

TECHNICAL DOCUMENTATION

Smart 3D in the Hexagon Cloud

Interaction with LICAD 2026.x

Data exchange, plug-in process and automated LICAD startup

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1 Introduction

This document describes how Smart 3D in the Hexagon Cloud interacts with LICAD 2026.x on a client computer. It focuses on data exchange, the functions of the Smart 3D plug-in and the automated startup of LICAD.

2 Prerequisites

- LICAD 2026.x is installed on the client computer.
- The LISEGA Smart 3D Catalog V3 is available in Smart 3D. The catalog has been completely redeveloped and is based on the same system-independent LISEGA 3D catalog as the solutions for AutoCAD, BricsCAD, Tekla Structures, MicroStation and E3D.
- The current Smart 3D plug-in is installed. It requires the LISEGA Smart 3D Catalog V3.
- A suitable data exchange method is available between the Hexagon Cloud and the client computer.

3 Data Exchange Between Hexagon Cloud and Client

Two options are available for exchanging the transfer files. The Smart 3D plug-in functions and the LICAD startup process are identical in both cases; only the method used to provide the files differs.

3.1 Network Share

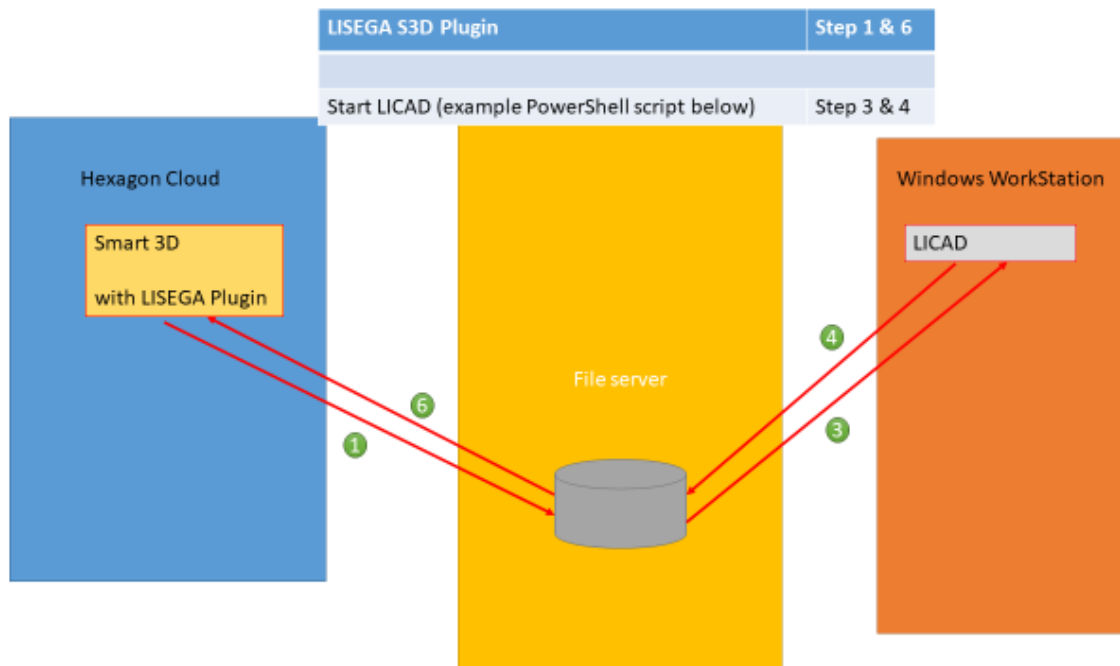


Figure 1 – Data exchange via a network share

3.2 File Transfer

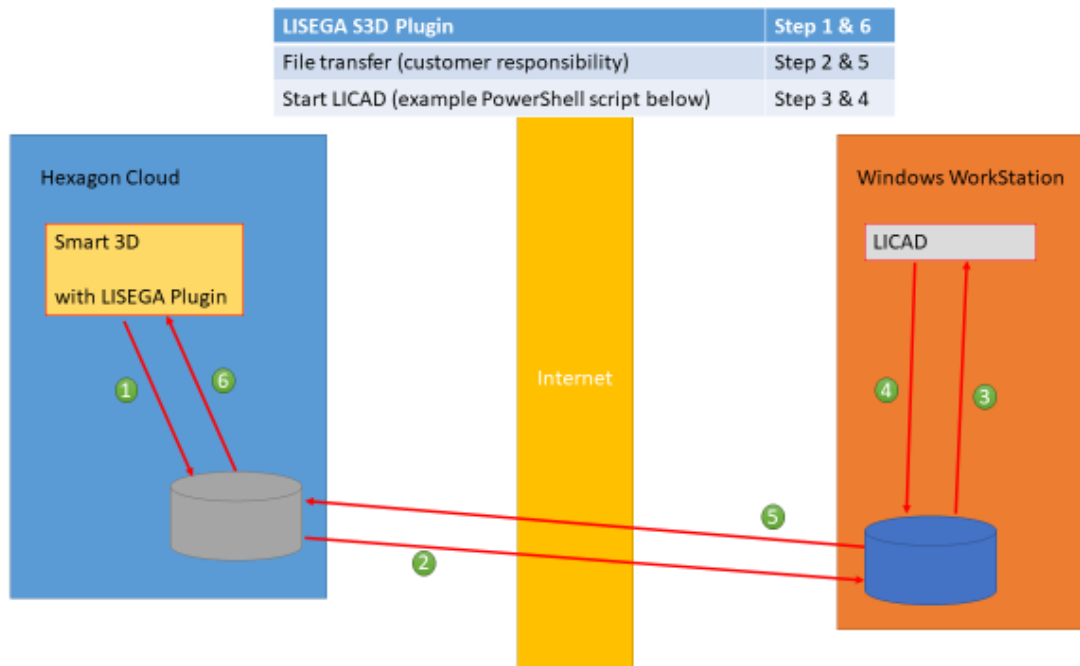


Figure 2 – Data exchange via file transfer

File transfer requires additional transfer steps compared with a network share. The workflows shown in the figures illustrate the respective process steps.

4 Smart 3D Plug-in Implementation

- The plug-in creates a transfer file containing the information that would otherwise be passed directly to LICAD in interactive mode.
- The destination folder is defined in the plug-in configuration dialog.
- After creating the transfer file, the plug-in waits for the corresponding L3DX file. The file name is derived from the transfer parameters.
- If the L3DX file is not created within the configured period, the plug-in terminates the operation with a timeout.
- As soon as the L3DX file has been written completely and closed by LICAD, the plug-in imports the file and automatically creates the support in the Smart 3D model.

5 Client Solution for LICAD

LICAD 2026.x can be started with parameters. This opens the same input form as the “Interactive LICAD” plug-in mode. The parameters are taken from the transfer file created by the Smart 3D plug-in.

LICAD then creates an L3DX file. The “Hanger Mark Number”, which corresponds to the designed support name in Smart 3D, is used as the file name.

For a robust and user-friendly workflow, LISEGA recommends running a background process on the client computer. This process monitors the transfer folder and starts LICAD automatically when a new input file is detected.

5.1 Automated LICAD Startup

The following PowerShell script monitors a client-specific folder. New LIF files are read, converted into LICAD startup parameters and then deleted. LICAD 2026.x is started using the standardized installation path.

NOTE: The monitored folder must be adapted to the local infrastructure. A separate subfolder is required for each client.

```
# Folder to monitor: one folder per client
$CurrentHost = $env:COMPUTERNAME
$TransferFilePath = "C:\temp\S3D_LICAD_DataTransfer\$CurrentHost\"

# Fixed installation path for LICAD 2026.x
$LICAD = "C:\Program Files\LISEGA\LICAD\LICAD.EXE"

# Files to monitor: .lif = LICAD input file
$FileFilter = '*.lif'
$IncludeSubfolders = $false
$AttributeFilter = [IO.NotifyFilters]::FileName, [IO.NotifyFilters]::LastWrite
$ChangeTypes = [System.IO.WatcherChangeTypes]::Created
$Timeout = 1000

function Start-LICAD
{
    param
    (
        [Parameter(Mandatory)]
        [System.IO.WaitForChangedResult]
        $ChangeInformation
    )

    # Initialize LICAD startup parameters
    $KATA_KZ = 'SM_LISEGA_2020'
    $LENGTHUNIT = 'MILLIMETERS'
    $LOADUNIT = 'KILONEWTONS'
    $WC_KZ = 'hot'
    $Hide = 'false'
    $NoMessage = 'false'

    # Input file containing the data exported from Smart 3D
    $InputFileName = Join-Path -Path $TransferFilePath $ChangeInformation.Name

    Write-Host -ForegroundColor DarkYellow `
        "New file '$InputFileName' detected. Reading content and starting LICAD ..."

    # Read the file content into a hash table
    $Data = Get-Content $InputFileName |
        Where-Object { $_ -match '=' -and $_ -notlike ';' } |
        ConvertFrom-StringData

    Write-Host "Content of $InputFileName converted to a hash table"
    Write-Host -NoNewline "Number of values read: "
    $Data.Count
    Write-Host ""
    $Data

    # Delete the input file
    Write-Host "Removing input file: $InputFileName"
    Remove-Item $InputFileName

    $ArgumentList = @(
        '/SML3D',
        "/OF:$TransferFilePath",
        "/KATA_KZ:$KATA_KZ",
        "/LENGTHUNIT:$LENGTHUNIT",
    )
```

```
"/LOADUNIT:$LOADUNIT"
)

# Temporary string prevents incorrect value conversions
[string]$s = ''

if ($null -ne $Data.HangerMark) {
    $s = $Data.HangerMark
    $ArgumentList += "/HMARK:$s"
}
if ($null -ne $Data.Normal) {
    $s = $Data.Normal
    $ArgumentList += "/F:$s"
}
if ($null -ne $Data.Size) {
    $s = $Data.Size
    $ArgumentList += "/DA:$s"
}
if ($null -ne $Data.Insulation) {
    $s = $Data.Insulation
    $ArgumentList += "/INSUL:$s"
}
if ($null -ne $Data.Temp) {
    $s = $Data.Temp
    $ArgumentList += "/TEMP:$s"
}
if ($null -ne $Data.Lateral) {
    $s = $Data.Lateral
    $ArgumentList += "/MOVEX:$s"
}
if ($null -ne $Data.Horizontal) {
    $s = $Data.Horizontal
    $ArgumentList += "/MOVEY:$s"
}
if ($null -ne $Data.Vertical) {
    $s = $Data.Vertical
    $ArgumentList += "/MOVEZ:$s"
}
if ($null -ne $Data.Config) {
    $s = $Data.Config
    $ArgumentList += "/CONFIGNO:$s"
}
if ($null -ne $Data.Pipe_X) {
    $s = $Data.Pipe_X
    $ArgumentList += "/KOOR_X:$s"
}
if ($null -ne $Data.Pipe_Y) {
    $s = $Data.Pipe_Y
    $ArgumentList += "/KOOR_Y:$s"
}

[double]$TopPos = 0
if ($null -ne $Data.El_Steel_L) {
    $TopPos = $Data.El_Steel_L
}

[double]$BottomPos = 0
if ($null -ne $Data.Pipe_Z) {
    $BottomPos = $Data.Pipe_Z
    $s = $Data.Pipe_Z
    $ArgumentList += "/KOOR_Z:$s"
}

if ($null -ne $Data.Width) {
    $s = $Data.Width
    $ArgumentList += "/WIDTH:$s"
}

[double]$DIM1 = [math]::Abs($TopPos - $BottomPos)
if ($DIM1 -ne 0) {
```

```
$s = $DIM1
$ArgumentList += "/DIM1:$s"
}

# Start LICAD 2026.x with the determined parameters
Start-Process -NoNewWindow -FilePath $LICAD -ArgumentList $ArgumentList
}

try
{
    Clear-Host
    Write-Host 'LICAD service PowerShell script'
    Write-Warning "FileSystemWatcher is monitoring $TransferFilePath"

    $watcher = New-Object -TypeName IO.FileSystemWatcher `
        -ArgumentList $TransferFilePath, $FileFilter -Property @{
            IncludeSubdirectories = $IncludeSubfolders
            NotifyFilter = $AttributeFilter
        }

    do
    {
        # The timeout allows the script to be stopped with Ctrl+C
        $result = $watcher.WaitForChanged($ChangeTypes, $Timeout)
        if ($result.TimedOut) { continue }
        Start-LICAD -ChangeInformation $result
    } while ($true)
}
finally
{
    $watcher.Dispose()
    Write-Warning 'FileSystemWatcher has been removed.'
}
```

6 Transfer File from the Plug-in to LICAD

The transfer file contains the data exported from Smart 3D in key-value format. The following example shows a file named "NMTEST01.lif".

6.1 Example: NMTEST01.lif

```
[DWG]
HangerMark=NMTEST01abc

[Load]
Normal=13

[Pipe]
Size=168.3
Temp=210
Insulation=80
Pipe_Z=7184
Pipe_X=23563
Pipe_Y=29089

[StaticMovements]
Lateral=1
Horizontal=2
Vertical=3

[SteelConnection]
El_Steel_L=9000
El_Steel_R=9000
Width=1000
Steel_Z=9000
Steel_X=24125
```

Steel_Y=33000

[Licad specific data]
Config=13

7 Result in LICAD

After the automated startup, LICAD 2026.x reads the values from the transfer file and displays them in the input form. Once processing is complete, LICAD creates the corresponding L3DX file for import into Smart 3D.

The screenshot displays the LICAD SM L3D software interface. The top bar shows the title 'LICAD SM L3D' and standard window controls. Below the title bar, there are input fields for '5006', '-3', '20000', and a date '13.12.2022'. The main interface is divided into several sections:

- Stress Condition Section:** Includes radio buttons for 'Static' (selected), 'Dynamic', and 'Cold'.
- Input Fields:** 'Hanger mark no.' is set to 'NMTEST01abc'. Other fields for 'Drawing no.' and 'Calculation point' are empty.
- Load Section:** Contains input fields for 'Load [hot]' (13 [KN]), 'Hydro Load' (0 [KN]), 'Pipe Diameter' (168,3 [mm]), 'Insulation' (80 [mm]), 'Temperature' (210 [°C]), 'Lateral' (2 [mm] [Y]), 'Horizontal' (1 [mm] [X]), and 'Vertical' (3 [mm] [Z]).
- Top connection:** A dropdown menu showing 'Hanger with base plate / brackets'.
- Bottom connection:** A dropdown menu showing 'Clamp base (Type 49)'.
- Product supplements for pipe clamps and clamp bases:** A dropdown menu set to 'Standard'.
- Diagram:** A central 3D diagram of a hanger system with a pipe, hanger, and base plate. Labels '1816' and '1000' are visible.
- Units:** A dropdown menu set to 'Metric (kN)'.
- Buttons:** 'Preselect Constant hanger' and 'Preselect Spring hanger' are visible.
- Footer:** Includes checkboxes for 'Selection of clamps for max. offset (4" or 6")' and 'Selection of 3/8" or M10 not allowed', a 'Hanger selection' dropdown set to 'AUTO', and project information: 'Project database: C:\temp\Vladimir\LICADV111PRJDB.FDB (Port for private FB: 27400)' and 'Project name: <Current project name>'.

Figure 3 – LICAD after automated startup with the data from the transfer file

8 Summary

The Smart 3D plug-in and the PowerShell script enable automated data exchange between Smart 3D in the Hexagon Cloud and LICAD 2026.x on the client computer. The input data is transferred in an LIF file; LICAD uses it to create an L3DX file, which is then processed automatically in Smart 3D.