# **Command Syntax for 408xAWG**

The following SCPI commands are used for arbitrary waveform generation using the 408xAWG series arbitrary function generators.

Termination character: LF or '\n'

### ARB:P\_P<sp><position><points>

<sp> - white space

<position> - Memory location, or the waveform storage location. 1 byte only. Available values are: 0x01 to 0x08. Format is in reverse order (little endian), so location 1 would be 10. Likewise, location 5 would be 50.

**points>** - This is the number of points the arbitrary waveform will have. This is specified with 2 hex bytes. Valid values are from 0x0008(8 pts) to 0x3E80 (16000 pts).

When this command is sent successfully, the string "Arb OK" will be returned.

#### Example:

To store waveform to storage location 2 with a waveform of 5000 points, we send the following command.

#### ARB:P\_P 208831

Storage location is 02, in reverse order it is 20. 5000 points in hex representation is 1388. In reverse order it is 8831.

#### ARB:DATA<sp><sequence number><sp><data>

<sp> - white space

<sequence number> - This represents the data block number that will be used to reference the data in memory. It is specified by 2 bytes, and the sequence always starts with 0001 (2 bytes). Each sequence refers to a block in the memory of size 256 bytes. Therefore, each sequence number references to a data block that can contain up to 256 bytes of data. When 256 bytes are all used, the sequence number should be incremented to the next number, and so on. In the command string, this must be specified in reverse order. So sequence number 1 would be specified as 1000, sequence 2 as 2000, etc.

**<data>** - This represents the data point values used for the arbitrary waveform. The vertical resolution can be specified up to 12 bits, starting from 0 to 4075. 0 being the minimum (negative peak) amplitude while 4075 would be the peak amplitude (positive peak). Every data point is specified by 2 bytes. This means that in every sequence number reference to a data block, up to 128 (256 / 2) data points can be represented. The format must be specified in reverse order also. If the total number of points specified using ARB:P\_P command does not fill in completely a 256 byte data block, 0x00 must be used to complete the block. For example, if 300 points is the length of the arbitrary waveform, sequence number 1 and 2 will be filled, but with sequence number 3, 44 points (88 bytes) will be used to specify the waveform. The remaining 84 points (128 – 44) should be stored with byte values 0x00. That means, 168 unused bytes should have a value of 0x00.

## Example:

To create a waveform of 300 points with the first two data points being 1037 and 856, the following strings are sent:

## ARB:DATA 1000 D0408530....up to 256 bytes, or 128 data points>

## ARB:DATA 2000 <data points up to 256 bytes, or 128 data points>

## ARB:DATA 3000 <data points up to 88 bytes>00.....00(up to 168 bytes)

From the above strings, the first line allocates data points to store in data block 1, referenced to sequence number 1. 1037 in hex is 0x40D, so reverse is D040 in 2 bytes. Likewise, 856 in hex is 0x358, so reverse is 8530 in 2 bytes. The first string addresses the first 128 points.

From second line, sequence number 2 is used since 1 is filled. This data block fills the next 128 points, totaling 256 points.

From the last line, sequence number 3 is used to store the remaining 44 points to complete all 300 points of the waveform. The first 88 bytes (44 points) are used. The remaining 168 bytes storage in this block will then be filled with 0x00.