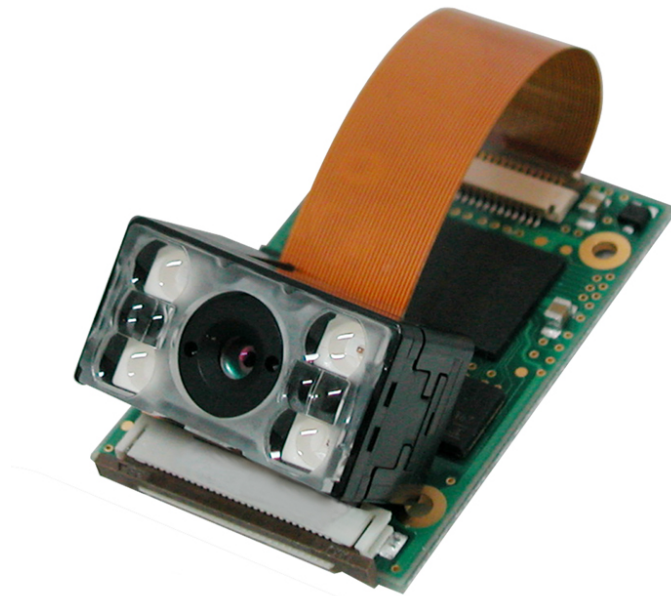


# **MDI 1000**

## **2D CMOS Imager**

***OPTICON***

## **Integration Guide**



All information subject to change without notice.

## Document History

<b>Model Number:</b>	MDI 1000	<b>Specification Number:</b>	TS06010
<b>Edition:</b>	5	<b>Original Spec Number:</b>	TS06009
<b>Date:</b>	2007-07-19		

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## 1. Introduction

The MDI 1000 CMOS two-dimensional (2D) imager consists of the MSI 1000 camera module (referred to as the “camera module”) and the DBM 1000 decoder board developed specifically for the MDI 1000 (referred to as the “decoder board”). This guide provides instructions for installing the camera module and the decoder board.

## 2. Integration Parameters

### 2.1. Exit Window Materials

For best optical quality, use an acrylic material (cast or extruded) for the exit window. Select a high-quality achromatic acrylic material with a smooth, flat surface and no scratches or dents. The acrylic material should be 1 mm thick and have an anti-reflective (AR) coating applied to both sides of the exit window.

You should also apply an anti-scratch coating to the surface of the exit window to protect it from scratches during operation. Coated acrylic plates are readily available. Such a coating greatly enhances anti-scratch properties without degrading the optical characteristics of the acrylic material.

To protect the exit window from dust, stains, and scratches during assembly, a protective sheet was attached. This should be removed before operation. After removing the protective sheet, use an ion-blower or other method to remove any dust that may have been attracted by static electricity.

Recommended acrylic material:

Nitto Jushi Kogyo Co., Ltd. “Clarex—Precision Thin Sheet”

MITSUBISHI RAYON CO., LTD. “Acrylite”

## 2.2. Exit Window Design

The exit window must be positioned to accommodate limitations of distance and inclination, as well as the range of the window itself. Design the layout within the range specified in the following diagram and associated table.

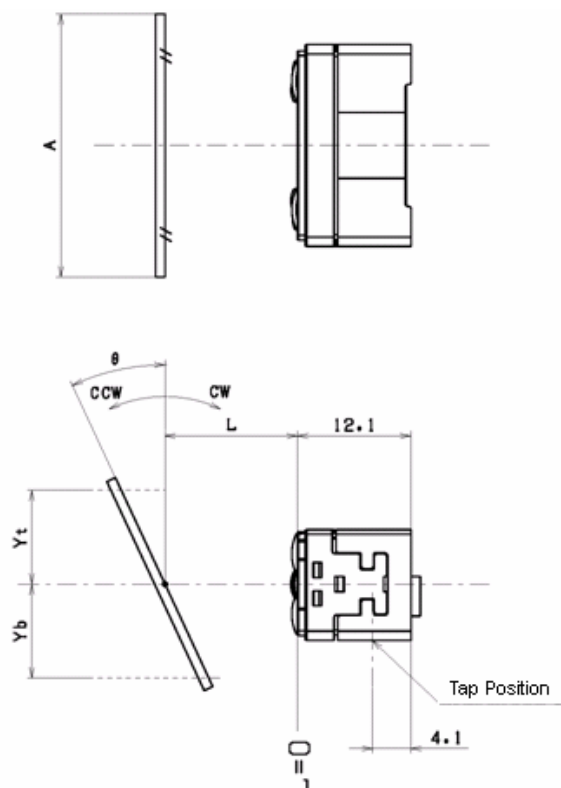


Figure 1: Exit window design

L	(mm)	3	4	5	6	7	9	12
A	(mm)	>25	>27	>29	>30	>32	>34	>38
Yt	(mm)	>9	>10	>11	>12	>13	>14	>15
Yb	(mm)	>7	>8	>8	>8	>9	>9	>10
$\theta_{cw}$	(deg)	>19°	>23°	>25°	>27°	>28°	>29°	>29°
$\theta_{ccw}$	(deg)	>19°	>23°	>25°	>27°	>28°	>29°	>29°

\* When installing the exit window close to the scan engine, use the following range (including the tolerance).

$$L = 1.5 \pm 0.5, \theta_{cw} \text{ and } \theta_{ccw} < 2^\circ(\text{deg})$$

\*The maximum exit window inclination is up to 40 degrees in both directions,  $\theta_{cw}$  and  $\theta_{ccw}$ .

During the design phase, check for image eclipse caused by insufficient exit window size and LED illumination entering the central part, due to improper angle settings. The check can be done by acquiring images from the camera module.

### 3. Installation

When installing a camera module, use the tapping screw holes on the bottom surface. Do not over-tighten the screw. Only the bottom surface of the camera module should be attached to a chassis for installation. Keep enough clearance to avoid damage to the camera module in case the host instrument is dropped and damaged. The anti-shock capabilities of the camera module apply only when acceleration is applied via the bottom surface. In case of direct shock, the camera module will almost certainly be damaged, since it consists of precise optical elements.

Use the mounting hole with screw clamp to install the decoder board. The size of the screw head must not exceed the diameter of the mounting land ( $\phi 3.6$ ).

Installation conditions—camera module side

Recommended screw: M2 B tight

Tightening torque: up to 20 N<sub>cm</sub>

The screwing depth should be within 4.5 mm from the contact surface of the camera module.

Installation conditions—decoder board side

Recommended screw: M1.7 (Do not use a countersunk screw)

Tightening torque: 20N<sub>cm</sub> or less





#### 4.2. Connection between Decoder Board and Host

Connector: 52437-3071 (30 pins), manufactured by MOLEX

Cable Length: 70 mm (max.)

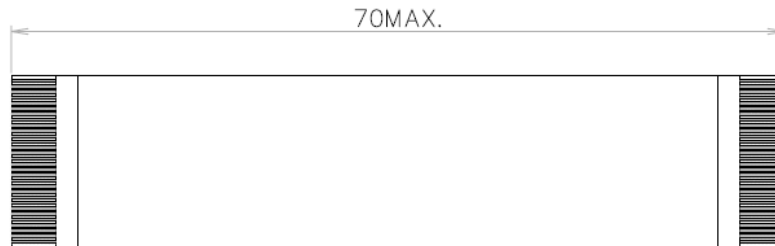


Figure 4: Signal connection

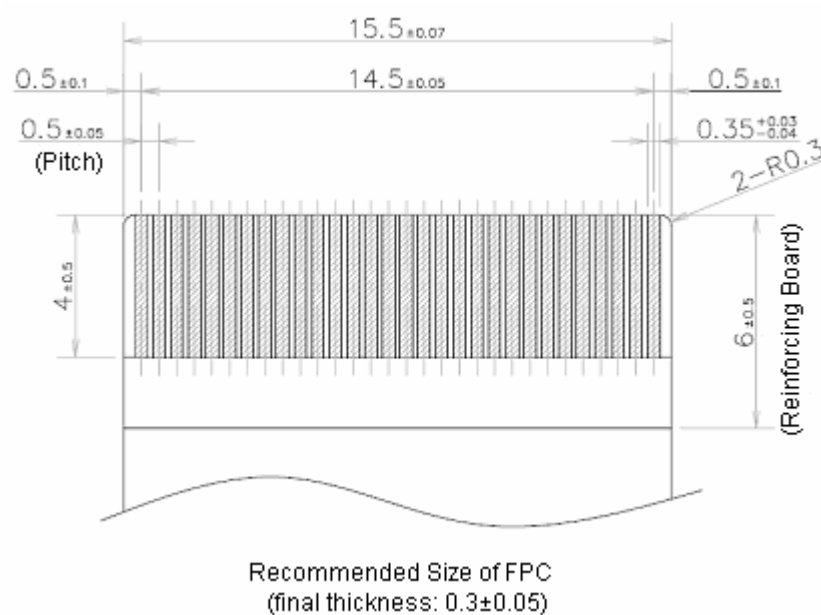


Figure 5: Connection between decoder board and host

About FPC:

- When producing the FPC, punch out the FPCs from the conductor side.
- Use polyimide as the material of the reinforcing board.
- Use thermoset adhesive.



## 5. Handling Requirements

Use anti-static measures such as a grounding strap before handling the scan engine in order to avoid damage to the electronic components from electrostatic discharge. Hold the scan engine only by the metal case. Do not touch the circuit board or the front side of the scan engine when handling it. Do not touch the electronic elements or the terminals of the circuit board.

Installation in a clean environment is recommended in order to protect the imaging lens from dust. Operators should wear a mask to avoid contaminating the optical elements.

## 6. Mechanical Drawings

### 6.1. Camera Module

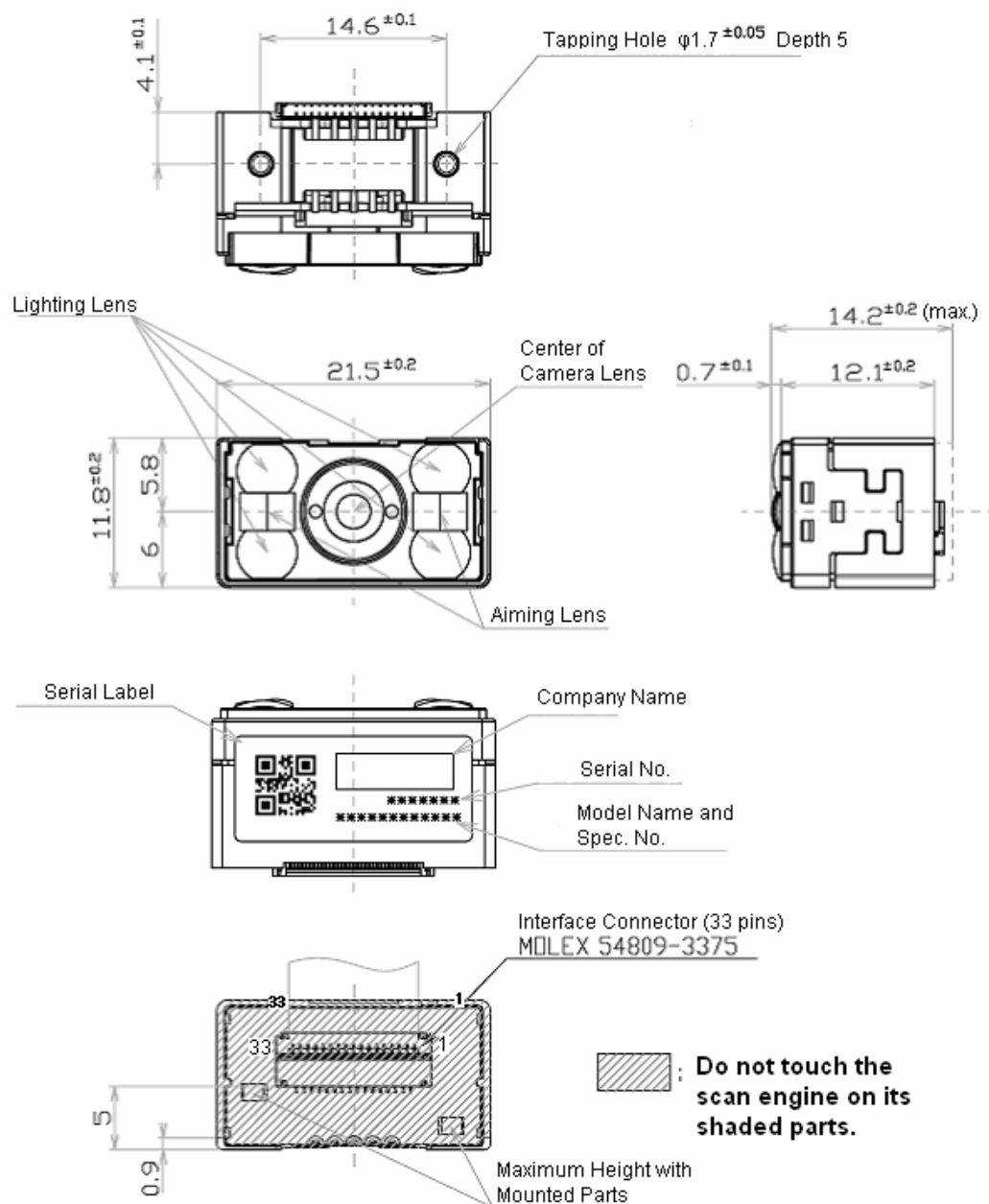


Figure 6: Camera module

Do not touch the circuitry when inserting the scan engine into the scanner. Only the black casing on the back side (0.9 mm thick) can touch the scanner case.

## 6.2. Decoder Board (DBM 1000)

Interface Connector at Scan Engine (33 pins)  
MOLEX 54809-3375

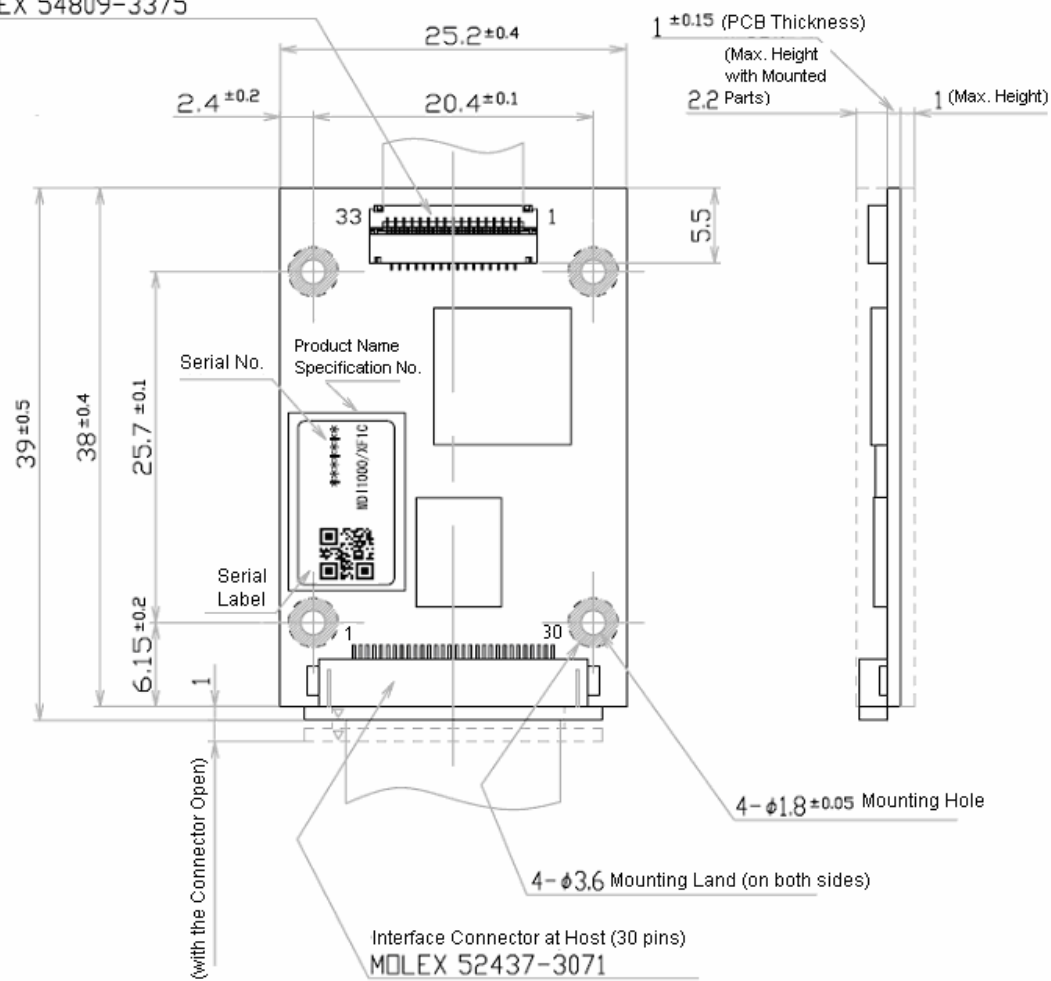


Figure 7: Decoder board