NAC-100 Network Audio Controller User Manual

NAC-100-BK
NAC-100-WH

TD-000270-00 rev.A

IMPORTANT SAFETY PRECAUTIONS & EXPLANATION OF SYMBOLS

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous" voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to humans.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in this manual.

SAFEGUARDS
Electrical energy can perform many useful functions. This unit has been engineered and manufactured to assure your personal safety. Improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards, observe the following instructions for its installation, use and servicing.

CAUTION: To reduce the risk of electric shock, do not remove the cover while power is applied. No user-serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: To prevent fire or electric shock, do not expose this equipment to rain or moisture.

1- Maximum operating ambient temperature is 50°C (122°F).
2- Connect the unit only an IEEE 802.3af compliant power sourcing device

FCC INTERFERENCE STATEMENT NOTE:
This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by switching the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

Introduction

Congratulations and thank you for your purchase of this professional network audio controller. To get the most from your investment, we recommend you review all the information provided in this User Manual.

The NAC-100 is a network audio controller allowing the system designer to create custom, graphical user interfaces using QSControl.net™ Venue Manager version 3.1 (or higher) systems. Bridging the gap between simple switch closure or potentiometer controls on one hand and sophisticated (and expensive) touch panel or computer-hosted control on the other, the NAC-100 will be at home in hospitality, convention, transportation, entertainment, worship and educational facilities. The NAC-100 operates via PoE (Power Over Ethernet, not included). Wiring consists of a single CAT-5 cable terminating to an RJ45 connector.

Creation of the custom, graphical user interfaces is accomplished within the Venue Manager environment where the system designer can add Screens and *Control Items*. Each Screen can be thought of a menu of *Control Items*. Each *Control Item* can be used for recalling Global Presets, screen navigation, and/or assigning the *Rotary* to Masters (Masters are created in Venue Manager and allow the system designer to control various parameters of any number of audio channels). Operation and screen navigation are accomplished by means of five push-buttons arranged in an intuitive left/right, up/down configuration plus a rotary encoder. When multiple NAC-100 controllers control a single system, changes made from one unit will be reflected on the displays of others. For applications in which room diagrams, corporate logos or other graphical elements are desired, the NAC-100 can support up to 15, full-screen bitmap images. Graphics and text are displayed on a 3.5 inch (8.9 cm), backlit, color display with 320 x 240 pixel resolution. Chassis colors are available in black (NAC-100-BK) or white (NAC-100-WH), and the NAC-100 may be mounted directly to a wall surface.

NAC Features

- Easily create intuitive user interfaces from within QSControl.net™ Venue Manager software.
- Capable of displaying custom bitmapped graphics
- 16-bit, 3.5 inch (8.9 cm), backlit graphics display
- Five navigation / push buttons and rotary encoder
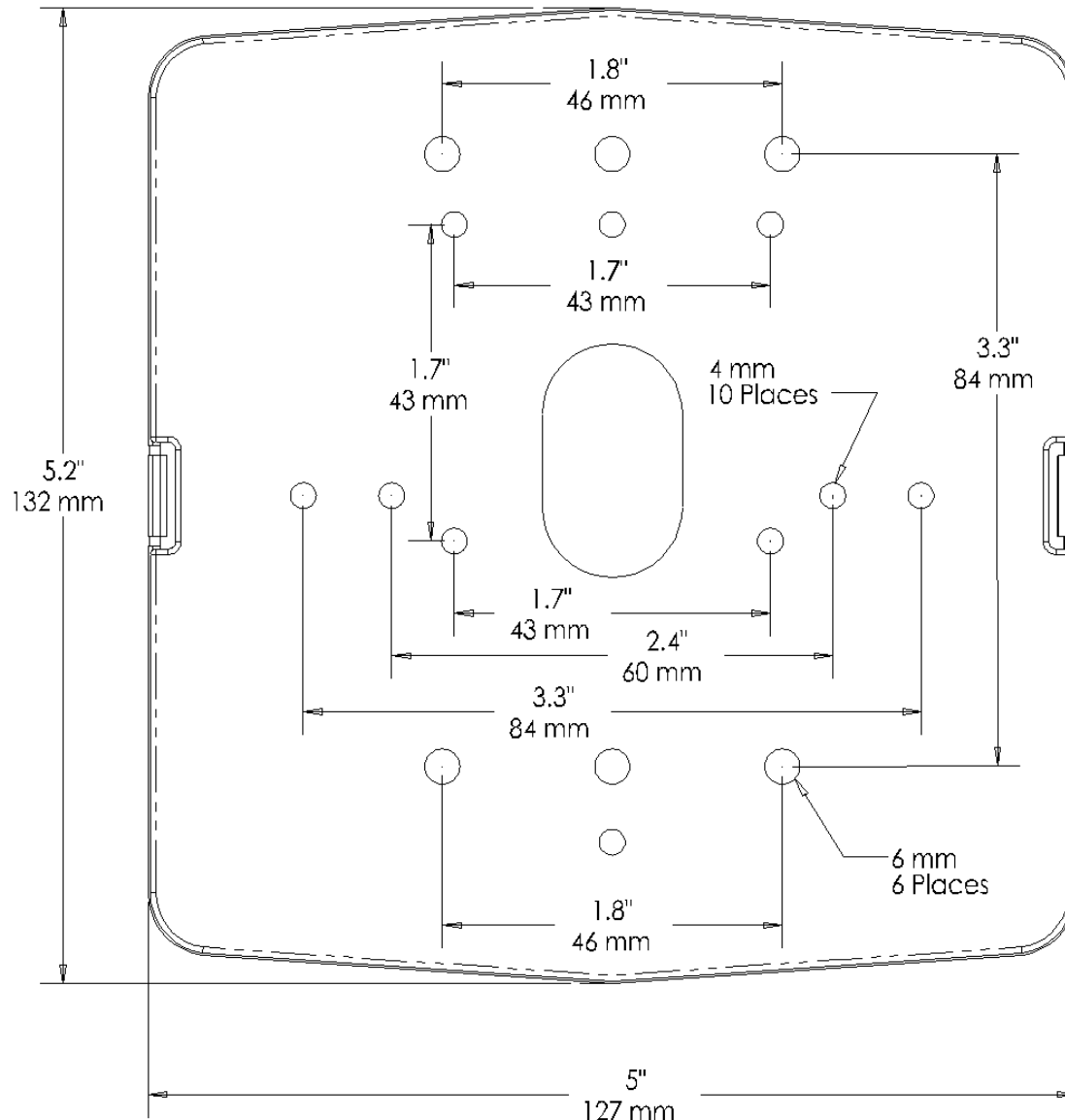- Simple, single-wire connection using PoE (Power Over Ethernet)

Unpacking

There are no special unpacking precautions. However, it is recommended to keep the original packing material for reuse in the rare event that service be required. If service is required and the original packing material is not available, ensure that the unit is adequately protected for shipment (strong box of appropriate size, sufficient packing material to prevent load-shifting or impact damage) or call QSC's Technical Services Department for packing material and a carton.

What is included in the carton:

Item	Description	Quantity
1	NAC-100	1
2	Hardware Manual (this document)	1
3	QSControl.net Software CD	1

Mounting

The rear panel of the unit includes holes conforming to the hole patterns of numerous domestic and international electrical boxes.

Back

Actual Size

ESD Warning

- Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic components are improperly handled and can result in complete or intermittent failures.

- Always follow ESD-prevention procedures when removing the rear panel. Handle the NAC-100 by the outer edges of the chassis, avoiding contact with the circuit board and components at all times. When inserting or removing the cable limit contact to plastic surfaces. When mounting the rear panel ensure that the remaining hardware is placed with caution, avoiding static-causing surfaces such as carpeted floors, plastic, and packing foam.

Computer Requirements & Software Installation

Installing QSControl.net is relatively simple. All that is necessary is to choose the folder where the program is to be stored (the default setting is acceptable for most applications). It is recommended the system meet the following **minimum** requirements:

1- IBM PC compatible computer with a Pentium 4 processor.
2- Processor speed of 1.4 GHz (2 GHz or faster recommended for systems with 30 or more BASIS units).
3- 512 megabytes of RAM (1 gigabyte recommended for systems with 30 or more BASIS units).
4- Hard drive with at least 500 MB of free space for the program and files you generate.
5- Display resolution of 1024 X 768, 16-bit color.
6- CD-ROM drive to install the software.
7- 10BaseT/100BaseTx network interface card
8- Windows XP Professional, XP Home, and Windows Vista operating systems. Windows 95, 98, 2000, NT4, and ME platforms are not supported.

Note: If system is used for real-time adjustments and configuration of audio systems, it is recommended that all Windows Power Options (located in the Windows Control Panel) features be disabled. Display, hard drive, system standby and hibernation settings should be set to "Never". This avoids waiting for the system to "wake-up" if adjustment is needed after an elapsed period of time.

To Install QSControl.net:

1- Start computer and start Windows.
2- If there are any programs running, please close them now. Be sure to leave Windows running.
3- Place the QSControl.net CD-ROM in the CD-ROM drive. It is also possible to select **Start-Run** and browse for the file named setup.exe on the CD.
4- Click the Install QSControl.net button.
5- Follow the installation instructions on the screen.

To Uninstall QSControl.net:

1- Click the **Start** menu button and choose **Settings/Control Panel**.
2- Double-click the **Add/Remove Program** icon.
3- Select QSControl.net from the list, then click **Add/Remove**.
4- Click Yes to begin uninstalling QSControl.net.

Connections

1-Gently separate the NAC-100 from its rear panel using the side tabs.

2-Run the category-5 cable through the access hole in the center of the NAC-100.

3-Connect one end of a category-5 cable terminated with an RJ45 plug into the RJ45 receptacle on the circuit board of the NAC-100 by inserting the RJ45 plug into the receptacle with the lock-tab oriented away from the circuit board. Push firmly until the connector locks into place (usually an audible "click" can be heard).
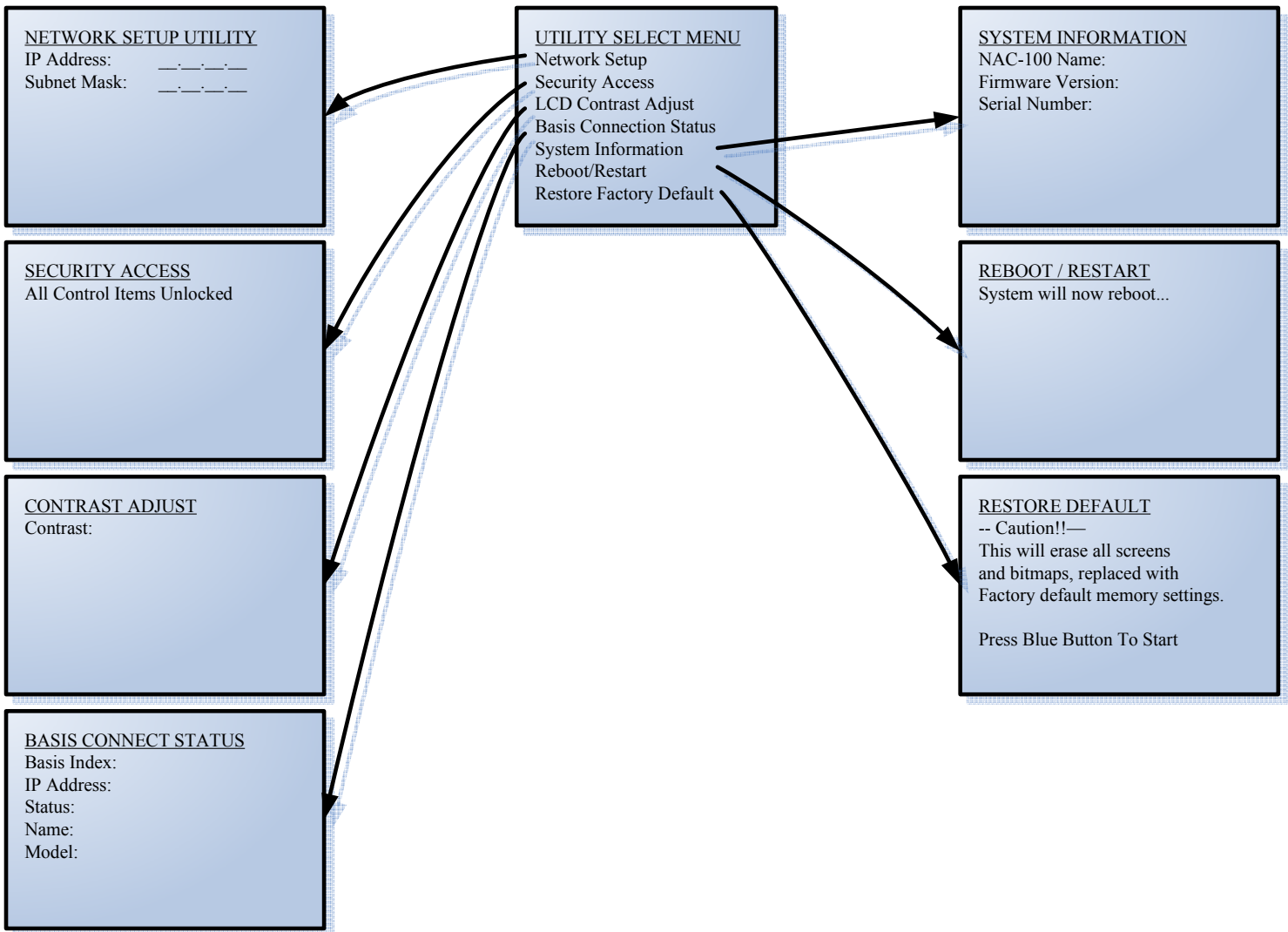
4-Connect the other end to the appropriate QSControl.net network port. (See the Networking Diagrams included later in this manual.)

Utility Navigation Map

During normal use the LCD navigation map will be defined by the user's design created using QSControl.net. However, the UTILITY SELECT MENU has a fixed navigation map.

To enter the UTILITY SELECT MENU, press and hold the *Rotary Button*, then simultaneously press the *Blue Button*. The user will be prompted for the Admin/Utility Password. (The default password is *qsc*.)

Turn the *Rotary* to select individual letters in the password. Press the *Rotary Wheel Button* when the correct letter is displayed. Press the *Blue Key* when the entire password has been entered. (The password should be completely represented by the "*" symbol before pressing the *Blue Key*, e.g. "***".) A letter may not be changed after it has been entered. If an error is made, press the *Blue Key* to begin entering the password from the beginning.

```
NETWORK SETUP UTILITY              UTILITY SELECT MENU              SYSTEM INFORMATION
IP Address:      __.__.__.__        Network Setup                   NAC-100 Name:
Subnet Mask:     __.__.__.__        Security Access                 Firmware Version:
                                    LCD Contrast Adjust             Serial Number:
                                    Basis Connection Status
                                    System Information
                                    Reboot/Restart
                                    Restore Factory Default


SECURITY ACCESS                                                     REBOOT / RESTART
All Control Items Unlocked                                         System will now reboot...




CONTRAST ADJUST                                                    RESTORE DEFAULT
Contrast:                                                          -- Caution!!—
                                                                   This will erase all screens
                                                                   and bitmaps, replaced with
                                                                   Factory default memory settings.

                                                                   Press Blue Button To Start

BASIS CONNECT STATUS
Basis Index:
IP Address:
Status:
Name:
Model:
```

Utility Select Menu Descriptions

TOP MENU

UTILITY SELECT MENU
Network Setup	*Use this sub menu to configure the NAC-100 on the network.*
Security Access	*Use this sub menu to disable/re-enable Control Password restrictions.*
LCD Contrast Adjust	*Use this sub menu to adjust the contrast of the NAC-100 LCD screen.*
Basis Connection Status	*Use this sub menu to check the status of any Basis unit controlled by the NAC-100.*
System Information	*Use this sub menu to read the system information of the NAC-100.*
Reboot/Restart	*Restarts the NAC-100.*
Restore Factory Default	*Restores factory defaults and restarts the NAC-100.*

SUB MENUS

NETWORK SETUP UTILITY (Read/Write)
IP Address:	*The NAC-100 IP Address*
Subnet Mask:	*The NAC-100 Subnet Mask*

SECURITY ACCESS

All Control Items Unlocked   *The default screen if none of the user configured Control Items are restricted using the Control Password.*

-or-

Press Blue Key   *This option disables Control Password restrictions for all Control Items.*
To Disable Security

↓

All Control Items Unlocked   *Control Password restrictions have been disabled for all Control Items.*

-or-

Press Blue Key   *This screen appears if user access passwords have been previously disabled.*
To Re-enable Security   *This option will re-enable Control Password restrictions for all Control Items.*

↓

All Control Items Locked   C*ontrol Password restrictions have been re-enabled for all Control Items.*

CONTRAST ADJUST

Contrast: *Range of 1-10, with 10 being the brightest.*

BASIS CONNECT STATUS (Read Only)
Basis Index:	*Basis Index – Change this number to view each of the Basis units controlled by the NAC-100.*
IP Address:	*Basis IP Address*
Status:	*Connection Status*
Name:	*Basis Name*
Model:	*Basis Model*

SYSTEM INFORMATION (Read Only)
NAC-100 Name:	*The name of the NAC-100*
Firmware Version:	*Current Firmware Version*
Serial Number:	*Serial Number*

REBOOT / RESTART

System will now reboot…

RESTORE DEFAULT

--Caution!!--
This will erase all screens
and bitmaps, replaced with
factory default memory settings

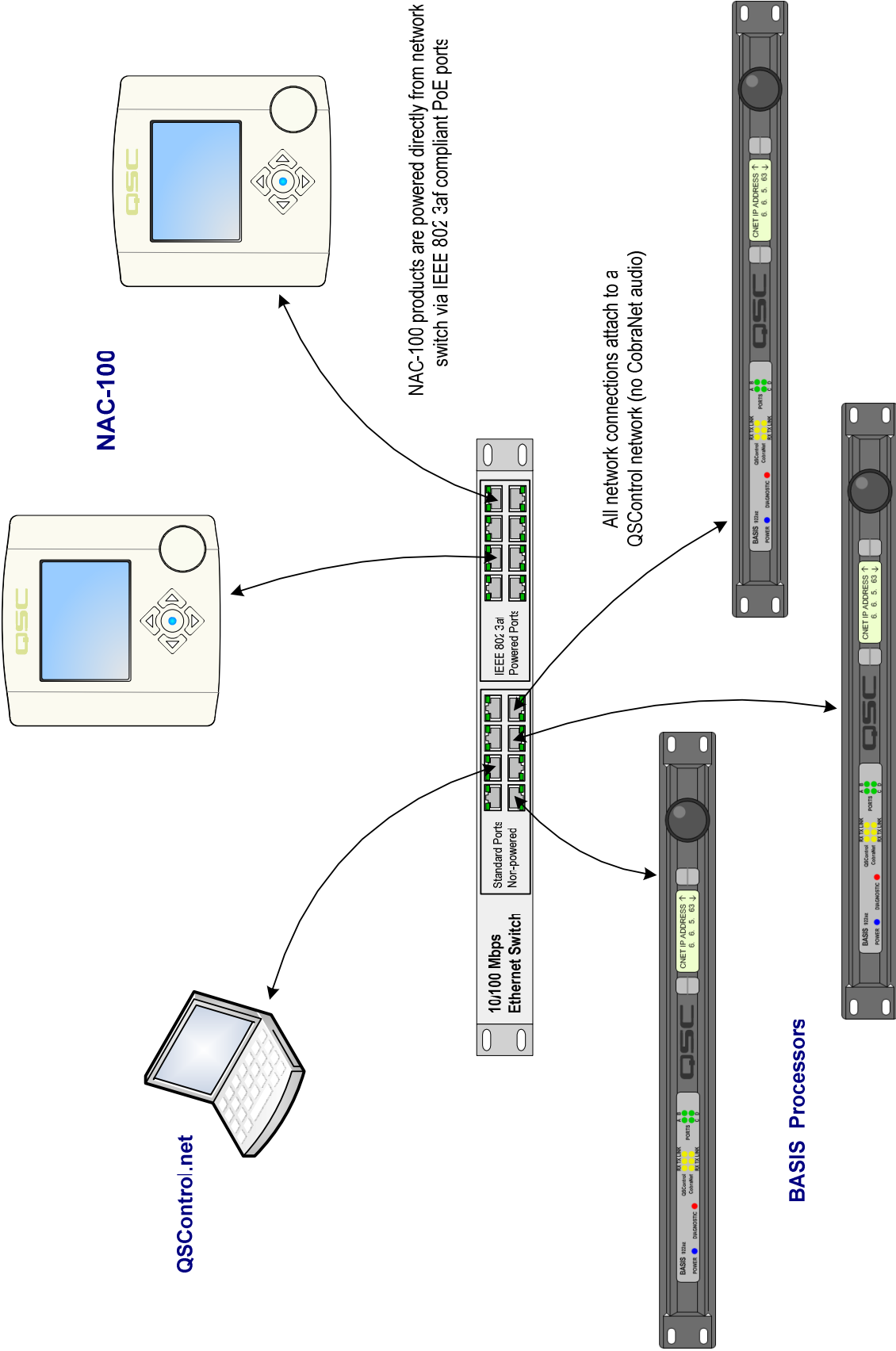Press Blue Button to Start

Passwords

There are two passwords on the NAC-100, one for Utility Select Menu, and one for *Control Items*.

The Admin/Utility Password allows access to the Utility Select Menu. (Change password in QSControl.net by clicking the *Admin/Utility Password* button on the edit screen for the NAC-100.)
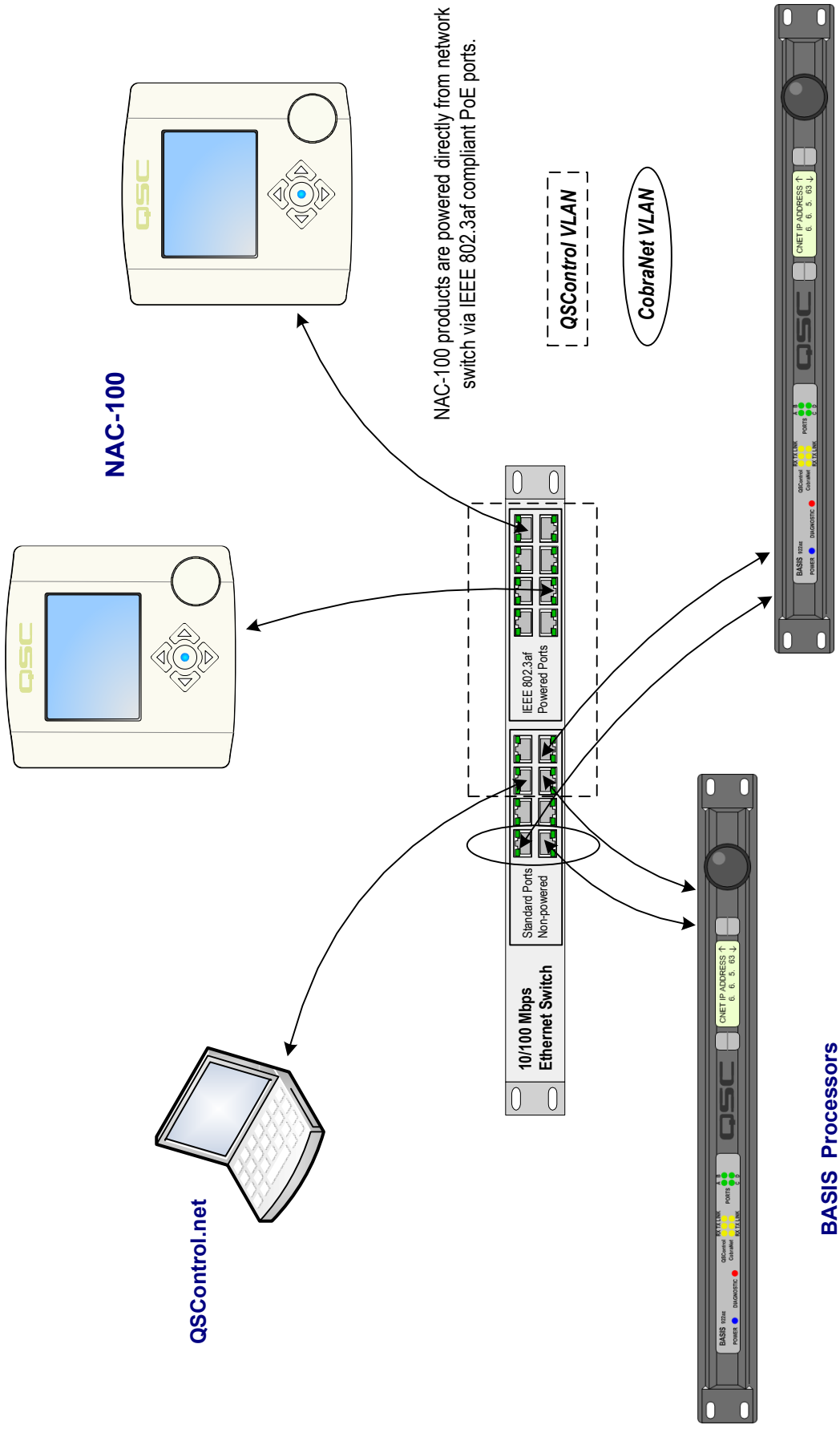
The Control Password limits access to specified Control Items during normal use. (Change password in QSControl.net by clicking the *Control Password* button on the edit screen for the NAC-100.)

Networking Diagrams

Illustrated below are several typical installations utilizing the NAC-100.

NAC-100

NAC-100 products are powered directly from network switch via IEEE 802.3af compliant PoE ports

All network connections attach to a QSControl network (no CobraNet audio)

QSControl.net

10/100 Mbps Ethernet Switch

IEEE 802.3af Powered Ports

Standard Ports Non-powered
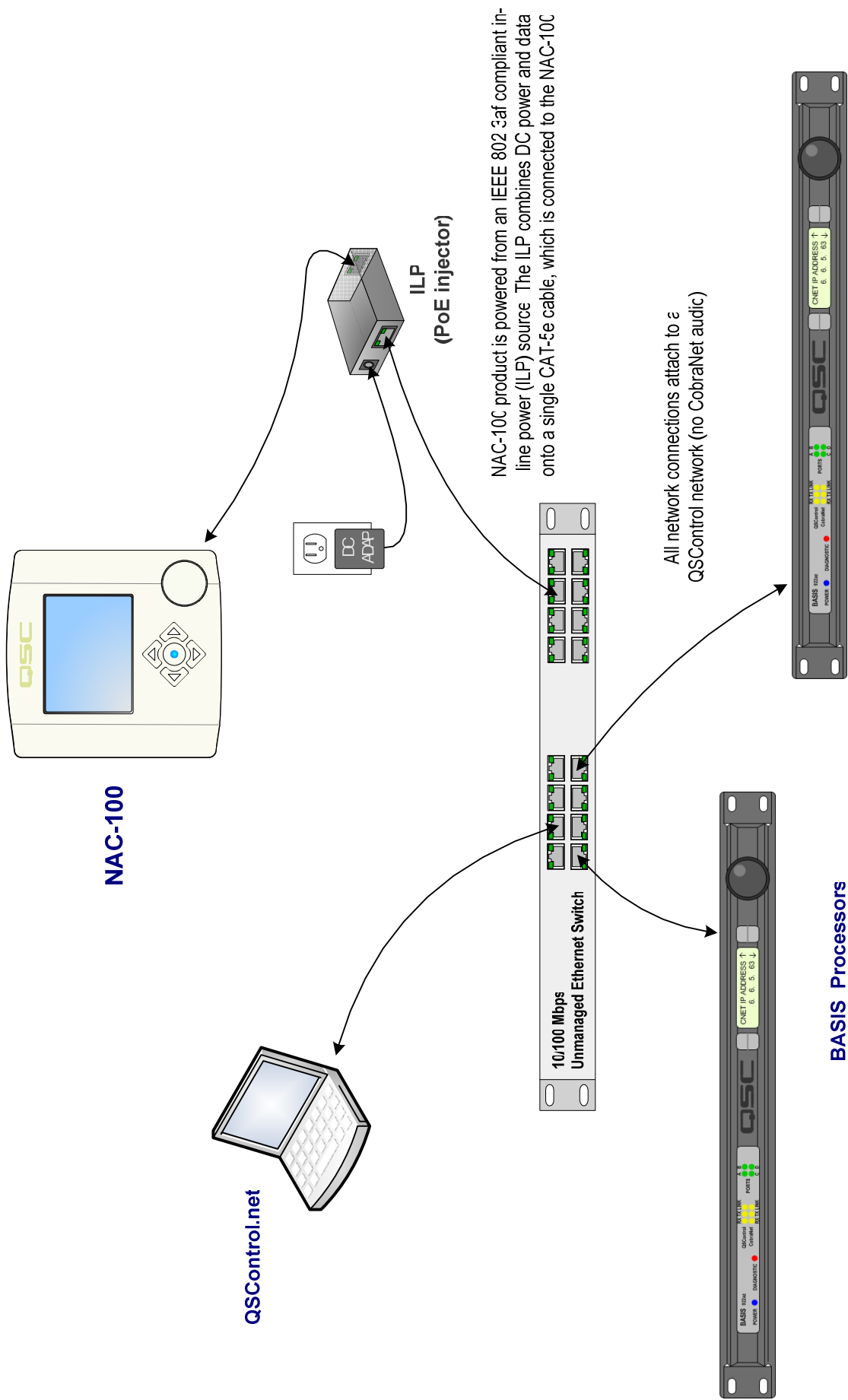
BASIS Processors

Figure 1: Multiple NAC-100s powered via IEEE 802.3af compliant switch ports. Each NAC-100 can manage multiple BASIS products or they can be configured to manage specific BASIS units. The example shows a flat network (no VLANs) with management via the QSControl.net suite of applications.
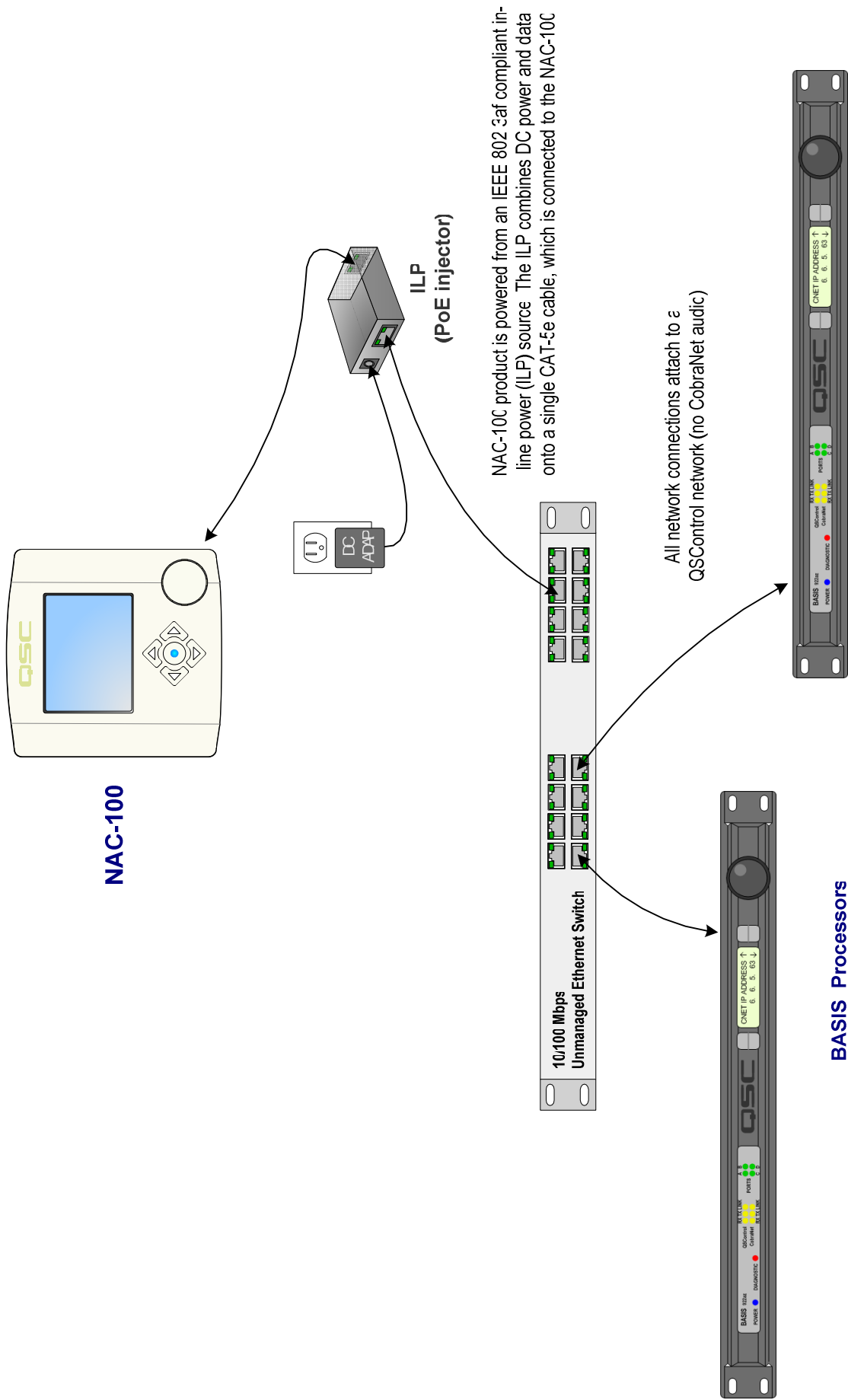
NAC-100 products are powered directly from network switch via IEEE 802.3af compliant PoE ports.
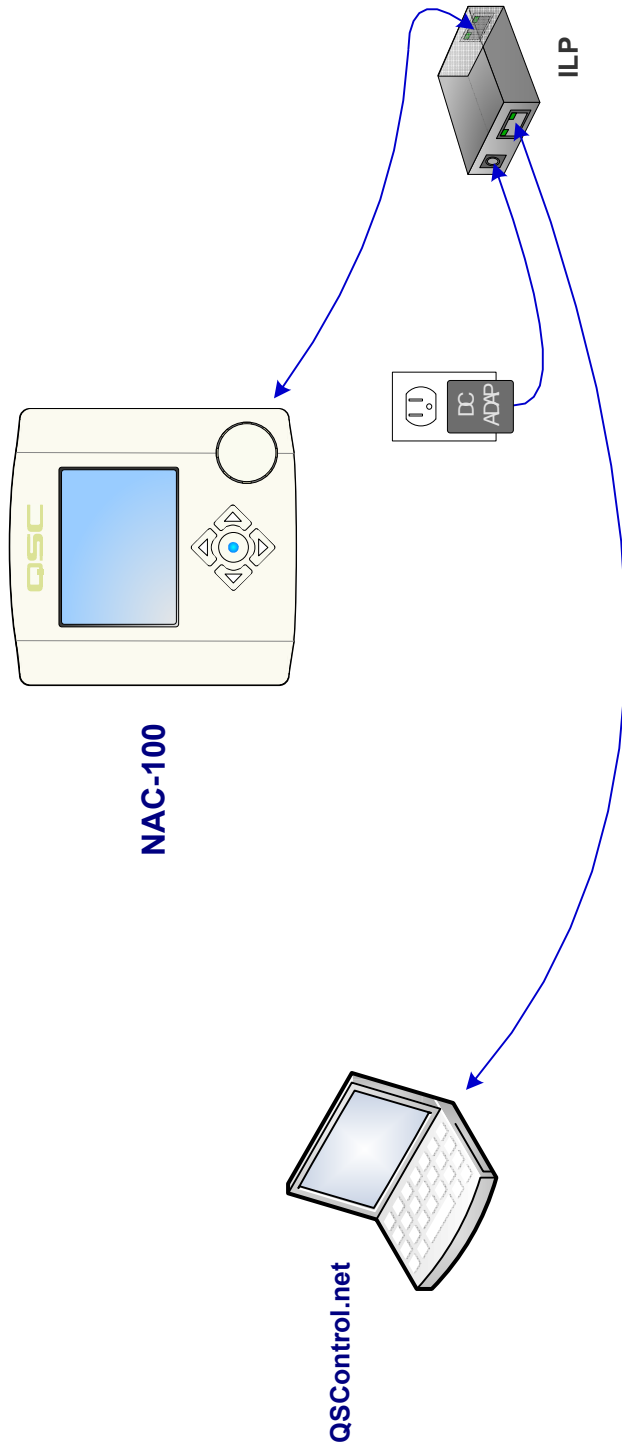
NAC-100

QSControl VLAN

CobraNet VLAN

IEEE 802.3af Powered Ports

Standard Ports Non-powered

10/100 Mbps Ethernet Switch

QSControl.net

BASIS Processors

Figure 2: Multiple NAC-100s powered *via* IEEE 802.3af compliant switch ports. The example shows a network using a managed switch with separate virtual local area networks (VLANs) configured for the CobraNet and QSControl networks. The NAC-100s manage BASIS products on the QSControl VLAN.

NAC-100

QSControl.net

**ILP
(PoE injector)**

DC ADP

NAC-10C product is powered from an IEEE 802.3af compliant in-line power (ILP) source. The ILP combines DC power and data onto a single CAT-5e cable, which is connected to the NAC-10C

All network connections attach to a QSControl network (no CobraNet audio)

**10/100 Mbps
Unmanaged Ethernet Switch**

BASIS Processors

Figure 3: Single NAC-100 powered via IEEE 802.3af compliant ILP (power injection source). The ILP combines power and data onto a single CAT-5e cable to supply an IEEE 802.3af compliant interface for the NAC-100. Note the use of an unmanaged and non powered (non PoE) switch.
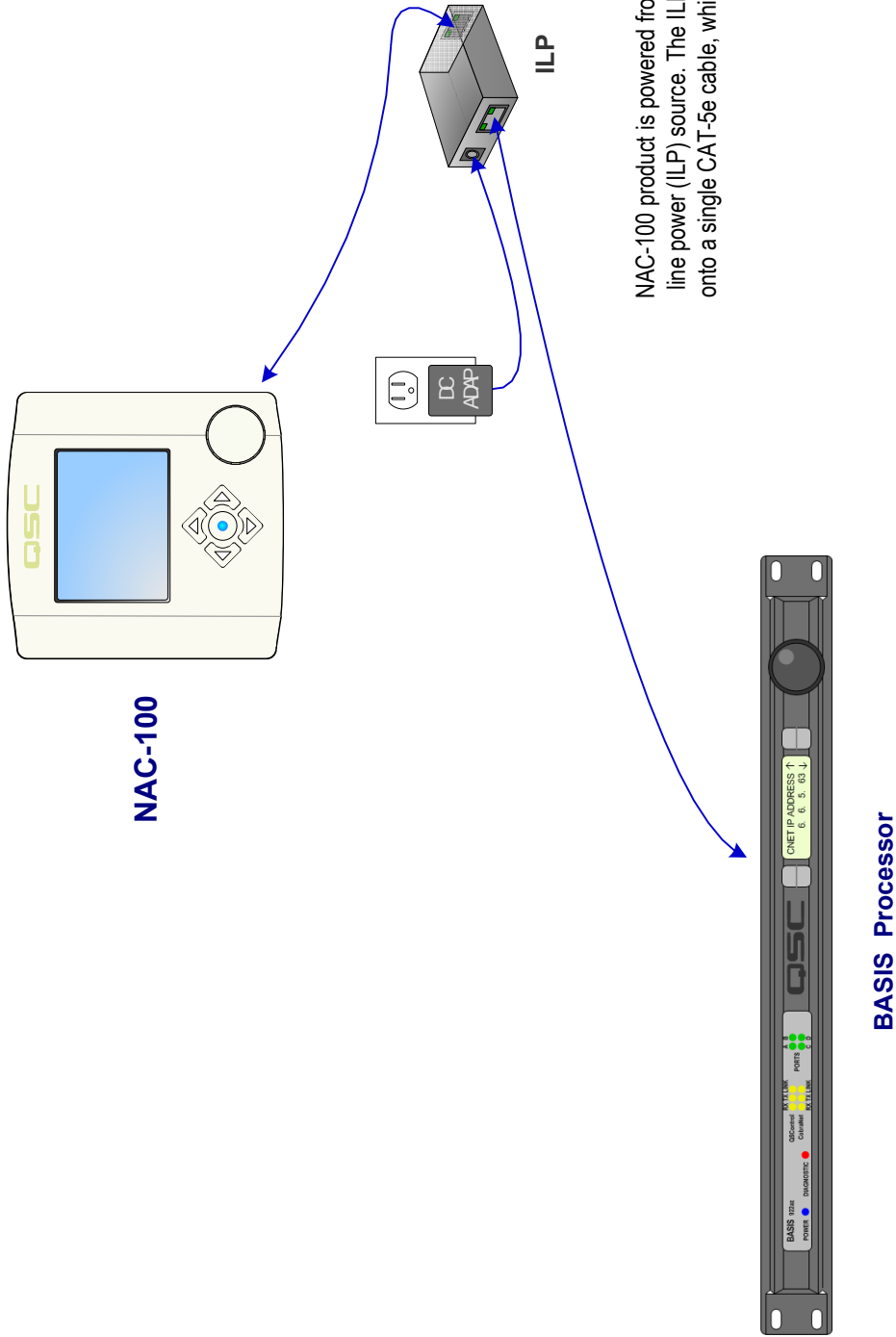
NAC-100

ILP (PoE injector)

NAC-10C product is powered from an IEEE 802.3af compliant in-line power (ILP) source. The ILP combines DC power and data onto a single CAT-5e cable, which is connected to the NAC-10C

All network connections attach to a QSControl network (no CobraNet audio)

10/100 Mbps Unmanaged Ethernet Switch

CNET IP ADDRESS ↑
6. 6. 5. 63 ↓

QSC

BASIS 922at
POWER ● DIAGNOSTIC ●

QSControl
CobraNet

RX TX LINK
PORTS 1 2

CNET IP ADDRESS ↑
6. 6. 5. 63 ↓

QSC

BASIS 922at
POWER ● DIAGNOSTIC ●

QSControl
CobraNet

RX TX LINK
PORTS 1 2

BASIS Processors

Figure 4: Single NAC-100 powered via IEEE 802.3af compliant ILP (power injection source). The example shows the NAC-100 as the sole source for system management (no computer is required).

NAC-100 product is powered from an IEEE 802.3af compliant in-line power (ILP) source. The ILP combines DC power and data onto a single CAT-5e cable, which is connected to the NAC-100.

ILP

NAC-100

QSControl.net

Figure 5: Single NAC-100 powered via IEEE 802.3af compliant ILP (power injection source). The NAC-100 is connected directly to a PC that hosts Venue Manager. This type of connection scheme is useful for off-line (off network) configuration of the NAC-100. Note that a "crossover" data communications cable may be required depending on the port properties of the PC and/or ILP in use.

NAC-100

ILP

NAC-100 product is powered from an IEEE 802.3af compliant in-line power (ILP) source. The ILP combines DC power and data onto a single CAT-5e cable, which is connected to the NAC-100.

BASIS Processor

Figure 6: Single NAC-100 powered via IEEE 802.3af compliant ILP (power injection source). The NAC-100 is connected directly to a BASIS product. This type of connection scheme is useful for managing very small systems with an NAC-100 when networked audio transport (CobraNet) is not required. Note that a "crossover" data communications cable may be required depending on the port properties of the ILP in use.

Getting Started

This section outlines one of the simpler methods of getting familiar with NAC-100 and the QSControl.net Venue Manager software. The goal of this procedure is to get your computer and the NAC-100 connected and communicating and the Venue Manager software installed and running. After the software is installed and running, refer to the Venue Manager's help file for all software related operation/issues. Note: The default password for the NAC-100 is "qsc" (no quotes, lower case).

1- Turn off the computer.

2- Use one of the Network Diagrams illustrated previously in this manual to connect the NAC-100 to the network.

3- Verify that the NAC-100 has turned on. (The NAC-100 will turn on when it has been properly connected to any PoE compliant switch or PoE injector.) Enter the UTILITY SELECT MENU. (Press and hold the *Rotary Button*, then simultaneously press the *Blue Button*. The default password is *qsc*.) Navigate to the Network Setup sub menu. Make a note of the IP Address. In steps 11 and on, you will need to change the IP address of the NAC-100 or your PC.

4- Turn on the PC and start Windows.

5- Place the QSControl.net CD-ROM in your CD-ROM drive. The install wizard should start. If not, you can also select *Start-Run* and browse for the file named setup.exe from the CD.

6- The installer queries the computer for available drive space and other information. If the required MDAC library (Microsoft) files are not already on the computer, the library files are installed. You must accept the Microsoft software agreement in order to install the MDAC library. It may be necessary to reboot the computer after library installation.

7- At the prompt for "Client/Server" selection, keep both Client and Server selected. This will be appropriate for general use.

8- When prompted "Select Installation Folder", specify the installation directory or accept the default location.

9- Reboot only if your computer prompts you to do so.

10- Click the on Start button on the lower left corner of your screen. Select Settings from the menu, followed by Network Connections on the sub-menu. Select Local Area Connection, and view its properties (click Properties button). Select the Internet Protocol (TCP/IP) option and view its properties. You will see an entry field for the IP address. Decide whether you want to change the IP address of your computer to be similar to that of the NAC-100 (easiest if you have many BASIS units) or if you want to change the IP address of your NAC-100 to be similar to that of the computer. This is a network management decision.

11- Change the IP address of the NAC-100 (or computer) to be compatible with that of the computer (or NAC-100). Typically, this is done by making the IP address of one of the devices 1 digit different in the last octet (group of digits in IP address). If changing the computer's settings, write down the current values, in case you want to revert later.

12- The subnet mask address should be exactly the same for both the computer and the BASIS. The Gateway address should not be altered as it is not used.

13- After you are satisfied with all of your settings, close all open windows and start the Venue Manager program. Select Start, Programs, QSControl.net, Venue Manager.

14- The login screen should open. The default password is "qsc" (lower case, no quotation marks). Select "Logon to Local Computer" and click OK.

15-The QSControl.net Venue Manager window will open.

16- Go to Design Mode by pressing Ctrl+D or by selecting *System* from the menu and selecting *Go To Design Mode*. Then select *System* from the menu and select *Discover and Map Devices*. The *Discover and Map Devices* window will open. Click the *Start Searching the Network…* button. If your computer has multiple VLANs a window will open allowing you which VLANs to broadcast discovery messages on. Select your NAC-100 from the *Discovered Unmapped Network Devices* list and click on the *Add selected unmapped devices to design…* button. Your NAC-100 should appear in the *Design Devices* list. Click *OK*. The *Enter Device Password…* window will open, enter "qsc" (lower case, no quotation marks). The device should now appear in your *Inventory*. To change the properties on the NAC-100, right click on the device in the *Inventory* and select *Device Properties…*

17- If the NAC-100 does not show in the *Inventory*, check the cable connections, verify IP addresses are set correctly, verify Subnet masks are set correctly, and verify PoE is properly applied to the NAC-100.

18- Double-Click on the NAC-100 in *the Inventory*. A view of applicable options will open.

19- Click on Help to access the software's Help system. All software operation is covered in the on-line help file.

Operation of the NAC-100 is accomplished with the included QSControl.net Venue Manager software. No software operation is covered in this hardware manual. After installing your software, open the Help file and follow its recommendations. The software Help file includes the most recent information available for your NAC-100.

Resetting the NAC-100

Resetting the NAC-100 should only be performed as a last resort.

To reset the NAC-100, cycle the power.
-Remove the cover of NAC-100 to access the RJ45 jack, located on the circuit board of the NAC-100.
-Unplug the Ethernet cable from the RJ45 jack. (Screen will turn off.)
-Reconnect the Ethernet cable to the RJ45 jack. (NAC-100 will reboot.)
-Immediately, press and hold *the Rotary Wheel Button* and the *Blue Button* until the NAC-100 has rebooted.

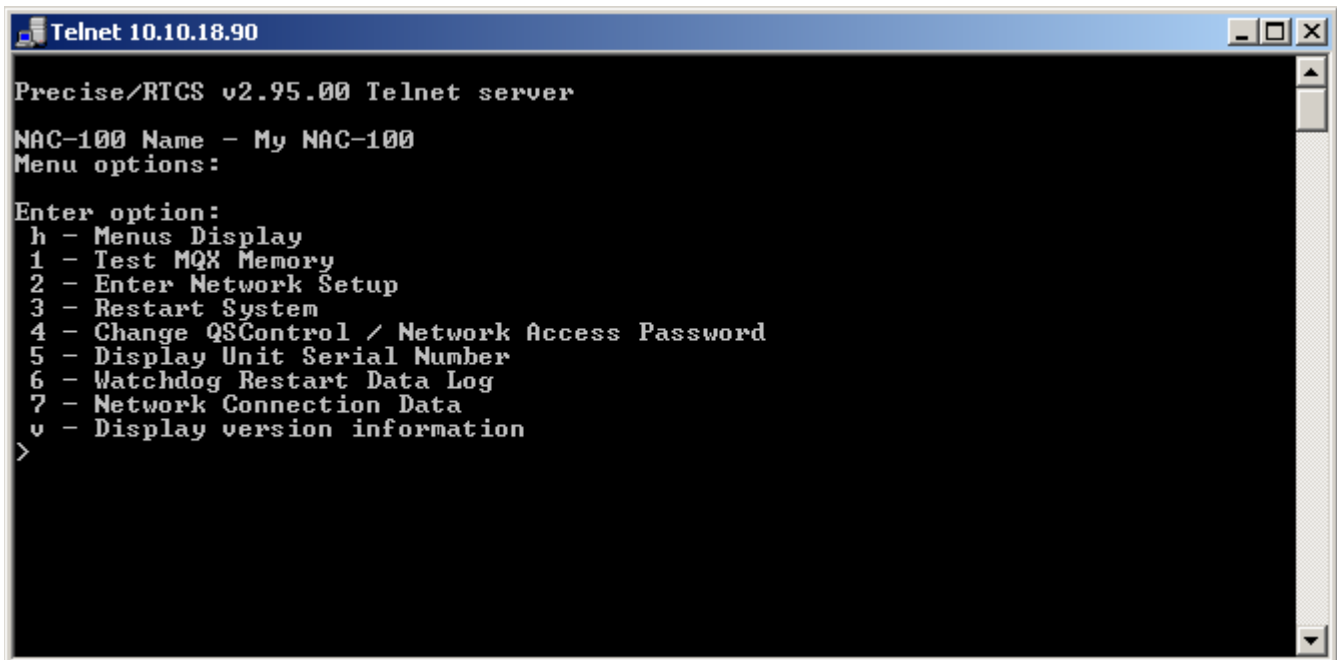The NAC-100 should boot up to the UTILITY PASSWORD screen.

-Enter the password. (The default password is *qsc*.)
-In the UTILITY SELECT MENU, use the *Down Arrow* to scroll down to the Restore Factory Default option.
-Press the *Blue Button* to select Restore Factory Default option.
-Press the *Blue Button* again to restore default settings

Telnet Access

Utility/Diagnostic Functions can be accessed via Telnet. The Microsoft Telnet application is a Windows program. Consult Windows documentation for Telnet information.

Basic procedure for opening a Telnet session on a Windows PC:
1- To open the Telnet session- Click START, select RUN, in the textbox provided type "Telnet" followed by a space, then the IP address of the NAC-100 with which communication is desired. Click OK.
2- If the address entered was correct and network communications with the NAC-100 are successful, the Telnet session should open.
3- Telnet options include:

```
Telnet 10.10.18.90

Precise/RTCS v2.95.00 Telnet server

NAC-100 Name - My NAC-100
Menu options:

Enter option:
 h - Menus Display
 1 - Test MQX Memory
 2 - Enter Network Setup
 3 - Restart System
 4 - Change QSControl / Network Access Password
 5 - Display Unit Serial Number
 6 - Watchdog Restart Data Log
 7 - Network Connection Data
 v - Display version information
>
```

Connection Password

To establish network communication with an NAC-100 from Venue Manager a connection password is required. This password can be changed via the telnet menu displayed above (The factory default password is *qsc*).
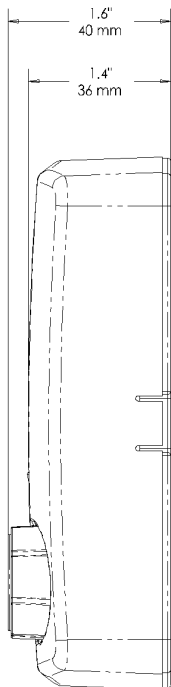
If you forget the Connection Password, start a telnet session and select "Change QSControl/Network Access Password" from the main menu. Then press the Enter key when prompted to enter the current password. You can now contact QSC and give them the Password Key that will appear directly below the "Password entry failed" warning to obtain you current password.
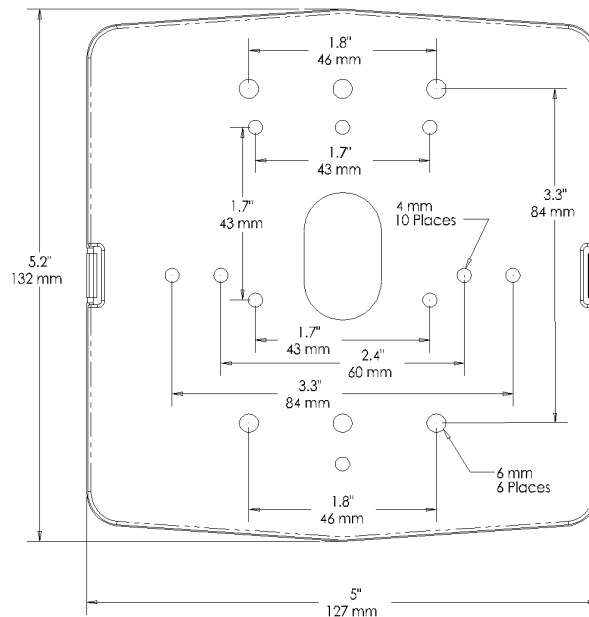
Specifications

Preliminary Specifications:

Display	3.5"(8.9cm); backlit, 16-bit color LCD; 320 x 240 pixels: CSTN
Controls	5 x push buttons, 1 x rotary encoder
Software Compatibility	Requires QSControl.net Venue Manager version 3.1 or higher
Dimensions (HWD)	5.2"(13.2 cm) x 5"(12.7 cm) x 1.6" (4 cm)
Power Requirements	Compliant with IEEE 802.3af-2003, works with any PoE compliant switch or PoE injector Power consumption, 3 W, Class 1 Device
Construction	ABS with UV protection additive, available in black (NAC-100-BK) or white (NAC-100-WH)

Dimensions

Side

Back

How to Contact QSC Audio Products

Mailing address: QSC Audio Products, Inc.
                                               1675 Mac Arthur Boulevard
                                               Costa Mesa, CA 92626-1468 USA

Telephone Numbers:
    Main Number   (714) 754-6175
    Sales & Marketing   (714) 957-7100 or toll free (USA only) (800) 854-4079
    Customer Service   (714) 957-7150 or toll free (USA only) (800) 772-2834

Facsimile Number:
    Sales & Marketing FAX   (714) 754-6174
    Customer Service FAX   (714) 754-6173

World Wide Web: www.qscaudio.com

E-mail: info@qscaudio.com
                                               service@qscaudio.com

Warranty (USA only; see your dealer or distributor for other countries)

Disclaimer

QSC Audio Products, Inc. is not liable for any damage to amplifiers or any other equipment that is caused by negligence or improper installation and/or use of this loudspeaker product.

QSC Audio Products 3 Year Limited Warranty

QSC Audio Products, Inc. ("QSC") guarantees its products to be free from defective material and / or workmanship for a period of three (3) years from date of sale, and will replace defective parts and repair malfunctioning products under this warranty when the defect occurs under normal installation and use – provided the unit is returned to our factory or one of our authorized service stations via prepaid transportation with a copy of proof of purchase (i.e., sales receipt).This warranty provides that the examination of the return product must indicate, in our judgment, a manufacturing defect. This warranty does not extend to any product which has been subjected to misuse, neglect, accident, improper installation, or where the date code has been removed or defaced. QSC shall not be liable for incidental and/or consequential damages. This warranty gives you specific legal rights. This limited warranty is freely transfer-able during the term of the warranty period.

Customer may have additional rights, which vary from state to state.

In the event that this product was manufactured for export and sale outside of the United States or its territories, then this limited warranty shall not apply. Removal of the serial number on this product, or purchase of this product from an unauthorized dealer, will void this limited warranty.

Periodically, this warranty is updated. To obtain the most recent version of QSC's warranty statement, please visit www.qscaudio.com.

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Customer Service (714) 957-7150 or toll free (USA only) (800) 772-2834

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http://aubethermostatmanual.com

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