

The IMSL® Fortran Library on Windows Installation Guide



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by Rogue Wave Software

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Installing the IMSL Fortran Library for Windows

1. Executing the Install Program

Insert the CD, and the install program should start automatically. If it does not start, run setup.exe in the root directory of the CD.

Note: On systems where administrative privileges are required to install software, start the setup.exe program from the CD with a right click and choose Run as administrator

Note: If you downloaded your software as a zip file, unzip the file into a temporary directory and treat that directory as if it was the CD. i.e. invoke the installation script by clicking on setup.exe.



2. System Selection

The first window allows you to select the system for which you are installing the IMSL Fortran Library. After selecting the appropriate architecture, press Next >.

IMSL Fortran Numerical Library 7.1.0		x
Rogue Wave Software, Inc.		XX
Select Fortran Numerical Library from the op	tions below.	
IMSL Fortran Numerical Library (x64)		
InstallShield		
	< <u>B</u> ack Next	> Cancel



3. Optional Libraries

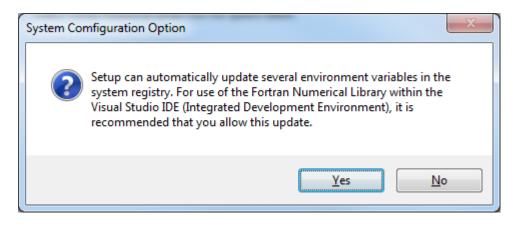
You will be prompted to install the optional IMSL NVIDIA CUDA[™] enhanced library. This version of the library will take advantage of computing capability of NVIDIA graphics cards if available.

IMSL Fortran Numerical Library 7.1.0	×
Rogue Wave Software, Inc.	No.
Select Fortran Numerical Library from the options below.	
Install CUDA-enabled, MKL-enabled, and IMSL versions of FNL 7.1.0	
Install MKL-enabled, and IMSL versions of FNL 7.1.0	
InstallShield	Cancel



4. Environment Variable Registration

You will be prompted to automatically update environment variables required to use the IMSL Fortran Library. It is recommended that you perform this update.





5. Welcome

The first window introduces the installation program for the IMSL Fortran Library. Press Next> to begin.

IMSL Fortran Numerical Library 7.1.0			
ی	Welcome to the InstallShield Wizard for IMSL Fortran Numerical Library 7.1.0		
	The InstallShield Wizard will install IMSL Fortran Numerical Library 7.1.0 on your computer. To continue, click Next.		
	< <u>B</u> ack Next > Cancel		



6. License Agreement

This screen presents the end user license agreement. When you have read the contents and agree, press Yes to continue the installation.

IMSL Fortran Numerical Library 7.1.0
License Agreement Please read the following license agreement carefully.
Press the PAGE DOWN key to see the rest of the agreement.
Rogue Wave® Software License Agreement IMSL® C Numerical Library, IMSL® C# Numerical Library, JMSL™ Numerical Library and IMSL® Fortran Numerical Library (March 2013) IMPORTANT - READ CAREFULLY: THIS SOFTWARE LICENSE AGREEMENT IS A LEGAL AGREEMENT BETWEEN YOU AND ROGUE WAVE SOFTWARE, INC. IF YOU ARE INSTALLING THE SOFTWARE FOR PERSONAL USE, THIS AGREEMENT APPLIES TO AND BINDS YOU PERSONALLY. IF YOU ARE INSTALLING THE SOFTWARE AS PART OF YOUR WORK FOR AN
Do you accept all the terms of the preceding License Agreement? If you select No, the setup will close. To install IMSL Fortran Numerical Library 7.1.0, you must accept this agreement. InstallShield
< <u>B</u> ack <u>Y</u> es <u>N</u> o



7. License Number

Enter your Rogue Wave license number. If you do not have a license number enter 999999.

IMSL Fortran Numerical Library 7.1.0	
Registration	
Enter Rogue Wave license number.	
1	
InstallShield	
	< <u>Back</u> Next > Cancel



8. Install directory

Set the directory where the IMSL Fortran Library will be installed. The default is C:\Program Files (x86)\VNI\. Use the Browse button to select an alternate location. Press Next> when you are satisfied with the selection.

IMSL Fortran Numerical Library 7.1.0	
Choose Destination Location Select folder where setup will install files.	
Setup will install IMSL Fortran Numerical Library 7.1.0 in the following folder.	
To install to this folder, click Next. To install to a different folder, click Browse and sele another folder.	ct
Destination Folder	
C:\Program Files (x86)\VNI\	
InstallShield	ancel



9. Installation Progress

You will be updated as the installation proceeds.

IMSL Fortran Numerical Library 7.1.0	×
Setup Status	
IMSL Fortran Numerical Library 7.1.0 is configuring your new software installation.	
C:\\VNI\imsl\fnl710\help\html\fnlmath\FNLMath\pairs\pair20_6.js	
InstallShield	
Car	ncel



10. Installation Complete

When the setup is complete, you will be notified. Press Finish to exit the install program.

IMSL Fortran Numerical Library 7.1.0		
	Setup Complete	
	Setup is now complete.	
	Click Finish to complete Setup.	
< <u>B</u> ack Finish Cancel		



License Key Setup

Note: For users who have permanent license, license setup is not necessary. Skip to "Using IMSL".

1. Editing the License File

Using a text editor, create the license file <VNI_DIR>\license\imsl_eval.dat. Then cut and paste the license key that you received via email from the Rogue Wave License Administrator into this file and save.

Using IMSL from the Visual Studio IDE

Note: The following documentation assumes that the product was installed in the default location. Modifications will be necessary to pathnames if you chose not to install in the default location.

Note: The instructions below use Visual Studio 2010 with the Intel Fortran compiler.

1. Creating a program

This simple example program will solve the following system of linear equations: 33x + 16y + 72z = 129 -24x - 10y - 57z = -9618x - 11y + 7z = 8.5

2. Start a new project

Start Visual Studio and create a new Intel Fortran Project, Console Application named fnl.

- Start Visual Studio
- Choose File->New->Project
- Under Project Types, select Intel(R) Visual Fortran -> Console Application.



- Under Templates, choose "Empty Project" as the project type,
- Fill in the name of the project and select the desired location; Click OK.

New Project	-	and inclusion and how one	and the second	२ <mark>२</mark>
Recent Templates		.NET Framework 4 Sort by: Default		Search Installed Templates
Installed Templates				Type: Intel(R) Visual Fortran
Visual Basic		Empty Project	Intel(R) Visual Fortran	A project for creating a command-line
Visual C#		Main Program Code	Intel(R) Visual Fortran	application
▷ Visual C++ ▷ Visual F#				
 Intel(R) Visual Fortr Console Applic Library QuickWin Appl Windowing Ap COM Server Other Project Type Database Test Projects Online Templates 	ation lication plication			
Name:	Test1			
Location:		ocuments\Visual Studio 2010\Projects\		Browse
Solution name:	Test1			Create directory for solution Add to source control
				OK Cancel

3. Create your Fortran Source File

Copy the following text into the fnl.f90 source file and save it.



```
PARAMETER (LDA=3, N=3)
   REAL A(LDA,LDA), B(N), X(N)
!
!
                Set values for A and B
!
                A = (33.0 \ 16.0 \ 72.0)
1
                    (-24.0 -10.0 -57.0)
!
!
                    (18.0 - 11.0 7.0)
1
                B = (129.0 - 96.0 8.5)
!
!
    DATA A/33.0, -24.0, 18.0, 16.0, -10.0, -11.0, 72.0, -57.0, 7.0/
   DATA B/129.0, -96.0, 8.5/
!
! The main IMSL function call to solve for x in Ax=B.
! This is the floating point version, to use
! double-precision arguments, call DLSARG.
!
   CALL LSARG(A, B, X)
1
! Now print the solution x using WRRRN, a printing utility
I.
   CALL WRRRN('X',X,1,N,1)
    END PROGRAM fnl
! ======= Program End ==========
```

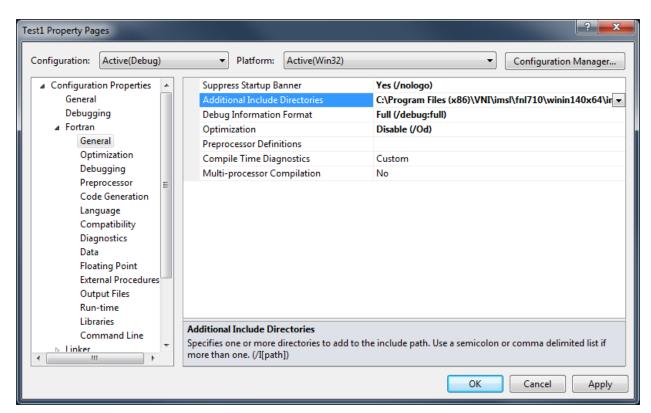
4. Add the Fortran Source File to the Project

- Select the Project Name -> Right Click "Source Files"
- Click Add -> Existing Item and add your Fortran source code file



5. Set Project Properties

- Right click on the Project name and choose Properties
- Go to Configuration Properties on the left side and select Fortran -> General
- Add the path C:\Program Files (x86)\VNI\imsl\fnl710\winin140x64\include\dll to the Additional Include Directories.
- Click OK





- Right click on the Project name and choose Properties
- Go to Configuration Properties on the left side and select Fortran -> Language, set Process OpenMP Directives to Generate Parallel Code (/Qopenmp)
- Click OK

Test1 Property Pages		?
Configuration: Active(Debug)	Platform: Active(Win32)	Configuration Manager
 ▲ Configuration Properties General Debugging ▲ Fortran General Optimization Debugging Preprocessor Code Generation Language Compatibility Diagnostics Data Floating Point External Procedures Output Files Run-time 	Source File Format Fixed Form Line Length Pad Fixed Form Source Lines Enable Alternate PARAMETER Syntax Enable FORTRAN 66 Semantics Compile Lines With D in Column 1 Process OpenMP Directives Enable F2003 Semantics Enable Coarrays MPI Configuration File Coarray Images	Use File Extension 72 Columns No Yes No Generate Parallel Code (/Qopenmp) No No 0
Linker + E	Process OpenMP Directives Enables the compiler to generate multi-thre (Qopenmp-stubs)	aded code based on the OpenMP directives. (/Qopenmp,
		OK Cancel Apply

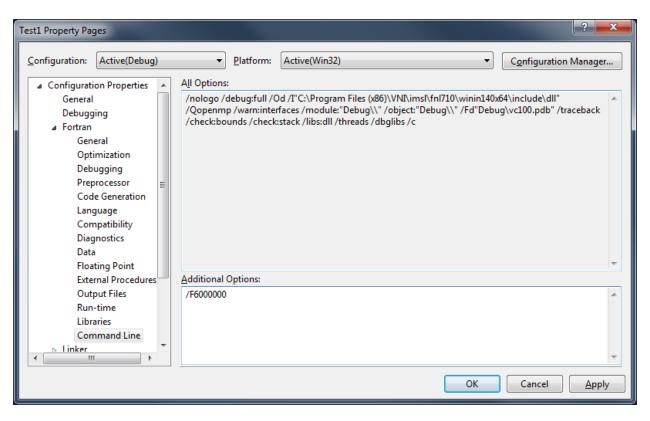


- Right click on the Project name and choose Properties
- Go to Configuration Properties on the left side and select Fortran -> Floating Point, check that the default setting for Floating Point Exception Handling is selected. It should be set to "Produce NaN, signed infinity, and denormal results"

est1 Property Pages		
Configuration: Active(Debug)	Platform: Active(Win32)	Configuration Manager
Command Line	Round Floating-Point Results Flush Denormal Results to Zero Extend Precision of Single-Precision Const Enable IEEE Minus Zero Support Limit COMPLEX Range	No No Safe
		OK Cancel Apply



- Right click on the Project name and choose Properties
- Go to Configuration Properties on the left side and select Fortran -> Command Line, add these switches in the Additional Options box: /F6000000
- Click OK





- Right click on the Project name and choose Properties
- Go to Configuration Properties on the left side and select Linker -> General, add C:\Program Files (x86)\VNI\imsl\fn1710\winin140x64\lib to the "Additional Library Directories" list
- Click OK

Test1 Property Page	25					? ×
<u>C</u> onfiguration:	Active(Debug)	• <u>P</u>	latform:	Active(Win32)	•	Configuration Manager
Debug Syster Optim Embe Advar	rg rest File gging m nization dded IDL nand Line s Tool nts Build Step	Suppress Ignore Im Register C Per-user F Additiona Link Libra Additional Lill Specifies one	ogress cremental Startup Ba nport Librar Dutput Redirection al Library D ary Depend	nner Ty h hirectories lencies	Yes search for libraries; configuration s	nsl\fnl710\winin140x64\ir 💌 pecific; use semi-colon
					ОК	Cancel <u>Apply</u>



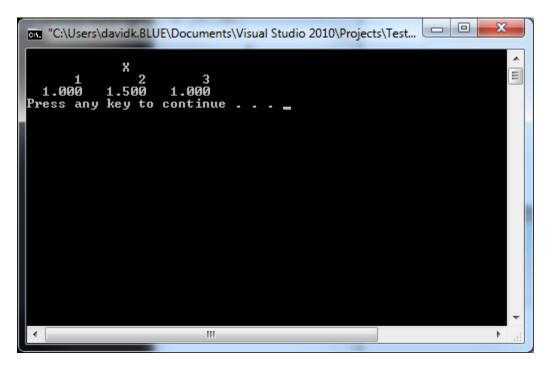
- From Solution Explorer right click on the project name; Choose Properties click Configuration Manager to open the Configuration Manager Dialog Box.
- Click the Active Solution Platform list, and then select the <New...> option to open the New Solution Platform Dialog Box
- Click the Type or select the new platform drop-down arrow, and then select x-64 platform.
- Click OK. The platform you selected in the preceding step will appear under Active Solution Platform in the Configuration Manager dialog box.
- Click Close in the Configuration Manager dialog box, and then click OK

Test1 Property Pages							
<u>C</u> onfiguration:	Active(Debug)	→ <u>P</u> latform:	Active(x64)	•	Configuration Manager		
 ✓ Configurati General Debugg > Fortran ▲ Linker Gen Inpu Man Deb Syst Opti Emb Adv. Com > Resource > MIDL > Manifes > Build Ev 	ion Properties jing eral at hifest File ugging iem imization bedded IDL anced nmand Line :es st Tool vents n Build Step	Output File Show Progress Version Enable Incremental Suppress Startup Ba Ignore Import Libra Register Output Per-user Redirection Additional Library D Link Library Depend Additional Options	Linking Inner Ty Directories				
				ОК	Cancel Apply		



5. Build the Project and Run the Program

- Build the Project by clicking on Build and selecting Build Solution
- Run the program by selecting Debug and selecting Start Without Debugging





Using IMSL from the Command Line

1. Setting the environment variables

The various environment variables may be set automatically. If you chose not to setup the environment automatically, you must run the fnlsetup.bat batch file from the IMSL Fortran Library install area.

2. Compile the program from the command line

To use the ifort command line compiler, start the environment from the Start Menu: Start -> Programs -> Intel(R) Parallel Studio -> Command Prompt -> Parallel Studio XE with Intel Compiler ->Intel Visual Studio Intel64 2010 mode.

Shared Library > %F90% %F90FLAGS% fnl.f90 %LINK_FNL%

Static Library > %F90% %F90FLAGS% fnl.f90 %LINK_FNL_STATIC%

3. Execute the program from the command line

> fnl.exe

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