Sound Bar – SB2

Installation Manual

Foreword

This document describes how to install and operate the Neets Sound Bar – SB2.

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

Questions, AFTER reading this manual, can be addressed to the local distributor or: Neets A/S
Langballe 4, 8700 Horsens Denmark

by E-Mail: support@neets.dk or you may use our contact form at www.neets.io

Revision list

This document has the following revision changes:

Author: Date	Description	Pages	Rev
MNH: 08-04-2021	Final	All	1.00

What is in the box?
The box contains the following items:

- 1 x Neets – Sound Bar SB-2
- 1 x Mains cable for power supply
- 2 x Terminal connectors
- 1 x Drilling Template
- 2 x Wall brackets
- 4 x M5 screws for wall brackets
- 4 x Wall plugs
- 4 x Rubber feet

Description

The Neets Sound Bar – SB2 is a stylish sound bar, designed to bring the presenter´s message to life.

It is designed to give a great sound quality no matter if it is used in a conference call or presenting in a small- to medium-sized meeting room.

The Neets Sound Bar – SB2 is simple and advanced at the same time. It has 4 audio input options to choose from; HDMI(ARC), USB, Balanced Audio or Unbalanced (RCA). It comes with a wake-on-signal feature built-in or it can integrate with a control system through the RS-232 port.

Function description

- **Control System compatibility**
  Compatible with all Neets Control Systems or 3rd party systems.
- **Placement options**
  Can be mounted on a wall or sit on a tabletop or shelf. Brackets for wall mounting are included in the box as well as 4 rubber feet.
- **Speaker configuration**
  2.0 stereo configuration, based on concept from stereo monitors: 2 set of 4" full-tone woofers
  + 1" tweeter
- **Signal processing**
  Amplifier with built-in DSP functionality and 3 pre-programmed EQ presets (Video Conference, Music or Present)
- **Power Amplifiers**
  4 x 20W Class-D
- **Power Management**
  RS-232 controlled or "Wake-on-signal"
- **Cabinet**
  All MDF construction is covered in black vinyl and the front grill is in fabric
- **Power indicator**
  Power LED on the front integrated behind the fabric

Specifications

Digital Input	HDMI (ARC), HDMI type A	1
Digital Input	USB Audio-in, USB-B	1
Balanced stereo input	5-pin euro block terminal	1
Unbalanced stereo input	RCA female	1
Auto Power On	Via Auto On/off switch on rear	Yes
RS-232	Bidirectional, 3-pin euro block terminal	1
Power supply	Built-in 100-240VAC	1
VESA compatible	400 mm and 800 mm	2
Amplifier	Built-in 4x20W Class-D	1
Volume control	Via HDMI(ARC), USB or connection of a control system	Yes
Feedback	Power On indicator at the front, integrated behind the fabric cover	Yes

Specifications

Neets Sound Bar SB-2

Audio output	
Output power	4 x 20 Wrms
THD+N	< 0.1 % @ 1 W
Woofer	2 x 4" dual magnet,
	sandwich membrane
	w/rubber surround
Tweeter	2 x 1" soft dome
Frequency Response	50 Hz - 20 kHz +/- 3 db
Maximum SPL	106 dBA
Unbalanced audio input	
Number of inputs	1 x stereo input
Max input level	1 Vrms
Input impedance	< 20 k Ohm
Wake-on-signal	Yes
Connector	2 RCA female
Balanced audio input	
Number of inputs	1 x stereo input
Max input level	2 Vrms
Input impedance	< 100 k Ohm
Wake-on-signal	Yes
Connector	1 x 5 pin screw block
HDMI (ARC) input	
Number of inputs	1 x HDMI A female
HDMI version	HDMI 1.4
CEC control from TV	Yes
Connector	HDMI Type-A Male
Codec	PCM stereo up to 24bit
Sampling rate	44.1/48 kHz
USB Audio input	
Number of inputs	1 x USB-B female
USB version	USB 2.0
Connector	USB 2.0 Type-B Female
Codec	PCM stereo up to 24bit
Sampling rate	44.1/48 kHz
On/Off	
Auto On/Off	Yes
Wake-on-signal	Yes

RS-232	
Ports	1 x bidirectional
Baud rate	19200 bit/sec
Data bits	8
Parity	None
Stop bits	1
Connector	1 x 3 pin screw block
Power input	
Input voltage	100-240 VAC
Max power usage	60 W
Standby power usage	< 0.5 W
Connector	IEC C8
Power Indicator	
Placement	LED behind front grill
General	
Enclosure	Wood (MDF)
Enclosure finish	Mate black vinyl
Front grille	Textile covered MDF
VESA comp.	400/800
Width	1018 mm / 40.1 inch
Depth	75 mm / 2.95 inch
Depth w. wall bracket	81mm / 3.18 inch
Height	130 mm / 5.1 inch
Weight	4.5 Kg
Shipping	
Width	1120 mm / 44.1 inch
Depth	150 mm / 5.9 Inch
Height	200 mm / 7.8 Inch
Weight	6.5 Kg
Storage temperature	-20 °C to 50 °C
Storage humidity	Non condensing
Approvals	
CE	EN55032:2015
	EN55035:2017
	EN61000-3-2
	EN61000-3-3
FCC	Part 15 Class B:2020

Installation

Neets Sound Bar – SB2 is designed to be easily installed, in any convenient location. It can be mounted on the wall beneath, or above a screen, or placed on a desk free standing.

To use the Sound Bar freestanding on a desk, simply unpack the unit, mount the adhesive feet, and it is ready to go.

To use the Sound Bar on a wall use the included brackets, screws and when necessary wall plugs. Unpack the unit, make the measurements on the wall and place the unit on the surface where it should be mounted.

⚠️ It is recommended to connect the power and audio cables to the Sound Bar before mounting on the wall.
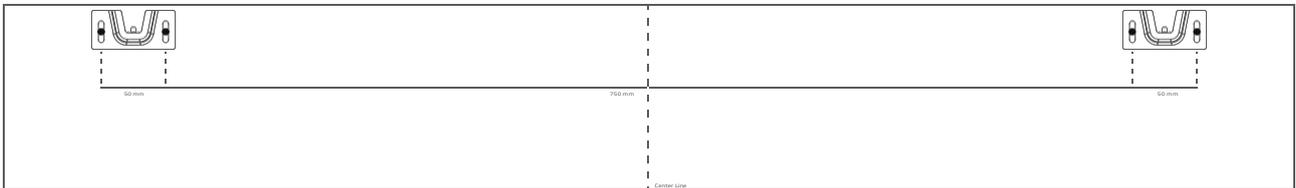
Included in the box is a template for easy mounting. Use a level to ensure the template is in level, and then tape the template securely to the wall. Use an awl or other sharp object to punch 4 small holes through 4 of the marked locations on the template.

Remove the template from the wall and drill pilot holes. Pre-drilling is optional, however it will result in a more accurate installation.

Insert and secure the wall anchors.

If drilling into wood stud, do not use the wall anchors.

If drilling into Sheetrock, screw the wall anchors into the drywall with a Phillips head screwdriver until the head is flat against the wall surface. Be careful not to overtighten.

Fasten the Sound Bar brackets to the wall, using the screws supplied in the wall mount kit. Use a level to verify accuracy a final time, and then tighten the screws securely.

Thumb scews
for adjustment
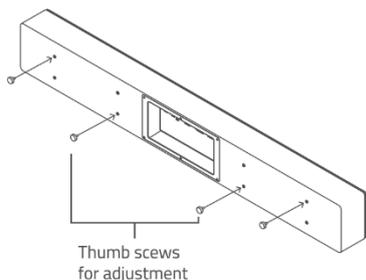
Then screw the four thumb screws included in the box into the Sound Bar. See drawing for correct placement.

Hang the Neets Sound Bar securely on the two (2) brackets and adjust the two thumb screws (marked on the drawing for correct spacing to the wall.

For mounting the Sound Bar to a cart, use the VESA 400 or 800 holes at the rear of the Sound Bar.

Connection and Controls

Front

Number	Description
1	Power/standby indication led

Power/standby indication LED

The LED indicate the current state of the Sound Bar:

- When powered on the LED will be on
- When powered off the LED will pulse slowly on and off
- When the output is muted by TV using CEC or an RS-232 command, the LED will blink

Back
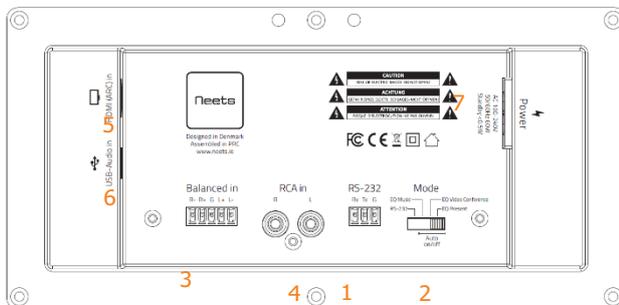
Number	Description
1	RS-232 connector
2	Switch for selecting RS-232 or Auto on/off mode
3	Balanced audio connector
4	RCA Unbalanced audio
5	HDMI (ARC)
6	USB Audio Input
7	Mains power in (100-240VAC)

RS-232 connector

The bi-directional RS-232 connector is used to control the Sound Bar from compatible RS-232 control systems.

To connect the Sound Bar to a control system, connect Sound Bar G to ground on control system. Connect Rx from Sound Bar to transmit/Tx from control system, and Tx from Sound Bar to receive/Rx from control system.
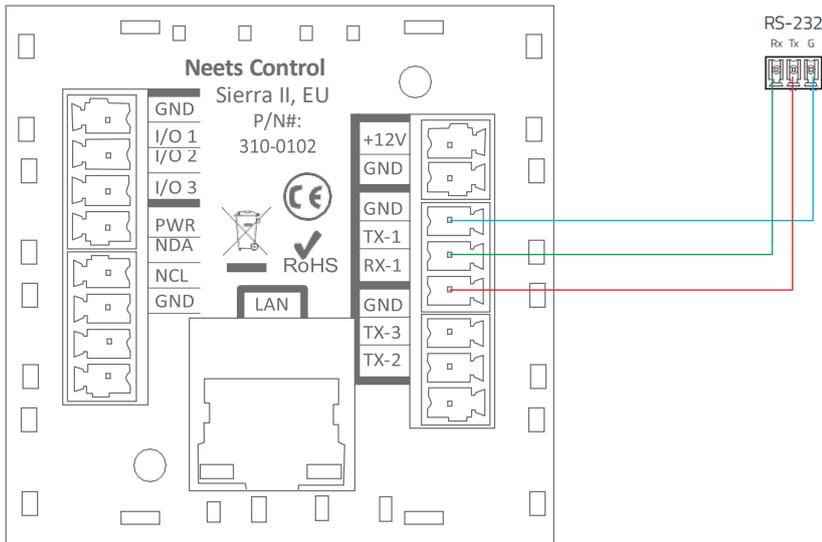
See the section "RS-232 protocol" on page 13 for details of the protocol and remember to set the mode selection switch as described below in "RS-232" mode.

Switch for selecting RS-232 or Auto on/off mode

This switch is used to select between the two operation modes of the Sound Bar.

For difference in operation modes see chapter "How to use" on page 9.
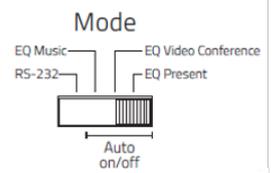
Balanced audio connector

The connector marked "BALANCED" is line level audio input which can be used in both balanced or unbalanced mode. Connect the audio source using the supplied terminal block.

To connect the input to a balanced source connect ground to the shield of both cables.

Extension

Connect:
- L+ to left positive/hot output
- L– to left negative/cold output
- R+ to right positive/hot output
- R– to right negative/cold output

Depending on which connector is used on the balanced source, use one of the connection diagrams shown below.

Euroblock

XLR

Jack input
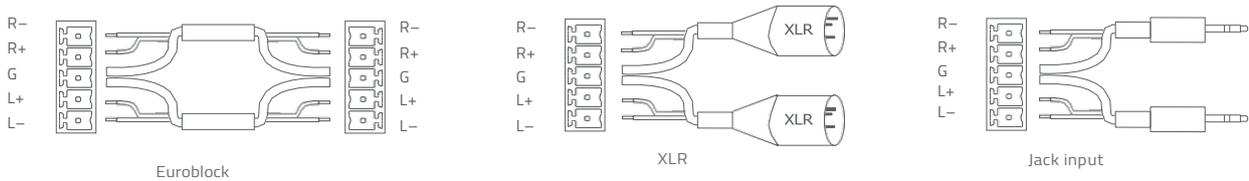
Connect:
- The G to the cable shield.
- L+ to left signal output
- R+ to right signal output
- Finally connect L– and R– to G with a small piece of wire

To connect the input to a single ended/unbalanced source.

RCA
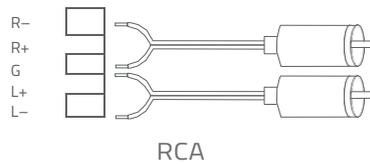
Unbalanced (RCA)

The connector marked "RCA" is a unbalanced line level audio input. Connect your audio source here with an RCA cable.
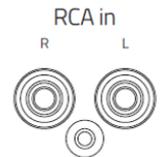
White input is left channel, red input is right channel.

USB audio connector

The connector marked "USB Audio-in" is a USB audio digital input. Connect the source using a USB-A to USB-B cable. Source is typically Solvo by Neets, a UC system or a Laptop.

AC input connector

Mains power (100 – 240VAC) is supplied through this connector.

RCA in
R   L

USB STIK
ILLUSTATION

AC STIK
ILLUSTATION

How to use

The mode select switch

The mode selection switch is used to select between RS-232 control mode and the Auto on/off mode combined with one of the three EQ presets (Video Conference, Music & Present).

Auto On/off mode

When the switch is set in one of the three Auto on/off modes the Sound Bar will activate the Wake-on-signal function and work autonomously powering on and off as described in "Wake-on-signal" chapter on page 10.

Setting the switch in Auto on/off mode will ensure that Wake-on-signal is activated even if Wake- on-signal previously have been disabled by a command in RS-232 mode.

In Auto on/off mode the RS-232 control port will still be active, but the Sound Bar will not react to incoming commands or queries. Instead, the Sound Bar will reply to a RS-232 command or query telling the connected control system that the Sound Bar is set to Auto on/off mode.

RS-232 mode

In RS-232 mode, the RS-232 port will be active. The RS-232 port is used to control the Sound Bar by commands and status from Sound Bar can be requested by queries.

The Wake-on-signal function will by default be disabled in RS-232 mode. But by RS-232 command it is possible to activate the function if both Wake-on-signal and RS-232 control is needed for the application.

To control the Sound Bar by RS-232 connect a control system to the RS-232 port with the following settings:

- Baudrate: 19.200
- Databit: 8
- Stopbit: 1
- Parity: None

Please be aware that RS-232 control is deactivated if the Sound Bar is set to Auto on/off mode. The commands for RS-232 control can be found on page 12.

When changing the mode switch from "Auto on/off" to "RS232" the Sound Bar will automatically apply the following settings:
- Power = ON
- Mute = OFF
- Volume = 70 (If max volume is set lower than 70, then that will not be exceeded)
- Input = 1 (RCA Unbalanced)
- Wake on signal = OFF
- EQ setting = Video Conference.

Wake-on-signal technology

The Sound Bar is equipped with Wake-on-signal technology. This means that the Sound Bar is able to automatically power on and off, if there is a signal present on one of the four connected sources.

For the USB input the soundbar looks for an active 5V signal in order for it to be detected as an active source.

For the HDMI(ARC) input the connected TV automatically powers on and off the soundbar using CEC when the TV turns on and off. On some TV brands, it should be configured to use ARC as audio output and/or use CEC to control the connected audio device's power state. Check your TV manual for recommended settings regarding ARC and CEC.

To trigger the Sound Bar to wake using the UNBALANCED (RCA) and BALANCED input, it needs to detect a signal on the inputs. The signal sense trigger level is not adjustable.

When the Sound Bar have powered on the activating input source will be kept as the active source for as long as there is a signal. When the signal is removed, the Sound Bar will be kept on for an additional 3 minutes before automatically powering off again. And the wake-on-signal function will start over again sensing for an active signal.

The volume level for Wake-on-signal will be last used volume. That means coming from the factory the Sound Bar will wake up at level 70 out of 100. If another volume level is needed for the specific application the volume should be adjusted by RS-232 command.

When the Sound Bar is powered off the Sound Bar will sense on the audio inputs for one second at a time in a circular manner. This means, that the time from activating the source until the Sound Bar starts the power on process can take up to 2 seconds. So, in order to power on the Sound Bar simply output a signal on one of the connected sources.

Equalizer presets

Three equalizer presets will provide enhanced listening experience for different use scenarios.

- Equalizer 1: Music. This setting has been optimized for best overall experience when listening to various types of music.
- Equalizer 2: Video Conference setting, default setting RS232. Will enhance the experience when using unified communication equipment with the Sound Bar.
- Equalizer 3: Present setting. Optimized for Presentations with a combination of videos and speech.

The presets can be selected using RS-232 commands or using the mode switch at the back of the sound bar.

Troubleshooting

Sound Bar not responding to RS-232 commands
Check your RS-232 cable is connected the right way. Try to swap Rx and Tx.

Sound Bar do not react to the RS-232 commands
Make sure that the "RS-232" mode is selected. See section "The mode select switch" on page 9.

Sound Bar not waking from signal in auto mode
Make sure mode switch on the back is in "Auto on/off" position. See section "The mode select switch" on page 9.
Turn up the volume on the connected device.

The sound is too low when using the Sound Bar in "Auto on/off" with RCA or Balanced
As default, the output level is set to 70 when starting up in Auto on/off. First: Adjust the volume, using the connected device, for increasing the output level. Second: For changing the default volume level, connect a Laptop to the USB Audio-in and adjust to your preferred default volume and disconnect the USB cable again. Volume setting will be remembered on next startup

The sound is too high when using the Sound Bar in "Auto On/off" with RCA or Balanced
As default, the output level is set to 70 when starting up in Auto on/off. First: Adjust the volume, using the connected device, for lowering the output level. Second: For changing the default volume level, connect a Laptop to the USB Audio-in and adjust to your preferred default volume and disconnect the USB cable again. Volume setting will be remembered on next startup

RS-232 protocol

Command structure

The Neets RS-232 protocol is structured in a special way, which is described here. The protocol consists of commands to control the Sound Bar and queries to request status from the Sound Bar.

Both commands and queries is a two-way data exchange where the command or query is sent to the Sound Bar. The Sound Bar responds with an acknowledge to a command and a value to a query.

Commands or queries send to the Sound Bar

Commands or queries to the Sound Bar is always structured the same way:

A header: "NEUNIT=1" all commands, queries and replies start with the header
The header and following command is delimited by a comma mark ","

Followed by the command: "POWER=ON"
A command can be changed to a query by replacing the string or number after the equal sign with a question mark "?"

And ending with a carriage return: "\CR"
Carriage return is commonly referred to as "CR". If you need to enter it in hexdecimal, the value is 0D and in decimal, it is 13

Replies from the Sound Bar

The Sound Bar will reply with an acknowledgement to a command to indicate that the command have been accepted
Reply on accepted command: NEUNIT=1,OK\CR

If a query is sent to the Sound Bar the reply will be equal to the query with the question mark replaced by the actual string or value matching the query:
Reply to a query: NEUNIT=1,POWER=ON\CR

If the Sound Bar detects an error in the command or query received, the Sound Bar will reply with the following reply indicating an error.
Reply on errors: NEUNIT=1,ERR\CR

If the Sound Bar is set to Auto On/off mode by switch on back panel and there is an incom- ing command, the Sound Bar will reply with the following indicating an error.
Reply when set in Auto On/off mode: NEUNIT=1,ERR_MODE_SWITCH_IN_AUTO\CR

⚠ All RS-232 communications is case sensitive.
It is possible to send multiple commands without time delay between commands by delimiting each command with the command ending \CR.

When adjusting any settings using RS-232 commands the changes will automatically be saved in the Sound Bar. The saved settings will be used as default values next time power is connected to the Sound Bar. This function could be used to change the volume in "Auto On/off" mode.

Global functions

In the global functions, all the functions allowed to adjust the basic functions of the Sound Bar is shown.

All commands start with "NEUNIT=1," followed by the command in <A>, the value after the equal sign must be replaced with the value in <X> or a question mark, all commands must end with a   \CR

Description	<A>	<X>	Default <X>	R/W
Power amplifier on and off	POWER=<X>	ON or OFF	OFF	R/W
Select audio input	INPUT=<X>	1 to 4	1	R/W
Increment or decrement output volume	VOL=<X>	INC or DEC		R/W
Set output volume to a specific value	VOL=<X>	0 to 100	70	R/W
Set maximum volume level of SB-2	MAXVOL=<X>	0 to 100	100	R/W
Mute audio output on or off	MUTE=<X>	ON or OFF	OFF	R/W
Request software version	SWVERSION=?		x.y.z	R

Example of use:

NEUNIT=1,POWER=ON\CR	<- Turn on the Sound Bar.
NEUNIT=1,POWER=OFF\CR	<- Turn off the Sound Bar.
NEUNIT=1,POWER=?\CR	<- Query the power status.
NEUNIT=1,INPUT=1\CR	<- Sets the audio input to input 1 (UNBALANCED).
NEUNIT=1,INPUT=2\CR	<- Sets the audio input to input 2 (BALANCED).
NEUNIT=1,INPUT=3\CR	<- Sets the audio input to input 3 (HDMI ARC).
NEUNIT=1,INPUT=?\CR	<- Query the selected audio input.
NEUNIT=1,VOL=INC\CR	<- Increments the master volume one step.
NEUNIT=1,VOL=DEC\CR	<- Decrements the master volume one step.
NEUNIT=1,VOL=DEC\CR	<- Decrements the master volume one step.
NEUNIT=1,VOL=23\CR	<- Sets the master volume to 23.
NEUNIT=1,VOL=?\CR	<- Query the current master volume level.
NEUNIT=1,MAXVOL=50\CR	<- Sets the maximum volume to 50.
NEUNIT=1,MAXVOL=?\CR	<- Query the current maximum volume level.
NEUNIT=1,MUTE=ON\CR	<- Mute audio output.
NEUNIT=1,MUTE=OFF\CR	<- Unmute audio output.
NEUNIT=1,MUTE=?\CR	<- Query the audio output mute state.

Audio input settings

Audio input settings are used to adjust settings for Wake-on-signal settings.

All commands start with: NEUNIT=1,SETTINGS=INPUT, followed by the command in <A>, the value after the equal sign must be replaced with the value in <X> or a question mark, all commands must end with a \CR.

Description	<A>	<X>	Default <X>	R/W
Set wake-on-signal function on or off. This applies for all inputs	WOS=<X>	ON or OFF	OFF	R/W

Example of use:

NEUNIT=1,SETTINGS=INPUT,WOS=ON\CR	<- Set wake-on-signal function on.
NEUNIT=1,SETTINGS=INPUT,WOS=OFF\CR	<- Set wake-on-signal function off.
NEUNIT=1,SETTINGS=INPUT,WOS=?\CR	<- Query the wake-on-signal setting.

Audio output settings

Audio output settings adjust Sound Bar equalizer output parameters.

All commands start with: NEUNIT=1,SETTINGS=OUTPUT, followed by the command in <A>, the value after the equal sign must be replaced with the value in <X> or a question mark, all commands must end with a \CR

Description	<A>	<X>	Default <X>	R/W
Select equalizer preset	EQ=<X>	1 – 3	1	R/W

Example of use:

NEUNIT=1,SETTINGS=OUTPUT,EQ=1\CR	<- Select equalizer preset 1.
NEUNIT=1,SETTINGS=OUTPUT,EQ=2\CR	<- Select equalizer preset 2.
NEUNIT=1,SETTINGS=OUTPUT,EQ=3\CR	<- Select equalizer preset 3.
NEUNIT=1,SETTINGS=OUTPUT,EQ=?\CR	<- Query the equalizer preset.