



## Network input panel - USB Type-C + BT (4 CH)

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## NWP400 Commands List

## ASCII Commands (NWP400 1.0.2)

This is the list of ASCII Commands supported by this device. An ASCII command always follows the same structure:

```
#|Destination|Source|Type^Target^Command|Arguments|CRC|CRLF
```

This format uses 3 separator characters for different levels of separating each value in the message:

- Message separator '|':  
This separates a message into 7 blocks (if you include the start '#' and end <CRLF>)
- Block separator '^':  
This splits a block into logical elements. This is used to split the command in the message type, 'command' and 'target'
- Value separator '>':  
This splits up a logical single value in their primitives, for example: a target consists of a channel type and a channel index, split by '>'

Messages are Case sensitive, if the example shows the text in uppercase, this should always be uppercase!

## Destination

The target device. This consists of 2 parts: **Device>Address**.

## Device

This is the device type: **NWP400**

## Address

This is the user-configurable device address, default: **1**. You can also leave this field blank; this causes all NWP320 devices that receive this command to respond.

| Examples                        | Destination        |
|---------------------------------|--------------------|
| default destination             | <b>NWP400&gt;1</b> |
| broadcast to all Nwp400 devices | <b>NWP400</b>      |

## Device Matching

If the device type or address does not match, the message will be ignored. Device Address 0 is a special address and will always match (this can be seen as a broadcast)

| Destination        | Device address: <b>NWP400&gt;2</b> | Remarks                                   |
|--------------------|------------------------------------|---|
| <b>NWP400&gt;2</b> | Destination Matches Device         | this is an exact match                    |
| <b>NWP400&gt;1</b> | Message ignored                    | the destination address does not match    |
| <b>NWP400</b>      | Destination Matches Device         | the destination address will always match |
| <b>NWP400&gt;0</b> | Destination Matches Device         | Equivalent to <b>NWP400</b>               |
| <b>CLIENT&gt;2</b> | Message ignored                    | the device type does not match            |
| <b>CLIENT</b>      | Message ignored                    | the device type does not match            |

## Source (optional)

The source address is optional when sending, but the device will always fill this field with its own address.

| Examples                                    | sent message                   | response message <b>NWP400&gt;2</b> |
|---|--------------------------------|-------------------------------------|
| broadcast to a Nwp400                       | # NWP400   ... <CRLF>          | #   NWP400>2   ... <CRLF>           |
| send to a specific Nwp400                   | # NWP400>2   ... <CRLF>        | #   NWP400>2   ... <CRLF>           |
| use a source address in the request message | # NWP400 CLIENT>1   ... <CRLF> | # CLIENT>1 NWP400>2   ... <CRLF>    |

## Type

The type explains what the message wants to do. There are 3 supported message types:

| Type    | From   | To     | Explanation   |
|---------|--------|--------|---|
| SET_REQ | CLIENT | Nwp400 | Change a setting in the Nwp400                                    |
| GET_REQ | CLIENT | Nwp400 | Request the current status of a setting in the Nwp400             |
| GET_RSP | Nwp400 | CLIENT | Response to either a GET_REQ or SET_REQ, if the request was valid |

## Command, Target, Arguments

These 3 parameters are explained together because they influence each other. The command dictates the meaning of the argument, while the target distinguishes which exact setting you want to change. the target can also influence the valid range of the argument.

Some commands (like the mixer) can have a range of arguments (for the mixer: all mixer volumes are individual arguments). In this case, the argument looks like `idx>val1[^idx2>val2]`, where the part in between the brackets `[ ]` can appear 0 or more times.

- idx, idx2, ...: the argument index
- val, val2, ...: the value at the specified index

## VOLUME

Set a single Volume in dB

### Argument (volume)

the requested Volume in dB

| Target                     | Argument         | Example (default value)   |
|----------------------------|------------------|---|
| INPUT_BLUETOOTH>1>VOLUME>1 | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_BLUETOOTH>1>VOLUME>1^VOLUME 0 U <CRLF> |
| INPUT_BLUETOOTH>2>VOLUME>1 | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_BLUETOOTH>2>VOLUME>1^VOLUME 0 U <CRLF> |
| INPUT_USB>1>VOLUME>1       | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_USB>1>VOLUME>1^VOLUME 0 U <CRLF>       |
| INPUT_USB>2>VOLUME>1       | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_USB>2>VOLUME>1^VOLUME 0 U <CRLF>       |
| INPUT_DANTE>1>VOLUME>1     | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_DANTE>1>VOLUME>1^VOLUME 0 U <CRLF>     |
| INPUT_DANTE>2>VOLUME>1     | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_DANTE>2>VOLUME>1^VOLUME 0 U <CRLF>     |
| INPUT_DANTE>3>VOLUME>1     | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_DANTE>3>VOLUME>1^VOLUME 0 U <CRLF>     |
| INPUT_DANTE>4>VOLUME>1     | min: -90, max: 0 | # NWP400>1   SET_REQ^INPUT_DANTE>4>VOLUME>1^VOLUME 0 U <CRLF>     |
| OUTPUT_DANTE>1>VOLUME>1    | min: -90, max: 0 | # NWP400>1   SET_REQ^OUTPUT_DANTE>1>VOLUME>1^VOLUME 0 U <CRLF>    |
| OUTPUT_DANTE>2>VOLUME>1    | min: -90, max: 0 | # NWP400>1   SET_REQ^OUTPUT_DANTE>2>VOLUME>1^VOLUME 0 U <CRLF>    |
| OUTPUT_DANTE>3>VOLUME>1    | min: -90, max: 0 | # NWP400>1   SET_REQ^OUTPUT_DANTE>3>VOLUME>1^VOLUME 0 U <CRLF>    |
| OUTPUT_DANTE>4>VOLUME>1    | min: -90, max: 0 | # NWP400>1   SET_REQ^OUTPUT_DANTE>4>VOLUME>1^VOLUME 0 U <CRLF>    |

## MUTE

mute an audio channel

### Argument (enabled)

is the audio channel muted

| Target                     | Argument            | Example (default value)  |
|----------------------------|---------------------|--|
| INPUT_BLUETOOTH>1>VOLUME>1 | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_BLUETOOTH>1>VOLUME>1^MUTE FALSE U <CRLF> |
| INPUT_BLUETOOTH>2>VOLUME>1 | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_BLUETOOTH>2>VOLUME>1^MUTE FALSE U <CRLF> |
| INPUT_USB>1>VOLUME>1       | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_USB>1>VOLUME>1^MUTE FALSE U <CRLF>       |
| INPUT_USB>2>VOLUME>1       | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_USB>2>VOLUME>1^MUTE FALSE U <CRLF>       |
| INPUT_DANTE>1>VOLUME>1     | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_DANTE>1>VOLUME>1^MUTE FALSE U <CRLF>     |
| INPUT_DANTE>2>VOLUME>1     | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_DANTE>2>VOLUME>1^MUTE FALSE U <CRLF>     |
| INPUT_DANTE>3>VOLUME>1     | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_DANTE>3>VOLUME>1^MUTE FALSE U <CRLF>     |
| INPUT_DANTE>4>VOLUME>1     | options: TRUE,FALSE | # NWP400>1  SET_REQ^INPUT_DANTE>4>VOLUME>1^MUTE FALSE U <CRLF>     |
| OUTPUT_DANTE>1>VOLUME>1    | options: TRUE,FALSE | # NWP400>1  SET_REQ^OUTPUT_DANTE>1>VOLUME>1^MUTE FALSE U <CRLF>    |
| OUTPUT_DANTE>2>VOLUME>1    | options: TRUE,FALSE | # NWP400>1  SET_REQ^OUTPUT_DANTE>2>VOLUME>1^MUTE FALSE U <CRLF>    |
| OUTPUT_DANTE>3>VOLUME>1    | options: TRUE,FALSE | # NWP400>1  SET_REQ^OUTPUT_DANTE>3>VOLUME>1^MUTE FALSE U <CRLF>    |
| OUTPUT_DANTE>4>VOLUME>1    | options: TRUE,FALSE | # NWP400>1  SET_REQ^OUTPUT_DANTE>4>VOLUME>1^MUTE FALSE U <CRLF>    |

## MIXER

mixer slider for zones

### Argument (volume)

mixing volume

| Target                 | Argument index     | Argument            | Example (default value)   |
|------------------------|--------------------|---------------------|---|
| OUTPUT_DANTE>1>MIXER>1 | min: 1,<br>max: 12 | min: -90,<br>max: 0 | # NWP400>1  SET_REQ^OUTPUT_DANTE>1>MIXER>1^MIXER 1>-90^2>-90^3>-90^4>-90^5>-90^6>-90^7><br><CRLF> |
| OUTPUT_DANTE>2>MIXER>1 | min: 1,<br>max: 12 | min: -90,<br>max: 0 | # NWP400>1  SET_REQ^OUTPUT_DANTE>2>MIXER>1^MIXER 1>-90^2>-90^3>-90^4>-90^5>-90^6>-90^7><br><CRLF> |
| OUTPUT_DANTE>3>MIXER>1 | min: 1,<br>max: 12 | min: -90,<br>max: 0 | # NWP400>1  SET_REQ^OUTPUT_DANTE>3>MIXER>1^MIXER 1>-90^2>-90^3>-90^4>-90^5>0^6>-90^7>-9<br><CRLF> |
| OUTPUT_DANTE>4>MIXER>1 | min: 1,<br>max: 12 | min: -90,<br>max: 0 | # NWP400>1  SET_REQ^OUTPUT_DANTE>4>MIXER>1^MIXER 1>-90^2>-90^3>-90^4>-90^5>-90^6>0^7>-9<br><CRLF> |

## CRC

The CRC block is calculated over the message starting from and including the first pipe "|", up to and including the last pipe **before** the CRC Block. These CRC's can ensure message integrity if desired.

| CRC Type  | Configuration   | Format | Example  | notes            |
|-----------|---|--------|--|------------------|
| None      | /   | U      | # NWP400>1  SET_REQ^INPUT_BLUETOOTH>1>VOLUME>1^VOLUME 0 U <CRLF> | 'U' means unused |
| CRC16-ARC | <ul style="list-style-type: none"> <li>input reflected</li> <li>output reflected</li> <li>polynomial: 0x8005</li> <li>initial value: 0x0000</li> <li>final exor: 0x0000</li> </ul>            | XXXX   | # ALL  SET_REQ^INPUT_LINE>1^VOLUME 0 C06C <CRLF>                 | calculator       |
| CRC32     | <ul style="list-style-type: none"> <li>input reflected</li> <li>output reflected</li> <li>polynomial: 0x4C11DB7</li> <li>initial value: 0xFFFFFFFF</li> <li>final exor: 0xFFFFFFFF</li> </ul> | XXXX   | # ALL  SET_REQ^INPUT_LINE>1^VOLUME 0 D887125C <CRLF>             | calculator       |

The examples in the table above are examples for calculating the CRC, they may not be a valid command for the NWP400

The CRC can ensure data integrity across unreliable data channels (RS232, RS485), but they are by no means a security measure! If someone has the knowledge and means to maliciously alter a message, correcting the CRC becomes trivial for the attacker. We support different kinds of CRC for maximum flexibility, but we recommend not using any so you do not get a false sense of security.

## Stop bytes

The final 2 characters are denoted as <CRLF>, they mean "Carriage Return, Line Feed" or simply put a new line. Depending on the tool used to create the command, you can have different representations:

- CRLF
- \r\n
- 0x0D 0x0A

We support both CRLF and LF only