

# greenGO digital intercom version 4.

## greenGO engine description

The greenGO system is like a large matrix intercom system, but with spread-out processing power. All channel and audio handling is performed by each device with the use of the greenGO engine. Each engine has its own 32 work channels plus program audio, announce and emergency channels. Each of the channels can be programmed to work with any of the 250 Groups (or party lines) or one of the up to 3000 users. A main feature of the system is the lack of a central unit, so no single point of failure. For devices to work together, information needs to be shared. This is done by creating a single configuration file that is stored on every device on the network. This file can be created and uploaded via the free configuration software. If a unit does not contain the correct configuration file, it can be uploaded from the software or directly cloned from another device without the use of a computer.

## Changes from version 3 to version 4

The firmware and software for green-GO intercom has moved from version 3 to version 4. Some major changes to the internals and network handling have been made to enable new features like wireless and remote connections. The main innovative features like the 250 groups (party lines), 3000 users and 32 channels per user and no central unit have not changed.

What has changed:

**The network** data has changed from a Layer2 protocol to Layer3 IP multicast, enabling easier handling of greenGO data on shared (audio/lighting/office) and corporate IT-managed networks.

**Internal Engine structure** changed allow the use of remote users. Any greenGO user device like beltpack or multichannel stations can be used anywhere in the world by plugging into an internet enabled network and make a connection to a Green-GO bridge somewhere else and become a Full member of that greenGO network and have access to all features and channels.

**Unified setup menu structures** give users a cleaner experience as the setup menu is structured the same on all devices. Features not supported by a device will of course not show up in the menu. The main user interface will be device dependent.

### Setup menu structure

The main setup menu is different on each device as it is device specific on functions. Also note that some functions described in the menus are maybe not available on some device or are directly accessible from the main front panel.

## Unified Setup Menus

### Program Audio

- Src -> select any of the Groups to be the source for the Program audio. If multiple sources are active on the Group, all audio will be mixed into the program audio.
- Vol -> Set the normal volume of the program audio between +12dB and Mute
- Dim -> Set the level for the dimming feature of the program audio. If any communication starts on any of the channels or direct, then the program audio can dim or mute its audio. It can be set to 0dB (no change), -6/-12/-24dB or to Mute

## Channel Assignment

When a user is selected, the default channels assignments are loaded from the configuration file. It is still possible to change these settings locally via the Channel Assignment menu. In the Channel Assignment menu all channels are listed with the assigned Group or User. Select a channel to start changing any setting for that channel. Channel options are :

- ID -> Select a Group (aka party line) to become part of it or select a User to enable a private conversation. Selecting none instead of Group or User will disable the channel.
- Set Label/Change Label -> in some situations it is useful to have a different name displayed instead of the real Group or User name. Then use this to change it. An example use could be that a Camera Group is created, but for clarity the channel is labeled Director for the camera operators. When a different Label is set to a channel, it will be indicated by a ' mark before the name.
- Talk -> Set the talk mode for the channel. This can be set to Talk/Momentary, then a short press with Latch/Unlatch the talk and a long press will act as a push to talk. Latch mode will always act as latch on/ latch off. Momentary will be acting as Push to Talk. Last option is Disabled and can be set if the device is not allowed to talk to the Group or User assigned to that channel.
- Listen On / Off -> Set Listen on or off for the channel, can be used when the Listen on/off function is not available on the Front-Panel (like on audio interfaces).
- Volume -> Set the Channel volume, same as before, to be used if no Front-Panel access to the function is available.
- Priority -> Set channel priority to Normal / Low / High. If a channel with a higher priority becomes active, then the audio can be dimmed or muted for lower priority channels. The Dim is set in the Option menu under Priority Dim.
- Call Send -> Is the device allowed to send a Call on Group or User assigned to the channel. This can be set to Enable or Disable.
- Call Received -> Is a Call or Alert signal from the User or Group assigned to the channel to be received (Enabled)or ignored (Disabled).
- Bandwidth -> greenGO used by default 16khz sampling and 16bit on it's audio communication. This gives a very low network latency of only 12 ms (comparable to audio traveling 4 meters thru air) and also only require very low network bandwidth (0.4% on 100Mbit). The audio response in this situation is up to about 7khz, perfect for normally voice communication. For some situations, like a announcement that goes over the main PA system, a larger audio bandwidth is required. In that case switch that channel to Enhanced Bandwidth. The audio bandwidth now increases to about 15khz, but the network used bandwidth also doubles when talking on that channel. The setting is only used when sending audio to a Group or User, it has no influence on the listen.

## Audio Setting

- Load Profile -> select one of the Audio profiles stored in the configuration file
- Volume -> Set main output volume if not supported from the main user interface
- SideT -> Set the side-tone between 0dB (full) and Mute (off)
- Auto -> Automatic gain control can be switched between Off / Slow / Medium/ Fast
- Gain / MaxG -> Gain setting (or Max Gain when auto gain is enabled), range is depending on the input type. Setting the Gain is the most important part of the whole system, if the audio level is not correct, then the result will also be dissatisfying. (Garbage in -> Garbage out). There is a level indicator on the right side of this menu showing the input level after the gain. The level should be just below the line (orange part on color displays or dotted on monochrome screens).
- Thld -> Noise-gate threshold can be set to off or -45dB to -20dB. Note when switching to off, the device will always send audio to the network when the talk is enabled. If the threshold is set to high,

intermittent audio will be the result. When the gain is set correct a value of -35 should be a good starting position.

- Hold -> The noise gate hold time can be set between Fast (200ms)/Medium(1s)/Long(2.7s)/Extra Long (4s)
- Bias -> Set the bias voltage On or Off for use with headsets
- In -> Select the audio source. This depends on the device to select Headsets / Frontpanel Mic / Line Inputs. An added feature is to select a fixed tone generator and can be used to help in tracking down issues.
- Spkr Dim (MultiChannelDesk) : If speaker dim is enabled, the front-panel speaker will dim when the Talk is enabled.
- Mic Pwr (MultiChannelDesk) : If the front-panel mic is selected as input, then you can enable phantom power for it. The voltage depends on the unit.

## Options Menu

- Active Time -> Set the time that a channels is active after the last audio of call event. This time value is used for front-panel indication, GPI/O handling and answer function.
- Isolate -> Isolate function can be switched on or off (on some devices like MultiChannelDesk it is directly accessible on the front panel). When in Isolate mode, all channels will be muted except on channels with talk enabled. If no talk is enabled channels remain as normal.
- Buzzer -> If a device has a buzzer build in, then it can be switched on or off. The buzzer will sound when an alert is received on a channel with Call Receive enabled. The alert signal is activated when the call signal is set for more than 2 seconds.
- Tone -> set the volume for signaling tones generated. Signal tones can be generated from Alert signals, Cueing indication or Connection issues (for the wireless system).
- Listen On Talk -> If enabled, a muted channel will switch to listen if the talk on that channel is enabled.
- Answer -> Enable or Disable the answer function. On a beltpack the answer function is by pulling up the rotary encoder on the BPX/WBPX or pushing the rotary encoder on the Original Beltpack
- Pop-Up -> Popup function is showing information about channels not directly accessible. It can be selected between No Popups, Only on Cue, Cue + Direct or All (Cue / Direct / Extended channels).
- Priority Dim -> The channels can be setup with priorities (Low / Normal / High) if a higher priority channel becomes active, then lower priority channels can have their volume adjusted by the Priority Dim value. The dim can be between 0dB (no change) and -6/-12/-24dB (din) or Mute.
- Direct Volume -> If audio is received outside of the 32 channels and program audio it is using the Direct channel. This audio can be from a user having a Private talk while the source user is not on one of the 32-channels. The volume of this temporary channel is set between +12dB and Mute.
- Direct Priority -> Set the channel priority for the temporary direct channel as described before.
- Auto Talk -> Set a channel to have the talk of this selected channel on if no other talks are enabled. This function is useful for 2-wire and 4-wire interfaces, but can be used in other devices also.
- Cue Mode -> How to react on an incoming cue signal. Normal will require actual feedback from the user after receiving an attention message. Auto will send an acknowledge directly back on receiving a attention message, the Cue sender will have confirmation that the device has received the signal. On Ignore the cueing will be completely ignored and no indication will be on the receiving unit, the sending will not receive any confirmation.
- Output Cue Time -> This is available on devices with the ability of sending Cue information (like the Multichannel desks). The Output Cue Time is the time a GO cue will remain active before it will be automatically switched of. The time can be set in steps between off (will not automatically switch off) and 60 seconds.

## Line In / Out

In this menu the function of the Line in and Out of the unit is setup. The Line input on the unit can be used to send audio into the greenGO system on any of the up to 250 available Groups. In addition it can be used as a source for the intercom, but this is setup in the Audio Settings menu (both can work in parallel). A function for the Line Input could be to get Program audio into the system. The Line out can be set to output any audio from an assigned Group. A function could be for Announcement out. On the Multichannel desk it is also possible to Mix in the Main intercom audio into the Line Out by setting the Main Mix Output.

### Line In

- Group -> Assign a Group where the audio should be sent.
- Gain Mode: Set the automatic gain to Off / Slow / Medium / Fast
- Gain or Max Gain: Set the gain for the Line Input. On the right side of the display is a level indicator showing the input level after the gain. The level should be just below the line (orange part on color displays or dotted on monochrome screens).
- Threshold -> Noise-gate threshold can be set to off or -45dB to -20dB. Note: when switching to off, the device will always send audio to the network when the talk is enabled. If the threshold is set to high, intermittent audio will be the result. When the gain is set correct a value of -35 should be a good starting position.
- Bandwidth -> Can be set to Normal (7khz audio) or Enhanced (15khz audio)

### Line Out

- Group -> Assign a Group to receive audio for this output. If multiple sources send audio, then the audio will be mixed.
- Output -> Set the output volume
- Loopback -> If needed, the audio from the Line In can be mixed in to the audio on the Line Out.

## GP Input / Output

In the GPIO menu, General Purpose Input Output, each GPIO Input and Output can be assigned a function. Each Input is labeled In 1: (function and function option) and each Output is labeled Out 1: (function and function option). To change set settings for a Input or Output, go to the line and select it. Next it will show the current function, function option and if the port is handling in a normally closed or normally open manner.

<u>Input Function</u>	<u>Option</u>
Talk	Answer or Channel selection
Call	Channel Selection
Cue	Acknowledge / Send Attention / Send Hold / Send GO
<u>Output Function</u>	<u>Option</u>
Active	Any channel or Channel selection
Call	Any channel or Channel selection
Cue receive	selection on Cue states

## Set User

As each device of the greenGO system holds internally a configuration file that contains all information of the system, it can be set to any user and load it's default settings. This is done in the Set User menu. Multiple devices can be set to the same user without any problems, giving the option to a person to have for example both a multichannel desk with many direct channels and a wireless

beltpack (any private message will arrive on both devices).

When entering the Set User menu, all available users will be shown in a list. To protect some user of being selected, a pin-code can be set in the configuration software for certain users. When selecting these users, a pin-code needs to be entered. After a user is selected, all settings for that user will be loaded from the configuration file, this includes channels and program audio settings, access level profile and if programmed audio profile and user interface settings.

## Connection

The connection menu sets the way the unit is connected to the greenGO system.

Local connection mode is the connection method used when the devices are directly on the network with other greenGO devices.

Remote connection is used if a device is operating in a remote location and connects to the greenGO network thru a greenGO bridge or bridgeX interface. For the Remote connection some extra settings are needed:

Password	this is an 8 character password that should match the settings in the bridge The <i>generate password</i> menu item can be used to create a password
Remote Port	this is the UDP port number the remote bridge is programmed
Remote IP	the IP address for the bridge
Backup	switch on or off the backup option.
SndBuf	Size of the send buffer
RecvBuf	Size of the receive buffer

Changing size of Send and Receive buffers can be changed to help with latency issues on connection.

## Clone Config

A great feature of the greenGO system has no central processor or unit, so no single point of failure. For all devices to work as one system, all will need the same configuration file. This file can be setup and uploaded via the free greenGO configuration software. If a device does not contain the same configuration file as others on the same network, it cannot communicate. To become part of the same system it will need the configuration file, this can be uploaded from the software or directly copied from another greenGO device in the Clone Config menu.

When entering the clone config menu, the device will search for configurations on the network other than it's current config. Up to 4 configurations can be shown. Select the configuration and it will be copied from the network. After the clone is done, the pack becomes part of the network. Next step would be to selected a user. At the end of the list in the clone configuration menu it gives the option of loading in a Factory Default configuration. This configuration has about 60 users, so even if no suitable configuration is available and no computer to program, this system can still be setup to function. Just load the Factory Default configuration, select users and make any channel modification as needed. The system will always be available to operate.

## Device Options

This menu's options are completely depended of the device used. Options like backlight and led level settings, function of the side encoders.

## Network

As greenGO works directly on Ethernet, some IP settings are needed. By default the units will work with Dynamic IP addressing enabled. The units will look for a DHCP server on the network to get an IP address. If no DHCP server is found, the IP address will be assigned automatically by using the LLC standard and the device will get a 169.254.x.x address. If a static IP address is preferred, then this can also be set in this menu, by switching off Dynamic and entering the IP address / Netmask and

Gateway (gateway only needed if remote connections are used). The greenGO communication will still work even if IP addressing is setup incorrect, only when trying to connect with computer software issues will arise.

A bridge unit has 2 Network connection options, Internal and External. Internal settings are used for the network connected to the greenGO system. The External is to be setup for a secondary network if in use, this could be an office network with internet access.

## Info

The top line of the Info menu will show the name programmed into the device from the configuration or connection software. This name is completely separate from the User selected and can indicate for example the location, like "dressing room 1". The next line indicates if any protection is enabled on the configuration, this can be used in protected configurations and systems with the 256-bit AES audio encryption enabled.

Line 3 -> serial number

Line 4 -> current firmware

Line 5 -> IP address of the unit

Line 6 -> Reset All Settings. Use this function to clear all settings in the unit except the configuration file.

## 4-Wire Port function

A 4-wire port can act in both a User manner (with all 32 channels, program audio and GPIO) or in General purpose Line In/Out. To select this operation, select either a User or Line In/Out Mode in the Set User / Mode menu. See DEVICES section below.

## 2-Wire Port function (Audio Line Setup) (See also DEVICES section below.

- Mode -> Select operation mode / Line Level. The line level depends on the compatibility of the connected analog party-line system.
- Run Auto Null -> After selected the desired operational line level, an auto-nulling procedure is needed to setup the system. Before running the Auto-Null, it is needed to connect the complete Party-Line system and have all microphones on the party-line system switched off. Then run the auto null procedure. It will setup the selected line-level and remove the audio return.
- Callsignal -> Sending and receiving Call signals to and from the Party-Line is supported. The types of signaling supported are both the DC (switching a hard voltage onto the audio line) and AC (sending a 20khz tone). If the 2-wire interface received a Remote Mic mute command from a multichannel desk, then it can send a 24khz AC signal onto the analog party-line, some analog party-line systems support this feature.
- Threshold -> The Noise-gate can be set, but on a 2-wire port it cannot be disabled, otherwise this would generate issues with echo and the internal DSP will not function correctly. If an echo is heard on the greenGO system, that would in most cases indicate an error in the 2-wire/party-line setup.
- To 2-wire -> If the audio on the Partyline received from greenGO is to low or high, then it can be changed with this value.
- From 2-wire -> If the audio from the Partyline to greenGO is to low or high, then this is the place to change it.
- Null On Boot -> enable or disable the Auto nulling procedure when the device is booted.

## Bridge(X) function and setup

A bridge has 2 or 4 (BridgeX) connection ports, not to be confused with Ethernet ports, to support 2 or 4 active connections. Each connection can be setup as Group Bridge or Remote User access.

In Group Bridge a Group from the greenGO configuration is selected. All audio on this group will be sent to its counterpart bridge and all audio received from the other bridge will be sent to the Group on the greenGO system. The two bridges create one large group between 2 sites. If 3 sites need to be connected, then each site will need 2 connections (one for each other site). On one site the connection is to be set as Active and the other set to Passive. A Passive connection will wait for a connection initiated from an Active connection.

- Password -> To be setup the same on both ends, Generate Password can be used to create a none guessable password.
- Local Port (on Passive Connection) -> UDP port to where the Active connection is to connect
- Remote Port -> UDP port of the Passive connection to connect to
- Remote IP -> IP address of the bridge unit with the Passive connection
- Backup -> Select if a backup Bridge connection is available
- SndBuf -> Size of the send buffer
- RecvBuf -> Size of the receive buffer

Changing size of Send and Receive buffers can be changed to help with latency issues on connection.

In User Access mode, any greenGO device can remotely connect into this connection to become a full member of the greenGO system. It is possible to select the User selection to be open to the unit, or fixed by setting the User option. In the Connection menu the connection details are setup.

- Password -> To be setup the same on both ends, Generate Password can be used to create a none guessable password.
- Local Port -> UDP port to where the remote greenGO device is to connect to
- Backup -> Select if a backup Bridge connection is available
- SndBuf -> Size of the send buffer
- RecvBuf -> Size of the receive buffer

Changing size of Send and Receive buffers can be changed to help with latency issues on connection.

When using the iPhone App the bridge needs to be set in User Access mode with the User option assigned to a user (not to Any).

## DEVICES

### Beltpack BPX

Beltpacks have 2 connections, an XLR4 for the headset and a Neutrik Ethercon for network connection and power via Power over Ethernet (PoE). The user interface has a color OLED screen, 4 buttons with RGB leds next to it and 2 side rotary encoders with click function. The click function of the encoder is accessed by pulling up the encoder. The first function of the encoder is the main volume. Each encoder can also be assigned a different default function in the setup menu, functions like program audio volume or side tone. When a talk button on a channel is pressed, then the encoders controls the volume of that channel. Clicking the encoder when a talk button is pressed with toggle the channel between Mute and Enabled. Lifting up any of the 2 encoders will bring up the second display page. If the answer function in the Options menu is enabled and any channel is active, at this time the talk would also be enabled for these channels. The second display page shows the name of the user selected on the device and gives access to the Extended channels via button 4.

Multiple channel operation modes are available:

## 2 channel operation

On the display channels 1 and 2 are visible. The buttons on the Left are the talk buttons, where the right buttons are used to send call signals to the groups or users assigned on the channels.

## 3 channel operation

The display shows channels 1 to 3, where the buttons 1 to 3 act as talk buttons and button 4 has a special function. When no talk is enabled on channels 1 to 3, then the button give direct access to the Extended channel menu. If talk is enabled on any of the channels 1 to 3 the function of button 4 becomes send call, pressing will send a call signal to any channel with the talk enabled.

## 4 channel operation

Access to the first 4 channels is given, with the buttons acting as talk buttons. In this mode it is not possible to send call signals to any of the 4 channels.

## Extended channels menu

Channels up to 32 not available from the main operation mode can be accessed in this menu by scrolling thru the list with the encoder. The top left button acts at Talk button for the selected channel, the lower left button is for sending calls. The top right button mutes or enables the channel. Press and hold this button and turn the encoder to change the channel volume. Press button on the lower right to exit this mode.

## Setup menu

To access the setup menu, go into the second display page by lifting up one encoder, followed by lifting up the other encoder.

## Device Options menu

- UI: set the operation mode
- Flip: select to rotate the display, either main operations and/or setup menu.
- Enc < / Enc >: set the default operation mode for the left and right encoder.
- LED brightness
- Scr saver: To prevent screen burn in of the OLED display, set the screen saver.

## Wireless beltpack WBPX

The greenGO wireless beltpack is designed to act the same way as the wired version, with the same user interface display, buttons and encoders, giving full access of all 32 channels and functions. The differences between the units are in the connections and some menu items. The wireless beltpack requires a greenGO active antenna to work and uses DECT 1.9 Ghz to communicate. The active antenna is connected directly on to the Ethernet network and can handle a maximum of 4 wireless beltpacks at the same time. On the back there is an on/off slide switch to power on the device. To power off the device activate the switch and the display will show a timeout counter before switching off. A mini USB connector is used for charging the battery or for connecting to a computer. When connected to the computer, the USB connection in combination with the wireless control software is used for firmware upgrades. The second display page, accessed by lifting up one of the encoders, will show the battery state, RF field strength and connected antenna index number, in addition to features shown in the wired version.

## Setup menu

To access the setup menu, go into the second display page by lifting up one encoder, followed by lifting up the other encoder.

## Clone Config

The clone config menu acts the same as normal, but it controls the configuration stored in the active antenna. The active antenna has one active configuration used by all, up to 4, connected wireless beltacks. Cloning the config of one wireless beltack also changes the configuration on the wireless beltacks connected to the same antenna.

## Connection menu

Wireless pairing and setup is described in a separate section.

## Active Antenna WAA

The active antenna is used to connect the wireless beltacks to the greenGO system network. It can serve up to 4 wireless beltacks at the same time and has an Neutrik Ethercon for network connection and power via Power over Ethernet. A small button and bi-color led is on the bottom, for use in setup. This is described in the Wireless pairing and setup section. The function of the bi-color LED is:

- Blinking GREEN: operational and other greenGO devices on the network available with the same configuration file.
- Blinking GREEN/RED: operational, but no greenGO devices on the network available with the same configuration file.
- Blinking RED (2x pre second): Pairing mode, described below
- Blinking RED fast: firmware error, please check the firmware or upload new one

## Wireless connection setup

For wireless beltacks to work with an active antenna, the two need to be paired. Pairing can be done over the air or via the Wireless Control software.

### Over the air pairing

Each Wireless Beltack can “remember” up to 4 Active Antennas, whereas an Active antenna has the option of remembering a maximum of 6 Wireless beltacks. Even though an Active antenna has the possibility to remember 6 beltacks, only 4 can be active and connected at one time. To start the pairing of a beltack to an Active antenna, first put the active antenna in pairing mode. Press the small button on the bottom of the antenna for about 1 second and release. The LED should now be blinking RED ( about 2 times per second ). Next step is on the Wireless beltack. Go into the connection menu and select a connection between 1 and 4. If a connection is already programmed, then first delete it. Next select the connection and select Start Pairing. After a few seconds, the message should read Registered. The Active antenna now goes out of pairing mode. If you need to pair another beltack to the antenna, the same procedure should be repeated. When the maximum of 6 beltacks are paired, any new beltack will overwrite the last one. You can clear all paired devices on the antenna by first putting it in pairing mode, as described before, and then press and holding the button for about 10 seconds. The LED will start flashing quicker and finally light up full RED when done.

## Original Beltack GBP2

The original beltack has 2 connections, an XLR4 pin for headset connections and a Neutrik Ethercon for the network connection and the power. The unit is powered from PoE (Power over

Ethernet). The user-interface consists of a LCD button with RGB backlight, 2 direct channel buttons and a rotary encoder with push function.

#### Main operation

Turning the encoder will change the main volume. Channels 1 and 2 are shown on the display and controlled by the 2 direct channel buttons. The buttons act as talk buttons, operation defined by the channel setting. Pressing the LCD button, will send a call on channel 1 or channel 2 if talk is enabled on that channel. If a cue attention is send, then it can be acknowledged by pressing the LCD button. If a channel is active and the Answer function enabled, then pressing the encoder will switch on the talk on any active channel.

#### Extended channels menu

To enter the Extended channels menu double click the encoder. Use the rotary encoder to scroll thru channels 3 and up. Press the encoder to enable Talk. When turning the encoder will depressed, will channel the channel level. Pressing the LCD button will send a call on the selected channel. To exit the menu click on one of the direct channel buttons, or scroll to the op marked Exit and click on the Encoder.

#### Setup menu

Entering the Setup menu is done from the main menu, by pressing and holding the Encoder followed by pressing the LCD button. Setup menu items are described in the Unified Setup Menus part.

#### Device Options menu

- Display, can be Normal or flipped. Flipped can be useful when hanging the beltpack upside down.
- The default backlight can be set to White, White Dimmed, Blue or Off.
- Backlight Timeout, can be set from Always on to Timed

### Multichannel Desk / Rack MCD/ MCR

The Multichannel desk / rack stations are available in desk sizes 8/16/24/32 and rack size 12. Connectivity on the units is: Front-panel mic and speaker, Headset connection, Line In/Out, GPIO (2x in and 2x out) and 2 Ethernet connections. Powering the unit can be done by either connecting Ethernet Port 2 to a PoE switch or connecting a 12V power supply to the DC input plug. The front-panel consists of multiple channel sections and a main section.

#### Channel section

Each channel section contains 4 channels with for each channel 2 RGB backlit buttons and a portion of the display. The top button always functions as Talk button, where the operation is defined for each channel in the channel settings. The button also indicates channel activity and call reception. The bottom button function is selectable via the 3 buttons in the main section, Listen/Call/Cue.

- Listen: the button can be used to mute or enable the channel. Press and hold the button and then use the encoder to channel the channel volume. Pressing the channel listen button also gives access to extra functions on the main section, like Remote Mute and quick Channel Setup.
- Call: press the button to send a call signal to the Group or to a User on that channel. Holding it longer will send an Alert.
- Cue: press the button to send a Cue Attention to a Group or User. Cues can be active on multiple channels. Is a Cue is acknowledged, then the button will show the Hold status. Press the channel button again to send the Go, or click on Go All in the main section to set all active channels to Go.

## Main Section

The main section has a display with 3 soft function buttons, 4 function buttons labeled Listen / Call / Cue / Setup and a rotary encoder with push function. The rotary encoders main function is for main volume control. The display and soft function buttons will change depending on the current status. Select between the Listen / Call / Cue operation for the channel buttons.

- Listen: The soft function buttons give access to the Extended channels. Answering function will enable talk on any active channel. Isolate will enable or disable Isolate function as described in the unified Options menu. Clicking on the Listen button when in Listen mode will bring-up the volume settings for Speaker, Headset and Program Audio. Select one of the 3 by pressing the assigned button and then use the encoder to change the volumes.

- Call: Functions under Call are the same as with Listen function.

- Cue: Depending on cues active functions are Direct Go, Clear, Go All and Talk.

Direct Go > press the button and then select a channel to directly send a Go command.

Clear > press the button and then select a channel to cancel a cue command, or select Cancel All

Go All > Send Go to any active Cue channel

Talk > switch on the Talk function on any active Cue channel

The Cue button will flash Green when not in Cue mode and cue's are still active on channels.

## Extended channels menu

Channel not directly accessible from the front-panel are available in the Extended channels menu. Use the encoder to select a channel, and use Talk and Call buttons below the screen. The button marked Vol can be used to mute or enable the channel, or hold it while turning the encoder to change the volume. To Exit the extended channels menu, press the Listen button. Pressing the Setup button will give access to channel settings.

## Audio Settings

Input options on the multichannel devices are Headset, Mic (frontpanel XLR3) or Line In. If Mic Pwr is enabled for the front-panel mic, then 10V of phantom power is supplied to the XLR3.

## Line In/Out menu

The multichannel units have an extra function on the Line In/Out compared to other units. It has the option to mix the Main intercom mix into the Line Out of the unit.

## Device Options

- Startup: what function show be active at power on, Listen / Call / Cue or the last function selected.

- Backlight: what show the screen timeout be. As the multichannel desks have OLED displays, it is best not to have the screens on when not used. Screen burn-in might otherwise occur.

- ScreenBright: set the brightness of the screen

- BackLight: Set LED back light Low / Med /High

- Led Color: There are 2 versions of LEDS used in the production of the Multichannel desks. The color can be Normal or Swap.

## Wallpanel

The wallpanel unit either has a XLR4 headset connection or a built-in speaker and microphone. Internally a RJ45 ethernet connection is for data and power via PoE. If PoE is not available, then the 12V internal connection can be used (using both will be possible). Other internal connections are the

GPIO (2 x In and 2x Out). Frontpanel user interface consists of 1 large LCD button with RGB backlight, 2 direct channel talk buttons and 1 rotary encoder with push function.

#### Main operation

There are 2 modes of operation for the wallpanel, Normal and Listen only. This is selected in the Device Options menu.

#### Normal operation

Turning the encoder will change the main volume. Channels 1 and 2 are shown on the display and controlled by the 2 direct channel buttons. The buttons act as talk buttons, operation defined by the channel setting. Pressing the LCD button, will send a call on channel 1 or channel 2 if talk is enabled on that channel. If a cue attention is send, then it can be acknowledged by pressing the LCD button. If a channel is active and the Answer function enabled, then pressing the encoder will switch on the talk on any active channel.

#### Extended channels menu

To enter the Extended channels menu double click the encoder, when in Normal operations mode. Use the rotary encoder to scroll thru channels 3 and up. Press the encoder to enable Talk. When turning the encoder will depressed, will channel the channel level. Pressing the LCD button will send a call on the selected channel. To exit the menu click on one of the direct channel buttons, or scroll to the op marked Exit and click on the Encoder.

#### Listen only operation

The Listen only operation is intended for applications like dressing rooms. This mode will allow an easy selection between stages and gives volume control to the person in the room. The main volume will not change, so announcements and special calls will always be heard. The first channels would be programmed with the audio of multiple venues or stages. Easy selection between the channels is done by clicking any of the 2 channel buttons (marked by and → arrow on the display). A list of available channels with names appear. Scrolling thru the list will directly switch between the channels. Press any key to go back, or this will be automatic. The selection for this mode is in the Device Options menu, where you set the number of available channels. Entering the Setup menu is the same as in Normal operation.

#### Device Options menu

- The default backlight can be set to White, White Dimmed, Blue or Off.
- Backlight Timeout, can be set from Always on to Timed
- Listen Mode: The mode of operation is Normal when set to Off, or the number of channels (starting at channel 1) available for selection in Listen Mode.

## Wallpanel No Audio

The wallpanel no audio is available for situations where only an indicator light is needed. The frontpanel only has one large RGB backlit LCD button. Main operation is only to view incoming calls or cues. Pressing the button will acknowledge a cue. Internal connections are RJ45 for Ethernet and power via PoE, GPIO (2 x In and 2 x Out) and optional 12V input.

#### Setup menu

To enter the setup menu, press and hold the top left corner of the display for 10 seconds. When pressing for 3 seconds, a countdown bar appears. Setup menu operation is handled by using the

corners. Top left corner is for Select or Enter, and the right top and bottom corners are for up and down.

#### Device Options menu

- The default backlight can be set to White, White Dimmed, Blue or Off.
- Backlight Timeout, can be set from Always on to Timed

## 4-Wire Interface

The 4-wire interface can be used to connect to other analog systems. The unit has 2 parts (or ports), each with its own greenGO engine. Connections on the back are 2 Ethernet connections with built in switch. Powering the unit is done by connecting an Ethernet switch with Power over Ethernet to Lan port 2, or a 12V dc to the DC input plug. Each of the 2 parts has an audio line input and output on XLR3 and a GPIO connector.

#### Main operation

Each of the ports is to be used in a general purpose Line In/Out or in User mode. This is selected in the Set User / Mode in the ports setup menu. In general purpose Line In/Out mode, any of the 250 groups be assigned to the input and to the output separately. When user mode is active, then the port has all the features of the greenGO engine like the 32 channels and program audio available. Control for the user is done by using GPIO and or Autotalk. On the main display, the status of both ports are shown. Turning the encoder will show individual port status with indication per channel.

#### Setup menu

To enter the setup menu, click on the front-panel encoder. The menu gives access to the setup menus for ports 1 and 2, clone config, network setup and device options.

#### Device Options menu

- Display, can be Normal or flipped
- The default backlight can be set to White, White Dimmed, Blue or Off.
- Backlight Timeout, can be set from Always on to Timed

## 2-Wire Interface

When integrating "old style" analog party-line systems, a 2-wire interface is needed. The unit has a 2-wire intercom ports on XLR3 and an extra general purpose Line In and Output port. The 2 Ethernet connections on the back feature a built in switch. Powering the unit is done by connecting an Ethernet switch with Power over Ethernet to Lan port 2, or a 12V dc to the DC input plug. The 2-wire can be setup as a user with all features like 32-channels. The auto talk should be setup, normally to channels 1, for enabling audio from the party-line to go onto the greenGO network.

#### Setup menu

To enter the setup menu, click on the front-panel encoder. The menu gives access to the setup menus for ports 1 and 2, clone config, network setup and device options.

#### Device Options menu

- Display, can be Normal or flipped
- The default backlight can be set to White, White Dimmed, Blue or Off.
- Backlight Timeout, can be set from Always on to Timed

### Setting up 2-wire audio settings

First connect the complete 2-wire system to the Intercom port and make sure all microphones are off. Next go into Audio Line Setup and select the correct type and signal level. Then click on Auto Null. This will find the correct balance of the 2-wire line. Use the threshold to block any strange noise from the party-line to go onto the greenGO network. If the audio level from greenGO to the analog party-line is not ideal, use the "to 2-wire" parameter to change this. If audio from the party-line is received to low or high on the greenGO system, change the value of "From 2-wire".

NOTE: the Intercom connection on the unit needs to be terminated. This is automatically done by either a master station or power supply in an existing party-line system. When the connection is not in use, a termination plug needs to be connected, otherwise there will be noise generated on the adjacent Line In and Out. A terminator plug can be as simple as placing a resistor between 200 and 400 ohms between pins 1 and 3.

NOTE2: if the 2-wire line is not setup correctly, echo's might appear on the greenGO network.

### Bridge and BridgeX

The bridge devices can be used to either create a connection between 2 separate networks, or to allow remote users to connect into the greenGO system. Connections on back of the units are 4 Ethernet ports on Neutrik Ethercon, divided into 2 network connections. The Internal network connection is to be connected to the greenGO network. The External network connection can be used to connect to a separate network, like an office network. Both connections should NOT be connected to the same network. Each of the network connections have their own IP address settings. If the External network connection is not used, the IP address should be set to the 0.0.0.0 address. Powering the unit is done by connecting an Ethernet switch with Power over Ethernet to Internal network port 2, or use the 12V DC input.

### Operation

A bridge has 2 operational ports or streams, whereas the BridgeX has 4 streams available. Each stream can work in either Group Bridge mode or User access mode.

#### Group Bridge mode

Use the Group Bridge mode to share a group or party-line between 2 separate greenGO systems. By linking the 2 systems one large party-line is created. Both greenGO systems can work on completely different configuration files. The Bridge on each location does need to have the correct configuration file of the local greenGO system. On each side a Group is selected, these can be different groups on both sides. All audio on the group on one side will be transferred to the other side and send out as audio to the group assigned. Call signals can also be transferred if enabled.

To make the connection between the sides, one side should be setup as Passive Connection (waiting for the other side to connect to). The other side will be set to active and programmed with the IP address and port settings of the Passive unit. Both sides can be set as active, as long as the Remote ports are set the same.

#### Remote User Access mode

A bridge port in Remote User Access mode allows greenGO devices to connect to the greenGO network remotely and become full members of the system with all the same functions as if were connected locally.

#### Connection via Internet

The bridge units give the option to use the greenGO system worldwide via the internet. Some

setups of the internet routers might be needed to work. For each bridge stream in a Passive Group Bridge or User Access mode, the router might need to be programmed to forward the assigned UDP ports (local port in the connection setting menu) to the IP address of the bridge. The IP address needed to be programmed depends on the connection to the bridge. If the router is connected to the same network as the greenGO system, then should have access to the Internal network of the Bridge unit. If the router is on the same network where the External network port of the bridge is connected, for example an office network, then the router should forward to the External IP address of the Bridge. Remote Users and Active Group Bridge connections need to program the IP address of the Routers internet connection. To find out the Internet address of a location, go to <https://whatismyipaddress.com/> when connected to the internet at that location (on the Passive bridge side).

## Trouble Shooting

### *- Units cannot talk to other units*

The configuration file does not match, please check in the clone config menu if other configs are available on the system.

### *- Echo on the system*

Check the settings of any 2-wire connection, or if microphones are active close to speakers of headsets.

### *- After plugging in a device, it starts up but takes some time before communication is possible*

This issue would be because of the protection settings in a managed switch. The switch needs to be certain that the newly plugged in device does not create a loop in the network.

### *- greenGO intercom communication is working, but the configuration software has issues connecting*

This would be a IP addressing issue. The intercom communication will work even if the IP addresses of the devices do not match, but the computer software will not be able to connect even though it might "see" the devices.

### *- Bridge connection does not come up*

If the display shows Error (or Err), then the passwords on both sides do not match. If the passive side remains in waiting and the active side is in connect, then the active side is not able to communicate with the bridge. This could be a wrong IP address of possibly a wrong forwarding setting in the router.