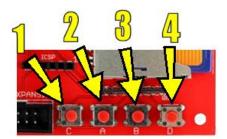# Menu Navigation – v3.54

Aug 7, 2018

Thank you for your interest in Run-DMD! This document describes the features of the above firmware version, but also includes the installation and configuration of the Run-DMD board.

Functions of buttons (when not in the menu system):

1 – Enter menu system
2 – Display "Key 2 Text" (with EXP ONE, remote switches ON)
3 – Display "Key 3 Text" (with EXP ONE, remote switches OFF)
4 – Sleep/Wake up

Within the menu system button 1 normally exits/cancels the current action. Buttons 2 and 3 navigates back/forth or decreases/increases a setting. To confirm/save a setting button 4 is used.

The current functions of the buttons are normally displayed at the bottom of the menu.
If you are using the optional remote control, the buttons are mapped 1-C, 2-A, 3-B and 4-D:

Run-DMD will remember where you exited the menu system and re-enter at the same main menu level to make repeated tests of the effects of a setting easier.

NOTE: The button functions can be reversed by settings in the menu system. Check the settings if the buttons give unexpected results!

We hope you enjoy your Run-DMD!
For additional information please visit: **run-dmd.com**

Best Regards,
The Run-DMD Team

Menu navigation and options

Main Menu	Sub Menu	Options	Description
SET TIME	-	-	Sets current time
TIME FORMAT	-	24 HOUR*	HH:MM (24 hour format)
		24H WITH SEC	HH:MM:SS (24 hour format)
		12 HOUR	HH:MM (12 hour format)
		12H WITH AM/PM	HH:MM XM (12 hour format)
		12H WITH SEC	HH:MM:SS (12 hour format)
CLOCK STYLE	-	PINBALL*	Selects the displayed clock visual appearance.
		HEAVY METAL	TWILIGHT, MAGIC and PIRATE are "analogue" clocks, the seconds indicator (hand) will for these styles be shown if CLOCK DOTS is set to BLINKING or if TIME FORMAT is set to display seconds (sec). The RANDOM setting will randomly select clock style (excluding TWILIGHT, MAGIC, PIRATE & CM-5 MODE 7).
		ROCK	
		CHROME	
		SPORT	
		COMIC	
		SPACE	
		PLAYER	
		ZOMBIE	
		DIGITAL	
		DARTHBOMAN	CM-5 MODE 7 will display the actual LED pattern displayed on a "Connection Machine CM-5" super computer in "mode 7" (as in movies like "Jurassic Park"). The Run-DMD display should be placed vertically. Animations, blinking clock dots, AM/PM, seconds and key texts will be disabled. Enabled temperatures will be displayed without decimals at fixed locations below the time.
		HEROES	
		ADVENTURE	
		AXE	
		CELEBRATION	
		TWILIGHT	
		MAGIC	
		PIRATE	
		CM-5 MODE 7	
		RANDOM	
CLOCK SHADE (only single color fonts)	-	-	Sets the shading (intensity) of the displayed clock. This option is only available for clock fonts PINBALL, HEAVY METALL, ROCK and SPACE. Setting the minimum value will prevent the clock from showing.
CLOCK DOTS	-	BLINKING*	Displays time with ":" separator blinking every second
		ON	Display time with ":" separator
		OFF	Display time without ":" separator
CLK TRANSITION	-	RANDOM *	Controls how the clock (or KEY TEXT) will appear/hide related to certain animations and also when the clock style setting is RANDOM with no animations.
		UP-UP	
		DOWN-DOWN	
		UP-DOWN	
		DOWN-UP	

		FADE	Setting FADE only have effect with "single color fonts" (see option CLOCK SHADE)
		NONE	
ANIMATIONS	FREQUENCY	RANDOM 1-20S*	Sets how often an animation should be displayed
		RANDOM 5-60S	
		1 SEC	
		2 SEC	
		3 SEC	
		5 SEC	
		10 SEC	
		15 SEC	
		30 SEC	
		1 MIN	
		5 MIN	
		10 MIN	
		NO ANIMATIONS	
	BROWSE	-	Browses animations and enables/disables specific animations. Disabled animations will not be shown (unless CONTENT FILTER/SHOW ALL is selected)
	BY GROUP	-	Enable or disable animations by group
	ENABLE ALL	-	Enables all animations
	DISABLE ALL	-	Disables all animations
	CLOCK OVERLAY	AUTO*	Controls if the clock should be displayed during animations
		FRONT	
		BACK	
		OFF	
	SHOW NAME	HIDE*	Does not display animation name
		BEFORE	Animation name scrolls before animation
		DURING	Name is displayed in the lower left corner during the animation
		AFTER	Animation name scrolls after animation
CUSTOM MESSAGE	MESSAGE TEXT	-	Edit custom message text. Change character with buttons 2/3. Select character with button 4. Cancel edit with button 1. "T1°"/" T2°" will insert temperature*, clock icon will insert current time. Save message by selecting "END". Erase character by selecting "←". *) Reading from temperature aware EXP board, if not connected T1 will display

			internal system temperature.
	SCROLL SPEED	VERY SLOW	Scrolling speed of the custom message text
		SLOW	
		NORMAL*	
		FAST	
		VERY FAST	
		INSANE	
	TEXT MODE	ENHANCED*	Custom message text attributes
		BLACK SHADOW	
		PLAIN	
	CLOCK POSITION	IN FRONT	Sets how the clock is displayed in relation to the custom text. RANDOM will randomly show the clock in front/behind custom text.
		BEHIND	
		RANDOM	
		NO CLOCK	
	FREQUENCY	DISABLE*	Disables custom text
		1 SEC	The time between custom text repetitions. (Note that the animation display time is included)
		5 SEC	
		15 SEC	
		30 SEC	
		1 MIN	
		5 MIN	
	TEXT MOVEMENT	HORIZONAL	Custom message text movement. RANDOM will randomly use movement, but exclude VERTICAL and STATIC if text exceeds DMD display area.
		BOUNCE	
		LOOP	
		DIAGONAL	
		VERTICAL	
		STATIC	
		RANDOM	
	TEXT POSITION	TOP*	Vertical start position of custom message text. RANDOM will set position on "pixel level". (This setting only affects HORIZONAL, BOUCE and STATIC)
		HIGH	
		MIDDLE	
		LOW	
		BOTTOM	
		RANDOM	
DMD BRIGHTNESS	-	LOW	Brightness setting of DMD display. (A higher setting could cause the power consumption to exceed the power supply capability)
		MEDIUM*	
		HIGH	
STATUS LED	-	ENABLED *	Flash LED on the Run-DMD once per second when system is OK
		DISABLED	Turn off LED on the Run-DMD when system is OK
BOOT MODE	-	VERBOSE*	Show system values at boot
		EXPRESS	Instant ("quiet") boot
STARTUP IMAGE (only if SD-card contains an image)	-	DISABLE	Never show startup image
		ENABLE*	Show once after startup
		REPEAT 1/5	Repeat startup image every x animations
		REPEAT 1/10	

		REPEAT 1/50	
SLEEP TIME	-	-	Configures the time when Run-DMD goes into sleep (standby) mode. When in sleep mode the LED on the Run-DMD will softly "breath" and the DMD display will be turned off. Button 4 or WAKE UP TIME will turn on Run-DMD again. Configuring SLEEP TIME and WAKE UP TIME to the same setting (time) these functions will be disabled.
WAKE UP TIME	-	-	Configures the time when Run-DMD will exit sleep (standby) mode.
MENU STYLE	-	ENHANCED*	Standard menu layout
		BASIC	Single color menu layout
CONTENT FILTER	-	ONLY ENABLED*	Only display enabled animations
		SHOW ALL	Display all animations regardless of being enabled or disabled
AMBIENT LIGHT (only with EXP ONE)	BACKGROUND	-	Set Red, Green and Blue levels for the background color
	ANIMATIONS	DISABLE*	Disable during animations
		RED	Color during animations. (Brightness will follow animations intensity)
		GREEN	
		BLUE	
		YELLOW	
		PURPLE	
		CYAN	
		WHITE	
		RANDOM	
		BACKGROUND	Same animation color as selected for the background
RF POWER CTRL (only with EXP ONE)	RECEIVERS	DISABLED*	Number of radio controlled power switch receivers in use , max 64.
		N RECEIVERS	
	LEARNING	RECEIVER *N*	Program receiver. 1. Select receiver to program 2. Set receiver in "learning mode" 3. Select "Send" (button 4)
	DELAY	1 SEC *	Times between receiver units are powered ON or OFF in the automated sequence.
		2 SEC	
		3 SEC	
		4 SEC	
		5 SEC	
	ADDRESS	-	Unique RF sender code (Choose a random code to avoid interference with other RF remote control units)
DMD CONTRAST	-	NORMAL *	Enhanced DMD contrast can

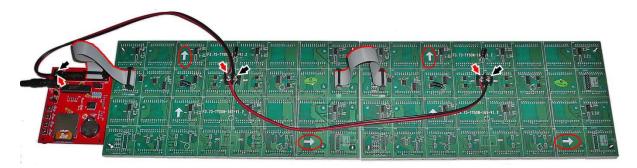|			
(not with DMD pinball plasma)		ENHANCED	(depending on DMD used) improve image quality
KEY TEXT	KEY 2 TEXT	-	Edit key texts, see "custom message" section above. Active/deactivate text with buttons 2 & 3 ("A" & "B").
	KEY 3 TEXT	-	
	TEXT STYLE	ENHANCED *	Enhanced text style
		CLOCK SHADE	Use selected clock shade
TEMPERATURE	SCALE	CELSIUS *	Temperature scale to use for displaying temperatures.
		FAHRENHEIT	
		KELVIN	
	SENSOR 1 SENSOR 2	DISABLE *	Temperature display positions. Requires temperature aware EXP board, otherwise sensor 1 will display internal Run-DMD system core temperature.
		TOP LEFT	
		BOTTOM LEFT	
		TOP RIGHT	
		BOTTOM RIGHT	
	DECIMALS	HIDE *	Displays temperature without decimals
		SHOW	Displays temperature with decimal
TOOLS	DMD TEST	-	Cycles DMD test loop
	BUTTONS	NORMAL *	Normal buttons functions (1->4)
		REVERSED	Reversed button functions (4->1). Use this setting if you mount your Run-DMD pcb (or EXP board with buttons) "up-side-down". An inverted "R" in the lower right corner will indicate revered button functionality (if BOOT MODE = VERBOSE).
	REBOOT	-	Restarts Run-DMD
	DMD DETECT	-	Set DMD type used. *(See "DMD type configuration")*

*) default setting

What is Run-DMD?

Run-DMD is a dot matrix display (DMD) control board with (depending on version) support for a single 128x32 pixel "pinball type" DMD or 2 linked 64x32 pixel HUB08 or HUB75 1/16 DMDs. (If using a non 5V type DMD, like a pinball plasma, a separate power supply will be required)
Run-DMD will display the current time mixed with custom text and/or optional random animations.
A SD-card is required for Run-DMD to store settings and must therefore be inserted before use.
For Run-DMD to keep time while powered down, a CR2032 battery is required and should be firmly installed in the battery holder on the Run-DMD board.

Connecting Run-DMD to HUB08 modules

Important: The Run-DMD board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working/handling this board.

1. Install the included CR2032 battery in the holder on the Run-DMD. *(During startup the Run-DMD will indicate if this battery needs replacing. The first power up after installing/replacing the battery Run-DMD will still indicate "Replace battery" to alert you that the clock settings have been lost and needs to be adjusted.)*

2. Make sure a SD (or SDHC) card is securely inserted into the card holder on the Run-DMD.

3. Connect the DMD power cables. Fasten one red/black cable between the Run-DMD ("5VDC DMD PWR") and the first DMD module. Red lead from "+" to "VCC", black lead from "-" to GND. Connect the second power cable between the DMD modules, VCC to VCC (red) and GND to GND (black).

4. Connect the data signal cables. Insert one end of the first cable in the Run-DMD "HUB08 DMD" connector, the other end to the first DMD module "INPUT" connector. The second data cable should be connected from the "OUTPUT" of the first DMD module to the "INPUT" on the second DMD module.
Important: Make sure that both DMD modules are lined up so that the horizontal arrows on the back are pointing AWAY from the Run-DMD, and that the flat data cables are installed with the red edge wire UPWARDS according to be vertical arrows on the back of the DMD modules.

5. Verify that both power cables and data cables are correctly installed and securely fastened.

6. Connect a power supply (5V 3-10A DC, center pin +) with a 5,5/2,5mm connector to the Run-DMD.

7. Power on the power supply.
On first power on (with a new SD card) Run-DMD will go into "automatic DMD type configuration", please see section later in this document.

8. Verify that the LED on the Run-DMD flashes correctly:
   a) Does not light up at all: No power? Incorrect connections?
   b) Flashes rapidly: Bad or missing SD card?
   c) Steady lit: DMD type selection mode. New SD card?
   c) Flashes steady once per second: Run-DMD is working OK

9. Verify that the video displayed on the DMD is correct. If not:
  a) Does the Run-DMD LED flash once per second?
  b) Are the power connections to the DMD modules correct?
  c) Are the data cable connections the DMD modules correct?
  d) Is the correct DMD module type selected? (See "DMD configuration section" below)
  e) Check the "HUB08 COLOR" jumper settings
  f) Switch order of the HUB08 modules and data cables

10. Build a nice mounting frame and hang it on the wall! Note that the Run-DMD and DMD modules have exposed sensitive electronic circuitry, make sure that the components never gets in contact with metal or other conducting materials!

Please note that the power supply unit might get hot and therefore requires proper ventilation!
If connecting an extension cord between the Run-DMD board and the power supply, make sure it is rated to handle the peak power of 10A (50W). Power loss in connectors are common, if the Run-DMD restarts unexpectedly check the power connections! If a standard pinball LED DMD is connected to the Run-DMD, a 5V 3A power supply should be sufficient. Do not remove/reinsert the SD-card while the Run-DMD is powered on.

Installation with HUB75 DMDs are similar as with HUB08 (above).

Color configuration HUB08/HUB75 DMD

If using dual color type HUB08 DMDs or RGB color type HUB75 DMDs, it is possible to configure the displayed color by selecting a combination of the DMD color channels.

HUB08:
Enabling/disabling of the red/green/blue colors are done by installing/removing the "R" (red) and "G" (green) jumpers on the Run-DMD board:

  -    For amber (yellow) color, install both the "R" and "G" jumpers (as pictured above)
  -    For red color, remove the two "G" jumpers
  -    For green color, remove the two "R" jumpers
If (in "Red" or "Green" mode) the DMD shows flickering or a solid background of the disabled color, change the PD/PU jumper position.
(If a single color (red) HUB08 DMDs are used, it is recommended to remove both the "G" jumpers and the "PD/PU" jumper.)

HUB75: Select color by using the DIP switches in similar way as with HUB08 above.

Manual DMD type configuration

Run-DMD can control various types of pinball and HUB08 or HUB75 1/16 display modules, but due to the lack of a true signaling standard it cannot be 100% guaranteed that all types of DMD:s will work with Run-DMD.) If you replace the SD-card or download another SD-card image you may have to use this procedure to set the DMD type since this configuration is stored on the SD-card.

Make sure your DMD is correctly powered and firmly connected to the "PINBALL DMD" or "HUB08 DMD"/"HUB75 DMD" connector on the Run-DMD.

1. Disconnect the power to the Run-DMD board and wait at least 15 seconds. If using HUB08 or HUB75 DMDs, select single color (red) by using the jumpers or DIP switches.

2. Keep button 3 (B) pressed while reconnecting the power. The LED on Run-DMD will now be constantly lit, exception for very short interruptions about every 4 seconds. Run-DMD will cycle through all DMD display types, displaying a "test image" for about 4 seconds for each type of DMD. The whole cycle will take about 30 seconds before it automatically starts over.

3. Press button 4 (D) when the "test image" is shown correctly, like this:

The display setting is now saved and the Run-DMD starts up with the new DMD setting. If the wrong DMD type was selected or the type of DMD connected to Run- DMD has been changed, just repeat the procedure.

Please note that if you have a LED pinball DMD (or newer type of Plasma) connected to the Run-DMD, both the "Pinball LED" and "Pinball Plasma" setting will work. In this case, choose "Pinball LED" for higher image quality.

Automatic DMD type configuration (New SD card)

If Run-DMD does not recognize the inserted SD card the DMD configuration (similar to above) will start automatically. This process will also initiate (format) the SD card and purge any existing data stored on it!

Press button 4 (D) when the "test image" is shown correctly, like this:

Run-DMD will initialize the SD-card and restart with the default settings.

Expansion boards

Run-DMD (Rev F and later) are equipped with a 10-pin expansion port that allows for expansion boards ("EXP boards") to be connected.
To install a EXP board power down Run-DMD and connect it to the 10-pin IDC connector and power Run-DMD back on. The EXP board should automatically be detected and working, if not set BOOT MODE to "verbose", restart and see if the board type and version is displayed. If the board is not displayed, check the cables and verify firmware version requirements for the EXP board.