

# ZEN NDI Router Protocol

Using blocks with a typical length of 8+2 ASCII characters, in the form

**ABxNNxNN**␣, where A & B = text characters, NN = decimal number (with leading zero), x = don't care (often blank), ␣ = Return/Linefeed (= CR + LF, i.e. hex 0d + 0a)

Router Outputs are represented by decimal numbers, even though they are shown as letters in the Router GUI, so A = 1, B = 2, etc.

## Commands/Requests accepted by the TCP server (e.g. port 9779)

**AB xx yy**␣      *Used to perform "AB" switching between two outputs on the router <v1.41>*

AB Switch Command affecting the sources on router outputs xx & yy (where 1=A, 2=B, etc)

e.g. If Input 5 was routed to Output C, and Input 7 was routed to Output F, then a command string of **AB 03 06** would result in Input 7 being routed to Output C, and Input 5 to Output F.

A command of **AB 00 00** will switch the inputs on the A & B outputs.

No response (except for ACK).

**BR xx yy**␣      *Used to request the "base name" used for a router's NDI outputs <v1.4>*

Base-name Request, xx & yy = don't care (for the request).

Response in the form BN XX YY Text␣, XX = Router number, YY = number of characters in the following Text string which contains the "base name" used for the NDI outputs. (e.g. "RouterOut")

**CR xx yy**␣      *Used to request the I/O config of a router*

Config Request, xx & yy = don't care (for the request). Response in the form CR XX YY␣ where XX = total inputs, YY = total outputs. E.g. CR 16x08␣ for a 16-input, 8-output configuration.

**DD xx yy**␣      *Used to request a "data dump" of multiple parameters*

Data Dump Request, xx & yy = don't care (for the request). This is equivalent to sending the following requests:

CR 00 00␣ (Config Request)

RN 00 00␣ (Router Number) <v1.4>

IV 00 00␣ (Validate Inputs)

IN 00 00␣ (get Input Names)

OR 00 00␣ (request Output Status)

PV 00 00␣ (Validate Presets)

PR 00 00␣ (Request current Preset)

ON 00 00␣ (get Output Names) <v1.4>

**IN XX YY** *Used to obtain the names of the NDI sources used by the input channels*

Input Name, XX = input number, YY = Option Code, 0 = full name (network name & device name), 1 = network name, 2 = device name

Response in the form IV XX YY Text, XX = input number (See Note below), YY = number of characters in the following Text string

**NOTE:-** XX is a decimal version of a 7-bit number, where the lower 5 bits indicate the input number, and the 2 highest bits the Option. If the requested Option is zero, then the inputs in the response will be numbered as normal, from 1 upwards. For Option 1, the return values of XX will be numbered from 33, and for Option 2 they will be numbered from 65

e.g. A response of IN 03 14 MSI (image 01) = NDI source "MSI (Image 01)" on Input 3, response of IN 37 03 MSI = NDI source with network name "MSI" on Input 4

A request with a zero input number (XX = 0) would return a list of all inputs (with the Option specified in YY)

**IV XX yy** *Used to validate input channels that are connected to NDI sources*

Input Validate, XX = input number, yy = don't care (for the request)

Response in the form IV XX YY, XX = input number, YY = 1 for NDI source connected, 0 for no source  
e.g. response of IV 03 01 = valid NDI source on Input 3, IV 04 00 = no NDI source for Input 4

A request with a zero input number (XX = 0) would return a list of all inputs

**ON XX YY** *Used to obtain the output channel names (if not using the "basename") <v1.41>*

Output Name, XX = output number (1 = A, 2 = B, etc), YY = don't care

Response in the form ON XX YY Text, XX = output number, YY = number of characters in the following Text string

A request with a zero input number (XX = 0) would return a list of all output names (as multiple ON XX YY Text responses)

**OR XX yy** *Used to obtain the status of one (or all) outputs*

Output Request, XX = output number (from 1 to max outputs), YY = don't care

e.g. OR 03\*\*\* requests the output status of Output 3. The response will be in the form as above,  
e.g. OS 03 05 for Input 5 routed to Output 3

A request with a zero output number (i.e. XX = 0) would return a status list of all outputs

e.g. OR 00\*\*\*, for a config with 4x Outputs, might return

OS 01 06

OS 02 03

OS 03 00 (no input routed)

OS 04 01

**OS XX YY<sup>d</sup>**      *Used to switch output routing assignments*

Output Set, XX = output number (from 1 to max outputs), YY = input number (1 to max inputs)

e.g. OS 04 10<sup>d</sup> requests that Output 4 uses Input 10. If successful, the same string will be returned, or else the returned string will show which input is being used by that output.

A response of OS 04 05<sup>d</sup> would indicate that there was no NDI source connected to Input 10, and that Input 5 was the last selected.

A response of OS 04 00<sup>d</sup> would indicate that no input is currently routed to Output 4.

**PC xx yy<sup>d</sup>**      *Used to create or change the configuration of a Preset <v1.52>*

Preset Change request, xx = Preset number, yy = don't care (for the request).

Response in the form PC XX YY Text<sup>d</sup>, XX = Preset number, YY = 1 if successful or 0 if no valid routing data is currently available (which would result in a meaningless Preset). Also generates a "PS" response when successful to indicate that this preset is now active/selected.

**PN xx yy<sup>d</sup>**      *Used to obtain the name assigned to the specified Preset <v1.4>*

Preset Name request, xx = Preset number, yy = don't care (for the request).

Response in the form PN XX YY Text<sup>d</sup>, XX = Preset number, YY = number of characters in the following Text string which contains the name assigned to the preset.

**PS XX yy<sup>d</sup>**      *Used to select a Preset routing configuration for one or more outputs*

PreSet, XX = Preset number, yy = don't care (for the request)

Response in the form PS XX YY<sup>d</sup> where XX = currently selected Preset (or 00 if no Preset is active). If a PreSet has no associated data, then the response will be the currently selected Preset, if any are active. YY = 1 if current routing exactly matches the stored Preset (*GUI button red*), or 0 if one or more of the outputs have been changed from the values in the stored Preset (*GUI button amber*).

**PR xx yy<sup>d</sup>**      *Used to request whether any Presets are currently active/selected*

Preset Request, xx = don't care, yy = don't care (for the request)

Response in the form PS XX YY<sup>d</sup> where XX = currently selected Preset (or 00 if no Preset is active). YY = 1 if current routing exactly matches the stored Preset (*GUI button red*), or 0 if one or more of the outputs have been changed from the values in the stored Preset (*GUI button amber*).

**PV XX yy** *Used to validate Presets to check whether they have associated routing data*

Preset Validate, XX = Preset number, yy = don't care

Response in the form PV XX YY where XX = Preset number, YY = 1 (or a non-zero value) for valid data (GUI button coloured), 0 if no data (GUI button grey, with no colour)

A request with a zero input number (XX = 0) would return a list of all Presets

e.g. PV 00\*\*\*, for a config with 6x Inputs, might return

PV 01 01 (valid data - can be selected)

PV 02 01

PV 03 01

PV 04 00 (cannot be selected – no data)

PV 05 00

PV 06 00

**RN xx yy** *Used to request the Router Number where multiple router instances are running on the same PC (e.g. 1, 2, 3, etc) <v1.4>*

Router Number request, xx & yy = don't care (for the request).

Response in the form RN XX YY, XX = Router number, YY = 1 (for a Router).

**Note:** *Some of these Requests/Responses are only supported in later versions of the Router application (e.g. tagged <v1.4>)*