LinkZill

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TruEbox 03MR PRO (64×64) User Guide

V1.0

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TruEbox 03MR PRO (64×64) User Guide

Product Overview

This product is specifically engineered for current acquisition and imaging applications utilizing sensor array, supporting high-resolution array readout with a maximum configuration of 64×64 pixels. The system features 64 independent row selection channels, two DC bias voltage outputs, and 64 parallel current readout pathways. Acquired sensor data is transmitted to a host PC via USB interface, where the signal intensity is visualized as a 256-level grayscale image. When integrated with a compatible thin-film transistor (TFT) array chip, the system facilitates comprehensive detection of various physical signals, including optical and pressure inputs.

Parameter	Specification
L*W*H	188×158×43 mm
Weight	900 g
Charging Interface	DC002-1.3
Regular	64-channel pulse voltage (row selecting signals Von/Voff), voltage range: -15 V ~ +15 V 64-channel current readout, current range: ±100 pA ~ ±500 nA (bidirectional) 2-channel DC bias (Vbias1/Vbias2), voltage range: -15 V ~ +13 V
Communication Interface	USB
Terminal	PC（Windows 10 or higher）
Range	4 standard ranges (1 nA/10 nA/100 nA/500 nA) and 1 customizable range

Imaging	Definition： 64 rows and 64 columns Gray level： 256
Duration	>4 hours under room temperature
Refresh rate	10-60Hz, varies with current range

Refresh Rate Description:

Range	Current Mode	Frame Rate（fps）	Period（ms）	Pulse Width of Scan（ms）
500 nA	positive	60	16.67	0.26
500 nA	negative	40	25.00	0.39
100 nA	positive	60	16.67	0.26
100 nA	negative	40	25.00	0.39
10 nA	positive/ negative	15	66.67	1.04
1 nA	positive/ negative	12	83.33	1.30

Product List

Host	X1
Charger	X1
User Guide (Electronic Ver.)	X1
USB interface cable	X1

Pin Assignment Description

160 Pin FPC Pin Assignment (Left to Right):

Pin No.	001-064	065-079	080	081-144	145-154	155-157	158-160
Definition	64 Current Readout	DUMMY	GND	64 Selecting Signal	DUMMY	Vbias1	Vbias2

1. Vbias1 and Vbias2 are two DC bias voltage outputs with an adjustable voltage range from -15V to +13V;

2. The 64-channel pulse row-selecting signals: "Von" in the APP corresponds to the select voltage level, while "Voff" corresponds to the non-select voltage level, both adjustable from -15 V to +15 V;

3. The 64-channel current readout pathways support bidirectional current measurement with a detection range from ±100 pA to ±500 nA.

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 64x64 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.

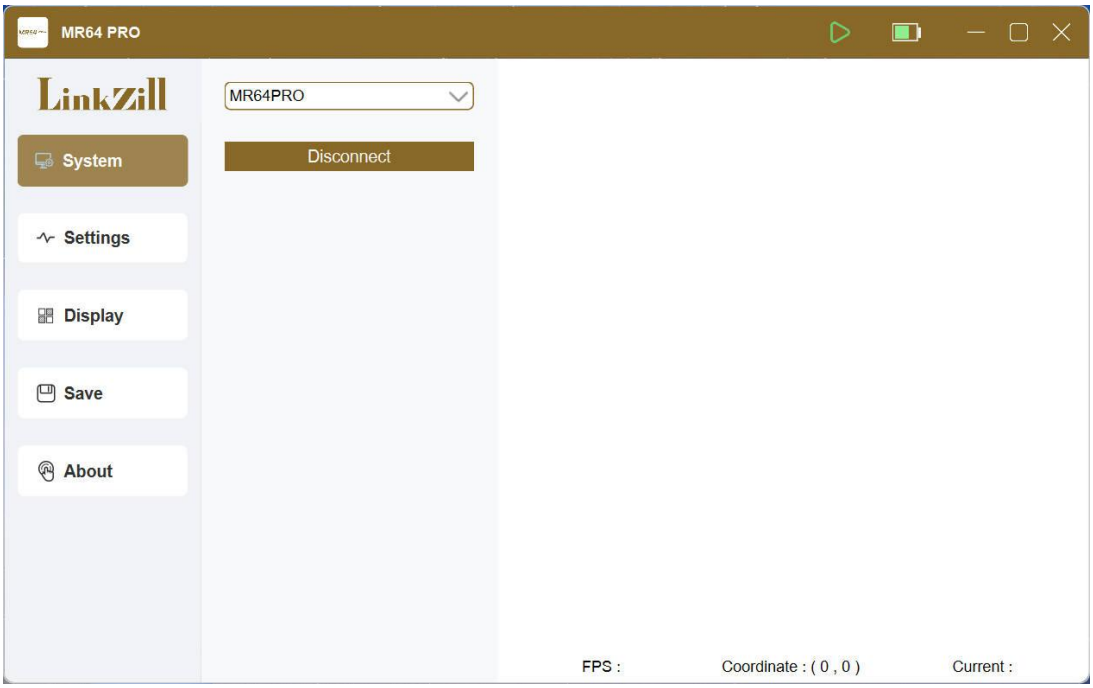
c. Close the lid to hold the FPC.

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.

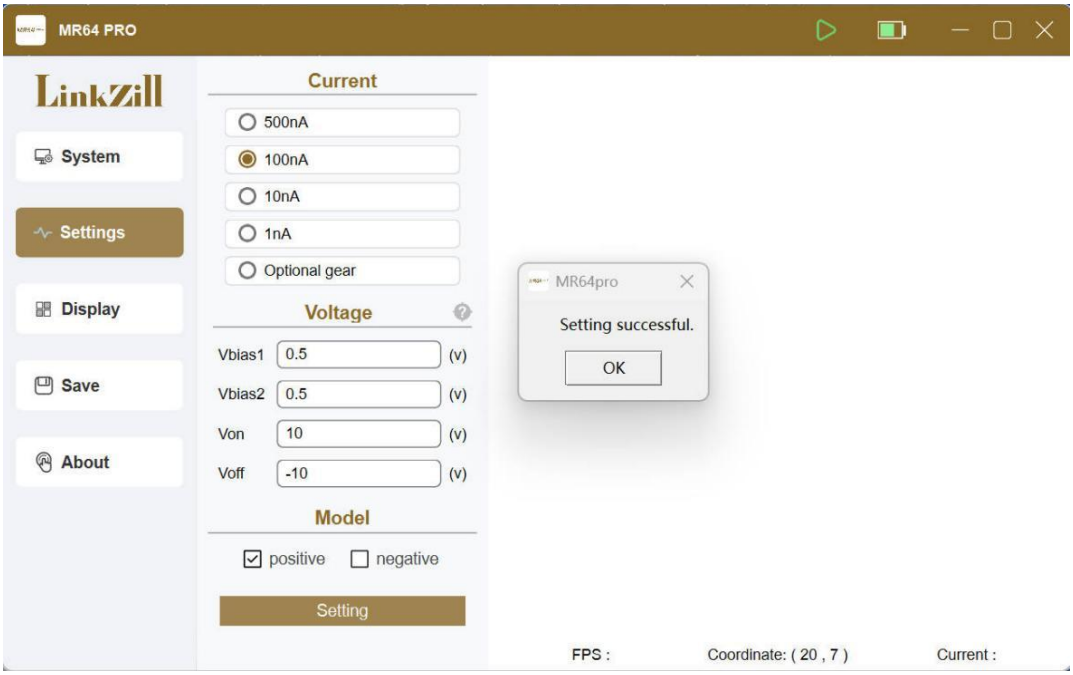
c. Open the application on the computer. If the connection is successful, the program device selection box will show the serial number of the device.



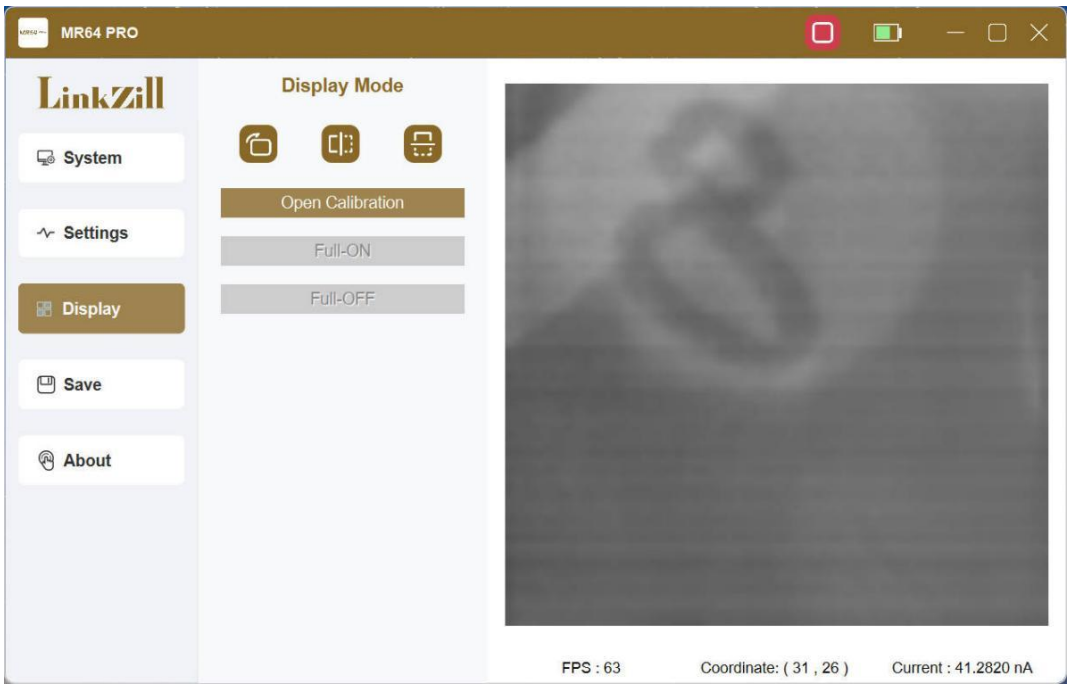
4. Start Testing

NOTICE: The following operation is based on a compatible 64x64 photosensor (with OPD on TFT array).

a. Click the "Settings" menu to configure the current readout range, Vbias1/Vbias2/Von/Voff voltages, and current mode (positive/negative). A common setting is as follows: Current Range=100 nA, Vbias1=0.5 V (common voltage), Vbias2=0.5 V (unused), Von=10 V (gate-on voltage), Voff=-10 V (gate-off voltage), and select positive current mode. After pressing "Setting" to confirm parameters, a pop-up dialog will indicate success/failure (See figure below). Click "OK" to close the notification.



b. Click the green triangle icon at the top-right corner to start acquisition. The current frame rate, coordinates, and current value of the selected point will be displayed below the imaging area. During operation, the icon changes to a red rectangle. Click it again to stop sampling. Access the "Display" menu （See figure below） to adjust the image: The top three buttons perform 90° clockwise rotation, left-right flip, and top-bottom



flip respectively. The raw pixel image is currently displayed. To perform grayscale calibration, click "Open Calibration". The calibration involves two steps:

① 255-Level Calibration: Place the array sensor in an unobstructed state and click "FULL-ON". This captures maximum photocurrent corresponding to 255 gray level (white). A pop-up notification confirms successful calibration.

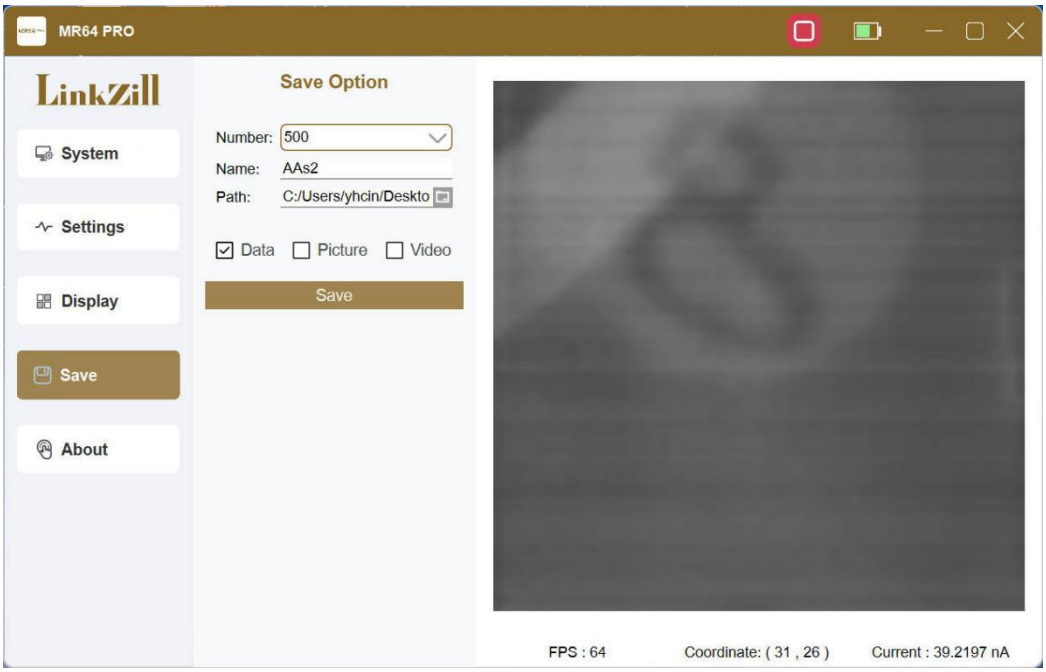
② 0-Level Calibration: Fully obstruct the array sensor and click "FULL-OFF". This captures minimum photocurrent corresponding to 0 gray level (black). Successful calibration triggers a pop-up notification.

Note: Repeat these steps to recalibrate. Click "Close Calibration" to exit the interface and revert to the raw image. Recalibration is recommended after changing any parameter (Current/Voltage/Model) to ensure imaging quality.

c. Click the "Save" menu (See figure below) to save data. Configure settings via the dialog: Select frame count in "Number" (≤1000), enter an ASCII-only folder name in "Name", set an ASCII-only storage path in "Path", and check desired outputs (Data/Pictures/Video). After clicking "Save" and waiting for completion, all files will be stored in the specified folder including:

1) Auto-generated SetParameterData.txt recording current parameters;
2) When "Data" is checked: current.csv (64×64 raw currents), gray.csv (64×64 grayscale values), fullon.csv/fulloff.csv (calibration data) for the saved frames;
3) When "Picture" is checked: "Number" of 64×64 grayscale PNG images;
4) When "Video" is checked: MP4 video compiled from all frames.

Note: Existing folders trigger automatic renaming (e.g., "Name_1", "Name_2") to prevent data overwriting.



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.