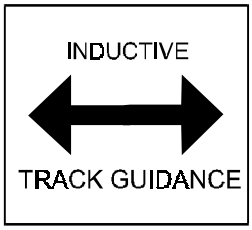
Steering Controller for AGV

HG 731x0



Steering controllers HG 73110, 73120, and 73130 have been developed for guiding Automated Guided Vehicles (AGV) automatically along a guidance conductor. They are made for low-cost applications and are provided with PLC interfaces.

Tasks

A steering antenna transmits information about the displacement to the steering controller which processes it using a special regulation strategy and transmits a correction variable to the steering drive. This steering drive and a steering motor help guiding the vehicle along the guidance conductor.

Regulation Strategy

Two different regulation strategies are available:

1. sensors that are mounted on the steering axis and thus steered
2. sensors that are mounted on the rigid vehicle frame

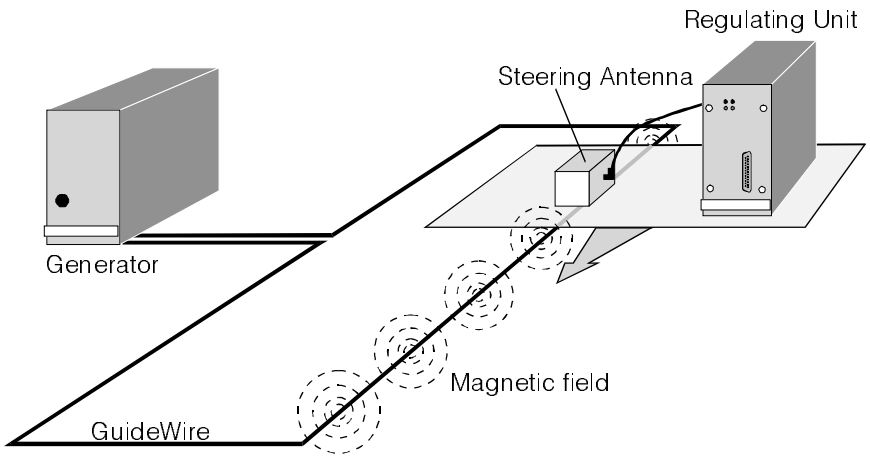
If the system has steered sensors, the measured displacement from the guide-wire is transformed into a correction variable for the steering motor. It can regulate the displacement even if the vehicle is not moving.

If the sensors are mounted on the rigid vehicle frame, the only way to regulate any displacement is when the vehicle is moving over a certain distance. Depending on the position of the sensor with regards to the steering axis, the relationship between vehicle displacement and resulting steering angle may vary accordingly.

Coil Systems

Steering controllers may be applied in various different system setups. There are several different systems, like one- or multi-frequency systems, with or without arrestor. It depends on the coil system, which steering controller is necessary:

- front cross coil: HG 73120
- front and rear cross coil: HG 73130
- front cross coil, two coils perpendicular to the wire in the rear: HG 73110



System Components

Steering Antenna HG 19510

Steering antenna HG 19510 includes a cross coil system. Per channel, is has a preamplifier set to meet the range of 5 to 10 kHz. Since the transmission amplification is normalized, the steering antenna may be exchanged or replaced without the necessity of recalibrating the whole system.

Regulating Unit

Regulating unit is the Universal Control Card HG 6141 (slip-in Euro card). It can be configured in various different ways with regards to interfacing and analog channels. The used microprocessor is an SAB80C537 which is able to efficiently carry out any necessary calculations with its arithmetic unit.

GÖTTING

Steering Angle Actual Value Unit

This unit should be a < 5 kOHMS resistance potentiometer. Power and reference potential are provided by the regulating unit. This steering angle actual value unit can be deactivated via the PLC interface, in case the card is only to be used as steering sensor or in case the steering antenna is steered.

Steering Angle Set-Point Adjuster

Again use a < 5 kOHMS resistance potentiometer. Power and reference potential are provided by the regulating unit and this unit can be deactivated via the PLC interface.

Vehicle Computer

Any computer or PLC may be used as vehicle computer. This unit's interfacing can be adjusted accordingly.

System Description

The steering antenna detects horizontal and vertical field line portions. The characteristic voltage curve of the horizontal field line portions (sum voltage) perpendicular to the wire is bell-shaped. The characteristic voltage curve of the vertical field line portions (difference voltage) has a negative and a positive maximum at a defined distance to the right and the left from the wire and is exactly zero above the wire.

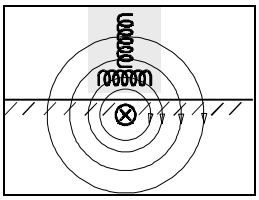
The interpreter amplifies, synchronously rectifies and measures these two voltages.

A special computation algorithm enables the microprocessor to determine the lateral displacement from the guidewire either independent from the reading height or the guidewire current. The microprocessor includes a PD controller.

In addition an optional second steering antenna may be connected to this interpreter in order to enable controlling reverse movement.

The calculated value for the displacement (or the corresponding control variable) can be output via a variety of interfaces.

Also there are two separate outputs which enable output of two defined logical values (e.g. left or right side of the wire).



Magnetic field of GuideWire

Technical Data

Dimensions	
- Steering Antenna HG 19510	Enclosure: 75 x 80 x 55 mm / IP 65
- Interpreter	Euro Card (60.96 mm)
System Performance	
- Nominal Voltage	24 V +30 % / - 35 %
- Current Assumption	approx. 250 mA (excluding signal LEDs)
- Reading Height	30 to 300 mm (distance wire - bottom side of antenna)
- Nominal Reading	60 mm
- Resolution	1 mm at nominal reading height
- Update Rate	3 to 6 ms (depending on the version)
- Repetition Accuracy	±1 mm
- Absolute Accuracy	±4 mm within ±50 mm of antenna center ±10 mm within > ±50 mm of antenna center