

1. UI Parameters

Table contains ranges of options accessed by the user interface.

Table 1 Ranges of options.

Name	Symbol	Range			
		(mm)	(in)	(°)	-
project mode					train, pair, single, adapter
displayed units (gear)					mm, in
module	m	0.5 ... 20	0.03125 ... 1		
diametral pitch	DP				0.25 ... 160 ⁽⁶⁾
circular pitch	CP		0.1 ... 20		
pressure angle	α			14.5 ... 25	
clearance factor	f_c				0.1 ... 0.25 ⁽²⁾
thickness	t	0.5 ... 1000	0.03125 ... 40		
helix angle	β			10 ... 40	
groove width	g_w	0.5 ... 960 ⁽¹⁾	0.03125 ... 38 ⁽¹⁾		
groove depth	g_d	0.1 ... 10000 ⁽¹⁾	0.00781 ... 400 ⁽¹⁾		
fillet radius ⁽⁷⁾	r_{nf}	0 ... m			
cutter radius ⁽⁸⁾	r_c				
teeth number	z				6 ... 300
great diameter ⁽⁹⁾	d_g	0 ... 10000	0 ... 400		
profile shift factor	x				0 ... 1 ^(2, 3)
taper factor	f_t				0 ... 0.5 ^(2, 4)
relief type ⁽¹⁰⁾					tangent arc, line
tip relief width	w_r	0 . 0.45 s_a			0.01 ... 0.1 ⁽²⁾
tip relief height	h_r	0 ... 0.5 m			0.1 ... 0.5 ⁽²⁾
backlash (linear)	j	-0.2 ... 0.2	-1/32 ... 1/32		
edge finishing type					height-width, height-angle, equal size, radius
edge finishing height	h_{ef}	0 ... m ⁽¹¹⁾			
edge finishing width	w_{ef}	0 ... $\min(0.5t, m)$ ⁽¹¹⁾			
edge finishing angle	γ_{ef}			5 ... 40	
edge finishing radius	r_{ef}	0 ... $\min(0.5t, m)$ ⁽¹¹⁾			
edge finishing sides					right, left, both
hole diameter ⁽¹²⁾	d_h	0 ... 1000 ⁽¹³⁾	0 ... 40 ⁽¹³⁾		
X-coordinate of gear's center	dX	-9100 ... 9100 ⁽⁵⁾	-460 ... 460 ⁽⁵⁾		
Y-coordinate of gear's center	dY	-9100 ... 9100 ⁽⁵⁾	-460 ... 460 ⁽⁵⁾		

wheel orientation angle	γ			0 ... 360	
displayed units (axles)					mm, in
diameter ⁽¹⁴⁾	d_{ax}	1 ... 1000	1/32 ... 40		
length ⁽¹⁴⁾	l_{ax}	1 ... 10000	1/32 ... 400		
module dimensioning					m, DP, CP
angle format					decimal, HMS
numbers precision	$pr.$				0 ... 6
connection type					first – first, first – second, second – first, second - second

- (1) all non-integer values within the range are possible,
- (2) visible for double helical gears; range can be also limited by thickness or root diameter,
- (3) related to module,
- (4) when automatically calculated (manual center distance) external gear's factor will be 0,
- (5) available for external gears,
- (6) they are edge limits; practically, range is strongly dependent of module, number of teeth, type of gears and type of tooth view; algorithm for calculating profiles automatically accepts only reasonable values, slightly different than basic dX, dY numbers for given settings,
- (7) available for herringbone gears,
- (8) available for arc gears,
- (9) available for internal gears,
- (10) available for external gears when there are no other modifications ($x = j = f_t = 0$),
- (11) values can be greater but then teeth have no head surfaces,
- (12) available for external gears,
- (13) limited by root diameter or depth of groove in case of double-helical gears,
- (14) independent for every axle.

2. Real-Time Calculated Parameters

When settings are changed, they automatically trigger calculation of parameters of gears. These parameters are displayed in the *Dimensions* group. Table below describes meaning of these parameters.

Table 2 3rd mode parameters.

Group	Symbol	Meaning
First gear	d	pitch diameter
	d_w	working pitch diameter
	d_b	base diameter
	d_f	root diameter
	d_a	outside diameter
	x	profile shift factor
	f_t	taper factor
	j	backlash
	a_x	center distance ⁽²⁾
	α_w	working pressure angle ⁽²⁾
Top land parameters	α_a	outside pressure angle
	θ_a	half of top land angle
	s_a	top land thickness
Second gear ⁽³⁾		
Top land parameters ⁽³⁾		
Stage dimensions	Φ	max. diameter (stage's largest element)
	L	length
Ratios	η_f	final ratio of train
	η_s	stage ratio
	η_p	ratio to the previous stage
Placement and rotation	dX	X-coordinate of stage center
	dY	Y-coordinate of stage center
	γ	stage orientation angle ⁽¹⁾
	z	number of teeth
Motion link formulas		motion links' formulas for setting revolute joints

(1) around the center axis of the previous stage,

(2) between driven and driving gear,

(3) if added.

3. Information Saved in Components

Components of created stages also contains parameters. In addition, they have motion link formulas, which are helpful in case of defining movement of gears.

The information is available in *Description* field of *Properties* of components.