## Application Note

# Remote control of HMB|TEC DMX Ethernet Controller using MXE Matrix Mix Engine's Active HTTP API and the OMNEO Dante OCA network interface

MXE Matrix Mix Engines are equipped with an OMNEO Dante OCA network interface for connecting to other systems, using CAT cables and Ethernet network switches.

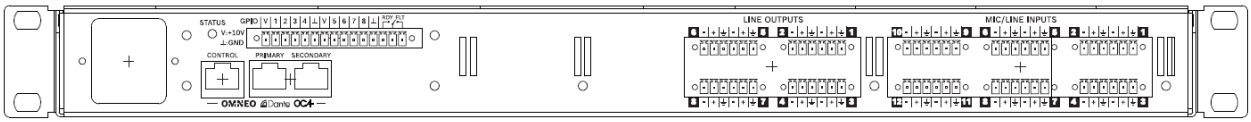


**Image 1:** MXE rear view

The network interface (*OMNEO Dante OCA*) can be found on the MXE's rear panel. It offers in total three network ports: *CONTROL*, *PRIMARY* and *SECONDARY*.

The three network ports can be configured via SONICUE to run either in Transparent, RSTP or Glitch-Free mode.

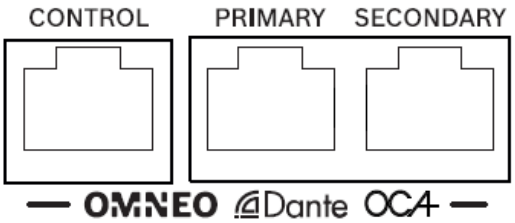


**Image 2:** MXE network interface detail view

### Requirements for using MXE Task Engine:

MXE Matrix Mix Engine with firmware version 1.4.3119 (or higher)

SONICUE Sound System Software 1.3.0 (or higher) installed on computer

### Documentation (recommended in addition to this application note)

A detailed description of all features and functions of the products mentioned in this application note can be found on the manufacturer's websites and in the HMB|TEC DMX Ethernet Controller device manual.

# 1. HMB|TEC DMX Ethernet Controller (third party)

## Product images

**Image 3:** HMB|TEC DMX Ethernet Controller bottom/rear view (left) and top/front view (right)

## Applications

HMB|TEC's DMX Ethernet Controller offers the following applications with MXE.

- Control DMX devices such as lamps, moving heads, spots, effects, light bars, etc.
  - switch DMX channels (color, brightness, flash, etc.) on/off (0, 255)
  - set single or multiple DMX channels to a certain value (0…255)

## Installation

The HMB|TEC DMX Ethernet Controller can be plugged-in directly at a DMX device with 3-pole XLR connection. In addition, a USB power supply needs to be connected.

## Variants

The XLR 3-pole (blue) version is standard.

An XLR 5-pole (black) version is available from HMB|TEC on request.

## Connections

The DMX Ethernet Controller has only three physical connections:

- Ethernet (RJ45)
- DMX (XLR 3-pole or 5-pole)
- USB for power

In addition, there's a built in Wi-Fi interface that can be used as an alternative to Ethernet.

## Basic set up – network connection

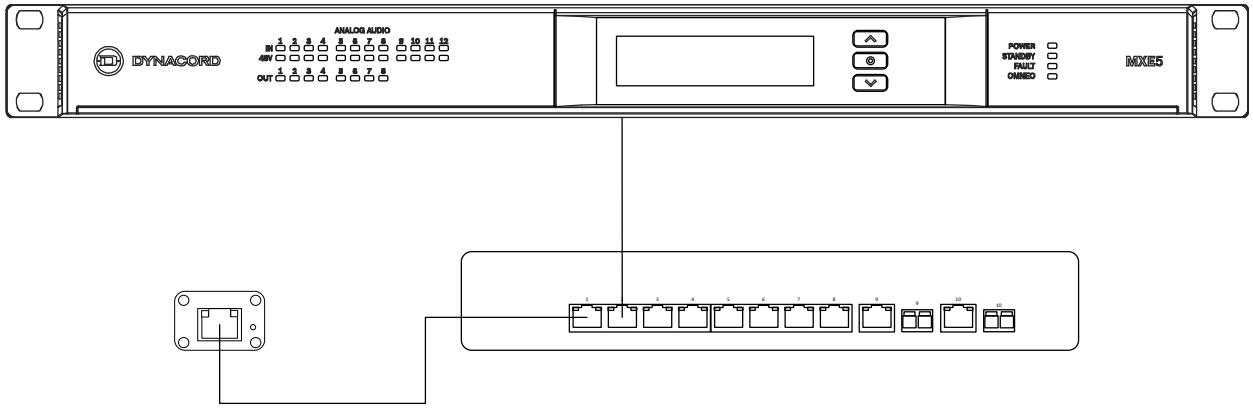


**Image 4:** HMB|TEC DMX Ethernet Controller connection to Dynacord MXE via Ethernet network switch

## 2. HMB|TEC DMX Ethernet Controller web interface

The HMB|TEC DMX Ethernet Controller's web interface is a very helpful tool to support testing of any programming made for the HTTP interface.

The network settings (*NETWORK-IP*) are made in the upper section of the web interface.

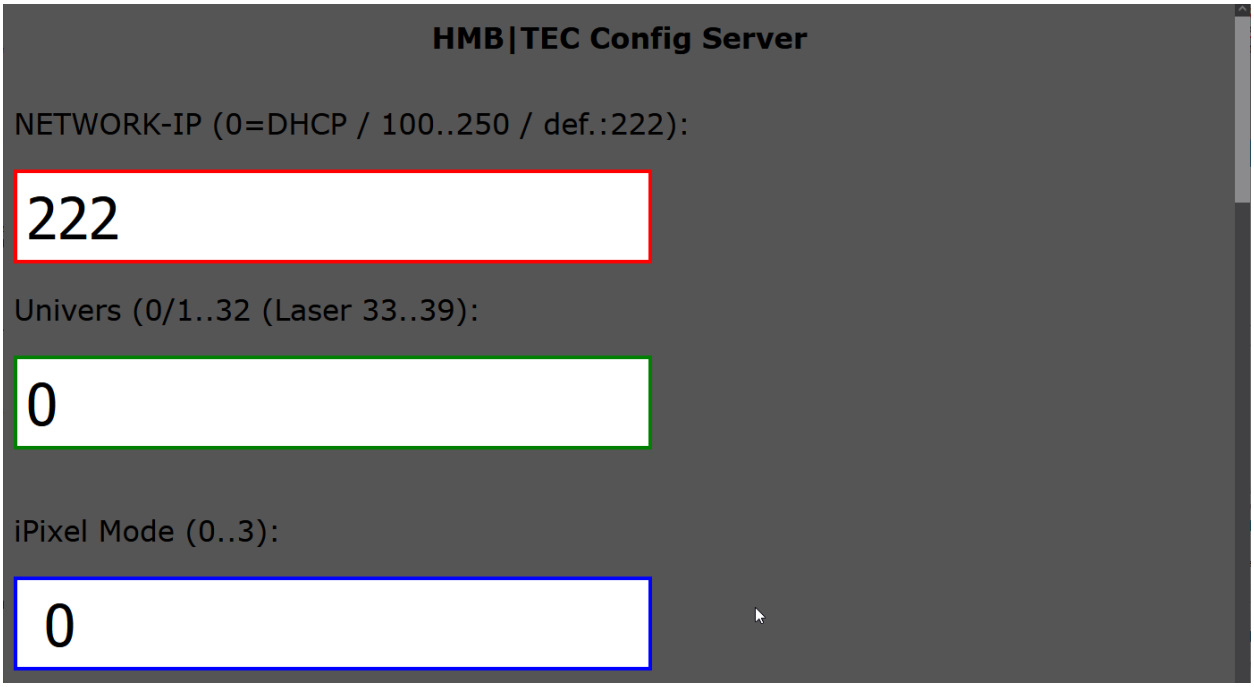


**Image 5:** HMB|TEC DMX Ethernet Controller web interface – upper section

With current device firmware it's necessary to use a DHCP server or as alternative - the Broadcast address.

If a DHCP server is present, there are two options:

- *NETWORK-IP* "0": all four octets of the IP address are set by the DHCP server.

- *NETWORK-IP* "100…250": the last octet of the IP address will be fixed
  The value entered here by default is "222", which means that if for example the gateway IP address is 192.168.178.1 (Home network with a Fritzbox), the DHCP server will assign the network ID 192.168.178 and the converter will add the last octet 222 as host ID. The IP address will then be 192.168.178.222 (as used in the example).

- *NETWORK-IP* "255": this is the broadcast address inside the network, in our example 192.168.178.255. In order to differentiate between multiple converters, the DMX *Univers* needs to be entered in addition. **As there's no option in MXE Logic to define a DMX universe, this option is only relevant if the DMX converter is operated via dedicated DMX control apps and has NOT been tested.** See device manual for further details concerning this mode.

For a simple function check, the following three basic settings can be made very quickly in the middle section = *DMX Control Tool* of the web interface:

- *set ALL Chan OFF (0)*
- *set ALL Chan ON (255)*
- *set ALL Chan RANDOM*

For those who are not familiar with the DMX protocol yet:

- setting a channel to “0” means 0% = off (minimum value)
- setting a channel to “255” means 100% = fully on (maximum value)


**Image 6:** HMB|TEC DMX Ethernet Controller web interface – middle section *DMX Control Tool*

For a detailed function check and testing, the *UNIVERSAL DMX Control Panel* can be used:

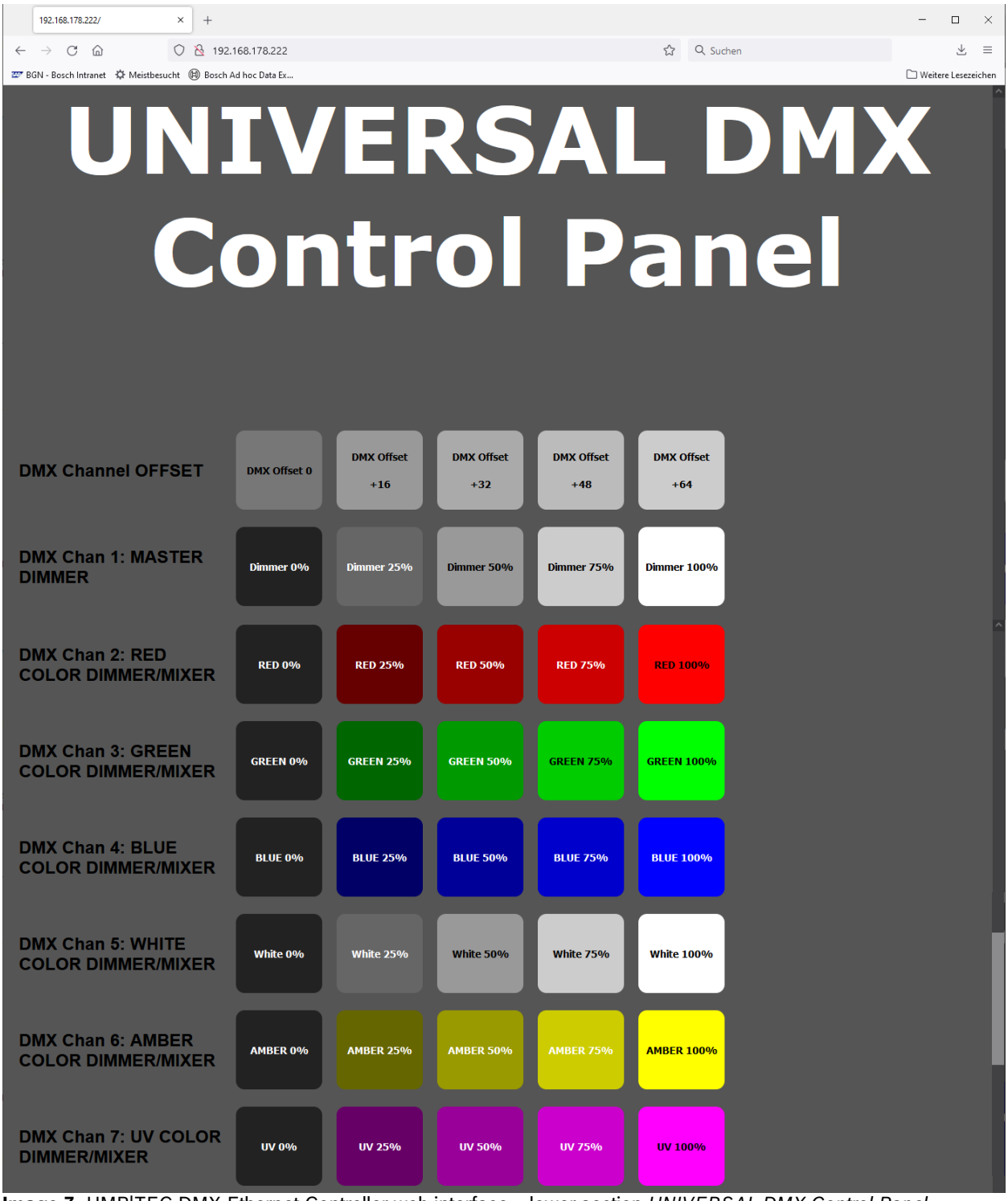


**Image 7:** HMB|TEC DMX Ethernet Controller web interface – lower section *UNIVERSAL DMX Control Panel*

**Important hint: the channel mapping may be different on various DMX controlled devices.**

**Always check channel mapping of the device you want to control first (see device manual)!**

# 3. HMB|TEC DMX Ethernet Controller HTTP commands

The HMB|TEC DMX Ethernet Controller's HTTP interface serves as a simple and easy to integrate interface to other systems.

The HTTP interface allows for sending commands to single DMX channels, and (theoretically) also multiple DMX channels at once.

Here's an overview of the supported commands (translated form the HMB|TEC website and adopted to the example IP address 192.168.178.222):

- /on switches all 512 DMX channels to a data value of 255 (e.g., „192.168.178.222/on“)
- /off switches all 512 DMX channels to a data value of 0 (e.g., „192.168.178.222/off“)
- /dim?on switches one DMX channel to a data value of 255 (e.g., 192.168.178.222/dim?on“)
- /dim?off switches one DMX channel to a data value of 0 (e.g., 192.168.178.222/dim?off“)
- /dmx?chan=N&value=VAL switches one DMX channel between 1 and 512 to a certain data value between 0 and 255 (e.g., „192.168.178.222/dmx?chan=3&value=128“ switches the DMX channel 3 to a data value of 128)
- /dmxrange?chan1=N&chan2=M&value=VAL switches a range of DMX channels between 1 and 512 to a certain data value between 0 and 255 (e.g., „192.168.178.222/dmx?chan1=1&chan2=16value=100“ switches the DMX channels 1 to 16 to a data value of 100)

For testing only single channels commands were used.

# 4. MXE Task Engine with active HTTP API

MXE Task Engine offers *HTTP Protocol* blocks for actively sending HTTP GET and POST requests to control 3rd party products or systems with HTTP control protocol.

## 4.1. MXE Task Engine configuration for controlling DMX channels via 3rd party HMB|TEC DMX Ethernet converter using http commands.

Hint: When online with the MXE Matrix, the Task Engine shows the status of logic or analog values on the connecting lines between blocks (screenshot: true/false or analog value).

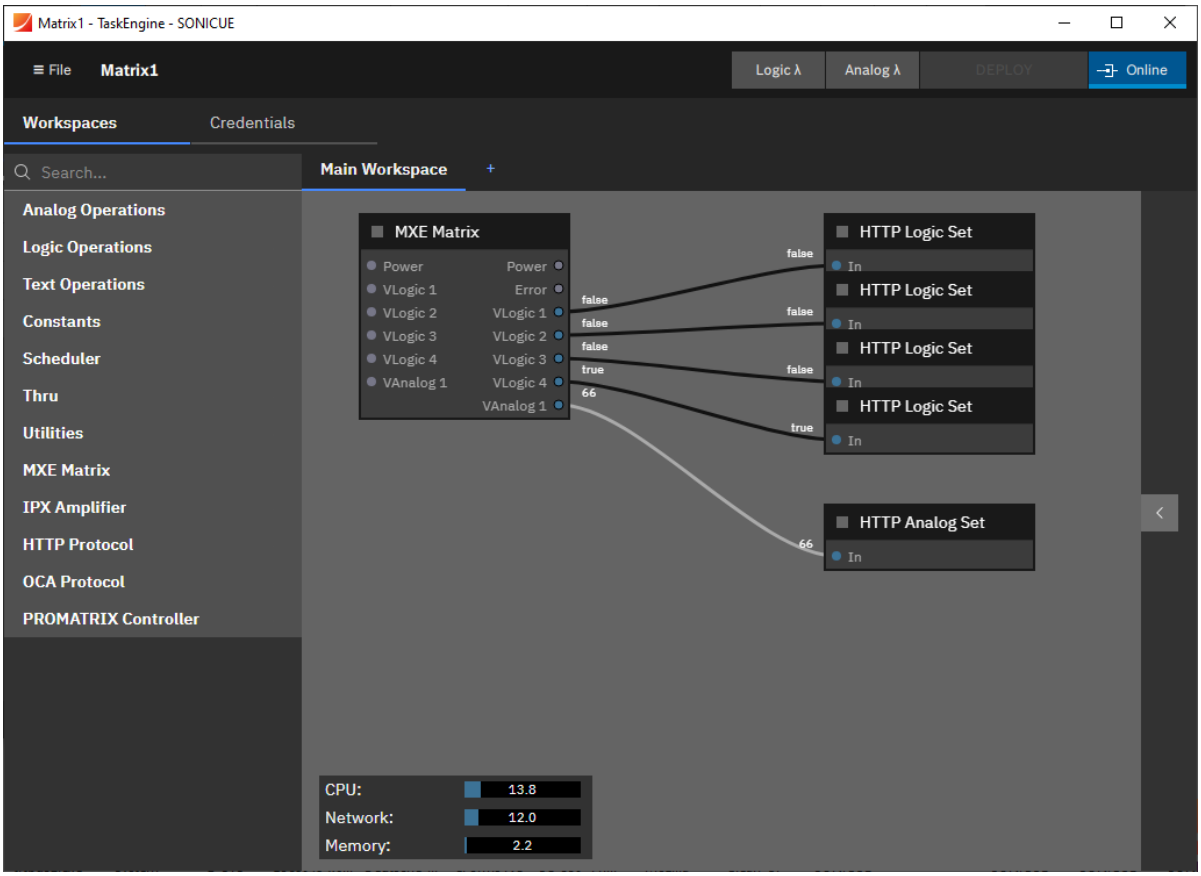


**Image 8:** MXE Task Engine configuration for controlling DMX channels via HMB|TEC DMX Ethernet converter

Hint: After creating a new or modifying an existing Task Engine configuration, don't forget to click the *DEPLOY* button when *Online* with the system!

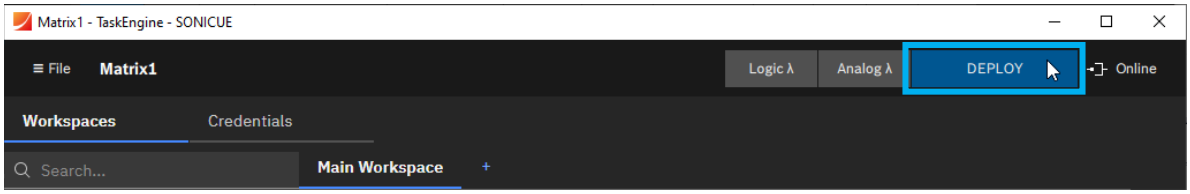


**Image 9:** MXE Task Engine *DEPLOY* button

4.2. MXE Task Engine *MXE Matrix* block configuration for using Virtual Logic and Virtual Analog values as interfaces.

The *MXE Matrix* block, added from the *MXE Matrix* menu, can be modified by selecting it, and then clicking the arrow button on the right-hand side of the worksheet.

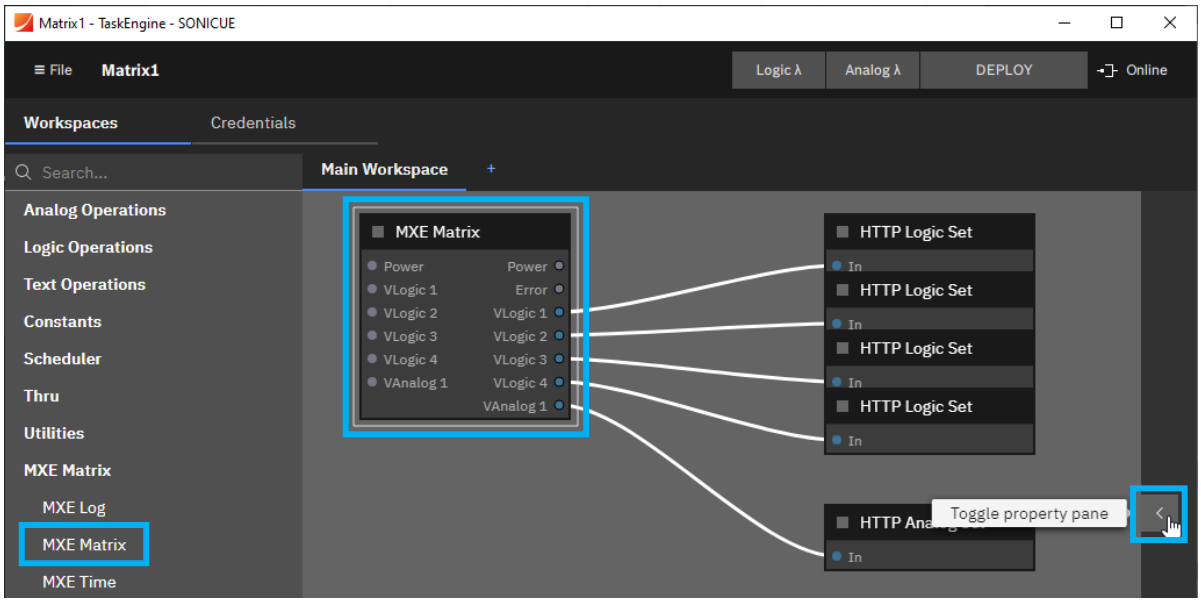


**Image 10:** MXE Task Engine *MXE Matrix* block, added from the *MXE Matrix* menu

The *VLogic 1-4* and *VAnalog 1* connectors on the *MXE Matrix* block are configured by selecting *Visible Virtual Logics 1-4* and *Visible Virtual Analog 1* in the drop-down menus.

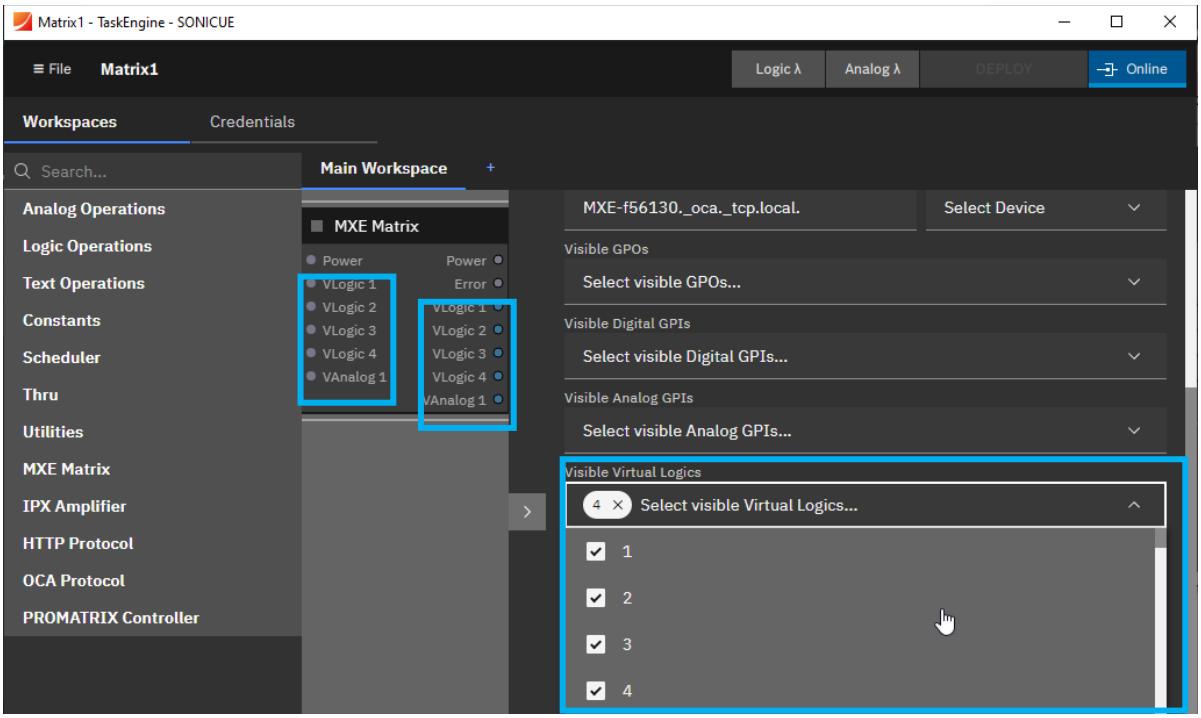


**Image 11:** MXE Task Engine *MXE Matrix* block configuration with *Visible Virtual Logics 1-4* and Virtual Analog 1

It's important to select the *Device* with the *Select Device* drop-down menu (therefore the Devices must be visible on network!).

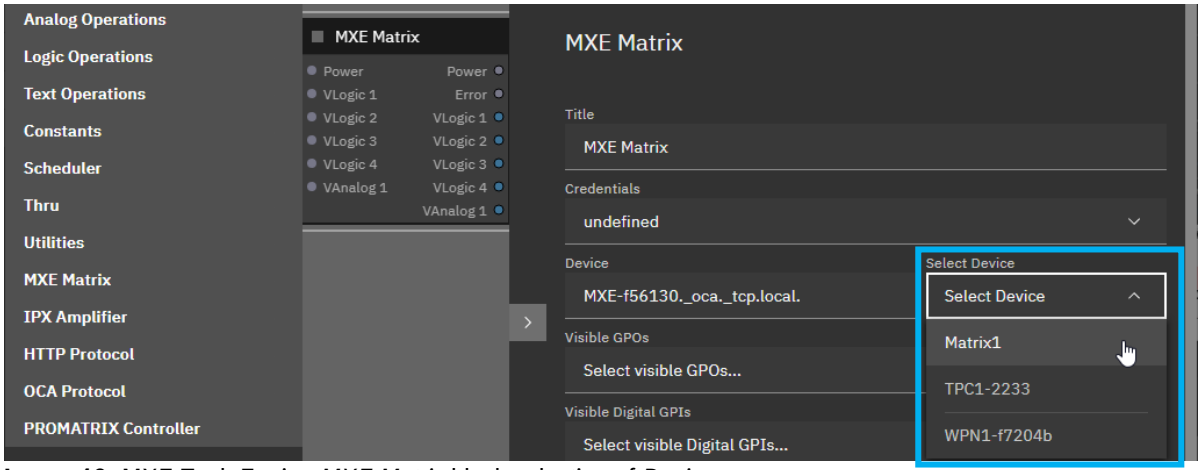


**Image 12:** MXE Task Engine *MXE Matrix* block selection of *Device*

## 4.3. MXE Task Engine *HTTP Logic Set* blocks added from the *HTTP Protocol* menu

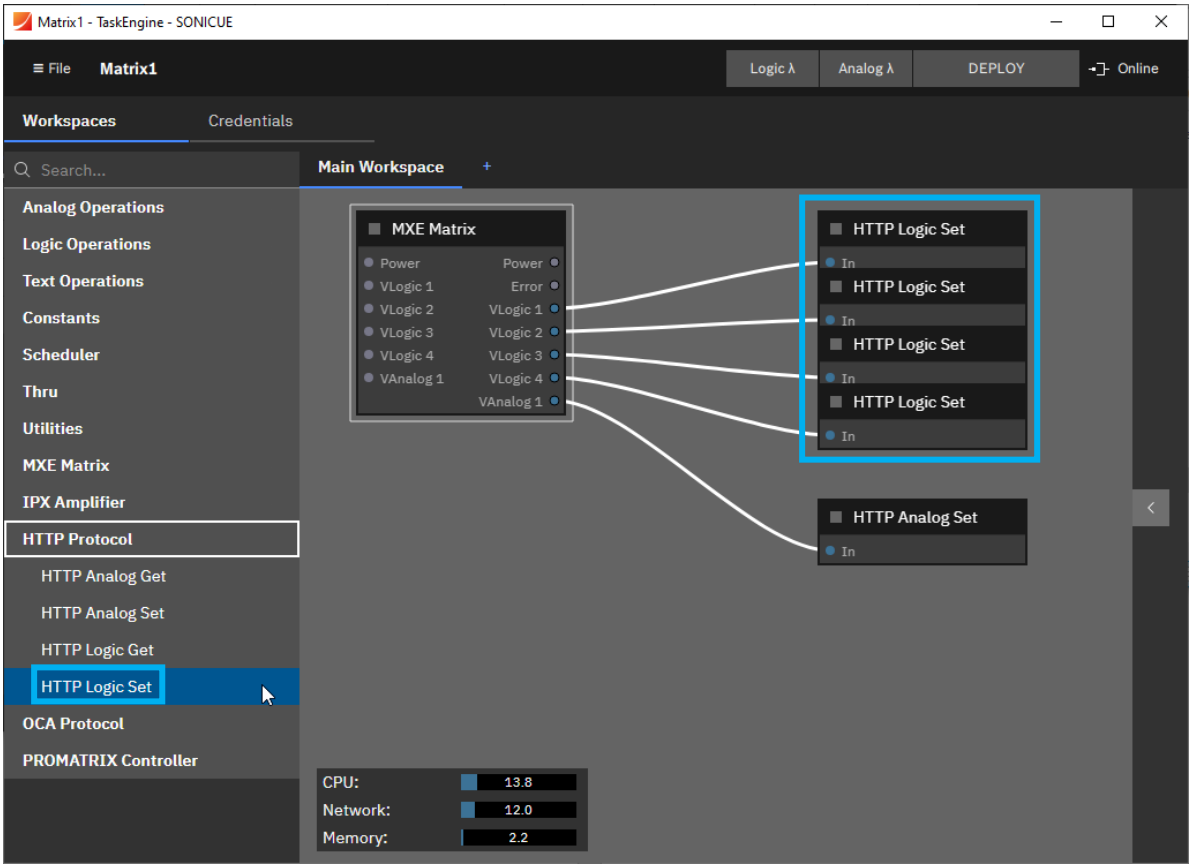


**Image 13:** MXE Task Engine *HTTP Logic Set* blocks, added from the *HTTP Protocol* menu

The HTTP Logic Set blocks need to be configured with the following information:

- *Title* optional, should be edited for better overview
- *Protocol* HTTP or HTTPS (S = secure)
- *Host* IP address of the device to be controlled
- *Port* standard = 80 for HTTP, 443 for HTTPS
- *Basic Auth Credentials* optional, to be used if the device to be controlled requires a login
- *Method* GET or POST, depending on implementation
- *URL* command to be sent to the device to be controlled
- *Body* optional, only necessary for method POST
- *If input reads true, ...* value sent if input reads true, replaces %value% in URL or Body
- *If input reads false, ...* value sent if input reads false, replaces %value% in URL or Body

In the screenshot example the command */dmx?chan=1&value=%value%* is used to control DMX Ch1, sending value = 255 (DMX = fully on) or value = 0 (DMX = fully off)

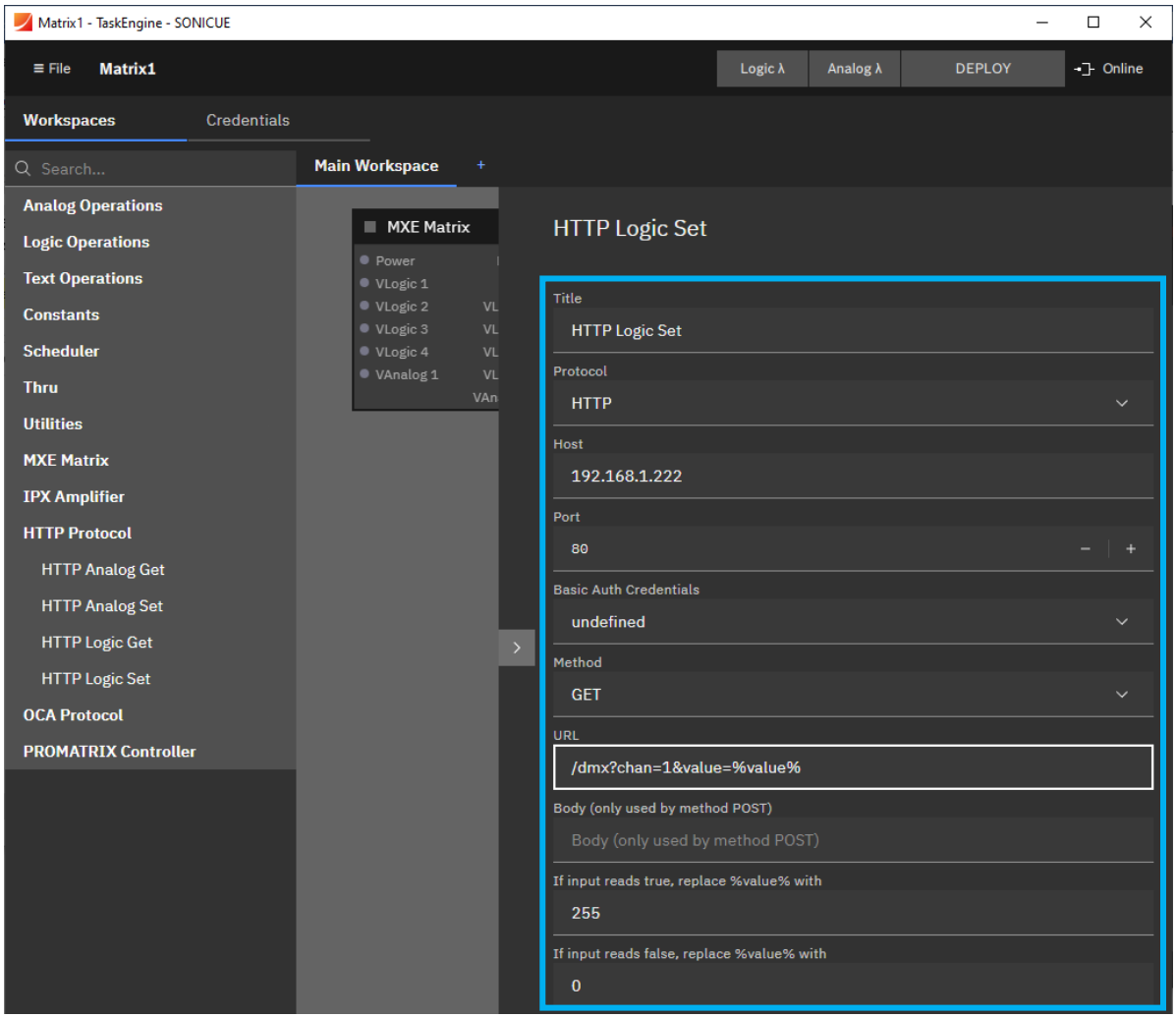


**Image 14:** MXE Task Engine *HTTP Logic Set* blocks information to be configured

## 4.4. MXE Task Engine *HTTP Analog Set* block added from the HTTP Protocol menu

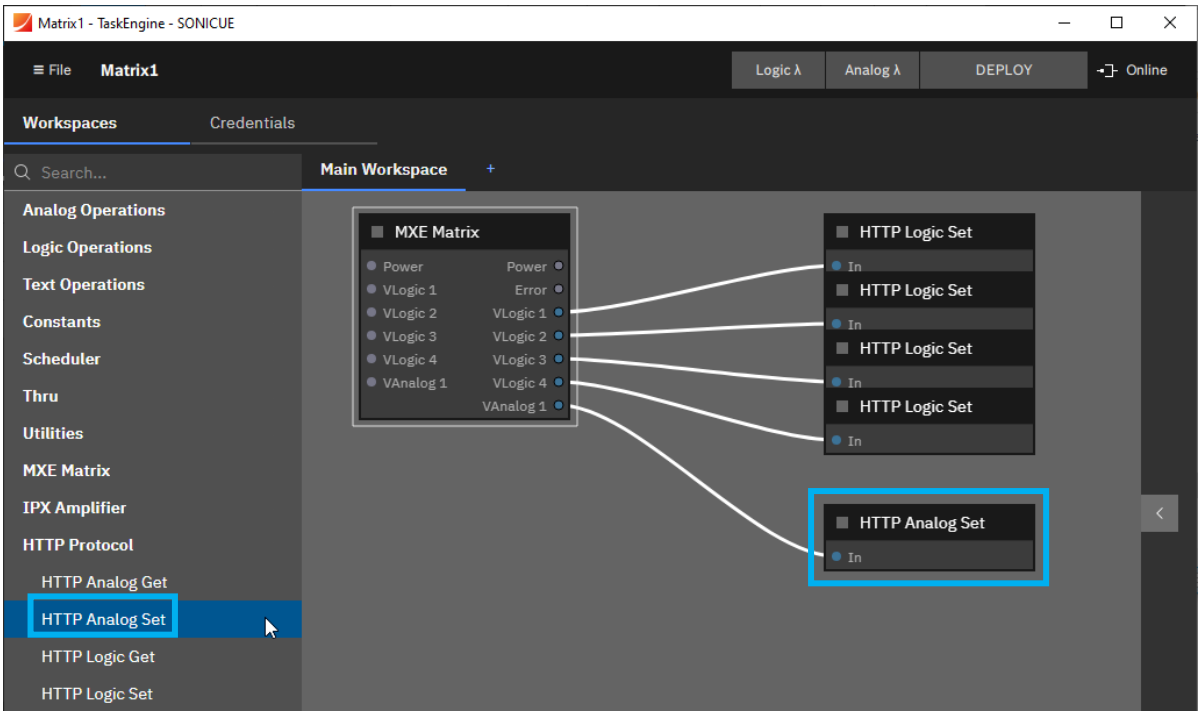


**Image 15:** MXE Task Engine *HTTP Analog Set* block, added from the *HTTP Protocol* menu

The HTTP Analog Set block needs to be configured with the following information:

- *Title*, *Protocol*, *Host*, *Port*, *Basic Auth Credentials*, *Method*, *URL* and *Body* as described for the HTTP Logic Set block
- *Replace and format %value% as* analog value sent at %value% position in URL or Body, to be formatted for example as:
  - %1s data type string with no decimal place, like 0, 128, or 255
  - %.2f data type float with two decimal places, like 32.45 or 11.20

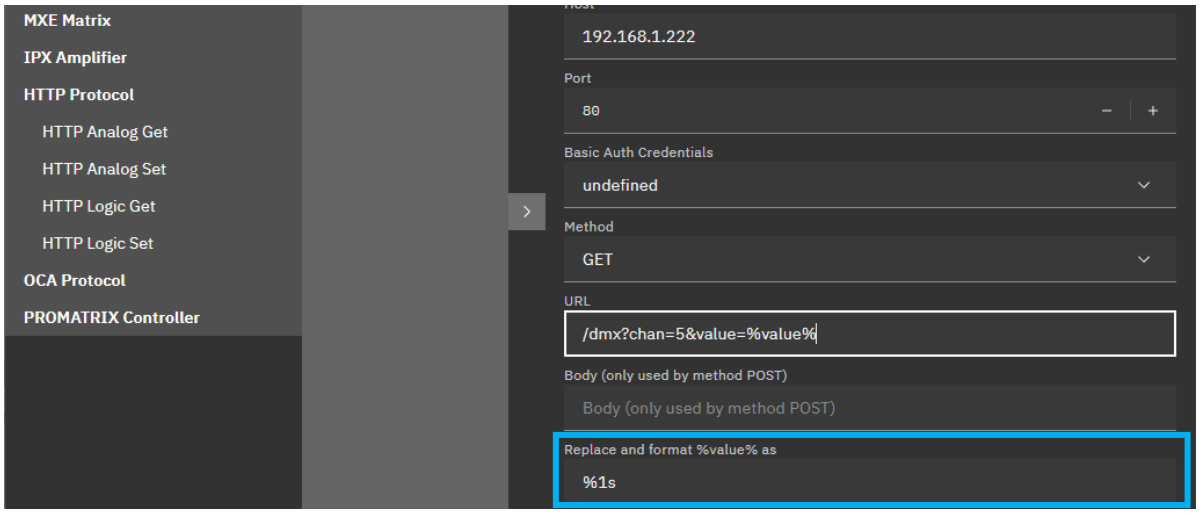


**Image 16:** MXE Task Engine *HTTP Analog Set* block *Replace and format %value" as* configuration

# 5. User interfaces created in SONICUE Panel Designer

### Example User Interface 1 created for TPC-1

The Virtual Logics can be controlled by Toggle button controls configured in SONICUE Panel Designer, like the *DMX Ch 1 - Red* button in the screenshot below. Virtual Analog values can be controlled for example by a Knob with *Up* and *Down* buttons, as used for the Dimmer control.

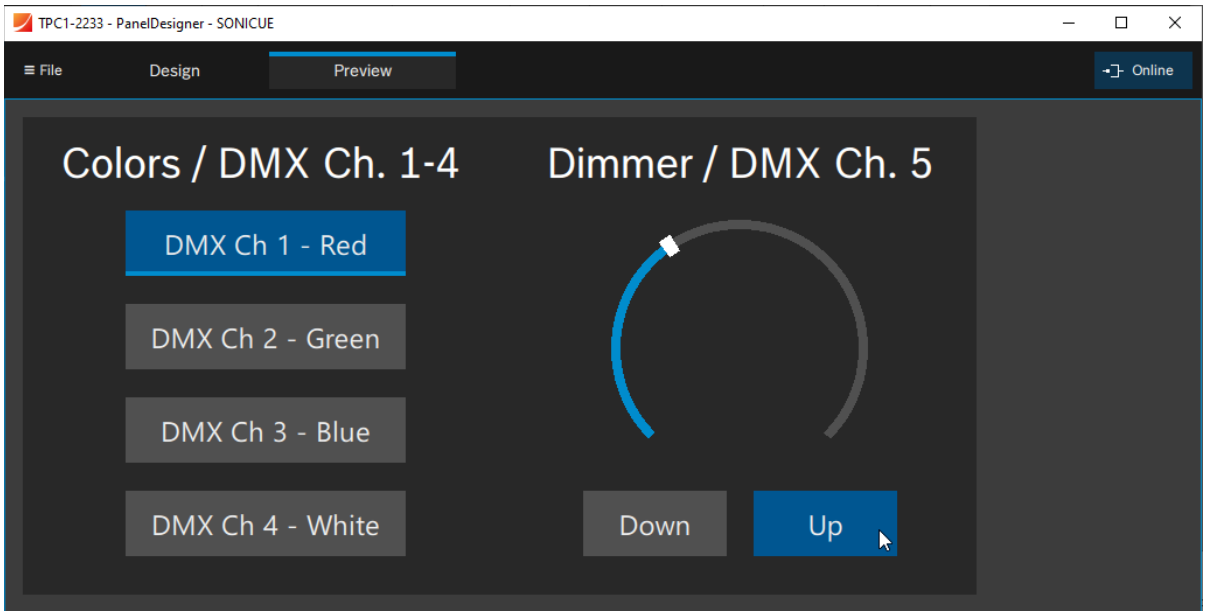


**Image 17:** SONICUE Panel Designer design for TPC-1 (in *Preview* mode)

### Alternative user interface 2 created for WPN-1

Simple layout with a main menu and two subpages.

*MXE light control* *DMX Colors* *DMX Dimmer*

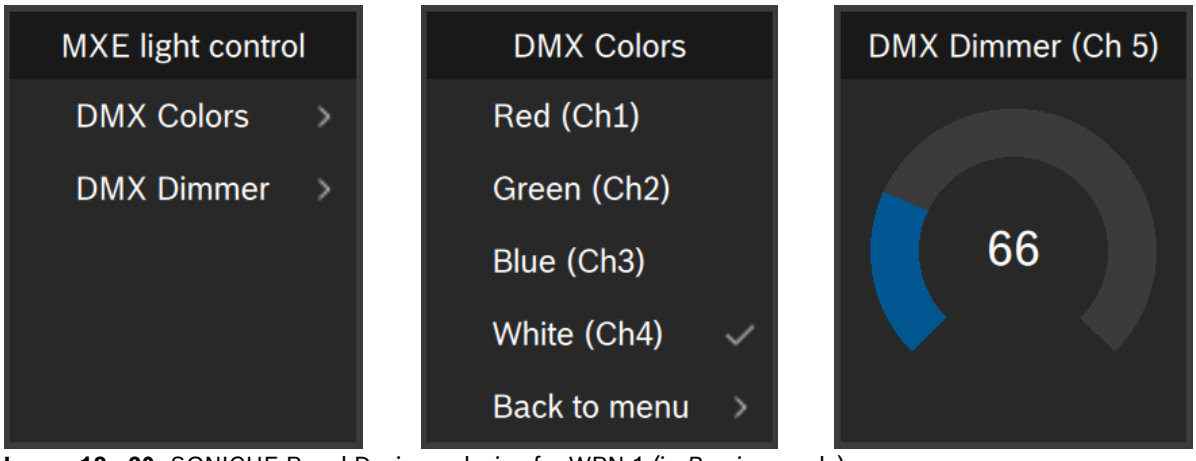


**Image 18 - 20:** SONICUE Panel Designer design for WPN-1 (in *Preview* mode)

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