Satellite-based GNSS steering systems

GPS PILOT

CLAAS

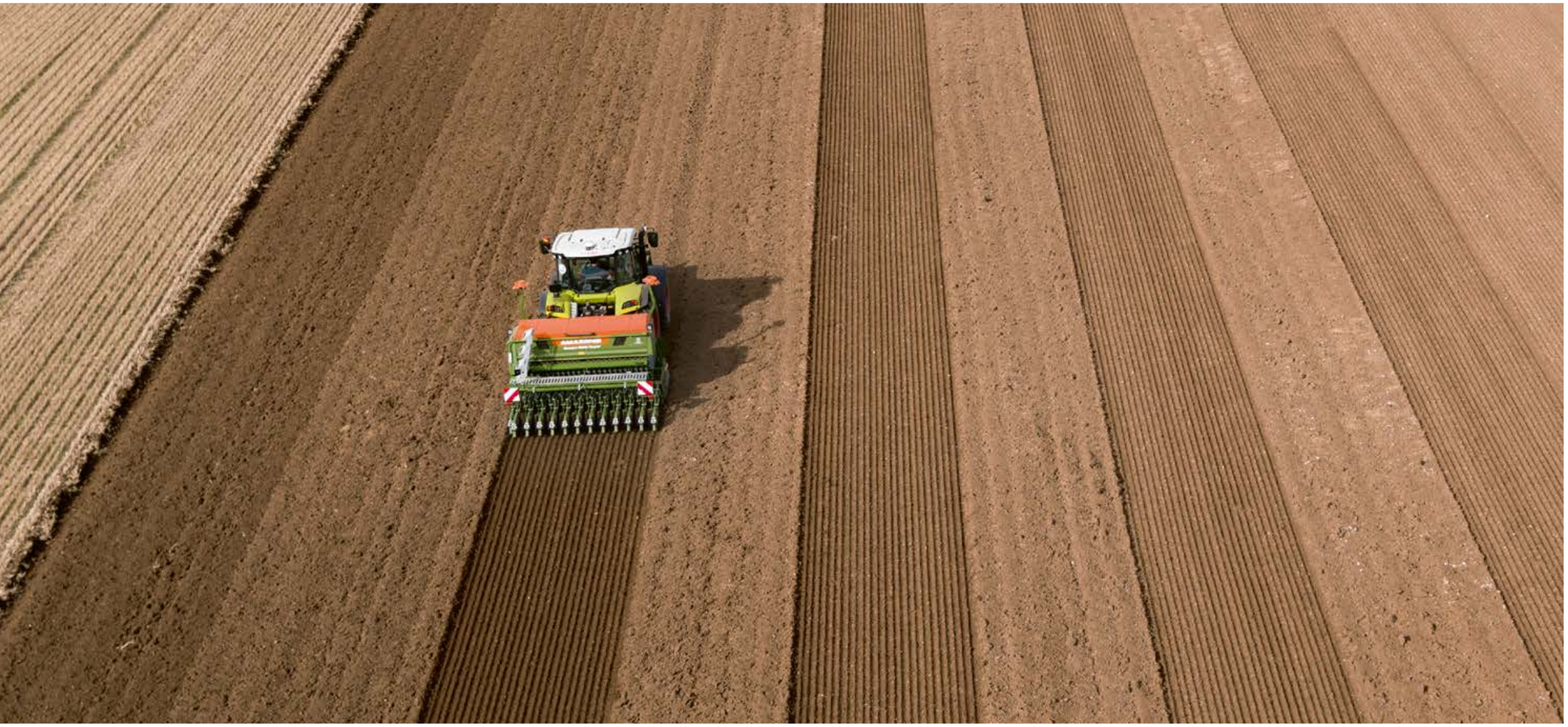
It pays to be precise.

We don't need to tell you that when it comes to field work, every centimetre counts. Steering systems play an important role in saving valuable resources such as consumables, time and money. Let's see what's on offer and together we can find the best steering system for your machines – it's bound to pay dividends.

Contents

steeringsystems.claas.com

Steering systems.
A standard feature from CLAAS for many years.



Benefits for the operator.

Nowadays, steering systems are an essential tool used by many drivers in their daily work. Thanks to them, precision to the nearest centimetre is no longer an art. The CLAAS GPS PILOT assists you in the field or on grassland by:

- Making every track exactly the same as the previous one
- Making full use of the working width
- Reducing overlapping
- Giving you more time to optimise your implement settings

Benefits for your business.

Ever since satellite-based steering systems were first introduced in agriculture, more and more farms have been reaping the benefits. You can retrofit this technology to your tractors and harvesters and enjoy the advantages of high-precision parallel steering systems every day.

The existing interface between GPS PILOT and AGROCOM NET, and also the CLAAS farm management software AGROCOM MAP, allows you to export tracks, reference lines and job-specific information to your farm PC easily using a USB stick.

Ten good reasons for investing.

A fully automated parallel steering system from CLAAS:

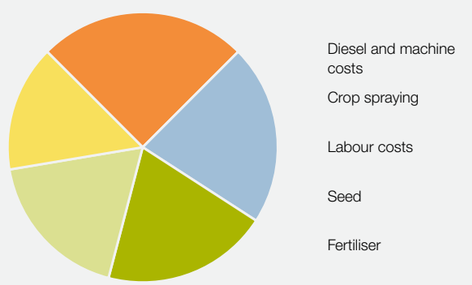
- Reduces fuel, labour, seed, spray and fertiliser costs
- Improves the efficiency and productivity of every pass
- Maximises capacity utilisation and increases service life
- Reduces stress and strain on the driver
- Makes optimum use of the machine's full working width
- Significantly improves work quality
- Allows consistent work quality around the clock – even at night and in bad weather
- Can be retrofitted to any hydraulically steered machine
- Gives the operator more time to optimise implement settings
- Boosts your profitability

What does a 5% improvement in accuracy mean?

Even the very best operators can't keep an eye on everything at once. So any system designed to give them more precise control has got to be worthwhile.

A 5% improvement in accuracy means that with production costs of 700 euros per hectare of wheat, for example, GPS steering can cut your overall costs by 5%, reducing your outlay by as much as 35 euros per hectare. At this rate, your investment often pays for itself in two to three years.

Average breakdown of operating costs in arable farming



History of CLAAS steering systems.

1977

AUTO PILOT (sensor).
The AUTO PILOT system for combine harvesters and forage harvesters was the first steering system CLAAS launched on the market, and it has proven its effectiveness thousands of times over. The AUTO PILOT technology has undergone a continuous process of development and refinement during which time numerous patents have been filed. Two mechanical sensors determine the position of the maize row,

send signals to the steering unit and automatically steer the machine through the crop. Maintaining the optimum position in all working conditions is the key to enhanced performance and higher efficiency.

2000

LASER PILOT.
The LASER PILOT's maintenance-free sensor continuously transmits invisible light signals and moves horizontally at an angle of 6°. The standing crop and the stubble reflect the light

beam. A second sensor measures the travel time of the reflected light signals and thereby determines the exact position of the edge between the cut and uncut crop. The machine is automatically guided along this crop edge with an accuracy of 10 to 20 cm. LASER PILOT also achieves high functional reliability in lodged cereal crops and when working on slopes.

2005

GPS PILOT.
GPS PILOT is the first GPS-based automatic steering system from CLAAS. Guided by GPS and correction signals, the

GPS PILOT is capable of high-precision track following with accuracies of up to ± 2 cm – even in foggy conditions or at night.

This steering system for tractors and other agricultural machines reduces the driver's workload, saves a great deal of working time, produces higher-quality work and reduces operating costs.

2007

CAM PILOT.
CAM PILOT is a camera-controlled automatic steering system which is specially designed for grass harvesting with the forage harvester pickup. A stereo camera mounted on the front of the JAGUAR scans the area ahead of the machine and accurately detects the position of the swaths. The forage harvester is then steered automatically on the basis of this information. Reliable, fast and accurate, it gives the driver more time to concentrate on filling operations, ensuring fast, loss-free harvesting.

2014

GPS PILOT with S10 terminal.
The GPS PILOT has already enjoyed great success thanks to its proportional valve technology. The two latest-generation CLAAS terminals further enhance its usability. The GPS PILOT with S10 terminal has a 10.4" touchscreen and integrated dual-frequency receiver for straightforward, intuitive operation.

With the S10 terminal you can operate the steering system while at the same time controlling ISOBUS-enabled implements and connecting up to four cameras.

2016

Enhanced ISOBUS functions in the S10 terminal.
Three ISOBUS Task Controllers (ISO TCs) simplify operations. TC-BAS documents total values from machines and implements. The data are exchanged between field map and Task Controller in ISO-XML format. TC-GEO gathers and

processes location-related data, allowing jobs to be planned and worked through with the aid of application maps, for example. TC-SC allows you to switch sections on and off automatically (Section Control), e.g. during crop spraying, fertiliser spreading or drilling, depending on the GPS position and degree of overlapping required.

2018

Live yield mapping in the S10 terminal.
LEXION, TUCANO and JAGUAR are equipped with systems which enable automatic yield mapping. The yield data are

recorded by the machine's QUANTIMETER and transferred directly to the field map in the S10 terminal. Based on the ISOBUS module TC-GEO (Task Controller geo-based), it allows you to monitor results even during harvesting operations.

2019

SATCOR 15 / SATCOR 5.
SATCOR – the very first CLAAS satellite-based correction signal – is the result of the systematic development of CLAAS GPS PILOT steering systems. It is available virtually worldwide and its basic accuracy is superior to that of EGNOS / E-DIF. There are two versions to choose from: SATCOR 15 with an accuracy of < ± 15 cm and SATCOR 5 with an accuracy of ± 5 cm. It is particularly recommended in areas where RTK or mobile phone coverage is poor.

Steering systems – an integrated approach.

Three, to meet every demand.

– Manual: GPS COPILOT
  Visual parallel guidance for the driver
– Assisted: GPS PILOT FLEX
  Electric steering wheel for parallel tracking
– Fully automatic: GPS PILOT
  Active control of steering hydraulics

Manual steering systems. GPS COPILOT.

– Parallel guidance by means of a lightbar or LED display
– Display shows the steering angle to be applied
– Corrects the direction of travel
– Accuracy depends on display and driver's skill
– Ideal when working without tramlines (fertiliser spreading, herbicide application)

Assisted steering systems. GPS PILOT FLEX.

– Entry-level automatic steering
– Assisted steering systems actively intervene in the steering process
– The vehicle is automatically steered along parallel tracks
– Electric steering wheel can be used flexibly on different machines
– CLAAS range of correction signals covers all accuracy requirements

Automatic steering systems. GPS PILOT.

– Actively controls the vehicle's steering hydraulics
– Built-in system with integrated steering valve
– Steering system terminal and navigation controller can be used flexibly on different machines
– CLAAS range of correction signals covers all accuracy requirements
– Offers the highest level of convenience and accuracy

GPS PILOT and GPS PILOT FLEX are controlled by the S10 and S7 touchscreen terminals.

The easy way to start – GPS COPILOT and GPS PILOT FLEX.

GPS COPILOT.

The GPS COPILOT from CLAAS is the ideal entry-level model for satellite-based steering systems and offers a wide range of functions.

The driver – guided by the EGNOS satellite signal (with no licence fee) – can steer the machine safely and securely in parallel lines or along variable contours with a GPS accuracy of ± 15 to 30 cm.

The system enables the operator to utilise the machine's full working width and reduces overlapping. This boosts the quality of work while reducing the work time even in difficult light and weather conditions.

Ideal for:
- Tillage
- Fertiliser application
- Slurry application
- Manure application
- Lime application
- All tasks with no orientation points (tramlines)

In addition to the GPS COPILOT terminal*, the S10 or S7 terminal with COPILOT function can be used if the machine does not have a built-in automatic steering system.

*COPILOT terminal not available in all markets

The GPS COPILOT terminal is the entry-level model for satellite-based steering systems.

GPS COPILOT terminal with a wealth of functions.

- LED lightbar for guidance
- EGNOS correction signal
- Automatic reference track offset
- Integrated area calculation
- Headland alarm
- RS-232 interface for outputting correction data
- Can be used flexibly on any machine
- Short set-up times

GPS COPILOT.
- Your introduction to the world of satellite-based steering systems
- Make full use of the working width and reduce overlapping

GPS PILOT FLEX.
- Automatic steering wheel for your entire machinery fleet
- Transfer between combine harvesters, forage harvesters and tractors

GPS PILOT FLEX.

The GPS PILOT can be used with hydraulic steering and also with the GPS PILOT FLEX automatic steering wheel. This steering wheel enables you to achieve very high levels of accuracy. The great advantage of the GPS PILOT FLEX is its enormous versatility.

The GPS PILOT FLEX steering wheel can easily be transferred between machines which are only used on a seasonal basis, such as combine harvesters and forage harvesters, and can also be used on a tractor for field work. It is also designed for installation on older CLAAS machines or machines from other manufacturers. A number of options are available. You can use the existing GPS PILOT equipment on the individual machines and just change the steering wheel, or you can move all the main components between machines.

The perfect addition to the GPS PILOT automatic steering system – the GPS PILOT FLEX steering wheel for added convenience and precision in the field.

Multiple selling points:
- No need to touch the hydraulics
- Steering system can easily be transferred from one machine to another
- Provides all the functions of the GPS PILOT

For maximum precision.
GPS PILOT.

GPS PILOT.
- Unbeatable steering precision for all tasks which depend on maximum pass-to-pass accuracy
- Guides you across the field in a perfectly straight line at all speeds
- Order your machine "GPS-ready" or with a complete factory-fitted steering system

GPS PILOT.

As an integral part of the machine's steering hydraulics, the GPS PILOT is almost unbeatable in terms of steering precision – thanks to its proportional valve, wheel angle sensor and navigation controller. This combination is perfect for all tasks which depend on maximum pass-to-pass accuracy, e.g. drilling or a wide range of work in row crops.

Depending on the precision level required, the GPS signals can be corrected by EGNOS, SATCOR, RTK FIELD BASE or the RTK signal. GLONASS satellite reception can also be enabled.

As an option, CLAAS can supply a GPS-ready machine by installing all the infrastructure required for the GPS PILOT at the factory. It can also be retrofitted. For machines from other manufacturers, CLAAS offers the GPS PILOT complete with manufacturer-specific installation kits.

The right speed for every job.

For field work, the CLAAS GPS PILOT covers a speed range which caters for all requirements (25 km/h to 400 m/h). Ideal for all types of work, from rotary cultivation tasks which move a lot of soil to planting, the GPS PILOT acts as a virtual string which ensures that your rows are completely straight. When working with modern seed drills, speeds of up to 20 km/h are the norm. Even at these speeds, the GPS PILOT guides the tractor and implement across the field in a perfectly straight line while still maintaining the required accuracy.

Benefits:
- High accuracy at all times and at all speeds
- 25 km/h to 400 m/h (depending on model)
- Also ideal for farms growing specialised crops

Automatic turning made easy.

Automatic line acquisition.
TURN IN.

TURN IN takes account of machine alignment, steering lock and current speed to identify the best parallel track and then guides the machine automatically into it. The driver can influence track choice at all times by changing the parameters or actively intervening in the steering. Starting at an angle of up to 120° to the track, TURN IN automatically identifies the new line to take after the turning manoeuvre and displays the optimum track. TURN IN is available for all CLAAS GPS PILOT steering systems with an S10 or S7 terminal.

Benefits of TURN IN:

- Advance track selection, taking account of speed, steering lock, etc.
- Steering system is activated in good time
- Activated at an angle of up to 120° to the track
- Driver is more relaxed during work at the headland, more time for the attached implement / implement settings
- Route for lining up with the next track is displayed
- Driver can influence the TURN IN route

Standard on all GPS PILOT S10 and S7 terminals: TURN IN indicates to the driver the best track to take next based on speed and steering lock. When the driver activates the steering system, the machine follows the suggested path.

Fully automatic turning.
AUTO TURN.

The driver does not need to steer – AUTO TURN turns the machine at the headland in one sweep and guides it precisely into the next pass. This function is factory-integrated into the S10 and S7 terminals and is activated by means of a licence code. The AUTO TURN function can be activated at the boundary line or on the worked headland (S7 terminal). With the S10 terminal, it is also possible to define a headland with a specified width. When the tractor reaches this headland line, AUTO TURN automatically triggers the turning manoeuvre.

Benefits of AUTO TURN:

- Automatically turns the machine at headlands
- Available for all machine types (tractors, forage harvesters and combine harvesters)
- Reduces the driver's workload considerably
- Blocks can also be worked automatically (S10 terminal)
- Lines up precisely after turning
- Protects the soil by turning in one sweep
- Minimises crop damage when lining up in row crops

AUTO TURN automatically turns the machine into the next track at the headland.

In the S10 terminal AUTO TURN can also create and work blocks automatically.

GPS COPILOT and GPS PILOT FLEX.
The components.

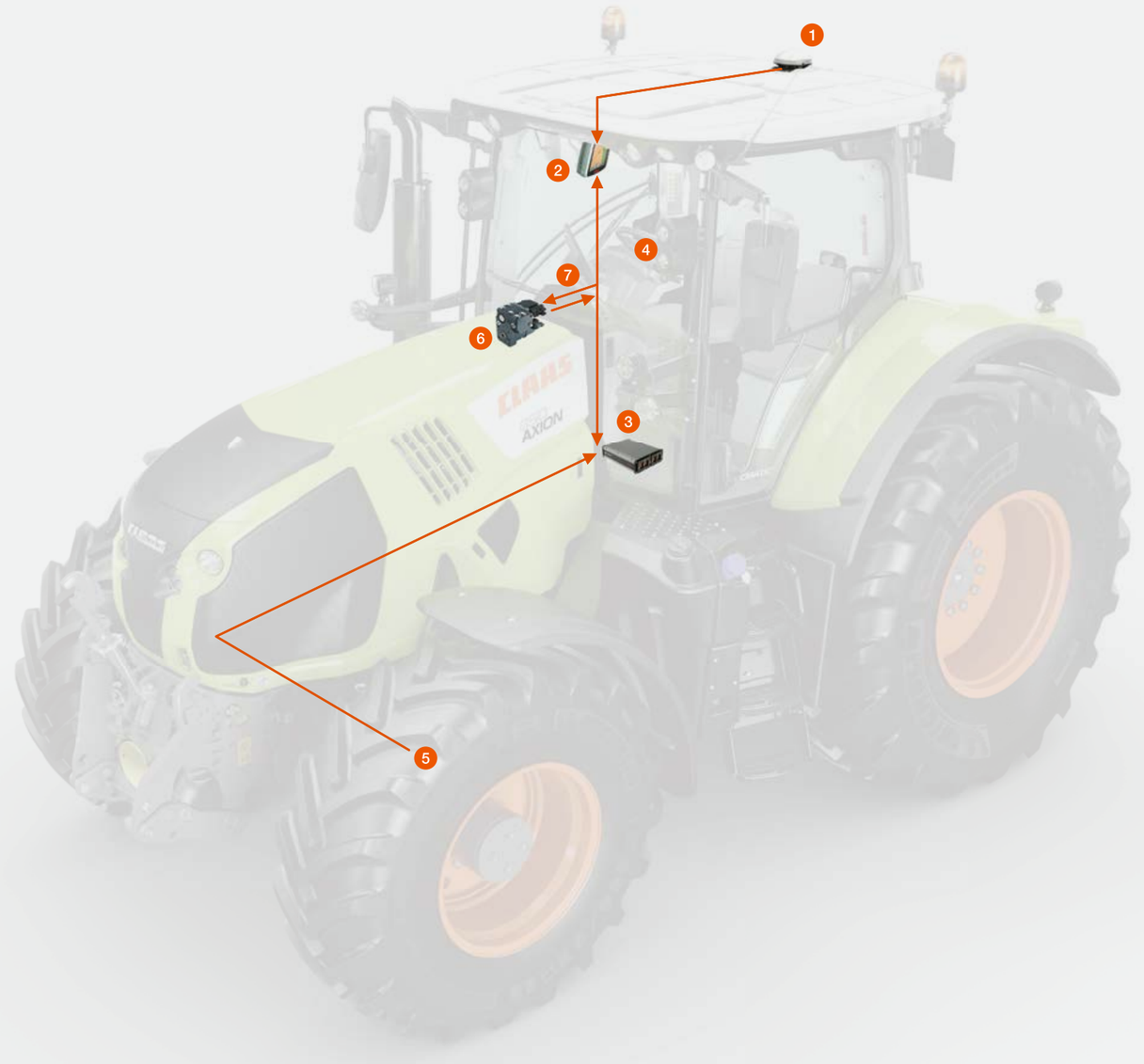
Factory-fitted options:

GPS PILOT-ready.
- GPS PILOT antenna (1)
- Basic wiring and sensors in the machine and connections in the cab
- Hydraulic valve control unit (5-7)

Fully integrated GPS PILOT.
- GPS-ready infrastructure
- S10/S7 terminal (2)
- Navigation controller (3)
- Additional receiver equipment for correction signal if required

Retrofit option – not GPS-ready:

- GPS PILOT antenna, terminal and navigation controller (1-3)
- GPS PILOT FLEX (4) or hydraulic valve control unit (5-7)
- Additional receiver equipment for correction signal if required



The illustrations are intended as examples. The actual level of equipment depends on the type of machine and may vary. Please contact your CLAAS distributor for more detailed information.

1

GPS PILOT antenna.
High-precision GNSS antenna to receive positioning data from GPS, GLONASS and GALILEO and transmit it to the GPS PILOT terminal.

2

S7 terminal.
High-resolution 7" touchscreen for straightforward GPS PILOT operation

S10 terminal.
High-resolution 10.4" touchscreen for operation of GPS PILOT and other functions.

3

Navigation controller.
The navigation controller with its 6-axis gyro calculates the track, taking account of longitudinal and lateral movements.

4

GPS PILOT FLEX.
Automatic guidance by means of an electric steering wheel instead of a steering valve.

5

Wheel-angle sensor.
The wheel-angle sensor determines the exact steering angle to allow high pass-to-pass accuracy.

6

Proportional valve.
The proportional valve accurately implements the steering commands.

7

Electronic valve control unit.
The electronic valve control unit connects the GPS PILOT terminal and the navigation controller to the proportional valve.

Working in harmony.
Terminals and driving modes.

The perfect choice, always.

The design of the COPILOT terminal means that it can only be used as a steering aid for the GPS COPILOT. The S10 and S7 terminals are different: they can be used either to assist manual steering with the GPS COPILOT or with the GPS PILOT FLEX and GPS PILOT automatic steering systems.

GPS COPILOT:
Manual parallel guidance
GPS PILOT FLEX:
Automatic steering system with electric steering wheel motor
GPS PILOT:
Automatic steering system which directly controls the steering hydraulics

COPILOT terminal

GPS COPILOT

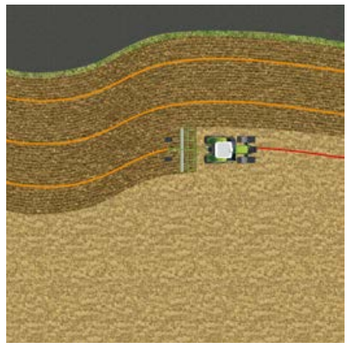
S7 terminal

GPS COPILOT
GPS PILOT FLEX
GPS PILOT

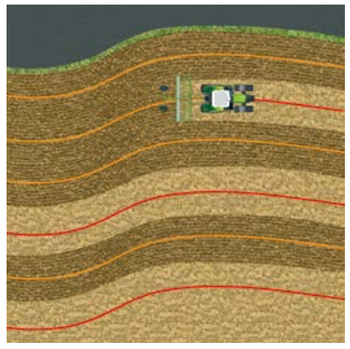
S10 terminal

GPS COPILOT
GPS PILOT FLEX
GPS PILOT
ISOBUS
Displays images from up to four cameras

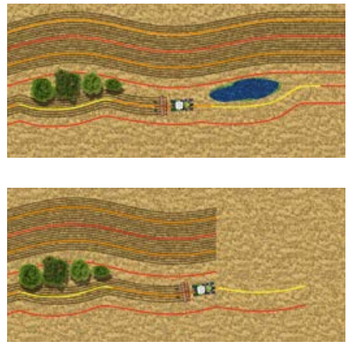
A-B mode.
The first pass is defined by setting the points A and B. All other passes are made at a constant distance (corresponding to the set working width) from the first pass. This means that the field can be divided into blocks and worked through block by block.



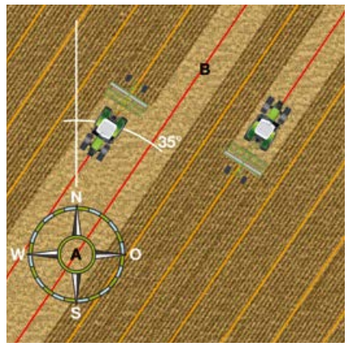
Contour mode.
The contour guidance function is normally used for headland turning or for tracking slightly curved field boundaries.



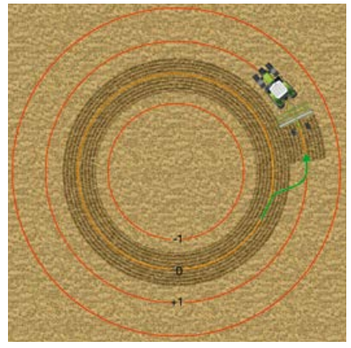
A-B contour mode.
With the A-B contour mode you can log a reference line on a slightly curved field boundary. The other passes are calculated by shifting the reference line parallel to the first pass by the set working width. This enables you to divide the field into blocks and work it in any sequence.



Adaptive A-B contour mode.
The adaptive A-B contour function makes it possible to bypass obstacles by recording a new section. This section is inserted into the existing A-B contour and is available for the rest of the field. The end of an existing track can also be extended by adding another section.



A+ angle mode (reference track transfer).
This driving mode allows adjustment of the track when several machines are working in parallel. After the A point has been set, the B point is determined by the angle information for another machine and the reference track is aligned accordingly.



Circle mode.
The circular tracking mode is used for working in a circular pattern. You can set the first circular track and then work either side of it. All other passes are made at a constant distance (corresponding to the set working width) from the first track.

One terminal for all applications. The S10 terminal.

The terminal that meets the toughest demands.

The CLAAS S10 terminal is designed for professional users. It has a large, high-resolution 10.4" touchscreen and features an extensive range of functions. With the S10 terminal you can operate the steering system while at the same time controlling ISOBUS-enabled implements and connecting up to four analogue cameras, such as the CLAAS PROFI CAM or AUTO FILL. It also includes comprehensive reference line management.

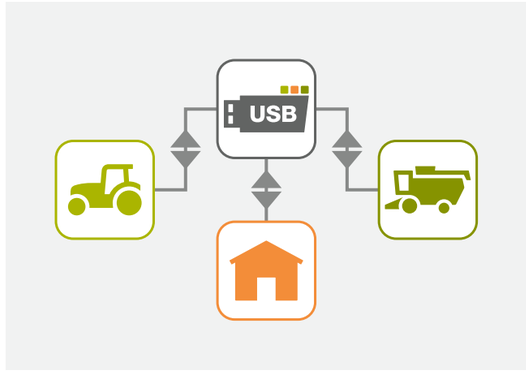
Perfectly coordinated technology.

Inside the S10 terminal there is a dual-frequency GPS receiver which guarantees maximum accuracy. In addition to the standard EGNOS and E-DIF correction signals, the S10 terminal can optionally be enabled for use with SATCOR, RTK FIELD BASE and RTK | RTK NET. Naturally, GLONASS satellites can be used as well as GPS satellites, significantly increasing the signal stability. All the optional functions can be activated directly from the terminal by entering special codes.

Data transfer between machine and office.

Both terminals (S10 and S7) are capable of exchanging tracks, field boundaries and calibrations between different machines with GPS PILOT. Tracks and field boundaries can also be planned and transferred on the PC. This data can be exported from the terminals and imported back into the management software to allow documentation of the work performed.

The TC-BAS or TC-GEO ISOBUS modules for the S10 terminal make it easy to plan and document work. ISOBUS tasks as well as application and yield maps can be exchanged in the standardised ISO-XML file format.



It is easy to do this, even in the field, by exporting and importing data on a USB stick.

Section View.

No more unwanted overlapping during spraying work. Section View shows you which sections to switch on or off. Up to 16 sections can be freely defined, depending on your implement. The degree of overlap shown on the display can also be adjusted.

Benefits:

- Sections to be switched on or off are displayed
- Cuts costs by reducing errors and overlapping
- Standard in all S10 and S7 terminals

The S10 terminal.

- High-resolution 10.4" touchscreen for professional users
- Dual-frequency GPS receiver for maximum accuracy
- Easy to exchange data between your office and all your machines
- Wide range of steering system functions, from ISOBUS control to connecting four cameras
- Additional ISOBUS modules, e.g. Section Control, can be enabled to suit the needs of your farm.

Highly versatile.
The S10 terminal.

1

2

3

4

ISOBUS on board.

The S10 terminal is designed to handle an impressive number of applications. It can be used for GPS steering, but also acts as an operating terminal for ISOBUS implements. All the key ISOBUS operating functions (developed according to ISOBUS standard 11783) are available in the S10 terminal. Naturally, ISOBUS functions can also be assigned to the function buttons on the CMOTION drive control lever or the machine's joystick by means of ISO AUX old and ISO AUX new.

1 ISO UT.

ISO UT stands for ISOBUS Universal Terminal. All I SOBUS-enabled implements (such as LINER, DISCO, CARGOS, QUADRANT and VARIANT) can be operated with the UT function.

2 Task Management Basic (ISO TC-BAS).

ISO TC-BAS means ISOBUS Task Controller Basic and allows standardised task management. TC-BAS imports the counter values needed for documentation of the work performed. These values are transmitted by the implement. All other relevant data, such as fields and working time, can also be documented. Advance job planning is also possible in conjunction with farm management software using data in ISO-XML format.

This means that tasks can easily be exchanged between the terminal and software and accurate documentation can be issued with ease.

3 Task management GEO (ISO TC-GEO).

ISO TC-GEO stands for ISOBUS Task Controller geo-based and, in addition to the TC-BAS functions, allows gathering of satellite-based position information. Documentation – e.g. of variable fertiliser application – can therefore be produced with pinpoint accuracy. The S10 terminal can display these location-specific values in map view during the task.

With this function it is also possible to execute pre-planned application maps. They can be linked to an ISO-XML task or imported directly into the terminal as a shapefile.

4 Section Control (ISO TC-SC).

ISO TC-SC stands for ISOBUS Task Controller Section Control. This function allows you to switch sections on and off automatically – e.g. during crop spraying, fertiliser spreading or precision drilling – for precision field work. All the settings can be adjusted individually on the implement currently in use and are easily entered according to the operation in hand. The status bar in the map view on the S10 terminal gives you a full overview of all the sections at all times without losing sight of other functionalities.

A terminal for GPS steering.
The S7 terminal.

The S7 terminal.

- High-resolution 7" touchscreen to control your parallel guidance or automatic steering system
- Can be enabled for all CLAAS correction signals
- Reference line management and USB interface for exchanging your data

Perfectly coordinated technology.

Inside the S7 terminal there is a dual-frequency GPS receiver which guarantees maximum accuracy. In addition to the standard EGNOS and E-DIF correction signals, the S7 terminal can optionally be enabled for use with SATCOR, RTK FIELD BASE and RTK / RTK NET. Naturally, GLONASS satellites can be used as well as GPS satellites, significantly increasing the signal stability. All the optional functions can be activated directly from the terminal by entering special codes.

The start of precision steering.

The S7 basic terminal has all the latest technology and is the right choice if you just want to use your terminal to control a parallel guidance or automatic steering system. With its high-resolution 7" touchscreen, the S7 performs all the functions provided by its predecessor, the S3. It also comes with reference line management and a USB interface for data management, as well as fast data exchange with the AGROCOM NET and AGROCOM MAP software packages.

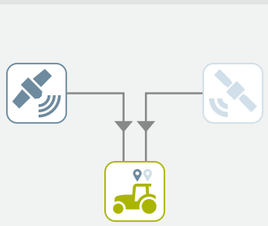
NEW

Correction signals for CLAAS steering systems.

Even greater precision.

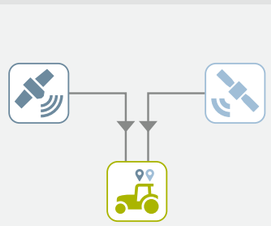
Correction signals make your CLAAS steering systems work even more effectively. The systems receive the GPS signal from the satellite and improve its accuracy. You can choose from seven correction signals with different accuracy levels to suit your requirements.

EGNOS / E-DIF.



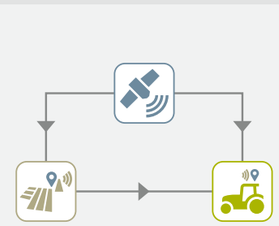
Accuracy ± 30 cm
- No licence fee
- Basic accuracy
- Single-frequency signal (EGNOS / WAAS)
- Algorithmic calculation of the correction signal from GPS data (E-DIF)

NEW: SATCOR 15 / SATCOR 5.



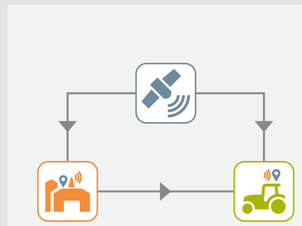
Accuracy < ± 15 cm (SATCOR 15)
Accuracy ± 5 cm (SATCOR 5)
- Satellite-based correction signal from CLAAS
- Improved basic accuracy
- Licence required
- Virtually worldwide coverage

RTK FIELD BASE.



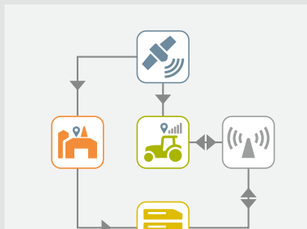
Accuracy ± 2-3 cm
- Mobile reference station
- Range 3-5 km
- No licence fee
- Proprietary correction signal
- RTCM 3.1 transmission standard

RTK FARM BASE.



Accuracy ± 2-3 cm
- Base station with digital and analog radio can be used
- Range up to 15 km
- Licence also available via CLAAS dealership
- Absolute accuracy
- RTCM 3.1 transmission standard

NEW: RTK FARM BASE LINK.

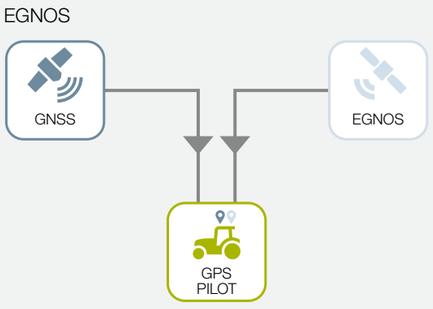


Accuracy ± 2-3 cm
- Base station
- Station data transmitted via the mobile phone network (NTRIP)
- 30 km (± 2-3 cm) range, up to 50 km with loss of accuracy
- Licence also available via CLAAS dealership
- Absolute accuracy
- RTCM 3.1 transmission standard

RTK NET.

Accuracy ± 2-3 cm
- Correction signal via mobile phone network
- Unrestricted operating radius
- Absolute accuracy
- Licence required
- RTCM 3.1 transmission standard

Licence-free correction signals. Available worldwide.

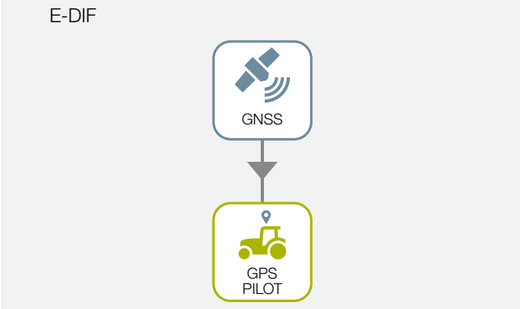


EGNOS.

EGNOS (European Geostationary Navigation Overlay Service) is available to users free of licence fees in many parts of Europe. It supplements GPS and uses 34 ground stations to generate the correction signal.

EGNOS is available for all machines. With an accuracy of ± 15 to 30 cm, it is ideal for many crop spraying, fertilising and soil cultivation applications.

WAAS (Wide Area Augmentation System) offers the same functionality as EGNOS in many regions outside Europe and can be processed by CLAAS receivers.



E-DIF.

E-DIF is a correction algorithm calculated purely from the GPS data. During the initialisation period it calculates how the current satellite constellation will change over the next few hours. The signal is available worldwide.

It must be receiving at least four satellites in order to work. This signal then provides the same accuracy as EGNOS (± 15 to 30 cm) and is therefore ideal for use in crop spraying, fertiliser spreading and tillage applications. When working in the field, it is only possible to drive from pass to pass; E-DIF cannot be used to establish blocks.

NEW

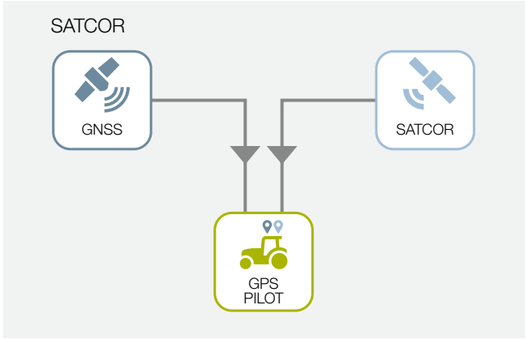
Flexible operating radius.

NEW: SATCOR 15 / SATCOR 5.

SATCOR – the very first CLAAS satellite-based correction signal – is the result of the systematic development of CLAAS GPS PILOT steering systems. SATCOR operates in much the same way as EGNOS and is available virtually worldwide. However, this system is equipped with a dual-frequency GPS receiver, enabling it to achieve a far higher level of GPS accuracy. The correction signal receiver is particularly quick to respond and supplies accurate position data following an initialisation period.

There are two licence models to choose from: SATCOR 15 has a basic accuracy of < ± 15 cm, which is a significant improvement on EGNOS / E-DIF. The correction signal is suitable for a wide range of agricultural applications and achieves the specified accuracy after only a short initialisation period.

SATCOR 5 with an accuracy of ± 5 cm is particularly recommended in areas where RTK or mobile phone coverage is patchy or non-existant.



[1] The machine receives signals transmitted by GPS satellites.
[2] The geostationary SATCOR satellite also transmits a high-precision correction signal (DGPS) to the machine.
[3] The GPS PILOT converts both signals into steering signals.

SATCOR can easily be retrofitted to CLAAS GPS PILOT steering systems since no additional hardware is required in most cases.

SATCOR.
- Satellite-based correction signal from CLAAS
- Licence required
- Virtually worldwide coverage

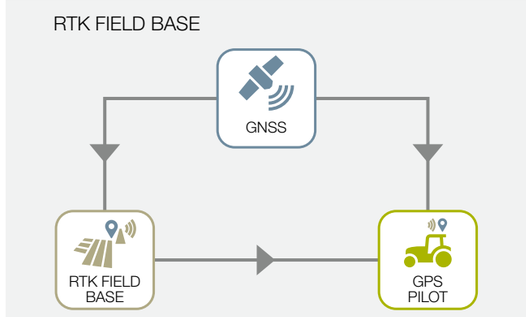
SATCOR 15 (< ± 15 cm).
- Improved basic accuracy compared with EGNOS / E-DIF
- Quick signal availability
- Good signal suitable for many applications from soil cultivation to harvesting

SATCOR 5 (± 5 cm).
- Ideal in areas where RTK and mobile phone coverage is patchy
- Longer initialisation period than SATCOR 15

RTK FIELD BASE (± 2-3 cm).
- Mobile reference station
- Range 3-5 km
- Proprietary correction signal
- No licence fee
- Integrated rechargeable battery
- RTCM 3.1 transmission standard for multi-manufacturer fleets

RTK FIELD BASE.

RTK FIELD BASE is a mobile reference station for flexible use. Thanks to the integrated dual-frequency receiver, the typical positioning accuracy with RTK is 2 to 3 cm. With three different radio units in the frequency ranges 403-450 MHz, 860 MHz and 900 MHz, the RTK FIELD BASE can be adapted to comply with radio communication authority guidelines. For use in fleets with machinery from different manufacturers, the standardised RTCM 3.1 correction data format is the logical choice when using RTK FIELD BASE. The range is between 3 and 6 km, depending on topography, transmitter power and frequency.

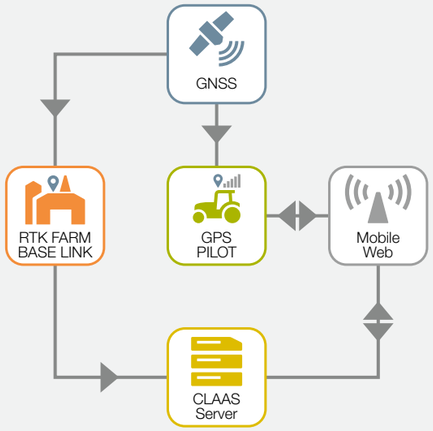


[1] The machine and RTK FIELD BASE receive signals transmitted by GPS and GLONASS satellites.
[2] The mobile reference station generates a high-precision correction signal (DGPS), which is also transmitted to the machine via a radio signal.
[3] The GPS PILOT converts both signals into steering signals.

NEW

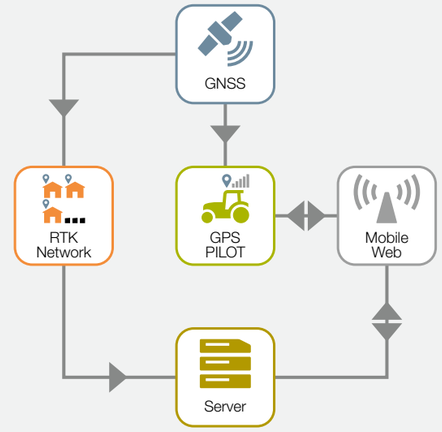
Maximum precision.
Maximum convenience.

RTK FARM BASE LINK



[1] The machine and the stationary reference station receive signals transmitted by GPS satellites.
[2] The RTK FARM BASE LINK reference station produces a correction signal which is sent to the CLAAS Server via the Internet. The server processes the correction signal for the reference station and assigns it to the right machine.
[3] The machine receives the high-precision RTK correction signal via the mobile phone network.
[4] The GPS PILOT converts both signals into steering signals.

RTK NET



[1] The machine and the RTK network receive signals transmitted by GPS satellites.
[2] The central server calculates correction signals for the networked reference stations.
[3] The machine receives the high-precision RTK correction signal via the mobile phone network.
[4] The GPS PILOT converts both signals into steering signals.

RTK FARM BASE.

The RTK FARM BASE is the right technology when every centimetre counts, e.g. for drilling or harvesting. The reference station is stationary and comes equipped with dual-frequency reception technology. From its fixed site, it sends the correction signal to any number of machines. It has a range of up to 15 km, depending on the topography and transmitter power, enabling all machines within the reception range to work simultaneously with a high level of precision.

NEW: RTK FARM BASE LINK.

As well as transmitting the correction signal via radio signal, the RTK FARM BASE LINK can supply the correction signal from the base station to the mobile phone network via NTRIP. With good mobile phone coverage, this can increase your operating radius around the station to 30 km with full RTK accuracy.

Benefits:
- Highest possible repeatable accuracy (± 2-3 cm)
- Fastest signal availability
- Lower operating costs in the long term
- RTCM 3.1 transmission standard for multi-manufacturer fleets

RTK NET.

RTK NET extends the product range for regions where there is no access to a base station. The correction signals are sent via the mobile phone network.

RTK NET is not constrained by a specific radius and is therefore the ideal solution for contractors and farms seeking to work with the highest repeatable precision. Like RTK, RTK NET uses dual-frequency technology. The system features very fast signal availability (initialisation) and a highest repeatable accuracy of ± 2-3 cm.

Benefits of RTK NET:
- Correction signal via mobile phone network
- Access to existing RTK networks
- Unrestricted operating radius
- Specific to individual machines
- Highest possible repeatable accuracy (± 2-3 cm)
- Very quick signal availability
- RTCM 3.1 transmission standard for multi-manufacturer fleets

Disclaimer in relation to correction signals.
Please note that some variants are not available in every country. Please contact your distributor for further information.

EGNOS is a service which is available free of charge in Europe. WAAS is a comparable service for North America. Please note that in both systems track lines may shift over time (satellite drift). These systems are not suitable for use in machine fleets (e.g. combine harvesting). The accuracy data given relates to the accuracy of the GPS receiver on the machine under perfect conditions. All data are expressed as maximum values. A distinction is made between pass-to-pass accuracy and absolute accuracy. Pass-to-pass accuracy defines the accuracy of the subsequent pass in 95% of cases within 15 minutes in relation to the reference track. Absolute accuracy indicates the level of accuracy with which a certain position can be found again at a later point in time. The actual accuracy of the overall system may deviate from the abovementioned accuracy data. It depends on various influential factors such as vehicle factors (wheelbase, ballasting, calibration, etc.), attached implements (side pull, configuration, attached front implements, etc.), and field and soil conditions.

The pricing of the individual services depends upon the region and the provider. In the case of correction data services transmitted via mobile phone networks, availability is dependent on the coverage of the network provider used. CLAAS assumes no liability for circumstances or events beyond its control. These may include, for example, disturbances in the atmosphere/troposphere/ionosphere, breakdowns/ disruptions or insufficient availability of satellites within global navigation satellite systems (GPS, GLONASS, GALILEO) and their ground reference stations or of satellites belonging to correction service providers (EGNOS, OMNISTAR, etc.).

E-DIF is patented correction algorithm which uses only standard GPS satellites to calculate a correction factor. E-DIF is therefore available worldwide as an alternative correction system in the basic accuracy segment and, within a few minutes, its accuracy is comparable with that of SBAS services (EGNOS, WAAS, etc.) for pass-to-pass applications. Therefore E-DIF should only be used for pass-to-pass tracking. E-DIF is completely unsuitable for driving in blocks or for use in controlled traffic applications or machine fleets (e.g. combine harvesting). It is also impossible to record points for absolute positioning. Shifts in tracks (satellite drift) due to long interruptions in work can be corrected using an update function (setting a reference point).

Ensuring a better **harvest**.

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