NETWORK INTERCOM SYSTEM
AN-8000 SERIES

Quickstart Guide

Thank you for purchasing AIPHONE's Network Intercom system.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

AN Quickstart Guide Overview

Network Design	*Setup a network your system will use to communicate between devices*
System Name	*The first (and critical) step in editing an existing system or designing a new one*
Unit Scan	*Give your equipment IP addresses*
Equipment List	*Tell the software what hardware you have*
Station Table	*Give your equipment dialing extension numbers*
Setting up Door Stations	*Tell the doors which master to call*
Setting up Master Stations	*Set a master to auto answer or to ring until answered*
Paging	*Set paging zones for one way announcements to multiple stations and / or speakers*
Uploading and Testing	*Save, double check, upload and verify desired functionality*
Advanced: Incoming Calls	*Advanced settings on how to additional masters to handle incoming calls*
Advanced: Group Blocking	*Advanced settings on how to segment and restrict access on your system*
Advanced: Background Music and Camera Call Up	
Troubleshooting the Network	*AN specific tips for solving common network connection issues*

Designing Your Network

Most systems will communicate over a local area network, some will involve VPN's or NAT over a wide area network. In every case, your network administrator will need to give you all the IP addresses for each piece of equipment in your system. You should also let your network administrator know you require access to ports 80, 5000-5025 on the network's router for each device. If the device is involved in paging, have the Admin open up ports 6000 – 6003 too. Our Example system pictured throughout the guide will use the network subnet 192.168.1.X with an AN-8000EX in one site and an AN-8500MS, AN-8540DS, and AN-8000MI located remotely and these will communicate through a secure VPN that has already been set up. For security reasons, this Example company has chosen to locate their DVR, background music source, and a paging amp in their corporate headquarters with the AN IP master, door and Multi Interface. Their operations center houses the AN-8000EX and an AN-8000MS, AN-8011MS, AN-8020MS, AN-8050DS and a paging amp. Before you install the software, if your computer has multiple networking cards disable any that are not being used to communicate with your AN equipment. For the Network Interface Card you are using, assign the IP address to be 192.168.1.100 (which is on the same default subnet as the equipment) to prevent problems communicating in Unit Scan.

Note: If you have a single AN-8000EX and no other IP devices, a network is needed to program the system but not to operate it. If your network is heavily restricted, we strongly recommend installing and programming it on an unmodified consumer level router to test your settings and the equipment. See Troubleshooting the Network for specific tips on how to find problems that could prevent the equipment from working.

System Name

The System Name is a very important step you must not forget about when making changes or designing your system. You must not forget the name and password you assign or you will no longer have access to the software which makes changes to your equipment. The program settings file will be labeled the same name as your system name as a folder inside the Program Files/Aiphone/AN8000/ folder. You will not actually name your system right now if it is new.

Customer Name _____ (for your reference)
System Name _____
Password _____

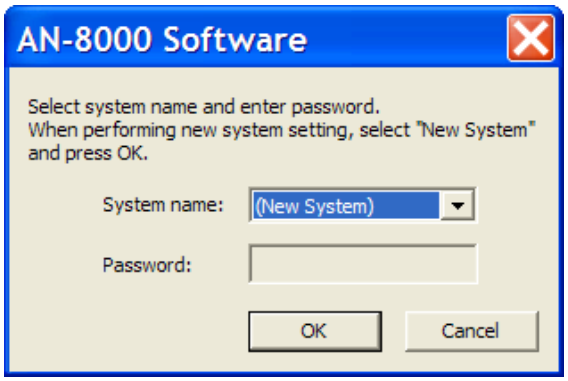


Figure 1: System selection screen

Open the AN-8000 software and select New System **unless you are adding equipment to an existing system**. Hit the OK button and you get 4 options, Unit Scan, System Settings, Password Change and Clock Setting. Click on Unit Scan to open the tool that searches the subnet for AN equipment and allows you to set IP addresses. This uses a broadcast which will not leave the router your computer is connected to, you should repeat the following step for every subnet on your system until every device has the correct, unique IP address, subnet mask and gateway information.

Unit Scan

Unit Scan is used to make IP address assignments to the hardware. With the Unit Scan window open click the Scan button. When the equipment list appears, double click each address and change it to match what you were given by the network administrator and press enter to save each setting. Once you have assigned the devices unique IP addresses, put a check in the box next to each device and hit Configuration to save those settings to the devices. You may then close the Unit Scan window.

At this point we should also change the computer's IP address to be on the same subnet our equipment is on.

Note: In this example, the AN-8500MS did not show up in the scan. If this happens check power, or wait 30 seconds and try again.

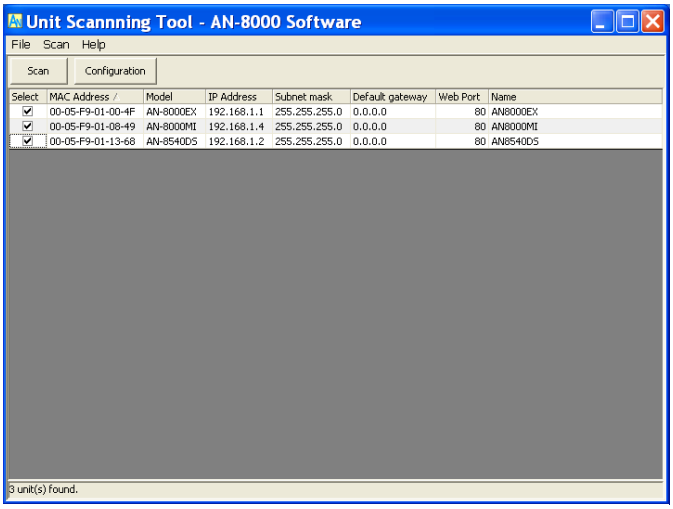


Figure 2: Unit Scan

Equipment List

The Equipment Registration tab of the General section is used to tell the software which devices our system will use.

The Content section of the Equipment Registration tab should be filled out with the appropriate quantities of each item in your system so the software is aware of each part of your system. Change each line in the Content section from 0 to the correct quantity and press enter, for each device an Equipment No. row will appear at the bottom with a set of default settings.

Each Exchange, IP Station (whether a door or a master) and Multi Interface requires an IP address to communicate with each other (the IP address we assigned in Unit Scan). You may import these IP Addresses using the

button. When the window pops up, you will see the Equipment No. items from before as well as a blank area on the bottom.

Hit the "Scan" button and you will see the result of your Unit Scan from before on the lower half of the window. One at a time select an item from the lower half (the correct settings) and an item from the top half (the default and incorrect settings) and click Import so the software and the Unit Scan agree on your IP addresses. Click OK when you are done.

You can also manually enter in the correct IP addresses without using the Import from Scan Result window, but it is highly recommended to use Unit Scan to verify that your equipment is connected to the network, has unique IP addresses before you get to this point, and to prevent problems when you upload for the first time. Be sure to press Enter after changing an IP address, so the program accepts the change.

You now should have a complete Equipment list.

Note: If you aren't installing every station today you should still add them to the equipment list. They can be quickly added to the system later using Unit Scan and Uploading the configuration settings.

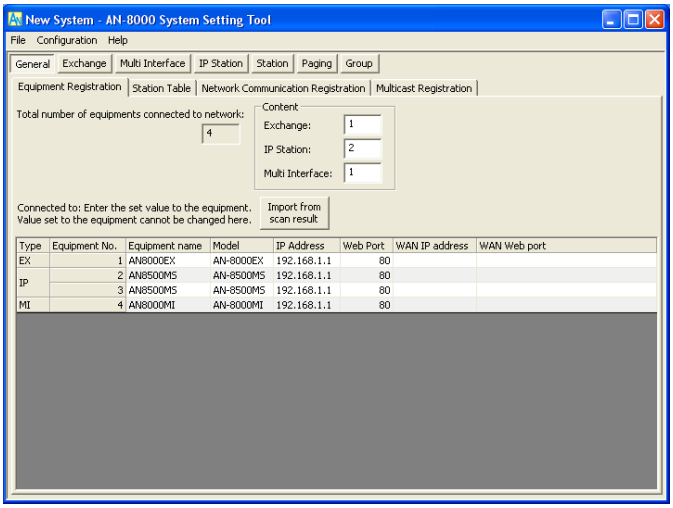


Figure 3: Equipment Registration, see page 150.

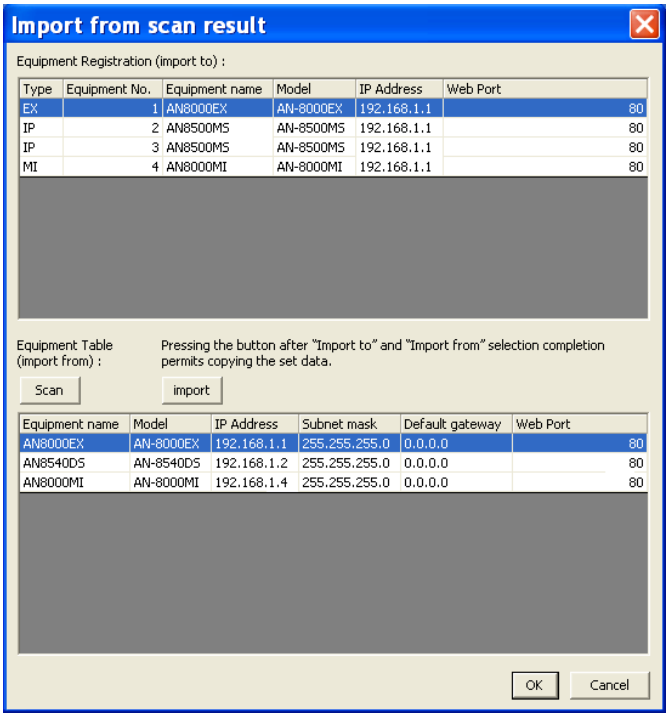


Figure 4: Import from Scan Result window, page 154.

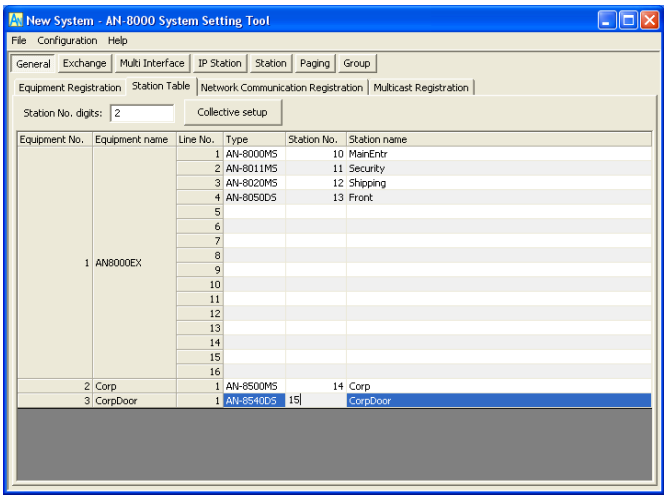


Figure 5: Station Table, see page 155 of the AN-8000 guide.

Note: When assigning extensions remember that there are speed dials that involve 0, 7, 8, 9, (and off hook) in addition to the eight Autodials located on some of the handsets, so no extension should start with 0, 7, 8 or 9 unless you plan on not using those speed dials.

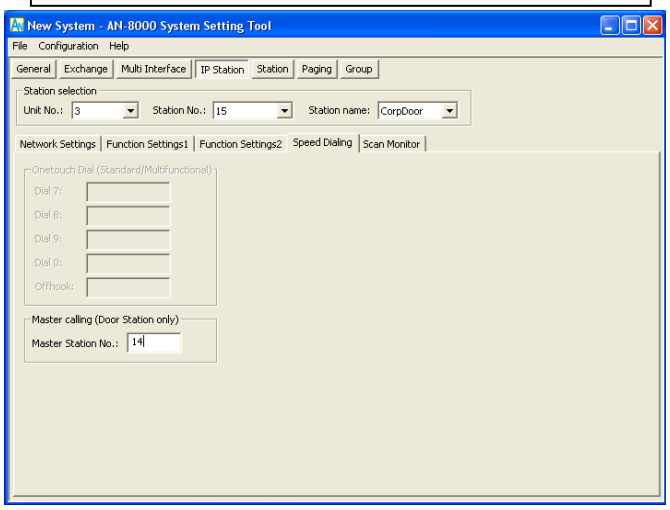


Figure 6: Speed Dialing for a door station, page 185 for an IP door station, or page 190 for an exchange connected door station.

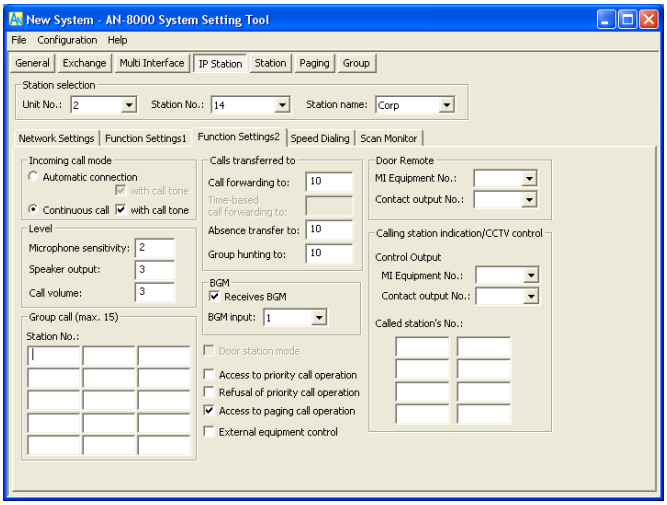


Figure 7: Function Settings2 for a master station, page 183 for an IP master or 187 for an exchange connected master station.

Station Table

The Station Table is the tab that allows us to assign extensions to allow the end user to dial between equipment.

Switch to the Station Table tab and fill out the blank column Station Number for each device. If you need more than 2 digits, change the Station No. digits field first and press Enter to accept. To assign a Station Number, double click on the field you wish to change, and your curser will appear. Enter the extension you wish the End User to dial in order to call that station, then press Enter to accept. If you have an exchange, each Line Number (corresponding to the 16 ports on the back of each exchange) will also need to be filled out with the hardwired equipment you have, such as AN-8000MS or AN-8050DS selected from the Type drop down menu available when you select the field under Type you wish to change. You may also give it an 8 digit name, for caller ID on masters that have an LCD display.

Setting up Door Stations

Door stations have a single call button on them, we need to tell the button which master to Speed Dial when it is pressed.

Switch to the Station (or IP Station) tab and select the Station number you wish to edit. Under the Speed Dialing tab there is a Master Station No. that the door station's call button can speed dial when pressed, put in the master station's Station Number that you the station will call when the call button is pressed. Repeat this step for each door station in your system. See *Advanced: Incoming Calls* if you wish for more than one master to be able to answer the call, or if you wish to set up forwarding and transferring options.

Note on Door Release: *To wire up door release, follow the diagram on page 113 or 118 section 3-25 or 3-30. Any master in communication with the door may press the key combination Transfer + Function + 0 to activate the relay added by the installer. No programming is necessary.*

Setting up Master Stations

Master stations have many functions that need to be explicitly set in the software, such as how calls are handled, how long they ring, what master to transfer to when absent, and what music channels are available.

Switch to the Station (or IP Station) tab and select the Station No. you wish to edit. Under the Function Settings (or Function Settings2 if using IP master) change the Incoming Call mode to Continuous Call, which will allow the End User the option of taking the call when they are ready or just ignoring it. Repeat this step for each master. If you are setting up any transferring, forwarding or if you want other master station to answer a speed dial from a door station, see *Advanced: Incoming Calls* for more information. If you are setting up background music channel, volume levels, and a portion of CCTV integration see *Advanced: Camera Call up and Background Music* for more information.

Paging

To set up paging switch to the Paging tab and select the stations you'd like to be in Zone 1, Zone 2, and so on by adding check marks next to those stations. A paging zone can be equipment like a Door station or Master station, a Paging amp, or a combination of them. Any master may initiate a page by pressing the Paging key then the zone #. Paging is used when you want to make a one-way announcement to one or more stations and / or paging amps and is preceded by an announcement tone.

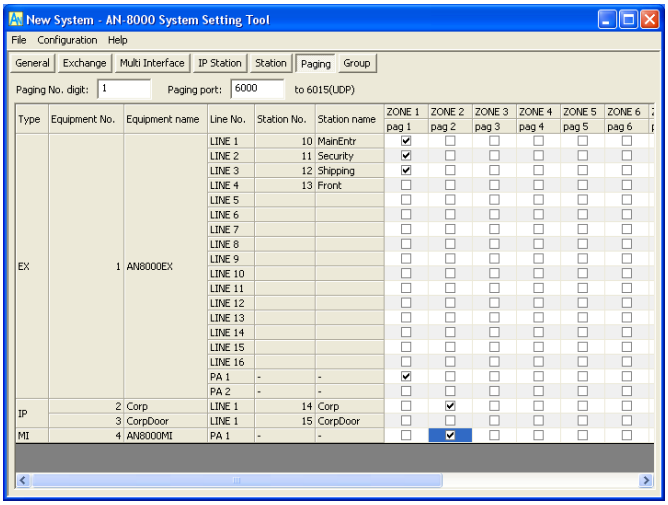


Figure 8: Paging, see page 192 of the AN-8000 guide.

Uploading and Testing

You now have enough to use the basic functions of the system but ***before you go any further, please take a moment and double check the following things. If you skip this step you may have to factory reset each piece of hardware and start all over from scratch.***

1. YOU MUST FIRST SAVE THE PROGRAM SETTINGS. Save the settings file in a secure, known location on your computer (the default location is inside the AN program folder). DO NOT LOSE THE SYSTEM NAME OR PASSWORD; WRITE IT DOWN AT THE TOP OF THIS GUIDE.
2. Disable any unused network connections your computer may have. If your computer is connected to the network your AN devices are on through its LAN connection, disable or turn off any Wireless card and any secondary LAN port.
3. Set your computer's IP address to be on the same subnet and ping each device (using the /COMMAND line window) to ensure it still has an active connection to the network. Move each device as close to its power source as possible, or use a PoE switch. The IP doors and masters are very sensitive to their distance away from their voltage source, so minimize it.
4. Upload the settings to all devices on your local subnet, be sure to type in the CORRECT system name and password at this prompt. If you get multiple prompts, it is probably because you manually entered the IP addresses instead of importing them from Unit Scan.

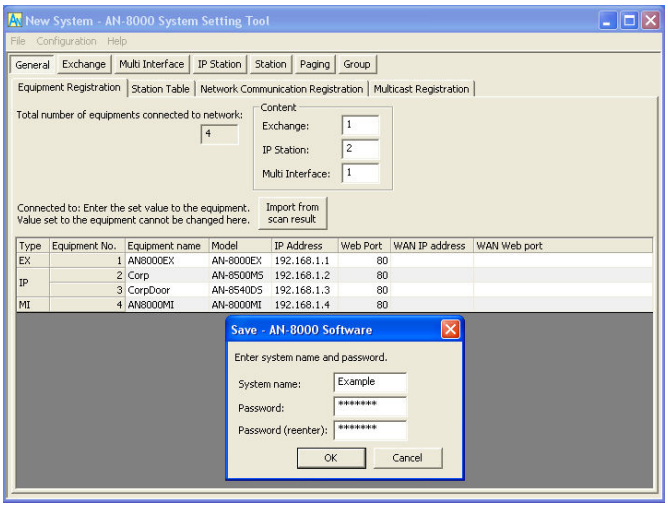


Figure 9: Save, page 197.

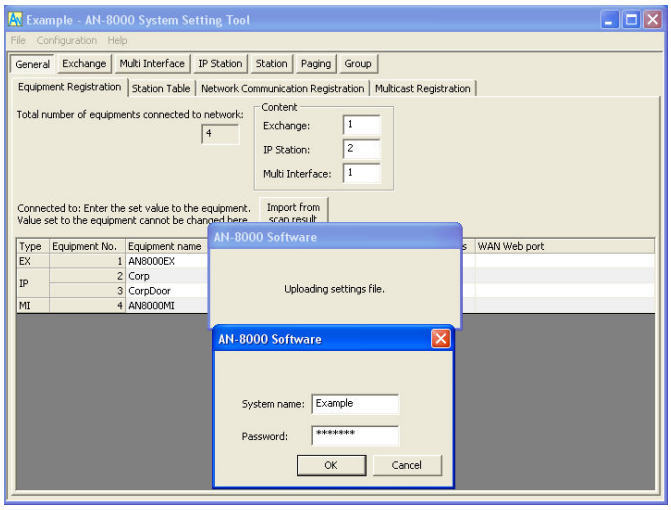


Figure 10: Uploading, page 197.

WARNING: If you type in a different User Name and Passwords for each device on your system or if you accidentally hit OK with the system name as AN-8000 and default password "guest", they will no longer be on the same system and will NEVER be able to communicate with each other and may need a reset at the factory.

Note: If there is a problem you can try pointing your browser to the IP address of the station and attempt to log in. See the Troubleshooting the Network section for additional details.
To test your system after all devices have successfully been uploaded to, press the call button on each door and see if the correct master rings. Answer the call by lifting the handset or pressing the PTT button. End the call and then attempt to direct dial the door station by dialing its Station Number. You may also direct dial other masters.

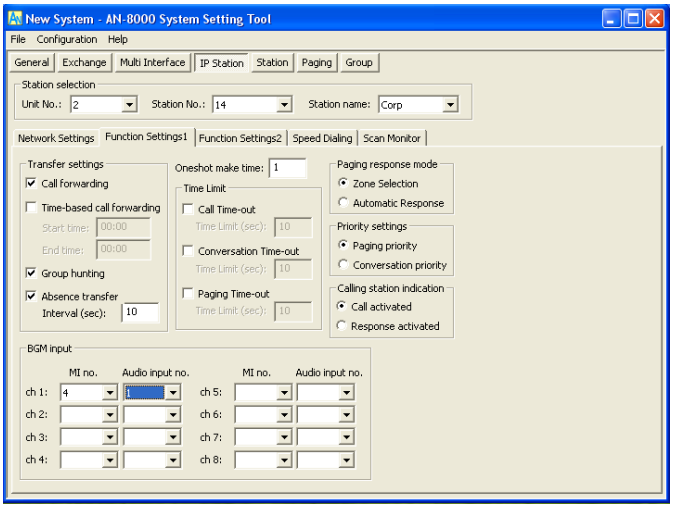


Figure 11: Function Settings1 to enable call forwarding.

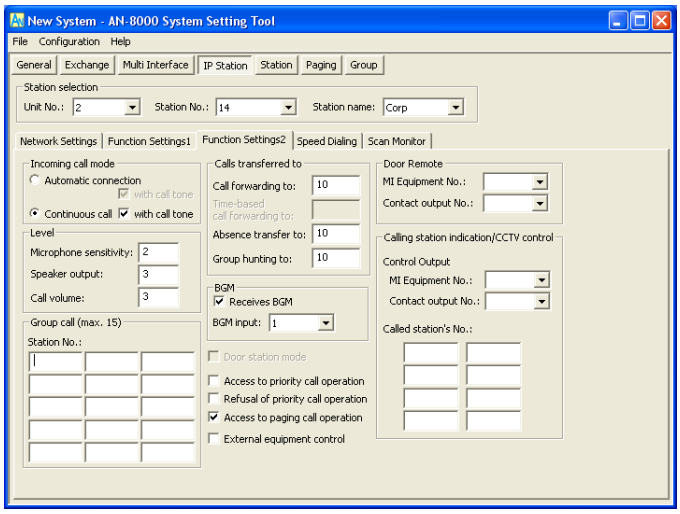


Figure 12: Function Settings2 to specify which Station Number to send the call to.

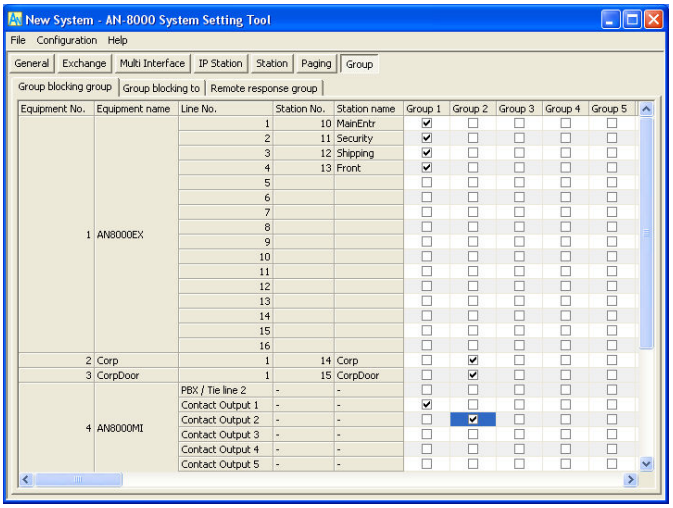


Figure 13: Group blocking group assignments.

Advanced: Incoming Calls

To set up automatic transferring and multiple masters getting a call, the feature intended must be enabled and then specific assignments must be made in the called station's Function Settings(2) tab. There are 5 ways to handle an incoming call.

Group call: Enabled in the called station's Station tab. Each incoming door call will also ring up to 15 additional masters.

Call forwarding: Enabled in the Exchange's Function Settings tab, or in Function Settings1 tab of an IP master. User may assign masters on the fly using the key combination Function + 41 + # + (#⧋), see page 66, or section 2-17.

Time-based call forwarding: Enabled in the Exchange's Function Settings tab, or in Function Settings1 of an IP master. This will auto forward the call to the assigned station in the called station's Function Settings(2) tab during the hours specified.

Group hunting: Enabled in the Exchange's Function Settings tab, or in Function Settings1 tab of an IP master. This will forward the call to the assigned station should the called station be busy in conversation.

Absence transfer: Enabled in the Exchange's Function Settings tab, or in Function Settings1 tab of an IP master. This will forward the call to the assigned station after the interval specified (default is 10 seconds).

Advanced: Group Blocking

Group Blocking allows you to segment your system in ways that prevent certain stations from having access to some features of or stations on your system. This is important for applications where an emergency broadcast is needed, or when some departments shouldn't be opening doors for other departments.

Fill out the "Group blocking groups" until the system is segmented the way you intend it to be. Each column represents a section of the system and the rows beneath it determine access to the other sections. For Group 1, go down the list and check each box to enable that Group 1 to call that group. When you have finished with Group 1's permissions, move on to the next column and fill out Group 2's permissions in the same way. The All page can be enabled for a particular group, but each paging zone that would be part of that All Page must also be enabled. When in doubt, a checked box *allows* an interaction from the Group column to the object row, a blank box *denies* that interaction. Remember the reverse is not necessarily true, so Group 1 may be able to dial Group 2, but Group 2 would not be able to dial them back unless there is a check box next to 1 under the Group 2 column.

Example: In Figure 13, we split the system into 2 groups, with a door and a master in each group. Figure 14 gives access for each group, and for each paging zone. Put a check box in the column for each group you want that column to have access to. In this example, group 1 has access to group 1 and paging zone 1. Group 2 can call group 1 and 2, and has access to the All Page and paging zones 1 and 2. You can also restrict which contact outputs can be triggered from which location. Remember the rule, a check box allows the device at the top of the column access and a blank box denies that interaction.

Advanced: Background Music and Camera Call Up

Give the quantity of MI's is given in the Equipment Registration tab and then the Multi Interface tab may be used. Each AN-8000MI provides 2 paging amp connections which you can configure using the Function Settings tab. The Audio I/O may be used to bring in a music source, select BGM on that channel. Once the background music is chosen for one of those 2 outputs, each Exchange or IP Master Function Settings(1) tab can be used to set up to 8 different MI channels, which involves an equipment number (AN-8000MI's are not named) and the input (1 or 2). Select the equipment number for the MI that has your BGM input, then select which of the 2 inputs on the MI it comes in on. Then go to the Function Settings for each Station (Function Settings2 if configuring an IP Station) and check the box next to Receives BGM and tell it which BGM channel (1-8) it uses. To operate, a master can control its own channel by using the sequence Function + 1 + X (where X is 1-8 or 0 to turn it off).

Note: In the example MI configuration, we are setting up audio channel 1 for a BGM source and channel 2 for a PBX connection.

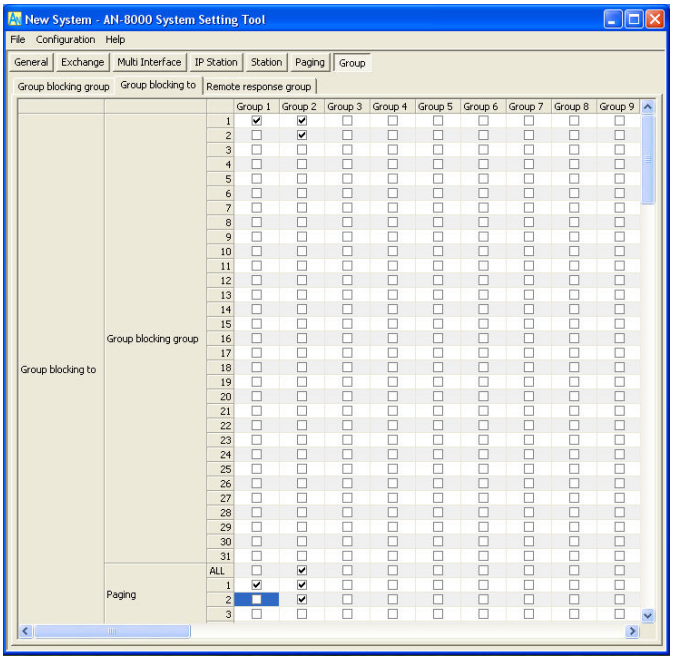


Figure 14: Group Blocking to, setting permissions. See page 193 of the AN guide.

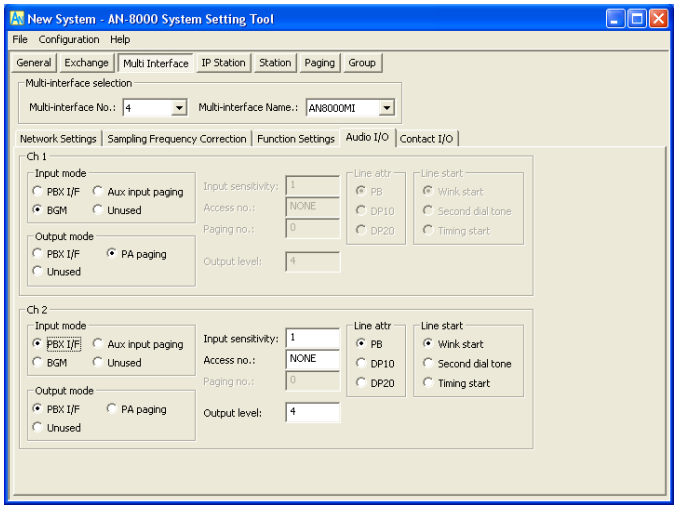


Figure 16: Multi Interface Audio I/O tab, see page 173.

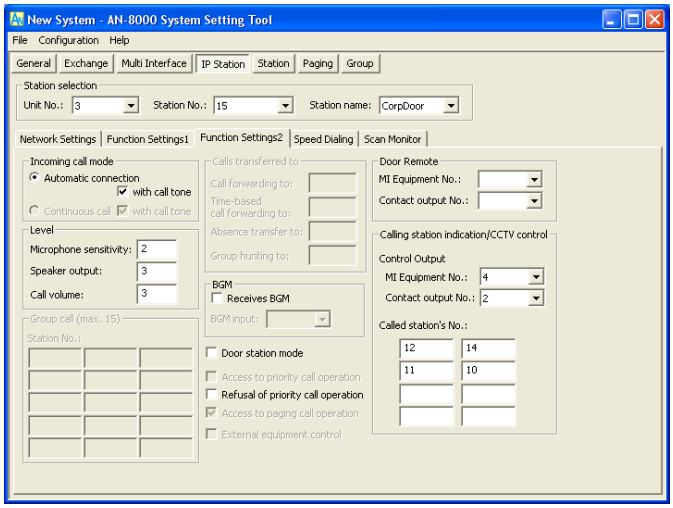


Figure 15: Function Settings2 for CCTV relay trigger, see page 184.

For Camera call up the Contact I/O tab contains all the outputs needed to tie in to the alarm inputs on the 3rd party DVR you are integrating with. Be sure to give it a Contact Output Access Number so it can be manually triggered by hitting Function + 30 + Contact Output Access Number. Once you have the contacts set up, switch to the Door station's Station Tab and set the contact number for CCTV Call up in the Function Settings tab. You have up to 8 masters which the relay will fire.

Note: If the contact is being used for door release, you may specify the contact as such in the Door Remote field of a Station's Function Settings tab. This will enable the relay to fire during communication using the sequence Transfer + Function + 0 for any door (the system will only fire the relay for the door you are currently talking to).

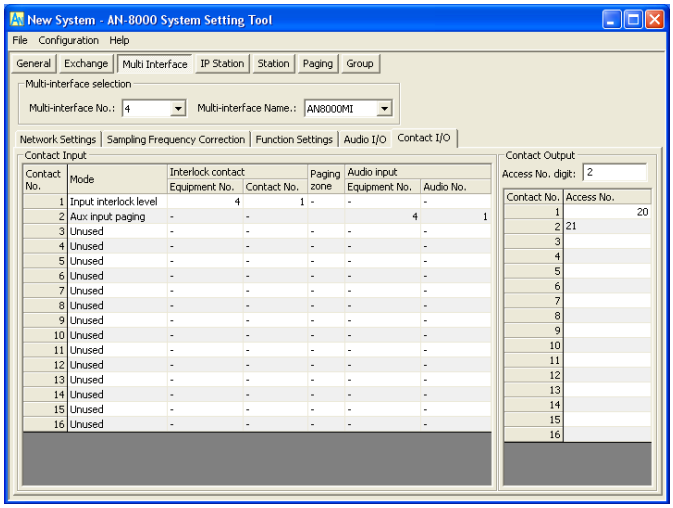


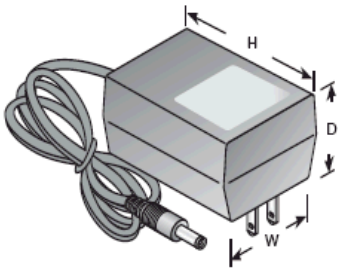
Figure 17: Multi Interface Contact I/O tab, see page 175.

Troubleshooting the Network

With as many steps there are and as many options to set in this system somewhere along the line a mistake could be made, or even the best software setup won't work at a particular site because of some external reason. If you have trouble in Unit Scan, or Uploading, or a call button or dialing on the master gives you an error tone or ignores you there are three procedures you can try to troubleshoot the problem and narrow down the possibilities of the cause.

Using the Command Line

If you can't upload to a particular device, the first thing to check is that it is still connected to the network. You can Ping it using the command window in windows XP. The command window is found by clicking the Start button, choosing Run… and then typing in CMD, which will open the command window for DOS style command line operations. Make sure your device is connected to the same network as your PC, and that they have different IP addresses, and then attempt to ping it using "ping 192.168.1.1" or whatever IP address you are trying to reach.



In most scenarios Ping will succeed, since very few routers block it. Routers however tend to restrict traffic on some ports, especially on large networks with lots of applications running. To test if there are problems with a particular port, use Telnet in the command line after a successful ping. The command is "telnet 192.168.1.1 5000" where 5000 is the port we are testing. Telnet will, depending on the network, return with either an error or will simply show a blank screen with a flashing cursor. The flashing cursor means you are "in" and can send information to that port without it being blocked by some firewall, close the window and check every other port your system uses (only 80, 5000-5002 will work).

If ping cannot find the address or telnet throws an error, there may be a power problem, or the address is incorrect, duplicate or invalid or there could be a network problem such as blocked ports or other restrictions.

Testing with Unrestricted Network Hardware

One of the best ways to troubleshoot a network problem is to recreate the network's IP settings on a consumer level router not connected over a WAN and attempt to ping, try the menu option Configuration -> Upload, and operate the equipment locally on what we call a bench test; where all the equipment is in front of you on a bench. *Out of the box consumer level routers (such as the PoE switch from PowerDsine) typically do not block internal traffic which is the main reason we recommend setting up the equipment in this simulated test environment before deploying it in the field*. It will however block incoming WAN traffic it does not recognize, so try to keep everything on one bench with only one piece of networking hardware; do not use multiple switches or routers for the initial setup and test. It is highly recommended to get the equipment up and running before taking it to a heavily restricted network.

Each router has a configuration page (contact the manufacturer for documentation), the only thing you'll need to adjust is to tell it what the LAN IP addresses will look like. Will it be on the subnet 192.168.1.X or will it be 192.168.0.X or will it be something else entirely. It is all up to you, but the LAN should match the first three octets of IP addresses of your equipment. The default IP address is 192.168.1.1, and if you haven't been able to get Unit Scan to find anything, then setup the simulated test network on the 192.168.1.X subnet and then try Unit Scan again. If this doesn't work, proceed to the next step, *Using a Web Browser.*

Note: Power over Ethernet is the preferred way to power AN-8540DS IP door stations or AN-8500MS IP master stations, although you can buy a select few plug in transformers if PoE is not available. Use a 12VDC power supply with a 2.1mm x 5.5mm barrel connector. Compatible models are: Mouser # 553-WDU12-1200, ELK Products Model P1216, Seco-Larm Model ST-1212-R1.0A

The limitation with these sources is that they limit the distance the station can be from the power source and electrical outlet at about 5ft, which can be difficult for AN IP door stations located at a remote gate without power, which is why we recommend Power over Ethernet from PowerDsine see http://www.microsemi.com/powerdsine/ for more information.

Using a Web Browser

A web browser like Internet Explorer or Firefox can be used to communicate to AN equipment if you know the IP address. Initially the IP address is 192.168.1.1 (although you may have changed it in Unit Scan) and the default user name is *AN-8000* and the password is *guest*, both of those are case sensitive. If you've already done an upload try the default user name and password, and then if that fails try the system name and password you attempted to give it. The AN software window will tell you what your system is named, in the blue title bar next to the AN software icon on the left there is the system name followed by a "-" and then the name of the section of the program "AN-8000 System Setting Tool". In all of our

screenshots it is still "New System" which means an upload has not been attempted and the default system name and password should still work, assuming of course no one else has attempted to upload settings to that device. You can directly log in and undo settings you don't like specifically or reset it to default settings using the Delete All Settings option in the System Maintenance menu.

Once you get in, you'll have the option of viewing the settings in Japanese or English, and then the navigation menu gives you several useful tools.

Resetting to Factory Default Settings

To reset to factory default settings go to System Maintenance and click Delete All Settings if you need to erase the System Settings you've uploaded to it, it will also reset the IP address to the initial 192.168.1.1, so you may need to change your router's settings (most of the time you won't) and your computer's IP address to match that subnet. This will also delete all configuration settings that associate it with a particular system, so if you accidentally isolated equipment intended for a single system on two separate systems (for instance one is on a system named Example and the other is on AN-8000 they can't talk to each other), Delete All Settings will erase that association (and the IP address will be reset) so they can be placed on their intended system.

If the browser does not ask you for a user name and password, either the IP address is not correct, or the unit may have a connection or power problem. If you get an error that you don't have the correct User Name or Password, exhaust every combination you can before sending the equipment to the factory for a repair restore.

Testing using Network Connection

Another way of testing the system is to use the Network Status menu and test a particular device's ability to communicate with every other AN IP enabled device on the system, such as an AN-8000EX, AN-IP doors or masters, or the AN-8000MI. If there are port forwarding problems, firewalls blocking ports or IP addresses this test will fail in some way and will help determine which segments of your network are not communicating with other segments, or if a particular device is having a connection or power related issue. This option is especially useful for testing across a Wide Area Network.

If a single device fails a communication test the first thing to do is to point your browser to that address and see if you can get in. Does it have the configuration uploaded? Does it ask for a user name and password? Remember to try the system name and password you gave it in addition to the default AN-8000 and *guest* password. If it only accepts the default information it probably doesn't have the right configuration, download the correct configuration from a working device and upload the file to the one that doesn't. If the configuration is there but you are still having intermittent issues, try a new port on the switch or perhaps investigate power issues.

Troubleshooting Communication Problems

Sometimes over a network there will be voice drop outs after a connection has been made. There may be a delay between networks or a difference in timing for routers that can make communication lag. Sampling Frequency Correction (section 8-3 of the manual) covers a scenario where an exchange or an MI is located on a different network segment or across a WAN in which there may be slight discrepancies in time for each router between the networks. To correct for this, the Sampling Frequency Correction tab for one exchange or MI in each network must be designated as either the transmitter or receiver for this purpose. This is not required for the AN-8500MS nor the AN-8540DS and there is no Sampling Frequency Correction tab for those IP stations.

You may also run into voice operated exchange (VOX) problems in areas with loud ambient noise that can interrupt the conversation and change the direction unintentionally. This could force a master in a loud area to be stuck transmitting this sound and never allowing the speaker to play the sound picked up by the door station's microphone as the guest responds. Use the handset or force the conversation into Push to Talk (PTT) to see if this is a network bandwidth issue or a VOX issue.

If the network used has a lot of traffic there could be bandwidth related voice drop outs. The default High Quality Sound Transmission Mode setting for the Network Settings tab of each device uses 130kbps. Bandwidth Saving Transmission Mode will introduce a delay of 1/3 of second to the conversation and drops the bandwidth requirement to 50kbps to get around the problem of high traffic networks pushing the voice path to a lower priority (as defined in Quality of Service sections in some router configurations) when high priority traffic comes through. If the end users complain about voice drop outs during specific consistent times of the day, bandwidth narrowing may help.