

GstarCAD 2026

GstarCAD 2024



Table of Contents

1.	Introduo	ction	3
2.	Program	nming Environment	4
3.	Require	ment on Original Source Code	5
4.	Install (GstarCAD SDK	6
5.	Project	Configuration	6
6.	Migrate	ARX Project with Visual Studio 2017	8
	6.1.	Configuration of Target Extension	8
	6.2.	Configuration of Include Directory	8
	6.3.	Configuration of Link	9
	6.4.	Compile Program1	0
7.	Descrip	tion of GRX Class Library1	1
	7.1.	GcRx	1
	7.2.	GcEd1	1
	7.3.	GcDb1	1
	7.4.	GcGi1	1
	7.5.	GcGe1	2
8.	Copyrig	,ht1	3

1. Introduction

GRX is the Runtime eXtension programming environment of GstarCAD, which is the latest application development SDK provided with GstarCAD. It provides Object-oriented development environment and APIs based on C++, which can be used to develop GstarCAD application programs, extension CAD classes and protocols, and create new commands in GstarCAD.

One of GRX's advantages is that it supports seamless migration of ARX application programs running on AutoCAD® to GstarCAD with little change to the original source code, keeping the source-code-level compatibility.

2. Programming Environment

- Microsoft® Visual Studio Enterprise 2017 (Version 15.9.17)
- Windows SDK 10.0.17763.0
- ► CPU:

Basic:	1.6 GHz CUP
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Recommended:	3.0 GHz CPU and above
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► RAM:

Basic: 2 GB

- Recommended: 8 GB and above
- Operation System (OS)

Windows 11

Windows 10 (version 1507 and above):

Home, Professional, Education and Enterprise (not support LTSC and Windows 10 S)

Windows 8.1 (with 2919355 update):

Core, Professional and Enterprise

Windows 7 SP1 (with the latest update):

Home, Professional, Enterprise and Ultimate

Monitor Resolution:

1028x800 and above true color display, including 4K (3840x2160) display

- GstarCAD SDK 2024
- ➢ GstarCAD 2024
- > .NET Framework 4.8 and above

3. Requirement on Original Source Code

For the application source code with version lower than ObjectARX 2020, it needs to upgrade the source code to the ObjectARX 2020 first. Source code shall be compiled with Visual Studio 2017, under '*Use Unicode Character Set*' and '*Multi-threaded DLL(/MD)*' environment.

4. Install GstarCAD SDK

Download GstarCAD SDK ('GRXSDK.ZIP' file) from GstarCAD website:

https://www.gstarcad.net/download/

Unzip GRXSDK.ZIP file to the local disk (e.g. '*C*:\grxsdk') and there will be 5 directories generated (in '*C*:\grxsdk') which are: **arx**, **inc**, **inc-x64**, **lib-x64** and **utils**.

arx contains the header files, library files and sample programs used for porting ARX programs to GRX programs. It contains the following directories:

- > Inc: Header files used for porting from ARX to GRX
- > inc-x64: Files used by COM and .NET (for 64-bit)
- > lib-x64: GRX libraries (for 64-bit)
- Samples: Sample projects, including Dotnet, fact_dg, HelloADS, HelloA and SimplePalette.
 - **Dotnet**: .NET programming samples
 - 1) Addline: .NET programming sample of adding solid lines
 - 2) Hello: .NET programming sample of outputting prompt information
 - 3) Vbhello: Sample of .NET programming with VB .NET
 - > fact_dg: Sample of LISP function definition
 - > HelloADS: Sample of ADS programming
 - > HelloARX: Sample of GRX programming
 - > SimplePalette: Programming sample of how to create a set Palette windows

> Utils: Directory contains sub-directories of GRX extended applications, including APIs for extended function development, e.g. BREP for boundary representation.

Inc: Header files used for programming the GRX

inc-x64: Files used by COM and .NET (for 64-bit)

lib-x64: GRX libraries (for 64-bit)

Utils: Directory contains subdirectories of GRX extended applications, including APIs for extended function development, e.g. BREP for boundary representation.

5. Project Configuration

NOTE: '<sdkpath>' indicates the installation path of GstarCAD SDK, e.g. 'C:\grxsdk'.

- 1) General/Target Extension: .grx
- 2) Select **C/C++** in **Configuration Properties** and set as below:

General/Additional Include Directories: <sdkpath>\arx\inc

3) Select Linker in Configuration Properties and set as below:

General/Accessory library directory: <sdkpath>\arx\lib-x64

NOTE: Under debug configuration, please delete _DEBUG macro definition and set **Code Generation/Runtime** Library as '*Multi-threaded DLL (/MD)*'.

Lib Name	Need to import or not	Description of related module
AecModeler.lib	As needed	Faceted solid modeler
GcDbConstraints.lib	As needed	Constraint
gcdyn.lib	As needed	Dynamic block
gcad.lib	Usually	GUI/Controls
gcax.lib	As needed	COM service
gcbase.lib	Usually	Basic APIs, including memory,
		graphics, strings, etc
gcbr.lib	As needed	3D solid boundary
gccore.lib	Usually	Editing/Document
gcdb.lib	Usually	Database/Entity
GcDbPointCloudObj.lib	As needed	Point cloud
GcGeolocationObj.lib	As needed	Geographic map
gcgs.lib	As needed	Display
GcImaging.lib	As needed	Image
GcModelDocObj.lib	As needed	Symbolic entity
gplot.lib	As needed	Printing

4) Additional Dependencies:

Select Input/Additional Dependencies under Linker in Configuration Properties, remove lib files of ARX and add lib files of GRX:

'AecModeler.lib;gcad.lib;gcax.lib;gcbase.lib;gcbr.lib;gccore.lib;gcdb.lib;GcDbConstrai nts.lib;GcDbPointCloudObj.lib;gcdyn.lib;GcGeolocationObj.lib;gcgs.lib;GcImaging.lib; GcModelDocObj.lib;gplot.lib;'

Meanwhile, set Module Definition File path as '<sdkpath>\arx\inc\AcRxDefault.def'

6. Migrate ARX Project with Visual Studio 2017

6.1. Configuration of Target Extension

Select General in Configuration Properties and set Target Extension as '.grx', and set Configuration as 'Release'.

HelloWorld Property Pages Configuration: Release		V Platform: x64	v	? × Configuration Manager
 ✓ Configuration Properties General Debugging VC++ Directories C/C++ Linker Manifest Tool XML Document Generator Browse Information Build Events Custom Build Step Code Analysis 	× V	General Target Platform Windows SDK Version Output Directory Intermediate Directory Target Name Target Extension Extensions to Delete on Clean Build Log File Platform Toolset Enable Managed Incremental Build Project Defaults Configuration Type Use of MFC Character Set Common Language Runtime Support .NET Target Framework Version Whole Program Optimization Windows Store App Support	Windows 10 10.0.17763.0 \$(SolutionDir)\$(Platform)\\$(Configur \$(Platform)\\$(Configuration)\ \$(ProjectName) .arx *.cdf;*.cache;*.obj;*.obj,enc;*.ilk;*.ipd \$(IntDir)\$(MSBuildProjectName).log Visual Studio 2017 (v141) No Dynamic Library (.dll) Use Standard Windows Libraries Use Unicode Character Set No Common Language Runtime Sup Use Link Time Code Generation No	ation)\ b;*.iobj;*.resources;*.tlb;*.tli;*.t port
<	Pr	oject Defaults		
			ОК	Cancel Apply

6.2. Configuration of Include Directory

Select C/C++ in Configuration Properties and set Additional Include Directories of General as <sdkpath > arx inc' as shown below.

elloworld Property Pages		?
onfiguration: Release	∨ Platform: x64	 Configuration Manager.
Configuration Properties	Additional Include Directories	C:\grxsdk\arx\inc;%(AdditionalIncludeDirectories)
General	Additional #using Directories	
Debugging	Debug Information Format	Program Database (/Zi)
VC++ Directories	Support Just My Code Debugging	No
▲ C/C++	Common Language RunTime Support	
General	Consume Windows Runtime Extension	
Optimization	Suppress Startup Banner	Yes (/nologo)
Preprocessor	Warning Level	Level3 (/W3)
Code Generation	Treat Warnings As Errors	No (/WX-)
Language	Warning Version	
Precompiled Headers	Diagnostics Format	Classic (/diagnostics:classic)
Output Files	SDL checks	Yes (/sdl)
Advanced	Multi-processor Compilation	
All Options		
Command Line		
N Linker		
Manifest Tool		
XML Document Generator		
Browse Information		
Build Events		

6.3. Configuration of Link

1) General Configuration

Select **General** under **Linker** of **Configuration Properties** and set **Additional Library Directories** to | < sdkpath > |arx|/lib-x64|, as shown below.



2) Input Configuration

Select Input/Additional Dependencies under Linker of Configuration Properties,

remove the lib files of ARX and add lib files of GRX:

'AecModeler.lib;gcad.lib;gcax.lib;gcbase.lib;gcbr.lib;gccore.lib;gcdb.lib;GcDbConstrai nts.lib;GcDbPointCloudObj.lib;gcdyn.lib;GcGeolocationObj.lib;gcgs.lib;GcImaging.lib; GcModelDocObj.lib;gplot.lib;'

Meanwhile, set Module Definition File path as '<sdkpath>\arx\inc\AcRxDefault.def'

figuration:	Release	✓ Platform: x64	~	Configuration Manager
-			A MALL P1 117 P1 1	
Out	put Files	Ignore All Default Libraries	Accinoueler.nb;gcau.nb;gcax.nb;gcba:	se.iib;gcbi.iib;gccore.iib;
Brou	wse Information	Ignore Specific Default Libr	raries	
Δdv	anced	Madula Definition File		
All (Options	Add Medule to Assembly	c. grxsuk (arx (inc (ActxDefault.def	
Con	nmand Line	Add Wodule to Assembly	- 51-	
▲ Linker		Embed Managed Resource	erile	
Gen	eral	Porce Symbol References		
Inpu	ut	Delay Loaded Dils		
Mar	nifest File	Assembly Link Resource		
Deb	ougging			
Syst	tem			
Opt	imization			
Emb	bedded IDL			
Win	dows Metadata			
Adv	anced			
All (Options			
Con	mmand Line			
Manifes	st Tool			
▶ XML Do	ocument Genera			
Browse	Information			
D Build Ev	vents			
Custom	n Build Step	Module Definition File		
V CODEA	inalysis v	The /DEF option passes a mod	lule-definition file (.def) to the linker. Only one .def file ca	n be specified to LINK.
	>			
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			ОК	Cancel Appl
		dditional Descendencies	ОК	Cancel Appl
	A	dditional Dependencies	ОК ? ×	Cancel Appl
	A	dditional Dependencies	ОК ? Х	Cancel Appl
	A A g	dditional Dependencies ecModeler.lib cad.lib	ОК ? ×	Cancel Appl
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	A A g g g g c Ev	dditional Dependencies ecModeler.lib cad.lib cax.lib cbase.lib cbr.lib ccore.lib aluated value:	ОК ? ×	Cancel App!
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	A A g g g g g c c Ev	dditional Dependencies ecModeler.lib cad.lib cbase.lib cbase.lib cbr.lib crore.lib aluated value: ecModeler.lib cad.lib	ОК ? × ^	Cancel App!
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	A g g g g g c Ev k	dditional Dependencies ecModeler.lib cad.lib cas.lib cbase.lib cbr.lib core.lib aluated value: ecModeler.lib cad.lib cas.lib cbase.lib cas.lib	ОК ? × , ``	Cancel App!
	A g g g g g g g g g g g g g g g g g g g	dditional Dependencies ecModeler.lib cad.lib cax.lib cbase.lib cbr.lib ccore.lib aluated value: ecModeler.lib cad.lib cad.lib cad.lib cad.lib cad.lib conselib core.lib core.lib	ОК ? × 	Cancel App!
	A g g g g g g g g g g g g g g g g c v v	dditional Dependencies ecModeler.lib cad.lib cax.lib cbase.lib cbr.lib ecModeler.lib cad.lib cax.lib cad.lib cax.lib cbr.lib core.lib	ОК ? × , •	Cancel App!
	A A g g g g g g c V Ev A g g g g c V In	dditional Dependencies ecModeler.lib cad.lib cax.lib cbase.lib cbr.lib ecOndeler.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib corre.lib corre.lib corre.lib	ОК ? Х 	Cancel App!
	A A g g g g g g g g g g g g g g g g g g	dditional Dependencies ecModeler.lib cad.lib cax.lib cbase.lib cbr.lib ecOndeler.lib cad.lib car.lib cad.lib cad.lib cad.lib car.lib cad.lib cad.lib car.lib cad.lib cad.lib cad.lib car.lib cad.lib cad.lib car.lib cad.lib car.lib cad.lib car.lib cad.lib car.lib cad.lib car.lib cad.lib car.lib cad.lib c	ОК ? Х 	Cancel App!
	A A g g g g g c v Ev A g g g g c v Init k u	dditional Dependencies ecModeler.lib cad.lib cbase.lib cbr.lib crore.lih aluated value: ecModeler.lib cad.lib cad.lib cad.lib cbr.lib crore.lih crore.lih crore.lib cad.lib corre.lib cad.lib	ОК ? Х 	Cancel App!
	A A g g g g a c v Ev A g g g g a c v Ini k u g	dditional Dependencies ecModeler.lib cad.lib cbase.lib cbase.lib cbr.lib ccore.lih aluated value: ecModeler.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib cad.lib corre.lib cad.lib	ОК ? X 	Cancel App!
	A A g g g g c V Ev A g g g g c V Ini k u g y	dditional Dependencies ecModeler.lib cad.lib cbase.lib cbase.lib cbr.lib ccore.lib aluated value: ecModeler.lib cad.lib cad.lib cad.lib crore.lib crore.lib ernel32.lib di32.lib di32.lib di32.lib	ОК ? × 	Cancel App!
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6.4. Compile Program

After completing the above steps, compile the project and make sure that the compilation is successful. Otherwise repeat the above steps to reconfigure the project settings.

Inherit from parent or project defaults

Macros>>

Cancel

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7. Description of GRX Class Library

The following libraries are frequently used in programming with GRX. These libraries have same functions with the corresponding ARX libraries.

- GcRx: same as AcRX of ARX, classes for binding an application and for runtime class registration and identification
- **GCEd**: same as **ACEd** of **ARX**, classes for registering commands and for event notification
- > GcDb: same as AcDb of ARX, GstarCAD database class
- > GcGi: same as AcGi of ARX, graphics classes for rendering entities
- > GcGe: same as AcGe of ARX, utility classes for common linear algebra and geometric objects

7.1. GcRx

The **GcRx** class library provides system-level functionality such as DLL initialization and linking, and runtime class registration and identification as below:

- > Object runtime class identification and inheritance analysis
- > Runtime addition of new protocol to an existing class
- > Object equality and comparison testing
- > Object copy

7.2. GcEd

The **GcEd** class library is used to define and register new GstarCAD commands which operate in the same manner as the original ones.

7.3. GcDb

The **GcDb** classes are components of the GstarCAD database. This database stores all the information for the graphical objects that compose a drawing, and the non-graphical objects (such as layers, linetypes, and text styles) that are also part of a drawing.

7.4. GcGi

The GcGi class library provides the graphic interface used for drawing CAD entities.

7.5. GcGe

The **GcGe** class library provides classes used for performing common 2D and 3D geometric operations, including utility classes such as vectors and matrices and basic geometric objects such as points, curves, and surfaces.

8. Copyright

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