The System
Modules and Extensions
card_1 has been a market leader since 1985. It’s an innovative, comprehensive CAD software application for surveying and civil engineers focusing particularly on road, rail and sewer planning plus cost calculation and GIS. The interaction between these modules guarantees its BIM-oriented, methodical approach. Modules which particularly support the BIM planning process are marked with BIM.

It can be used to plan any road- and rail-based transport infrastructure, to complete any surveying task, including those involving point clouds, to plan the drainage of complex projects and subsequently visualize them. German planning regulations, norms and guidelines are an integral part of the software.

As a member of the FGSV (Road and Transportation Research Association), IB&T is involved in developing a common framework for data processing. We are also contributing to building-SMART e.V.’s objectives. We are also an initiator of the BIM-Traffic Routes specialist group.

Our software and a wide range of services are available worldwide through our local and international branch offices and sales partners. Group headquarters are located in Norderstedt, just north of Hamburg. In conjunction with our offices in Berlin, Düsseldorf, Stuttgart and Aalen, and our regional sales partners, we provide regular program updates, reliable customer support, comprehensive training and project consultation.

Our partners in China, Eastern Europe and South America are all valuable members of our international business. A total of 75 staff members and partners are continuously striving to extend and enhance the system to bring only the best to you.

www.card-1.com
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System
Project Management, File Management, Editor and System Services.

CardScript
Develop and execute scripts with the integrated card_1 programming language CardScript. Automate processes. Easy data handling: generating, altering, evaluating and analyzing project data. Results exported in files, graphics and reports. Data exchange via CSV, XML, Excel and SQL. Documentation and example scripts come with the software.

Drawing Editing
Create, edit and compile drawings then output using commonly available plotters or printers. This function is required by modules which generate drawings such as the Base Map, Alignment Drawing, Cross-section Drawing, Profile Drawing, Switch Elevation Plan, Route Plan or Base Map Drawing Sewer.

Hybrid Drawing Editing
Import, process and display raster data in drawings, hybrid drawing output. Requires the Drawing Editing module.

Image Documentation
Photo documentation for projects. Import and manage images. Automatically transform and position photos with coordinates. Display and edit the images in the base map view. Output as drawings, exported via DWG.

3D Project View
Spatial display of all available project data (existing conditions and design). The 3D Project View aids users when analyzing spatial relationships and helps to identify possible planning weaknesses or errors early. Export freeze frame images for documentation. The 3D Project View is also an excellent way to present planning results clearly.

Virtual Reality
Displaying 3D project data in virtual space. Move freely within the 3D project. Simulate routes and assess sight distances in virtual space, requires the Route Simulation module. Detect conflicts/glitches more easily. Real simulation. Clear presentations and visualisation. Requires the 3D Project View module.

Modelling Existing Conditions
Generating 3D objects of the existing conditions incl. user defined or code based attribute assignment.
Point Management
Manage, import and export points.

Graphic Fieldbook
Control and import of measurement data from total stations and GNSS, evaluate measurements and log object information, set out data. Suitable for fieldwork, easy to use. Requires the Point Management module.

Tacheometer Data Transfer
Data exchange between total stations (Leica, Trimble, Topcon etc.) and card_1, data pre-processing for Surveying.

Surveying
COGO (calculate coordinates), evaluate measurement data either dialog-based or in batch mode, transformations (Helmert), setting out calculations. Requires the Point Management module.

Transformation
Transform coordinates for project data. Supports various transformations such as Federal state solutions for GK/ETRS89, NTv2-transformations, control point-based methods and setting transformation parameters etc. Optional transformation „on the fly“ when importing and exporting project data such as ALKIS-imports.

Levelling
Manage and calculate engineering and precise levels, cross-section measurements and import precise level data from electronic surveyor’s levels.

Network Adjustment
Combined horizontal and vertical adjustment with statistical analysis. Requires the Surveying module. Adjust levelling networks. Requires the Levelling module.

Point Cloud Management
Import point clouds (laser scanner data etc.). Colour display in the base map, longitudinal profile and cross-section, 3D project view. Create drawings and output to commonly available plotters or printers. Requires the Hybrid Drawing Editing module.

Point Cloud Evaluation
Generate terrain models, contour lines and cross-sections as well as point/line elevations from point clouds (laser scanner data). Requires the Point Cloud Management module.

ALKIS Import
Import and revise the official geobasis data: land survey register and real estate register (ALKIS®), topographic data (ATKIS®) and fixed points (AFIS®) according to the AdV’s AAA model. Preview on-screen. Updates with revised data.

Base Map
Design, edit and manage points, lines, texts, symbols and other data graphically in the base map. Automatically generate slope hachures, area calculations and base map drawings. Requires the Point Management module.

Base Map Generator
Automatically generate topographic data (e.g. lines) from survey points. Requires the Base Map module.

Base Map from Cross-Sections
Create points, lines and slopes from cross-sections in the base map view.

Raster Image Display
Display card_1 raster images in the base map and on terrain models in the 3D project view.

Raster Image Editing
Import and process raster data e.g. scanned-in maps (TIFF, JPG, BMP, PNG, PDF) or WMS maps. Requires the Raster Image Display module.

Raster Image Digitizing
Digitize points, areas and distances on-screen based on raster data. Requires the Raster Image Display module.

Digitizing
Digitize points, areas and distances.
Digital Terrain Model
Digital terrain models with triangulation, graphic editing, automatic TIN generation, cross-sections, longitudinal profiles, contour lines and drawing output.

DTM Volumes
Volumes on a datum, prismoidal volume calculation (according to German guidelines REB 22.013), water volumes, fill tables. Requires the DTM module.

DTM Intersection
Calculate cut and fill volumes between two terrain models and ascertain base areas and surfaces plus intersection polygons. (GAEB VB 22.114). Requires the Digital Terrain Model and DTM Volumes modules.

SoundPLAN Export
Export existing conditions data and design data to the SoundPLAN program.

OpenStreetMap Import
Import data in the OpenStreetMap-format as card_1 topographic data.

GEOgraf Import
Import data in the GEOgraf format as base map data.

Road Cadastre
Manage classified road networks. Log and evaluate road structures, road furniture and road conditions. Evaluations presented in lists or diagrams.

Real Estate Management
Manage land with leasehold and rental contracts. Attributes used to evaluate and register land. Evaluations presented in lists or diagrams.

Rail Cadastre
Log, document and manage railway facilities.

GIS Export
Export card_1 topographic data in the Shape format (ESRI).

GIS Import
Import GIS data in the Shape format (ESRI) and via Web Feature Service (WFS) as card_1 topographic data incl. comments as sub-attributes. Evaluation of sub-attributes.

CityGML Import
Import 3D-building data (3D-city models). Visualize in card_1 in e.g. the 3D-project view. Transformation into project coordinates-system ‘on the fly’ (requires the Transformation module).

Alignment Management
Manage alignments, import and export alignment master points (KA040 and REB DA50 formats).

Alignment Design
Design road alignments, intersections, and roundabouts on-screen, run constraining point analyses. Requires the Alignment Management and Alignment Evaluation modules.

Alignment Evaluation
Evaluate and analyze alignments individually and in batch mode. Alignment setting-out. Requires the Alignment Management module.

Automatic Alignment
Calculate basic elements and alignments from sorted point sets. Requires the Alignment Management, Alignment Evaluation and Alignment Design modules.

Swept Turning Path
Various methods to calculate swept turning paths. Vehicle library in accordance with the FGSV (German Road and Transportation Research Association). Visualize swept turning paths with lane markings and vehicles. Simulate manoeuvres. Visual, interactive individual analyses. Create swept turning path drawings. Requires the Alignment Management module.

Vertical Alignment Design
Design vertical alignments on-screen with constraining point analyses, evaluate in lists or individually.

Vertical Alignment Transformation
Transform vertical alignments onto parallel alignments, calculate dependent vertical alignments.

Cross-fall Generator
Generate an optimized and true-to-terrain cross-fall automatically. The cross-fall generator takes alignments, vertical alignments, speed strings and various other parameters into account. The cross-falls are calculated according to the current applicable guidelines.

Cross-Section Editing
Manage and design cross-sections on-screen. Import and export cross-sections.

Cross-Section Design
Design cross-sections and surface elevation lists automatically. Requires the Cross-Section Editing module.

Cross-Section Transformation
Transform cross-sections from one alignment onto another alignment.
Volumes from Cross-Sections
Calculate volumes from cross-sections (according to German guidelines REB-VB 21.003 and 21.013). Requires the Cross-Section Editing module.

Cross-Sections from Points
Calculate cross-sections and longitudinal profiles from points taken, for example, from tacheometric surveys.

Cross-Sections from Lines
Calculate cross-sections and longitudinal profiles from lines of the base map system.

Sight Distances\textsuperscript{BIM}
Assess existing sight distances, run vertical alignment-based 2D and spatial 3D analyses based on RAL, HViST and other methods. Requires the Vertical Alignment Design and Cross-Section Design modules.

Surface Optimization
Generate an optimized and true-to-terrain vertical alignment automatically for 'overlay' road resurfacing. Requires the Vertical Alignment Design module.

Alignment Drawing
Create complete alignment drawings with flexible annotation, carriageway edges and gradient changes.

Profile Drawing
Create profile drawings with vertical alignments, ground profiles, flexible annotation, curvature, cant gradient, sight distance and other strings.

Cross-Section Drawing
Create cross-section drawings with individual sheet positioning, flexible annotation and user-defined layouts.

Route Simulation\textsuperscript{BIM}
Animated test-drive of roads and railway tracks plus fly-overs in the 3D project model. To test project data visually or for presentations. Requires the 3D Project View module. Visualize the sight distances according to RAL, HViST and others. Requires the Sight Distances module.

Bridge Generator\textsuperscript{BIM}
Generate bridges as structures as part of the route development. BIM-standard structure of the assemblies. Use for drawings, sight distance calculation, structure catalog and BIM export. Standard bridge schematics included.

OKSTRA Export Design\textsuperscript{BIM}

OKSTRA Import Design\textsuperscript{BIM}

VESTRA Import Routeing Data
Import route data in the VESTRA format (S40) as card_1 alignments incl. description. Requires the Alignment Management module.

Point Management
Coordinates with higher accuracy. Requires the Point Management module.

Surveying
Additional features to output all results and lists with increased accuracy. Requires the Surveying module.

Transformation (DB_REF)
Additional features to directly support the GNTRANS transformation solution in order to transform project data between the Gauß-Krüger system or ETRS89 and the DB_REF system. Requires the Transformation module.

Alignment Design
Additional features to design track alignments on-screen with rail-specific transition curves, switches, cants and switch elevation calculations. Requires the Alignment Design module.

Vehicle Dynamics Check
Check track route according to the German Federal Railways regulation No. 800.0110. Test track geometry for any speed profile with many test runs possible for each track geometry. Results can be printed out and easily read and include all relevant vehicle dynamics data.

Vertical Alignment Design
Additional features to design vertical alignments on-screen with rail-specific curvature and cant strings. Requires the Vertical Alignment Design module.

Vertical Alignment Builder
Generate optimized and true-to-terrain vertical alignments for railway design. Requires the Vertical Alignment Design (Rail) module.
Cross-Section Design
Additional features to design rail-specific cross-sections. Requires the Cross-section Design module.

GEOPAC-Clearance Envelope for card_1
Calculate clearance envelopes for LRVs. The 3D clearance envelope is created as a card_1 structure and used for clearance space analyses. A comprehensive vehicle library with an integrated vehicle editor comes with the software. Requires the Alignment Management module.

Point Management (German Federal Railways)
Map sheet based management of master points of German Federal Railways' routes. Generate German Federal Railways map sheets and key directories. Assign the points numbers and attributes according to the German Federal Railways guidelines.

Alignment Drawing
Additional features to draw and annotate track alignments and switches according to the German Federal Railways guidelines. Requires the Alignment Design module.

Profile Drawing
Additional features to draw and annotate rail-specific longitudinal profiles with curvature and cant strings. Requires the Profile Drawing module.

Cross-Section Design
Additional features to design rail-specific cross-sections. Requires the Cross-section Design module.

Route Design
Create route plans (track marking plans) for single and double track lines.

Switch Elevation Plan
Create switch elevation plans.

ACSIIBAHN Import/Export
Import and export alignments, switches, cants, cross-falls and vertical alignments.

LandXML Export Rail
Export route data in the 7-line model in order to upload to a tacheometer and set out track routes.

SDF Import/Export
Import and export data in the German Federal Railways' SDF format.

AKVS/eIK Cost Calculation
Calculate costs according to AKVS based on the cost calculation catalogue (KBK) for route design, structure design and telematics design. Fees calculated according to the current German HOAI guidelines. Output in AKVS forms. Export according to KOSTRA. Quantities imported from card_1.

Costs OKSTRA/GAEB
Interface to import cost calculations in the OKSTRA and GAEB formats. Requires the Costs AKVS module.

Land Acquisition Logging
Log and manage land acquisition data. Output land acquisition directories in compliance with the German RE guidelines. The export interface complies with the German OKSTRA guidelines. Requires the Base Map module.

Land Acquisition Intersection
Process land acquisition data easily and calculate sub areas automatically. Produce sketch maps. Requires the Land Acquisition Logging module.

Land Survey Register Preparation
Importing land survey data in various formats, e.g. ALKIS or OKSTRA, into the card_1 land acquisition database. Preparation of cadastre borders and names e.g. of boundary lines. Requires the Land Acquisition Logging module.

Sewer Data Import/Export

Sewer Network Hydraulics – Time Coefficient Method
Calculate and size sewer networks according to the time coefficient method for a maximum of 250 reaches, incl. ISYBAU output.

Sewer Network Hydraulics – Hydrological
Calculate and size sewer networks according to a hydrological calculation model for 1000, 2000 or 3000 reaches. Requires the Sewer Network Hydraulics – Time Coefficient Method module.

Sewer Network Hydraulics – Hydrodynamic
Hydrodynamic verification calculations of sewer networks for a maximum of 1000, 2000 or 3000 reaches incl. flood verification calculations while taking various special structures into account.
Profile Drawing
Create sewer profile drawings in conjunction with a road's longitudinal profile. Requires the Profile Drawing module.

Base Map Drawing Sewer
Create sewer base map drawings with flexible annotation and individual signatures.

Sewer Data Logging
Log sewer networks for urban wastewater management as a separation or combined system from a measurement or digitised data. Design, exchange data (ISYBAU), manage master data incl. connections to housing, gullies or special structures.

Sewer Design
Design sewer networks for urban wastewater management as a separation or combined system. Design (in the base map and longitudinal profile), calculate (time coefficient, stationary, transient) calculate excavations, draw longitudinal profiles, sketch manholes, exchange data (ISYBAU), manage master data incl. connections to housing, gullies or special structures.

Cross-Section Editor
Define additional, non-standardized cross-sections and special cross-sections to calculate drainage systems. Requires the Sewer Design module.

Special Structures Sewer
Special structures adds to what the Sewer Design module can do in terms of designing, editing, managing and calculating the special sewer structures of local drainage systems. Requires the Sewer Design module.

Sewer Cadastre
Set up (ISYBAU data exchange), manage (master data, existing conditions data, property holdings optional), calculate (evaluation of existing conditions, sewer rehabilitation optional), document (base map, profile drawings, damage report, manhole condition), analyze and evaluate sewer networks.

Sewer Cadastre Viewer
View and evaluate projects in the Sewer Cadastre module.

Sewer Rehabilitation
Create, calculate, manage and document rehabilitation measures for local wastewater management. Compare costs according to the LAWA guidelines. Requires the Sewer Cadastre or Sewer Cadastre Viewer module.

Sewer Network Valuation
Determine the value of a selected area of an existing sewer network. Current replacement values, construction costs and depreciation data can be calculated for manholes and reaches with the help of a volume estimation method based on the principles of the DWA-A133. Requires the Sewer Cadastre module.

Hystem-Extran Import/Export
Two-way interface to the Hystem-Extran calculation program of ITWH Hanover. Requires the Sewer Cadastre or Sewer Design module.

FLUT Import/Export
Two-way interface to the FLUT calculation program of Pecher Software GmbH. Requires the Sewer Cadastre or Sewer Design module.

Drinking Water Supply Logging
Log drinking water supply networks from surveying data. Design, exchange data, manage network data incl. pumps, reservoirs, connections to housing or installations.

Drinking Water Supply Design
Design, calculate and document drinking water supply networks right down to each node's details.

Drinking Water Supply Cadastre
Set up, manage, calculate, document, analyze and evaluate drinking water supply networks.

Drinking Water Supply Cadastre Viewer
View and evaluate projects in the Drinking Water Supply Cadastre module.

STANET Import/Export
Two-way interface to the STANET pipeline network calculation program of Ingenieurbüro Fischer-Uhlig. Requires the Drinking Water Supply Design or Drinking Water Supply Cadastre module.

Watercourses
Design, edit, run hydraulic calculations (HEC-RAS) and evaluate watercourses (open channels). Requires the DTM module.
eView S
Presentation module – basis

eView M
Present, document, duplicate and archive project information with electronic View-In technology. Requires the eView S module.

eView L
Ready to use standard solution to document planning projects with user-definable standards. Requires the eView M module.

eView Key
User management for eView.

card_1 DESITE SHARE
Interactive visualization and exchange of models for BIM-communication (integration into card_1 via CPIXML format). IFC file viewer.

DESITE MD
Interactive visualization, model analysis, 4D-simulation, documentation and notes, model extension and application programming (integration into card_1 via CPIXML format).

DESITE MD PRO
Interactive visualization, model analysis, 4D-simulation, documentation and notes, model extension and application programming, coordination of building sub-sections/checks on collisions, model checks/quality management, link to central database (integration into card_1 via CPIXML format).

Traffic Sign Catalogue
Traffic sign Catalogue with official traffic signs according to the German Highway Code StVO.

Street Furniture Catalogue
Street furniture catalogue; contains a wide range of drawing objects to enhance base maps and profile drawings, standard and road cross-sections as well as other drawings.

Catalogue for Road and Traffic
All traffic signs of the German Traffic Regulations in photo-realistic 3D images as card_1 Catalogue/Rules Framework. Traffic Lights, Danger Signs, General Traffic Signs, Road Furniture, Traffic Regulations Signs, Additional Signs. Selection of design models as a 3D-Model such as people or groups of people, Cars, Trucks, Buses. Visualizing in the 3D Project View, Route Simulation.

CPIXML Import/Export
Generates BIM-route structures from cross-sections and 3D surfaces from DTMs; import/export project data incl. structures (volumes) and quantity positions from REB-methods in the CPIXML format (data exchange RIB iTWO, ceapoint DESITE etc.). Model visualization and exchange via card_1 DESITE SHARE.

DA 001 Import/Export
Import and export points and lines in the DA 001 data format.

DGN Export
Export card_1 drawings in the DGN format (MicroStation).

DGN Import
Import data in the DGN format as drawings or base map data.

DXF Export
Export card_1 drawings in the DXF format (AutoCAD, BricsCAD).

DXF Import
Import data in the DXF format (AutoCAD, BricsCAD) as drawings or base map data.

DWG Export
Export card_1 drawings in the DWG (AutoCAD, BricsCAD), DWF or PDF formats. Requires the DXF Export module.

DWG Import
Import data in the DWG format (AutoCAD, BricsCAD) as drawings or base map data. Requires the DXF Import module.

HPGL Import
Import data in the HPGL format as drawings.

IFC Import/Export
Import/export IFC-Objects to exchange project data in BIM-projects (data exchange with Autodesk Revit, RIB iTWO, G&W California, Nemetschek Allplan, ceapoint DESITE, Siemens NX etc.).

LandXML Import/Export
Import and export terrain models, alignments, vertical alignments and cross-sections in the LandXML format.
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