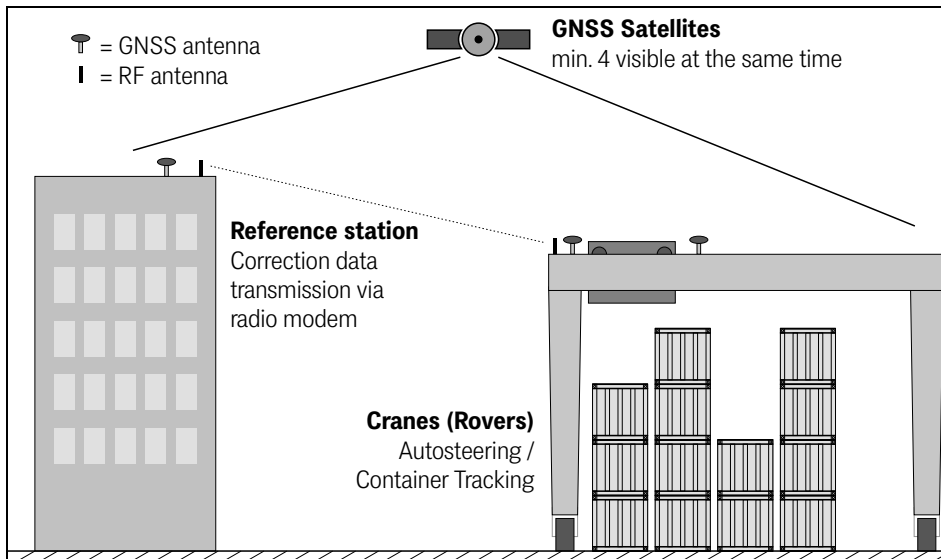


Positioning of Cranes using RTK DGNS (Control Unit HG G-61430YD)



The system uses RTK DGNS to calculate highly accurate positions (GNSS = Global Navigation Satellite System, e.g. GPS). DGNS stands for Differential GNSS and means that a reference station uses its known position to calculate the current deviation of the GNSS signal. This difference value is then transmitted wirelessly to all rovers (usually cranes).

To make the position even more accurate Real Time Kinematic (RTK) is applied. Here the carrier phase of the satellite signal is evaluated (the system needs up to approx. 60 seconds after initial start up for ruling out ambiguities). RTK DGNS gives an accuracy of about ± 2 cm which enables Container Tracking and RTG Autosteering.

Container Tracking

Using the system RTGs can detect and wirelessly transmit the current position whenever they pick up or set down a container. The

superordinate container management system can then check the position and store it, thus documenting the whereabouts of individual containers.

RTG Autosteering

Due to the high accuracy of the system it is possible to track a vehicle's movements. Consequently by using a series of measurements together with the geographical positional data it is possible to determine the vehicle's direction and its velocity. With the help of these functions it is possible to automatically steer a RTG over a predetermined route within a container yard. This means that apart from the free movability that rubber tired vehicles provide, they can also be used like rail mounted vehicles.

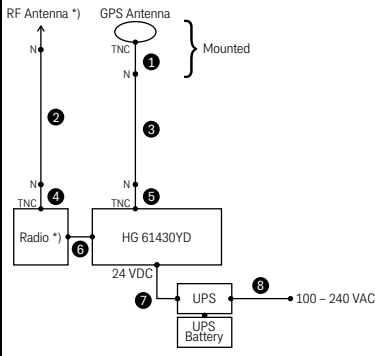
A special advantage of the system is that for both functions there is no need to mount equipment within the track surface of the container yard.

Overview

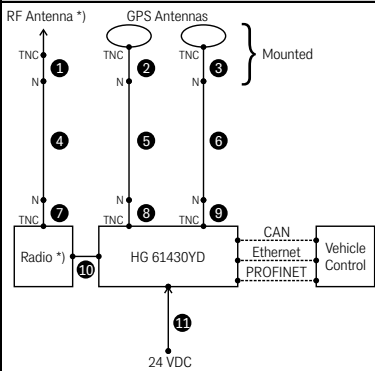
- ♦ RTG positioning/autosteering or container tracking with Global Navigation Satellite Systems (GNSS)
- ♦ State of the art RTK DGNS
 - Position accuracy better ± 2 cm with 20 Hz update rate
 - Heading accuracy $\sim 0.1^\circ$ with 2 m baseline and 20 Hz
- ♦ Up to 255 blocks for autosteering / container tracking
- ♦ User friendly and comfortable web interface via Ethernet
 - all web browsers supported
 - all operating systems
 - remote usage possible
- ♦ Interfaces to PLC/vehicle control
 - CAN interface
 - Ethernet interface
 - RS 232 interface (optional)
 - PROFINET interface (optional via extension module HG G-61432ZA)

Operating Conditions
 Obstacles (e.g. buildings, trees, etc.), that are higher than the horizon of the GNSS antennas, may generally have a bad influence on the satellite reception. As a result of these shadings and/or reflections, the accuracy of the GNSS may decrease. Even a total breakdown of the GNSS might be possible. Therefore it is advisable, to include the Götting KG already in the project planning phase.

Components Reference Station



Components Rover



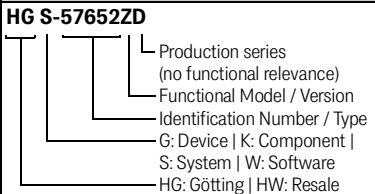
Variants of the Control Unit

HG G-61430YD	001	Reference Station
	002	Rover
	003	Reference Station / Rover

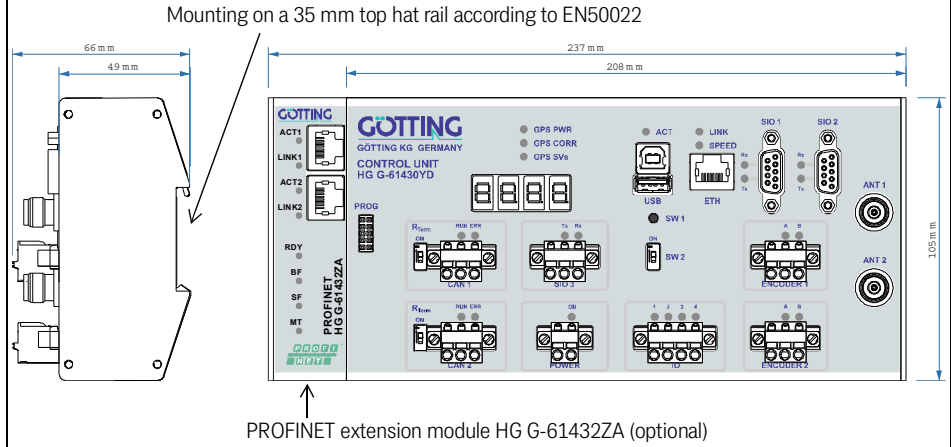
Additional Products / Accessories

HG G-61432ZA	PROFINET Extension Module for Control Unit HG G-61430YD (has to be specified when ordering)
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Götting Product IDs (order codes)



Control Unit HG G-61430YD



Component-List GNSS Positioning System HG S-57652ZD (see sketches to the left)

Reference Station			Rover (Crane)		
Cable	Order No.	Description	Cable	Order No.	Description
1	HW CAB00042	RG58 GNSS antenna cable	1	HW CAB00055	RG58 RF antenna cable
2	HW CAB00079	ECOFLEX10 cable	2	HW CAB00042	RG58 GNSS antenna cable
3			3		
4	HW CAB00042	RG58 cable	4	HW CAB00079	ECOFLEX10 cable
5			5		
6 *)	HW CAB00135	Interface cable	6	HW CAB00042	RG58 cable
7	**)	Cable UPS -> Control Unit	7		
8	**)	Power cable	8	HW CAB00042	RG58 cable
	HG G-61430YD	Control Unit	9		
	HW ANT00044	GNSS antenna	10 *)	HW CAB00135	Interface cable
	HW DEV00058	UPS	11	**)	Power cable
	HW DEV00059	UPS battery		HG G-61430YD	Control Unit
	HW DEV00101	Radio modem *)		HW ANT00044	GNSS antenna
	HW ANT00007	RF antenna *)		HW DEV00101	Radio modem *)
				HW ANT00007	RF antenna *)

*) Project specific, the components listed are used in most projects.
 **) Not within scope of supply.

Technical Data Control Unit HG G-61430YD

Casing	Aluminum
Dimensions	- Basic configuration: 208 mm x 105 mm x 66 mm (W x H x D) - With PROFINET extension module: 237 mm x 105 mm x 66 mm (W x H x D)
Weight	- Basic configuration: 950 g - With PROFINET extension module: 1050 g
Temperature ranges	Operation: -25° C to +70° C / Storage: -40° to +85° C
Protection class	IP 20
Mounting	Can be mounted on a 35 mm top hat rail according to EN50022
Shock / Vibration	DIN rail mount: 3.5 mm from 5-9 Hz, 1G from 9-150 Hz 10 sweeps each axis, 1 octave per minute
Relative humidity	95 % @ 25° C (not condensating)
Supply voltage	Nominal: 12 - 24 Volt (maximum range 10 - 30 Volt)
Current consumption	- Basic configuration: 350 mA @ 24 Volt - With PROFINET extension module: 400 mA @ 24 V
Interfaces	Ethernet (configuration via web interface, firmware update), CAN, USB (logging, firmware update), supply voltage, RS 232, GNSS antennas, optional: PROFINET (see picture above)