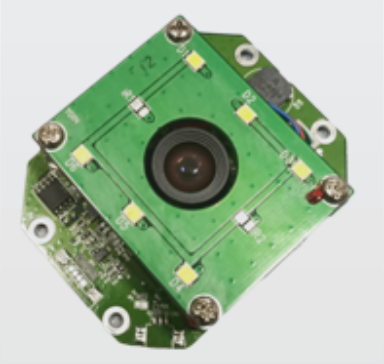
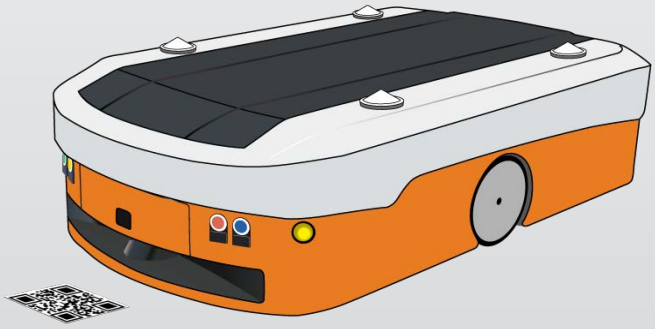




MIR8N

CHAMPTEK
We value your ID's

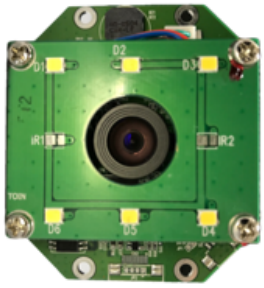
AGV navigation NaviCode reader module

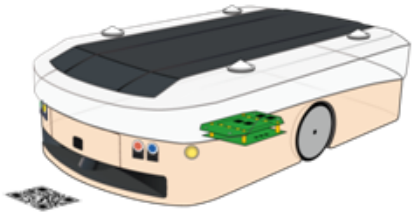
Introduction

NaviCode is a robust barcode which is designed to support effective navigation.The MIR8N is a high performance, omni-directional area imager NaviCode Reader module to support effective Automated Guided Vehicle (AGV) navigation.
To optimize the pick and pack process in very large warehouse environments, the routing conveyor system may not be the most efficient way to route products for picking and packing. An emerging technology that has seen adoption in AGVs navigate around the warehouse by reading 2D codes that are laid out in a grid on the warehouse floor with the barcode readers mounted on the bottom of the AGVs. However, codes on the floor can be worn down and smudged through traffic which can present problems for the automated guided vehicles.
The process of decoding a barcode and moving through the warehouse must be fast and accurate to keep the AGVs moving smoothly without crashing into each other as well as keep the pick process efficient. Spending time dealing with no reads or mis-reads by the automated guided vehicles not only reduces efficiency, it costs time and money. With thousands or up to ten thousands of codes on the floor, it can be hard to track which ones are wearing down and could cause issues.
NaviCode and MIR8N reader are designed to solve these issues, with its advanced algorithms and decoding technology, fully symmetric and robust symbology, high error-correction capability ensure high read rates, even with smudged or damaged codes.

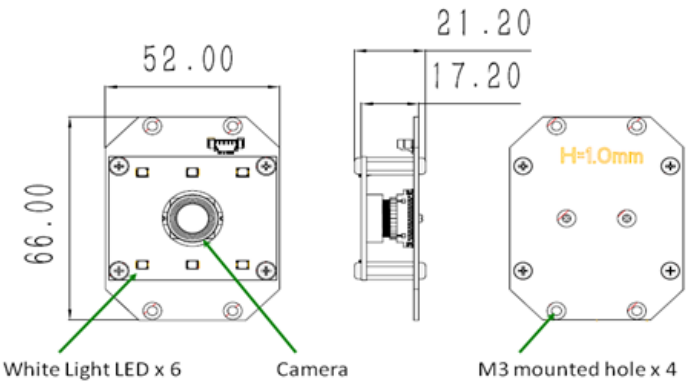
Features

To support effective navigation, NaviCode features
•Fully symmetric symbology - fast localization, to accelerate decoding process and enhance robustness, no any existing 2D symbology are fully symmetric.
•High error-correction capability to enhance robustness
Data region is protected with ECC capability as high as~46% damage correction, comparing to that of QR/DM ~30% and of Amazon code ~0%;
•4-bulleye symbology - higher precision of navigation info, specifically, NaviCode symbol's position & camera's inclination angles & orientation angle;
•Data security - 4 copies of ECC protected format info to support, in worst case, only single bulleye decoding, and data can be encrypted with user-specified keys.
•Additional information returned by MIR8N NaviCode Reader,
The axial inclination angle of the optical axis of the camera relative to the center of the symbol in both X and Y direction, Symbol's horizontal rotation angle, the X and Y axis position of the symbol center in the image, the damage ratio of the symbol read, the proportion of symbol in focus, decoding time





Dimension: mm



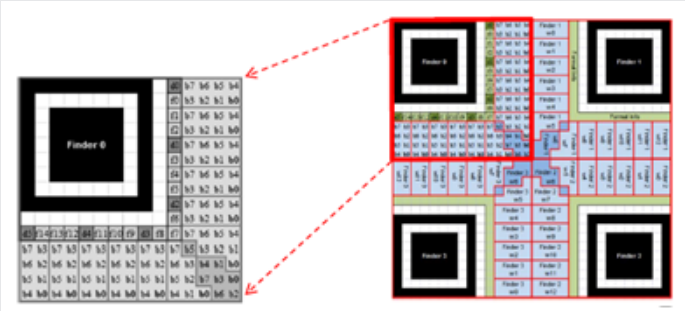
Specifications

- **MIR8N Kit Specification**

Dimension (mm)	52 W x 66 L x 21.2 H
Weight	Approx. 0.098 oz (2.8g)
Light Source	White light LED
Sensor Resolution	1280(H) x 800(V) pixels
Field of view	80°x 57°(W x L)
Illumination	white light LED x 6
Output Interface	1.5m USB , VCOM or UART
Power	5V/0.5A
Operation (Typ.)	380mA
Life Time	MTBF(Calculated) 50,000 hours
Command SDK and document	

- **Fully symmetric symbology**

fast localization, to accelerate decoding process and enhance robustness, no any existing 2D symbology are fully symmetric.



- **High error-correction capability to enhance robustness**

Up to 44-byte data for navigation info, data region is protected with ECC capability as high as~46% damage correction, comparing to that of QR/ DM ~30% and of Amazon code ~0%;

Table. Reed-Solomon Error Correction Levels and Data Capacity

ECC Level	#Data (bytes)	#Ecc (bytes)	#Codeword (bytes)	RS (c, k, r)	Max Correction
0	44	8	52	(52,44, 4)	8%
1	40	12	52	(52,40, 6)	12%
2	36	16	52	(52,36, 8)	15%
3	32	20	52	(52,32,10)	19%
4	26	26	52	(52,26,13)	25%
5	20	32	52	(52,20,16)	31%
6	12	40	52	(52,12,20)	38%
7	4	48	52	(52, 4,24)	46%

- **4-bulleye symbology**

higher precision of navigation info, specifically, NaviCode symbol's position & camera's inclination angles & orientation angle;

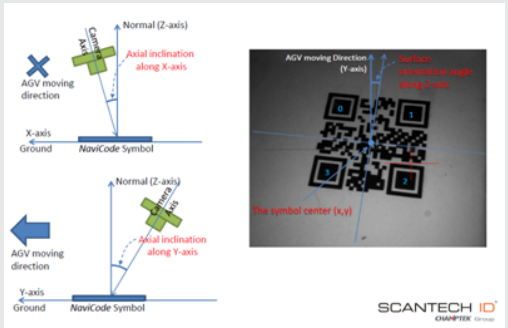
Figure. Popular symbologies for navigation applications

- **Data security**

4 copies of ECC protected format info to support, in worst case, only single bulleye decoding, and data encryption with user-specified keys.

- **Additional information returned by MIR8N**

The axial inclination angle of the optical axis of the camera relative to the center of the symbol in both X and Y direction
Symbol's horizontal rotation angle
The X and Y axis position of the symbol center in the image
The damage ratio of the symbol read
The proportion of symbol in focus
Decoding time



Due to Champtek's / Scantech ID's continuing product improvement programs, speciÿcations and features are subject to change

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