MIR8

Embedded 2D Barcode and NFC card Reading Module

Specification V1.1

Disclaimer

Pleasse read all content of this manual carefully before using product which is described in this manual. This manual is helpful for using product safely. Please keep well for next use.

Do not dismantle terminal equipment or tear up sealed bidding, otherwise our company will do not be responsible for repairing or replacing the terminal.

The pictures in this manual are for reference only. Please refer to the actual product if there is any discrepancy between individual pictures and actual product. For the improvement and update of this product, Our company reserves the right to modify the document at any time without notice.

All information contained in this manual is protected by copyright. Our company reserves all rights. Units and individuals are not allowed to extract, copy or combine all or part of this document in any way or for any reason without permision. The products described in this manual may include the copyrighted software of our company or a third party. Units and individuals are not allowed to copy, distribute, modify, excerpt, reverse editing, decode, reverse engineering, lease, transfer, sublicense or other violations of software copyright for the aforementioned software in any form unless permission is obtained from the relevant right holder.

Our company reserves the right of final interpretation of this statement.

MIR8 Specification V1.1

Version

| Version	Version Description	Release date
V1.0	Initial release	2024-09-03
V1.1	Increase size diagram	2024-09-26

Content

Introduce

MIR8 is an embedded **2D barcode** and **NFC card** reading module, using advanced CMOS image recognition technology, intelligent image recognition system. With excellent reading performance, you can easily read the bar code on paper, goods, screens and other media. It also supports NFC function and various IC cards.

Its all-in-one compact design allows easy insertion into a wide range of equipments, such as queuing machines, self-service inquiry machines, ticket checking machines, vending machines, entrance guards, corridors, etc.

Appearance

The following picture shows the appearance of MIR8.　There is a camera on the front, a buzzer and an interface on the back, and a fixed hole in the four corners.

Cushioning Foam		Buzzer
Camera		8PIN Interface
Location Hole		12PIN Interface
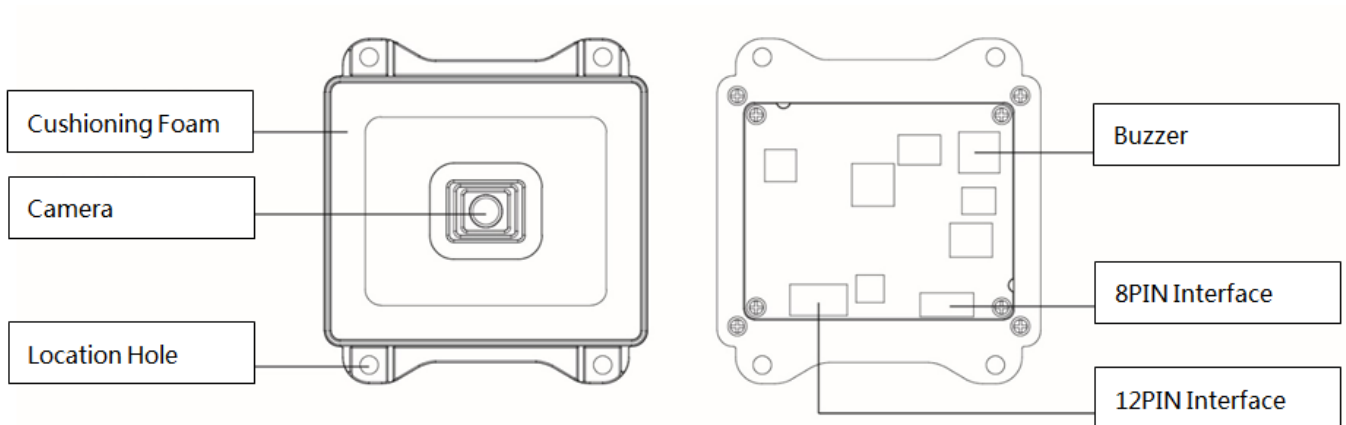
【MIR8 Appearance】

Attention：

> In order to maintain the excellent reading performance of the scanner, please keep the product clean.

> Please use soft cloth to clean the window. Do not spray any liquid on the window.

Product Features

- Ultra-thin structure: less than 16mm thickness, especially suitable for light and thin terminal equipment supporting use.
- The overall appearance of the whole body light transparent material, uniform light transparent not dazzling.
- Warm white light design, the light source is more moderate.
- Rich in decoding functions: support more than 40 types of bar code reading, OCR-B reading, support for a variety of reading modes.
- Optional NFC card reading function, support to read access card, membership card and other protocol cards.
- Supports USB(USB-KBW*, USB-COM, USB-HID POS), optional TTL, RS232, RS485, Wiegand interface communication.
- Strong compatibility: it supports the Raspberry Pi, 51 single-chip microcomputer; Windows, Mac OS, Ubuntu, Linux, Android, UOS, Kylin OS, Redflag OS, Deepin OS, Fonder OS, etc.
- SDK, custom development, custom protection, support to customize various specifications of electronic wire.
- Read screen/paper code: support all kinds of materials, different colors, curved, folded bar code scanning, using enhanced reading ability, can adapt to low brightness screen, all kinds of film screen bar code scanning .

Application

This high performance embedded 2D image and NFC module is specially designed for OEM applications. It can be easily embedded into a variety of equipment as a barcode reading component application, such as queuing machines, self-service inquiry machines, ticket checking machines, vending machines, entrance guards, corridors, etc.

Interface Information

The MIR8F communicates with the outside world through a 12PIN PFC socket and a SH1.0-8PIN dupont socket. MIR8F supports USB, TTL, RS232, RS485, Wiegand communication.
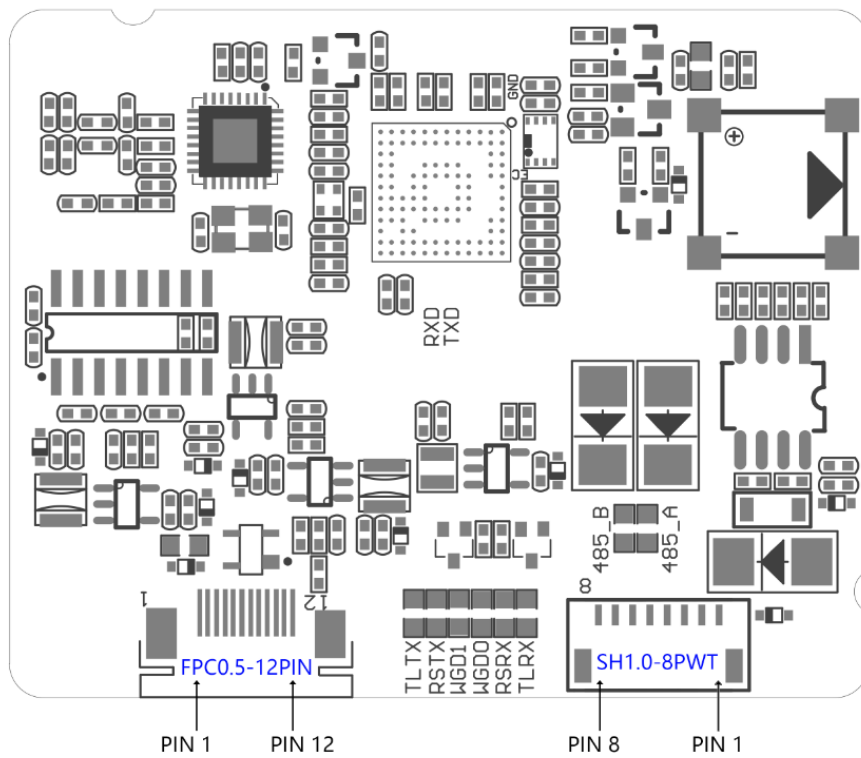
12PIN Definition

MIR8 uses 12pin pitch 0.5 data interface. The name and signal description of each PIN pin of the 12PIN connector are listed in the table below.

PIN	信号	类型	定义
1	NC	-	NC
2	VIN	P	Power Input DC 3.3-5V±5%
3	GND	P	
4	UART_RX	Input	TTL-RS232 reception, 3.3V level
5	UART_TX	Output	TTL-RS232 transmit, 3.3V level
6	USB_DM/D-	Input/ Output	USB_D- Signal
7	USB_DP/D+	Input/ Output	USB_D+ Signal
8	NC	-	NC
9	BEEP	Output	Passive buzzer output signal, idle low level
10	LED	Output	Successful decoding prompts output signal, idle low level
11	NC	-	NC
12	TRIG	Input	Low level trigger, keep the low level more than 20ms to trigger reading code (external can not be connected to the pull resistor, also can not be connected to the capacitor)

When the MIR8 can communicate using an 8-pin Pitch1.25 interface, the interfaces are defined as follows.

PIN	USB	RS232	TTL	Wiegand	RS485
serial number	default	Use RS hop point (default)	TL hop points are used	Use the WG hop point	485 hop points are
1	5V	Power Input DC 5V±5%			
2	GND	Power Ground			
3	TRIG	Low level trigger, keep the low level more than 20ms to trigger reading code (external can not be connected to the pull resistor, also can not be connected to the capacitor)			
4	BEEP	Passive buzzer output signal, idle low level			
5	USB_D+	USB_D+/DM Signal			
6	USB_D-	USB_D-/DP Signal			
7		RS232_TXD	TTL-RS232 RXD, 3.3V	Wiegand-D1 5V	RS485_A
8		RS232_RXD	TTL-RS232 TXD, 3.3V	Wiegand-D0 5V	RS485_B

Cable
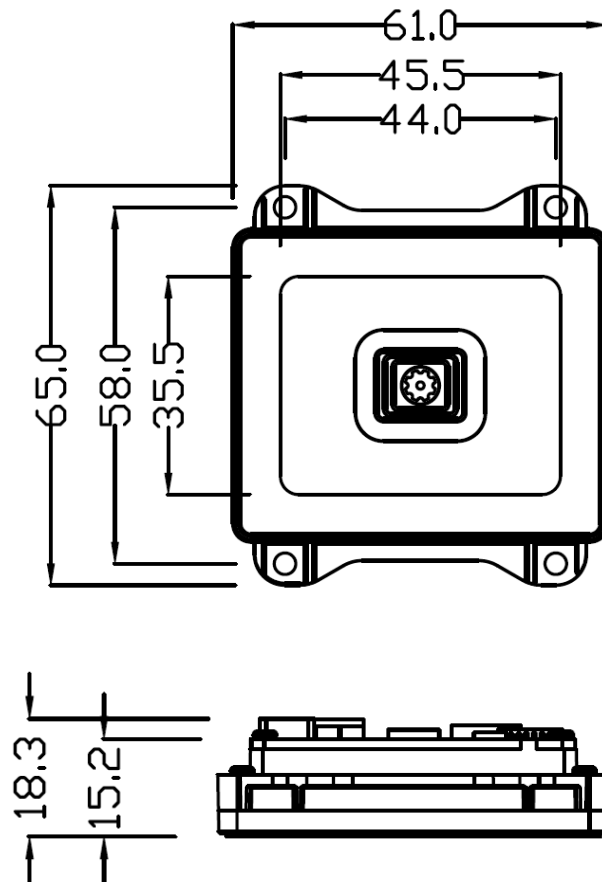
12 PINS FPC

8 PINS USB
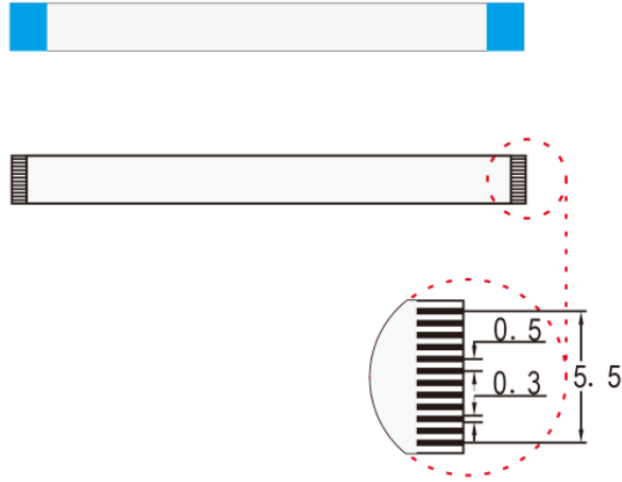
MIR8 Specification V1.1
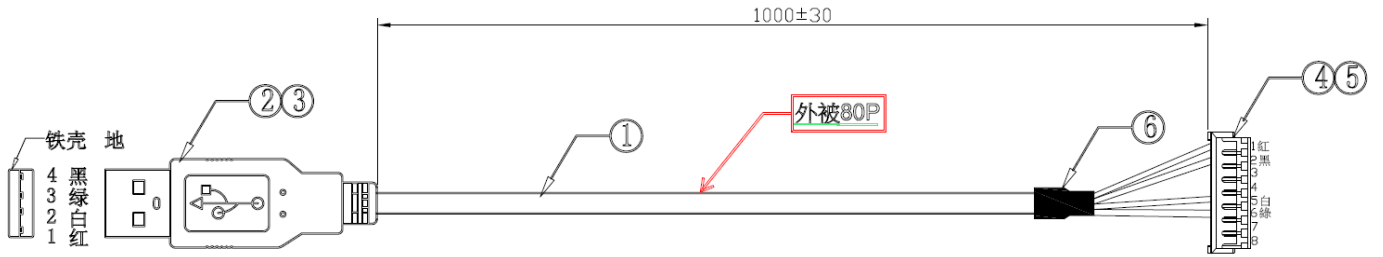
Structure Dimension

MIR8 embedded 2D imaging module is designed to be integrated. When using MIR8F for

integrated applications, you can refer to the following physical size specifications.

Unit:mm

Performance

Communication Mode	USB (USB-KBW，HID-POS，USB-COM) 、RS232, TTL, Wiegand, RS485
Dominant Frequency	1Ghz
Sensor	CMOS Global Shutter
Pixel	300,000， 640 x 480
Reading Precision	≥3mil/0.075mm（PCS90%,CODE 39)
Illumination	Warm White LED
Depth of Field	30mm~210mm（Different barcode range)
Decoding Speed	65cm per second
Scanning Mode	Induction, Continuous，Instruct
Prompt Mode	Buzzer
Perspective	60°Horizontal，50°Vertical，Opposite Angles 72°
Reading Angle	Test Conditions：CODE39,10mil/0.25mm,PCS90%
	Roll: ±360°，Pitch:±60°，Skew: ±55°
Print Contrast	≥20%
Ambient Illumination	Dark Environment，Indoor Natural Light

Code System	1D：UPC-A，UPC-E，EAN-8，EAN-13，ISBN, ISSN, Coupon. Code 128，GS1-128(UCC/EAN 128)，ISBT 128， Code 39， Code 39 Full ASCII，Code 32, Code 93， Code 11,Codabar（NW-7），Interleaved 2 of 5，Matrix 2 of 5，Industrial 2 of 5(Straight 2 of 5)， Standard 2 of 5 （IATA 2 of 5），NEC 2of 5，HongKong 2 of 5(China Post), MSI Plessey， UK Plessey， Telepen Code， Trioptic Code ， BC412， Pharma Code(One-Track), etc. 2D: QR Code, Micro QR Code, Data Matrix，PDF417, Micro PDF 417，MaxiCode, Aztec， HanXin Code, Codablock A, Codablock F, etc. Other composite code： GS1 Databar(Omnidirectional, Truncated Stacked, Limited, Expanded, Stacked Omnidirectional, Expanded Stacked, Expanded Stacked)，GS1 Composite（Omnidirectional, Truncated, Stacked, Stacked Omnidirectional, Limited, Expanded, Expanded Stacked, GS1-128, UPC-A, UPC-E, EAN/JAN-8, EAN/JAN-13）,Chinese ID Card OCR, Korea Post, Australian Post, Royal Mail, USPS Intelligent Mail, Japanese Post, Planet Code, USPS Postnet, KIX Code
NFC Distance of Sensing	0-5CM
NFC Output Format	Decimal (default), hexadecimal

| NFC Reading | UID Read supported, write not supported |
| NFC Supporting Protocols | ISO14443A, ISO14443B and other 13.56Mhz protocols Refer to "NFC Read Card Type" |

Note: For bar codes of different code systems, the actual reading ability is subject to the actual effect because some bar codes are wide or dense.

NFC Read Card Type

Protocol Standard	Tag Type	CardType
ISO 14443A	Type 1 Tag	ToPaz 512
ISO 14443A	Type 2 Tag	Mifare Ultralight NTAG216
ISO 14443A	Type 2 Tag	Mifare ultralight-C
ISO 14443A	Type 2 Tag	NTAG215
ISO 14443A	Type 2 Tag	MiFare UL
ISO 14443A	Type 2 Tag	NTAG213
ISO 14443A	Type 2 Tag	NTAG203
ISO 14443A	Type 2 Tag	NTAG200
ISO 14443A-4	Type 4 Tag	Type A(7816-4 1KB)
ISO 14443B	Type 4 Tag	Type B
ISO 14443A	Type 4 Tag	MiFare DESFIRE D22
ISO 14443A	Type 4 Tag	MiFare DESFIRE EV1 2K
ISO 14443A	Type 4 Tag	MiFare DESFIRE D42
ISO 14443A	Type 4 Tag	MiFare DESFIRE D82

ISO 14443A	Type 7 Tag	MiFare Plus 4K
ISO 14443A	Type 7 Tag	MiFare plus 2K
ISO 14443A	Type 7 Tag	MiFare 1K
ISO 14443A	Type 7 Tag	NXP-S70 EV1
ISO 14443A	Type 7 Tag	MiFare S50
ISO 14443A	Type 7 Tag	MiFare S70

Mechanical/Electrical Parameters

Product Weight	26.5g (Scanner)
Appearance	65mm L* 61mm W * 18.3mm H
Wire Length One	5cm (FPC Single-sided Wiring)
Interface Type One	FPC12PIN，Pitch=0.5mm
Wire Length Two	1.0M
Interface Type Two	SH1.0 - 8PIN, Pitch=1.0mm
Power Input	DC 5V/1A
Current	195mA (Average Work)

Working Environment

Working Temperature	-20℃ to 50℃
Storage Temperature	-40℃ to 70℃
Working Humidity	5% to 95%（Non-Condensing)
Transportation Vibration Test	10H@125RPM

Spare Part List

FPC	12PinPitch 0.5 Coplanar 5CM。
Development Board（optional)	It is used to connect modules and wires, has the output function of different interfaces, and the scanning prompt function.
Cable（optional)	It is used to connect the development board and the communication host, and can be equipped with different interface cables.
Power Adapter （optional)	Output: DC5V 1A, Input: AC100~240V 50~60Hz, can be used for serial port power supply.

Depth of Field

Barcode Type	Barcode Density	Minimum	Maximum
Code 39	0.075mm(3mil)	30mm	80mm
Code 39	0.127(5mil)	30mm	140mm
Code 39	0.5(20mil)	60mm	210mm
UPC/EAN	0.33mm(13mil)	30mm	160mm
Wechat	6 inch screen	30mm	170mm
Alipay payment	6 inch screen	30mm	180mm

**Testing Conditions: Environment Temperature = 24℃, Ambient Light Illumination =

300~400 lux; Testing Barcodes were prepared by our company**