



LINORTEK Netbell-NTG Network Enabled PA System Controller User Manual

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Netbell-NTG User Manual

www.linortek.com



For Netbell-NTG and Netbell-NTG Speaker System

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1. Read Instructions – Read all the safety and operating instructions before operating the product.
2. Retain Instructions – Retain the safety and operating instructions for future reference.
3. Heed Warnings – Adhere to all warnings on the product and in the operating instructions.
4. Follow Instructions – Follow all operating and use instructions.
5. Cleaning – Unplug the product from power before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning the enclosure only.
6. Attachments – Do not use attachments unless they are specifically recommended by Linortek. Using incompatible or otherwise unsuitable attachments can be hazardous.
7. Accessories – Do not place this product on an unstable stand, tripod, bracket, or mount. The product may fall, causing serious injury to a person and serious damage to the product. Use only with a stand, tripod, bracket, or mount recommended by the manufacturer, or sold with the product. Follow the manufacturer's instructions when mounting the product, and only use mounting accessories recommended by the manufacturer. Be cautious when using an appliance and cart combination. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
8. Ventilation – Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating. Do not block or cover these openings. Do not place this product in a built-in installation unless proper ventilation is provided or the Linortek's instructions have been adhered to.
9. Power Sources – Operate this product only from the power source type indicated in the instruction manual or on the product label.

If you are not sure of the type of power supply you plan to use, consult your appliance dealer or local power company – provided that use of any power source type other than indicated in the instruction manual or marking label will void any warranty. For products intended to operate from battery power, or other sources, refer to the operating instructions [included with the product].

10. Grounding or Polarization – This product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit it is because your outlet is incompatible with the plug.

Contact your electrician to replace your outlet with one that is compatible. Do not force the plug to fit into an incompatible outlet or otherwise try to defeat the safety purpose of the plug. Alternately, this product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. Do not force the plug to fit into an incompatible outlet or otherwise try to defeat the safety purpose of the plug. If your outlet is incompatible with the plug, contact your electrician to replace your outlet with one that is compatible.

11. Power-Cord Protection – Route power supply cords so that they are not likely to be walked on or pinched by

items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where the cords exit from the appliance.

12. Power Lines – Do not place an outdoor system anywhere in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outdoor system, use extreme care to keep from touching such power lines or circuits as contact with them might be fatal.
13. Overloading – Do not overload outlets and extension cords as this can cause fire or electric shock.
14. Object and Liquid Entry – Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts which can cause fire or electric shock. Never spill liquid of any kind on the product.
15. Servicing – Do not attempt to service to this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing of the product to Linortek.
16. Damage Requiring Service – Unplug the product from the outlet and refer servicing to Linortek Customer Support under the following conditions:
 - a. When the power-supply cord or plug is damaged.
 - b. If liquid has been spilled, or objects have fallen onto the product.
 - c. If the product has been exposed to rain or water.
 - d. If the product does not operate normally by following the operating instructions [included with the product]. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
 - e. If the product has been dropped or the cabinet has been damaged.
 - f. If the product exhibits a distinct change in performance.
17. Replacement Parts – If replacement parts are necessary, have a Low-Voltage Electrician replace them using only part specified by the manufacturer. Unauthorized substitutions may result in fire, electric shock or other hazards. Replacement parts can be found at <https://www.linortek.com/store/>
18. Safety Check – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
19. Coax Grounding – If an outside cable system is connected to the product, be sure the cable system is grounded. U.S.A. models only– Section 810 of the National Electrical Code, ANSI/NFPA No.70-1981, provides information with respect to proper grounding of the mount and supporting structure, grounding of the coax to a discharge product, size of grounding conductors, location of discharge product, connection to grounding electrodes, and requirements for the grounding electrode.
20. Lightning – For added protection of this product during a lightning storm, or before leaving it unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the product due to lightning and power-line surges.
21. Outdoor Use – This product is not waterproof and should not be allowed to get wet. Do not expose to rain or other types of liquid. Do not leave out-of-doors overnight as condensation may occur.
22. While changing batteries, fuses or handling a board level product be careful of electrostatic discharge which can damage electronic devices. It is best to use a grounded electronics service bench. If this is not available you can discharge yourself by touching a metal appliance or pipe. While changing the batteries or fuses do not touch i) any wires other than the battery wires and ii) the printed circuit board.

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Unless specifically stated, our Products are NOT designed to switch line voltage (110V and above) devices. To control device that operate at line voltages a qualified electrician MUST install an intermediary device such as a relay. When choosing devices to control, it is best to select low voltage controls such as a 24VAC solenoid to water flow control. Only qualified electricians may wire a line voltage device. Additionally, local codes must be followed including but not limited to wire gauge size and suitable housing. Linortek assumes no responsibility for harm to the user or third parties for improperly using our Products. This liability remains with the user. Linortek assumes no responsibility for damage to the device due to improperly using our Products.

RELAY VOLTAGE SPECIFICATIONS

Please use caution when connecting devices to electrical circuits or other equipment. This web controller is NOT designed to connect to any voltage greater than 48V. If you want the product to control Line Voltage products and devices, refer to Diagram 1 below. Utilizing this arrangement, should allow you to virtually control anything. It is important that you use licensed electricians and comply with electrical codes that are applicable to your location. These codes exist for your safety, as well as the safety of others. Linortek assumes no responsibility for any harm or damage resulting from a failure adhere to local laws, ordinances or regulations or failure to follow specified instructions for installation and product usage.

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Any provision of this EULA that is found to be unenforceable will be edited and interpreted to accomplish the objectives of that provision to the greatest extent possible under applicable law and all remaining provisions will remain in full force and effect.

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14. California Proposition 65 Warning.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

Thank you for purchasing the Linortek-NTG tone generator and controller. This powerful multitone generator can easily be wired into an existing PA system to schedule and play automated messages or play a pre-recorded message based on user-defined conditions. All of our products are designed and manufactured in the USA using the highest quality materials to provide a long lasting and reliable service to you.

All of our controllers come complete with all parts and software necessary for installation, operation and ability to control the devices attached to it. Upon arrival, please inspect the contents of the box to ensure that your kit is complete and contains all necessary components.



Safety Instructions

- If the device is powered by PoE, DO NOT use the 12VDC power supply. If the device is not powered via an Ethernet cable, use only the power adapter provided by Linortek that comes with your order. Other power supplies may damage or destroy the device, affect its behavior, or induce noise.
- Avoid placing the cables where people may trip over them or where they may be exposed to mechanical pressure as this may damage them.
- Do NOT install the device in rooms with high humidity. Do NOT immerse the device in water and do NOT spill or pour liquids of any kind onto or into the device.
- Do NOT install the device in surroundings at risk for explosions. Do NOT use the device if you smell gas or other potentially explosive fumes.
- Do NOT use the device during thunderstorms. Lightning striking the power grid may cause electric shocks.
- Do NOT remove the device's power supply (Ethernet cable when using PoE, power adapter when not using PoE) when the RED LED is blinking and the GREEN LED is on (called Bootload state); a firmware update is ongoing. Cutting off the device's power during a firmware update (red LED blinking, green LED on) will damage the firmware and render the SERVER inoperative. In such cases, it will need to be returned to factory for

resetting.

Quick Setting Instruction

1. Wire the speakers to the amplifier, connect the Netbell-NTG line output to one of your amplifier audio inputs with the provided cable. Please refer to Audio Output Connection of this manual for wiring instruction.
2. Find the IP address with Linortek Discover tool to access the software. Please check Finding the IP Address to Access the Software on this manual for instructions of finding the IP address.
3. Enable audio system so that you can use different sounds for different events. Please refer to Enabling the Audio File System on this manual for instruction of how to enable the audio system.
4. Set time and date. Your Netbell-NTG is set to use Eastern Standard Time (GMT-5) by default. If your timezone is different than that, you need to change the time zone to your local timezone. Please refer to Setting Time and Date of this manual for how to change the time.
5. Assign audio tones to a relay so that you can schedule to play that sound for break time alarm. For instructions of how to assign a tone to a relay, refer to Assigning Audio Tones to Relays of this manual for instructions.
6. Create custom sounds for your Netbell-NTG: you can upload custom sounds up to 10 hours on your Netbell-NTG and schedule to play those sounds. Please refer to Creating Custom Sounds section of this manual for instructions.
7. Schedule audio playback from Bell Scheduling page. Once you have assigned a sound to a relay from step 5 (and 6 if you use your custom sounds), you can add timed schedules to play the sound. Please refer to Scheduling Audio Playback of the manual for instructions.
8. Use an external trigger a sound. You can connect a digital sensor or a push switch to one of the digital inputs to trigger special sounds for special events or emergency. Please refer to Using an External Trigger section on the manual for instructions.

Factory Reset

To reset the SERVER to its factory defaults, first to push the RESET button, the RED LED should be blinking and the GREEN LED is on. While in this state (called Bootload state) press and hold the RELOAD (DFLT) button (about 1015seconds) until the RED LED comes on steady (blinks at 1 second rate).

There is an equivalent RESET DEFAULTS function in the web browser at System/ Load/Reboot System page. Check the Restore Default Values box, then click the Boot Mode button, your device will be reset to factory default once the RED LED come back to normal (blinks at 1 second rate).

For instructional videos, FAQ's and contact information for our technical support team, please visit: <https://www.linortek.com/technical-support>

For full instructions on the Web Interface please see the Fargo G2 and Koda Manual available at: <https://www.linortek.com/downloads/documentations/>

Wiring the Netbell-NTG

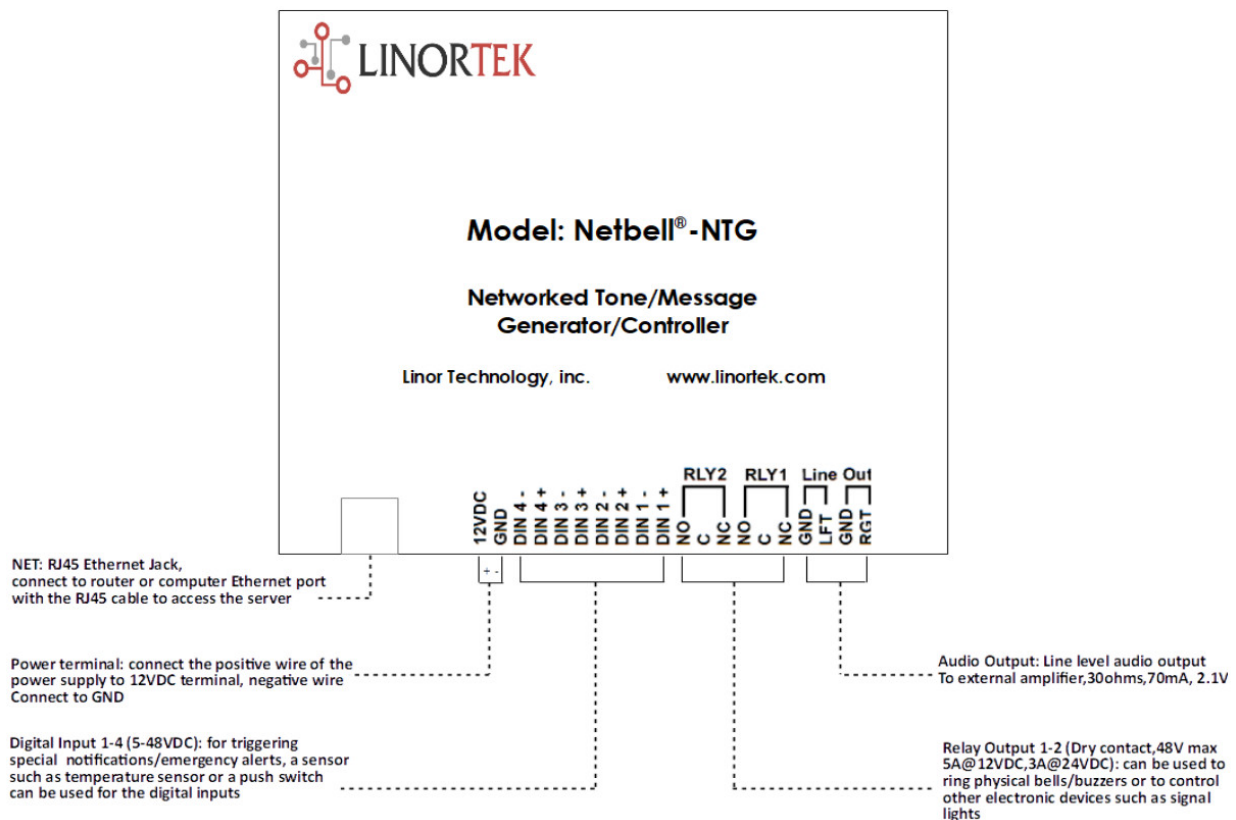
The Netbell-NTG unit is a self-contained web server configured with various input and output circuits designed to output an audio signal to a PA system. You should not use voltages through the Netbell-NTG exceeding 48 volts. IT IS NOT SAFE.

The output ratings for the Netbell-NTG are a 30-ohm impedance at 70mA maximum, and a 2.1V audio signal. The line output from the terminal is suited for this and can be wired directly to a power amplifier that uses AC voltage. Take note of the ohm ratings of your speakers and how they are wired, make sure you use the following calculation to determine if you are within the amplifier's impedance ratings.

R represents the impedance (ohms)

$$R_{TOTAL} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \dots}$$

The Netbell-NTG has a stereo line out, a terminal block with left and right outputs, which can be connected to a power amplifier for a higher volume or the ability to drive larger speakers. Make sure the amplifier has a stereo line input, and is rated to drive the speakers you wish to connect too. We are not responsible for 3rd party amplifiers or speakers connected to our device, or the failure of our Netbell-NTG when wired incorrectly. We provide 2 cable types (RCA stereo to line out, 3.5mm stereo to line out) to connect your Netbell-NTG to an amplifier or PA system, etc. Choose the cable that matches your amplifiers audio input to be able to wire it to your Netbell-NTG.



Ethernet Connection

Plug an Ethernet cable into the NET connector. This device is POE enabled (Please note: this device can only work on IEEE 802.3af or 802.3at standard. Please check your network switch specifications before plugging the device in to prevent potential damage to your device.), the GREEN/Boot LED on the device and the “Connection” LED on the Ethernet connector side will come on if you connect to a POE network switch and a 100MHz network is available, otherwise it will remain off and the “Activity” LED should start blinking indicating network activity. If the device is powered on at this point, DO NOT use the 12VDC power supply at step below.

Power Connection

To power the Netbell-NTG connect the power supply to the 12VDC and GND power terminal.

When connecting the power supply, connect the positive wire of the 12VDC power supply to the 12VDC terminal, negative cable (marked with a white stripe) to the GND terminal. Plug the power supply to a suitable AC outlet. At this point, the GREEN/BOOT LED light on the board should come on and start flashing, indicating that the Netbell-NTG is operating and is in the “Bootloader Mode”. After about 5 seconds, the GREEN LED will go off and the RED LED will start blinking, indicating the Netbell-NTG is operating in “Server Mode” and it is accessible on a network utilizing TCP/IP protocols.

Audio Output Connection

We provide three different kinds of cable to connect your Netbell-NTG to your amplifier depending on what type of input connection is on your amplifier.

a) The most common audio input for amplifiers is an RCA connection, the YELLOW wire is to be wired into the

LFT terminal position, the RED wire is to be wired into the RGT terminal position and the BLACK wires are always wired into the GND terminal position.

b) If your amplifier uses a 3.5mm stereo audio jack input then use the provided 3.5mm stereo to line out cable. The YELLOW wire is to be wired into the LFT terminal position, the RED wire is to be wired into the RGT terminal position and the BLACK wires are always wired into the GND terminal position.

c) If your amplifier uses an audio line input then use two 18-gauge 2-ply cable (not provided). As the wires for the 2-ply cable will be the same color for both left and right sides, wire the left side first then once completed wire the right side to avoid crossing the input/outputs. Use the black wires for the GND positions and the red wires for the LFT and RGT positions for each respective input/output.

Relay Output Connection

There are two relay outputs on the board. They are both dry contact (48V max 5A@12VDC, 3A@24VDC). There are 3 terminals for each relay labelled: NO, C, and NC which stand for Normally Open, Common and Normally Closed. Physical bells/buzzers can be connected to the C and NO terminals. When wiring physical bells or buzzers to the relay output, you need to select a suitable power source that meets the requirements of the bell or buzzer. Wire one side of the power source to one side of the bell – The other power wire is connected to the relay terminal C. Finally, connect the other side of the bell wire to relay terminal NO.

Digital Input Connection

There are 4 digital inputs (5-24VDC) built on the board for triggering special notifications/emergency alerts. A sensor such as temperature sensor or a push switch can be connected to the digital input. Please note, when connecting a 12VDC-48VDC sensor to the input, an external resistor (provided upon request, 2.2k ohm 0.5watt) must be used.

There are two modes of operation for the digital inputs: ISOLATED and PULL UP.

a) ISOLATED mode allows you to directly drive the Netbell-NTG's opto-isolator with an external voltage though and internal 1K resistor. This voltage may be in the range of 5VDC to 48VDC supplying a minimum of 2mA or a maximum of 30mA to the opto- isolator diode. There is no other internal connection to this voltage so it is an isolated input.

b) PULL UP mode connects a 1K resistor to an internal voltage allowing you to use a simple switch (such as a magnetic door switch) across terminals 1 and 2. When the switch is activated a signal is sent to the input. These modes are selected by the switch on the server (see the board layout for reference) marked ISO and PU for isolated or pullup respectively. On the Netbell-NTG put the switch up for pullup and down for isolated.

CAUTION: These units are ground isolated. Always connect so that power loop is only connected to the NetbellNTG unit. Do NOT use external ground connections. Doing so may damage the Netbell-NTG or POE originating device. If you intend to use the isolated mode, set the input switch before applying an external voltage. Doing otherwise may damage the Netbell-NTG or POE originating device.

Wiring a Background Music Connection

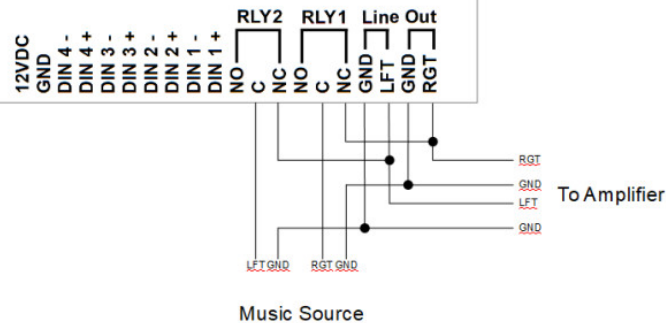


Model: Netbell®-NTG

Networked Tone/Message Generator/Controller

Linor Technology, Inc.

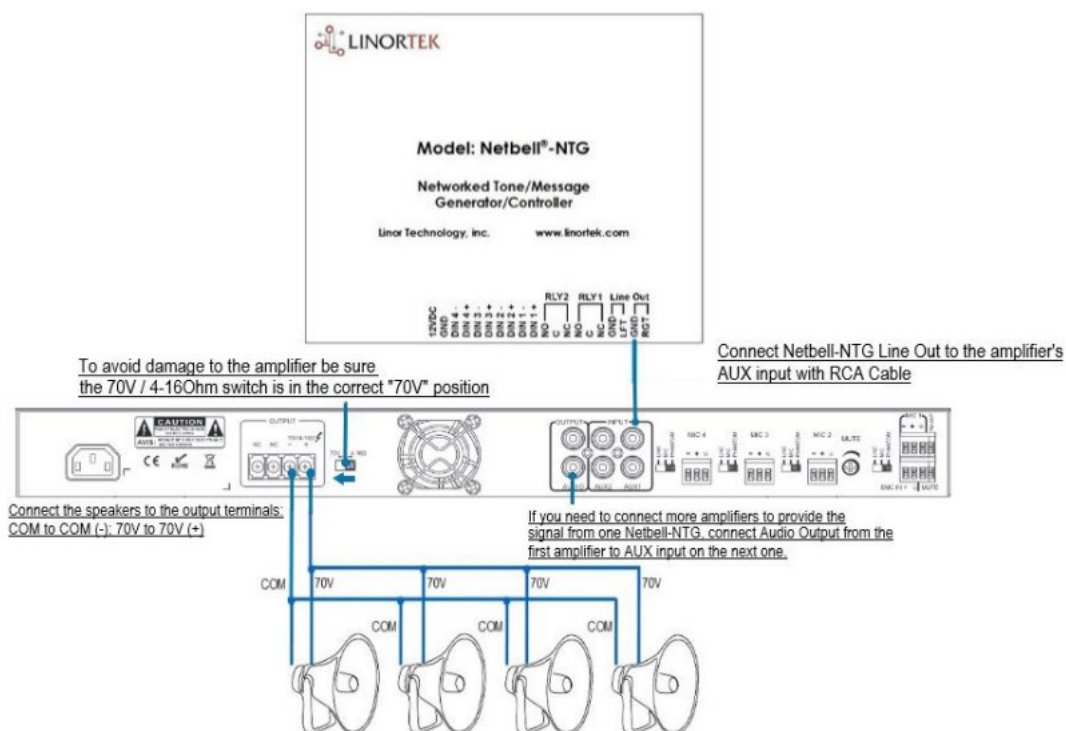
www.linortek.com



The Netbell-NTG is capable of using its relays to switch between an external stereo source such as a PA system or a music player. Following the wiring schematic above, the External source is wired into the relays using a Normally Closed circuit. It is then connected to the audio Line Out of the Netbell-NTG.

The Netbell-NTG must then be configured to disconnect the music source while playing the tone. Please refer to page 21 for instructions to program your Netbell-NTG for this.

Netbell-NTG Speaker System Wiring Diagram

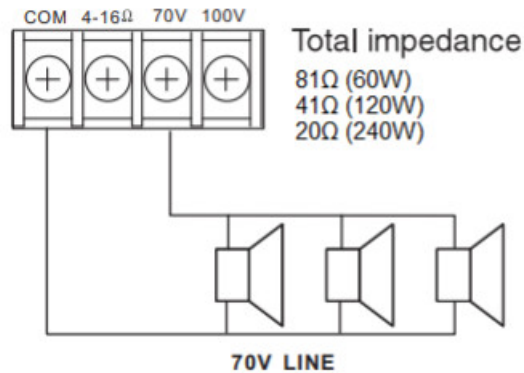


• Speaker Connection

The wires on your speaker:

- 30W Speaker: White (70V/positive), green/black (com/negative).
- 20W Speaker: White (70V/positive), black (com/negative).

This is a 70V speaker system. 70V speakers are designed to be wired in parallel, with the wattage adding up to be no more than 80% of the amplifier's wattage output as to give you ample headroom. The wiring schematic below shows how to wire 3 speakers, additional speakers could be added to the 70V circuit exactly like the previous speakers. To connect the speakers, refer to the diagram below to wire these speakers in parallel. Use the 70V wire for the amplifier's 70V output, and the com wire for the ground/negative (COM/-). The diagram below shows how to wire 3 speakers, additional speakers would be added to the 70V circuit exactly like speaker #3. For more detailed instructions on how to wire the speakers to the amplifier, please refer to the amplifier manual that comes with your system.



Notes:

- The 4-16 ohm and 70V/100V terminals cannot both be used at the same time.
- Impedances indicated in the figures represent the total speaker system (load) impedances.

Cable Requirements: If you need to extend the cable, the cable needs not be shield in most case and should be of sufficient gauge to minimize losses due to the resistance of the wire over long runs (insertion loss). Cable thinner than 18-gauge AWG is not recommended. Long runs require 16-gauge AWG or heavier.

In some cases where the output cable is run in close proximity to unshielded intercom cables, electrical cables, radio transmission antennas or other sources of interference, or when the amplifier is being used for paging from a telephone system, the amplifier may require shielded output cabling to prevent audio feedback or interference.

Max length of wire: It is recommended that high quality, heavy gauge, two conductor twisted speaker cable is used when connecting your loudspeakers. 14-16 AWG wire will work in most applications. The maximum length of speaker wire for a 70V line depends on the gauge of wire being used. You will find a chart with different gauges and their maximum length for use in a 70V system below.

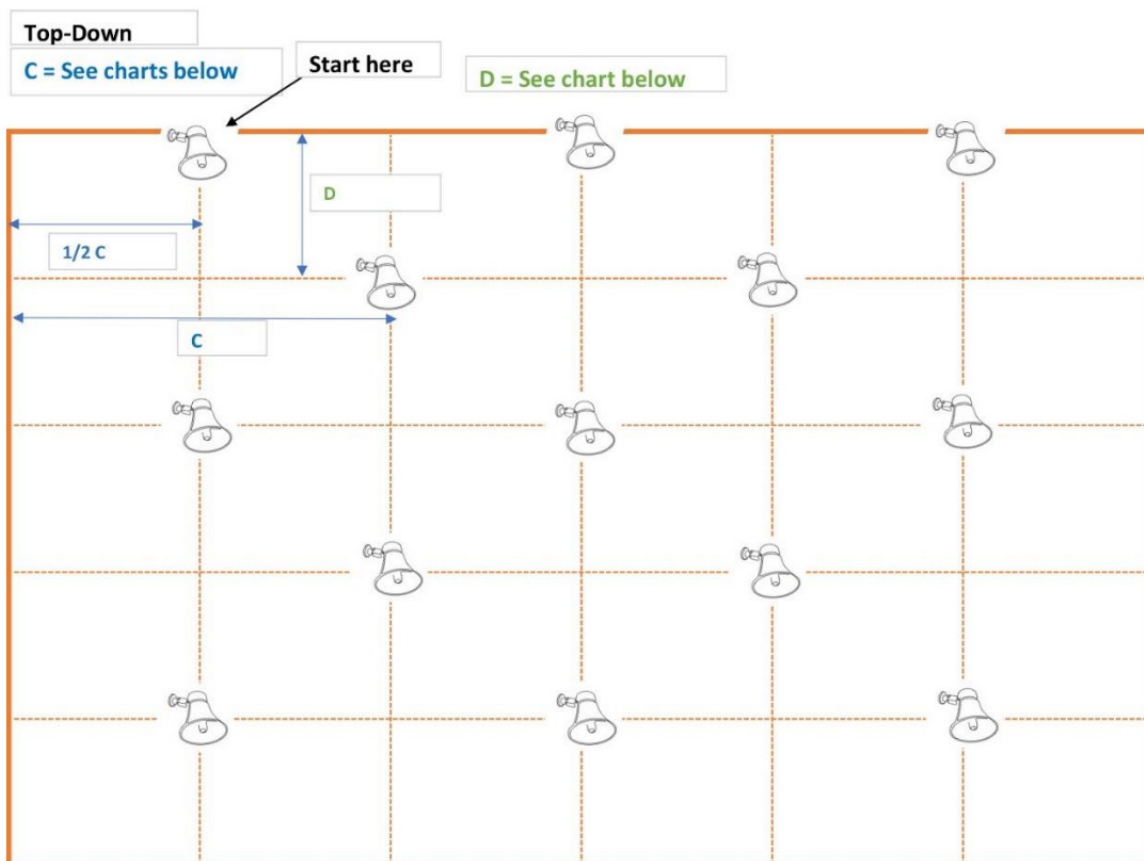
Speaker Cable Transmission Distance as a Function of Conductor Size vs. Loss									
AWG	Power Loss in Cable (%Loss & dB Loss)								
	4 Ohm Speaker			8 Ohm Speaker			70V Speaker*		
	11%	21%	50%	11%	21%	50%	11%	21%	50%
	0.5	1.0	3.0	0.5	1.0	3.0	0.5	1.0	3.0
6	277 ft	571 ft	1930 ft	554 ft	1141 ft	3859 ft	13580 ft	27965 ft	94548 ft
8	174 ft	359 ft	1214 ft	349 ft	718 ft	2428 ft	8546 ft	17598 ft	59498 ft
10	110 ft	226 ft	764 ft	219 ft	452 ft	1528 ft	5377 ft	11072 ft	37434 ft
12	69 ft	142 ft	480 ft	138 ft	284 ft	959 ft	3376 ft	6952 ft	23505 ft
14	43 ft	89 ft	302 ft	87 ft	179 ft	604 ft	2127 ft	4380 ft	14809 ft
16	27 ft	55 ft	185 ft	53 ft	110 ft	371 ft	1305 ft	2687 ft	9085 ft
18	17 ft	35 ft	117 ft	34 ft	69 ft	234 ft	823 ft	1694 ft	5726 ft
20	11 ft	22 ft	74 ft	21 ft	44 ft	147 ft	518 ft	1068 ft	3610 ft
22	7 ft	13 ft	46 ft	13 ft	27 ft	91 ft	321 ft	661 ft	2234 ft
24	4 ft	9 ft	29 ft	8 ft	17 ft	57 ft	202 ft	417 ft	1409 ft

• Speaker Placement

Ceiling speakers: Ceiling speakers are used with drop-tile ceiling panels and are appropriate for heights between 8 and 20 feet. A rule of thumb for placement is twice the ceiling height. So if your ceiling height is 8 feet, for example, speakers should be placed 16 feet apart.

Wall baffles: Instead of radiating sound downwards as with a ceiling speaker, wall baffles send soundwaves horizontally. Normally spaced 20 feet apart, wall baffles should never directly oppose each other. Wall baffle speakers are a good option for office, school which have a ceiling height over 20 feet, but aren't large enough to warrant horns.

Horns: Horns are typically used in manufacturing, warehouse, and outdoor environments. Horns can be mounted 15 to 20-plus feet off the ground, and spaced 50 to more than 100 feet apart, aiming 30 degrees down from horizontal (60 degrees up from straight down). Like wall baffles, horns should never directly oppose each other. Begin in one corner of the area. The first speaker in Row 1 is positioned a distance equivalent to (1/2C). The next speaker in Row 1 should be a distance equivalent to (C) from the first speaker. Each additional speaker in the row should use this same spacing. Row 2 starts at the indicated distance (D) from Row 1. Using the diagram as a guide, fill in the remaining rows in this same alternating pattern until the entire area is appropriately covered. See the layout sample and chart below:



Note: Each environment is unique. This layout plan is general in nature and may not be applicable for every installation.

Ambient Noise Range	Speaker Power Taps (Watts)	C	D
Medium Noise (65dB-75dB)	20	110	70
High Noise (75dB-85dB)	20	100	65
Very High Noise (85dB-95dB)	20	65	40
High Noise (75dB-85dB)	30	100	65
Very High Noise (85dB-95dB)	30	95	58

Finding the IP Address to Access the Software

Once your Netbell-NTG is powered on and connected to the network, it will automatically obtain an IP address via DHCP as long as your router is configured to do so. To connect, enter the IP address into your web browser. This will take you to your Netbell-NTG's landing page. To log in, click the Log In button on the top right of the page. Your browser will prompt you to enter your username and password. By default, these credentials are both set to admin. To find your Netbell-NTG's IP address, see below.

Using Linortek Discoverer

The Discoverer program will automatically locate your Netbell-NTG SERVER. The Discoverer is a Java program, and requires Java Runtime to be installed to use this feature. Java can be found here: <http://java.com/en/download/index.jsp>.

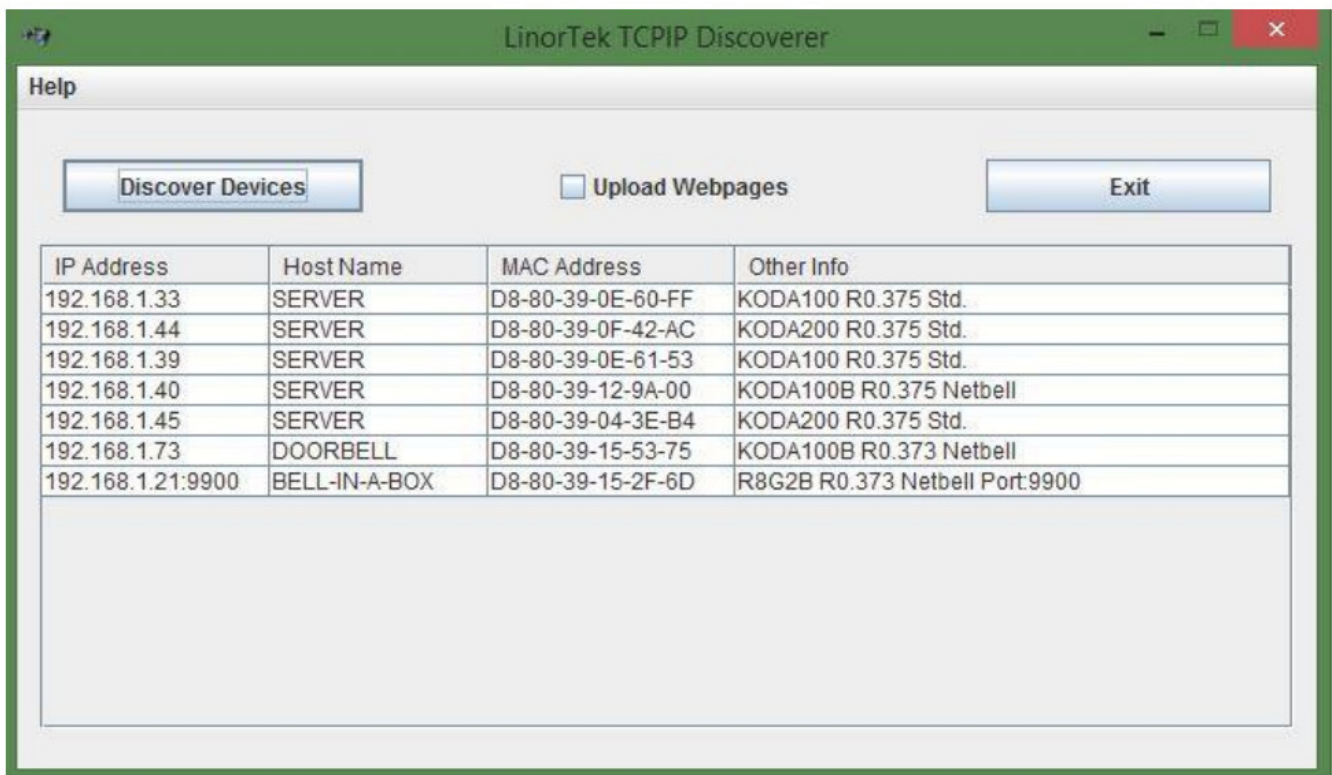
To download the Discover program, please go to: <https://www.linortek.com/downloads/supportprogramming/> Use of Chrome & Firefox browsers is recommended. Please note: If you prefer to use Internet Explorer, Internet Explorer saves Linortek Discoverer as a Zip file by default. In order to use the Discoverer, you will need to select Save as and rename the file as Linortek Discoverer.jar when you download.

When downloading the Discover program, sometimes you will see a popup warning message depending on your

browser security settings, asking if you want to keep or discard this file, please click the Keep button as this is a Java program, it won't harm your computer.

Once Discoverer locates your device, it will display:

1. IP Address
2. Host Name
3. MAC Address
4. Other Info:
 - a. Blue LED (if on)
 - b. Product Name
 - c. Server Software Revision
 - d. Port Number (If ported)



Click the device you want to use shown on the Discoverer program to launch the SERVER web pages in your browser. Click the Login button on the homepage. Default username/password is: admin/admin. You may change these as you desire or disable this feature in the Settings menu.

Connecting Directly to Your PC

You can also plug your Netbell-NTG directly to your PC in the case there is no network connection available. If you plug your Netbell-NTG into your PC's Ethernet port it will use the default IP address: 169.254.1.1 unless you have previously configured your Netbell-NTG to use a static IP. Enter 169.254.1.1 into your web browser to connect. No internet connection required. Once configured, you can then install your Netbell-NTG where desired.

Basic Software Configuration

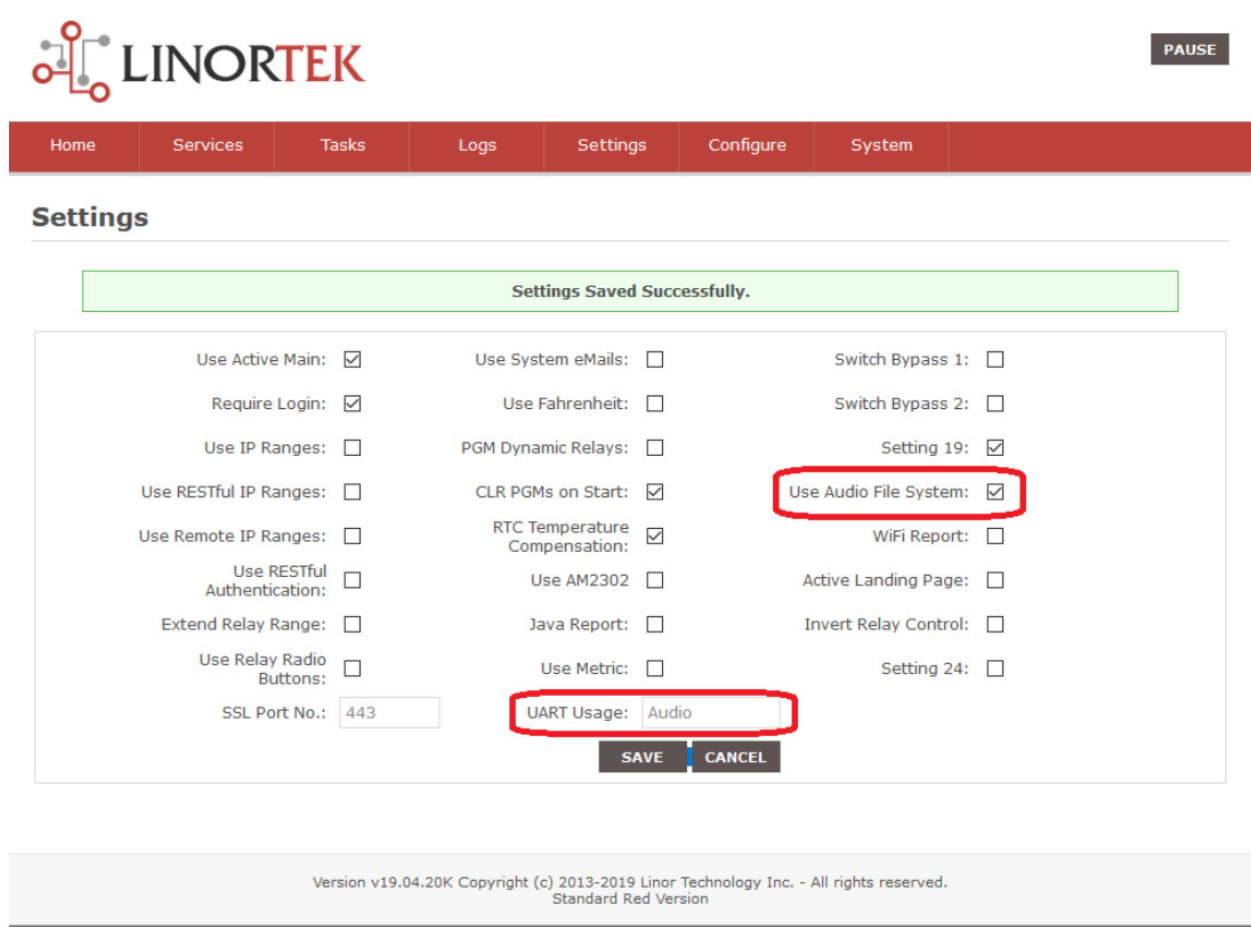
If you are configuring your Netbell-NTG for the first time, the section below will demonstrate how to enable the audio system. If you have already done this, skip to the section Assigning Audio Tones to Relays.

Enabling the Audio File System

Upon logging into your Netbell-NTG for the first time you will need to activate the audio system.

1. Navigate to the SETTINGS dropdown menu, then click SETTINGS.
2. Enter audio in the UART Usage field (not case sensitive).
3. Check the box Use Audio File System.

Click SAVE, the device should start playing through the files on the SD card now.



The screenshot shows the LINORTEK web interface. At the top is a navigation bar with links: Home, Services, Tasks, Logs, Settings, Configure, and System. A 'PAUSE' button is in the top right. Below the navigation bar is a 'Settings' section. A green banner at the top of the settings area says 'Settings Saved Successfully.' The settings are organized into three columns of checkboxes and a few text inputs. In the third column, 'Use Audio File System:' is checked and highlighted with a red box. At the bottom of the settings area, 'UART Usage:' is set to 'Audio' and is also highlighted with a red box. Below the settings are 'SAVE' and 'CANCEL' buttons. At the very bottom of the page is a footer with version and copyright information.

Settings

Settings Saved Successfully.

Use Active Main: <input checked="" type="checkbox"/>	Use System eMails: <input type="checkbox"/>	Switch Bypass 1: <input type="checkbox"/>
Require Login: <input checked="" type="checkbox"/>	Use Fahrenheit: <input type="checkbox"/>	Switch Bypass 2: <input type="checkbox"/>
Use IP Ranges: <input type="checkbox"/>	PGM Dynamic Relays: <input type="checkbox"/>	Setting 19: <input checked="" type="checkbox"/>
Use RESTful IP Ranges: <input type="checkbox"/>	CLR PGMs on Start: <input checked="" type="checkbox"/>	Use Audio File System: <input checked="" type="checkbox"/>
Use Remote IP Ranges: <input type="checkbox"/>	RTC Temperature Compensation: <input checked="" type="checkbox"/>	WiFi Report: <input type="checkbox"/>
Use RESTful Authentication: <input type="checkbox"/>	Use AM2302: <input type="checkbox"/>	Active Landing Page: <input type="checkbox"/>
Extend Relay Range: <input type="checkbox"/>	Java Report: <input type="checkbox"/>	Invert Relay Control: <input type="checkbox"/>
Use Relay Radio Buttons: <input type="checkbox"/>	Use Metric: <input type="checkbox"/>	Setting 24: <input type="checkbox"/>
SSL Port No.: <input type="text" value="443"/>	UART Usage: <input type="text" value="Audio"/>	

SAVE CANCEL

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Setting Time and Date

When first configuring your Netbell-NTG you will need to verify the time and date on your home page. Your Netbell-NTG is configured by default to use Eastern Standard Time (GMT-5) and will apply correction for daylight savings time. To change these settings, navigate to the Settings dropdown menu and then choose Time/Date. You can then change your time zone by adjusting the value in the third box labeled Time Zone.

If you intend to keep your Netbell-NTG off your network after configuring, you will need to uncheck Use Daylight Savings Time and Use NTP Update. You will then have to manually set the time to account for daylight savings, and adjust the time periodically to account for time creep.

Time/Date

Use hh:mm:ss and yy/mm/dd formats for setting the Time and Date.

Time

10:47:44

Format HH:MM:SS Always use Standard Time.

Date

20/03/26

Format YY/MM/DD

Time Zone

-5

☒ Use Daylight Savings Time
 ☐ Use MIL Time (24hr clock)

☒ Use NTP Update
 ☐ RTC Cap Sel 12.5pf (7pf def)

RTC Crystal Freq.

32769.8

32768.0 + if clock is slow. 32768.0 - if fast.

NTP Web Site

time.nist.gov

NTP Interval

30

☐ Log NTP Event

SAVE

CANCEL

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Assigning Audio Tones to Relays

As we use a relay to trigger a tone on the Netbell-NTG controller, the relay is just a tool for this purpose and not functioning as a physical switch in this case. You can assign the audio tone to any relays (1-8), so you can schedule that tone from the scheduling page (Services – Bells page). Tip: when you go to Services – Relays page, only 4 relays are visible. To enable 8 relays, go to Settings – Settings page, check the Extend Relay Range box, then click SAVE.

To view all 8 relays, go to Services-Relays page, change the relays4 to relays8 from the URL. For example, the URL on your Services-Relays page might look like this: <http://172.16.10.105/p/relays4.htm>, you can change it to: <http://172.16.10.105/p/relays8.htm> to see 8 relays.

The device comes installed with 40 default sounds from the factory, these sounds can be heard at our website <https://www.linortek.com/netbell-standard-sound-list/>. If you prefer to use custom sounds or your prerecorded messages, you can do so by adding those sound files to the SD card up to 10 hours as long as you convert the messages to OGG format (The Netbell-NTG uses .ogg file format for the playback of audio). If your custom sounds or messages are not in this format you will need to convert the file to an .ogg file using a free program called Audacity. For instructions on how to create customer sounds for the Netbell-NTG, please refer to Creating Custom Sounds section of this Manual. We will use the tone named “GOODMORN” and assign it to Relay 1 (bell 1) as an example here.

1. Navigate to the Tasks page on your Netbell-NTG
2. Click the Edit icon at the end of the first available line
3. Enter a name (if desired) in the Schedule Name field
4. Check the Use box
5. Set Device A to RELAY
6. Set Data A to 01+ (This refers to the Bell 1 on the bell schedule page for bell 2, 3, ... use 02+, 03+, ...)
7. Set Device C to SEND UART

8. Set Data C to PGOODMORNOGG (This must be an 8-character name preceded by P and followed by OGG. This must be capitalized)
9. Set Action to ON
10. Click SAVE

Home
Services
Tasks
Logs
Settings
Configure
System

Set Schedule

This page allows the user to edit the settings for the individual scheduled task selected on the previous page. Click "Save" to save changes made or click "Cancel" to return to the previous page. Leaving the page without clicking save will result in your changes being ignored by the Fargo server.

Schedule Select: 1
Schedule Name:
Use: ☒ Log ☐ Email ☐

IF

Device A: RELAY
Data A: 01+
Logic: NONE
Device B: NONE
Data B:

A/D-In: <,=,>
D-In: S=State. C=Cntr, c=Resetable Cntr, F=Freq., P=Period

THEN

Device C: SEND UART
Data C: PGOODMORNOGG
Action: ON

SAVE
CANCEL

Scheduling Audio Playback

Once the audio system is enabled you can then program your Netbell-NTG for audio playback. This can be done using the Netbell-NTG's Bell Schedule, or by using an external signal as a trigger.

Creating a Bell Schedule from the Bells Page

Each Netbell-NTG can set up to 500 bell event schedules. To add an event schedule, navigate to the Services dropdown menu, then select Bells. You will see the following page:

Home
Services
Relays
Bells
Tasks
Logs
Settings
Configure
System

Status OK
Page: 1 #Recs: 0

No	Name	Time	Bell								Day	Date	Dur	PW	Use	Once		
			1	2	3	4	5	6	7	8	S	M	T	W	T	F	S	yy/mm/dd

Enter "#upload" to enter BELLS from a .txt file; "#!reset@memory!" to clear all BELLS memory.

Name: Time: Duration: ADD SAVE DOWNLOAD

Date: mm/dd/yyyy

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You may use this page to enter up to 500 events. An event can be created in 9 simple steps.

1. Enter an event name up to 15 characters long (use letters and numbers only)
2. Use the 3 fields labeled Time to enter the time in HH:MM:SS (Note: the first field to select the hour uses a 24hr format. For 12 AM select 00, for 1 PM select 13)
3. Duration: Enter any number in the Duration box and select a duration multiplier (mS, Sec, Min), skipping this box might cause your schedule not working. The max duration the Netbell-NTG can play depends on the length of the audio file. For example, if the audio file is 10 seconds, it will continuously play for 10 seconds no matter what duration you set here.
4. (Optional) Enter a date. This will trigger the event only on this specific date
5. Click the Add button. You will see this event listed above. Subsequent events will be listed in chronological order
6. Once an event is added, you may adjust which relay output is triggered by selecting pips 1 – 8 under the Bell column. By default, 1 and 2 are automatically selected. Note which numbers you are using as you will need to assign a sound to each one. For numbers 5 – 8 see the section Activating Extended Relay Range on page 21
7. You may choose which days of the week will use this event under the Day column. Days are listed Sunday – Saturday (Note: if a specific date is chosen it will override the Day column)
8. Check the Use box to enable this schedule. If you only want it to trigger one time, check the Once box
9. Finally, click Save Below is an example of what a bell schedule may look like.

Home	Services	Tasks	Logs	Settings	Configure	System
------	----------	-------	------	----------	-----------	--------

Loaded 8
Page: 1 #Recs: 7

No	Name	Time	Bell								Day							Date	Dur	PW	Use	Once					
			1	2	3	4	5	6	7	8	S	M	T	W	T	F	S	yy/mm/dd									
001	Morning bell	07:30:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			8	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
002	Start	08:00:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			3	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
003	Production	08:30:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			4	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
004	Meeting	09:30:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			5	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
005	First break	09:45:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			5	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
006	Lunch	12:00:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			3	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		
007	End of day	17:00:00	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>			3	Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>		DEL		

Enter "#upload" to enter BELLS from a .txt file; "#!reset@memory!" to clear all BELLS memory.

Name: Time: : : Duration:

Date:

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Deleting Items

You can delete an item from your schedule by clicking the DEL button to the right of the list. To clear the entire schedule, enter #!reset@memory! Into the Name field and click Add.

Uploading a Premade Schedule

You may upload a Premade schedule by entering #upload into the Name field and click Add. This will take you to a new page. Click Choose File to browse your computer for the schedule in either .txt or .csv format. Once selected, click Upload. This will return you to the previous screen with your new schedule listed.

You can create a schedule using a Plain Text editor such as Notepad. Your first line should be #Start – each subsequent line will be a separate entry with 13 items, each separated by a comma. Save this file as Plain Text (.txt).

Saving your Bell Schedule

To save the bell schedule on your Netbell-NTG, click on the Download button in the bottom-right. This will open a new tab in your browser and display the schedule as plain text. Copy and paste this text into a plain text editor such as Notepad and save.

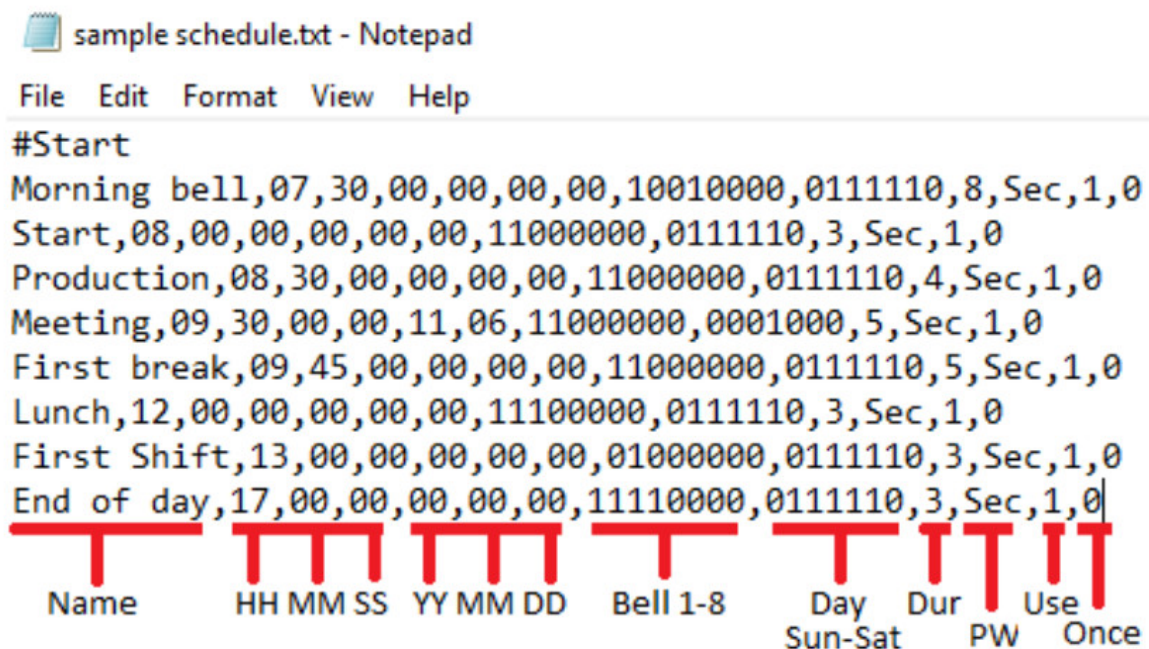
Creating a Bell Schedule Using the Bell Scheduler Desktop App

There is a free desktop app to create a bell schedule available at:

<https://www.linortek.com/downloads/supportprogramming/Documentation> is available at:

<https://www.linortek.com/downloads/documentations/>

Below is a sample prewritten bell schedule.



```
#Start
Morning bell,07,30,00,00,00,00,10010000,0111110,8,Sec,1,0
Start,08,00,00,00,00,00,11000000,0111110,3,Sec,1,0
Production,08,30,00,00,00,00,11000000,0111110,4,Sec,1,0
Meeting,09,30,00,00,11,06,11000000,0001000,5,Sec,1,0
First break,09,45,00,00,00,00,11000000,0111110,5,Sec,1,0
Lunch,12,00,00,00,00,00,11100000,0111110,3,Sec,1,0
First Shift,13,00,00,00,00,00,01000000,0111110,3,Sec,1,0
End of day,17,00,00,00,00,00,11110000,0111110,3,Sec,1,0
```

The screenshot shows a Notepad window titled "sample schedule.txt - Notepad". The window has a menu bar with "File", "Edit", "Format", "View", and "Help". The text content is a bell schedule. Below the text, there are red vertical lines indicating the structure of the schedule. The lines are labeled: "Name", "HH MM SS YY MM DD", "Bell 1-8", "Day Sun-Sat", "Dur", "PW", and "Use".

Using an External Trigger

You may also program your Netbell-NTG to play a tone upon input from an external trigger such as a pushbutton or door contact switch.

Note: unless your trigger device supplies its own power, ensure your input switch is set to Pull UP (PU) (See Wiring the Netbell-NTG page 5 and Board Layout Reference page 21)

Activating the Digital Input

Note: The following guide will assume you are using Digital input 1 and the tone EVACUATE.

Navigate to the Services dropdown menu and select Inputs. The top 4 items are your digital inputs. They are marked DIN 1 – DIN 4. Click on the blue pencil icon under DIN 1 and enter the following settings.

1. Enter a name in the Name field (if desired)
2. Enter a label in the Label field (if desired)
3. Check the Use box
4. Set Type to State
5. Set Relay L/T to 0L
6. Set Command L/Z/N/I to i
7. Click SAVE

Home	Services	Tasks	Logs	Settings	Configure	System
------	----------	-------	------	----------	-----------	--------

Set Digital Input

Digital Input Selected

Name

Label

Corrector Two term corrector, use +,-,*,/ value, separate terms with space
For example: +8 /1.5

USE : ☒

Type

Display

Relay L/T R#+L: Relay linked to Input state, R#+T: Triggers relay

Command L/Z/N/I L: Load counter, Z: Zero Counter, N: Input Normal mode, I: Invert input

Value Min : Max :

Yellow From : To :

Red From : To :

Green From : To :

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Setting Task for Digital Input

Now that your external trigger is wired to your Netbell-NTG and your digital input is configured, you will need to set up a task.

1. Navigate to the Tasks page
2. Click the Edit icon on the first available task
3. Name the task if desired
4. Check the Use box
5. Set Device A to Digital
6. Set Data A to 1S=1 (1 represents the number of the digital input, S signifies to your device to refer to input state, the last 1 signifies the state is on)
7. Set Device C to Send UART
8. Set Data C to PEVACUATEOGG (to play sound file EVACUATE in this sample)
9. Set Action to ON
10. Click Save

If you are using a trigger such as a door contact switch, set Data A in the example above to 1S=0 to play the tone when the contact is broken.

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Set Schedule

This page allows the user to edit the settings for the individual scheduled task selected on the previous page. Click "Save" to save changes made or click "Cancel" to return to the previous page. Leaving the page without clicking save will result in your changes being ignored by the Fargo server.

Schedule Select: 2

Schedule Name: Din1 push butto

Use
☒ Log
☐ Email
☐

IF

Device A: DIGITAL
Data A: 1S=1
Logic: NONE

Device B: NONE
Data B:

THEN

Device C: SEND UART
Data C: PEVACUATEOGG
Action: ON

SAVE

CANCEL

A/D-In: <,>
D-In: S=State. C=Cntr, c=Resetable Cntr, F=Freq., P=Period

A/D-In: <,>
D-In: S=State. C=Cntr, c=Resetable Cntr, F=Freq., P=Period

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Programming Netbell-NTG to Interrupt Background Music

Your Netbell-NTG can also be interrupt background music from an external source. Once your Netbell-NTG is wired to your audio system shown in page 8, you can program the Netbell-NTG to open its relays, play a prerecorded tone or message and then resume the background music connection.

First, create a bell schedule event for the desired times. Relays (bells) 1 and 2 will need to be triggered to disconnect the external source. And use relay 3-8 on the bell schedule page to play the audio file on your Netbell-NTG. Next create a task using relay 3-8 as described in page 15 to trigger the tone or message.

Enabling Extended Relay Range

While your Netbell-NTG only has 2 relays built-in, you can activate up to 8 relays for the purpose of scheduling additional tones and messages. To enable these software relays, follow the following steps:

1. Navigate to the Settings dropdown menu and select Settings
2. Check the box labeled Extend Relay Range
3. Click SAVE

Now that the extended relay range is activated, you can assign tones to relays 5-8 in the Tasks page. These will correspond with Bells 5-8 on the bell schedule page.

Creating Custom Sounds

The device comes installed with 40 default sounds from the factory. You can create custom sounds or record messages and save them to the built-in micro SD card to play your Netbell-NTG. The Netbell-NTG uses the .ogg file format for the playback of audio. If your custom sounds or messages are not in this format you will need to convert the file to an .ogg file.

We recommend using Audacity to create your custom tones and messages. Audacity is a free program that

enables you to record directly to .ogg format and also to convert other audio files into the .ogg format.

Note: When creating your custom file, the name of the file must be 8 characters long using only capitalized letters or numbers.

Audio File Guidelines

1. The Netbell-NTG comes with a 1GB Micro SD card, you can record and save over 10 Hours audio file on the card at 44.1k rate/16bit resolution.
2. The system supported file rates are 44.1k, 22k and 11k. Supported file resolutions are 16 bit and 8 bit. For best quality the .ogg file should be 44.1k/16bit/stereo.

Adding custom sounds or messages to the Netbell-NTG

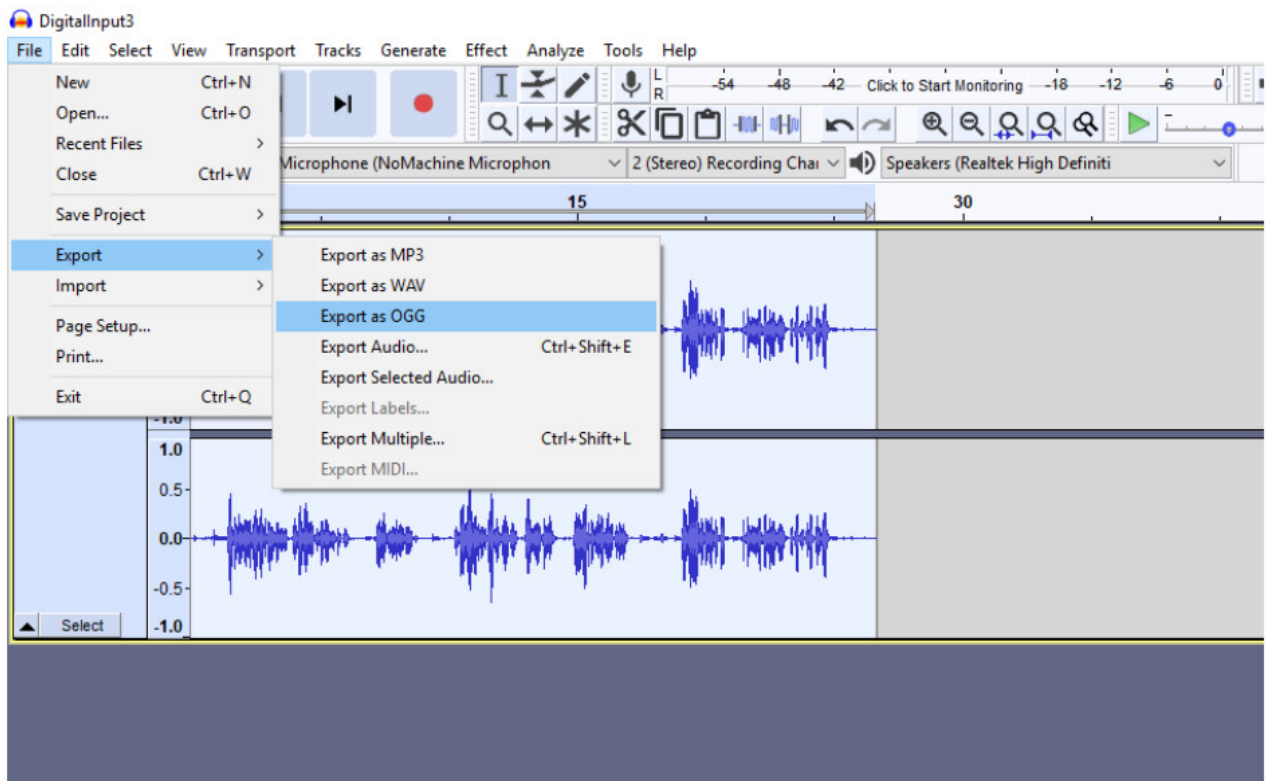
1. Choose your preferred sounds or record your own message from your computer or your phone.
2. Open the lid of the Netbell-NTG and remove the Micro SD card out from the slot on the board.
3. Insert the card into your computer's Micro SD card slot or put it in a Micro SD card reader and connect to your computer.
4. Convert your audio files to .ogg format using Audacity. (You may use any other program to convert your audio files into .ogg format, however we found Audacity is the simplest solution to record, edit, and convert audio files to be .ogg file.
5. Export the audio file from Audacity and save to the Micro SD card after converting. When exporting the file, make sure the file name is 8 characters long such as sound001 or the audio file system will not recognize it.
6. Remove the Micro SD card from your computer or card reader and insert it back into the Netbell-NTG's card slot.
7. Refer to pages 15 – 19 to program your Netbell-NTG to use your new sounds.

Using Audacity

1. Download the Audacity program to your computer from here: <https://www.audacityteam.org/>
2. Open the audio file in the Audacity program by clicking OPEN in the FILE dropdown menu.
3. Export the audio files as an OGG file by clicking EXPORT under the FILE dropdown menu, then clicking Export as OGG, save it to the SD card.

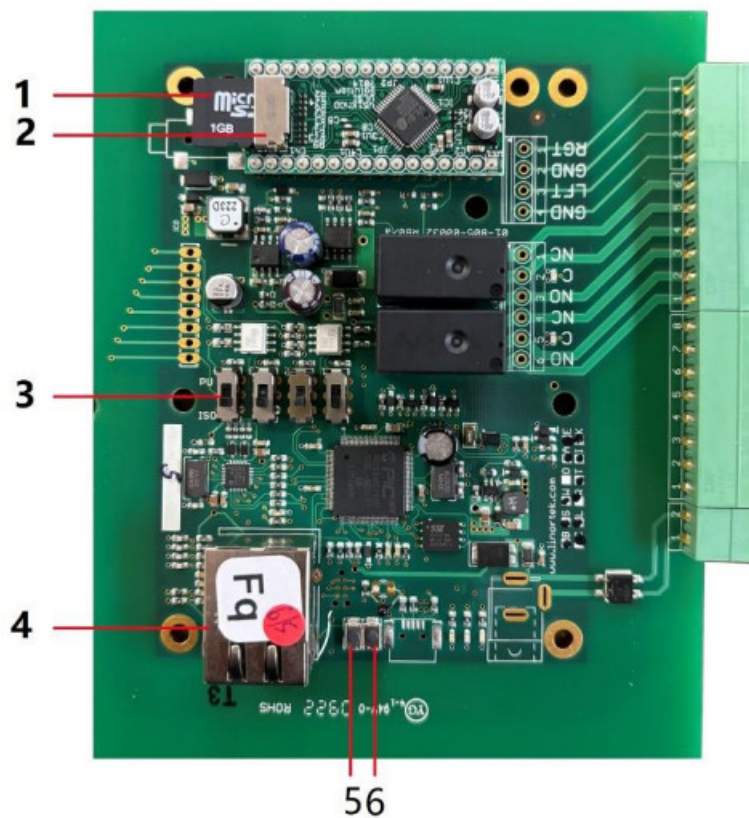
Video Tutorial: How to Create Custom Sounds for Netbell-NTG PA System Controller:

https://youtu.be/RFSO9U14I4Q?si=dJ0Z_EW-QSzS1B5v



Note: To change the pitch (the sound quality), select the whole file in Audacity by typing “CTRL + A,” Then going under “Effect” and clicking “Change Pitch.”

Board Layout Reference



1. Micro SD card slot
2. Audio Module
3. Digital input switches (the order is 4, 3, 2, 1 from left to right)


4. RJ45 Connector
5. Reset Button
6. Reload Button (turns on blue LED – identified on Discoverer)

This is an image of a bare board Netbell-NTG, it explains the inputs and outputs of the device and the ratings for each. The device comes with a 1GB Micro SD card, and will be enough for over 10 hours of audio playback. If more is desired a larger Micro SD card can be easily installed. The line out is divided into left and right for stereo sound and can be used with an amplifier, it has a 30-ohm impedance rating. A 12VDC power supply is provided with the controller, it is also POE (Power Over Ethernet) enabled (Please note: this device can only work on IEEE 802.3af or 802.3at standard. Please check your network switch specifications before plugging the device in to prevent potential damage to your device.).










This document can be found at www.linortek.com/downloads/documentations/
If you need assistance with your device please visit www.linortek.com/technical-support
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Documents / Resources

	<p>LINORTEK Netbell-NTG Network Enabled PA System Controller [pdf] User Manual Netbell-NTG Network Enabled PA System Controller, Netbell-NTG, Network Enabled PA System Controller, Enabled PA System Controller, PA System Controller, System Controller</p>
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References

-  [Linortek - Remote Control Monitoring Solutions](#)
-  [Documentations](#)
-  [Linortek`s Technical Support and FAQ Page](#)
-  [Linortek Terms and Conditions](#)
-  [P65Warnings.ca.gov](#)
-  [Audacity ® | Free Audio editor, recorder, music making and more!](#)
-  [Documentations](#)
-  [Linortek Products Support Programming Resources](#)
-  [Linortek Products Support Programming Resources](#)

-  [End-User License Agreement](#)
-  [LINORTEK ONE-YEAR LIMITED WARRANTY](#)
-  [Netbell Standard Sound List](#)
-  [Linortek Website Store](#)
-  [Linortek`s Technical Support and FAQ Page](#)
- [User Manual](#)

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