SEED-7I0A-55

User Manual

Preface

SEED-7I0A-55 is a new generation display screen of Shanghai Rising Digital Co.,Ltd.. It is a monitoring and control platform specially designed for construction machinery products. The display screen is based on cortex-a9 platform and adopts a new digital display scheme. It has high resolution, good human-computer interaction performance, capacitive touch, multimedia video entertainment, 4G communication and GPS Positioning, camera, radio functions, can be applied to construction machinery, mining, chemical industry, factory automation and other complex environment, powerful function, high reliability.

The display part adopts 7.0 inch TFT LCD with resolution of 800 × 480, flat front panel design, and beautiful industrial appearance。

1.Functions and features

- 7 Inch Touch screen with capacitive touch
- Internal integrated radio with external radio antenna
- Microphone voice input, audio output
- 4G, GPS, BLE
- Support two-way can communication, support ISO11898 CAN2.0B、J1939、CanOpen
- The interface uses te 2-6447232-3 connector. It is recommended that the harness connector te 4-1437290-0, and the model of the matching terminal is 3-1447221-3
- Function overview

Item	function	Subnumber	Subfunction	describe
1	Display	1.1	Page switching	Page switching is realized by touching the key
		1.2	Variable display	Displays the variable value at the specified location
		1.3	Icon display	Displays a custom icon at the specified location
		1.4	Bar chart display	The progress bar displays the associated variable values
		1.5	Cut pictures	Cut image to custom target location
		1.6	Picture in picture display	Picture in picture display of custom target position
2	communi-cation	2.1	CAN communication	support ISO11898 CAN2.0B、J1939、CanOpen
		2.2	4G communication	Upload the data to the remote monitoring center; receive the data from the monitoring center, and support 4G LTE high-speed transmission (Please insert SIM card before using)
		2.3	GPS communication	Receive satellite's longitude and latitude information
		2.4	USB communication	Support u disk upgrade program and U listen to songs and other functions
		2.5	BLE communication	Support BLE and smart phone connection, Upload the data and other functions(Match your phone before using it)
3	human-computer interaction	3.1	Touch the button	Support capacitance touch function
		3.2	Light sensing	Support light sensing function
		3.3	FM	Internal integrated radio function
		3.4	Music playing	Support Bluetooth and USB flash disk
4		4.1	Switch input	Support switch input

	Inpu/ output	4.2	Output switch	Support switch output
		4.3	Audio analog signal output	Audio analog signal output
5	camera	5.1	Camera acquisition and display function	Support NTSC / PAL analog camera, can access 1 channel, support single picture, picture in picture display
6	Microphone	6.1	Microphone input	Support microphone input, Bluetooth phone function

Product appearance structure function description

1、Appearance size

unit：mm

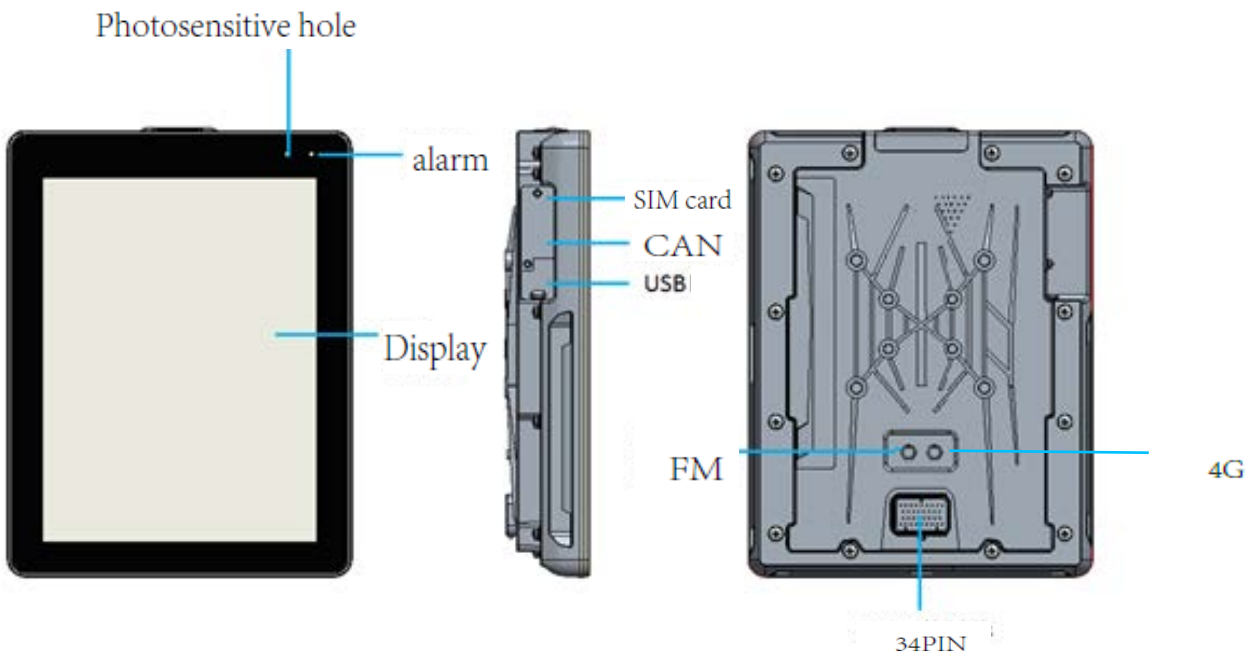


Fig. 1 appearance dimension of display screen

2、Installation dimensions

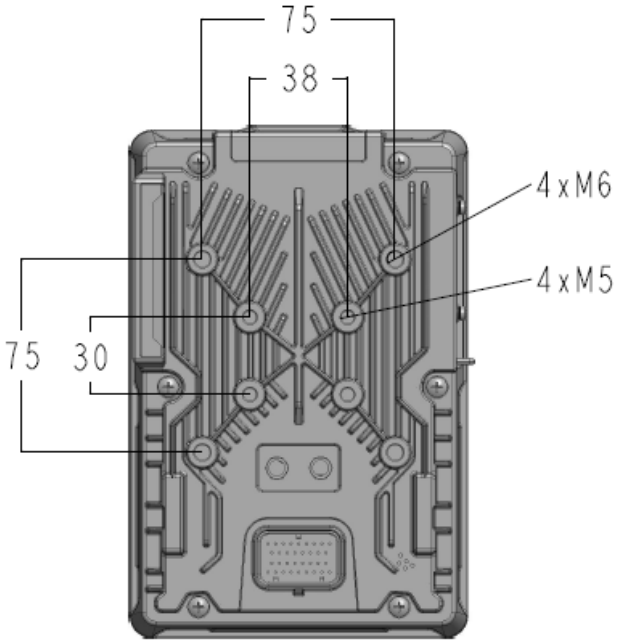


Fig 2 display screen installation size

The outer ring is fixed with 4 × M6 screws (including spring washer and flat washer), and the inner ring is fixed with 4 × M5 screws (including spring washer and flat washer).

3、Product port function details

name		function	Pin	remarks
digital signal input	System settings	SYS_SET	3	Power on and ground short circuit into BIOS, wiring harness is not connected
	signal	DI	30	One key start signal
Digital signal output	signal output	DO	8	Electrical signal on battery
	signal output	DO	9	Start signal
Audio output	Audio ground	A_GND	5	Power amplifier
	Audio power supply	A_POWER	4	Power supply of power amplifier
	Left vocal tract	A_LF	6	Left channel
	Right vocal tract	A_RF	7	Right channel
	MUTE	MUTE	16	amplifier MUTE
	STB	STANDBY	23	amplifier STB
Video input	camera	CAM1+	10	camera 1 signal +
		CAM1-	11	camera 1 signal -
One button start	indicator light	red	26	One button start red light
		green	27	One button start green light
		Ice blue	28	One button start ice blue light belt
SMI control	SMI		17	Key switch
GND	GND		24,33	
12V output	+12VOUT		14,22	Camera power supply
+5V output	+5VOUT		29	Sensor power supply
Power input	+24VIN		25,34	Rating: 12~24V
communication	CAN1	CAN1_H	2	There is no internal 120 Ω terminal resistance, which needs external connection
		CAN1_L	1	
	CAN2	CAN2_H	32	There is no internal 120 Ω terminal resistance, which needs external connection
		CAN2_L	31	

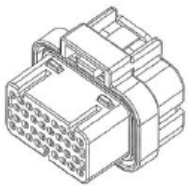
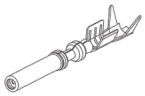
3.Product program download and upgrade

3.1 Hardware development platform

Fig.3 USB interface for program download and upgrade of display screen

To download and upgrade the display program, please loosen the screw of the metal cover plate on the left side of the display screen, connect the computer with the USB data cable, and download and upgrade the program cable through the upper computer. The USB interface is also used for screen program debugging.

The electrical connector must be equipped at the same time when purchasing the product. The recommended table is as follows:

No.	Name	Model	Illustration	manufacturer
1	Amp connector socket sheath	4-1437290-0		Tyco Electronlcs
2	AMP Connector metal pin	3-1447221-3		Tyco Electronlcs

3.2 Software development platform

It supports QT configuration software, adopts standard ide development environment, and can develop QT application program according to project requirements. Can refer to the commonly used sample programs, rapid development of applications. include:

1) QuickStart human-machine interface, including common man-machine operation control
2) QT based communication function library, including can communication, 4G communication, GPS communication, BLE communication。

3.3 Program burning

3.3.1 QT application program burning

1) Create app folder under the root directory of U disk and place QT configuration program
2) The USB flash disk is connected to the USB port behind the display screen. When the main board is powered on, the display screen will pop up the configuration selection, click "burn", the U disk indicator light starts to flash, and the burning progress is displayed.
3) after burning, the display screen will automatically restart to complete the burning without power off.

3.3.2 Kernel and device tree burning

1) Connect the upper USB port and notebook behind the display screen through USB adapter
2) Turn off the firewall of laptop windows system.
3) If the rndis network device cannot be recognized in "Device Manager → network adapter", please install rndis driver. 4) set IP (display IP) and server IP (computer IP) must be in the same network segment
(1) Set computer IP: 192.168.1.66
(2) Set the IP of display screen: 192.168.1.62, which can not be modified by default
(3) Restart the display screen and enter the uboot mode. Enter the command from the serial console:
setenv serverip 192.168.1.66
setenv ipaddr 192.168.1.62
saveenv
5) Create a folder on the desktop, put tftpd32.exe, kernel and device tree in this directory,
(1) Open tftpd32.exe, select "sever interface" option, and select native IP: 192.168.1.66
(2) Update the device tree and input the command run update on the serial console_ FDT
(3) Update the kernel, input the command of the serial console: run update_ kernel

4. Connection with external controller

It is connected with external controller through CAN bus and supports CAN2.0B, CANopen, J1939 and other protocols.

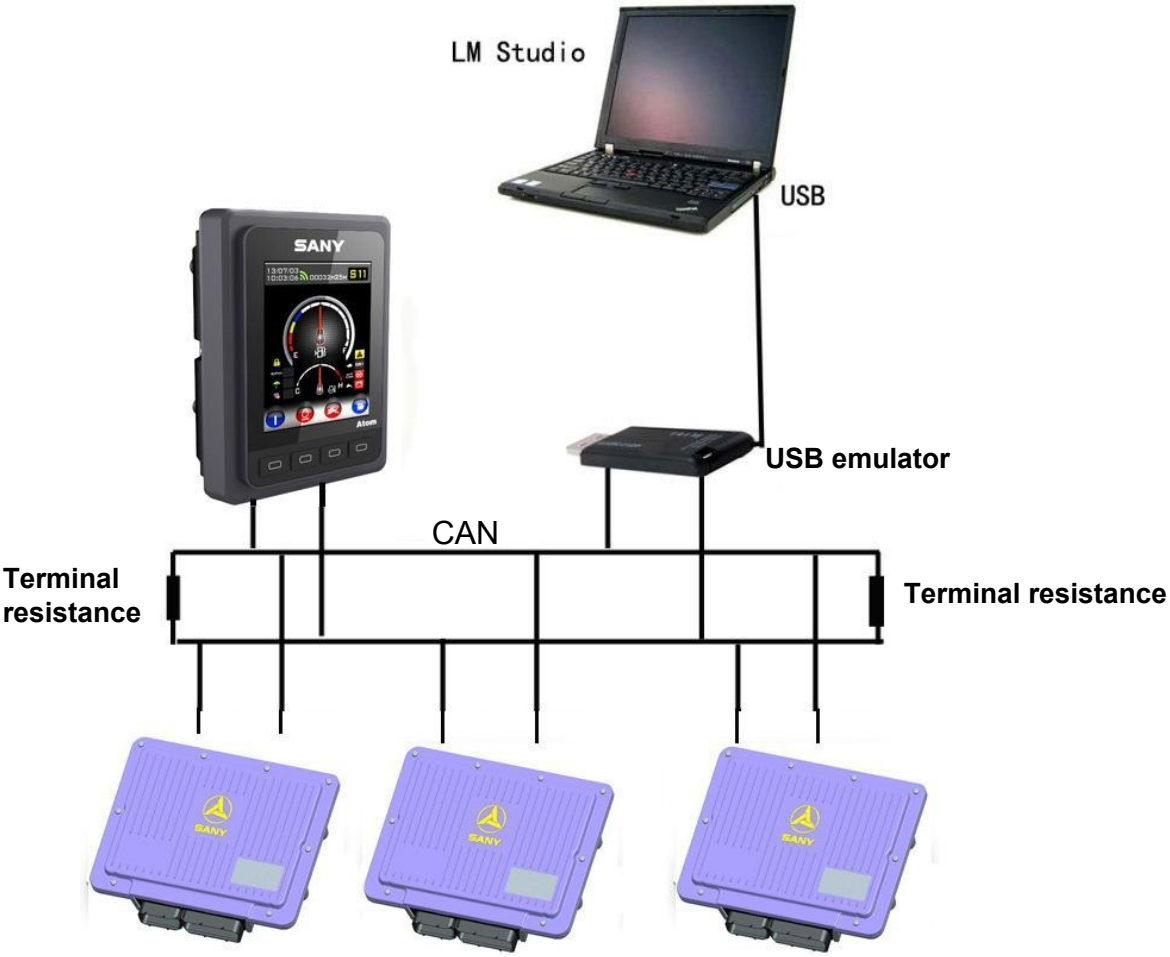


Figure 4 connection with external controller

5. Description of product parameters and environmental indicators

Number	Product name	Detailed
1	Video input	4 channel, PAL / NTSC signal
2	12V OUT	2 channel
3	➢ Communication	CAN: 2 channel, Rate selectable ISO11898 CAN2.0B、J1939、CanOpen; USB: 1 channel, USB2.0; Support u disk upgrade program and U listen to songs and other functions 4G, Antenna built-in: LTE: B5/B41 GPS :Receive satellite's longitude and latitude information bt : 1 channel, 5m Communication (No obstacles) distance (barrier-free), receiving sensitivity: <-90 dBm, antenna built-in; EtherNet: 1 channel, 10/100/1000 Mbps
4	Display	7 inches Resolving power: 800x 480 Industrial TFT LCD Screen Capacitive touch
5	Key	Quantity: 1, HOME key
6	Conventional parameters	Kernel: ARM Dual Core Main Frequency: 1GHz DDR3 Memory: 1GB Storage: 8GB Power supply: DC 12-24V. （Recommended voltage DC 24 V ） **Note: If the power supply voltage of video function should be > 14V, otherwise the camera can not be driven.** Output voltage: DC 12V, 1A Consumption current: 0.55A (DC 24 V) Power waste: ≤ 14W Video Display: Picture in Picture, 4 Segments/Single Picture

7	Work environment	working temperature: - 20 ~ 65 ° C Storage temperature: - 25 ~ 80 ° C Overvoltage protection: 37.2 V Anti vibration: 4 - 300 Hz 10mm 5G Impact resistance: 50G 6ms & 11ms Relative temperature: 10 % ~ 95 % Protection level: IP 65
8	Outline size	197×131.5×48.9 (mm

6. Operating instructions

Bluetooth:

Turn on and find the Bluetooth logo in the main interface,

click to enter, turn on the switch, Search the device, you can connect to use.

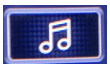
4G:

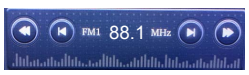
Plug in the SIM flow card, and the traffic will be turned on by default after power on, and you can use it. Upload the data to the remote monitoring center; receive the data from the monitoring center,

GPS:

After power on, the GPS function is automatically turned on to determine the location of the device.

FM:

Turn on and find the Music logo in the main interface,  click to enter, Select Radio,

Select or switch the channel, you can use it directly. 

FCC Statement：

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference,and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However,there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.