

MiniGIS 2

DIGITAL PLOT PLANNING FOR PRECISE AND EFFICIENT REALIZATION



MiniGIS is a geographic information system for parcel trial planning at the PC – true to scale and exactly at the location, where they shall be positioned later.



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MiniGIS 2

Plot Planning – simple and quick on the PC

The layout of trial plots with chalk carriages and prisms is time consuming. With MiniGIS, plot designs are displayed on the PC with regard to the field boundaries. Soil or yield maps can be used in the background to position the trials exactly in areas with lowest differences in soil and yield. The planned data is used as basis for GPS systems that automatically steer tractors and seeders. As no marking is needed before the sowing in the field, this solution facilitates an efficient and on-schedule seeding. Thanks to the prepared steering rou-

tes, the layout and maintenance of paths is also automatically possible in an accuracy up to 2.5 cm. Furthermore steering systems can automatically trigger the changing procedure in seed material when entering the plot and the marking of paths is not needed at all.

In addition MiniGIS also offers modules for irrigation, for flight planning of UAVs, as well as for analysing captured picture data (scoring, crop height, beginning of flowering, counting plants etc.)

Main Features:

- Importing of shape-files like e.g. field survey data in WGS84, Gauss-Krueger or UTM coordinates
- Importing of kml-files from Google Earth
- Microsoft® Bing Maps as background maps
- Planning and placing of trial plots in geographic coordinates
- Importing of soil and yield data
- Orientation of trial blocks with regard to field boundaries
- Planning of steering routes for sowing and maintenance of paths
- Export data to GPS systems
- True to scale printing of the trial design
- Importing of hyperspectral data cube (ENVI) in UTM coordinates
- Import and analysis of digital orthophotos and digital elevation models

Complete steering of the plot seeder

geo-konzept deliver a complete hardware for piloting and surveying the seeder.

Actuating of the belt cone

Via the hydraulic propulsion of the belt cone, the plot lengths planned in MiniGIS are automatically realized. A changing of the gear setting is not needed. The adjustment of the plot length is even possible inside a trial.



Seed monitoring

By the subsequent installation of sensors in the seed pipes, the most important function of the seeder, namely the deposit of seed, can be monitored. A warning is displayed, as soon as no seed is running through one of the pipes or a blockage occurs. The corresponding seed row with a malfunction is displayed. So errors can be detected and removed quickly. Hence false applications are reduced to a minimum.



MiniGIS Modules

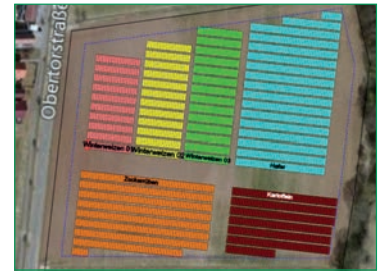
Basic Module

- Display of shape and kml files
- Opening of MiniGIS projects (useful supplement in the seeding tractor)
- Connection to GNSS receivers to display the current GPS position in the trial
- Display of background maps
- Export of layers in shape or kml format for further processing in external software



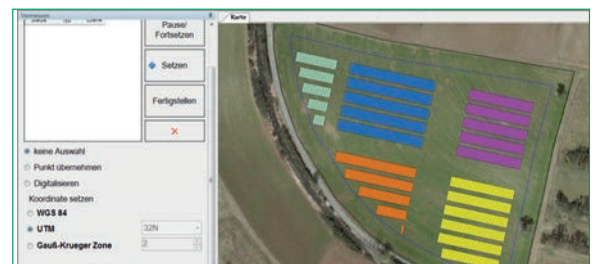
Field Trial Manager

- Planning of trials with varying path and base width as well as plot lengths and widths
- Orientation of trial plots
- Display of background maps
- Import of trials from Excel, PIAF and Schlingmann software
- Data exchange via CSV-interface
- Export to other mobile devices, e.g. survey systems



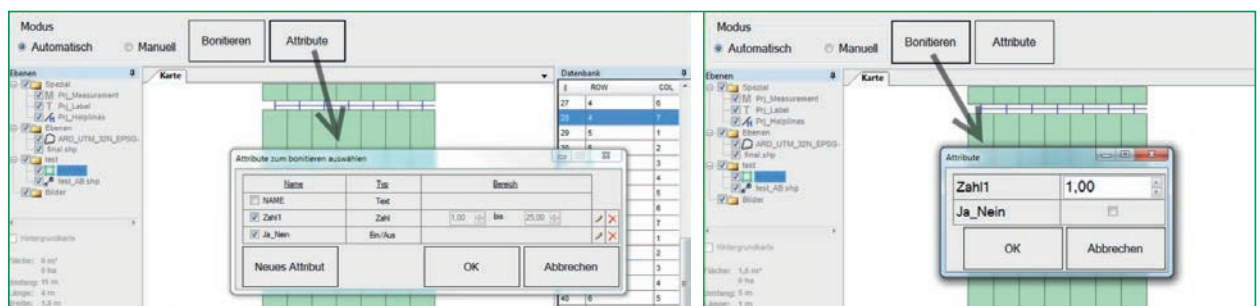
Mapping Module

- Recording of points, lines and polygons
- Multiple recording possible (simultaneous recording of several points, lines and polygons)
- Easy data exchange within MiniGIS software
- Navigation to points or plots
- Interval recording
- Automatic and manual recording
- Survey system with known MiniGIS user interface
- Locating of coordinates, e.g. landmarks



Scoring Module

- Semi-automatic recording of scoring values
- Automatic, faultless assignment of scoring values to plots
- No marking of trials needed anymore, as an high-precise RTK-GNSS connection simplifies the detection of plots
- Free definable attributes

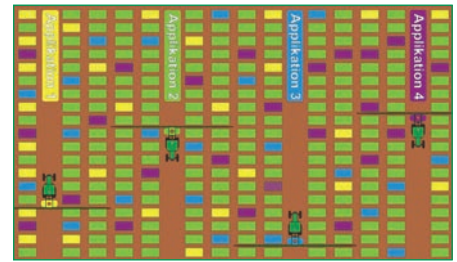


MiniGIS Modules

VRC Add-On

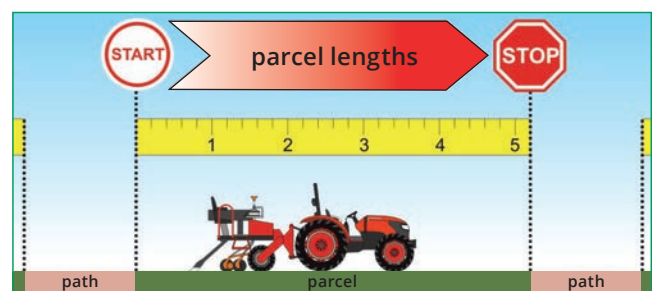
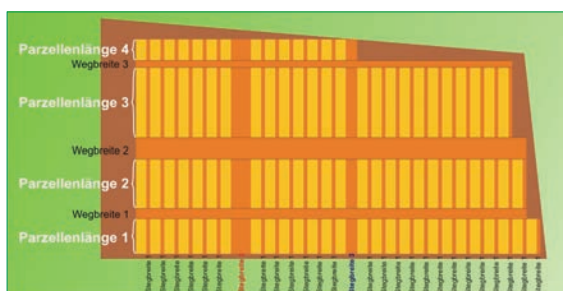
Crop protection trials

- Creation of application maps for crop protection trials (subdivision in productive and unproductive plots)
- Semi-automatic selection of plots (faultless assignment)
- Effective and faultless working



Application maps for varying plot lengths

- Parcel lengths planned in MiniGIS are transferred to an application map
- Equipped with an appropriately prepared seeder
- Automatic change of plot length without manual adjustments of the seeder



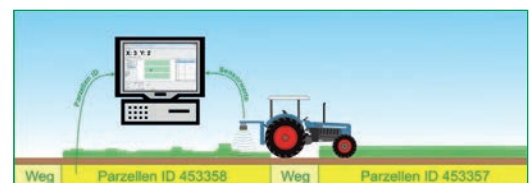
Multilogging Tools

Easy

- Automatic logging of sensor values
- CAN interface
- Serial interface
- Digital output

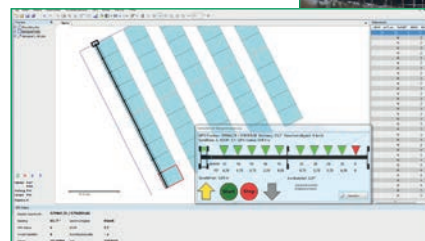
Advanced

- Automatic logging of sensor values
- CAN interface
- Serial interface
- Digital input
- Automatic assignment of scoring values to the plot



Irrigation Add-On

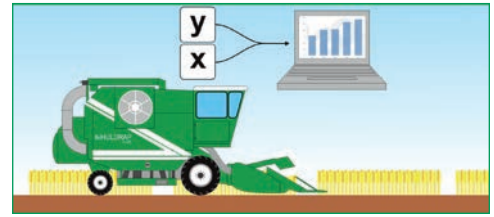
- Planning of irrigation trials for linear irrigators
- Definition of irrigation amounts individually for each plot
- Automatic autonomous application



MiniGIS Modules

Harvest Add-On

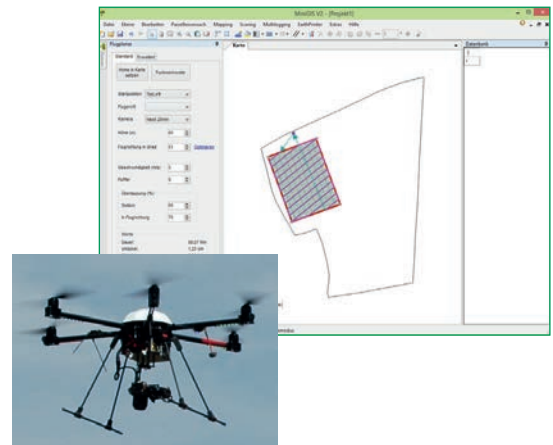
- Output of parcel coordinates to yield mapping software Schlingmann and Haldrup Harvest Manager
- Faultless assignment of yield data to specific parcel by high-precise RTK-GNSS-system
- No harvesting plan needed
- Harvesting of plots in any order



MiniGIS Flight planner

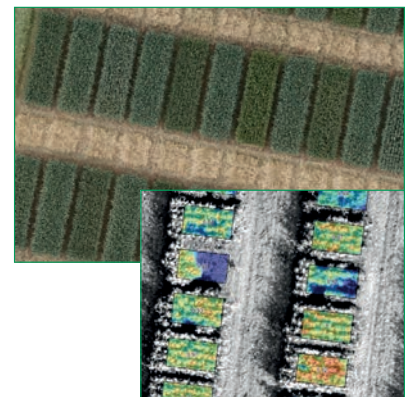
Flight planning

- Flight planning in the office based on MiniGIS trials
- Specification of flight parameters like overlap, flight height and speed
- Automatic splitting of missions in several flight plans
- Automatic transfer of the created flight plan to Pixhawk flight controller
- Automatic flight



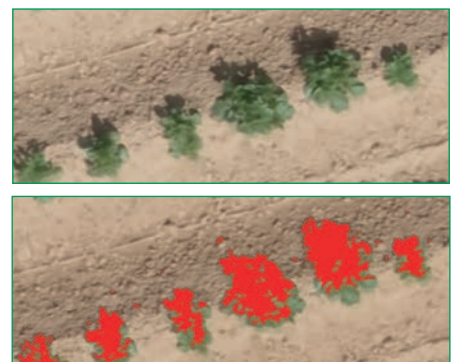
MiniGIS Advanced Scoring

- Import of digital elevation models and georeferenced multispectral & RGB orthophotos
- Automatic creation and assignment of scoring parameters per parcel
- Export of statistic analysis as database file (*.dbf) or comma separated values (*.csv)
- Colourising of scoring parameters per plot to identify trial errors
- Calculation of plant height and several vegetation indices per plot
- Use of predefined or proprietary vegetation indices with the formula editor
- Creation of ground-level digital elevation models



Counting Add-On

- Automatic counting of plants
- Manually count single objects in digital orthophotos
- Automatic parcel-specific evaluation after calibration
- Applicable to several scoring features (e.g. number of plants, soil coverage, number of flowers, ...)
- Specific analysis of masked areas or measurement spots within parcels



Technical Data

System Requirements for MiniGIS

- Windows Vista, Windows 7, Windows 8 or Windows 10
- 300 MB hard disc storage
- 2 GB RAM or more (recommended)
- Supported formats: *.shp (ESRI Shape) and *.kml (Google Earth), *.TIFF, ENVI
- Coordinate systems: lat/long (WGS84), UTM and Gauss-Krueger (Zone 2-5)

Hardware for MiniGIS

Topcon automatic steering	Topcon X-Display	KALEO DT301
Accuracy until 2.5 cm	Display of parcel trials	Multi-functional Tablet-PC with integrated Trimble RTK-receiver
Supports all accuracy levels from EGNOS to RTK	Automatic seed change on seeders	gradient adjustment compensated slope position error
Very slow minimum speed of 70 m/h	Fast and easy usability – latest processor technology	Sunlight qualified, capacitive touchscreen
gradient adjustment compensated slope position error	Clear ISOBUS integration	Integrated three-frequency GNSS module
Highest performance in all visibility circumstances	Control of field sprayers based on MiniGIS field plans up to single nozzle shutdown	Lightweight helix antenna directly on the tablet PC for exact positioning, connection of an external antenna possible
Pre-planned trials can be machined immediately with the steering system without previous marking.	Upgradable to assisted steering system or automatic steering system	Suitable for GNSS based scoring in parcel trials
	Upgradable with section control/ variable rate control	Extremely lightweight (IP65)
		Weight: 1.16 kg
		Ideal hardware for mobile MiniGIS applications

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