

FACTORY AUTOMATION

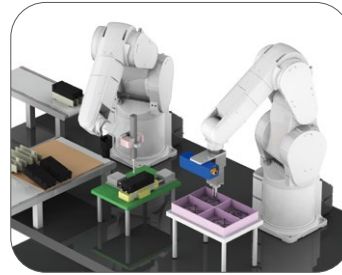
# MITSUBISHI ELECTRIC INDUSTRIAL ROBOT MELFA-3D Vision 3.0



## Feature 1

# Lightweight and Compact

Smaller and more lightweight, equipped with ENSENZO camera head. Both hand-eye and fixed installation are available. Additionally, the camera itself supports oil mist environments (IP65/IP67), and increased workpiece distance and visual field allow for broader application. It flexibly supports everything from precision assembly of small parts to bulk picking from large pallets.



Small part assembly (hand-eye)



Picking from large pallet (fixed camera)

## Feature 2

# High-speed Picking

High-speed recognition technology reduces the time required for image recognition (30% improvement over previous model). Model-less recognition is available, which does not require a 3D model of the workpiece.

Model-less recognition : A method of recognizing workpiece grip by registering the shape of the hand tip and suction pad and looking for a space to insert the tip or where the pad can stick (The shape of the workpiece does not need to be registered).

## Feature 3

# Auto Calibration Function

Equipped with an auto calibration function to automatically align the robot and vision sensor. This simplifies adjustment work.

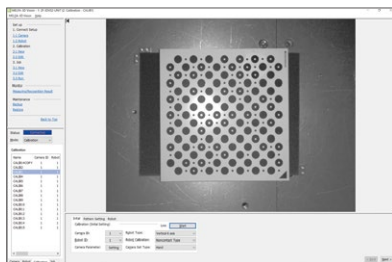
### Start up



### Using vertical 6-axis robot

#### STEP 1 Imaging position teaching

Initialize and configure patterns



##### Initialization (items)

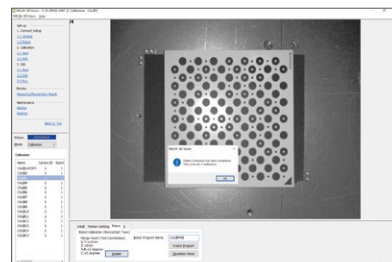
- Camera ID
- Robot ID
- Robot type
- Robot calibration
- Camera installation type
- Camera parameters

##### Pattern settings (items)

- Number of patterns
- Grid size (mm)

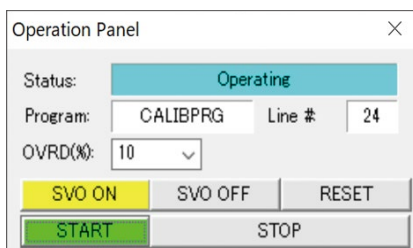
#### STEP 2 Generate calibration program

Press "Generate program" button to generate program

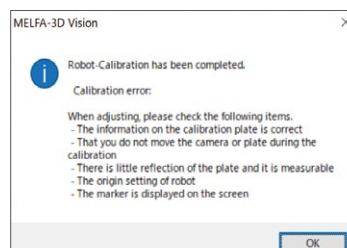


#### STEP 3 Start calibration

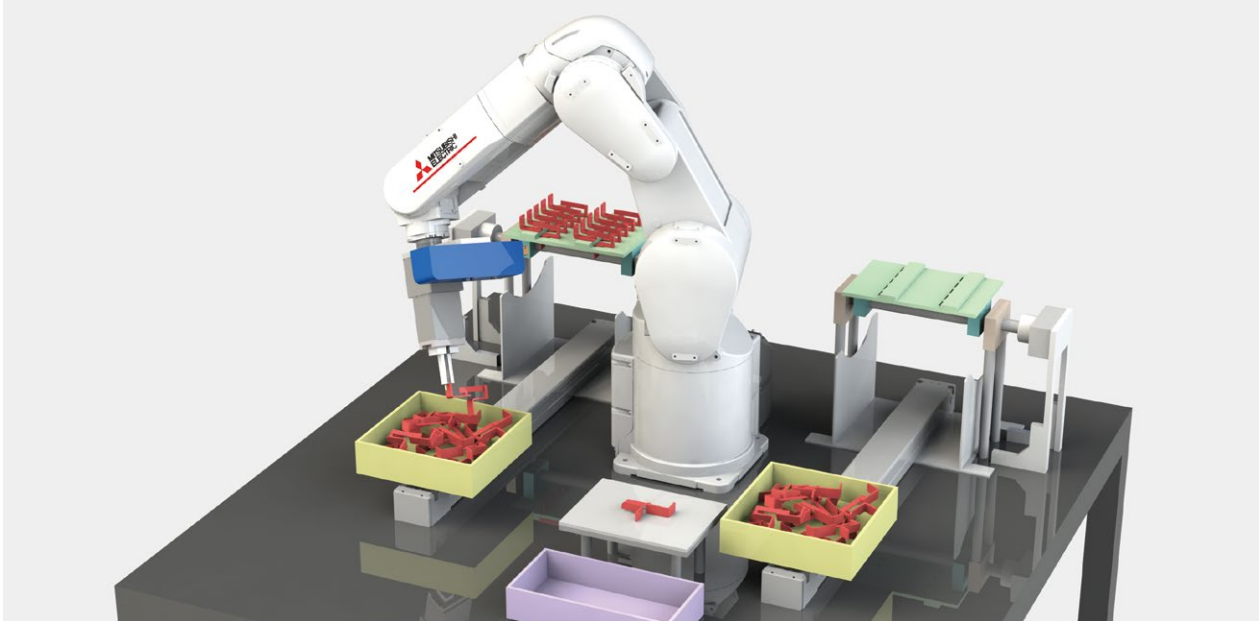
Open control panel and press "Start" button  
(Calibration will start automatically)



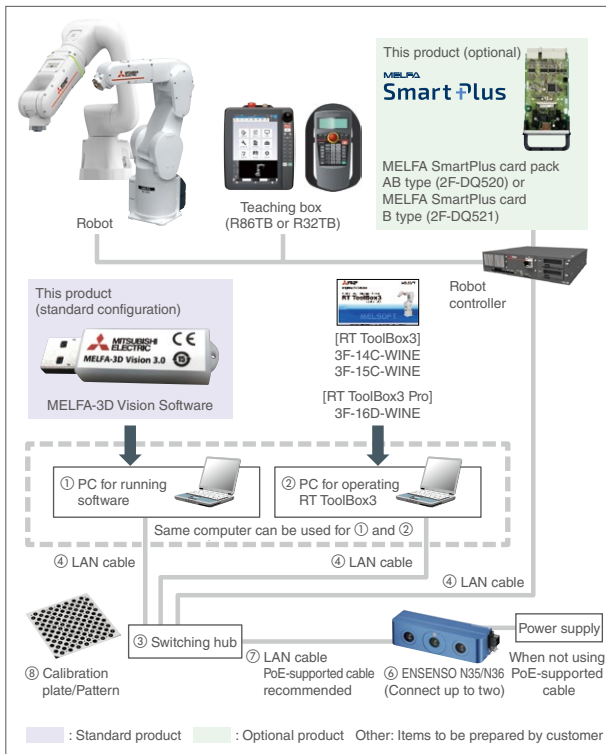
#### STEP 4 Calibration complete



**Just 4 steps!  
Quick and simple  
setup!**



## Product components



## Prepared by customer

Item	Overview of specifications	Quantity
① PC MELFA-3D Vision Software	OS: Windows 10 Professional/ Enterprise (64bit) CPU: Intel Core i7 (9th gen) RAM: At least 8GB HDD: At least 100GB Gigabit Ethernet port x 1	1
② PC for operating RT ToolBox3	RT ToolBox3 installed (can be same PC as (1) above)	1
③ Switching hub*1	At least 1000 BASE-T, PoE-supported	1
④ LAN cable	Cat 5e or higher	3
⑤ Camera head attachment jig	-	1
⑥ Camera head*2	ENSENDO N35/N36 series (infrared model) See table below. Manufacturer: ENSENDO GmbH (Distributor: IDS Imaging Development Systems GmbH)	1
⑦ LAN cable*3	Cat 5e or higher, PoE-supported Recommended: AD00268 (Distributor: IDS Imaging Development Systems GmbH)	1
⑧ Calibration plate/Pattern	Compatible with camera head model selected for (6) (Distributor: IDS Imaging Development Systems GmbH)	1

\*1. Use a switching hub that has Gigabit Ethernet capacity and is PoE-supported. If a PoE-supported cable is not used, a separate power cable will be necessary for the camera.

\*2. There are models in the ENSENDO N36 series other than those in the table below. Check with IDS imaging Development Systems GmbH for details. The N35 series has been discontinued.

\*3. We recommend a PoE-supported cable. If a PoE-supported cable is not used, a separate power cable will be necessary for the camera.

## Our recommended models (Manufacturer: ENSENDO GmbH.)(\*1)

Model	N36-802-16-IR	N36-804-16-IR	N36-806-16-IR
Measuring range*2(mm)	522x411 to 1559x1233	334x257 to 601x463	249x190 to 315x252
Minimum workpiece size(reference)	Model-less: Short side of 1/25 measurable area to long side of 1/3 of measurable area		
Measuring time(sec)	Approx. 0.8		
Recognition time*3(sec)	Model-less: Approx. 0.7		
Workpiece distance*4(mm)	800 to 2400	500 to 900	370 to 490
Focal distance(mm)	1200	650	420
External dimensions(mm)	W175xD52xH50		
Mass(kg)	0.65		
Usage environment(°C)	0 to 40		
Protection level	IP65/IP67		

\*1. You can select the optimal camera for the workpiece distance and measuring range on IDS Imaging Development Systems GmbH's website. (Camera selection tool)

\*2. When using MELFA-3D Vision 3.0. Not the same as the camera head measuring range.

\*3. Standard time from start of recognition to output. May exceed standard time depending on various conditions, including peripherals, workpiece, and processing parameters.

\*4. Distance from front end of camera to what is measured. Whole range cannot be used simultaneously.

\*5. Recognition Parameter automatic adjustment AI is not available for the ENSENDO N36 series. For details, please refer to "MELFA-3D Vision System Specifications" in the separate "MELFA 3D-Vision3.0 Instruction Manual".

# Global Partner. Local Friend.

<b>USA</b> <b>Mitsubishi Electric Automation, Inc.</b> 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A. TEL: +1-847-478-2100	<b>Brazil</b> <b>Mitsubishi Electric do Brazil Comercio e Servicos Ltda.</b> Avenida Adelino Cardana, 293, 21.o andar, Bethaville, Barueri SP, Brazil 06401-147 TEL: +55 (11) 4689-3003	<b>Mexico</b> <b>Mitsubishi Electric Automation, Inc. Mexico Branch</b> Boulevard Miguel de Cervantes Saavedra 301, Torre Norte Piso 5 Col. Ampliacion Granada, Miguel Hidalgo, Ciudad de Mexico, C.P.11520, Mexico TEL: +52(55)3067-7500
<b>Australia</b> <b>Mitsubishi Electric Australia Pty. Ltd</b> 348 Victoria Road, Rydalmere, NSW, 2116 Australia TEL: +61-2-9684-7777	<b>China</b> <b>Mitsubishi Electric Automation (China) Ltd.</b> No.1386 Hongqiao Road, Mitsubishi Electric Automation Center 3FShanghai, China TEL: +86-21-2322-3030	<b>Taiwan</b> <b>Mitsubishi Electric Taiwan Co., Ltd.</b> 10F, No.88 Sec. 6, Chung-Shan N.Rd,Taipei, Taiwan, TEL: +886-02-2833-5430
<b>Korea</b> <b>Mitsubishi Electric Automation Korea Co.,Ltd</b> 7F-9F, Gangseo Hangang Xi-lower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 157-801, Korea TEL: +82-2-3664-8333	<b>Singapore</b> <b>Mitsubishi Electric Asia Pte. Ltd</b> 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943 TEL: +65-6473-2486	<b>Malaysia</b> <b>MITSUBISHI ELECTRIC SALES MALAYSIA SDN. BHD.</b> Lot 11, Jalan 51A/219, Seksyen 51A, 46100 Petaling Jaya, Selangor Darul Ehsan, Malaysia +60-3-7626-5000
<b>Indonesia</b> <b>PT. Mitsubishi Electric Indonesia</b> Gedung Jaya 8th Floor, J.L. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia TEL: +62-21-3192-6461	<b>Vietnam</b> <b>Mitsubishi Electric Vietnam Company Limited</b> 11th & 12th Floor, Viettel Tower B, 285 Cach Mang Thang Tam Street, Ward 12, District 10, Ho Chi Minh City, Vietnam. TEL: +84-28-3910-5945	<b>Thailand</b> <b>Mitsubishi Electric Factory Automation (Thailand) Co., Ltd.</b> 101, True Digital Park Office, 5th Floor, Sukhumvit Road, Bang Chak, Prakanong, Bangkok, Thailand TEL: +66-2092-8600
<b>Philippines</b> <b>MELCO Factory Automation Philippines Inc.</b> 128, Lopez-Rizal St. Brgy. Highway Hills, Mandaluyong City, MM, Philippines TEL: +63-(0)2-8256-8042	<b>India</b> <b>Mitsubishi Electric India Pvt. Ltd.</b> ICC-Devi Gaurav Technology Park, Unit no.402, Fourth Floor, Survey no. 191-192 (P) ,Opp. Vallabh Nagar Bus Depot, Pune - 411018, Maharashtra, India TEL:+91-(20)-46242100	<b>Germany</b> <b>Mitsubishi Electric Europe B.V.</b> <b>German Branch</b> Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany TEL: +49-2102-486-0
<b>UK</b> <b>Mitsubishi Electric Europe B.V.</b> <b>UK Branch</b> Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, U.K TEL: +44 (0) 1707/28-87-80	<b>Italy</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Italian Branch</b> Energy Park Via Energy Park 14, 20871, Vimercate (MB) TEL: +39-039-60531	<b>Spain</b> <b>Mitsubishi Electric Europe, B.V.</b> <b>Spanish Branch</b> Carretera de Rubi, 76-80-AC, 4720, E-08190 Sant Cugat del Valles (Barcelona), Spain TEL: +34-935-65-3131
<b>France</b> <b>Mitsubishi Electric Europe B.V.</b> <b>French Branch</b> 2, Rue de l'Union-92565 Rueil-Malmaison Cedex TEL: +33 (0) 1-55-68-57-01,	<b>Czech Republic</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Czech Branch, Prague Office</b> Pekarska 621/7, 155 00 Praha 5, Czech Republic TEL: +420-734-402-587	<b>Poland</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Polish Branch</b> ul. Krakowska 50, 32-083 Balice, Poland TEL: +48(0)12-347-65-00
<b>Ireland</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Irish Branch</b> Westgate Business Park, Ballymount, IRL-Dublin 24 TEL: +353-14198800	<b>Netherland</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Netherlands Branch</b> Capronilaan 46, NL-1119 NS Schiphol-Rijk TEL: +31-297-250-350	<b>Hungary</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Hungarian Branch</b> 2040 Budaors, Szabadsag ut 117 TEL: +36-70-3322-372
<b>Sweden</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Sweden Branch</b> Hedvig Mollers gata 6 223 55 Lund TEL: +46(0)8-625-10-84	<b>Turkey</b> <b>Mitsubishi Electric Europe B.V.</b> <b>Turkey Branch</b> Serifali Mahallesi. Kale Sok. No.41, 34775 Umraniye / ISTANBUL TEL: +90(0)216/969-25-00	<b>India</b> <b>MITSUBISHI ELECTRIC INDIA PRIVATE LIMITED</b> ICC Devi Gaurav Technology park, Unit no 4+B12:D2902 4th floor, Pimpri Pune -411018 Maharashtra India TEL: +91-020-46242227

Windows is registered trademark of Microsoft Corporation in the United States and other countries.

Ethernet is registered trademark of Xerox Corporation.

All other company names and product names used in this document are trademarks or registered trademarks of their respective companies.



Mitsubishi Electric's e-F@ctory concept utilizes both FA and IT technologies, to reduce the total cost of development, production and maintenance, with the aim of achieving manufacturing that is a "step ahead of the times". It is supported by the e-F@ctory Alliance Partners covering software, devices, and system integration, creating the optimal e-F@ctory architecture to meet the end users needs and investment plans.



**MITSUBISHI ELECTRIC CORPORATION**

HEAD OFFICE: TOKYO BLDG., 2-7-3 MARUNOUCHI,  
CHIYODA-KU, TOKYO 100-8310, JAPAN