



KETA C series Molecular Imaging System



Installation and Operation Manual

Version 3.0

Item# 01250

****This instrument is intended for laboratory use only***

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A. Important Notice

Before setting up and operating the instruments of KETA C series imaging system, please carefully read these instructions to get familiarized with the installation and operation process. Instruction should be read by experienced individual before operating the instrument.

Any improper usage of the instruments may cause damage. Please refer to the safety notice included with this equipment.

The instruments shall not be modified or altered in any way. Any modification or alteration will void the warranty, void the regulatory certifications and create potential safety hazard. Wealtec is not responsible for any injury or damage caused by using the instruments for any non-intended purpose or injury as a result of modification of the instruments by any person who is not authorized by Wealtec Corp.

A-1. Warranty

KETA C series imaging system is warranted to be free from defects in materials or workmanship for a period of one year from the original invoice date, under normal usage. Any defects occurring during warranty period, Wealtec Corp. will repair or replace defective products or parts without charge unless the defects arise from conditions outlined below. The defects described below are specially excluded from Wealtec warranty policy.

1. Improper operation of the instrument.
2. Repair or modification by any person who is not authorized by Wealtec Corp.
3. Damage caused by any (in)-direct accident, neglect or misuse.
4. Damage caused by disaster.
5. Damage caused by any improper solvents or samples

A-2. Technical and Service Contact

Most of the operation details are described in this instruction manual to assist and guide operator for an appropriate solution. For any other technical/ service questions, please contact your local representative or contact Wealtec international technical/ service specialist by E-mail: support@wealtec.com.

A-3. CE Certification



It is not allowed to use a screwdriver to open the enclosures.

- The product must be connected to the AC power supply mains through a three-conductor power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet.
- A certified power supply cord has to be used with this equipment. The relevant national installation and/or equipment regulations shall be considered. A certified power supply cord not lighter than ordinary polyvinyl chloride flexible cord according to IEC 60227 (designation H03 VV-F) shall be used. Alternatively, a flexible cord be of synthetic rubber according to IEC 60245 (designation H05 RR-F) shall be used. The power cord set shall have a power supply cord with conductors providing a cross-sectional area of $3G, 0.75\text{mm}^2$ minimum.
- The appliance coupler/inlet shall be easily accessible and readily disconnectable.
- For ventilation purpose, suitable space shall be maintained.

A-4. Symbols

Symbol	Definition of symbol
	Alternating input current
	Push control at on position
	Push control at off position
	Only on built-in power supply for earth terminals
	Protective conductor terminal
	Caution of hazards

B. Introduction

KETA C Chemiluminescence imaging system provides different models of high sensitivity cooled CCD camera with leak free dark room which is easy to calibrate and keep absolutely dark at any time. Designed ideal for Chemiluminescence signal detection, KETA C has superior performance on detecting of ECL, ECL Plus, ECL Advance, ECL Enhanced, CDP Star, Super Signal and CSPD chemical illumination. For image capturing, KETA C equipped with a standard two levels sample stage and optional computer control motorized sample stage which provides easier way to place the samples. Operated with Magic Chemi software package, auto default and overlay background subtract function is also included.

B-1. Specifications

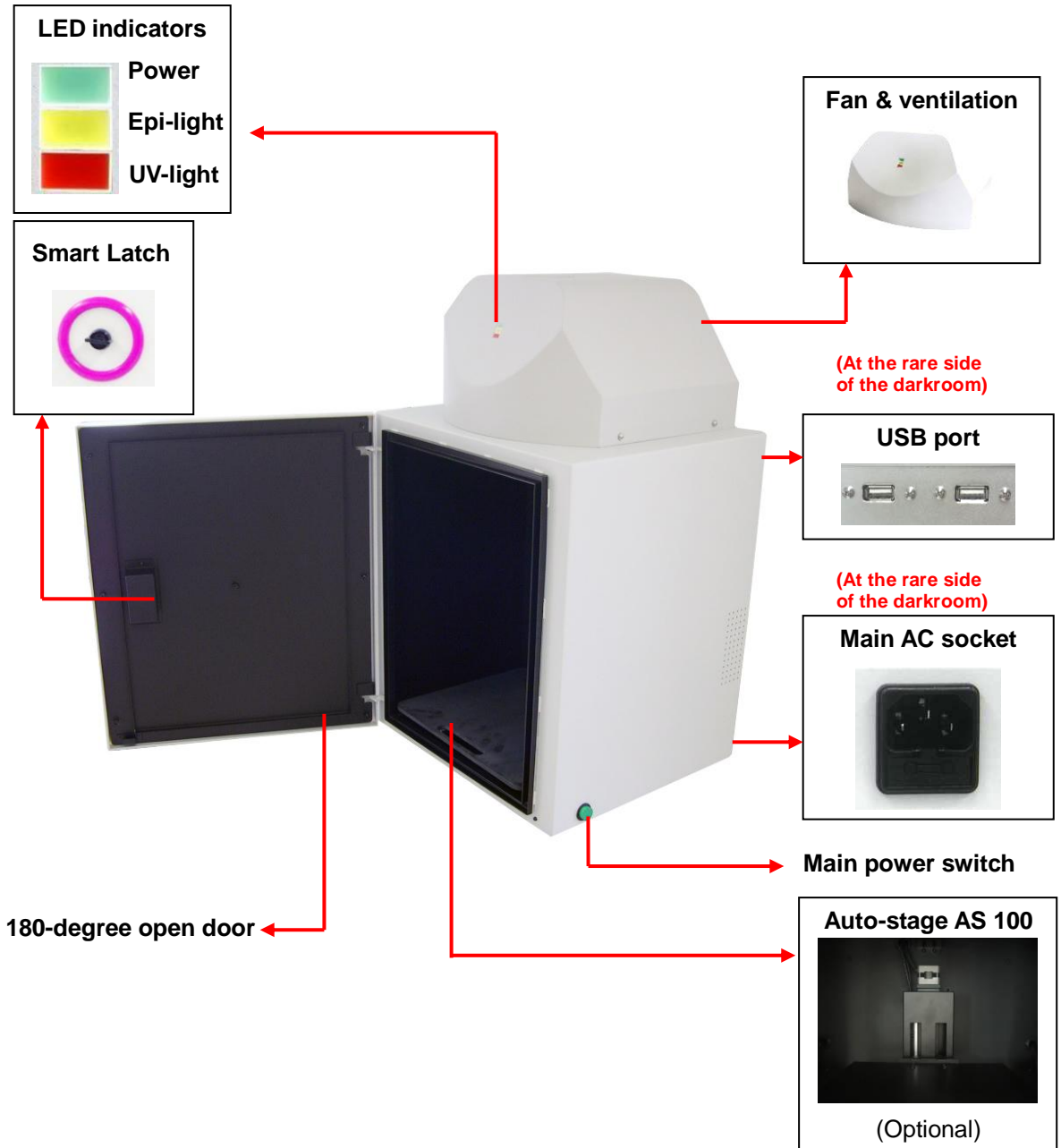
	KETA C	KETA CL	KETA CLX
Camera	K12CH	K12CHS	[#] K16C
CCD depth	12/16. A/D bit	12/16. A/D bit	16 bit
Operation temp	Ambient -30°C	Ambient -45°C	Ambient -40°C
Chip size	2/3"	2/3"	2/3"
Resolution	1360 x 1024	1360 x 1024	1360 x 1024
S/N Ratio	>62 dB	>67 dB	>69 dB
Cooling	Peltier	2- stage Peltier	Peltier
Lens	f1.4/16 mm	f0.95/17 mm	f0.95/17 mm
Smart Latch	Standard	Standard	Standard
Tri-level stage	Standard	Standard	-
AS 100 stage	Option	Option	Standard
Internal light source	Standard	Standard	Standard
Magic Chemi	Standard	Standard	Standard
OS system	Windows XP, Vista, 7	Windows XP, Vista, 7	Windows XP, Vista, 7
Physical Dimension(WxDxH)	460 x 450 x 725 mm	460 x 450 x 725 mm	460 x 450 x 725 mm
Weight	34.7 kg	34.7 kg	34.7 kg

[#]K16C upgrade to 4.0 megapixels

- ※ Minimum computer system requirement for software analysis: PIV-2.6GHz, 1 G RAM with **English version** Windows XP/VISTA/7 system or higher, USB (2.0) supported. Pentium is a registered trademark of Intel Corp. Windows and Windows XP/VISTA/7 are trademarks of Microsoft, Inc.

B-2. Product Description

B-2-1. KETA C Series Imaging System Hardware Overview



CCD camera

All models camera for KETA imaging system are using progressive integration CCD element with USB 2.0 communication port. Features with low dark current, high QE values, and excellent performance, all cameras are ideal for bio imaging or molecular imaging. Three types of cooled CCD camera offer the most proper choice for customer to order their own system and were optimized for long terms integration, high sensitivity and still frames imaging.

KETA C system with 2/3" inch CCD with 1.4 megapixels array and 12 bits gray layer provides high quality image in excess for chemiluminescence's applications. The integration mode allows the electronic shutter to remain open for a long period of time to collect photons from low light scenes for full dynamic range imaging. All signals are digitized by a 12 bit ADC and connect to the computer via the USB 2.0 .

KETA CL system equipped with 2nd stage peltier cooler significantly reduces the CCD temperature to below -45 below ambient and substantially reduces dark current noise to facilitate useful long integration time. The video signal of KETA CL are digitized by a 12-bit CCD and sent to the computer via the USB 2.0 interface.

KETA CLX system carried with 16 bit CCD depth and 1.4 megapixel resolutions meet the most stringent requirement for highly sensitivity chemiluminescence imaging. All signals are digitized by a 16 bit ADC and connect to the computer via the USB 2.0 .

Lens

KETA C series imaging system all equips with manual zooming lens, both f1.4/16 mm and f0.95/17 mm, which provides manual adjustments of focal length with good quality image capturing. With the pantoscopic lens, lights in the darkroom will all be detected and give the best chemiluminescence result.

Light source

Hg free Epi-white LED light technology as a standard observation source configuration within the KETA C imaging system provides stable, high intensity, and longer life time (50,000 working hours) for visualization of samples placement.

Darkroom

Leakage proof designed KD 100 Dark Room allows all kinds of application in molecular imaging. UV radiation safety interlock switch and smart latch as standard configuration keeps operators in safety environment. 180° fully closed / opened door easy for gel cutting.

B-2-2. Magic Chemi Software Features Overview

Features	Descriptions
Automatic lane, band, and spot detection	Automatic detection capability, allows Magic Chemi software for gel data analysis. It is also convenient for spot image assay.
User-friendly quick guide operation	The step-by-step quick guide function provides the user guidance from capturing image to fast image analysis. Ability to learn a complicated software operation is not necessary.
Compatible image files format	Various images file format JPG, BMP, JPEG, DFN, TIF, TIFF, PCX, GIF, and TGA is supported as can be loaded, analyzed and saved.
Short time (Within one minute) data analysis	Various options under "Analysis" function allows user to run the software automatically for various analysis and reports.
Traceable image enhancement function	While analyzing image, Magic Chemi software provides convenient tools such as text, line, color adjustment, rotation, flipping, invert etc. With all this convenient tools, "Record" function allows users to track previous action easily.
Ability to identify smiling gel accurately	Magic Chemi software can identify bands, even if the gel is deformed as smiling gel.
Image profile & 3-D display	Image data can be visualized in lane profile and 3-D display
Image blending function	Blending of image can have precise comparison between two different images

Support GLP/GMP mode	Image data can be protected by password log-in setting to avoid uncertain modification
Signal Enhancement	Signal intensify through the data processing and image capturing

Minimum computer system requirement for Magic Chemi software



PIV-2.6 GHz, 1 G RAM with English version Windows XP/VISTA/7 system or higher, USB (2.0) supported.





B-2-3. Printer (Optional)

An optional digital thermal printer or inject printer is applicable for KETA C series. It is controllable using PC through Magic Chemi software.

C. Installation of KETA C series Gel Imaging system and Magic Chemi Software

C-1. Package List

Item	Quantity
KETA C series darkroom 	1
USB cable 	2

<p>Sample tray</p> 	<p>1</p>
<p>Power cable</p> 	<p>1</p>
<p>Instruction package (One Instruction and Operation Manual, one Gel Analysis Software Operation Manual, one ruler, and one calibration chart.)</p> 	<p>1</p>
<p>Magic Chemi software (Including installation CD and USB protection key [USB key-pro])</p> 	<p>1</p>

C-2. Installation of KETA C series Imaging system

C-2-1. Space Requirement

Minimum area of 46 cm (D) x 45 cm (W) x 72.5 cm (H) is required, excluding computer and printer.

C-2-2. Installation Procedure

- 1. Place darkroom unit:** Carefully pull the darkroom out of the package box and place it at the workbench. The workbench should provide the space with the minimum size of 46 cm (D) x 45 cm (W) x 72.5 cm (H).
- 2. Connect the USB cable to the computer: (USB 2.0)**
Connect two USB cables in the back of the machine.



Connect the other side of USB cables to the computer.
(Make sure to connect with USB 2.0 port.)



3. Install sample tray:

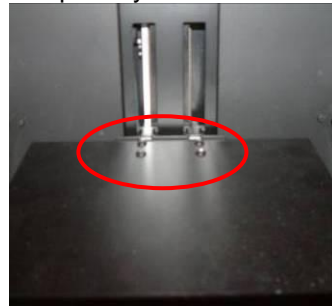
Tri-level stage:

Place the sample tray fit into the shelf on both sides of the darkroom.



AS-100 Auto-stage:

Remove the tray protection sheet and install the sample tray to the motorized stage.



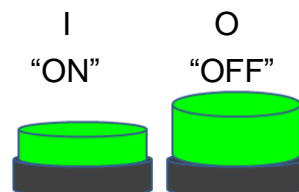
4. Setting Default Switching Positions:

Main Power Switch:

Ensure the main power switch is switched off (light off) as shown in the following picture.



Main power switch



5. Connect Power Cable:

Ensure the working voltage of the imaging system matches the local voltage. The AC socket is located at the rear side of the darkroom unit and thermal printer (If printer is purchased). Connect power cable to the AC socket and plug it into main power source.

6. Installation of the Magic Chemi software:

Install the Magic Chemi software according to the instruction of the software. For the first time install or re-install of the Magic Chemi software, it takes 2 hours for C series imaging system to finish the installation procedures. Remember to turn off the power saving scheme in the computer before getting start with the darkroom calibration.

7. Examine Installation Functionality:

Turn on the main power switch and ensure the main power switch and status display LED indicator is illuminated (Green). Install the device when the main power switch is turned on. After finished with the darkroom calibration, click on the buttons in the controller setting interface to check whether each function can work normally or not.

D. Operation

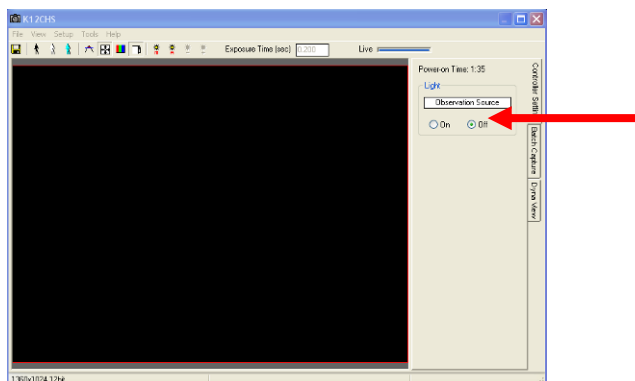
While operating with KETA C series imaging system, connection between software to machine needs five minutes to wait for the cooling of the camera. Please remember to turn on the imaging system and connect with the software prior to operate. For the first time installation, darkroom calibration would be needed to have the best performance of KETA C series. Ensure follow the instruction in Magic Chemi software manual to setup the system prior to the darkroom calibration.

D-1. Magic Chemi Software

Please refer to Magic Chemi software installation and operation manual for details.

D-2. KETA C series Imaging system Hardware Operation

1. Turn on your computer system and KETA C series main power switch five minutes before operation (Green switch located at the bottom right hand side of the darkroom).
2. Connect Magic Chemi software with KETA C series imaging system by opening the camera from the software. The system will be warmed up for five minutes and then come out with capturing window. Select live mode for image visualization. (Please refer to Magic Chemi software operation manual for details)
3. Turn on the "Observation Source" in order to observe the placement of samples.



4. Turn the smart latch counterclockwise to open the KETA C series darkroom cabinet door and take out the sample tray.
5. Adjust the height of the sample tray. Usually, a shorter distance between the CCD-camera and sample is needed in order to optimize light capture by the CCD. Higher stage placement will have smaller observation area should also be noticed.
6. Roughly adjust the iris and focus with the calibration chart as a reference.
7. Remove the calibration chart from the sample tray.
8. Place the chemiluminescence sample, e.g. a blotting membrane, on the sample tray on the relative focused position and close darkroom cabinet door. Additional manual fine tuning of sample position as well as tray height and focus may be needed.
9. Turns the iris close to fully opened and turn off the “Observation Source”. A fully opened iris (100 %) gives the highest light throughput; however, the captured image may appear blurry. Less than maximally opened iris gives better resolution, but generally requires longer exposure times in order to generate the same light throughput. Individual samples require optimization in sample tray height, iris adjustments and exposure times in order to generate high resolution images of good sensitivity.
10. Capture image using Magic Chemi software and save the image data to process or for further analysis. Note: Batch Capture or DynaView setting is necessary for various samples and chemiluminescent reagents. (Please refer to Magic Chemi software

operation manual for details)

11. After capture, disconnect the software with the imaging system and turn off the main power switch upon capturing the image. Open the darkroom cabinet door and remove the captured target from KETA C series imaging system.
12. Touched sample surface shall be cleaned with pre-moistened soft tissue after every use to avoid any possible contaminations and damages to the instrument.
13. Use Magic Chemi software to analyze the captured image.

E. Care and Maintenance

- Darkroom of KETA C series can be cleaned with pre-moistened soft tissue soaked with clean water. Organic solvents or strong detergents may damage the instrument and should not be used.
- CCD camera should be protected from all possible moisture, organic solvents and detergents.
- Sample touched surface of KETA C series should be cleaned with pre-moistened soft tissues after every usage to avoid all possible contaminations and damages to the instruments.
- KETA C series system should be disconnected with the software if the camera is not going to use within 30 minutes.

F. Order Information

KETA C series Molecular Imaging system

Item #	Description
1150061	KETA C chemiluminescence system & Magic Chemi software, 120V, 50/60 Hz
1150062	KETA C chemiluminescence system & Magic Chemi software, 230V, 50/60 Hz
1150071	KETA CL chemiluminescence system & Magic Chemi software, 120V, 50/60 Hz
1150072	KETA CL chemiluminescence system & Magic Chemi software, 230V, 50/60 Hz
1150081	KETA CLX chemiluminescence system & Magic Chemi software, 120V, 50/60 Hz
1150082	KETA CLX chemiluminescence system & Magic Chemi software, 230V, 50/60 Hz
1151111	K16C(1.4 megapixels) upgrades to K16CH 4.0 pixels (factory install)
1146003	Digital thermal printer
1153005	Magic Chemi Software package, single user key only
1153006	Magic Chemi Software package, three user key only
1155002	AS 100 motorized sample stage (factory install)

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