Dlubal

Structural Analysis & Design Software

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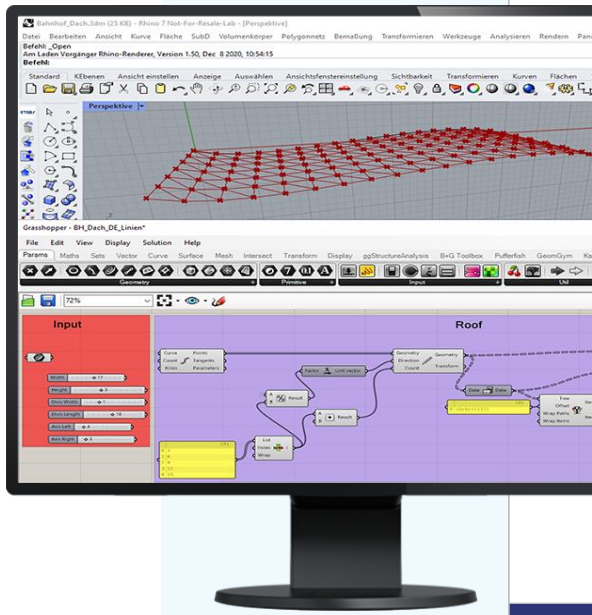
Webinar

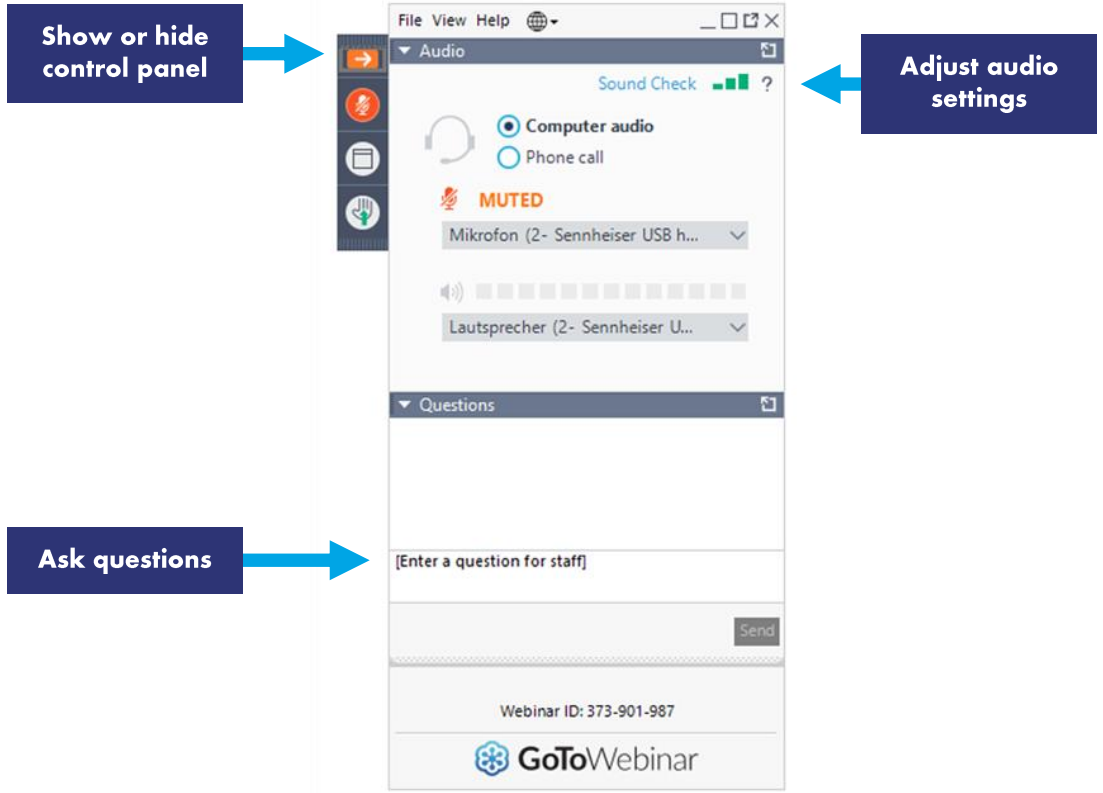
Interfaces With RFEM 6 Briefly Presented: Webservice and Rhino / Grasshopper



Questions During the Presentation

GoToWebinar Control Panel
Desktop

E-mail: **info@dlubal.com**

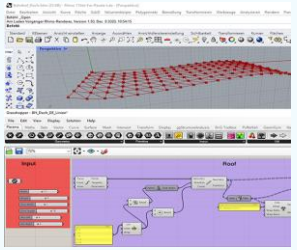


CONTENT

01 Data exchange with Rhino/Grasshopper

02 What are webservices?

03 Practical example using a C# template



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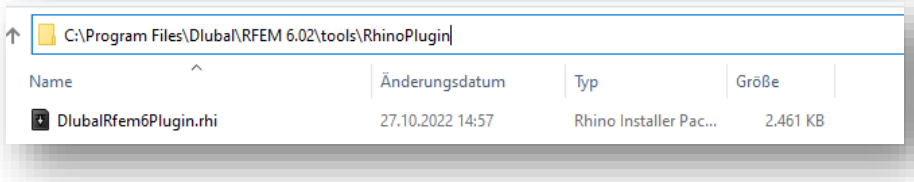
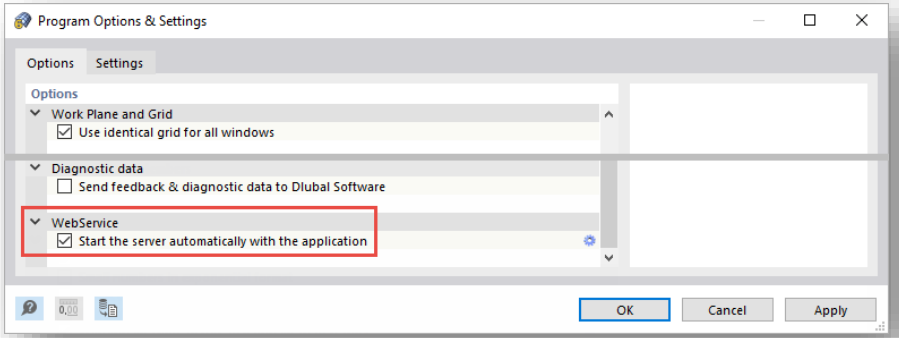
General Information

- Manual subsequent installation of the plug-in
- Direct interface (web service)
  → Both programs on one computer
- Currently (still) requires a web service license
- Start the server to use web services

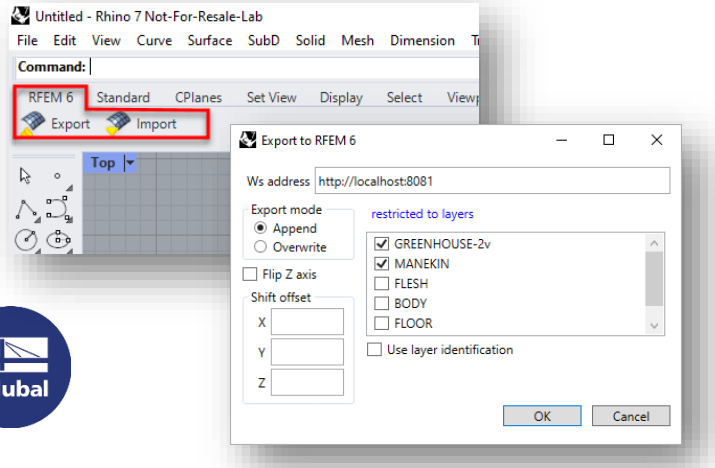




Plug-ins for Rhino and Grasshopper

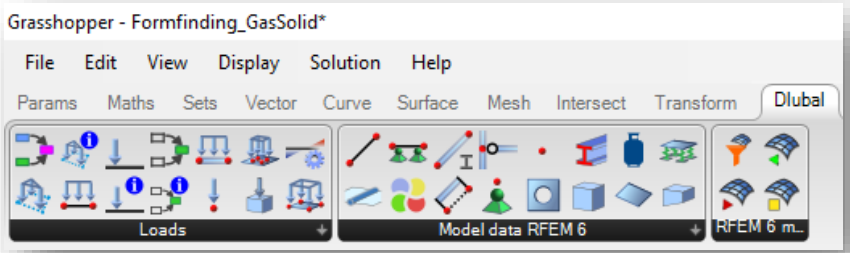
Rhino-RFEM-Link

- Import and Export
- Lines and Surfaces



GH-RFEM-Link

- (Import) and Export
- Model data & Supports
- Load Cases/Combinations
- Loads



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Recent und Future Developments

Recently implemented

- Component for opening loads
- Component for gas solids
- Extension for load transfer surfaces
- Extensions for form finding calculations
- Line rotation via help nodes

Planned

- Component for FE-mesh settings
- Component to start the analysis in RFEM 6
- Import of results into GH
- Rendering of member incl. profile shapes

Why Web Service & API?

- **Use the power of RFEM6 beyond its graphical interface**
- **Easy way**
  - to create an application on top of RFEM6
  - to plug-in RFEM6 to your chain of application
  - to extend / reinforce RFEM6 with your own checks
- **Usage of libraries and functions**

- **All objects in RFEM6 are accessible**
  - Geometrical data
  - Loads
  - Supports
  - Results

```
    j = 4*number_frames + 3*(number_frames-1)
    while i <= number_frames-1:
        k = j + (i-1)*4
        Member(k+1, MemberType.TYPE_TENSION, (i-1)*5+1, (i-1)*5+7 , 0.
        Member(k+2, MemberType.TYPE_TENSION, (i-1)*5+2, (i-1)*5+6 , 0.
        Member(k+3, MemberType.TYPE_TENSION, (i-1)*5+5, (i-1)*5+9 , 0.
        Member(k+4, MemberType.TYPE_TENSION, (i-1)*5+4, (i-1)*5+10, 0.
        i += 1

    # Diagonals on the roof
    j += 4*(number_frames-1)
    if number_frames > 1:
        Member(j+1, MemberType.TYPE_TENSION, 2, 8, 0.0,  4, 4)
        Member(j+2, MemberType.TYPE_TENSION, 7, 3, 0.0,  4, 4)
        Member(j+3, MemberType.TYPE_TENSION, 3, 9, 0.0,  4, 4)
        Member(j+4, MemberType.TYPE_TENSION, 4, 8, 0.0,  4, 4)

# ------------------------------------------------------------
    # Surfaces
    Surface(1, "1", 1)

    Surface(2, "3", 1)
    Surface(3, "4", 1)
    Surface(4, "5", 1)
    Surface(5, "6", 1)
    Surface(6, "7", 1)
    Surface(7, "8", 1)
```

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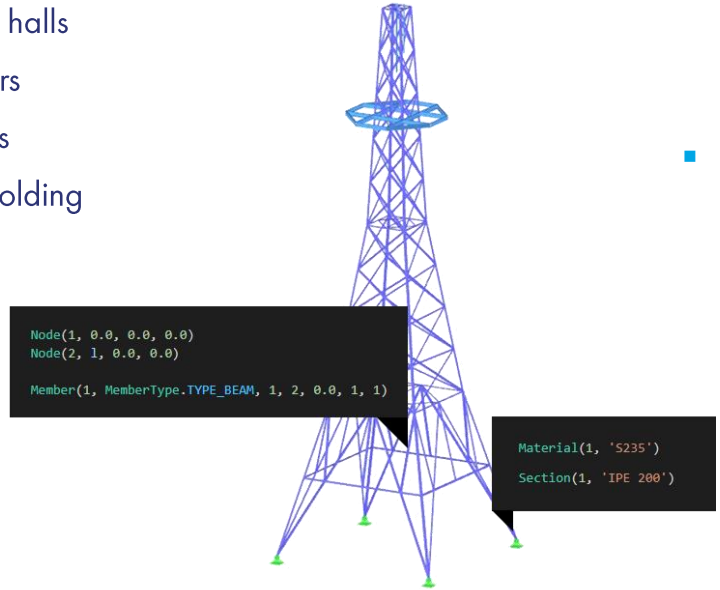
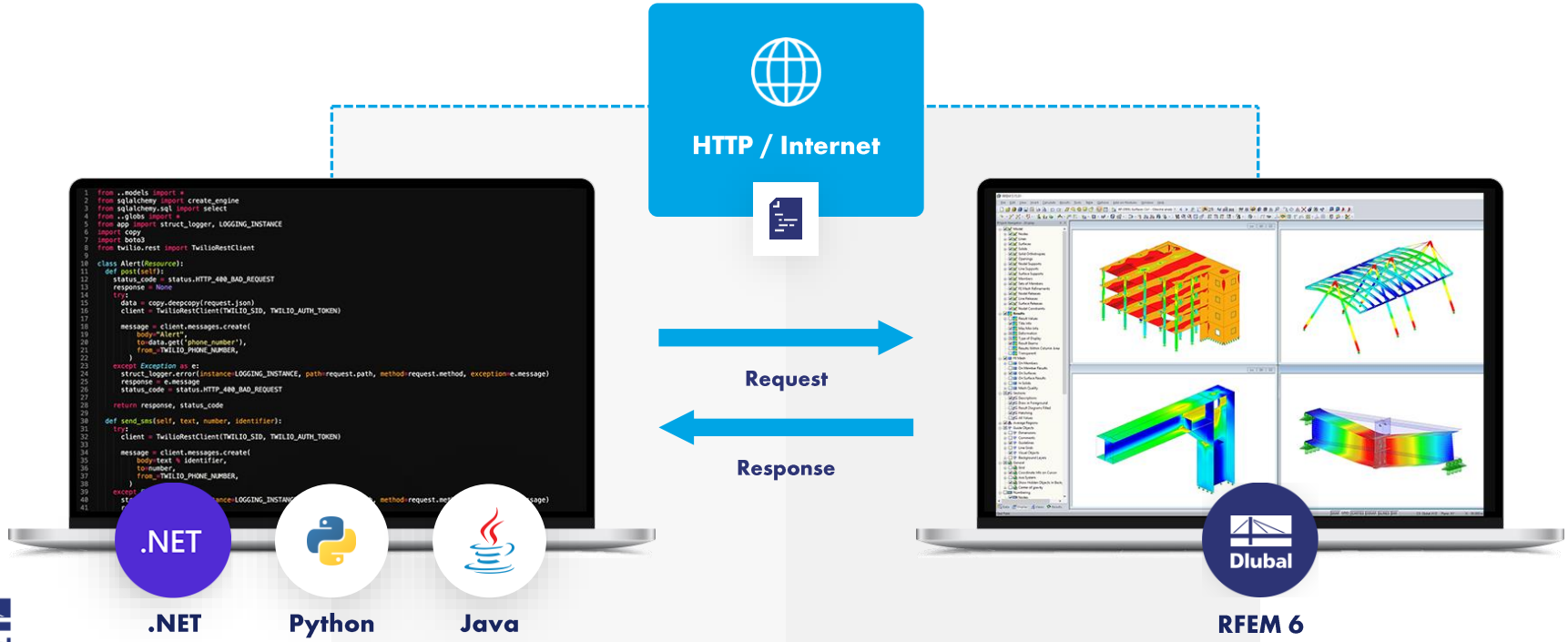
Examples

- **Parametrized structures & modular structures**
  - Steel halls
  - Towers
  - Racks
  - Scaffolding



- **Optimization & Generative design**
  - Optimization of structural geometry, section shapes
  - Optimization of costs of structure
- **Automatization**
  - Import / export of data to other applications
  - Load patters

What is WebService?



WebService libraries

SOAP
Simple Object Access Protocol

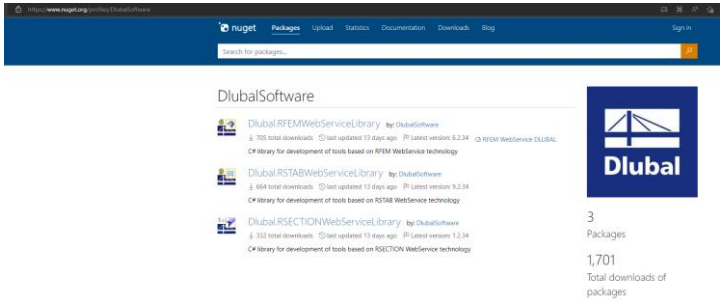
Python High Level Library for RFEM/RSTAB/RSECTION

SOAP
Simple Object Access Protocol

C# Low Level Library for RFEM/RSTAB/RSECTION

Where to find C# library?

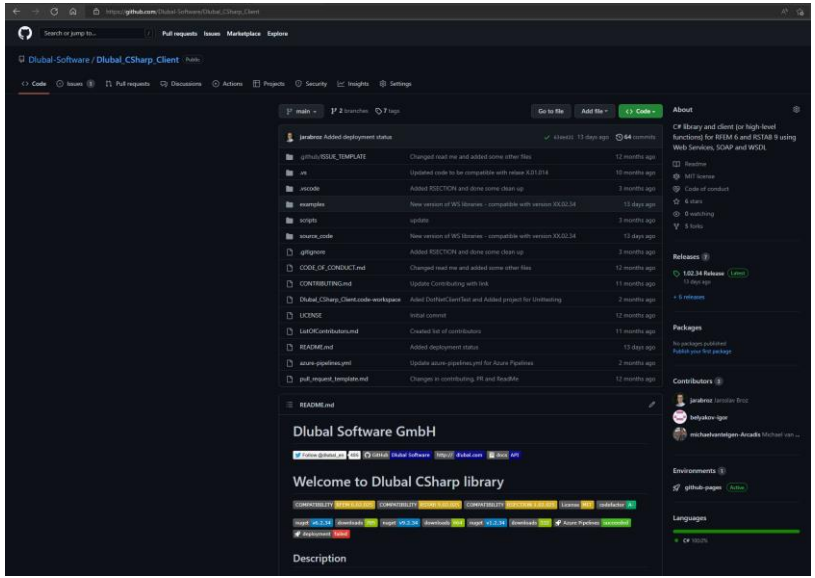
- NuGet Gallery | DlubalSoftware



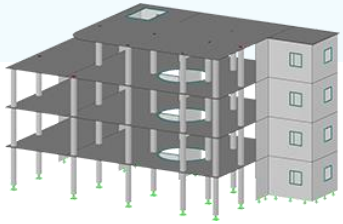
- Publisher Dlubal Software - Visual Studio Marketplace

Where to find source code of C# library?

- Dlubal-Software/Dlubal_CSharp_Client: C# library and client (or high-level functions) for RFEM 6 and RSTAB 9 using Web Services, SOAP and WSDL (github.com)



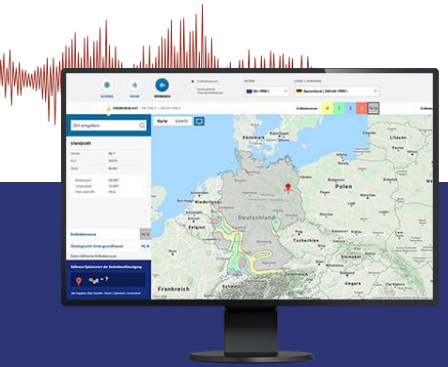
WebService DEMO



Free Online Services

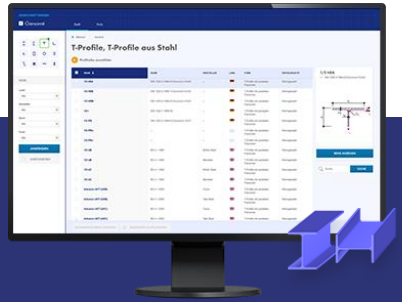
Geo-Zone Tool

Dlubal Software provides an online tool with snow, wind and seismic zone maps.



Cross-Section Properties

With this free online tool, you can select standardized sections from an extensive section library, define parametrized cross-sections and calculate its cross-section properties.



FAQs & Knowledge Base

Access frequently asked questions commonly submitted to our customer support team and view helpful tips and tricks articles to improve your work.

Models to Download

Download numerous example files here that will help you to get started and become familiar with the Dlubal programs.

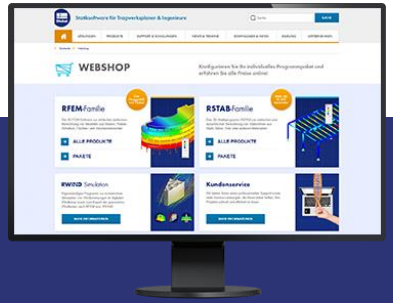
Free Online Services

Youtube Channel - Webinars, Videos

Videos and webinars about the structural engineering software.

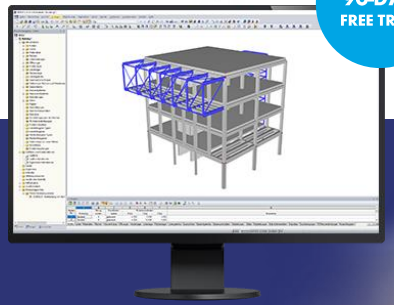
Webshop with Prices

Configure your individual program package and get all prices online!



Trial Licenses

The best way how to learn using our programs is to simply test them for yourself. Download a 90-day free trial version of our structural analysis & design software.



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