



eyeheight



# pc hardware control protocol

software notes

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# I System Overview

This manual describes how to connect a PC and control the hardware via an RS232 connection.

## I.I PC Hardware Control Protocol software notes

This manual describes how to:

- Connect the PC and boxes together.
- Set up the DG-9 'Dongle'.
- Set up the PC's COM port.
- Ascertain the Box Number.
- Ascertain the Slot Number.
- Calculate the NID.
- Control the Menus, Variables and Values.

# 2 Installation

## 2.1 Cabling the PC, Dongle and Boxes

The PC communicates with the boxes through an Eyeheight DG-9 'Dongle' connected to a COM port on the PC and to the I-BUS port on the first box.

N.B. For a single chassis system connect the chassis and PC using a straight through pin-to-pin cable.

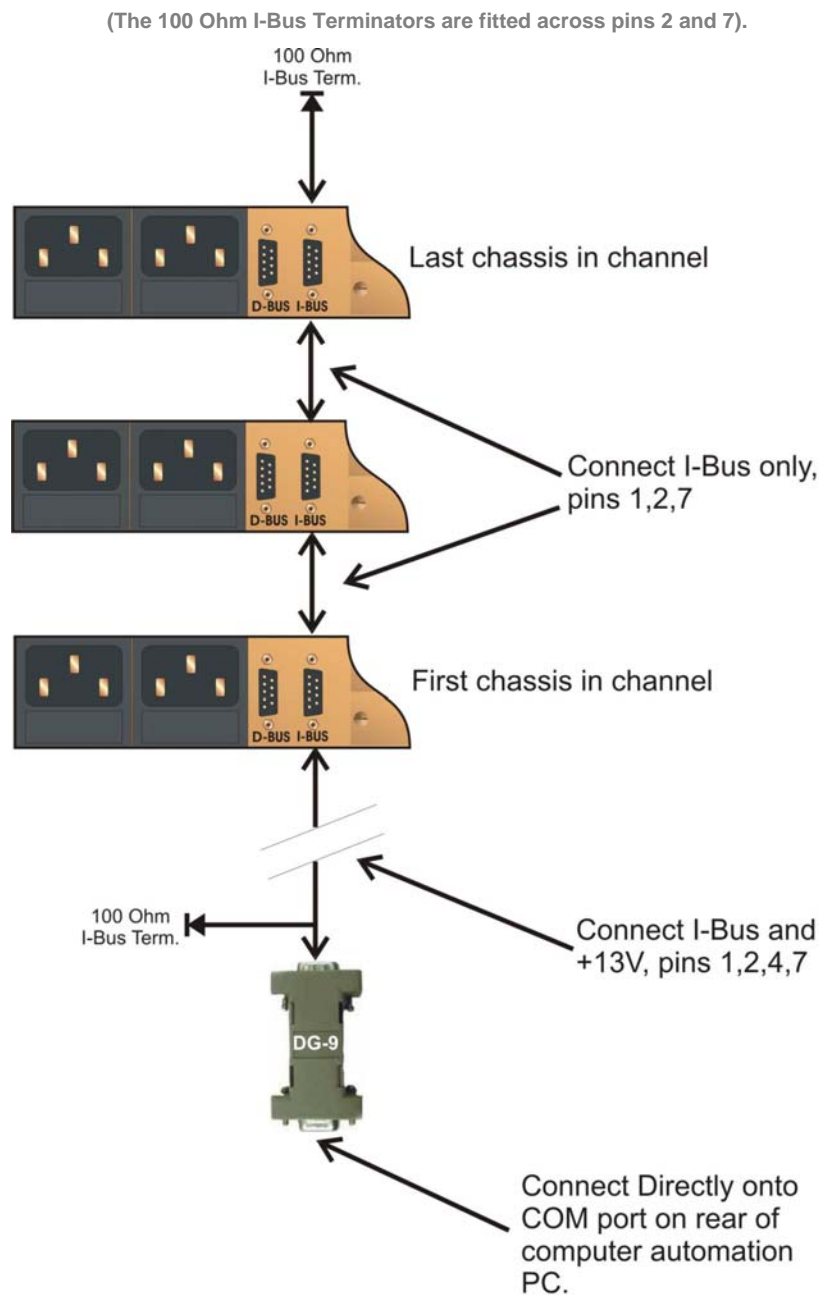


Figure 1 - Cabling the PC, DG-9 and Boxes

## 2.2 Setting Up The DG-9

To Set the DG-9 ready to communicate with the PC and the box's I-BUS:

- Disconnect the DG-9 from the PC COM port.
- Short pins 7 and 8 on the RS232 side of the DG-9.



Figure 2 - Resetting The DG-9

- Connect the DG-9 to the I-BUS port on a chassis. The LEDs on the DG-9 will flash and then both LEDs will remain red.
- Remove the short from pins 7 and 8.
- Disconnect the DG-9 from the I-BUS port on the chassis.
- Re-connect the DG-9 to the I-BUS port on the chassis. Both LEDs on the DG-9 should flash Red and Green and then go out.

***For more in depth programming of the dongle use the “DongleSetup” program which can be downloaded from [www.eyeheight.com](http://www.eyeheight.com)***

## 2.3 Setting up the PC's COM port

The COM port on the PC will have to be set to the default state of the Dongle:

- Baud Rate 38400
- Parity No Parity
- Data Bits 8
- Stop Bits 1
- Flow Control None

# 3 Software control information

## 3.1 Ascertaining the box number

Each chassis in a system must be given a unique Box Number. This Box Number is configured on a DIPswitch on the Flexi-box motherboard. To access the switch The user must remove the top lid of the flexiBox by removing the 14 off M2.5 screws on top of the lid. The location of the switch is then shown below. **Ensure the box is disconnected from any mains supply before removing the lid.**

N.B. A single chassis system will be factory preset to Box Number 1

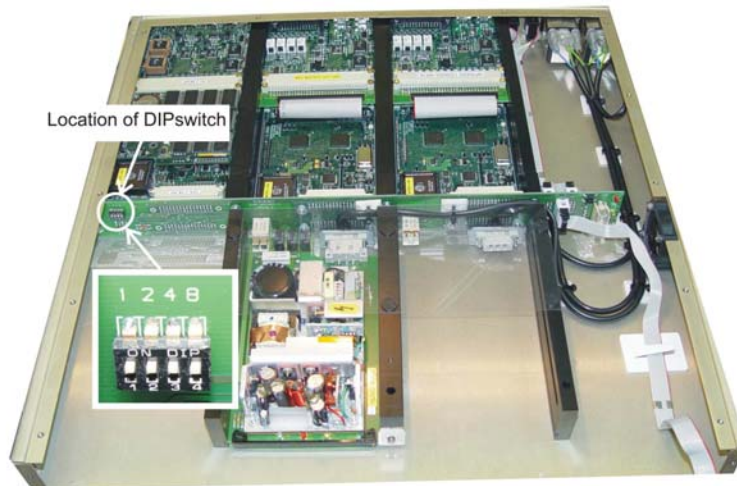


Figure 3 - Open Flexi Box showing Chassis Number DIP Switches

The chassis/box number is calculated by adding 1 to the binary value of the DIPswitches that are in the ON position. Please note that the switch is ON if it is DOWN and OFF if it is UP.

If all switches are in the UP position the box number is:

$$1 + (0 + 0 + 0 + 0) = 1$$

If all switches except Switch 1 and Switch 8 are up the box number is:

$$1 + (1 + 0 + 0 + 8) = 10$$

## 3.2 Ascertaining the Slot Number of the Module

The Slot Number can be calculated by viewing the box from the rear as shown below:



Figure 4 - Rear view of Chassis showing Slot Numbering.

### 3.3 Calculating the NID

The Network ID (NID) of a card is calculated as follows:

$((\text{Box Number} - 1) * 0x0C) + ((\text{Slot Number} - 1) * 2)$  ∴ Box 1 Slot 1 = NID of 0  
 whereas Box 2 Slot 3 = NID of 0x10

### 3.4 Controlling the Menus, Variables and Values

Transmitting a value to a variable on the relevant menu, using the following protocols, can simulate the operation of the front panel:

To write to a variable send:

Sender, NID, Len, 'A', 'A', Menu, Hi Byte, Lo Byte, Variable, Checksum

To read a variable send:

Sender, NID, Len, 'A', 'A', Menu + 0x80, 0x00, 0x00, Variable, Checksum

**Sender** can be anything but to avoid accidental NID clashes always use 0xCF.

**NID** is the NID of the board to be communicated with, calculated as shown on the previous page.

**Len** is the length of the command and will be 0x06.

**'A','A'** is the protocol identifier so will be 0x41, 0x41. (It means **Automation Adjust**).

**Menu** is the menu number of the menu on the front panel that is to be set and is obtained from the 'Operational Menu' pages in the user manual for the relevant hardware, under the heading "Menu #". **N.B.** When **writing** use the menu number, when **reading** add 0x80 to the menu number.

**Hi Byte and Lo Byte** is the value to be sent, ascertained by looking under the heading "Range of Value", to achieve the desired result.

**Variable** is 0xC1 for the first variable, 0xC2 for the second variable and 0xC3 for the third variable.

**Checksum** is the least significant byte of the sum of all the values added together.

**For example:**

To set the TD-2 in Box 1, Slot 1 so that the 'Text Language' is set to 'German' you would need to transmit:

Sender, NID, Len, 'A', 'A', Menu, Hi Byte, Lo Byte, Variable, Checksum

CF, 00, 06, 41, 41, 0C, 00, 02, C1, 26

This will set Menu 12 to 2, which will select 'German' as the text language.

The response from the box will be NID, Sender, Len, 'a', 'a', Checksum

00, CF, 02, 61, 61, 93

Please note that the actual value will change immediately but the change will not always show on the display until it has been refreshed by pressing the 'NEXT' and 'PREV' buttons on the front panel.

To read if 'T'Text Display' is set to 'ON' on the TD-2 in Box 1, Slot 1 you would need to transmit:

Sender, NID, Len, 'A', 'A', Menu + 0x80, 0x00, 0x00, Variable, Checksum

CF, 00, 06, 41, 41, 84, 00, 00, C1, 9C

The response from the box will be NID, Sender, Len, 'a', 'r', Hi Byte, Lo Byte, and Checksum

00, CF, 04, 61, 72, 00, 01, A7

This is telling you that the variable is set to '1', which is 'ON'. If the variable was set to '0' 'T'Text Display' would be set to 'OFF'.

Always wait until you have received the reply to a command, before sending the next command.