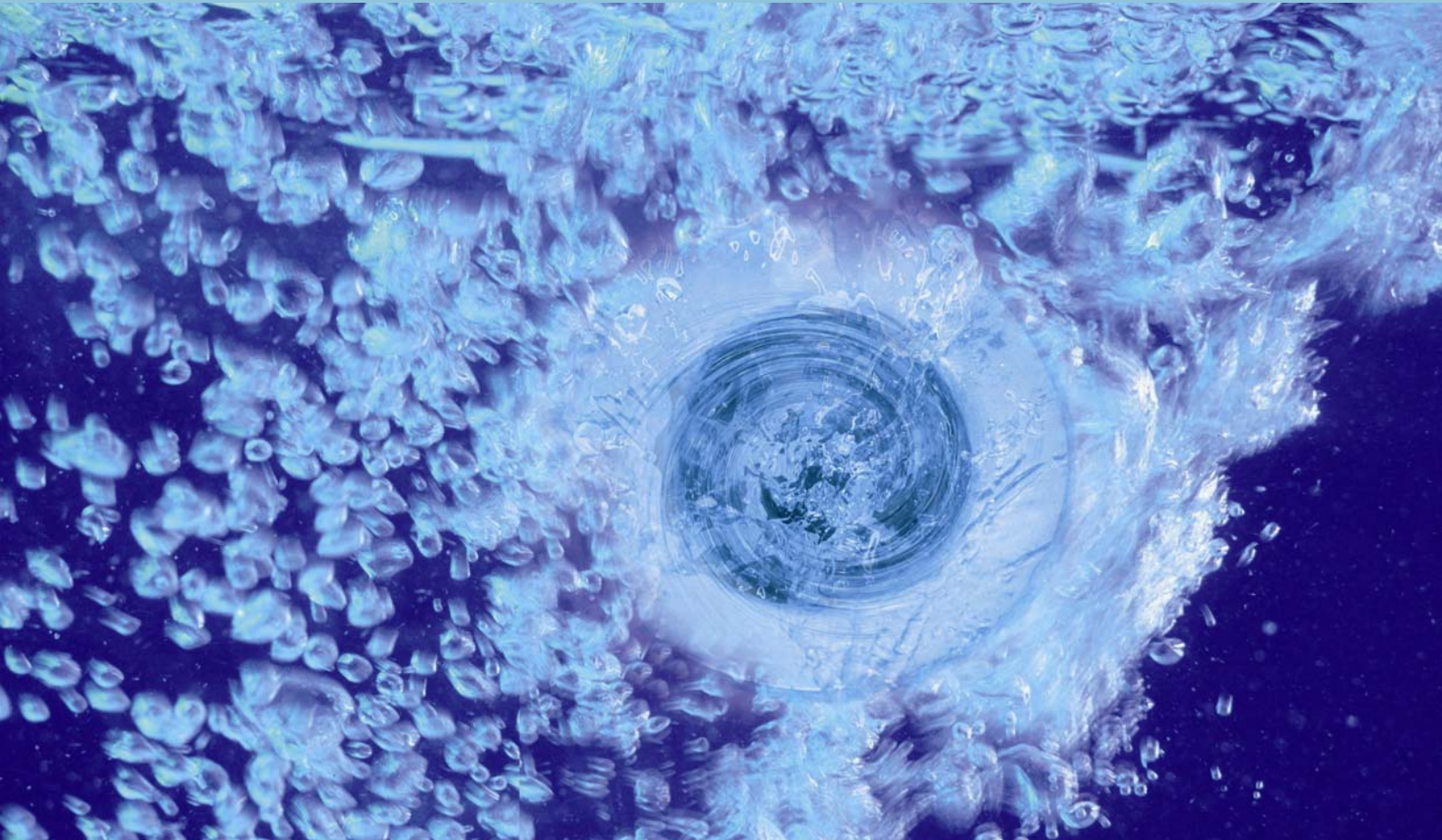




eyeheight



Hardware Installation Guide for Playout/Iris/Bug eyes control systems

user manual

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The scope of this guide

This guide covers the wiring of the I-Bus and D-Bus control networks and remote power in all eyeheight systems, in particular.

- Playout chassis
- Playout control panels
- Playout Application Suite (includes Logo management and Squeezeback)
- Playout Automation (AU-1)
- Playout router control (RT-9)
- Bug-eyes (BU-7) bug management system

The Iris system can be considered to be a small playout system for installation purposes.

This guide will explain how to put the control system in place. It does not deal with Video and Audio connections.

I Overview

Below is described the eyeheight I-Bus and the D-Bus. This information is relevant to any user putting together an eyeheight system. If care is not taken with the I-Bus wiring erratic operation can occur that frequently leads to the wrong conclusions being drawn making troubleshooting very difficult. It is best to get this right to start.

I.1 The I-Bus (Sometimes called the can-bus)

ALL eyeheight systems are linked together using a control network called the I-BUS. This is a hub-less 2-wire network. Every eyeheight item **MUST** be connected to this 2-wire network for them to communicate with each other. The I-Bus connection is on a 9-way D-Type connector, usually male.

I.1.1 I-Bus pin-out.

The I-bus pin-out is as follows:

Pin 1 and 5	Ground 0V
Pin 2	I-Bus-
Pin 7	I-Bus+

Table 1 Basic I-Bus pin-out on a 9-way D-type connector.

I.1.2 What cable do I use?

The very best cable to use is the same cable you would use for cabling AES-2 digital audio (digital audio twisted pair). We find that this makes a very robust network, which will work reliably at distances up to 250meters. You can use a CAT-5E pair but this will only work up to 50meters. The Shield for the pair should be connected to ground.

I.1.3 Must I terminate the network?

The answer to this is **YES** the network **MUST** be terminated for reliable operation. Both ends of your cable must be terminated each with a 100ohm resistor.

I.1.4 How do I cable I-bus items together?

The best way is to loop a single cable from the first item to the next and so on until the last item is cabled. This results in a single run with no "spurs" meaning the two ends of the cable are clearly identifiable as the place to put the termination resistors. Avoid "Star" type of cabling.

I.1.5 What are the other pins on the 9 way D-type for?

The other pins are for remote power. The pin-out is given below

Pin 1,5	Ground 0V
Pin 4,9	Remote Power (+13V 1 Amp)

Table 2 - Power pins on the I-bus connector.

Eyeheight chassis will all **SUPPLY** power. All other items require power to operate. These will be dealt with as we go along.

I.2 The D-Bus

The D-BUS is a data link. It is **ONLY** used to connect eyeheight Logo Inserters (BA-2, BB-2 and LK-2) to the BU-7 Bug management system for faster logo file downloads. **IF YOU HAVE NO BU-7 YOU DO NOT NEED TO CONNECT THE D-BUS.** You will find a connector labelled D-Bus on the rear of the eyeheight chassis. (FB-9, MX-9)

The D-bus pin-out is as follows:

Pin 1 and 5	Ground 0V
Pin 2	D-Bus-
Pin 7	D-Bus+

Table 3 Basic D-Bus pin-out on a 9-way D-type connector.

I.2.1 What cable do I use?

The only cable to use is the same cable you would use for cabling AES-2 digital audio. The D-bus will work reliably at distances up to 50 meters. **Do not use any other types of cable**, CAT-5 will not work.

I.2.2 Must I terminate the network?

The answer to this is **YES** the network **MUST** be terminated for it to operate. Both ends of your cable must be terminated each with a 100ohm resistor. Without terminations the D-Bus will probably **NOT** work

I.2.3 How do I cable D-bus items together?

You must loop a single cable from the first item to the next and so on until the last item is cabled. This results in a single run with no "spurs" meaning the two ends of the cable are clearly identifiable as the place to put the termination resistors. Avoid "Star" type of cabling.

I.2.4 What are the other pins on the 9 way D-type for?

The other pins are for remote power. The pin-out is given below

Pin 1,5	Ground 0V
Pin 4	Remote Power (+13V 1 Amp)
Pin 9	Remote Power (+13V 1 Amp)

Table 4 - Power pins on the I-bus connector.

Eyeheight chassis will all **SUPPLY** power. All other items require power to operate. These will be dealt with as we go along.

I.3 Dongles.

A dongle is a small converter product provided by eyeheight as a solution to communicating to the I-bus and D-bus. The Dongle is designed to connect directly to a PC COM port or a compatible connection. (RS232C, 9W). It is necessary to use one wherever there is an “outside” communication, for example to an automation system.



Figure 1-1 A Dongle

The Dongle is re-programmable and also often provides protocol conversion as well. They will arrive with many eyeheight products. These units are re-programmable. When they come from the factory they will be programmed and tested for the purpose they are used. You should generally find the following labelling on them.

Table 5 Dongle labelling.

Sales Code	Purpose	Labelling on Dongle
CF-9	Playout application suite	I-Bus - DG-9 - RS232
GV-9	M2100 Protocol emulation	I-Bus - GV-9 – RS232
RT-9	Third Party Router control	I-Bus – Router – RS232
AU-9	Eyeheight PresTX Automation Protocol.	I-Bus – Playout – RS232 OR I-Bus – PresTX – RS232
IB-9	High Speed BU-7 bug management system (bug-eyes), I-Bus dongle	I-Bus – Bug Eyes – RS232
DB-9	High Speed BU-7 bug management system (bug-eyes), D-Bus dongle	D-Bus – Bug Eyes – RS232

Because the dongle is re-programmable it is possible that the label can be “out of date” if a user has re-programmed it without re-labelling it. Please be aware of this possibility.

Do not discard the dongles. They are easily lost but they are essential.

2 Wiring examples.

The user must consider separately:

1. The I-Bus wiring.
2. The D-Bus wiring.
3. The Remote Power wiring.

2.1 Planning.

Treat each of the above separately. The best way to show how to do this is to plan here a complex playout system with all the options on it. That way it is easy for the systems engineer to take parts of this example as relevant to your particular system.

Please note that the diagrams below refer to the same connectors in each separate diagram. For example the D-type for the Router (RT-9) shown in the power diagram AND the I-bus diagram are the SAME connector.

Please note that in the diagrams below, some D-types are male and some are female. However each D-type outline is shown the same and labelled as either "front view" or "rear view". Pin 1 is always labelled.

2.2 Example of a complex playout system.

This is an example of a multi-channel playout system with panel sharing. The system consists of:

- Two playout channels.
- Two control panels, different types, one in a TB-12 and one made of separate modules).
- Automation interfaces on both channels.
- Playout application suite.
- BU-7 bug management system.
- Third party Router interface.

Three separate diagrams are shown. The I-Bus and Power diagrams refer to the same physical connectors and are shown separately for clarity. Both sets of wiring are necessary for a working system. These are described below.

2.2.1 The I-Bus wiring diagram

The I-Bus diagram shows the I-bus control network wiring. The I-bus loops around all chassis and all panel modules. It also loops around to all dongles other than the D-Bus dongle on COM 4 of the BU-7 interface.

2.2.2 The Power wiring diagram

All dongles and separate panels require to be supplied with power from one chassis. It is up to the system integrator to choose which chassis supplies the power to items that need it. The main considerations are|:

1. Provide power from a logical source. For example provide power for the dongle connected to channel 1's automation system from a channel 1 chassis not from a channel 2 chassis. This provides independence for each channel.
2. Do not exceed the power supply current of a chassis. The rule of thumb is only power one complete control panel set from one chassis. You can power as many dongles as you like also, because the power drain of these is insignificant.
3. The control panel in the TB-12 tub has its own power supply and so does not require power from a chassis. For multi channel systems this is recommended because this provides power independence.
4. The user can provide a PSU instead of using the chassis power connections to supply power. We recommend that a +12V DC 1 amp supply will supply power to one complete control panel set.
5. On the I-bus connector on each chassis it is best to link pins 1,5 together (ground) and pins 4,9 (+13V) this then shares the current load correctly within the chassis.
6. NEVER CONNECT POWER CONNECTIONS FROM ONE CHASSIS TO ANOTHER. This may cause high currents to flow from one chassis to another as both chassis try to supply each other with current.

2.2.3 The D-Bus wiring diagram

The D-Bus diagram shows the D-bus data link for downloading logos (bugs) into the BA-2/BB-2 and LK-2 logo inserters. The D-bus loops around all chassis that contain these modules. It is not necessary to connect the D-Bus to chassis that do not contain logo inserters. This diagram also shows the power connection to the D-bus dongle on COM 4 of the BU-7.

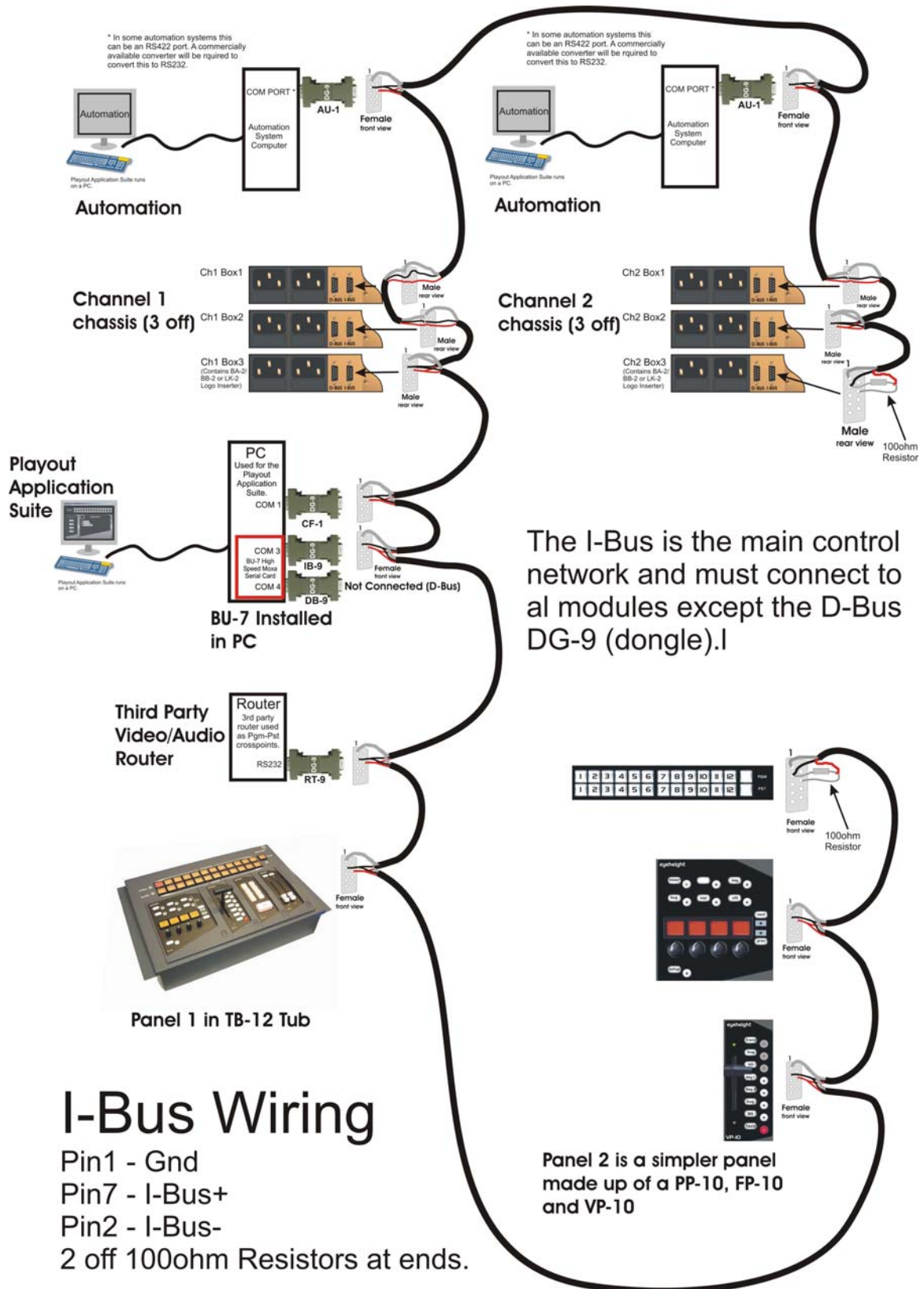
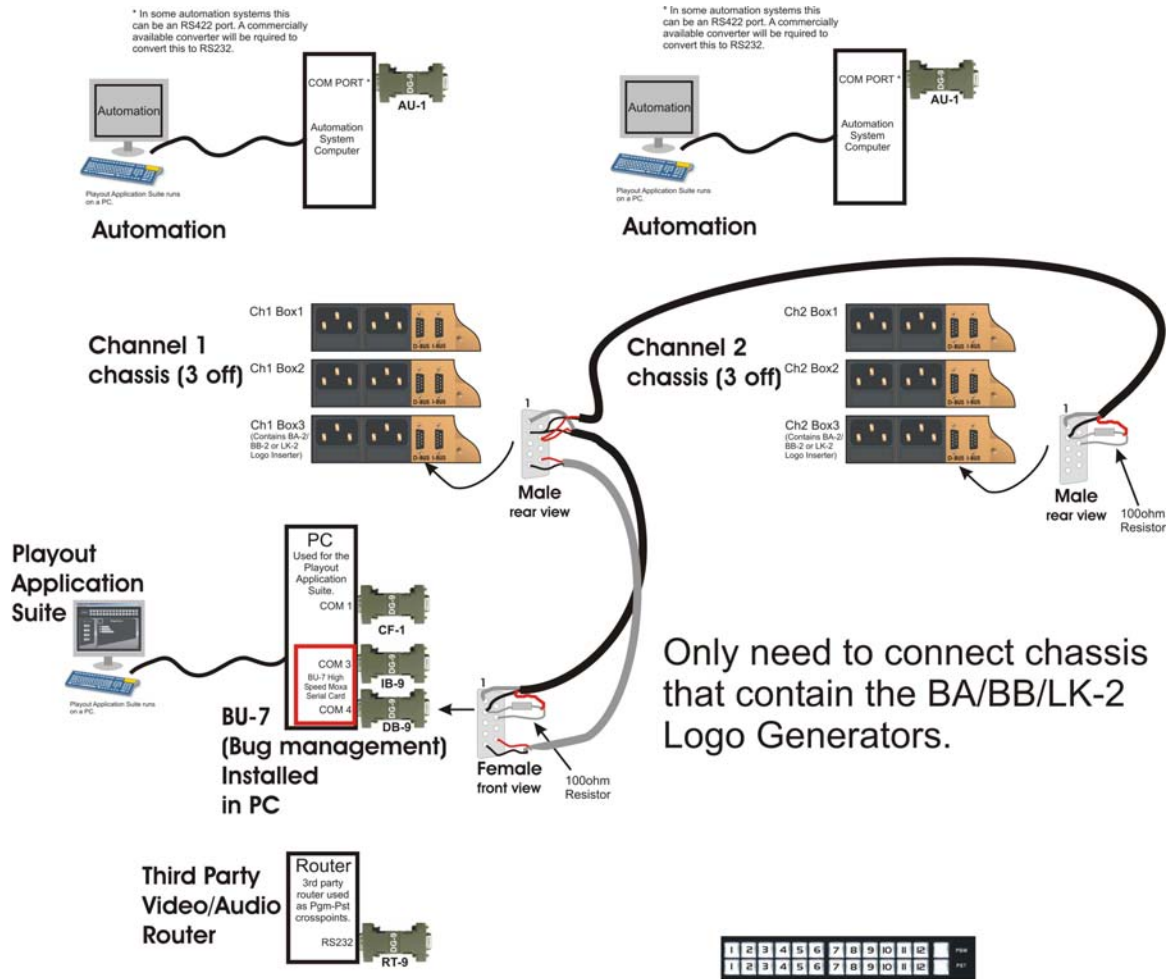


Figure 2-1 Complex multi-channel playout, I-Bus wiring.



Panel 1 in TB-12 Tub

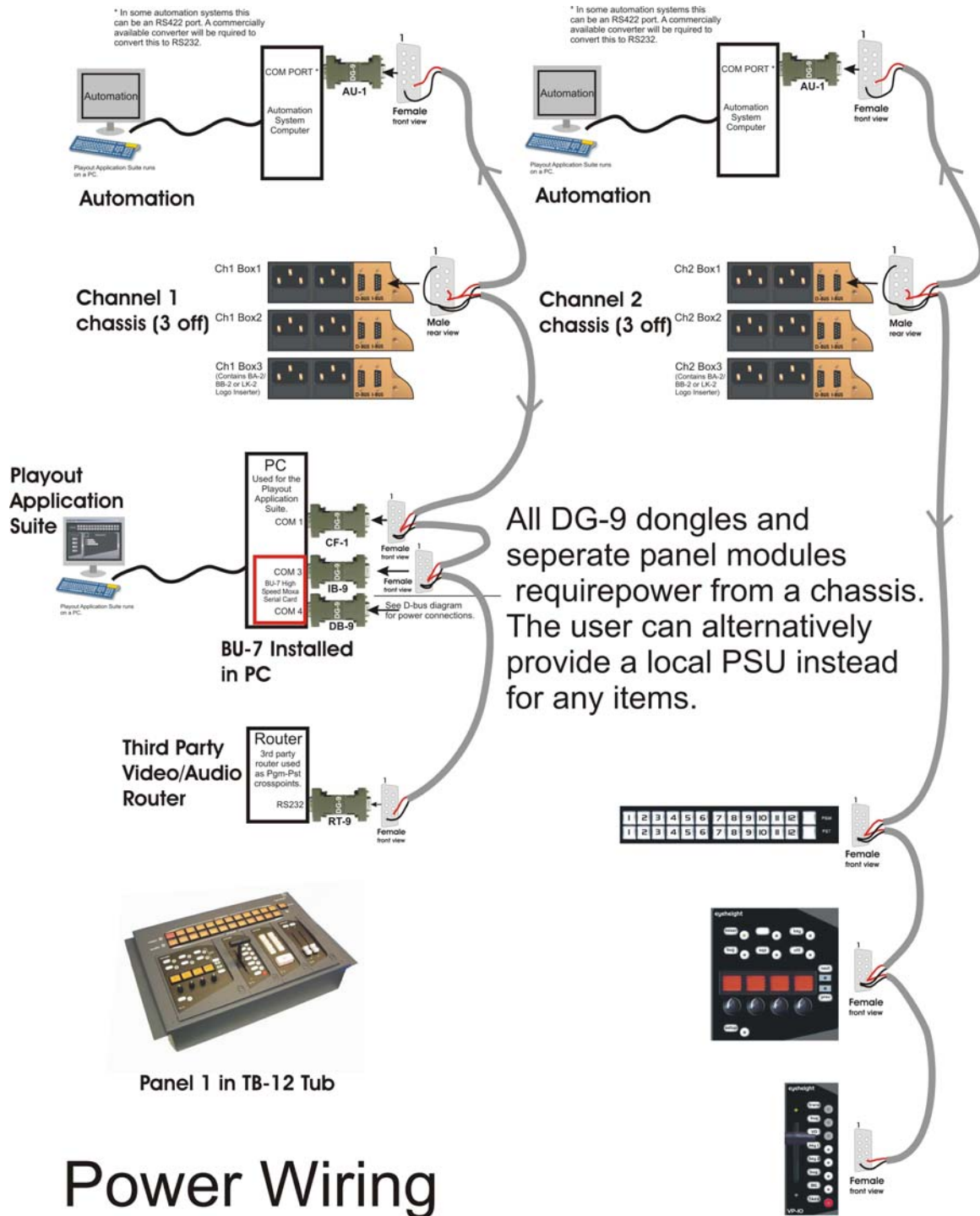


D-Bus Wiring

(Including power for D-Bus dongle)
 Pin1 - Gnd
 Pin7 - D-Bus+
 Pin2 - D-Bus-
 2 off 100ohm Resistors at ends.

Panel 2 is a simpler panel made up of a PP-10, FP-10 and VP-10

Figure 2-2 Complex multi-channel playout, D-Bus wiring.



Power Wiring

Pins 1,5 - Gnd

Pins 4,9 - +13V

Power cable, 1 amp rated min

CAT-5 is usually suitable. Max voltage drop approx 6 Volts.

Figure 2-3 Complex multi-channel playout, Power wiring.

2.3 Example of a BU-7 Bug management system.

This example shows the wiring of a BU-7 bug management system. Please read sections 2.2.1, 2.2.2 and 2.2.3 as these apply for the bug management diagram also. In this diagram we show all the wiring rather than split it into I-Bus, D-Bus and power.

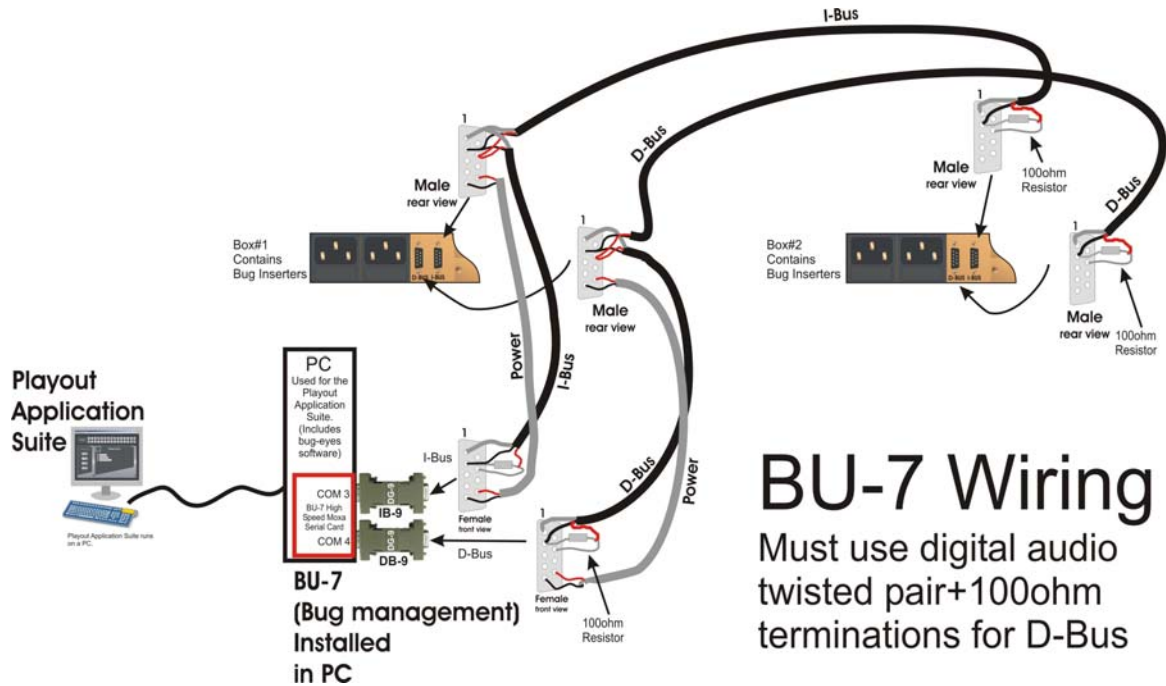


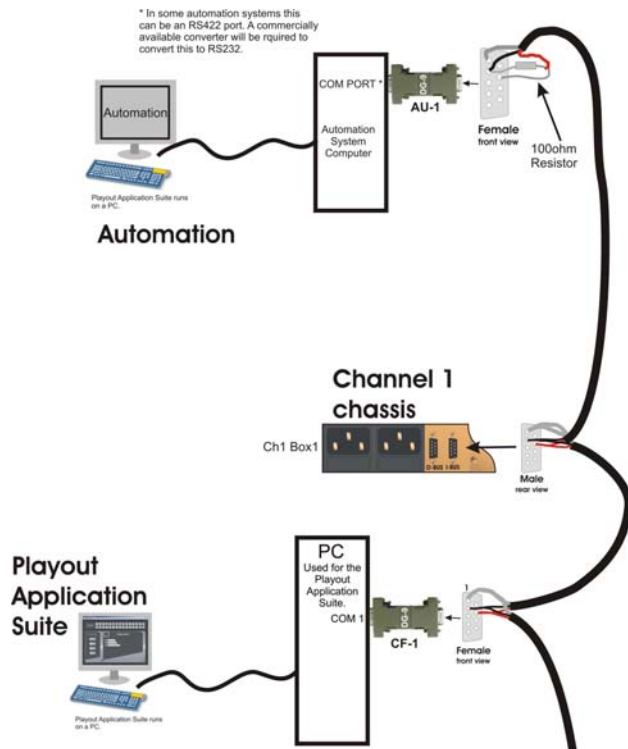
Figure 0-1 BU-7 Wiring diagram.

2.4 Example of a typical single channel playout.

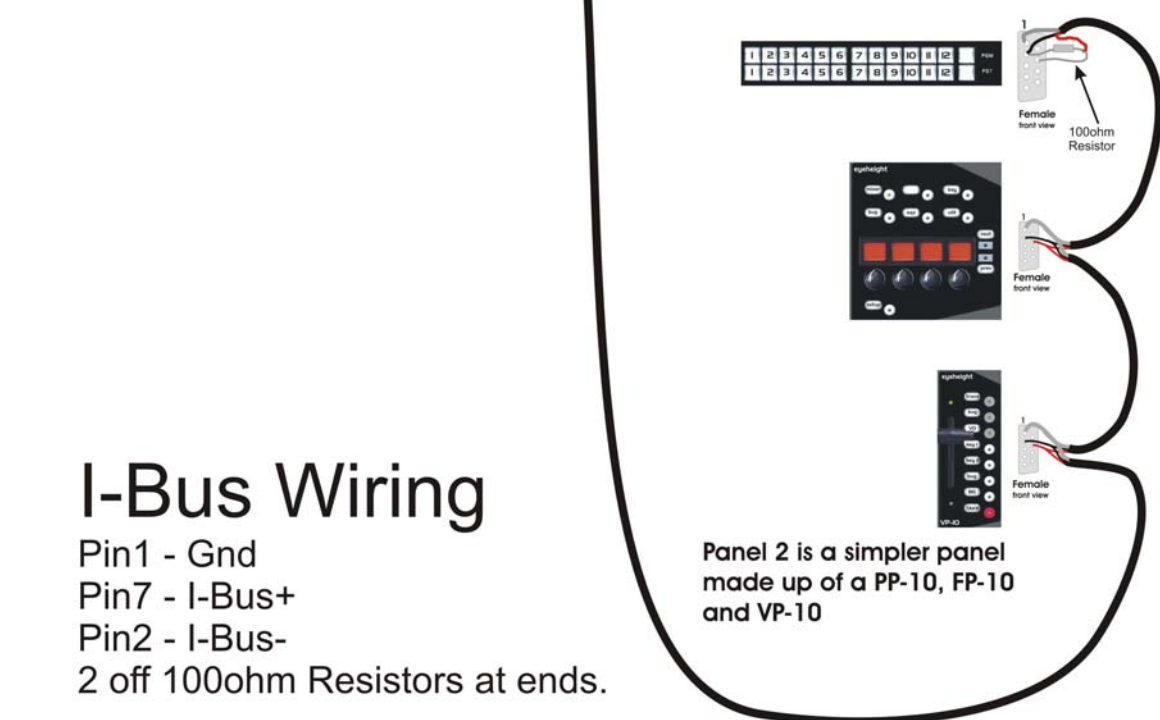
This is an example of a single channel playout system with an emergency panel (Not a full TB-12). The system consists of:

- One playout channel in one chassis.
- One control panel consisting of some separate modules
- Automation interface.
- Playout application suite.

This example shows how you can take the example in section 2.2 for a complex playout and reduce it to a simple playout. Please read sections 2.2.1, 2.2.2 and 2.2.3 as these apply for the single channel playout diagram also. Diagrams are shown below. There is no D-Bus because there is no bug management.



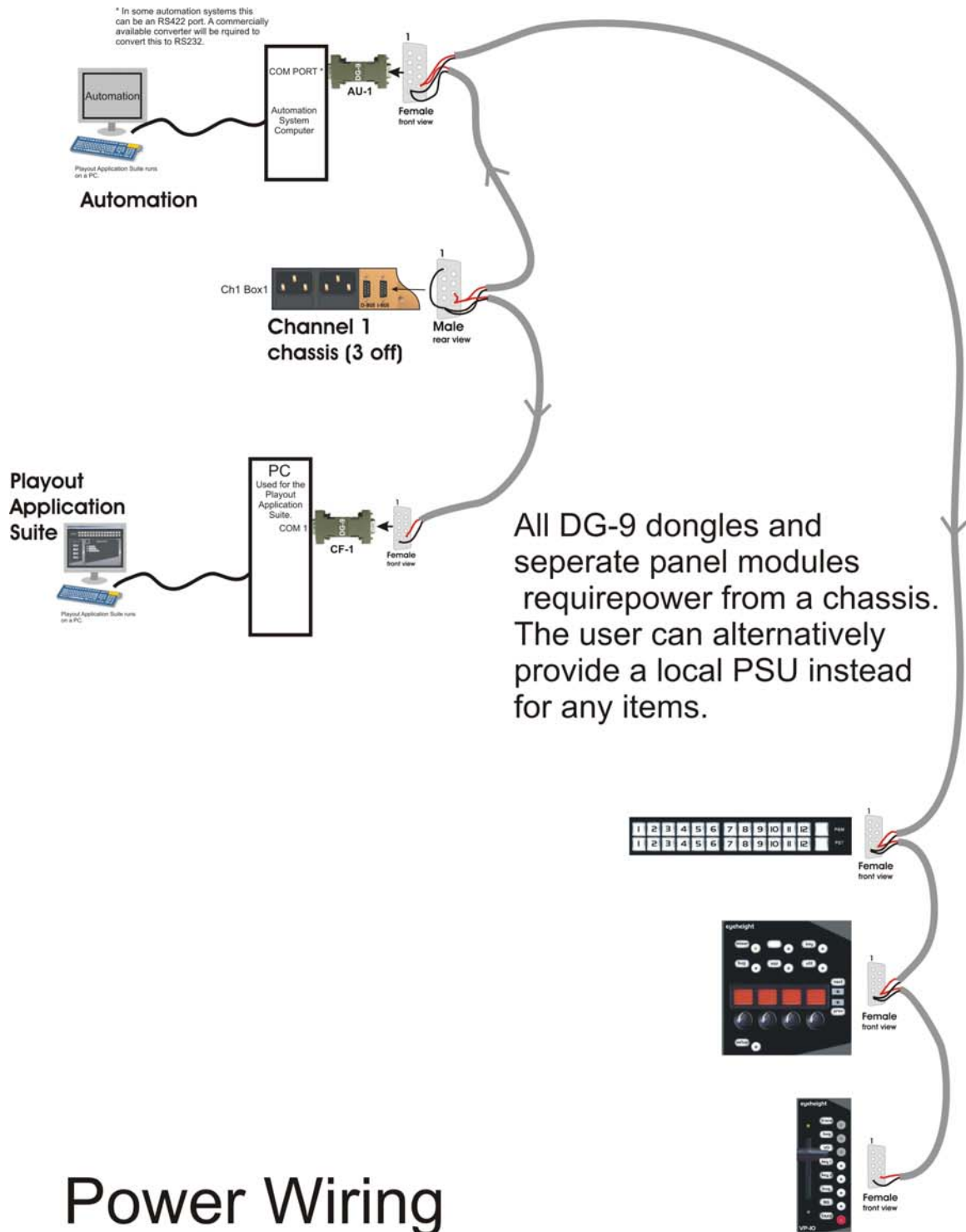
The I-Bus is the main control network and must connect to all modules.



I-Bus Wiring

- Pin1 - Gnd
- Pin7 - I-Bus+
- Pin2 - I-Bus-
- 2 off 100ohm Resistors at ends.

Figure 0-2 Single channel payout. I-Bus wiring.



Power Wiring

Pins 1,5 - Gnd

Pins 4,9 - +13V

Power cable, 1 amp rated min

CAT-5 is usually suitable. Max voltage drop approx 6 Volts.

Panel 1 is a simple emergency panel made up of a PP-10, FP-10 and VP-10

Figure 0-3 Single channel playout. Power wiring.

3 Troubleshooting

Playout and Bug management systems can be quite complex due to the nature of the system. This is some guide to what to do if it doesn't work.

3.1 The Panel does not light up.

In the case of a panel in a TB-12, then simply there is no mains voltage provided! Check the IEC inlet.

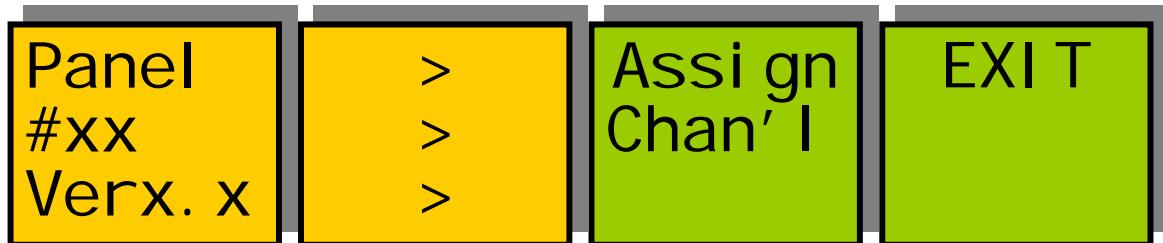
Otherwise where the chassis provides the power, in the corner of each panel module there is a green power LED. If this is not lit then either:

- The power wiring is incorrect. Check it!
- The Fuse has blown in the chassis providing the power. In this case the internal fuse on the FB-9 chassis motherboard requires changing. If this is the case please contact Eyeheight Ltd.

3.2 The Panel does not operate the mixer.

In this case check the following:

If the panel lights up and the LEDs in the LCD display have the words,



then follow section 2.15 (Multi channel operation) on the Playout 2 user guide provided with your system and assign a channel to this panel. If you cannot assign a channel because the channel that is connected to your panel does not appear to exist then you must check your I-Bus wiring and check that mains power has been applied to all the chassis of the channel.

3.3 Playout Automation Suite (PAS) is not communicating with the playout system.

- Check that the CF-1 dongle is getting power. When power is applied to a dongle, the LEDs on the dongle will flash momentarily. If this does not happen check the power wiring.

- When the PAS application sends a command (For example while doing a Health check) ensure that the LED next to the computer system's connector (COM port) flashes. If it does not check that the correct COM port is selected in the "options" menu. (Button at the top right of the PAS screen)
- If the above is OK, then check that when the PAS sends a command, the LED next to the I-Bus side also flashes. If it does not then you may be using a dongle programmed for another purpose. (If you have received more than 1 dongle they will be labelled as per Table 5 above. (Dongle labelling table)

3.4 Automation is not working.

- Check that the AU-1 dongle is getting power. When power is applied to a dongle, the LEDs on the dongle will flash momentarily. If this does not happen check the power wiring.
- When the automation system sends a command check that the LED next to the automation system's connector (RS232, COM port) flashes. If it does not either the system is NOT sending a command to the correct COM port OR the baud rate set-up is wrong.
- If the above is OK, then check that when the automation system sends a command, the LED next to the I-Bus side also flashes. If it does not then the automation system is sending the wrong protocol OR the dongle is not correctly configured. If this is the case please contact Eyeheight Ltd.

3.5 Bug management system BU-7 (bug-eyes) is not downloading bugs.

- Ensure that the D-Bus cable is digital audio twisted pair 110 ohm and of good quality. It must not be any other kind of cable. Ensure that the cable run is less than 50 meters and that there are 100 ohm terminations at each end. The system will probably NOT work unless all the above criteria are satisfied. SEE SECTION 1.2. Ensure that the wiring is correct.
- Check the I-bus wiring is correct. Although not as critical as the D-Bus please read section 1.1 for guidelines.
- Check that the BU-7 high-speed serial interface card (Moxa) is installed correctly in the PC.
- Check that the Moxa PORT 1 is connected to the I-Bus dongle and that the Moxa PORT 2 is connected to the D-Bus dongle. (RS232 ends!).

- Check that both dongles are getting power. When power is applied to a dongle, the LEDs on the dongle will flash momentarily. If this does not happen check the power wiring.

- When the bug-eyes software starts to download a bug, you should see:
 - The I-Bus dongle: both LEDs flash ONCE on both the I-Bus and D-Bus sides of the dongle.
 - The D-Bus dongle: both LED's should then stay on most of the time as the bug is downloading.

If not, check that the COM port settings are correct on the bug-eyes software.