Gain Controlled Pre Amplifier

Installation

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# USB Gain Controlled Pre Amplifier

The Gain Controlled Pre Amplifier (GCA) is a preamplifier designed to use with P730 Picro Pro+ and P830+ acoustic test systems.

One GCA can be added to the P730 test system mean wile up to 4 GCA's can be added to a P830 test system.

A GCA has two balanced inputs supplied with a combo XLR / Jack plug. The XLR connection can freely be supplied with a phantom voltage +48 V. The voltage is selected for each input on the backplane.

For easy calibration of the P730 and P830 test systems the GCA has a reference generator. This enables an automatically test and calibration when the p730 and p830 program enter the run and setup modes.

For external control as signals as test results and start test the GCA have a digital input and out lines at TTL level.
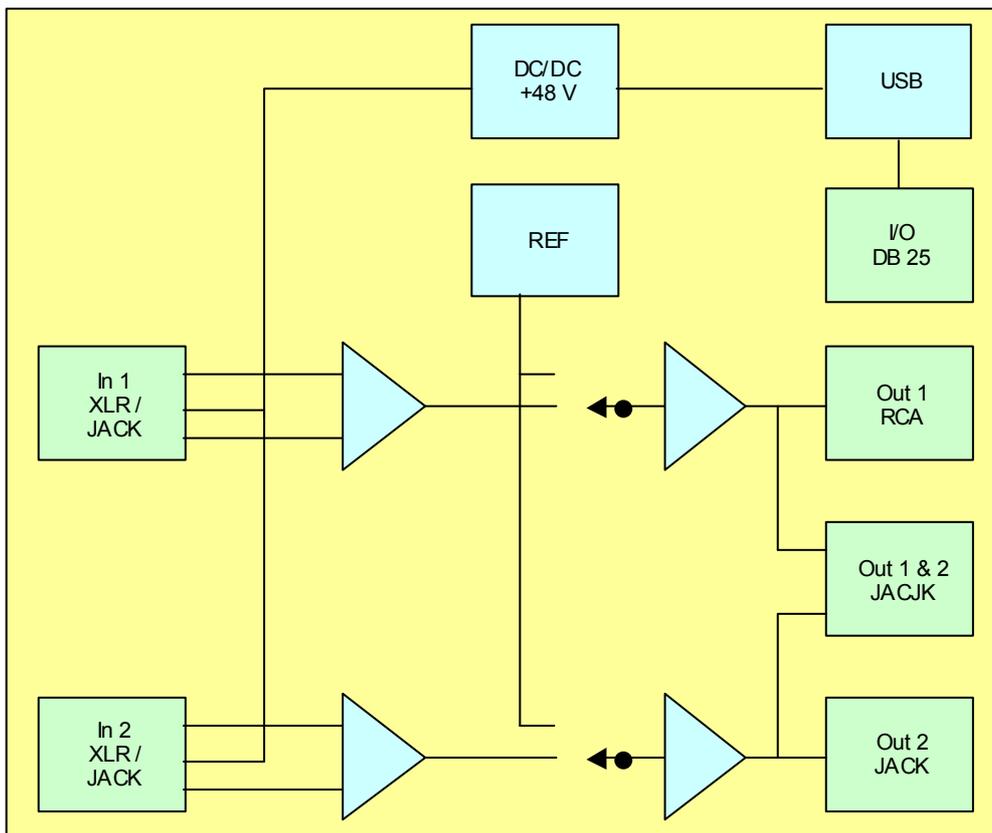
Block Diagram

Installation

Hardware Installation

Front Connections
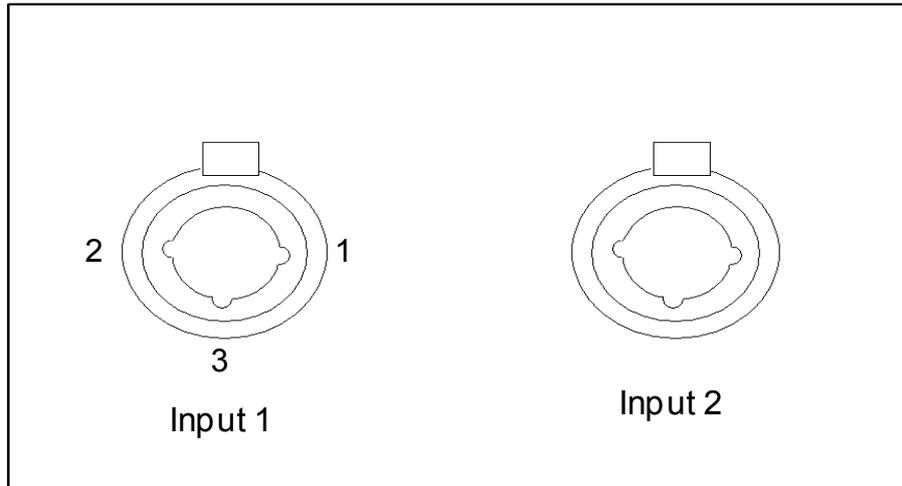
Front view

On front are placed the two combo plugs for input 1 & 2. The combo plug support the XLR and Jack style.
The XLR inputs support a +48 V phantom supply for microphones. This voltage is selected on the backplane for each input.

Recommended connections

Balanced input – XLR & Jack

Source — Jack Input

Source		Jack Input
Signal −		Mid-ring
Signal +		Tip
GND		Screen

Single-ended input

Source — XLR Input

Source		XLR Input
		3
Signal +		2
GND		1

Source — Jack Input

Source		Jack Input
		Mid Ring
Signal +		Tip
GND		Screen

Rear Connections

```
                    USB              I/O              DC

                    1       2
                 ON -OFF  ON-OFF           ◯      ◯       ◯
                   ▭       ▭
                    +48 V              Out 1   Out 2   Out 1 & 2
```
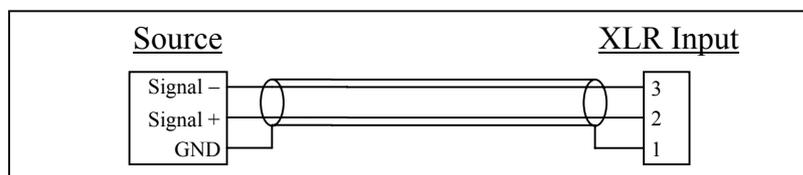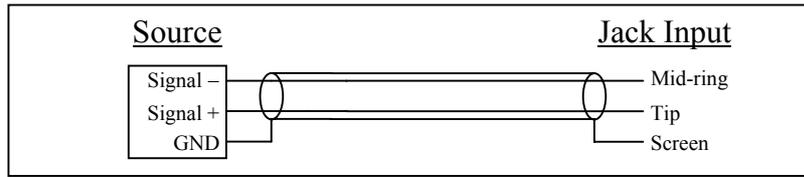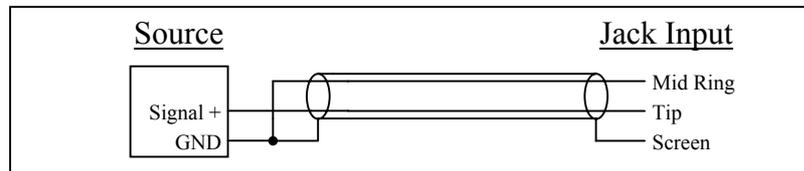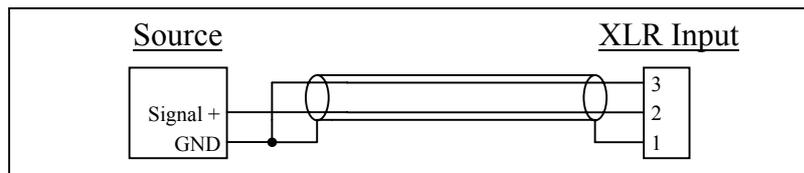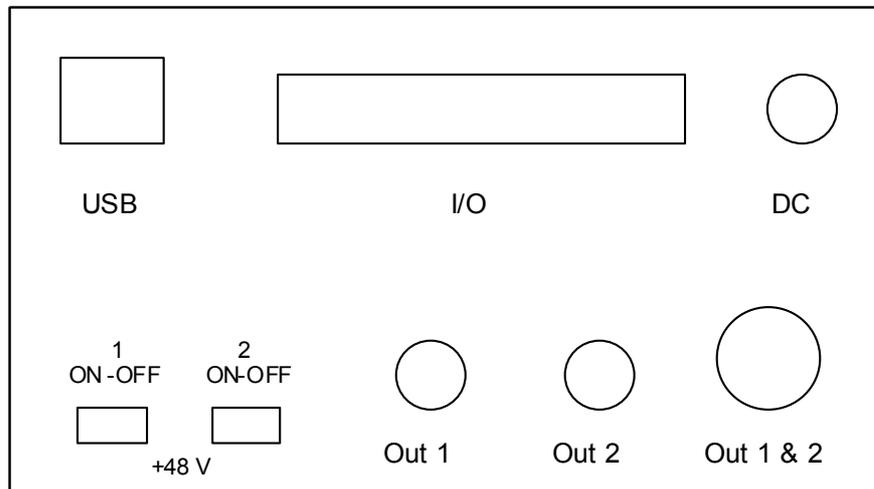
Rear View

USB

USB connection to PC.
The GCA get normally the power via this connection.

I/O

The I/O is digital input and output port. There are 8 inputs and 8 outputs ports all at TTL level.
A DB-25 female connector is used. Maximal output load is 1 mA.

DC

The DC supplies the GCA with DC power. This power is optional. Normally the USB connection is able to give power for GCA. However if the USB is not able to give all power or if both inputs are using phantom with maximal load an additional power can be added via this connector. The centre pin is negative. An external DC voltage between 6 and 12 volt is accepted.

ON-OFF

The two ON-OFF switch select the +48 V phantom power ON or OFF on the XLR input.
Switch 1 for input 1 and switch 2 for input 2.

Out 1

Out 1 is the output for pre amplifier 1. The connector is a RCA type.
This output is normally connected to input 1 on UA-25 for the P730 and for P830 to input 1, 3, 5 or 7 depending of no of GCA used.

Out 2

Out 2 is the output for pre amplifier 2. The connector is a RCA type.
This output is normally connected to input 2 on UA-25 for the P730 and for P830 to input 2, 4, 6 or 8 depending of no of GCA used.

Out 1 & 2

Out 1 &2 is the output for both pre amplifiers. The connector is a Jack type.
The centre pin is output 1.

Recommended output connections
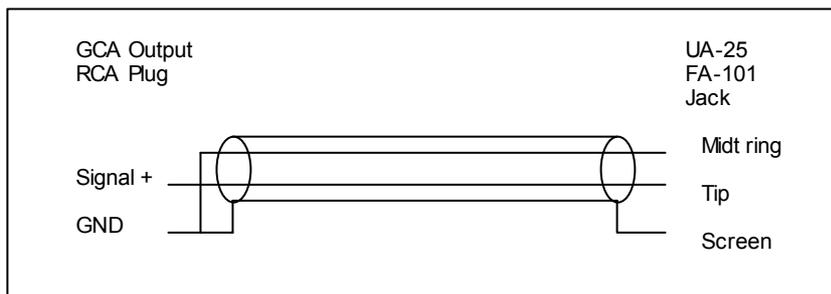
Software Installation

Installation of drivers

Some internal I/O ports control the GCA. The GCA has 3-time 8 bits bus. The two is used for the external I/O while the last is for internal control. The I/O hardware is an USB-PIO.

Use the Nextview CD-ROM to install the USB-PIO USB driver.
- Select Products.
- Then select USB-PIO. Install the BMCM-DR drivers.
- Install the activeX Controls for USB-PIO by installing the STR-meM program.
  Note the program installs the drivers and activeX for all your USB ports on same time.

Activating of Preamplifier

An activation of the Preamplifier for the P730 or P830 software is needed. Adding some commands to the P730 or P830 hardware config file does this. The file is located same place as the P730 or P830 program is saved. Add following lines to the "ALT4-HW.CFG" file:

```
Pio = on
Pre = on
```

The line "Pio [space] = [space] on" tells the system that an USB-PIO hardware is installed and under the program start-up the drivers is activated.
The line "Pre [space] = [space] on" tells the system that a GCA pre amplifier is installed and functions to support the preamplifier is activated in the P730 or P830 software.

P830 functions

For P830 it is possible to mount up to 4 GCA's at same time. A P830 can select between 8 inputs. If only one GCA is installed it is possible to allocate the GCA to freely between P830 input no 1 to 8 in a group of 2. To tell the system witch input there are used by the GCA following lines have to be added in the file "ALT4-HW.CFG":

```
In12 = off (on)
In23 = on (off)
In46 = off (on)
In78 = off (on)
```

In this example one GCA is installed and use P830 input 2 and 3.
The line "In12 [space] = [space] off" tell – do not use input no 1 and 2.
Command "on" and "off" is valid.

If more than 1 GCA is installed the P830 program need to know witch I/O port is used for external control. To tell this a line is added to the "ALT4-HA.cfg" file:

```
UsbIo = 1 (1 to 4)
```

The line "UsbIo [space] = [space] 1" tell that the first GCA is used for external I/O control. Each USB-PIO has a serial number saved in the firmware. The lowest number is the first.
Number between 1 and 4 is valid. If no line is present the first installed GCA is used.

I/O Connections

Input Pins

The I/O has 8 input pins. The input ports I connected to the 25 pole female plug as following:

|	
Pin 1	Input bit 0
Pin 14	Input bit 1
Pin 2	Input bit 2
Pin 15	Input bit 3
Pin 3	Input bit 4
Pin 16	Input bit 5
Pin 4	Input bit 6
Pin 17	Input bit 7

Output Pins

The I/O has 8 output pins. The output ports I connected to the 25 pole female plug as following:

Pin 5	Output bit 0
Pin 18	Output bit 1
Pin 6	Output bit 2
Pin 19	Output bit 3
Pin 7	Output bit 4
Pin 20	Output bit 5
Pin 8	Output bit 6
Pin 21	Output bit 7

A +5 volt is supplied on the 25-pole plug. This voltage is for pulling up input pins is needed.

Pin 9	+5 Volt
Pin 13	GND

Timing diagram for P830 & P730 I/O signals
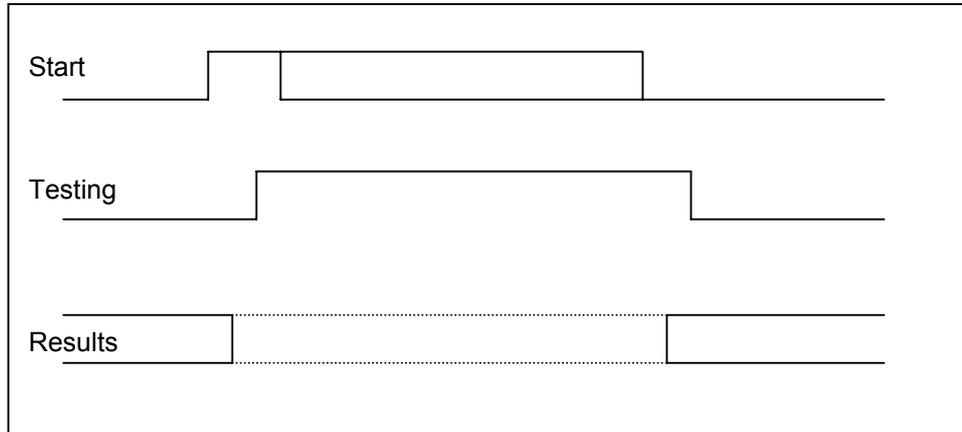
Signal level for P830 & P730 I/O is 0 and 5-volt level with maximal current output on 1 mA.
Recommended pull down resistor: 3,9 Kohm.

Test sequence:
When start signal is received the P830 & P730 program set the testing signal high. The testing
signal is set to low when the test is completed and the test result(s) are present on selected output(s).

Test result(s) signal(s):
Approved is low level. Rejected is high level.

P830 & P730 I/O pin out

Input

Start	=	Pin 1
Delete	=	Pin 2

Outputs

Depending on the set up of I/0 in the alt4.hw.cfg file output pin assignments can be changed.
Valid IO commands are:

IO = normal
IO = separate
IO = group

I/O = Normal (or not defined)

Pin 5   Out 0   =   Testing
Pin 18   Out 1   =   Result

I/O = Separate

Pin 5   Out 0   =   Testing
Pin 18   Out 1   =   Result: Frequency-, sensitivity and 3rd limit test
Pin 6   Out 2   =   Rub & Buzz Ch. B & D
Pin 19   Out 3   =   Impedance-, resonance- and F-test
Pin 7   Out 4   =   Polarity test

I/O = Group

Pin 5   Out 0   =   Testing
Pin 18   Out 1   =   Result: Freq.-, sensitivity-, Loudness-, Impedance- Resonance-, F-test
                                   and 3rd limit test
Pin 6   Out 2   =   Rub & Buzz Ch. B & D
Pin 7   Out 4   =   Polarity test

The Alt4-hw.cfg file

This file located on installed path contains all hardware dependent information for the P830 & P730 program.
In the file you find a configuration list for your hardware.
With the system delivery this file is prepared for your actual system.
If you change hardware in your system, you must make changes in this file.

Commands keywords:

IO = normal   The IO output control lines from the I/O can be modified in a "separate", a "normal" or as a "group" function.

Chain = normal
               Normal/One. In chain mode the test "result" (i/o output bit 0) and "test end" (i/o output bit 1) are activated at every single sub-test in the chain. This is the normal condition (chain = normal or if no command is used). With the command "Chain = one" all the test results are treated as one total test and the "test end" signal is only activated one time.

Sdelay = 0   Sweep delay is an optional. Sdelay is default 0. Valid value is between 1 and 3000. The value between 1 and 3000 is a delay between start signal of test and actual sweep is done in mSec.

Pio = on   On / Off   See "Activating of Preamplifier"

Pre = on   On / Off   See "Activating of Preamplifier"

In12 = on   On / Off   See "P830 functions"

In23 = off   On / Off   See "P830 functions"

In46 = off   On / Off   See "P830 functions"

In78 = off   On / Off   See "P830 functions"

UsbIo = 1   1 – 4   See "P830 functions"