

3D PCB Inspection System Standard Specification

3Di-LS2

Delivery Destination

Company Name

Person in Charge

Confirmation Sign by Customer

BF Software Ver. : x.xxxxxxxxxx

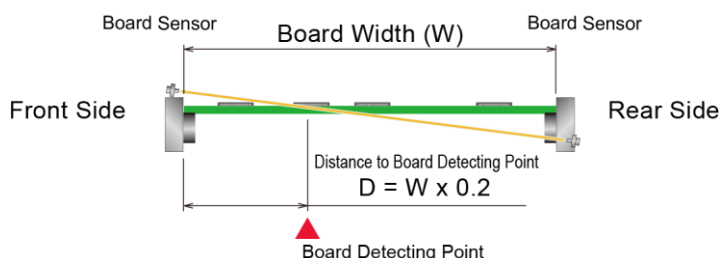
Approved by	Created by

Created on 18th December, 2017

Saki Corporation

1. 3Di-LS2 Hardware Specification

Dimensions	1040 W x 1440 D x 1500 H mm (40.94 W x 56.69 D x 59.06 H in.) ^{(*)1}	
Weight	Approx. 900 Kg (1984.16 lbs)	
Color	Standard color: Medium gloss white satin (Munsell N8.5)	
	Medium gloss silver flat (Approximate color : Munsell N7.5)	
Usage Environment	15°C(59F) - 30°C(86F) / 15 - 80%RH (Non-condensing)	
Electric Power Requirement and Power Consumption	Single-phase ~200V - 240V+/-10%, 50/60Hz 700VA	
	Cable 5 m with a plug	
Noise Level	60 dB(A)	
Air Requirement	0.5 MPa @ ≥5L/min (ANR)	HIGH COUPLER 20PM (NITTO KOHKI)
Target PCB	PCB Size	7μm Camera Head: 50 W x 60 L - 330 W x 330 L mm (1.97Wx2.36L-12.99Wx12.99L in.)
		12/18μm Camera Head: 50 W x 60 L - 500 W x 510 L mm (1.97Wx2.36L-19.68Wx20.07L in.)
	PCB Thickness	0.5 - 5.2 mm (0.02 - 0.20 in.) ^{(*)2}
	PCB Weight	12 kg (26.46 lbs) or less
	Material	Glass Epoxy, Paper Phenol, Ceramic
	Warpage	2mm (0.08 in.) or less
	PCB Clearance	Top: 40 mm (1.57 in.), Bottom: 60 mm (2.36 in.) ^{(*)3}
	Fiducial Mark	One mark at any corner and another at opposing corner
		(total two marks and above)
	Transfer Conveyor	Height: 880 - 965 mm (34.65 - 37.99 in.)
	Method	Flat belt transfer
	Transfer	With adjustable-speed function
	PCB Setting	Clamp at rail transfer width
		Clamp width is 3 mm-wide (0.12 in.-wide) at each side ^{(*)4}
	Width Adjustment	Auto Width Adjustment
	Transfer Direction	Left to Right / Right to Left ^{(*)5}
	Machine Origin	Rail 1 (Fixed)
	Movable range of rail	The second rail adjustable: 50 - 500 mm
	Belt	Flat belt SE-A-PB (NITTA)
	Board Detecting Point	Detect the Board Width x 0.2[mm] point from front rail



^{(*)1} If a PCB transfer side is 900 mm, height from floor to top of signal tower is 1930 mm. The monitor and keyboard arm are not included.

^{(*)2} PCB Thickness includes PCB warpage.

^{(*)3} E.g., when the warp is 2 mm, 38 mm top clearance is required from the PCB surface.

^{(*)4} Clamp width can be changed to 2mm-wide(0.08 in.-wide) or 4mm-wide(0.16 in.-wide) at each side.

^{(*)5} The factory default setting is "Left to Right". For "Right to Left" direction, setting is changed at the time of installation.

Optical System	Lighting	2D lighting system: Red LED, Green LED, Blue LED ^{(*)1} 3D lighting system: White LED (for profilometry) ^{(*)2}
	Camera	CMOS area camera
	Resolution	7μm, 12μm, 18 μm
	Imaging	FOV camera gantry ^{(*)3}
	FOV size	7μm Camera Head : 22 W x 29 L mm (0.87 x 1.14 in.) 12μm Camera Head : 36 W x 42 L mm (1.42 x 1.65 in.) 18μm Camera Head : 41.5 W x 41.5 L mm (1.63 W x 1.63 L in.)
Communication Feature	Network I/F	Ethernet 1000BASE-T
Signal Tower	Model Number	LD6A-3KQW-RYGC (IDEC)
	Color Specification	Red, Yellow, Green from above
	Display	Dependent to operation mode
	Operation Mode	Automatic operation mode, Automatic operation ended, Automatic operation stopped, Manual mode
	Display Method	Signal tower: lighting, blinking
Alarm	Buzzer	EB-1124 (Panasonic Electric Works)
Upstream / Downstream	Connector	SMEMA (AMP) ^{(*)4}
Connection	Upstream Machine	READY signal (Dry contact), BUSY signal, OK/NG signal
	Downstream Machine	READY signal, OK/NG signal (Dry contact), BUSY signal (Dry contact)
Safety Equipment	Power Switch	T0-1-102/EA/SVB-SW(Moeller, UL/CE mark compliance product) On lock and off lock are available.
	Door Switch	D4NS-1AF (OMRON, UL/CE mark compliance product)
	Emergency Stop Switch	A22E-M-01 (OMRON, UL/CE mark compliance product)
	Breaker	NV30-FAU-2P-20A-240V-30mA (Mitsubishi Electric, UL/CE mark compliance product)
	Residual Pressure Relief Valve	HV6-02 (PISCO)
PC Specification	OS	Windows 10 IoT Enterprise 64bit English Edition (Microsoft) ^{(*)5}
	Memory	7μm : 64GB
		12μm : 32GB
		18μm : 32GB
	CPU	7μm Camera head : E5-2650 2.2GHz(Intel) or higher 12μm Camera head : Core i7-6770 3.4GHz (Intel) or higher (TBD) 18μm Camera head : Core i7-6770 3.4GHz (Intel) or higher (TBD)

^{(*)1} CoaxialtopLight: Red LED, TopLight: Red LED, SideLight: Blue LED, Green LED, Red LED, and LowLight: Red LED.

^{(*)2} Height differences can be measured by projecting stripe patterns.

^{(*)3} The camera and PCB table move to capture each FOV.

^{(*)4} Two kinds of connection methods are available by using ancillary conversion cables. For details, refer to the Upstream / Downstream I/F specification diagram and select when ordering. If you prefer the other connector or other connection method, please contact us.

^{(*)5} OS language is English. Language on basic operation screen for the inspection system can be arranged either with Japanese or English.

Display	Hard Disk Drive	1TB×2 Raid 1 Configuration (for System disk and Data disk)		
	Auxiliary Storage Unit	DVD-R/RW drive		
	Keyboard	104 English keyboard		
	Mouse	Optical Microsoft-compatible type mouse		
	Screen Size	24-inch LCD monitor		
Manufacturing Option ^(*1)	Screen Resolution	WUXGA (1920×1200) 24-bit full color		
	Side Camera	Camera	CMOS Area camera	
		Resolution	18 μm	
		Imaging	FOV camera gantry	
		FOV Size	36 W x 18 L mm (1.42 x 0.71 in.)	
		Inspectable Components	J lead, QFN, Connectors with cover	
		Inspection Categories	Absence of solder, Insufficient solder, Excess Solder, Bridge	
		Inspection Method	Inspection starts right after capturing image of every FOV. Components ,that cannot be seen from above direction, can be captured by 4 direction cameras.	
		Inspection Images	Images by angled lighting (top/side/low) Color image by side lighting	
		Slide board guide	For taking out PCB directly from the inside of machine	
		Self-diagnosis function	Accuracy diagnosis, Predictive and preventive maintenance	
Additional Option ^(*2)	Touch panel	24-inch touch panel LCD monitor		
	Conveyor Reference Position	The 1st lane position is shifted 160mm backward.		
	External Bar-code Reader (for auto model change)			
	Journal printer (for traceability)			
	UPS	Power will be supplied to PC for about 10 minutes during power interruption. PC and monitor need to be power off normally during power supply from UPS		
	Point sub backup	For large board (Support the middle of PCB with 2 points.)		
	Line sub backup	For large board (Support the middle of PCB with plate.)		
	M2M Function	FeedBack/FeedForward functions and system connection between Solder Printing Machine or Mounting Machine. ^(*3)		

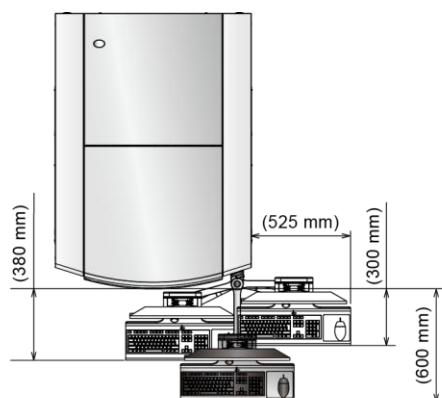
^{(*)1} Customer can select when ordering.

^{(*)2} Customer can order even if after manufacturing is completed.

^{(*)3} For the corresponding manufacturers, please contact Saki Corporation.

Support System	BF2-Editor (Offline Teacher)
	BF2-Monitor (Central Control System)
	Multi Process View (Operator Judgement Assistance System)
	BF-Logger (Inspection Information Output Function Software)
	BF-WebTracer II (Traceability System)
	BF-Manager (Barcode Management System)

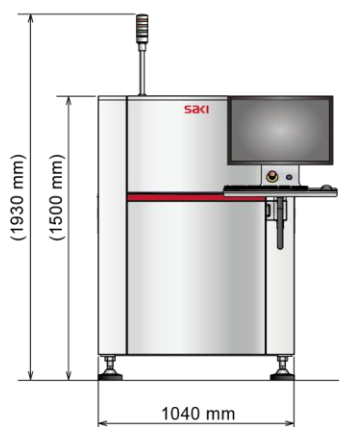
System Appearance Diagram



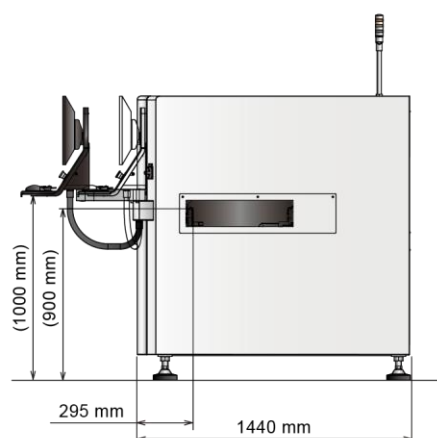
Top View



Rear View



Front View



Side View

Air Coupler Connection Specification

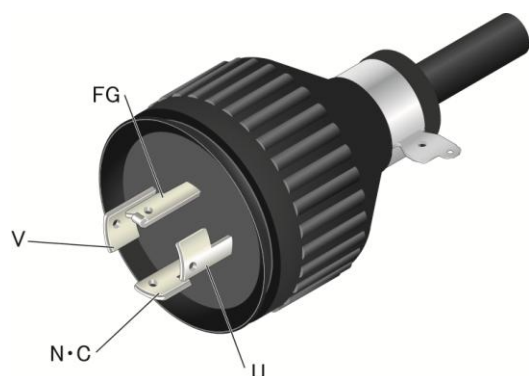
The air connecting port is connected to the bottom side of the back of the unit.

Connecting Port of Inspection Unit Side HIGH COUPLER 20PM (NITTO KOHKI)

Recommended Plug HIGH COUPLER 20SH (NITTO KOHKI)

Power Supply Plug

WF8420K (Panasonic Electric Works)



The plug in the above is connected to the tip of the cable whose length is 5 m from the bottom side of the back of the unit.

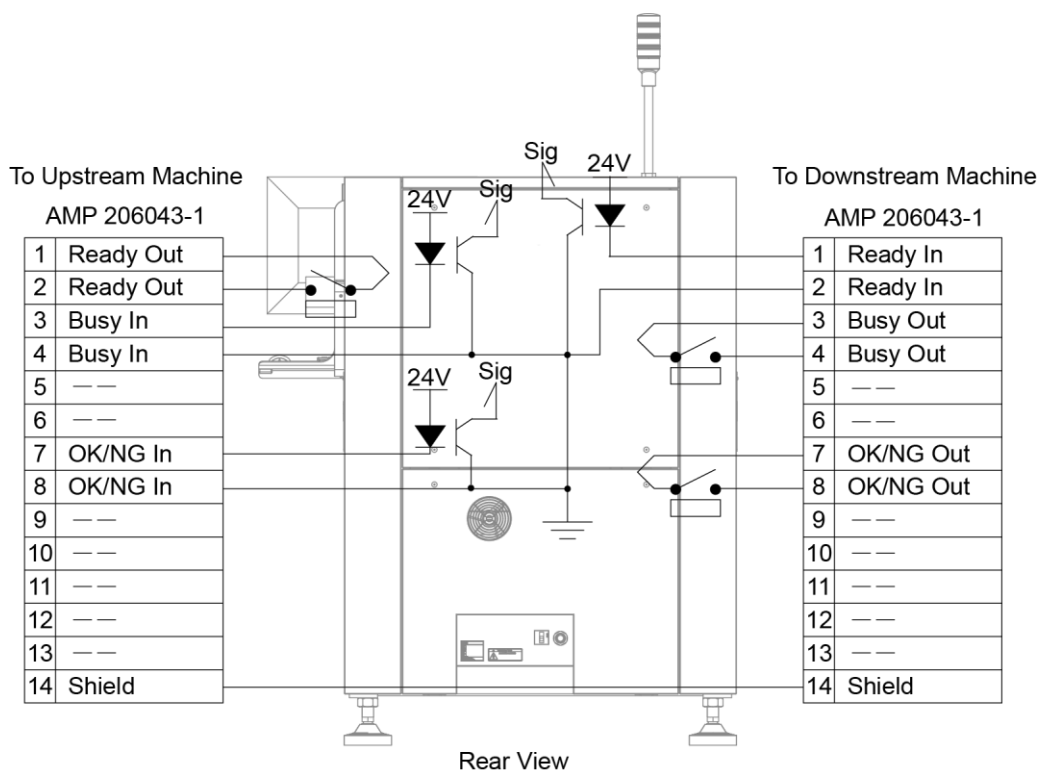
A single-phase 200 - 240V is recommended. When it is connected to the three phase, please consult us separately.

Warning: Please make sure that the outlet FG terminal at the factory equipment is properly grounded at the time of system installation.

Upstream / Downstream Stages I/F Specification

Connector in machine side 206043-1 (AMP)

Contact in machine side 66105-1 (AMP)



Accessory Cable Specification for I/F Connection

The following 2 kinds of cables for Upstream / Downstream machine are available.

Please specify either of them when ordering.

(1) SMEMA-standard Specification

Pin Array	Ready Out / Ready In	No.1, 2 pin
	Board Available (Busy In / Busy Out)	No.3, 4 pin
	Failed Board Available ((OK/NG In) / (OK/NG Out))	No.7, 8 pin
	Shield	No.14 pin

Connector 206044-1 (AMP)

Contact 170246-1 (AMP)

(2) MOLEX Connector Conversion Specification

Convert by cable to support.

Pin Array	Upstream	Ready Out	No.1, 4 pin
	Downstream	Ready In	No.1, 3 pin
		OK/NG Out	No.2, 4 pin

Connector 1490P-04P1 (MOLEX)

Contact 1380TL (MOLEX)

2. Inspection Capability

Applicable Process	Assembled component inspection before reflow process Solder inspection after reflow process	
Inspectable Components	0201 mm (008004 in.) packages and up (7μm camera head), 0402 mm (01005 in.) packages and up (12μm and 18μm camera head), Diodes, Tantalum Capacitors, Aluminum Electrolytic Capacitors, Module chips, Transistors, Power transistors, MELF resistors, Filters, Special-shaped components, Connectors (0.4mm pitch and up), QFP, SOP, CSP, BGA (0.4mm pitch and up), and Solder joints viewable from vertical top ^{(*)1}	
Inspection Categories	Presence/Absence, Misalignment, Tombstone, Reverse, Polarity, Bridge, Absence of solder, Insufficient solder, Lifted lead, Lifted chip, and Fillet defect Each defect name can be arranged freely by the system function. ^{(*)2}	
Inspection Method	Inspections are processed after capturing each FOV. Height differences are detected by projecting stripe patterns from four directions at the maximum.	
Inspection Images	Images taken by different angle lightings (CoaxialtopLight, TopLight, SideLight, LowLight), color images taken by SideLight, visualized height information, and composite of those images	
Data Import	From CAD data, Mount data, or NC data	
Fiducial Mark	Shape	Circle, Square, Triangle, Rhomboid
	Offset Calculation	Two-point, Three-point
Tact Time	Tact time is calculated by adding image capturing time and PCB loading/unloading time. ^{(*)3} ^{(*)4}	
	(A) Image Capturing	7μm: TBD
		12μm: TBD
		18μm: TBD
	(B) PCB Loading/Unloading	Approximately 4 sec.
Measurable Height	7μm camera head:	4 mm (8.82 in.) or less
	12μm camera head:	10 mm (0.39 in.) or less
	18μm camera head:	20 mm (0.79 in.) or less
Measurement Accuracy	Height Resolution	1 μm
	Height Inspection Repeatability	2 μm (3σ) or less ^{(*)5}
Inspection Result Output	Screen display of defect locations	
	File output of defect details	
	Image output of defective area	
	Network output of the above files	
Recognizing Ability	OCR function, 1D barcode, 2D barcode	

^{(*)1} J lead fillet for PLCC and BGA/CSP bottom solder joints are excluded from inspectable categories. Side camera(optional function) enables to inspect materials that cannot be seen from just above such as the solder fillet of J leads.

^{(*)2} Inspection categories are limited to items viewable on inspection images.

^{(*)3} Calculation and image capturing are processed at the same time. If the inspection data is heavier, the calculation time becomes longer.

^{(*)4} Image Capturing time and PCB Loading/Unloading time are for reference purpose only.

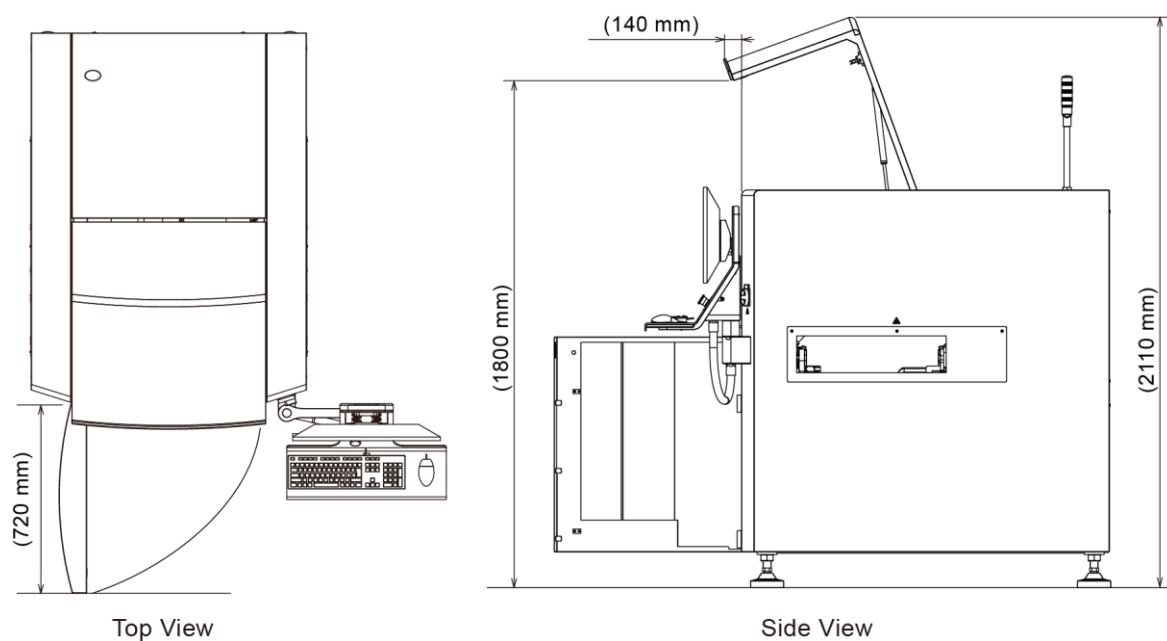
^{(*)5} By using Saki's Height calibration jig. When using 2500μm height jig, repeatability is 2μm (3σ) or less. When using 8000μm height jig, repeatability is 10μm (3σ) or less.

3. Standard Accessories

Manual and Programming Manual	1each
USB License Key	1
System Recovery Disk	1
External Hard Disk Drive for Storing the System Image	1
Work Conveyor Belt (Spare)	2
Interface Cable to Connect with Upstream / Downstream Machine (2 meters)	2 (1 for upstream, 1 for downstream)

4. Installation Condition

For the maintenance of the machine, secure a space for opening the front door (see the figure below).



5. Acceptance Inspections

Following items shall be checked / verified by Saki service personnel at the time of installation for your acceptance of the purchased system.

- Conveyor carrying in/carrying out operation (OK/NG)
- Image loading operation (OK/NG)
- Inspection operation (OK/NG)
- Position check against glass board (OK/NG)
- Luminosity check against gray scale (OK/NG)

6. Warranty Period

SAKI guarantees to customer that the system is adapted to the quality such as construction, functionality, performance, security and the like separately set forth in this specification sheet for a period of 1 year after completion of acceptance inspection ("Warranty Period"). During the Warranty Period, against any trouble which Saki is liable for, Saki will provide the Technical Support stipulated in Clause 2 of Article 2 of the Terms and Conditions for technical Service for free of charge along with the Terms and Conditions for technical Service.

As for the technical service including the Technical Support after the Warranty Period, Saki may offer the Fare-paying Service along with the Terms and Conditions for technical Service. Please contact us for the details.

7. Terms and Conditions for Technical Service

Article 1 (Purpose) These terms and conditions (hereinafter "Terms and Conditions") is to stipulate the agreement between Customer and SAKI about the services to maintain normal action and operation of the objective equipment and its system option which SAKI Corporation or its related company (hereinafter "SAKI") sales (hereinafter "Product"). Customer may use the Product only in case agrees with this Terms and Conditions.

Article 2 (Definition) The definition of each service menus which SAKI provides are as below:

(1) **Hardware Periodical Maintenance**
Service in relation to periodical check for the objective hardware of the Product (hereinafter "Objective Hardware") written on the Individual Contract.

(2) **Software Periodical Maintenance**
Service in relation to periodical check for the software of the Product (including the Fare-Paying Software of (8) of this Article, hereinafter "Objective Software").

(3) **On-call Service**
Service in relation to a survey, checkup, and maintenance of the Product or the system option connected to the Product which is not included in the (1) and (2) above and provided over a phone.

(4) **On-line Service**
Service in relation to a survey, checkup, and maintenance of the Product or the system option connected to the Product which is not included in the (1) and (2) above and provided by monitoring or remote controlling the Product, the system option connected to the Product, other electronic devices and the like (hereinafter "Connection Media") through the system which SAKI indicates (hereinafter "Remote System") to show how to use the Product or the system option connected to the Product (hereinafter "Remote Monitoring").

(5) **On-site Service**
Service in relation to a survey, checkup, and maintenance of the Product or the system option connected to the Product which is not included in the (1) and (2) above and provided by visiting the Installation site of the Product which SAKI indicates (hereinafter "Product") when SAKI assumes the trouble is not able to be solved only with (3) and (4) above.

(6) **Training**
The service in relation to give explanation, instruction, and teach how to use the Product or the system option connected to the Product through the Remote Monitoring, teaching video (DVD), or at the place where SAKI indicates.

(7) **Inspection Data Support**
The service in relation to a support to make the inspection data of the Product through the Remote Monitoring, or at the place where SAKI indicates.

(8) **Fare Paying Software**
Selling of the fare-paying software which SAKI provides.

(9) **Service Parts**
Selling of the service parts which SAKI provides.

2. The service (1) and (2) above shall be referred to as "Periodical Maintenance" and the service (3), (4), and (5) above shall be referred to as "Technical Support" and the service from (1) to (9) above shall be referred to as "Service" in this Terms and Conditions.

3. The details, such as contents of the Periodical Maintenance, charge and so on, shall be stipulated separately by SAKI.
4. Individual service menu which SAKI provides to Customer shall be stipulated in the individual contract which is completed by the fact that Customer issues an order to SAKI in a manner predefined by SAKI and SAKI accepts the order (hereinafter "Individual Contract").

5. Customer shall agree that (a) providing the Periodical Maintenance and the Technical Support does not guarantee prompt response from SAKI, entire operation of the Product, or entire recovery of troubles, and (b) the inspection data which is made through (6) Training and (7) Inspection Data Support above does not guarantee the accuracy of the inspection and its improvement.

Article 3 (Periodical Maintenance) In case Customer purchases the Periodical Maintenance in the Individual Contract, SAKI shall visit Customer once per 6 months to provide the Periodical Maintenance during the term as written in the Individual Contract. One visit shall 8 hours at the maximum and its schedule shall be informed by SAKI to Customer one month before and decided through mutual consultation between Customer and SAKI.

Article 4 (Reception time and service time for On-call Service and On-line Service) The reception time and service time for the On-call Service and On-line Service shall be as below. However, in case of Saturday, Sunday, national holiday or other date which SAKI indicates as holiday, SAKI shall not provide the On-call Service.

- Reception time: From Monday to Friday AM 9:00 to PM 5:00 (time of the place where SAKI (who provide the Service)'s office is located)
- Service time: From Monday to Friday AM 9:00 to PM 5:00 (time of the place where SAKI (who provide the Service)'s office is located)

2. In case Customer requests SAKI to provide the On-call Service or On-line Service at the time other than the date and time of preceding section, this request shall be assumed as the request received in the next working day by SAKI, and SAKI shall provide the On-call Service or On-line Service in the time stipulated in the preceding section of the next working day. However, in case SAKI judges the degree of importance and urgency is high, SAKI may provide the On-call Service or On-line Service at the time other than the preceding section with the additional charge as stipulated in the appendix.

Article 5 (Reception time and service time for On-site Service) The reception time and service time for the On-site Service shall be as below. The fee for the On-site Service is as stipulated in the appendix. However, in case of Saturday, Sunday, national holiday or other date which SAKI indicates as holiday, SAKI shall not provide the On-site Service.

- Reception time: From Monday to Friday AM 9:00 to PM 5:00 (time of the place where SAKI (who provide the Service)'s office is located)
- Service time: From Monday to Friday AM 9:00 to PM 5:00 (time of the place where SAKI (who provide the Service)'s office is located)

2. In case SAKI judges the degree of importance and urgency of a trouble is high, SAKI may provide the On-site Service at the date and time other than the date and time of preceding section with the additional charge as stipulated in the appendix. In case SAKI provides the On-site Service on the several time blocks stipulated in the appendix, only the highest Accommodation fee and Allowance shall be applied.

Article 6 (Remote Monitoring) Customer shall agree the following terms to be provided the Remote Monitoring:

- (1) To follow all the terms of service and other rules which the third party who provides the Remote System stipulates,
- (2) To prepare the Connection Media and an internet connection which are necessary for the Remote Monitoring by its own cost and responsibility,
- (3) To acknowledge that there is a possibility that any wrong function and

wrong operation screen which is different from Customer's intention might be activated or shown due to the Remote Monitoring,

(4) To acknowledge that there is a possibility that the Remote Monitoring is not be able to use due to the situation of the Product, the system option connected to the Product, or the internet connection,

(5) To manage the information which is sent from SAKI by an e-mail to use the Monitoring System (hereinafter "Login Information") under its own responsibility, and

(6) To use the Monitoring System under its own responsibility, and to indemnify and hold SAKI and its related companies harmless from and against all claims, losses, liabilities or obligations arising as a result of such use/ inoperativity of the Monitoring System, loss of data due to computer virus, and any other damage occurred including (3), (4), and (5) of this Article above.

(7) SAKI may introduce antivirus software based on the Customer's request. In case Customer uses any antivirus software, Customer shall use and maintain any antivirus software and the Product which antivirus software is installed under its own liability and SAKI shall not have any obligation to guarantee certain and collect operation of such antivirus software and the Product which antivirus software is installed.

Article 7 (Charge for Maintenance Service) The terms of the payment from Customer to SAKI shall be stipulated in the Individual Contract.

2. The charge for the Service shall not refund for any reason whatsoever.
3. SAKI may change the charge of the Service considering the market situation, economic situation, commodity price and the like.

Article 8 (Customer Expenses) Customer shall burden the costs as below other than the charge stipulated in the preceding Article:

- (1) electricity and water rates
- (2) cost occurred related to any communication device (including phone, the Connection Media, and the like), and an internet connection
- (3) parts price (excluding the selling of (9) Service Parts of Article 2) and its transportation cost

Article 9 (Title of Exchanged parts) The title of the faulty parts which are exchanged through the Periodical Maintenance and the Technical Support shall belong to SAKI.

Article 10 (Reconsignment) SAKI may consign all or a part of the Service to any third party with notification to Customer.

Article 11 (Maintenance of Installation Condition) Customer shall always adjust and maintain the installation condition of the Product to meet the condition defined in instructions for handling (e.g. power sources, humidity, vibrations, magnetisms, saltiness, grounding conditions, etc.).

Article 12 (Objective Software) Customer may use the Objective Software only for the appropriate use of the Objective Hardware and this License of use of the Objective Software shall be non-exclusive and non-assignable license.

2. The Copyright of the Objective Software and any output made through the Objective Software shall be owned by SAKI, and Customer shall not be granted the Copyright nor other rights. SAKI shall not provide any guarantee that the Objective Software does not infringe any third parties' right including but not limited to the copyright and the like.

3. SAKI may modify specifications or contents, and alter distribution method of Objective Software without making any prior notice to and without obtaining agreement with Customer. This terms and condition shall also be applicable to the software produced by modifying specifications or contents and altering distribution method of the Objective Software.

4. In case trouble, damage etc., are caused by updating, adding of function and the like to the Objective Software by SAKI, SAKI shall restore it before updating, adding of function and the like. Next action after the restoration shall be decided through mutual consultation between Customer and SAKI.

Article 13 (Cooperation) Customer shall agree following terms to be provided the Service smoothly by SAKI.

- (1) to do the maintenance which is stipulated to be done by Customer in the appendix
- (2) to keep the log book of the Product and disclose the log book when SAKI requires
- (3) to try its best effort to organize the circumstances so that SAKI is able to access the Product and/or other external network freely during SAKI's performance of the Service
- (4) to try its best effort to assign Customer's employee who is familiar with the Product as the window person for the Service and
- (5) (in case the Product is X-ray product) to recognize the Product shall have checked periodically by the qualified person according to the legal standard and cooperate with its check

Article 14 (Information) SAKI may collect, use, process, store, and utilize the information which SAKI obtains from Customer through the execution of the Service according to the Privacy Policy to improve and enhance SAKI's Product including the Service.

Article 15 (Beta Service) SAKI may make available a "beta" version of the Service (hereinafter "Beta Service") for evaluation and feedback by third parties. In case Customer requests the Beta Service, Customer shall agree with the following terms:

- (1) Not to use the Beta Service for the purpose other than the evaluation and feedback,
- (2) To agree that Beta Service may contain bugs, errors, and other problems, use the Beta Service with the care of a good manager, and not to claim the damages which are occurred due to the Beta Service against SAKI,
- (3) Not to use the Beta Service for illegal purpose, or other purpose which would cause trouble or other damage against a third party's tangible/intangible property, and
- (4) To provide all of the data and feedback of test and evaluation of the Beta Service to SAKI for free of charge.

Article 16 (Prohibited Activities) Customer shall not make any activities defined in following each paragraph.

- (1) to alter the Objective Hardware
- (2) to repair, alter, or decompose the Objective Hardware or replace the parts thereof unjustly
- (3) to rent, lease, or transfer the Objective Hardware to any third party without permission from SAKI
- (4) to copy or alter a part or all of the Objective Software
- (5) to use the Objective Software outside the scope of the license defined in Clause 1 of Article 12
- (6) to install and use the Objective Software in other products which is out of this Terms and Conditions
- (7) to rent, lease, transfer or re-license the Objective Software to any third party without permission from SAKI
- (8) to try to analyze, change the source code of the Objective Software and the like by reverse engineer, disassemble or decompile and the like a part or all of the Objective Software
- (9) to make software and derivation similar to the Objective Software;
- (10) to insert the service key which unlocks the interlock of the Product

(hereinafter "Service Key") at the time of being provided the Remote Monitoring, and

(11) to have any third party make activities defined in each previous paragraph.

Article 17 (Indemnities) If the events defined in following each paragraph should occur, SAKI shall be released from the duty of providing the Service and compensating any damages occurring on Customer by each event, or any and all other duties.

(1) In the event that Customer should make the prohibited activities defined in the previous Article,

(2) In the event that the installation condition of the Product defined in the Article 11 should not be met,

(3) Trouble, damage etc., caused by the change of installation site or removal of the Product after its delivery,

(4) Trouble, damage etc., caused to consumable parts of the Product,

(5) Trouble, damage, etc., caused by or related to any device other than the Product,

(6) Trouble, damage, etc., caused by stolen or loss,

(7) In the event that Customer should decompose or repair the Product or replace the parts thereof without permission from SAKI,

(8) Trouble, damage etc., caused by use or inoperativity of the Product,

(9) Trouble, damage etc., caused by using the Objective Software together with any other software,

(10) Trouble, damage, etc., caused by computer virus,

(11) Trouble, damage etc., caused by making change or update of the BIOS, drivers, or OS without a confirmation by SAKI,

(12) Trouble, damage etc., caused by operation in any environment other than the recommended environment of the Product,

(13) In case any and all data which the Objective Software outputs are lost,

(14) In the event that Customer should commit any breach of instructions for use and for handling of the Product defined by SAKI,

(15) In the event of force major such as fire, earthquake, lightning strike, wind and flood damage, gas damage, salt damage, and other act of providence, war, armed conflict, etc occurs,

(16) Trouble, damage, etc., caused on the Product by the events which are other than the events defined in each previous paragraph and not for reasons attributable to SAKI and

(17) In the event any defect is found or any trouble or damage occurs after the termination or termination of the period stipulated in the Individual Contract.

Article 18 (Data Save) Customer shall acknowledge that inspection data or other data may be lost by a certain trouble or damage, and shall try to save data at new creation and every updating under its responsibility. SAKI shall not be liable for the responsibility about such loss of data.

Article 19 (Cancellation of Agreement) In case the other party corresponds to one of the following each paragraph, either party may have the right to immediately cancel the Individual Contract without requiring any notice regardless of the preceding article:

(1) In case the other party breaches one of the paragraphs stipulated in this terms and condition and does not correct the breach in spite of the notice defining the reasonable period

(2) In case the other party is subjected to punishment for revoking or suspending business by the competent authority

(3) In case the other party suspends payment, or is subjected to punishment for dishonor of the clearinghouse

(4) In case the other party is subjected to attachment, provisional attachment, provisional disposition, compulsory execution, and the like by any third parties

(5) In case the other party offers or makes a procedure for bankruptcy, company liquidation, special liquidation, civil rehabilitation or corporate reorganization, or any grounds causing these events arise

(6) In case the other party passes a resolution for dissolution, or institutes a significant change in the other management structures, and

(7) In case Customer relocate the Product more than 50 km from the Installation site in the Individual Contract.

2. In case the Agreements is cancelled according to the preceding article, either party may make a claim for damages incurred thereby against the other party.

3. In case the Individual Contract is cancelled or expired for any reasons, Article 12, Article 14, Article 15, Article 16, Article 17, Article 20, Article 21, Article 22, Article 23, and Article 24 shall survive and be still valid.

Article 20 (Maintenance of Confidentiality) Customer shall not disclose or leak any SAKI's trade or technical secrets which are knowable in relation to the Product, Individual Contract, or this Terms and Conditions to any third party during and after the period of the Individual Contract.

Article 21 (Liability) In any case, the maximum amount which SAKI burdens shall not exceed the purchase price of the Product which causes the damage.

2. SAKI shall not burden any liability of trouble and damage caused on an object other than the Product, indirect damage such as manufacturing loss, and the like.

3. Except the extent that by statute liability may not lawfully be excluded, the whole liability which SAKI shall incur related to the Individual Contract and the Product shall be what is written specifically in this Terms and Conditions. SAKI, directly and indirectly, shall not be liable for any other matters against Customer.

Article 22 (Jurisdiction) As to any legal dispute arising with respect to the Individual Contract and this Terms and Conditions, the Tokyo District Court shall be designated as an exclusive agreement jurisdictional court of the first trial.

Article 23 (Consultation and Resolution) Matters arising any questions relating to this Terms and Conditions and the Individual Contract and matters not provided for in this Terms and Conditions and the Individual Contract shall be resolved through mutual consultation between Customer and SAKI.

Article 24 (Jurisdiction) As to any legal dispute arising with respect to this Terms and Conditions and the Individual Contract, the Tokyo District Court shall be designated as an exclusive agreement jurisdictional court of the first trial.

Article 25 (Entire Agreement) This Terms and Conditions supersedes and cancels any and all previous agreements, contracts or understandings between the parties relating to the Product, the Service and expresses the complete and final agreement of the parties in respect thereof.

Article 26 (Severability) In any provision or any portion of any provision of this Terms and Conditions shall be held to be void or unenforceable, the remaining provisions of this Terms and Conditions and the remaining portion of any provision held void or enforceable in part shall continue in full force and effect.

January 1st, 2016

SAKI Corporation