Argon SDC 212
Argon SDC 213

(incl. Software KDC-A)

Operating manual

Table of contents

1 Introduction and description

This camera describes the operation of the Argon camera and the software KDC-A.

The camera features an RS 232 interface. Via this interface you can configure, control and optimize the camera functions. Parameter profiles can be saved on the PC. You can load one of these user profiles into the camera and use the camera PC-independently with this profile. Of course PC-independent use is also possible with the default settings.

Scope of delivery
Camera Argon SDC 212C (961-3122) or Argon SDC 213C (961-3133)
CD Kappa KDC-A Argon (772-0005)

2 System requirements

Software requirements
- PC with Windows XP, Windows Vista, Windows 7, 32-bit or 64-bit version.
- Serial port RS 232 (adapter to USB might be required).

Hardware requirements:
See connection diagrams in chapter 3 and chapter 4

3 PC-independent operation

You can use the camera PC-independently. The camera then uses the default settings. You can also make adjustments via the PC and software KDC-A and save them as a user profile. Up to 8 profiles can be saved. You can load one of these profiles as start setup into the camera. At the next start the camera uses this profile and you can also work PC-independently. To load a new profile connect the camera again to the PC. For a detailed description see chapter Parameter.
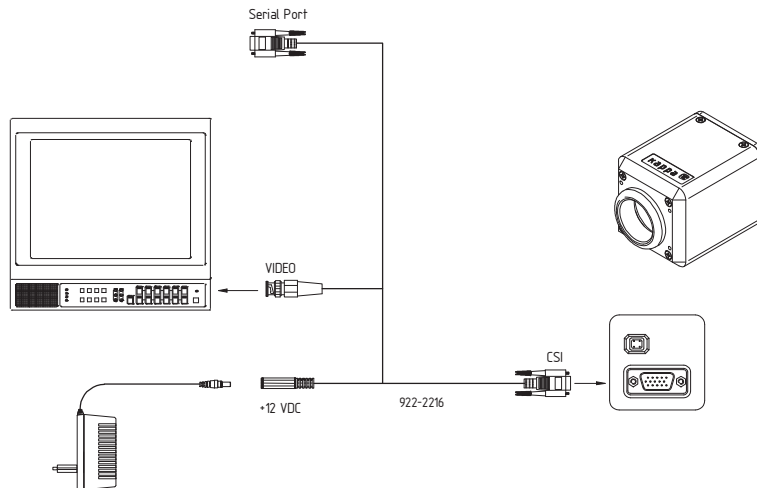
Connection diagram for monitors with video input (PC-independent operation)
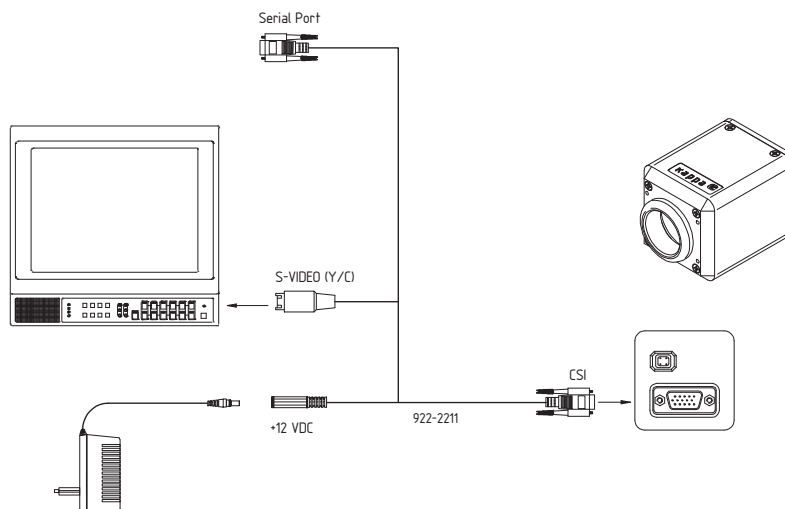
Connection diagram for monitors with S-VIDEO input (PC-independent operation)
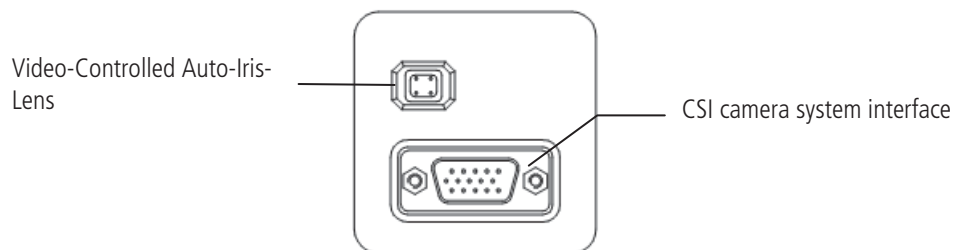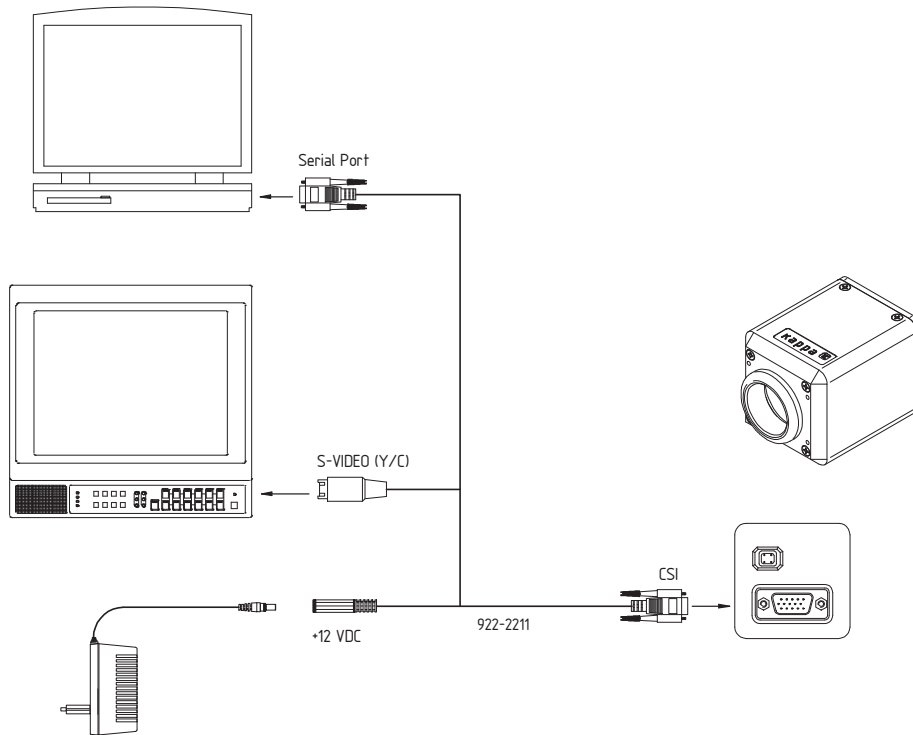
Figure camera back side

4 Operation with PC and software KDC-A

4.1 Connection diagrams

Connection diagram for monitors with video input (BNC connection)
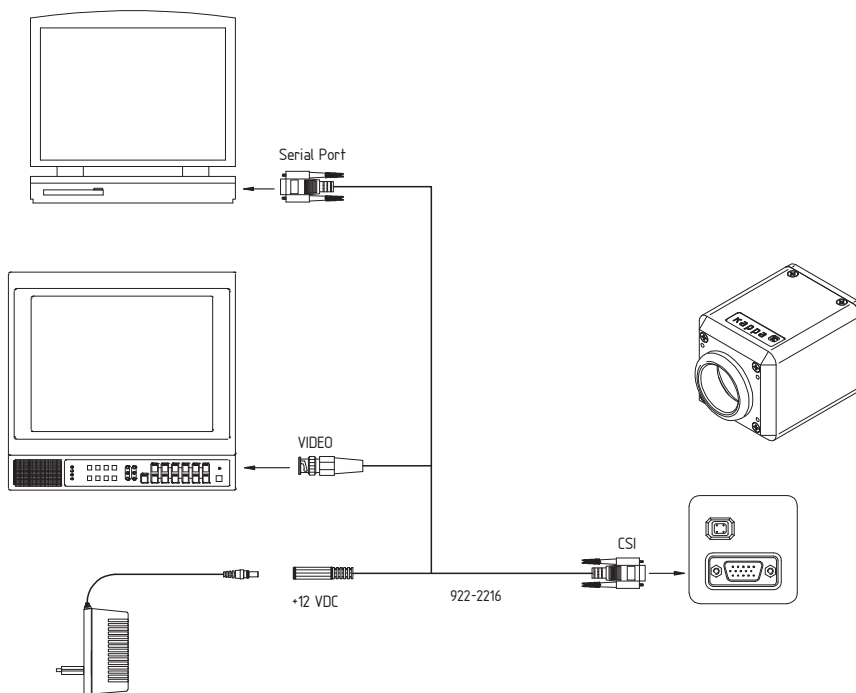
Connection diagram for monitors with S-VIDEO input

4.2 Installation instructions for software KDC-A

The installation is described for Windows 7. The installation under Windows XP and Windows Vista differs only optically.

Perform the following steps:

Insert the Kappa Device Control CD. The install wizard launches automatically. Please follow the instructions of the install wizard.

The version numbers of the software in this operating manual only serve as example. They might be higher on your CD-ROM or in your software.
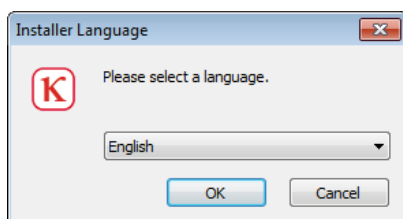
This window appears when the CD-ROM is inserted. Choose a language and confirm with "OK".

Click on „Next" and follow the instructions.
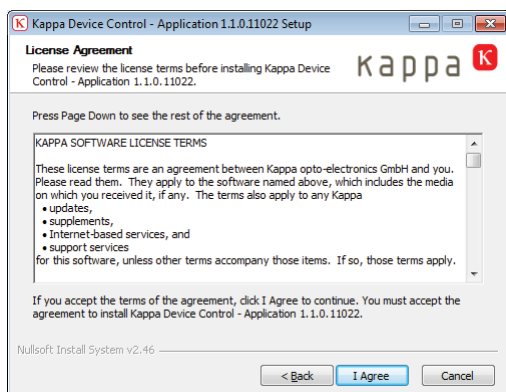
Read the license agreement and click on „I agree" to accept the agreement.

Select Argon and click on „Install".

Click on „Finish" to complete the installation.

4.3   Control via PC with software KDC-A

Many adjustments are done with sliders. Besides pressing and moving with the left mouse button the keyboard can be used. Use the arrow keys for fine adjustment and the "Image up" and "Ima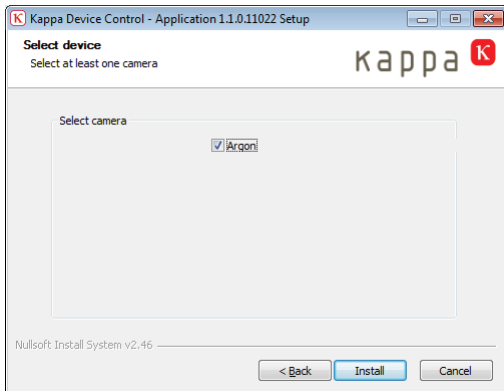ge down" keys for bigger steps. Additionally the keys "Pos 1" and "End" are available to get quickly to the beginning or the end.

4.3.1 Open control dialog box of KDC-A

Connect the camera to the serial interface of your PC via an appropriate cable and to the power supply before starting the software KDC-A Argon (see connection diagram).

You can start the control at any time via the start menu - Start / Programs / Kappa / KDC-A / Kappa Device Control Application or with the icon on the desktop (if selected at the installation).

At the first start the following dialog box appears automatically:
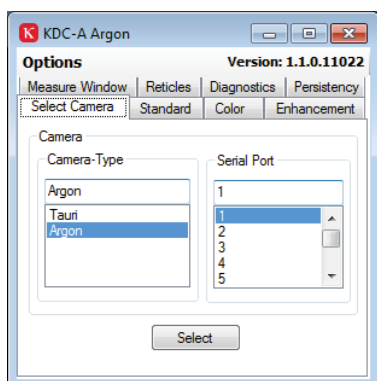
Select the used interface port and click on „Select".
If the connection is correctly established, the Argon control dialog box is opened.

4.3.2 Options
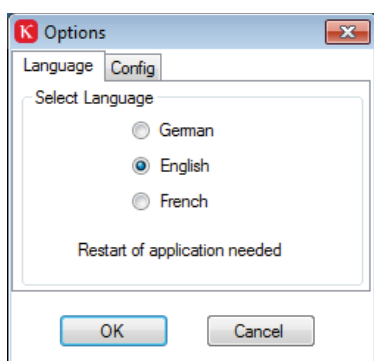
Language: Select a language and confirm with „OK".
Note: If you change the language this is only valid after a new start of the KDC-A Argon!

4.3.3 Standard
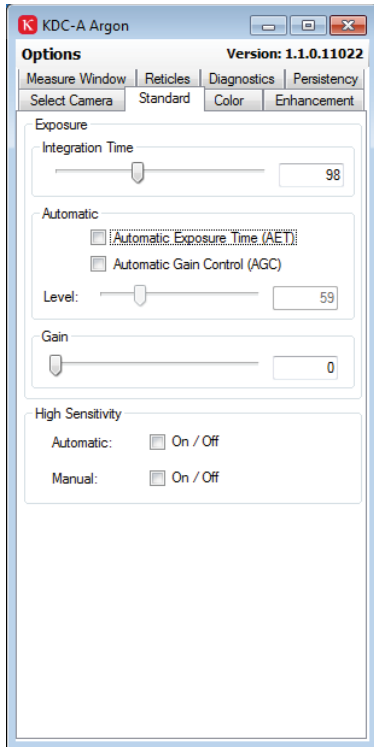
Exposure

You can adjust the integration time between 0 and 255 (corresponding to 1/50 s and 1/ 100000) or switch to automatic exposure time (AET).

Automatic

You can activate or deactivate the automatic exposure time (AET) and the automatic gain control (AGC). In the automatic mode the values for exposure and gain are calculated on the basis of different measuring windows (see chapter Measuring Windows). If the automatic function is active, the sliders for the corresponding functions are deactivated.

Level

With the "Level" slider you can adjust the target value for the automatic functions. With smaller values the image will be darker; with higher values the image will be brighter.

Gain

With the slider you can adjust the gain between 0 and 92 (corresponding to 0 – 26 dB). A smaller gain leads to a darker image; a higher gain leads to a brighter image. The higher the gain, the higher is the noise in the image. Generally the image brightness is controlled via the integration time. The "Gain" should only be used if this is not possible. Normally, it is recommended to use the automatic gain control (AGC). With difficult lighting conditions a manual adjustment can be necessary.

4.3.4 Color
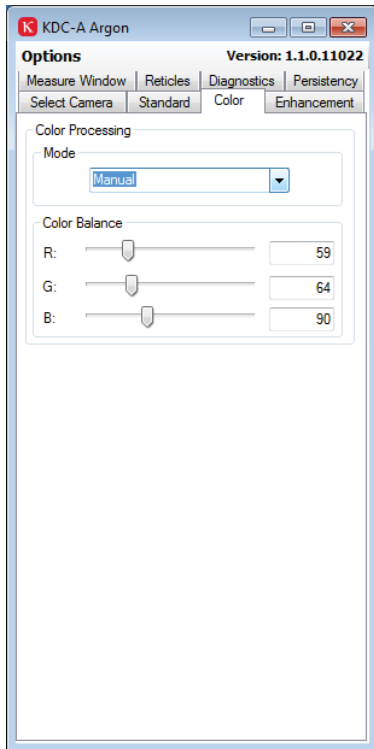
Color processing
Mode
Different modes are available for color processing.
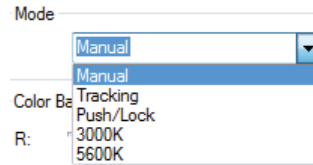
Manual
The white balance is adjusted manually with the three sliders R (Red), G (Green) and b (Blue). See below under color balance.

Tracking
A continuous white balance is performed. The camera is automatically adapted to the lighting conditions.

Push/Lock
An automatic white balance is performed and saved. For the automatic white balance direct the camera under real lighting conditions to a white surface and perform „Push". After approx. 5 seconds the white balance is completed

3000K/5600K
Select 3000 K for warm light applications (for example halogen illumination). Select 5600 Kelvin for daylight applications (sun).

Color balance
With the sliders R (Red), G (Green) and B (Blue) you can perform a manual color balance fine adjustment. For quick results it is recommended not to modify the "Green" slider.

4.3.5 Enhancement

Automatic Contrast Control
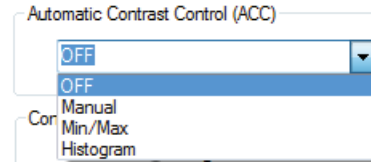
Off
Values are set to standard.

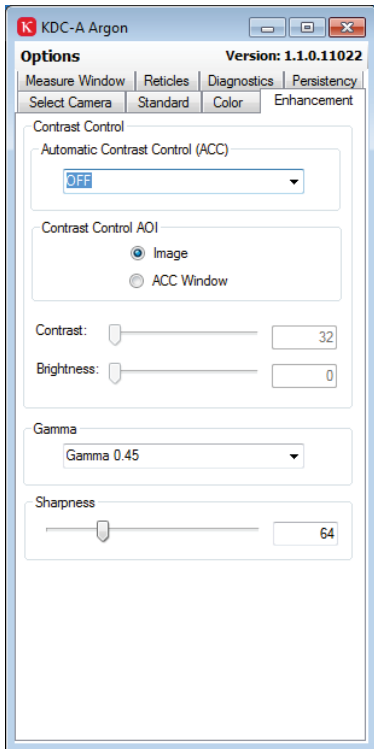**Manual**
The values for contrast and brightness can be manually adjusted with the sliders below.

MIN/MAX
Automatic control for brightness and contrast.

Histogram
Histogram equalization by analysis of brightness and contrast.

Contrast Control AOI (Area Of Interest)
Image: The adjustments of the „Automatic Contrast Control" are effective for the complete image.

ACC window: The adjustments of the „Automatic Contrast Control" are only effective for the ACC window. You can adjust size and position of the ACC window in the tab „Measure window".

Contrast/Brightness
Here you can perform manual adjustments with the sliders. The sliders are only active if "manual" is selected under „Automatic Contrast Control".

Gamma
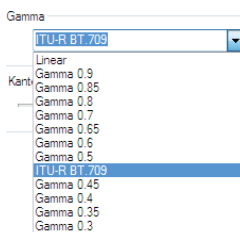
Small Gamma values enhance the dark areas in the scene compared to the bright areas and stress the details in the dark areas without overexposing the bright areas. Gamma 1 is the standard (linear).

Sharpness
The slider can be adjusted between 0 and 255. The sharpness of the image changes according to this adjustment.

4.3.6 Measuring windows
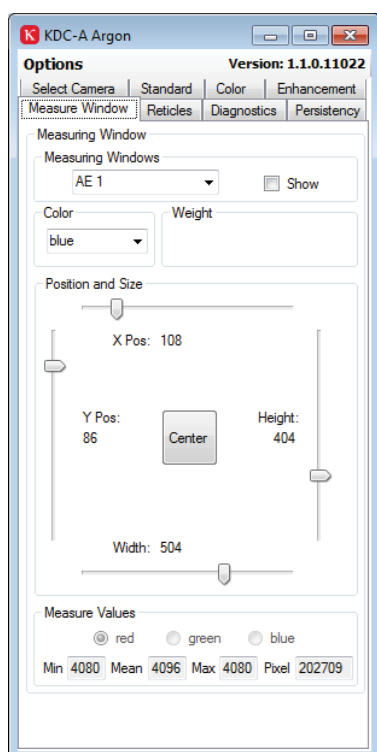
Measuring Windows

Different measuring windows are available for different automatic functions.

AE1/ AE2:   Automatic exposure time
ACC1/ACC2:   Automatic control for contrast and brightness.
AWB: Automatic white balance

AE1/AE2

The measuring windows AE1 and AE2 are effective for the automatic control of the exposure time.

ACC1/ACC2

The measuring windows ACC1 and ACC2 are effective for the automatic control of brightness and contrast. See tab **Enhancement** „Automatic Contrast Control".

AWB

The measuring window AWB is effective for the automatic white balance. See tab **Color** „Mode".

AOI

A frame without measuring function is displayed in the image, for example for marking an area of interest.

Show

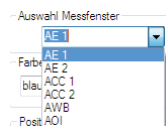If "Show" is not checked no window is displayed. Select a window and check the "Show" box to display the selected window. Only the checked window can be adjusted. If you want to display more than one window you have to check the "Show" box for the wanted windows one by one. After that "Show" remains active for all windows and you can select a window from the list for individual adjustments. You can also switch between the windows.

Color

Here you can define a color for each selected measuring window. This allows to distinguish the individual measuring windows when several windows are shown.

Weight (function to be implemented in future software version)

This function will allow a different weighting of two windows (AE1/AE2 and ACC1/ACC2).
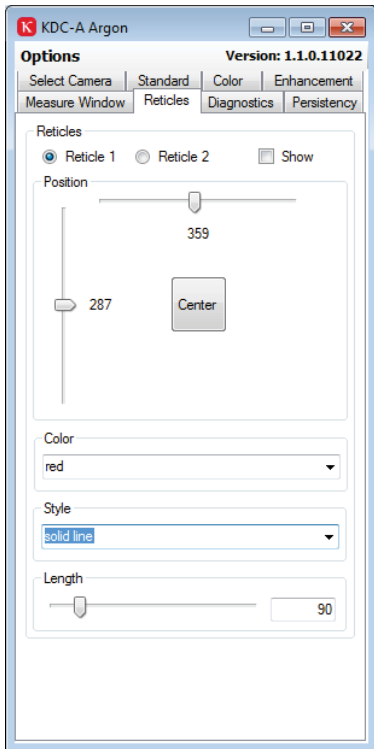
Position and Size

Here you can adjust size and position of the selected measuring window (show box is checked), or you can click on the center button to center the window.

Measure values

Display of minimum, mean and maximum values and pixels for the selected measuring window.
The "Red/Green/Blue" selection is only active for the AWB window (white balance).

4.3.7 Reticles

You can display up to two reticles and position them individually.

Reticles

Select "Reticle1" or "Reticle2" and check the "Show" box to display the selected reticle. Only the checked reticle can be adjusted. If you want to use both reticles you have to check the "Show" box for both reticles one by one. After that "Show" remains active for both reticles and you can select reticle 1 or 2 for individual adjustments. You can also switch between the reticles.

Position

Use the sliders to adjust the position or click on „Center" to center the selected reticle.

Color

Here you can choose a color for the selected reticle. You can also hide a reticle with "Off".

Style

Here you can choose if the selected reticle is displayed with solid or broken lines.

Length

Use the slider to adjust the length of the reticle.

4.3.8 Parameter
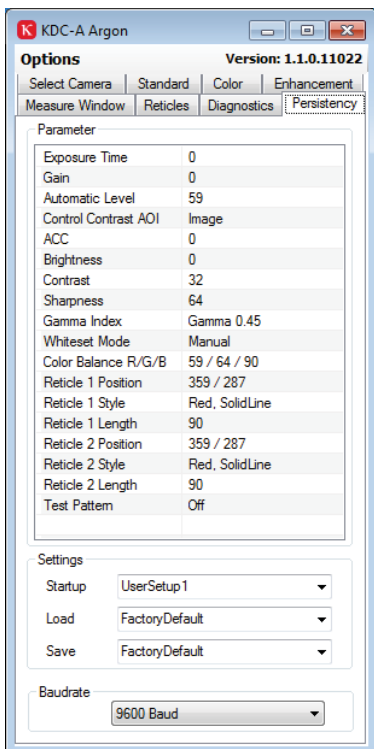
The register „Parameter" lists the current parameters of the device. In the block „**Settings**" you can save settings or load saved settings. You can also define a saved setting as start setup for stand-alone operation of the camera after a new start.

Settings
Startup

A saved setting can be defined as start setup for the camera. This setting is saved into the camera. So you can optimally configure the camera for the application and operate the camera as "stand-alone" camera (camera, analog monitor) afterwards. If no specific user setup is loaded the camera starts with the factory default at a new start.

Load

Here you can load saved profiles. So you can change the setting during operation if the camera is used with PC.

Save

The current adjustments can be saved under a user profile and reloaded at any time under „Load". To save the current adjustments open the „Save" list and select a user profile (user1 to user16). The adjustments are then saved under this profile.

Baudrate

Here you can select a Baudrate. An adaptation of the baudrate can be necessary according to the specification of your PC. The new Baudrate is only active after a new start of the KDC-A software.

4.3.9 Diagnostics
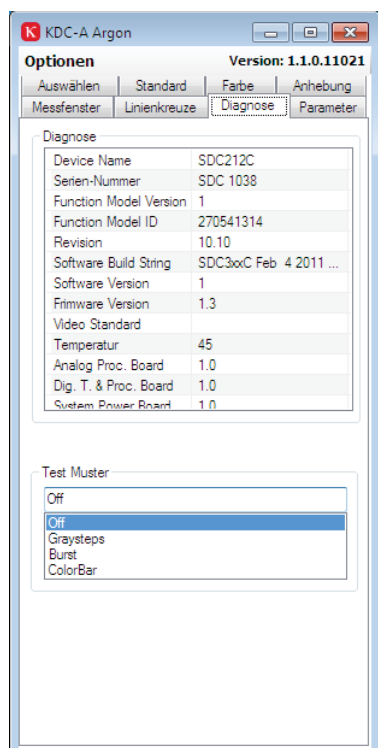
Diagnostics
This page lists important camera parameters.

Test pattern
For testing purposes the live image of the camera can be replaced by several test patterns.

5 Flange distance

The flange distance is the distance between the sensor (CCD chip) and the surface of the lens. It is 17.526 mm and is called C-mount.

The camera is fitted with a C-mount. The use of C-mount lenses guarantees the correct flange distance of 17.526 mm. TV adaptors of microscopes and endoscopes usually offer an adjustment of the flange distance.

5.1 Check and adjust flange distance (zoom lens)

The flange distance is set in the factory. If you use a lens or a TV adapter of a different flange distance, the image will be blurred. In such a case the flange distance has to be readjusted. Proceed as follows:

1. Mount the lens firmly on the camera.

2. Adjust the lens to an object in great distance with maximum zoom and focus the image.

3. Zoom to the maximum wide angle (minimum focal length) without changing the focus. When the image is displayed sharply over the whole zoom range the flange distance is set correctly. When the image becomes blurred at the minimum zoom range the flange distance has to be readjusted.

4. Loosen the 1.3 mm screw located on the bottom side of the camera until you can turn the lens mount.

5. Turn the C-mount ring slowly, without moving the lens, until the image on the monitor is sharp in the minimum focal length.

6. Repeat the procedure described above and readjust if necessary.

7. After the adjustment tighten the 1.3 mm screw.

5.2 Check and adjust flange distance (fixed focal length)

Set the lens to infinite focus and verify if the object is displayed sharply. If the object appears blurred adjust the flange distance as described above.

5.3 Check and adjust flange distance (microscope)

Verify that the dioptric adjustment of the eye-piece is set to "0". Adjust the ocular so that the object is displayed sharply. If the object appears blurred on the monitor adjust the flange distance as described above.

6 Safety Guidelines

Observe the following precautions:

- Connect the camera when it is switched off.

- Do not bend the electric and light cables in a very small radius.

- Handle the camera with care. Avoid shocks, falls and strong vibrations.

- Do not try to open the camera. It can be damaged if it is not treated or stored appropriately. There will be the risk of an electric shock.

- Do not expose the camera to water or high humidity or operate it in places where there is such a risk.

- If you direct the camera into the sun or into the beam of a searchlight, there will be an overshoot or blurring in the shape of vertical stripes in the image. This is **not** a defect of the camera and disappears immediately after turning the camera away from the light. If you direct the camera into the sun for a long time, the sensor can be damaged.

- Only operate the camera within the range of the specified values for temperature, humidity and voltage. See technical data!

- Read all safety and operating manuals before using this device and the connected instruments.

- Keep the safety and operating manuals so that you can look up things later.

- Observe all warnings on the instrument and in the operating manuals.

- Follow all instructions in the operating manuals.

- Cleaning: Pull the plug of the camera out of the socket before cleaning. Observe the cleaning instructions that are specified for your instruments.

- Only use the proper connections, other connections are dangerous for the safety of your instrument and hazardous for your own safety.

- Do not put the camera on an unstable trolley, pillar, bracket or table. The instrument could drop, be damaged and cause serious injuries.

- Supply the camera with the indicated voltage only. If you are not sure about voltage in your facilities, please ask the vendor of your instrument or the local power company.

- Cables should be arranged so that you cannot step on them and they will not be caught by things. Please pay attention to the cables at the plugs and at the sockets.

- For additional protection of the unit, disconnect the plug when you experience thunderstorms or when the unit is not supervised or used for a longer period. This helps to protect the product against damages by lightning or accidental damage.

- Do not overload the socket or the power cables. They could become hot and cause a fire or an electric shock.

- Maintain the unit only in a way described in the chapter "Maintenance". If you open or remove the covers, make sure you disconnected the power cable. Please leave all maintenance to qualified personnel.

- Defects requiring maintenance: Pull the power plug of the camera out of the outlet and leave the maintenance to qualified personnel when the following conditions occur:

  - When the cable of the power supply or the plug is damaged.

  - When liquids or objects have gotten into the unit.

  - When the camera was exposed to water.

  - When the camera does not work normally according to the operating manual.

  - When the camera was dropped or when the housing has been damaged.

- When the camera's performance is reduced.

■ Only use original spare parts. Otherwise, there can be a fire, electric shock or other dangers. Also, the warranty becomes void.

■ Safety checks: After every maintenance job or repair ask your maintenance engineer to perform safety checks to ensure that the product is in proper operating condition.

7 Repairs

Check all connections, power supply and software installation in case of problems during operation.

Please feel free to contact our support team for further information and in case of questions during installation. See www.kappa.de under "Support" for further details.

Repairs may be carried out only by Kappa or by an establishment expressly authorized by Kappa. Only use original Kappa spare parts.

If persons not expressly authorized by Kappa open the camera we do not guarantee the safety of operation of the instrument and warranty becomes void.

8 Technical data

|		
Highlight	Rugged video camera	
Video Standard	PAL/NTSC	
Sensor interline transfer CCD (optional EXview HAD)	1/2" CCD	1/3" CCD (Super HAD CCD
Pixel (H x V)	752 x 582 (PAL) / 768 x 494 (NTSC)	
Sensitivity	0.3 lux at 14 dB / 0,075 lux at max. gain (High Sensitivity Mode 0.01875 lux at max. gain) **EXview**: 0.2 lux at 14 dB / 0.05 lux at max. gain (High Sensitivity Mode 0.0125 lux at max. gain)	0.2 lux at 14 dB / 0.05 lux at max. gain
Dynamic range	> 50 dB	
System	FPGA: 12 bit, Controller 32 bit ARM7TDMI	
Resolution	440 lines (horizontal)	
Signal output / Interfaces	S-Video (Y/C), Video (composite)	
Exposure time	1/50s (PAL), 1/60s (NTSC) to 1/100 000s	
Gain	0 to 26 dB	
Adjustments	RS 232 (RS 422/485 available on request): AIT, AGC, gamma, white set, measurement window, automatic contrast control (ACC/DRE), edge enhancement, line generator, built-in test	
Firmware update	FPGA Firmware, Microcontroller Software	
Synchronization	intern/extern (composite sync.)	
Lens mount	C-Mount	
Connection	Kappa CSI, 4-pol socket for auto iris control (video)	
Power supply	9 - 36 V DC, > 3 W (lens with auto iris control according to the manufacturer specifications)	
Temperature	-20°C to +60°C	
Dimensions / Weight	50 x 50 x 63 mm (without connectors), 310 g	
Order-no.	961-3122 (PAL) 961-3122N (NTSC)	961-3133 (PAL) 961-3133N (NTSC)
Equipment / Options	PC Software camera control KDC-A, USB connection	

We are constantly checking the accuracy of the technical data. We are prepared to provide more detailed information on request.
Technical data is subject to change without notice!

9 Pin connections

Kappa CSI
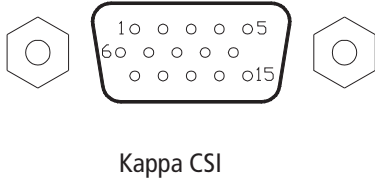
Pin	Signal	Pin	Signal
1	NC	9	GND
2	NC	10	TXD
3	NC	11	RXD
4	Y	12	NC
5	Chroma	13	NC
6	GND	14	composite video
7	GND	15	+ 9...36 VDC *
8	GND		
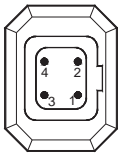
Pin	Signal	Pin	Signal
1	+ 9 - *	2	NC
3	VIDEO	4	GND

Video-Controlled Auto-Iris-Lens

* Attention: If you are using a video-controlled auto-iris lens, make sure before connecting that the voltage range of the lens corresponds to the voltage range of the camera (9-36 VDC).