LinkZill

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Matrix Readout System (64x64) User Guide

V1.1

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Matrix Readout System (64x64) 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 64*64 definition. The matrix readout system can provide 64 selecting signals, 2 DC bias voltages, and 64 current readout channels. All current data will be transmitted to an android terminal device through WIFI and converted to an 8bit 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	170×151×170 mm (including the optional antenna)
Weight	600 g
Regular	64 channel pulse voltage (row selecting signals), voltage range: -15V~+15V 64 channel current readout, current range: 100pA~200nA (positive-only) 2 channel DC bias: -15V~+15V
Communication	WIFI
Terminal	Phone/Tablet（Android 9.0 and 6GB RAM or higher）
Range	4 ranges (1nA/10nA/100nA/200nA) and 1 customized range
Imaging	Definition：64 rows *64 columns Grey level：256
Duration	>4 hours under room temperature
Refresh rate	8.2Hz on 10nA, 64*64 data per frame

Refresh Rate Description:

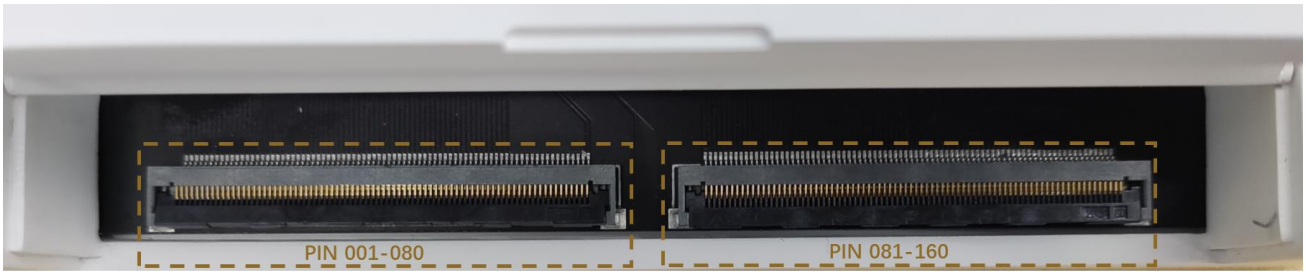
Range	Frame Rate（fps）	Period（ms）	Pulse Width of Scan（ms）
200nA	10.9	92	1.4
100nA	9.3	107	1.7
10nA	8.2	122	1.9
1nA	1.2	813	12.7

Product List

Host	X1
Charger	X1
User Guide (Electronic Ver.)	X1
External Antenna	X1
Antenna Extension Cable and Base	X1

Pin Assignment Description

160 Pin FPC Pin Assignment (Left to Right):



Pin No.	001-064	065-080	081-144	145-154	155-157	158-160
Definition	64 Current Readout	DUMMY	64 Selecting Signal	DUMMY	Vbias1	Vbias2

1. Vbias1 and Vbias2 are two DC bias voltages corresponding to Vbias1 and Vbias2 in the APP separately, with the voltage adjustable from -15V to +15V;

2. The “Von” and “Voff” in APP correspond to the selected voltage and unselected voltage of the 64 selecting signals separately, adjustable from -15V to +15V;

3. The 64 current readout channels support positive current reading from 100pA to 200nA.

Operating Manual

1. APP Installation:

Install the APP by scanning the QR code with the default browser and press ⬇ to download. The TruEbox App will show on the desktop after installation.

⚠ **The APP only works with Android version 9.0 and 6GB RAM or higher. For smooth operation, the App will need permission to access the WIFI/location/storage of the terminal device. The permission will not do any harm to the terminal devices, please don't worry about the security of the APP.**

2. Device Connection:

NOTICE: The following operation is based on a compatible 64*64 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. Make sure that the golden contactors of the FPC face down and the dark side face up.

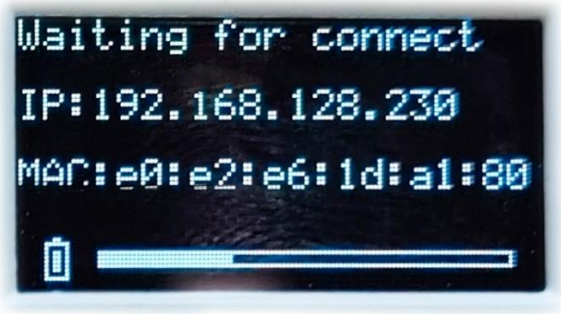
c. Close the lid to hold the FPC.

3. Matrix Readout System Connection:

a. Turn on the Matrix Readout system. When powered on, the white indicator light should turn on and the screen should show the following picture. If not, please charge the system for the low battery.

b. Turn off the WIFI and open the hotspot on the phone or tablet. Follow the instruction on the screen and set the hotspot's name as "MatrixReadout" with the password "12345678". The last row on the screen shows the battery level of the system. The system will be automatically connected to the terminal device's hotspot.

c. If successfully connected, the system will show "waiting for connect" and its IP/MAC address on the screen. If not, please shut the hotspot and redo the previous procedures again.

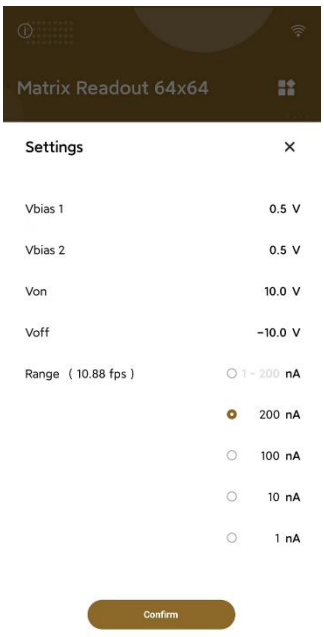


d. Open the APP and press the WIFI button on the top right, and a window called “Available Devices” will pop up. Select the option with the same IP address shown on the screen of the system. If the correct option is not available, please type in the **System’s IP address manually**. If successfully connected, the system will show the current specification on the screen.

4. Measurement:

NOTICE: The following operation is based on a compatible 64*64 photosensor (with OPD on TFT array).

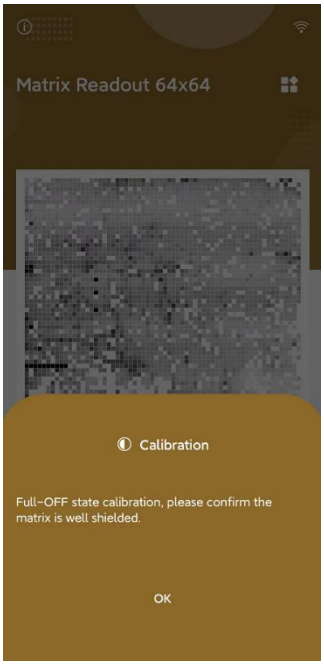
a. Click the “Settings” button to set the parameter (Vbias1, Vbias2, Von, Voff, and Range). In the example, the specifications are Vbias1 0.5V (common voltage), Vbias2 0.5V (irrelevant), Von 10V (transistor switch gate



voltage), and Voff -10V (transistor switch off voltage), Rang 200nA. Click the “Confirm” button to finish the settings (shown in the previous image).

b. Click the “Calibration” button to set up the grey level for every individual pixel from 255 to 0 grey levels:
①. 255 grey level calibration: Make sure the TFT sensor array is not shielded to maximize the photocurrent. Click the “OK” button to set the 255 grey level (shown in the following image).

②. 0 grey level calibration: Make sure the TFT array is fully shielded to minimize the photocurrent. Click the “OK” button to set the 0 grey level (shown in the following image).



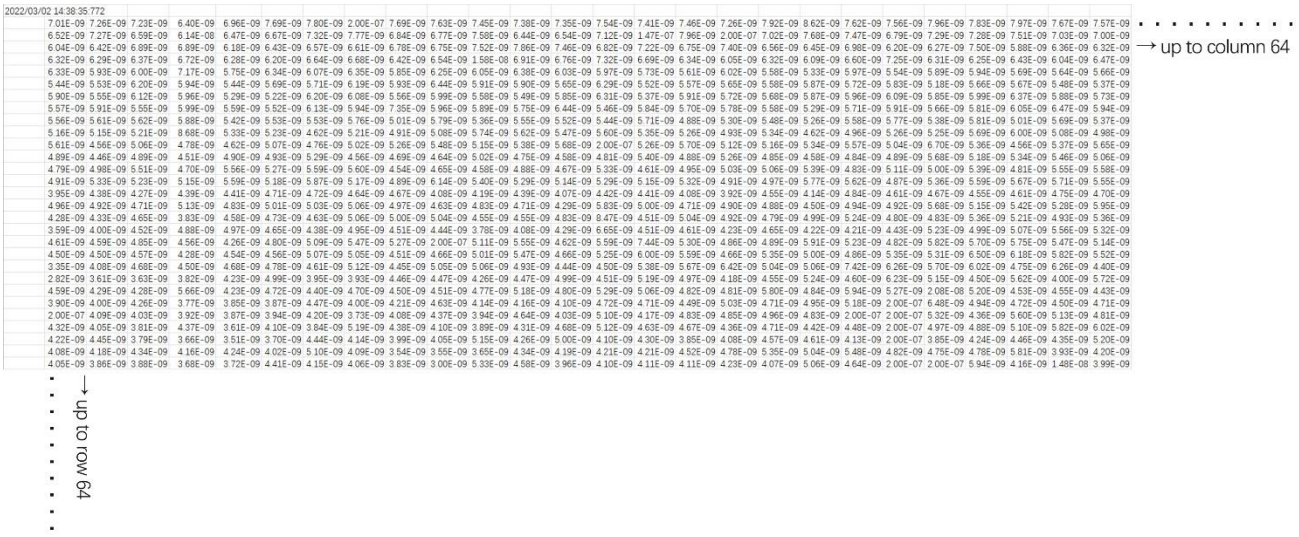
NOTICE: To recalibrate the system, press the "Calibrate" button and redo the previous procedures. Please recalibrate the system after changing any parameter for better image quality.

c. Click the "Start" button to run the real-time light imaging. Opaque objects would show its outline on the APP when placed on the TFT array. You can pause the measurement by clicking the "Pause" button.

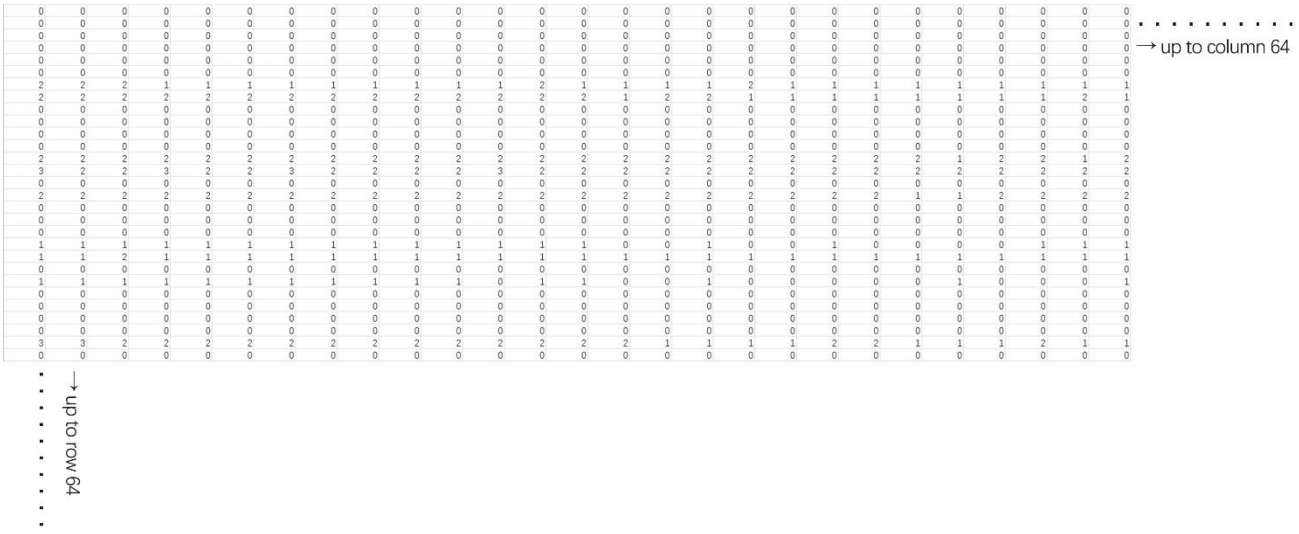
d. Press the Transformation button to adjust the placement of the image. Press "Rotate Right 90°", "Flip Vertical", and "Flip Horizontal" to acquire the needed image.

e. Click the "Save" button to start the recording and the button will change to "Saving". Click the button again to end the recording and save the data. The data is only generated when the test is running, including 64*64 current data for every frame recoded. You can rename the data, or it will be named after the current date. The data is saved in the file "MatrixReadout" under the file "LinkZill" by default. After saving the data, a window will be popped up, and you can share the measured data through email, Bluetooth et. al. The format of the save file is .csv and the data contains 4 parts:

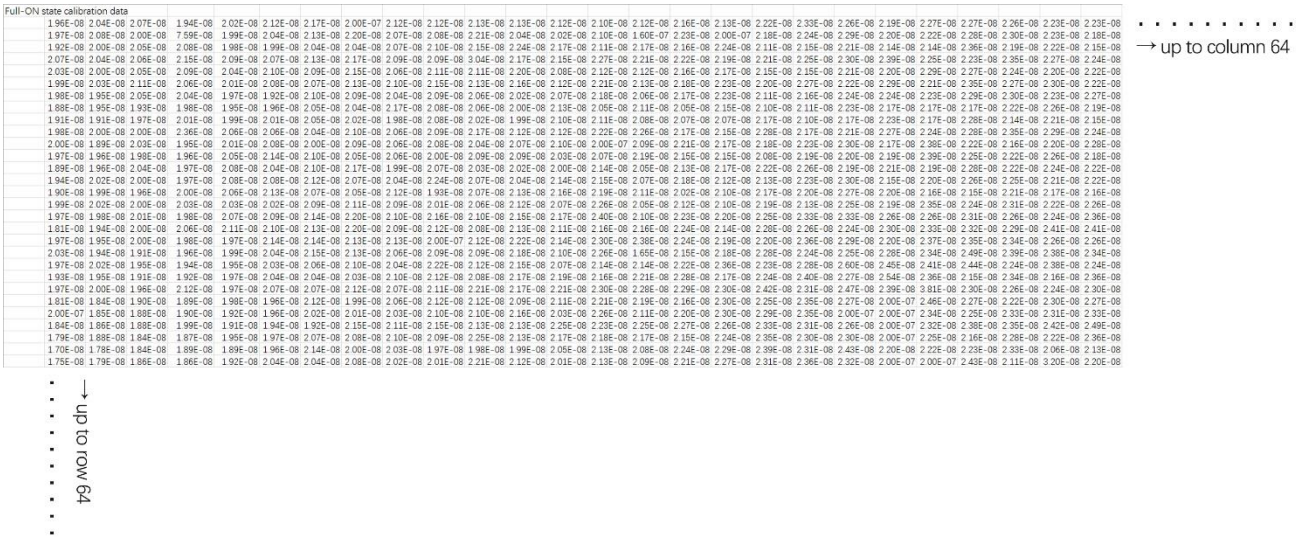
② . Original current data: (unit: A)



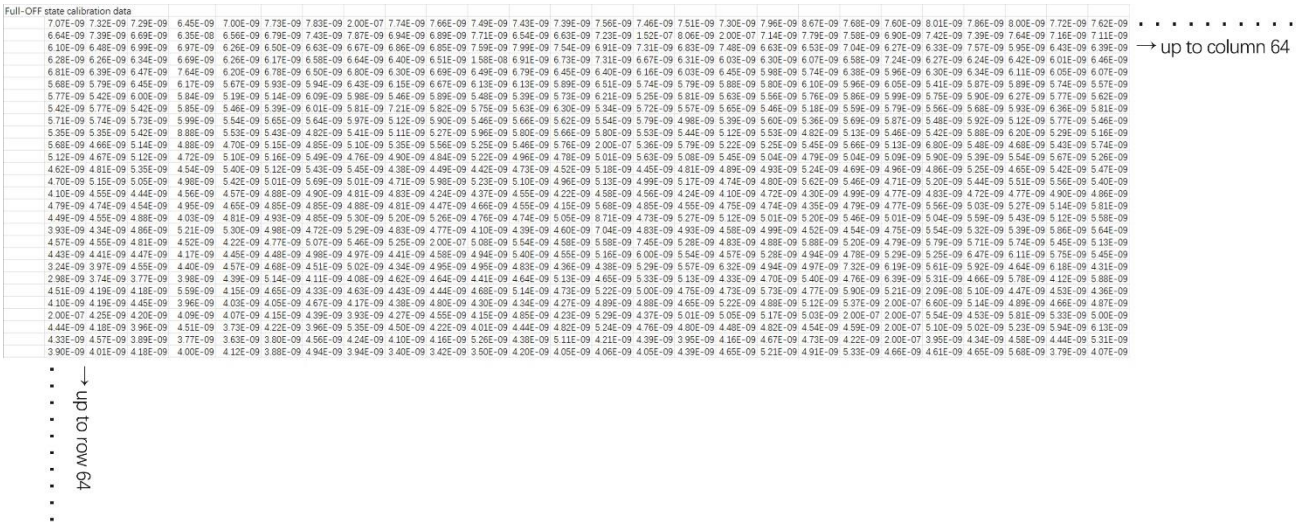
②. Grey level, 0 (dark) ~ 255 (bright):



③. Calibrated data of 255 grey level: (maximized photocurrent, unit: A)



④. Calibrated data of 0 grey level: (minimized photocurrent, unit: A)



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.