

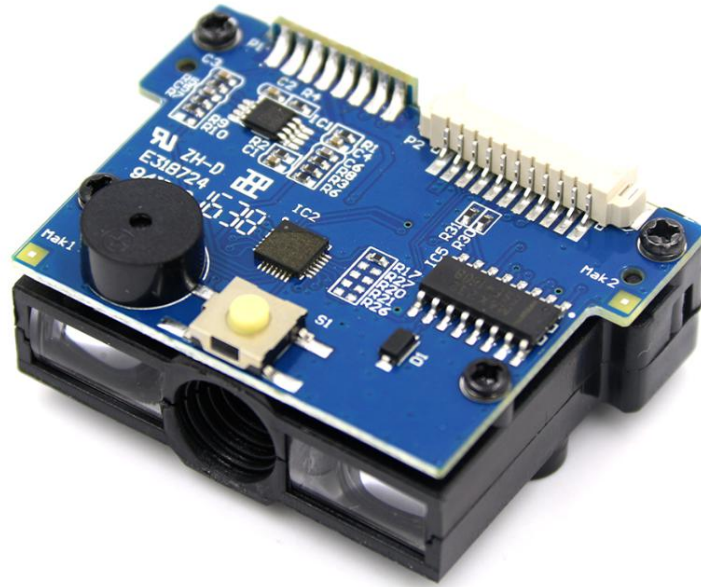
# 1D Scan Engine Integration Guide

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# Chapter 1 Getting Started

## Introduction



MCR12series is a sort of utilitarian embeddedbarcode reading engine. Applying to Computerized CCD Image Recognition System, it ensures the fast scanning and decoding accuracy on popular 1D barcodes.

This module is specialized to be integrated into OEM equipment to provide solutions for all kinds of lockers, and medical facilities. Integrated core components guarantee the reliability and stability of the product, and decrease the rate of failure of the scanner.

## Feature

- Linear barcode scanning: fast and easy to scan print code, paper code, screen code, and have nice performance in scanning abrasion code, fuzzy code and even damaged code
- Multiple interfaces support: support USB、TTL-RS232、RS232、PS2、USB-COM.
- USB fast transmission: to improve work efficiency, for better user experience.
- Secondary development: support secondary development, and have been widely used in all kind of MCU.
- Wide application area: apply to all kinds of lockers, MCU development and for medical and scientific research.

## Application area

Supermarket locker, MCU development, medical and scientific research facilities, vending machine, Self Service Terminal, Queue Management System, Lottery Machine, mobile coupon, mobile phone payment scanning etc.

## MCR12 General Requirements

**ESD Protection:** ESD protection has been taken into account when designing the MCR12 and the engine is shipped in ESD safe packaging. Always exercise care when handling the engine outside its package. Be sure grounding wrist straps and properly grounded work areas are used.

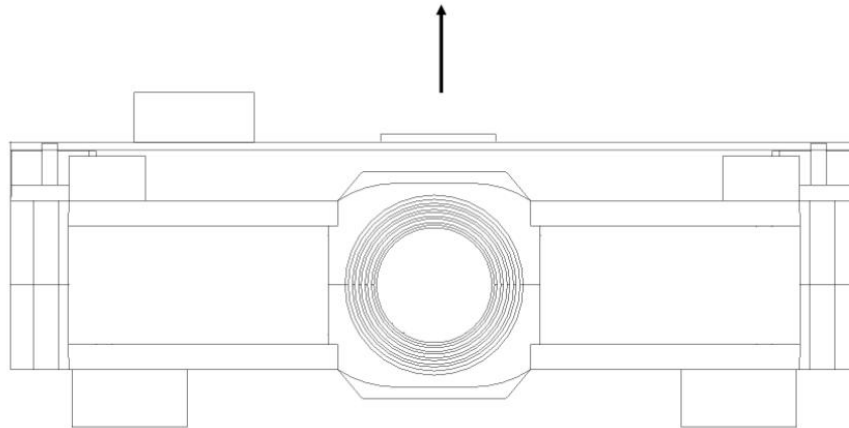
**Dust and Dirt:** The must be sufficiently enclosed to prevent dust particles from gathering on the image and lens. Dust and other external contaminants will eventually degrade the engine's performance .

**Ambient Environment:** Working temperature : $-20^{\circ}\text{C}\sim 50^{\circ}\text{C}$  , Storage temperature: $-40^{\circ}\text{C}\sim 70^{\circ}\text{C}$  , Humidity:5%-95% (non-condensing).

**Thermal Considerations :** Electronic components in the will generate heat during the course of their operation. Operating the MCR12 in continuous mode for an extended period may cause temperature to rise on CIS and decoder chips. Overheating can degrade image quality and affect scanning performance. Given that, the following precautions should be taken into consideration when integrating the :

1. Reserve the sufficient space for good air circulation in the design.
2. Avoid Wrapping the with thermal insulation materials such as rubber.

**Installation Orientation:** The following figure illustrates a front view of the after installation, with the engine's decoder board on the top, and the illumination and lens on the front.

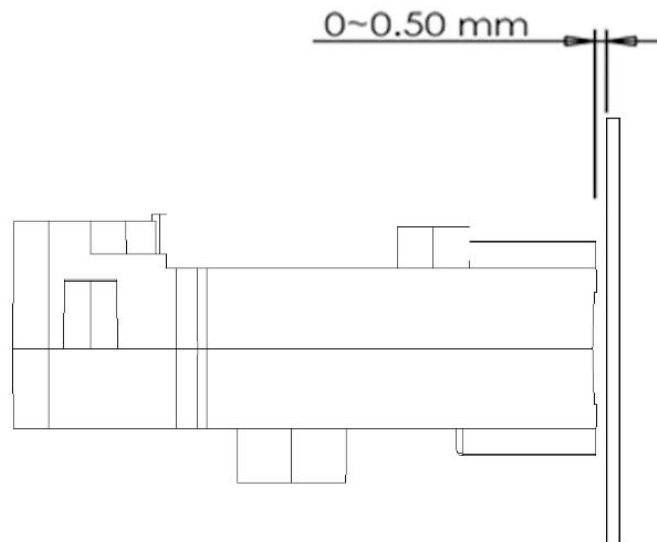


## Optics

### Window Placement

The window should be positioned properly to let the illumination and the aiming beams pass through as much as possible and no reflections back into the engine(reflections can degrade the reading performance).

Window should be mounted close to the front of the engine(parallel).The maximum distance is measured from the front of the engine housing to the furthest surface of the window.In order to reach the better reading performance,the distance from the front of the engine housing to the furthest surface of the window should not exceed 1.5mm and the distance from the front of the engine housing to the nearest surface of the window should not exceed 0.5mm.



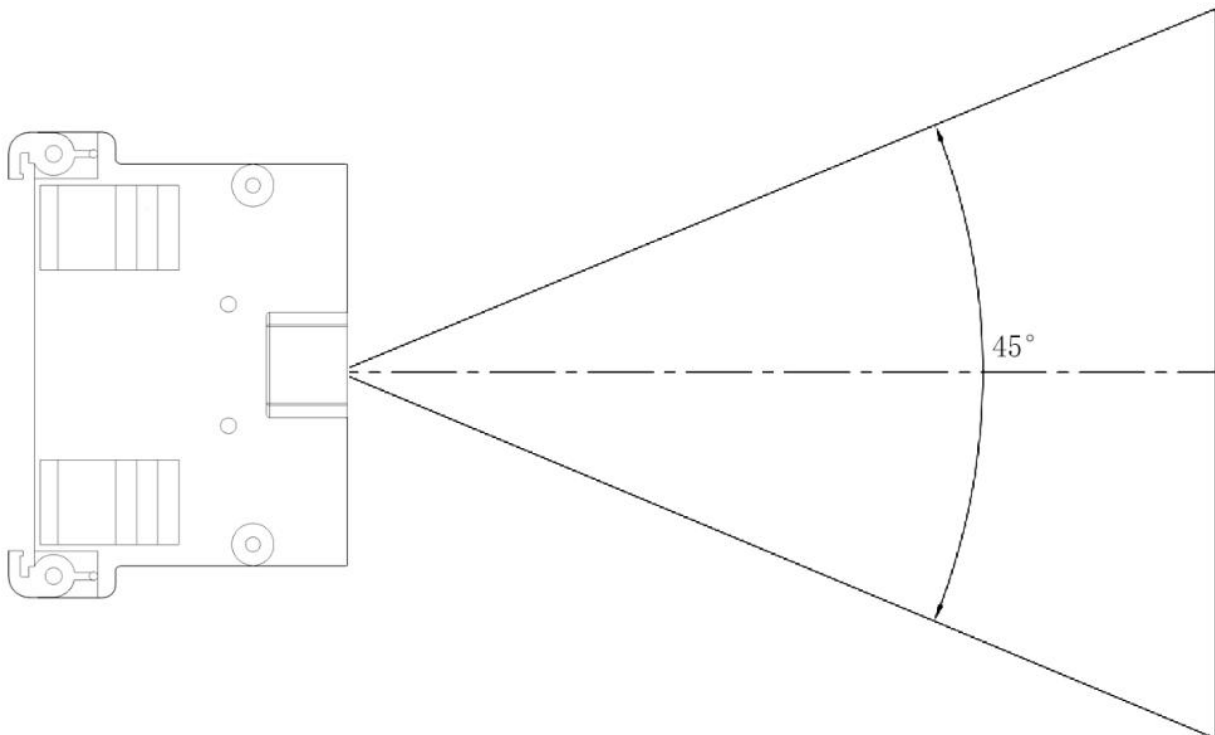
If the window is required to be in a tilted position, the above distance requirements should be met and tilt angle should ensure no reflections back into the lens.

## Window Material and Color

Illumination wavelengths and CIS's responsiveness (mainly to wavelengths of red light) should be taken into consideration when choosing window material and color, in order to achieve the possible highest spectral transmission, lowest haze level and homogeneous refractive index. It is suggested to use PMMA or optical glass with spectral transmittance over 95% and haze less than 1%. Whenever to use an anti-reflection coating or not depends on the material and application needs.

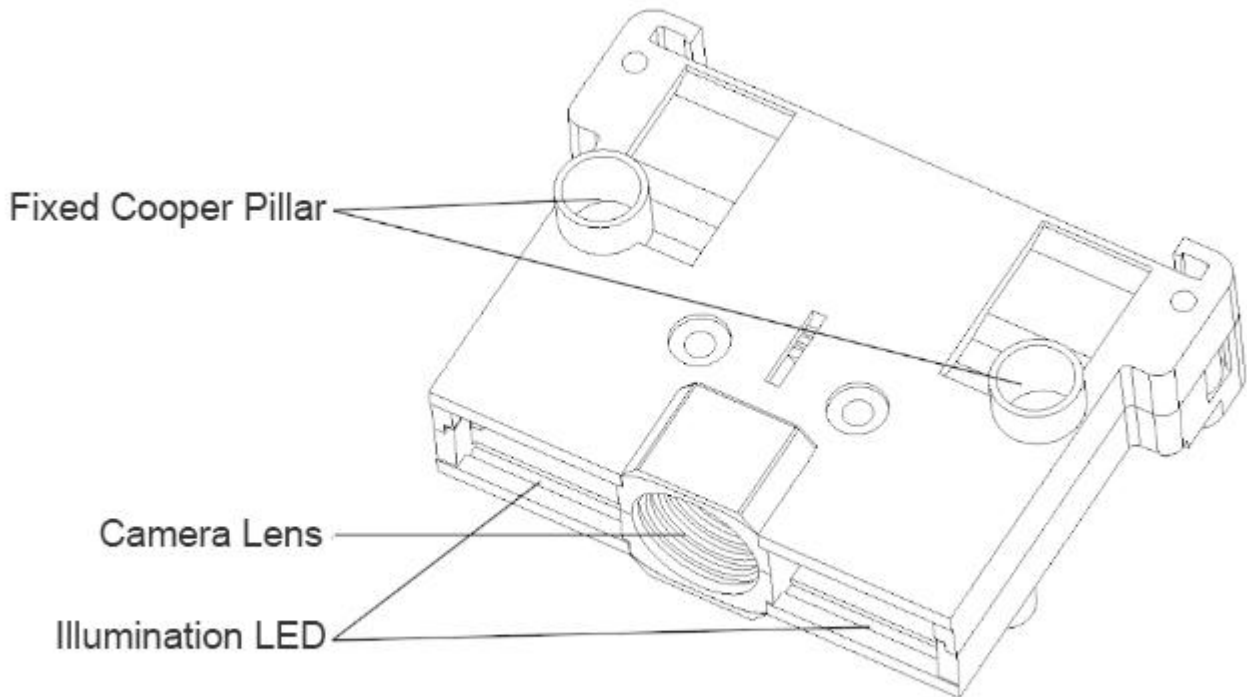
## Window Size

The window must not block the field of view and should be sized to accommodate the aiming and illumination envelopes shown below.





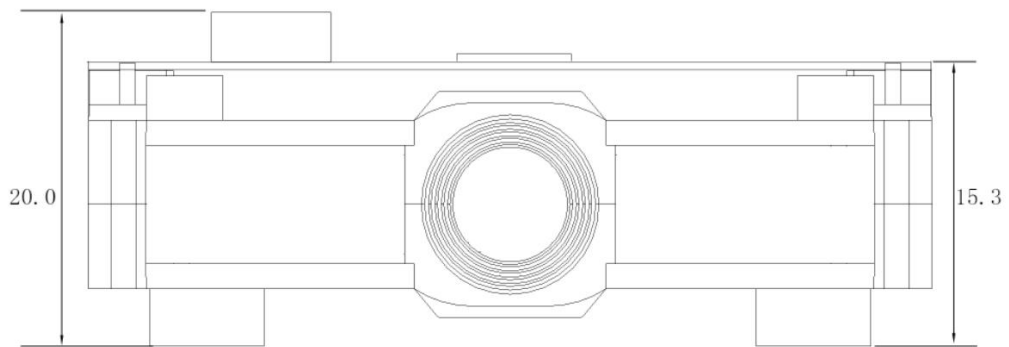
## Appearance



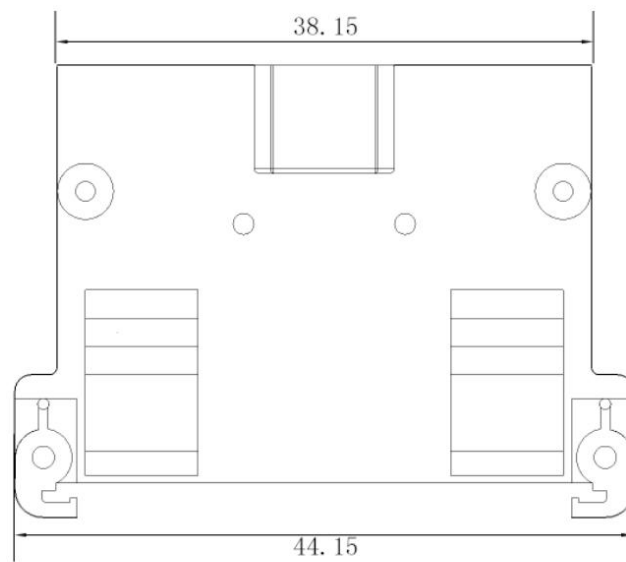
## Structure Size

The illumination below show the mechanical mounting dimensions for the .The structural design should be leave some space between components. Users can connect the engine with 11PIN Pitch 1.25 connector.

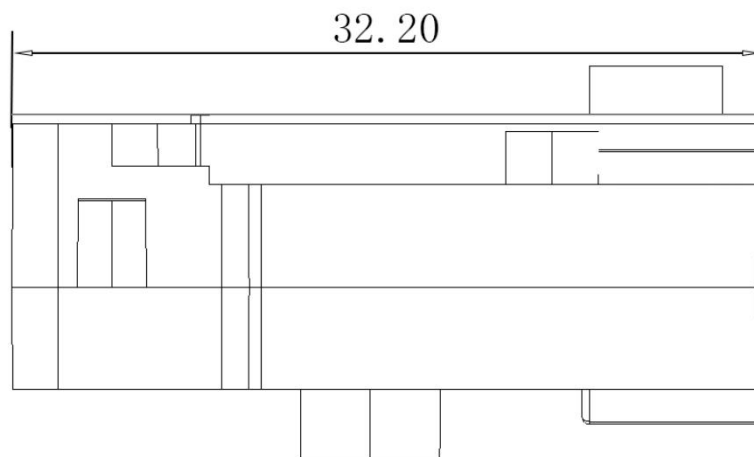
Front View (unit: mm)



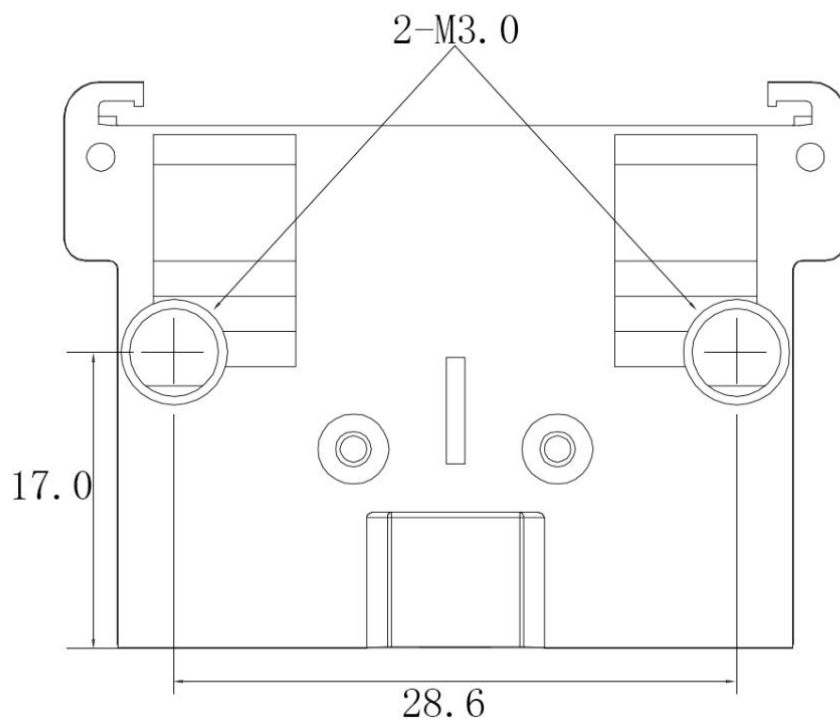
Vertical View (unit: mm)



Side View (unit: mm)



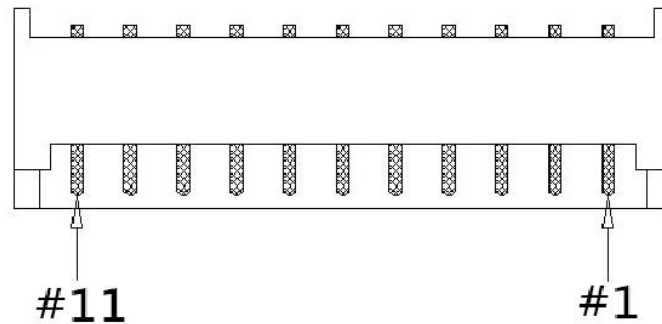
Bottom View (unit: mm)



## Data Interface

### Interface Definition

The table below listed the names and signal definition of 11PIN pitch 1.25 data interface of .



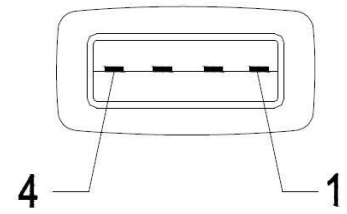
PIN	Signal	I/O	Definition
1	GND	-	Ground
2	VCC	-	Current SourceDC +5V
3	TX/D+	output	TTL input/USB_D+
4	RX/ D-	input	TTL input/USB_D-
5	HOST DATA	input/output	PS2_HOST DATA
6	HOST CLK	input/output	PS2_HOST CLK
7	KB DATA	input/output	PS2_KB DATA
8	KB CLK	input/output	PS2_KB CLK
9	RTS	-	
10	CTS	-	
11	SHIELD	-	Shield

## Data Interface

scanner must be operated with a connected main engine which refers to PC host, POS and Android host etc.

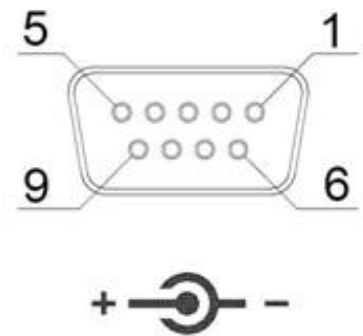
### USB interface

Pin No.	Function
1	Vcc
2	D-
3	D+
4	GND



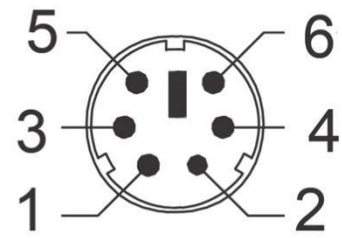
### RS232 interface

Pin No.	Function
2	TXD
3	RXD
5	GND
9	Vcc/+5V
Power Lead	Vcc/+5V

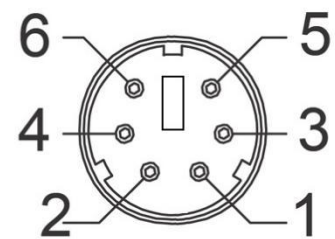


**PS2/KBW****Mini DIN HOST MALE**

Pin No.	Function
1	HOST DATA
3	GND
4	Vcc(+5V)
5	HOST CLK

**Mini DIN KB FEMALE**

Pin No.	Function
1	KB DATA
3	GND
4	Vcc(+5V)
5	KB CLK



## Chapter 2 Scanner Parameter

### Physical Parameter

Physical Parameter	
Device Weight	<16g
Device Dimension	32.2mm L * 44.15mm W * 20mm H
Cable Length	1500mm (optional)
Interface	USB/TTL-RS232/RS232/PS2
Connector	11pin pitch 1.25

## Performance Parameter

Performance Parameter	
Light Source	632nm visible red light
Sensor	Linear CCD Sensor
Image Resolution	2500dpi
Processor	ARM32-bit
Decoding speed	Up to 300 scans/sec
Resolution	$\geq 4\text{mil}/0.1\text{mm}@PCS90\%$
Depth of field	3-70CM
Print Contrast	$\geq 30\%$
Scan Angles	<i>Test Conditions : CODE39,10mil/0.25mm,PCS90%</i>
	Pitch: $\pm 60^\circ$
	Roll: $\pm 30^\circ$
	Skew: $\pm 60^\circ$
Work Voltage	DC 3.3-5V
Electriccurrent	110mA (work) ; 30mA (stand by)
Ambient illumination	100,000Lux Max
Decode Capability	EAN-8, EAN-13, Codabar, CODE11, CODE 39, CODE 93, CODE128,China Post, GS1-128, GS1 Limited, GS1 Omnidirectional, UPC-A, UPC-E, ISBN/ISSN, ISBT , Interleaved 2 of 5, Matrix 2 of 5, Industrial 2 of 5, MSI, Plessey, ITF14.



## Depth of field

Range of decoding			
Code	Code dimension	Nearest	Farthest
Code 39	0.1mm(4mil)	80mm	130mm
Code 39	0.15mm(6.0mil)	60mm	180mm
Code 39	0.25mm(9.8mil)	30mm	270mm
Code 39	0.5mm(20mil)	30mm	470mm
Code 39	1.0mm(40mil)	130mm	700mm
UPC/EAN	0.33mm(13.0mil)	30mm	320mm

**Test condition: 25°C indoor, ambient illumination200LUX, PCS=0.9**

## User Environment

User Environment	
Operating Temperature	-20°C to 50°C
Storage Temperature	-40°C to 70°C
Relative Humidity	5% to 95% (non-condensing)
Drop test	1.2 meter, 100 times
Temperature test	30 minutes for high Temp., 30 minutes for low Temp.,
Highest temp	60°C
Lowest temp	-20°C
Shock resistance	10H@125RPM