card_1

The System Modules and Extensions



IB&T Software GmbH

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 Potsdam, Düsseldorf, Stuttgart and Munich, and our regional sales partners, we provide regular program updates, reliable customer support, comprehensive training and project consultation.

Our partners in China and Eastern Europe 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^{BIM}

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^{BIM}

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^{BIM}

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 simulaton. Clear presentations and visualisation. Requires the 3D Project View module.

Modelling Existing Conditions^{BIM}

Generating 3D objects of the existing conditions incl. user defined or code based attribute assignment.

Issue Management

Creating and managing reports (issues) in card_1 projects. Import/export via BCF and synchronization of issues as part of BIM collaboration. Visualisation of viewpoints in the base map view and in the 3D project view. Recording and managing report status, user, priority, due date, description and comments for issues.

Visualisation

Photorealistic representation of traffic signs, street furniture and vegetation as a 3D model in a card_1 catalog/rules framework. Import function to incorporate your own 3D symbols. The 3D symbols are also used by the new design systems to visualise technical objects. For visualisation in the 3D Project View, Route Simulation and Virtual Reality. Requires the 3D Project View module.

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 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.

Transformations

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^{BIM}

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^{BIM}

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.

ALKIS Export Structures (NAS)

Preparation of building measurements. Attribution of building points, lines and special building lines. Generation of texts. Export in the NAS format according to MiA-GÜVO guidelines. Requires the Base Map module.

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.

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^{BIM} Import data in the OpenStreetMap-format as card_1 topographic data.

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

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^{BIM}

Import 3D-building data (3D-city models). Visualize in card_1 in e.g. the 3D-project view. Transformation into project coordinatessystem ,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 crossfalls 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/3D Route Structures^{BIM}

Automatic development of cross-sections, surface elevation list. Basic system of smart infra-modelling technology for parameterised, rule-compliant and technical development of 3D route structures for roads, motorways, footpaths and cycle paths; generation of roadways without junctions and intersections; simple design of roadsides. Requires the Cross-Section Editing module.

3D Design Elements^{BIM}

Interactive, parameterised and technical design of roadsides, squares, driveways and traffic areas; equipment with 3D symbols, railings, trees and general as well as individual equipment from catalog cross-sections.

3D Road Design^{BIM}

Parameterised, rule-compliant and technical 3D design of roads including their various intersections; consideration of secondary conditions such as water protection areas; automated markings and signage. Requires the Cross-Section Design/3D Route Structures module. The 3D Design Elements module is also recommended.

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). Generates BIM-route structures from cross-sections and 3D surfaces from DTMs. 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^{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.

Regulations Catalogue

Creation, output and management of regulation catalogues (RV) according to the German guidelines RE 2012, including automatic number updates in forms and drawings as well as drawing generation and adaptation.

Route SimulationBIM

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^{BIM}

Generate bridges as structures as part of the route development. BIMstandard structure of the assemblies. Use for drawings, sight distance calculation, structure catalog and BIM export. Standard bridge schematics included.

OKSTRA Export Design^{BIM}

Export card_1 data (schematics: 008 – design, 018 – geometry, 021 – general. Geometry objects incl. point clouds, 022 – land acquisition (requires Land Acquisiton Logging module), 024 – Cadastre, 030 – topography) in the OKSTRA format.

OKSTRA Import DesignBIM

Import data (schematics: 008 – design, 018 – geometry, 021 – general.Geometry objects incl. point clouds, 030 – topography) in the OKSTRA format.

VESTRA Import Route Dat

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

Point Management (Rail)

Coordinates with higher accuracy. Requires the Point Management module.

Surveying (Rail)

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

Transformations (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 (Rail)

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 (Rail)

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 (Rail)

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

Vertical Alignment Builder (Rail)

Generate optimized and true-to-terrain vertical alignments for railway design. Requires the Vertical Alignment Design (Rail) module.

Cross-Section Design (Rail)

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

GEOPAC-Clearance Envelope for card_1BIM

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.

Rail StructuresBIM

Generation of 3D objects for rail structures including 3D switches. BIM-compliant attribution. Requires the modules: Alignment Management, Cross-section Editing, Vertical Alignment Design and Vertical Alignment Design - Rail.

Platform Generator^{BIM}

Calculate the platform edge. Create the 3D objects for the platform. BIM-compatible attribution. Export for Autodesk© Revit. Calculate the setting-out points. Requires the Cross-section Editing module.

Point Management (DB AG)

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 Plan

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

Switch Elevation Plan Create switch elevation plans.

ASCIBAHN Import/Export

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

AKVS/elKe 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

Import and output cost calculations in the OKSTRA, GAEB, CSV formats. Requires the Costs AKVS/elKe module.

Cost Calculation Civil Engineering Pro

Create and manage individual catalogues based on the KBK system catalogues. Enter free items in the "number 9 range", up to 99 items per hierarchy level. Calculation of quantities ("smart calculation" feature). Precise output in euros. Requires the AKVS/elKe Cost Calculation 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.

WATER MANAGEMEN

Sewer Data Import/Export

Import sewer data ISYBAU K-type (1996) and K/EY-type (2001). Import and export sewer data in the ISYBAU format XML (2006/2013).

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.

4D Sewer Level Simulation

Visualize the time-based simulation of the sewer flow; qualitative as well as quantitative evaluation and representation of the water level of a dynamic sewer network calculation with comparison of variants. Requires the 3D Project View module.

Profile Drawing (Sewer)

Create sewer profile drawings in conjunction with a road's longitudinal profile. Requires the Profile Drawing module.

Sewer Base Map Drawing

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 Sewer

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.

Designing Conduits

Log conduit networks from surveying data. Design, exchange data, manage network data incl. pumps, reservoirs, connections to housing or installations.

Designing Conduits

Design, calculate and document water supply conduit networks right down to each node's details. Requires the Logging Conduits module.

Conduit Cadastre

Set up, manage, calculate, document, analyze and evaluate conduit networks.

Conduit Cadastre Viewer

View and evaluate projects in the Conduit Cadastre module.

STANET Import/Export

Two-way interface to the STANET pipeline network calculation program of Ingenieurbüro Fischer-Uhrig. 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^{BIM}

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

card_1 DESITE share pro^{BIM}

This module is an extension of the freeware card_1 DESITE share, allowing several modules to be combined.

DESITE md^{BIM}

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

DESITE md pro^{BIM}

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).

DESITE custom^{BIM}

Simplified variation of DESITE. The project structure and the selection quantities are available. The 4D simulation can be run and the ,forms' module is included.

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.

CPIXML Import/Export^{BIM}

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. Model visualization and exchange via card_1 DESITE share.

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.

IFC Import/Export^{BIM}

Generating BIM route structures from cross-sections and 3D surfaces from DTMs; Importing/exporting IFC objects to exchange 3D project data incl. engineering structures (spatial structures) and quantity records from REB methods in BIM projects. The basis is IFC version 4.0 or 4.1. Model visualization and transfer via card_1 DESITE share.

LandXML Import/Export^{BIM}

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

Bluebeam Basics

For simple markups, measurements and document management.

Bluebeam Core

For professional-grade markups, measurements, collaboration and project management.

Bluebeam Complete

For advanced markups, measurements and automation to accelerate and optimise your projects.

BricsCAD[®] Lite und BricsCAD[®] Pro

BricsCAD* has developed into a high-performance CAD platform worldwide and is a cost-effective alternative to AutoCAD* or AutoCAD* LT in terms of scope of features, usability/user interface and compatibility. Anyone who can use AutoCAD* will quickly and easily find their way around BricsCAD*. BricsCAD* is based on the DWG format and can read and write this from version 2.5 to the current version. Exchanging data with other CAD systems is quick and easy with absolutely no data loss.

Spatial Manager[™] Pro for BricsCAD[®]

Spatial Manager[™] for BricsCAD[®] is a powerful BricsCAD plug-in for BricsCAD users who need to import, export, transform and manage geospatial data in an easy, fast and cost-effective manner. This includes many features not previously available in BricsCAD. It comes in a compact app that runs on BricsCAD and allows the user to import and export geospatial data between BricsCAD drawings and geospatial files, data servers or data stores, view background maps, manage alphanumeric data and data tables, create terrain models and contours, search for locations, convert coordinate systems and many other geographic features.

Geo++° GNTRANS

Module for transforming coordinates. It allows unambiguous, homogeneous, continuous and adjacency-preserving transformations between ETRF89, DB_REF and state systems. Module requirement to use with card_1 Transformations and Transformations (DB_REF).

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RZI Software Graphic Fieldbook SURVEYING ROAD Planning Sewer Planning Clearance Envelope Point Clouds GEOPAC Railway Planning Revu Card_1 SOCTOR BIM Limage Documentation

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