

MHS2300 series of dual-channel DDS signal generator

communication protocol (draft)

◆Summary

The overall structure of control commands using the command line, the communication rate 9600, 19200, 38400 and 57600 bps optional, issue the command from the PC, the native resolution is performed, and then returns the result to the PC, at the end of each command newline symbol (hexadecimal representation of "0x0a"),. The following illustrate different commands.

◆ Details

The overall command structure of the machine in three parts, each instruction are comma (,) to separate

A start instruction

Starting instructions include a start flag colon character (:), And the machine address of the decimal representation of the two characters,

For example, the local address is set to 01, the start command is: 01

2 command section

Command section can contain One or more instructions executed simultaneously, there are three general instruction,

The first class to read instructions to lowercase r at the beginning;

The second category is a write command, in lowercase w at the beginning;

The third category is an arbitrary wave transmission commands in lowercase a beginning;

Against r and w commands to define a number of the machine can access the register address, read or write all you need to specify the register address

For example, reading CH1 frequency command value is r23

CH1 amplitude values of read instruction r25

WriteFrequency is 12.45kHz instruction CH2 is w241245000

WriteCH2 amplitude value of 2.58V instructions to w26258

As for the specific list of address register instructions detailed in the table behind, arbitrary wave transmission instruction for individual instruction is followed by specific instructions.

3 End instruction

The end of the instruction is three decimal numbers LRC checksum value, plus behind the line breaks 0x0a, ASCII value and one of the LRC checksum value in front of all the characters and then add 1 to get negated, the LRC value can also be set by the local inspection and not be inspection, generally in order to simplify the operation, the machine default is not carried LRC checksum

Without LRC checksum end command 000 + (carriage return 0x0d) + (newline 0x0a)

ConductLRC parity, LRC is 23 and the command

023 + (carriage return 0x0d) + (newline 0x0a)

4 Specific application examples:

Based on the above description, for example, we want to readCH1 single frequency value of the task,

: 01, r23, 000 + (carriage return 0x0d) + (newline 0x0a)

Reply message to the machine(Read frequency is 26.38kHz), 067 for the LRC checksum value, which is the blue part of the character values negated sum plus one

: 01, r230002638000,067 + (carriage return 0x0d) + (newline 0x0a)

If you want to readCH1 frequency and amplitude values do two tasks at the same time, you can use the following command

: 01, r23, r25, 000 + (carriage return 0x0d) + (newline 0x0a)

Reply message to the machine(Read frequency is 26.38kHz, amplitude value 7.26V)

: 01, r230002638000, r250000000726,079 + (carriage return 0x0d) + (newline 0x0a)

In reading, while you can also write, for example, the following command needs to be done to put the four with the use of a command to achieve the

: 01, r23, r25, w241245000, w26258, 000 + (carriage return 0x0d) + (newline 0x0a)

Machine returns information

: 01, r230002638000, r250000000726, w24, w26,059 + (carriage return 0x0d) + (newline 0x0a)

5 Register Address List

Name	Show	Address	Remark
CH1waveform	Wave1	21	0: sine, 1: squart, 2: triangle 101: arbitrary01, 102: arbitrary02...
CH2waveform	Wave2	22	0: sine, 1: squart, 2: triangle 101: arbitrary01, 102: arbitrary02...
CH1frequency	Freq1	23	0 ~ 500000000 (max 5MHz)
CH2 frequency	Freq2	24	0 ~ 500000000 (max 5MHz)
CH1amplitude	Ampl1	25	0 ~ 2000 (max 20.00Vpp)
CH2 amplitude	Ampl2	26	0 ~ 2000 (max 20.00Vpp)
CH1offset	Offs1	27	0 ~ 100:0 ~ 100% 65535: -1% 65534: -2%...
CH2offset	Offs2	28	0 ~ 100:0 ~ 100% 65535: -1% 65534: -2%...
CH1 duty	Duty1	29	999:0.1 ~ 1% ~ 99.9%

CH2 duty	Duty2	30	999:0.1 ~ 1% ~ 99.9%
CH1phase	Pha1	31	1 to 359:1° ~ 359°
CH2phase	Pha2	32	1 to 359:1° ~ 359°
Burst pulse	P_num	33	1 ~ 1048575
Sweep frequency (begin)	S_f0	34	0 ~ 500000000 (max 5MHz)
Sweep frequency (end)	S_f1	35	0 ~ 500000000 (max 5MHz)
Sweep amplitude (begin)	S_a0	36	0 ~ 2000 (max 20.00Vpp)
Sweep amplitude (end)	S_a1	37	0 ~ 2000 (max 20.00Vpp)
Sweep duty (begin)	S_d0	38	999:0.1 ~ 1% ~ 99.9%
Sweep duty (end)	S_d1	39	999:0.1 ~ 1% ~ 99.9%
Sweep time	S_tim	40	1 ~ 99:1 s ~ 99s
Sweep mode	S_mod	41	0: Sweep Frequency 1: Sweep Amplitude 2: Sweep Duty
Sound option	Sound	42	0: Sound disable 1: Sound enable

Language option	Lang	43	0: English 1: Chinese
Key lock	K_loc	44	0: Keyboard Unlock 1: Keboard Lock
Memory position	Mpos	45	0 to 99
The following parameters are read-only, write invalid			
Counter	M_c	80	
Measure Frequency	M_f	81	
Measure Low Frequency	M_lf	82	
Measure High level Time	M_h	83	
Measure Low level Time	M_l	84	
Measure period	M-t	85	
Measure duty	M_d	86	
The following is a bit manipulation instructions			
CH1 Output	CH1_ON	61	0: OFF 1: ON
CH2 Output	CH2_ON	62	0: OFF 1: ON
CH1 Low Frequency	CH1_uHz	63	0:Normal 1:10 uHz resolution
CH2 Low	CH2_uHz	64	0:Normal

Frequency			1:10 uHz resolution
TTL_IO mode	TTL_IO	65	0: TTL_IO Output 1: TTL_IO Input
Measurement select	Ext_SEL	66	0: Ext.IN 1: TTL_IN
CH1 Trace mode	CH1_TR	67	0:Normal 1: Trace Frequency
CH2 Trace frequency	CH2_TF	68	0:Normal 1: Trace Frequency
CH2 Trace amplitude	CH2_TA	69	0:Normal 1: Trace Amplitude
CH2 Trace duty	CH2_TD	70	0:Normal 1: Trace Duty
The following parameters are stored command execution			
Save configations parameter	save	90	
Save common parameter	savemem	91	00 to 99
Here's the address of an arbitrary wave			
Arbitrary data	Arbitrary01 ~ Arbitrary15	01 ~ 15	The Adderss is Used to Write Arbitrary data

The following are the key sequence			
Key_sequence	Key_S	00	This is used to simulate keyboard events

6 bit operation instruction

Address 61 to 70 is a bit operations, which is the value written only 0 or 1, for example,

Open ChannelsW611 is a command

Close ChannelW610 is a command

Open ChannelsCommand 2 is w621

Close ChannelCommand 2 is w620

7 save the parameters on the implementation of Directive

Here are two commands, addresses, 90 instructions for saving the configuration parameters, such as sound options, language options, etc., can be followed by any parameters

Instruction format indicate w900

91 instruction set used to store common parameters, such as channel 1, channel 2 frequency, amplitude, etc., the storage location is 00 to 99 total 100 positions

Instruction format indicate (stored position 18) w9118

8 written instructions about any wave

Do not write any wave and w r commands and instructions

simultaneously, can only be used alone, one can only write to a memory location, the machine total 15-bit arbitrary waveform storage.

Arbitrary Waveform written format is very simple, such as writing position01 a full-wave rectified waveform of the form:

a01512, 515,518,, 515,000 + (carriage return 0x0d) + (newline 0x0a)

Ellipsis There are a lot of said intermediate data, separated by commas, this example command due to the longer format, we specialize in one file to describe all arbitrary command.txt complete command.

9 button on the analog command

Address key analog command in00, the back can simulate up to 10 with the keys, each key figure is expressed as:

F1 1

F2 2

F3 3

F4 4

F5 5

Left 6

Right 7

Ok 8

For example, followed by pressing F3 F5 F2 to enter the frequency measurement mode

By sending commands Such operation can be achieved w00352

