

HIOKI

IN CIRCUIT HiTESTER

NEW 1220

1 2 2 0 - 5 0 / 1 2 2 0 - 5 1 / 1 2 2 0 - 5 2 / 1 2 2 0 - 5 5

HIOKI. ——— Certifying reliability.



NEW

An extensive range of measurement modes

Using the 1220-50 as a controller, you can perform active testing on the same pin fixture after ICT testing without the need to reconfigure the system.

Extensive range of measurement modes

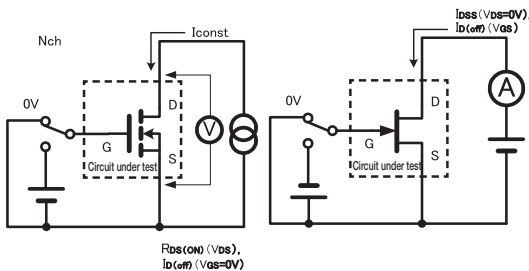
FET Active Testing

The 1220-5x supports MOS-FET and J-FET measurements.

FET operation test

Judgments are based on the operating status of the component under test.

A PASS/FAIL judgment of FET operation is made by measuring the voltage and current between the drain and source when on and off voltages are applied to the MOS-FET or J-FET gate. (Both Nch and Pch devices are supported.)



A PASS/FAIL judgment is made based on the off current and on-resistance values.

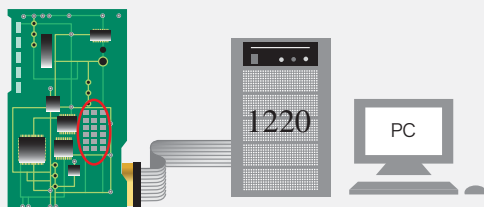
A PASS/FAIL judgment is made based on the off current and measured current (IDSS).

Analysis and management of measurement data

Multi-point Scanner Measurement

The 1220-5x can conduct tests while switching among a large number of measurement points at high speed, allowing tests to be started at a fixed interval.

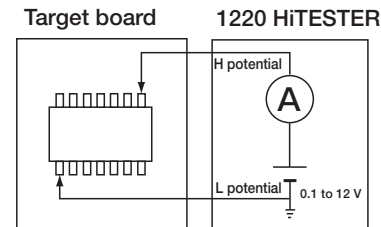
A compact data gathering solution that can be used in a constant-temperature oven



Current measurement function

IC Standby Current Measurement

In current measurement mode (CURR-CV), voltage generation and current generation are performed on the 1220's DC board, eliminating the need for an external power supply or other generator.



Current Test Block Diagram

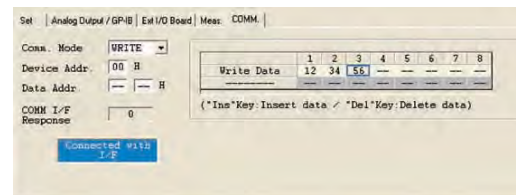
I2C support

Inter-device Information Transmission (Option)

The 1220-5x delivers I2C control and leakage current testing functionality in response to growing demand for lower standby leakage currents in low-power-consumption devices such as mobile phones.

ICs on the board under test are controlled using the I2C bus. Using its Ratoc Systems I2C controller, the 1220 can write data to target devices, verify write data, and generate controller DIO output.

This functionality allows CURR-CV mode to be used to measure the leakage current after placing the target device in standby mode.

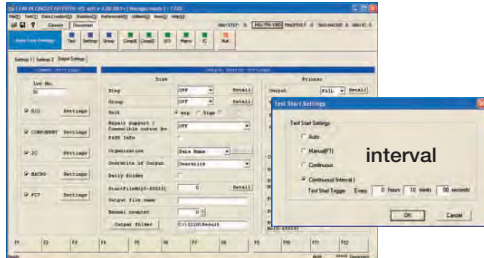


*I2C is a serial bus standard that is widely used in mobile phones and embedded systems.

Analysis and management of measurement data

Log Output Function

The 1220-5x allows you to switch output modes according to your application: select sheet output when you wish to group output by measurement target, or select log output when you wish to observe changes in the measurement target over time.



Sheet output

【検査結果】
ファイル: HIOKI
検査回数: 1
LotNo: 0
Starcode:
TIME: 2006/7/5 10:00:00
測定: ストップ
部品名: HEN-LE>測定モード: レン>H9999 L9999 実装種: 基準値: 測定値

Dr	1														
PASS	1	R1	336	R-CV	6	1.00E+01	-1.00E+01	2.00E+04	2.00E+04	2.00E+00					
PASS	2	R2	338	R-CV	6	1.00E+01	-1.00E+01	2.00E+04	2.00E+04	2.01E+04					
PASS	100	R100	301	R-CV	6	1.00E+01	-1.00E+01	2.00E+04	2.00E+04	2.01E+04					

Log output

【検査結果】
ファイル: HIOKI
検査回数: 1
LotNo: 0
Starcode:
TIME: 2006/7/5 10:00:00

DATE	TIME	Dr	1	2	100	測定値	基準値	許容範囲	判定
2006/7/5	10:00:00					2.01E+04	2.00E+04	2.01E+04	通過
2006/7/5	10:00:00					2.01E+04	2.00E+04	2.01E+04	通過
2006/7/5	10:00:00					2.01E+04	2.00E+04	2.01E+04	通過
2006/7/5	10:00:00					2.01E+04	2.00E+04	2.01E+04	通過

<説明>
測定値の表示は、標準値-測定値

Improved ease of use

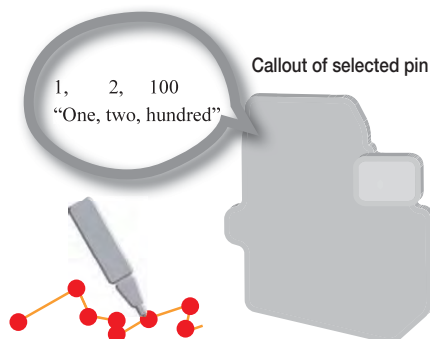
Pin Search Function with Audio Guidance

This functionality provides spoken confirmation of pin numbers when using the pin search function, eliminating the need to look at the screen so that you can focus on identifying the target pin. The instrument can call out pin numbers in Japanese, English, and Chinese, and you can use a speaker to provide clear, easily intelligible spoken guidance without taking up space at your worksite.

Upgrade your HiTESTER software and install the audio callout software! Use of the callout feature in Japanese requires separate purchase of a speech synthesis engine that supports Microsoft Speech API Ver. 5 (SAPI5) or later. The following speech synthesis product has been confirmed to work properly with the system:

Document Talker Japanese Speech Synthesis Engine for Windows
Create System Development Co., Ltd.
(<http://www.creatsystem.co.jp/>)

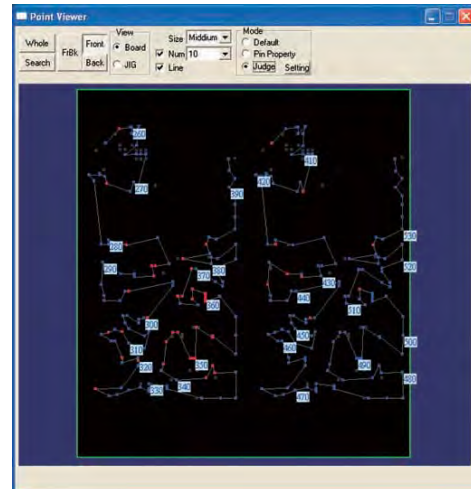
This product can be purchased and downloaded online.



Easier analysis

Point Viewer Function

The Point Viewer display of pin coordinates, a useful feature when performing fixture maintenance, provides immediate access to information while eliminating the need to carry around printed documentation. You can select the top or bottom surface of the board, the perspective from which points are viewed, and the zoom factor, among other settings. FAIL pins are shown in red. During pin search operation, the pin number for the point in question is enlarged on the display.



Ask HIOKI to manufacture your pin fixture!

HIOKI will create a point information file* along with the test data file. You can then enable the Point Viewer function simply by placing these two files in the same folder.

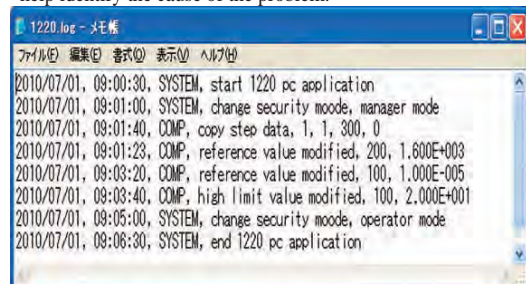
*Optional service. Please request when having your fixture manufactured.

Safer operation

Operation History Function

coming soon

In the event you make an inadvertent or unintentional change to test data, the operation history lets you verify the change and revert the data to its previous state. If you experience a problem with the system, you can also use the operation log to help identify the cause of the problem.



*Example output

STANDARD

Useful Functionality

Expand the potential of your business by updating your measurement environment.

New measurement modes

Component Test

Test for incorrect fuse ratings

Standard feature: 4-terminal measurement functionality

Until now it was only possible to detect low resistance defects in short mode. But complex, high value-added boards require milliohm-level quality assurance. Enter 4-terminal measurement functionality, a standard feature on the 1220. Add a 1131-03 Relay Board to unleash the potential of measurement starting at just 40 $\mu\Omega$.



Support for measurement of up to 100 V

High-current/high-voltage diode testing

Now it's possible to test diodes and Zener diodes at their true rated values. Whereas characteristics testing of diodes was previously impossible due to power limitations, you can now test Zener diodes rated at up to 100 V.



(Requires 1131-03 Relay Board and 1137-01 High-voltage Measurement Unit.)

From combined resistance to impedance measurement

Standard feature: Impedance measurement

High-density circuit designs are making it increasingly difficult to place measurement pins. Where detection of pinless components had been implemented by taking a combined resistance reading, impedance measurements enable a higher level of precision.

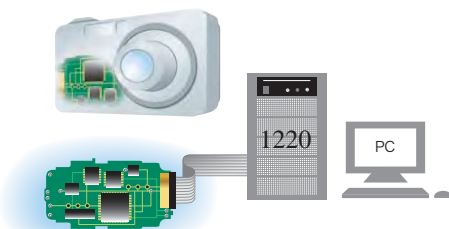
Simple, programming-free operation

Macro Testing

Macro testing, which measures the impedance of a single user-selected pattern compared to all other patterns, performs similar measurements for all patterns. The advantage of macro testing lies in the fact that the number of measurement steps equals the number of measurement points, allowing the test to be performed in a shorter period of time.

But this function does more than just reduce testing time. It also allows synthetic impedance judgments and other determinations to be made even when there is only limited space for probes to be applied, for example due to closely spaced components or the design of boards with embedded passive and active devices.

The actual test requires only a pin board and known-good reference board. Test data is generated automatically by an acquisition process, and no data is required. Component test steps can then be added as needed. We've also reduced manufacturing lead times for test fixtures and delivered a simple system that requires only that the operator connect the necessary connectors.

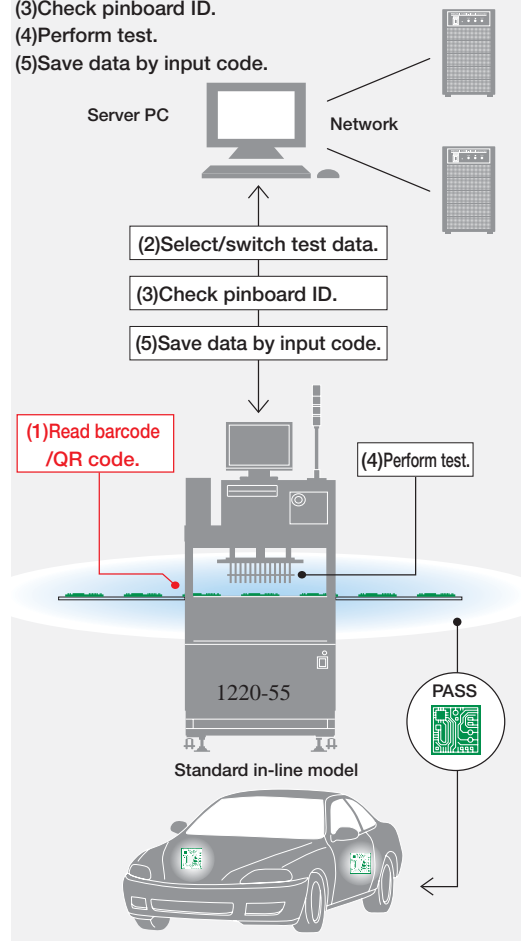


Support for high-speed systems

Standard Barcode System

Production sites for applications requiring high reliability, such as boards used on vehicles, require more advanced and rapid testing solutions, leading to increased demand for features such as test result management and automatic setup. The 1220 is designed to prevent human error and facilitate maximum automation, an approach that is also reflected in its networking support.

- (1) Read barcode/QR code.
- (2) Select/switch test data.
- (3) Check pinboard ID.
- (4) Perform test.
- (5) Save data by input code.



Trilingual support

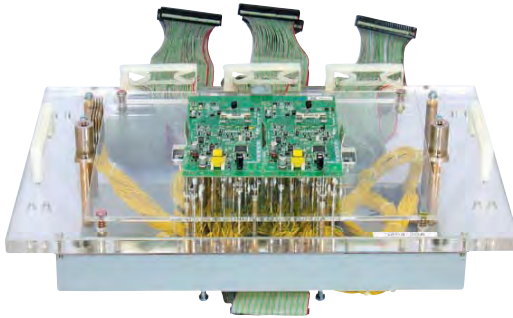
Standard Chinese Language Support

Support for local languages is in demand as production shifts overseas. Against this backdrop, China is the focus of Japanese and worldwide attention as the world's largest manufacturing nation. The 1220 includes Chinese language support as a means of boosting efficiency by allowing operators to interact with the device in their native language.

● Supported languages: Japanese, English, Chinese (simplified)

Newly developed probes with increased performance

Pin Board Manufacturing



Durable, high-precision, high-quality
Comprehensive measurement, data, and pin board support

- **High quality:** The guarantee of genuine manufacturer parts

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 data. We can provide optimal debugging services based on our extensive measurement expertise.

- **Point Viewer function**
(when used in combination with the 1220)

The 1220 In-Circuit HiTESTER allows you to check a pin coordinate plot on the tester's screen, a useful capability when you're performing fixture maintenance. (Not available for all HiTESTER versions.)

1. Support for high-density boards

HIOKI can install straight pins at pitches as low as 0.5 mm with a high-precision punching machine, enabling accurate probing of increasingly small points.

2. Probes

Probes must deliver a combination of high reliability and durability. We develop the most reliable probes in an industry with numerous probe manufacturers and select the optimal parts based on tip profile, diameter, pressure, and structure as we manufacture your pin board.

3. Optimized programming

Expert technicians conduct an optimized debugging process from your populated board to assess the most suitable tolerances, wait times, and guarding. The need for post-delivery debugging is minimized by performing the debugging process on the same testing equipment as operated by the customer.

4. Design that minimizes stress on the board

Warping of the board when the press is lowered subjects not only the board but also its components to significant stress. Extensive experience allows HIOKI to deliver consistent, warp-free probing.

5. Fast delivery

With the time from prototype to full production shrinking every year, the most effective way to assure product quality is to deploy an in-circuit testing solution at the earliest possible stage. HIOKI is currently working to revamp and streamline our manufacturing processes to enable us to meet customers' demands for fast product delivery.

6. Documentation

Every HIOKI pinboard ships with the documentation required for customer quality control and pinboard maintenance, including a debugging list, probe plot, and location diagram.

7. Extensive options

In addition to electrical testing, pinboards can be used in a variety of tests:

- **Stamp unit**

Stamps PASS boards. A variety of print surfaces are available, from typical water-based ink to oil-based ink. (Requires tester with stamp mechanism.)

- **Connector detection and reverse insertion test**

Checks for improper manual connector insertion with a switch probe.

- **Capacitor reverse insertion test**

Detects reverse capacitor insertion by probing the tops of electrolytic capacitors with a special probe. (Requires tester with capacitor reverse insertion detection function.)

- **Counter function and antistatic design**

《Documentation required for manufacturing a test fixture:》

(1)Circuit diagram (2)Component list (3)Bare board

(4)Populated board(s) (as many as possible)

(5)Component plot (6)Net list, etc.

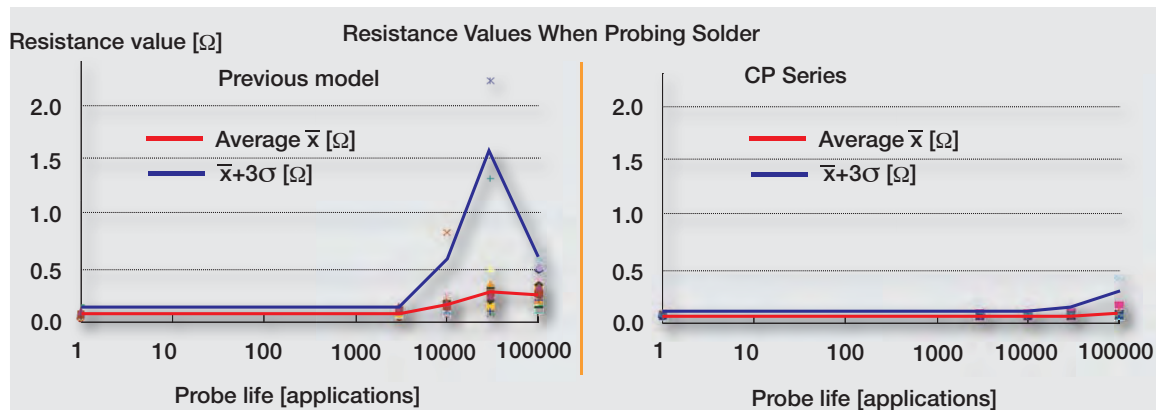
*Test fixtures can also be manufactured from Gerber data.

Additional benefits in terms of improved contact reliability

Newly Developed Probes

Newly developed probes deliver improved reliability
with less tip wobble and low contact resistance.

1. Resistant to flux and oxide films: We have reassessed tip profiles to ensure optimal performance.
2. New line of tip profiles: New profiles including claw, single-blade, and flat lance designs offer more stable contact performance.
3. Tip wobble rigidity: Tip rigidity has been improved by about 200% (1.27 pitch).



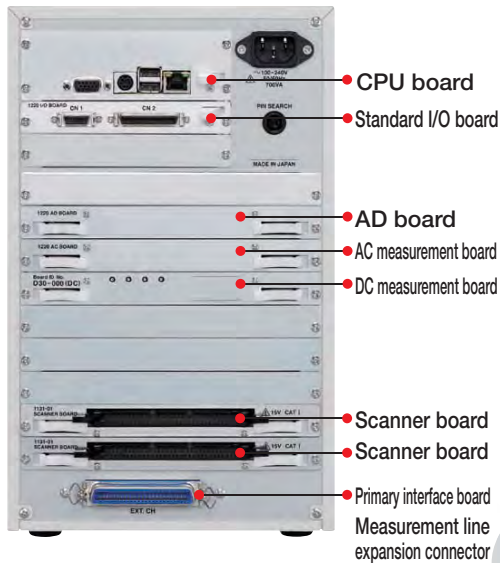
SYSTEM UP

Exceptional Expandability

Upgrade your system easily to accommodate the full gamut of needs.

Keep using the same test fixtures. Update only your measurement unit.
Exceptional Expandability

Unit Architecture



The 1220 HiTESTER is controlled by a PC using the familiar Windows operating system.
 (*PC unit optional)

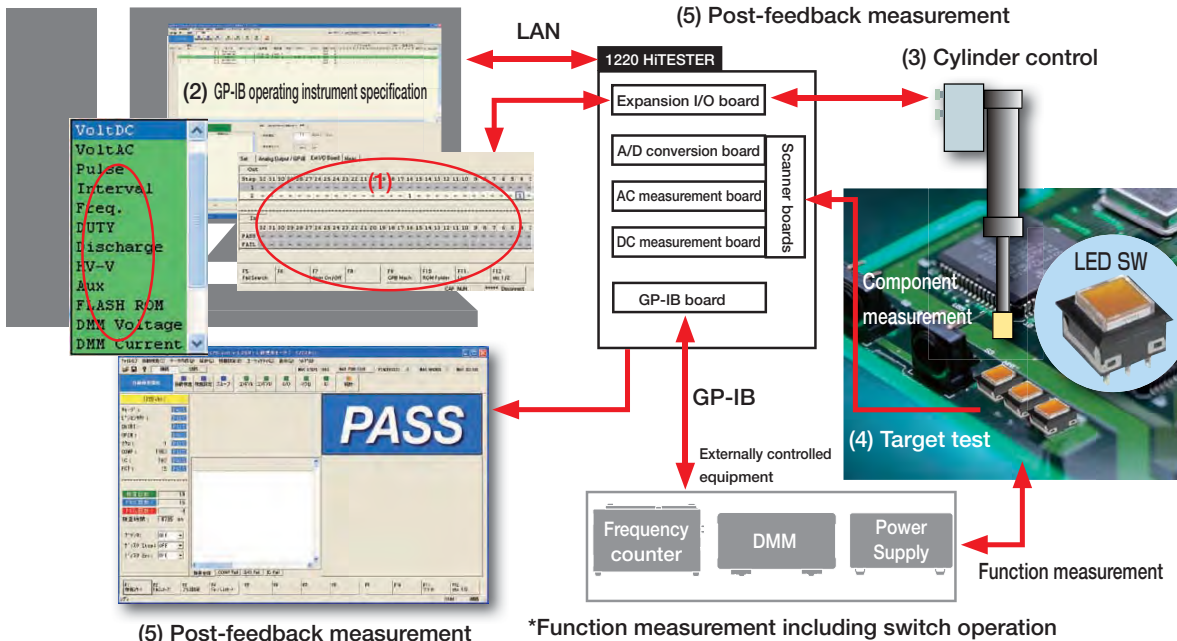
Keep using the same test fixtures. Update only your measurement unit.
Exceptional Expandability

The 1220 line now features the standalone 1220-00 desktop measurement unit, which can be paired with a desktop press to form a truly compact testing environment. Space-saving configurations like this one are ideal for the growing cell production market.



Simple I/O port configuration
Simple external control capability

Computer



Simple control

Standard I/O Board (Connector Pin Assignments)

Signal Descriptions

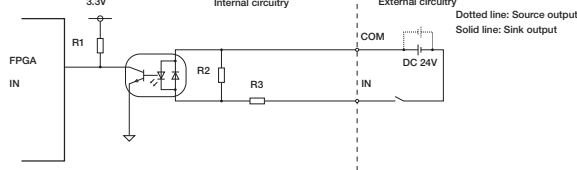
CN1

 Press control (I/O = 12/4) 20-pin

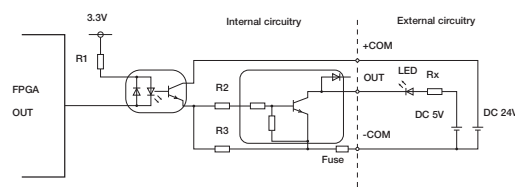
Signal name	Pin no.	1220 signal name	Description	
IN1_COM1	1	IN1_COM1	Input COM (Supports sink and source output.)	Press 1
IN1_1	2	AREA_SENSOR1	Area sensor	Press 1
IN1_2	3	E_STOP_SW1	Emergency stop switch	Press 1
IN1_3	4	PRESS_DOWN_LS1 (VCM_STRAT1)	Down signal when press 1 is lowered (signal that turns AUTO_VCM1 on)	Press 1
IN1_4	5	PRESS_UP_LS1 (VCM_STOP1)	Up signal when press 1 is raised (signal that turns AUTO_VCM1 off)	Press 1
IN1_5	6	MANUAL_SW1	Signal when the press 1 manual switch is turned on	Press 1
IN1_6	7	AREA_SENSOR2	Area sensor	Press 2
IN1_7	8	E_STOP_SW2	Emergency stop switch	Press 2
IN1_8	9	PRESS_DOWN_LS1 (VCM_STRAT1)	Down signal when press 1 is lowered (signal that turns AUTO_VCM1 on)	Press 2
IN1_9	10	PRESS_UP_LS2 (VCM_STOP1)	Up signal when press 2 is raised (signal that turns AUTO_VCM2 off)	Press 2
IN1_10	11			
IN1_11	12			
IN1_12	13			
OUT1_24V	14		Output +24 V power supply	
OUT1_1	15	AUTO_PRESS_UP1#	Signal to raise press 1	Press 1
OUT1_2	16	AUTO_PRESS_UP2#	Signal to raise press 2	Press 2
OUT1_3	17	AUTO_VCM1	Vacuum 1 solenoid valve control	Press 1
OUT1_4	18	AUTO_VCM2	Vacuum 2 solenoid valve control	Press 2
OUT1_GND1	19		Output common 24 V ground	
N.C.	20		Not connected	

Circuit Diagram

Input



Output (A single power supply can be used as both the external and drive power supply.)



CN2

 External interface (I/O = 16/20) 50-pin

Signal name	Pin no.	1220 signal name	Description	
IN1_COM1	1		Down signal when press 1 is lowered (signal that turns AUTO_VCM1 on)	
IN2_1	2	TEST_START_TRIGGER	Test start when on for at least 200 ms	
IN2_2	3	TEST_STOP_TRIGGER	Test stop when on for at least 200 ms	
IN2_3	4	BAR CODE READ	Barcode scan when on for at least 200 ms	
IN2_4	5			
IN2_5	6			
IN2_6	7			
IN2_7	8			
IN2_8	9			
IN2_COM2	10		COM for IN2_9 to IN2_16 input (Supports sink and source output.)	
IN2_9	11			
IN2_10	12			
IN2_11	13			
IN2_12	14			
IN2_13	15			
IN2_14	16			
IN2_15	17			
IN2_16	18			
OUT2_24V1	19		Output +24 V power supply 1	
OUT2_1	20	PRESS1#	Press 1 has started test.	
OUT2_2	21	PRESS2#	Press 2 has started test.	
OUT2_3	22	PASS#		
OUT2_4	23	FAIL1#		
OUT2_5	24	FAIL2#	Reserved	
OUT2_6	25	TEST#		
OUT2_7	26	TEST_END#		
OUT2_8	27	RETEST#		
OUT2_GND1	28		Output common 24 V ground 1	
OUT2_24V2	29		Output +24 V power supply 2	
OUT2_9	30	READY#	Automatic test mode	
OUT2_10	31	CNT_FAIL#	Stop due to consecutive FAIL results	
OUT2_11	32	E_STOP#		
OUT2_12	33	AUTO_PRESS_UP1#		
OUT2_13	34	AUTO_PRESS_UP2#		
OUT2_14	35	MON_AREASENSOR1#	IN1_1 Press 1: Area sensor monitor	
OUT2_15	36	MON_PRESS_DOWN_LS1#	IN1_3 Press 1: Down signal monitor	
OUT2_16	37	MON_PRESS_UP_LS1#	IN1_4 Press 1: Up signal monitor	
OUT2_GND2	38		Output common 24 V ground 2	
OUT2_24V3	39		Output +24 V power supply 3	
OUT2_17	40	MON_AREASENSOR2#	IN1_6 Press 2: Area sensor monitor	
OUT2_18	41	MON_PRESS_DOWN_LS2#	IN1_8 Press 2: Down signal monitor	
OUT2_19	42	MON_PRESS_UP_LS2#	IN1_9 Press 2: Up signal monitor	
OUT2_20	43	BUZZER#		
OUT2_21	44	GROUP PORT1#	Group output port 1	
OUT2_22	45	GROUP PORT2#	Group output port 2	
OUT2_23	46	GROUP PORT3#	Group output port 3	
OUT2_24	47	GROUP PORT4#	Group output port 4	
OUT2_GND3	48		Group output port-4	
N.C.	49		Not connected	
N.C.	50		Not connected	

Simple control

1912-01 Expansion I/O Board (Option)

32 points each of input and output

Signal name	Pin no.	1220 signal name	Description	
-COM1	1	GND	Upper fixture COM	
-COM1	2	GND	Lower fixture COM	
IN1	3		Upper fixture No. 1	
IN2	4		Upper fixture No. 2	
IN3	5		Upper fixture No. 3	
...
IN15	17		Lower fixture No. 7	
IN16	18		Lower fixture No. 8	
+COM1	19,20	+24 V DC		
	21-28	Unused		
-COM2	29,30	GND		
IN17	31		Can also be used as external input.	
IN18	32		Can also be used as external input.	
...
IN31	45		Can also be used as external input.	
IN32	46		Can also be used as external input.	
+COM2	47,48	+24 V DC		

No. of inputs	32
Input type	Sink-type output
Isolation	Optocoupler
Input logic	ON: Low optocoupler LED on (shorted) OFF: High optocoupler LED off (open)
Max. rated voltage	+24 V DC
+COM applied supply voltage	Sink-type output 24 V DC
Input signal voltage range	0 to 24 V DC
Input impedance	5.6 kΩ
Input off current	0.5 mA or less
Operating voltage	ON voltage: 18 V or greater OFF voltage: 4.1 V or less



Signal name	Pin no.	1220 signal name	Description	
-COM3	49,50	GND		
OUT1	51		Can also be used as external output group output port 1.	
OUT2	52		Can also be used as external output group output port 2.	
OUT3	53		Can also be used as external output group output port 3.	

...
OUT15	65		Can also be used as external output group output port 15.	
OUT16	66		Can also be used as external output group output port 16.	
+COM3	67,68	+12 to 24 V DC		
	69-76	Unused		
-COM4	77,78	GND		
OUT17	79		Fixture number application authorization signal Can also be used as external output group output port 17. Note: Cannot be used for both purposes simultaneously.	
OUT18	80		Barcode scan in progress Can also be used as external output group output port 18. Note: Cannot be used for both purposes simultaneously.	
OUT19	81		Barcode scan complete Can also be used as external output group output port 19. Note: Cannot be used for both purposes simultaneously.	
OUT20	82		Can also be used as external output group output port 20.	
OUT21	83		Can also be used as external output group output port 21.	
...
OUT31	93		Can also be used as external output group output port 31.	
OUT32	94		Can also be used as external output group output port 32.	
+COM4	95,96	+12 to 24 V DC		

No. of outputs	32
Output type	Open collector output (sink-type)
Isolation	Optocoupler
Output logic	ON: Low optocoupler LED on (shorted) OFF: High optocoupler LED off (open)
Max. rated voltage	+50 V DC
+COM applied supply voltage	+12 to 24 V DC
Max. output current	100 mA/output

Computer

●Computer Unit 1913-01

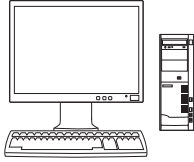
You can use your own computer.

★Requires at least 1 empty network port.

●1220 PC Application (1137-02)

Controls the 1220 HiTESTER from the computer using the familiar Windows operating system.

●UPS Unit (available only in Japan) 1913-02



Example computer

Standalone operation

Factory Option

Application software

●1137-04 standalone operation software for the 1220 HiTESTER

By using this software and connecting a keyboard, mouse, and display directly to the 1220 HiTESTER, the instrument can be used to perform automatic testing and simple data editing in a standalone configuration without a control PC.

●Model 1220 Data Creation Application (1137-05)

Allows Model 1220 data to be created on a general-purpose computer.

HiTESTER models



1220-50 Desktop Type

The HiTESTER and expansion box are both the size of a tower-type computer. The computer is sold separately, and you can use your own computer if desired. If the unit will be used primarily for automatic testing, the optional Standalone Application can be used to enable HiTESTER operation without a computer for a more compact installation.



1220-51 Press Type

This traditional horizontal type press can accommodate more test pins in recognition of the trend toward more pins due to the high mounting densities on today's boards. Its versatile design allows the operator to either sit or stand.

Expansion boxes



●Expansion Box 1912

- For 1220-00
- Max. 640 pins



●Extension Rack 1911-02

- For 1220-01/02/11
- Max. 640 pins

Extension boards



●Scanner Board 1131-01

- Analog switching (high-speed)
- 64 pins/board, switchable between 2- and 4-terminal operation
- Maximum rating: 30 V/20 mA



●Relay Board 1131-03

- Read relay (high-voltage)
- 64 pins/board, switchable between 2- and 4-terminal operation
- Maximum rating: 250 V/500 mA

Cables



●Scanner Cable (64-pin, shielded) 1156-01(2m)



●Scanner Cable (64-pin) 1131-01(0.8m)

Test Fixtures



●Press Unit (for use with part 1160) 1144



●1162



●Press Unit (for use with part 1162) 1142

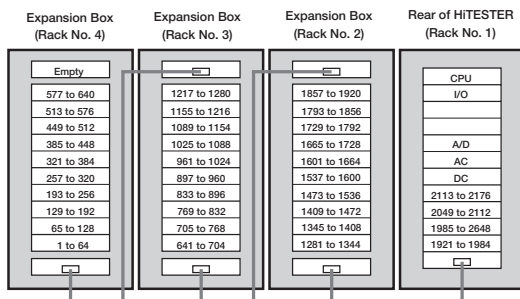


●1160

※ Connection to the 1220-00 requires a separately available 24 V power supply.

Example rack expansion

■ With 4 racks (Total: [10 + 10 + 10 + 4] × 64 = 2,176 pins)



Additional Options

Factory Option

All Model 1220 versions

- Electrolytic capacitor polarity detection 1931
- IC reverse insertion detection 1930
- High-voltage Zener diode VZ measurement (25 to 120 V)(*Setting range)
- High-current-applied diode VF measurement (200 mV)

Model 1220-51/52

- Area sensor (with cover)
- Side safety cover
- Rear safety cover

Model 1220-51/52/55

- 1,024-pin one-touch connector
- 2,048-pin one-touch connector
- Large pinboard support
- Stamp unit
- Thermal printer paper (10 rolls per box) 1197

1220-52 Space-saving Type

Despite its mainstream tower design, this model provides 1,536 pins of testing capability—as much as most customers will ever need. It's all about getting the most power in the smallest possible space.



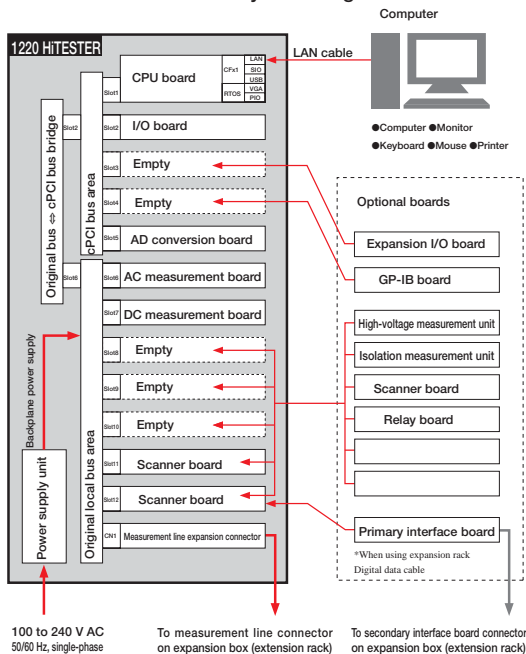
1220-55 Standard In-line Type

Designed for in-line applications, this model includes transport functionality to meet customers' demands for automated operation. It brings together a range of HIOKI technologies for faster, safer, and more reliable testing.



Example system expansion

■ Basic 1220 HiTESTER System Diagram



Optional boards



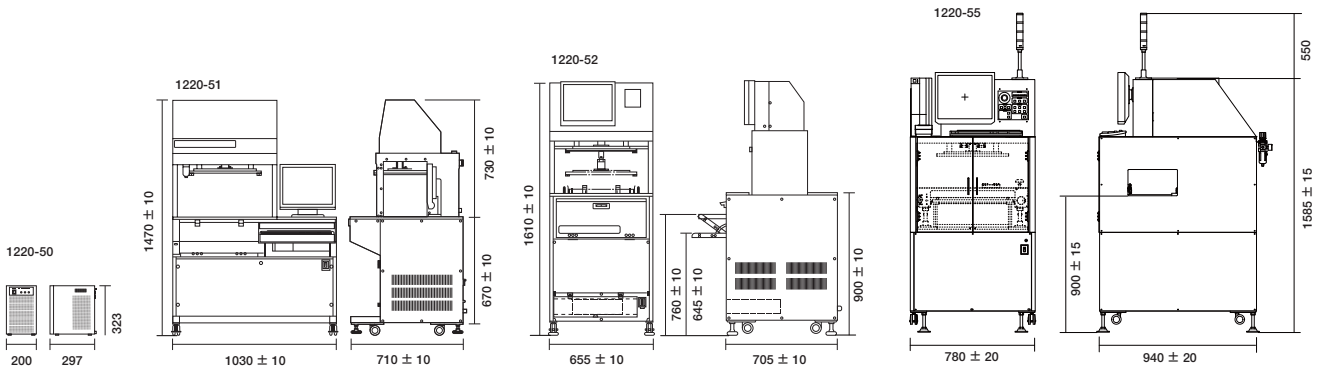
- GP-IB Communications Function Board 1936
Communicates directly with the necessary external measuring instruments when performing an active test.
- High-voltage/Isolation Measurement Unit 1937
Features the functionality of both the 1937-01 and 1937-02 boards.
- High-voltage Measurement Unit 1937-01
High-voltage diode measurement from 25 to 100 V
DC high-voltage measurement from 1 mV to 250 V
- Isolation Measurement Unit 1937-02
High-voltage resistance measurement from 1 to 100 V / 400 m to 1 GΩ
Isolation measurement from 1 to 100 V/200 m to 1 GΩ
- Expansion I/O board 1912-01
32 input points (sink input, 0 to 24 V DC)
32 output points (open collector +12 to 24 V DC)
- LAN Connection Unit 1913-03
Add a LAN board to the 1220 control computer for network connectivity.

1220-50, 1220-51, 1220-52, and 1220-55 Shared Specifications			
No. of test steps	Component data : Max. 10,000 steps Macro data : 2,176 steps Round-robin short/open : 2,176 pins Pin contact data : 2,176 pins	IC data † : 500 steps (Max. 4,000 pins/step) Group data : 256 groups Charge data : 40 sets	
Test types and ranges	Round-robin short/open : 4 Ω to 400 Ω	Macro test (Impedance) : 1 Ω to 10 MΩ	
Test signals	Component test Resistance : 400 mΩ to 40 MΩ Low resistance † : 40 μΩ to 400 mΩ Impedance : 1 Ω to 10 MΩ High-voltage low-resistance measurement † : 400 mΩ to 1 GΩ Isolation measurement † : 200 Ω to 1 GΩ Capacitors : 10 pF to 400 mF Coils : 1 μH to 100 H Diodes and transistors : 0 V to 25 V High-current-applied diodes † : 0 V to 9 V Zener diodes : 0 V to 25 V High-voltage Zener diodes † : 1 V to 100 V Switching transistors : 0 V to 25 V	MOS-FET on-resistance measurement : 0 Ω to 1,000 Ω J-FET drain current measurement : (N-JFET) : 0 mA to 20 mA (P-JFET) : -20 mA to 0 mA Photocoupler test function : 0 V to 25 V DC voltage measurement : 4 Ω to 4 MΩ Open Short Discharge Capacitor reverse insertion detection † IC reverse insertion detection †	
Measurement unit	DC low voltage : 0.1 V, 0.4 V DC low current : 200 mA to 100 mA AC low voltage : 160 Hz, 0.1 Vrms 1.6 kHz, 0.1 Vrms 0.2 Vrms to 2.0 Vrms in 0.1 V steps 16 kHz, 0.1 Vrms 160 kHz, 0.1 Vrms 0.2 Vrms to 2.0 Vrms in 0.1 V steps HV low-voltage : 1 V to 100 V in 1 V steps HV constant current : 1 mA to 20 mA in 0.1 mA steps	2 ranges 12 ranges single range single range single range single range (with 1937 high-voltage and isolation measurement units installed) (with 1937 high-voltage and isolation measurement units installed)	
Scanner unit	Analog switching (1131-01 Scanner Board) : 64 channels/board 2-/4-terminal switchable Input protection: ±15 V/±0.5 V (with batch configuration)	Read relay (1131-03 Relay Board) : 64 channels/board 2-/4-terminal switchable	
Judgment range	-99.9% to +999.9% or absolute value		
Guarding	Max. 5 points/step		
Self-test function	Execution format : By unit (manual)/at startup		
Statistical functions	Overall FAIL rate by test and group; graph display by month; histogram function; linked with Excel		
Automatic data creation function	ATG function (automatic reference data acquisition and guard point configuration), acquisition of reference values from reference board, acquisition of wiring resistance, acquisition of stray capacitance, group specification		
External I/O	Standard I/O: 28 input points and 28 output points (For more information, contact your nearest HIOKI Sales Office.)		
Operating environment	Operating temperature and humidity range : 23°C ±10°C at 75% rh or lower Environment : Avoid using the HiTESTER in environments characterized by the presence of dust, vibration, or corrosive gasses. Storage temperature range : 10°C to 43°C		
Control unit	Control device : PC/AT-compatible computer Operating system : Windows 2000/XP*2, Japanese or English version Storage media : Floppy disk and hard disk Display : 15" LCD Input devices : PS/2 keyboard, PS/2 mouse External I/O : USB × 6 ports, Ethernet (LAN) 10BASE-T/100BASE-TX × 1, SIO × 1 port, PIO × 1 port	Computer*1	
	Control device : Single-board computer Operating system : Real-time OS Storage media : CompactFlash × 1	HiTESTER	
Other	Faulty contact retry/reverse-polarity retry/retest functions, FAIL stop, test jump, test hold function, test data, test result output function (printer/RS-232C/disk), FAIL map display function, mask pin configuration function, surplus test function, consecutive FAIL stop function, password protection function, automatic test data backup function, load/convert legacy data (1105 data, text data), test data switching function (A/B data), network connectivity, remote self-test function		

*Optional equipment. Low-resistance measurement is a standard feature, but use of the 1131-03 relay board enables high-precision measurement (delivering an improvement in accuracy of about 3 times according to HIOKI comparisons).

The 1131-03 relay board is required in order to make use of high-voltage low-resistance measurement, isolation measurement, and high-current diode measurement.

*1 The computer is optional equipment for the 1220-50.



■ In-Circuit HiTESTER 1220-00, 1220-01, 1220-02, and 1220-11 Dimensions (unit: mm)

	1220-50	1220-51	1220-52	1220-55
No. of test	Standard : 128 pins Max. : 320 pins (with standard HiTESTER) (Can be expanded in 64-pin blocks.) Max. : 2,176 pins (Supports up to three 640-pin expansion boxes.)	Standard : 320 pins Max. : 320 pins (with standard HiTESTER) (Can be expanded in 64-pin blocks.) Max. : 2,176 pins (Supports up to 3 extension racks.)	Standard : 320 pins Max. : 320 pins (with standard HiTESTER) (Can be expanded in 64-pin blocks.) Max. : 1,536 pins (with 2 extension racks)	Standard : 320 pins Max. : 320 pins (with standard HiTESTER) (Can be expanded in 64-pin blocks.) Max. : 1,156 pins (with 2 extension racks)
Measurable board dimensions	Determined by test fixture unit.	Standard, single-sided : 390×300mm Standard, double-sided : 340×240mm Large, single-sided : 416×340mm Large, double-sided : 416×335mm Special-order sizes are also available.		
Press unit	None	Theoretical thrust: 3.96 kN (at 0.5 MPa) Support pinboard: 1160 (measurable board dimensions: 420 × 300 mm) Air pressure: 0.5 to 1.0 MPa (dry air)		
Power supplies	HiTESTER 100 to 240 V AC (±10%) Single-phase, 50/60 Hz Power consumption: Max. 700 VA (in full 320-pin scanner board configuration) Expansion box 100 to 240 V AC (±10%) Single-phase, 50/60 Hz Power consumption: Max. 700 VA (in full 320-pin scanner board configuration)	HiTESTER 100 to 120 V AC; 200 to 250 V AC (±10%) (Specify at time of order.) Single-phase, 50/60 Hz Power consumption: Max. 1 kVA (in full scanner board configuration)		
Weight and dimensions	HiTESTER Dimensions : 200 (W) × 298 (D) × 325 (H) mm Weight : Approx. 10 kg (in standard configuration with 2 scanner boards) Expansion box Dimensions : 200 (W) × 298 (D) × 325 (H) mm Weight : Approx. 10 kg (in standard configuration with 2 scanner boards)	Dimensions : 1030 (W) × 710 (D) × 1470 (H) mm Weight : Approx. 240 kg	Dimensions : 670 (W) × 710 (D) × 1600 (H) mm Weight : Approx. 220 kg	Dimensions : 800 (W) × 960 (D) × 2150 (H) mm Weight : Approx. 290 kg
Common accessories	Instruction manual × 1, test lead × 1, 1220 system disk (CompactFlash) × 1			
Accessories	Power cable × 1		Scanner cable × 5, 1220 Computer Application (CD-ROM) × 1	

Macro Test Specifications

No. of test steps	Data: Max. 2,176 steps
Test type and range	Impedance: 1 Ω to 10 MΩ
Test signals	0.2 to 0.5 V rms in 0.1 V steps (during testing of ATG step) 0.2 to 2.0 V rms in 0.1 V steps (during testing of specified pin pairs) Frequency: 1.6 kHz
Measurement unit	Ammeter: 10 μ/100 μ/1 m/10 mA rms (4 ranges)
Judgment criteria	Comparison with value acquired from reference board PASS judgment region: $X \pm (3\sigma + \alpha)$ X = Average value acquired from reference board $3\sigma = 3 \times$ standard deviation (statistical tolerance) α = Coefficient reflecting measurement accuracy
Measurement time	From 2.0 ms/step
Guarding	3 points/step (for tests of specified pin pairs only)
Data creation	Automatic generation with ATG function or manual creation of specified pin pairs

Active Test Shared Specifications

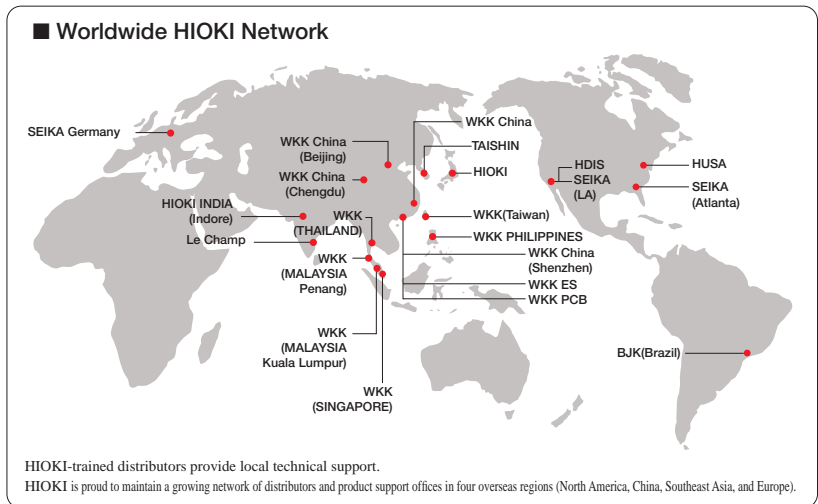
No. of test steps	Data: Max. 256 steps
Test types	DC voltage, DC high-voltage measurement*, AC voltage, timer, interval, frequency, waveform check, discharge
Generation unit	Dedicated board <ol style="list-style-type: none"> Digital output (CMOS level) : 16 channels LVDS output (differential signal) : 4 channels Analog output : 4 channels; 0 to 5 V (0.1 V resolution) Expansion open collector output : 4 channels Digital power supply (+5 V) : 1 channel External DC stabilized power supply 0 to 20 V / 0 to 36 V / 0 to 60 V / 0 to 120 V (max. 4 channels) External electronic load (max. 4 channels)
Measurement unit	1220 HiTESTER <ul style="list-style-type: none"> DC voltmeter : 800 μV fs to 25 V fs, 8 ranges DC voltmeter : 25 mV fs to 250 V fs, 5 ranges (with optional 1131-03 and 1937 installed) Internal discharge : Up to 15 V (use external electronic load for 15 V and greater) External measuring instruments 1.Digital multimeter 2.Universal counter 3.Digital oscilloscope
Interface unit	I/O 1912-01 Expansion I/O Board (32 sink input points, 32 open collector output points) GP-IB 1936 GP-IB communications function (enables control of up to 14 external measuring instruments or other devices)
Other	External judgment result retrieval function, slave function (Other tests and shared functionality depend on the 1220 HiTESTER model.)

*Notes on 1101 and 1102 data compatibility

Legacy 1101 and 1102 data cannot currently be converted for use by the 1220 due to an inability to supply the computers for running the necessary 1137 support software. For more information, please contact your HIOKI distributor.

*Legacy product (1220-00, -01, -02, -11) and 1220-5x data compatibility

Although data from legacy products can be used with the 1220, compatibility is not complete. You may need to repeat stray capacitance acquisition, wiring resistance acquisition, S/O data acquisition, IC data acquisition, and component test debugging. In particular, it is necessary to repeat stray capacitance acquisition for applications involving minute capacitance measurement.



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HIOKI is ISO 14001 certified.
All of HIOKI's domestic and overseas facilities have been certified compliant with ISO 14001, an international standard governing environmental management systems.

CAUTION To ensure safe and proper operation, be sure to read this product's Instruction Manual before attempting to use it.

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