

NDS-ISG

ISaGRAF Interfaces for NuDAM6000 Series Modules User Guide

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How to Use This Manual

This user guide is designed to help you to use the NDS-ISG ISaGRAF software driver for NuDAM6000 serial modules in CJ International ISaGRAF software. The manual describes how to install and configure the software driver to let your ISaGRAF application programs can direct control the NuDAM6000 modules. This manual is organized as follows:

- Chapter 1, "Introduction of NDS-ISG ISaGRAF Driver" describes what is the NDS-ISG ISaGRAF Driver, how to install the driver, and which kind of NuDAM6000 modules are supported by this driver.
- Chapter 2, "Operations with Driver and the ISaGRAF workbench " describes how to add and remove the NDS-ISG ISaGRAF driver in the ISaGRAF I/O connection dialog box environment. It also describes how to use the archive manager to restore the drivers and sample programs.
- If user finds any question go beyond this manual, please contact with us:

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Introduction of NDS-ISG ISaGRAF Driver

1.1 Overview of ISaGRAF

ISaGRAF is a complete industrial software package consisting of Soft Logic Programming Tools, and a Runtime execution engine. It was designed to turn any industrial computer into a high performance, yet inexpensive Soft Logic Controller. ISaGRAF is based on the only internationally recognized industrial standard for industrial automation control languages, the IEC1131-3. With this standard, you can create your own factory automation solution in the following graphic- and text-based language, they are IL (Instruction List), ST (Structured Text), FBD (Function Block Diagram), LD (Ladder Diagram), and SFC (Sequential Function Chart) The ISaGRAF software package combine two parts. They are described below :

1. Workbench : The ISaGRAF Workbench is a Windows-based software development environment used to create control logic programs written in any or all of the five IEC1131-3 languages. It is also a fully featured set of tools providing editing, debugging, code generation, documentation, library management, archiving, on-line monitoring, off-line simulation and on-line change of projects made for execution by the ISaGRAF runtime kernel. The Workbench runs on Windows 3.1, 95, NT, or OS/2. Any ISaGRAF Workbench can be used with any target system that uses the ISaGRAF runtime kernel.
2. Target : The Workbench is a authoring tool for control system development. The Target is the execution section of the control program or control system. The Workbench and Target may be installed in the same computer or different computers connected by RS-232 or EtherNet. Now in ISaGRAF, The Target support many operation system such as DOS, Window NT, VxWORK, OS9, etc. About the ADLink NDS-ISG ISaGRAF driver, it supports Window NT ISaGRAF Target only.

1.2 Overview of NDS-ISG ISaGRAF Driver

ADLink's NDS-ISG ISaGRAF Driver is a software component to combine ISaGRAF Target and NuDAM6000 serial modules. After user develops a control program or system with the ISaGRAF Workbench tool, the next step he or she has to do is to download the program to the ISaGRAF Target system, then with ADLink's NDS-ISG ISaGRAF driver the ISaGRAF Target system can connect the program's digital or analog channel to ADLink's NuDAM6000 serial modules. With the connection, control program can first get the outside digital or analog signals from the NuDAM 6000 serial modules as the data source, then control program can execute the control logical and produce some results about the control program in the ISaGRAF Target. These results will be sent to control the outside machines or switches by the form of digital or analog signals through the modules.

ISaGRAF provides the control system programming environment and it also support the world wide IEC1131-3 PLC language standard. And NDS-ISG ISaGRAF driver can link the control program with the physical I/O modules (NuDAM6000 serial modules). With ISaGRAF and NDS-ISG driver software, the PLC functions, can be provided and be able to replace PLC in some industry applications. This is the PC-based software PLC control system. Now it is ready for us.

In this version, the NDS-ISG ISaGRAF driver can support seventeen types of ADLink NuDAM6000 serial modules. They are ND-6011/ND-6011D, ND-6012/ND-6012D, ND-6013, ND-6014D, ND-6017, ND-6018, ND-6021, ND-6024, ND-6050, ND-6052, ND-6053, ND-6054, ND-6056, ND-6058, ND-6060, ND-6063, ND-6080.

Because the ISaGRAF system combines two parts, so in the ISaGRAF Target user has to install the NDS-ISG ISaGRAF Driver, and in the Wokrbench user has to Restore the NDS-ISG ISaGRAF I/O Board and I/O Equipment Object by using the Archive Manager.

1.3 Installation of NDS-ISG ISaGRAF Driver in the ISaGRAF Target

1.3.1 NDS-ISG ISaGRAF Driver Installation

System Requirements

NDS-ISG ISaGRAF Driver requires the following minimum configuration:

- **An IBM PC/AT or compatible or a CompactPCI system, running Windows NT version 4.0 or later**
- **A hard disk with enough disk space to install NDS-ISG ISaGRAF Driver**
- **A 1.44-MB 3.5-inch floppy disk drive or a CD-ROM drive.**
- **Application development system: CJ International ISaGRAF Workbench and Target for Windows NT**
- **ADLink NuDAM6000 serial modules that NDS-ISG supports.**

Installation

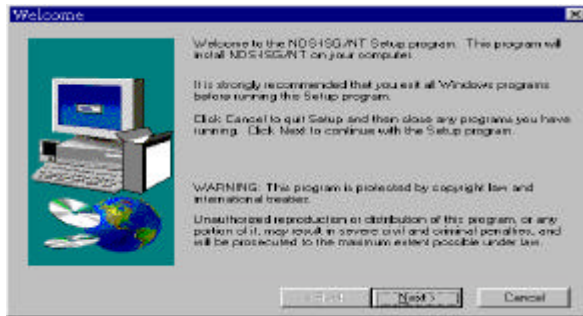
The Setup program provided by NDS-ISG ISaGRAF Driver performs all tasks necessary for installing the software.

With ADLink's "NDS-ISG" diskettes :

- step 1.** Place the "NDS-ISG ISaGRAF Driver Disk1" in the 3.5" floppy drive A:.
- step 2.** If Windows NT is loaded, choose Run from the taskbar.
- step 3.** Type A:\SETUP in the Run dialog box.

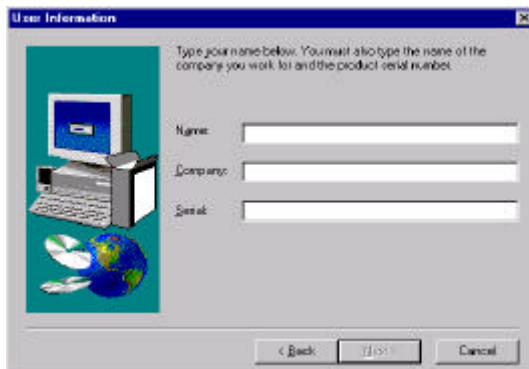
With "ADLink All-in-One Compact Disc":

- step 1.** Place "ADLink All-in-one Compact Disc" in the CD-ROM drive.
- step 2.** If autorun setup program is not invoked, execute x:\setup.exe(x indicates the CD-ROM drive).
- step 3.** Select Software Package->NDS-ISG/NT to install the software.

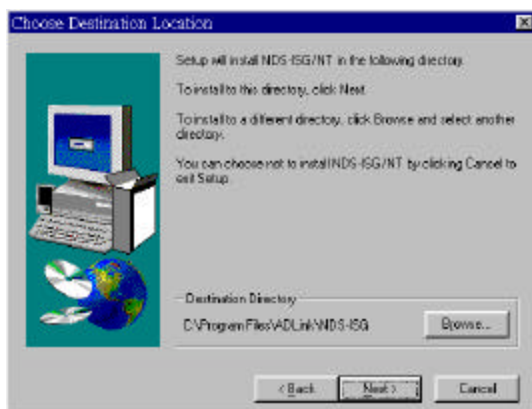


Setup first displays a Welcome dialog box. Please click “Next” button to go to the next step.

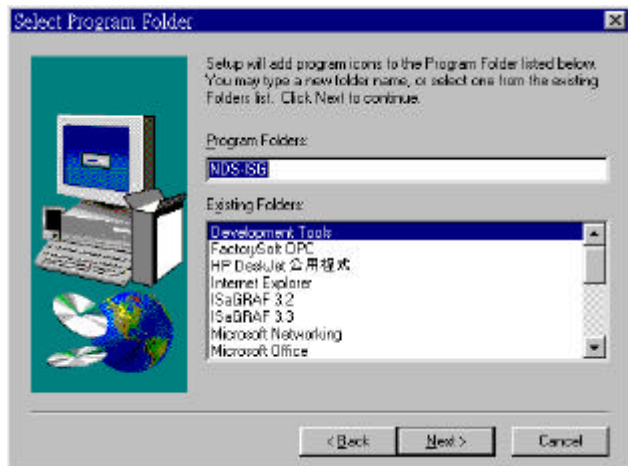
Then Setup will display a User Information dialog box. Please fill items in the dialog box (including the serial number data). You have to enter the valid serial number to get the valid license. Otherwise you can only use NDS-ISG in 120 minutes demo mode. Then click “Next” button to go on installation.



Setup then prompts the following dialog box for you to specify the destination directory for NDS-ISG. The default path is c:\Program Files\ADLINK\NDS-ISG. If you want to install NDS-ISG in another directory, please enter the directory you would like to install NDS-ISG



Then user can assign the “Program Folder”. The default “Program Folder” is “NDS-ISG”.



After these procedures, the installation of NDS-ISG is completed now.

1.3.2 NDS-ISG ISaGRAF Driver Un-installation

NDS-ISG ISaGRAF Driver has the capability of automatic un- installation.

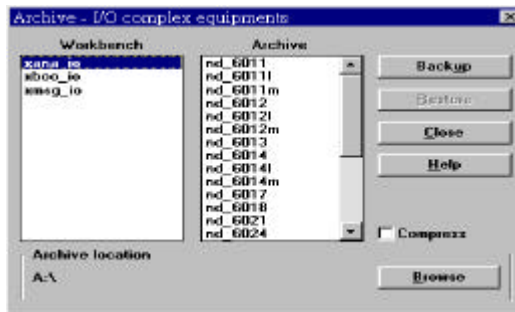
To un-install NDS-ISG ISaGRAF Driver, open the “Control Panel”, double-click “Add/Remove Programs”, select “NDS-ISG/NT” to un-install it.

1.4 Restore NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects in the ISaGRAF Workbench

1.4.1 With ADLink’s “NDS-ISG” diskettes :

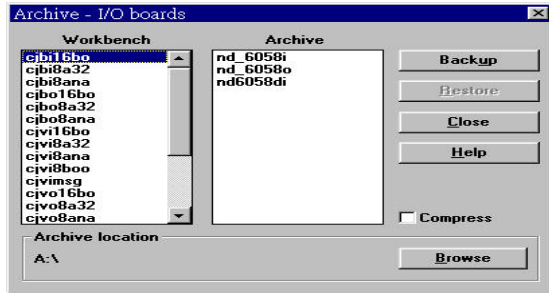
In order to restore NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects, user must follow the procedures:

- step 1.** Place the diskette “NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects” in the 3.5" floppy drive A:.
- step 2.** Open the ISaGRAF Archive Manager Utility for “IO Complex Equipments”.
- step 3.** Click the Restore button, then NDS-ISG ISaGRAF I/O Equipment Object will copy to the ISaGRAF Workbench.



- step 4.** When the copy operation finish, user then click the “Close” button and exit this tool.

step 5. Open the ISaGRAF Archive Manager Utility for “IO Boards”.



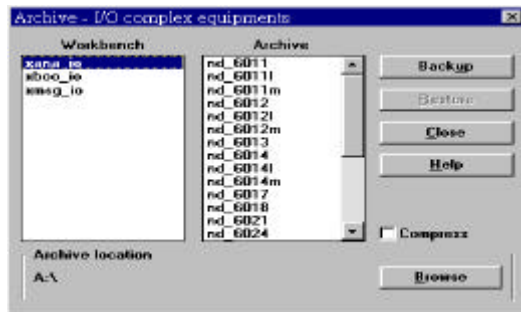
step 6. Click the “Restore” button, then NDS-ISG ISaGRAF I/O Board Object will copy to the ISaGRAF Workbench.

step 7. When the copy operation finish, user click the Close button and exit the ISaGRAF Archive Manager Utility.

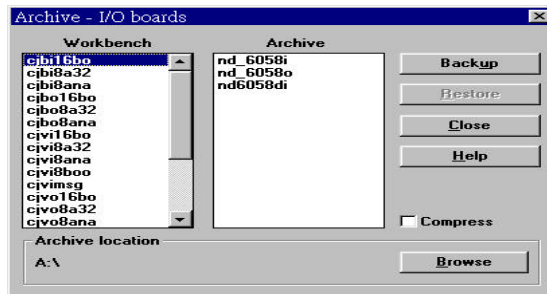
1.4.2 With “ADLink All-In-One Compact Disc”:

In order to restore NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects, user must follow the procedure:

- step 1.** Place “ADLink All-In-One Compact Disc” in the CD-ROM drive.
- step 2.** Open the ISaGRAF Archive Manager Utility for “IO Complex Equipments”.
- step 3.** In the “ADLink All-In-One Compact Disc”, the NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects are located in the “Software\NDS-ISG\ ISaGRAF I/O Board and I/O Equipment Objects” directory, so user has to click the “Browse” button, then assigns the correct directory.



- step 4.** Click the Restore button, then NDS-ISG ISaGRAF I/O Equipment Object will be copied to the ISaGRAF Workbench.
- step 5.** When the copy operation finish, please click the “Close” button and exit this tool.
- step 6.** Open the ISaGRAF Archive Manager Utility for “IO Boards”.
- step 7.** Because in the “ADLink All-In-One Compact Disc”, the NDS-ISG ISaGRAF I/O Board and I/O Equipment Objects are located in the “Software\NDS-ISG\I/O Board and I/O Equipment Objects” directory, so user has to click the “Browse” button, then assigns the correct directory.



- step 8.** Click the Restore button, then NDS-ISG ISaGRAF I/O Board Object will be copied to the ISaGRAF Workbench.
- step 9.** When the copy operation finish, please click the “Close” button and exit the ISaGRAF Archive Manager Utility.

1.5 Restore NDS-ISG ISaGRAF Sample Programs

There are several sample programs provided by NDS-ISG. They could help you to program your own applications by using NDS-ISG ISaGRAF driver easily. The brief descriptions of these programs are specified as follows :

- ND-6011 : The introduction about use ISaGRAF with ND-6011/ND-6011D NDS-ISG driver (Disable Alarm Mode),
- ND-6011L : The introduction about using ISaGRAF with ND-6011/ND-6011D NDS-ISG driver(Enable Alarm LATCH Mode),
- ND-6011M : The introduction about using ISaGRAF with ND-6011/ND-6011D NDS-ISG driver(Enable Alarm MOMENTARY Mode),
- ND-6012 : The introduction about using ISaGRAF with ND-6012/ND-6012D NDS-ISG driver (Disable Alarm Mode),
- ND-6012L : The introduction about using ISaGRAF with ND- 6012/ND-6012D NDS-ISG driver(Enable Alarm LATCH Mode),

ND-6012M : The introduction about using ISaGRAF with ND- 6012/ND-6012D NDS-ISG driver(Enable Alarm MOMENTARY Mode),

ND-6013 : This introduction about using ISaGRAF with ND-6013 NDS-ISG driver,

ND-6014 : The introduction about using ISaGRAF with ND-6014D NDS-ISG driver (Disable Alarm Mode),

ND-6014L : The introduction about using ISaGRAF with ND-6014D NDS-ISG driver(Enable Alarm LATCH Mode),

ND-6014M : The introduction about using ISaGRAF with ND-6014D NDS-ISG driver(Enable Alarm MOMENTARY Mode),

ND-6017 : The introduction about using ISaGRAF with ND-6017 NDS-ISG driver,

ND-6018 : The introduction about using ISaGRAF with ND-6018 NDS-ISG driver,

ND-6021 : The introduction about using ISaGRAF with ND-6021 NDS-ISG driver,

ND-6024 : The introduction about using ISaGRAF with ND-6024 NDS-ISG driver,

ND-6050 : The introduction about using ISaGRAF with ND-6050 NDS-ISG driver,

ND-6052 : The introduction about using ISaGRAF with ND-6052 NDS-ISG driver,

ND-6053 : The introduction about using ISaGRAF with ND-6053 NDS-ISG driver,

ND-6054 : The introduction about using ISaGRAF with ND-6054 NDS-ISG driver,

ND-6056 : The introduction about using ISaGRAF with ND-6056 NDS-ISG driver,

ND-6058 : The introduction about using ISaGRAF with ND-6058 NDS-ISG driver,

ND-6060 : The introduction about using ISaGRAF with ND-6060 NDS-ISG driver,

ND-6063 : The introduction about using ISaGRAF with ND-6063 NDS-ISG driver,

ND-6080 : The introduction about using ISaGRAF with ND-6080 NDS-ISG driver(Counter Mode, Disable Alarm),

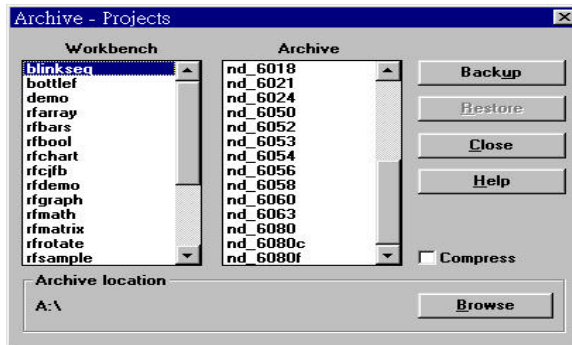
ND-6080C : The introduction about using ISaGRAF with ND-6080 NDS-ISG driver(Counter Mode, Enable Alarm),

ND-6080F : The introduction about using ISaGRAF with ND-6080 NDS-ISG driver(Frequency Mode, Disable Alarm),

1.5.1 With ADLink's "NDS-ISG" diskettes :

In order to restore NDS-ISG ISaGRAF sample programs, user must follow the procedure:

- step 1.** Place the diskette "NDS-ISG ISaGRAF Sample Program" in the 3.5" floppy drive A:.
- step 2.** Open the ISaGRAF Archive Manager Utility for Project.
- step 3.** Select the sample program user want to use, then click the "Restore" button, then NDS-ISG ISaGRAF sample program will be copied to the ISaGRAF Workbench.

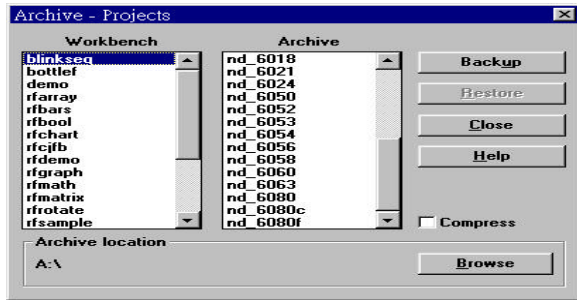


- step 4.** When the copy operation finish, please click the "Close" button and exit this tool.

1.5.2 With "ADLink All-In-One Compact Disc":

In order to restore NDS-ISG ISaGRAF sample program, user must follow the procedure:

- step 1.** Place "ADLink All-In-One Compact Disc" in the CD-ROM drive.
- step 2.** Open the ISaGRAF Archive Manager Utility for Project.
- step 3.** Because in the "ADLink All-In-One Compact Disc", the NDS-ISG ISaGRAF Sample program are located in the "Software\NDS-ISG ISaGRAF Sample program" directory, so user have to click the "Browse" button, then assign the correct directory.
- step 4.** Click the Restore button, then NDS-ISG ISaGRAF sample program will copy to the ISaGRAF Workbench.



step 5. When the copy operation finish, please click the “Close” button and exit this tool.

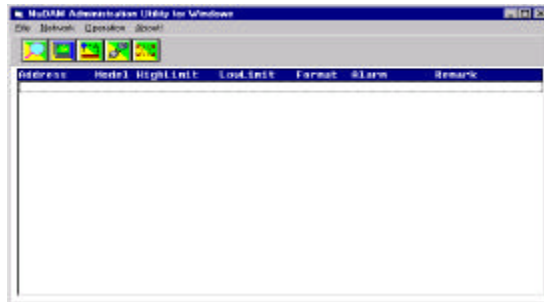
2

Operations with Driver and the ISaGRAF Workbench

2.1 Before Working with the NDS-ISG Driver and the ISaGRAF Workbench

Before working with the NDS-ISG driver and the ISaGRAF Workbench project, user has to do the following procedares:

1. **Configure each NuDAM 6000 Module** : Please use NuDAM Administration utility to set the configuration of each NuDAM 6000 modules. After invokeing this utility and find the modules, please select operation configuration command in menu has to configure each NuDAM module which will be used in the programs. The basic configuration data of each NuDAM module are "Checksum" status,

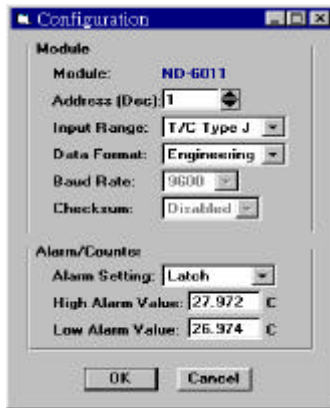


“Baud rate” status and module’s “Address”. The other special configuration data for NuDAM module are described as below :

▪For ND-6011, ND-6012, ND-6014 : The NDS-ISG ISaGRAF drivers support three modes for ND-6011, ND-6012 and ND-6014 module. There are described as below :

- 1.Disable Alarm, Mode : “Alarm Setting” is designed to “Disable”.
- 2.Enable Alarm, LATCH Mode : “Alarm Setting” is designed to “LATCH”.
- 3.Enable Alarm, MOMENTARY mode : “Alarm Setting” is designed to “MOMENTARY”.

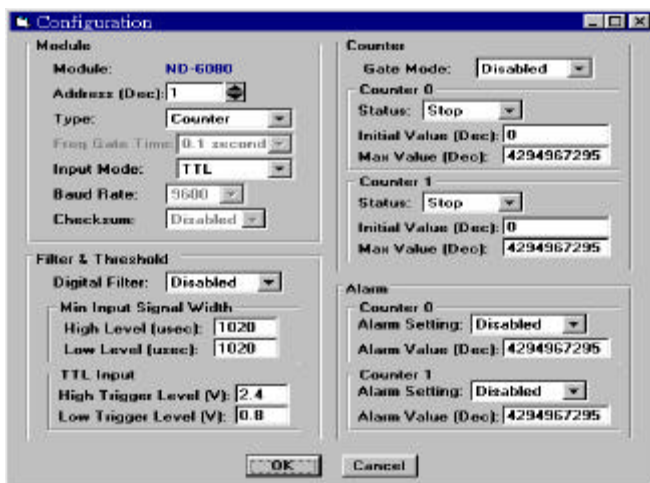
User also has to fill other data items in the “Configuration” dialog box.



▪For ND-6080 : The NDS-ISG ISaGRAF drivers support three modes for ND-6080 module. There are described as below :

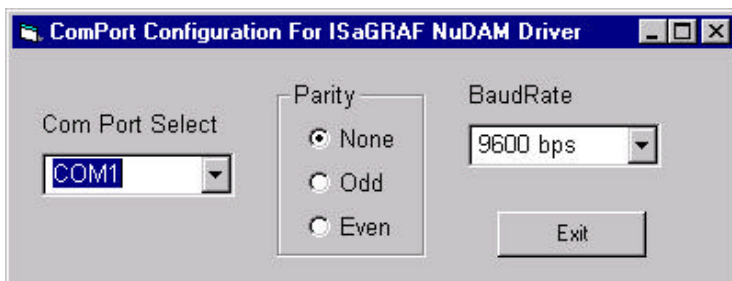
- 1.Disable Alarm , Coanter Mode : “Type” is designed to “Counter”.
“Counter0 Alarm Setting” is designed to “Disable”,
“Counter1 Alarm Setting” is designed to “Disable”.
- 2.Enable Alarm, Counter Mode : “Type” is designed to “Counter”.
“Counter0 Alarm Setting” is designed to “Enable”,
“Counter1 Alarm Setting” is designed to “Enable”.
- 3.Enable Alarm, Frequency Mode : “Type” is designed to “Frequency”.
“Counter0 Alarm Setting” is designed to “Enable”, “Counter1
Alarm Setting” is designed to “Enable”

User also has to fill other data items in the “Configuration” dialog box.



**** All NuDAM module’s “Data Format” item must assign to “engineering” type**

2. **Configuration the COM Port status :** After step 1, user has to execute the “ComConfig.exe” which is located in the NDS-ISG folder. After the program executes, it will open a “Com Port” configuration window, In this window, user has to assign the baud rate and parity status for the COM port which will use in the programs.

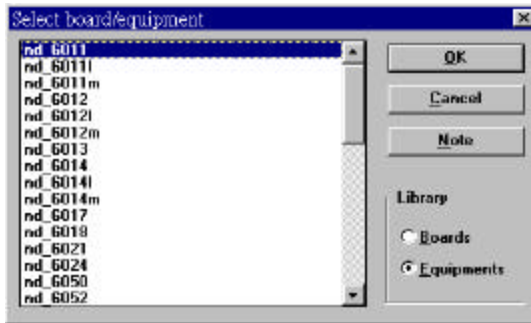


After these procedures, the NuDAM modules and COM ports are configured well. So now we can go to operate the NDS-ISG driver with ISaGRAF system.

2.2 Adding the Driver to the ISaGRAF Workbench

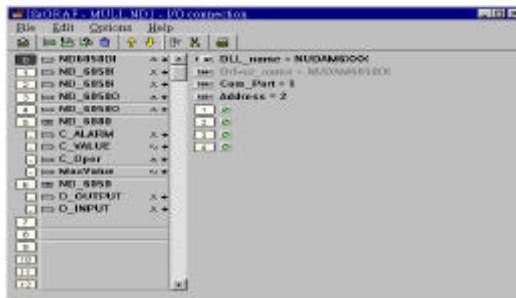
After installing the ADLink NuDAM6000 modules and NDS-ISG ISaGRAF Driver, if users want to use the NDS-ISG ISaGRAF driver and the ISaGRAF to control ADLink NuDAM6000 modules, the procedures are described as below:

1. On the Program Management window, click the “I/O connection” button, then the I/O Connection Editor will appear.
2. On the I/O Connection Editor, choose a empty slot, double click this slot, then Select Board/Equipment dialog box will appear.

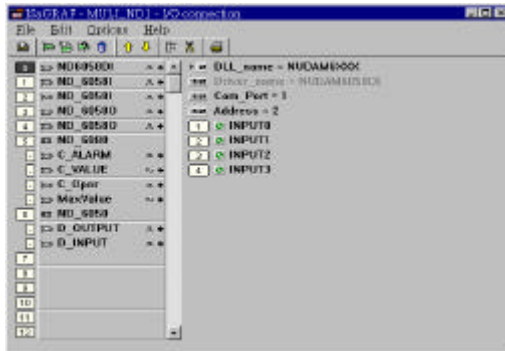


Depending on user's requirement, user can choose Boards type or Equipments type as this project's hardware configuration (In this version, NDS-ISG ISaGRAF driver configures the ND-6058 drivers as the Board type and other modules are as the Equipment type).

3. After user complete the hardware configuration of the project. The I/O Connection dialog box will appear as below. (For example, in this project user defines three modules ND-6058, ND-6050 and ND-6080 as the hardware configuration)



4. Now what user has to do is to connect every modules channels to the project variables.



2.3 Removing the Driver from the ISaGRAF Workbench

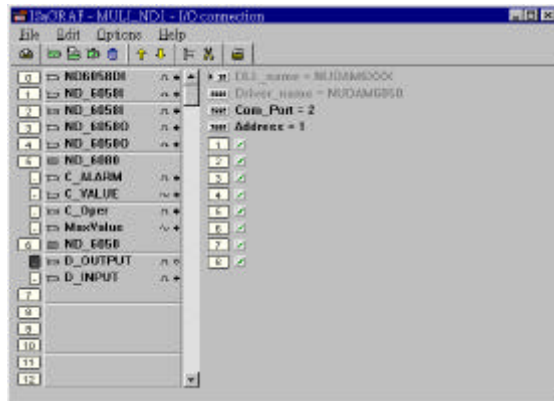
You can remove the driver from the ISaGRAF Project. Any variables that mapped to the I/O points on the Board or Equipment can be deleted as the following procedures:

1. On the Program Management Window, click the “I/O connection” button, then the I/O Connection Editor will appear.
2. On the I/O Connection Editor, select the slot which you want to delete, click this slot, then select “Clear Slot” button. The slot now is empty and the driver is removed.

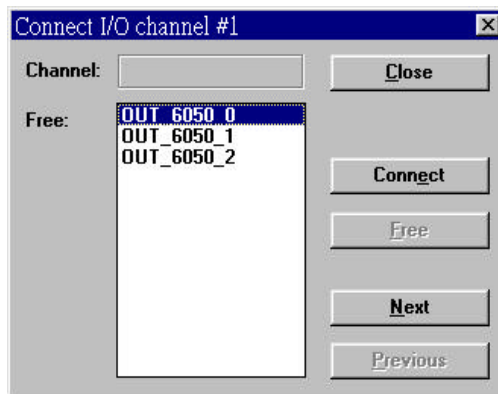
2.4 Assign Module Channel

Because each module can provide different function, the channels that module provide is also different(Depend on module function, it may provide AI(Analog Input), AO(Analog Output), DI(Digit Input) or DO(Digit Output)channels. When user has completed the choice of module for his program, the next step he or she has to do is to assign the modules channels to the variable in the program. The procedures are described as below:

1. On the I/O connection dialog box, user selects a channel of the module which will be assigned to the variable.(For example, user selects the D_Output Channel 1 of the module ND-6050)



2. Then user clicks the channel, Connect I/O Channel dialog box will appear.



3. Now what user has to do is to select a variable in the program. Then the real module channel will connect to the program variable.

