.1.2 Start NfRemote From a Copy on your PC

The NfRemote version for your LQ-1000 is always available in the HTTP server and can be accessed as described above. The same NfRemote version is also on the USB flash drive that comes, in the box, with each new unit. The latest version of NfRemote can also be downloaded from our website.

Every new version of NfRemote is **backward compatible with all previous versions**. The same NfRemote is used for configuration, control and metering AERO.10/100/1000/2000 units. Always update your NfRemote when you update your LQ-1000 software. Below we will explain how to get started with NfRemote if you have the USB flash drive or you have downloaded NfRemote.exe from our website.

Once a valid IP address is displayed on the LQ-1000 make sure that your PC is in the same subnet (but not the same IP address as the LQ-1000). Find the NfRemote.exe on the USB flash drive or on your PC and drag it to your desktop.   Continue with 7.1.3, below.

7.1.3 Starting NfRemote

Launch the installer and select **Install** from the menu. See Figure 7-1.
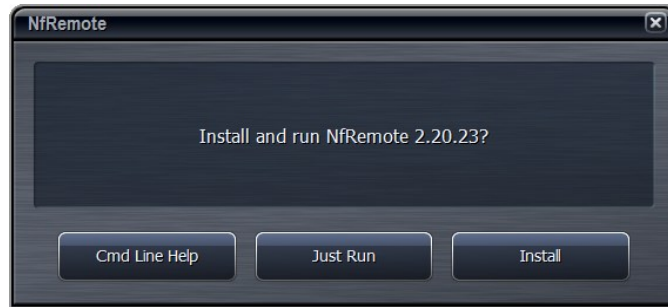
Figure 7-1 Remote software installer

1. Launch the NfRemote software (New Framework Remote)

2. Enter the LQ-1000 IP address, and password.

3. You can also add a name for the LQ-1000.

4. Click Add so that NfRemote remembers the entry.

5. Click Connect and NfRemote should connect to the LQ-1000.

6. See Figure 7-2, below.

Of course the PC must be connected to the same network and be addressed in the same subnet as the LQ-1000. On the work bench a PC may connected directly to the Ethernet port on the LQ-1000 using a straight Ethernet cable for the initial setup.
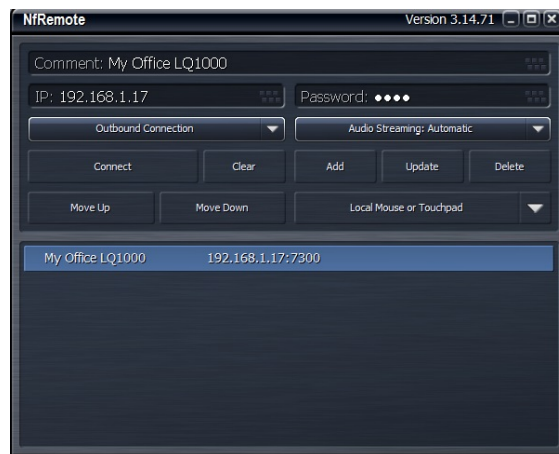
Figure 7-2 NfRemote Launch screen

Click Connect and the connection screen will be displayed and NfRemote will open.
See Figure 7-3.
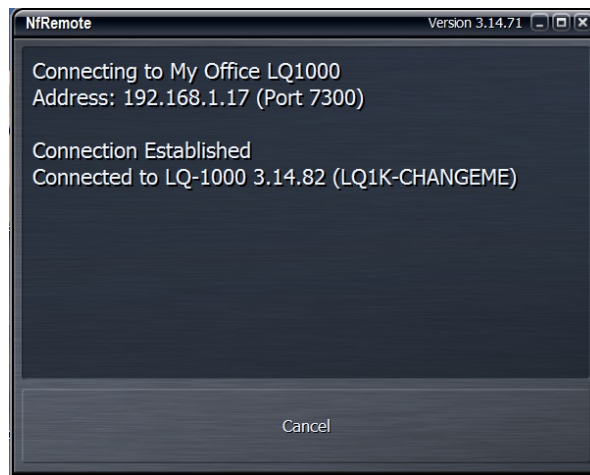
Figure 7-3 NfRemote connection screen

7.1.4 If NfRemote Fails to Connect

If NfRemote fails to connect make sure that there is an IP address shown on the unit's front panel display. If the front panel is not on the lock screen, navigate to the IP configuration screen to see the IP address.

System > Network Access > IP Configuration and read the IP address here.

Ensure that your PC is in the same subnet and has the same subnet mask and does not have the same IP address. Ensure that there are no address conflicts in the subnet. If there are still connection problems connect a PC directly to the LQ-1000 Ethernet port (not the reserved Ethernet port!). A straight Ethernet cable can be used. Change your PC Ethernet port IP address to something in the same subnet and subnet mask as the LQ-1000. After establishing a connection this way troubleshoot the network connection.

7.2 Using NfRemote

After successful connection, the remote starts at the Home Screen. The remote interface screen is fully re-sizeable and can be adjusted in the same manner as any MS Windows app screen via handles at each corner. The displays and windows will dynamically adjust themselves to make the best use of available screen real estate as you resize the window.

The first time NfRemote starts it is in Tree navigation mode. Tree navigation works in the same way that front panel navigation works. Each time you click a menu item it opens the next menu level and so on down through the menus. Breadcrumbs are shown in the space below the meters. Figure 7-4 shows the Home menu. Home is shown at left below the meters.

Figure 7-4 Home screen, Tree mode (default)

At the top of NfRemote are displays that indicate the LQ-1000's CPU load, client volume (streaming audio), headphone volume, and the host PC's CPU load. See Figure 7-4. In some cases, when the display is made smaller, these controls combine and a drop-down arrow appears allowing you to activate individual controls.

Note!

In no case should the LQ-1000 CPU load exceed 80% for any length of time. This should be a rare occurrence and may be due to an excessive number of simultaneous NfRemote connections.

7.2.1 Menu Button

Click the **Menu** button (top right) to select:
- Tree or Tabbed navigation
- Full screen meter display
- Lock the window's onscreen position, maximize the window
- Enter full screen mode, or close the window
- When the display is in meters only mode, place the mouse in any meter window and left click to return to the NfRemote configuration screen.

7.2.2 Display Presets

To the right of the **Menu** button are six Display Presets that quickly recall display configurations. Simply select a display preset from 1 to 6 and configure the display using the Display Settings menu. The Display Settings menu is available within the following menus:

- LQ-1000
- Client Audio Output
- Client Microphone Input
- Client File Recorder

The LQ-1000 remote software first appears with display preset 1 active. Any changes made to the screen (i.e., selecting between navigation modes, resizing window sections, or choosing the number and/or type of meters) are automatically saved in real time to Display 1. This works the same way for Displays 2 through 6. Switching back to this preset from any other automatically recalls your saved settings. Each Display Setting is saved on the local PC so every PC that connects can have 6 unique metering configurations instantly available. See Figure 7-5.

Figure 7-5 NfRemote Tabbed interface, Menu drop down

From any configuration screen you can click on any meter to go directly to the display setup page and specific settings for that meter.

7.3 Tree and Tabbed Navigation

Tree and Tabbed navigation refer ONLY to how information and controls are displayed on the screen, not to the number of controls available or their precision.

The default mode is Tree Navigation. This devotes the top of the screen to meter displays while the bottom is reserved for menus and controls. The area between these two sections displays breadcrumbs indicating where you are in the menu hierarchy. The on-screen arrows can be clicked to navigate between the most recently visited controls. The "ribbed" section of the display, to the far right of the

arrows, allows the top and bottom sections to be resized. Place your pointer in the ribbed area, left click, and drag to change the relative sizes of the meters and controls.

In Tabbed mode, all menus and all controls are displayed on the screen simultaneously. This mode inherently makes menus, controls, and their labels smaller but provides direct access to all menus items and associated controls without having to step through the menu structure in sequence.

This mode works best when the remote software window can be made large enough so that all text items can be easily read.

Notice in Figure 7-5 that you can see all of the sub-menus of System, all of the sub-menus of I/O Setup in the center section, and all of the available selections under I/O Setup in the bottom section. There are two size adjustments in Tabbed view. One adjusts the meter vs menu item size and the other the relative sizes of the center and lowest section of the menus.

7.4 Configure Time/Date settings

Do this first as setting the time zone requires a reboot of the LQ-1000.

- **System > Time/Date > Time Zone >** Select your time zone from the drop down.
- **System > Time/Date > Apply Time Zone** and **Yes** when dialog box appears. LQ-1000 will reboot.
- Set the current time and date manually in the **System > Time/Date > Set Clock** menu.
- If you know the NTP server addresses these can be set now even if the LQ-1000 is not currently on the network segment that can access them via the **System > Time/Date > NTP** menu. Set **NTP Synchronization Off** (dark indictor).
- Enter the NTP server address(s).
- Remove NTP server addresses that are not accessible to the LQ-1000
- Enable NTP Synchronization by turning **NTP Synchronization On** (yellow indicator). The clock will free run until the servers are found and then automatically use the NTP server time.

7.5 Clock Sync

The proper source synchronization must be set. For SDI input, select SDI as the clock reference:

- **System > Hardware I/O > Main > Clock Reference:** select **SDI** from the drop down
- If an SDI source is connected to the LQ-1000 the sync indicator in the upper left corner of the NfRemote display will be a solid silver color. If there is no SDI present, or the LQ-1000 cannot lock to it, the sync indicator will flash red. See Figure 7-6, below

Sync OK   Sync Fail
Figure 7-6 Sync Indicator

7.6 Configuring Meter Displays

Although up to eight meters can be shown on the NfRemote screen at once, each additional meter takes away screen space from the others. Depending on your monitor size you may find it practical to limit the number of meters on any one screen. Display presets can be used to quickly switch between different meter selections. Display presets can also be used to create full screen meter displays. More meters can be used for full screen view than are practical when the menus are visible.

To setup display preset 1 with 3 loudness meters as shown in Figure 7-7 start by clicking display preset 1 (next to Menu button) then:

1. LQ-1000 > Display Settings.

2. Display 1 > Program 1 > LM Program 1.

3. Display 2 > Program 1 Downmix > LM Program 1Dmx.

4. Display 3 > Program 2 > LM Program 2 shown in See Figure 7-7.

Figure 7-7 NfRemote Display Preset 1

To remove a meter from the Display click on Display Settings, select any Display and select "Off" from the menu.

To aid in setting up loudness controllers and also to evaluate content, there are several audio analyzers available in the Display settings menus:

For each Pgm there are meters for:

- Loudness Meter
- Loudness Graph
- EBU Loudness Range.

Instrumentation includes:

- Oscilloscope
- RTA
- FFT

The oscilloscope, RTA and FFT are valuable monitoring and diagnostic tools that can measure and display signals from the inputs to the LQ-1000. Extensive setup controls are provided for several meter types. An example is shown in Figure 7-8 below.

Figure 7-8 Settings for the loudness graph display

7.7 Configuring Loudness Meters

ATSC A/85 and EBU R-128 metering are both available. The selection is made here:

System > System Options > EBU Mode.

When the indicator is dark the loudness measurements are shown in LKFS units. When the EBU Mode indicator is yellow loudness measurements are in LUFS units. The EBU Mode selection is global. The selection may be changed while the unit is in operation. Remember that LKFS and LUFS units are identical.

Changing the metering mode will rest the LQ-1000 and close the NfRemote session. The reset takes approximately 1 second.

ITU-BS.1770-3 loudness meters for each program input are provided. The loudness meter is tied to a specific input, or downmix, and the meter integration settings can be different for Program 1 and Program 2 loudness meters. Program 1 downmix meter follows settings of the Program 1 meter. This allows program-specific monitoring if desired.

LQ-1000 > Loudness Meter Program 1

- The **Default Target Level** sets the LKFS measurement that corresponds to the desired audio LKFS target level.
- **Readout Precision** sets the number of decimal places in the LKFS digital display.
- **Downmix Type** sets the downmix sent to the Downmix LKFS meter. Choices are:
    o Lt/Rt II
    o Lt/Rt

- o Lo/Ro
- o Lo/Ro 90

- **Integrate On/Off** and **Reset** work together with the Readout selection. The Readout drop-down provides the selections for the digital readout meter. The times are the integration durations of the LKFS measurement displayed.
  - o Readout: 3
  - o Readout: 10
  - o Readout: 30
  - o Readout: Integrated
  - o Readout: Integrated (Gated)

- If Integrated or Integrated (Gated) are chosen the Integrate switch starts and stops the meter and Reset is used before the beginning a new measurement.

- There are three bar graphs in the loudness meter. **S (slow), M (medium) and F (fast).** The drop down for each of these allows the same selection of LKFS measurements to be shown on the bar graphs. The bar graph selections add 1 second integration to the choices.

- Note that the meter settings available here do not affect the loudness log readings.

- Remember that the meter setup for each Instance is independent.

- The setup screen for the Program 2 meter is shown in Figure 7-9 below.

Figure 7-9 Settings for the program 2-specific ITU meter

7.8 Configuring LQ-1000 I/O

Steps for selecting inputs is described below.

AES unbalanced digital audio output assignments are fixed and are always the meter outputs for Program 1 and Program 2. Program 1 may be 5.1 or other multichannel format from 2.0 to 5.1. AES-3 outputs 1/2, 3/4, and 5/6 are used for PGM 1 output. A stereo Program 1 source will always be on AES-3 output 1/2. Program 2 is only stereo and will appear on the AES-3 output 7/8.

7.8.1 Inputs

A typical SDI source with embedded LPCM audio is shown below:

- Embedded pair 1/2: Stereo or 5.1 Lf/Rf.
- Embedded pair 3/4: silent or C/LFE.
- Embedded pair 5/6: silent or Ls/Rf.
- Embedded pair 7/8: SAP (secondary audio program) or descriptive video service.
- Embedded pair 9/10 to 15/16 silent or not used.

Navigate to System > H/W I/O. Select the drop down for each input and select the sources as shown:

1. Input 1/2: SDI 1/2
2. Input 3/4: SDI 3/4
3. Input 5/6: SDI 5/6
4. Input 7/8: SDI 7/8

Select "Clock Source" and then select "SDI" from the drop down. If an SDI source with embedded LPCM audio is connected the meters will begin to show audio levels. See Figure 7-10. Note that the Display setting is 2 and the meter configuration is different than in Figure 7-9.

There is an SRC Bypass button in the H/W I/O menu. When the indicator is dark it shows that the SRC (sample rate convertors) are active on all audio inputs. This is the normal operating mode for LPCM sources.

> ### Note!
>
> When a source is a Dolby E, Dolby Digital or Dolby Digital Plus encoded audio stream, **the SRC must be placed in Bypass.** Click the button and the indicator will turn yellow.

Figure 7-10 LQ-1000 input source selection

7.8.2 Outputs

The LQ-1000's AES-3 unbalanced digital outputs always have Program 1 and Program 2 audio present as follows:

1. Output 1/2: Program 1 stereo or Lf/Rf
2. Output 3/4: Program 1 C/LFE
3. Output 5/6: Program 1 Ls/Rs
4. Output 7/8: Program 2 stereo

7.9 Configure GPI

There are four front panel buttons to the left of the display plus eight additional pull-to-ground GPIs in the new LQ-1000. All twelve of these can be configured individually.

The front panel buttons and the GPI's have defined functions available from a pull-down list available in the GPI menu as shown in Figure 7-11 below:

Figure 7-11 GPI menu

Each of the three digital display meters can be placed in integration mode and the measurement can be started, stopped, and reset. To access the configuration menus:

- **System > GPI > Main**.
  - o   This enables and disables the GPIs and buttons.
  - o   The GPIs must be disabled to make or change settings.
- **System > GPI > GPI A-D**
  - o   This menu allows the function of GPIs 1-4 to be configured.
- **System > GPI > GPI E-H**
  - o   This menu allows the function of GPIs 5 - 8 to be configured.
- **System > GPI > Front Panel Buttons**
  - o   This menu allows the function of four front panel buttons to be configured
  - o   The buttons have a latch mode to allow a single press to hold a function true until the button is pressed again.
  - o   For instance, use a latch on a meter Run command to press and release the button to start an integrated measurement.

7.10 NfRemote Conclusion

We hope that that this section has helped to provide our users with an understanding of how to navigate the remote menus and a get a good start in configuring the LQ-1000 using NfRemote.

Section 8 contains description of all of the LQ-1000 settings.

8 LQ-1000 Reference Guide

The LQ-1000 Reference Guide is organized by the main menu headings found in both the front panel menu display and the NfRemote display. These main menu headings are:

- System
- LQ-1000
- Headphone Output
- Client Audio Output
- Client Microphone Input
- Client Recorder
- Client IP

8.1 System

System > Information menu contains information that can be used for upgrades and support.

System > Information > System Information
- Software version
- GUI version
- FPGA version
- CN1000 version

System > Information > Network Information
- IP Address
- MAC address
- Number of current connections

System > Information > Audio I/O Status
- Audio sample rate
- Jitter
- Up time

System > Information > Monitor Out Status
- Source of headphone feed
- SRC overrun/underrun

8.1.1 H/W I/O

System > H/W I/O menu is where the audio sources are chosen.

System > H/W I/O > SRC
- Sample rate conversion active (dark indicator)

- Sample rate conversion bypass (yellow Indicator)
- Normal configuration is sample rate conversion active. The audio sample rate of the selected sources will be adjusted based on the clock reference.
- The SRC MUST be bypassed for Dolby encoded sources.

System > H/W I/O > Input Source X/Y
- Audio source for LQ-1000 meter inputs selected for Inputs 1/2 through 7/8.
- Inputs 1/2, 3/4, and 5/6 are for audio Program 1.
- Stereo source for Program 1 MUST be assigned to Input 1/2.
- 5.1 audio sources must be assigned as follows:
    - 1/2 = L/R or Lf/Rf
    - 3/4 = C/LFE or silent
    - 5/6 = Ls/Rs or silent
- Program 2 is for a stereo source assigned to Input 7/8

System > H/W I/O > Clock Reference
- Click for drop down
- Select Clock Reference source

Figure 8-1 LQ-1000 H/W I/O Menu- Clock Reference selections

8.1.2 GPI

System > GPI allows selection of front panel button functions and GPI functions. Functions include recall of presets and start, stop and reset of loudness meters for Program 1, Program 1 downmix and Program 2.

System > GPI > Main
- Click to Enable GPI function (yellow indicator)
- Click to disable GPI function (dark indicator)
- GPI must be disabled (dark indicator) to make any changes to GPI functions.

System > GPI > GPI A-D (and > **GPI E-H**)
- Click drop down for each GPI, A to D, to select function to be controlled.
- Functions include:
    - o   Input Preset selection
    - o   Run/Reset for Program 1, Program 1 downmix and Program 2 meters
- Click LO/A drop down to choose function when GPI is pulled LO.
- Click HI/B to select function when GPI is in normal Hi state.
- Click Latch to hold Lo/A selection if GPI closure to ground is momentary.
- Figure 5-2 shows latching selection to recall a source preset called AES 1-8.

Figure 8-2 GPI Menu

System > GPI > Front Panel
- Click drop down for each GPI, A to D, to select function to be controlled.
- Functions include:
    - o   Input Preset selection
    - o   Run/Reset for Program 1, Program 1 downmix and Program 2 meters
- Click LO/A drop down to choose function when button is pushed.
- Click HI/B to select function when button is released

8.1.3 Password

System > Password
- To change the, password press Clear Password.
- Enter a new password in Enter Password field and again in Repeat password field.
- Clear Password button now changes to Set Password. Press Set Password.
- **There MUST be a password saved or the LQ-1000 will need to be sent back to the factory to be unlocked.**
- If you have entered a valid address in the LQ-1000 and whitelisted a PC running NfRemote, it is possible to recover from a lost password situation without sending the unit back to the factory.

8.1.4 IP Options

System > IP Options
System > IP Options > **IP Cfg**
- Use DHCP is active by default (yellow indicator). Click to turn DHCP Off (dark indicator)
- If DHCP is Off a fixed IP address, network Mask, Gateway and DNS addresses can be entered.
- If the LQ-1000 has Internet access for NTP time the DNS server addresses can be entered. DNS servers may also be used on a large private network.
- Click Apply before leaving this menu.
- Do not enter leading zeroes in IP addresses

System > IP Options > Outbound Connection
Normally an instance of NfRemote running on a PC initiates the connection to LQ-1000. This is called an "Inbound" connection. There are some situations where it is more appropriate for LQ-1000 to initiate the connection to an instance of NfRemote on a remote computer. This is called an "Outbound" connection and is done using the Outbound Connection menu.

One example of how this can be used is for technical support. By creating an outbound connection, the user can connect to a remote support engineer's NfRemote computer which in turn allows them to control the LQ-1000.

In such a situation, the remote engineer would provide an IP address (or host name) and a port number. An example of a valid address is 123.45.67.89:7373. This address would be entered in the Host field and the Connect button is clicked.

Because IP addresses are commonly dynamically allocated, using a host name is the preferred method. Up to three outbound connections can be saved for quick recall.

System > IP Options > HTTP Access
There is an HTTP server built into the LQ-1000. From the HTTP server a user can access LKFS measurement logs, a manually operated LKFS log, the IP based commands, and a copy of NfRemote. To access the HTTP server a server or host PC must be in the HTTP whitelist. There is room for up to eight white list entries.

Wild cards can be used in the whitelist to allow an entire range of addresses and/or subnets to be allowed.

Only computers that have their IP addresses in the HTTP white list, found in HTTP Access, can access the unit's HTTP server. We recommend that an IP address in the same subnet as the LQ-1000 IP address be immediately entered in the white list and stored in a safe place. A computer can be connected directly to the unit's Ethernet port using an ordinary Ethernet cable.

By setting the computer's IP address and subnet mask to the same IP and subnet mask stored in the white list the computer can access the LQ-1000 HTTP server. This access can even allow you to recover from a lost password!

8.1.5 Time/Date

System > Time/Date
Setting the time and date accurately ensure that the LKFS logs have accurate time and date entries.

System > Time/Date > Time Zone
- Click time zone drop down and select your time zone
- Click Apply Time Zone
- The unit will warn you that setting a new time zone will reboot the unit.
- After reboot reconnect with NfRemote.

System > Time/Date > NTP
- If NTP Synchronization is active (yellow indicator) click to turn NTP Off.
- When NTP Sync is Off NTP server addresses can be entered. These can be servers on your network or, if the LQ-1000 has access to the Internet, internet time serves can be used.
- Current time, date and day of the week is shown.
- If NTP will be used activate NTP Sync before leaving this menu.

System > Time/Date > Set Clk
If NTP time will not be used or the NTP server is not available at setup the time can be manually set.
- If time settings are grayed out NTP is active.
- Go to System > Time Date > NTP and click NTP Sync to turn NTP Off.
- Return to System > Time date > Set Clk
- Set current time and click Apply
- Set Current Date and click Apply.
- If NTP will be used return to System > Time Date > NTP and click NTP Sync to turn NTP On. The clock will free run until an NTP server is reached.

8.1.6 Backup

System > Backup
Backup and Restore functionality allow the configuration of the LQ-1000 to be saved and recalled and shared among LQ-1000 units.

System > Backup > Backup
Clicking Backup opens File Manager on the host PC. The configuration can be named and saved anywhere in the host PC or a network location.

System > Backup > Restore
Clicking Restore opens a file manager window on the host PC and allows the PC and the local network to be accessed and a configuration to be chosen to be restored.

System > Backup > Password
Clicking Restore opens File Manager on the host PC. A configuration can be selected from a location anywhere in the host PC or a network location.

System > Backup > IP configuration: Retain
After an LQ-1000 is configured this file can be saved and restored on any number of LQ-1000 units. When this is done to deploy a standard configuration to many LQ-1000's, the IP addresses of each individual LQ-1000 can be retained. Choose IP configuration: Retain from the drop down.

System > Backup > IP configuration: Override
If the intent is to restore an individual LQ-1000 to the saved configuration or to replace an LQ-1000 with another unit (such as a factory loaner) then select IP configuration: Override. This will write the IP address stored in the configuration over the existing IP address.

8.1.7 Maintenance

System > Maintenance
 The Maintenance menu is used for software updates and firmware updates.

System > Maintenance > Upload Software

Note!

Before doing any software or firmware upgrade always read all of the information included in the update file. Updates can take anywhere from seconds to an hour. The included notes will explain how to apply the update.

- Clicking Upload software opens File Manager on the local PC.
- Locate the unzipped .pak update file and double click.
- The software version will be displayed and the Install button will be active.
- Click Install.
- Follow the install instructions.
- If there is also a firmware update the Update Firmware button will be active.
- Follow install instructions.

System > Maintenance > Power Cycle
This button may be used to power cycle the unit. The use of this button may be included in the instructions for software or firmware upgrades.

System > Maintenance > Re-initialize Software
In the event that you require technical assistance a factory engineer may request
that the re-initialize software button be pressed.

8.1.8 Upgrades

System > Upgrades
The text input window in this menu item is used to enter upgrade codes.

8.1.9 System Options

System > System Options
The only option present in the current LQ-1000 software is EBU metering mode.

1   Click EBU Mode to enable it (yellow indicator)
2   Click Apply Config
3   The LQ-1000 will show a confirmation screen.
4   Select Yes to continue
5   Select No to wait before initiating the change

8.1.10 TCP Link Status

System > TCP Link Status
This is an information screen showing statistics and information about the TCP link
to the NfRemote host PC.

8.2 LQ-1000

8.2.1 Load Preset

LQ-1000 > Load Preset
The Load Preset menus allows the user to manually load and switch between LKFS
meter configurations. Display Settings are NOT recalled with presets as these are
stored on each individual host PC that runs NfRemote and are not part of the
physical LQ-1000 configuration.

- LQ-1000 > Load Preset > Current Preset shows the current preset
- The current preset is also shown in the LKFS meter. See Figure 7-3.
- In the display area stored presets are shown.
- Select a preset and it appears in the Load: button
- Click the load button to make the preset active.
- A preset can also be double-clicked to immediately make it active.
- The preset that is replaced appears in the Recall Backup button.

LQ-1000 > Load Preset > Delete
This will remove a highlighted preset from the list.

LQ-1000 > Load Preset >Load From

This opens File Manager on the local PC to allow a stored preset to be recalled.

LQ-1000 > Load Preset > Diff Preset
Highlights all of the preset settings, in the NfRemote menus, that are different between the current preset and the last preset selected.

Figure 8-3 Load Preset Menu

8.2.2 Save Preset

LQ-1000 > Save Preset
The Save Preset menu allows the current configuration to be saved. The current name appears in the text box. This name can be edited.

LQ-1000 > Save Preset > Save Preset
This saves the named preset in the LQ-1000. The name appears in the list of presets seen in the LQ-1000 > Save Preset > Recall Preset menu.

LQ-1000 > Save Preset > Save to PC
This selection opens the host PC and allows saving Presets to any location on the host PC or the local network.

8.2.3 Dolby Decoder

LQ-1000 > Dolby Decoder
A Dolby encoded bitstream selected as the source for Input 1/2 will be decoded and technical information about the bitstream will be displayed here.

LQ-1000 > Dolby Decoder > Decode 7/8
If the audio source is a Dolby E bitstream the Decode 7/8 button selects whether or not audio on channels 7/8 of the Dolby E bitstream are sent to the LQ-1000 Input 7/8.

LQ-1000 > Dolby Decoder > Apply DRC %
Any percentage of the dialnorm metadata value can be used to set the gain reduction of the received audio channels according the % entered here.
For instance, if the dialnorm metadata value is 24 and the Apply DRC: is set to 100% then 7 dB of attenuation will be applied to the audio channels BEFORE measurement and output from the AES-3 BNC connectors.

8.2.4 Loudness Meter Program 1

Loudness Meter settings are where the three available loudness meters are configured.

LQ-1000 > Loudness Meter Program 1 > Default Target Level:
In the absence of externally applied dialnorm metadata the **Default Target Level** sets the: reference line on the LKFS bar graph meters; bar graph and digital meter color changes, histogram graphic color changes.
- Levels approximately +/- 2 dB around the Default target will show as green.
- Lower levels show is progressively darker shades of blue.
- Higher levels show in colors ranging from yellow through orange and then red.

LQ-1000 > Loudness Meter Program 1 > Readout Precision
This drop down allows the digital meter to display in steps of:
- integers
- 0.5 dB
- dB

LQ-1000 > Loudness Meter Program 1 > Downmix Type
Program 1 can be a 5.1 program and the Program 1 metering includes a meter for the 5.1 downmix. This drop down selects the type of downmix to meter. Selections are:
- Lt/Rt
- Lt/Rt II
- Lo/Ro
- Lo/Ro 90 °

LQ-1000 > Loudness Meter Program 1 > Integration Time > Fast
There are 4 drop down boxes under Integration Time. These are Fast, Medium, Slow and Readout. These correspond with the 3 bar graph meters labeled F, M and S and the digital display. The selections in the drop down are:
- 400 ms
- 1 sec
- 3 sec
- 10 sec
- 30 sec
- Integrated
- Integrated with gating

Each meter has individually selectable integration time.

LQ-1000 > Loudness Meter Program 1 > Integrate
This button starts the integration of loudness on any meter set to Integration or Integration with gating.
- Integration on/off and reset can be controlled from this menu manually.
- Integration on/off and reset can be controlled by the front panel buttons.
- Integration on/off and reset can be controlled by GPI.
- Integration on/off and reset can be controlled by commands over Ethernet.

LQ-1000 > Loudness Meter Program 1 > Reset
This button resets the integration of loudness on any meter set to Integration or Integration with gating. See Integrate, above.

The Program 1 downmix meter follows the settings of the Program 1 meter.

8.2.5 Loudness Meter Program 2

Loudness Meter Program 2 works identically to Loudness Meter Program 1 with one exception. There is no down mix meter.

Loudness Meter Program 2 measures the level of the audio program routed to Input 7/8.

8.3 TCP Link Status

This is the same display described in 4.2.7, above.

8.4 Display Settings

LQ-1000 > Display Settings
The Display settings menu contain the configurations for all of the available LQ-1000 metering. Up to eight meters can be configured in a single view. There are 6 display presets that can each have their own view. These six presets are found next to the Menu selection at the top right of the NfRemote screen. Simply select a view and then configure the desired meters in that view.

LQ-1000 > Display Settings > Display 1

There are 4 meter menus available for Display 1:
- Program 1
- Program 1 Downmix
- Program 2
- Instrumentation
- Off
- These same choices are available for Displays 2 through 8.

LQ-1000 > Display Settings > Display 1 > Program 1

Program 1 has three meters to choose from:
- LM (loudness meter) Program 1
- Grf (graph) Pgm 1
- LRA Pgm 1
- The same choices are available for Pgm 1 Downmix and Pgm 2.
- LM Program 1 and LRA Program 1 have a delay control. This can be used to delay the meter readout to match picture.

LQ-1000 > Display Settings > Display 1 > Instrumentation

Instrumentation has 4 meter selections:
- Oscilloscope
- RTA
- FFT
- Client Audio Meters (future use)
- Each meter has configuration options which include a choice of the source audio channel(s) to be monitored.
- See Figure 8-4, below. It shows 6 meter displays in a view saved in display preset 2. The displays are RTA of a 5.1 program. The display of the LFE meter has been changed from the default values. See Figure 8-4 below

Figure 8-4 Display Settings RTA configuration

8.5 Headphone Output

The headphone Output menu controls the audio output to the front panel headphone jack. Test signals, L/R level controls, dynamic and fixed filters, EQ, delay, phase, and monitor limiting can be adjusted to provide precise control over monitoring.

A brief description of where to find the Headphone Output controls follows. Instructions on using these controls for calibration is beyond the scope of this manual, but an audio professional can assist users in creating an accurate monitoring environment according to the specific aims and desires of a user's specific situation.

Headphone Output > Patch Point
In this menu the input source feeding the headphone output is chosen. For multichannel input programs the type of stereo down mix is chosen here.
The level control is also located here.

Headphone Output > Load Preset and **Headphone Output > Save Preset**
The Load Preset and Save Preset menus are identical to the menus under LQ-1000 except that these files affect only the headphone output, not the configuration of the LQ-1000 itself. See 4.3.1 and 4.3.2 above. Settings in the Headphone Output menus can be saved and recalled using these Save Recall.

Headphone Output > Main
There are five processing submenus found here. These settings provide extremely fine control over the headphone output audio.

Channel Coupling, when active (yellow indicator) automatically makes changes to the right channel EQ and delay settings when a left channel adjustment is made.

Headphone Output > Loudness
Up to 6 bands of loudness control can be turned on in this menu. Each band also has a parametric EQ associated with it. Minimum and maximum levels can set in each band. This can be used to compensate for perceived loudness curves at a preferred listening level, for protection from high levels, or to improve listening in a loud environment.

Headphone Output > Left EQ and **Right EQ**
12 bands of parametric EQ are provided. When Channel coupling is active (under **Main** submenu) the Right EQ controls are inactive as all left channel changes will be automatically copied to the right channel.

Headphone Output > TCP Link Status
This is the same display described in 4.2.7, above.

8.6 Client Audio Output

The LQ-1000 can stream stereo and 5.1 audio (or a downmix of 5.1 audio) over the network connection between the LQ-1000 and remote PCs. If the network connection has sufficient bandwidth the audio is transmitted at a high bit rate and provides excellent audio quality.

The audio can be heard using a PCs built in speakers for reference or a high quality multichannel sound card can be used instead. Extensive calibration tools are provided to help the user to create a very high quality listening environment in any suitable location.

A brief description of what controls are available in the Client Audio Output menus follows. Instructions on using all of these controls to create a calibrated listening environment is beyond the scope of this manual, though an audio professional can assist users in creating an accurate monitoring environment according to the specific aims and desires of a user's specific situation.

Client Audio Output > Patch Point
Like the headphone output patch point the client audio output patch point provides selections of what audio to monitor over the IP audio link. The controls in the section include:

Client Audio Output > Patch Point > On/Off.
Starts and stops audio to the host PC

Client Audio Output > Patch Point > SRC On/Off.
Normally On the sample rate convertor will eliminate timing issues with playback on the PC or attached sound card.

Client Audio Output > Patch Point > Sound card
Provides selection of PC soundcard or other attached audio interface

Client Audio Output > Patch Point > Downmix drop down
Select type of downmix when monitoring a 5.1 mix in stereo.

Client Audio Output > Patch Point > Client Volume
Adjusts level of the audio output

Client Audio Output > Patch Point > Audio Buffer
Normally 200ms but can be adjusted to compensate for slower network connections.

Client Audio Output > Patch Point > I/O
Allows selection of the LQ-1000 audio sources to be monitored. Selecting Input 1-6 will bring all 6 channels of a 5.1 program to the host PC.

Client Audio Output > Patch Point > Monitor Out allows the input and output of the Headphone Output processing to be auditioned.

Client Audio Output > Load Preset and **Client Audio Output > Recall Preset**
The Load Preset and Save Preset menus are identical to the menus under LQ-1000. See 4.3.1 and 4.3.2 above. Settings in the Client Audio Output menus can be saved and recalled using these Save Recall.

Client Audio Output > Main through **Right Surround EQ**
There are 17 submenus with processing settings to help create an accurate monitoring environment in any suitable location. Or in multiple locations since all of the settings in this section can be saved and recalled for later use. The processing is very similar to the settings found in the **Headphone Output** menu. There are, however, several additions to better serve 5.1 monitoring.

Client Audio Output > Bypass
All client audio processing can be bypassed and a gain offset is provided so that comparisons can be made between processed and unprocessed audio at the same listening levels. The differences in sound in this case should be from the processing and not simply the level change.

Client Audio Output > Patch Point > Client Audio Output > Let Front EQ through
Right Surround EQ
Equalization is provided for all 6 outputs of a 5.1 program to allow the best match
between each speaker and the room.

Client Audio Output > Patch Point > Client Audio Output > TCP Link Status
This is the same display described in 4.2.7, above.

Client Audio Output > Patch Point > Client Audio Output > Display Settings
This is the same display described in 4.3.7, above.

8.7 Client Microphone Input

The output of the pink noise generator in LQ-1000 can to be played through a
connected speaker system so that the combined speaker and room response can be
captured by a measurement microphone connected to the host PC sound card.
Microphone EQ is provided to correct the frequency response of a microphone used
for measurement. Presets for the microphone EQ can be saved. Using the
Instrumentation meters with the **Client Microphone Input** creates a complete
speaker/room response measurement and correction system.

> *Note!*
>
> _____
>
> All of the Instrumentation meters, the oscilloscope, RTA and FFT, have
> the Client Mic Input as a source in the **Display Settings > I/O input
> menu.**
>
> _____

Client Microphone Input > Input Device
This is a drop down. Choose the host PC microphone or a sound card input where
an external measurement microphone is connected.

Client Microphone Input > Load Preset and **Recall Preset**
The Load Preset and Save Preset menus are identical to the menus under LQ-1000.
See 4.3.1 and 4.3.2 above. **EQ** settings for the measurement microphone and gain
settings in the **Main** submenu are saved in recallable presets.

Client Microphone Input > Main
This menu contains gain controls for the microphone input.

Client Microphone Input > EQ
This menu has 12 bands of parametric EQ for flattening the frequency response of
measurement microphones.

Client Audio Output > TCP Link Status
This is the same display described in 4.2.7, above.

Client Audio Output > Display Settings
This is the same display described in 4.3.7, above.

8.8 Client File Recorder

There are three Client File Recorders in NfRemote. For documentation of content or trouble shooting or assistance with loudness management settings the file recorders can be invaluable. Recording is done to the host PC hard drive. Recordings can be made of all 6 channels of a 5.1 source or any stereo pair can be chosen. All three recorders can be run simultaneously. Bit rate reduction is done using the Nicam algorithm.

Client File Recorder > Client File Recorder 1 (or 2 or 3)
Settings for Recorder 1 appear below. There are identical controls for Recorders 2 and 3.

Client File Recorder > Client File Recorder 1 > Record
- Starts the recording
- The amount of free space on the host drive is shown

Client File Recorder > Client File Recorder 1 > Start All
This button will start all 3 recorders simultaneously.

Client File Recorder > Client File Recorder 1 > Name:
Click in this text field to enter a name for the recording.

Client File Recorder > Client File Recorder 1 > Folder:
Click in this text field to change the folder where the recording will be saved.

Client File Recorder > Client File Recorder 1 > Gain
Adjusts incoming level to the recorder.

Client File Recorder > Client File Recorder 1 > Split
- Automatically breaks the recording into the selected file size.
- No recording time is missed if a split is selected.

Client File Recorder > Client File Recorder 1 > Vox
This will start and stop recording automatically based on audio presence.

Client File Recorder > Client File Recorder 1 > I/O
- Select the LQ-1000 Input to record.
- Selecting Input 1-6 will record all 6 channels of a 5.1 source in a single file.

Client File Recorder > Client File Recorder 1 > Monitor Out
The source of the headphone output can be recorded or the output (post processed)
of the headphone output can be recoded.

**Client File Recorder > Client File Recorder 1 > Client Audio Output > TCP Link
Status**
This is the same display described in 4.2.7, above.

**Client File Recorder > Client File Recorder 1 > Client Audio Output > Display
Settings**
This is the same display described in 4.3.7, above.

8.9 Client IP Options

Client IP > Host Information
Information about the host PC is found here

Client IP > Outbound Connection
This menu is also available under IP Options in section 1.4.5. Please see 1.4.5 for
details.

9 Specifications

9.1 I/O Signal Specifications

Sampling Rate: 32-96 kHz, 48kHz nominal ± 0.1%)

Word Length: 16 to 24-bits

Measurement Algorithm: ITU-R BS.1770-3

Measurement Displays: ATSC or EBU

Digital Audio Inputs: Four unbalanced, female, BNC connectors. AES-3ID-2001/SMPTE 276M. Internal 75-Ohm termination.

Digital Audio Outputs: Four unbalanced, female, BNC connectors. AES-3ID-2001/SMPTE 276M specifications.

Metadata Input/Output: RS-485, 9-pin female D-connector on rear panel

GPIO Port: TTL level, activate low, 25-pin female D-connector

Ethernet port: RJ-45 female jack. 10-1000 BASE-T.

Analog Headphone Output
>   **Frequency Response:** 20 Hz–20 kHz, ±0.5 dB
>   **Distortion:**   Less than 0.1% at 1 kHz
>   Less than 0.2%, 20 Hz–20 kHz
>   **Output Level:** +12dBu maximum into 600 Ohms

SDI
>   HD/SD-SDI I/O
>   Audio can be de-embedded (demuxed) from any of the 8 audio pairs.
>   Audio can be re-embedded (muxed) into any of the 8 audio pairs
>   Signals per SMPTE 299M-2004/292M-2004.
>   Metadata can be extracted from VANC per SMPTE 2020 A or B.
>   Supports 1080i/720P

9.2 Electrical

Power Requirements: 90-240 VAC, auto-sensing, 50–60 Hz
Power Consumption: 40 W maximum
EMC Radiation Limits FCC Part 15 Class A, ICES-003

9.3 Physical

Dimensions: 3.5 x 19 x 17 in (8.9 x 48.3 x 43.2 cm)
Net Weight: 10 lb. (4.5 kg) approx.
Shipping Weight: 14 lb. (6.4 kg) approx.
Operating Temperature: 0° C to 50° C, fan cooled
**Non-Operating Temperature: (Storage)** –20oC to +70oC
Humidity Up to 98% relative humidity, non-condensing

9.4 Metadata I/O Port

9-pin female D-connector with full-duplex RS-485 protocol running at 115 kbps. Pinout is compatible with SMPTE 207M. Pin-for-pin compatible with Dolby metadata sources (i.e. straight-through cable should be used.

9.4.1 Metadata I/O Port Pinout

| Pin	Connections
1	Shield
2	TX A asynchronous data out –
3	RX B asynchronous data in +
4	Ground
5	NC
6	Ground
7	TX B asynchronous data out +
8	RX A asynchronous data in –
9	Shield
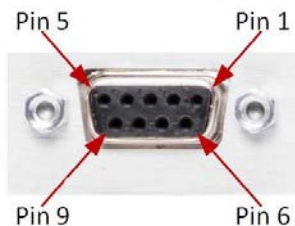
9.5 General Purpose I/O

9.5.1 GPI/O Parallel Control Port

GPI's must be held low to activate their assigned function, or latching mode can be selected in the GPI menu. The 5-V output for external GPO indicators is limited by a self-resetting fuse.

9.5.2 GPI/O Connector

Pin Function Pin Function

Pin	Function	Pin	Function
1	+ 5 V (150 mA)	14	+ 5 V (150 mA)
2	GPI A (Hold Low=On)	15	Ground
3	GPI B (Hold Low=On)	16	Ground
4	GPI C (Hold Low=On)	17	Ground
5	GPI D (Hold Low=On)	18	Ground
6	GPI E (Hold Low=On)	19	Ground
7	GPI F (Hold Low=On)	20	Ground
8	GPI G (Hold Low=On)	21	Ground
9	GPI H (Hold Low=On)	22	Ground
10	Unit Status (NC): Open = OK	23	Unit Status: Common
11	Unit Status (NO): Closed = OK	24	GPO 1
12	GPO 2	25	Ground
13	Ground		
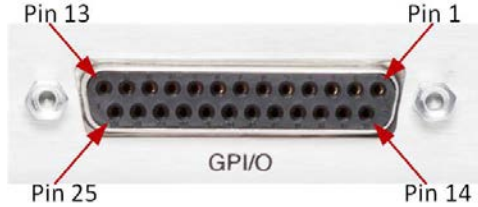
9.6 LQ-1000 Rear Panel

Figure 6-1 LQ-1000 back panel

4 AES-3 unbalanced BNC inputs and outputs.
Channels 1/2, 3/4, and 5/6 are for surround. Lf/Rf, C/LFE, Ls/Rs. A stereo only signal can be applied to the 1/2 inputs and it will be measured correctly. Channel 7/8 is for a secondary stereo source.

Metadata
DB9, female connector is an RS-485 connection that accepts the metadata output of any Dolby equipment (DP572, DP570, etc...) or any Dolby-compatible metadata source. Metadata is currently only used for limited display in the "System Info" menu.

SDI Input
Any of the 8 possible audio pairs from an applied HD/SD-SDI signal can be de-embedded and used in place of or along with AES inputs. This can be selected in the System Options->**I/O Options menu on a pair-by-pair basis.**

SDI Output
Up to 8 audio pairs, including the Main outputs and audio channels present in the applied SDI signal, can be re-embedded. Pairs in the SDI stream can also be passed through in a bit-accurate manner, allowing pre-encoded Dolby E or AC-3 bitstreams to pass untouched. AES outputs remain active in parallel with embedded audio.

GPI/O
Used to remotely control meter Start/Stop, Apply, Reset, and Next Screen and Input presets. There are 8 pull to ground commands.

Ethernet
Automatically senses 100 or 1000BASE-T Ethernet connectivity. NfRemote application, access to the built-in HTTP server for control and logs, downloading NfRemote application and NTP time service. The LQ-1000 has DHCP enabled and the unique MAC address is displayed in the System Info menu.

A fixed address can also be assigned to the unit. If the unit displays and IP address of 127.0.0.1 it indicates that the Ethernet port is not connected to a network or PC. The use a crossover is NOT required for direct connection to a PC.

Future
The Future port is for future I/O use.

VGA
The 15 pin VGA connector can be used to display the front panel on a larger/remote VGA monitor.

AC Power
The dual AC power connectors provide inputs for AC power coming from two different AC power circuits to protect against power loss.