protocol 1wire controlled LCD-Display (HD44780 controller)

constants:
```
DC_LCD_INIT            = 0x1f
DC_LCD_READ            = 0xab
DC_LCD_WRITE           = 0x56
DC_LCD_RAW_READ        = 0xf6
DC_LCD_RAW_WRITE       = 0x16
DC_LCD_PWM             = 0x6a
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command frame 1-wire:

rom command	command	number of bytes, without command, number and crc	[byte 0]	[byte 1]	[...]	[byte n] (max. 31)	crc16 low	crc16 high	read crc16 low	read crc16 high	read slot to start execution

The crc16 is calculated with the polynom $X^{16}+X^{15}+X^2+1$ over all bytes except rom command.

Directly after the transfer of the crc16 the w1 master must execute two read slots to read back the crc16 computed by the slave. If the crc is correct, the command will be executed by the slave after the next read slot. To prevent execution of an incorrect command, just do w1 reset.

Returned data from the slave must be read direct after the execution read time slot. The slave is transmitting the requested number of bytes followed by the crc16 over these bytes.

The command is buffered by the 1wire-slave ATTINY45/85 until complete transmitted. After a complete commmand there must be a gap to transmit the command via serial connection to the lcd. The speed is 115200 baud, so a 32 byte transfer with answer from lcd needs about 5ms plus bus transfer to the lcd. If an init-command is executed additional 5ms have to be added. A 10ms delay after every command will be fine, 5ms will work without init command.

command frame DC_LCD_CLEAR:

DC_LCD_INIT	0x00	crc16 low	crc16 high

clears the complete display and moves the cursor home

No data is returned.

command frame DC_LCD_READ:

DC_LCD_READ	0x02	0xAA	0xNN	crc16 low	crc16 high

read 0xNN bytes starting at address 0xAA
For accessing the display (DD-RAM) the address must be ored with 0x80, for access to the CG-RAM use 0x40 + address. Refer to the HD44780 datasheet for a desciption of memory configuration.
The maximum number of bytes that can be read at a time is 32 (0xNN = 0x20).

returns 0xNN bytes

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command frame DC_LCD_WRITE:

DC_LCD_WRITE	0xNN	0xAA	byte 0	byte 1	...	byte NN-2	crc16 low	crc16 high

write 0xNN-1 bytes starting at address 0xAA
For accessing the display (DD-RAM) the address must be ored with 0x80, for access to the CG-RAM use 0x40 + address. Refer to the HD44780 datasheet for a desciption of memory configuration.
The maximum number of bytes that can be written at a time is 32 (0xNN = 0x21).

No data is returned.

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command frame DC_LCD_RAW_READ:

DC_LCD_RAW_READ	0x00	crc16 low	crc16 high

reads BUSY-flag and address of controller
The read function is executed with HD44780 signal RS=0. The readed byte is passed in the answer frame.

returns 1 byte

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command frame DC_LCD_RAW_WRITE:

DC_LCD_RAW_WRITE	0x01	data write	crc16 low	crc16 high

write any byte to the HD44780 controller
The write function is executed with HD44780 signal RS=0. Any HD44780 command can be executed.

No data is returned.

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command frame DC_LCD_PWM:

DC_LCD_PWM	0x01	pwm value	crc16 low	crc16 high

write an 8 bit value to the backlight pwm controller 0 means backlight is off, 0xff is full on, any value between is dimmed backlight
The pwm output is PIN9/PD5/OC0B at the ATTINY2313. The dimming is smooth with one step up or down every 10 ms.

No data is returned.