Neets Control – DelTa

Installation Manual



Neets

Foreword

The purpose of this document is to describe how to install and configure the Neets Control – DelTa.

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CHANGES - Neets reserve the right to change the specification and functions of this product without any notice.

Questions, AFTER reading this manual, can be addressed to your local distributor or:

Neets A/S
Denmark

by E-Mail: Support@Neets.dk

or you may use our contact form at www.neets.dk

Revision list

This document (no: 310-0310-001-007) has the following revision changes:

Author: Date	Description	Pages	Rev
TSA: 21-11-13	First release	All	1.00
SVL:11-12-13	Wrong default setting in preamp	6	2.00
TSA:10-02-14	Wrong drawing for PRE-amplifier	5	2.00
MH: 26-05-14	Various text corrections	All	3.00
MH: 11-06-14	Proof reading and text corrections	All	4.00
SVL: 24-10-14	Added new error indication	11	5.00
MH: 01-09-2015	New design according to Neets design guide	All	6.00

What is in the box?

When you open the box it will contain the following items:

1 x Neets Control - DelTa
Power cable
Cable relief bracket
Cable relief cover
Phoenix connectors
Installation manual

Important Safety Instructions

Caution:

Read these instructions:
Read and understand all safety and operating instructions before using the equipment.
Keep these Instructions:
The safety instructions should be kept for future reference.
Heed all Warnings:
Follow all warnings and instructions marked on the equipment or in the user information.
Avoid Attachments:
Do not use tools or attachments that are not recommended, because they may be hazardous

Warning!:

- This equipment should be operated only from the included power supply.
- To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).
- Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.
- Do not defeat the safety purpose of a polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards. Contact your local Neets reseller or distributor.
- If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.
- Do not use this equipment near water.
- To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture and objects filled with liquids.
- Unplug the product before cleaning. Clean only with a dry cloth and not cleaning fluid or aerosols. Such products could enter the unit and cause damage, fire, or electric shock. Some substances may also mar the finish of the product.

FCC Class A Notice:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

FCC regulations state that any unauthorized changes or modifications to this equipment, not expressly approved by the manufacturer, could void the user's authority to operate this equipment.



The lightning bolt triangle is used to alert the user to the presence of uninsulated "dangerous voltages" within the unit's chassis that may be of sufficient magnitude to constitute a risk of electric shock to humans.



The exclamation point triangle is used to alert the user to presence of important operating and service instructions in the literature accompanying the product.

Neets

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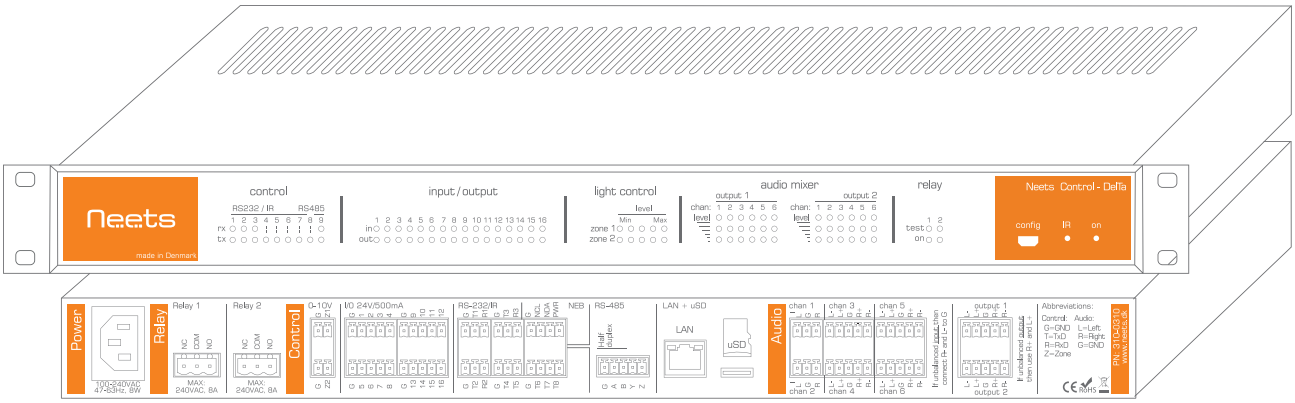
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Description

Neets Control - DelTa gives you comprehensive yet intuitive control of complex AV systems in auditoriums, large meeting rooms, and conference rooms. All AV systems in the entire room are easily controllable from any mobile touch device. The built-in audio-mixer, 240VAC Relays, light- and AV control makes the DelTa an unmatched and cost-effective three-in-one solution, giving you complete room control via mobile touch device or web browser.

Custom graphical user interfaces can easily be made and configured using the new and intuitive Neets Project Designer software. You can drag and drop the devices you need from the extensive device driver library, create custom buttons, or use one of the many templates to make control of the room a breeze.

All connected devices are controlled through a large number of RS-232, RS-485, LAN and IR ports, making the Neets Control - DelTa capable of handling even very demanding facilities.

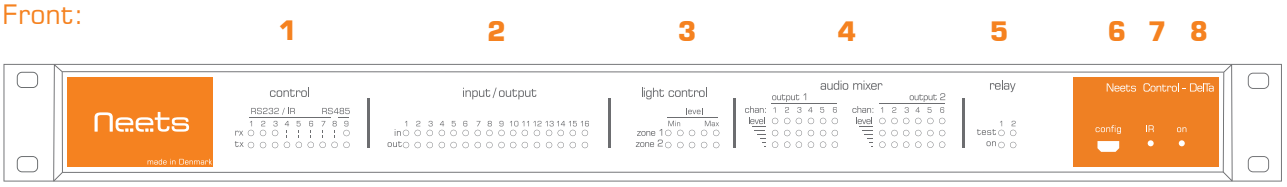


Function description	
RS-232 (Tx, Rx) / IR (controls up to 2 IR devices on each port)	3
RS-232 (Tx) / IR (controls up to 2 IR devices on each port)	5
LAN device control	10
I/O	16
0-10V output (Light control)	2
Relays	2
Test buttons	2
NEB Bus (including Extender up to 20m)	1 (5 NEB)
RS-485 half/full duplex	1
Real time clock	Yes
IR Learn option with Device editor	Yes
Unbalanced line in (0dB gain)	1
Microphone input / unbalanced line in (Mic 30-42dB gain)	1
Balanced/unbalanced line in (with up to +12dB gain)	4
Balanced/unbalanced outputs (0dB gain)	2
Mixer line in 0 to -100 dB (individual volume, treble, bass and balance)	All inputs

Connections on DelTa

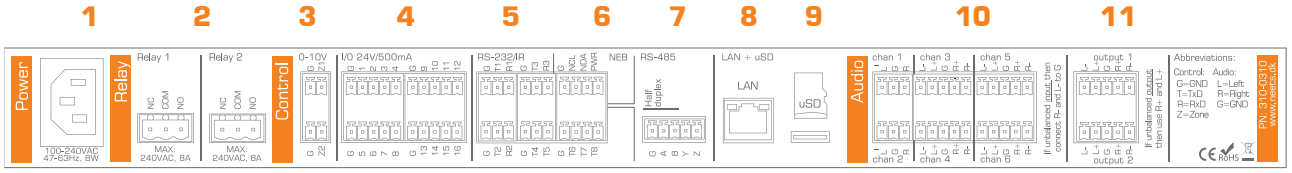
Connectors and indicators are available on the front and rear panels. These are shown below:

Front:



Number:	Description
1	Indication for transmitting or receiving on RS-232, RS-485 or IR
2	Indication for Input and Output on rear panel (I/O)
3	Light control indication (20% each step)
4	Audio mixer indication with low/med/high level (not a true VU meter)
5	Relay indication and test buttons
6	Mini USB for programming
7	Input for IR learning
8	Power indication

Rear:



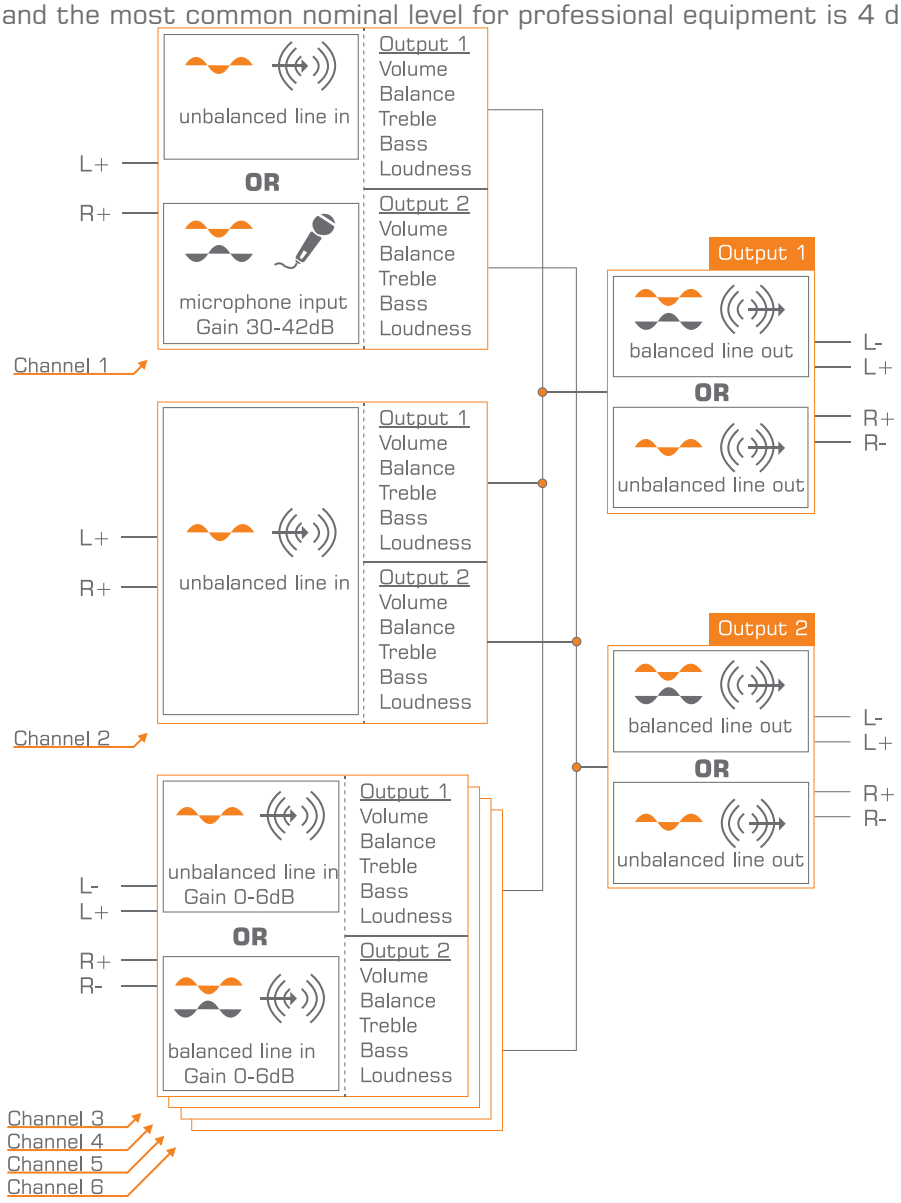
Number:	Description
1	110-230 VAC power in
2	2 x potential-free relays
3	2 x 0-10V output connector
4	16 x Input/Output connectors
5	8 x RS-232 or IR connectors (3 x bidirectional RS-232)
6	1 x Neets Extension Bus (NEB)
7	1 x RS-485 connector
8	1 x RJ-45 Network (LAN) connector
9	1 x µSD card
10	6 x audio inputs
11	2 x audio outputs

Audio mixer description

The mixer has six channel inputs and two outputs; you can mix all input channels to either or both outputs. The mixer also has 12 different treble, bass, balance and loudness functions (six channel inputs x two differential outputs = 12) for flexible control of the sound.

What is line level on the mixer?

Line level describes the strength of an audio signal used to transmit analog sound information between audio components such as CD and DVD players (and some MP3 players) to an audio mixer. Signals from microphones are much weaker, and those used to drive loudspeakers are much stronger. The strength of the various signals does not necessarily correlate with the output voltage of a device; it also depends on the source's output impedance, or the amount of current available to drive different loads. The most common nominal level for consumer audio equipment is −10 dBV (0,316 VRMS), and the most common nominal level for professional equipment is 4 dBV (1.228 VRMS).



When you power up the Neets Control – DelTa for the first time the default settings are as follows:

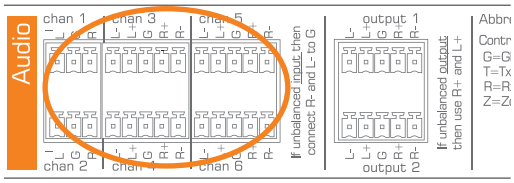
Input, function	Gain settings	Output	Level
Input 1, unbalanced line in	N/A	Zone 1	-25dB
Input 2, unbalanced line in	N/A	Zone 1	-100dB (Muted)
Input 3, balanced line in	0dB	Zone 1	-100dB (Muted)
Input 4, balanced line in	0dB	Zone 1	-100dB (Muted)
Input 5, balanced line in	0dB	Zone 1	-100dB (Muted)
Input 6, balanced line in	0dB	Zone 1	-100dB (Muted)
Input 1, unbalanced line in	N/A	Zone 2	-25dB
Input 2, unbalanced line in	N/A	Zone 2	-100dB (Muted)
Input 3, balanced line in	0dB	Zone 2	-100dB (Muted)
Input 4, balanced line in	0dB	Zone 2	-100dB (Muted)
Input 5, balanced line in	0dB	Zone 2	-100dB (Muted)
Input 6, balanced line in	0dB	Zone 2	-100dB (Muted)

All balance, treble, bass and loudness will be set to 0dB or off

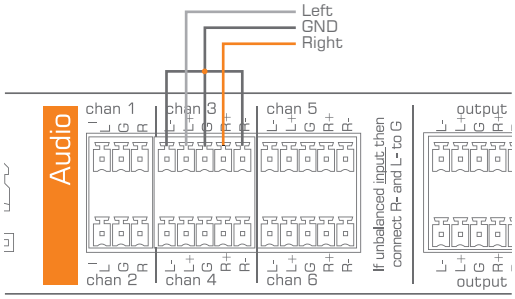
Connections

Audio input

Channel 1 can be either unbalanced line in or a differential dynamic microphone input with 30 – 42dB gain (must be selected in software). When in microphone mode, left input terminal becomes Cold (-) and right input terminal becomes Hot (+). Channel 2 can be unbalanced line in.

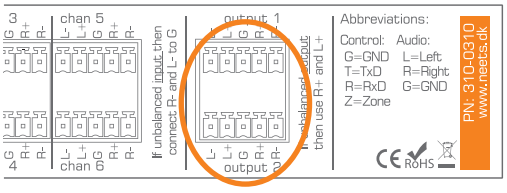


Channel 3, 4, 5 and 6 can be either balanced line input or unbalanced line input. If you want to use the channel as an unbalanced input, you will have to connect the "L-" and "R-" to GND in the 5 pin screw block, and connect your signal to "L+" and "R+". In the software, you can set the gain from 0dB to + 6dB if the signal level is too low. (Default is 0dB).



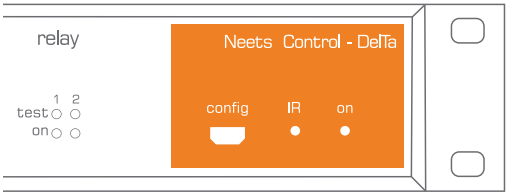
Audio output

The output terminal can be used either in balanced or unbalanced mode. Simply use "L-", "L+", "R+" and "R-" for balanced mode, and use "L+" and "R+" for unbalanced mode (IMPORTANT: NEVER connect "L-" to "R-")



USB

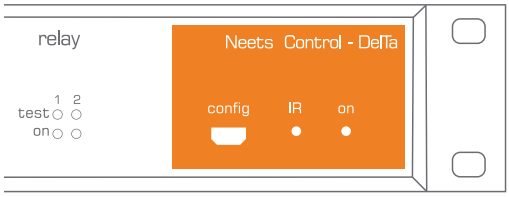
The USB port (labeled "config" on the front) can only be used to configure the Neets Control – DelTa from the Neets Project Designer software. It cannot be used to control any external devices. The USB port is not able to power the control system while configuring, so always remember to connect the 230 VAC power.



The USB connector for connecting to the Neets Control – DelTa is type “mini USB B 5P”. You can buy this cable on the web (buy a USB A to Mini USB B 5P).

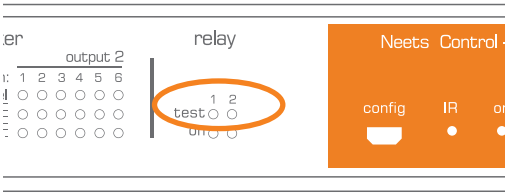
IR receiver

The IR learner can be connected directly to the Neets Device Editor software through the USB port. With this you can learn IR codes from your existing IR remote for easy configuration on-site, or even on your desk.



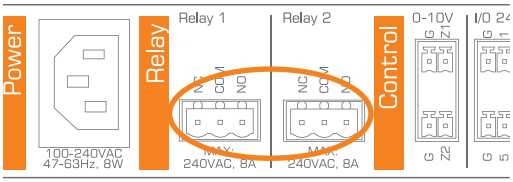
Switch and LED

The two switches (SW-1 to SW-2) are used to test the relay functions. The LEDs indicate if the relay is activated (ON) or not activated (OFF).



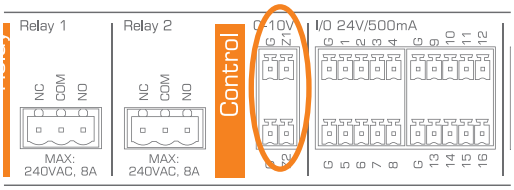
Built-in relays

Relays allow the option of NO (Normal Open contacts) and the NC (Normal Close contacts) for greater flexibility.



0-10 Volt output

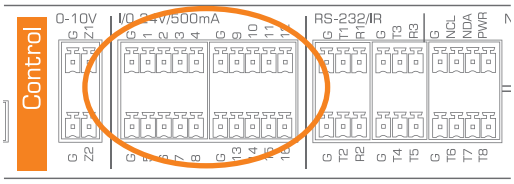
The Neets Control – DelTa has two x 0-10 Volt outputs. They can be used for controlling lights or levels on external equipment. The ports are not potential free, which means you will need external protection to prevent ground loops.



I/O ports

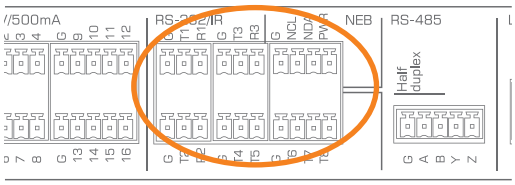
The Neets Control – DelTa has 16 I/O (Inputs/Outputs) available. They can be used for an external control keypad, PIR (movement) sensor, keyboard lock, extra relays, or other compatible uses. The ports are not potential free; you may need external relays if you need to prevent ground loops.

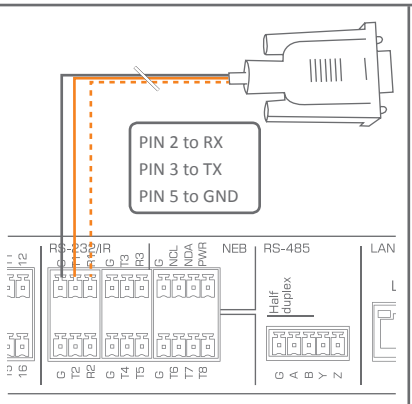
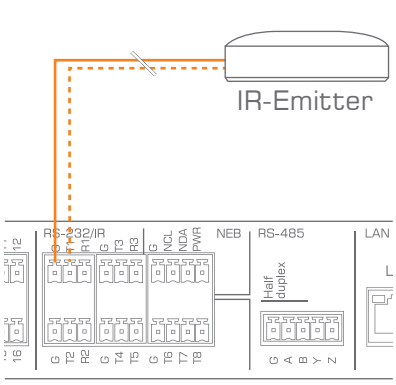
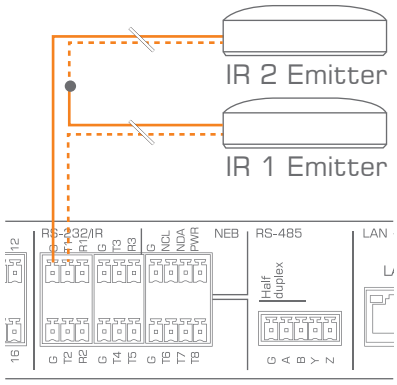
When used as outputs, the ports are active low. When the software indicates they are activated, the pins are tied to GND through a FET transistor (also called open drain/collector function). Each can draw up to 24VDC/500mA. When used as inputs the voltage has to be below 1 Volt DC to be accepted as LOW, and above 4 VDC (but below 24 VDC) to be accepted as HIGH. The inputs are default HIGH and must be connected to ground in order to change state.



RS-232/IR ports

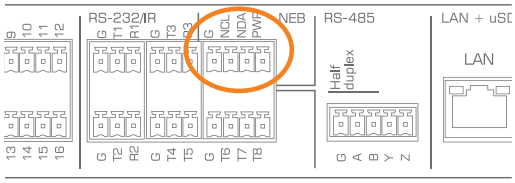
The onboard RS-232 ports (T1, R1, T2, R2, T3, R3, T4, T5, T6, T7 and T8) are used for one- or two-way communication. (Ports 1-3 are two way: Transmit and receive, 4-8 are one way (transmit only). Two way ports are used for devices on which you want to use reply (e.g. your projector). All of the RS-232/IR ports can be configured in the software either as RS-232 or as IR emitter.



		
When used as RS-232 transmit port: Connect the device to T1, R1 and GND, as shown here above.	When used as single IR port: Connect the IR emitter to T1 (white striped wire) and GND, as shown above.	When used as dual IR port: Connect the IR 1 emitter to T1 (white striped wire) and black wire on IR 1 emitter to IR 2 emitter (white striped wire), and black wire from IR 2 emitter to GND, as shown above.

NEB port

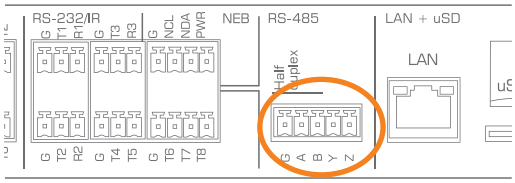
The Neets Control – DelTa has a built-in NEB (Neets Extension Bus). This port is used to add up to 5 NEB devices (e.g. two Keypads, two Level Controls and one Expander). The NEB port includes an NEB extender that allows up to 20m of separation between the DelTa and your NEB devices. BUT you MUST connect NEB extender module (310-0005) at the end for your NEB units.



The DelTa has a built-in NEB extender; therefore, you need an extender for all your NEB units as well.

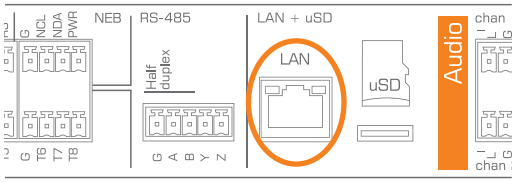
RS-485 port

The onboard RS-485 ports can either run in full duplex (using all 5 wires) or in half duplex (using 3 wires). The mode can be set using Project Designer software. You can also swap RxD wire or TxD wire in the software, should the wiring connection prove incorrect.



LAN

The network connector integrates the system into the local area network.



There are two LEDs on the connector with the following indication:

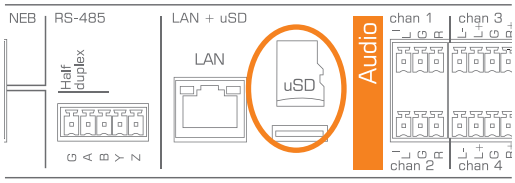
Color	Off	On	Blink
Yellow	No Link	Link	Activity
Green	10Mbit	100Mbit	

Default IP settings is:

IP address: 192.168.254.253
Subnet: 255.255.255.0
10/100Mbit: Auto
DHCP: Disabled

uSD-Card

The uSD-Card is used to store the DelTa setup made in the Project Designer, preamp homepage and general settings. The card should not be removed during normal operation.



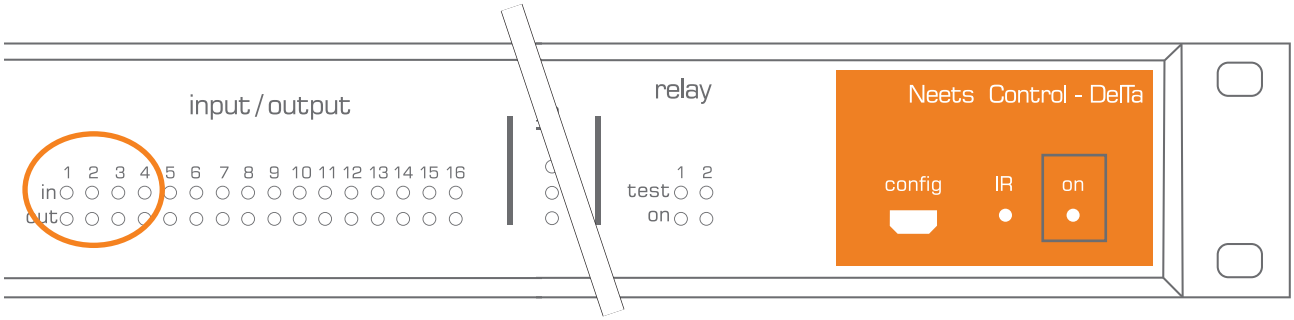
To remove the SD Card from the unit, push it GENTLY into the holder about 1mm (by using your finger tip). Release again, and it will slide out.

REMEMBER to remove power from unit (power down) before removing Micro SD card!

Troubleshooting

On the front of the unit you will find five LED indicators used for error indication ("on" LED and input/output LED 1-4).

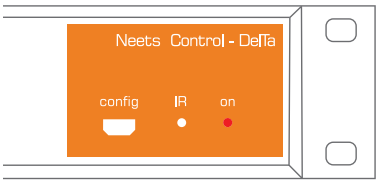
The "on" LED can have the following indications:

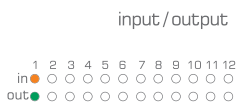
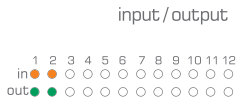
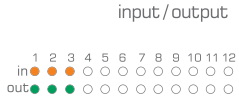


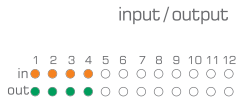
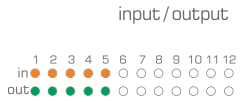
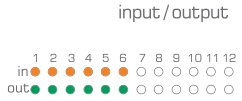
Description	"on" LED behavior
System starting	Orange non-flashing
System running	White non-flashing
System error	Red flashing
Firmware upgrade in progress	Orange non-flashing

Error LED

If you experience a system error, the "on" LED indicator on the front will be flashing red together with some of the input/output LED indicators. You can find the error type and solution for trouble-shooting below.



LED shows	Description	Solution
	No connection to one or more NEB units.	o Check that the NEB units used in the project are connected. o Make sure that a NEB extender is used at the end of the connected NEB unit. After doing one of the above, remove the power to the control system for 20 sec before reconnecting the power again.
	No project found on the control system	o Try to upload the project again. o If the problem persists after several successfully uploads, contact Neets or your local distributor
	Missing SD card or error on SD card	o Make sure that there is a SD card inserted in the Control system. (Look at the rear panel.) After doing one of the above, turn off the power to the control system for 20 sec before turning the power on again.

LED shows	Description	Solution
	Unexpected Error	o Turn off the power to the control system for 20 sec before turning the power on again. If the error is not resolved, contact Neets or your local distributor.
	No contact to Neets network unit	o When adding a Neets Network unit like the Switching relay 4 or 8, the DelTa indicates this error when it do not have contact to all units. Check the used SN in the Project Designer match the one you have on you network.
	Firmware upgrade Neets network unit	o One or more of the Neets network unit used in the current project need a firmware upgrade before it will work with

Neets

Specifications

Power input

Voltage	97VAC - 240VAC
Frequency	47Hz - 63Hz
Power usage	8W
Connector type	IEC plug

Relay Output

Voltage max	240VAC
Current max	8A
Load max AC1	1150W @ 230VAC
Load max AC15	500W @ 230VAC
Single phase motor	370W @ 230VAC
Connector	3 pin screw block

0-10V output

Output error	+/- 0.01% full scale
Min step (full scale)	2048
Mode options	0-10V, 1-10V, free
Output impedance	10R
Output current max	25 mA / 400 ohm
Connector	2 pin screw block

Input / Output

Input trigger low	< 1VDC
Input trigger high	> 4VDC
Output type	Open drain
Isolated output	No
Max voltage load	24VDC
Max current	0.5A
Connector	5 pin screw block

RS-232

Baud rate	1200-115200bit/sec
Data bits	7 – 8
Parity	Even, Odd, None
Stop bits	1/2

RS-485

Duplex modes	Half or full
Baud rate	1200-115200bit/sec
Data bits	7 – 8
Parity	Even, Odd, None
Stop bits	1/2

IR

Transmit frequency	400Hz to 500 KHz
IR Learn frequency	1KHz to 150 KHz

Network (LAN)

Speed	10/100Mbit
Duplex modes	Half or full
DHCP	Default off
Default IP	192.168.254.252
Default gateway	192.168.1.1
Default subnet mask	255.255.255.0

Audio

Un- or Balanced inputs	4
Microphone or line input	1
Unbalanced input	1
Un- or Balanced outputs	2
Microphone gain	30dB - 42dB
Mic SNR (@3,6mV RMS)	<93dB
Line in SNR (@ 1V RMS)	<92dB
Channel separation	<95dB
Frequency response	20Hz - 20KHz +/-1dB
Input level max (THD 1%)	2.3VRMS
Output max (THD 1%)	2.3VRMS
Balanced input Gain	0 - 6dB
Volume level	0 - 79dB
Mute	<100dB

uSD-Card

Type	Micro-SD,
Card size min / max size	1Gb / 4Gb
File system	FAT 32

General

Width (mm)	437 / 483mm.
Depth (mm)	141mm.
Height (mm)	44mm. (1U)
Weight kg/lbs.	1.9kg / 4.1lbs
Weight shipping kg/lbs.	2.2kg / 4.9lbs
Dimension shipping (W/D/H)	530mm / 230mm / 80mm
Storage temperature	-20°C to 50°C
Storage moisture	Non condensing
Operation temperature	0°C to 30°C
Operation moisture	Non condensing