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Introduction

The following guidelines are recommended parameter that will aid the user in the proper use and installation of the   ZLIM-210 linear image module.

1. Positioning the Window

A window in the housing is required to protect the module .The exit window must be positioned so that lighting reflected off the inside of the exit window is not reflected back into the collection optics of the scan engine.

The design and placement of the window in the target system is critical for best performance, **Table 1.1** and Figure **1.**1~1.3 show the minimum size and position of the window along the horizontal and vertical axes.

The following points need to be noticed:

- The windows must not block light reflected from barcode,
- The window must be positioned so that LED light reflected off the inside of the window is not reflected back into the collection optics of the scan engine.
- The window must not block outgoing light.
- The specified (Height, width and angle) are minimums and care must be exercised to allow for manufacture tolerances.

Table 1.1 Position Exit Window Information

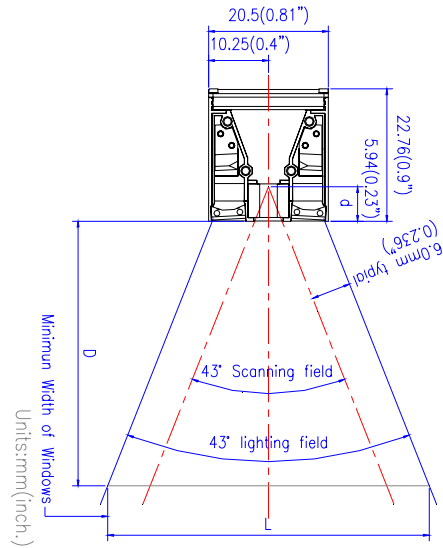| Distance from engine at scan center line	5mm (0.2")	10mm (0.4")	15mm (0.6")	20mm (0.8")	25mm (1")	30mm (0")	35mm (1.2")	40mm (1.6")	45mm (1.8")	50mm (2")	55 (2.2)
Minimum windows width(mm)	23.5	28.3	33.1	38	42.7	47.5	52.3	57.1	61.9	66.7	71.5
Minimum windows Height(mm)	4.66	5.32	5.98	6.64	7.3	7.96	8.62	9.28	9.94	10.6	11.26
Minimum Windows Tilt/Positive	32°	20°	15°	12°	11°	10°	10°	8°	8°	7°	7°
Minimum Windows Tilt/Negative	27°	17°	13°	11°	10°	9°	9°	7°	7°	6°	6°

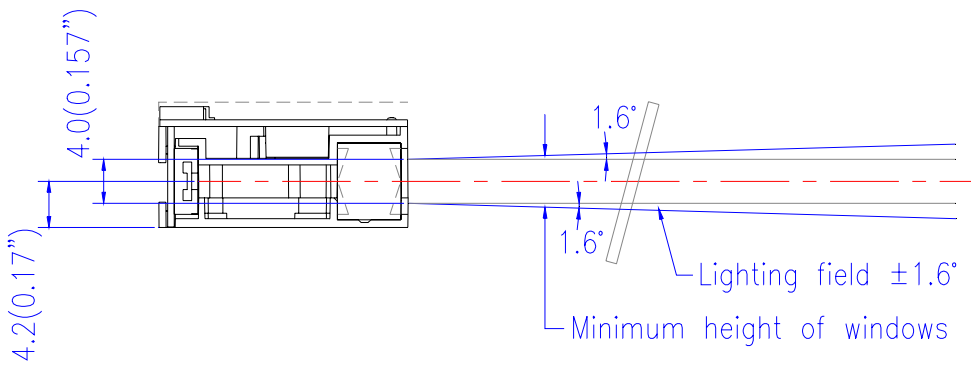Figure:1.1　Scanning field and Lighting field

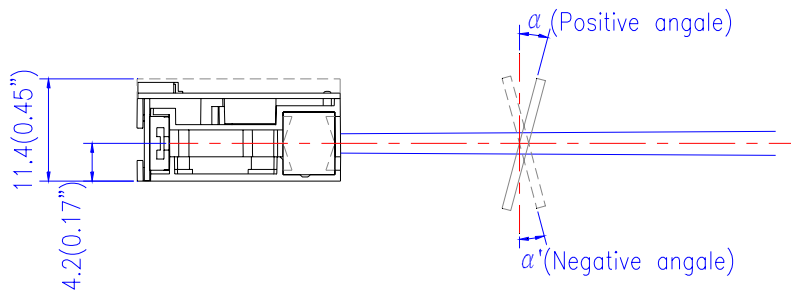Figure:1.2　Clear Aperture Requirements

Figure 1.3 Window Title Angle Requirements

2. Window Material

The window material you can select depends on the anticipated environment and your product's intended use. Appropriate window material include glass, plastic, However ,if you use any type of plastic, it should have a protective hard-coat on at least the exposed surface. Among the most commonly used window materials are:**PMMA (P**oly**M**ethyl**M**eth**A**crylate)
PolyMethyl Methacrylate (PMMA) is an excellent material option for exit windows and low initial cost .This cellcast acrylic is a clear plastic that can be used as a shatterproof replacement for glass that maintains transparency for any thickness.

a.**CR-39 (Columbia Resin 39)**

CR-39 is a an optically clear plastic, manufactured by cell casting, and is available with a thickness of between .031 in. to 1 in. This material is scratch-resistant as well as resistant to acids, alkalies and organic solvents. Coatings are not required with this material as the surface is strong enough to resist damage in most environments.

b.**Chemically tempered float glass**

Glass is also an optional exit window material, however the following issues should be considered when designing the exit

window for your end use product.

Tempered glass should receive the same care as annealed glass. Improper handling and installation can produce edge damage. Breakage can occur when edge-damaged tempered glass is subjected to a moderate thermal of mechanical stress. Full penetration of the compression layer can produce total fragmentation of tempered glass. Therefore, tempered glass cannot be cut or modified following heat treatment

c. Color

Plastic is available in a wide range of colors. Exit windows can be colored if desired. The only requirement is the optical transmission in the spectral region between 600 nm and 630 nm, which should be a minimum of 85%.

d. Avoiding Scratched Windows

Scratching of the host window can reduce the scan engine performance.We suggest you either recess the window into the housing,or apply a hard-coat on window.

3. Mounting

There are two screw mount holes at the bottom of the chassis (see Figure xx), the scan engine can mounted in any position and any angle   without any degradation in performance. Which allows to easily mounting the scanner onto the host instrument .
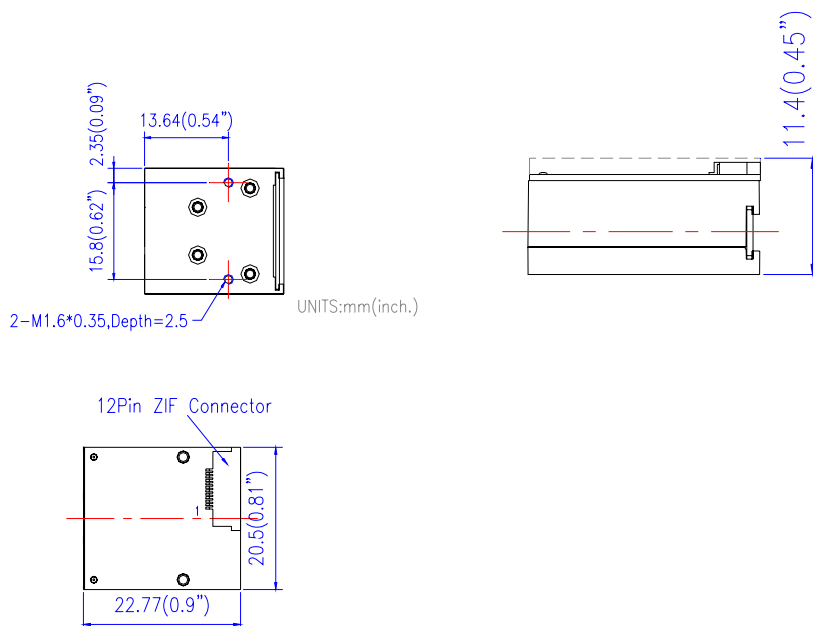
Figure 3.1 Outline Drawing

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To ensure the scanner reaches its best performance, the following points need to be noticed when mounting the scanner:

(1)   To avoid straight sunlight or any other bright light source illuminating.

(2)   When placing the barcode label, one must be careful not to over tilt, skew and/or pitch the barcode.   (refer to reading feature drawing)

(3)   To avoid putting the scanner in specula reflection position.   If the angle between the scanner and the barcode is between specula reflection, therefore the LED light of the scanner will reflect straight back on the scanner.   As to the CCD sensor, it will not able to read any barcodes.

(4)   The barcode must be placed within the effective depth of field (D.O.F.) area.   So-called "Depth of Field" is the effective reading distance for the barcode from the scanner.   Its theory is like a camera, if the object is placed within the focal range, however the image appears clearly.   But if the object is outside the focal range, the image then is blurred.   The same theory could be applied to read the barcode.   Therefore, different quality and density of barcodes could effect its D.O.F., usually a lower piece or high density of barcode, its depth of field is shorter. Besides, it could be better to avoid using depth of field extremes range, this will prevent moving the barcode often and it easily could be move away from the reading range.

The best placing position, please refer to the Decode Depth of Field drawing.

±75°normal

Pitch

Pitch Angle

Scan Beam

±25°normal

Roll

Roll Angle

Scan Beam

Note: Test were performed using 100% EAN13 barcode 0.33mm(13mil) at a distance of 14cm (5.5 inches) in optimum lighting conditions.

±60°normal

Skew

Skew Angle

Scan Beam
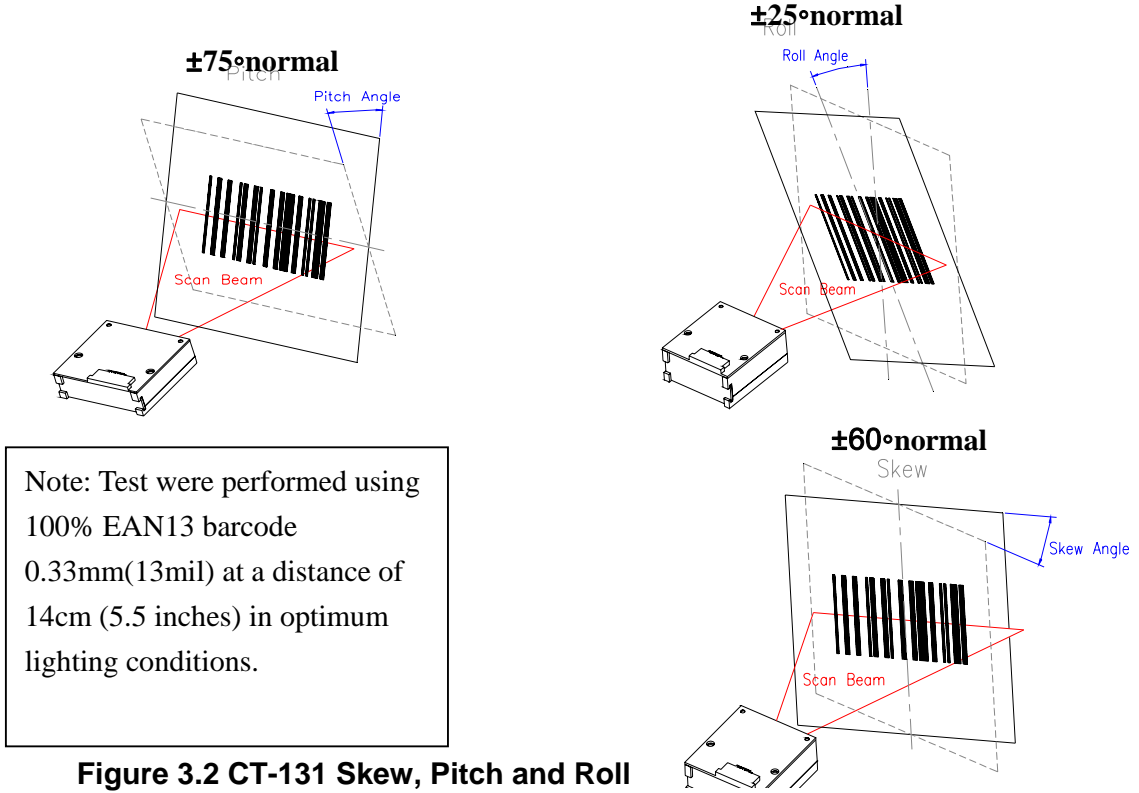
Figure 3.2 CT-131 Skew, Pitch and Roll

Optics System

18.57 7.31
15   5.91
10   3.94
5   1.97
0   0
5   1.97
10   3.94
15   5.91
18.57 7.31
cm. in.
Width of Field in Centimeters/Inches

5 mil(0.127mm)
6   11
10 mil(0.25mm)
4.5   20
0.33 100% UPC/EAN
4.5   25
20 mil(0.5mm)
4   40
40 mil(1.0mm)
4   50

0   5   10   15   20   25   30   35   40   45   50 cm.
0   1.97 3.9 5.9 7.87 9.84 11.8 13.8 15.75 17.72 19.69 in.
Typical Depth of Field in Centimeters/Inches
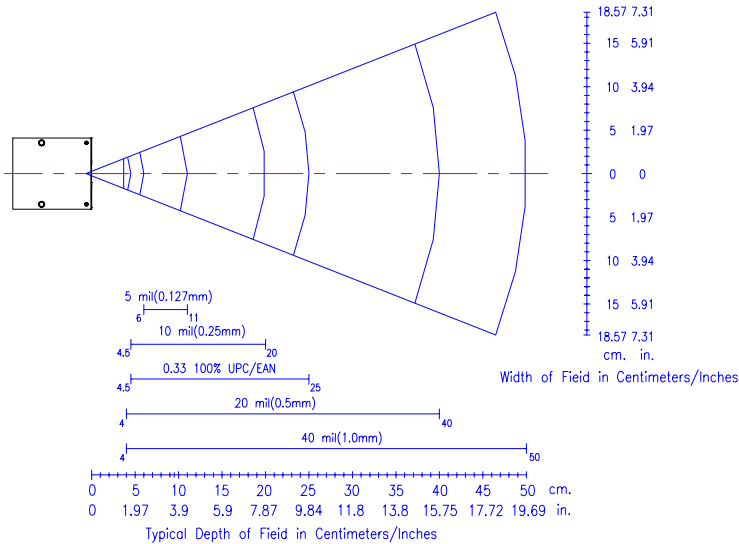
Figure 3.3 CT-131 Decode Zone

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4. Technical Specifications

Table 4.1. ZLIM-210

Item	Description
Power Requirements Input Voltage Input Current LED off Current Surge Current Power save mode current	 3.1~5.25VDC 75mA typical 27mA typical 150mA 600uA
Scan Angle	43°
Pitch Angle	±75°
Skew	±60°
Roll	±25°
Ambient Light Immunity	100000 Lux
Shock	2000G
Vibration	50G r.m.s.
Operating Temperature	0℃ ~ 55℃ (32°F~131°F)
Storage Temperature	-20℃ ~ 60℃ (-4°F~140°F)
Humidity	5% to 95% non-condensing
Height Width Depth Weight	11.4mm(0.45") 20.5mm(0.81") 22.6mm(0.89") 12g
Connector	12 Lower contact ZIF connector
Interface	RS-232 (TTL level)
Symbologies	UPC/JAM/EAN, Code 39, Code93, Codabar, I2of5, Industries 2of5,Standard 2of5,IATA,ISBN/ISSN,Chinese post code, Code 11,MSI/Plessy,EAN-128,Code 128

5. ZLIM-210 Pin configuration

a. 12Pin ZIF connector

2.

Pin	Signal Name	Input/ Output	Control Status	Description	Electrical Equivalent
1	VDD	--		+3.1V~5.25V Power Input	VIN VDD
2	RXD	Input		Receive data	VDD 1K D1 DATA In RXD DIODE SCHOTTKY
3	Trigger	Input	L = Start session H = Inactive	Used to start decode session	VDD 10K Data In TRIGGER
4	reserved	--		For Factory use	
5	TXD	Output		Transmit data	+3.3V DATA OUT TXD
6	RTS	Output		Request To Send control signal	+3.3V DATA OUT RTS
7	GND	--		System Ground	GND
8	reserved	--		For Factory use	

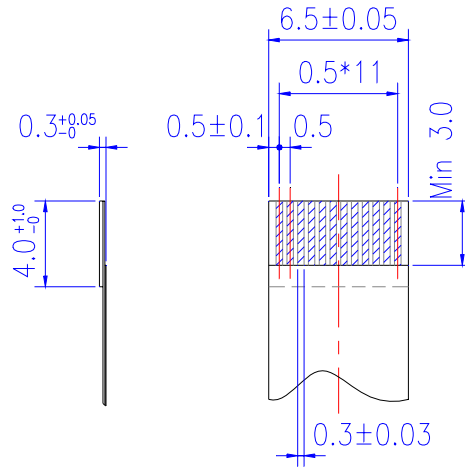| 9	LED_OUT	Output	H=LED ON L=LED OFF	Active low output used to indicate a valid bar-code decode. Normally used as a control signal for a LED drive circuit. Control line can only source/sink 5 mA.(for 3.3V)	
10	CTS	Input		Clear To Send control signal	
11	BEEPER_OUT	Output	L=normal H=Active	Pulse width modulated output used to control an external beeper Control line can only source/sink 5 mA.(for 3.3V)	
12	reserved	--		For Factory use	

Pin 12

Front of the Scanner

Pin 1

12 pin ZIF connector
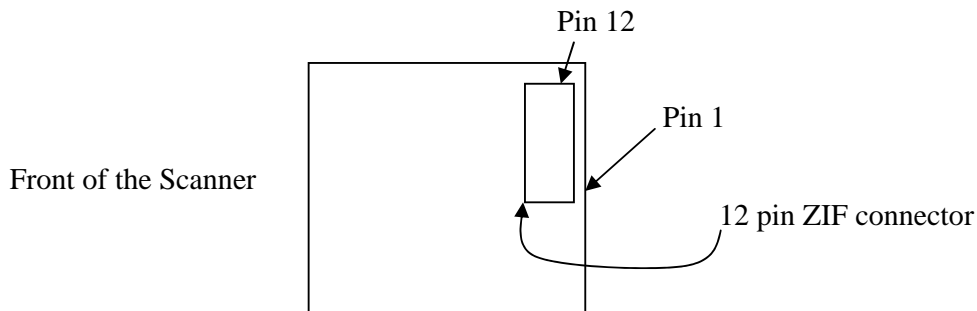
Top view for Pin orientation

a. Flat Flex ribbon Cable Connector

A flex strip cable is used to connect the scan engine to your host terminal.