



Leica QuickSteer User Manual

Version 1.0
English

- when it has to be **right**

Leica
Geosystems

Introduction

Purchase



Congratulations on your purchase of a Leica QuickSteer system.

This manual contains important safety directions as well as instructions for setting up the system and operating it. Refer to "6 Safety Directions" for further information. Read carefully through the User Manual before you switch on the product.

The QuickSteer steering motor is to be used solely in combination with a Leica Geosystems Auto-Guidance system such as the mojoRTK. Therefore it's mandatory to also observe the directions and instructions contained in the corresponding User Manual.

To ensure safety when using the system, please also observe the directions and instructions contained in the User Manual and Safety Handbook issued by the:

- Agricultural machinery manufacturer.
-

Product identification





The type and serial number of your product are indicated on the type plate. Enter the type and serial number in your manual and always refer to this information when you need to contact your agency or Leica Geosystems authorised service workshop.

Type: _____

Serial No.: _____

Symbols

The symbols used in this manual have the following meanings:

Type	Description
 Danger	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 Warning	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.
 Caution	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury and/or appreciable material, financial and environmental damage.
	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

To understand the user manual

To ease the use of this manual please observe the following advise:
Relating to all pictures and schematics, they are to be seen as reference only. There may be slight deviations from the actual look of the QuickSteer. These deviations are caused by individual applications and have no impact on the function capabilities of the QuickSteer.

Use only original parts

Leica Geosystems original spare parts are especially designed for the Leica QuickSteer. They live up to the high design standards for safety and reliability. We advise you, that components or parts, not provided by Leica Geosystems for the QuickSteer should not be used because they might jeopardise the safety and function of the QuickSteer. We therefore can not be responsible for such redesign or adaptations. Any unauthorised changes on our QuickSteer void the company warranty. In addition conformity declaration or local authority regulations could be voided. This also applies to the removal of factory applied seals.



The QuickSteer supports you and improves your efficiency, while working in the field. The responsibility for quality and work related results rests as always with the driver. As common with all machinery, the basic rules apply. The more exact the system is adjusted, calibrated and operated the higher the quality of results will be.

Table of Contents

In this manual	Topic	Page
	1 System Description	7
	1.1 Components	8
	2 Assembly of the QuickSteer	11
	3 Operation of the QuickSteer	17
	3.1 Operating Position	18
	3.2 Standby Position	19
	3.3 Deactivate the QuickSteer	20
	3.4 Contact Pressure	21
	3.4.1 Increase / Decrease Spring Preload	21
	3.4.2 Contact Wheel Replacement	23
	4 Troubleshooting	24
	5 Care and Transport	25
	5.1 Transport	25
	5.2 Storage	25
	5.3 Cleaning and Drying	26

6	Safety Directions	27
6.1	General	27
6.2	Intended Use	27
6.3	Limits of Use	29
6.4	Responsibilities	30
6.5	Hazards of Use	31
6.6	Labelling	34
7	Technical Data	35
8	International Limited Warranty	38

1

System Description

General

The QuickSteer is a steering motor, that is capable of steering vehicles like tractors and other self-propelled machines without the support of an electrohydraulic steering interface, in agriculture and forestry applications.

So tractors and self-propelled work machines can be steered automatically during their use in agriculture and forestry including specialised cultivation and vegetable gardening.



Caution

The QuickSteer is designed to assist the machine operator to use the equipment more efficiently.

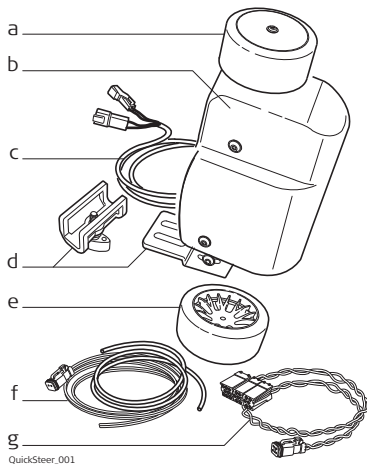
Precautions:

Even when relying on the function of the QuickSteer the driver is still responsible for observation of the machine and the surrounding area. The driver should shut down or assume manual steering control in dangerous situations.

1.1 Components

Components

The Leica QuickSteer unit is composed of the following parts:

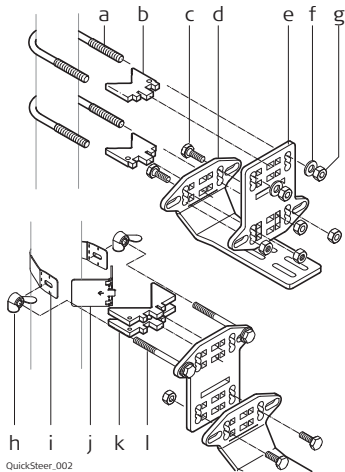


- a) Contact wheel (cellular rubber)
- b) Rigid thermoplastic two-part housing, including transmission, motor, and collapsible mechanism
- c) Connection cable
- d) Assembly base with sliding carriage

Additional parts supplied:

- e) Replacement contact wheel
- f) Add-on cable power supply
- g) CAN-Bus cable

Steering-wheel bracket universal



QuickSteer_002

- a) U-bolts
- b) Ashlar plates, small
- c) Screws, M8x20
- d) Base plate
- e) Mounting plate
- f) Washers
- g) Nuts, M8
- h) Wingnuts, M8
- i) Assembly bail
- j) Fixing clip
- k) Ashlar plates, big
- l) Screws, M8x80



Two different mounting options are shown.



Using the universal bracket it's possible to mount the QuickSteer in about 80% of available tractors. In some tractors special mountings might be needed. Please contact Leica Geosystems or your local reseller for more information.

Options available

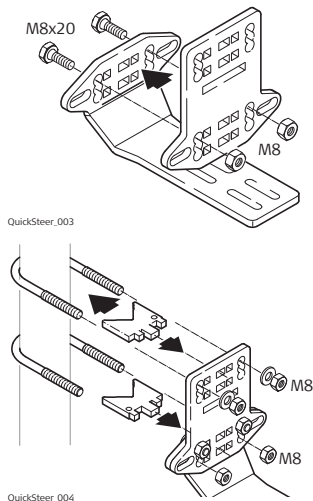
- Add-on cable power supply John Deere
 - Add-on cable power supply Agco
 - Add-on cable power supply AMP
-

2

Assembly of the QuickSteer

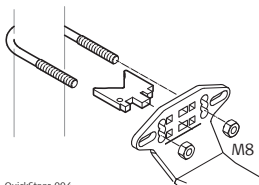
Assembly of the mounting bracket

Depending on the tractor's interior equipment different mounting combinations are possible.



Fixing the mounting bracket directly to a non-cased steering column is presented as an example.

1. Attach the mounting plate to the base plate.
2. Connect the plates using two M8x20 screws and nuts. Fasten the nuts using a 13 mm open end wrench.
3. Attach the ashlar plate to the mounting plate.
4. Place the U-bolts around the steering column and slip the mounting plate onto the bolts.
5. Attach one washer and one nut at each bolt.
6. Fasten the mounting plate by tightening the nuts.

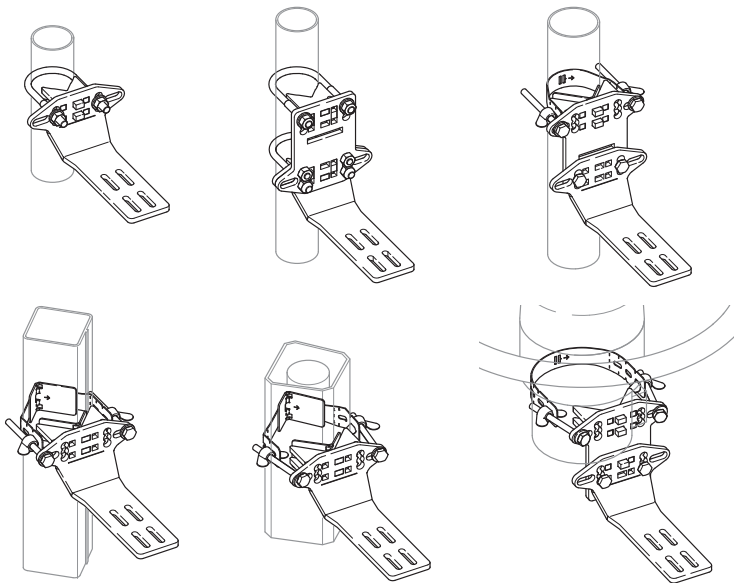


The picture shows an alternative assembly, without the mounting plate, for tractors with little space at the steering column.

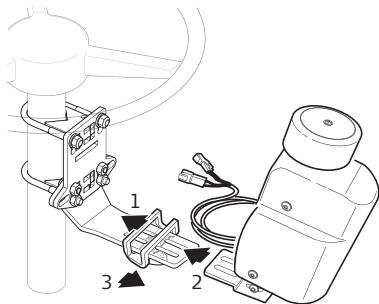


- Tighten the nuts with care. The steering column might get squeezed and steering impaired otherwise. Anyway, there must not be a movement in the mounting bracket when QuickSteer is attached and operating.
- Position the mounting bracket in a way to ensure a correct position of the contact wheel on the steering-wheel, nevertheless the steering-wheel must not be blocked in any way.
- The mounting bracket always must be mounted directly to the tractor's steering column. When your tractor's steering column encasement hinders the direct mounting of the QuickSteer onto the steering column, contact Leica Geosystems or your local reseller for more information.

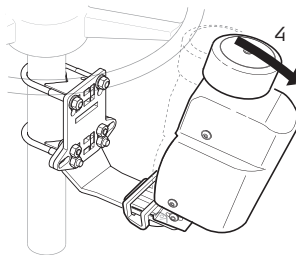
Possible assemblies of the mounting bracket



Assembly of the QuickSteer



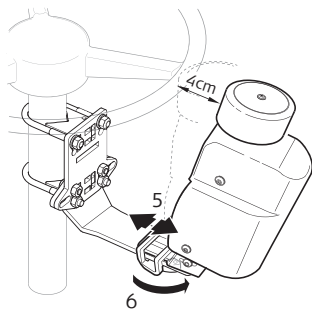
QuickSteer_005



QuickSteer_006

1. Slip the sliding carriage onto the mounting bracket.
2. Slip the assembly base onto the mounting bracket.
3. Pull the sliding carriage back above the assembly base.

4. Bring the QuickSteer to its standby position (refer to "3.2 Standby Position").



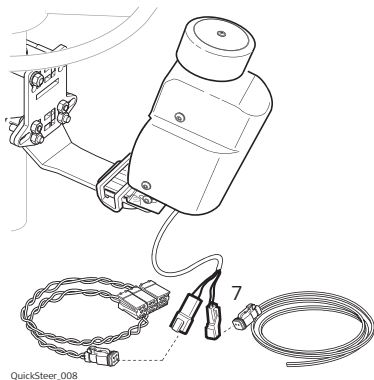
- Slip the QuickSteer as close to the steering-wheel, that the contact wheel has a distance of 4 cm (1.6 in) to the steering-wheel.
- Fix the QuickSteer in this position at the steering-wheel bracket by tightening the T-handle screw by hand only. Do not use any tools.



When using QuickSteer on one tractor only fix the base plate to the mounting bracket using screws, washers and nuts instead of the sliding carriage.



- To test the contact pressure: Bring the QuickSteer to its active position (refer to "3.1 Operating Position"), turn the steering-wheel and the QuickSteer's contact wheel also must turn. Refer to "3.4 Contact Pressure" for more information.
- When using QuickSteer on different tractors: Mark the ideal position of the QuickSteer on the steering-wheel bracket to make the next vehicle change easier.



7. Connect the cable set of the QuickSteer to the harness of the vehicle.
 - CAN-Bus plug to CAN-Bus connector (yellow/green cable), then to the CAN cable of the Auto-Guidance system such as the mojoRTK.
 - Power supply plug to power supply connector, then to tractor's power supply - ideally to an external power supply plug.



Do not connect the power supply cable directly to tractor's battery.

Disassembly

Disassembly of the QuickSteer and the mounting bracket is done in the reverse order of the assembly instructions.

3 Operation of the QuickSteer



Operation of the QuickSteer is completely controlled by the Leica Auto-Guidance system such as the mojoRTK. You only have to bring QuickSteer into its active position to get it ready for action, or into its standby position to disable the steering motor.



Warning

On public roads and drives always disengage the QuickSteer from the steering-wheel. For safety reasons it is better if you keep one hand on the steering-wheel, when using the QuickSteer at speeds over 10 kmh (6 mph). In case of malfunction you are able to take action immediately.



Caution

Do not stick parts of your body or other parts in the openings of the housing of the QuickSteer! Rotating parts inside the housing can cause injuries.

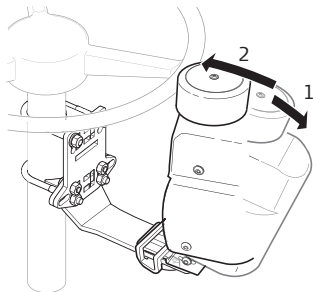


Caution

Keep hair, clothes, gloves as well as necklaces and jewelry away from moving parts! Long hair, loose clothing, jewelry or similar loose parts can get caught by moving parts of the QuickSteer.

3.1 Operating Position

Operating position



QuickSteer_009

To bring the QuickSteer into its active position:

1. Grasp the QuickSteer at the contact wheel and pull it away from the steering-wheel until the mechanism disengages.
2. The QuickSteer is pulled in the direction of the steering-wheel automatically. The QuickSteer is active and ready for action now.

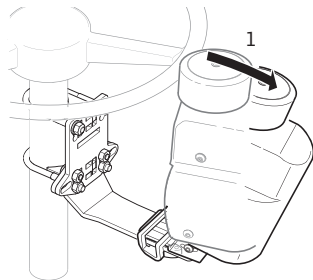
Tuning

When using for the first time or after a vehicle change tuning of the QuickSteer might be necessary. Tuning is done using the Auto-Guidance system such as the mojoRTK. Refer to the corresponding User Manual for more information.

3.2

Standby Position

Standby position



QuickSteer_010

To bring the QuickSteer into its standby position:

1. Grasp the QuickSteer at the contact wheel and pull it away from the steering-wheel until the mechanism engages - you will hear a click.
The QuickSteer is in the standby position now.



Don't pull the QuickSteer too far away from the steering-wheel as the mechanism will disengage and bring the motor into its active position again.



Any time you are not using QuickSteer, while on the road or when stopped, flip it into the inactive position so there is no contact with the steering-wheel. That way the life expectancy of the QuickSteer and the contact wheel will be greatly extended.

3.3

Deactivate the QuickSteer

Deactivate the QuickSteer

If the QuickSteer is in the operating position on the steering-wheel and the Auto-Guidance system such as the mojoRTK is activated, QuickSteer is operating and automatically steering the vehicle.

To disable QuickSteer:

- bring the QuickSteer into its standby position, or
 - disengage the steering-wheel by steering the tractor manually. The system notices this "intervention" and disengages automatically.
-

3.4



Contact Pressure

Should the contact wheel slip while activating the steering-wheel, the contact pressure needs to be increased by:

- either sliding the QuickSteer towards the steering-wheel, or
- increasing the spring preload.

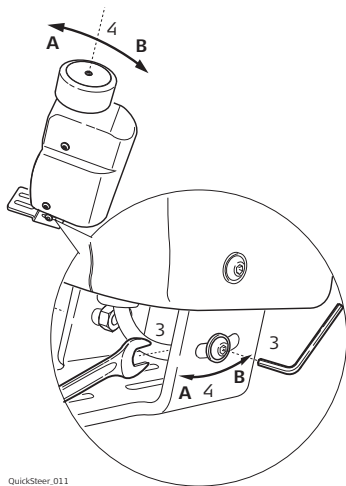
The recommended (easier) solution is sliding the QuickSteer towards the steering-wheel. Refer to "Assembly of the QuickSteer", page 14-15, for more information.

3.4.1

Increase / Decrease Spring Preload

Adjust the spring preload

1. Disassemble the QuickSteer.
2. Bring the QuickSteer to the normal operating position, so that the spring tension against the two mounting screws is at it's lowest.



QuickSteer_011

3. Loosen the two mounting screws in the assembly base with a 2.5 mm allen key, if necessary hold the inside nut with a 8 mm open end wrench.



Be aware that the spring tension can be strong!

4. To increase spring tension move the two mounting screws with the spring ends in direction (A).
To reduce tension move the two mounting screws with the spring ends in direction (B).

5. Once you have the desired spring tension tighten the two mounting screws.
6. Reassemble the QuickSteer to its mounting bracket on the steering column.

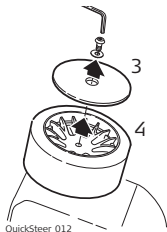
3.4.2

Contact Wheel Replacement

Replace the contact wheel

The contact wheel is a wear part and it therefore can also influence the contact pressure. The contact wheel has to be replaced at a given rate of wear.

1. Bring the QuickSteer to the standby position, so the contact wheel is freely rotatable.



2. Unscrew the cover mounting screw with a 2.5 mm allen key.
3. Remove the cover from the contact wheel.
4. Pull the wheel off the four holding pins.

5. Slip the new contact wheel, facing the hex-head recess downwards, onto the four holding pins and press it down.
 6. Replace the cover and tighten the holding screw.
 7. Adjust the contact pressure according to the information in "3.4 Contact Pressure".
-

4 Troubleshooting

Troubleshooting

Description	Possible cause	Solution
QuickSteer does not turn.	No signals from the Auto-Guidance system such as the mojoRTK to QuickSteer.	Check Auto-Guidance system.
	Open wire between the Auto-Guidance system such as the mojoRTK and QuickSteer.	Check cable between Auto-Guidance system and QuickSteer.
	Open wire between power supply and QuickSteer, QuickSteer is not supplied with voltage.	Check power supply of QuickSteer.
Contact wheel of QuickSteer slips on steering-wheel.	Spring force of collapsible mechanism of QuickSteer is too low.	Slide QuickSteer closer towards the steering-wheel or increase spring force of collapsible mechanism of QuickSteer.
	Contact wheel of QuickSteer has a high rate of wear.	Replace contact wheel of QuickSteer.

5

Care and Transport

5.1

Transport

Transport in the field

When transporting the equipment in the field, always make sure that you carry the product in its original transport container.

Transport in a road vehicle

Never carry the product loose in a road vehicle, as it can be affected by shock and vibration. Always carry the product in its transport container and secure it.

Shipping

When transporting the product by rail, air or sea, always use the complete original Leica Geosystems packaging, transport container and cardboard box, or its equivalent, to protect against shock and vibration.

5.2

Storage

Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to "7 Technical Data" for information about temperature limits.

Operation and storage conditions

Electronic components of the QuickSteer are designed for rough environmental conditions like agricultural applications. However it should always be installed inside the cab of the vehicle.



- Never use a pressure washer to clean the QuickSteer. If needed wipe with a moist cloth.
- Always protect the QuickSteer from falling onto a hard surface, to prevent internal damage.

Life expectancy of the QuickSteer can be extended by storing it under optimal conditions. Keep all mounting screws and brackets together if the QuickSteer is not installed in a vehicle. Avoid locations with high humidity as well as high temperatures near generators, radiators or near windows in direct sunlight.

5.3

Cleaning and Drying

Product and accessories

Use only a clean, soft, lint-free cloth for cleaning. If necessary, moisten the cloth with water or pure alcohol. Do not use other liquids; these may attack the polymer components.

6

Safety Directions

6.1

General



The QuickSteer steering motor is to be used solely in combination with a Leica Geosystems Auto-Guidance system such as the mojoRTK. Therefore it's mandatory to also observe the directions and instructions contained in the corresponding User Manual.

Within the Leica QuickSteer User Manual only specific hazards of use are stated.

Description

The following directions should enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

6.2

Intended Use

Permitted use

- The QuickSteer is exclusively developed for usage in agriculture or forestry by persons in control.

- The QuickSteer is only intended to be fitted to agricultural tractors. It is not permitted to install this product in any other vehicles.
 - The QuickSteer steering motor is to be used solely in combination with a Leica Geosystems Auto-Guidance system such as the mojoRTK.
-

Adverse use

- Use of the product without instruction.
 - Use outside of the intended limits.
 - Disabling safety systems.
 - Removal of hazard notices.
 - Opening the product using tools, for example screwdriver, unless this is specifically permitted for certain functions.
 - Modification or conversion of the product.
 - Use after misappropriation.
 - Use of products with obviously recognisable damages or defects.
 - Use with accessories from other manufacturers without the prior explicit approval of Leica Geosystems.
 - Inadequate safeguards at the work site, for example when using on the intended site.
 - The QuickSteer is not suitable for applications on narrow dikes or on steep hill-sides, where danger of vehicle roll over exists.
-

 **Warning**

Adverse use can lead to injury, malfunction and damage.
It is the task of the person responsible for the equipment to inform the user about hazards and how to counteract them.
The product is not to be operated until the user has been instructed on how to work with it.

 **Warning**

Unauthorised modification of agricultural machine by mounting or installing the product may alter the function and safety of the machine.
Precautions:
Follow the instructions of the machine manufacturer. If no appropriate instruction is available, ask machine manufacturer for instructions before mounting or installing the product.

6.3

Limits of Use

Environment

Suitable for use in an atmosphere appropriate for permanent human habitation: not suitable for use in aggressive or explosive environments.

 **Danger**

Local safety authorities and safety experts must be contacted before working in hazardous areas, or in close proximity to electrical installations or similar situations by the person in charge of the product.

6.4 Responsibilities

Manufacturer of the product

Leica Geosystems AG, CH-9435 Heerbrugg, hereinafter referred to as Leica Geosystems, is responsible for supplying the product, including the user manual and original accessories, in a completely safe condition.

Manufacturers of non Leica Geosystems accessories

The manufacturers of non Leica Geosystems accessories for the product are responsible for developing, implementing and communicating safety concepts for their products, and are also responsible for the effectiveness of those safety concepts in combination with the Leica Geosystems product.

Person in charge of the product

The person in charge of the product has the following duties:

- To understand the safety instructions on the product and the instructions in the user manual.
- To be familiar with local regulations relating to safety and accident prevention.
- To inform Leica Geosystems immediately if the product and the application becomes unsafe.

Warning

The person responsible for the product must ensure that it is used in accordance with the instructions. This person is also accountable for the training and the deployment of personnel who use the product and for the safety of the equipment in use.

6.5

Hazards of Use

Warning

During dynamic applications, there is a danger of accidents occurring if the user does not pay attention to the environmental conditions around, for example obstacles, excavations or traffic.

Precautions:

The person responsible for the product must make all users fully aware of the existing dangers.

Warning

Unauthorised modification of machines by mounting the product may alter the function and safety of the machine.

Precautions:






Follow the instructions of the machine manufacturer. If no appropriate instruction is available, ask machine manufacturer for instructions before mounting the product.

Warning

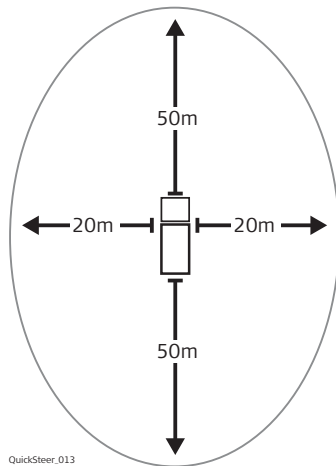
On public roads and drives always disengage the QuickSteer from the steering-wheel. For safety reasons it is better if you keep one hand on the steering-wheel, when using the QuickSteer at speeds over 6 mph (10 kmh). In case of malfunction you are able to take action immediately.

Caution

Do not stick parts of your body or other parts in the openings of the housing of the QuickSteer! Rotating parts inside the housing can cause injuries.

-  **Caution** Keep hair, clothes, gloves as well as necklaces and jewelry away from moving parts! Long hair, loose clothing, jewelry or similar loose parts can get caught by moving parts of the QuickSteer.
-
-  **Warning** With exemption of the driver no other person should ride in the drivers area of the vehicle fitted with a QuickSteer. Additional persons could distract or block visibility of the driver from operating and observing the QuickSteer, which could lead to dangerous situations.
-
-  **Warning** The presence of a rider on a passenger seat is only acceptable for brief observations or for training purpose. The passenger seat is never considered a children seat. Only persons especially experienced, with the operation of the machine, should be considered for schooling on a machine which is fitted with a QuickSteer.
-
-  **Danger** Pay special attention that no children are near or on the vehicle which is fitted with a QuickSteer. Especially important as soon as the motor runs. Children are unpredictable and supervision is limited when operating the QuickSteer. They might be exposed to additional danger.
-
-  **Caution** Before starting field work make yourself comfortable with the use of the QuickSteer and the vehicle. As soon as the QuickSteer is activated, an adult, responsible person has to be in charge of supervision and monitoring. In dangerous situations it is always safer to disengage the QuickSteer and drive by hand, in order to avoid personal injury or material damage.
-

Danger Zone



At no time should there be any person within the danger zone after the QuickSteer is activated.

At any sign of danger deactivate the QuickSteer immediately. Ask any person within the danger zone to leave promptly. Only when there are no more people within the danger zone re-activate the QuickSteer.

For service and control duties only authorised persons can enter the danger zone, after verbal confirmation with the operator. Such people have to be clearly informed about possible dangers before entering the danger zone. All activities between the operator and these persons should be discussed before hand. All service, adjustment and control duties on this QuickSteer should only take place if technically possible, on a parked vehicle with the engine turned off.



Danger

People present within the danger zone are exposed to serious bodily harm or even death. People could be run over in case of malfunction of the machine. The operator is obligated to stop the vehicle as soon as people enter the danger zone.

Prepare for possible emergencies

- Always have a fire extinguisher and First Aid kit at hand.
- Always have actual emergency phone numbers for Fire department, ambulance and doctor handy.

6.6

Labelling



Warning

Changes or modifications not expressly approved by Leica Geosystems for compliance could void the user's authority to operate the equipment.

Labelling QuickSteer

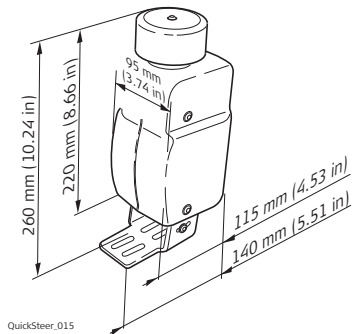


QuickSteer_014

7

Technical Data

Dimensions and weight



Weight: 2900 g (102 oz)

Electrical data

Power supply: 9 V ... 32 V
(reverse polarity and overvoltage protected)

Maximum current: 4.5 A

Connectors:

- Voltage supply:
 - Assignment:

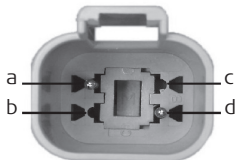
Deutsch DT04-2P



- a) Ubb (+12 V)
- b) Ground

- CAN-Bus:
 - Assignment:

Deutsch DT04-4P



- a) CAN low
- b) Not connected
- c) Not connected
- d) CAN high

Motor data

- Nominal voltage: 12 V
- Nominal torque: 0.5 Nm
- Nominal speed: 420 rpm
- Nominal current: 2.5 A
- Starting torque: 2 Nm

Environmental

Operation temperature: -40 °C ... 80 °C
(-40 °F ... 176 °F)

Storage temperature: -40 °C ... 90 °C
(-40 °F ... 194 °F)

Protection rating: IP 30

8 International Limited Warranty

International Limited Warranty

This product is subject to the terms and conditions set out in the International Limited Warranty which you can download from the Leica Geosystems home page at <http://www.leica-geosystems.com/internationalwarranty> or collect from your Leica Geosystems distributor.

The foregoing warranty is exclusive and is in lieu of all other warranties, terms or conditions, express or implied, either in fact or by operation of law, statutory or otherwise, including warranties, terms or conditions of merchantability, fitness for a particular purpose, satisfactory quality and non-infringement, all of which are expressly disclaimed.

Total Quality Management: Our commitment to total customer satisfaction.



Leica Geosystems AG, Heerbrugg, Switzerland, has been certified as being equipped with a quality system which meets the International Standards of Quality Management and Quality Systems (ISO standard 9001) and Environmental Management Systems (ISO standard 14001).

Ask your local Leica dealer for more information about our TQM program.

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- when it has to be **right**

Leica
Geosystems

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