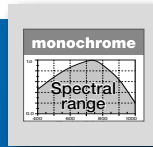
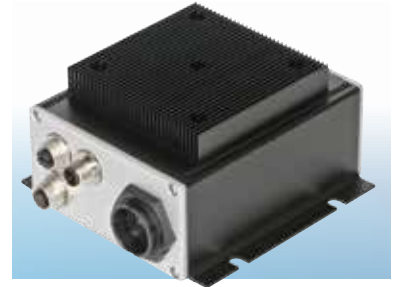


SMART CONTROL

The intelligent camera add on for stand-alone operation

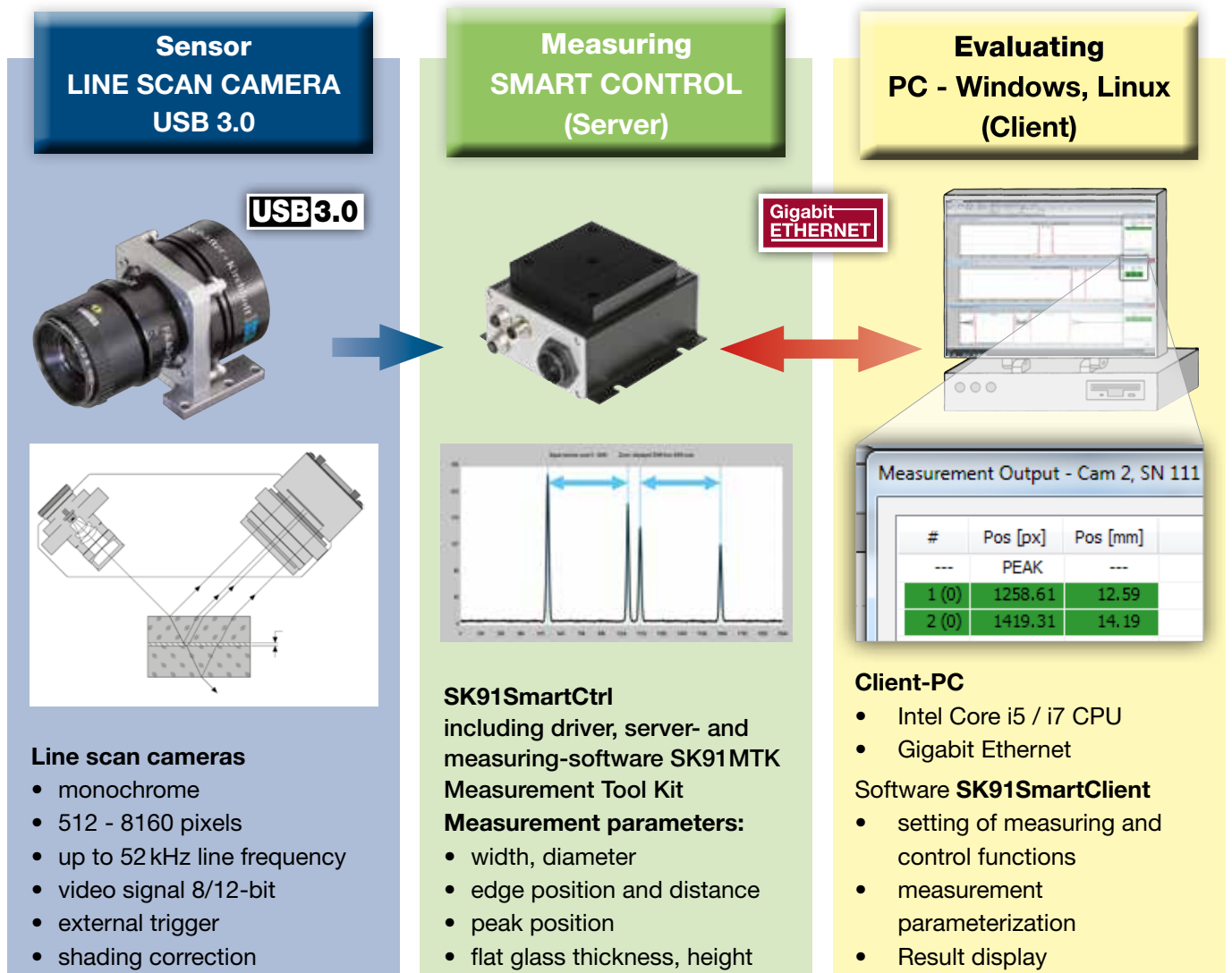


- High-performing signal- und image processing on ODROID XU4 systems with Samsung 8-core-CPU's Cortex™-A15 or Cortex™-A7.
- Extremely compact design for machine-integrated installation.
- Monochrome sensors, 512 - 8160 pixels, USB 3.0 interface.
- Client-server configuration for Ethernet based measurement data transfer.
- Client user interface for Windows 7/8/10 and Linux (Debian, Mint).



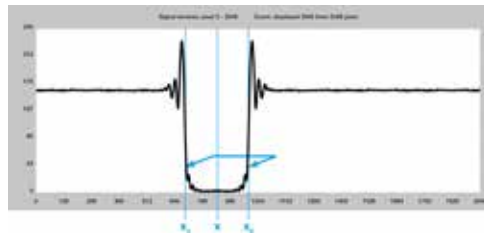
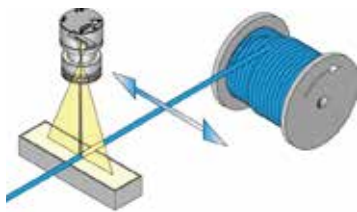
High-performing, compact, flexible - these are the key features of Schäfter+Kirchhoff's new Smart line scan camera systems. They perform as autonomous measuring unit directly attached to the machine or in close contact to the object. They are measuring widths, diameters, distances, edge or peak positions and many more values. Good-bad decisions are made according to adjustable tolerances. The optical sensor, a line scan camera, is connected by an USB 3.0 interface to the ODROID XU4 system. The Samsung 8-core-CPU Exynos 5422 series is originally implemented to smartphones. In

the SK91SmartCtrl the CPU's performance benefits value calculations with sub-pixel accuracy. System commands and requests are sent from a client computer via Ethernet and the measurement results are returned from the ODROID system accordingly. To facilitate the setup and adjustment of the sensor the server can provide complete line signals to the client in real time. The maximum distance between client and server is 100 meters. Up to 8 Smart line scan camera systems can be handled and controlled by a client. Data output from the ODROID system is also possible by CAN bus, RS232 or digital I/O.



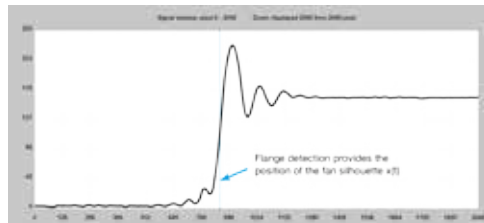
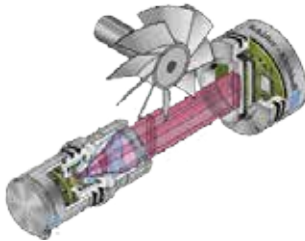
Applications

Spooling inspection of a cable reel



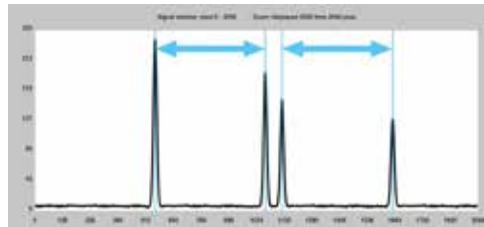
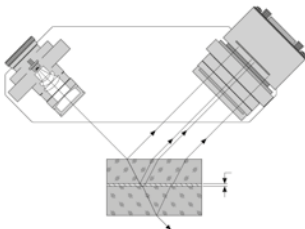
The light is blocked by the cable, creating a shadow on the sensor. The position of the cable is given by the edges of the shadow. The position measurement is used to check for the correct lateral pendulum movement during spooling.

Measuring the concentric runout of a fan



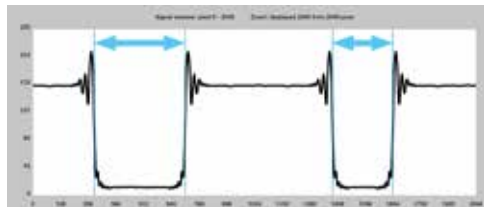
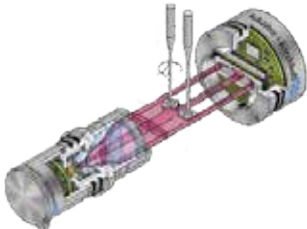
The collimated laser beam directed to the line scan camera is tangentially interrupted by the rotating fan, creating a shadow edge in the line signal. The concentricity of the rotation is calculated from the variation of the edge position.

Detecting the reflex peaks from optical boundary layers for measuring glass thickness



When light transmits from one transparent medium to another with differing refractive index, it is both partially reflected and refracted at the interface between the two media. This principle is used to measure the thickness of multi-layer glass.

Micro positioning and alignment of SMD electronic devices



SMDs require an exact positioning on the designated carrier. Tweezers rotate the components. The tweezers are located in the collimated beam of a laser line that is directed to the line sensor. The required rotational position is determined with the CCD signal of the deflecting edge.

USB 3.0 Line Scan Cameras		Order code	Pixels	Max. Pixel Freq.	Max. Line Freq.	Video Signal	Pixel Size	Active Length	Anti-Blooming	Integration Ctrl.	Dynamic Range (RMS)	Power Supply	Camera Casing	Lens Thread
		1	2	3	4	5	6	7	8	9	10	11	12	
USB 3.0	1	SK512U3SD	512	30 MHz	53.5 kHz	8/12 Bit	14 x 14 µm	7.17 mm	x	x	1: 2000	USB (400 mA)	AT1	C-Mount
	2	SK1024U3PD	1024	60 MHz	52.6 kHz	8/12 Bit	10 x 10 µm	10.24 mm	x	x	1: 2000	USB (540 mA)	AT1	C-Mount
	3	SK1024U3SD	1024	30 MHz	28 kHz	8/12 Bit	14 x 14 µm	14.3 mm	x	x	1: 2000	USB (400 mA)	AT1	C-Mount
	4	SK2048U3HA	2048	120 MHz	52.63 kHz	8/12 Bit	8 x 8 µm	16.38 mm	x	x	1: 2500	USB (650 mA)	AT1	C-Mount
	5	SK2048U3JR	2048	10 MHz	4.73 kHz	8/12 Bit	14 x 14 µm	28.7 mm	-	x	1: 1000	USB (350 mA)	AT2	M40x0.75
	6	SK2048U3PD	2048	60 MHz	27.78 kHz	8/12 Bit	10 x 10 µm	20.5 mm	x	x	1: 2500	USB (550 mA)	AT2	M40x0.75
	7	SK2048U3SD	2048	30 MHz	14.3 kHz	8/12 Bit	14 x 14 µm	28.7 mm	x	x	1: 2000	USB (450 mA)	AT2	M40x0.75
	8	SK4096U3FD-L	4096	120 MHz	27.78 kHz	8/12 Bit	10 x 10 µm	41 mm	x	x	1: 2000	+5V, +15V	AT3	M45x0.75
	9	SK5150U3JR	5148	40 MHz	7.56 kHz	8/12 Bit	7 x 7 µm	36 mm	-	-	1: 1000	USB (550 mA)	AT2	M40x0.75
	10	SK7456U3TO	7456	40 MHz	5.2 kHz	8/12 Bit	4.7 x 4.7 µm	35.04 mm	-	-	1: 1000	USB (400 mA)	AT2	M40x0.75
	11	SK7500U3TF-XB	7500	80 MHz	10.1 kHz	8/12 Bit	7 x 7 µm	52.5 mm	-	-	1: 1000	+5V, +15V	ET5	M72x0.75
	12	SK7500U3TO-XL	7500	40 MHz	5.2 kHz	8/12 Bit	7 x 7 µm	52.5 mm	-	-	1: 1000	USB (600 mA)	CT5	M72x0.75
	13	SK8160U3KO-LB	8160	100 MHz	11.9 kHz	8/12 Bit	5 x 5 µm	40.8 mm	x	x	1: 2000	+5V, +15V	AT3L	M45x0.75

Accessories and order codes

USB 3.0 Cable
for connecting a USB 3.0 line scan camera to the Odroid XU4
Order-Code
SK9020.1 1 m length
Synchronization cable
Order Code
SK9026.5 5 m length

Mounting Bracket
Order Code
SK5105
Clamping Set
Order Code
SK5101



F-Mount Lens Adapter
Order-Code
AOC-F-40
attachment thread
40 = M40x0.75



Order Code
SK91SmartCtrl
Odroid XU4 incl. driver, server- and measuring-software SK91MTK
Order Code
SK91SmartClient
Client software for **SK91SmartCtrl**

