

**NAME**

mgsimdev-lcd – Character matrix display pseudo-device in MGSim

**DESCRIPTION**

The MG matrix display is text-oriented output device. It provides both grid addressing of individual characters and a serial interface with automatic management of line feeds, tabs and scrolling.

The matrix display is rendered in text mode on the terminal where **mgsim** runs, using ANSI escape codes.

An I/O device of this type can be specified in MGSim using the device type **LCD**.

**CONFIGURATION**

Each **lcd** device support the following configuration variables:

**<dev>:LCDDisplayWidth, <dev>:LCDDisplayHeight**

Size in characters of the display device.

**<dev>:LCDOutputRow, <dev>:LCDOutputColumn**

Position in the terminal where the matrix display is rendered.

**<dev>:LCDBackgroundColor, <dev>:LCDForegroundColor**

Terminal colors to use when rendering the matrix display. This uses standard ANSI color codes.

**<dev>:LCDTraceFile**

File name to output every byte sent to the matrix display.

**PROTOCOL****Writing characters at specific positions**

Sending *I/O write* requests to the first  $W \times H$  bytes, where  $W$  and  $H$  are the display size in characters, causes the corresponding characters to be displayed. Only printable characters are recognized.

The characters are organized in row-major order, that is bytes  $0 \dots (W-1)$  correspond to the first row of characters,  $W \dots (2W-1)$  to the second row, and so on.

**Accessing the display size**

When queried using an *I/O read* request to offset 0 and size 32 bits, the pseudo-device will report the matrix display size. The low-order 16 bits indicate the height, and the high-order 16 bits indicate the width. This must be accessed as a single 32-bit operation.

**Serial output**

The special offset  $W \times H$  supports a serial output terminal with internal display cursor. Each character sent at that offset is printed at the current cursor position, and the cursor position is modified automatically. The pseudo-terminal recognizes newline (`\n`), tabulations (`\t`), form feeds (`\f`), carriage returns (`\r`) and backspaces (`\b`). Lines wrap automatically, and outputs beyond the last display line cause the existing characters to "scroll up".

**INTERFACE**

The device presents itself to the I/O bus as a single device.

Address	Access width	Mode	Description
0	4 bytes	Read	Display size (see below)
0 to $W \times H - 1$	(any)	Write	Grid-addressed output buffer
$W \times H$	1 byte	Write	Serial output

**SEE ALSO**

mgsim(1), mgsimdoc(7)

**BUGS**

Report bugs & suggest improvements to *microgrids@svp-home.org*.

**AUTHOR**

MGSim was created by Mike Lankamp. MGSim is now under stewardship of the Microgrid project. This manual page was written by Raphael 'kena' Poss.

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