



Camera systems for mobile machines.

Industrial imaging



www.o3m.ifm

Future-oriented technology meets user-friendly handling.

3D sensor system O3M



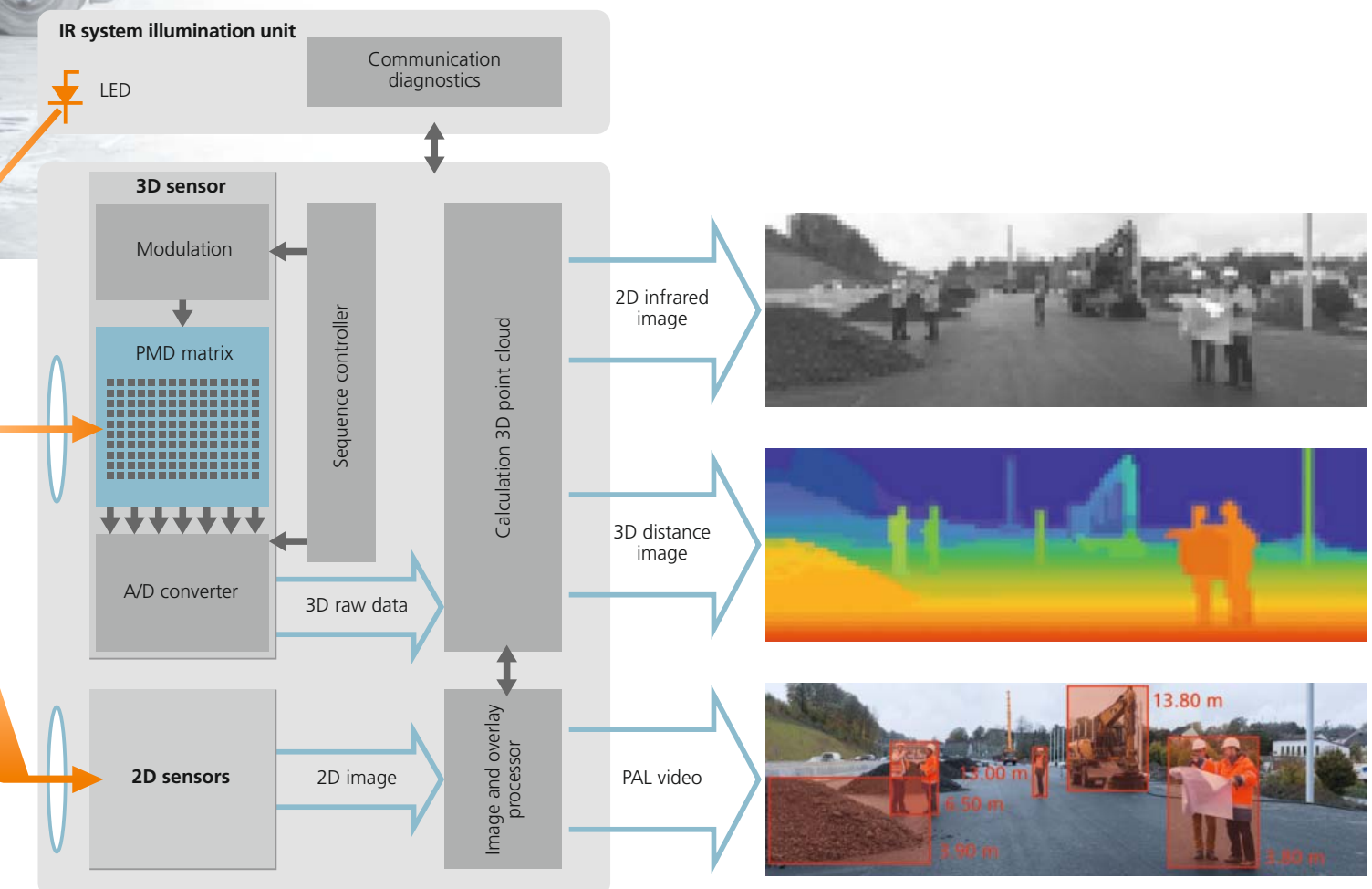


Augmented reality – new 3D smart camera.

The function principle of ifm's PMD technology is based on time-of-flight (ToF). The scene is illuminated by modulated invisible infrared light and the reflected light hits the PMD sensor. This sensor is also connected to the source of modulation. Each pixel on the PMD chip determines the distances to the scene from the phase shift between the transmitted and the received signal.

The integrated active suppression of background illumination almost completely prevents saturation of the image sensor by extraneous light. That means that ifm's PMD 3D sensor can be operated in bright sunlight up to 120 klx. Simultaneously the optionally integrated camera provides a live image with superimposed real-time warning messages such as in dangerous situations or with imminent collisions.

The sensor system places warning symbols, icons, line objects or text into the image and combines them with the video signal. The command to display these objects can also be given directly by the machine control system via CAN bus. The analogue PAL video output supports conventional monitors and dialogue modules with video input and graphics capabilities.

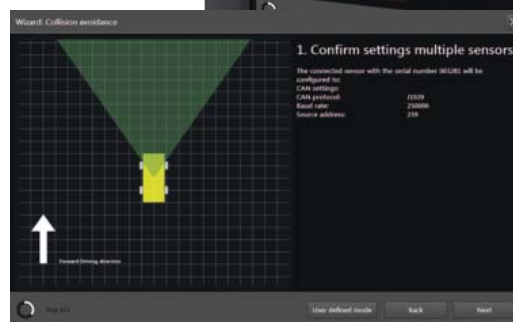


Three-dimensional detection of scenes. Automatic detection of objects.

3D sensor system O3M

Easy set-up and handling

The 3D sensor system is set up and operated via ifm's user-friendly Vision Assistant. Its use ensures parameter setting of even complex configurations with several 3D sensor systems without profound previous knowledge. The preset wizards give support for many standard applications and intuitively guide to the best solution. At the same time the Vision Assistant enables checking of the setting in a monitoring mode during operation and even recording of all data for later replay.



Set up collision warning





Systems for mobile machines

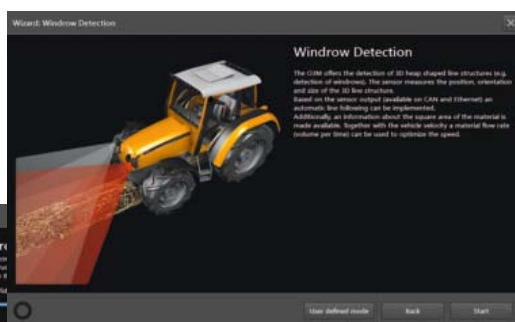


Augmented reality – now in real 3D

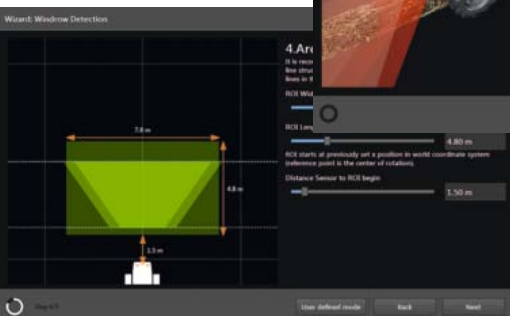
The PMD 3D sensor from ifm detects scenes and objects three-dimensionally with only one image capture. This avoids the motion blur that can occur with line scanners. ifm's award-winning patented PMD technology forms the basis for a sensor system that can cope with the harsh operating conditions of mobile machines. Besides the robust and compact design the 3D sensor system is especially designed for outdoor applications with changing light conditions or bright sunlight.

The ifm 3D sensor has no moving components in contrast to other sensors such as laser scanners. Therefore it is particularly robust and not subject to wear. The so far unique combination of PMD 3D sensor and 2D camera with integrated overlay function allows a completely new perception. Overlay of customer-specific symbols, warning messages, texts and even drawings of complex, geometric shapes is supported by the new 3D smart camera system.

The request for overlay can either be event-controlled or directly triggered by the machine control system via CAN bus.



Set up line guidance

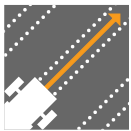


Camera systems for mobile machines. The optimum solution for every requirement.

3D sensor system O3M



*Area
surveillance*



*Line
guidance*



*Distance
monitoring*



*Object
detection*



*Reflector
tracking*



*Positioning
help*



*Intelligent
collision
avoidance*





Construction machines

Area surveillance
in harsh environments

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Transport and logistics

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Transport and logistics

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Heavy-duty universal camera O2M
TFT LCD monitor
"Ready-to-start" application package
I/O module for 3D camera system O3M
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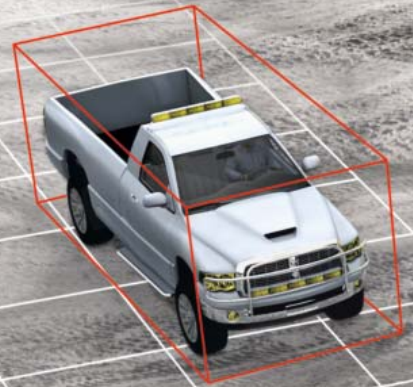
Area surveillance in harsh environments

Construction machines



Intelligent collision avoidance

The integrated, automatic object recognition detects up to 20 stationary or moving objects in the path of a construction vehicle. By comparing the current speed, the motion vector and fixed parameters such as the braking distance, the collision probability is calculated by the 3D sensor and transferred to the machine control system via CAN bus or Ethernet and then signalled to the driver.



3D smart camera:

Integrated camera with overlay function to provide a live image and real-time warning messages.

Enormous far sightedness:

The 3D sensor that is optimised for long ranges even detects moving reflective objects at a distance of up to 35 metres.

Integrated evaluation:

All 3D calculations are made in the powerful sensor system and the results are provided via the CAN bus or the Fast Ethernet connection.

Simply convenient:

The parameters of the system are set via the easy-to-handle "ifm Vision Assistant" for Windows. Ready-to-use function blocks are available for the CODESYS software for machine integration.





Collision Avoidance X

Collision Status: Crash predicted

Predicted impact velocity of collision: 2.70 m/s

Predicted time to collision: 1.28 s

ID of the object causing the collision: 69

Object information X

ID: 69

Type: Normal

x1: 7.52 m

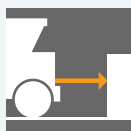
delta-x: - 0.08 m

y1: - 0.22 m

delta-y: 1.32 m

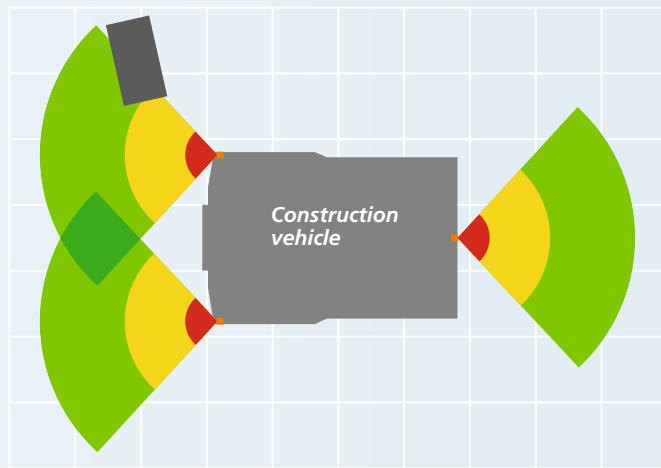
Velocity x-direction: - 3.00 m/s

Velocity y-direction: 0.00 m/s



Distance monitoring

For simple distance functions the integrated distance monitoring provides up to 64 adjustable regions of interest (ROIs), i.e. individual regions whose distances are to be monitored. Rear area monitoring can be implemented or automation or assistance tasks can be solved.



Learn more at ifm.com/gb/o3m-ca

Automation solutions for agricultural machinery

Agriculture and forestry

For the harshest environments:

Since the sensor does not have any moving components, it is virtually free of wear. Its high ambient temperature range of -40 to 85°C is the basis for universal use.

Resistant to extraneous light:

The PMD technology ensures high repeatability of the measured data even in difficult ambient light conditions or with direct sunlight.

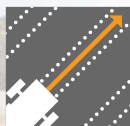
Communicative:

Interfaces such as CAN with J1939 or CANopen and Fast Ethernet are integrated as standard. Self-diagnostic functions from the sensor to the IR system illumination unit continually monitor the system status.

Reliable and fast:

With a highly developed algorithm from the automotive sector and a frame rate of up to 50 frames / second the sensor allows fast and reliable calculation of the 3D information.





Line guidance

A highly developed algorithm with generic recognition of linear contours provides the machine driver with a selection of recognised lines and their guidance. With interrupted contours the data is interpolated. This ensures that guidance does not stop in case of smaller interruptions. An offset function ensures fine adjustment between vehicle and the line to be followed.

Besides the actual line guidance, the volume flow of the harvested material can be determined at the same time so that the speed of the tractor unit or harvester can be adapted to match the quantity of material.

Windrow recognition

The mobile 3D sensor recognises windrows and provides the information for automatic steering to the machine control system.

At the same time the quantity of material [m^3/s] is determined to avoid overloading or underloading of the baler.



Grape harvesting machine

To relieve the driver and to protect the plants the 3D sensor transmits all relevant

data for automatic steering along the grape row to the machine control system.



Learn more at ifm.com/gb/o3m-lg

Collision avoidance and area surveillance

Transport and logistics

Integrated camera:

An additional camera in the 3D sensor system provides the machine operator with a user-friendly overview.

Continuously reliable:

Thanks to the specially modulated infrared light a continuously high recognition rate can be achieved even with reflective material of different intensity. All that with a minimum response time of only 40 ms.

High coverage:

The range of up to 15 m in typical environments and up to 35 m on reflective objects ensures universal use.

Goal-oriented:

Object distances and dimensions are automatically provided in a clear grid using the selectable world coordinate system. The ground recognition integrated in the algorithm ensures high unambiguity of object recognition.





Area surveillance

With more than 1,000 individual distance values the 3D sensor recognises objects in the detection range and signals this to the machine control system depending on the distance to the machine.



Vertical drill

Automatic detection of objects in the danger zone. The system is automatically stopped if something enters the monitored area.

As the machine parameters are pre-selected, the 3D system is harder to bypass than conventional systems.



Collision avoidance and area surveillance

Transport and logistics



Intelligent collision avoidance

The integrated, automatic object recognition detects up to 20 stationary or moving objects in the path of a refuse truck. By comparing the current speed, the motion vector and fixed parameters such as the braking distance, the collision probability is calculated by the 3D sensor and transferred to the machine control system via CAN bus or Ethernet and then signalled to the driver.

Integrated camera:

An additional camera in the 3D sensor system provides the machine operator with a user-friendly overview.

Continuously reliable:

Thanks to the specially modulated infrared light a continuously high recognition rate can be achieved even with reflective material of different intensity. All that with a minimum response time of only 40 ms.

No interference:

Automatic suppression of background illumination ensures reliable recognition even with full solar radiation of 120 klx.

Reliable parallel operation:

The reliable operation of several 3D sensor systems in the same area is guaranteed by an adjustable frequency change method. This may be random or preset.





Side loader

The 3D system for the side loader automatically detects objects such as pedestrians or cyclists in the danger zone. Lowering is immediately stopped.

Refuse trucks can enter tight spaces even without a banksman utilising the 180° field of view of the system monitoring the area behind the vehicle. The 3D system detects objects in its path and automatically brakes and stops the vehicle.



Collision avoidance and area surveillance

Transport and logistics

Truck positioning at a loading bay

To protect the logistic facilities the driver is informed as soon as he has reached the ideal discharge position at the bay.

Continuously reliable:

Thanks to the specially modulated infrared light a continuously high recognition rate can be achieved even with reflective material of different intensity. All that with a minimum response time of only 40 ms.

High coverage:

The range of up to 15 m in typical environments and up to 35 m on reflective objects ensures universal use.

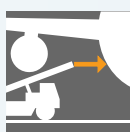
Goal-oriented:

Object distances and dimensions are automatically provided in a clear grid using the selectable world coordinate system. The ground recognition integrated in the algorithm ensures high unambiguity of object recognition.

Driver assistance during reversing

To prevent accidents the danger zone behind the fork lift is detected in 3D and the driver is informed in time by a warning message before a possible collision.

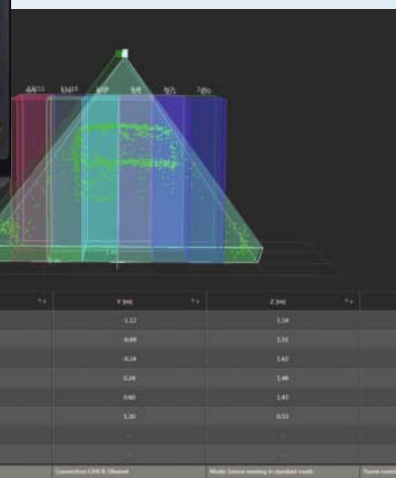
Simultaneously the machine control system can get a command to lower the speed, for example.



Position determination of transport vehicles

For simple position determination the integrated distance monitoring provides up to 64 adjustable regions of interest (ROIs), i.e. individual regions whose distances are to be monitored.

This ensures, for example, position determination of a transport vehicle underneath a loading point.



Collision avoidance and area surveillance in ports

Transport and logistics

Fast reaction:

The 2 x 32-bit processor architecture ensures very fast and reliable calculation of the 3D data with up to 50 frames / second directly in the sensor system.

No interference:

Automatic suppression of background illumination ensures reliable recognition even with full solar radiation of 120 klx

Reliable parallel operation:

The reliable operation of several 3D sensor systems in the same area is guaranteed by an adjustable frequency change method. This may be random or preset.

Automatic detection of reflectors:

By detecting highly reflective objects these can be classified and evaluated as reflectors. Even simple safety vests suffice for this recognition.

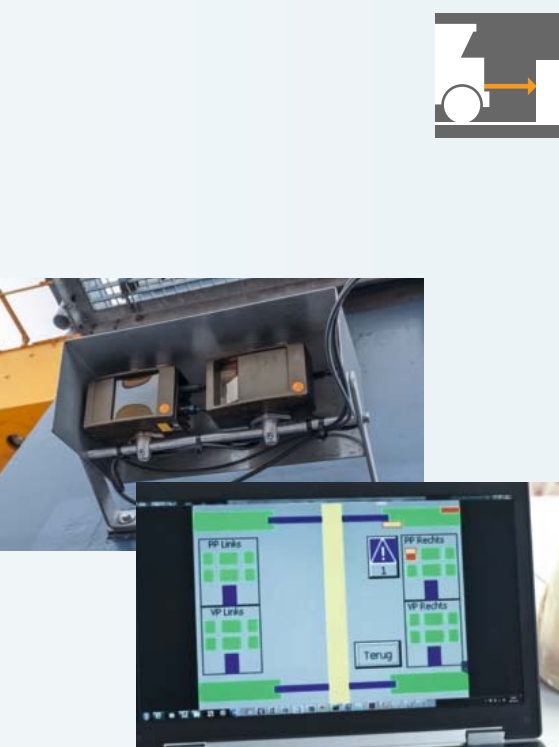
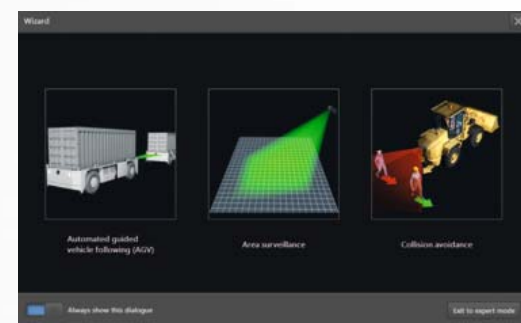




Automatic vehicle tracking with collision avoidance

A special classification of reflective objects is used as basis for automatic tracking of the vehicle ahead. The proven and highly-developed algorithm from the automotive sector is relied on. The minimum and maximum distance to the vehicle ahead is set or recognition is limited to a certain arrangement of reflectors via various parameters.

An additional collision warning ensures that obstacles are reliably detected and signalled to the machine control system in two stages. Interference by direct solar radiation or other 3D sensor systems is automatically suppressed.



Easy area surveillance in ports

The integrated functions in the 3D sensor are especially suited for monitoring the rails of a gantry crane. The sensor detects an obstacle on the rails or extending into the path and signals this to the crane driver in time. The crane is stopped automatically in critical situations.



Collision avoidance and area surveillance in ports

Transport and logistics

Integrated camera:

An additional camera in the 3D sensor system provides the machine operator with a user-friendly overview. Recognised obstacles are superimposed on the camera image.

Customer-specific warning messages:

The overlay function of the 3D smart camera also allows overlay of graphics or text by the machine control system via CAN bus.

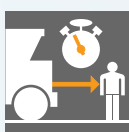
No interference:

Automatic suppression of background illumination ensures reliable recognition even with full solar radiation of 120 klx.

Reliable parallel operation:

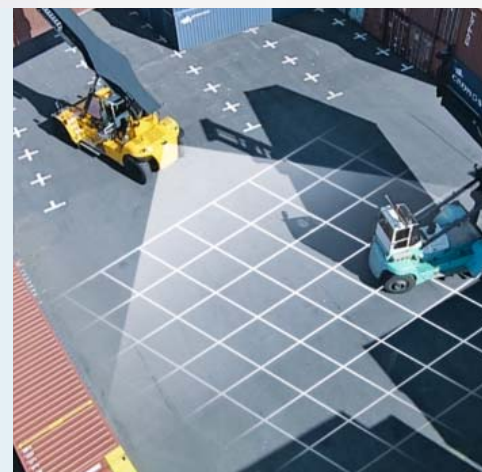
The reliable operation of several 3D sensor systems in the same area is guaranteed by an adjustable frequency change method. This may be random or preset.





Intelligent collision avoidance

The integrated, automatic object recognition detects up to 20 stationary or moving objects in the path of a reach stacker. On the basis of the current speed, the motion vector and fixed parameters, for example for the braking distance, the collision probability is calculated by the 3D sensor. It is transferred to the machine control system via CAN bus or Ethernet and signalled to the driver. In a live image provided by the integrated camera the recognised obstacles are highlighted.



Height and distance monitoring in airports

Transport and logistics

High-performance measuring system:

Thanks to the patented PMD technology it is possible to have a high repeatability of the measured data even on materials of different reflectivity.

The multi-phase measuring system even detects interference caused by dust or water mist formation.

Robust sensors:

The protection rating IP 67 and IP 69K and a wide temperature range of -40 to 85 °C ensure universal use in different applications.

High reliability:

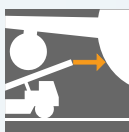
Integrated self-diagnostic functions from the sensor to the IR system illumination unit always ensure comprehensive information of the machine control system about the current function status of the 3D sensor.

In case of damage, interference or heavy soiling the sensor system can give corresponding signals in time.

Height monitoring for tankers

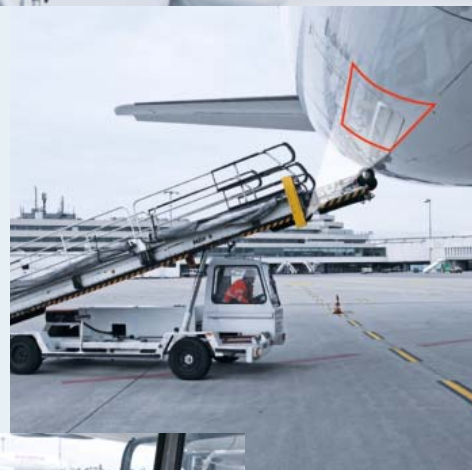
The integrated distance function 'minimum distance' can monitor up to 64 selectable points above the tanker simultaneously.

The driver can, for example, be supported when he positions the tanker underneath the aeroplane wing or is informed if the wing is lowered.



Positioning and docking help for airport ground equipment

More than 1,000 individual measurements precisely detect the environment of the vehicle. When approaching an aircraft the speed is automatically reduced depending on the distance until the vehicle comes to a complete stop.



Safety zones.

- 1 Docking area
- 2 Equipment restrain area
- 3 Ramp area



Learn more at ifm.com/gb/o3m-sd

3D sensor system

Overview of articles / Technical data

O3M PMD 3D sensor

Description	Horizontal x vertical angle of aperture [°]	Order no.	Suitable illumination	Order no.
Mobile 3D smart sensor	70 x 23	O3M151	IR system illumination unit	O3M950
Mobile 3D smart sensor with integrated 2D/3D overlay	70 x 23 (3D), 90 (2D)	O3M251	IR system illumination unit	O3M950
Mobile 3D smart sensor	95 x 32	O3M161	IR system illumination unit	O3M960
Mobile 3D smart sensor with integrated 2D/3D overlay	95 x 32 (3D), 120 (2D)	O3M261	IR system illumination unit	O3M960
Mobile 3D smart sensor with integrated 2D/3D overlay	97 x 44 (3D), 155 (2D)	O3M271	IR system illumination unit	O3M970



Technical data

Type of sensor	PMD 3D chip
Pixel resolution [Pixel]	64 x 16
Illumination	IR system illumination unit 850 nm (wave length)
Max. frame rate [Hz]	25 / 33 / 50
Wiring	M12 connector
Protection rating / protection class	IP 67 / IP 69K, III
Operating voltage [V DC]	9...32
Ambient temperature [°C]	-40...85

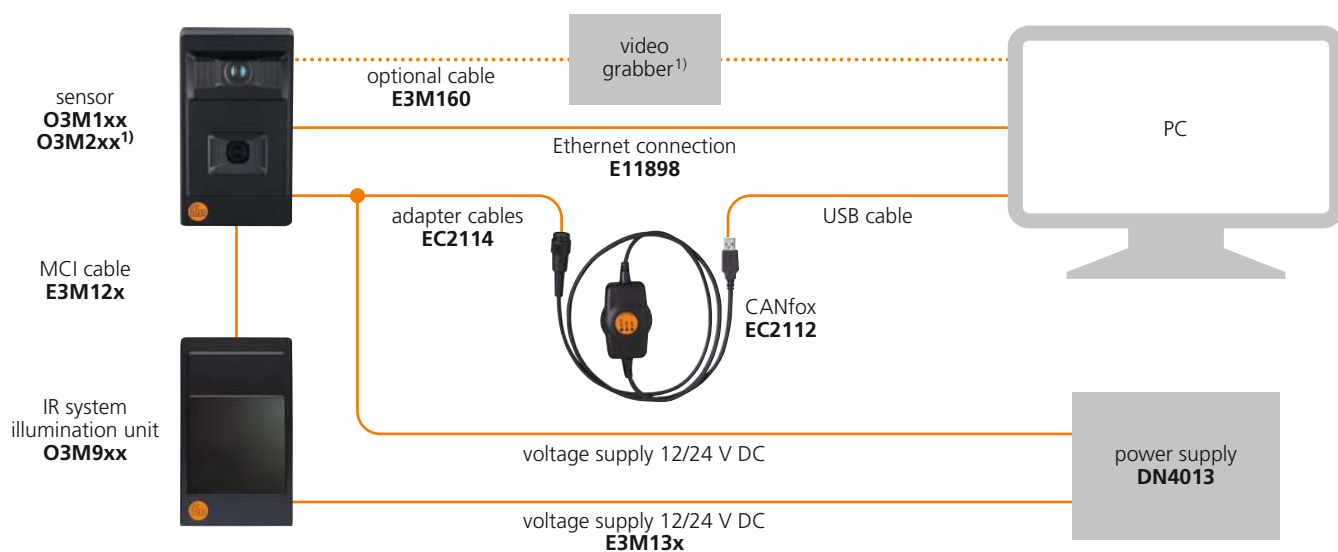
Further technical data Devices with 2D camera

Type of sensor	1/4" 4:3 VGA CMOS image sensor colour
PAL resolution [Pixel]	640 x 480

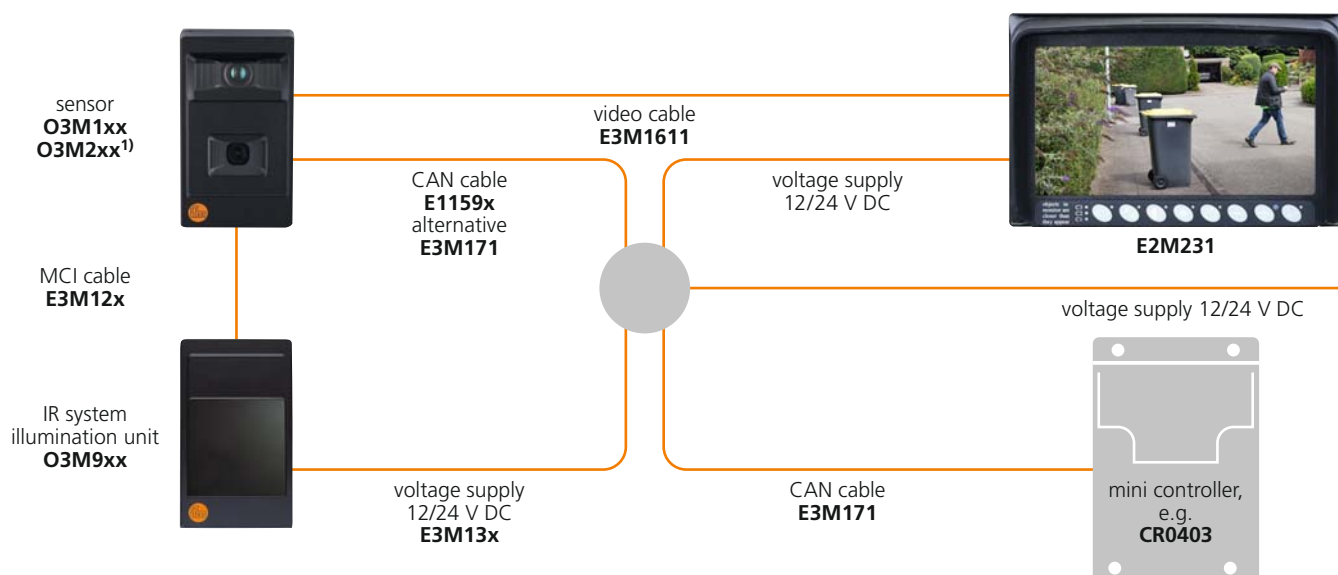
Note:

The 3D sensors of the O3M series can be used for example as driver assistance for collision avoidance or for area surveillance. They are photoelectric systems whose function may be impaired by heavy soiling, for example. This system does not meet the requirements of IEC 61496 for electro-sensitive protective equipment and must not be used for implementing a safety function for operator protection. The 3D sensors of the O3M series can be used to assist the machine operator. The machine operator is, however, always fully responsible.

Wiring for parameter setting



Wiring for installation



¹⁾ Type O3M2xx provides an additional analogue video output








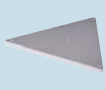




3D sensor system

Overview of articles / Technical data

Application wizards

Application wizards available in the ifm Vision Assistant	Application examples
Collision avoidance as driver assistance	Monitoring the area behind construction vehicles and fork lifts, monitoring the blind spots, recognition of collisions when moving forwards, collision recognition with dockside cranes.
Area surveillance for mobile or stationary machinery	Area surveillance on drilling rigs, refuse trucks and cranes.
Automatic following for driverless transport vehicle	Automatic tracking of transport vehicles ahead and keeping safety distances.
Line guidance	Automatic windrow recognition and calculation of the volume flow, automatic steering of a grape harvester.

Accessories

Design	Description	Order no.	Design	Description	Order no.
	CAN/RS232 USB interface CANfox	EC2112		U-shaped bracket, suitable for sensor or illumination unit, stainless steel	E3M100
	Adapter cable set for CANfox	EC2114		Mounting set for clamp mounting, Ø 14 mm, stainless steel / high-grade stainless steel	E3M103
	Operating software for vision sensors	E3D300		Reflector, triangular, 200 mm	E3M140
	Weather protective cover, stainless steel black	E3M101		Reflective tape, triangular, self-adhesive, 200 mm	E3M141
	U-shaped bracket, suitable for sensor or illumination unit, stainless steel black	E3M102		Reflective tape 210 x 297 mm, self-adhesive	E3M142

Connection technology

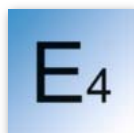
Design	Description	Order no.
	TPU cable, connection sensor / system illumination unit, 0.25 m	E3M120
	TPU cable, connection sensor / system illumination unit, 2 m	E3M124
	MCI cable, connection sensor / system illumination unit, 1 m	E3M121
	MCI cable, connection sensor / system illumination unit, 2 m	E3M122
	MCI cable, connection sensor / system illumination unit, 3 m	E3M123
	Socket, M12, voltage supply system illumination unit, 2 m, PUR cable, 4 poles	E3M131
	Socket, M12, voltage supply system illumination unit, 5 m, PUR cable, 4 poles	E3M132
	Socket, M12, voltage supply system illumination unit, 10 m, PUR cable, 4 poles	E3M133
	M12 video connection cable, connection sensor / display PDM360, 5 m	E3M151
	M12 video connection cable, connection sensor / display PDM360, 11 m	E3M152
	M12 video connection cable, connection sensor / display PDM360, 16 m	E3M153
	M12 video connection cable, connection sensor / display PDM360, 21 m	E3M154

Design	Description	Order no.
	M12 video extension cable, 5 m	E3M159
	M12 video adapter cable / Cinch plug, for connection of a video grabber, 1 m	E3M160
	Video adapter cable M12 connector to M16 connector for connection to the multi-view box E2M250 or monitor E2M231, 1 m	E3M161
	Socket, M12, CAN bus, 2 m, PUR cable, 5 poles	E11596
	Socket, M12, CAN bus, 5 m, PUR cable, 5 poles	E11597
	Ethernet, cross-over patch cable, 2 m, PVC cable, M12 / RJ45	E11898
	Ethernet, cross-over patch cable, 10 m, PVC cable, M12 / RJ45	E12204
	Ethernet, cross-over patch cable, 20 m, PVC cable, M12 / RJ45	E12205
	Ethernet, cross-over patch cable, 2 m, PVC cable, M12 / RJ45, angled / straight	E12226



Heavy-duty universal camera

Overview of articles / Technical data






O2M2xx camera with analogue video output

Description	Angle of aperture [°]	Mirror function	Order no.
CMOS camera	80	–	O2M200
CMOS camera	80	integrated	O2M201
CMOS camera	118	–	O2M202
CMOS camera	118	integrated	O2M203
CMOS camera	170	–	O2M210
CMOS camera	170	integrated	O2M211

Technical data

Type of sensor	1/4" 4:3 VGA CMOS image sensor colour		
PAL resolution [Pixel]	640 x 480		
Image repetition rate [fps]	25		
Wiring	cable 0.5 m with M16 connector		
Protection rating / protection class	IP 67 / IP 69K		
Operating voltage [V DC]	12...32		
Ambient temperature [°C]	-40...85		
Lens heating	automatic		

Multi-view box

Design	Description	Order no.
	Video splitter, visualises up to 4 camera images (PAL) on a conventional monitor or a process and dialogue module	E2M250
	M16 cable, 3.85 m, 8 poles, for the voltage supply of the E2M250 multi-view box, open cable end	E2M251
	Socket, M16, wirable, 8 poles, for the voltage supply of the E2M250 multi-view box	E2M252

Technical data

Video signal	PAL, 720 H x 576 V (active 680 x 480)
Inputs	4
Wiring	M16 connector

Accessories

Design	Description	Order no.
	Metal protective cover, stainless steel	E2M212
	Dome fixture	E2M211
	Vibration damper set	E2M213
	Replacement fixture	E2M210



Connection technology

Design	Description	Order no.
	Adapter cable, M12 connector to M16 socket, black, PVC. To connect a camera to the PDM NG	E2M200
	Adapter cable, M12 connector to M16 socket, black, PVC. To connect two cameras to the PDM NG	E2M201
	Cable, M16 connector to M16 socket, 3 m, black, PVC	E2M202
	Cable, M16 connector to M16 socket, 5 m, black, PVC	E2M203
	Cable, M16 connector to M16 socket, 11 m, black, PVC	E2M204
	Cable, M16 connector to M16 socket, 16 m, black, PVC	E2M205
	Cable, M16 connector to M16 socket, 21 m, black, PVC	E2M206
	Adapter cable, BNC connector to M16 socket, for connection to monitors with BNC socket	E2M260
	M16 socket, wirable, 4 poles, for connecting O2M2 cameras	E2M261

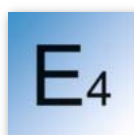
Monitors and graphic displays

Design	Description	Order no.
	7" TFT LCD monitor with LED backlight, 1 video input	E2M231
	7" TFT LCD monitor with LED backlight, 2 video inputs	E2M232
	7" colour display, 9 function keys, navigation key, 2 x analogue video input, touch screen	CR1082
	7" colour display, 9 function keys, navigation key, 2 x analogue video input	CR1085
	7" colour display, 8 function keys, 2 x analogue video input	CR1083
	7" colour display, 9 function keys, encoder, 2 x analogue video input	CR1084
	12" colour display, 13 function keys, navigation key, 2 x analogue video input	CR1200
	12" colour display, 13 function keys, navigation key, 2 x analogue video input, touch screen	CR1201



Robust 7" TFT LCD monitor

Overview of articles / Technical data



Monitor with analogue video input E2M2xx

Description	Order no.
7" TFT LCD monitor with LED backlight for direct connection of an O2M2 camera or O3M2 smart camera. With video input. Resolution WVGA 800 x RGB x 480.	E2M231
7" TFT LCD monitor with LED backlight for direct connection of O2M2 cameras and / or O3M2 smart cameras. With two video inputs. Resolution WVGA 800 x RGB x 480.	E2M232

Accessories

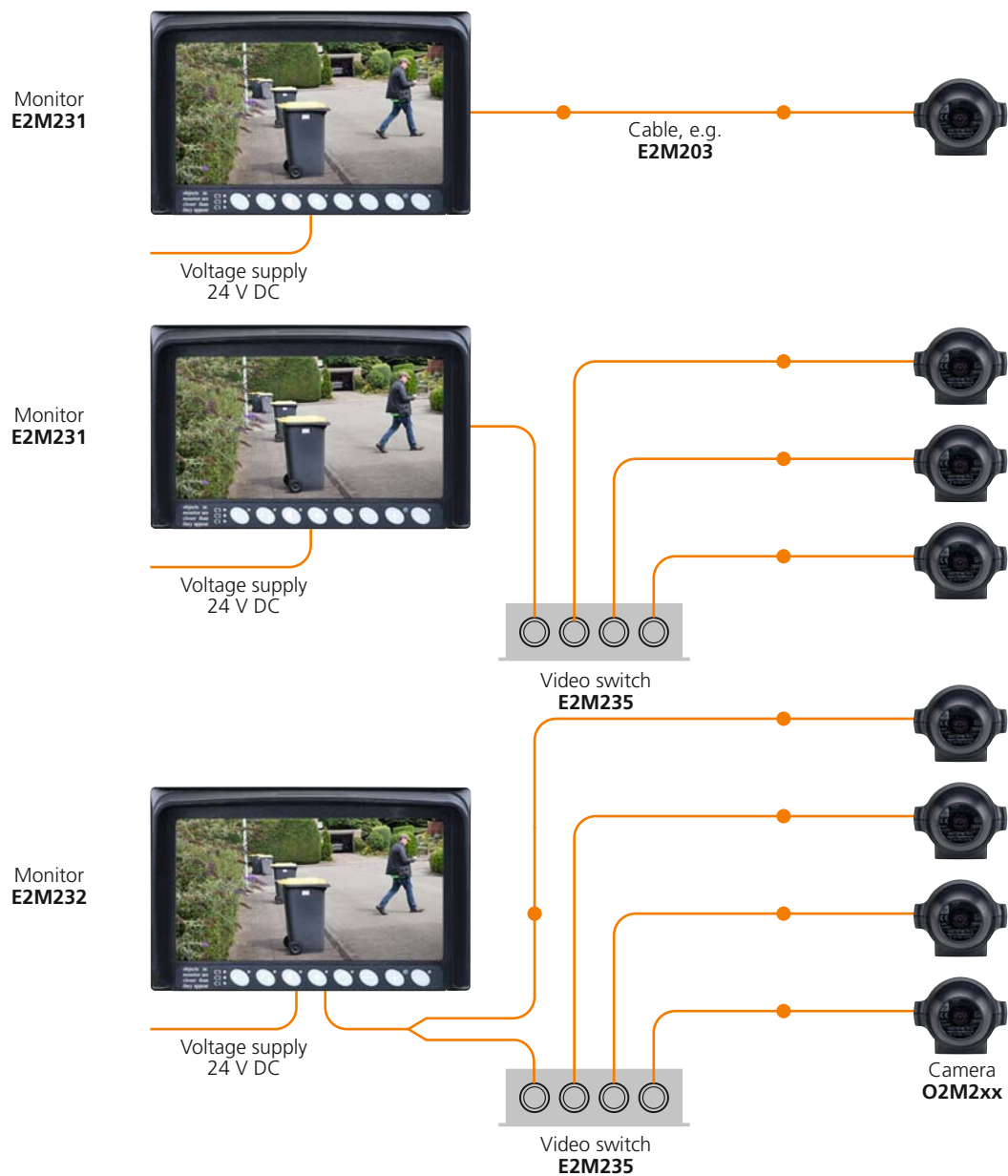
Design	Description	Order no.
	Anti-glare frame large, elastic	E2M233
	Anti-glare frame small (supplied with each monitor)	E2M234
	Video switch for connection of 3 further cameras	E2M235
	RAM mount bracket 90 mm	E2M236
	RAM mount bracket 144 mm	E2M237
	RAM mount mounting plate	E2M238

Design	Description	Order no.
	Monitor bracket - complete set	E2M239
	Video adapter cable M12 connector to M16 connector for connection to O3M2 3D cameras	E3M161

Cameras

Description	Angle of aperture [°]	Order no.
3D smart camera with PAL video output	70 x 23 (3D), 90 (2D)	O3M251 ²⁾
	95 x 32 (3D), 120 (2D)	O3M261 ²⁾
	97 x 44 (3D), 155 (2D)	O3M271 ²⁾
Analogue camera with PAL video output	80	O2M200
	118	O2M202
	170	O2M210
Analogue camera with PAL video output, integrated mirror function	80	O2M201
	118	O2M203
	170	O2M211
Video splitter, visualises up to 4 camera images (PAL)	–	E2M250

²⁾ More accessories needed, see from page 25



I/O module for 3D camera system O3M

Overview of articles / Technical data

In addition:

Additional binary and analogue inputs and outputs for the 3D camera system O3M.

Simple:

Easy retrofitting on mobile machines without a bus system.

User-friendly parameter setting:

The parameter setting and the creation of the logic in the device are carried out via the ifm Vision Assistant.

Complete:

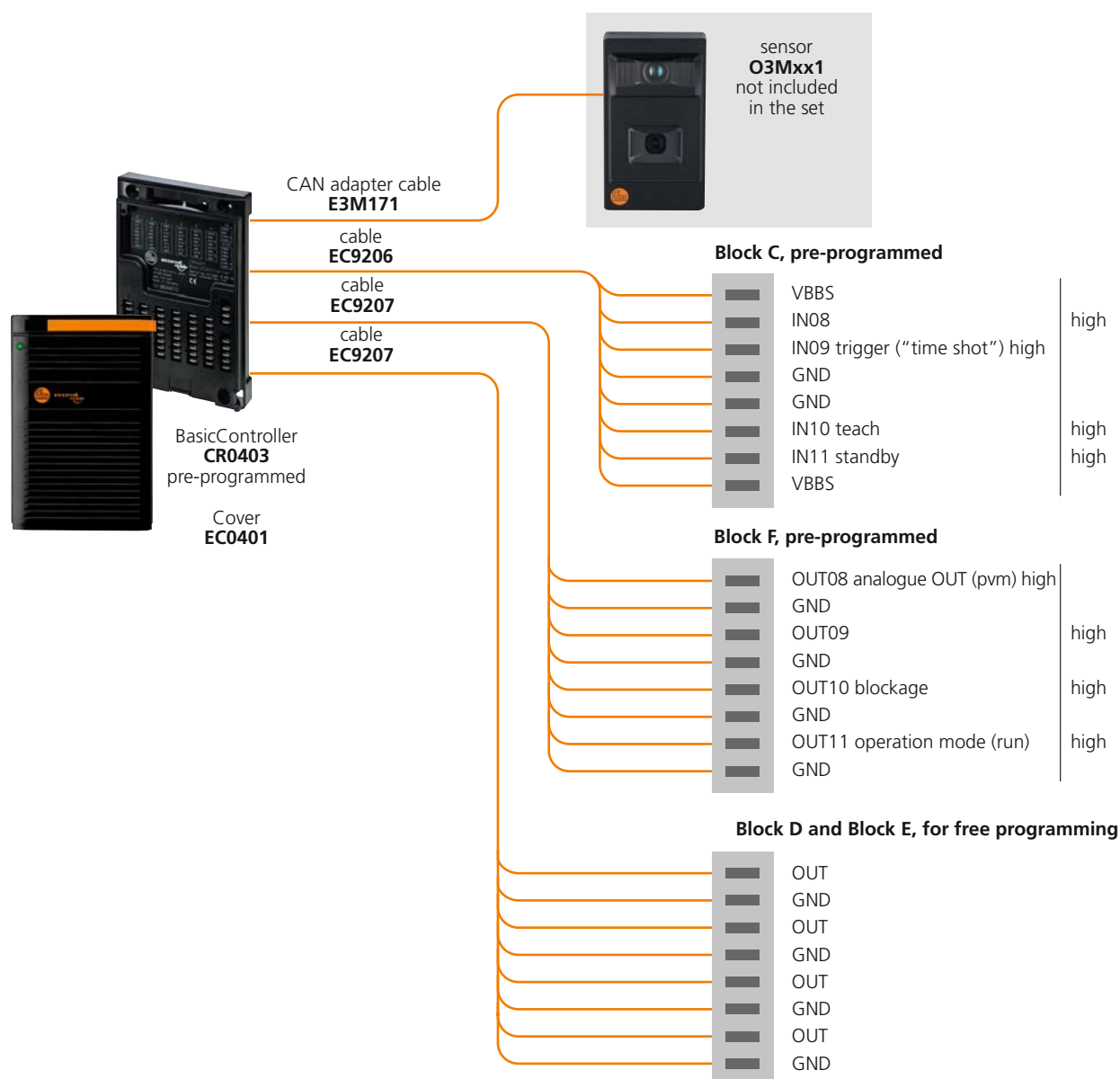
Includes CAN connection cable for connecting the 3D camera system O3M and all necessary adapter cables for the inputs and outputs.

Articles	Order no.
I/O module for a complete camera system set	ZZ1102

Content complete set

Quantity	Articles	Order no.
1	BasicController, programmable controller with multifunctional input and output channels (article is preprogrammed especially for the application package. In case of individual purchase, there is no pre-programming.)	CR0403
1	Module cover IP 54 without display recess, with cable seal	EC0401
1	CAN adapter cable for the connection and voltage supply of O3M and CR0403, 10 m	E3M171
1	Connection cable for BasicController CR04xx, inputs A/B/C, 1.5 m	EC9206
2	Connection cables for BasicController CR04xx, outputs D/E/F, 1.5 m	EC9207

Cabling



Ready-to-start application package 3D collision warning system for mobile machines

Overview of articles / Technical data

Active obstacle detection:

The system monitors up to six danger zones around the vehicle and warns the driver of imminent collisions in good time. Warnings are provided visually, acoustically and in the form of icons via the supplied 7" monitor. The highly-developed 3D time-of-flight system reduces false alarms to a minimum.

Easy retrofitting:

The application package contains all necessary components including any cables and mounting accessories. This means it can be easily retrofitted on all mobile machines with 24 V on-board system voltage.

Quick to set up:

After installation of the components and plug & play wiring, the system can be set up in just a few minutes thanks to its intuitive handling using the colour display supplied.

Articles	Order no.
Ready-to-start application package (complete set) 3D collision warning system for mobile machines	ZZ1103

Contents application package

Quantity	Articles	Order no.
1	Mobile 3D smart camera with integrated 2D/3D overlay (article is specifically pre-programmed for the application package. In case of individual purchase, there is no pre-programming.)	O3M261
1	IR system illumination unit	O3M960
2	U-shaped bracket, suitable for 3D camera or illumination unit, stainless steel black	E3M102
1	MCI cable, connection sensor / system illumination unit, 0.25 m	E3M120
1	Connection cable with M12 socket, voltage supply system, illumination unit, 10 m, PUR, 4 poles	E3M133
1	BasicController, programmable controller with multifunctional input and output channels (article is preprogrammed especially for the application package. In case of individual purchase, there is no pre-programming.)	CR0403
1	CAN adapter cable 10 m for the connection and voltage supply of O3M, CR0403 and CR0451	E3M171
1	Upper part of the housing for CR0403, suitable for installation of the CR0451 display	EC0402
1	Adapter cable for the connection of the buzzer to CR0403 and use of the output channels	E3M172
1	BasicDisplay, programmable graphic display with CAN connection (article is pre-programmed specifically for the application package. In case of individual purchase, there is no pre-programming.)	CR0451
1	7" TFT LCD monitor with LED backlight, 1 video input. Displays the camera image.	E2M231
1	Bracket for monitor E2M231	E2M239
1	Video extension cable, M16 connector / M16 socket, 5 m, black, PCV	E2M203
1	Video adapter cable M12 connector / M16 connector for the connection of O3M261 to E2M231	E3M161
1	Buzzer for connection to CR0403 ³⁾	

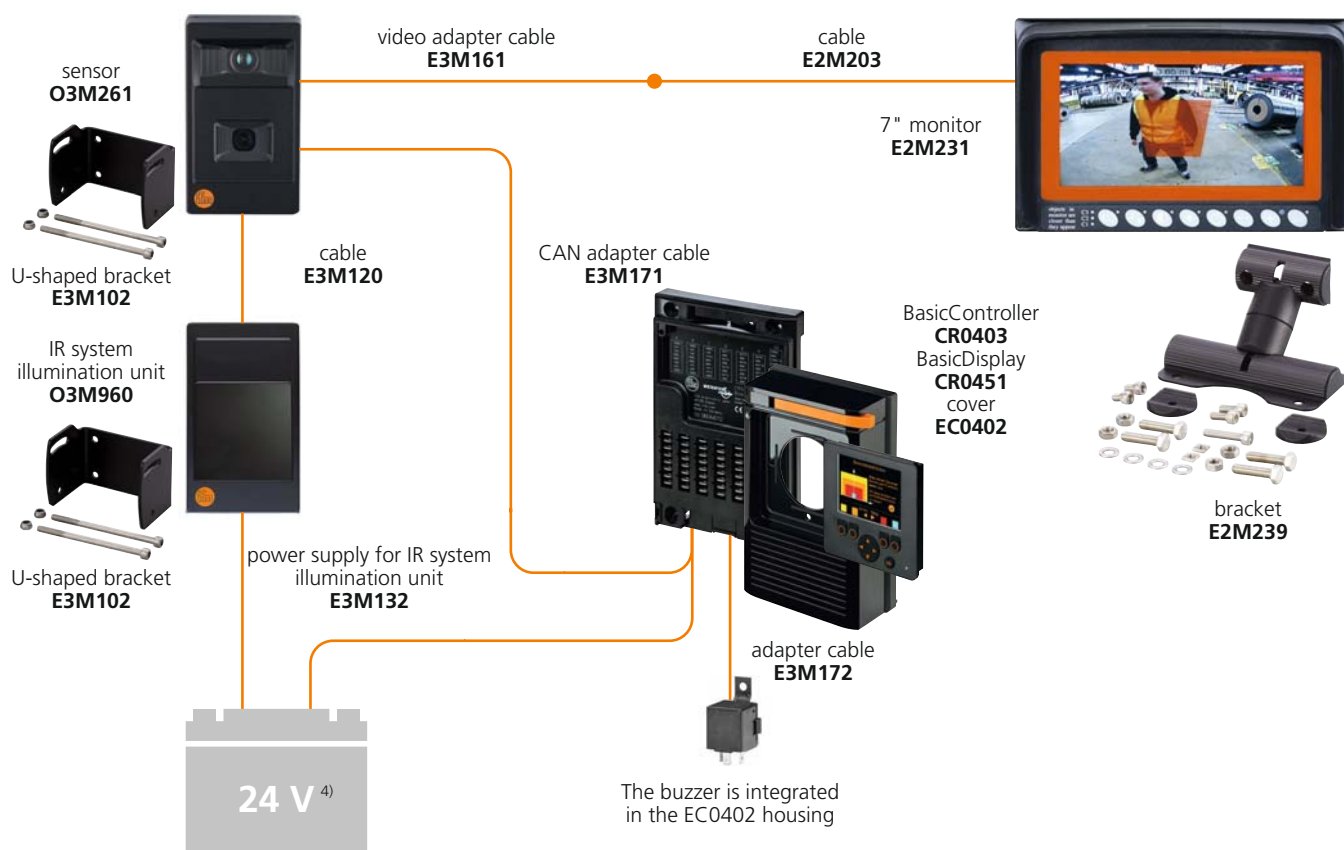
³⁾ Article is part of the application package and cannot be ordered separately

Watch the unboxing and application package installation videos at ifm.com/gb/o3m-howto





Application package cabling



⁴⁾Please contact your ifm service centre if the on-board system voltage differs.



Detection of reflective clothing.

Thanks to a special classification of reflective materials, e.g. reflective vests or clothing, the collision warning for persons can be given priority over other objects. This increases the safety of persons.

Watch the heavy-duty forklift application video at ifm.com/gb/o3m-hd

Watch the system parameter setting video at ifm.com/gb/o3m-howto

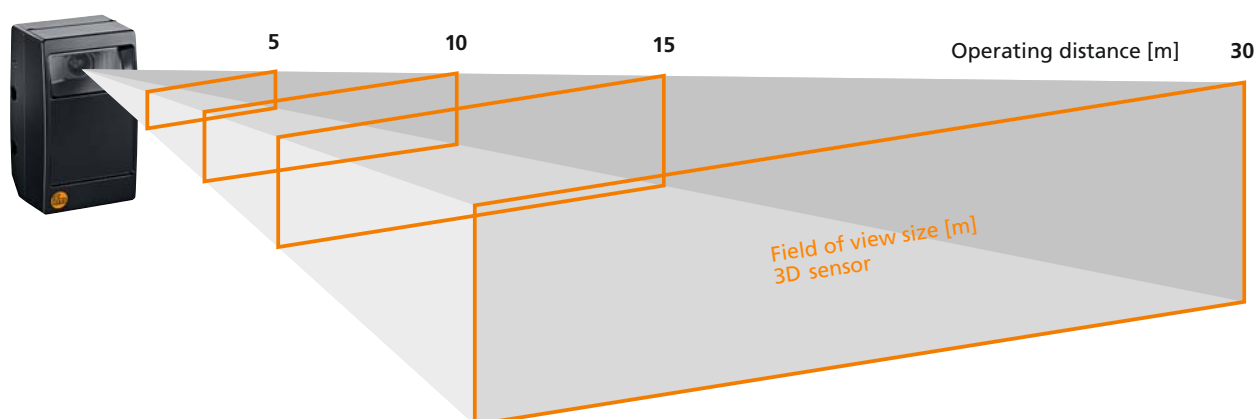


3D sensor system

Operating distance / field of view sizes

Overview of articles / Technical data

Type O3M angle of aperture 70° x 23° / 95° x 32° / 97° x 44



Type O3M151 / O3M251 / O3M161 / O3M261 / O3M271 Measuring accuracy

Software version	Object type size	Operating conditions	Measuring range for object recognition [m]		
			O3M151 O3M251	O3M161 O3M261	O3M271
OD object recognition	vehicle	sunny (~120 kLux)	0.25...30	0.25...21	0.25...17
		cloudy (~20 kLux)	0.25...40	0.25...30	0.25...25
		darkness	0.25...50	0.25...35	0.25...29
OD object recognition	person ⁵⁾	sunny (~120 kLux)	0.25...12	0.25...9	0.25...7
		cloudy (~20 kLux)	0.25...16	0.25...12	0.25...10
		darkness	0.25...20	0.25...15	0.25...12
OD object recognition	retroreflector (e.g. reflective vest)	sunny (~120 kLux)	1...40	1...29	1...24
		cloudy (~20 kLux)	1...60	1...42	1...35
		darkness	1...80	1...55	1...46
DI / BF distance image basic functions		sunny (~120 kLux)	–	–	–
		cloudy (~20 kLux)	–	–	–
		darkness	–	–	–

⁵⁾The term person is only to be understood as a reference for size.

Note:
The 3D sensors of the O3M series can be used for example as driver assistance for collision avoidance or for area surveillance. They are photoelectric systems whose function may be impaired by heavy soiling, for example. This system does not meet the requirements of IEC 61496 for electro-sensitive protective equipment and must not be used for implementing a safety function for operator protection. The 3D sensors of the O3M series can be used to assist the machine operator. The machine operator is, however, always fully responsible.

Operating distance / field of view sizes

Type	Angle of aperture [°]	Operating distance [m]	Field of view size [m]
O3M151 O3M251	70 x 23	5	7 x 2
		10	14 x 4.1
		15	21 x 6.5
		30	42 x 12.2
O3M161 O3M261	95 x 32	5	11 x 2.9
		10	21.8 x 5.7
		15	32.7 x 8.6
		30	65 x 17
O3M271	97 x 44	5	11.3 x 4
		10	22.6 x 8.1
		15	33.9 x 12.1
		30	67.8 x 24.2

Typ. measuring range for ROI [m]			Typ. measurement accuracy [cm]		
O3M151 O3M251	O3M161 O3M261	O3M271	O3M151 O3M251	O3M161 O3M261	O3M271
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
—	—	—	—		
0.25...12	0.25...8	0.25...7	± 15		
0.25...15	0.25...11	0.25...9	± 10		
0.25...30	0.25...21	0.25...17	± 5		

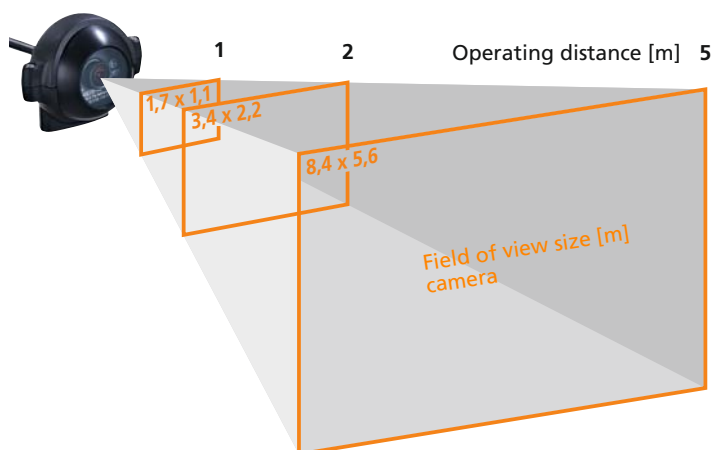


Heavy-duty universal camera

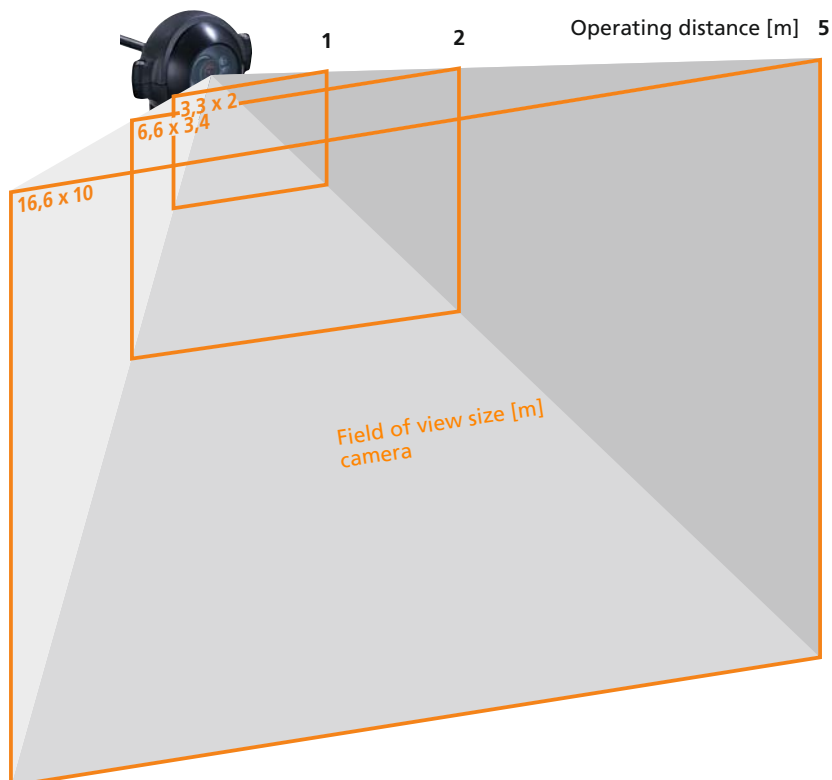
Operating distance / field of view size

Overview of articles / Technical data

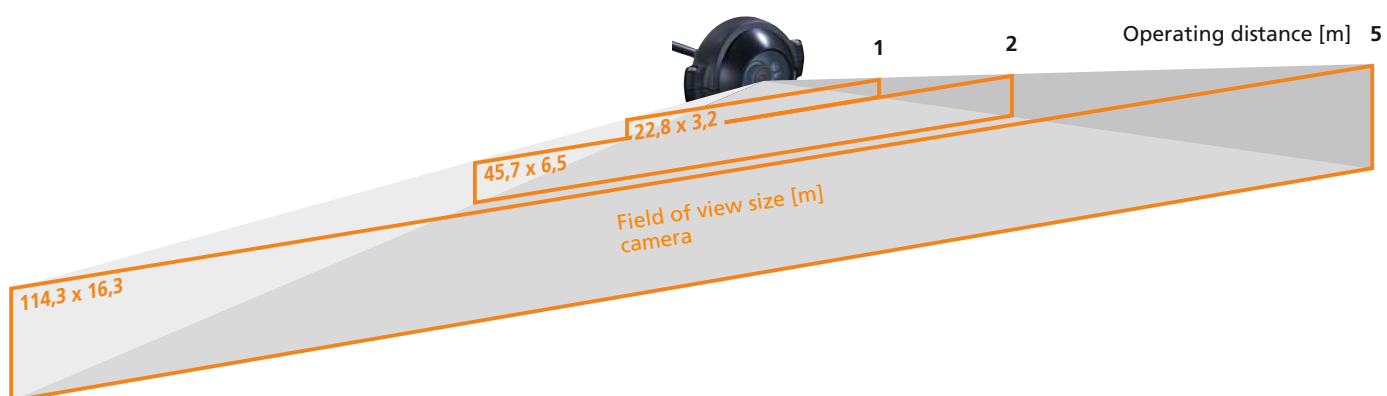
Type O2M200 / O2M201 angle of aperture 80°



Type O2M202 / O2M203 angle of aperture 118°



Type O2M210 / O2M211 angle of aperture 170°





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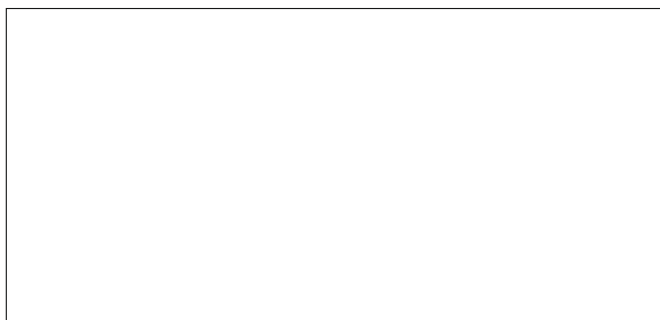
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