

# Sharpens your view

**LiXplore® – digital camera-  
monitor systems for your  
mobile working machine**

**LIEBHERR**

**Components  
Electronics**





## LiXplore® Clear view

**A clear view - an ideal situation for operators of large and complex machines such as agricultural and forestry machinery, excavators or municipal vehicles. Nothing restricts the field of vision more than a complex and compartmentalised structure of the mobile machine.**

Demanding environmental conditions such as changing light conditions, vibrations and temperature differences do the rest. Efficient working? A mistake. But not only that. In the worst case, inadequate visibility can lead to serious damage to property and personal injury.

With digital camera monitor systems from Liebherr, you are on the safe side. They provide drivers with the best possible support in the challenge of recognising people and objects in the working environment safely and in good time – and thus avoid accidents.

The sharper the camera image, the easier and more pleasant the driver's work becomes. Whether as a vision solution for reversing and side areas or as a 360° all-round vision system – our digital camera systems offer greater work safety and comfort.

They have not only been developed for original equipment: Our fully digital camera monitor systems are suitable for both newly constructed and existing machines.

With LiXplore® Detect, this level of safety is further increased: the AI-based assistance function automatically recognises people in the immediate working environment and warns them with a visual signal – for even greater safety when working.

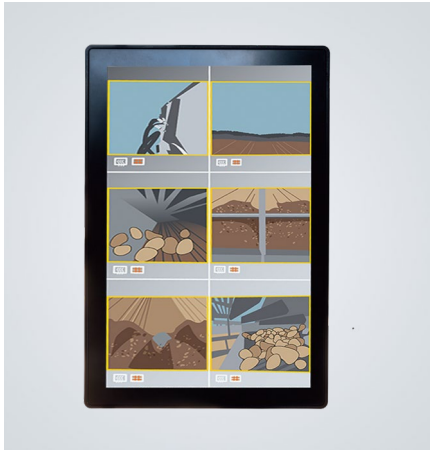
For you, this means lower costs, greater efficiency – and increased safety for everyone involved.

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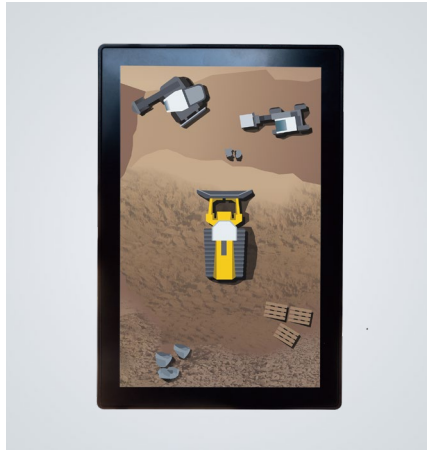
# At a glance **LiXplore®**

## Camera systems



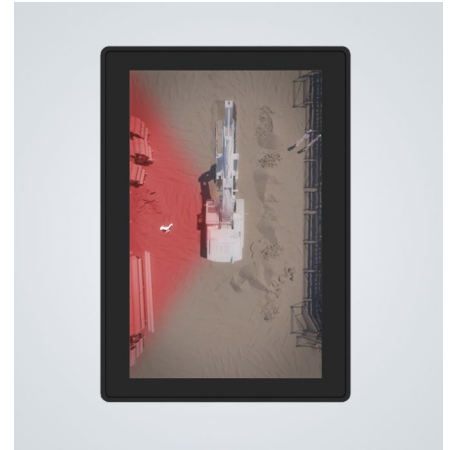
### LiXplore® CMS

The digital camera-monitor system can be flexibly equipped with up to six cameras, providing the driver with a significantly extended field of view.



### LiXplore® Bird's Eye

The digital 360° surround view system can be used to display a seamless bird's eye view for the driver – by seamlessly merging the images from four digital cameras into one view in real time.



### LiXplore® Detect

With LiXplore® Detect, the CMS and Bird's Eye camera systems are enhanced with an AI-based person detection function – available soon.

## Systems in comparison

	LiXplore® CMS Camera-monitor system	LiXplore® Bird's Eye 360° surround view system
<b>Number of cameras</b>	1-6	4
<b>Field of view (HFOV)</b>	120° , 150°	150°
<b>Display sizes</b>	9 inch , 12 inch	9 inch , 12 inch
<b>Views</b>	Gallery mode Single cam	Topview Single view
<b>Overlays</b>		✓
<b>Assistance function LiXplore® Detect</b>	✓	✓





## Safe all round

# **LiXplore<sup>®</sup> CMS**

With the increasing size and complexity of mobile machinery: for example, due to add-on or front components – conventional mirrors quickly reach their limits. People and objects in the direct working area can often no longer be reliably detected.

The LiXplore<sup>®</sup> CMS digital-camera monitor system offers a pioneering solution here. It can be flexibly equipped with up to six cameras and specifically extends the driver's field of view – for greater safety and efficiency in daily use.

- High-resolution monitoring of work areas thanks to proven, robust components
- Daisy-chain cabling for minimal installation effort
- Integration of up to six digital cameras possible
- Controlled via a display controller



360° at a glance

# **LiXplore® Bird's Eye**

LiXplore® Bird's Eye offers drivers a 360° surround view of their machine's working environment by combining the individual images from four high-resolution digital cameras into a seamless overall picture. The system eliminates blind spots and ensures that no objects disappear, giving drivers full control of their machine and surroundings at all times.

Thanks to minimal latency, obstacles, employees and potential hazards are displayed in real time, enabling fast and safe reactions.

- Optimum visualisation of the working environment in the cab thanks to seamless stitching
- Time savings thanks to simple system calibration
- Cost savings thanks to the control unit (ECU) already integrated in the display
- Crystal-clear images in any lighting situation
- Robust components for demanding environments



# The structure

**The LiXplore® Bird's Eye with the MDC3 usually consists of:**

- four digital cameras
- a display controller with an intuitive graphical interface

**The LiXplore® Bird's Eye with the MDC4 usually consists of:**

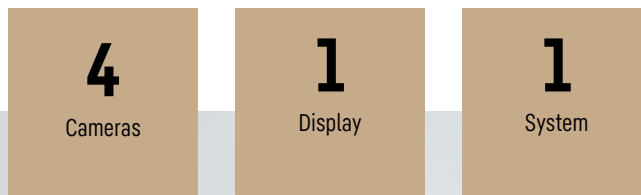
- four digital cameras
- a display controller with an intuitive graphical interface
- an ethernet switch

## Did you know?

The system has already proven its robustness.

The individual components are in daily use on construction sites all over the world and under the most demanding environmental conditions.

We would be happy to test the implementation on your machine.



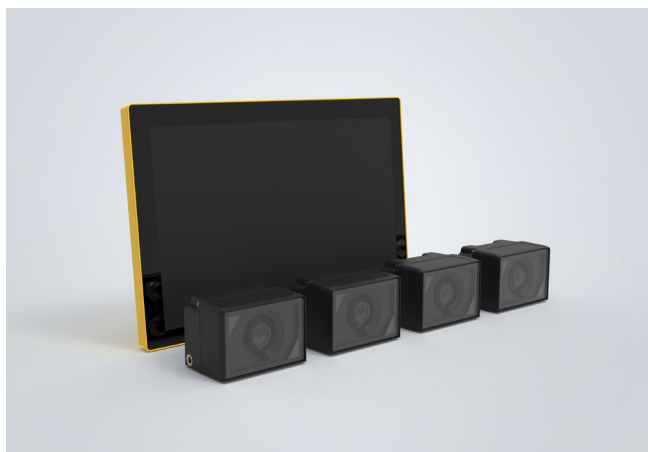


LiXplore®

# Digital cameras for every challenge

## **MDC3 digital camera: Reliability in all lighting conditions**

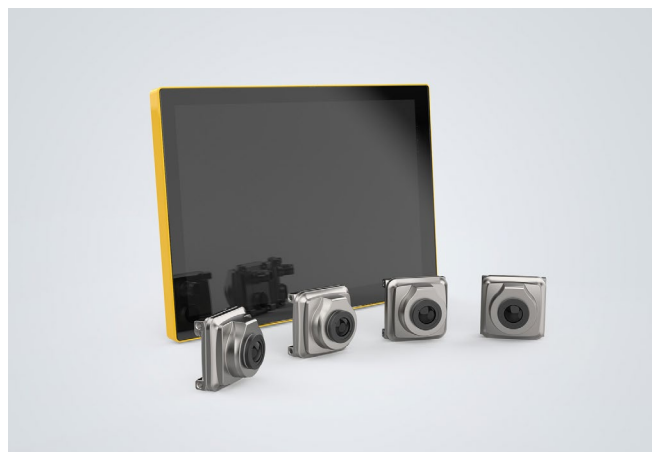
The third generation of digital cameras has already proven itself in numerous applications, impressing with its ability to adapt quickly to changing lighting conditions. Thanks to its intelligent algorithm, light-dark transitions are processed quickly and reliably. compensated for, while the integrated high-performance imager ensures clear HD images (1280 x 960 pixels), even in extremely dark conditions, with residual light sensitivity of 1 millilux. This digital camera is the ideal solution for mobile applications where precise vision in all lighting conditions is crucial.



[TO THE WEBSITE](#) →

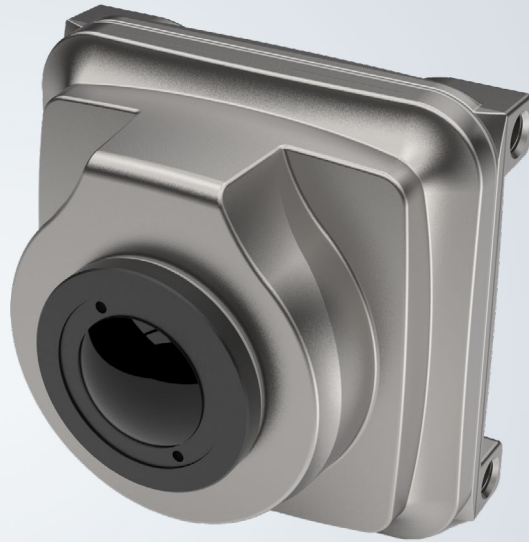
## **MDC4 digital camera: The next level of image quality**

Building on the strengths of the MDC3, the fourth generation offers even higher resolution, faster image processing and advanced sensor technology. With an impressive 2-megapixel resolution, the MDC4 digital camera delivers exceptionally detailed images and enables even more accurate recognition of people and objects, even from greater distances. The camera is highly robust and reliable in all conditions, from heat to ice and snow. What's more, it is AI-ready, making it ideally prepared for future driver assistance functions.



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# MDC4 digital camera



The fourth generation of digital cameras sets new standards for mobile machinery. It has been specially developed for the challenging requirements of a wide range of industries - from agriculture and forestry to construction, heavy goods and municipal vehicles.

Thanks to high-resolution 2-megapixel technology, the MDC4 digital camera delivers precise images at all times, even under extreme conditions such as heat, rain, snow or ice. People and objects are reliably captured - even from a great distance.

The MDC4 combines robustness and image quality to create a high-performance solution that sustainably increases safety and efficiency.

## Outstanding image quality



Full HD resolution of up to 1920 x 1080 pixels for a clear view in any situation.

## Maximum robustness



Thanks to the robust die-cast zinc housing, the camera is designed for extremely harsh environmental conditions.

## Clear view



Active heating of the lens for crystal-clear images even in frosty conditions.

## Built for the future



Future-proof: Developed for viewing, sensing and perception applications.



# Display controller DC5+

Even in extreme operating conditions, the DC5+ display controller with i.MX 8M+ processor guarantees a consistently precise overview of the surroundings.



1.280 x 800  
px  
resolution

i.MX 8M+  
processor

9" or 12"

# Functions at a glance

The LiXplore® Bird's Eye digital 360° all-round vision system offers a comprehensive bird's eye view. The following functions show how the system supports drivers in the safe and efficient operation of mobile machines – from automatic calibration and AI-based person recognition to flexible display options.

## 01

### Autocalibration

After a one-off basic configuration per machine type, all other machines of the same machines of the same type can be calibrated in a very short time.

Four printed calibration mats in the overlap area are sufficient  
No time-consuming measurement of mats or camera positions required  
Progress is conveniently shown via a bar chart on the display  
Calibration complete and system  
immediately ready for use

Watch the video to see how quick and easy the calibration process is.

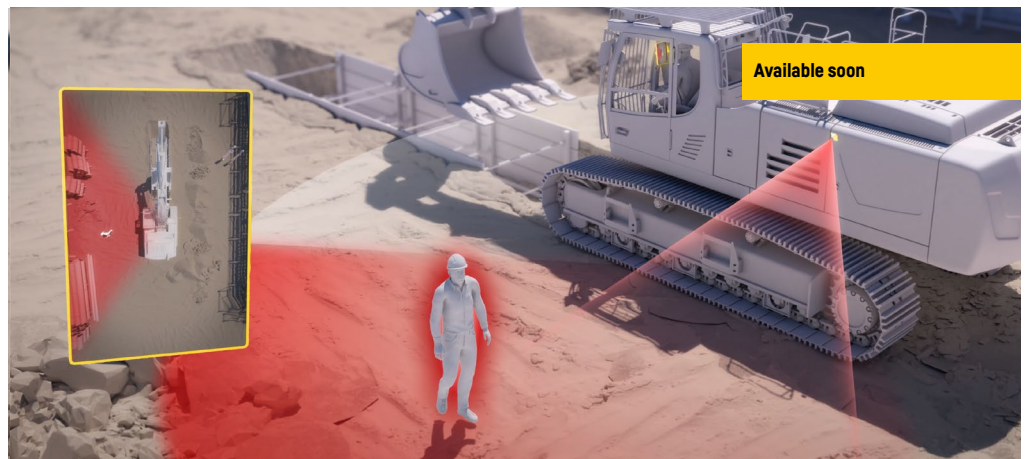


# 02

## LiXplore® Detect

Detect hazards at an early stage thanks to AI-based person detection: The LiXplore® Detect assistance function recognises people in the individually defined danger zone at an early stage. If one or more people approach this area, the machine operator receives a visual warning.

Potential risks are recognised in real time and accidents are proactively prevented – for greater safety every time the machine is moved.



# 03

## Free-Flight mode

With the Free-Flight mode, you can control the camera image more easily than ever before. Use multi-touch gestures to navigate intuitively through the 360° view – move, pan, rotate or zoom – completely freely, without fixed zoom levels or predefined perspectives. In a matter of seconds, you can enlarge relevant image sections or switch effortlessly between different views. This allows you to maintain an overview at all times and find the perfect perspective in no time at all – simply, quickly and precisely.



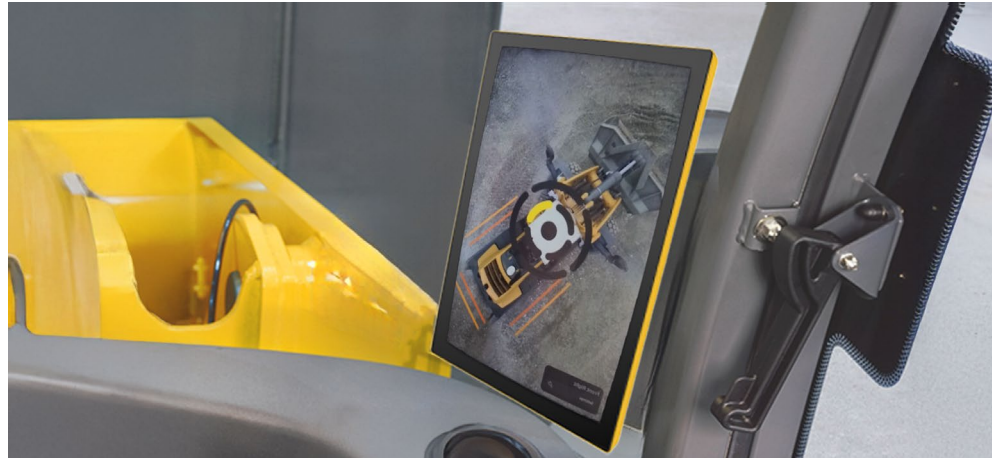


# 04

## Detailed view

In addition to the 360° top view, various detailed views can also be predefined. Switching between the views is done intuitively via the touch display.

This allows the driver to quickly gain detailed insights into individual areas.



# 05

## Overlays

Customised overlays provide the driver with additional information:

- Illustration of a close range
- Indication of the maximum possible working range
- Marking of a maximum swivelling range



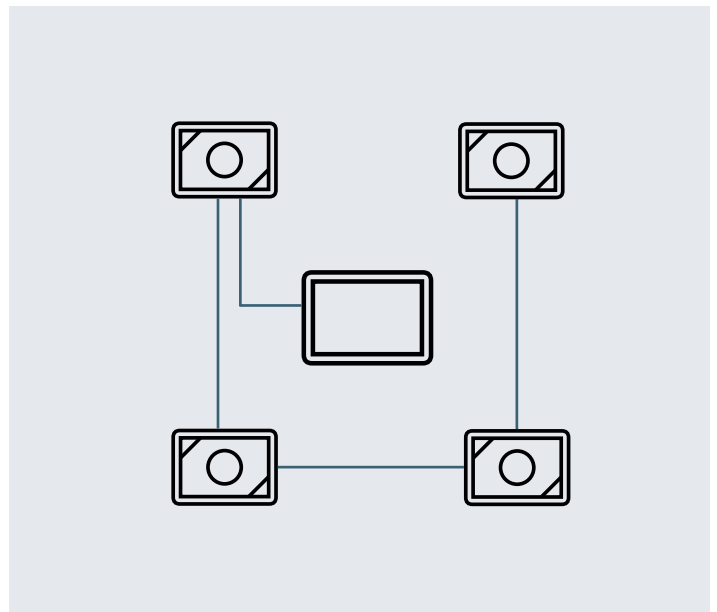
# Simple system architecture

## LiXplore® Bird's Eye

- Simple system design, frugal cabling
- Uncomplicated auto-calibration without time-consuming measurement of the mats
- The digital cameras enable better image quality with more details and optional detailed views

## LiXplore® Bird's Eye – MDC3

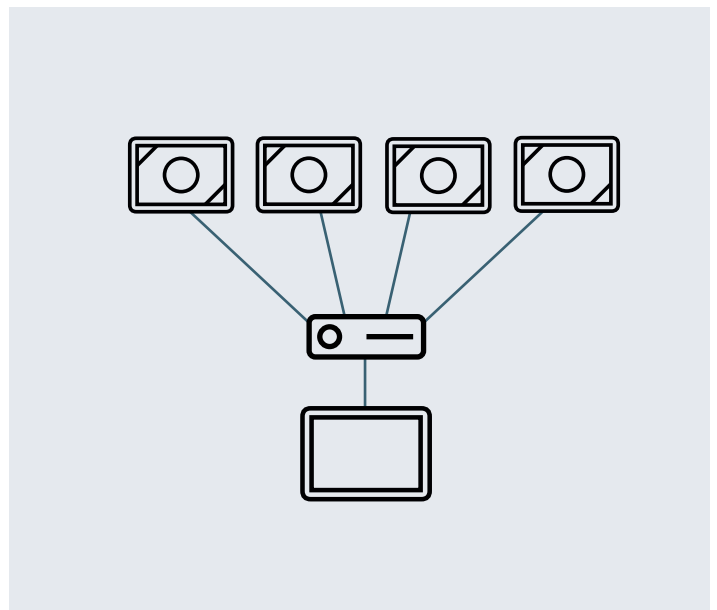
The system can be set up with MDC3 digital cameras in either line or star topology. In both variants, no additional Electronic Control Unit (ECU) is required as the stitching algorithm is executed directly on the display controller.



## LiXplore® Bird's Eye – MDC4

The system with MDC4 digital cameras is based on a star topology. All cameras are connected directly to a central Ethernet switch, which forwards the image data to the display controller.

A separate electronic control unit (ECU) is not required, as the stitching algorithm is executed directly on the display controller.



# All advantages at a glance



## Proven components

LiXplore® Bird's Eye relies on full HD image quality with the MDC4 digital camera. This enables important details to be displayed in the cabin - even in poor lighting conditions.



## Time-saving auto-calibration

The uncomplicated calibration ensures that the system is quick and easy to use.



## System architecture

LiXplore® Bird's Eye enables a simple system architecture. Connecting the components via daisy chain reduces the amount of cabling required. The DC5 display controller also eliminates the need for an additional computing unit (ECU).



## Robustness

All LiXplore® Bird's Eye components are designed for demanding applications. The cameras and displays prove their worth every day around the world in industries such as construction, agriculture and mining.



## Stitching

Seamless stitching without duplicate or disappearing objects ensures an optimum display of the working environment in the cabin - for maximum focussed work. The stitching algorithm is integrated in the DC5 display controller.



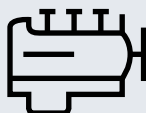
# Liebherr Components

From A to Z – the components division of the Liebherr Group offers a broad range of solutions in the area of mechanical, hydraulic, electric and electronic drive system and control technology. The efficient components and systems are produced at a total of ten production sites around the world to the highest standards of quality. Central contact persons for all product lines are available to our customers at

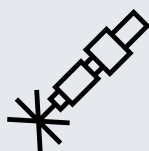
Liebherr-Components AG and the regional sales and distribution branches.

Liebherr is your partner for joint success: from the product idea to development, manufacture and commissioning right through to customer service solutions like remanufacturing.

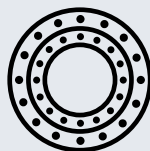
[components.liebherr.com](https://components.liebherr.com)



Engines



Fuel injection systems



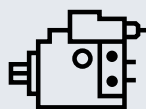
Slewing bearings



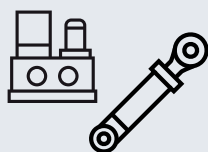
Gearboxes



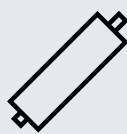
Winches



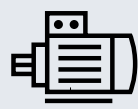
Hydraulic pumps and motors



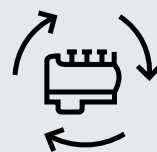
Hydraulic cylinders and power packs



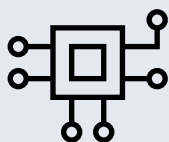
Piston accumulators



Electric machines



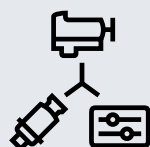
Remanufacturing



Industrial electronics



Electrical drive and control technology



Drive systems



Aerospace electronics



Fibre composite

# LIEBHERR

Liebherr-Components AG · Brown Boveri Strasse 7 · 5400 Baden, Switzerland  
+41 56 296 43 00 · [components@liebherr.com](mailto:components@liebherr.com) [www.liebherr.com](http://www.liebherr.com)