Coils array communications protocol

Defining Frames

Commands are sent as $Axxx where A is the command letter listed below, and xxx is a three-digit numerical value for the parameter. All commands are always 5 characters long i.e. starting with a $, and ending with xxx, even if the command doesn't require a numerical component/parameter.

All communication is carried out at 9600 BAUD (this will be increased to either 19200, 38400, or even possible 115200 BAUD when I get time)

$Lxxx

List stored frame data

$Cxxx

Clear stored frame data

$Fxxx

Start frame definition for frame xxx

$Dxxx

Set coil-coil delay, x 1 ms

$Pxxx

Set coil "on-time", x 100 us

$Nxxx

Set number of coils in sequence to xxx (N)

$Xxxx

Start coils definition from sequence value xxx, i.e. from xxx = 0 to xxx = N-1, where maximum number of coils in sequence is N-1

Note that X is set to zero when you start a frame definition

$Yxxx

Define coil X as xxx

Note that X will increment with each definition of Y so you don't really need to use $X000 at all

$Gxxx

Once the system is running, this will run Sequence xxx, where sequences start with 000.

Example

$F000
$N005
$D030
$P007
$Y003
$Y007
$Y030
$Y045
$Y063
$T000 (frame definition terminated as all details have been sent)
$F001
$N003
$D025
$P006
$Y030
$Y045
$Y027
$T000

$L000 will list the 2 frames and their parameters/coil data

$C000 will clear all frame definitions

Defining Sequences of Frames

A Sequence is a list of Frames, with each frame having a Repeat number i.e. how many times that frame should be "displayed" before moving onto the next frame in the sequence.

$Sxxx

> Define a sequence. Note that when you define a sequence, it is simply added to the list of sequences (currently, you cannot delete sequences, only add another…)

Each sequence must have the number of frames for that sequence defined with

$nxxx

> Where xxx is how many sets (frames with repeats) are included

$fxxx

> xxx the frame number

$rxxx

> Xxx is the number of times to repeat the above defined frame

To define a sequence, complete the following instructions:

$Saaa

$n004

$f000 first frame

$r005 repeat frame 000 5 times

$f001

$r010

$f003

$r007

$f002

$r010

$Taaa Terminate the sequence definition as we've added 4 frame "sets" to the sequence

The above will be stored as "Sequence 0"

$Saaa

$n002

$f015

$r010

$f018

$r020

$Taaa

The above will be stored as "Sequence 1"