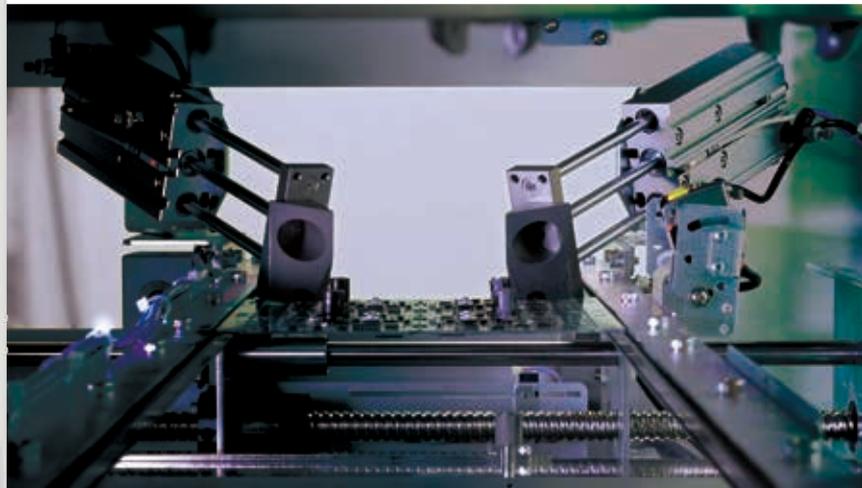


Boost the productivity of populated circuit board testing with the FA1220-11 inline automatic testing system



Extensive functionality for building efficient production lines.

Installation footprint that's about 23% smaller than previous models.

3-year warranty and CE Mark compliance.

Boost productivity. Safeguard quality.

Slash preparation man-hours. Shorten takt times. Reduce waste.

Detect and exclude defective boards. Expand your testing coverage. Maximize test functionality.

Hioki provides robust support for populated circuit board quality assurance through sure measurement and man-hour-saving automation.

Reduce setup man-hours

The FA1220 features an extensive range of new functionality for automating setup tasks that must be performed every time the board model changes, including checking the installed test fixtures, loading the corresponding test program, and adjusting conveyor rail width.

Save space

The FA1220's depth measures 230 mm less than previous models. It can also be installed back-to-back to create parallel lines, offering new flexibility for production line layout.



Harness an extensive selection of tests

In addition to component testing, which generates judgments based on measured values for the components mounted on the board under test, the FA1220-11 can simultaneously perform IC testing and active testing, which inspects individual components as they operate.

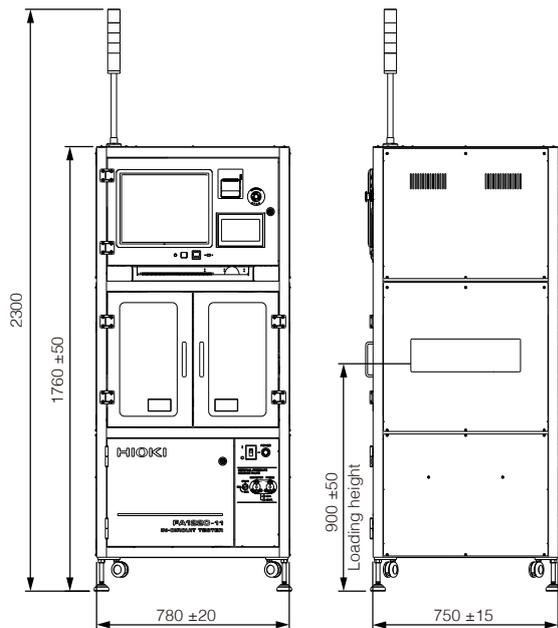
Detect and exclude boards with defects

Since the FA1220-11 not only generates FAIL judgments for defective products, but also produces detailed test result data, the system helps you analyze the causes of defect and generate feedback for other processes.

Productivity: Creating valuable space and time

Installation area that's 23% smaller than the previous model

Unlike the previous model, the FA1220-11 doesn't require additional measurement racks when you need to increase the number of measurement pins. The system's depth has been reduced from the previous model's 980 mm to a sleeker 750 mm. This smaller size allows it make more effective use of production space.



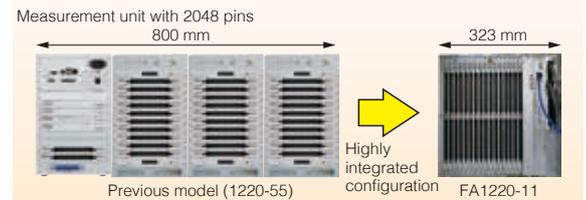
Slide-in mechanism for test fixtures

The FA1220 inherits the previous model's slide-in test fixture loading mechanism. The shape of the loading port is designed to further reduce operator workload.



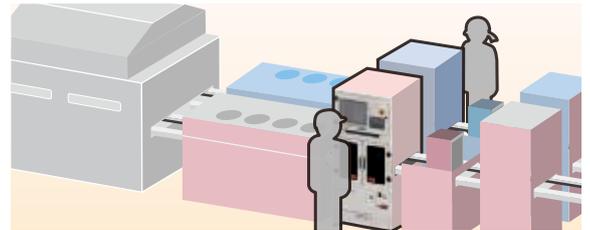
Measurement technology for a more compact design

The measurement unit at the heart of the FA1220-11 features a highly integrated configuration. Even when equipped with the maximum 2048 pins (with 16 scanner boards installed), the system requires no additional racks. The FA1220-11 provides extensive testing functionality in a compact footprint.



Parallel, back-to-back lines

The FA1220's shallower depth allows it to be installed back-to-back to create parallel lines.



No need to connect cables: Automatic connections

ONE-TOUCH CONNECTOR E4268, ONE-TOUCH CONNECTOR E4269

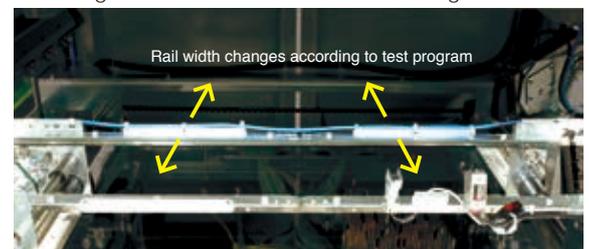
One-touch connectors eliminate the need to connect test fixture cables. The connections are made automatically in response to touch panel operate.



Automatic width adjustment based on board dimensions

E4291 AUTOMATIC WIDTH ADJUSTMENT FUNCTION

To reconfigure the line, all you need to do is to change the test program. The transport rail width is adjusted automatically according to the dimensions of the boards being tested.



Mouse-free operation

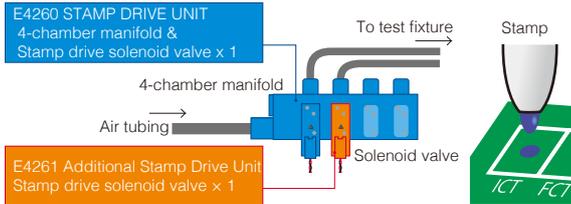
Data selection, test mode selection, and test start can all be performed using the touch panel. In production operation that doesn't require debugging, setup changeover can be made without a mouse.



Judgment result stamps

STAMP DRIVE UNIT E4260, ADDITIONAL STAMP DRIVE UNIT E4261

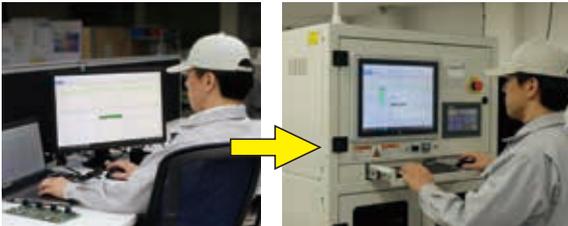
The system can operate up to 16 stamps, which are installed on the test fixtures. Up to four E4260 units can be added to the FA1220-11. Each E4260 unit can accommodate up to three E4261 units.



Data creation that doesn't monopolize the line

1220 DATA COMPOSITION SOFTWARE 1137-05

The application can be installed on a standard computer, allowing data creation and analysis work to be performed without regard to whether the production line is operating.



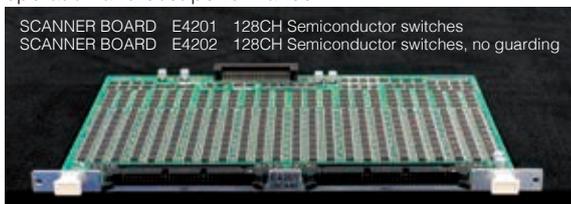
Create data in the office.

Debug and test on the production floor.

Maintenance-free semiconductor relays

SCANNER BOARD E4201, SCANNER BOARD E4202

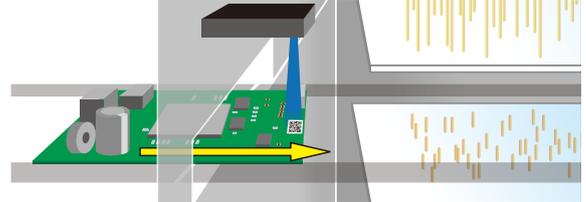
Compared to contact relays that switch on and off mechanically, semiconductor relays, which switch between circuits electrically, excel in terms of maintenance-free operation and cost performance.



SCANNER BOARD E4201 128CH Semiconductor switches
SCANNER BOARD E4202 128CH Semiconductor switches, no guarding

Automatic model-based loading of test program

The FA1220-11 can load test program automatically by scanning 2D code on the board. In this way, data can be loaded and configured automatically from a multi-model data library based on variations in board specifications and other factors.



*Requires separately purchased reader.

Rear cable connections

REAR SAFETY DOOR E4292

Upper and lower fixture connections using ribbon cables are made from the rear of the system. The rear safety door makes this work more convenient.



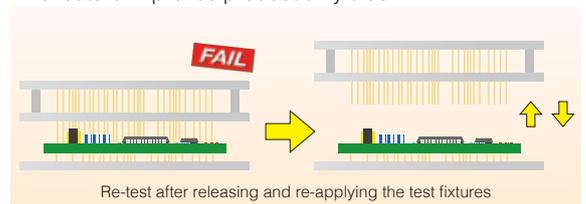
Data creation support functionality

The ATG function can be used to automatically generate test program from multiple known-good reference boards. Test steps are generated by means of macro testing and component acquisition.

1 Macro	*	0	4	278.0	Ω	278.0	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	5	646.8	Ω	647.0	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	8	131.0	Ω	131.1	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	9	1.075	kΩ	1.075	kΩ	PASS	11 %	-11 %	0.2
1 NormDiode	*	0	10	437.5	Ω	437.4	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	11	112.0	Ω	112.0	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	4	278.0	Ω	278.0	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	5	646.8	Ω	647.0	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	8	131.0	Ω	131.1	Ω	PASS	11 %	-11 %	0.2
1 Macro	*	0	9	1.075	kΩ	1.075	kΩ	PASS	11 %	-11 %	0.2
1 NormDiode	*	0	10	437.5	Ω	437.4	Ω	PASS	11 %	-11 %	0.2

Auto retest for improved contact

In the event a contact error between the test fixture and the board under test results in a fail judgment, the FA1220-11 can press down the test fixtures again to improve contact. This feature improves production yields.

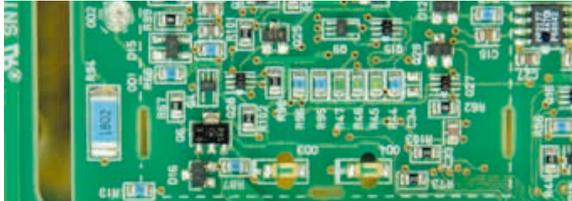


Re-test after releasing and re-applying the test fixtures

Quality: Broad coverage and extensive functionality for detecting defects

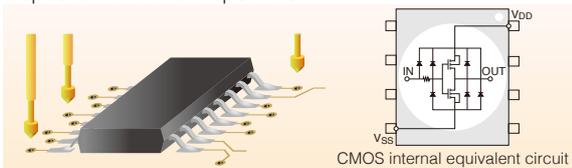
Extensive component testing capability

The FA1220-11 ships standard with extensive testing capability, including a polarity check to detect electrolytic capacitors that have been mounted backwards and milliohm-range resistance testing using 4-terminal measurement.



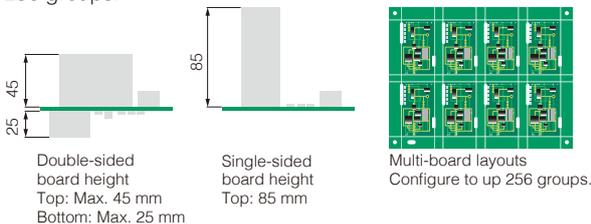
Detection of IC reverse insertion

The FA1220-11 ships standard with a test mode for detecting ICs that have been mounted backwards. This function uses the polarity of the IC's internal protective diode to reliably detect reverse mounting of ICs whose shape would make the defect difficult to detect with a visual inspection and of stamped ICs.



Support for a variety of boards

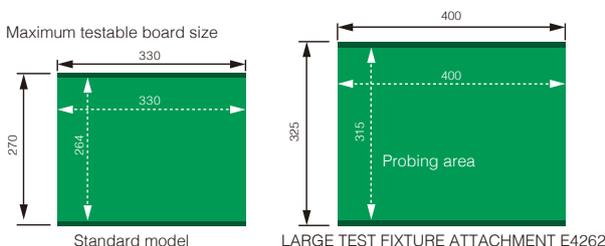
The FA1220-11's improved transport rails accommodate boards with a bottom-surface height of up to 25 mm. During double-sided testing, it can test multi-unit layouts with up to 256 groups.



Testing of even larger boards

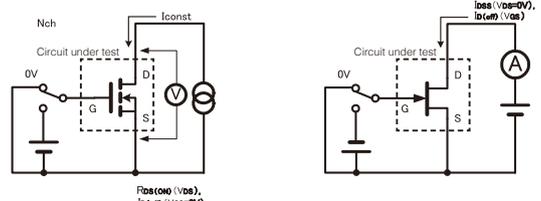
LARGE TEST FIXTURE ATTACHMENT E4262

When equipped with the large test fixture support option, the FA1220 can accommodate maximum board dimensions of 400 mm x 325 mm.



Active-state testing of semiconductors

The FA1220-11 can measure drain-source voltage and current while applying on/off voltages to MOS-FET and J-FET gates. In this way, it can generate pass/fail judgments for FET operation under active conditions.



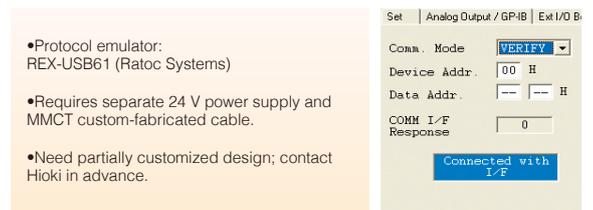
Pass/fail judgment based on off-current and on-resistance

Pass/fail judgment based on off-current and measured current (IDSS)

I²C-compatible testing

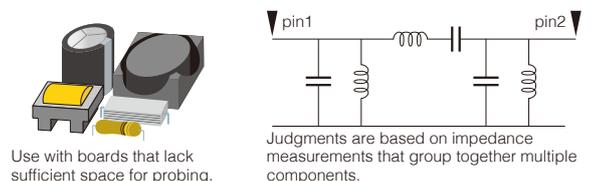
I²C TEST UNIT 1960-10

The FA1220 can use the I²C bus to write data to ICs mounted on the board under test, verify written data, and generate controller DIO output.



Component testing less measurement pins

When it's difficult to set probe contact with a component's pads, the FA1220 can generate judgments based on the composite impedance of multiple components. Macro testing allows the system to acquire measured values from a known-good reference board for use as reference values.



Use with boards that lack sufficient space for probing.

Judgments are based on impedance measurements that group together multiple components.

Post-testing writing of programs

ONBOARD PROGRAMMING FUNCTION E4231

This function allows you to use a ROM writer to write programs to a microcontroller with built-in flash memory after testing has been completed. It uses a ROM writer from DTS Insight.



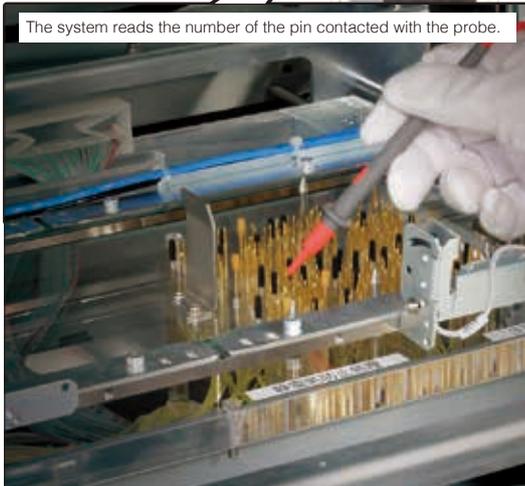
Audio pin number guidance function

This function provides audio guidance for pin numbers while the operator conducts a pin search. By eliminating the need to look at the screen, it allows the operator to concentrate on identifying target pins. The function can read pin numbers in Japanese, English, and Chinese, and a speaker can be used to ensure clear audio without taking up valuable work space.

“Two”, “three”, “five”,
“Thirteen”,
“Eighty-nine” ...



The system reads the number of the pin contacted with the probe.



Output of analytical data

PRINTER UNIT E4243

Standard functionality allows measurement data to be output to a datafile. Additionally, an optional printer unit can be used to print test results on the production floor.

[Test Results]						
File HIOKI						
----- Component -----						
DATE	TIME	PinNo 1-1	PinNo 2-2	***	PinNo 19-19	PinNo 20-20
2010.12.1	10:00:00	6.29E+08	2.46E+08	***	3.93E+08	1.00E+12
2010.12.1	10:01:00	6.29E+08	2.46E+08	***	3.93E+08	1.00E+12
2010.12.1	10:02:00	6.29E+08	2.46E+08	***	3.93E+08	1.00E+12
2010.12.1	10:03:00	6.29E+08	2.46E+08	***	3.93E+08	1.00E+12

explanation	
Display	Description
[Test Results]	Header
File	Header
----- Component -----	Header
	Header

Example electronic data file output

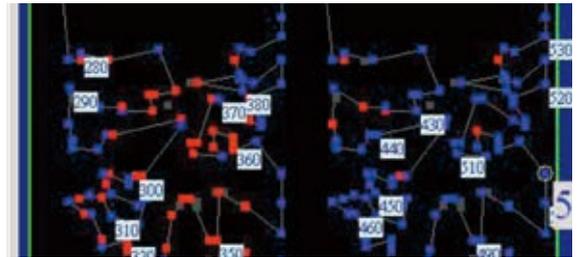


E4243 Printer Unit

FAIL board analysis point viewer

The point viewer displays pin coordinates as points, which is helpful when performing test fixture maintenance. This functionality allows you to refer to information immediately on-site instead of needing to carry printed material with you.

The viewer allows you to switch board surfaces (top/ bottom) as well as the view surface and display zoom factor, among other settings. Pins associated with FAIL results are shown in red. When conducting a pin search, the point's pin number is shown in larger text.



When you have Hioki fabricate test fixtures, you can add point information files as an option. To use the viewer function, simply place the test program file and point information file in the same folder.

Single-click visualization of FAIL information

FAIL VIEWER UA1782

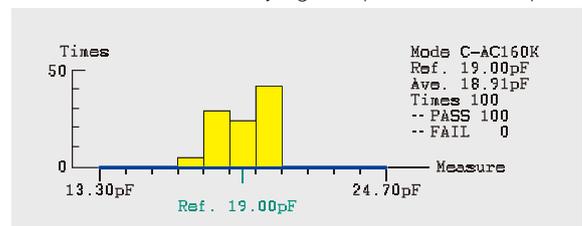
The FAIL VIEWER UA1782 is a software application that aids in analyzing populated circuit boards by adding component and probe search functions to an analytical database viewer. The application provides functionality for not only searching for component mounting positions and probe contact positions on boards, but also searching for components that connect to the user-specified probe number, all with a one click. With the UA1782, there's no longer any need to view parts allocation diagrams while performing repair work. Additionally, you can search for contiguous locations between pins (patterns), allowing the software to be used to search for solder bridge defects.



Net search results

Statistics function for checking quality trends

This function allows you to review a histogram of measured values inside the test software. The software stores up to 100 measured values and judgment pairs for each step.



3-year warranty and CE Mark compliance

Hioki has evaluated the quality of the FA1220-11 through EMC testing and safety verifications to ensure CE Mark compliance. The system is covered by a three-year product warranty.



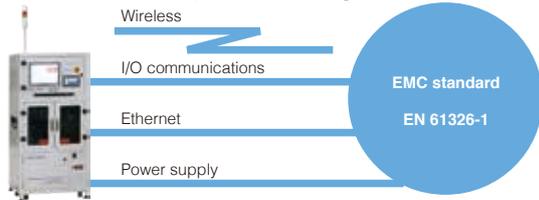
Optimal test fixture application force for reliable testing

The FA1220-11 ships standard with a press cylinder that has a large, 125 mm diameter. This design allows the system to press down the test fixtures with theoretical thrust of approximately 1.5 times that of the previous model.



Reduction of noise-related issues

Hioki has carried out immunity (electromagnetic susceptibility) and emission (electromagnetic compatibility) testing to ensure compliance with the EN61326-1 EMC standard. This design limits issues caused by electrical wiring and radiative noise.



Measurement unit calibration for more reliable testing

CALIBRATION UNIT FOR MEASUREMENT SECTION 1330

An optional calibration unit calibrates the measurement unit. Periodic calibration makes possible reliable, traceable testing.



Line configuration: Launch testing lines quickly

Worldwide adoption

The FA1220-11's standard software supports Japanese, Chinese, and English. Its 100 V to 240 V free power supply supports supply voltages around the world. It also complies with CE, Chinese RoHS, WEE, KC, and other standards.



Rear connectors

Transport inter-operation with upstream and downstream processes

The FA1220-11's external I/O signals allow it to communicate board transport and request signals as well as test results.

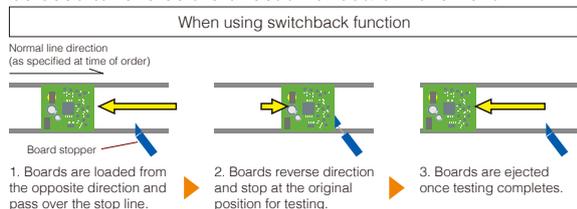


Rear connectors

- Connectors used on FA1220
- Connector housings: SC-1634(10) (Hirose)
- Female contacts: SC-1600-112 (bare wires), SC-1600-212 (continuous)
- Stopper brackets: P-1634A-STA(51) (Hirose)
- Connectors used on cables (included)
- Male connectors: P-1634BA(09), soldered type (Hirose)
- Plug case: P-1634A-CA(50) (Hirose)

Support for both left- and right-hand lines

The FA1220-11 supports both left- and right-hand line movement (specify at time of order). Even if the line direction changes after system purchase, a switchback function can be used to reverse the direction of board movement.



Effective use of legacy assets

The FA1220-11 is compatible with data from the 1105 and 1220 legacy models, and it can use test program from those systems. The FA1220-11 can load 1220 data as-is, and it can load 1105 data via a conversion function.



Safety: Safeguard people, products, and lines

Emergency features

RESIDUAL PRESSURE EXHAUST UNIT E4270

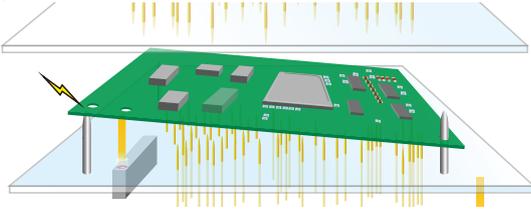
The FA1220-11 ships standard with an emergency stop switch and warning lamp. An available residual pressure exhaust unit allows the cylinder lock to be released while the system is stopped.



Verification of proper board positioning

BOARD CONFIRMATION UNIT E4265

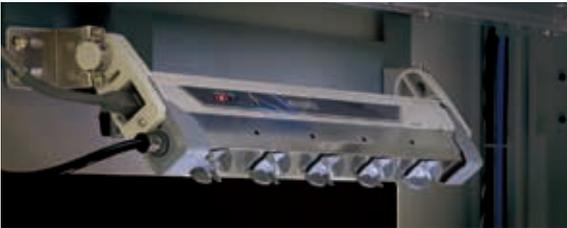
This feature inter-operates with sensors installed on the test fixture to detect and warn the operator about issues including board float, backward insertion, improper board type, and board absence.



Elimination of static electricity for safe testing

IONIZER UNIT E4267

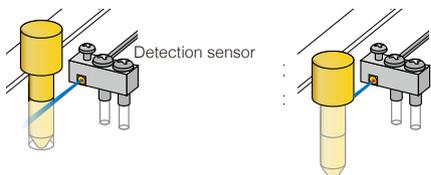
Boards transported along production lines may build up a static charge. An ionizer unit installed at the system's inlet eliminates static electricity.



Test fixture verification function

FIXTURE VERIFICATION FUNCTION E4263 (For upper test fixture)
FIXTURE VERIFICATION FUNCTION E4264 (For lower test fixture)

This feature checks whether the upper and lower test fixtures have been securely installed. Sensors are used to check the upper and lower test fixtures' positioning pins.



Missing or misaligned fixture

Properly installed fixture

Interlock

An interlock links operation of the system with the status of the front door and rear safety door. Opening either door stops operation.



Accurate stopping of boards at the test position

ADDITIONAL BOARD STOPPER E4293

A second stopper limits board inclination at the test position, including non-rectangular boards with unusual profiles. Boards are stopped accurately at the test fixture position.

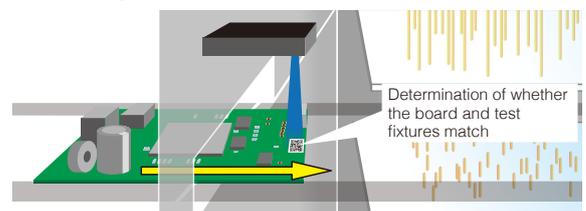


Even boards with beveled edges and boards with different angles on the front and rear edges can be stopped accurately.

Prevention of erroneous test fixture installation

TEST FIXTURE ID DETERMINATION UNIT E4266

This feature prevents the test fixtures pressing down if the ID assigned to each board model's test program doesn't match the test fixtures' IDs. In this way, it prevents damage from mismatching between boards and test fixtures.



*Requires separately purchased reader.

Resilience in the face of sudden power outages

BACKUP POWER SUPPLY E4242

This option continues to power the system's control computer and LCD even in the event of an outage so that you can shut them down normally.

Computer restoration

RECOVERY CD FA1395

This option creates a recovery disc at the time of shipment for use with individual products. The disc can be used to restore the operating system, settings, and other files to their state at the time of shipment.

*The FA1220-11 does not have a CD or DVD drive. You will need to provide an external CD or DVD drive in order to use the Recovery Disc FA1395.

Test fixtures: Measurement and comprehensive assistance

Guaranteed genuine manufacturer parts and rigorous debugging

Have you grappled with problems where it was difficult to trace the issue to either the fixture or ICT? If you use a genuine HIOKI fixture, HIOKI guarantees everything, right down to the test program.

We at HIOKI use our expertise in measurement to provide both test fixtures and test program that have undergone rigorous debugging. It makes possible to launch production line quickly.



Pin Board 1160 (bottom)

Streamline repair work by creating an analytical database from Gerber data and mounting data

From the standpoint of the thermal contraction of boards, the previous method of acquiring probing information from the board under tested is an extremely effective technique for ensuring stable contact.

However, it is becoming increasingly common to fabricate test fixtures based on electronic data such as Gerber data and mounting data (component mounting information) in order to accommodate finer-pitch circuit trace layouts as well as shorter lead times. Hioki has gone beyond computerizing the fabrication of test fixtures by providing analytical databases that can also be used in repair work and test fixture maintenance. Since repair work can be computerized, there's no longer any need for paper documentation such as component schematics and pin assignments.

Support for high-density boards

High-precision drilling machines can space probes as close as 1.27 mm apart. This precision makes it possible to accurately probe minuscule points.

Probes

Test fixtures are fabricated using optimal probes while taking into account tip profile, diameter, downward force, and structure.

Optimal test program

Populated circuit board experts carry out debugging work to determine the appropriate tolerances, wait times, and guarding. Performing this debugging work on the customer's system helps minimize post-delivery debugging.

Designs that minimize stress on boards

Flexure of boards at the time of test fixture press down stresses not only the board, but also its components. Many years of experience allow Hioki to provide flex-free, stable probing.

Short lead times

The amount of time available between prototyping and volume production continues to decline. The most effective way to assure product quality is to introduce In-Circuit Test as early in this process as possible. Hioki works continuously to review and rationalize fabrication processes to accommodate demand for shorter lead time.

Documentation

Hioki test fixtures ship with all the documentation you'll need to perform maintenance work, including debugging lists, plot diagrams, and location diagrams.

Extension range of options

Stamp units

This option applies stamps to boards. Our extensive selection of stamp units includes water-based ink, oil-based ink, and seal face variants. (Requires Stamp Drive Unit E4260 on the FA1220-11.)

Missing connector and reverse insertion testing

This option uses switch probes to check for manual connectors that have been inserted backwards.

Capacitor reverse insertion testing

This option uses special probes to touch on the top of electrolytic capacitors and detect backward mounting.

Counter function, anti-static design, etc.

Materials required for test fixture fabrication

Circuit schematics, BOM (Bill of Material), PCB (bare board), populated boards (multiple boards), component schematics, net list, etc.

Electronic data required for test fixture fabrication

Gerber data and drill data (274D, 274X)
Mount data (CSV, Excel)
BOM (Bill of Material: CSV, Excel)

Specifications

Basic specifications

Testable board size

External dimensions (Standard)	Single-sided model	Max. 330 (W) × 250 (D) mm Min. 90 (W) × 60 (D) mm
	Double-sided model	Max. 330 (W) mm × 210 (D) mm Min. 90 (W) × 60 (D) mm
External dimensions (With E4262)		Max. 400 (W) mm × 325 (D) mm Min. 90 (W) × 60 (D) mm Details vary with test fixture specifications.
Thickness	0.8 to 2.0 mm	
Weight	1.5 kg or less	
Shape	Rectangular	
Area in which components can be mounted	Single mounted surface:	Max. 85 mm
	Dual mounted surfaces:	Max. 45 mm (top) Max. 25 (bottom)

Test program structure

Number of test points	Standard	0 pins (scanner boards optional) Max. 2048 pins (expandable in blocks of 128 pins)*
Group data	256 groups	
Round-robin S/O data *	2048 pins*	
Macro data	2048 pins/2048 steps (regardless of pin count)*	
Component data	10000 steps	
Charge data	40 groups	
Pin contact data	2048 pins*	
IC data	500 steps (max. 2048 pins/step)*	

*The maximum number of active pins for each test type depends on the total number of scanner board pins installed in the product.

Test types and ranges

Round-robin S/O test*	4 Ω to 400 kΩ	
Macro test	1 Ω to approx. 10MΩ (impedance)	
Component test	Resistance:	400 μΩ to 40 MΩ
	Low resistance:	40 μΩ to 400 mΩ (when equipped with E4203)
	Capacitance:	10 pF to 400 mF
	Inductance:	1 μH to 1 H
	Impedance:	1 Ω to 10 MΩ
	Diode VF:	0 V to 25 V
	Zener diode:	0 V to 25 V
	Digital transistor:	0 V to 25 V
	MOSFET on-resistance:	0 Ω to 1 kΩ
	JFET drain current:	0 mA to 20 mA (N-JFET) -20 mA to 0 mA (P-JFET)
	Photocoupler:	0 V to 25 V
	DC voltage:	0 V to 25 V
	Open:	4 Ω to 4 MΩ
	Short:	0.4 Ω to 400 kΩ
	DC current measurement while applying constant DC voltage:	100 nA to 100 mA
Discharge function	Electrolytic capacitor polarity check	
IC test	IC reverse insertion test:	0 A to 500 μA 0 V to 4 V
	IC pin-to-pin S/O test*:	4 Ω to 400 Ω

*S/O Short/open

Measurement unit

Measurement unit architecture	I/O board, measurement board, IF board, scanner board slot × 16	
Test signals	DC constant voltage:	-200 mV to 10 V, 4 ranges
	DC constant current:	200 nA to 20 mA, 11 ranges 100 mA to 200 mA, 2 ranges (when equipped with E4203)
	AC constant voltage during component testing:	0.1 Vrms, 1 range
	During impedance testing:	0.2 Vrms to 2.0 Vrms, 0.1 V steps
Measurement unit	DC voltmeter:	800 μV f.s. to 25 V f.s., 8 ranges
	DC ammeter:	100 nA f.s. to 250 mA f.s., 9 ranges
	AC ammeter:	10 μArms to 10 mArms, 4 ranges
Scanner unit	E4201 and E4202	Switch type: Analog Number of channels: 128 per board Input protection: ±15 V / ±0.5 V (batch-configurable)
	E4203	Switch type: Read relay Number of channels: 128 per board Input protection: None
	Judgment range	-99.9% to +999.9%, or absolute value
	Guarding	5 points per step

Measurement time	Round-robin S/O test:	From approx. 0.8 msec per pin
	Macro test:	From approx. 2.0 msec per pin
	Component test:	From approx. 0.9 msec to 280 msec per step
	Charge test:	From approx. 3.0 msec per group
	Pin contact test:	From approx. 1.0 msec per pin
	IC test:	From approx. 1.0 msec per pin

Stamp

Number of drivable stamps	Up to 16															
Combinations of drivable stamp counts and required options	Number of drivable stamps															
	Required number of options		E4260	1			2			3			4			
	Required number of options		E4261	0	1	2	3	3	4	5	6					
	Number of drivable stamps															
Required number of options		E4260	3			4			5			6				
Required number of options		E4261	6	7	8	9	9	10	11	12						

Measurement control

Control device	Single-board computer
Operating system	Real-time operating system
Storage device	SD card (for booting system)
External I/O	Ethernet (LAN) 100Base-TX × 1 (for computer connection only)

Main unit control

Hardware	Industrial computer
Operating system	Windows 10 Pro 64-bit
	Operating system language: Japanese/ English (specified at time of order)
Storage device	64 GB SSD
Operation	Keyboard and mouse
Display	15-inch display
Printer	E4243 (option)
External I/O	Ethernet (LAN) 100Base-TX × 1 (For communication with external devices, please contact HIOKI.)
	USB 2.0 × 1

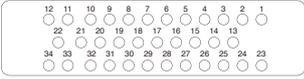
Safety

Machine safety features	Emergency stop switch, front safety door, rear safety door (when equipped with E4292)		
Warning devices	Signal tower (red, yellow, green), buzzer		
Warning status display	Appearance	Signal tower	Buzzer
	Error stop/emergency stop	Red	Continuous
	Summon operator (pause)	Yellow	Continuous (4 sec.)
	Automatic operation/ testing	Green	None

Interface specifications (EXT. I/O)

Connectors	CN1: For upstream process (system before FA1220-11) CN2: For downstream process (system after FA1220-11)		
Connectors used	On FA1220		
	Connector housings:	SC-1634(10) (Hirose)	
	Female contacts:	SC-1600-112 (bare wires) SC-1600-212 (continuous)	
	Stopper brackets:	P-1634A-STA(51) (Hirose)	
Input	On cables (included)		
	Male connectors:	P-1634BA(09), soldered type (Hirose)	
	Plug case:	P-1634A-CA(50) (Hirose)	
	24 V DC input	Rated input voltage: 24 V DC Input impedance: 5.6 kΩ Input current: 4.1 mA typ. (24 V DC)	
Output	Relay output		
	Maximum rating:	30 V DC, 5 A	
	On response time:	10 ms or less	
	Off response time:	10 ms or less	

Pin assignments at FA1220-11 (viewed from connecting side)



CN1

Pin	Signal name	I/O	Functionality
1	Input COM (0 V)	IN	Board transport signal from upstream process
2	Eject signal	IN	Board request signal from upstream process
3	F receive signal	IN	Test results from upstream process
4	PASS	IN	Test results from upstream process
5	FAIL	-	
18	Output COM		
19	Receive signal	OUT	Board request signal to upstream process
20	F eject signal	OUT	Board eject signal to upstream process
21	F GO	OUT	Test results to upstream process
22	F NG	OUT	Test results to upstream process

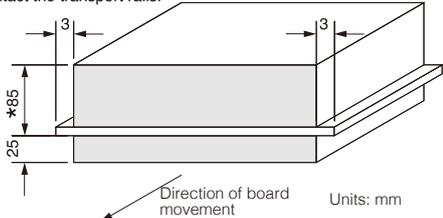
CN2

Pin	Signal name	I/O	Functionality
1	Output COM		
2	Eject signal	OUT	Board transport signal to downstream process
4	PASS	OUT	Test results to downstream process
5	FAIL	OUT	Test results to downstream process
18	Input COM (0 V)		
19	Receive signal	IN	Board request signal from downstream process

Architecture

Theoretical thrust when applying test fixtures	6.1 kN (at 0.5 MPa)
------------------------------------------------	---------------------

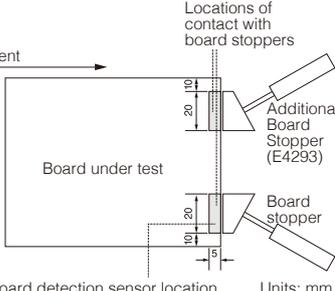
Component mounting area



No components may be present within 3 mm of the two edges that contact the transport rails.

*Component mounting area dimensions assume use of a single-sided test fixture. If using a double-sided test fixture, 45 mm.

Constraints on shape of board under test



If boards move in opposite direction, locations shown here will be mirrored horizontally.

Locations of contact with board stoppers
There can be no notches or other interruptions on the right side (or if boards move from right to left, on the left side).

Board detection sensor detection location
There can be no holes, notches, or similar features with a diameter of greater than 5 mm.

Reference guide hole location	At least 5 mm inside both sides on Y-axis side of object under test
Transport method	Belt transport (using anti-static belt)
Conveyor speed	Max. approx. 0 m to 32 m/min.
Conveyor reference	Front side
Direction of movement	Right to left / left to right (specified at time of order)
Transport height	900 mm (when installed on a level floor) Adjusters allow system to be adjusted up or down 50 mm.
Control device	Programmable controller
Standard transport takt time	10 sec. per board (time from board feed to board eject with electrical test time set to 0 sec.)

Functional specifications

Data creation functionality	ATG function (automatically acquires values from a known-good reference board and configures guarding points) Acquisition of reference values, stray admittance values, and residual impedance values from known-good reference board Group specification
Retest functionality	Retry, retry with polarity change, retest
Control during automatic testing	FAIL stop, test jump, test hold
Test result output	Output of results to a printer or as text data for the specified unit (by test, group, step, etc.) and content (off, all results, or FAIL results) once automatic testing completes
Data output	Output of test program, statistical data, and settings data to a printer or as text data.
Self-test functions	AD function, DC function, AC function, scanner boards, test fixtures, at power-on, at automatic test
Statistics functions	Defect rate tabulation and graph display for by pin, test, group, or overall Hours of operation: Cumulative, with two subtotals Histogram data display for component testing

Other functionality

FAIL map display	Display of the names of components that received a FAIL judgment during automatic testing as a map by part position
Mask pin configuration	Setting to disable testing of specified pins
Surplus test	Used when the component at a specified step is not present (resulting in the opposite judgment of other tests)
Stop at consecutive FAIL results	Function for stopping testing when the set number of FAIL results are encountered consecutively during automatic testing
Password protection	Function for limiting the operations that can be performed by setting a password
Save/ load Hioki test program as a text file	Function for saving test program to, or loading it from, a text file
Load Hioki 1105 data	Function for converting 1105 test program for use by the FA1220
Test program selection (A/B data)	Function for loading two sets of test program and selecting which to use
Barcode support	Function for scanning barcode IDs
Fixture ID verification (Barcode-related function)	Function for verifying that the test program ID and scanned barcode ID match
Automatic setup (Barcode-related function)	Function for automatically selecting test program based on scanned barcodes
Application interface	Function that enables communication between a computer and the FA1220
External I/O control	Function for controlling the FA1220 using external I/O
Overall PASS/FAIL stamp application	Function for controlling stamps based on PASS/FAIL judgments during automatic testing
Pin search with audio guidance	Function for outputting pin search results as audio
Point viewer	Function for displaying test fixture pin coordinates graphically

General specifications

Location of use	Indoors, Pollution Level 2, maximum elevation of 2000 m
Operating temperature and humidity range	Temperature 23°C ±10°C, 75% RH or less (non-condensing)
Storage temperature and humidity range	Temperature 10°C to 43°C, 75% RH or less (non-condensing)
Environment	Do not use in a setting where the product would be exposed to dust, vibration, corrosive gases, or other adverse environmental characteristics.
Vibration	Avoid use in locations with excessive vibration.
Standard compliance	Safety: EN 61010-1:2010 EMC EN 61326-1:2013 Class A
Product warranty	3 years (excluding consumable parts)
Power supply	Rated supply voltage: 100 to 240 V AC, 50/60 Hz Maximum power consumption: 1 kW Maximum current consumption: 10 A
Compressed air	Pressure Primary side (supply): 0.5 MPa to 1.0 MPa (dry air) Secondary side (inside system): 0.5 MPa ±0.1 MPa Air consumption 150 L/min. (ANR) *Calculated when testing 6 boards per minute.
Dimensions	780 ±20 (W) × 750 ±15 (D) × 1760 ±50 (H) mm (excluding protruding parts)
Weight	390 ±20 kg (without options)
Paint color	PANTONE CoolGray 1C
Accessories	User Manual (with warranty certificate) × 1, test lead × 1, application disc × 1, positioning screws × 4, maintenance key (for opening and closing the maintenance door) × 1, set of transport motor accessories × 1

Options



**IN-CIRCUIT TESTER
FA1220-11**

Accessories

- User Manual × 1
(with warranty certificate)
- Test lead × 1
- Application disc × 1*
- Positioning screws × 4
- Maintenance key × 1
(For opening and closing maintenance door)
- Set of transport motor accessories × 1

Scanner boards



SCANNER BOARD E4201
Semiconductor switches, 128 channels per board
Cannot be combined with other scanner board models.
Factory option

SCANNER BOARD E4202
Semiconductor switches, no guarding
Cannot be combined with other scanner board models.
Factory option

RELAY POWER SUPPLY E4241
Required if adding two or more E4203 boards.
Factory option



SCANNER BOARD E4203
Read relay, 128 channels per board
Cannot be combined with other scanner board models.
Factory option

Connection



SCANNER CABLE 1152-04
Scanner cable (64 pins)
Length: 800 mm, ribbon cable



ONE-TOUCH CONNECTOR E4268
1024CH, Factory option

ONE-TOUCH CONNECTOR E4269
2048CH, Factory option

Test fixtures



PIN-BOARD 1160
Compatible with CP probes
One-touch connector available on special-order basis.



TEST FIXTURE CP1167
Compatible with 75 mil probes.
Not compatible with Ingun probes.
One-touch connector available on special-order basis.

Factory option

Name	Model	See page	Specifications
I2C TEST UNIT	1960-10	5	Protocol emulator: REX-USB61 (Ratoc Systems). Requires 24 V power supply and MMCT special-order cable. Some components manufactured on a special-order basis; contact Hioki in advance.
ONBOARD PROGRAMMING FUNCTION	E4231	5	Compatible with EEPROM. Uses Hioki-specified ROM writer AF430 (DTS Insight). Some components manufactured on a special-order basis; contact Hioki in advance.
BACKUP POWER SUPPLY	E4242	8	For use with FA1220 control computer and LCD (UPS)
PRINTER UNIT	E4243	6	For printing test results
RECOVERY DISC*	FA1395	8	For restoring the operating system, settings, and other files to their state at the time of shipment
STAMP DRIVE UNIT	E4260	4	4-chamber manifold + stamp drive solenoid valve × 1; FA1220 can accommodate up to 4 units.
ADDITIONAL STAMP DRIVE UNIT	E4261	4	Stamp drive solenoid valve × 1; each E4260 can accommodate up to 3 units.
LARGE TEST FIXTURE ATTACHMENT	E4262	5	Max. 400 (W) × 325 (D) mm; probable area: 400 (W) × 315 (D) mm
FIXTURE VERIFICATION FUNCTION	E4263	8	For upper test fixture
FIXTURE VERIFICATION FUNCTION	E4264	8	For lower test fixture
BOARD CONFIRMATION UNIT	E4265	8	Detects float, reverse insertion, improper board type, and board absence with support for up to 3 detection sensors.
TEST FIXTURE ID DETERMINATION UNIT	E4266	8	Checks board and test fixture against test program. Requires separately purchased reader.
IONIZER UNIT	E4267	8	Eliminates static electricity from board surface. SJ-E036A (Keyence)
RESIDUAL PRESSURE EXHAUST UNIT	E4270	8	Exhausts air while stopped to prevent lock.
AUTOMATIC WIDTH ADJUSTMENT FUNCTION	E4291	3	
REAR SAFETY DOOR	E4292	4	
ADDITIONAL BOARD STOPPER	E4293	8	

Other options

1220 DATA COMPOSITION SOFTWARE 1137-05
For editing data on a computer

RECORDING PAPER 1197
Set of 10 rolls (length: 30 m)

CALIBRATION UNIT FOR MEASUREMENT SECTION 1330
For calibrating the measurement unit

Transport and text fixture application unit only

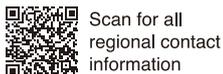
PRESS UNIT FA1140
No measurement unit Transport and text fixture application unit only

*The FA1220-11 does not have a CD or DVD drive. You will need to provide an external CD or DVD drive in order to use the included application disc.

Note: Company names and product names appearing in this catalog are trademarks or registered trademarks of various companies.

HIOKI
HIOKI E. E. CORPORATION

HEADQUARTERS
81 Koizumi,
Ueda, Nagano 386-1192 Japan
<https://www.hioki.com/>



DISTRIBUTED BY