

Truss4 version 17

The new version of Truss4 software brings a new program for management of project, new modelling core in Truss 2D and many other improvements

Two parallel versions

Truss4 now supports two parallel versions on one computer. In addition to the current version (version 17), the previous version (version 16) will always be available. Both versions can be installed using the installer from our website:

https://www.finesoftware.eu/download/install/

The installer contains a menu for selecting a version. If version 16 is uninstalled during the installation of version 17, it can be reinstalled using the installer mentioned above. When working with two versions, the rules of the Windows operating system regarding file associations must be observed. In most cases, Windows associates files with the version that was installed last.

New modelling core in Truss 2D

A new modeling core was added in the "**Truss 2D**" program. This model replaces existing mounting of the structure. The new model significantly expanded the possibilities of truss topology, most of limitations no longer appear in the software. The main changes are:

- Unlimited number of members in joint
- Eccentric connection of any member into a joint
- Unlimited number of cuts at the member ends, both convex and concave ends are supported
- Manually defined cuts
- Joint and member codes are used only for assignment of pre-defined details (eaves detail etc), the insertion of automatic loads and other calculation parameters (buckling etc.). Codes does not affect feasibility of the design.

You can switch between old and new modelling mode in the tab "**Mounting**" of the "**Project/Truss settings**":

fruss settings			×
O Standard	Type:	truss	Ŧ
Truss properties	Manuficereda	(and a based (ald style)	_
O Parameters	Mounting mode	code-based (old style)	-
O Material	Mounting mode:	code-based (old style)	
O Thickness		general geometry	
Mounting	 Automatically de 	etermine truss geometry	
O Symmetry	Geometry:	[not recognized]	
O Suppliers	-		
Design options	Automatic truss ty	pe recognition has been performed yet by function mounting .	
O Splices		h on setting Automatically determine truss geometry and select truss type by yourself, type will be prefered.	

Switching between old and new modelling mode

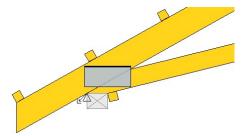
The main improvements of the new modelling mode are:

Eccentric connections of members

Previous versions supported eccentric connections of members only in a few clearly defined cases (eaves height entered for rafter, web connections, offset of the edge vertical). The eccentric connection can be defined for the beginning and end of each member now. The eccentricity can be entered in the "**Topology**" tab of the "**Member properties**" and consists of two components:



- Automatic eccentricity this component contains the above-mentioned eccentricities depending on the properties of member or detail. This includes the eccentric connection of rafter into the eaves detail, the offset of the edge vertical, the alignment of the webs according to the chord height and the eccentricity caused by the alignment of member to another member or line.
- **Manual eccentricity** the ability to move the beginning or end of the member relative to the joint. The offset is entered as a combination of length and orientation. An angle of 0° represents a shift in the direction of the Y axis, an angle of 90° a shift in the direction of the Z axis.



End of bottom chord offset from the joint in the horizontal direction by the width of the support (offset equal to the width of the support, angle 0°)

Both components of eccentricity can be switched off separately.

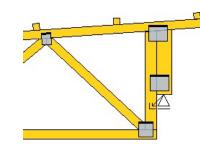
lopology	Coue	Section	Splices	Buckling	Scabs		-
Primary jo	oint:	16	•		<->	Secondary joint:	2
Choo	se differe	ent end c	onditions				
End con	ditions:		rigid	-			- rigid
Align:			No aligr	nment		-	Reset
Start of th	ne referen	ice line			End of the refere	nce line	
Y:			fx	[mm]	Y:	fx	[mm]
Z:			fx	[mm]	Z:	fx	[mm]
Z: Eccentrici	ity of beg	jinning	fx] [mm]	Z: Eccentricity of er		[mm]
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Entering eccentricities in "Member properties"

New concept for superchords

Superchords are no longer a property of the main member but are entered as separate members. As a result, they are no longer limited by additional topological rules. The superchords can now be placed on the inner and outer edge of the main part, member depth is not limited, and the additional member can even extend beyond the main member.





Detail showing a member aligned to the outer edge of vertical

Superchords are entered using the standard "**Add member**" command. If the start and end points lie on the same member, the program automatically aligns the additional member to the main member. The edge for alignment can be changed using the "**Align**" setting in the "**Topology**" tab of "**Member properties**".

Topology	Code	Section	Buckling	•			
Primary jo		10 rent end c	• onditions		<->	Secondary joint:	11 -
End con	ditions:		rigid	H			— rigid 👻
Align:			To mem	ber 1 - belo	w axis on the ri	ght side 👻	Reset
Start of th	e refere	nce line			End of the r	eference line	
Y:			fx	[mm]	Y:	fx	[mm]
	-		112/442		Z:	1.220	

Alignment of member to the edge of another member

Manual cuts in joints

Cuts in any joint can be modified manually. The user interface for these modifications is placed in the "**Joint edit**" tab of "**Joint properties**".

Edit detail prop	perties Number 2			×
Topology Co	ode Support Wall plate	Bottom detail Joint edit		
Custom	C Restore		Ŷ.	
Member 1				
Member 4	Lines - envelope 🔻	÷		
Line	Member edge	▼ 1 - right bottom ▼ △ X I		
Line	Vertically	▼ Δ: -507,9 [mm] X		1 4
Line	Horizontally	▼ Δ: 0,0 [mm] X		
Number:	2			V OK X Cancel

Editing cuts in detail

The program cuts members in the joint automatically according to the selected detail properties (cutting diagonals, etc.) and according to the priorities of individual members (outer members have a higher priority than webs). However, you can enable manual cut entry by checking the "**Custom**" box. Cuts are entered for each member separately, there are three ways of input:

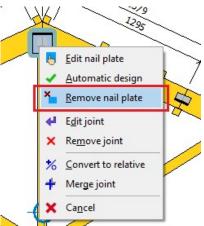


- **Lines envelope** cuts at the end are entered without distinguishing the order. Each cut can be linked to different reference objects (joint, member edge, intersection, etc.). In this way, any convex member end can be created.
- **Lines order** member end is created with the help of ordered list of cuts. Both convex and concave ends can be created using this mode.
- **Polygon** An option to specify geometry using individual polygon points

It is assumed that the user interface for manual input of cuts will be improved in the following versions.

Remove any nail plate

Any nail plate can be deleted using the "**Remove nail plate**" tool in the context menu of the joint.



Nail plate removal tool

If the automatically inserted nail plate is removed, it can be restored using the "**Generate nail plate**" command in the context menu of the joint.

Option to insert an additional nail plate into the structure

You can insert a nail plate anywhere in the structure using the "**Add nail plate**" tool in the context menu of the workspace. This nail plate corresponds to the non-structural plates in previous versions, but it is part of structural analysis now.

Modified window for editing nail plates

The nail plate editing window has been redesigned. The most significant change is the ability to edit more plates without having to close the window. If a dwg/dxf construction layer is loaded, it is also displayed automatically in this window.



dit nail plate			×
	Nail plate properties	Q 🖸 🗆	•
Connection type:	nail plate	-	
Material	common material (zinc coated)	-	
Туре	BV15 1,50	-	
Dimensions	BV15 1010 (105 x 105)	•	
Rotation	174,126	[°]	
Displacement Y	51	[mm]	
Displacement Z	48	[mm]	
Price	0,26 EUR		
	Manipulation options		
Distance	5	[mm]	
Rotation style	general	-	
Rotation increment	1,000	[*]	
Change dimensions syr	nmetrically		
Use for symmetrical pla	te		k_105 .
VERIFICATION Structural principles. S Capacity: Statistical [94 Structural principles e truss span (max: 400 • truss thickness (min • ochords depth (min: 50 • overlap of members: [1] (min: 40 mm): 48 permissible nail plate • Verification of decisi [1]: 53,6 mm; : 79.54	(0 %) 00,0 mm): 5159,5 mm 35 mm): 50 mm 50 mm 100 mm by nailplate mm utilization: 100,0 % ve joint segments 1; (47,2 %) [20]	19)	

New window for editing nail plates

General connections

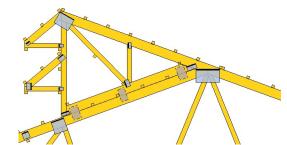
Any nail plate (manually inserted or automatically created in the joint) can be converted to "**General connection**" in the "**Edit nail plate**" window. In this way, any structural connection (bolt, nail, etc.) made on site can be considered during structural analysis. The joint geometry in the structural model is based on the position and dimensions of the defined rectangle. The joint stiffness is entered in the form of springs k_x , k_y a k_{ϕ} .

Nail plate properties		
		Q 🖸 🗖 🗖 🕂 🔍
general connection		
general connection		
nail plate		
20,000	[°]	
1248	[mm]	
89	[mm]	
0,500	[MN/m]	
0,500	[MN/m]	
0,500	[MNm/r	
Manipulation options		* * *
5	[mm]	* * *
general	•	
1,000	[°]	
metrically		*
e		
		152
		K
		V OK X Ca
	nail plate 20,000 1248 89 0,500 0,500 0,500 0,500 0,500 0,500 1,000 metrically	nail plate 20,000 [*] 1248 [mm] 89 [mm] 0,500 [MN/m] 0,500 [MN/m] 0,500 [MN/m] 0,500 [MN/m] general [mm] 1,000 [*] metrically [*]

Input of general connection

The general connection only creates the connection of members in the structural model, no verification of the connectors is performed.





Three general connections are connecting additional part to the main truss

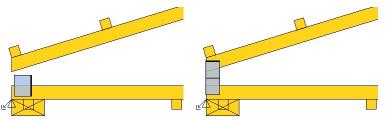
Changes in structural design

Structural analysis was adapted for the new modelling core. The main changes are:

- In combination with the new modeling core, it is no longer possible to use simpler types of structural models ("out of center-lines" and "eccentricities in joints"). The recommended static scheme now is a static scheme according to DIN EN 1995-1-1
- In addition to the fixed and pinned connections of member ends, it is also possible to use semi-rigid connections. This method of modeling is the only one allowed in most European countries (Germany, France, Great Britain, Scandinavia)
- Reduction of shear forces in the vicinity of supports according to 6.1.7(2) of EN 1995-1-1 is used in the verification of members
- In-plane buckling is not verified close to the joints
- Bending moment reduction is performed in the inner joints on chords

Two new topological tools have been added:

• **Disconnect member (context menu of member)** – if the member is connected to the joint eccentrically (for example, a rafter in the eaves detail), the program creates a new joint at the point of member origin, reconnects the part into it and creates a new member between both joints.



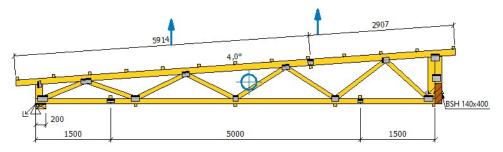
Eaves detail before and after using the "Disconnect member" tool for the rafter

 Merge joint (context menu of joint) - If two joints are located close to each other so that it is not possible to create a member between these joints, it is possible to merge the joints into one using this tool. The "Merge joint" tool is currently only available in the context menu of the joint in the "Truss 2D" program.

Centre of gravity and lifting points on the workspace

Marks for the center of gravity and the lifting points on the top chords can be switched on in the dimensioning settings.





Centre of gravity and lifting points

Merging windows with joint and detail properties, respectively member and cutpiece properties

The "Joint properties" and "Detail properties" windows have been merged into one "Joint Properties" window. The same adjustment was also made for the "Member properties" and "Cut-piece properties" windows. This adjustment greatly simplifies manual truss adjustments.

Construction layer in the program Truss 2D

The drawing in *.*dwg* or *.*dxf* format can be used as a construction layer during modeling trusses. This function is identical to the already existing tool in the "**Truss 3D**" program.

Extended saw settings

The settings for exports to automatic saws have been extended in the "**Application options**". In the new "**Export file formats**" tab, user can set, for example, the maximum number of cuts per member end for each format and how concave cuts are to be transferred to the saw. The same tab also contains an option to set the destination folder for saving export files.

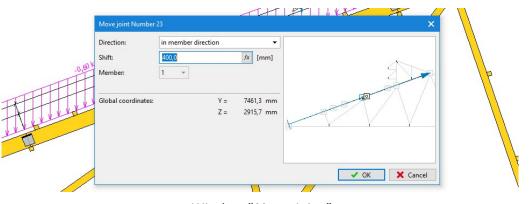
Define paramet	ters for saw ex	ports							
arameters of expo	ort files								
Format	Merge	Divide	Do not merge	ltem	ltems per file		member end	Concave	Format
format	into file	acc. to section	members	limit	maximum	limit	maximum	cuts	optimization
XLS						1	2		Stromab
PRG						~	2		CT600 N
BVN								✓	no optimization
SBS									SBS
BTL								✓	no optimization
DEPAUW						\checkmark	2		Depauw
S-BTL						~	2		Stromab
BV									no optimization
RND	1					~	2		no optimization
SSF+SIF						~	2		no optimization
VECTOR						~	2		no optimization
DAT						1	2		no optimization
EASYSAW SA						1	2		no optimization
 Export files also efault folder for s according to pr 	aw exports	parts custom folder							
Add subfolder ' Remove all files dditional settings		extension from ta	arfet folder befor	e export					
Create calculati	ons in XLS file	Create	e XLS file for K2 s	oftware					

New tab "Export file formats"

New tool for joint shift

The new tool "Move joint" was added into the local menu of joint. This tool is used to quickly move the joint in the direction of the member by the specified distance.





Window "Move joint"

Combination rules for photovoltaics and solar panels

The new load case type "**Photovoltaics, solar panels**" has been added to the list of available load types. These load cases are a permanent load, but load combinations without these load cases are also verified during the truss design. The current version only solves combination rules, loads in these load cases must be entered manually.

Option to turn off watermark in outputs

It is now possible to turn off the watermark in the printing window. This setting can be used in cases where only informative documentation of unverified or unsatisfactory structure is printed and where the watermark can be a disturbing element. The setting is in the header of the document tree, where the verification status is also newly displayed.

04_04_fermettes demo - Truss 2D - o	locuments				
📄 🖶 🖲 Open and edit	Document:	Manufacturing	project 👻 👘	Page setup Page numbering	
Save Print Document settings	Scheme:	color	•	- i uge numbering	Сору
Template: <none></none>	-				
	ED		Project: Task:	04.04 dama	
NOT SATISFI		fin	Designer:	04_04_demo [unknown]	
 ✓ Summary ✓ Truss - dimensions 			Investor:		SUMMARY

Option to hide watermark

Truss4 version 18

The version will bring following functions which are currently missing for the new modelling core:

- Documentation in parts for trusses divided for production or transport purposes
- Automatic insertion of nail plates in superchords

Support for structures created with the help of the original "**Mounting**" will be terminated in version 18. The version 17 will remain available to all customers also in the future. It will be possible to use it for editing old structures or for converting them into new modelling.