**Mestra**

**Combined Controller**

Variables

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# History

Table 1: History

|  |  |
| --- | --- |
| **Date/period** | **Actions** |
| Jan 23, 2018 | Initial version |

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# Introduction

This document describes the variable (declaration) for the combined Controller and MIDI/DMX slave.

# Variables

## Introduction

Variables need to be defined in a separate chapter.

Variables can be 1, 2 or 4 bytes and signed or unsigned.

## Example

Var VarNote 1

Var VarNote 1 Signed

Var VarNote 1 S

Var VarNote 4 Signed

Var VarNote 4 U

## Syntax

<var> <name> <size> <signed\_unsigned>

<var>: @”Var”

<name>: as variable name

<size>: “” | 1 | 2 | 4 (default 1)

<signed\_unsigned>: < “” | @”S” | “Signed” | “U” | “Unsigned” (default unsigned)

### Memory

Variables names are not stored, instead in the Mestra file a number is given. And numbers start with 0, thus the order depends the ID and thus the name.

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte** | **Name** | **Value(s) (nnnn)** | **Meaning/comment** |
| nnnn nnnn | Number of Variables | 0-255 | Number of variables. |

Per variable, a nibble is used where only the three most significant bits are filled. This means per byte, two variables are stored.

|  |  |  |  |
| --- | --- | --- | --- |
| **Nibble** | **Name** | **Value(s) (nnnn)** | **Meaning/comment** |
| ss-- | Size | 00 | 1 byte |
| ss-- | Size | 01 | 2 bytes |
| ss-- | Size | 10 | 4 bytes |
| --S- | Signed | 00 | Unsigned |
| --S-- | Signed | 01 | Signed |

Within the Mestra controller, variables are stored with pointers (offsets of 2 bytes). This means every variable uses up 13 bits for the size of the variable and 3 bits for the type (1, 2,4 and signed/unsigned). At most (256 variables of 4 bytes), this will cost 1,536 bytes. 10 bits can store a value 1,024 which is enough for 256 variables of max. 4 bytes.

|  |  |  |  |
| --- | --- | --- | --- |
| **Byte(s)** | **Name** | **Value(s) (nnnn)** | **Meaning/comment** |
| nnnn nnnn | Number of Variables | 0-255 | Number of variables. |
| Per variable: |  |  |  |
| ss-- | Size |  | See above |
| --S- | Signed |  | See above |
| ---# ##-- | Reserved |  |  |
| ---- --ff ffff ffff | Offset | 0-1,024 | Offset of variable |
| Per variable: |  |  |  |
| vvvv vvvv  (vvvv vvvv)  (vvvv vvvv  vvvv vvvv  vvvv vvvv  Vvvv vvvv) | Value | 0 - 255, -128 - 127,  0 - 65,535,  -32,768 - 32,767,  0 - 4,294,967,295, -2,147,483,648 - -2,147,483,647 |  |