LinkZill

Hangzhou LinkZill Technology Co., Ltd.

Matrix Readout System (256x256) User Guide

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E-mail: info@linkzill.com

Web: www.linkzill.com

Matrix Readout System (256x256) User Guide

Product Overview

The matrix readout system is mainly for collecting the current signal and imaging from the sensor array, which can support up to 256*256 definition. The matrix readout system can provide 256 selecting signals, 4 DC bias voltages, and 256 current readout channels. All current data will be transmitted to a PC terminal device through USB and converted to 256 grey level image based on the current intensity. The matrix readout system is very suitable for light or pressure monitoring with compatible thin-film transistor (TFT) array chip.

Parameter	Specification
L*W*H	258×173×48 mm
Weight	1400 g
Regular	256 channel pulse voltage (row selecting signals), voltage range: -15V~+15V 256 channel current readout, current range: 100pA~150nA (positive-only) 4 channel DC bias: -15V~+15V
Communication	USB
Terminal	PC（Windows 10 or higher）
Range	4 ranges (1nA/10nA/50nA/150nA)
Imaging	Definition： 256 rows *256 columns Grey level： 256
File saving types	Selected data by user: .CSV
Duration	>8 hours under room temperature
Refresh rate	2Hz on 10nA, 256*256 data per frame

Refresh Rate Description:

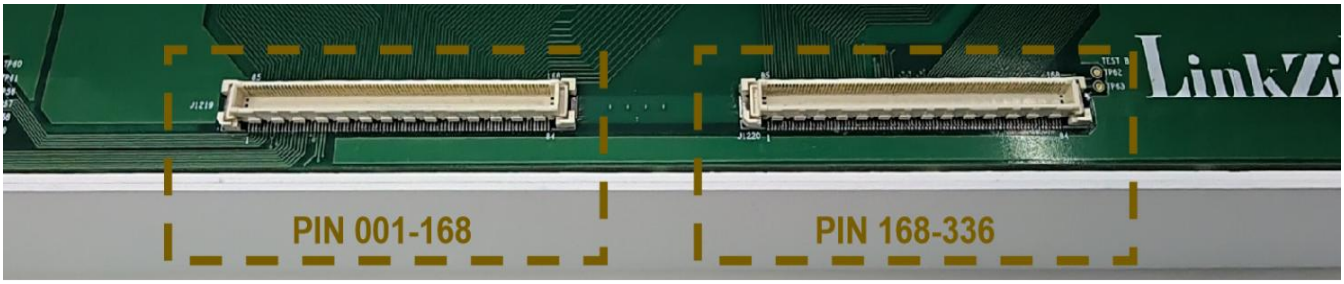
Range	Frame Rate（fps）	Period（ms）	Pulse Width of Scan（ms）
150nA	9	111	0.43
50nA	5	200	0.78
10nA	2	500	1.95
1nA	0.5	2000	7.81

Product List

Host	X1
Charger	X1
User Guide (Electronic Ver.)	X1

Pin Assignment Description

336 Pin FPC Pin Assignment (Left to Right):



Pin No.	001-006	007-008	009	012-015	023-278	030
Definition	Test Pin	Vss	Vcom	Row select drive signal (GOA)	Row select drive signal (GOA)	Von
Pin No.	031	032	033	037-292	295	296
Definition	Voff	Gate_VDD	Gate_GND	256 Current Readout	DUMMY	Vin
Pin No.	304	305-306	Remaining Pins			
Definition	Vcom	Vss	DUMMY			

1. Vss, Vcom, Vdd, and Vin are four DC bias voltages output, corresponding to Vss, Vcom, Vdd and Vin in the PC software separately, with the voltage adjustable from -15V to +15V.

2. The “Von” and “Voff” in PC software correspond to the selected voltage and unselected voltage of the 256 selecting signals separately, adjustable from -15V to +15V. Recommend to keep Von and Voff at the original settings of the system.

3. The 256 current readout channels support positive current reading from 100pA to 150nA.

The specific details are shown in the figure below (1T0C and 4T1C refer to the TFT chip structure, for more information refer to "TFT Sensing Array Chips User Guide").

Voltage	Function	Suggest
Vss	Bias voltage applied on the cathode node of PD	1T0C: Vss must be postive value, PD current is related to Vss. 4T1C: PD current is related to VSS-Vin and keep PD current within ±1nA.
Vcom	Reserved bias voltage	1T0C/4T1C: Not used here.
Vdd	Power voltage applied on drive TFT	1T0C: Not used here. 4T1C: Range is from 0.1V to 5V and 3V is recommended for initial setting.
Vin	Reset voltage for 4T1C and play the anode voltage of PD	1T0C: Not used here. 4T1C: Range is from -3V to 3V and 0.5V is recommended for initial setting.
Von	Select voltage of TFT	1T0C/4T1C: Range is from 1V to 15V and 15V is recommended for initial setting.
Voff	Non-select voltage of TFT	1T0C/4T1C: Range is from -1V to -15V and -15V is recommended for initial setting.

Operating Manual

1. PC Software Installation:

The after-sales staff will send the PC software to you by email.

2. Device Connection:

NOTICE: The following operation is based on a compatible 256*256 photosensor (with OPD on TFT array).

a. Before connecting the TFT array to the system, please make sure the Matrix Readout system is powered off.

b. Flip the lid of the system and plug in the FPC. It needs to be pressed several times to make sure that the FPC is firmly inserted.

c. Close the lid to hold the FPC.

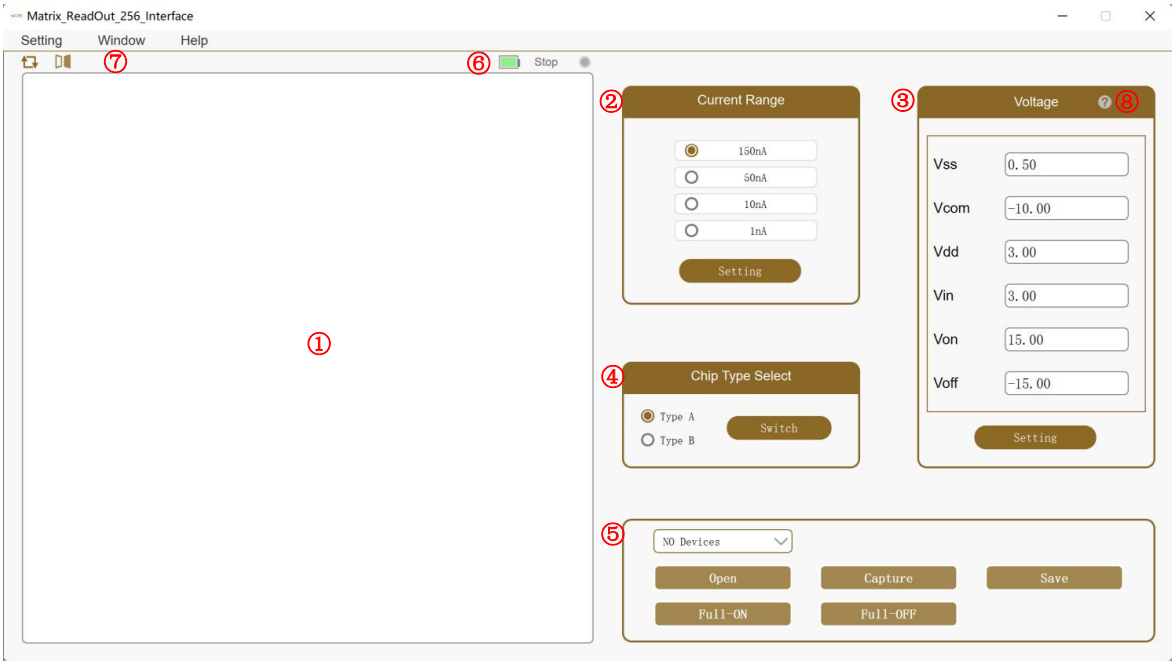
3. Matrix Readout System Connection:

a. Turn the power switch of the device to the "ON" and power on the device.

b. Connect the device to the computer (PC) using a USB cable. Make sure both ends of the USB cable are correctly inserted into the device and the computer's USB ports.

c. Open the application on the computer. If the connection is successful, the program device selection box will show the serial number of the device.

4. PC Software Introduction:



Menu Bar:

Setting -> ①. Open/Close Calibration: Enable/Disable image calibration.

②. Open/Close FTT: Enable/Disable enhanced image quality.

Window->Screen Exchange: Switch between full-screen mode and window mode (press "esc" to exit full-

screen mode).

①: Display area, showing real-time photosensitive imaging.

②: Set the current range.

③: Set the operating voltage.

④: Select chip type.

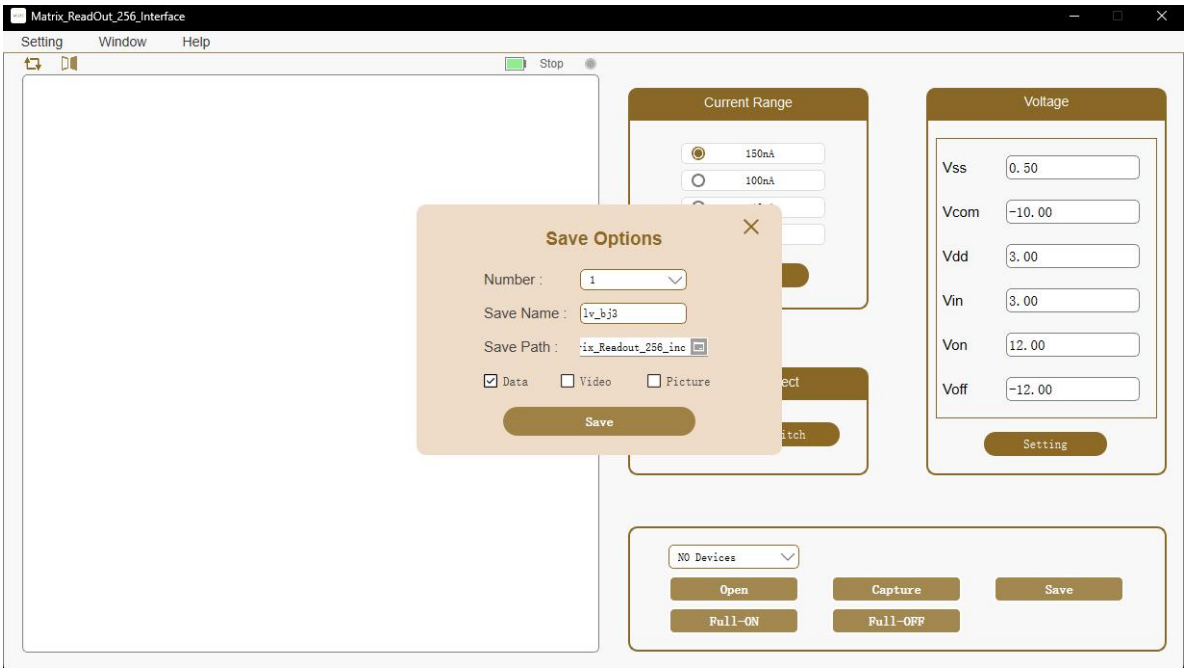
⑤: Function area.

NO Devices: Select devices.

Open: Turn on/off the device.

Capture: Start/stop data acquisition.

Save: Save function, click the save button and select the following options: a. "Number" (number of frames to save); b. "Save Name" (file name to save); c. "Save Path" (save file address, the path needs to be in English); d. "Data", "Video", "Picture": save type (multiple selections allowed, 'Data' is a required option).



Full-ON: Perform independent 255 grayscale calibration for each pixel. After ensuring that the array sensor is in an unobstructed state, click the "Full-ON" button to record the current at this moment, corresponding to the 255 grayscale signal (white).

Full-OFF: Perform independent 0 grayscale calibration for each pixel. After ensuring that the array sensor is in a blocked state, click the "Full-OFF" button to record the current value at this moment, corresponding to the 0 grayscale signal (black).

⑥: Acquisition/pause status and power indicator:

Gray: stop status,

Green: running status.

⑦: Image rotation and mirroring.

⑧: Detailed explanation of the Vss-Voff voltage.

5. Usage Process:

a. After confirming the system is connected to the computer, open the MR256 program. The appearance of

the device name in the function area indicates a successful connection. Then click the "Open" button to start the device.

b. Select the corresponding chip type (Type A: Gate Driver IC driven, Type B: GOA driven), click "Switch"; set the current range and voltage, and click "Setting". After successful setting, a successful setting interface will appear in the lower right corner. The default mode is Type A.

c. Click the "Capture" button to enter the acquisition state (at this time, the "Capture" button will change to "Stop" button). When it is necessary to change the chip type, current range, and voltage settings, please click "Stop" first (at this time, the "Stop" button will change to "Capture" button), then change the corresponding settings, and click "Setting". After successful setting, a successful setting interface will appear in the lower right corner.

d. When there is no obstruction to the TFT device, click the "Full-ON" button to perform 255 gray scale calibration. After the calibration is successful, then proceed with the obstruction; when the TFT device is completely obstructed, click the "Full-OFF" button to perform 0 gray scale calibration (gray scale adjustment can only be performed in the acquisition state. After calibration is completed, a calibration successful message will appear in the lower right corner), and then the obstruction can be removed. **The calibration data obtained is saved in the Calibration folder under the project root directory.**

Note: If recalibration is needed, simply click the "Calibration" button and repeat the above steps. Recalibration is required whenever any parameter (Current Range, Voltage, Chip Type Select) is changed to ensure image quality.

e. Place an opaque object above the light array sensor (Visible light imaging), and the system will display the shape of the object in real-time. Click the "Stop" button to pause the test.

f. Click the "Save" button, select the number of frames to save, save name, save path, and save type in the pop-up dialog box, then click "Save". Wait for the progress bar to complete and data export to finish (saving can only be done in capture mode). The saved data types are divided into CSV, images, and videos. The CSV data is divided into two parts, current (nA) and grayscale (0~255), and each frame of data contains the relevant data of 256*256 points for all frame images. The grayscale data will change with the calibration current.

Warnings:

- ⚠ Please do not use the matrix readout system while charging to avoid disturbance. Do not use the system in complex electromagnetic environments (e.g. within 2 m of power strips and powered devices). Please keep the testing environment, subject, and interface clean and dry.
- ⚠ Please use the original charger to avoid damage.
- ⚠ The charging indicator is red when the system is charging and change to green when the battery is full. It takes about 8 hours to fully charge the system. To avoid damaging the system, please unplug the charger when the system is fully charged.
- ⚠ Please don't use the system in hot or humid environments. Don't throw the system into fire or water to avoid damage or explosion.
- ⚠ Please don't bash or drop the system from height to avoid damage.