



Augmented reality solution with the uEye XS mini industrial camera

Seventh sense in customer service

A picture paints a thousand words – true to this saying, KNAPP AG has developed an audiovisual support system, which, among other things, enables faster troubleshooting and, as a result, greater system availability during fault repair or maintenance. A futuristically designed headset with a see-through display and integrated camera is the main component of the wearable system, which provides a live connection via the cloud between the on-site service employee and experts back at the support center.

Into this headset, KNAPP has integrated one of the smallest industrial cameras on the market today — the uEye XS from IDS. This robust camera with a USB 2.0 connection weighs just 12 g, has a size of less than one cubic inch, and delivers pin-sharp images in virtually any conditions thanks to its 5 MP resolution, autofocus and all the automatic features of a standard digital camera.

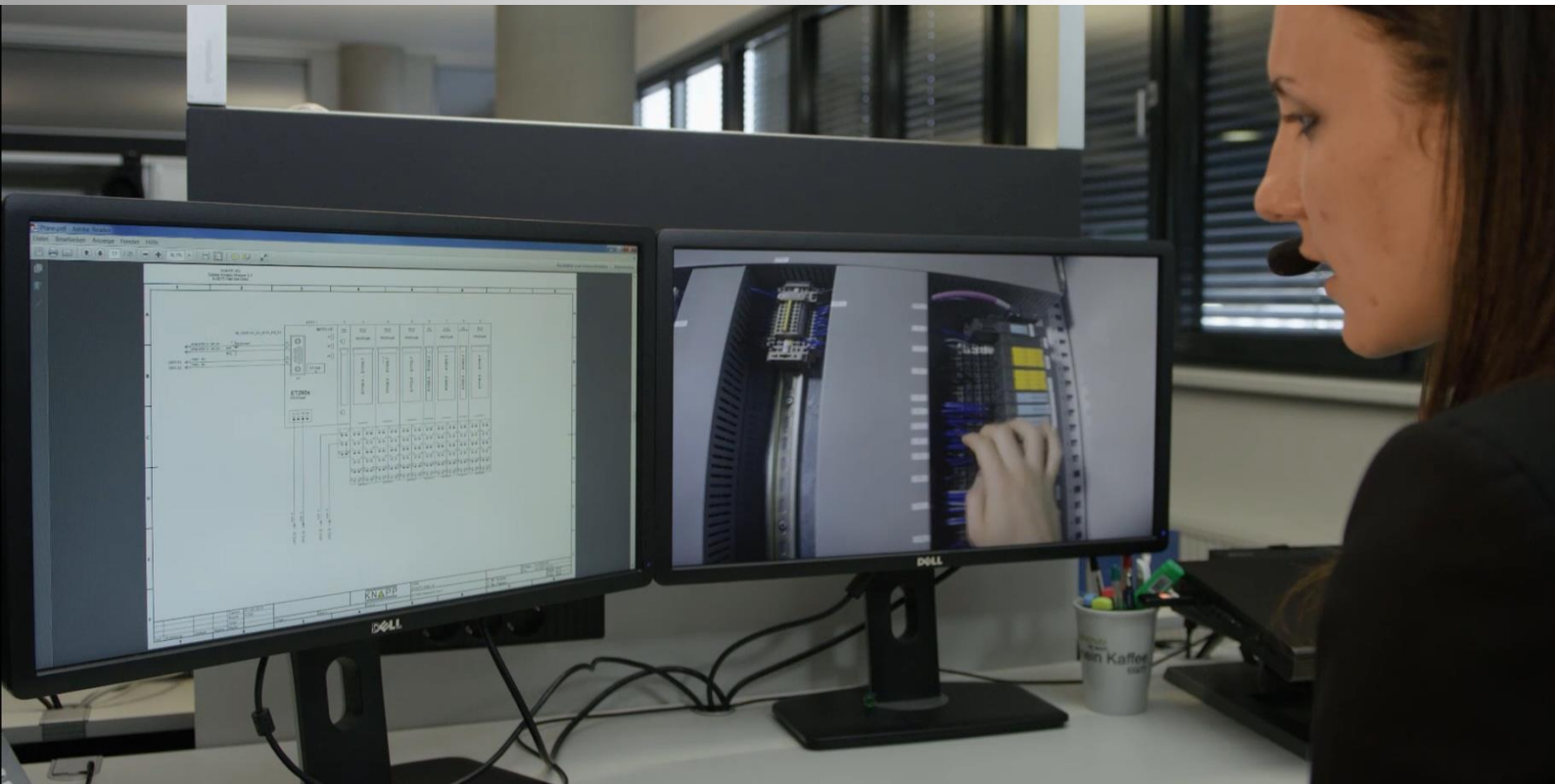
With its KiSoft WebEye system, which relies entirely on augmented reality, KNAPP is paving the way for a "seventh sense" becoming part of customer service. Reality and virtual information are blended on the headset's see-through display, enabling fast and efficient collaboration between the on-site technician and the support center.

KNAPP itself uses the system in-house to improve its support services, while also selling it on the business-to-business market. With around 2,700 employees and a turnover of more than 466 million euros, KNAPP AG, based in Hart bei Graz in Austria, is among the world's leading providers of intralogistical complete solutions and automated warehouse solutions for a range of industry sectors.

KiSoft WebEye consists of a headset complete with mini camera, a see-through display, headphones and a microphone, as well as a vest with a portable PC, battery and a wireless mini keyboard. If a KNAPP customer experiences a breakdown or requires maintenance work to be carried out, a customer service technician will get to the customer site as quickly as possible, get "hooked up" to the system and then connect to the service center at the click of a button. Thanks to the camera in the headset, the experts can then see "live" everything that the on-site technician is seeing, and can communicate with him via the microphone/headphones.



KiSoft WebEye: headset with mini camera, see-through-display, headphones, microphone and vest.



Meanwhile, the see-through display gives on-site technicians the view that hotline employees currently have in front of them in the service center, making communication even easier. The hotline employee can also make additional information, such as sketches, videos or instructions, available on the see-through display. This information is shown on the technician's KiSoft WebEye display, which means that he never has to take his eye off what he's doing, and can concentrate fully on the task in hand. Misunderstandings such as those that can occur with troubleshooting over the phone and may cause delays or even operating errors, are eliminated from the outset with this system. In addition, the camera enables the recording of system processes and of service calls, e.g. to simplify the transfer of knowledge.

For its "wearable system" and headset, which allows the service technician to work hands-free with complete freedom of movement, KNAPP needed a camera that was as small and lightweight as possible, with autofocus and offering all the benefits of an industrial camera, such as a rugged design (IP30) and long-term availability.

The uEye XS from IDS – the world-leading manufacturer of USB industrial cameras based close to Heilbronn in south-west Germany – fitted the bill perfectly. It is one of the smallest industrial cameras in the world, weighing in at just 12 grams, and is less than one cubic inch in size (approx. 23 x 26.5 x 21.5 mm). Despite its miniature dimensions, the tiny device sets new standards thanks to its autofocus feature and many automatic functions, which are usually only found in digital cameras on the consumer market.

Its USB 2.0 port, which also delivers power to the camera, allows it to be connected very easily to any PC or notebook.

The autofocus feature delivers a crisp image from distances of just 10 cm. The 5 megapixel Aptina CMOS sensor with a pixel size of 1.4 μm delivers exceptionally detailed true color images, with a choice of seven fixed image formats – from VGA to 5 MP. The mini camera also transmits live images in various sizes up to a "HD ready" resolution of 720p (1280 x 720 pixels) at 15 frames per second. A frame rate of up to 30 frames per second can be achieved at lower resolutions. The camera also boasts high-spec optics. The integrated lens has a 53° horizontal angle of view, which corresponds to a focal length of 35 mm in small image format. The wide aperture angle captures a field of view that is sufficient for many applications.

However, the many functions for automatic image adjustment are what makes the XS ideal for use in a constantly changing environment. The camera's fast image control automatically adjusts parameters such as white balance and ISO (gain) in changing light conditions.

The uEye XS also has backlight compensation to ensure correct exposure of people or objects in the foreground or if the picture is taken against the light. In indoor areas, an additional effect often occurs that has a negative impact on image quality. Artificial light sources such as light bulbs and fluorescent tubes create flicker that can be seen in the camera image. An anti-flicker feature adjusts the recording parameters for exposure time and frame rate, thereby preventing any noise from appearing in the image. In addition to an automatic setting, you can also select between the standard frequencies of 50 and 60 Hz.



With its auto focus, digital zoom plus 15 frames per second using the JPEG mode, the XS caters for the most customer demands.

Video conferencing software with single-stream technology controls the exchange of all image and audio data in the KiSoft WebEye. The video stream with 30 fps is compressed and transmitted to a server together with an audio stream. To connect the camera to the software, KNAPP uses the DirectShow interface, which, together with the Software Development Kit (SDK) and a TWAIN, ActiveX and GenICam interface, is included in the camera package.

With DirectX, the Windows operating system offers many options for direct and easy integration of multimedia devices. The DirectShow component is the relevant interface for cameras. With the latest version of the DirectShow interface, IDS also offers a universal connection option for its entire range of industrial cameras. This option supports virtually all functions contained in the Software Development Kit (SDK). This is a particularly useful function because, in addition to many consumer-oriented programs, all standard software packages from the machine vision area support the DirectShow interface. These include, for example, LabVIEW and Streampix. Integration of the camera via DirectShow is very popular in the non-industrial area of machine vision in particular.

The range of possible applications includes everything from interactive billboards with high-resolution cameras to the application in amusement parks or in assistance robots. This interface is also used in some cases in the medical area, as well as in professional apparatus engineering and in the conventional industrial sector.

Thanks to the mini industrial camera's extensive automatic functions, you can avoid having to adjust any settings in most cases. However, each individual parameter in the tiny camera can be changed manually if necessary using the Software Development Kit supplied. More than 140 programming functions enable access to all properties and performance features of the camera. The software package also includes many sample programs, including source codes and a useful tool for testing the camera and detecting the ideal settings.

Interface: USB 2.0
Sensor type: CMOS
Manufacturer: Aptina
Frame rate: 15 fps
Resolution: 2592 x 1944 Px (5 MP)
Shutter: Rolling shutter
Optical class: 1/4"
IP code: IP30
Dimensions: ca. 26,5 x 23 x 21,5 mm
Weight: ca. 12 g
Power supply: USB cable



Very small, really easy, just ingenious:

the uEye XS

Customer

KNAPP AG operates internationally in the field of warehouse automation and warehouse logistics. The company is a global market leader among suppliers of intralogistic complete solutions and automated warehouse systems. Customers from all over the world in sectors such as pharmaceuticals, fashion, retail, food and industry rely on the experience and innovative power of KNAPP AG.



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