MoTec ®
Heavy-Duty Camera Solutions

AMETEK ®
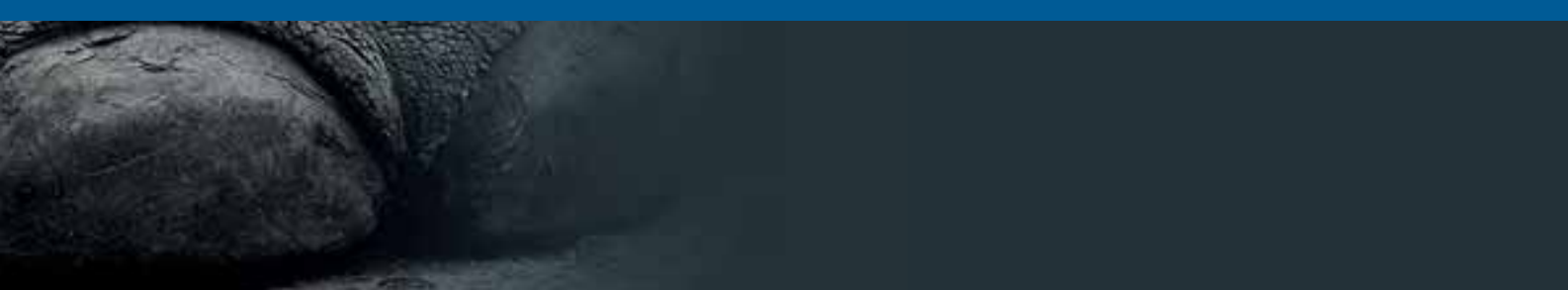
Forklift truck

Motec Camera Monitor Systems
for Logistics, Harbour and Industrial Applications

MOTEC HEAVY-DUTY CAMERA SOLUTIONS

Motec specializes in the development and production of camera-based driver assistance systems for utility vehicles and mobile machinery.

Motec protects lives by making mobile machinery and their surroundings safer. Its cameras make operaters' work easier by reducing stress and uncomfortable physical movements. And, it helps companies become more successful by accelerating processes and avoiding damage.

Motec has over 25 years of experience in the construction and manufacture of robust, reliable mobile cameras, including the associated electronics.

Its product range includes reversing cameras, industrial cameras, displays, advanced video controllers, DVRs, customer-specific wiring looms, and wireless video transmission solutions.

Motec's customers ar leading OEMs of utility vehicles and mobile machinery for industries working in tough environments.

At its development center for utility vehicle assistance systems (MENAS) Motec develops, tests and validates software algorithms for customized driver assistance systems. Its suite of algorithms incorporates solutions for real-time image processing, aerial view projection, sensor fusion (e.g. cameras, ultrasound sensors, radar sensors, lasers), stereo view, image processing and driver assistance systems.

Motec is a unit of AMETEK Inc. a leading global manufacturer of electronic instruments and electromechanical products.

Motec camera monitor systems for the logistics area

Motec camera monitor systems support the operator of large and complex vehicles to move them safely and more efficiently, regardless of the vehicle's size. With the assistance of extremely robust heavy-duty cameras, the operator can detect people and objects within the machine's danger zone before it is too late. This way, Motec systems save lives, make working conditions easier, and save costs.

Technical service – guaranteed fast support
Top quality means also top service. When faced with difficult technical challenges or questions that need answers, Motec can assist. Its sales and engineering departments work hand in hand. Customers benefit from efficient communication with no red tape. Motec engineers understand customers processes, know what they need and can find a solution quickly.

Hotline
Phone +49 6433 9145-9888
Fax: +49 6433 9145-9877
motec.service@ametek.com

115°
100°
90°
70°
40°
20°

Robust modular hardware and intelligent software

▪ High housing protection class

▪ Shock- and vibration-resistant

▪ High temperature range

▪ Modular components

▪ In-house cable production

▪ Digital technology for superior image quality

▪ Development, validation and integration of algorithms

▪ Real-time image processing

▪ Top view projections 270°/360°

▪ Sensor fusion (ultrasound/radar)

▪ Stereo cameras (object detection)

▪ Driver assistance system (collision warning)

Contents

Reach trucks
Fork-mounted camera

The loading and unloading of extremely long and deep loads in the warehouse requires precision and the driver's careful attention. A fork-mounted camera makes it possible to monitor both forks.

In order to avoid the installation of cables inside the mast, a wireless system can be installed. Digital signals provide the image transmission from camera to monitor across short or long distances. Several unit pairs operated in parallel allow high flexibility for the adaptation to a variety of forklift and visualisation problems.

The fork camera on the reach truck allows the view onto both forks.

EXAMPLE OF SYSTEM:
Fork-mounted camera
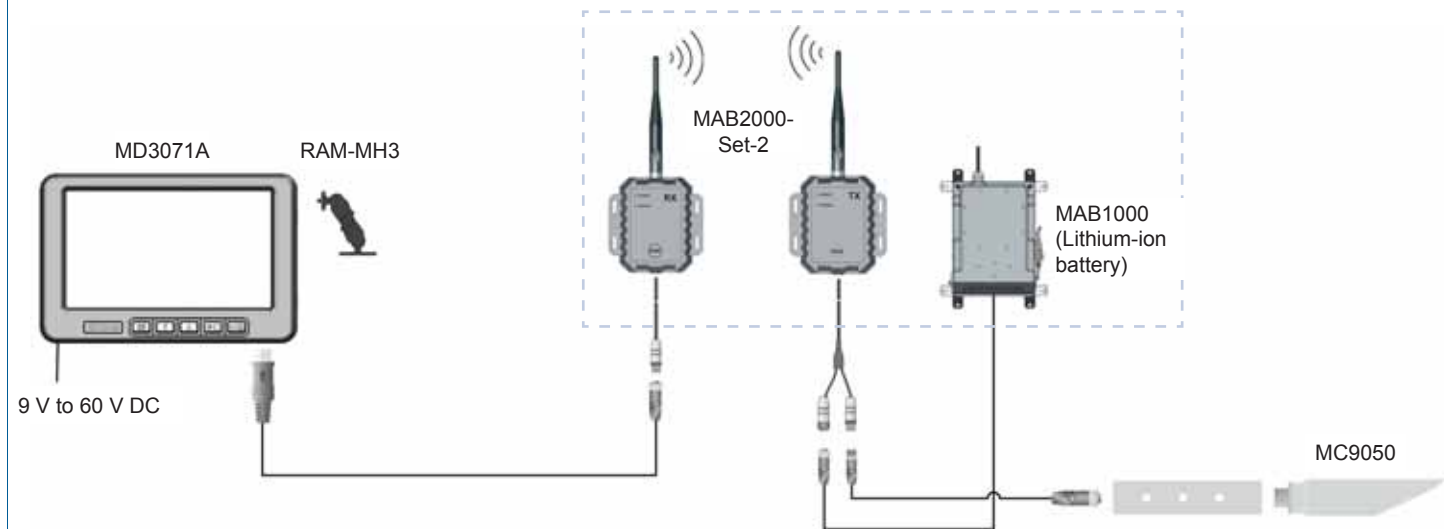
MD3071A Heavy-duty 7" monitor	MAB1000-Set-2 (incl. batteries) Digital wireless system	MC9050 Fork-mounted camera
1	2	3

MD3071A   RAM-MH3

MAB2000-Set-2

MAB1000 (Lithium-ion battery)

9 V to 60 V DC

MC9050

Reach trucks
Fork shank camera

Compared to the add-on fork-mounted camera, the rugged and compact MC9150 is mounted to the back of the fork. This provides the best protection for the camera against shocks and impacts. The 3 mm pinhole lens is also protected to prevent damages caused by pallet cages or pallets due to a pinhole opening.

The 50° angle of view provides an unobstructed view onto both forks facilitating the loading and unloading of goods.

Increased safety when used at high lifting heights and in poorly visible positions, thanks to Motec camera systems.

Protected installation position of the fork shank camera.

EXAMPLE OF SYSTEM:
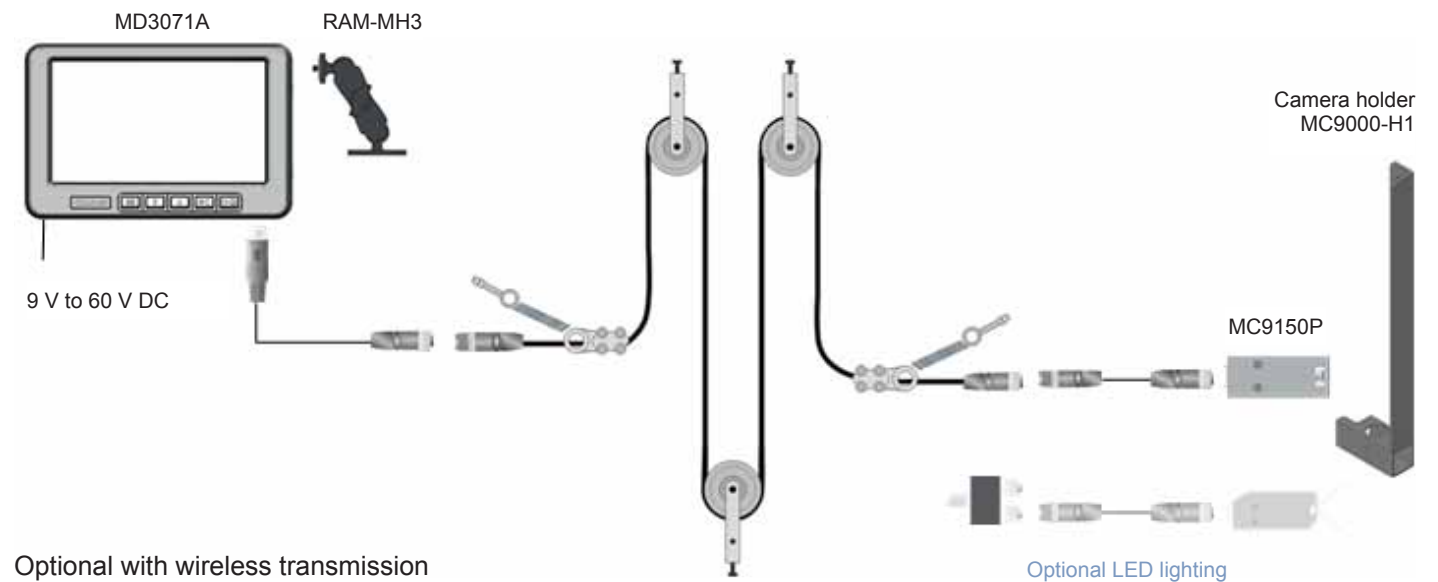## Fork shank camera
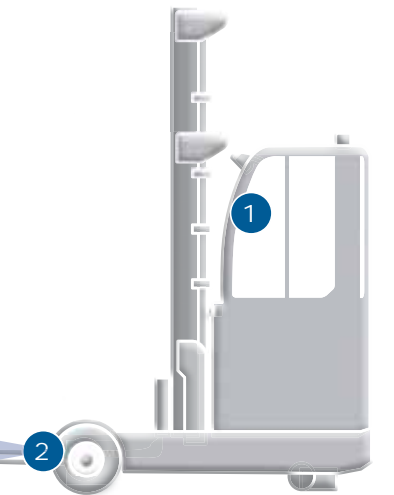
MD3071A Heavy-duty 7" monitor	MK554 Mast cable	MC9150 Fork shank camera

MD3071A   RAM-MH3

Camera holder
MC9000-H1

9 V to 60 V DC

MC9150P

Optional with wireless transmission

Optional LED lighting

Reach trucks
Duo camera system

2 cameras, fixed to the inside mast, also allow the view to the outer right- and left-hand side of the pallet. Both camera images are displayed simultaneously on the monitor (split-screen mode).

The operator can visualise both forks and can see the area below and to the side of the forks or load.

Cameras allow simultaneous viewing of the outer left- and right-hand side of the pallet.

8 9
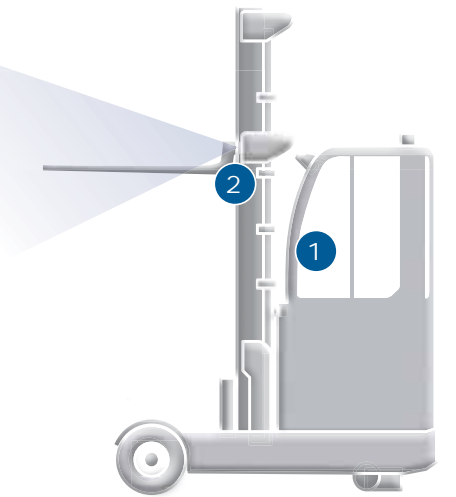
EXAMPLE OF SYSTEM:
Duo camera system

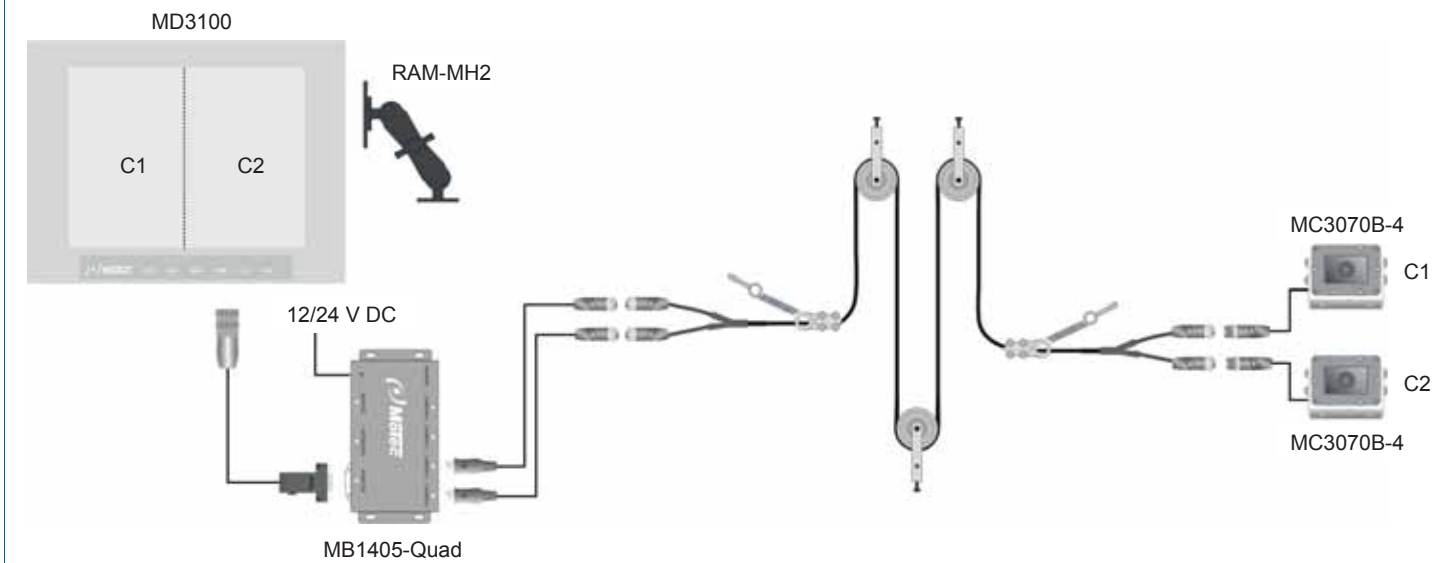| MD3100 Heavy-duty 10,2" monitor	MB1405-Quad Video control unit	MK701 Duo mast cable	MC3000B Heavy-duty camera
1			**2**

MD3100

RAM-MH2

C1   C2

12/24 V DC

MB1405-Quad

MC3070B-4   C1

MC3070B-4   C2

Optional with wireless transmission

High rack stackers
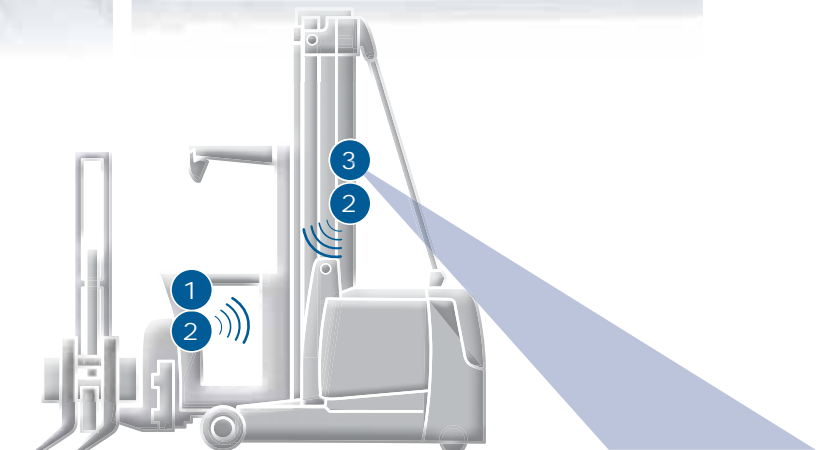## Rear view monitoring

High rack stackers use a camera that is attached to the rear mast. The camera is activated automatically as soon as the driver engages the reverse gear. This way, people and objects behind the forklift truck are detected in time and accidents are avoided. This makes it also easier to judge distances to stored goods and racking so that material damage is less frequent.

Ergonomic advantage: the driver sees the rear area without having to turn around, which protects the driver's back and neck.
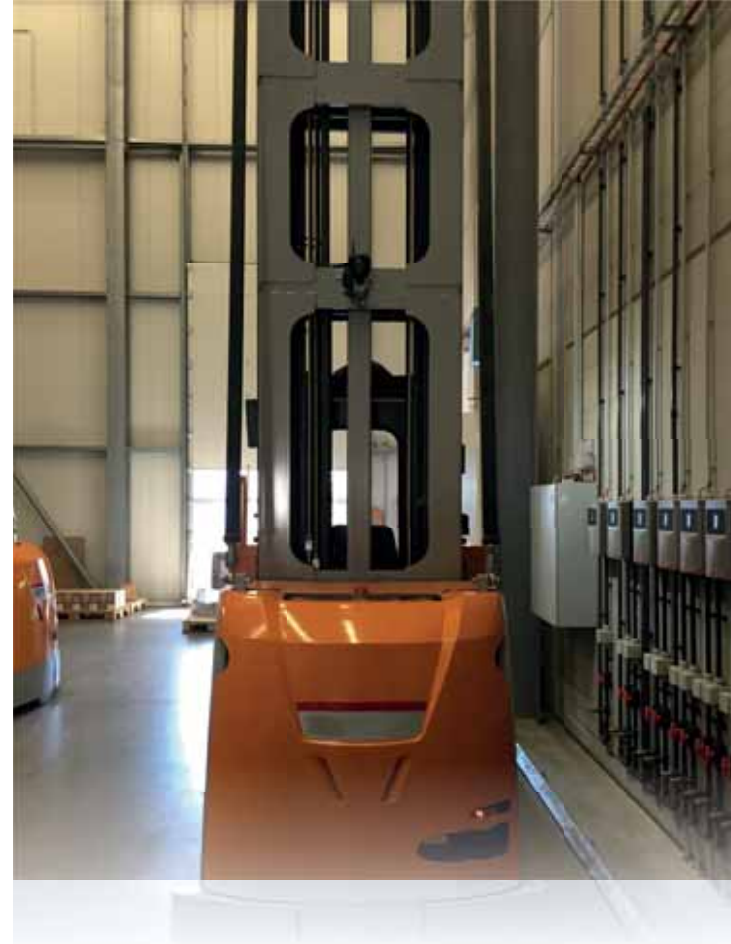
Camera mounted to the rear mast.

10   11

EXAMPLE OF SYSTEM:
Rear view monitoring

MD3071A **Heavy-duty 7" monitor**	**KIT-MVRD1000** **Digital wireless system**	**MC7000P** **Heavy-duty camera**
1	2	3

MD3071A   RAM-MH3

9 V to 60 V DC

KIT-MVRD1000

MC7115P-4-E

9 V to 32 V DC
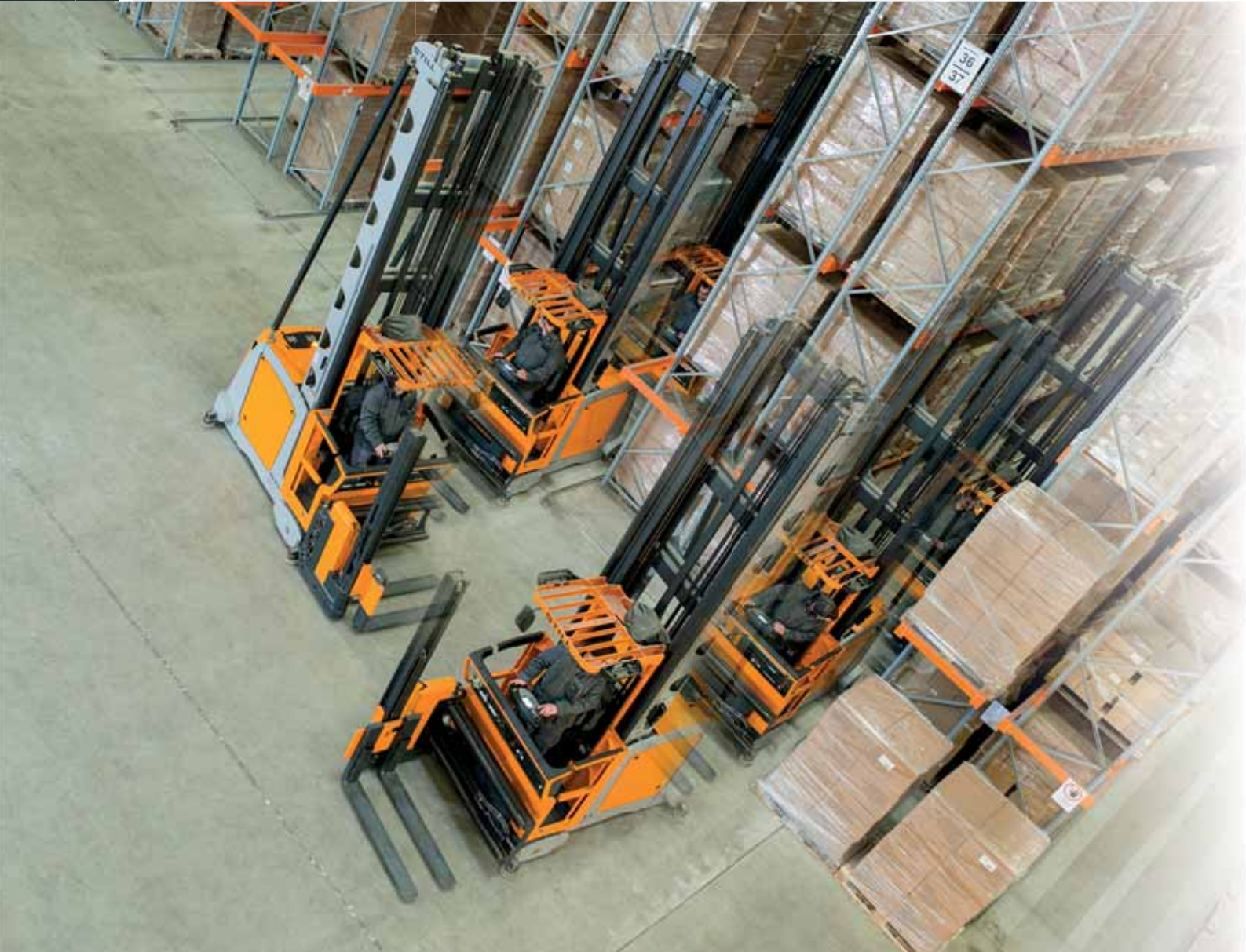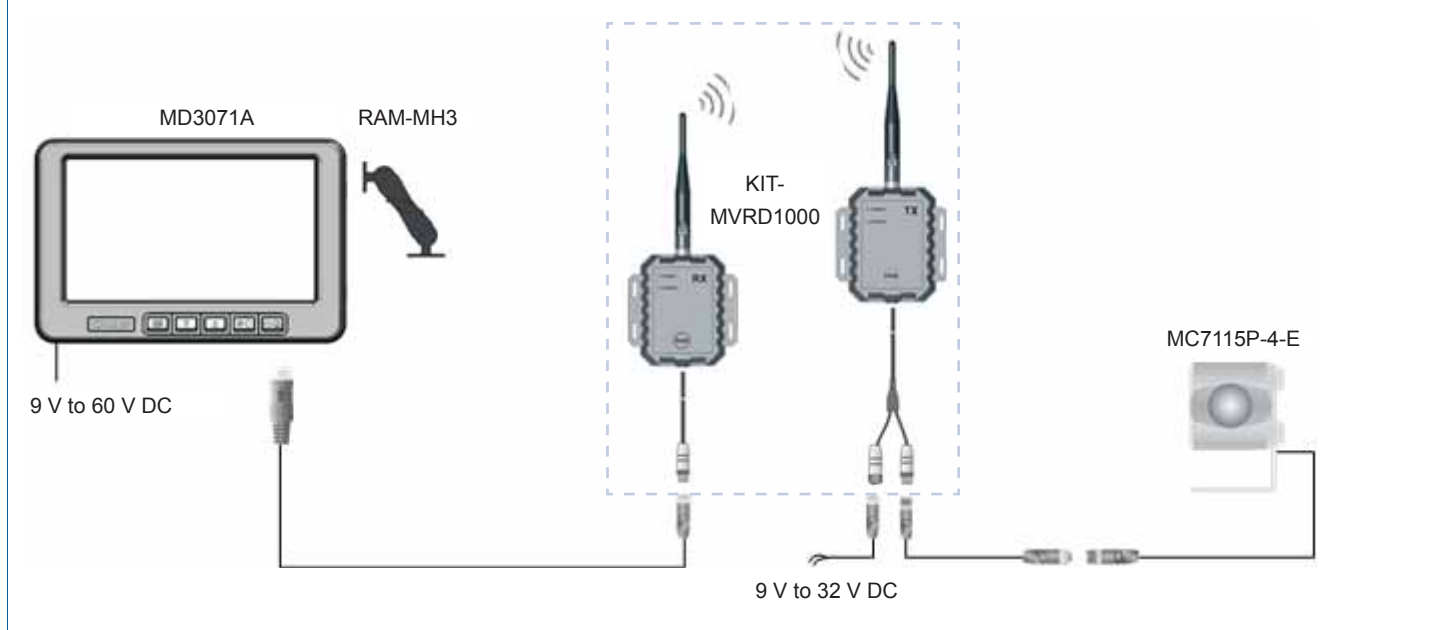
Forklifts
Carriage mounted camera

The fork carrier camera provides the operator with an optimal view onto the forks and the area in front/underneath his vehicle. This allows a safe access into a variety of load carriers. In addition, the camera provides an indirect view of the area in front of the truck.

The system can be extended by a camera that is automatically activated when reversing the vehicle.

A carriage mounted camera is lifted simultaneously with the load.
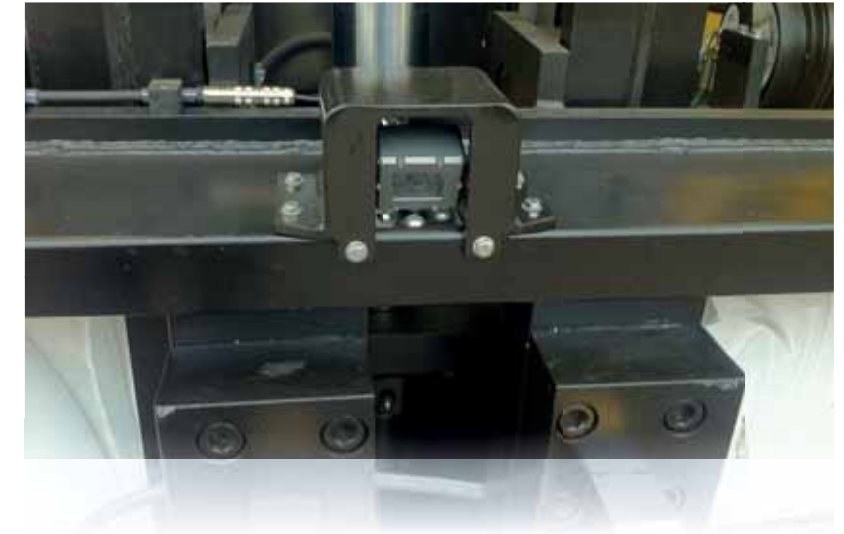
EXAMPLE OF SYSTEM:
Fork carriage camera system

MD3071A Heavy-duty 7" monitor	FLT Cable drum	MC3000B Heavy-duty camera
1	2	3

MD3071A   RAM-MH3

MC3070B-4

9 V to 60 V DC

MC7115P-4-E

Optional with wireless transmission

![Motec - Heavy-Duty Camera Solutions]

![AMETEK]
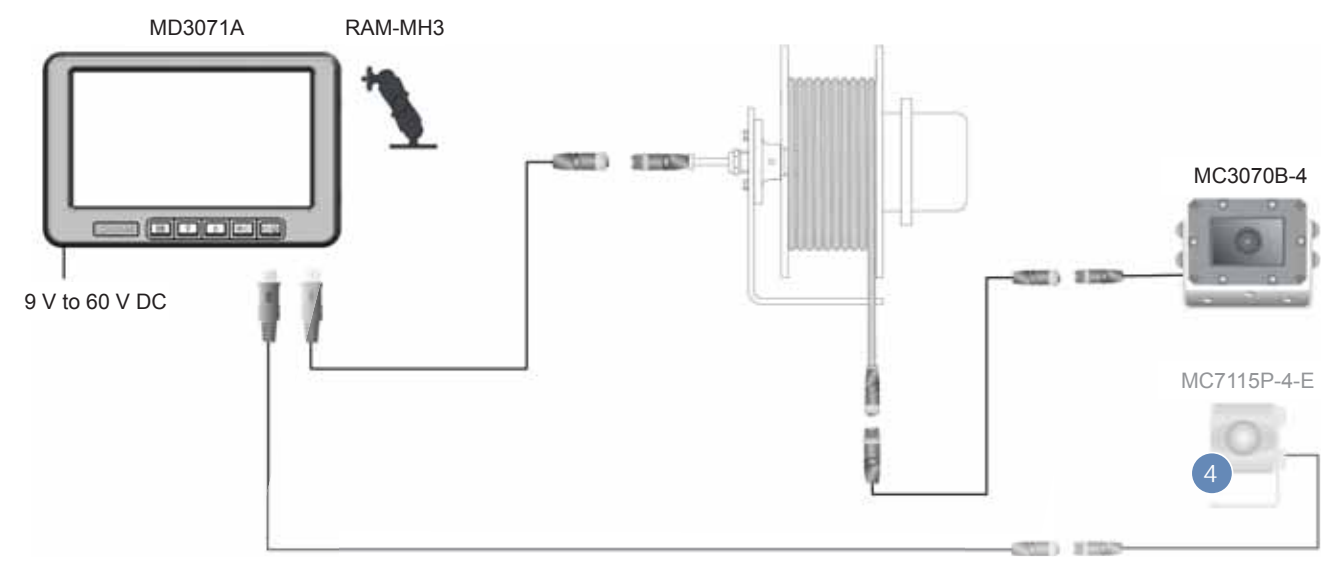
Forklifts
Rear view monitoring – safe and ergonomic

A camera at the rear – optionally with an angle of 115° or 180° – is automatically activated as soon as the truck is shifted into reverse. This way, people and objects behind the forklift truck are detected in time and accidents are avoided. This makes it also easier to judge distances to stored goods and racking so that material damage is less frequent.
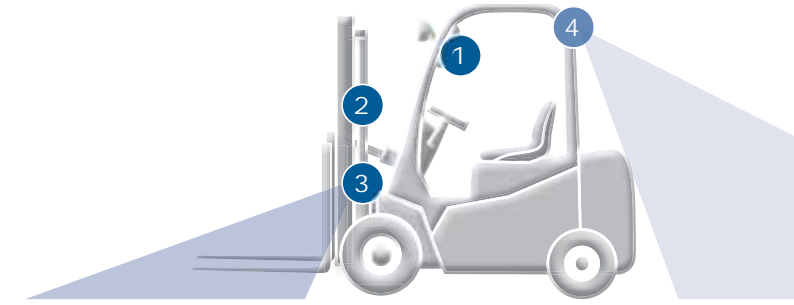
Ergonomic advantage: the driver sees the rear area without having to turn around, which protects the driver's back and neck.

Various mounting positions for back room monitoring

14   15
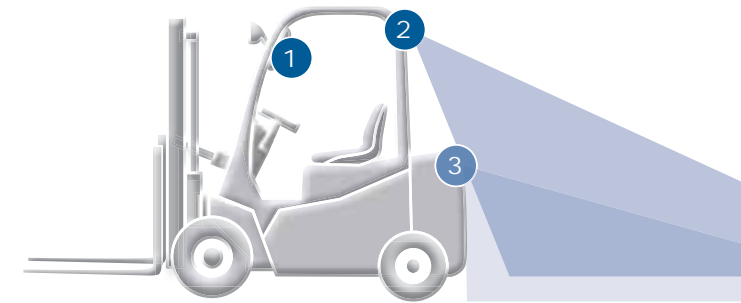
EXAMPLE OF SYSTEM:
Rear view monitoring

MD3073 Heavy-duty 7" monitor	MC7000P Heavy-duty camera
1	2

MD3071A

RAM-MH1

MC7115P-4-E

9 V to 60 V DC

MC7180N-4

3 Optional wide-angle camera

Motec®
Heavy-Duty Camera Solutions

AMETEK®
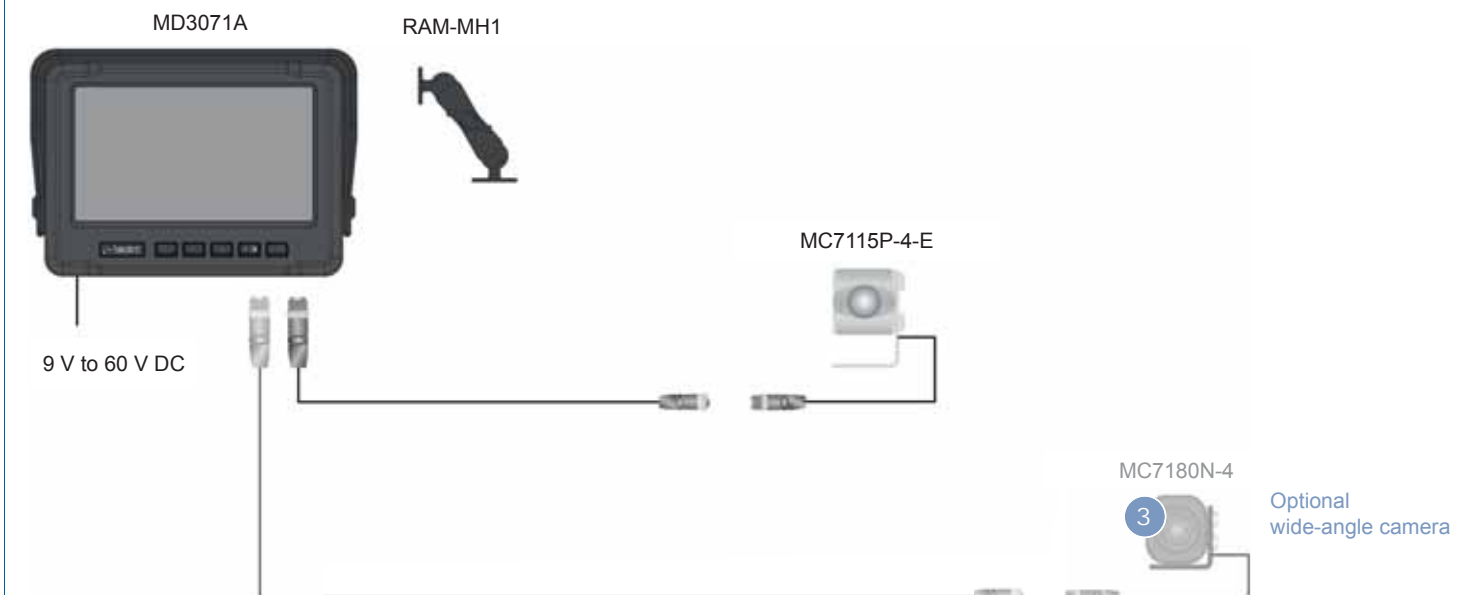
Forklifts
Visibility of carriage way

Large volume loads, e.g. in the beverage industry, block the driver's view to the front of the vehicle. A camera on the mast allows the operator to look ahead of the forklift truck into the storage aisle. This way, the driver can observe people in the lift truck's path and can detect objects and obstacles in front of his vehicle well ahead of time.

The system can be extended by a camera that is automatically activated when reversing the vehicle.

Significantly increased safety in the storage aisles:
Without the lifting mast camera, a person behind the load would be difficult to see.

16   17

H01
G01
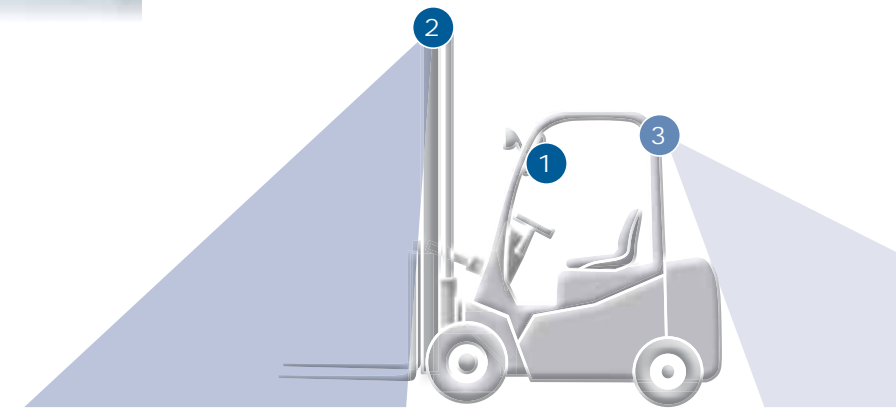
EXAMPLE OF SYSTEM:
Visibility of carriage way

MD3071A Heavy-duty 7" monitor	MC7000P-4-E Heavy-duty camera

MD3071A   RAM-MH3

MC7090P-4-E

9 V to 60 V DC

MC7115P-4-E

Optional rear view monitoring

Forklifts

Truck loading with image recording

A camera mounted on the mast allows you to look underneath the lift truck forks, directly onto the load or loading edge.

In addition, a WLAN-capable digital recorder with a recording capacity of up to 5 days can be connected. A live view and recording of the images are possible simultaneously. Recording takes place at the push of a button and can be event- or time-controlled.

The system can be extended by an automatically activated rear view camera to detect other vehicles or persons in the danger area.

Camera-assisted truck loading.

EXAMPLE OF SYSTEM:
Image recording

MD3071A Heavy-duty 7" monitor	Digital recorder	MC3000B Heavy-duty camera
1	2	3

MD3071A RAM-MH3

MC3070B-4

9 V to 60 V DC

Digital recorder

8 V to 40 V DC

MC7115P-4-E

Optional rear view monitoring

18 19
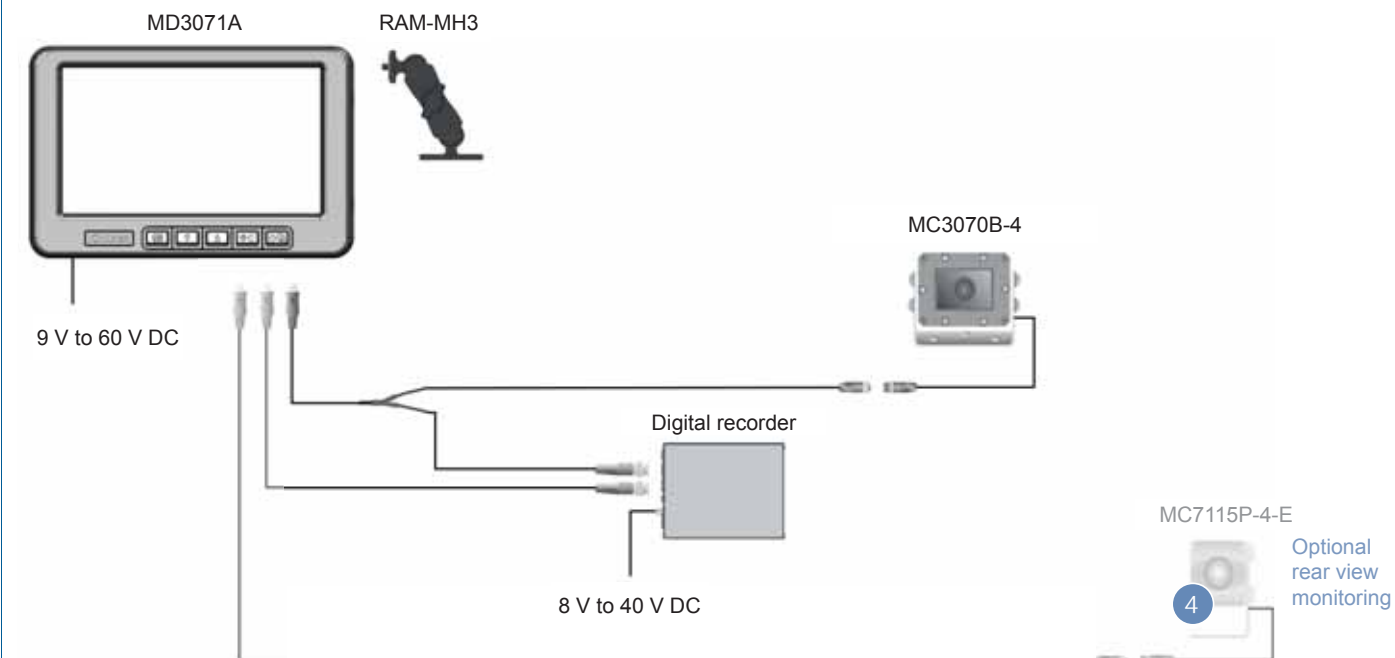
Attachments
Visual aids for rotators, paper roll clamps and multi-contact clamps

Bulky loads, e.g. rolls used in the paper industry or rotators in, obscure the view forward. Special system solutions effectively support the driver when manoeuvring load in the storage aisle and when positioning an attachment or a truck lift fork.

The safety risk for man and machine is reduced to a minimum and the efficiency is increased.

The camera allows visibility ahead of or below the load.
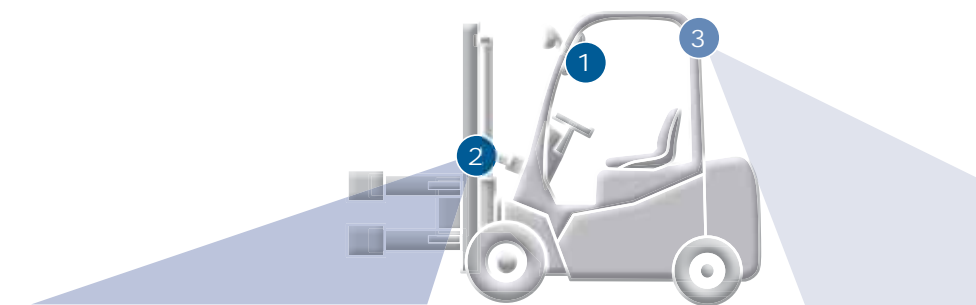
EXAMPLE OF SYSTEM:

Attachments

MD3071A Heavy-duty 7" monitor	MK554 Mast cable	MC3000B Heavy-duty camera
1		2

MD3071A   RAM-MH3

MC3070B-4

9 V to 60 V DC

MC7115P-4-E

3

Optional
rear view monitoring

Optional with wireless transmission
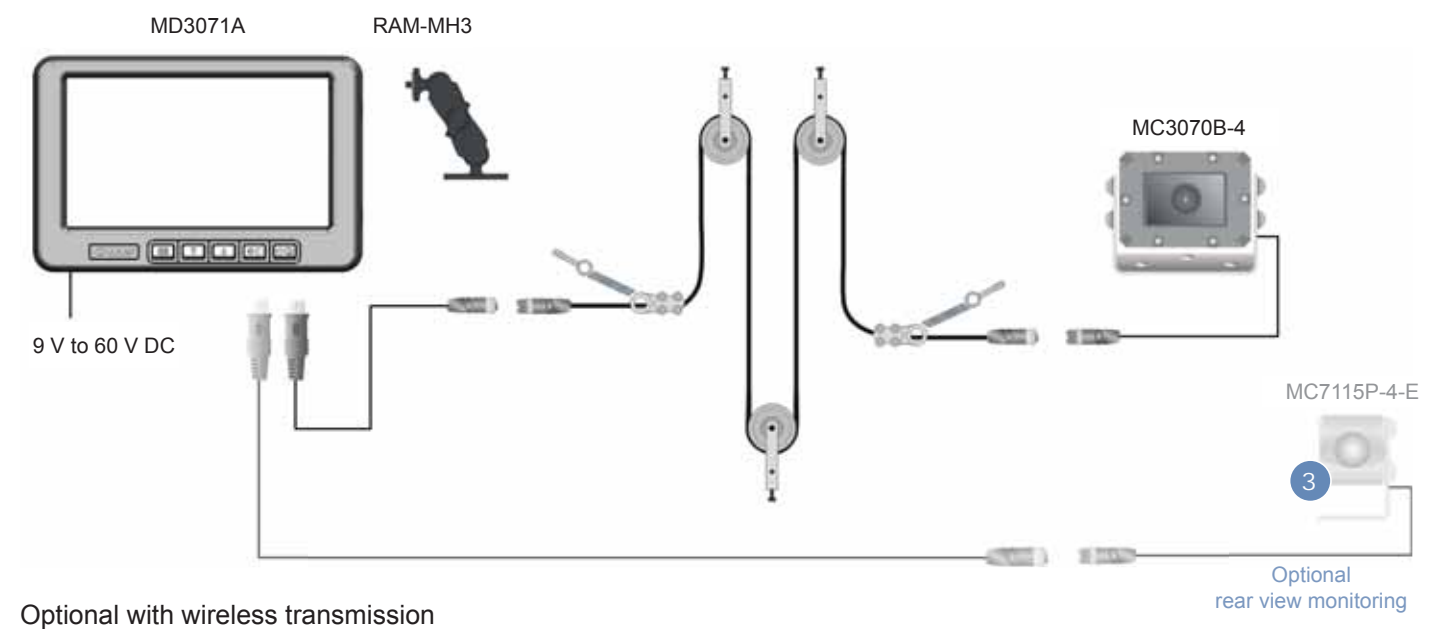
Telescopic fork
Handling of pallets

Attached to the inside of the telecopic fork, the camera is well protected and always at the level of the lift truck fork. Due to the 50° angle of view, the driver has a secure view of both the forks and the void entry points of the pallets.

Motec cameras are designed to increase the safety during loading and unloading of goods. Thanks to the LED power light, the safe loading and unloading is assured even under poor light conditions.

MC9150 on telescopic forks.

22 | 23
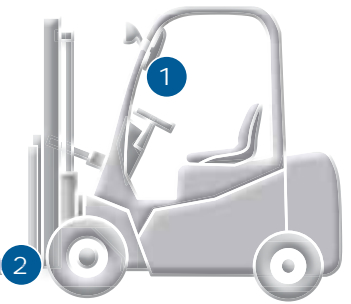
EXAMPLE OF SYSTEM:
Telescopic fork

MD3071A Heavy-duty 7" monitor	MK554 Mast cable	MC9150 Heavy-duty camera

1

MD3071A   RAM-MH3

9 V to 60 V DC

MC9150P

LED

MAB2000 (Lithium-ion battery)

MAB2000-Set-2

MC9150P

LED

Optional with wireless transmission
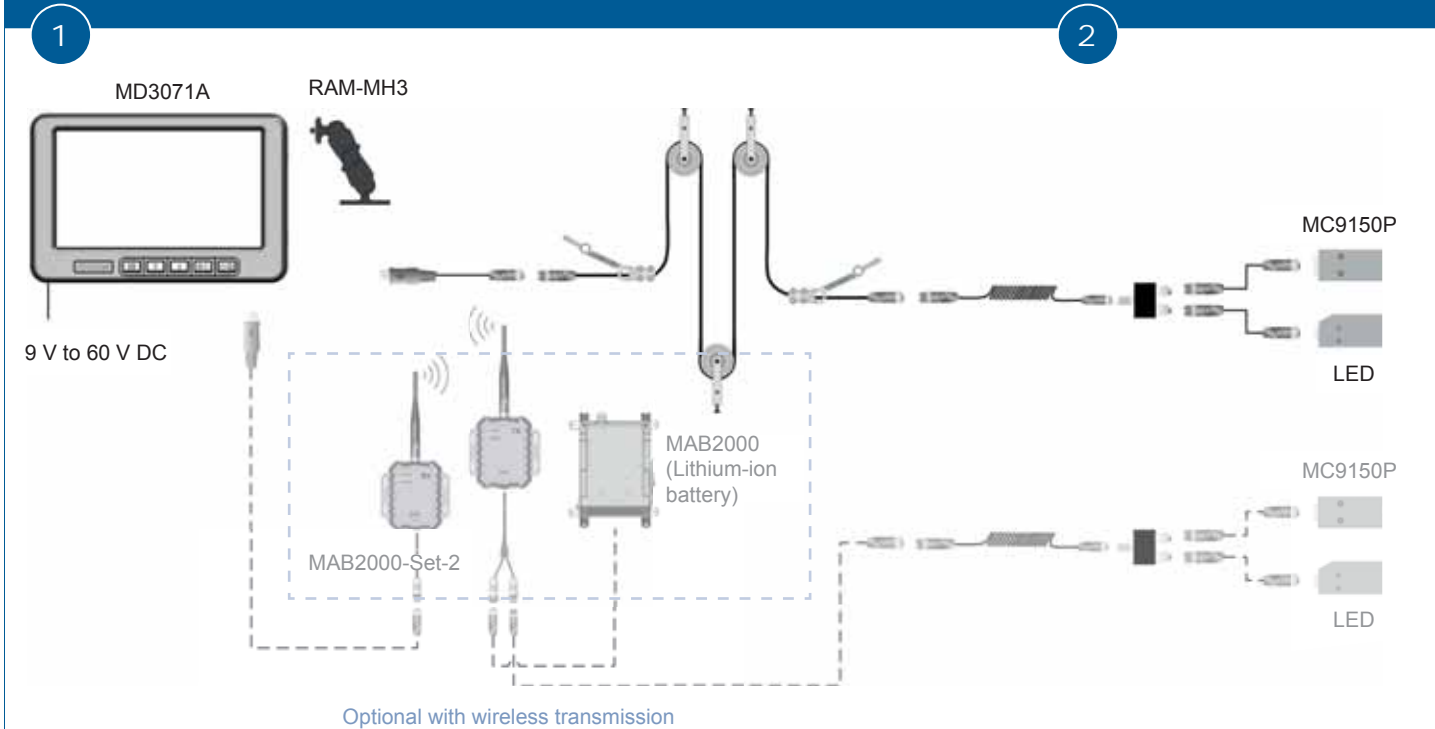
270° or 360° bird's eye view system
MVS – Mobile Vicinity Scout

The Motec Mobile Vicinity Scout (MVS) is a camera system especially designed for heavy-duty vehicles. It provides the driver with a clear, seamless 270° or 360° view around their vehicle, thereby saving lives, assisting people, and reducing costs.

Crystal clear, intuitive bird's eye perspective of the vehicle's surroundings. Specially developed for heavy-duty applications and vehicles – flexible, adaptable, reliable. Customised, dynamic overlays. Can be extended through ultrasonic or radar sensors. Simple end-of-line and in-field calibration. Can be integrated into the electronic system of the vehicle by way of various types of interfaces (Ethernet, CAN bus, control cables).

MVS system:
MC3000B as optional fork carrier camera.
Wide-angle camera MC7180N for lateral and rear view monitoring.

24 25
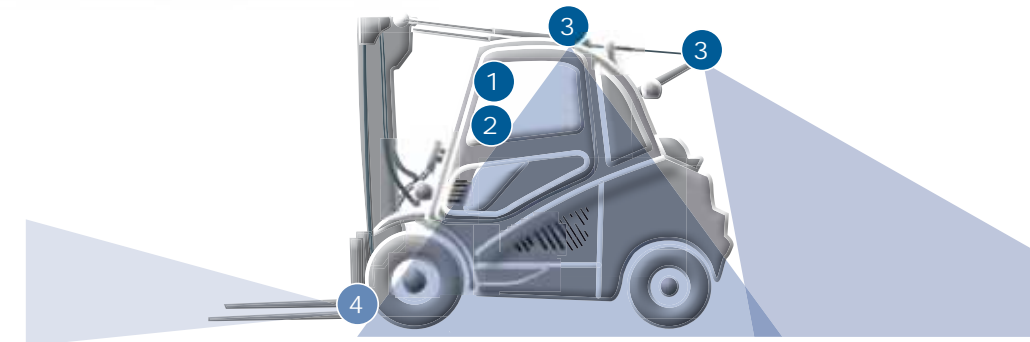
EXAMPLE OF SYSTEM:
MVS 270° System

MD3071A Heavy-duty 7" monitor	MVCD1000 Video control unit	MC7180N Wide angle camera
1	2	3

MD3071A   RAM-MH3

MC7180N-4

9 V to 60 V DC

MVCD1000

MC7180N-4

MC7180N-4

MC3070B-4
Optional fork carrier camera

9 V to 60 V DC

4

![Motec - Heavy-Duty Camera Solutions logo]

Protecting lives, helping people, saving money

AMETEK®

Radar monitoring
Driver assistance systems for industrial trucks

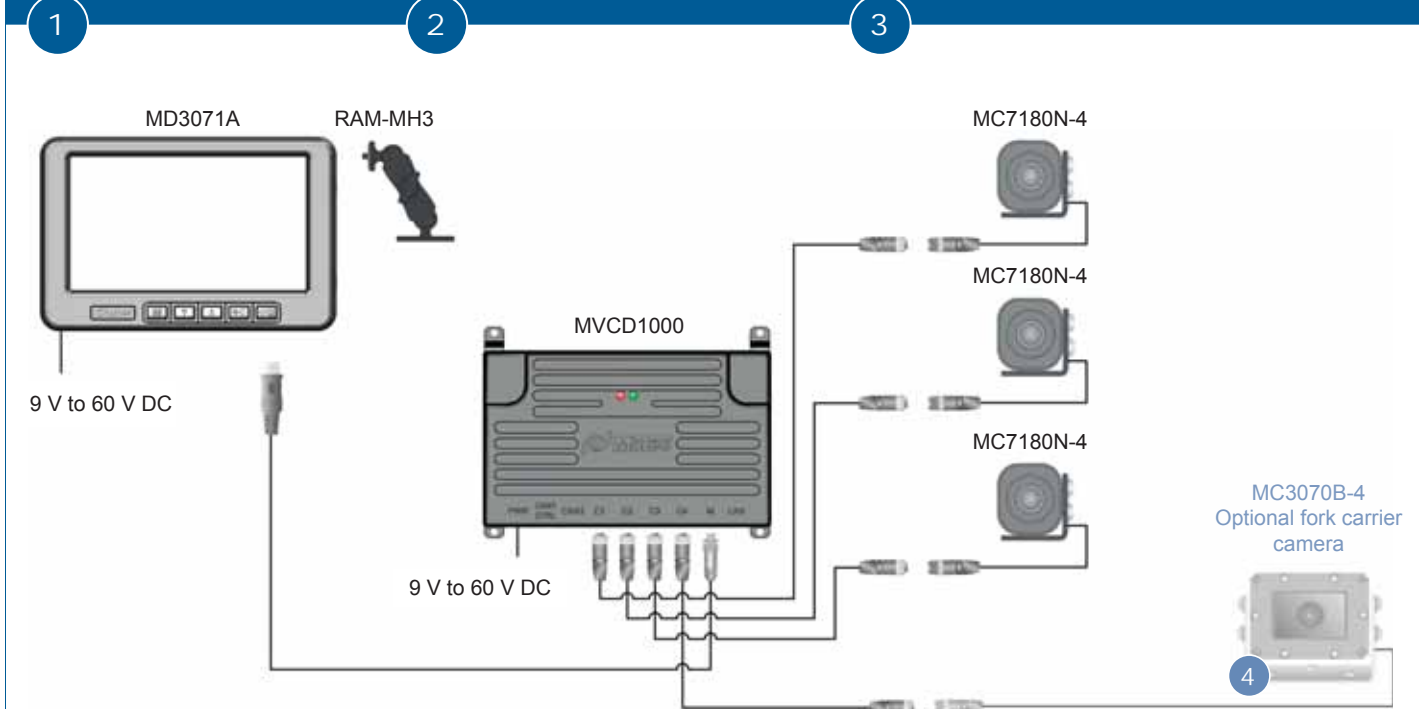In order to monitor the entire rear area of a machine, an increasing amount of sensors, such as radar, are used in addition to imaging systems. Radar sensors increase collision protection under poor visibility conditions and can withstand various weather conditions due to their rugged construction.

The detection range of the Motec radar sensor covers a distance of up to 50 meters and a horizontal detection angle of 150°. The visual distance display can be adjusted individually – traffic lights, direction signs, distance values or warning symbols can be integrated.

Cameras and radar sensors compliment each other and guarantee increased safety.

EXAMPLE OF SYSTEM:
Radar monitoring

1 MD3071A Heavy-duty 7" monitor	**2** MVCD1000 Video control unit	**3** MC7000P Heavy-duty camera	**4** MRS Radar sensor

MD3071A

RAM-MH3

MC7115P-4-E

MVCD1000

Radar sensor
MRS-MH-1

MBE1000-4
(only required for
setting purposes)

Internal buzzer

9 V to 60 V DC
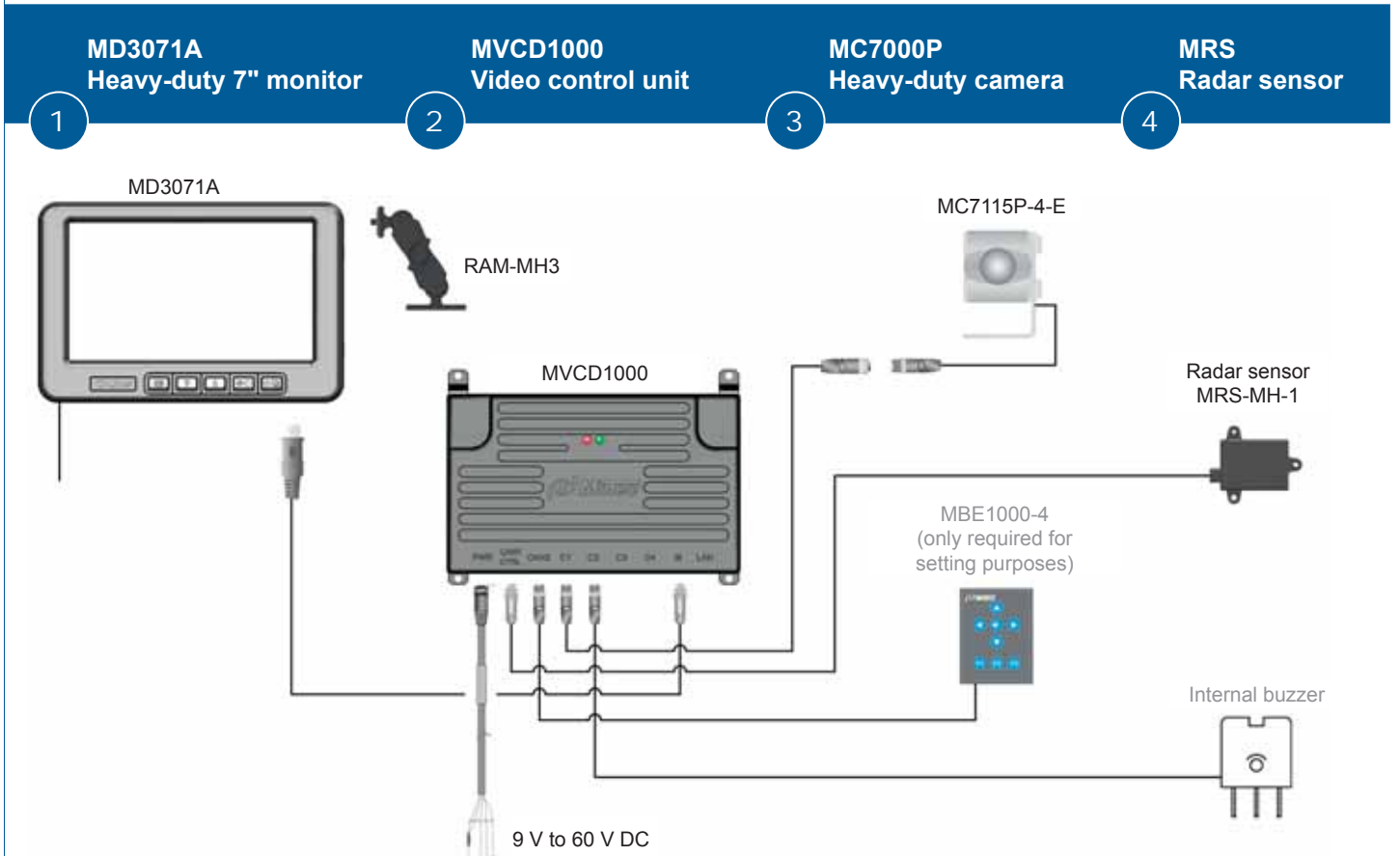
SmartFork® The intelligent lift truck fork

Counterbalance truck/reach trucks with sensor system integrated in the tip of the lift truck fork

The camera and the sensor system are integrated into the fork tip and are thus protected against mechanical damage. The driver has an unobstructed view of the load both in front and above the fork.

SmartFork®, the intelligent complete solution combines camera technology with ultrasonic, laser and inclination sensor system. An LED light, mounted next to the camera and optimally adjusted to the light sensitivity of the camera, improves visibility in poorly lit working environments.

In cooperation with Vetter Industrie GmbH.

Sensor system inside the tip of the fork
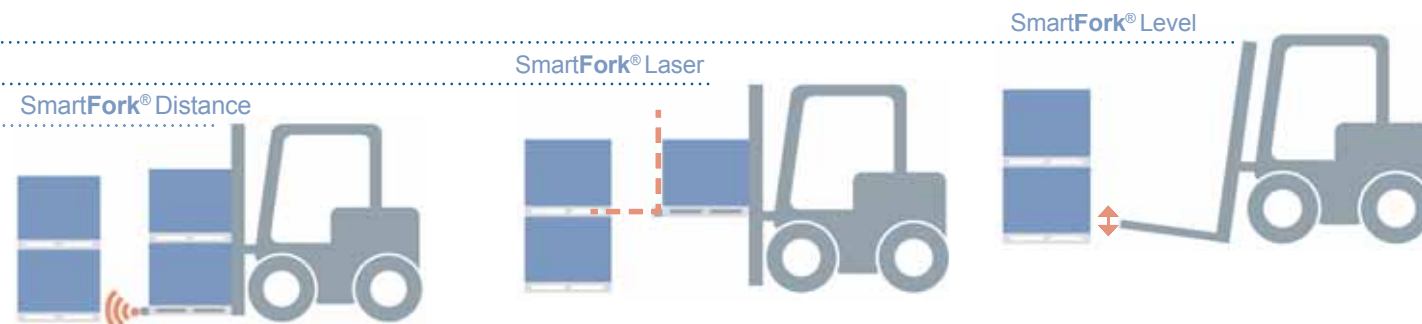
Ultrasonic sensor

Ideal for distance measurement if block stacking offset pallets is used or if obstacles are to be expected (warehouse wall, boxes, etc.). When approaching the obstacle, the distance is counted down in increments of one centimetre.

Laser sensor

If block stacking is used, the laser as an aiming device indicates the gap between 2 pallets. The driver recognises whether or not the second pallet is raised during pallet pick-up.

Inclination sensor

This sensor indicates the relative inclination of the forks in relation to the ground, even if the floor is bumpy or the forks are under load. Visual support of the angle of inclination using a virtual horizon.

SmartFork® Level

SmartFork® Laser

SmartFork® Distance

EXAMPLE OF SYSTEM:
Counterbalance truck/reach trucks

MD3071A Heavy-duty 7" monitor	Transmission paths	MVCU1300 Video control unit	MC9350 Lift truck fork camera

MD3071A   RAM-MH3

MK554

MVCU1300

9 V to 60 VDC

MC7000P-4-E

FLT-M12

Optional
rear view monitoring

☐ Ultrasonic sensor

☐ Laser sensor

☐ MC9350

☐ LED

☐ Inclination sensor
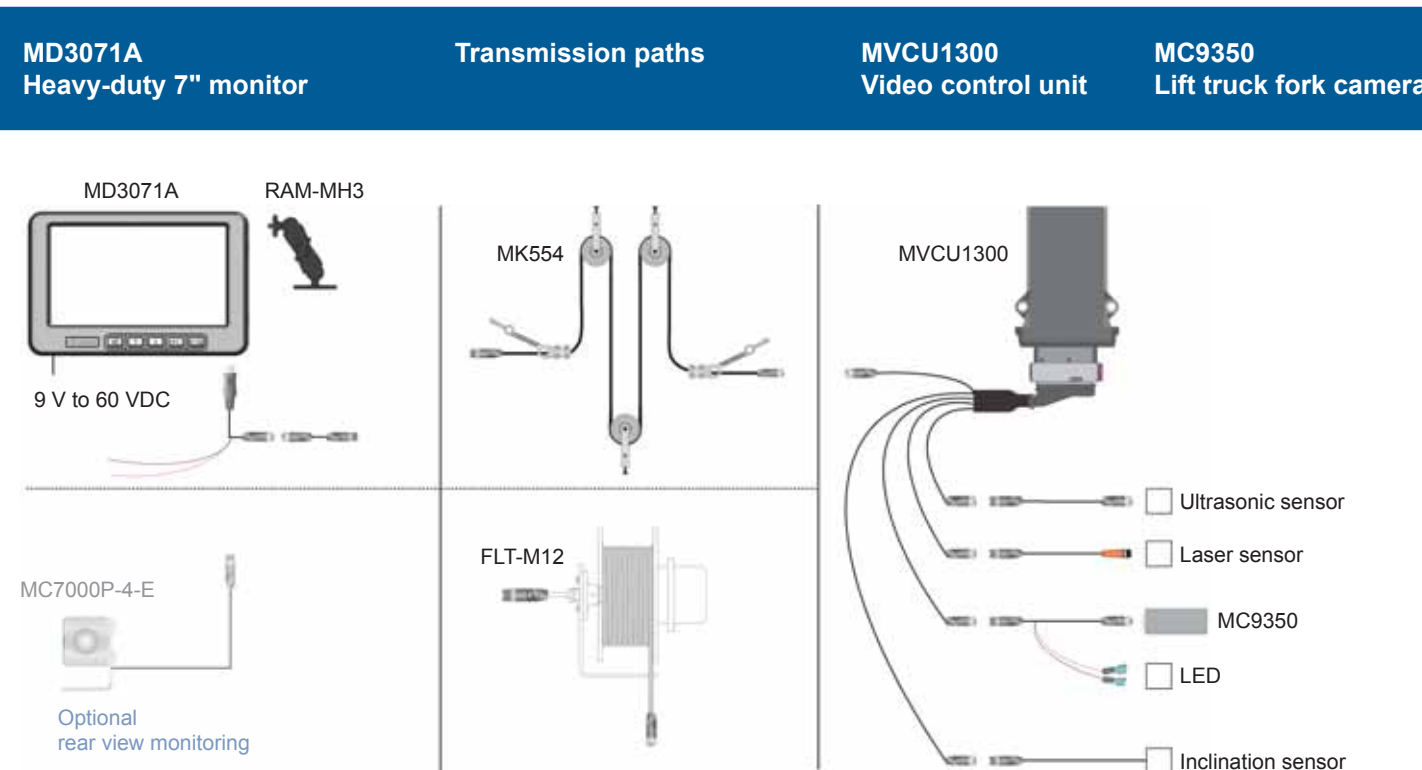
Optional with wireless transmission

Four way sideloader
Mast or fork carrier camera system

Four way sideloaders are used as conventional counterbalance trucks or especially for the transport of extremely long and deep loads in narrow storage aisles. Here, the material handling requires the utmost precision and attention from the lift truck operator.

A fork carrier or mast camera facilitates the loading and unloading of goods, providing a direct view onto the load or the forks.

Motec mast or fork carrier camera – always level with the load.

30 31
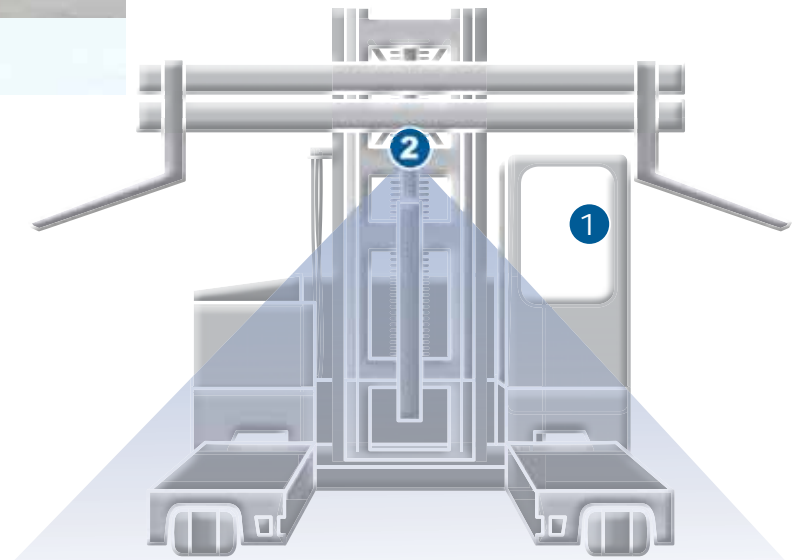
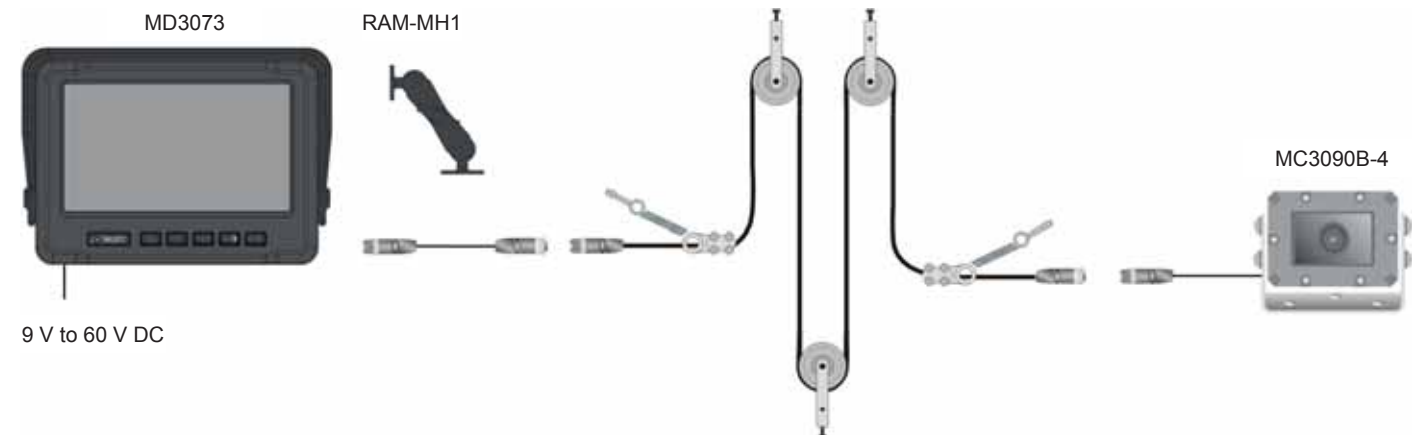EXAMPLE OF SYSTEM:
Mast or fork carrier camera system

MD3073 Heavy-duty 7" monitor	MK554 Mast cable	MC3000B Heavy-duty camera
1		2

MD3073   RAM-MH1

MC3090B-4

9 V to 60 V DC

Side loader
Lateral and rear view monitoring for more safety

When used under heavy-duty conditions, side loaders enable safe and fast transport of long, bulky loads, even in narrow aisles or passages.

Rear and side cameras open the driver's view in all directions and increase safety while on the move. People and obstacles around the side loader are recognised well in time.

An optional fork carrier camera facilitates the loading and unloading of goods, providing a direct view of the load or the forks.

Reversing camera for more safety while on the move.

32 33
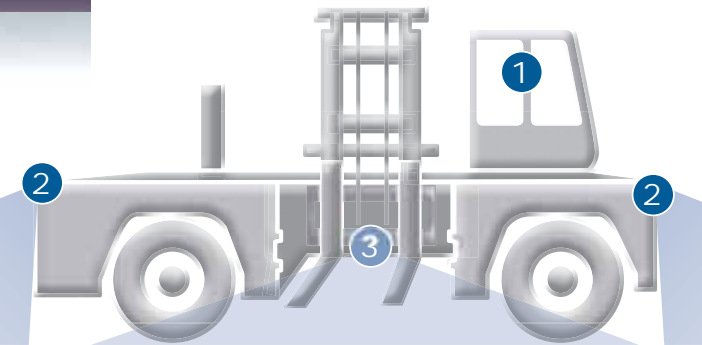
EXAMPLE OF SYSTEM:
Lateral and rear view monitoring

| MD3072B Quad | MC3000B |
| Heavy-duty 7" monitor | Heavy-duty camera |

1

MD3072B Quad

RAM-MH1

C1   C2

12/24 V DC

2

C1   MC3115B-4

C2   MC3115B-4

Optional wireless transmission

MAB2000-Set-2

MAB2000 (Lithium-ion battery)

3   Optional fork carrier camera MC3090B-4

Telescopic loader
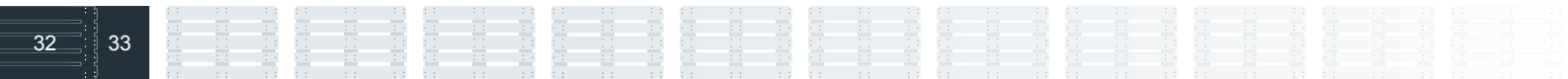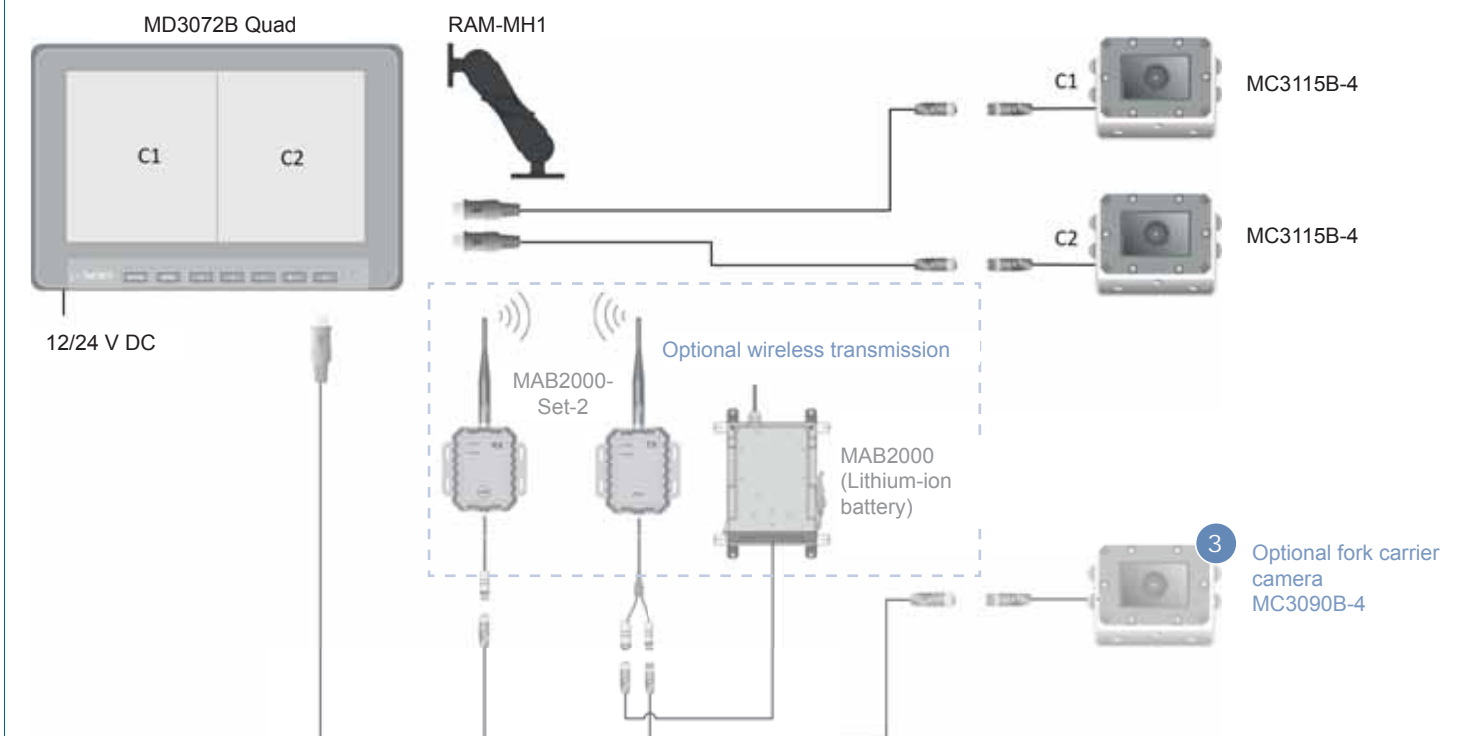## Wireless solution

Cameras on the retrieval of the telescopic handler enable the driver to view the unloading area. They facilitate the handling of pallets and material or the attachments and work platforms.

Due to various lifting heights and a wide range of payloads, wireless data transmission should be preferably used.

The system can be extended by a camera that is automatically activated when reversing the vehicle.

Telehandler with add-on device.

EXAMPLE OF SYSTEM:
Telescopic loader

1 MD3071A Heavy-duty 7" monitor	2 MAB1000-Set-2 (incl. batteries) Digital wireless system	3 MC7000P Heavy-duty camera

MD3071A

RAM-MH3

MAB2000-Set-2

MAB2000 (Lithium-ion battery)

9 V to 60 V DC

MC7115P-4-E

4

MC7070P-4-E
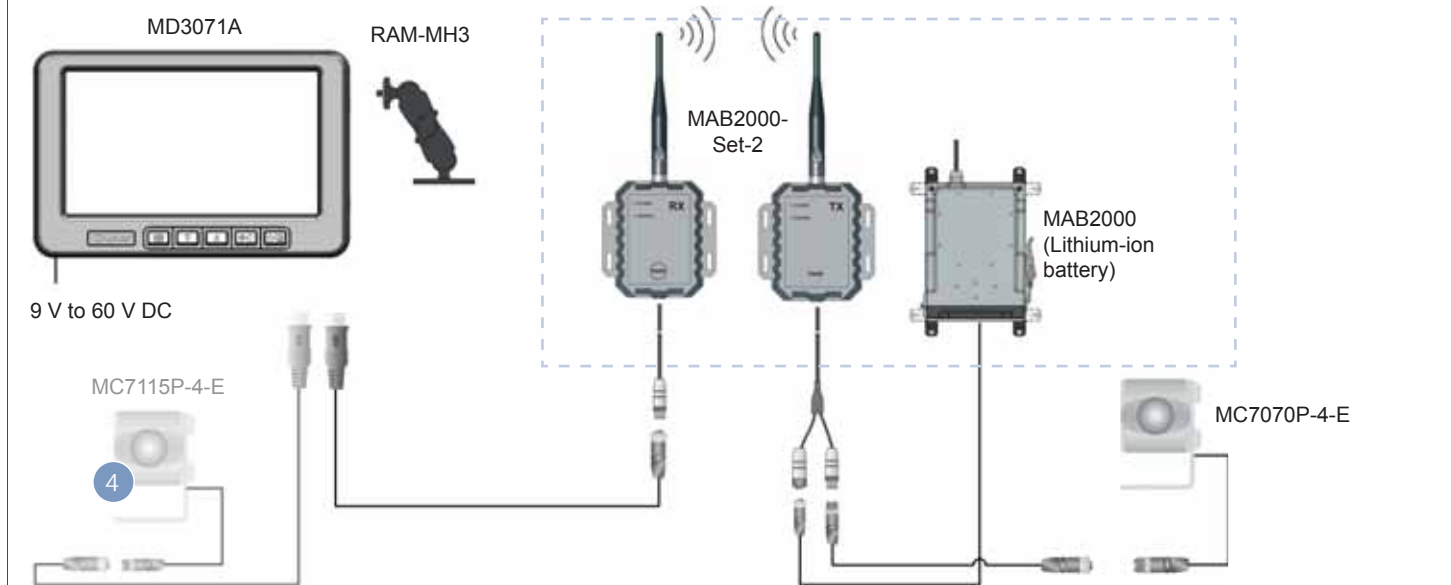
Optional rear view monitoring

Log stacker
Efficient material handling due to wireless camera systems

Log stackers are used for mobile wood handling. When loading logs, a camera mounted above the conveyor belt transmits the images via radio to the monitor of the log stacker.

The driver always has the conveying process or the filling level in view. He can therefore detect material jams or foreign objects at an early stage and thus reduce idle times.

The system can be extended by a camera that is automatically activated when reversing the vehicle.

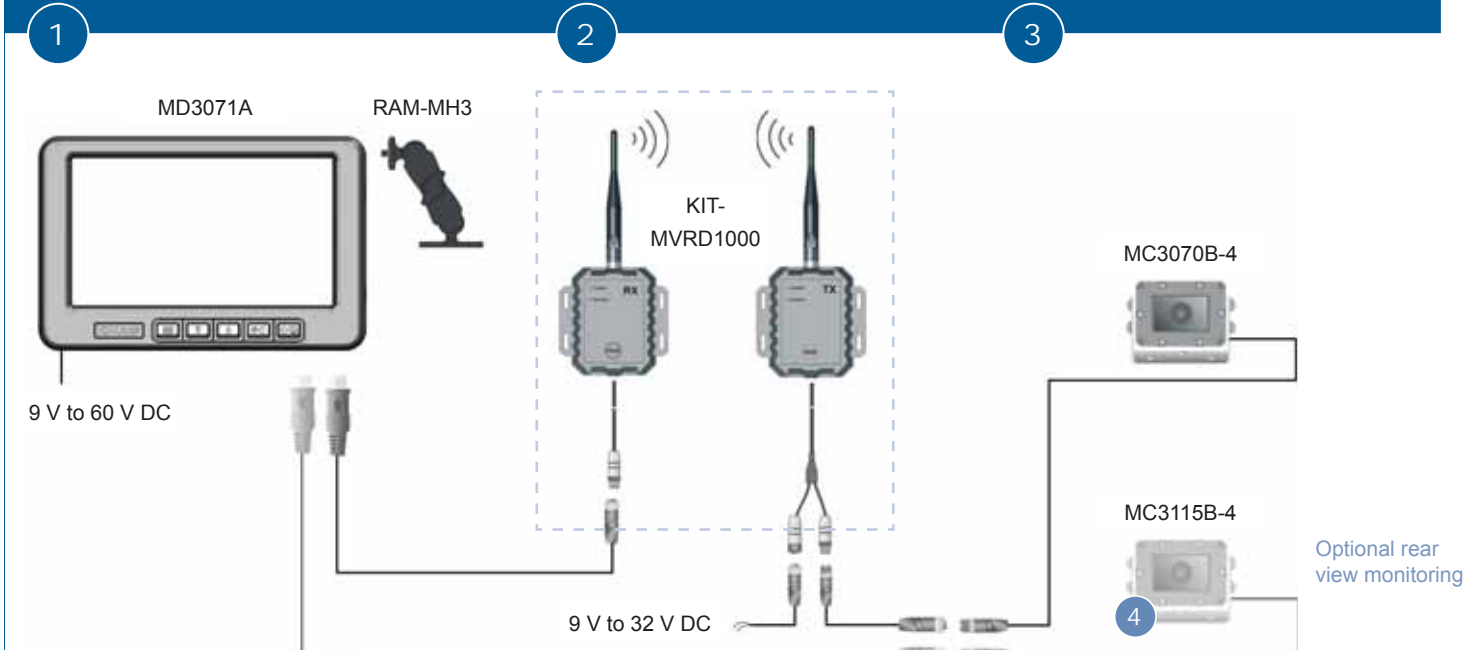MC3000B for monitoring the filling level of a wood container.

EXAMPLE OF SYSTEM:
Efficient material handling

MD3071A Heavy-duty 7" monitor	Kit MVRD1000 Digital wireless system	MC3000B Heavy-duty camera
1	2	3

MD3071A   RAM-MH3

KIT-MVRD1000

MC3070B-4

9 V to 60 V DC

MC3115B-4

Optional rear view monitoring

9 V to 32 V DC

Reach stacker

Assistance during manoeuvring, twistlock and rear view monitoring during container handling

The mobility of reach stackers is limited without camera technology. Motec cameras help the driver to see the rear area as well as the path ahead of him. The cameras help to assess distances and recognise persons or obstacles in the danger area well in time.

Additional cameras on the spreader support the driver and ensure the safe handling of containers by monitoring the position of the twistlocks. Consequently, it effectively prevents accidents and saves costs through fast operating procedures.

The cameras are mounted in such a way as to provide an optimum view onto the twistlocks.
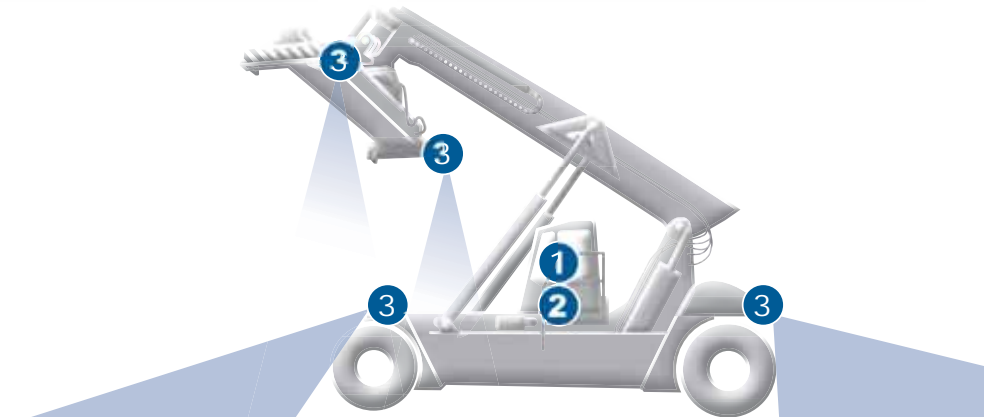
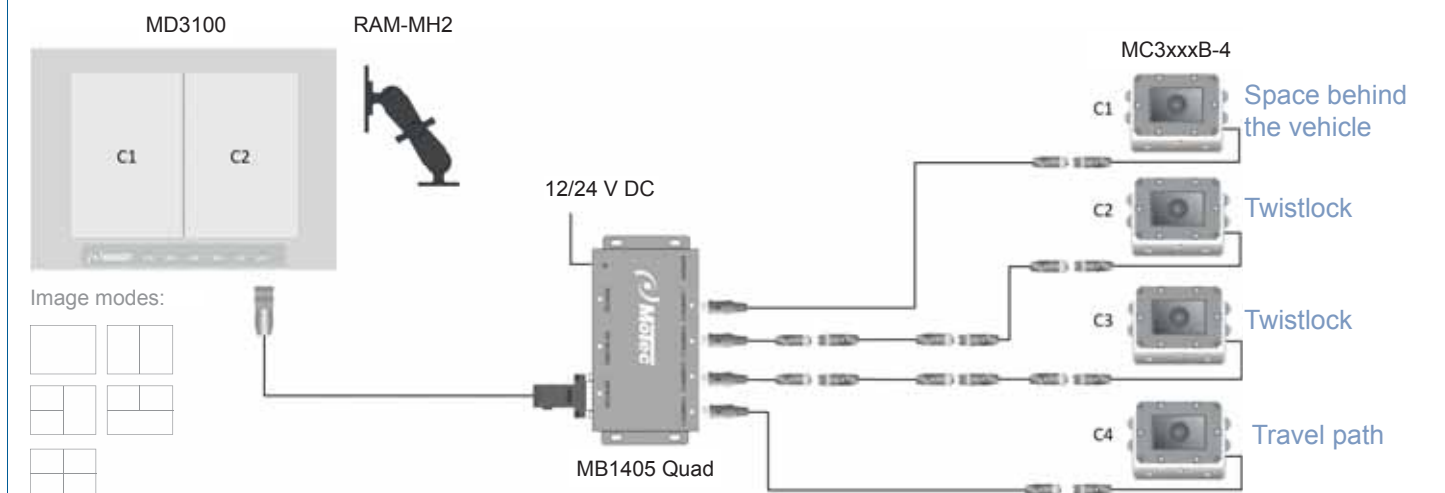**EXAMPLE OF SYSTEM:**
Reach stacker

MD3100 Heavy-duty 10,2" monitor	MB1405 Quad Video control unit	MC3000B Heavy-duty camera
1	2	3

MD3100   RAM-MH2

C1   C2

Image modes:

12/24 V DC

MC3xxxB-4

C1   Space behind the vehicle

C2   Twistlock

C3   Twistlock

C4   Travel path

MB1405 Quad

Optional with wireless transmission

Empty container handler
Container handling

The cameras support the driver when loading containers. The monitoring of the twistlocks enables a faster and more secure positioning.

The system can be extended by an automatically activated 180° rear view camera, which significantly facilitates manoeuvring processes.

Twistlock camera for safe container handling.
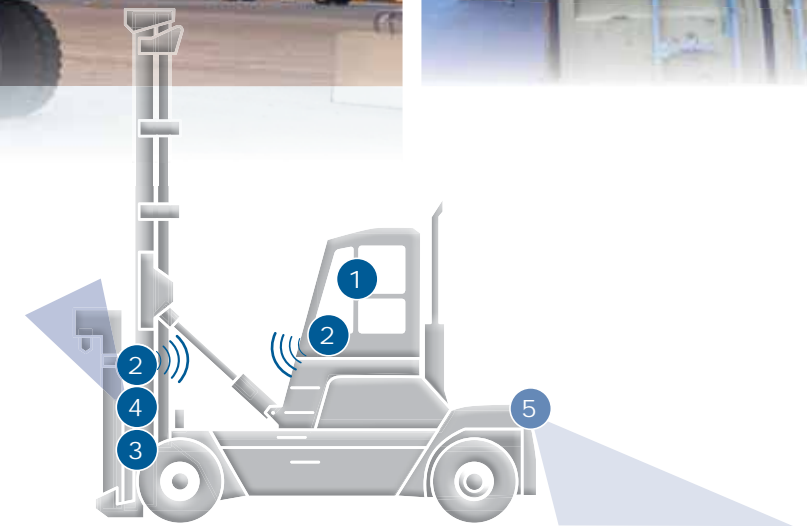
EXAMPLE OF SYSTEM:
Empty container handler

MD3071A Heavy-duty 7" monitor	Kit MVRD1000 Digital wireless system	Kit MVCU1400 Video control unit	MC3000B Heavy-duty camera
1	2	3	4

MD3071A   RAM-MH3

C1   C2

9 V to 60 V DC

12/24 V DC

KIT-MVRD1000

KIT-MVCU1401-11-1

MC3040B-4

C1

C2

9 V to 32 V DC

MB1405 Quad

MC7180N-4

Optional rear view monitoring
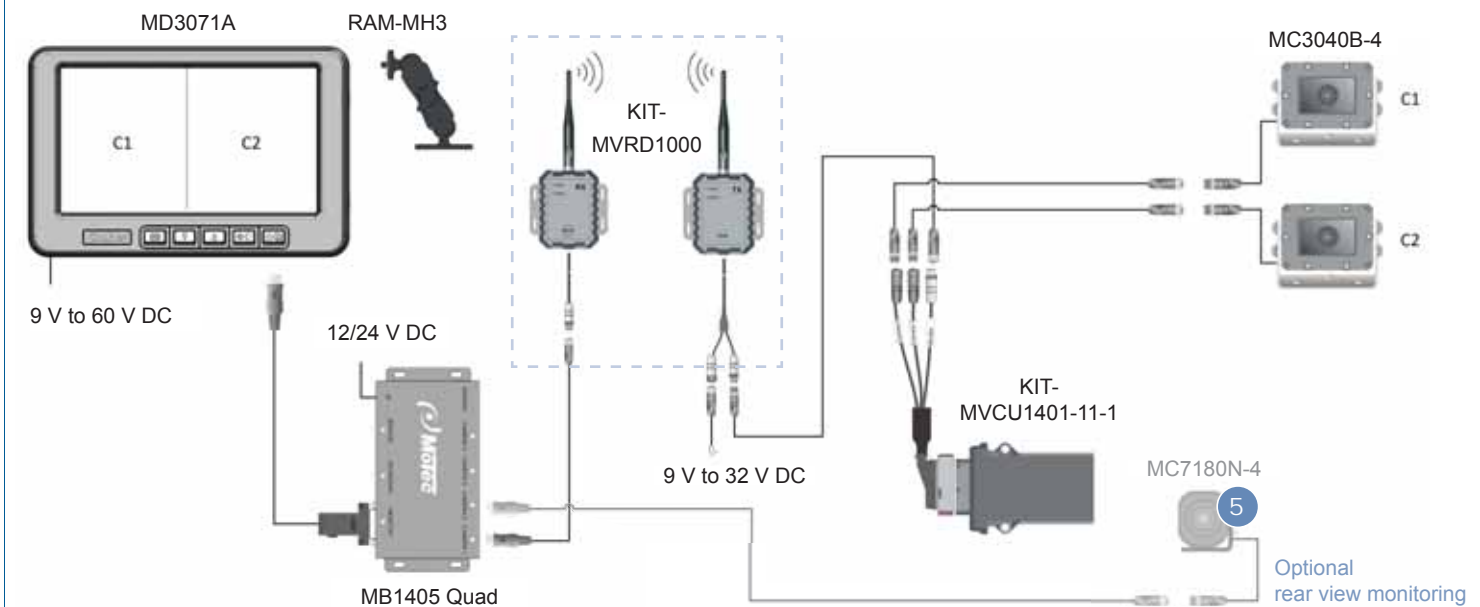
Straddle carrier
Rear view monitoring and safe and fast handling of containers

At a height of up to 15 meters, the drivers have the best view forward and into the loading zone. However, the rear view is difficult and the mast cannot be positioned precisely from that height.

Motec cameras help the driver to see the rear and lateral area. The cameras help to assess distances and recognise persons or obstacles in the danger area well in time. 2 additional cameras provide an optimal view of the twistlocks.

The images are transferred to 2 monitors so that the driver can position the containers in a millimetre-accurate manner and can safely move around.

42 43

Lateral monitoring from great heights with Motec camera monitor systems.

EXAMPLE OF SYSTEM:
Straddle carrier

MD3072B Quad Heavy-duty 7" monitor	MC3000B Heavy-duty camera
1	2

MD3072B Quad   RAM-MH1

C1   C2

12/24 V DC

MD3072B Quad   RAM-MH1

C3   C4

12/24 V DC

MC3xxxB-4

C1   Page

C2   Space behind the vehicle

C3   Twistlock

C4   Twistlock
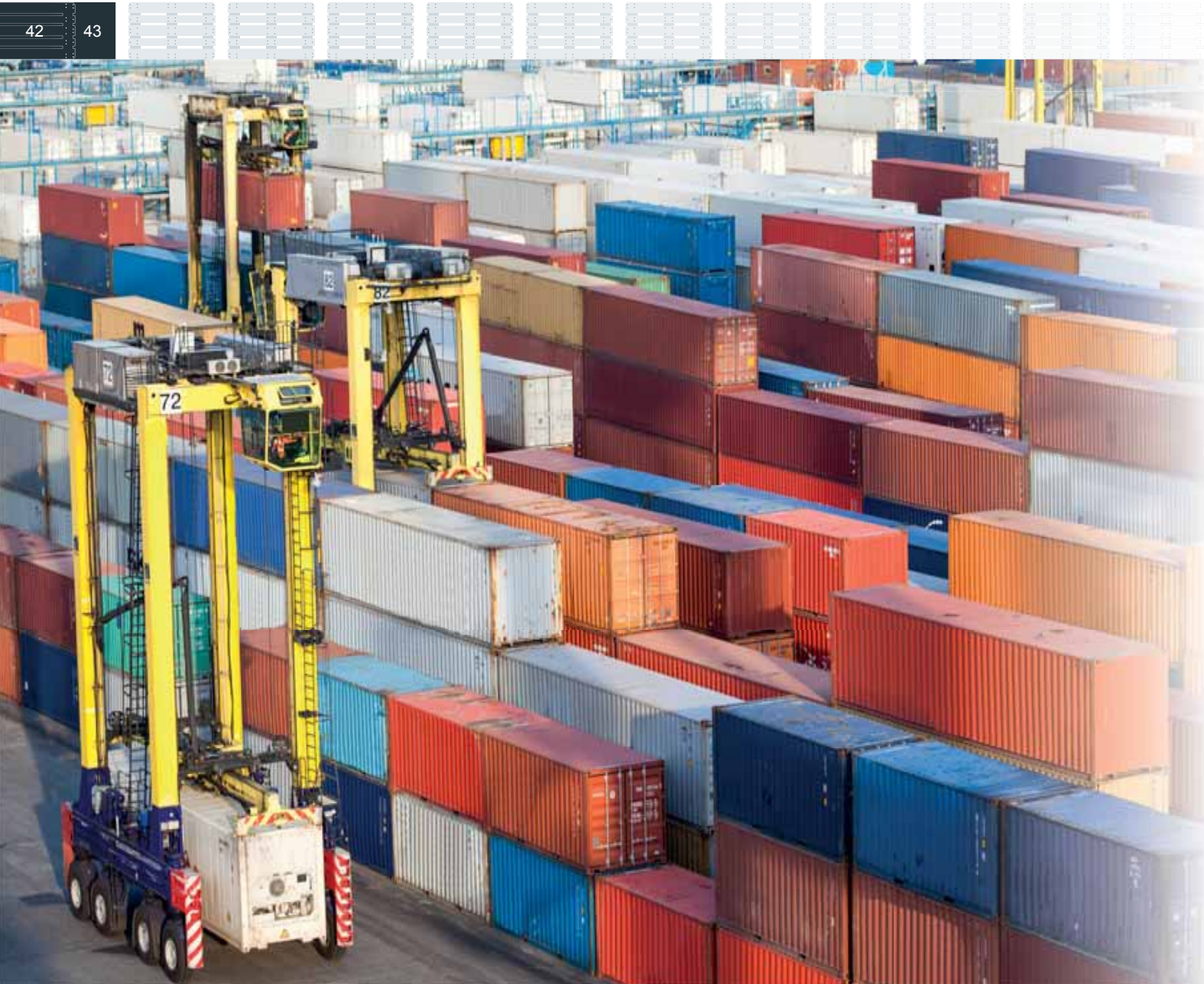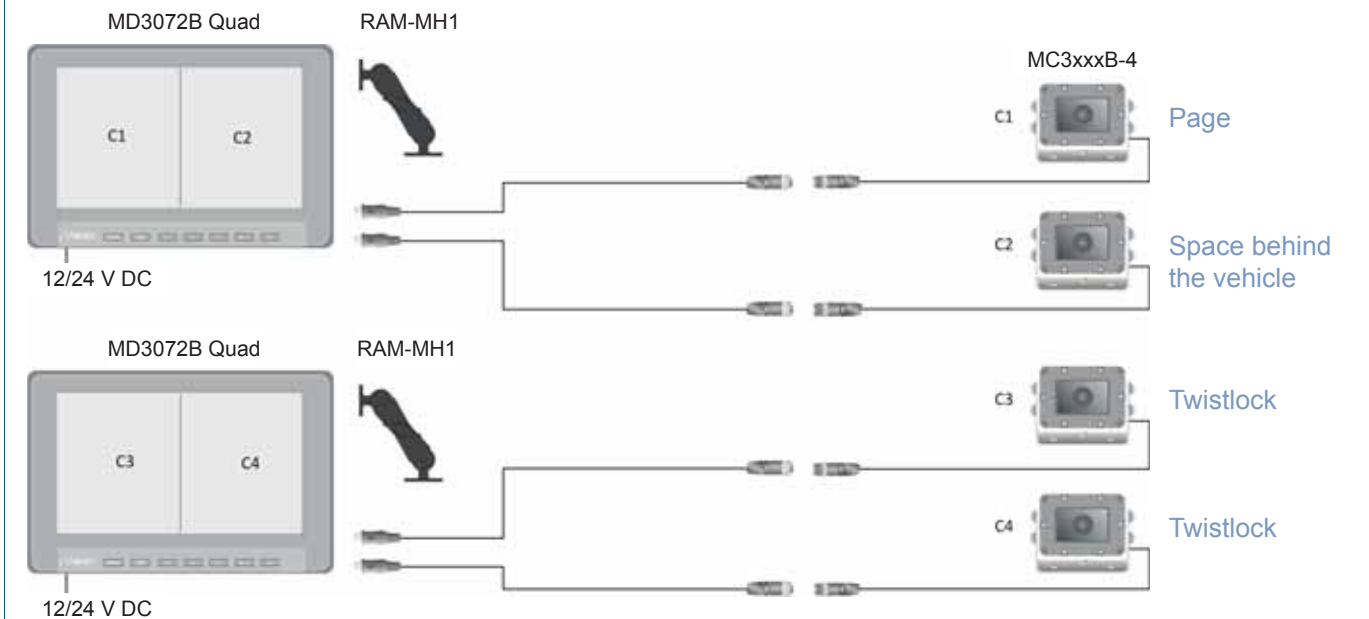
Reach stacker
Piggyback spreader

With the piggyback spreader, a reach stacker picks up the entire semi-trailer, which considerably simplifies the transport change between rail and road.

The cameras support the driver when recording the trailers. By monitoring the twistlocks, a faster and safer positioning is possible.

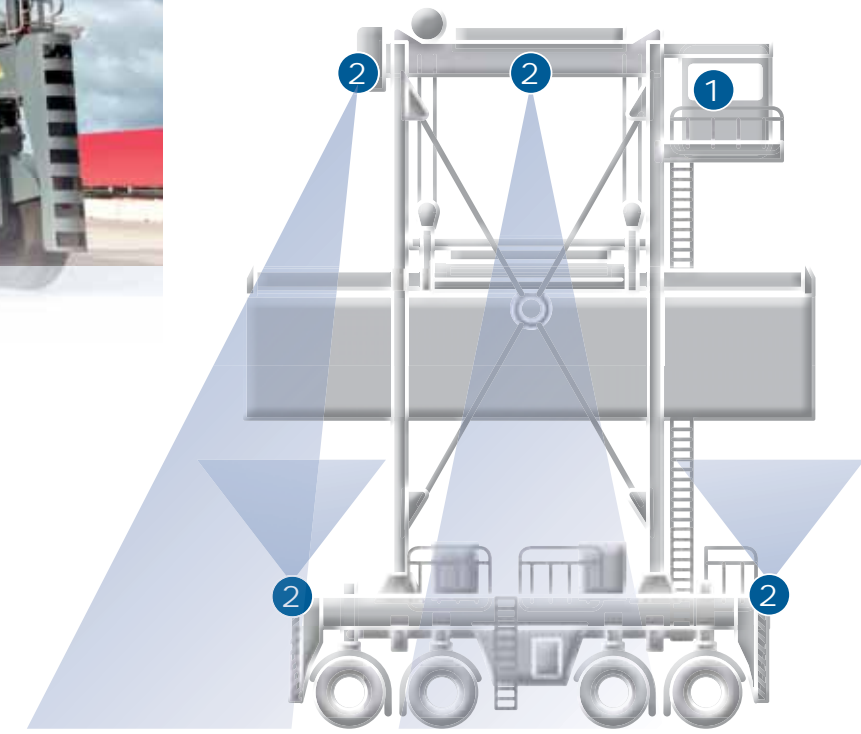The system can be extended with an automatically activated reversing camera, which makes maneuvering much easier.

The cameras are mounted at the bottom of the 4 foldable lift legs. When gripping the swap bodies they allow an optimal view.

44 45
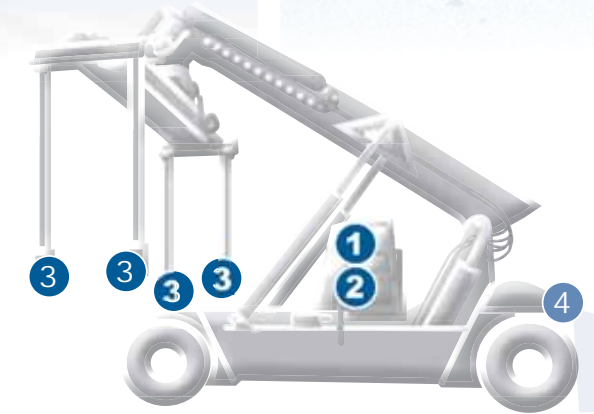
EXAMPLE OF SYSTEM:
Piggyback spreader

1 MD3100 Heavy-duty 10,2" monitor	2 MB1405-Quad Video control unit	3 MC9150P camera with LED

MD3100   RAM-MH2

MC9150P
+ LED

Y-Junction

MB1405-Quad

MB1205

12/24 V DC

MC3115B-4 +
MC3000-SHL

4

Optional rear view monitoring

Container bridge
Container handling

Due to the design, the driver has only limited visibility to the rear and front of the vehicle. The risk of a collision with people, trucks or other obstacles is very h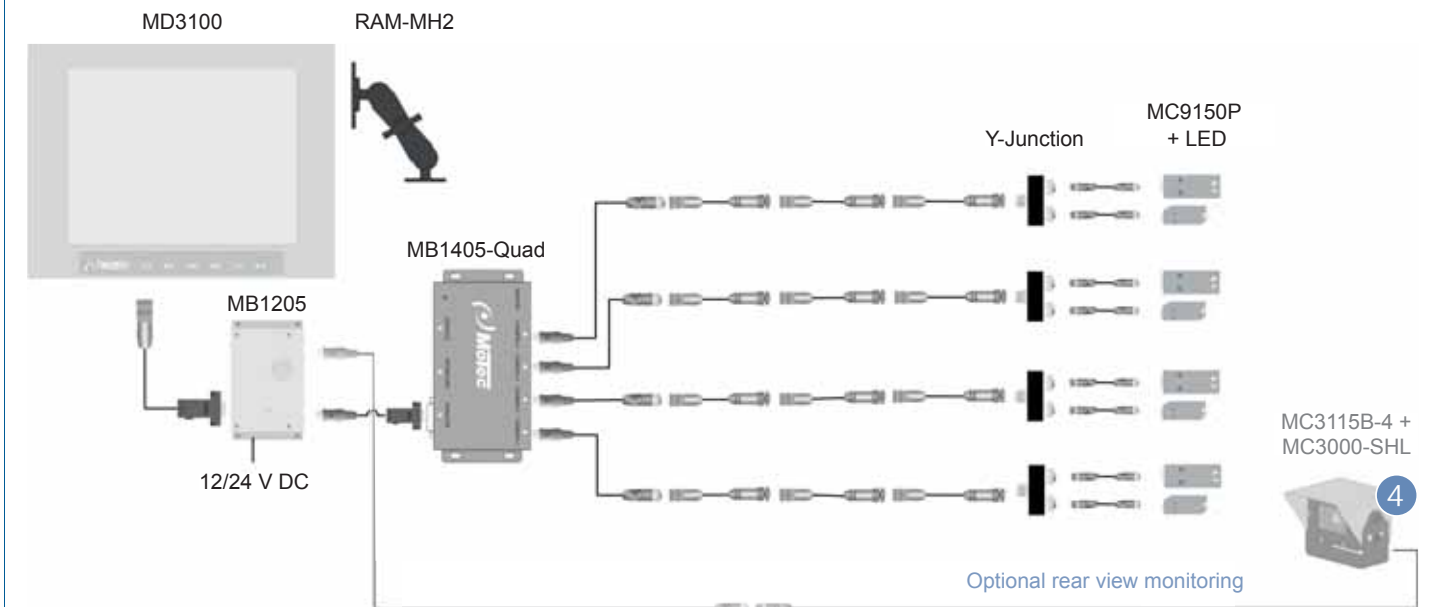igh. An intelligent camera monitor system surveys the travel path in all directions and simultaneously displays up to 4 camera images on a single monitor. The image is transmitted via digital radio signals.

It is possible to switch the camera automatically between the front/rear area and the twistlocks.
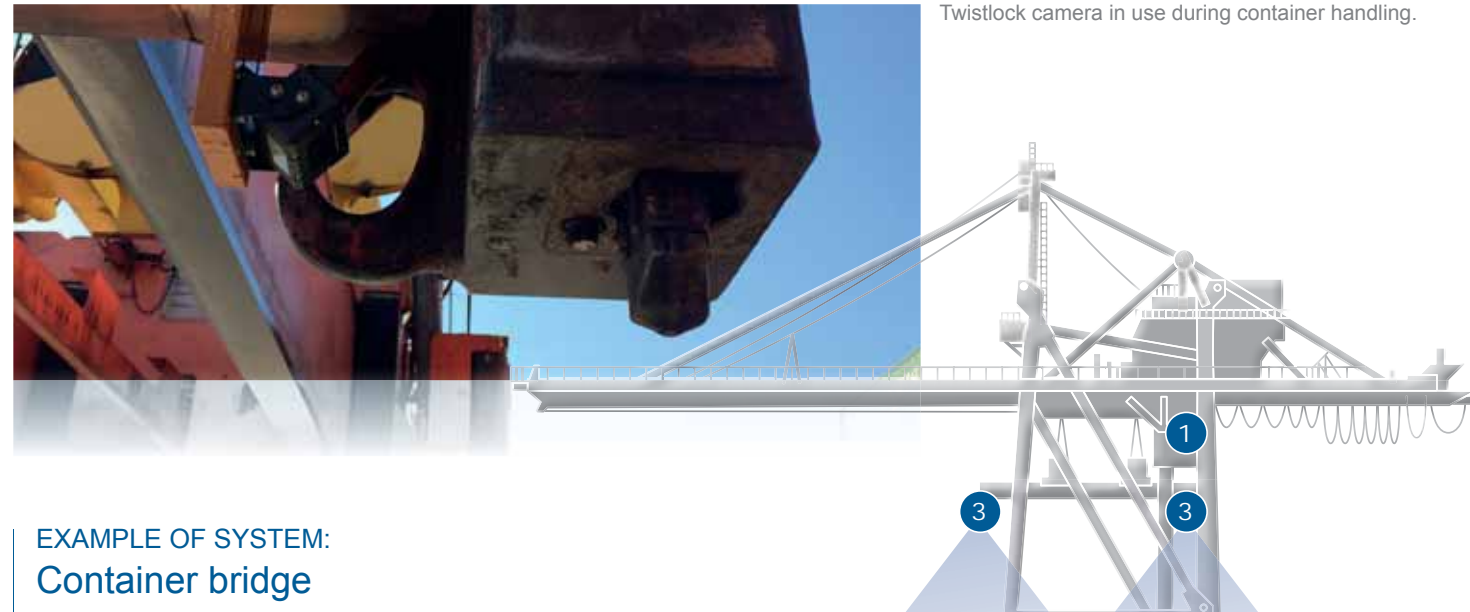
Twistlock camera in use during container handling.

EXAMPLE OF SYSTEM:
Container bridge

MD3100 Heavy-duty 10,2" monitor	Kit MVRD1000 Digital wireless system	MC3000B Heavy-duty camera
1	2	3

MD3100   RAM-MH2   KIT-MVRD1000   MC3xxxB-4

C1   C2

C3   C4

C1

C2

C3

C4

12/24 V DC

9 V to 32 V DC

MB1205

KIT-MVCU1401-11

MC7000P-4-E

C5   Optional rear view monitoring
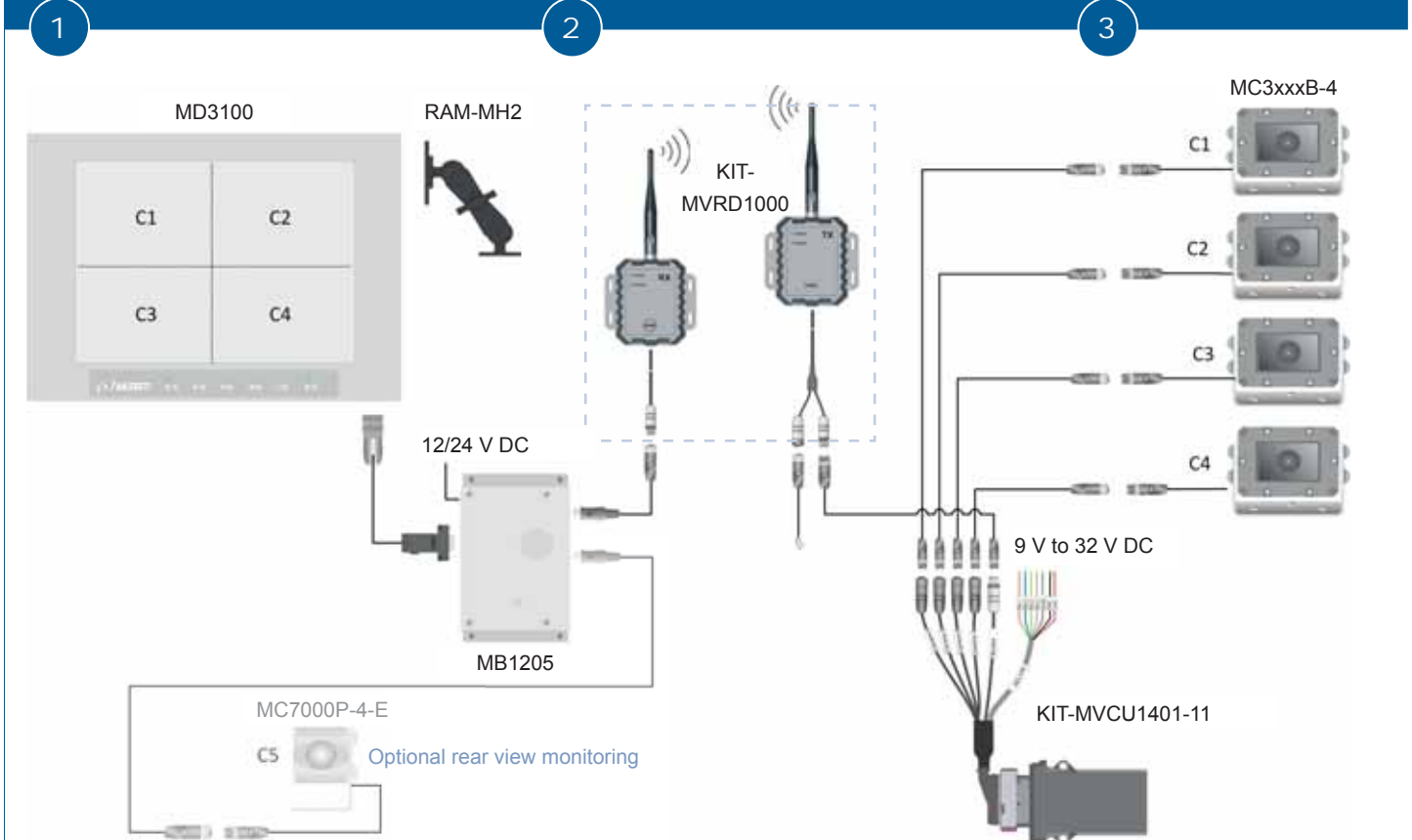
Optional image transmission via FOC (fibre optic cable) or twisted-pair converter.

Stationary and semi-stationary applications
Example of machine tools

In order to monitor production processes, cameras are mounted to the gripper and transport container. The cameras help you to verify the correct positioning of the workpiece or semi-finished product, or to display the filling level of the transport boxes.

This allows workflows and production planning to be optimised.

Alternatively, the system can be extended by a digital wireless system. In addition, it is possible to integrate an Ethernet camera.

Camera-monitored workplace during line production.

EXAMPLE OF SYSTEM:
Stationary and semi-stationary applications

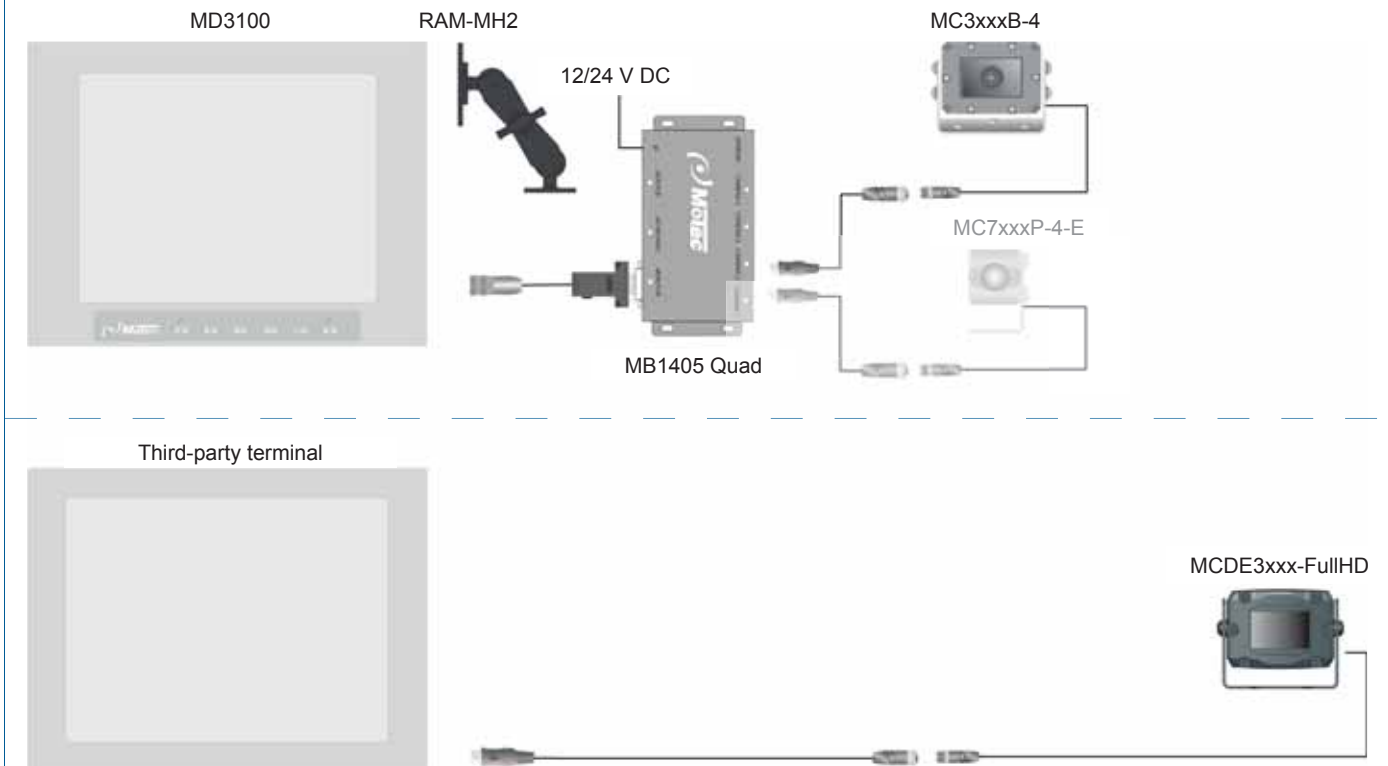| MD3100 Heavy-duty 10,2" monitor	MB1405 Quad Video control unit	MC3000B Heavy-duty camera	MCDE3000-FullHD Ethernet camera

MD3100   RAM-MH2   12/24 V DC   MC3xxxB-4

MC7xxxP-4-E

MB1405 Quad

Third-party terminal

MCDE3xxx-FullHD

Heavy-duty cameras
Overview

MC9000
Fork-mounted camera

The MC9050 fork camera is designed especially for forklift trucks and is mounted to the inside of the fork. This places the camera at the eye level of the pallet. Based on its pinhole size opening in the housing, the lens is protected from damage that may be caused by lattice boxes or pallets

MC9150P
Pinhole camera

The MC9150P is designed for mounting on the fork carriage, fork bend and spreader. The 50° viewing angle makes it possible to observe both forks. Based on its pinhole size opening in the housing, the lens is protected from damage that may be caused by lattice boxes or pallets. The camera has a very high shock and permanently shock resistant up to 100 g.

MC925C
Fork-mounted camera with LED

The MC9000 fork camera is designed especially for forklift trucks and is mounted to the inside of the fork. Two integrated LED high resolution modules let the forklift operator maintain visual contact with the forks even during poor lighting conditions.

MCDE7000-FullHD
Ethernet camera

The MCDE7000-FullHD is a FullHD Ethernet camera suitable for mobile use.It can be utilised in networks compliant with IEEE 802.3 (LAN). Fitted with intelligent image processing, a high optical dynamic range (HDR) and dynamic overlays, it functions as a smart sensor in a variety of applications. For example, it can be integrated into existing video monitoring systems or used for video streaming across large distances.

MCDB7000-FullHD
BroadR-Reach camera

The MCDB7000-FullHD is a FullHD BroadR-Reach camera suitable for mobile use. It can be utilised in networks compliant with IEEE 802.3 (LAN). Fitted with intelligent image processing, a high optical dynamic range (HDR) and dynamic overlays, it is used in a variety of applications. For example, it can be used for 360°-bird's eye view systems or as rear view camera.

MCDL7000-FullHD
LVDS camera

The MCDL7000-FullHD is a compact LVDS camera suitable for mobile use. The LVDS interface provides uncompressed data transmission of raw data up to 3 gigabits per second without loss of quality for image processing. LVDS cameras are used in applications that require high-speed serial communications, for example, video streaming, 360°-bird's eye view systems or stereo cameras.

MC9350
Pinhole camera

The MC9350 is fitted in the front of the fork, meaning it is always at the same level as the pallet. A safe immersion of the fork in the pallet and a fast and safe sett-ling of the pallet in the high rack is thus ensured. The pinhole lens and the associated pin-prick sized opening in the casing reduced the risk of wire mesh crates or pallets damaging the lens.

MC7000P-4-E
Heavy-duty camera

Based on its **small design**, the MC7000P-4-E is perfectly suitable for the installation on mobile machines with limited space available. The individually adjustable lens makes it possible to install the camera vertically, horizontally, at an angle, or overhead. The stainless steel housing guarantees a high level of durability to prevent corrosion and resist acids.

MC7180N-4
Wide angle camera

The MC7180N-4 is a heavy-duty wide-angle camera used for 360° panoramic view systems or 270° rear view/front view systems. But the robust 180° camera can also be used as a standalone camera. The real flexibility of the camera enables adaptation to different visual requirements and vehicles, e.g. as a MC7180N-4-MH with integral holder.

MC3000B-4
Heavy-duty camera

There are no visibility issues the MC3000B with its anodised and coated aluminium housing cannot handle in robust, heavy-duty applications and under extreme weather and environmental conditions. Its numerous available view angles and plug connections make it the perfect choice for a wide range of applications in utility vehicles and mobile machinery.

MC3000C-IR/-WL
Night vision capable camera

The MC3000C-IR/-WL is a heavy-duty camera with infrared LEDS (night vision) or white light LEDs. Both cameras automatically switch to LED mode as darkness sets in. The IR and WL version is characterized by high electromagnetic compatibility (EMC). The development is based on the high demands of industry and defense.

MCDE3000-FullHD
Ethernet camera

The MCDE3000-FullHD is a FulHD Ethernet camera suitable for mobile use. It can be utilised in networks compliant with IEEE 802.3 (LAN). Fitted with intelligent image processing, a high optical dynamic range (HDR) and dynamic overlays, it functions as a smart sensor in a variety of applications. For example, it can be integrated into existing video monitoring systems or used for video streaming across large distances.

Heavy-duty monitors
Overview

MD3071A
7" monitor

Due to its compact and versatile design and its integrated functions, the tough heavy-duty MD3071A monitor offers a wide range of applications, for example the horizontal and vertical version in the 360° bird's eye view system (MVS). The software update option ensures that the MD3071A is always up to date and thereby future-proof.

MD3072B-Quad
7" monitor

The MD3072B-Quad monitor has an integrated video control unit. Up to 4 camera feeds can be displayed simultaneously. An integrated menu function and control cables to the automatic controls of the connected cameras ensure quick image changes.

MD3074A-Quad
7" monitor

The MD3074A-Quad is a tough heavy-duty monitor that, due to its protection class IP65, can not be harmed by water and is even able to be used in cooling warehouses. Various picture modes can be selected and up to 4 camera images displayed simultaneously, including interval controlled image selection.

Heavy-duty video control units
Overview

MVCD1000
Video control unit

The MVCD1000 is a digital FPGA-SoC-based Ethernet and CAN bus-compliant heavy-duty video control unit which can process up to 4 camera images in parallel. It can merge the camera images with other sensor data and output it via a monitor output or via Ethernet video stream. It is the video controller unit for MVS and radar applications.

MB1405-Quad
Video control unit

The MB1405 quad is a video control unit which allows the display of up to 4 camera images at the same time in quad split mode. The camera display and switching to single image mode are controlled automatically by means of situation-based signals or manually using the control unit (keyboard) supplied. Direct image mirroring is also possible.

MVCU1400
Video control unit

The MVCU1400 is an intelligent, CAN-controlled heavy-duty multi camera video control unit that processes up to 4 camera images and displays them on up to 2 monitors in various modes.

52 53

Data storage and transmission
Overview

MD3073
7" monitor

The waterproof and dustproof monitor MD3073 is used in the forklift and logistics area (cold store operation). Furthermore, the robust monitor is used on construction and agricultural machinery as well as foundry vehicles. Especially its use in alternating operation in cold and warm temperatures are its strengths. It fulfills the protection class IP67.

MD3100
10" monitor

The MD3100A has a 10" screen and thereby is suitable to simultaneously display multiple camera images. For industrial use it was equipped with a powder coated metal housing, wich fulfills the protection class IP54 on the front side.
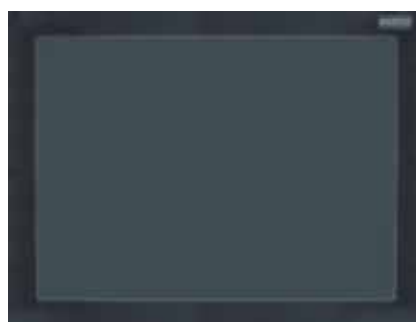
LCD-Monitor
17"-1 metal housing monitor

The 17" LCD monitor is a monitor for industrial applications and stationary use with powder-coated metal housing. The large screen size ensures the display of complex image combinations. The higher resolution provides sharp camera images that are true to the detail.

DVR-BD-301-2WG/-WIFI
Digital video recorder

The DVR-BD-301-2WG/-WIFI is a WLAN-enabled digital recorder for mobile applications for which up to 2 heavy-duty cameras can be connected. The recording is started by pressing a button, through event- and time-base control or through movement-based control in the AVI format. Parallel live viewing and recording possible along with setting of image quality and frame rate. GPS data can be displayed in the recording.

MAB2000-Set-2
Digital wireless system

Digital wireless system for image transmission. Including video receiver, video transmitter, charger, battery box and 2 Li-ion batteries. Operating time > 28 hours thanks to automatic shutdown. Range up to 120 meters. 2.4 GHz.

Other ways of transmission

- Analogue wireless 5.8 GHz
- FOC (fibre optic cable)
- Twisted pair converter
- Ethernet/BroadR-Reach

Cables and cable harnesses, cable accessories, cable protection systems and customer-specific solutions

Motec GmbH has more than 25 years of expertise in assembling high-quality, customised cable systems in Germany. At this point in time, we produce approximately 1.000 different cables in various lengths and designs.

Individually-customised solutions are our specialty: We use all standard plug-in connectors and can produce complex cable harnesses and cable sets.

We process any type of wire or conductor, with diameters from 0.013 mm² (AWG36) to 107.2 mm² (AWG 4/0), without any limits in the number of conductors.

Certified quality

for the most sophisticated requirements

- Pull testing
- Micrograph laboratory
- Crimp height measuring
- Automatic crimping force monitoring
- 100% semi-automatic, logged final test for correct functioning
- EDP-supported merchandise management and production planning and control system
- Operational data recorded via bar code
- 100% traceability
  (via batch and serial numbers)

System solutions

Customised solutions for a wide range of other industries

- Product range
- Construction machinery
- Transport and municipal vehicles
- Logistics, port and industrial applications
- Railway vehicles and machines
- Logistical and tactical vehicles

Motec is certified according to the quality standard ISO 9001:2015 and ISO14001:2015 for environmental management. For the development and production of road-use products, the management system also has an extended certification for approval-relevant requirements (GRA).

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