![Ivie Technologies, Inc. logo]

Setup Guidelines for LDS Standard Plan Systems Using the i*Flex* 1280 Mixer

Checkout Procedure Guidelines

For Standard and
"Head End Replacement" Systems

Why this Setup Guide?

The i*Flex* 1280 "Head End Replacement" is a new approach to replacing older LDS sound systems where the system electronics can be upgraded and replaced very economically without replacing the rest of the system (speakers, wiring, Cultural Center controls, etc.). Yet even with the economies provided, a significant improvement of the system can be realized because:

*   Narrow-band equalization is added
*   Older system components that have proven over time to be weak points (zone switching relays, on/off relays, etc.) are removed.
*   Practically all of the work is done inside the rack. Time for replacement is kept to a minimum. This cuts cost and down-time.

While being almost completely transparent to the user, we are actually lifting up the hood and driving under it a new car. New cars have new controls and new systems. i*Flex* hardware and Sonata software are intuitive for the installer and consultant, but they are different. This Setup Guideline for the i*Flex* 1280 "Head End Replacement" system will show you how you can make some of those improvements and changes work to your advantage. We'll walk you through the new system in just a few pages. We think you'll find this information very helpful in getting the job done efficiently.

No Setup Manual can take the place of training. We strongly recommend that you download the standard i*Flex* / Sonata manuals and become familiar with them. And you should avail yourself of the training available from your own organization and from Ivie.

We also strongly recommend that you use the **standard Sonata Layout templates** *as they are provided*. With the flexibility a mode-based system such as i*Flex*, there are virtually endless ways to design a system to perform in a certain way. Ivie simply cannot support a large number of Sonata files (setup/layout files) based on individual preferences and different approaches. We CAN support the standard Sonata files because we know them very well. If you call us for support on a standard Sonata file we will know how to help you. If you call us for support on a Sonata file that has been substantially or conceptually modified, we will be in the dark to begin with and support will take much longer. With non-standard Sonata files, on-site support may be impossible.

"Head End Replacement" System Components

i*Flex* 1280 Mixer
"Heart of the system". All audio inputs and outputs connect directly to the i*Flex* 1280 Since there are 12 inputs and 8 outputs, new possibilities are available for LDS buildings; but this manual will consider the standard system as constituted in the Heritage/Legacy/Sage 98 plans, or even earlier implementations. Some remote controls can be connected directly to the 1280, and some to the RMPC-12LDS.

Note: The 1280 is not compatible with power supplies from earlier mixers such as the 884+ or 1026.
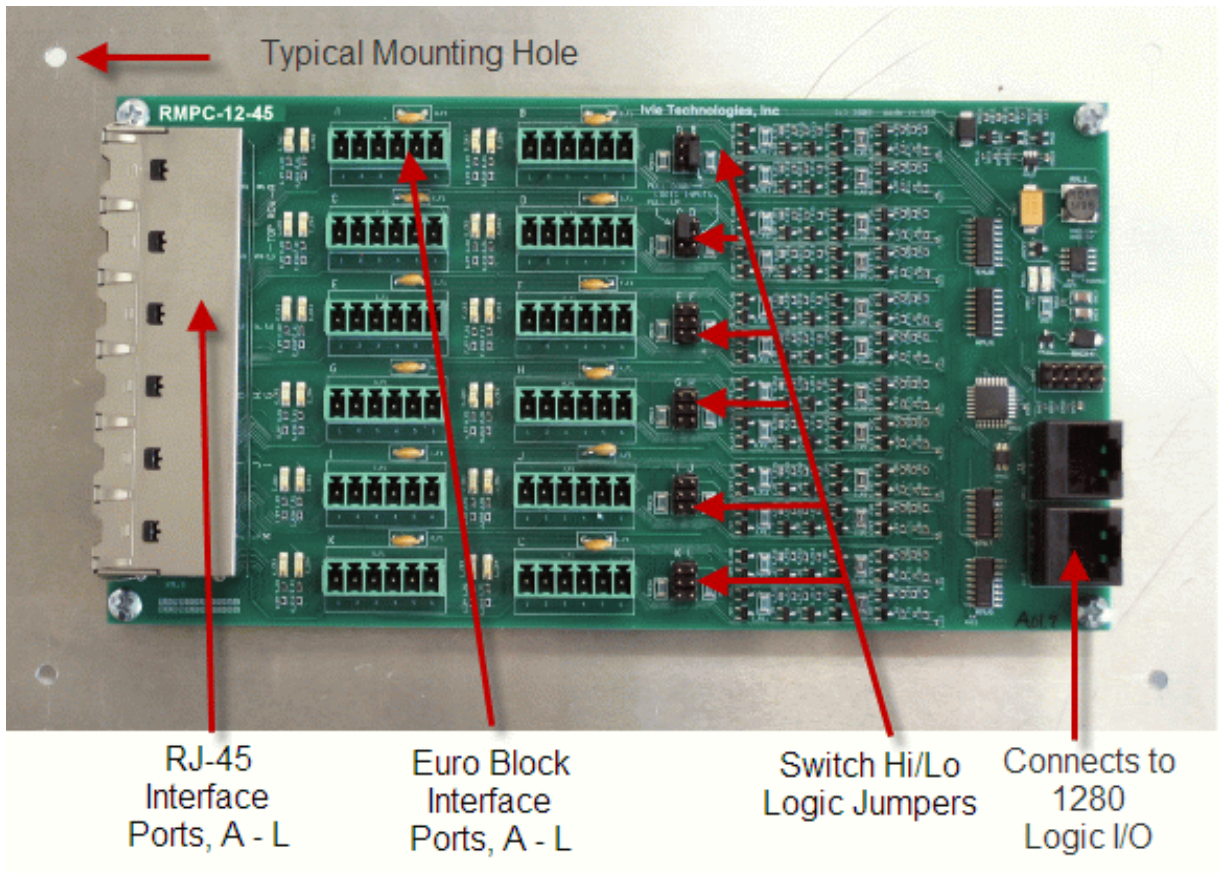
LDS Power/Relay board

1280 mixers ordered for LDS installations should come with this optional daughter-board already installed inside the 1280. The LDS Power/Relay board takes the place of the "PWR RLY" connection on the back of an 884IF or 1026IF. It also takes the place of the "Overflow Relay" on an IF.
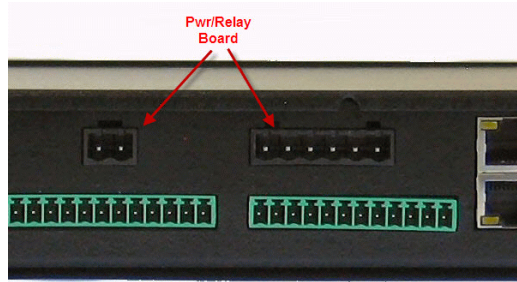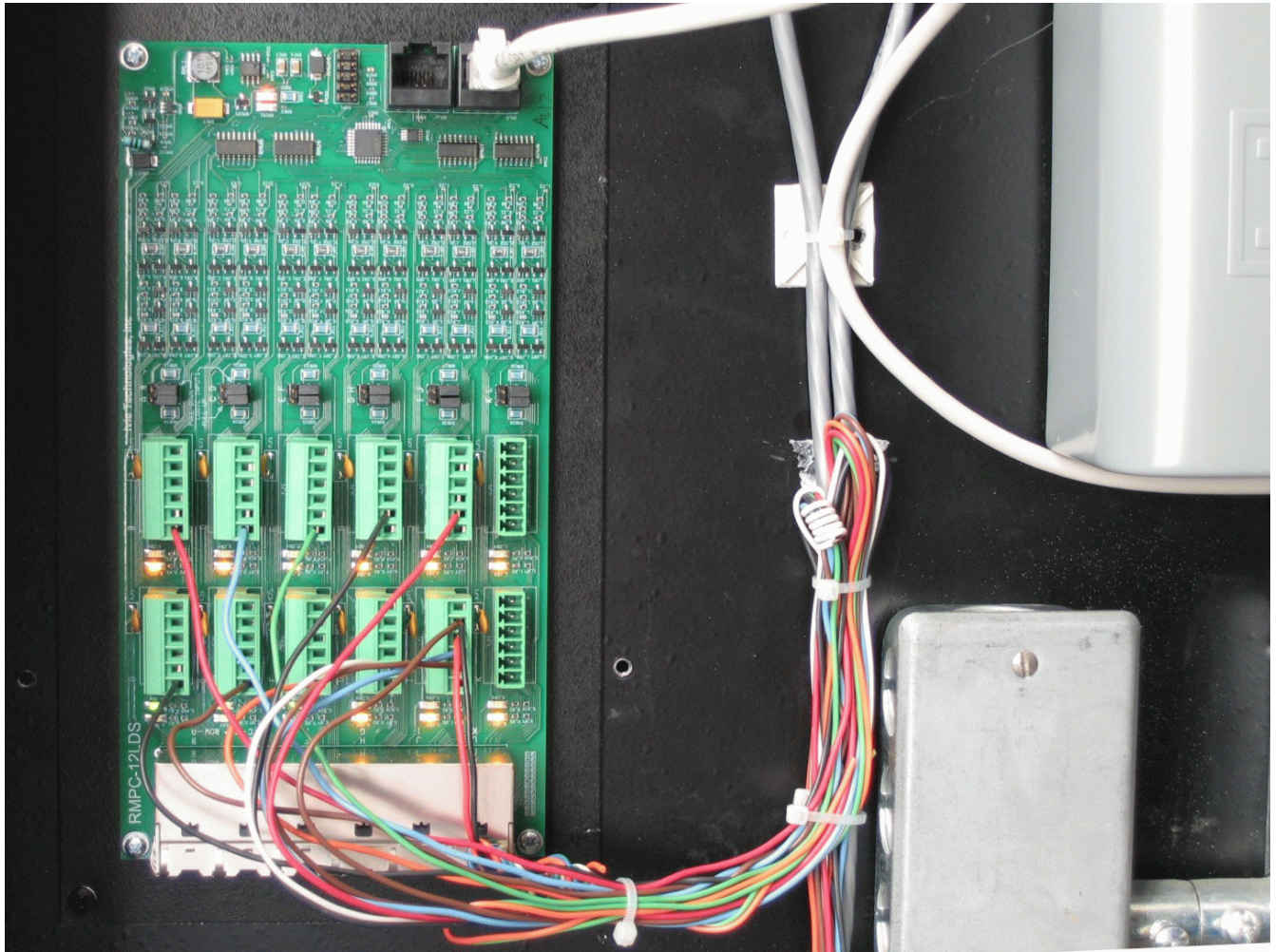

RMPC-12-45

Euro-block connections, as well as RJ-45 connections are supplied on the RMPC-12-45. You can connect the now-standard RJ-45/Cat-5e remotes and sensors to the RMPC-12-45, and you can also connect LDS system microphone remote controls, selector switches and sensors that are wired with the older multi conductor cables. Thus you can do "head end" replacements" of older systems without pulling in new cables. *(Note: Cat-6 is also acceptable)*

The RMPC-12-45 also physically replaces the relays on the back wall of the rack in most of these older systems. All connections that went to the relays now terminate at the RMPC-12LDS.

RJ-45 Interface Ports, A - L   Euro Block Interface Ports, A - L   Switch Hi/Lo Logic Jumpers   Connects to 1280 Logic I/O

See Appendix A Port Assignments and Instructions

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RMPC-12-45 Shown in Typical Installation

RMI-CP

The RMI-CP corresponds to the familiar CP-884. If you are using multi conductor cable from an old installation, you will need an RJ-45 "pig tail" to plug into the RMI-CP and connect to the multi-conductor cable. Another "pig tail" will be needed to connect the rack end of the multi conductor cable to one of the I/O ports on the 1280. <u>Because the RMI-CP is a pulse-type up/down level control, it will need to be plugged directly into an I/O port on the 1280 rather than into the RMPC-12-45</u>.

As with all "SmartControls", **a minimum wiring standard of CAT-3 should be provided.** In some older buildings this may not be possible due to the running of "DC" cables (3, 2-conductor shielded mic cables). Where this older cable is found, an attempt might be made to pull in new cable. If that is not practical, then another strategy would be to use an RMPC-4 in the bishop's pedestal to connect both MI-CP and RMI-CS together for one cable run back to the equipment rack.

Note: If the installer attempts to use the older DC cable, reliability and stability may suffer. Even then, every attempt must be made to keep the RMI-CP data line (RJ-45 pin 1) and the ground (RJ-45 pins 7 & 8) in the same 2-conductor shielded cable.

RMI-CS

The RMI-CS corresponds to the earlier CS-884. The RMI-CS now has an ID chip which allows it to be recognized when plugged directly in to an iFlex Logic I/O port. Using the RMI-IRX to connect RMI-IR3 door sensors to the system, it is likely that there will be enough Logic I/O ports to connect the RMI-CS directly to the 1280.

By means of an RJ-45 to bare wire "pigtail" you can also connect an RMI-CS to the RMPC-12-45 using an already-installed multi conductor cable**.

   ** *Please see the note above regarding DC cable.*

RMI-IRX

The RMI-IRX can be used as a port expander specifically to connect RMI-IR3 door sensors to an iFlex mixer. **In many instances the RMI-IRX can be used in place of the RMPC-12-45 for connecting infra red sensors to the system.**

Please see pp. 29 & 30 for more information on the RMI-IRX.

Physical Connections

Inputs and outputs: Mic and line inputs connect to the Euro-block connectors on the back of the 1280. Outputs connect directly to the connectors on the back of the 1280. See the supplied drawing on assigned input/output connections.

Remote controls and sensors: Older systems using multi conductor cabling connect to the RMPC-12-45 using that cabling. Screw-down Euro-block terminals are provided. Newer RJ-45/Cat-5e controls can also connect to the RMPC-12-45 via the supplied RJ-45 connectors. The RMPC-12-45 connects to any of the 1280 Logic I/O ports via a single RJ-45/Cat-5e cable.

Troubleshooting aid: *Ivie makes a small tester (model CT-1) that will plug onto the remote control end of a Cat-5e cable connected to a Logic I/O port of the iFlex. This small tester will confirm proper wiring AND communication on the Cat-5e line. Lights on the tester will tell you that there is power, proper voltages, proper RS-485 communication, etc.*

The CT-1 tester does not take the place of a Cat-5e cable tester. A standard Cat-5e tester should be used on all lines prior to connection to iFlex. AFTER connection to iFlex, the Ivie CT-1 tester will check for proper voltages, proper ground, and proper communication with iFlex.

Note: Since most of the external controls and sensors will connect to the system via the RMPC-12-45 it is necessary to pay special attention to making those connections. A large amount of trouble shooting time can be avoided if special care is taken to assure that all connections to the RMPC-12-45 are correct.

When a 1280 LDS system is ordered, the 1280 mixer and the RMPC-12-45 come pre-configured to a *standard LDS design* that has been approved by Church Engineering. See the diagram in APPENDIX A that shows wiring connections to the RMPC-12-45. If the various remote controls, sensors and selector switches are connected to the RMPC per the APPENDIX A diagram, the system should function properly "out of the box."

Software Setup and Connection

Sonata Software: i*Flex* is a new concept. The i*Flex*/Sonata software approach is at once simple to see and understand, but very different from the way others do it. Don't expect to "figure it out" on the job site. You'll need some orientation. Consultants will be involved with virtually every head end replacement. They are very conversant with the software and will be able to make changes to match any non-standard applications in unusual buildings.

An LDS system is designed to be ultra simple for the customer to use and operate. But the flexibility to provide all of the features, the "behind the curtain logic", etc. needed for an LDS system requires that the system be set up in a specific way. For this reason there are standard LDS templates ("Sonata files") available for the standard LDS designs, both old and new. You can find the appropriate layout, or Sonata, files on Ivie's website at: www.ivie.com/insider. ***Ivie provides support for the standard templates***. *If the templates are modified it becomes much more difficult to support because we have no way of knowing what changes have been made and how changes affect the over-all behavior of the system. On-site support for substantially modified files may be impossible.*

The standard iFlex/Sonata manual will be very valuable as background orientation for the Sonata software. It is available from Ivie's website. It will answer most of your questions. We suggest you take a hard copy of the iFlex manuals with you to any iFlex job.

If you DO need support from your own home office or from Ivie, remember that it may not be possible for the support person to know what changes you have made to the layout, or how you have made them, or what the consequences are. Therefore, be prepared to load back in one of the standard, supplied Sonata setup files before you call for support.

Connecting your PC to the iFlex 1280: Your PC can be connected to an iFlex mixer by one of two means:

   USB: We recommend that you connect using USB if you are working close to the rack.. It will be faster and simpler. By means of a standard USB A-B cable, simply "plug in". (You will hear the standard USB "connect sound"). Start the Sonata software. Click on the icon in the tool bar or use the "File" drop-down menu and select "Connect." A "Connect to Mixer" box will appear, where the mixer is identified in the "iFlex Hardware" box. Select the mixer by clicking on it and then click on the "Connect" button.

Note: The first time you connect to an iFlex 1280 your Microsoft USB port will detect the 1280 as new hardware and issue a "Found New Hardware" message. The "Welcome to the Found New Hardware Wizard" screen will pop up. Choose, "No, not at this time" and go to the next screen.
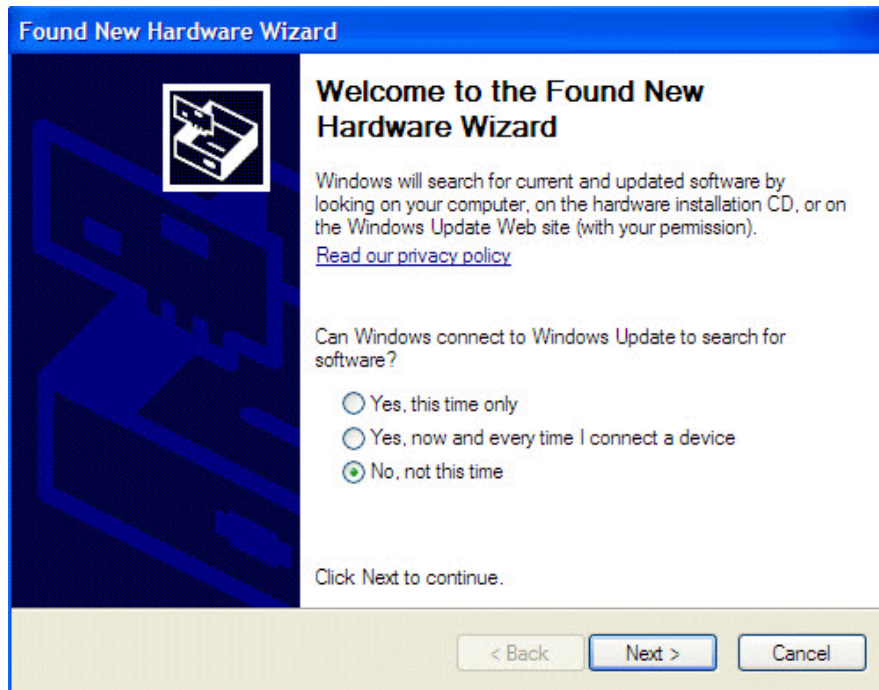

The next screen will ask you if you want the Wizard to automatically install the USB software or install from a specific location. THE FIRST TIME your PC computer ever connects to an iFlex 1280 you will need to select "Install from a list or specific location." The correct specific location is the directory on your hard drive where the executable file for Sonata resides. [The default directory for a Sonata install is: C:\Program Files\Ivie Technologies\Sonata].
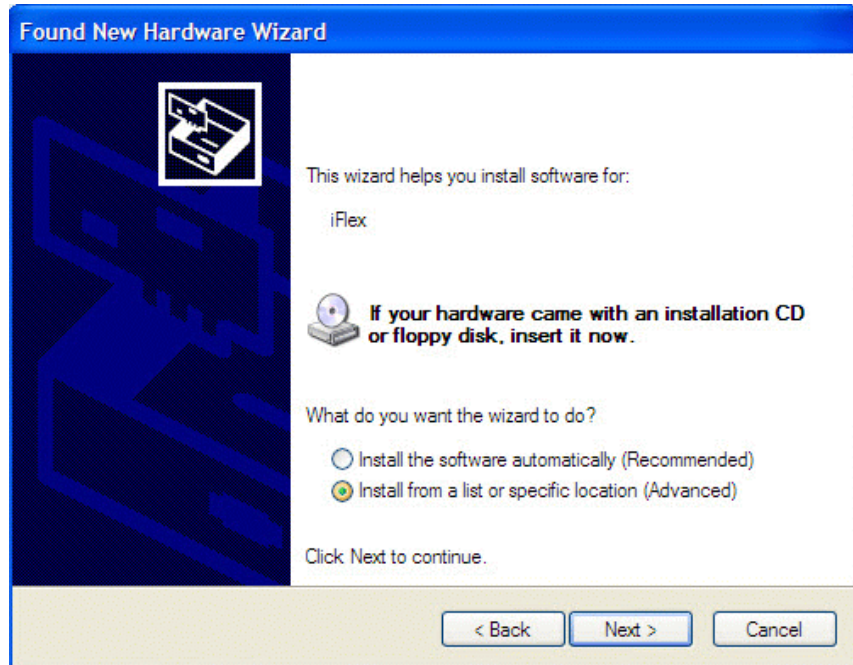
Any time AFTER YOU HAVE FIRST CONNECTED WITH A 1280 for that particular USB port, your PC should know where the file is located.   Thus any time after the first time, you can select "Install the software automatically. (See below)
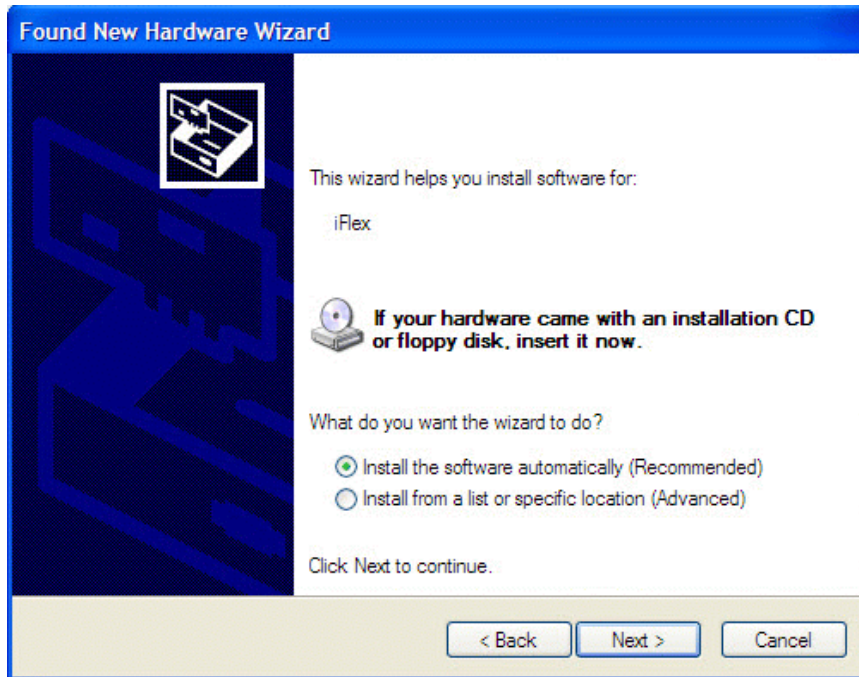
After the first 1280 connection, for subsequent new
1280 mixers, use the "automatic install" choice.
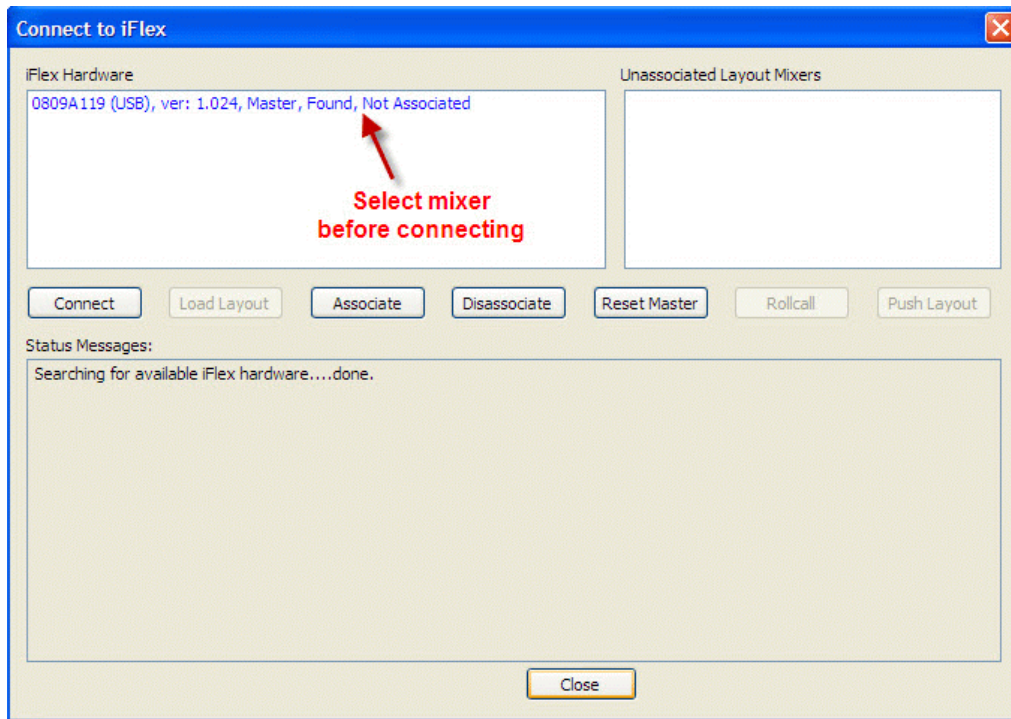
Note: The information shown in the mixer info line in the connect box is very useful. It will tell you the mixer serial number, the firmware version number, what type of connection (in this case, USB) etc.

Network: Using TCP/IP protocol, you can connect to the mixer via the network port. While consultants may wish to use this means since it makes equalization simpler when the PC can be in the room being equalized, it is slightly more involved but can be very useful.

Windows XP TCP/IP Connection Guidelines for iFlex Mixers

Disable Firewall: As with most connection processes using Windows you should make sure that your Windows or other firewall is turned off. Reliable connection to iFlex mixers is not possible with the firewall turned on.

Wireless: If you are connecting via wired TCP/IP, turn off your WiFi service (wireless connection)

DHCP (automatic IP address assignment): When you open Sonata software to control an iFlex mixer your Windows XP OS will follow several steps to try to connect with the mixer. If you are connecting using a router with a DHCP server between the PC and the mixer (which automatically assigns IP addresses to the hardware involved) you will have to do nothing but open the Connect page in Sonata and you will see that the mixer is already recognized and ready to connect.

Direct Connection: If you are <u>not</u> using a router or other device with a DHCP server you will need to make a change in the network connection settings in your computer. To do so, follow the following steps.

Open "Control Panel" on your Windows XP PC.

Select "Network Connections".

Right click on "Local Area Connection" and select "Properties"

Slice down to and select "Internet Protocol (TCP/IP)"

Click on the "Properties" button.

Change the selector from "Obtain and IP address automatically" to "**Use the following IP address**"

Type in this IP address: 192.168.1.30

For the Subnet Mask, type in: 255.255.255.0

Click "OK" to keep the new settings, then click "OK" to close the Local Area Connection Properties window and then close the Network Connections window.

Now physically connect your iFlex mixer to the network port on your computer. It could take up to 60 seconds for the Windows network to find your mixer, but probably will take substantially less.

Open your Sonata software, open the "Connect" page, and you will see the connected mixer recognized. Select the mixer and click on "Connect". (*Note:* if the software does not "see" your mixer in the connect screen, you may need to wait just a little longer for Windows to recognize the connected mixer. If for some reason your PC doesn't "see" the mixer, break the physical connection to the mixer re-power the mixer and then re-connect the physical connection, then wait a minute or so before opening the Sonata "Connect" screen)

Windows 7 Connection Guidelines for iFlex Mixers

Disable Firewall: As with most connection processes using Windows you should make sure that your Windows or other firewall is turned off. With Windows 7 you have the option of turning off the "Public Network" firewall while leaving your Internet and other firewalls intact. Be sure the appropriate firewall is disabled in order to make a connection.

Wireless: If you are connecting via wired TCP/IP, turn off your WiFi service (wireless connection)

DHCP (automatic IP address assignment): When you open Sonata software to control an iFlex mixer your Windows 7 OS will follow several steps to try to connect with the mixer. If you are connecting using a router with a DHCP server (which automatically assigns IP addresses to the hardware involved) you will have to do nothing but open the Connect page in Sonata and you will see that the mixer is already recognized and ready to connect.

Direct Connection: If you are <u>not</u> using a router or other device with a DHCP server you will need to make a change in the network connection settings in your computer. To do so, follow the following steps.

Open "Control Panel" on your Windows 7 PC.

Select "Network & Sharing Center

Select "Change Adapter Settings"

RIGHT CLICK on "Local Area Connection" and select "Properties"

Select "Internet Protocol Version 4 (TCP/IP / IP v 4)

Click on "Properties"

Change the radio button selector FROM "Obtain IP Address Automatically" TO "**Use the following IP address**"

Type in 192.168.1.30

For the Subnet Mask, type in: 255.255.255.0

Click "OK" to keep the new settings, then click "Close" to close the Local Area Connection Properties and close the Network Connections window

Now physically connect your iFlex mixer to the network port on your computer. It could take up to 60 seconds for the network to find your mixer, but probably will take substantially less.

Open your Sonata software, open the "Connect" page, and you will see the connected mixer recognized. Select the mixer and click on "Connect". (*Note:* if the software does not "see" your mixer in the connect screen, you may need to wait just a little longer for Windows to recognize the connected mixer.)
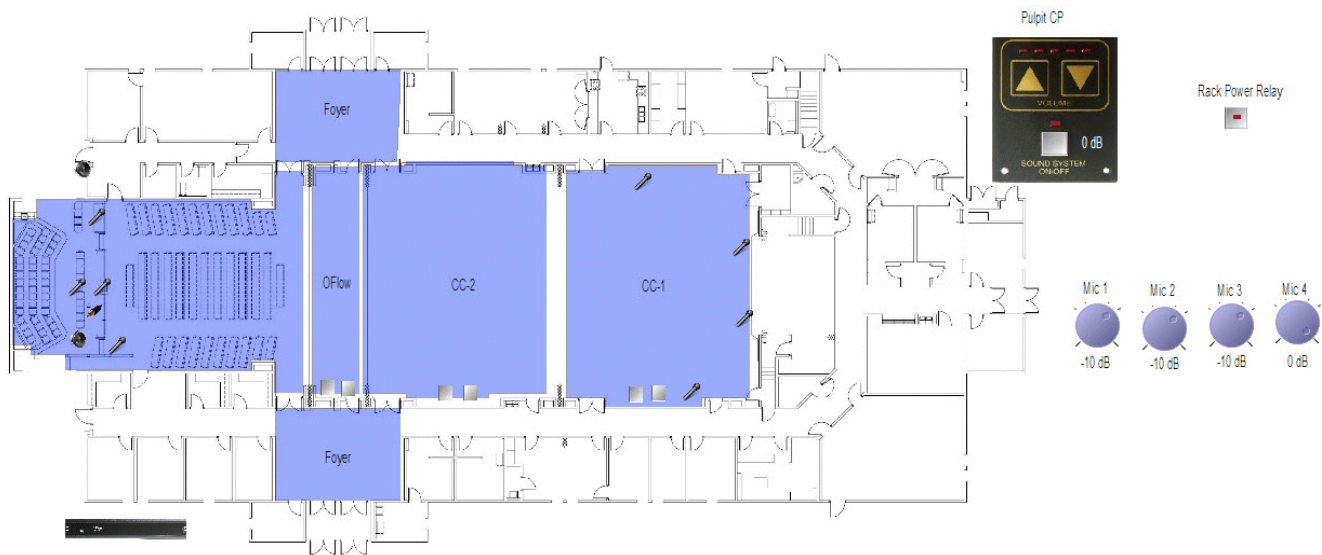
File Name: 1280_HeadEnd_3 (for three section overflow)

If necessary, load a Sonata layout file into the mixer: With your PC physically connected and with the Sonata software open, open the Connect screen, select the mixer, and click on "Connect". The software will connect with the mixer.

1. When the software has connected with the mixer, the current layout file from the mixer will download to the software and appear on-screen.

2. Using the File > Open drop down menu, or clicking on the File Open toolbar icon, select the setup file you would like to load into the mixer.

3. Go back to the Connect screen, select the mixer, and click on "Push Layout." This will "push" the on-screen layout into the mixer.

With the PC and mixer connected physically, the Sonata software loaded and connected to the mixer, and the correct Sonata layout file loaded, you are ready for system setup and checkout.

Hardware Programmer

Using the Hardware Programmer is an essential step in setting up a system with the iFlex 1280. After making sure that the correct Sonata layout is loaded into your mixer you are ready to connect the remote controls (RMPC-12-45, RMI-CP, red/green switches or RMI-IR-3's, etc). To do this, you will need to program these items using the Hardware Programmer. The Hardware Programmer is found in the "View" pull-down menu in Sonata. **Please see Appendix A** for more information on making assignments with the hardware programmer.

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Sound System Checkout Suggestions

After confirming that the Sonata setup file is correct for the room, test the level controls, selector switches, etc. You should see their action in the on-screen layout if the software is in the "Run" mode. See the drawing above. Each of the on/off switches, selector switches, volume controls, etc., is represented. <u>When you change a control setting in the room you should see it on the screen.</u> Verify that the proper actions take place on-screen when the system is turned on and the controls operated.

Confirming proper function of these external devices will
accomplish 90% of your trouble shooting up front.

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Do not bother to adjust any EQ at this time.
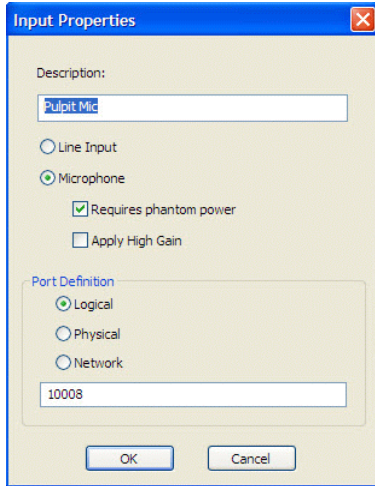
Input Properties: With an LDS template loaded, parameters for the various inputs should be pre-set correctly. If you need to change any parameters, right click on the desired input on the layout screen and select "Properties". An "Input Properties" box will open. Here you can define the input. Among other things, you can turn on/off Phantom Power, add gain to the input, etc.

Do an audio "rough check" by "talking the system out." During this process you can set rough levels on the inputs and outputs. Start by setting the level of the pulpit mic (the setup file will have most levels set at a good starting point). If necessary, set the Trim control to about 0 and adjust the output for the chapel so that level in the chapel is about right. Once the pulpit mic is set and the output level to the chapel is appropriate, set other inputs for appropriate levels. Standard installation practices always apply. Generally, you should move the gain closer to the front (input stages) of the box.

Special Note: By clicking on the "Save Levels" button you will save the levels you have set into all modes of the system. The Save Levels function works much the same way as in the 884 and the 1026. It is a way to quickly propagate levels throughout the system without copying and pasting.

Using the ALC Feature (Automatic Level Control)

Setting ALC. The 1280 mixer adds increased flexibility to your system in that there is a <u>separate ALC function for each input</u>. This allows you to separately set ALC for the pulpit microphone, where the ALC function is probably most critical. ALC in LDS chapels is an "attenuate only" type of Automatic Level Control.

ALC Setup Procedure: With the power amps off, set ALC for the pulpit microphone. Turn the system on, either from the software or from the RMI-CP. Amplifiers should be switched off or unplugged. You do not need to listen to the sound system at this point. In fact, listening to the system while you make these adjustments may well affect your ALC setting adversely.
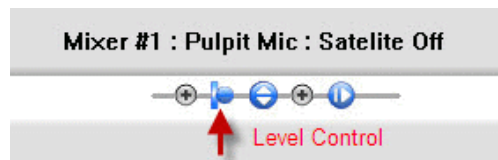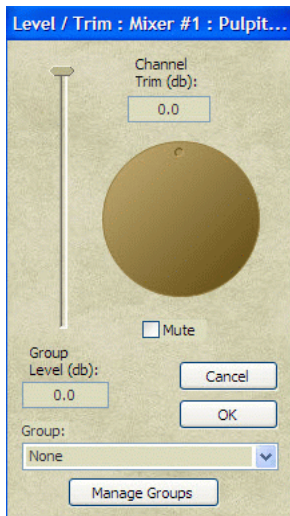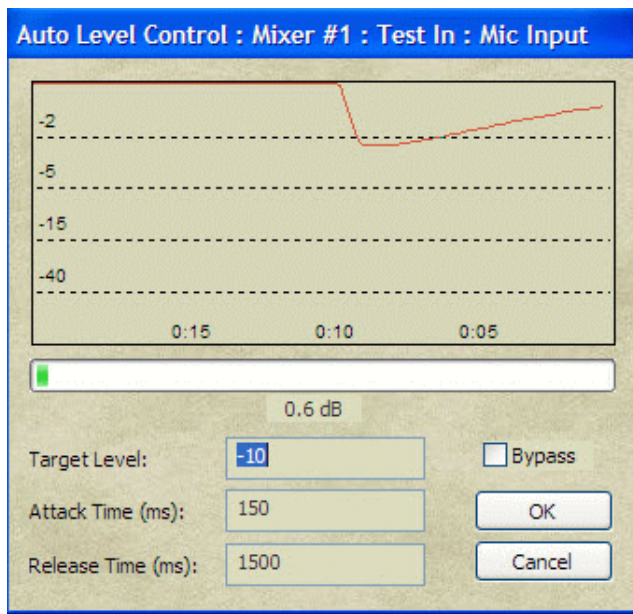
Bring up the pulpit microphone level control on-screen by clicking on the pulpit mic in the layout, then clicking on the level control icon at the bottom of the Layout Screen. Adjust the pulpit microphone software level slider to "0". <u>Leave the level control screen in view.</u>

You can access the ALC function for the pulpit microphone in at least two ways. Clicking on the pulpit microphone in the layout screen will expose the processing string for that input at the bottom of the screen. Going to the "Processing" tab in the software will also allow you to access ALC. For purposes of this Setup Guide, we will use the Layout screen.

In the Layout screen, click on the ALC icon in the displayed processing string at the bottom of the screen. This will bring up the ALC Control window. You will see a "virtual chart recorder" in the ALC Control window. Attack and Release Time settings should be the "Default" settings (attack = 150, Release = 1500).

Set the ALC "Target Level" at -10 (simply type in the number). This will temporarily set ALC so that gain reduction will begin to occur when a -10dBu level is present at the input to the matrix bus of the mixer.

Confirm that the pulpit mic software input level control is set to 0. Now have someone speak into the pulpit microphone in a "normal" speaking voice. Adjust the software rotating input "trim" control for the pulpit microphone until normal speech causes the red chart recorder pen to just begin to slightly "bobble" at the upper levels of normal speech.

Having set the pulpit microphone input trim to achieve some very slight "pen bobbling" with normal speech at a target level of -10 dBu, now change the Target Level setting to -6. Doing so will allow 4 dB more ALC "dynamic headroom," which gives speech a very natural sound and masks the operation of the ALC.

Note: *You have set the pulpit mic for proper ALC action. If you wish, you can set ALC action on other inputs independently. You can also copy and paste the settings of the control from on input to another. You can choose which inputs you want to use ALC with.*

With the amplifiers back on, touch up the gain through the signal chain for the pulpit mic for proper gain before feedback. Use gain settings after the mic input (since ALC target levels are based on the existing settings). This will be a "final set" for the pulpit mic.

Now set the other input levels in the chapel, relative to the already-set pulpit mic. Reminder: when settings levels in the room, you should temporarily turn off the ALC function on the microphones. To do this, access the ALC control for the pulpit mic and click on the "bypass" box. *Remember that you will have to "unclick" the box when you are done setting levels!*

<p style="text-align:center">Setting Levels</p>

See "Replicate Levels" on pp 14 & 15!

Levels can also be set, copies, pasted, etc., from the "Processing " page of Sonata. To the right of each input or output is a "processing string" that includes a level control. First, use the Mode combo box to select an appropriate Mode for the input our output (Chapel On), for example. Click on the level control to bring up the "Level / Trim" window. Set the Trim from this window. When you are satisfied with the level for this input or output, close the Level / Trim window. Then right-click on the level control on the processing string and select "Copy Function" Then right-click on the far right of the processing string (to the right of the "+" sign) and select "Paste Function All." This will past the level control to all modes associated with that input our output. If you don't "Past Function All" you may find that the level will shift as the system moves from one mode to another when switches, doors, sensors, are changed.

Alternatively, you can right-click on the processing string outside the "+" signs, select "Copy String", and then right click in the same place and select "Past String All." This will copy and past all of the DSP signal processing functions (including the level control) to all modes associated with that input or output.

<p style="text-align:center">Sticky Level</p>

The RMI-CP has the Sticky Level feature built into it. <u>You will not have to set up Sticky Level in this system.</u> By turning off the system with the CP and waiting about ten seconds, the system will come back on in the -4 dB gain position automatically. This is true even when the CC System is still on.

<p style="text-align:center">A Word About Gain Settings</p>

In setting up the iFlex 1280 there are a few guidelines for setting gain through the unit that will maximize signal and minimize noise. These guidelines follow general good practice in system gain. There are several points in the 1280 where gain can be adjusted or affected. These general guidelines will help to maximize the performance of the system.

1. <u>Push as much gain as possible toward the "front" of the system.</u> This prevents you from amplifying noise picked up along the way.

2. Minimize overall gain. The mixer / amplifier combination has much more gain than is needed. Modern amplifiers are at least 20 dB more sensitive than older designs. All too often the installer is reluctant to adjust the amplifier's gain down to match the mixer's output. This results in far too much gain, far too late in the signal chain, resulting in your signal-to-noise ratio is not optimal. In LDS systems, the standard procedure is to leave amplifier gain settings full up so as to give the "well meaning local technician" fewer settings to adjust. This can mean that more careful gain adjustments are needed in the 1280. As a general rule, however:

> - Remove output trim to compensate
> - Eliminate excess gain. Avoid gain stages followed by attenuation stages.

Special Note - Adjusting gain for the "W" line input: When you set up gain on the input that is used for connecting the "W" control, you will find a unique situation of ultimately connecting a line level device (such as a

<p style="text-align:center">15</p>

computer or iPod, etc, that has "line level" output which is considerably lower in level than a professional line level. You may need more gain to get an appropriate line level. In the Input Properties window you can access the Input Properties of a line input and select "Apply High Gain" to that input. If you **"Apply High Gain"** to the W input you will have the gain necessary to allow for lower, or consumer, line level inputs.
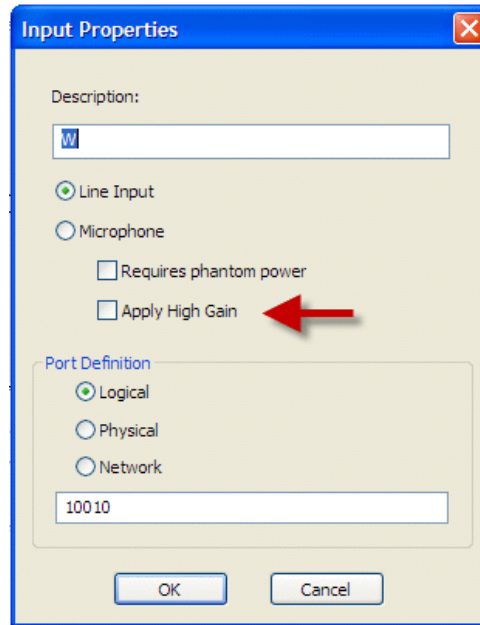
"Replicate Current Levels" feature. Beginning with Sonata version 1.54 a very useful feature has been added for those installing and adjusting levels in an LDS or other application. "Replicate Current Levels" allows the installer or consultant to set a level on an input or output and then quickly copy that level to all Modes associated with that input our output. This is roughly analogous to the "Volume Save" button on 884+ or 1026 software.

Using "Replicate Current Levels" solves the problem of trying to remember to save levels to all modes. Using the features copies all Trims but does not copy Group Levels or special states such as "mute."
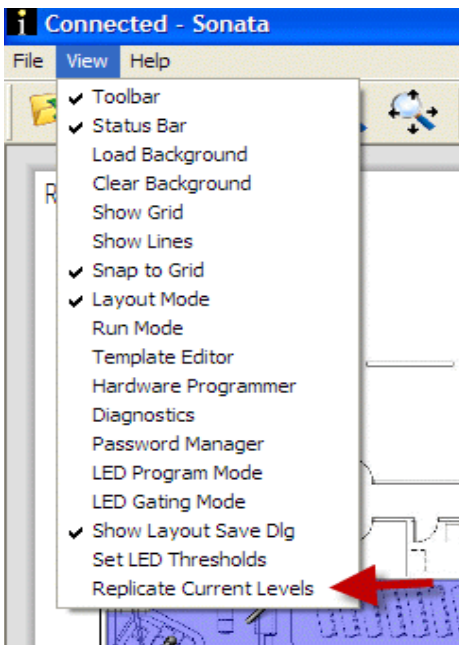
Adjust all output trims with everything switched to Chapel Mode, and then do "Replicate Current Levels". That will make sure all output trims are the same in every mode, and it will not affect the Group Levels or Group Assignments.

After the outputs are set in all modes, then adjust all input trims. Use trim for adjusting all levels, including side and rostrum mics. Adjust CC mics in either auto or manual modes – it doesn't matter. Then in the Satellite Off mode, do "Replicate Current Levels". That will make sure all input trims are the same in every mode, and it will not affect the Group Levels or Group Assignments. It will not change the inputs that are muted during Satellite On (or the Group Level change of the pulpit mic), because muting is an exception, and is not copied or overwritten during "Replicate Current Levels"

Replicate Levels Summary

First, adjust output trims with all outputs switched to chapel, then Replicate Current Levels.
Second, adjust all input trims, and then in Satellite Off mode, Replicate Current Levels.

Some thoughts about setting up and using the PEQ filters

Copying EQ settings
Chapel EQ has a group of None, but it doesn't have to be copied, because it is always in Chapel mode.
Any CC section that is assigned to "CC EQ" group doesn't have to be copied. If any CC section needs
to have a different EQ (such as the Overflow), then assign it to None group **before** EQing, and after the
EQ is done, copy the EQ function only, and Paste Function All for just that output.

Shortcuts (hot keys) for adjusting PEQ's
The following **hot keys** are very useful in setting up and adjusting multiple parametric filters:

TAB - tabs through filter value fields

Ctl C - with a filter selected, this copies the gain and bandwidth settings of that filter.

Ctl V - with a filter value copied (Ctl C), select another filter and paste the gain and bandwidth settings
to the new filter.

"`" key (lower case ~) - when a filter is selected, this will move to the next unassigned filter.

Left/Right arrow keys - shifts selected filter frequency.

Up/Down arrow keys - shifts filter gain.

Page Up/Page Down - Next or previous filter in order of frequency (rather than filter number).

Appendix A

RMPC-12-45 General Information

The RMPC-12-45 is an interface card designed to provide flexibility and increased capability, where needed, by connecting multiple remote control lights, switches, and pots to iFlex products via a single Cat-5e cable. Twelve channels of remote connection are provided (each channel provides control for a switch, a light, and a pot). In addition, RMPC's can be daisy-chained to provide even more connections if needed.

While a series of iFlex RS-485 and analog controls can be connected directly to iFlex products, it is inefficient to use the Logic I/O ports on the iFlex to connect "dumb" controls and sensors. The RMPC-12-45 is provided to allow connection of multiple switches, lights, pots, sensors, etc., to the iFlex with a single Cat-5e (or better) cable.

Input Ports

The RMPC-12-45 provides for connection of remote switches, sensors, lights, etc., via two means. Twelve Euro-block connectors, labeled A through L, allow for connection via discreet wires (as in a multi-conductor cable). In addition, twelve RJ-45 connectors are provided; they are connected in parallel with the Euro-block connectors. If Cat-5e cables are already installed in the system, it may be much more convenient to install remote controls such as the RMI-CP using the RJ-45 connectors. The Euro-block connectors and the RJ-45's are in parallel and have the same functions for each input. See the pin-out key for these connectors on a following page.
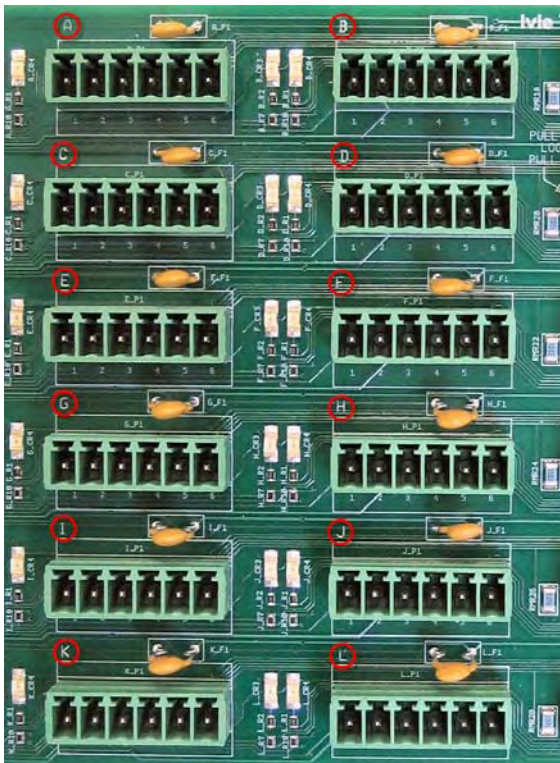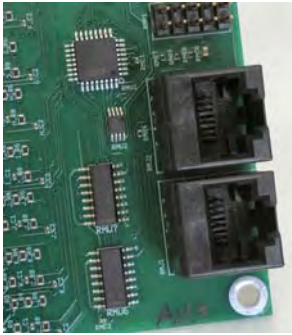

Euro-block connectors A - L

RJ-45 Connectors, A - L
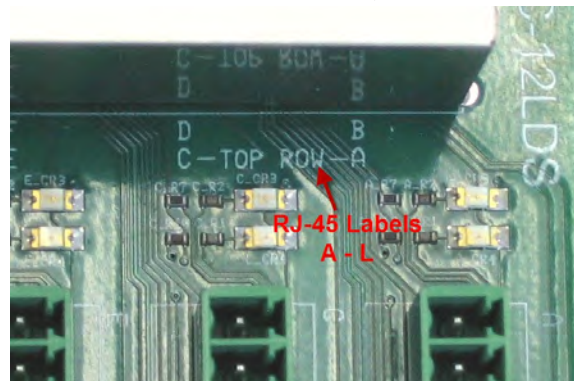
RJ-45 Labels (silk screened) , A - L

18

iFlex Logic I/O Connections

Connection to the iFlex mixer is done via a standard Cat-5e cable (straight through connection, pin to pin). Connect from one of the Logic I/O RJ-45 connectors on the RMPC-12-45 to one of the Logic I/O connectors on the back of the iFlex.

Remote Switch Logic Jumpers

If you are connecting a remote switch (such as the "Red/Green overflow selector switches in an older LDS building) or even an IR-3 to a port on the RMPC-12-45, the Remote Switch Logic Jumper allows you to select whether the switch connection will short to ground, or will connect +24 VDC.

In many of the older buildings the Red/Green switches connect +24 VDC when selected. Most of the modern buildings are wired so that selector switches (including the RMI- IR3) short to ground when connected. You have to "tell" each of the ports on the RMPC that will connect to a remote switch whether to be looking for a short or for +24.

This is done by setting a jumper on the appropriate Remote Switch Logic pins. A jumper configures for "Switch High" will tell the RMPC to be looking for a +24 VDC connection when the switch is selected. A jumper set for "Switch Low" will tell the RMPC to be looking for a short to ground when the switch is activated. Each port can be set separately by means of its own jumper.

1. "Switch High" jumper sets the RMPC to look for +24 VDC when the switch is activated (and an open circuit when the switch is in the "off" position). *Red/Green switches usually use active high*.

2. A "Switch Low" jumper sets the RMPC to look for a short to ground when the switch is activated (and an open circuit when the switch is in the "off" position). *IR-3 door sensors use active low*.
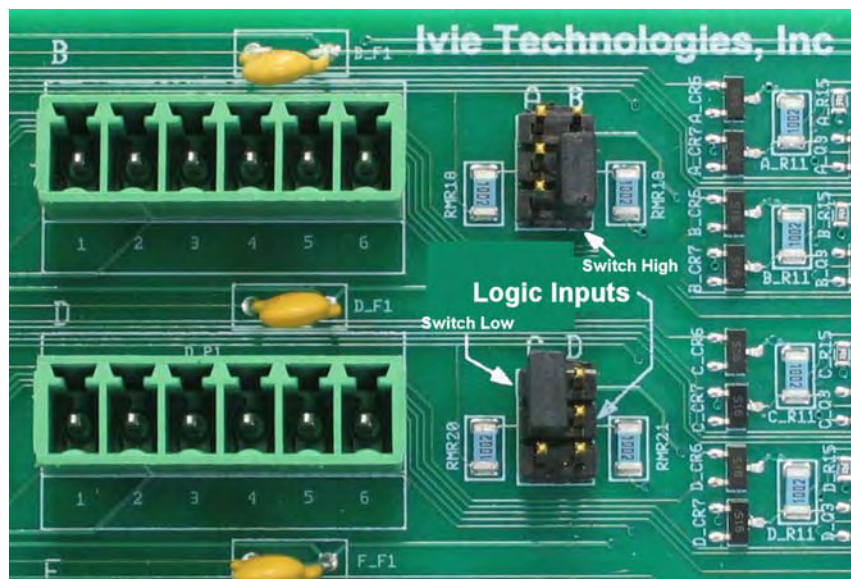
Port B is jumpered "Switch High", Port C is "Switch Low"

Mounting

The RMPC-12-45 is provided already mounted to a metal plate with standoffs. Mounting holes on the corners of the plate allow physically mounting the plate and the attached RMPC-12-45 to the inside metal wall in the back of the rack.

Connection Pin-out Key

The following is a key for input connections using either the Euro-block connectors or the RJ-45 connectors. These connections follow the Ivie standard for all Ivie products.

<table>
<tr><td colspan="2" align="center">RMPC-12-45
Euro Block Key</td><td colspan="2" align="center">RMPC-12-45
RJ-45 Connector Key</td></tr>
<tr><td>Pin #</td><td>Assignment</td><td>Pin #</td><td>Assignment</td></tr>
<tr><td>1</td><td>Switch in</td><td>1</td><td>Switch in (RS-485 Data A)</td></tr>
<tr><td>2</td><td>Pot wiper</td><td>2</td><td>Pot wiper (RS-485 Data B)</td></tr>
<tr><td>3</td><td>Remote + (10 VDC)</td><td>3</td><td>Remote + (10 VDC)</td></tr>
<tr><td>4</td><td>+24 VDC</td><td>4</td><td>+24 VDC</td></tr>
<tr><td>5</td><td>Ground</td><td>5</td><td>+24 VDC</td></tr>
<tr><td>6</td><td>LED out</td><td>6</td><td>LED out</td></tr>
<tr><td></td><td></td><td>7</td><td>Ground</td></tr>
<tr><td></td><td></td><td>8</td><td>Ground</td></tr>
</table>

Note: The +24 and ground lines are doubled for better current handling on small conductors.

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**Mixer Input / Output / Logic I/O and RMPC-12-45 Assignments and Connections
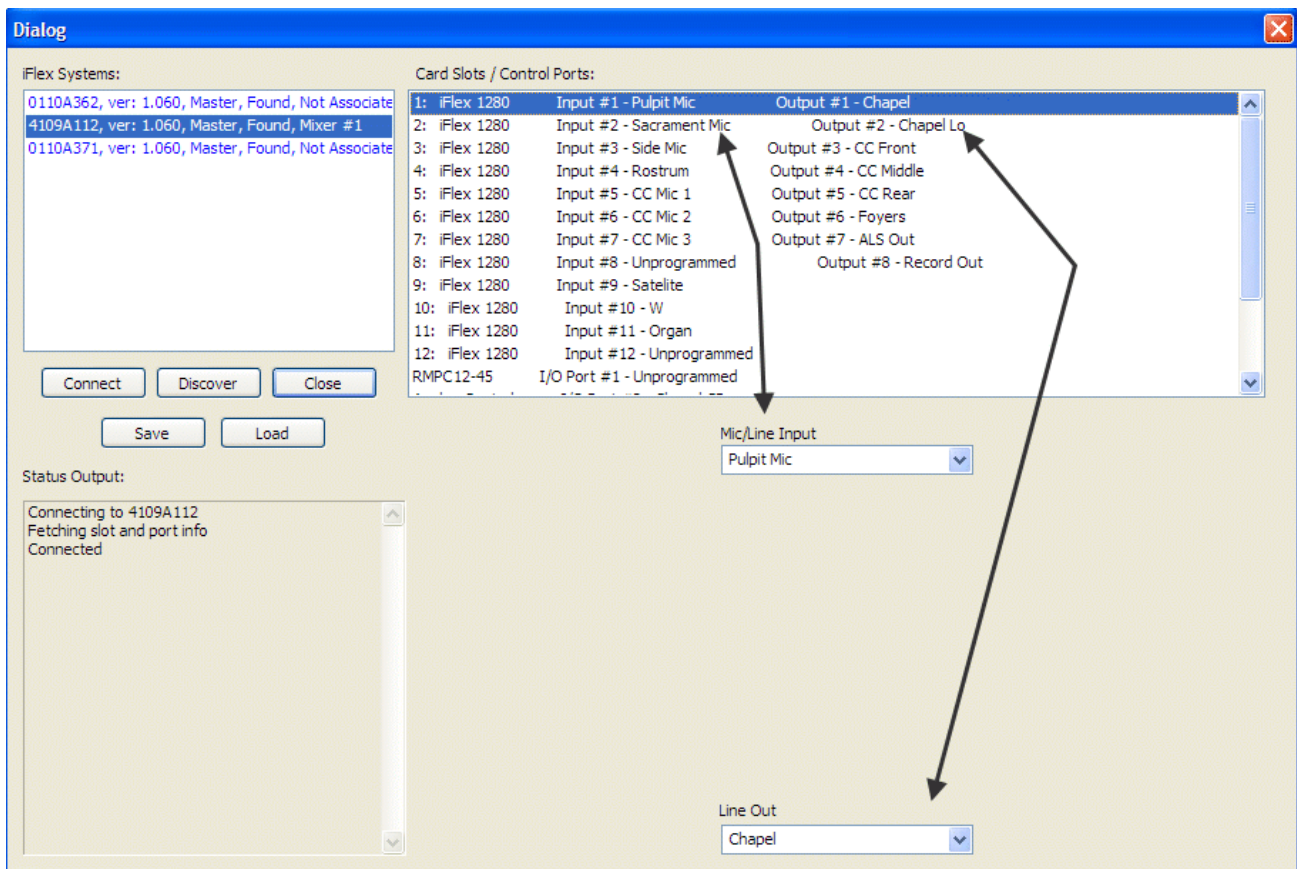and using the Hardware Programmer**

Standard connections of the various switches and controls in an LDS building is necessary. If the standard is not followed it will be difficult if not impossible to provide technical support to contractors or consultants on the job site.

The following page shows the standard connection assignments for LDS buildings using the iFlex 1280 mixer. Please be very careful to follow these connection standards so we can support you in the field and so that any contractors or other who come later to the building may quickly be able to determine what is installed.

The Hardware Programmer is the tool you use to make assignments and associations for remote controls, the RMPC, the RMI-CP, etc. Additionally, the Hardware Programmer is used to assign functions to the input and output audio ports on the 1280. The first items in the "Card Slots/Control Ports" window are the Input and Output assignments.   The 1280 has twelve inputs and 8 outputs. When you select any of the first eight inputs in the Hardware Programmer you will have the opportunity to assign one of the outputs as well (think of the first eight inputs on the 1280 as dual channel cards with one input and one output). See the example below.

When you open the Hardware Programmer (from the "View" menu), you should select the mixer and "Connect" to the mixer. You can then select the hardware you want to program. A lot of the hardware is connected to the mixer via the RMPC-12-45. in the first graphic below you will see an example of how inputs and outputs are assigned with the Hardware Programmer. The combo box choices for inputs and outputs show a list of the ins and outs that are in the Sonata layout you are using. The in/out assignments shown immediately below are the standard assignments for a 3-door "Head End Replacement" system.

Note in this example that Slot 1 has the Pulpit Mic assigned as its input and the Chapel Output Zone assigned as its output.

When you select the RMPC-12-45 in the Hardware Programmer, a special screen comes up showing each port on the RMPC-12-45. It is from this screen that you can assign hardware such as sensors and remote controls to their proper locations and functions.

The screen immediately below shows the port assignments in the Hardware Programmer display for a Head End Replacement, three door, red/green switch layout. The RMPC-12-45 is shown as the selected hardware.
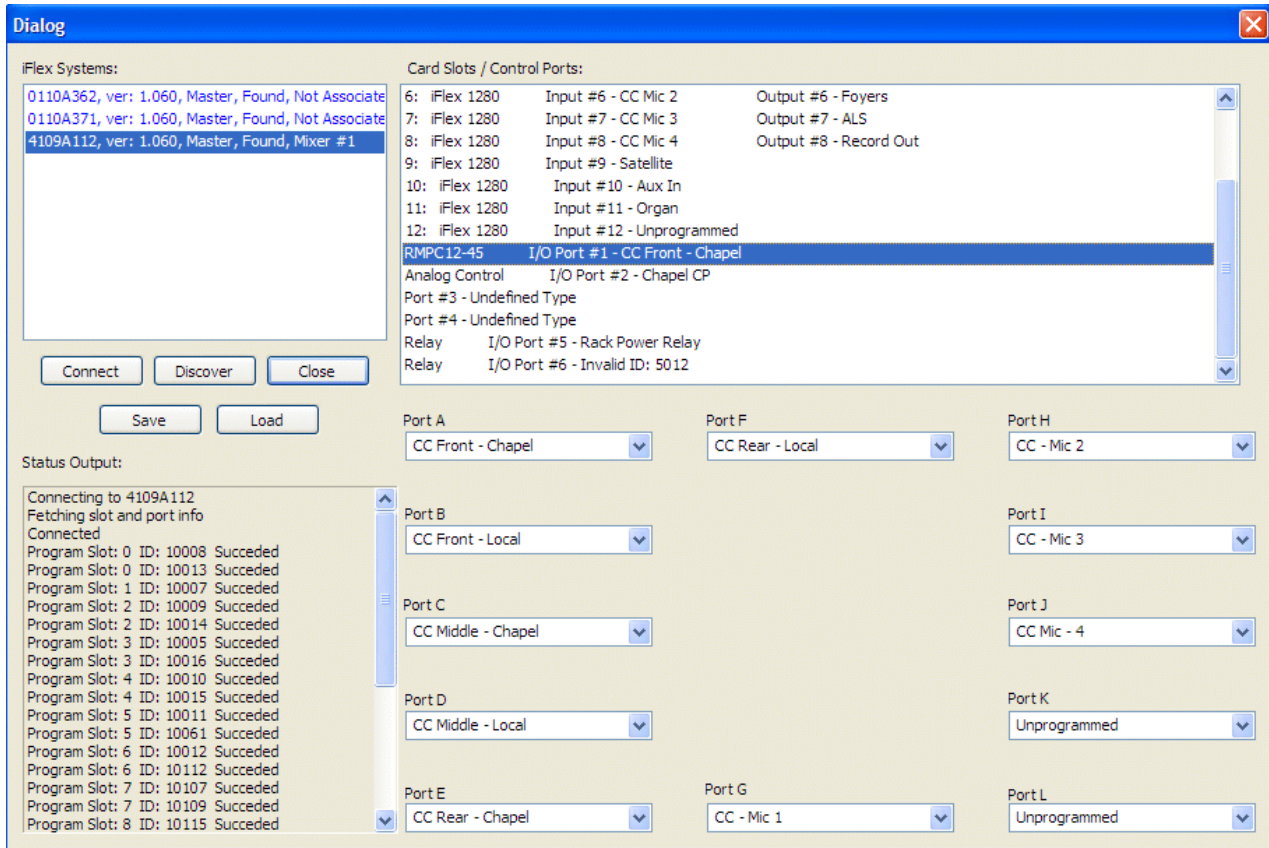
The standard I/O port assignments in the Hardware Programmer for a 1280 system are:

Port 1: RMPC-12-45
Port 2: "Analog Control" - this is the RMI-CP
Port 3: RMI-CC (*if using an 884-CC, connect through the RMPC-12-45*)
Port 5: LDS Power Relay
Port 6: Overflow Relay (you don't need to assign it if you are not going to use it)

These are the Hardware Programmer standard port assignments for a Head End Replacement. The arrows show that the Port #2 "Analog Control" is assigned to be the Chapel RMI-CP control. Note also that the Rack Power Relay is assigned to Port #5 (the rack power relay is on the LDS Power/Relay card which is an optional accessory installed inside the mixer.
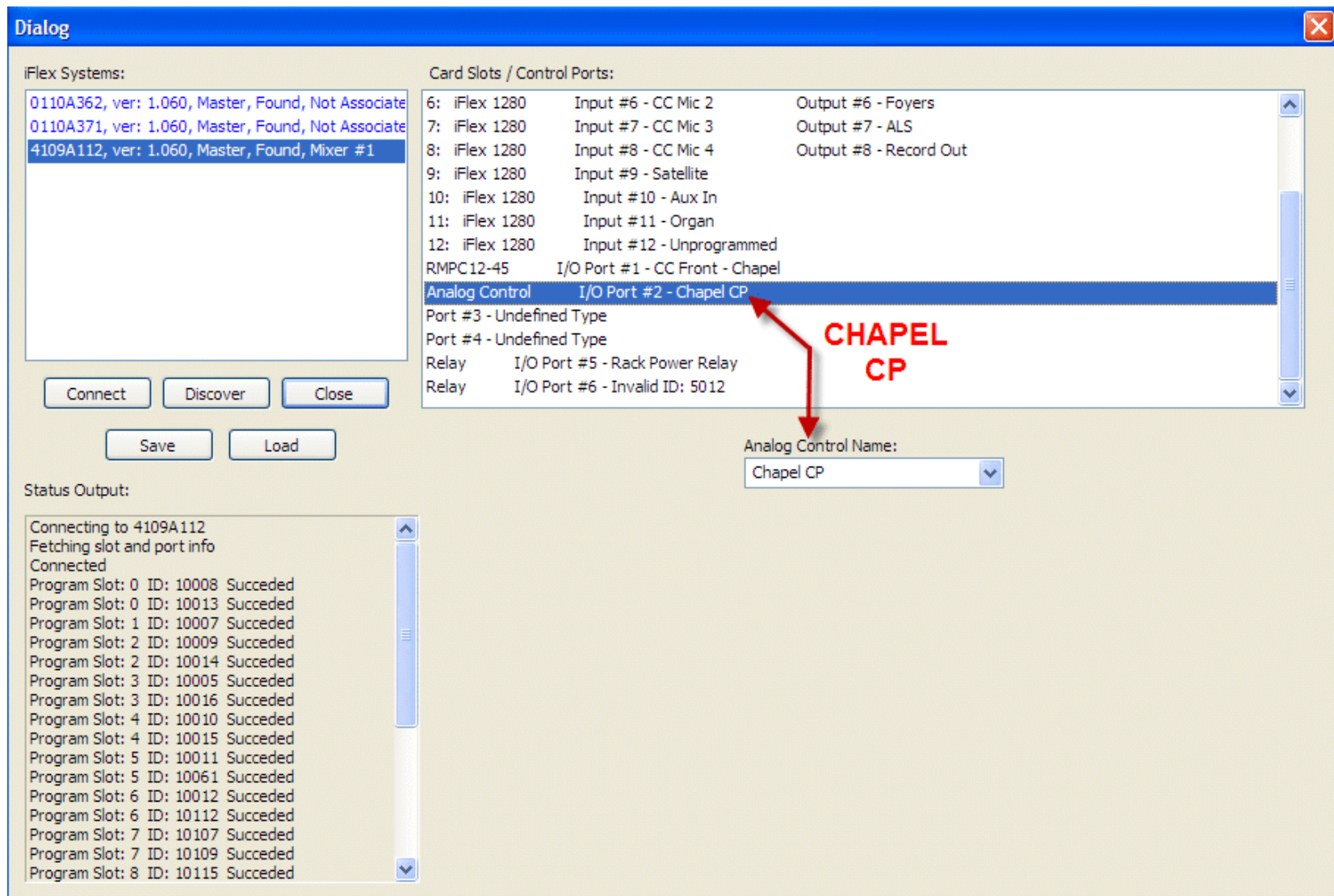
1280 i*Flex* – Input / Output / Logic I/O / RMPC-12-45 Assignments
For "Head End Replacement" and Standard LDS Systems

|	Mixer Inputs	Mixer Outputs	1280 Logic I/O		RMPC-12-45
1	Pulpit	Chapel	RMPC-12-45	A	**Red**/Green Zone 1 / (RMI-IR3 - Front)**
2	Sacrament	Chapel	RMI-CP	B	Red / **Green** Zone 1 / (RMI-IR3 - Middle)**
3	Side	CC - Front	(RMI-CC)**	C	**Red**/Green Zone 2 / (RMI-IR3 - Rear)**
4	Rostrum	CC - Middle		D	Red / **Green** Zone 2
5	CC Mic 1	CC - Rear		E	**Red**/Green Zone 3
6	CC Mic 2	Foyers		F	Red / **Green** Zone 3
7	CC Mic 3	ALS		G	RMA6-1 / (CC-884 - Pot 1 + CC on/off switch)##
8	CC Mic 4	Record/Camera		H	RMA6-2 / (CC-884 - Pot 2 + CC Auto/Manual)##
9	Satellite			I	RMA6-3 / (CC-884 - Pot 3)##
10	W			J	RMA6-4
11	Organ			K	
12				L	RMI-CS

** items in parenthesis used only in "standard full" installations

in the event that an old, or existing, CC-884 is present in a building and the consultant/contractor wishes to use the existing CC-884 rather than install a new RMI-CC, the CC-884 needs to be connected to the system via the RMPC-12-45. Three ports are needed. Ports G, H, and I should be used.

Hardware connections to the RMPC-12-45 can be made with either the Euro-block style connectors or the RJ-45 connectors.   The Euro-blocks and the RJ-45s are in parallel with each other so they can be used interchangeably.

A red/green switch is actually two switches, so two ports on the RMPC-12-45 are used. The graphic below shows how a red/green switch typically would be connected to the RMPC-12-45. The connection shown would be for the "CC Front" section.

Note that Euro-bloc connector pin #4 is +24 VDC. The pin #4 terminals on all of the Euro-block connectors provide the same, common, +24 VDC. The same is true for connector pin #4, which is ground. Pin #5 on all connectors provides a common ground.
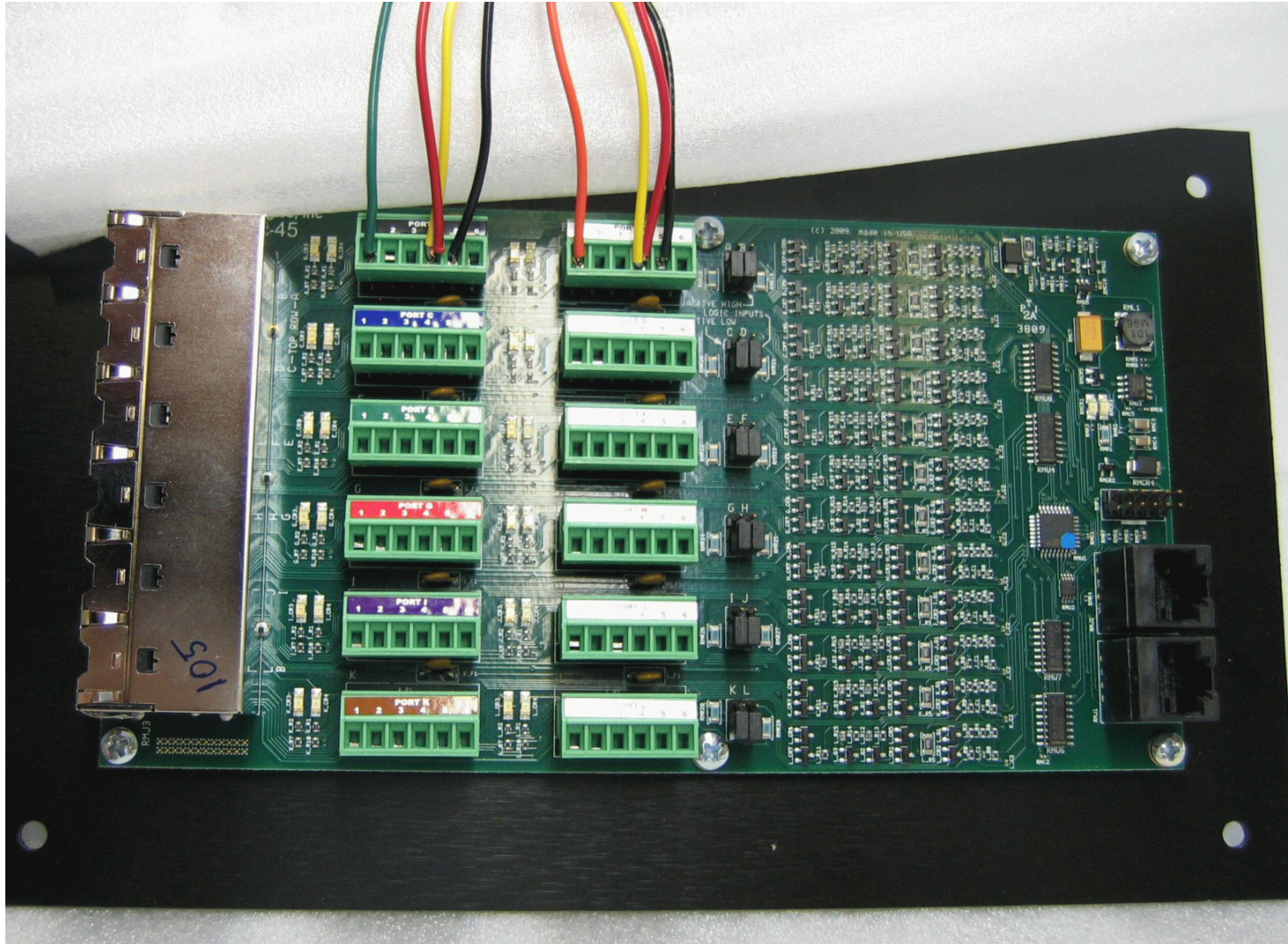
The new RMI-CC replaces the CC-884. Either one can be used with an iFlex 1280, but they are connected differently. How do you tell the difference? It's pretty easy.

CC-884
The CC-884 has the front panel label "CC-884", the PC board has resistors beside the RJ-45 connectors, and the labels "White"and "Blue" on the PC board to define the two Cat5e lines that are required for connection.
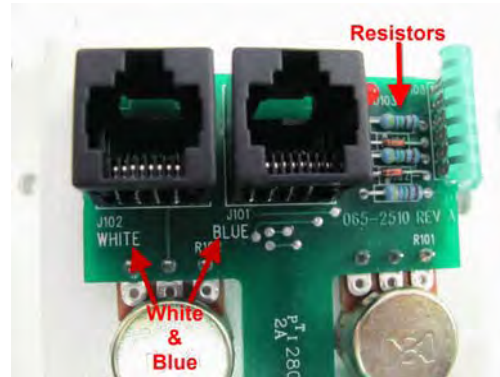

RMI-CC
The RMI-CC has the front panel label "RMI-CC", and there is an IC chip beside the RJ-45 connectors. There are there are orange dots on the chip and on the edge of an RJ-r5 connector, and the silk screened label identifies the RMI-CC.
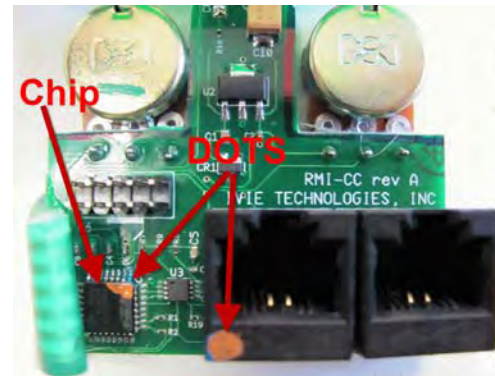

The new RMI-CC uses a single Cat5e cable to connect directly to the 1280 via one of the Logic I/O ports. It will appear in the Hardware Programmer as a separate item, rather than as a listing in the RMPC-12-45. (See p 23)

If a new RMI-CC is connected to one of the Logic I/O ports (in the case below, Port 4), it will appear in the hardware programmer.   The three CC mic controls are programmed in CC-1, CC-2, and CC-3. A fourth CC control is provided for in the software for future use only. (Note that the CC On/Off switch and light are a part of CC-1 and the Auto/Manul switch and light are a part of CC-2.)
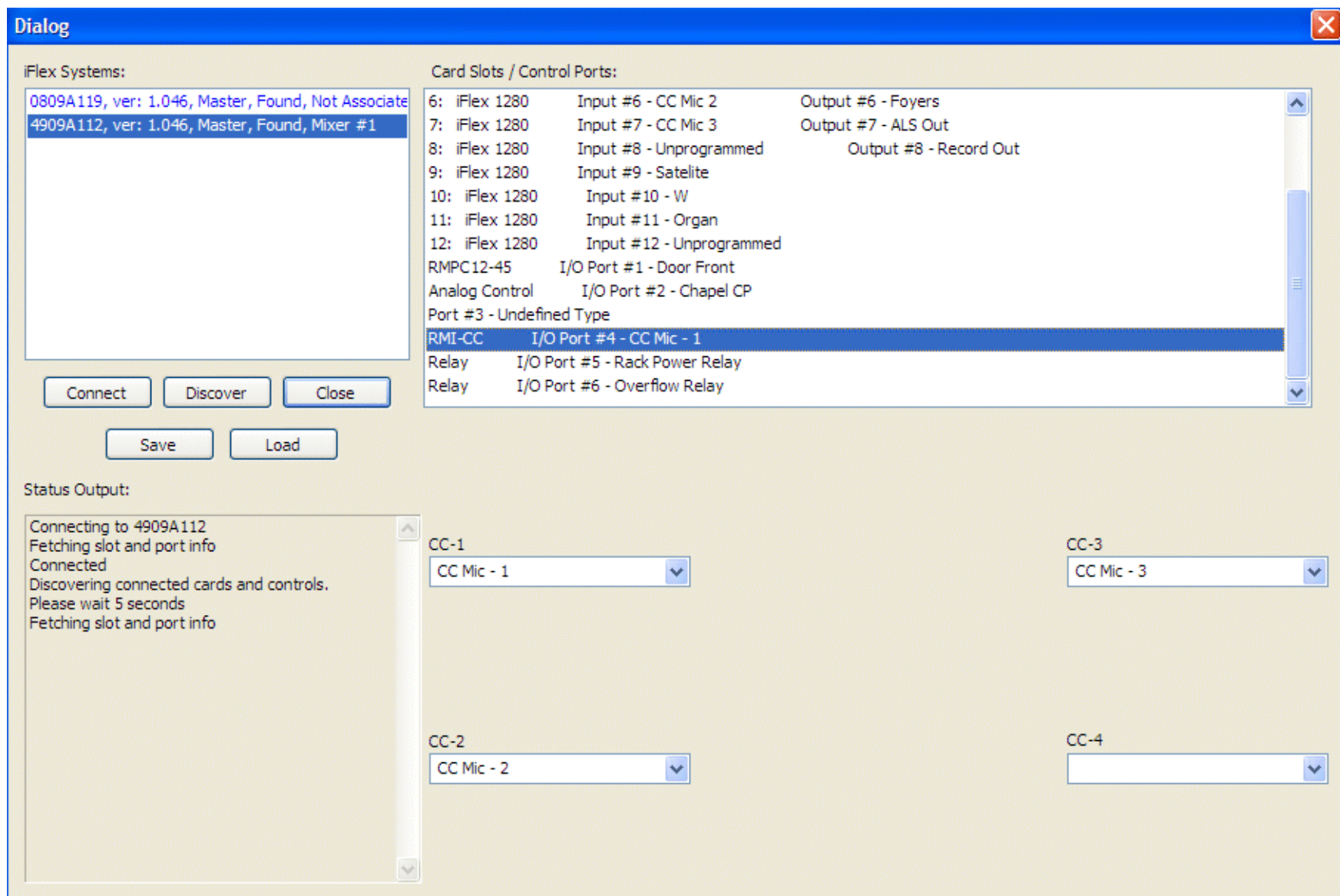
An older CC-884 control (used with 884's and 1026's) can be connected to an iFlex system. The newer control (RMI-CP) connects with a single Cat-5e cable, directly to one of the I/O ports on the 1280 mixer. However, the older CC-884 is not a SmartControl and therefore must be connected to the system via the RMPC-12-45. The graphic below shows how a CC-884 is connected to the RMPC-12-45. Ports G, H, and I are used for the CC-884 connection.
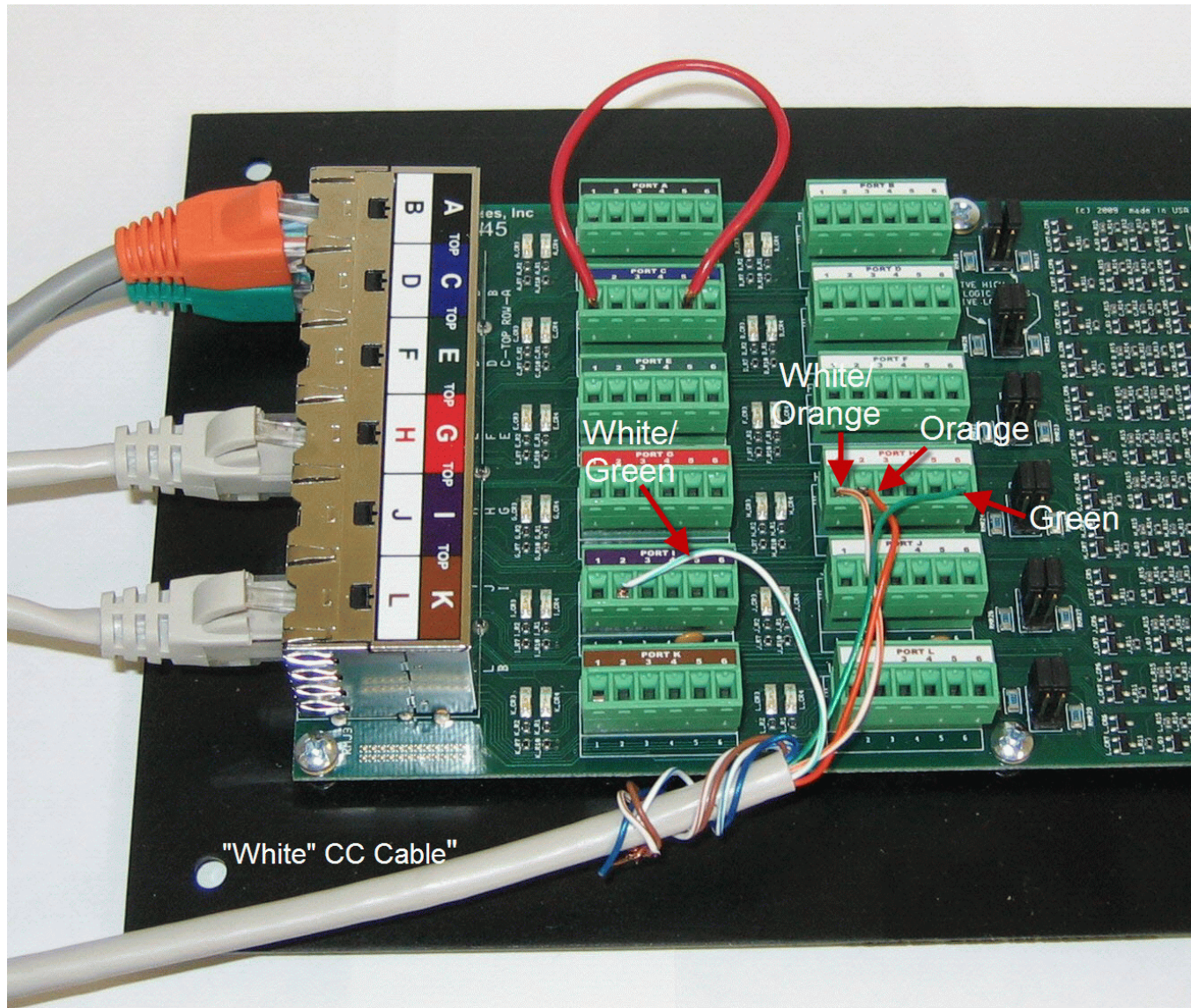
Note in the graphic above that the "Blue" Cat-5e from the CC-884 can be connected directly, via Cat-5e cable, to Port G. The "White" Cat-5e from the CC-884 must be split between two ports, and therefore must be connected using the Euro-block connectors H, and I. See the hand-notated diagram below and note that only one conductor from the "White" Cat-5e (the white/green) is split out to Port "I". *Since the RJ-45's and the Euro-block ports are in parallel, you can connect the BLUE Cat-5e either directly to the Port G RJ-45, or discreetly to the Port G Euro-block.*
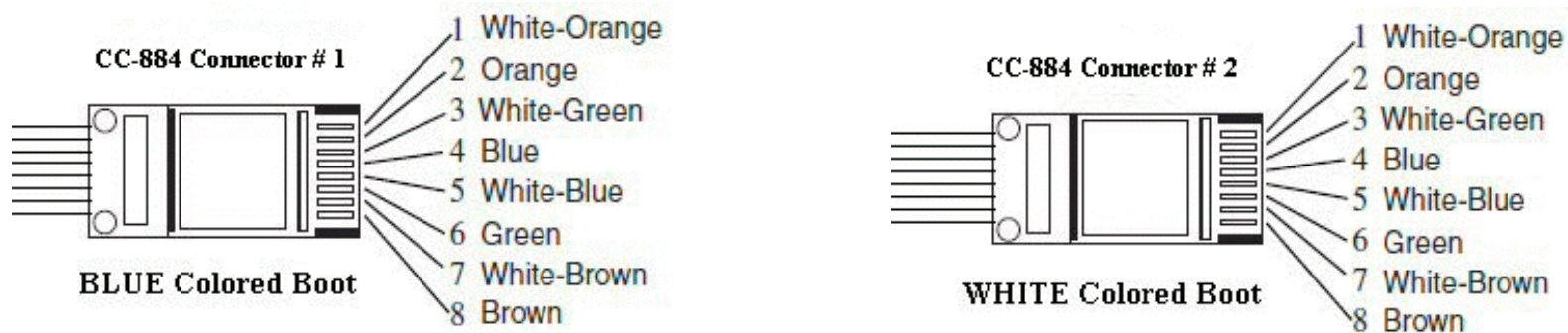

CC-884 Cat-5e / RJ-45 Conductor Color codes
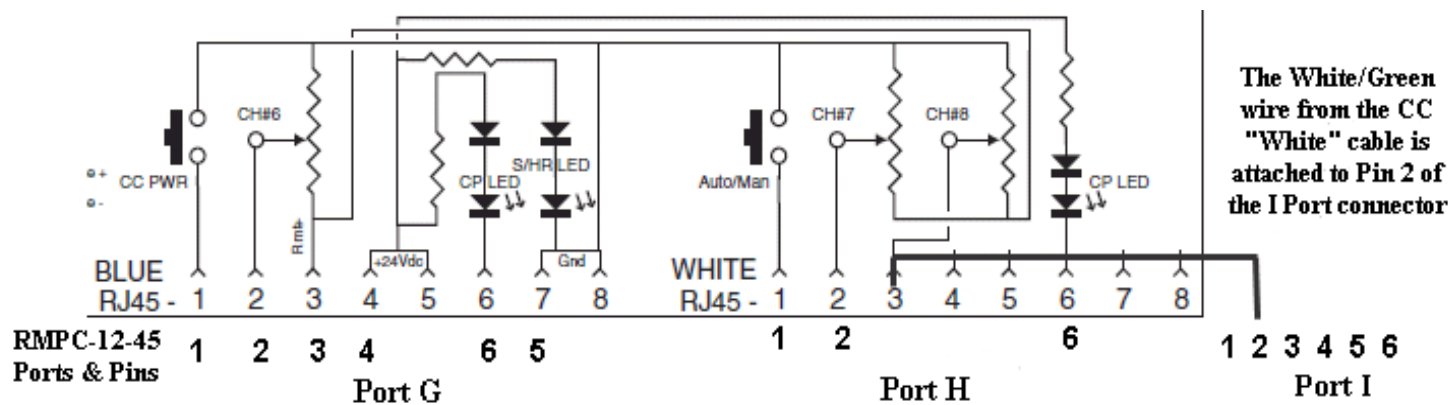
Connecting a CC-884 to the RMPC-12-45, these are the pin/port assigns.

For purposes of expediency, a standard 3-door Legacy plan may also be used for two door and one door plans. Though the Sonata layout graphic looks a little odd, it will work quite well if door jumpers are used, just as they can be used on existing 1026 installs where jumpers are used to tell the system logic that doors are always open.

The graphic below shows jumpers in place for the CC-Middle and CC-Rear doors on an RMPC-12-45. This example would be used if this were a 1-door building. Note that the jumpers go between Pin 1 and Pin 5 on the Euro-block connector. The same thing could be accomplished by jumpering Pin 1 to Pin 8 on the corresponding RJ-45. RMPC-12-45 Port B is the CC Middle zone and Port C is the CC Rear Zone.
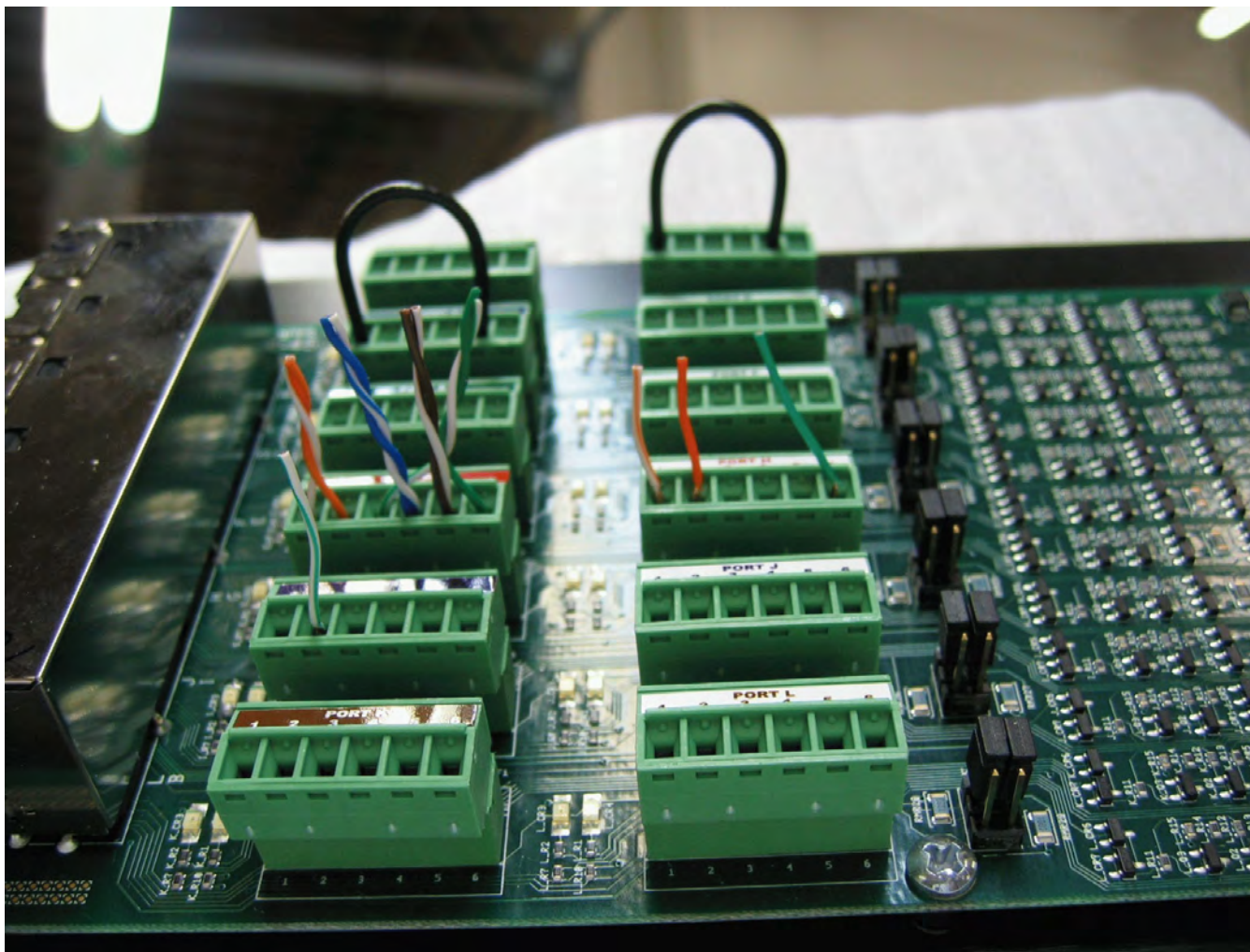
Can I create an LDS system WITHOUT using an RMPC-12-45?

Under many circumstances you can create an LDS system without using an RMPC-12-45.

The Port count - using the Logic I/O Ports
Remember that you have four Logic I/O ports on the 1280 mixer. If you have more than four sensors and controls to connect to the mixer, than you have to use an RMPC-12-45 or possibly an RMI-IRX.

You will always connect the RMI-CP bishop's Pedestal control and the RMI-CC directly to the Logic I/O ports on the 1280. That leaves two more ports. If, for example, you have a building with only two door partitions and no satellite system, you could use ports 3 and 4 to connect the RMI-IR3 door sensors directly to the 1280 mixer and thereby not need any type of port expander such as the RMPC-12-45 or the RMI-IRX.

If you have need for connecting more than 4 sensors and controls, there are two paths you can take to expand the number of ports for connection of controls.

THE RMI-IRX
The RMI-IRX is a port expander specifically designed for use with the RMI-IR3 infra red door sensors. It takes one Logic I/O port on the iFlex mixer and provides up to four connections for RMI-IR3 sensors. The RMI-IRX is specifically for use with RMI-IR3 door sensors.

When you use an RMI-IRX, the Sonata Hardware Programmer will identify it and the drop down boxes associated with it can then be used to assign the RMI-IR3 sensors, just as it is done on the RMPC-12-45.

As an example, using a 1280 in an LDS installation, you would connect the RMI-CP, the RMI-CC, and the RMI-CS directly to Logic I/O ports on the back of the 1280. You would then connect the RMI-IRX to the fourth Logic I/O port and connect the RMI-IR3s to it.

If you do not need to connect the older Red/Green switches (instead of door sensors) to the system, using an RMI-IRX can make the connections physically simpler (no jumpers to worry about) and considerably less expensive.

The RMPC-12-45
If you are doing a "head end replacement" or other retrofit to a building that is old enough to be using the "red/green" selector switches for room combining you will run out of ports just using the switches, and so need an RMPC-12-45.

There are some additional advantages to using the RMPC-12-45:

1. You can set each port to use a switch reference to ground or to 24 volts. This is essential when using the older "red/green" switches.

2. You will see LED's on the RMPC-12-45 that show switch state and switch action.

3. You can connect switches and controls to the RMPC-12-45 via either RJ-45 connectors or euro-block connectors.

RMI-IRX shown identified by the Sonata Hardware Programmer
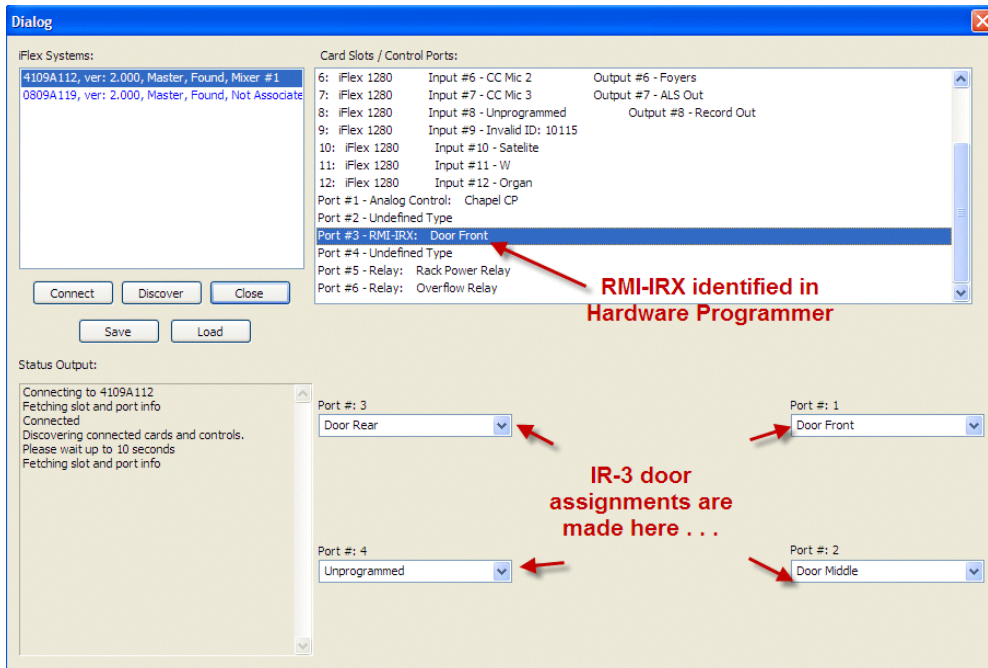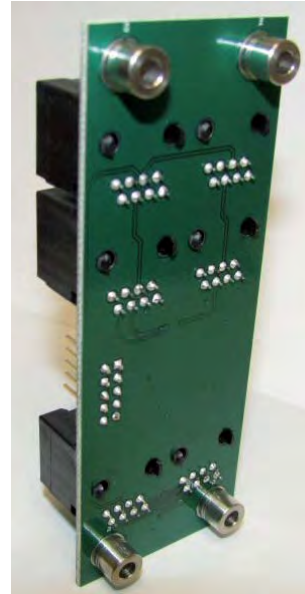
The iFlex IRX is an expander that provides for connection of multiple RMI-IR3 infra red door sensors to an iFlex mixer. Up to four (4) RMI-IR3 door sensors can be connected to a single IRX. The IRX is then connected via one Cat5e (or better) cable to a single Logic I/O port on an iFlex mixer.

By using one iFlex IRX many systems that may have required an RMPC-12-45 in order to connect the necessary remote sensors to an iFlex 1280 may now be able to use the iFlex IRX instead of the RMPC-12-45, thus realizing a significant savings.
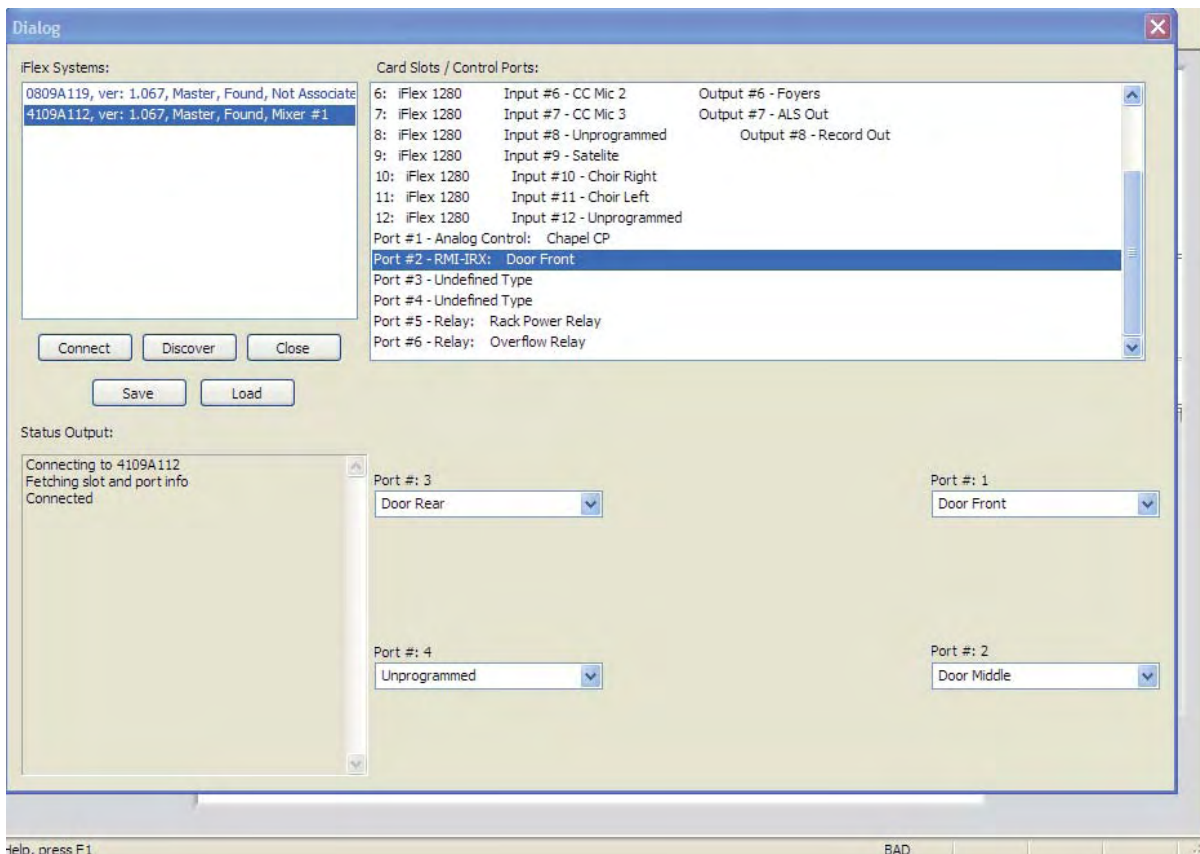
Typical Use: If you are using an iFlex 1280 mixer in a system with an RMI-CP control, and RMI-CS control, an RMI CC control, and also need to connect from two to four RMI-IR3 door sensors, you can now choose to use the iFlex IRX instead of an RMPC-12-45. Doing so will save considerable cost, and give you all the connectivity and flexibility that you need, and more.

The iFlex IRX comes four compression mounting stand offs (see photo above) for direct mounting to the rack back wall.. The IRX is for use only with RMI-IR3 door sensors.
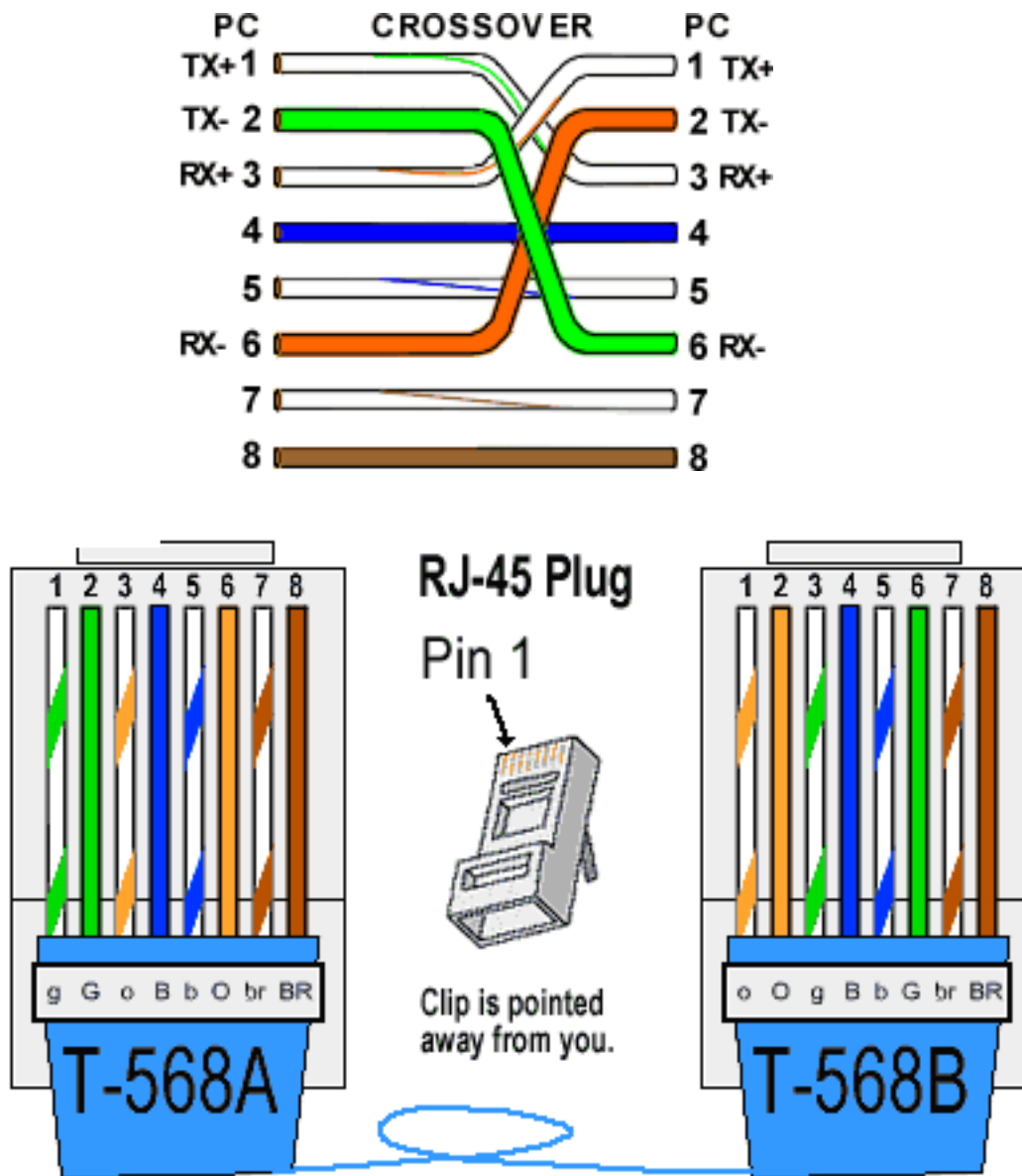
Instructions

The IRX functions much in the same way as the larger RMPC-12-45.

1. Either of the two RJ-45 connectors on the one end may be used to connect the IRX (via standard Cat5e or better cable) to one of the ports on an iFlex mixer.

2. RMI-IR3 infra red door sensors are connected to ports 1 – 4 on the IRX, as needed.

3. Connect your PC to the mixer, start the Sonata software, and using the Hardware Programmer do a "Discover". The IRX will appear, listed on one of the Logic I/O ports on the mixer.

4.   Select the IRX in the Hardware Programmer and four windows will appear that will allow you to assign doors in your current layout to the ports on the IRX.

Ethernet Crossover Cable

PC   CROSSOVER   PC

TX+ 1 — 1 TX+
TX- 2 — 2 TX-
RX+ 3 — 3 RX+
4 — 4
5 — 5
RX- 6 — 6 RX-
7 — 7
8 — 8

RJ-45 Plug

Pin 1

Clip is pointed
away from you.

1 2 3 4 5 6 7 8

g G o B b O br BR

T-568A

1 2 3 4 5 6 7 8

o O g B b G br BR

T-568B

A good way of remembering how to wire a Crossover Ethernet cable is to wire one end using the T-568A standard and the other end using the T-568B standard. Another way of remembering the color coding is to simply switch the Green set of wires in place with the Orange set of wires. Specifically, switch the solid Green (G) with the solid Orange, and switch the green/white with the orange/white.