YAMAHA

TRUSTED TECHNOLOGY

YRi-V NEW

SMT Innovation

3D hybrid optical inspection system

Multi-purpose optical inspection systems for all markets
Super high-speed and high-accuracy 3D inspection

Super high-speed 3D inspections
56.8 cm²/sec (under optimum conditions)

Super high-accuracy 3D inspections
8-way projector

4-way oblique imaging inspections
20-megapixels 4-angle camera

Device inspection features
5 µm resolution / coaxial lighting

YRi-V

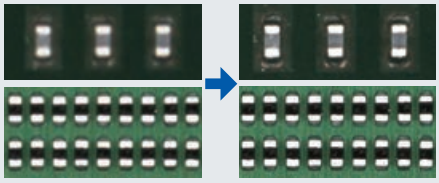
Multi-purpose optical inspection systems realize super high-speed and high-accuracy 3D inspections for all markets. The mounted coaxial lighting and 5-µm lenses added to the lineup enable high-accuracy inspection of devices and board features.

Newly designed GUI

The new user interface is intuitive and easy to see. New built-in capabilities simplify viewing and recording inspection results.

Super high-resolution 5-µm lenses

The 5-µm lenses added to the lineup are capable of higher definition inspections compared to the conventional 7-µm lenses. The lenses improve the performance of high-accuracy inspections of the smallest components (e.g., 0201mm SMD chips) and inspections of minute defects such as cracks and damage to components.



Conventional lens　　5-µm lens

Super high-speed and high-accuracy inspections

New type of inspection head

The newly developed high-performance inspection head significantly improves the performance of 2D inspections, 3D inspections, and modes that use the 4-angle cameras. The increased inspection performance delivers benefits for all SMT sectors.

Super high-speed inspections

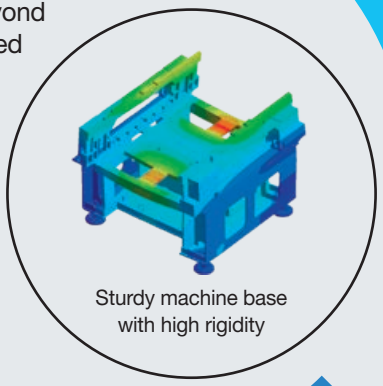
Yamaha's proprietary high-rigidity frame is the foundation for the YRi-V's high-accuracy and super high-speed inspections. The YRi-V inspection speed is 1.6 to 2.0 times faster than the YSi-V and is therefore suited to use in mass-production.

2D High-speed, high-resolution 2-dimensional inspections

High-resolution imaging with 12 megapixels

YRi-V is a high-end system with a high-performance 12-MP camera with 12 µm resolution and a telecentric lens. It also incorporates a new high-speed graphical processing unit (GPU) for image analysis, as well as other features to boost inspection capability beyond that of ordinary systems, along with the expanded visual field, superior image resolution, and high throughput.

Provides optimal inspection technique selectable from 5 different methods

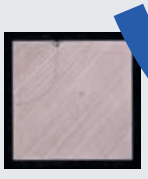


Sturdy machine base with high rigidity

Brightness
Selective brightness adjustment of captured image enhances inspection for missing components, polarity, component ID by character recognition.

Infrared
Shows white components on white resist.

Color
Can isolate features of a desired color. Example: detection of exposed copper.



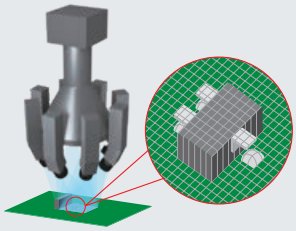
Coaxial lighting
Detects minute defects on mirror-finished components.

Shape
Extracts sloped sections. Example: detection of solder fillet.

Height and sloped surface 3-dimensional inspections (option)

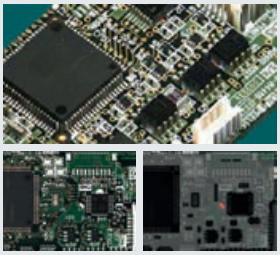
8-way projector / 4-way projector (select)

The 8-way projector added to the lineup enables inspection of closely spaced 0201mm components. The projector reduces the number of blind spots for large components, realizing high-accuracy 3D inspections. The increased 3D measurement range enables 3D inspections of components with heights of up to 25 mm.



The 8-way projector eliminates blind spots in 3D inspections.

YRi-V performs high-speed height measurements within an entire field of view, in one batch. This 3D imaging reliably detects floating components that a 2D inspection can miss. Detection is also improved where color tones between board and components are similar or when there is interference between silk-screen and pattern. YRi-V 3D inspection can also detect the slope gradient and direction, and make pass/fail contour judgements.

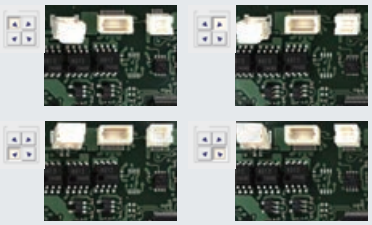


Detection of extra components or contamination such as solder particles or black material, by assessing luminance or by 3D height detection.

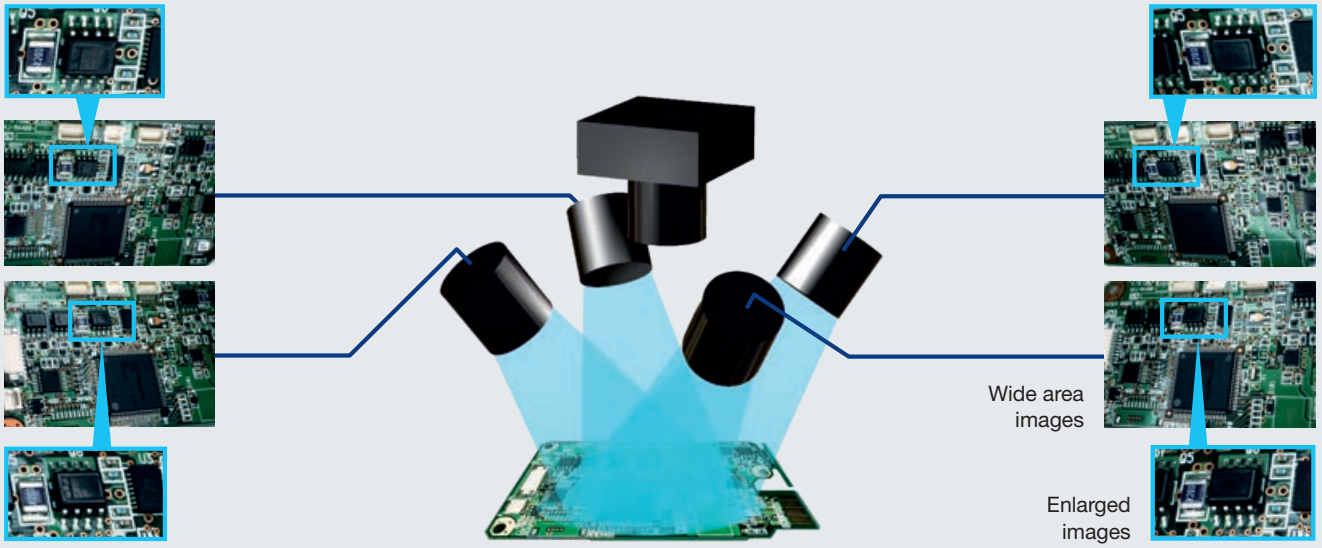
2D and 3D inspection of leaded packages and chip components

20-megapixels 4-directional angle camera

The YRi-V contains new 20-megapixels high-resolution cameras. Clear images enable accurate secondary judgment. The higher picture quality improves the accuracy of automatic inspections based on oblique images. YRi-V can do angular inspection from four directions (45°, 135°, 225°, 315°). You can isolate a component and inspect it as if looking at the board from four different angles from the remote judgement station or mobile application without removing the board from the line. This minimizes human intervention with boards, thereby eliminating errors and reducing the number of process steps.



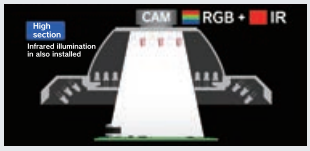
Easy selection camera image



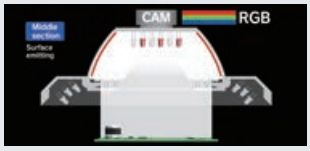
3-color high-middle-low plus IR for 10 types of image identification

Lighting arrangement avoids shadows from other components

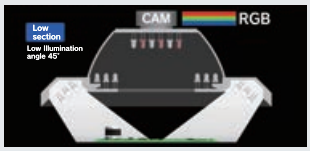
High section:
Also has IR (infrared) lighting to transmit through flux for shiny look on image.



Middle section:
Light emitted from dome light source causes no shadows even around tall components.



Low section:
High lighting angle means any shadows are small.



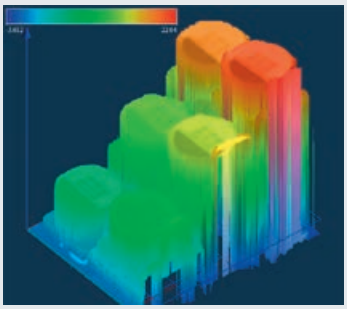
High, middle, low stage 3-color identification + infrared identification

Accurately identifies color and shape by lighting via RGB and IR combinations on high, middle and low.

Many types of inspection in one unit

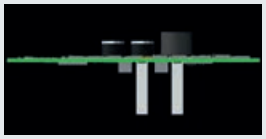
3D measurement height has been expanded to 25 mm, so that 3D inspection is available even for tall components. This maximizes the quality gains achievable using 3D inspection, especially in PCBs for automotive and industrial equipment.

Adjustable settings to handle tall components mounted on topside or underside of PCB enable capturing sharp images with lighting that seldom causes shadows, even in areas near tall components.



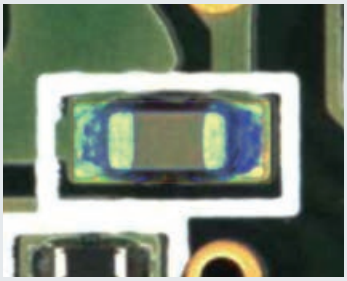
Handling tall components

Easily handle components up to 45 mm above the board and 85 mm below.



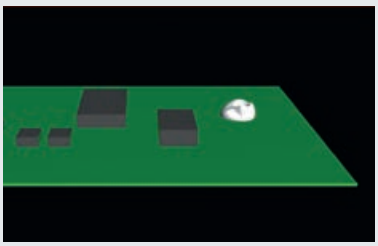
Detects fillets

Recognizes fillet shapes with deep blue color just on slope section of fillet.

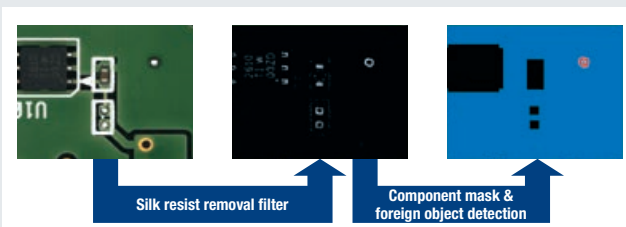


Full surface foreign object inspection mode

Automatically searches the entire board, including areas where no 3D objects should be, and detects any foreign objects found there.



* Reversal area against components being mounted

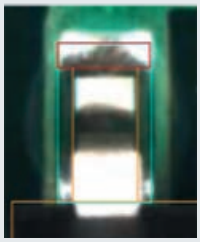


Automatic parameter setting cuts data-tuning time by 50 %

The latest improvements in automatic parameter setting ensure the easiest data creation in the market. In particular, the data-tuning time is significantly shortened by using PCB information in original data.

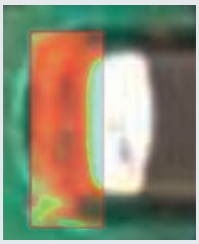
No need to set inspection area

The inspection area is automatically set according to the positional relationship between the component shape and the pad.



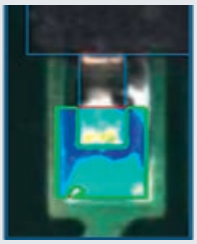
Automatic setting of lighting parameters

The most suitable lighting for each inspection area is automatically set.



Automatic position correction

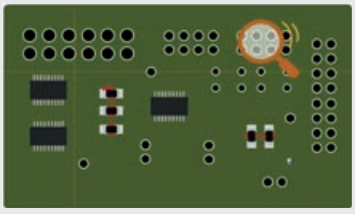
The inspection areas are automatically adjusted according to component shift.



You can import data from Yamaha mounters in a split second to generate the inspection program automatically. A preinstalled library of over 1,000 component types drastically shortens the startup time. Supports IPC standards IPC-A-610 and just specifying the particular class automatically updates the inspection standards. Auto tuning of the inspection window size is based on pad size.

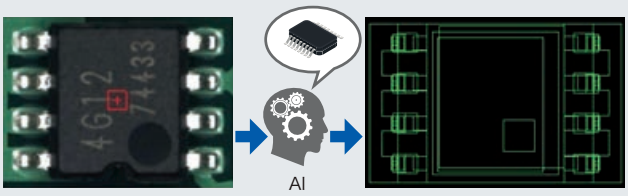
Automatic inspection data creation

The system can directly convert all types of data (e.g., CAD, CAM, and mounter data) into inspection data and automatically creates PCB images from Gerber data. The system detects through-holes on DIP PCBs automatically and can create inspection data automatically.



Automatic component library matching [AI function]

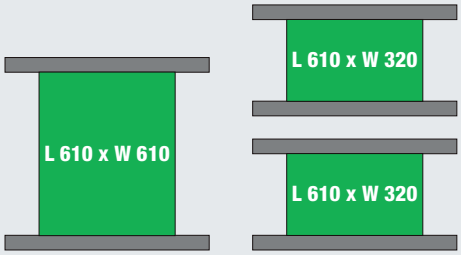
AI automatically identifies the component types based on images taken by the camera and applies the optimum component library automatically, contributing to simplifying the creation of inspection data.



Enhanced PCB conveyance capability

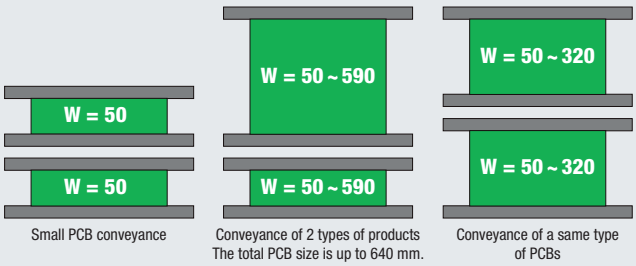
Large PCBs conveyable

YRi-V can handle large PCBs with length 610 mm and width 610 mm as standard. The dual-lane system can convey large PCBs of width 320 mm on the two lanes.



Dual lane system

The newly developed dual-lane system can operate each lane flexibly. The system that can be easily connected to upstream and downstream equipment contributes to establishing dual-lane lines flexibly.

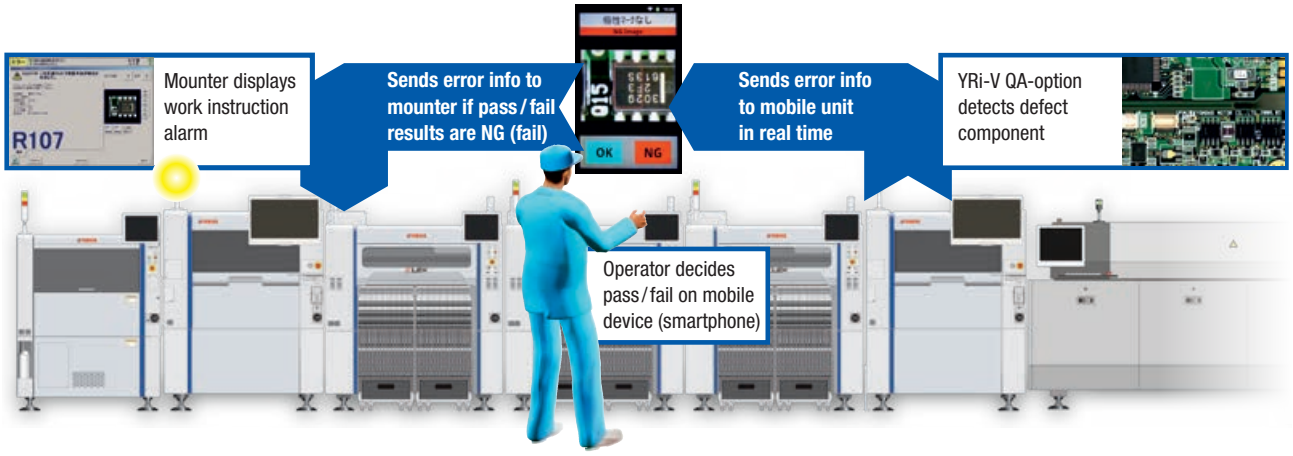


Mobile judgement

Images that show defects are sent to the operator's mobile unit via a wireless LAN, which makes it possible to judge pass or fail remotely. The system allows line operators to enact their decisions, contributing to labor savings.

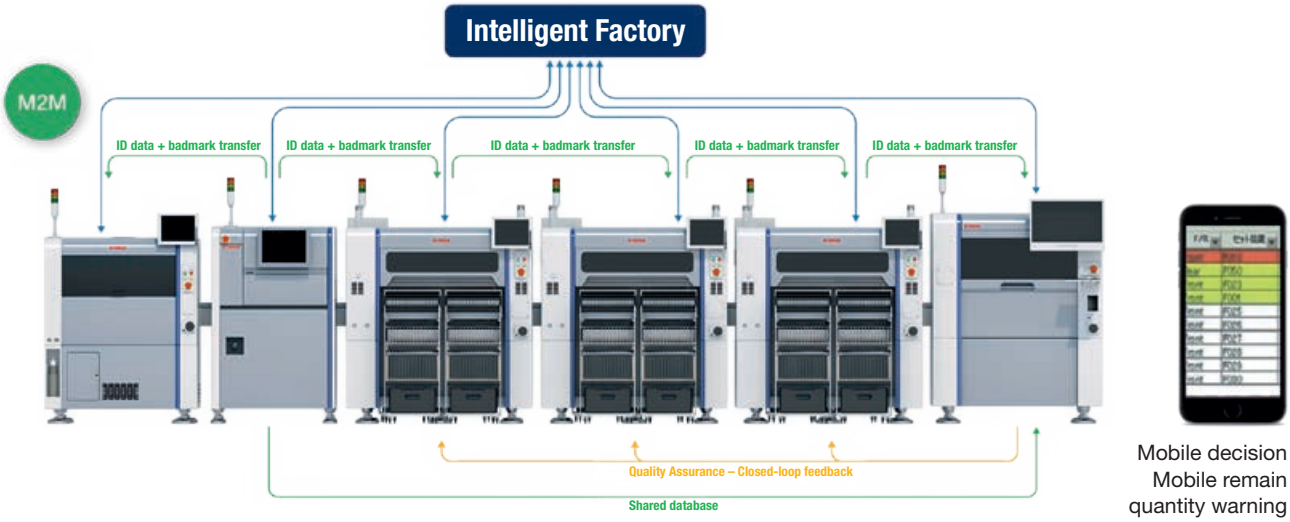
Quality assistance, using mobile pass/fail judgement (option)

If a defect is detected, this system identifies the responsible mounter and feeds back error information. That mounter is automatically set to cycle-stop and data such as the setting position, head number and nozzle type appears on the monitor. The error information and an image of the defect are sent by wireless LAN to the operator's mobile terminal. The operator can communicate the pass/fail judgement directly from the mobile device to resume normal line operation.



Automatic program changeover

Automatically selects the PCB program by scanning 2D code on the board or by scanning barcode on production order sheet. After changing the program, the board width and support pin positions are automatically changed and the machine checks that all components are available.

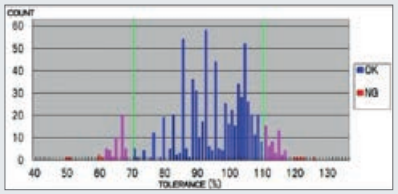


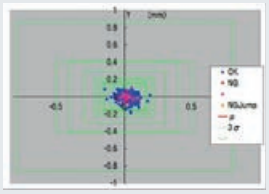
Transfers the scanned ID information and the PCB position information, and selects the conveyor width and PCB program on each machine.

Analysis tools offer diverse functions for super usability!

Analysis of inspection data helps increase operating efficiency

Performs machine checks from threshold values and distribution of inspection results on histogram.

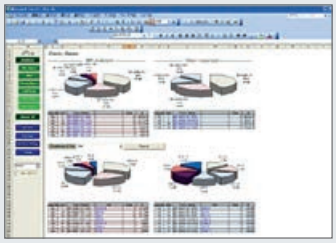




Tuning support function simplifies analysis.

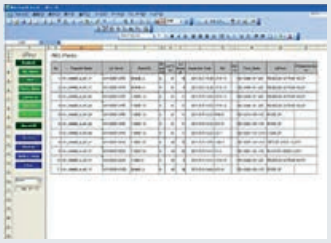
Trends analysis helps to pinpoint the causes of any problems

Pinpoints defect mode where problem occurred from auto inspection and retest results that also allow verifying the defect image.



Performs traceback searches via the product history

Alternatively, verify defect images by checking the product inspection history.



Monitoring package (Monitors productivity and product quality, etc.)

Live production dashboard

Visual management of factory floor and line status.

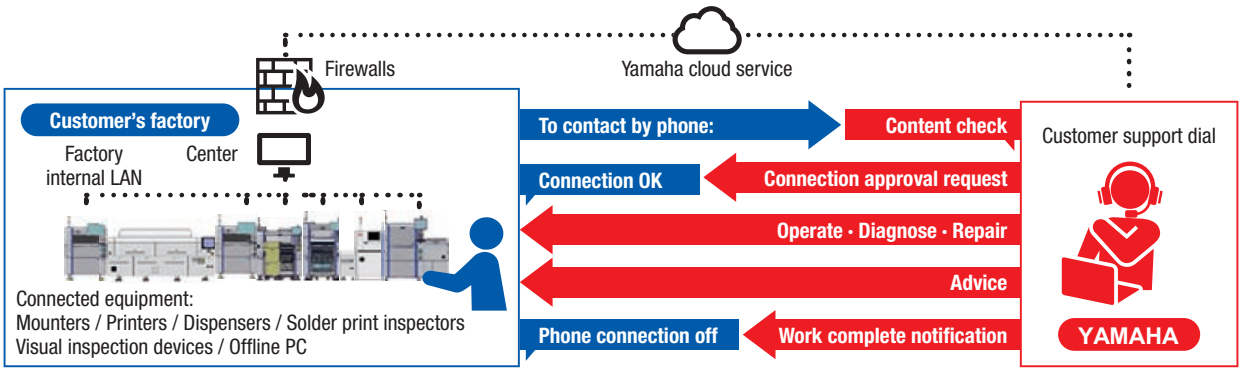
Production analytics dashboard

Supports pinpointing the problem source by analyzing any reduction in operating rates or increased quality-control problems.

Maintenance package (After-maintenance, product warranty, etc.)

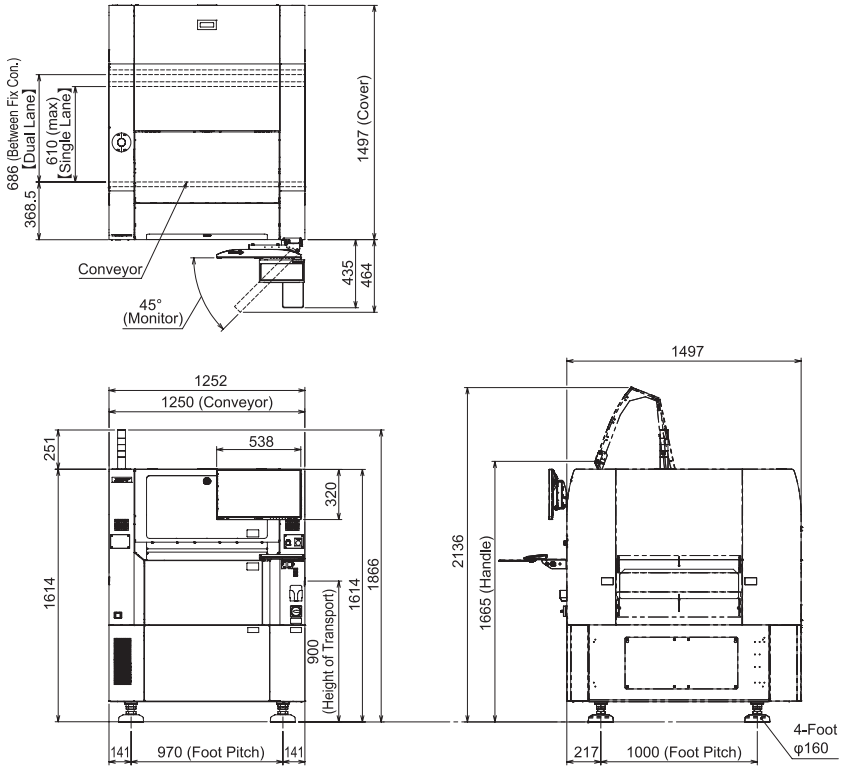
Remote machine support

The display screen on the customer's machine also appears on the Yamaha service engineer's PC via the Internet. Sharing screen images in this way leads to swiftly solving the problem.



Specifications	YRi-V		
Applicable PCB	L 610 x W 610 mm (max.) to L 50 × W 50 mm (min.) (single lane) L 750 mm long length PCBs available (option)		
PCB height that can be carried in	Top: 45 mm, bottom: 85 mm (single lane)		
Maximum 3D measurement height	25 mm		
Number of pixels	12 megapixels		
Number of pixels of the 4-angle camera	20 megapixels		
3D inspection speed (under optimum conditions) 4-projection	12 µm resolution	7 µm resolution	5 µm resolution
	56.8 cm^2/s	19.6 cm^2/s	10.1 cm^2/s
External dimension (excluding projections)	L 1,252 x W 1,497 x H 1,614 mm		
Weight	1,480 kg		

YRi-V external dimension



Yamaha Motor Europe N.V.
Niederlassung Deutschland, Geschäftsbereich IM
German Branch Office, IM Business
Hansemannstrasse 12 · 41468 Neuss · Germany
Tel: +49-2131-2013520
info-ymeim@yamaha-motor.de
www.yamaha-motor-im.eu

Yamaha Motor Co. Ltd., Head office Robotics Operation
127 Toyooka, Kita-ku, Hamamatsu, Shizuoka 433-8103, Japan, Tel: 81-53-525-7061
Yamaha Motor IM (Suzhou) Co. Ltd.
#8 Building No.17 East Suhong Road, Suzhou Industrial Park, China 215026, Tel: 86-512-6831-7091
Yamaha Motor IM (Suzhou) Co. Ltd., Shenzhen Branch, 1/F, Bd. 1, Yesun Intelligent Community, Guanguang Rd. 1301-70, Guanlan St, Longhua District Shenzhen, Guangdong, P.R.C. China, Tel: 86-755-2393-9910
Yamaha Motor Corporation, U.S.A., IM Division (USA office)
3065 Chastain Meadows Parkway Marietta, GA 30066, Tel: 1-770-420-5825
Thai Yamaha Motor Co. Ltd. (Thailand Office), 64 Moo1, Debaratana Rd., Km 21, Tambol Srisa Jorrake Yai, Amphur Bangsaothong, Samutprakarn 10570, Thailand, Tel: 66-96-779-7680
Yamaha Motor Parts Manufacturing Vietnam Co. Ltd. (Vietnam Office)
Lot G1-G2, Thang Long Industrial Park, Vong La Com, Dong Anh Dist, Hanoi, Vietnam, Tel: 84-24-3951-6456

Yamaha Motor Robotics division is a subsidiary of Yamaha Motor Company. Version: August 2021.