

Technical Specifications for upgradation of existing KISSsoft Software

S.N.	Specifications	CMTI Remarks	Vendor Acceptance
1.	KISSsoft 2021 Release (upgradation of existing version – License No. 261)	Essential	
2.	List of modules/Functionalities Refer Annexure-A All modules as supplied previously to be included along with latest features included in 2021 version	Essential (Complete list of modules & functionalities to be provided.)	
3.	Network license (Floating license)	Essential	
4.	Perpetual validity of license	Essential	
5.	1 year warranty & AMC / subscription a) The software should have a standard warranty of 12 months from the date of installation, commissioning & acceptance at CMTI. Supplier modification (s) / software updates and upgrades shall be intimated and same should be made available free of cost during the warranty period. b) The access to online learning resources shall be made available free of cost during the warranty period.	Essential	
6.	Migration of network license manager & licenses Migration of network license manager & licenses across hardware (In case of change of hosting server hardware) should be carried out free of cost.	Essential	
7.	Training Suppliers to provide comprehensive training for 5 days (in phases) for on usage, operation & maintenance of software at CMTI within 1 month of installation	Essential	
8.	Acceptance The capabilities of the software must be proved by supplier at CMTI after installation, at no extra charges	Essential	
9.	Installation Installation & commissioning of software must be done at CMTI, at free of cost	Essential	
10.	Documents / Manuals – 2 sets of hard copy with 1 set of soft copy in English a) Maintenance manual b) Training manual	Essential	
11.	Service Support The supplier should provide online service support for 1 year, at free of cost. Please indicate the shortest turnaround time for making the software license operational from the time of reporting license corrupt or PC loaded with above software corrupt	Essential	

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ANNEXURE - A
Basic Packages

Modules	Description	Details
ZPK	Cylindrical gear package	<p>Geometry, control measures (DIN 3960 and DIN 58400)</p> <p>Calculation and presentation 2D and 3D of the tooth form for external and internal toothing with tooth flank modification</p> <p>Graphical display of specific sliding</p> <p>One strength calculation, either according to DIN 3990 or ISO 6336 or AGMA 2001 or VDI 2545 or VDI2736 (draft)</p> <p>Tooth friction / power loss acc. to Niemann</p> <p>Extended range for possible profile shift</p> <p>Deep tooth form / short cut tooth form</p> <p>Cutter/Tool</p> <p>Flash temperature course</p> <p>Scuffing according to DIN3990 and ISO TR 13989</p> <p>Micropitting according to ISO TR 15144:2010 (Method B)</p> <p>Arc of a circle or spline approximation for 2D output (requires CA1)</p> <p>Manufacturing drawing</p> <p>Rights: Z01, Z02 (or Z02a or Z13 or Z14 or Z14a), Z05, Z05l, Z5i, Z19e, Z19m</p>
WPK	Shafts and bearing standard package	<p>Calculation of deformations also for statically over determined systems / multiple supports, and line loads, Input of linear stiffness,</p> <p>Pressure angle and transverse shear</p> <p>Roller bearing service life (ISO281, L10)</p> <p>Bearing power losses</p> <p>One strength calculation (static and endurance): either according to DIN 743 or FKM or according to Hanchen & Decker</p> <p>Smith and Haigh diagram</p> <p>Rights: W01, W01c, W03, W03a, W05, W06a (or W06b or W06c), K07b</p>

MPK	Shaft-hub-connections	<p>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</p>
SPK	Bolt calculation according to VDI2230	<p>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</p>
FPK	FPK Springs	<p>Tension springs, compression springs, disc springs, leg springs, torsion springs Rights: F01, F02, F03, F04, F05</p>
APK	Automotive	<p>Synchronization according to Borg/Warner allows for the calculation of either time or force for gear shifting Friction Clutches Rights: A10, A20</p>
RPK	V-belts, toothed belts, chain drives	<p>Strength and dimensioning, roller diameter, distance between axes, number of belts, with or without tensioning pulley Rights: Z90, Z91, Z92</p>
LPK	Stress analysis with local stresses according to FKM Guideline 2012, 6th Edition	<p>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</p>
VPK	Linear drive train and Spindles according to Roloff/Matek	<p>Calculation of safeties against buckling, flank pressure and more, for the operation modes tightening and loosening Rights: K15</p>
TPK	Tolerance analysis	<p>Maximum- minimum dimension analysis, statistic analysis, tolerances: ISO / own input Rights: K10</p>
Hardness conversion		<p>Hardness conversion according to DIN EN ISO 18265 from and to HB, HRC, HV, Rm, etc. Rights: K09</p>

HPK	Hertzian pressure	Calculation of hertzian pressure for rolls, balls and planes Rights: K14
Basic Package Gearbox		
KPK-G	ZPK, WPK, MPK, TPK, HPK, Hardness conversion	
Basic Packages Complete		
KPK	ZPK, WPK, MPK, SPK, FPK, RPK, LPK, TPK, HPK, VPK, APK Hardness conversion	
System modules		
KISSsys		
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		
KSE	Interface to Eclipse	Development Environment for KISSsys functions, incl. Debugging and Breakpoints feature. Requires KISSsys Rights: K11e
Gearbox Configurations		
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) Requires corresponding KISSsoft modules (minimum WPK, ZPK) Rights: K11, K11c
Gearbox Variant Generator		

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 gear stage, and for planetary gearboxes Requires KISSsys or GPK. Rights: K11f
Expert Modules Gears		
Cylindrical Gears		
Configuration / Dimensioning		
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 Pre manufacturing tools with grinding allowance, Topping tools Sizing for tooth height regarding contact ratio Sizing of linear profile modification Proposal for recommendable tooth trace correction Printout of tolerances ISO1328, DIN3961,

		DIN58405, BS436, AGMA2001, AGMA2015 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		
ZA10	ISO6336 edition 2006, Rights: Z02a	
ZA11	DIN3990, Rights: Z02	
ZA12	AGMA2001, AGMA2101, Rights: Z13	
ZA13	VDI2737 tooth root load capacity of internal gear with influence of rim thickness, Rights: Z23	
ZA14	ZA14 FVA (output of analogue results like STplus), Rights: Z10	
ZA15	Graphical method, Rights: Z19i	
ZA16	AGMA925, Lubrication gap EHD and flash temperature course acc. to AGMA Z19k	
ZA17	VDI2545 (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, API613 Rights: Z13b	
ZA21	VDI2736 (draft) for Plastics (sheet 2), Rights: Z14a	
Calculation with Load Distribution		
ZA30	Contact Analysis of cylindrical and planetary	taking into account shaft deformation and tooth flank modifications

	gears	<p>Path of contact under load</p> <p>Calculation and display of Hertzian pressure and tooth root stress along the actual tooth flank</p> <p>Calculation of tooth mesh stiffness and transmission error under load based on the actual tooth form</p> <p>Display of specific sliding, sliding velocity and sliding factors for gears under load from actual tooth form</p> <p>Display of friction loss and local heat generation along the meshing</p> <p>Rights: Z24, Z25, Z27, Z32</p>
ZA31	Calculation of wear for cylindrical gears	<p>Based on the simulated contact, for plastics (dry run) and steel (cold wear)</p> <p>Rights: Z31, Z32</p>
ZA32	Calculation of safety against micropitting according to ISO TR 15144	<p>Calculation of lubrication gap according to ISO 15144 and AGMA 925</p> <p>With actual normal force based on the contact analysis</p> <p>Rights: Z30, Z32</p>
ZA33	Optimization of tooth flank modifications	<p>Classifies all feasible solutions regarding different criteria</p> <p>Graphical display of the classification (Addition to ZA30 or ZA31 or ZA32), Rights: Z33</p>
ZA35	KHbeta according to ISO6336 Annex E Rights: Z02c	
Master Gears		
ZA40	Master gears	Master gear analysis and check, Rights: Z29
Gear Pumps		
ZB1	Gear pumps, Basic calculation	<p>Calculation of the transported volume of oil for gear pumps (without consideration of any feed-back volume)</p> <p>for internal and externally geared pumps for both standard involute and non-involute profiles</p> <p>can be combined with fine sizing</p> <p>Rights: Z26</p>
ZB2	Gear pumps, Enhanced calculation	<p>Calculation and presentation of the pump characteristics during contact for detailed analysis and optimization</p> <p>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</p>

		number Alternatively, the Hertzian flattening due to tooth contact can be considered Rights: Z26a
Bevel Gears		
ZC1	Bevel and hypoid gears geometry	Geometry according to DIN 3971 and ISO23509 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	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 (requires CB1). Visual checking of the load free tooth contact, through rotation of one single gear or both gears Rights: Z07p
ZC2	Strength calculation	Strength calculation according to ISO10300 and ISO10300/DIS:2011 method B and C, Rights: Z07e
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 KN3030 1.2 (Hypoid, Palloid, Cyclo-Palloid), Rights: Z07b	
ZC7	Strength calculation according to VDI2545 and Niemann, rights: Z07h	
ZC8	Static strength bevel gears / differentials, Rights: Z07i	

ZC9	Strength according to ISO10300/DIS:2011 for hypoid gears. Rights: Z07f	
ZC11	Strength calculation according to DNV41.2, root and flank strength, flank breaking, safety, hardening depth, Rights: Z07l	
ZC12	Fine sizing for bevel and hypoid gears Rights: Z07n	
Worm Gears (Globoid)		
ZD1	Worm gear geometry	Cylindrical Worms with enveloping worm wheels, geometry according to ISO14521 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 (requires CB1).	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 Rights: Z08p
ZD2	Strength calculation according to ISO14521 (draft). Rights: Z08b	
ZD3	Strength calculation according to DIN3996, Rights: Z08a	
ZD4	Strength calculation according to AGMA6034 und AGMA6135, Rights: Z08c	
ZD5	Fine sizing for worm gears Rights: Z08n	
Crossed Helical Gears or Worm Gears (Cylindrical-Worm Gear)		
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 ISO6336/Niemann, method Hirn. Rights: Z17a	

ZE3	Strength calculation for plastics on the basis of VDI2545/Niemann, method Hoechst, Rights: Z17b, Z17c	
ZE4	Static strength (bending and shearing) for metal and plastic, Rights Z17d	
ZE5	VDI2736 (draft) für Plastics (sheet 3), Rights: Z17e	
ZE6	Fine sizing for crossed helical gears Rights: Z17e	
Face Gears		
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 face width Rights: Z06
ZF10	Generation of 3D model, with offset and shaft angle by choice	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		
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
Tooth Form Calculation		
ZY1	Enhanced 2D 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	
Further Gear specific Modules		
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) 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		
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 DIN743, 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		
WB1	Enhanced bearing calculation (L10m, Lnm)	Influence of lubrication according to ISO281-1 Thermally permissible service speed acc. DIN732 Rights: W05a
WB2	Reference service life calculation, with inner	(L10r or Lnmr if combined with Module WB1) Diagram of the load distribution in the bearing

	geometry according to ISO16281	Diagram of the load distribution over the rolling bodies User specified input of roller profiles Rights: W05b, W05c Requires WA1
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		
CA1	2D DXF and IGES Export, Rights: K05a, K05e	
3D Export		
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 Rights: K05d
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
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 Rights: K05m

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	Pro Engineer –Integration	Generation of 3D gears (cylindrical gears, worms, 16.04.2013 14 / 14 crossed helical gears, straight bevel gears, splines (shaft-hub)) (manufacturer: Applisoft), Rights: K05q*
CB7	NX Interface Generation of 3D gears	NX Interface 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, Rights K05n
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	Co-Create Modeling – 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: K05p*

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