KISSsoft
Calculation programs for machine design

KISSsoft Release 03/2014

Module List

NEW

Highlights

- Strength calculation and 3D models of beveloid gears
- Simulation of flank wear based on iterative calculation
- COM-Interface
- 3D display of shafts and bearings
- Efficiency and thermal rating in KISSsys

and many more

KISSsoft AG
Rosengartenstrasse 4
8608 Bubikon
Switzerland

Tel: +41 55 254 20 50
Fax: +41 55 254 20 51
info@KISSsoft.AG
www.KISSsoft.AG

SHARING KNOWLEDGE

Offer

The software KISSsoft has a modular structure: a variety of calculation modules are available. You can limit the amount of modules to suit your requirements.

Get to know

Our free 30 days test version enables you to evaluate and select the modules independently before purchasing a license.

Contents

Basic Packages

Basic Packages

Modules	Description
ZPK	Cylindrical gear package Geometry, control measures (DIN 3960, SIN 3962, DIN 3963, DIN 58400) Tolerance values according to updated ISO 2328-1:2013 **NEW** Calculation and presentation 2D and 3D of the tooth form for external and internal toothing with tooth flank modification Graphical display of specific sliding One strength calculation, either according to DIN 3990 or ISO 6336 or AGMA 2001 or VDI 2545 or VDI 2736 Tooth friction / power loss acc. to Niemann Extended range for possible profile shift Deep tooth form / short cut tooth form, Cutter/Tool Flash temperature course Scuffing according to DIN3990 and ISO TR 13989 Micropitting according to ISO TR 15144:2010 (Method B) Arc of a circle or spline approximation for 2D output (requires CA1) Manufacturing drawing Rights: Z01, Z02 (or Z02a or Z13 or Z14 or Z14a), Z05, Z05l, Z5i, Z19e, Z19m
WPK	Shafts and bearing standard package Calculation of deformations also for statically overdetermined systems / multiple supports, and line loads, Input of linear stiffness 3D graphics for forces and bending line **NEW** Pressure angle and transverse shear Roller bearing service life (ISO281, L10) Bearing power losses One strength calculation (static and endurance): either according to DIN 743 or FKM or according to Hänchen & Decker Smith and Haigh diagram Rights: W01, W01c, W03, W03a, W05, W06a (or W06b or W06c), K07b
MPK	Shaft-hub-connections Cylindrical interference fit Conical interference fit Keys and Woodruff key Multi-Spline, Polygonal connection Involute splined shaft (DIN5480, ANSIB92, ISO4156, DIN5482) Flank form “straight line” (DIN5481) Bolts and pins, welded , glued and soldered joints Clamped connections according to Roloff/Matek, Snaprings Rights: M01a, M01x, M01b, M1c, M02a, M02e, M02b, M02d, M02c, Z09, M03a, M08, M09, Z5n, M05
SPK	Bolt calculation according to VDI2230 Single bolt with axial and shearing force Cylindrical flange General connections with user-defined screw configurations (sheet 2) Input of results from FEM calculation (sheet 2) Considers high and low temperatures, temperature differences Rights: M04, M04a, M04b

FPK	Springs Tension springs, compression springs, disc springs, leg springs, torsion springs Rights: F01, F02, F03, F04, F05
APK	Automotive Synchronization according to Borg/Warner allows for the calculation of either time or force for gear shifting Friction Clutches Rights: A10, A20
RPK	V-belts, toothed belts, chain drives Strength and dimensioning, roller diameter, distance between axes, number of belts, with or without tensioning pulley Rights: Z90, Z91, Z92
LPK	Stress analysis with local stresses according to FKM Guideline 2012, 6th Edition Consideration of support effect, for fatigue and static load For calculation of safety factor and service life on basis of an external FEM calculation Rights: K12
VPK	Linear drive train and Spindles according to Roloff/Matek Calculation of safeties against buckling, flank pressure and more, for the operation modes tightening and loosening Rights: K15
TPK	Tolerance analysis Maximum- minimum dimension analysis, statistic analysis, tolerances: ISO / own input Rights: K10
	Hardness conversion Hardness conversion according to DIN EN ISO 18265 from and to HB, HRC, HV, Rm, etc. Rights: K09
HPK	Hertzian pressure Calculation of hertzian pressure for rolls, balls and planes Rights: K14

Basic Package Gearbox

Modules	Description
KPK-G	ZPK, WPK, MPK, TPK, HPK, Hardness conversion

Basic Packages Complete

Modules	Description
KPK	ZPK, WPK, MPK, SPK, FPK, RPK, LPK, TPK, HPK, VPK, APK Hardness conversion

System modules

KISSsys

Modules	Description
SYS	KISSsys Software extension for the calculation of complete systems with power transmission calculation, administration of variants and integrated programming language, import of CAD data, collision check Assistant for parallel shafts and planetary stages Includes GPK Requires corresponding KISSsoft modules (minimum WPK, ZPK) Rights: K11, K11a, K11c

Extended Development Environment for KISSsys

Modules	Description
KSE	Interface to Eclipse, Development Environment for KISSsys functions, incl. Debugging and Breakpoints feature. (requires KISSsys) Rights: K11e

Gearbox Configurations

Modules	Description
GPK	Package for sizing and rating of complete gearboxes (bearings, shafts, gears) based on KISSsys One to five stage cylindrical gearbox One to four stage bevel-cylindrical gearbox (requires min. ZC1) One to four stage worm-cylindrical gearbox (requires min. ZD1) One and two stage planetary gearbox (requires ZA1), with coaxial shafts (requires WA1) Efficiency calculation **NEW** Load spectrum (requires ZZ1, WA8) **NEW** Requires corresponding KISSsoft modules (minimum WPK, ZPK) Rights: K11, K11c

Gearbox Variant Generator

Modules	Description
KS1	KISSsys model for the sizing of Gearbox variants Automatically generates a set of gearboxes with different numbers of stages and different ratio distribution from total ratio and torque Results will be displayed in 3D For helical gearboxes with first stage as cylindrical-, bevel-, worm- or crossed helical gearstage, and for planetary gearboxes (requires KISSsys or GPK) Rights: K11f

Expert Modules Gears

Cylindrical Gears

Configuration / Dimensioning

Modules	Description
ZA1	Planetary gear, Three gears, Four gears, rights: Z01a, Z19g
ZA2	Rack, Rights: Z01b
ZA3	Rough sizing Cylindrical gear pre-sizing (gear pairs, planetary trains) Sizing according to given safeties, several proposals Rights: Z03
ZA4	Fine sizing Gear pairs, planetary trains, gear chains The optimization produces a list of all possible variants with various parameters; varying of gear module, number of teeth, profile shift, pressure angle, helix angle, center distance Considers assembly conditions For each solution a separate strength calculation is performed Automatic sizing of deep tooth form (requires module ZA5) Calculation of transmission error for all variants (requires module ZA30) Classifies all feasible solutions regarding different criteria Graphical display of the classification Rights: Z04, Z04a
ZA5	Sizing of profile shift related to various criteria Calculation of profile shift based on measured tooth geometry Calculation of tooth thickness allowances based on measured tooth geometry Premanufacturing tools with grinding allowance, Topping tools Sizing for tooth height regarding contact ratio Sizing of linear profile modification Proposal for recommendable tooth trace correction Sizing of lengthwise crowning and helix angle modification considering the axis misalignments according to ISO 6336-1, Appendix E (requires ZA35) **NEW** Printout of tolerances ISO 1328, DIN 3961, DIN 58405, BS 436, AGMA 2001, AGMA 2015 Calculation with manufacturing profile shift Sizing of center distance regarding balanced specific sliding Sizing of helix angle regarding various criteria Profile and tooth trace diagram (K diagrams) Rights: Z01x, Z15, Z19a, Z19d, Z19f, Z19h, Z19l, Z19n

Methods for Strength Calculation

Modules	Description
ZA10	ISO 6336 edition 2006, Rights: Z02a
ZA11	DIN 3990, Rights: Z02
ZA12	AGMA 2001, AGMA 2101, Rights: Z13

ZA13	VDI 2737 tooth root load capacity of internal gear with influence of rim thickness, Rights: Z23
ZA14	FVA (output of analogue results like STplus), Rights: Z10
ZA15	Graphical method, Rights: Z19i
ZA16	AGMA 925, Lubrication gap EHD and flash temperature course acc. to AGMA Rights: Z19k
ZA17	VDI 2545 (plastics), Rights: Z14
ZA18	Static strength (metal and plastic), Rights: Z02x
ZA19	BV-RINA for military vessels, RINA 2010 for commercial vessels DNV41.2 (requires ZA10), Rights: Z02b
ZA20	AGMA 6011, AGMA 6014, AGMA 6004, API 613, Rights: Z13b
ZA21	VDI 2736 for Plastics (sheet 2), Rights: Z14a **NEW**

Calculation with Load Distribution

Modules	Description
ZA30	Contact Analysis of cylindrical and planetary gears**,** taking into account shaft deformation and tooth flank modifications Path of contact under load Calculation and display of Hertzian pressure and tooth root stress along the actual tooth flank Calculation of tooth mesh stiffness and transmission error under load based on the actual tooth form Display of specific sliding, sliding velocity and sliding factors for gears under load from actual tooth form Display of friction loss and local heat generation along the meshing Rights: Z24, Z25, Z27, Z32, Z34
ZA31	Calculation of wear for cylindrical gears Based on the simulated contact, for plastics (dry run) and steel (cold wear) Simulation of wear progress for realistic prediction of the wear distribution **NEW** Rights: Z31, Z32, Z31a, Z34
ZA32	Calculation of safety against micropitting according to ISO TR 15144, Calculation of lubrication gap according to ISO 15144 and AGMA 925 With actual normal force based on the contact analysis Rights: Z30, Z32, Z34
ZA33	Optimization of tooth flank modifications Classifies all feasible solutions regarding different criteria Graphical display of the classification Cross varying of values and coefficients and synchronizing of steps **NEW** (requires ZA30, or ZA31, or ZA32), Rights: Z33
ZA35	KHbeta according to ISO6336 Annex E Gap and load distribution are shown for all combination of (+/-) fma and (+/-) fhb in graphs and listed in the report. Also shown for single planets **NEW** Rights: Z02c

Master Gears

Modules	Description
ZA40	Master gears Master gear analysis and check, Rights: Z29

Gear Pumps

Modules	Description
ZB1	Gear pumps, Basic calculation Calculation of the transported volume of oil for gear pumps (without consideration of any feed-back volume) for internal and externally geared pumps for both standard involute and non-involute profiles can be combined with fine sizing Rights: Z26
ZB2	Gear pumps, Enhanced calculation Calculation and presentation of the pump characteristics during contact for detailed analysis and optimization Enclosed volume during mesh (feed-back volume), volume under critical in-flow speed at the narrowest point in entry chamber, total volume under entry pressure, torque on both gears (including option for calculation with or without Hertzian Pressure consideration), sliding velocity, wear number Alternatively, the Hertzian flattening due to tooth contact can be considered Rights: Z26a

Bevel Gears

Modules	Description
ZC1	Bevel and hypoid gears geometry Geometry according to DIN 3971 and ISO 23509 dimensions of bevel gears (measurements for manufacturing), for straight, helix- and spiral bevel gears Conventional production, Klingelnberg or Gleason Conversion of Gleason bevel-gear geometry data to DIN 3971 and vice versa Rough sizing Rights: Z07, Z07d, Z07m
ZC10	Generation of 3D model for straight and helical bevel gears with modifications (tip apex not in one point) and spiral toothed bevel gears with modifications, for export. Visual checking of the load free tooth contact, through rotation of one single gear or both gears (requires CB1, ZY1). Rights: Z07p
ZC2	Strength calculation according to ISO 10300 and ISO 10300:2014 method B and C, Rights: Z07e **NEW**
ZC3	Strength calculation according to DIN3991, Rights: Z07g
ZC4	Strength calculation according to AGMA2003-B97 and AGMA2003-C10 Rights: Z07j
ZC5	Strength calculation according to Klingelnberg KN3030 1.2 (Spiral Bevel, Palloid and Cyclo-Palloid), Rights: Z07a

ZC6	Strength calculation according to Klingelnberg KN 3030 1.2 (Hypoid, Palloid, Cyclo-Palloid), Rights: Z07b
ZC7	Strength calculation according to VDI 2545 and Niemann, rights: Z07h
ZC8	Static strength bevel gears / differentials, Rights: Z07i
ZC9	Strength according to ISO 10300:2014 for hypoid gears, Rights: Z07f **NEW**
ZC11	Strength calculation according to DNV 41.2, root and flank strength, flank breaking, safety, hardening depth, Rights: Z07l
ZC12	Fine sizing for bevel and hypoid gears Rights: Z07n

Worm Gears (Globoid)

Modules	Description
ZD1	Worm gear geometry Cylindrical Worms with enveloping worm wheels, geometry according to ISO 14521 and DIN 3975 Control measures for worms (measurement over 3 pins) and worm wheels (measurement over balls) Worm sizing with tool module Rights: Z08
ZD10	Generation of 3D model for export. Visual checking of the load free tooth contact, through rotation of one single gear or both gears For flank forms ZA, ZI and ZN, ZC, ZK (requires CB1, ZY1) Rights: Z08p
ZD2	Strength calculation according to ISO 14521 (draft), Rights: Z08b
ZD3	Strength calculation according to DIN 3996, Rights: Z08a
ZD4	Strength calculation according to AGMA 6034 und AGMA 6135, Rights: Z08c
ZD5	Fine sizing for worm gears Rights: Z08n

Crossed Helical Gears or Worm Gears (Cylindrical-Worm Gear)

Modules	Description
ZE1	Geometry of crossed helical gears Calculation of crossed helical gear and und worm (cylindrical worm and cylindrical worm gear– as e.g. usual in precisions mechanics) Control measures for worms (measurement over 3 pins) and worm wheels (measurement over balls) Rights: Z17
ZE2	Strength calculation on the basis of ISO 6336/Niemann, method Hirn, Rights: Z17a
ZE3	Strength calculation for plastics on the basis of VDI 2545/Niemann, method Hoechst, Rights: Z17b, Z17c
ZE4	Static strength (bending and shearing) for metal and plastic, Rights Z17d
ZE5 **NEW**	VDI 2736 für Plastics (sheet 3) Rights: Z17e

ZE6	Fine sizing for crossed helical gears Rights: Z17n

Face Gears

Modules	Description
ZF1	Face gears geometry Calculation module that calculates the geometry of face gears coupled with cylindrical pinion gears. 2D views with tooth form simultaneously on the inside, at the centre and on the outside. Checking undercut and pointed tooth tip is performed graphically in the 2D view, while tooth addendum height can be varied to prevent pointed tooth tip (including sizing function). Sizing of optimal facewidth Rights: Z06
ZF10	Generation of 3D model, with offset and shaft angle by choice, for export (requires CB1). Visual checking of the load free tooth contact, through rotation of one single gear or both gears Rights: Z06f
ZF2	Strength calculation on the basis of ISO6336 and literature, Rights: Z06a
ZF3	Strength calculation on the basis of CrownGear/ASS/DIN3990, Rights: Z06b
ZF4	Strength calculation on the basis of ISO10300, Method B, Rights: Z06c
ZF5	Strength calculation on the basis of DIN3991, Method B, Rights: Z06d
ZF6	Static strength calculation, Rights: Z06e

Non-Circular Gears

Modules	Description
ZG1	Calculation of non-circular gears Only sold in combination with an engineering executed by KISSsoft AG. A special description for the usage of the tool will be part of the delivery Rights: Z40

Beveloid Gears (available as beta in this version and for purchase in version 03-2015)

Modules	Description
ZH1 NEW	Beveloid gears geometry, strength calculation and 3D model Modifications and corrections like twist and negative crowning Graphical contact analysis (requires CB1, ZY1) Rights: Z50

Tooth Form Calculation

Modules	Description
ZY1	Enhanced 2D and 3D graphics for tooth form animation of gear wheels in mesh contact, Simultaneous presentation of subsequent manufacturing steps, Measure function in graphics; memory function for comparison A-B, Tooth form and tool in normal section Collision check, marking of contact point, marking of collision Rights: Z05x, Z05j, Z05k
ZY2	Import of tooth form or tool geometry Import of any kind of non-involute tooth shapes or tools (e.g. from CAD or 3D-application, DXF or VDA) Rights: Z05a
ZY3	Calculation of milling cutter (hob) and pinion type cutter, Calculation of type cutter reference profile and pinion (also for the design of special tools), Rights: Z05c
ZY4	Calculation of counter gear's tooth form by generating with actual gear tooth, Rights: Z05d
ZY5	Addition for molding Compensation of shrinking, spark gap, modification of pinion type cutter, Rights: Z05e
ZY6	Progressive Profile corrections, arc-like running in curve, Elliptical root radius, Rights: Z05f, Z05g
ZY7	Cycloid- and arc of circle tooth forms, designed Involute, Straight flank, Rights: Z05h, Z05n
ZY8 **NEW**	Scaling of tools Scaling the DXF tool shape or a tooth form with the normal module of gear Rights: Z05q

Further Gearspecific Modules

Modules	Description
ZZ1	Load spectra, service life, transmissible torque/power Calculation of transmissible power with and without load spectra Calculation of service life with and without load spectra Calculation of safety factors with load spectra (for cylindrical-, bevel- and crossed helical gears) Consideration of the load and speed direction of each load bin **NEW** Rights: Z16, Z16a, Z18, Z18a
ZZ2	Hardening depth Proposal of required hardening depth based on Hertzian pressure (for cylindrical- and bevel gears), Rights: Z22
ZZ3	Backlash Calculation of acceptance-backlash and operating-backlash (for cylindrical-, crossed helical- and worm gears), Rights: Z12

ZZ4	Flank breaking calculation for bevel gears and cylindrical gears according to Dr. Annast, TU München, 2002, Rights: Z07k
ZZ5	Calculation of measurement grid for topology measurements, flank and root, for cylindrical-, bevel- and worm gears and for splines Measuring machines: Klingelnberg and Gleason (requires CB1); Rights: Z05o

Expert Modules Shafts and Bearings

Shafts

Modules	Description
WA1	System of shafts composed of various coaxial shafts Calculation of the deformation in the shaft system (taking in account the bearing offset, bearing clearance, non linear stiffness calculated from the inner geometry, thermal expansion, linked shafts) Rights: W01a, W01b, W03b, W03c, W03d
WA2	Tooth trace modification Calculation of longitudinal deformation Load distribution with and without modification Rights: W10
WA3	Buckling (for beams and shafts) Rights: W13
WA4	Critical speeds and frequencies Torsions-, bending-, longitudinal frequencies Campbell diagram Rights: W04, W04x
WA5	Strength calculation according to Hänchen & Decker Shaft design regarding constant equivalent stress and maximal deformation Rights: W06a, W12
WA6	Strength calculation according to DIN 743, 2012 Edition Shaft design regarding constant equivalent stress and maximal deformation, Rights: W06b, W12
WA7	Strength calculation according to FKM guide line, 2012 Edition Shaft design regarding constant equivalent stress and maximal deformation Rights: W06c, W12
WA8	Load spectra for shafts and bearings Calculation for shaft limited life- and endurance strength Bearing calculation with load spectra Rights: W01s, W06s

Bearings

Modules	Description
WB1	Enhanced bearing calculation (L10m, Lnm) Influence of lubrication according to ISO 281-1 Thermally permissible service speed acc. DIN 732 Rights: W05a
WB2	Reference service life calculation, with inner geometry according to ISO 16281 (L10r or Lnmr if combined with Module WB1) Diagram of the load distribution in the bearing Diagram of the load distribution over the rolling bodies User specified input of roller profiles (requires WA1) Rights: W05b, W05c
WB3	Hydrodynamic bearings Hydrodynamic radial journal bearings: Oil or grease lubricated, according to DIN and Niemann Hydrodynamic axial journal bearings: Calculation of tilting-pad thrust bearings according to DIN 31654 Rights: W07, W07a, W07b, W07c, W08
WB4	Calculation of a single bearing with inner geometry according to ISO16281 Own input of the inner and outer ring deformation (possible without the WPK) User specified input of roller profiles Rights: W51

CAD Interfaces

2D Export

Modules	Description
CA1	2D DXF and IGES Export, Rights: K05a, K05e

3D Export

Modules	Description
CB1	STEP and Parasolid format export in 3D through Parasolid kernel Display and export of cylindrical gears with modifications and of straight and helical bevel gears (tip apex in one point, without modifications), Display as skin model for the control of tooth contact and meshing; splines (shaft-hub), shafts, rack Rights: K05u, P01
CB2	Solid Edge-Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub), shafts and rack) directly from the calculation using KISSsoft menu in Solid-Edge, includes CC1 Rights: K05d, K04

CB3	SolidWorks-Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub) shafts and rack) directly from the calculation using KISSsoft menu in SolidWorks Rights: K05k, K04
CB4	Inventor-Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub) shafts and rack) directly from the calculation using KISSsoft menu in Inventor, includes CC1 Rights: K05m, K04
CB5	CATIA V5 –Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) (manufacturer: SWMS), Rights: K05o*
CB6	Creo Parametric –Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)), includes CC1(manufacturer: Applisoft) Rights: K05q*, K04
CB7	Siemens NX – Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub) shafts and rack) directly from the calculation using KISSsoft menu in NX, includes CC1 Rights: K05n, K04
CB8	Think3 – Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) directly from the calculation (manufacturer: StudioTurci) Rights: K05r*
CB9	Creo Elements/Direct – Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) directly from the calculation, Rights: K05p*
CB10	Askon Kompas V13 – Integration: Generation of 3D gears (cylindrical gears, worms, crossed helical gears, straight bevel gears, splines (shaft-hub)) directly from the calculation, Rights: K05l

*) please refer to the conditions

COM Interfaces

Modules	Description
CC1 NEW	COM Interface basic Call of basic KISSsoft functionalities as i.e. create reports, CalculateRetVal and KsoftVersion KISSsoft messages can optionally be shown Rights: K04
CC2 NEW	COM Interface expert Most of the sizing and optimizing functions are available through the extended COM interface via CallFunc and CallFuncNParam Contact analysis can be fully controlled by the COM Interface Rights: K04a

Languages

Modules	Description
LA1	German, Rights: K02
LA2	English, Rights: K02a
LA3	French, Rights: K02b
LA4	Italian, Rights: K02c
LA5	Spanish, Rights: K02d
LA6	Russian, Rights: K02e
LA7	Portuguese, Rights: K02f **NEW**

Services

Engineering

KISSsoft AG also offers engineering and consulting services. Our competence and our broad know-how, are based on all kind of different projects, which we executed for various industry sectors. We are pleased to share this know-how with you and prepare a precise offer according to your specifications.

Trainings

In our trainings, you will learn the efficient use of the software and you will understand the necessary theoretical background. Information on public seminars can be found on our homepage. For a company specific training, please contact us directly.

Conditions

Single-user version

The single-user installation of KISSsoft is licensed with a USB dongle. The calculation program can be installed on various computers, but calculations can only be executed with dongle in the USB port.

Multi-user network version

We offer network installation for any number of users, whereas the number of simultaneous users is restricted to the number of purchased access rights. For multi-user installations we charge an extra 25% on listed prices. The license is restricted to one site (physical address).

Software update contract

The software maintenance and update contract guaranties continuous long term use of KISSsoft. It offers the following benefits Technical support on the calculation methods, software usage support, updates of software, adaptations to new standards and full compatibility with new operation systems at a rhythm of one update a year, patches, and some additional features. Copy of contract on request.
Price: 15% of software value per year, minimum of 100 EUR per year. Exact price on request.

* Third party manufacturers

* = Software developed by one of our partners. The modules marked with * may have different conditions. Details on request.