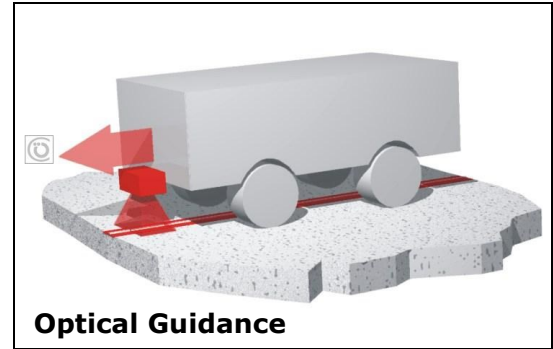


## Optical Guidance Sensors

The guideline for the vehicle is painted or taped onto the floor. The vehicle system video-films this line and calculates the deviation from the line which is provided to the customer's vehicle-controller as an analogue voltage ( e. g. "-4.5 VDC equals 0.7 inch deviation to the right") or on a digital interface.

- Inexpensive site preparation, guideline is painted or made of tape.
- Easy reconfiguration of the vehicle pass, just paint/tape a new line, no program updates or "learning" needed for a shift of the line.
- Easy to troubleshoot, live video images from guidance camera can be shown on a monitor
- The line may have some blemishes and interruptions but generally must be visible. Use in a "dirty" environment has its challenges (e.g. snow, leaves, debris and spills, opaque fluid spills, fog/steam).
- Cameras have their own light-source, night and "lights-out" as well as sunlight operation (with camera shaded from sunlight) are possible.
- System may navigate switches by external input "follow right branch" or "follow left branch".
- HG 73840ZA can read "bar-codes" on the floor to identify work stations or switches. An inexpensive transponder reader on the vehicle combined with easily to relocate transponder-"buttons" on the floor is another possible solution to mark locations.
- The precision at 4" camera mounting heights is  $\pm 0.12$ " [3mm]. The signal processing time is 20 ms with HG 73840 ZA.



Optical guided AGV by DPM Daum Partner Maschinenbau, Aichstetten Germany



Optical Guided Kirow Multi Mover bridge transporter for elevated highway by Kirow, Germany

Off the shelf we offer two optical guidance product groups:

- ⇒ Indoor AGV system, camera about 4" above floor
- ⇒ Large vehicle system, cameras 2 - 3' above floor, outdoor components

**Optical Guidance Sensors — Example Packet A**

Optical Guidance Components for an AGV (Automated Guided Vehicle), driving in two directions (forward and backward) along a network of lines.

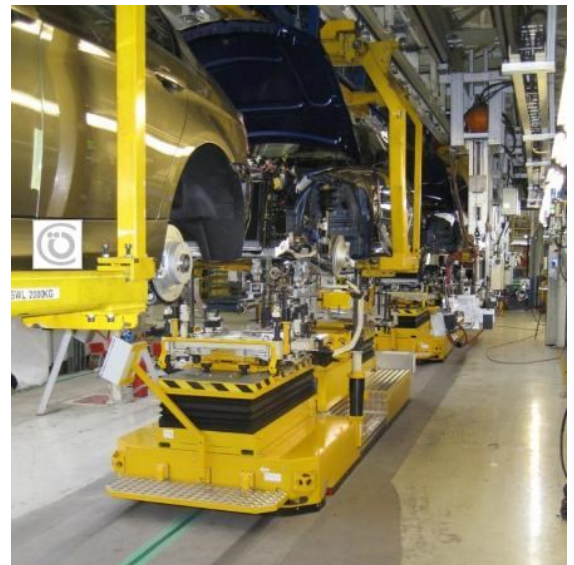
This is an indoor application, the GOETTING "interpreter" is mounted inside a cabinet on the vehicle. The camera is mounted 4 inches above the floor.

The interface to the vehicle controller/PLC uses analogue communication (voltage) or CAN-Open. This packet includes reading of "bar-codes" on the floor to mark loading stations, switches etc.

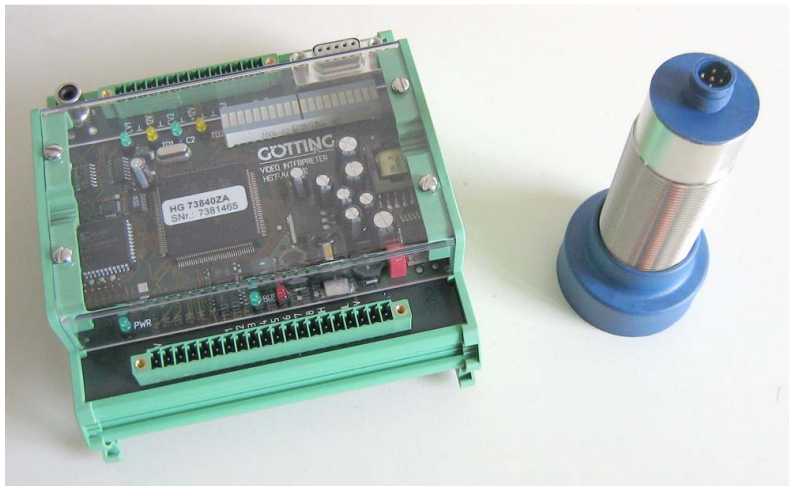


Optical guided AGV by DPM Daum Partner Maschinenbau, Aichstetten Germany

Quantity	Part Number	Description
1	HG 73840 ZA	Optical Interpreter, CAN Open and analogue
1	HW CON 00041	Connector for HG 73840, 20 pin
1	HW CON 00042	Connector for HG 73840, 14 pin
2	HG 73841 ZA	Bl/W (black and white) camera 30mm industrial casing, LED illuminator
2	HW CAB 00001	Cable with M12 plug [camera cable]



Optical guided AGV in a car assembly plant



**Optical Guidance Sensors – Example Packet B**

Optical Guidance Components for a large vehicle driving in two directions (forward and backward) along a line.

This is an in and outdoor application. The cameras , are IP67 (NEMA 4 equivalent) weather - proof, and can operate at low temperatures. The distance between camera and floor is 2 feet.

The interface to the vehicle contoller/PLC uses analogue communication (voltage equals vehicle deviation from painted line.)



Optical Guided Kirow Multi Mover bridge transporter for elevated highway by Kirow, Germany

This vehicle picks up a prefabricated bridge section of an elevated highway and transports it to the bridgehead of the highway, driving on section previously built.

An optical guidance system was chosen for two reasons:

- Driveway configuration changes often (after each new sections).
- Preparation and quality check of line layout on new driveway section is very easy.
- A reliable system was needed, that is easy to troubleshoot (visual check of camera pictures).

Quantity	Part Number	Description
1	HG 73830 XA	Optical Interpreter , IP65, analogue interface
2	HG 73831 ZA	black and white (B/W) camera, ball type, with heater and illumination





**HG 73830 Optical Interpreter - Outdoor**

This unit controls up to 2 black and white (B/W) cameras and provides information of the vehicle's deviation from the painted guideline:

- Video Output for maintenance monitor (e.g. lap-top with frame-grabber)
- LED bar indicating deviation
- Weatherproof IP65 (equivalent NEMA 4)
- Provides power for outdoor cameras
- Service Interface (serial) RS 232 for configuration



**General Technical Data:**

Supply Voltage:	18 V - 36V DC
Supply Current:	180mA at 24V without cameras
Camera Power:	Adjustable 5V - 15V DC , max 1 Ampere
Update Rate:	40 ms
Protection:	IP 65
Dimensions (Housing with plug):	(7.9" x 4.4" x 3.6" (200 x 110 x 90 mm)

**Versions:**

HG 73830 XA	Data Interface: Analogue +/- 10 V DC, max. 1 mA Configuration Interface : RS 232
HG 73830 ZA	Data Interface: Analogue +/- 10 V DC, max. 1 mA or CAN-Open Configuration Interface : RS 232 or CAN Open SDO object

**Accessories:**

HG 73831 ZA	Video Camera with Ball Housing, gas filled, illuminator, heater
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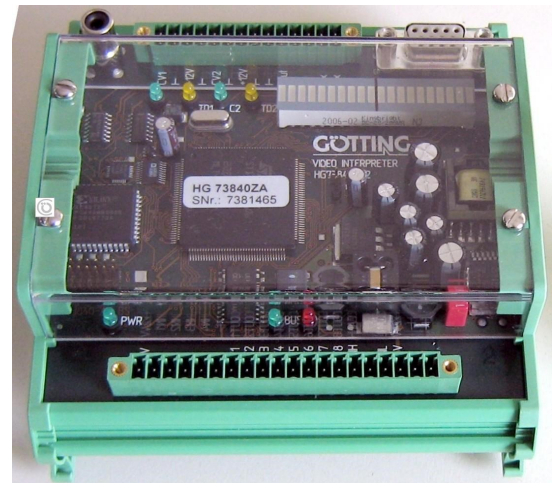
**HG 73840 Optical Interpreter - Indoor, with Bar-Code Reader**

This unit controls up to 2 black and white (B/W) cameras and provides information of the vehicle's deviation from the painted guideline.

- Reads Bar - Codes, that are painted on the floor (maximum 100 codes):
- Video Output for maintenance monitor (e.g. lap-top with frame-grabber)
- Provides power for indoor cameras

**General Technical Data:**

Supply Voltage:	20 V - 30V DC
Supply Current:	130mA at 24V without cameras
Camera Power:	12V DC , max 0.3 Ampere
Update Rate:	20 ms
Protection:	IP 25
Dimensions (Housing with plug):	4.7" x 4.9" x 2.4" (117.5 x 124.3 x 59.7 mm) DIN rail mount



**Versions:**

HG 73840 ZA	Data Interface: Analogue +/- 10 V DC max. 1 mA , status bits or CAN-Open Configuration Interface : RS 232 or CAN Open SDO object
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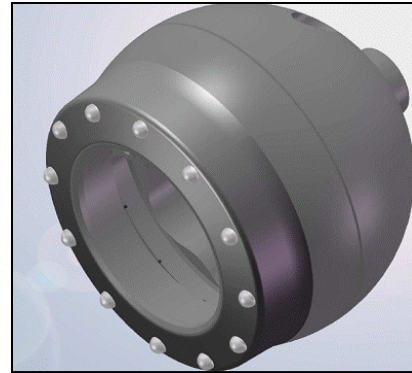
**Accessories:**

HG 73841 ZA	B/W camera 30mm industrial casing, LED illuminator
HG 73831 ZA	Video Camera with Ball Housing, gas filled, LED illuminator, heater
HW CON 00041	Connector for HG 73840, 20 pin
HW CON 00042	Connector for HG 73840, 10 pin

### HG 73831 ZA Ball Camera - outdoor

This black and white (B/W) camera with integrated LED illuminator is used for HG 73830 interpreter in an optical guidance system.

- Outdoor Version
- Includes LED illuminator
- Camera housing gas filmed to prevent fogging
- Camera Housing heated



### HG 73841 ZA Camera - indoor

This black and white (B/W) camera with integrated LED illuminator is used for HG 73840 interpreter in an optical guidance system.

- Indoor Version
- Includes LED illuminator



#### Accessories:

HW CAB 0001                      Cable with M12 plug