

KEOSOFT

DRIVE NAVIGATOR

CONFIGURATION & DOCUMENTATION SOFTWARE
FOR Siemens AC/DC Drives

Software Manual

~~December 2003~~

Quad Plus, Inc.

Variable Speed Drives and Systems for Industry



The Software is intended to be linked and communicated with high-power, industrial equipment. Only qualified personnel should interface the Software to the aforementioned equipment, and only after becoming familiar with all safety notices, operations, and hazards associated with using the equipment.

Table of Contents

Chapter 1 - Getting Started..... 5

- Welcome to Drive Navigator 5
- System Requirements 6
- System Requirements 6
- Installation Instructions 6
- Starting Drive Navigator 6
- Obtaining an Authorization Code..... 7
- Authorizing Drive Navigator 7
- Demonstration Mode..... 8
- Technical Support 8
- Feedback 9

Chapter 2 - Introduction 10

- Overview 10
- What is a Project?..... 13
- Application Environment 14
 - Menu Bar..... 14
 - Toolbar 23
 - Status Bar 28
 - Project Explorer 28
 - Block List 31
 - Configuration Editor 31
 - Parameter Editor..... 31
- Title Block Organization..... 32

Chapter 3 - Designing a New Application Example 34

Chapter 4 – Documenting an Existing Application Example..... 42

Chapter 5 – Basic Functionality 50

- Drives 50
 - Adding a Drive 50
 - Importing a Drive 50
 - Removing a Drive 51
 - Changing the Drive Name 51
 - Saving the Drive as a Template..... 52
- Engineering Sheets 53
 - Inserting a Sheet 53
 - Removing a Sheet 53
 - Changing a Sheet Name 53
- Blocks..... 54
 - Block List 54
 - Dragging Blocks onto Sheets 55
- Editing Parameters 55

Contents

Lines.....	57
Connecting Lines	57
Deleting Lines	58
Basic Utilities.....	59
Selecting Objects.....	59
Moving Objects.....	59
Removing Objects	59
Cut / Copy / Paste.....	59
Cleaning up the Drawing.....	60
Export to DXF File (AutoCAD).....	61
Chapter 6 – Printing Projects	62
Page Setup.....	62
Changing Sheet Size	62
Changing Title Block Logo.....	62
Print Options	63
Chapter 7 - Communications.....	65
Communication Setup	65
Upload.....	66
Download	66
Communicate with 6RA24 Drive.....	67
Communicate with 6RA70 Drive.....	70
Communicate with 6SE70-CUVC Drive	73
Communicate with 6SE70-CUMC Drive (Compact PLUS).....	76
Communicate with 6SE70-CUMC Drive (Compact / Chassis)	78
Chapter 8 – Moving Authorizations.....	81
Appendix A – Documentation Services	83
Appendix B – Contact Information	84

Chapter 1 - Getting Started

Welcome to Drive Navigator

Welcome to KeoSoft Drive Navigator, an easy to use configuration and documentation tool for digital adjustable speed drives!

Drive Navigator is a PC-based software tool that, together with separately selected drive product databases, provides a user-friendly graphical interface to thousands of sophisticated parameters incorporated into microprocessor-based (digital) adjustable speed drives. The drive parameters are presented in an intuitive block diagram format that enables the user to quickly visualize how the drive parameters combine to affect the operation of the drive.

Presently available drive databases include:

- Siemens 6RA24, SIMOREG DC Drive
- Siemens 6RA70, SIMOREG DC MASTER Drive
- Siemens 6SE70, MASTERDRIVES (CUVC) Vector Controlled AC Drive
- Siemens 6SE70, MASTERDRIVES (CUMC) Motion Controlled AC Drive

With Drive Navigator you can download parameters directly from your drives or import existing configuration files including Simovis, Drive Monitor, and PCin. The ease of downloading and uploading drive configurations reduces the time required to update the drive parameters as well as the time needed to configure custom applications. With Drive Navigator it is easy to produce professional documentation of your drives in A, B, C, or D sizes.

System Requirements

To run Drive Navigator you must meet the following minimum hardware and software requirements:

- Pentium II 233 MHz or higher processor
- Microsoft Windows 98/NT/2000
- 64 MB of RAM (128 MB recommended)
- 150 MB of available hard drive space
- A CD-ROM disk drive
- VGA or higher-resolution color display
(minimum SVGA 800 x 600 recommended)
- Mouse and keyboard
- Internet Explorer

Installation Instructions

Note: Be sure to close all other applications before installing this software.

1. Insert the CD into your CD-ROM drive. The CD has an autoplay feature that will automatically start the installation process. If, for some reason, this feature does not work on your machine, you will need to run the setup program (SETUP.EXE) to begin the installation process.
2. Follow the instructions on your screen.

Starting Drive Navigator

1. Click the **Start** button in the lower-right corner of your screen.
2. Select **Programs** and then find the Program Group Name used when Drive Navigator was installed (the default name is **Drive Navigator**).

You can also create a shortcut to Drive Navigator, and double-click the shortcut.

Obtaining an Authorization Code

Quad Plus Inc. will generate the authorization code for the software once the following information is provided:

- The **Software Serial Number**. This number is located on the product packaging, the CD jewel case, and the inside front cover of the software manual.
- The **Site Code**. This 18-character code is listed on the Drive Navigator splash screen. To display the splash screen, run Drive Navigator and select the **About Navigator...** menu item from the **Help** menu.
- The **User Information** requested below. Alternatively, Drive Navigator can generate a faxable form containing this information—just click on the **Authorize** button located on the splash screen, complete the electronic form, and then click on the **Print** button.

This information can be transmitted to Quad Plus Inc using any of the following methods:

Phone: (815) 740-0860

Fax: (815) 740-0864

Email: support@keosoft.com

An authorization code will be provided once this information is received.

Authorizing Drive Navigator

1. Open the Drive Navigator splash screen. Click on the **Authorize** button followed by the **Enter Authorization** button.
2. Click on the **Enter Authorization** button on the Authorization screen.
3. Enter your authorization code in the space provided. The authorization code is NOT case sensitive. As the authorization code is typed, the cursor will automatically move to next box as needed. Note that only numbers and the letters 'A' to 'F' are used, so '0' is always zero (not the letter 'O') and '1' is always one (not the letter 'I').
4. Once the authorization code is typed click on the **Enter** button.

Chapter 1 – Getting Started

If the authorization code is incorrect, an error message such as "*Site Key Not Valid – Possible Mistype*" will be displayed. Check the authorization code for accuracy and correct any mistakes. If the authorization code continues to generate errors, contact Product Support for assistance.

5. Once the authorization code is accepted, the splash screen will appear will appear with the license information listed beneath the site code. Click on the **OK** button to begin using Drive Navigator.

To display the splash screen, run Drive Navigator and select the **About Navigator...** menu item from the **Help** menu.



Important: Using Norton Speed Disk to de-fragment your hard disk will damage the authorization code files. The effected files are *drivenav.rst*, *drivenav.ent*, *drivenav.41s*, and *drivenav.key*. To prevent this, configure Norton Speed Disk so that it does not move these files.

Demonstration Mode

When Drive Navigator is initially installed, a 60-day demonstration license will be generated by default. This demo license contains all the features of the licensed version, with the exception of printing, saving, and downloading to a drive. You can, however, upload drive configurations from the drive and view them in the Drive Navigator graphical format.

The demonstration license is granted only once per computer. All future installations of the software on a particular computer will not generate a new demonstration license.

Technical Support

For assistance with the installation and configuration of Drive Navigator, please call KeoSoft Technical Support at (815) 740-0860. For best service, please be at the computer with the Drive Navigator software.

Feedback

Comments or suggestions of possible improvements to the software and/or manual are appreciated and may be sent to the following addresses:

Phone:

815-740-0860

Fax:

815-740-0864

Email:

support@keosoft.com

Standard Mail:

Quad Plus, Inc.
PO Box 186
New Lenox, IL 60451
Attn: Keosoft Support

Chapter 2 - Introduction

Overview

Drive Navigator presents the configuration of a drive in an intuitive block diagram format. This provides the user with a much broader understanding of the drive configuration than can be obtained from only a list of parameters and their values. The block diagram is composed of:

- Function Blocks
- Connectors
- Binectors (DC MASTER and MASTERDRIVE)
- Binary Input Functions (SIMOREG 6RA24 Only)
- Binary Output Functions (SIMOREG 6RA24 Only)
- Parameters
- Terminal Blocks

Function Blocks

Most of the available drive functions, especially the open- and closed-loop control structures, are represented by function blocks. These blocks can be grouped together by their relationship to one another, with the relationships shown by lines connecting the various blocks. By grouping and connecting the blocks you can view the drive configuration similar to a circuit diagram for an analog circuit.

In addition to the function blocks for basic drive functions, such as the speed controller, there are also several general purpose function blocks such as adders, multipliers, inverters, and so on, that can be freely configured to create custom functions. The free configurability of the function blocks provides an easily way to implement custom functions for special applications.

Connectors

The connectors represent the points on the block diagram where the internal virtual connection between blocks is made. All of the signals that are available as digital values in memory are available as connectors. The signals that can be represented by connectors are analogous to the measurement points of an analog circuit. Each connector is identified by a unique connector number--“Kxxxx” for single words and “KKxxxx” for double words.

Binectors (DC MASTER and MASTERDRIVE)

All binary functions (inputs and outputs) are designated as binectors. Each binector is identified by a unique binector number, “Bxxxx”.

Binary Input Functions (SIMOREG 6RA24)

Binary input functions are special switch inputs that are either on or off. In this way they are similar to input control bits. Each binary input function is identified by a unique number, “BIFxx”.

Binary Output Functions (SIMOREG 6RA24)

Binary output functions indicate the status of a binary switch. They are similar to output status bits and can be assigned to one of the four output terminals. Each binary output function is identified by a unique number, “BOFxx”.

Parameters

Parameters are the settings that define the drive configuration. All drive controller adjustments, configuration settings, and measurements are performed by setting the appropriate parameter values.

In the block diagram representation, the parameters tell the function blocks where to get their values: from a connector (Kxxxx), from a binector (Bxxxx), from a binary input function (BIFxx), from a binary output function (BOFxx), or from a fixed value. Each parameter is identified by a unique parameter number:

	<u>SIMOREG 6RA24</u>	<u>DC MASTER and MASTERDRIVES</u>
Read Only	Pxxx.x	rxxx.x or nxxx.x
Read Write	Pxxx.x	Pxxx.x or Uxxx.x

Terminal Blocks

The terminal blocks are the real-world physical connections and correspond directly to the low voltage control terminals available on the drive itself. Each of the control terminals is identified by a unique terminal number:

<u>SIMOREG 6RA24</u>	<u>DC MASTER and MASTERDRIVES</u>
TB1.1 to TB1.26	X101.1 to X101.12
TB2.27 to TB2.52	X102.13 to X102.22
TB3.53 to TB3.70	X103.23 to X103.30

What is a Project?

The block diagrams for a collection of drives are grouped into a unit referred to as a *Project*. The drive collection can be multiple drives of the same type (i.e. – all 6RA24 DC drives) or a mixture of drives (i.e. – some 6RA24 and some 6SE70). It is denoted by a file folder icon at the top level of the *Project Explorer*.

The Project Reference Sheet is common to the entire project and serves as a cover sheet for the project documentation. It contains basic information about the project such as the project details, end-user/company information, and supplier information, as well as a list of all the drawings contained in the project. Some of the data on this sheet are maintained automatically, while other data can be modified by selecting the **Project** menu item from the **Definitions** menu on the *Menu Bar*.

The project consists of several “sheets” of documentation, many of which are unique to each drive in the project. *Reference Sheets (Rxx)* are common to the entire project and serve as cover sheets for the project documentation. They contain basic information about the project such as project configuration details, end-user/company information, and supplier information, as well as a list of all the drawings contained in the project.

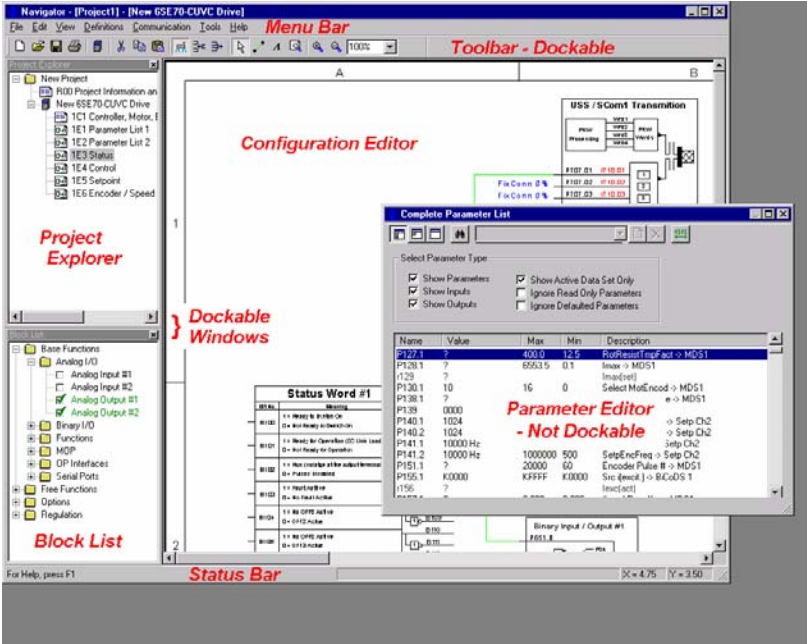
Configuration Sheets are unique to each drive and serve as a summary of the drive configuration. Some of the information displayed on these sheets includes motor information, Binary I/O definitions and Analog I/O definitions.

Engineering Sheets are also unique to each drive and contain the block diagram drawings that provide a graphical view of the drive configuration.

To view a sheet, simply click on the desired sheet listed in the *Project Explorer*. The corresponding sheet details will be loaded in the *Configuration Editor*. The information of each sheet is editable to various degrees, depending on the sheet type.

Application Environment

The Drive Navigator interface consists of a main window divided into several sections. This main window is known as the *Application Window* and is the workspace in which the drive configuration is viewed and edited. It consists of a Menu Bar, a Toolbar, a Status Bar, a Project Explorer, a Block List, Configuration Editor, and a Parameter Editor.



Menu Bar

The Menu Bar resides at the top of the application window and lists the commands available for use in Drive Navigator. In addition to the standard File, Edit, View, Tools, and Help menus, additional menus specific to Drive Navigator are included. The Menu bar is visible any time the application is open. The following sections describe the menu items in detail.

File Menu Functions

These menu items provide project and file system functionality.

File → **N**ew Project...

Select this command to start a new project. The currently open project will be closed with the option to save changes, and the *New Project* window will appear.

File → **O**pen...

Select this command to open an existing project. The currently open project will be closed with the option to save changes, and the *Open Project* window will appear. Use this window to locate and open the file of interest.

File → **C**lose

Select this command to close the current project. The currently open project will be closed with the option to save changes.

File → **S**ave

Select this command to save the project with the existing project name.

File → **S**ave **A**s...

Select this command to save the project with a new name or in a new location. The *Save As* window will appear when this option is selected.

File → **S**ave **A**s **T**emplate...

Select this command to save one of the drives in the current project as a drive template. Drive templates represent a library of applications that can be used to create new drives in projects.

Refer to [Saving the Drive as a Template](#) on page 52 for more information.

Chapter 2 - Introduction

File → **Export Drawings...**

Select this command to save the project diagrams as a set of DXF files. The DXF format is supported by most CAD programs including AutoCAD.

Refer to [Export to DXF File \(AutoCAD\)](#) on page 61 for more information.

File → **Add Drive...**

Select this command to add a new drive from a template. The list of templates includes default applications provided by KeoSoft and any templates created by the user.

Refer to [Adding a Drive](#) on page 50 for more information.

File → **Import Drives...**

Select this command to add a new drive and import parameters from a separate PCin, Simovis, or Drive Navigator file.

Refer to [Importing a Drive](#) on page 50 for more information.

File → **Page Setup...**

Select this command to view the *Page Setup* window. This window contains settings for the logo used in the title block and the sheet size of the project.

Refer to [Page Setup](#) on page 62 for more information.

File → **Print...**

Select this command to print the project diagrams. Several printing options are available.

Refer to [Print Options](#) on page 63 for more information.

File → **R**ecent projects

This section of the **File** menu displays a list of the four most recently accessed project files. Select any project from this list to open it.

File → **E**xit

Select this command to close the current project and exit Drive Navigator. If any unsaved changes exist in the current project, an opportunity will be provided to save them.

Edit Menu Functions

These menu items provide a set of project editing commands.

Edit → **C**ut

Edit → **C**opy

Edit → **P**aste

Select these commands to perform cut, copy, and paste operations. Blocks, lines, and text can be copied/moved to a different drive or to a different sheet of the same drive.

Refer to [Cut / Copy / Paste](#) on page 59 for more information.

Edit → **E**dit Parameters...

Select this command to open the *Parameter Edit* window. This window displays all the parameters in the current drive and provides a way to edit parameter values.

Refer to [Editing Parameters](#) on page 55 for more information.

Edit → **I**nsert New Sheet

Select this command to insert a blank Engineering Sheet immediately in front of the currently selected sheet. Existing Engineering Sheets are renumbered accordingly.

Chapter 2 - Introduction

Edit → **R**emove Sheet

Select this command to permanently remove the currently selected Engineering Sheet. Existing Engineering Sheets are renumbered accordingly.

Edit → **R**emove Drive

Select this command to permanently remove the currently selected drive from the project.

View Menu Functions

These menu items change how the project is displayed.

View → **P**arameter Sets

The parameters in the drives are grouped into different parameter sets. The number and type of these groups depends on the type of drive, and include the following:

- Parameter Data Sets (PDS)
- Function Data Sets (FDS)
- Motor Data Sets (MDS)
- BICO Data Sets (BDS)

Use this menu item to select the desired parameter set(s) for the current editing session. A checkmark is placed in the menu beside the active parameter set.

View → **B**lock List

Select this command to toggle the visibility of the *Block List* window. This window lists all the blocks available to the current drive. A checkmark is placed beside this menu item when the *Block List* window is visible.

Refer to [Block List](#) on page 54 for more information.

View → **Project Explorer**

Select this command to toggle the visibility of the *Project Explorer* window. This window provides a hierarchical view of the current project and is used to select the sheet displayed in the *Configuration Editor*. A checkmark is placed beside this menu item when the *Project Explorer* window is visible.

Refer to [Project Explorer](#) on page 28 for more information.

View → **Status Bar**

Select this command to toggle the visibility of the *Status Bar*. A checkmark is placed beside this menu item when the *Status Bar* window is visible.

Refer to [Status Bar](#) on page 28 for more information.

View → **Toolbar**

Select this command to toggle the visibility of the *Toolbar*. A checkmark is placed beside this menu item when the *Toolbar* is visible.

Refer to [Toolbar](#) on page 23 for more information.

View → **Zoom In**

Select this command to increase the viewing scale to the next higher setting. The zoom settings are Fit, 50%, 75%, 100%, 150%, and 200%. When this command is selected, the *Configuration Editor* window will center on any selected objects when zooming. If no objects are selected, then the *Configuration Editor* window will center on the middle of the screen.

Chapter 2 - Introduction

View → **Zoom Out**

Select this command to decrease the viewing scale to the next lower setting. The zoom settings are 200%, 150%, 100%, 75%, 50%, and Fit. When this command is selected, the *Configuration Editor* window will center on any selected objects when zooming. If no objects are selected, then the *Configuration Editor* window will center on the middle of the screen.

View → **Fit In Window**

Selection of this command sets the magnification to a value that allows the entire drawing to fit in the *Configuration Editor* window.

Definitions Menu Functions

These menu items provide access to various Definition windows. These windows provide a simplified interface to certain functions in the drive. The list of available screens and their contents depend on the currently selected drive in the *Project Explorer* window.

Definitions → **Project**

Select this command to open the *Project Definition* window. This window provides fields for Project Information, Supplier Information, and End User / OEM Information. This information is displayed on the Reference Sheet (Rxx).

Definitions → **Base Drive Setup**

Select this command to open the *Base Drive Setup* window. This window provides fields relating to Controller and Motor Information. Some of this information is displayed on the Controller Sheets (xCx), while other information is used to determine the values of some parameters.

Definitions → **Base Drive I/O Setup**

Select this command to open the *Base Drive I/O Setup* window. This window provides fields relating to the Analog and Binary Inputs and Outputs. Some of this information is displayed on the Controller Sheets (xCx), while other information is used to determine the values of some parameters.

Definitions → **Base Drive Com Setup**

Drive Dependant Windows

Select this command to edit drive communication functions. The windows listed in the *Base Drive Com Setup* menu depend on the currently selected drive, and may include fields for serial ports, CB/TB, SCB, and/or SIMOLINK communication.

Communication Menu Functions

Communication → **Setup...**

Communication → **Upload (Read)** → **All Parameters**

Communication → **Upload (Read)** → **Changes Only**

Communication → **Download (Write)** → **Write to RAM**

Communication → **Download (Write)** → **Save to EEPROM**

Select these commands to access the communication functions of Drive Navigator.

Refer to [Section VII –Communications](#) on page 65 for more information.

Please note that the SIMOREG 6RA24 drive does not have the capability of uploading changes only (menu item will be disabled when active drive is of this type).

Chapter 2 - Introduction

Tools Menu Functions

These menu items provide a set of *Configuration Editor* tools.

Tools → **Select Tool**

The Select Tool (arrow) is the most commonly used tool. With it, you can select specific sheets to view, position objects in the *Configuration Editor* window, and so on. Selected objects are denoted with a red box surrounding the object, or the object itself may turn red (such as a selected line, for example). Multiple objects can be selected by drawing a dashed box around them with the Select Tool.

If the SHIFT key is pressed while selecting objects (individually or in groups), any new objects are added to the currently selected group.

Refer to [Selecting Objects](#) on page 59 for more information.

Tools → **Line Tool**

The Line Tool (crosshairs) is used to connect two blocks together. To draw a line, click on an Output of a Function (a RED BOX will appear while hovering over the edge of the block indicating the correct spot) and drag the line to the Input of the target Function (another RED BOX will appear indicating the correct spot). Clicking while dragging the line will insert an anchor in the line, allowing line direction to change by 90 degrees.

Refer to [Connecting Lines](#) on page 57 for more information.

Tools → **Text Tool**

The Text Tool (I-beam) is used to insert comments into the *Configuration Editor* window. Simply click on the sheet displayed in the window, then type the desired text. Clicking on existing text with this tool will allow the text to be modified.

Tools → **Zoom Tool**

The Zoom Tool (magnifying glass) is used to magnify the *Configuration Editor* window. Use the tool to draw a BOX around a group of objects, and the window will zoom to scale that displays only the selected objects. The

highest zoom factor available is 200%. If the area selected by the BOX would require a greater magnification, the window will be displayed at 200% centered on the middle of the BOX.

Tools → **Auto Line Reconstruct**

Select this command to toggle the Auto Line Reconstruct feature. When it is on, connecting lines will be redrawn using a standard algorithm after blocks are selected or moved.

This function is especially useful when cleaning up a drawing from a drive that was imported from a Simovis or PCin file, or uploaded directly from the drive.

Help Menu Functions

Help → **Online Help**

Select this command to display the online manual for Drive Navigator.

Help → **About Navigator**

Select this command to display the Drive Navigator splash screen, which contains information about the software revision and authorization. The splash screen is also used to transfer licenses and print registration information.

Toolbar

When enabled, the Toolbar resides near the top of the application window, directly below the *Menu Bar*. It provides quick access to commonly used commands. Click once on the appropriate button in the Toolbar to carry out the action represented by that button. The Toolbar can be toggled on and off by selecting the **Toolbar** menu item in the **View** menu. A checkmark is placed beside this menu item when the *Toolbar* is visible.

The Toolbar is a dockable toolbar. This means that it can be attached to any of the four sides of the application window by clicking on the toolbar handle and dragging it to another location (the toolbar handle is a small

Chapter 2 - Introduction

vertical line at the left end of the toolbar). It can also be pulled out of the application window and displayed as a separate window.

The Toolbar contains the following buttons:



New Project

Click this button to start a new project. The currently open project will be closed with the option to save changes, and the *New Project* window will appear. This button performs the same function as the *File → New Project* command on the *Menu Bar*.



Open

Click this button to open an existing project. The currently open project will be closed with the option to save changes, and the *Open Project* window will appear. Use this window to locate and open the file of interest. This button performs the same function as the *File → New* command on the *Menu Bar*.



Save

Click this button to save the project with the existing project name. This button performs the same function as the *File → Save* command on the *Menu Bar*.



Print

Click this button to print the project diagrams. Several printing options are available. This button performs the same function as the *File → Print* command on the *Menu Bar*.

Refer to [Print Options](#) on page 63 for more information.



Add Drive

Click this button to add a new drive from a template. The list of templates includes default applications provided by KeoSoft and any templates

created by the user. This button performs the same function as the *File* → *Add Drive* command on the *Menu Bar*.

Refer to [Adding a Drive](#) on page 50 for more information.



Cut



Copy



Paste

Click these buttons to perform cut, copy, and paste operations. Blocks, lines, and text can be moved/copied to a different drive or to a different sheet of the same drive. These buttons perform the same functions as the commands in the *Edit* menu of the *Menu Bar*.

Refer to [Cut / Copy / Paste](#) on page 59 for more information.



Reconstruct Lines

Click this button to toggle the Auto Line Reconstruct feature. When it is on, connecting lines will be redrawn using a standard algorithm after blocks are selected or moved. This button performs the same function as the *Tools* → *Auto Line Reconstruct* command on the *Menu Bar*.



Insert New Sheet

Click this button to insert a blank Engineering Sheet immediately in front of the currently selected sheet. Existing Engineering Sheets are renumbered accordingly. This button performs the same function as the *Edit* → *Insert New Sheet* command on the *Menu Bar*.



Remove Sheet

Click this button to permanently remove the currently selected Engineering Sheet. Existing Engineering Sheets are renumbered accordingly. This button performs the same function as the *Edit* → *Remove Sheet* command on the *Menu Bar*.



Select Tool

Click this button to make the Select Tool (arrow) active. With it, you can select specific sheets to view, position objects in the *Configuration Editor* window, and so on. Selected objects are denoted with a red box surrounding the object, or the object itself may turn red (such as a selected line, for example). Multiple objects can be selected by drawing a dashed box around them with the Select Tool.

If the SHIFT key is pressed while selecting objects (individually or in groups), any new objects are added to the currently selected group. This button performs the same function as the *Tools* → *Select Tool* command on the *Menu Bar*.

Refer to [Selecting Objects](#) on page 59 for more information.



Line Tool

Click this button to make the Line Tool (crosshairs) active. This tool is used to connect two blocks together. To draw a line, click on an Output of a Function (a RED BOX will appear while hovering over the edge of the block indicating the correct spot) and drag the line to the Input of the target Function (another RED BOX will appear indicating the correct spot). Clicking while dragging the line will insert an anchor in the line, allowing line direction to change by 90 degrees. This button performs the same function as the *Tools* → *Line Tool* command on the *Menu Bar*.

Refer to [Connecting Lines](#) on page 57 for more information.



Text Tool

Click this button to make the Text Tool (I-beam) active. This tool is used to insert comments into the *Configuration Editor* window. Simply click on the sheet displayed in the window, then type the desired text. Clicking on existing text with this tool will allow that text to be modified. This button performs the same function as the *Tools* → *Text Tool* command on the *Menu Bar*.



Zoom Window Tool

Click this button to make the Zoom Tool (magnifying glass) active. This tool is used to magnify the *Configuration Editor* window. Use the tool to draw a BOX around a group of objects, and the window will zoom to scale that displays only the selected objects.

The highest zoom factor available is 200%. If the area selected by the BOX would require a greater magnification, the window will be displayed at 200% centered on the middle of the BOX. This button performs the same function as the *Tools → Zoom Tool* command on the *Menu Bar*.



Zoom in

Click this button to increase the viewing scale to the next higher setting. The zoom settings are Fit, 50%, 75%, 100%, 150%, and 200%. When this command is selected, the *Configuration Editor* window will center on any selected objects when zooming. If no objects are selected, then the *Configuration Editor* window will center on the middle of the screen. This button performs the same function as the *View → Zoom In* command on the *Menu Bar*.



Zoom out

Click this button to decrease the viewing scale to the next lower setting. The zoom settings are 200%, 150%, 100%, 75%, 50%, and Fit. When this command is selected, the *Configuration Editor* window will center on any selected objects when zooming. If no objects are selected, then the *Configuration Editor* window will center on the middle of the screen. This button performs the same function as the *View → Zoom Out* command on the *Menu Bar*.



Sheet size

Click on the arrow to display a list of the available zoom levels. Select the desired magnification to apply it to the sheet that is currently active in the *Configuration Editor*. A custom magnification between 50% and 200% can also be selected by typing the value in the text area of the control.

Status Bar

The Status Bar resides at the bottom of the application window and provides information about the current status of the project, including the currently selected object name, connector descriptions, and the cursor position. The Status Bar can be enabled and disabled by selecting the **Status Bar** menu item on the **View** menu. A checkmark is placed beside this menu item when the Status Bar is visible.

The *Help Message Box* occupies the left section of the Status Bar. It displays useful information about items in the *Menu bar* and *Toolbar* as they are selected with the Select Tool.

The section of the Status Bar to the right of the *Help Message Box* is the *Status Message Box*. It is used to display the name of the object (e.g., function block or connection) that the Select Tool or Line Tool is currently hovering over.

To the right of the *Status Message Box* are the boxes for the *X Coordinate* and *Y Coordinate* of the mouse pointer. The coordinates are relative to the upper left corner of the drawing and are displayed in centimeters.

Project Explorer

The Project Explorer window occupies the upper-left pane of the *Application Window* by default. It provides a hierarchical view of the entire project and is used to navigate between the different components of the project. Clicking on a component listed in the Project Explorer will open a detailed view of it in the *Configuration Editor*.

The Toolbar is a dockable window. This means that it can be attached to any of the four sides of the *Application Window* by clicking on the title bar and dragging it to another location (the title bar is the thin box at the top containing the text “Project Explorer”). It can also be pulled out of the application window and displayed as a separate window.

The project is arranged in the *Project Explorer* according to the following hierarchy:

- Project Name
 - Reference Sheets
- Drive Name #1
 - Controller Sheets
 - Engineering Sheets
- Drive Name #2
 - Controller Sheets
 - Engineering Sheets
- Drive Name #3...

Project Name

The top level of the hierarchy is the Project Name. It can be modified by clicking on selecting the **Project** menu item from the **Definitions** menu on the *Menu Bar*. Simply modify the Project Name field and click the **OK** button.

Immediately below the Project Name is the *Reference Sheet* (R00), named “*Project Information and Drawing Contents*”.

Reference Sheets (Rxx)

The Project Reference Sheet is common to the entire project and serves as a cover sheet for the project documentation. It contains basic information about the project such as the project details, company information, and supplier information, as well as a list of all the drawings contained in the project. Some of the data on this sheet are maintained automatically, while other data can be modified by selecting the **Project** menu item from the **Definitions** menu on the *Menu Bar*.

There is initially only one Reference Sheet, R00 in a new project. As more drives are added to the project, additional sheets (R01, R02...) are added to provide as needed to provide additional space for their information.

Chapter 2 - Introduction

Drive Name

Located under the Project Name are listed each of the drives in the project. The top level for each drive is the Drive Name which can be changed by **Base Drive Setup** menu item from the **Definitions** menu on the *Menu Bar*. Simply modify the Drive Name field and click the **OK** button. Alternatively, clicking on Drive Name in the *Project Explorer* while it is highlighted will open the Drive Name for in-place editing.

Listed under each of the drives are the Configuration Sheets (xCx) and the Engineering Sheets (xEx) associated with that drive.

Configuration Sheets (xCx)

Each drive in the project has at least one *Configuration Sheet*. They serve as a summary of the drive configuration and may be edited by using the menu items from the **Definitions** menu on the *Menu bar*. Some of the information displayed on these sheets includes motor information, Binary I/O definitions and Analog I/O definitions.

The Configuration Sheets are uniquely identified by a three-character labeling scheme. The first character identifies the drive number within the project. When the first drive is created, the sheets for that drive are designated as 1xx. If a second drive is added its sheets are designated as 2xx, and so on. Drives are numbered sequentially from top to bottom as listed in the *Project Explorer*, and this number may change as drives are inserted into and removed from the project.

The second character, 'C', identifies the sheet as a Configuration Sheet, while the last character is determined by the number of Configuration Sheets for that drive. For example, the first Configuration Sheet for drive 1 is labeled 1C1. The second Configuration Sheet for drive 1 is 1C2, and so on.

Engineering Sheets (xEx)

The first Engineering Sheet for each drive (sheet xE1) contains a list of all the non-defaulted parameters for that particular drive. The remainder of the parameters can be accessed through the objects on the remaining Engineering Sheets. These sheets contain the block diagram drawings that provide a graphical view of the drive configuration. They are primarily used to configure and view the parameters of the associated drives.

The Engineering Sheets are also uniquely identified by three-character labels. The only difference between the labeling mechanism for these sheets and the Configuration Sheets is the second letter, which is an 'E' in this case.

These sheets can be renamed by clicking the Engineering Sheet name in the *Project Explorer* while it is highlighted.

Block List

The Block List occupies the lower-left pane of the *Application Window* by default. It provides a list of all blocks available in the current drive and is organized by category. Double-click on any of the components listed in the Block List to open the *Parameter Edit Screen* for that particular block.

The Block List, like the *Project Explorer*, is also a dockable window. Refer to [Block List](#) on page 54 for more information.

Configuration Editor

The Configuration Editor normally occupies the right pane of the application window. It is the main work area and is where the actual editing of the drive configuration is performed. Selecting a sheet in the *Project Explorer* will load the block diagram for that sheet into the Configuration Editor.

Parameter Editor

The Parameter Editor window provides access to view and modify parameter values. It can be accessed by double-clicking a block on an Engineering Sheet with the Select Tool or selecting the **Edit Parameters...** menu item from the **Edit** menu on the *Menu bar*. When Drive Navigator is online with the drive, changes are written directly to the drive instead of the project sheets.

Refer to [Parameters, Editing](#) on page 55 for more information.

Title Block Organization

At the bottom border of every sheet in the project is the Title Block. The Title Block provides key information about the sheet, which varies depending on the individual sheet being viewed. The type of information included is detailed in the following sections.

Firmware Revision

This information is displayed on Engineering and Controller Sheets, and may vary between drives. This information is not applicable on Reference Sheets.

Revision History

This section of the Title Bar provides boxes for up to seven notes that can be used to indicate changes to the project or to a particular drive.

The *Revision History* boxes on the Reference Sheets indicate changes made to the project.

The *Revision History* boxes on any of the other sheets indicate changes made to the associated drive. The information in these boxes is the same for all sheets associated with a particular drive. Each drive can have its own revision history.

Controller Section

The *Controller Section* provides information about the drive controller. The information in this box varies depending on the sheet type.

On Reference Sheets the first line of this section displays the project name. The project name is identical for all sheets.

On all other sheets the first line of this section displays the project name followed by the controller name. The information on this line is the same for all sheets associated with a particular drive.

The second line of information in the *Controller Section* always displays the name of the drawing sheet. This name can only be changed on Engineering Sheets. The *Controller Section* on Engineering Sheets also

contains a third line that is user definable. Simply click on the third line to add text.

The upper right corner of the *Controller Section* displays the *Active Parameter Set* that is documented by this set of drawings. The *Parameter Set* is changed by selection the **Parameter Sets** menu item from the **View** menu on the *Menu Bar*. The list of available parameter sets depends on the type of the currently selected drive. This information is identical for all sheets associated with a particular drive.

Date

Two boxes are available for date information. They are identical for all sheets.

Engineer

Two boxes are available for project engineer names. They are identical for all sheets.

Logo

The logo of the company providing the drawing set is shown and is identical for all sheets. The logo can be set by selecting the **Page Setup...** menu item from the **File** menu on the *Menu Bar*.

Drawing Number

The drawing number can be edited and is identical for all sheets.

Sheet Number

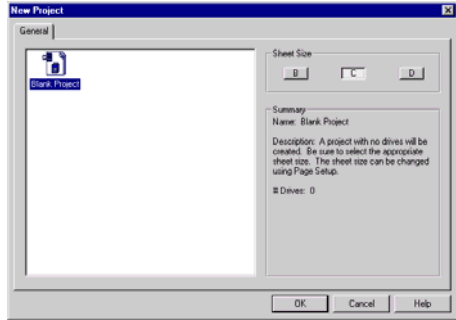
The *Sheet #* is generated automatically by Drive Navigator and cannot be changed. The information in this box is unique to each sheet and is intended as a suffix to the Drawing Number.

Chapter 3 - Designing a New Application Example

Step #1. – Create Project

From the **File** Menu, select **New Project** (Ctrl+N) to create a new project. Select **B** as the sheet size.

Selecting larger sheet sizes depends on your printing capabilities. More blocks can be displayed on larger sheets, but once scaled to the printer's physical sheet size, the blocks maybe too small to read.

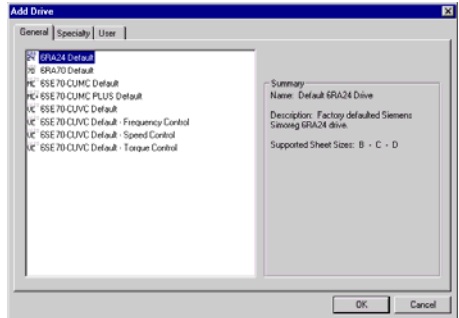


Select a Project Template (such as “Blank Project”). Click on **OK** to create your blank project.

Step #2. – Add a Drive

From the **File** Menu, select **Add Drive** (Ctrl+D) to add a new drive.

Select a Drive Template (such as “6RA24 Default”). If your version of Drive Navigator does include the 6RA24 database, this option will not be shown. Please select from one of the available drives.



Click on **OK** to add the drive to your project.

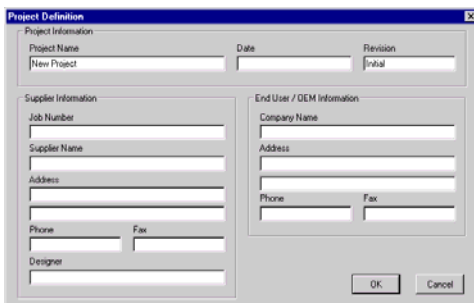
Step #3. – Define the Project

From the **Definitions** Menu, select **Project** to display the Project Definition Template.

Enter the appropriate data.

Click **OK** to update the changes to the project information.

This information will be displayed on Reference Sheet #R00.



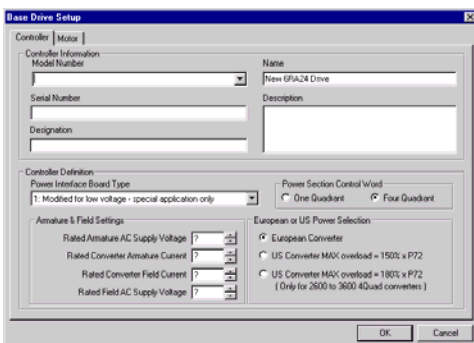
Step #4. – Define Controller and Motor

From the **Definitions** Menu, select **Base Drive Setup**.

Enter the name of the controller, serial number, and other desired information.

Click **OK** to update the changes.

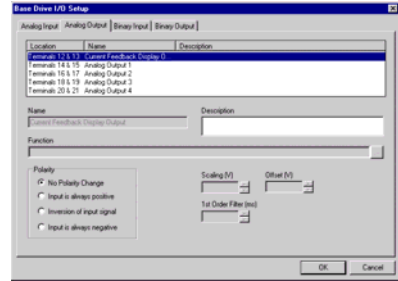
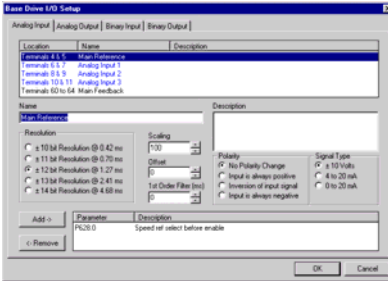
This information will be displayed on the Controller Sheets (xCx) and some parameters will be changed.



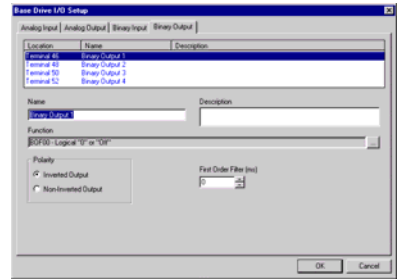
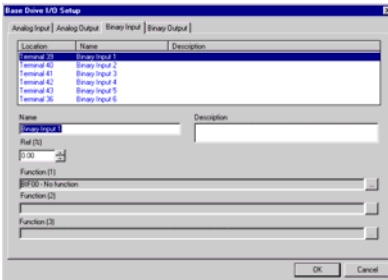
Chapter 3 - Designing a New Application Example

Step #5. – Define Analog and Binary I/O

From the **Definitions** Menu, select **Base Drive I/O Setup**. Fill in name and function information for the Analog I/O.



Fill in name and function information for the Binary I/O

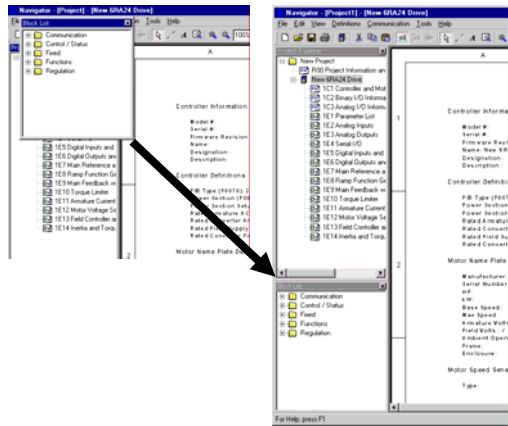


Click **OK** to update the changes.

This Information will be displayed on the Controller Sheets (xCx) and some parameters will be changed.

Step #6a. – View and Expand the Block List

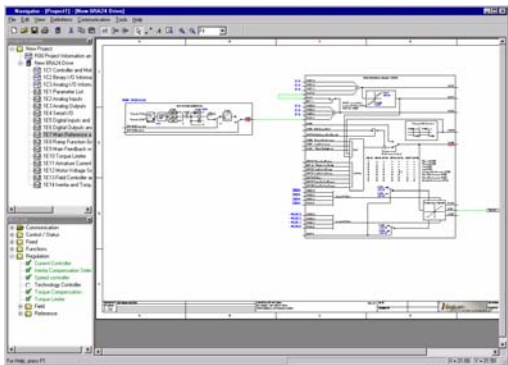
From the **View** Menu, select **Block List** to display a list of available blocks in the drive. The *Block List* can be dragged and docked below the *Project Explorer*.



Step #6b.

From the *Project Explorer*, click on **1E7 – Main Reference and Reference Select**. In this example we will connect the Technology Controller to the main setpoint of the Setpoint Channel.

Expand the Regulation folder in the *Block List* to display all regulation functions available to the 6RA24.

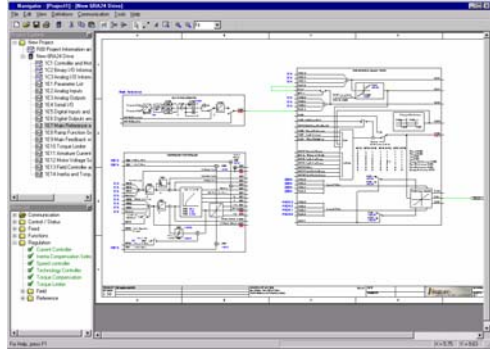


Chapter 3 - Designing a New Application Example

Step #7. – Add a Function to Sheet

Click on Technology Controller, drag it onto the *Configuration Editor* and drop it onto the engineering sheet.

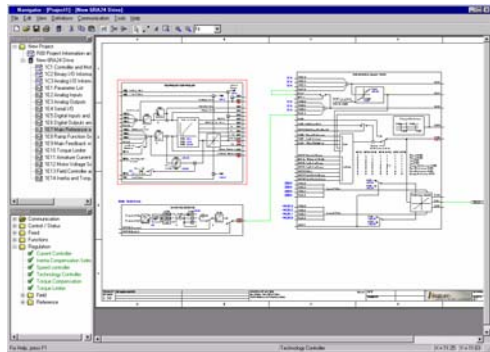
Blocks can only be dragged on engineering sheets (xEx).



Step #8. – Rearrange Blocks

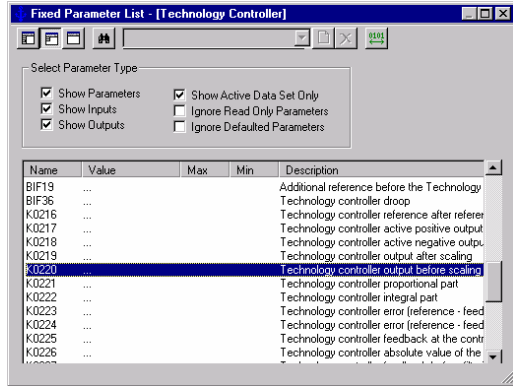
Rearrange the blocks so the Technology Controller is above the Main Reference block.

Blocks can be moved by clicking (and holding) on the block and dragging the block to its new location. Release the mouse button after the block has reached its destination.



Step #9a. – Making Changes by Parameter

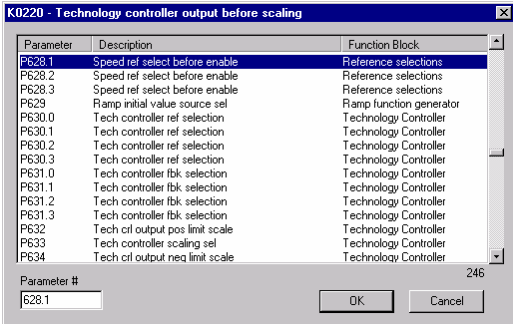
The drive configuration can be changed by editing the parameter list of the drive or by drawing lines between blocks. In this case, a connection between the Technology Controller and the Reference Select will be made by setting P628.1 = K0220.



Double click on the Technology Controller to view the parameters for that block. Find connector K0220 and double click.

Step #9b.

The parameter P628.1 can be assigned to the output by typing “628.1” or by finding the connector in the list and selecting it.



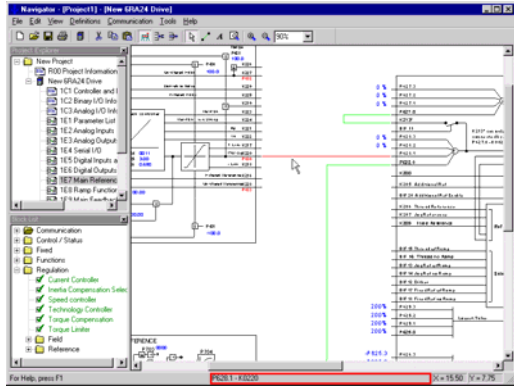
Press the ENTER key when done.

Close the parameter edit screen.

Step #10. – Making Changes by Deleting Lines

If the mouse cursor is placed over the line, information about the line is displayed in the *Status Bar* at the bottom of the screen.

While this line (and only this line) is selected, press the SHIFT + DELETE key to remove the connection made.

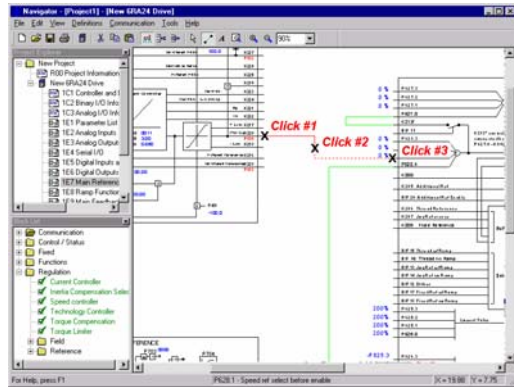


If a block (i.e. Technology Controller) is still selected. Click the mouse in an empty space of the *Configuration Editor* to unselect any objects.

Step #11. – Making Changes by Drawing Lines

The connection that was just deleted can also be made by drawing a line between the blocks.

Move the cursor over the right edge of the line for K0220 and a red highlight box will appear (See Click #1). The *Status Bar* will indicate that K0220 is selected.

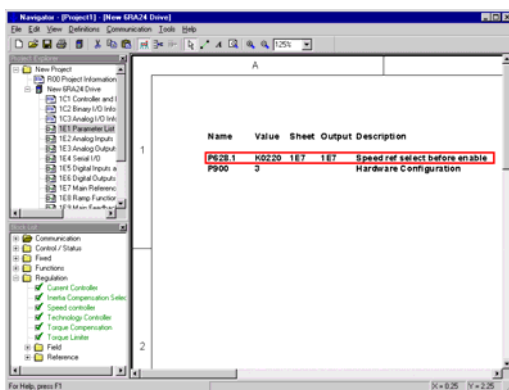


With a single left mouse click, start the line at K0220. The *Status Bar* will change to indicate that a line has been started from K0220. The line can be directed around other blocks by single mouse clicks. Once over the connector for P628.1 single click to complete the line draw.

Step #12. – Verify Changes

From the *Project Explorer*, click on **1E1 – Parameter List**.

See that the non-default parameter list now includes the change P628.1 = K0220.



General Editing Recommendations

In order to create drawings that are easy to read and understand it is helpful to maintain left-to-right signal flow when laying out your design. That is, the object that is the signal source should be to the left of the object that is the signal destination wherever practical. In this way, the signal flow is from left to right across the page. Also, in order to help the reader easily locate cross-sheet references it is helpful to extend any stubs to the left and right edges of the page, as appropriate.

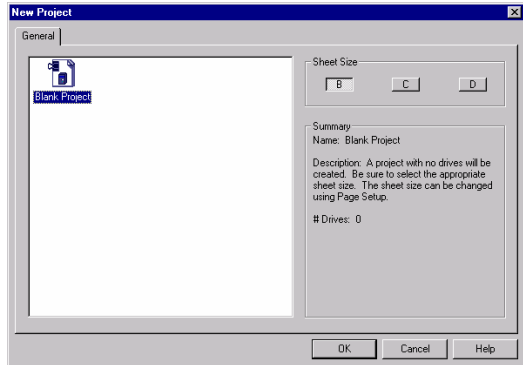
It is also advisable to keep related portions of the design together on the same sheet whenever possible. A quick way to move an object from a cross-sheet reference onto the current sheet is to double click on the stub that designates the cross-sheet reference. This will automatically pull the corresponding block onto the current sheet.

Chapter 4 – Documenting an Existing Application Example

Step #1. – Create Project

From the **F**ile Menu, select **N**ew **P**roject (Ctrl+N) to create a new project. Select **B** as the sheet size.

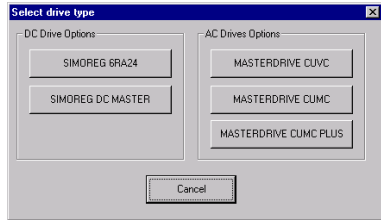
Selecting larger sheet sizes depends on your printing capabilities. More blocks can be displayed on larger sheets, but once scaled to the printer's physical sheet size, the blocks maybe too small to read.



Select a Project Template (such as “Blank Project”). Click on **OK** to create your blank project.

Step #2. – Import Drive from *.dnl File

The parameter list can be extracted from several backup formats including PCin Files (*.txt), SIMOVIS Files (*.dnl), and Drive Navigator Files (*.ksd).



Select the source of the parameter list for the drive. For purposes of this example, select the SIMOVIS download file located in the Project Files directory. Typically the file is located at:

C:\Program Files\Drive Navigator\Project Files\6RA24 Example.dnl

Once the SIMOVIS file is selected, a screen is displayed asking for you to specify the drive type ... in this case, SIMOREG 6RA24.

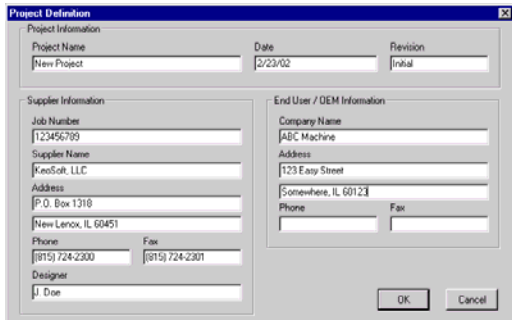
The parameter list can be extracted from several backup formats (PCin and Simovis) or directly from the drive using USS protocol (Serial port). During the download, warnings will be noted in the Communication Status window. Some files store read only parameters that Drive Navigator will not recognize. These are merely warnings and do not affect the rest of the download.

Step #3. – Define the Project

From the **Definitions** Menu, select **Project** to display the Project Definition Template. Enter the appropriate data.

Click **OK** to continue.

This information will be displayed on Reference Sheet #R00.

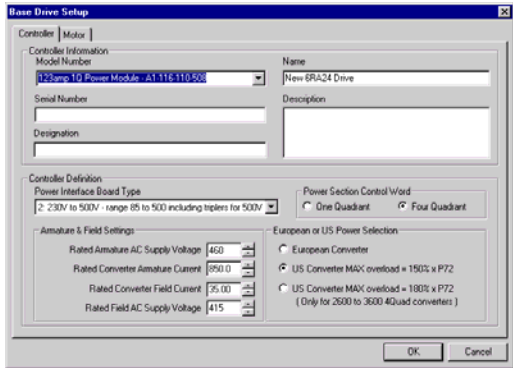


Step #4. – Define Controller and Motor

From the **Definitions** Menu, select **Base Drive Setup**.

Enter the name of the controller, the model number, serial number, and other desired information.

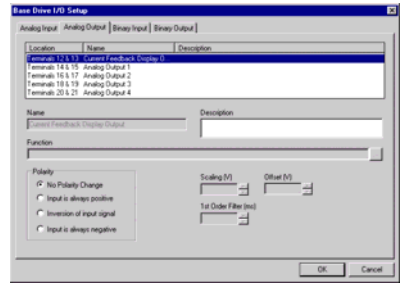
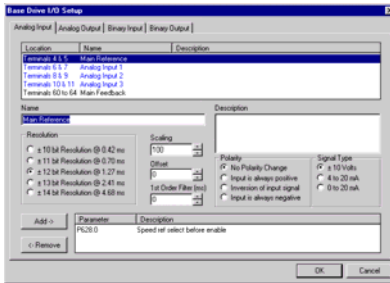
Click **OK** to continue.



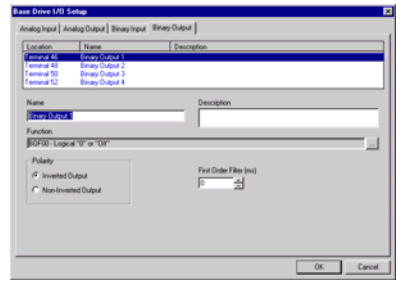
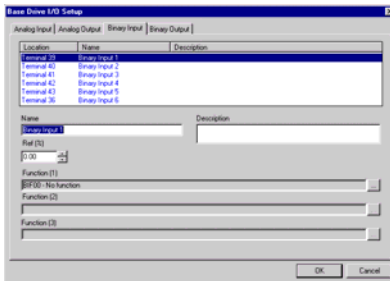
This information will be displayed on the Controller Sheets (xCx) and some parameters will be changed.

Step #5. – Define Analog and Binary I/O

From the **Definitions** Menu, select **Base Drive I/O Setup**. Fill in name and function information for the Analog I/O.



Fill in name and function information for the Binary I/O



Click **OK** to update the changes.

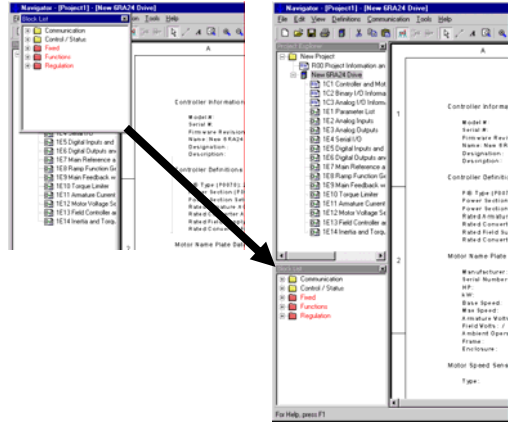
This Information will be displayed on the Controller Sheets (xCx) and some parameters will be changed.

Chapter 4 – Documenting an Existing Application Example

Step #6. – View and Expand the Block List

From the **View** Menu, select **Block List** to display a list of available blocks in the drive. The *Block List* can be dragged and docked below the *Project Explorer*.

Items in the *Block List* that are displayed in RED include functions that are enabled in the drive but not yet displayed or connected in the Block Diagram.

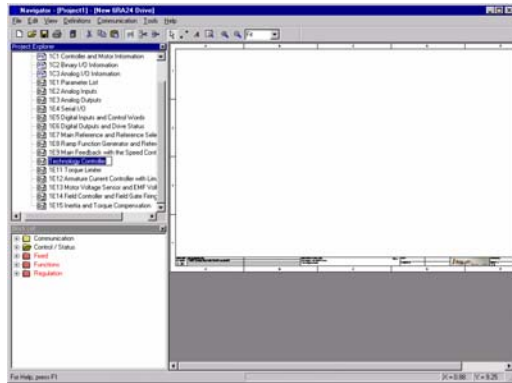


Step #7. – Insert an Engineering Sheet

From the *Project Explorer*, click on **1E9 – Main Feedback with the Speed Controller**.

From the **Edit** Menu, select **Insert New Sheet**.

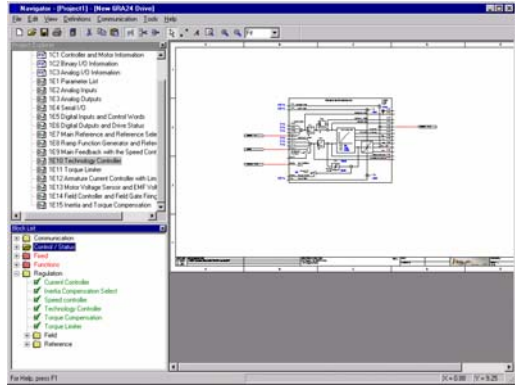
With sheet 1E10 selected click on the name to edit the sheet description. Type “Technology Controller” and press RETURN key.



Step #8. – Add the Technology Controller

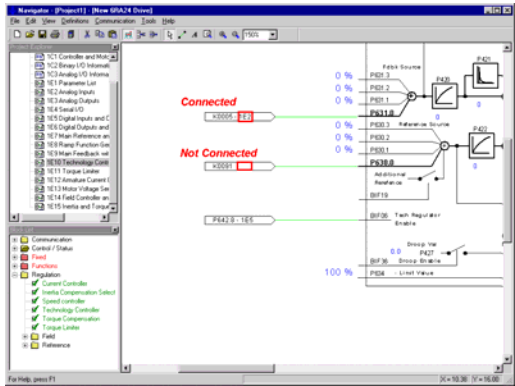
Click on **Technology Controller** (in the *Block List*) and drag the function onto the *Configuration Editor*.

Note that Inputs and Outputs are shown as line stubs with cross-references.



Step #9. – Find a Connector

The stub connecting to K0091 does not include a sheet number in the cross-reference. This is because the block attached to K0091 has not been placed on a sheet.

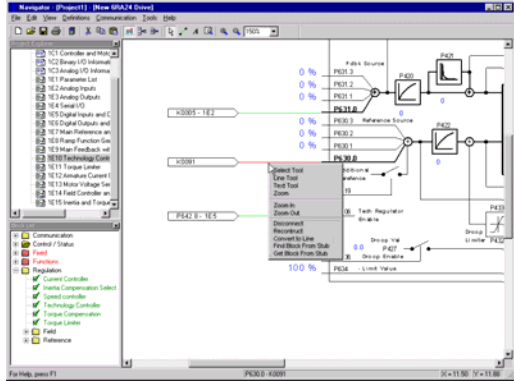


Chapter 4 – Documenting an Existing Application Example

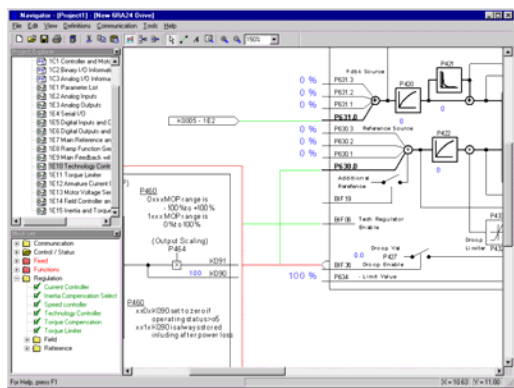
Step #10. – Get Block From Stub

Move the mouse over to the line connecting P630.1 to K0091. The line is automatically selected.

Right mouse click to get the context menu. From the context menu, select Get Block From Stub.



The MOP is placed on the sheet.



General Editing Recommendations

In order to create drawings that are easy to read and understand it is helpful to maintain left-to-right signal flow when laying out your design. That is, the object that is the signal source should be to the left of the object that is the signal destination wherever practical. In this way, the signal flow is from left to right across the page. Also, in order to help the reader easily locate cross-sheet references it is helpful to extend any stubs to the left and right edges of the page, as appropriate.

It is also advisable to keep related portions of the design together on the same sheet whenever practical. A quick way to move an object from a cross-sheet reference onto the current sheet is to double click on the stub that designates the cross-sheet reference. This will automatically pull the corresponding block onto the current sheet.

Chapter 5 – Basic Functionality

Drives

Adding a Drive

To add a new drive to the project, select the **Add Drive** menu item from the **File** to open the New Drive Options window. A new drive can be created from one of the following methods:

- KeoSoft provided applications including defaulted drives.
- Templates of previously saved files.

When adding a new drive, two options are given to include drive and motor parameters that are typically not valid for new applications. Any parameters that are not included when creating a new drive will show up as “?” indicating that the value of the parameter is not known. These parameters will not be downloaded to the drive until the current value is read from the drive or its value is changed.

Importing a Drive

To add a new drive to the project, select the **Import Drive** menu item from the **File** menu to open the *Open File* window. Once a file is selected, a new drive is created and parameters are imported from the file. The following file formats are supported:

- SIMOVIS (*.dnl) File
- PCin (*.txt) File
- Drive Navigator (*.ksd) File

Please note that when a drive is imported from an existing file, all the parameters in the file is imported. This may not be advantageous if the file being imported is to be downloaded to another drive. The parameters in these files often include drive and motor parameter values that may not be applicable to a new drive if it is not an identical to the original model number. In this case, download the parameters to the new drive and review the parameters that are rejected by the drive. Once you are satisfied with

the application downloaded to the drive, simply upload the parameters to overwrite the remaining invalid parameters.

Removing a Drive

To remove a drive from the project, first select the drive you wish to remove by clicking on its name in the project Explorer. Then, select the **Remove Drive** menu item from the **Edit** menu.

Note: Caution should be exercised with this command as the drive will be removed immediately. The only recovery will be to exit Drive Navigator without saving changes and reopening the project. However, changes made since the last Save command will be lost.

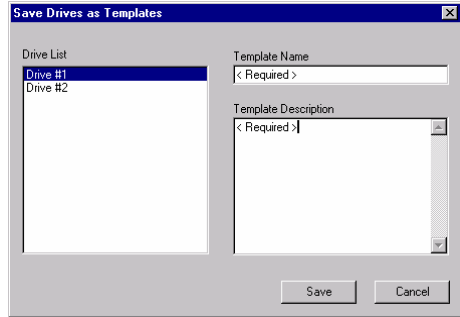
Changing the Drive Name

The drive name is used to distinguish one drive from another in a project. There are several ways to change the drive name including:

- Open the Base Drive Setup window from the **Definitions** Menu. Update the name field and click the **OK** button.
- Click on the drive name in the *Project Explorer*. Once selected, click on the drive name again to edit it.
- Select a Controller (xCx) or Engineering (xEx) sheet, then click on the first line of the title block (in the *Configuration Editor*) to edit the drive name from directly on the title block.

Saving the Drive as a Template

Select this command to open the *Save Drive Template* window to allow you to save the current configuration to a user defined drive template. These templates serve as a library of drive configurations from which new applications can be created.



Select one of the drives in the drive list and fill in the template name and description. Once filled, the template can be saved. Once saved, the template can be loaded as a new drive by selecting the *User* tab when adding a drive (see below).

Engineering Sheets

Only Engineering (xEx) Sheets can be inserted or removed; all other sheets are created and destroyed automatically.

Inserting a Sheet

When this command is executed, a new Engineering Sheet is added at the location of the currently selected sheet in the *Project Explorer* and the Engineering sheets are renumbered accordingly.

Removing a Sheet

When this command is executed, the currently selected Engineering Sheet in the *Project Explorer* is removed and the Engineering sheets are renumbered accordingly.

Changing a Sheet Name

Only Engineering Sheet names can be changed. There are a few ways to change the sheet name, including:






- Click on the sheet name in the *Project Explorer*. Once selected, click on the sheet name again to change it
- While an Engineering Sheet is selected in the *Project Explorer*, click on the second line of the title block to edit the sheet name.

Blocks

A block represents a subset of parameters in the drive used to perform a particular function. Blocks are shown graphically in the *Configuration Editor* and can be edited by double-clicking on them.

Block List

The Block List provides a list, organized by category, of all blocks available in the currently selected drive. The following table defines the various icons that are used in the Block List:

- | | | |
|---|------------|--|
|  | Black Text | Available: The block is neither currently used nor placed on a sheet. Drag this icon onto an Engineering Sheet displayed in the <i>Configuration Editor</i> to place this block on that sheet. |
|  | Green Text | Used: The block is placed on a sheet. |
|  | Red Text | Not Placed: The block is used but not placed on a sheet. This means the block is connected to another block and should therefore be placed on a sheet. Drag this icon onto an Engineering Sheet displayed in the <i>Configuration Editor</i> to place this block on that sheet. Any connections to this block will be reconstructed. |
|  | Black Text | Available/Used Folder: The following categorized list of blocks under this folder is either available or used. |
|  | Red Text | Not Placed Folder: The following categorized list of blocks under this folder has at least 1 block that is used but not placed on a sheet. |

Dragging Blocks onto Sheets

Any block that is available (not already placed on a sheet) may be placed on an Engineering Sheet (xEx) by dragging the block from the Block List to the sheet. Once placed on the sheet, the block's status in the Block List will change to indicate that it is now located on a particular sheet.

Editing Parameters

Parameters can be edited directly using one of the *Parameter Edit* Windows. There are two ways to access a *Parameter Edit* Window.

1. Double-click on a Block in the *Configuration Editor* or the *Block List* to open *Parameters Editor* window for that block. The name of the block being edited is shown at the top of the window.
2. Select the **Edit Parameters** menu item from the **Edit** menu on the *Menu Bar*. The *Complete Parameter List* window will be displayed.

The Parameter Editor has several filters from which to restrict the parameters shown in the list.

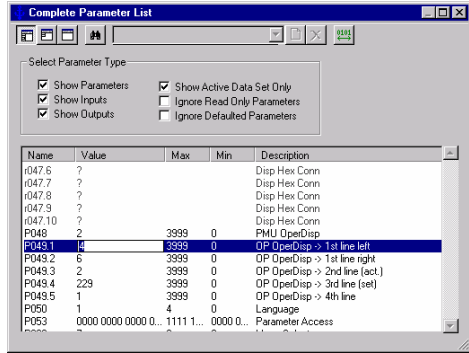
- Show Parameters: Parameters are displayed.
- Show Inputs: Input type parameters (parameters that connect blocks with lines) are displayed.
- Show Outputs: Binectors, BIFs, BOFs, and Connectors are displayed. This option is not available while online with the drive.
- Show Active Data Set Only: Only those parameters that are currently active are displayed. To change the active parameter set, select the **Parameter Sets** menu item from the **View** menu on the *Menu* to view the available options. These options depend on the currently selected drive type.
- Ignore Read Only Parameters: If the Show Parameters option is selected, select this option to ignore the read only parameters. In this case, only read/write parameters will be displayed (parameters that can be edited).
- Ignore Defaulted Parameters: If the Show Parameters option is selected, select this option to ignore defaulted parameters. In this case, only the non-default parameters are displayed. This option is not available while online with the drive.

Chapter 5 – Basic Functionality

Double-click on the read / write parameter you wish to modify. Read only parameters are grayed out and cannot be edited. Depending on the parameter type, Drive Navigator will provide the following information.

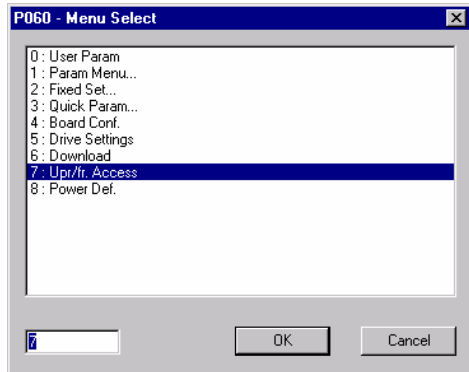
Standard Parameter – most parameters have a range of values from min to max.

Simply enter the new value and press ENTER. If the value is out of range, the value is return to the original value.



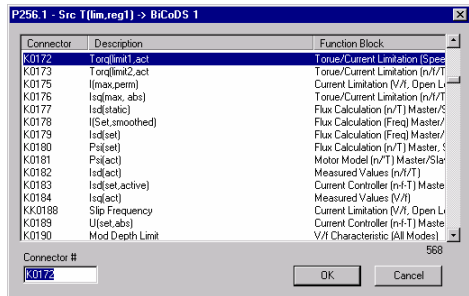
Parameter with Index Text – some parameters in the drive include a descriptive list for the meaning of each value.

Select the new value from the list or simply type the new value and press ENTER.



Input Parameter – some parameters are used to connect two points of a block(s).

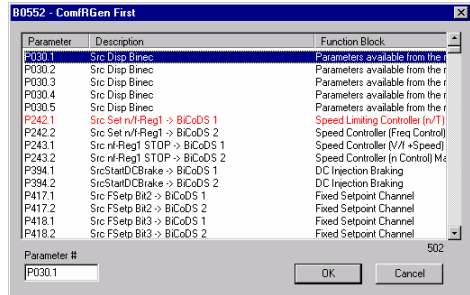
Select the new value from the list or simply type the name or connector number of the output.



Output – can also double-click on an output to assign a parameter to its value.

Select the new value from the list or simply type the name or parameter number of the input.

Note: If the parameter is assigned to a non-default value, the parameter is shown in red. This is used to indicate that the parameter is already connected for a different purpose and may not want to be changed.



Note: On the 6RA24 drive, inputs that are assigned to a value “K0002” are always defaulted. The default value depends in the parameter. If the input is assigned to “K0002”, the Parameter Editor will display the value of the parameter followed by the default value (i.e. “K0002 = K0149”).

Lines

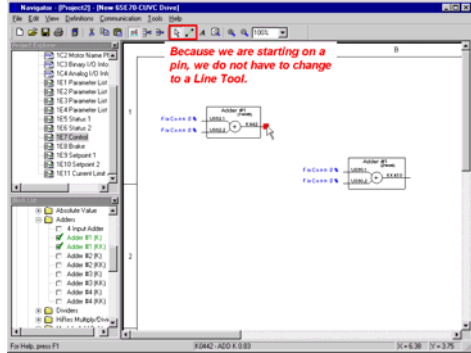
Lines connect an input parameter to an output. Lines are drawn automatically when a block is initially placed on a sheet and will move as the block is moved

Connecting Lines

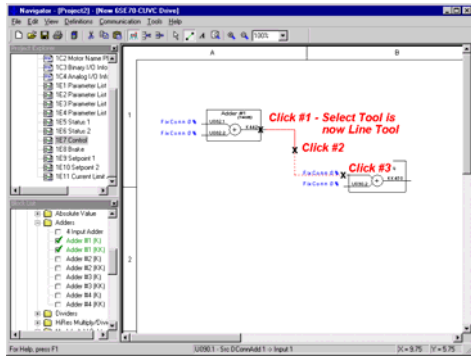
Input parameters can also be assigned graphically by drawing lines between input (parameter) pins and output (binector, BIF, BOF, or connector) pins.

Chapter 5 – Basic Functionality

To start a line on an input or output pin, single-click while the pin is highlighted by a red box. Since the pin was selected, the tool is automatically changed to the line tool.



As you move the mouse, two lines will be drawn from the previous to the next point. The longer of the two lines is always drawn first.



The line is completed when it is connected to a valid pin or line (provided started on an input pin).

To start a line from an existing line, the Line Tool must be selected first. In cases where a line is started from an existing line, it can only be completed by selecting a valid input pin (otherwise two outputs would be connected together).

It is sometimes necessary to drop a line that has been started but is no longer needed. Press the ESC key to drop a line.

Deleting Lines

To delete a line or line segment click on the line or segment with select tool. The line will be highlighted in red. Press SHIFT + DELETE to delete the line.

Basic Utilities

Selecting Objects

Click on any function block to select it. A red highlight box is drawn around the selected object. To select multiple objects, hold down the SHIFT key while clicking on additional objects. Alternatively, the *Select Tool* on the *Toolbar* can be used to draw a selection area around several objects on the *Configuration Editor*.

Moving Objects

To move an object, first select it and then drag it with the mouse. For finer control, use the ARROW keys to move it a step at a time. To move in larger steps, hold down the SHIFT key while pressing the ARROW key.

Note: While a block is being moved, some of the detail is turned off to allow for faster program response. It is turned back on when the block is re-selected.

To move objects between drawing sheets use the cut/copy/paste operations.

Removing Objects

To remove an object from a sheet, select the object(s) and press the DELETE key. The objects can include text, blocks, and lines. Any blocks that are removed from the sheet will show up in the *Block List* as not used. If lines are selected and SHIFT + DELETE is pressed, the input parameter is set to 0 to delete the connection. This effectively removes the block from the sheet and disconnects it from any other blocks.

Cut / Copy / Paste

The cut operation is used to remove the currently selected objects from the sheet and place them in a paste buffer (clipboard). Once placed in the clipboard these objects can be pasted to any drive. If the blocks are pasted on a drive that already has these blocks placed on a sheet, then the blocks will be moved to the new location.

The copy operation is used to copy the currently selected objects into the paste buffer (clipboard). Once placed in the clipboard these objects can be pasted to any drive. Again, if the blocks are pasted on a drive that already has these blocks placed on a sheet, then the blocks will be moved to the new location.

Cleaning up the Drawing

In the course of moving blocks and making connections, the lines can become scrambled and difficult to read. Drive Navigator provides a reconstruct function that is very helpful for cleaning up the drawing to make it more readable. The reconstruct command unscrambles the lines and reroutes them cleanly between their source and destination(s). It can be applied to a single line, to all of the lines connected to a particular block, or to all lines connected to a group of blocks.

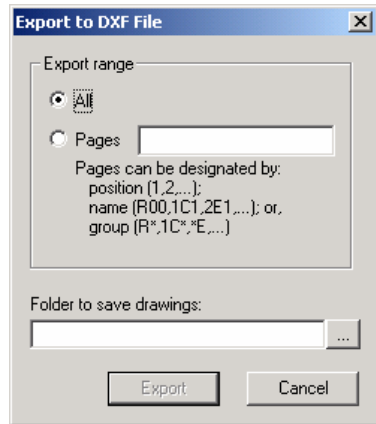
You can also use the **Reconstruct Lines** button on the *Toolbar* to enable automatic reconstruct during editing. If the *Reconstruct Lines* mode is enabled (button pressed) all of the lines connected to a block will be reconstructed any time the block is moved. If a group of blocks is selected, all of the lines connected to all of the blocks will be reconstructed.

Export to DXF File (AutoCAD)

Sheets can be exported to a DXF file format. This format is supported by most CAD programs, including AutoCAD.

Select the folder to save the exported files. Drive Navigator automatically names the files using the drawing set and sheet numbers.

Selected sheets or the entire project can be exported. The specific pages are identified similarly to the print setup screen. Sheets can be specified by their sheet number (R00, 1C1, 2E3, etc) or by their position in the drawing set (1,2,3...).



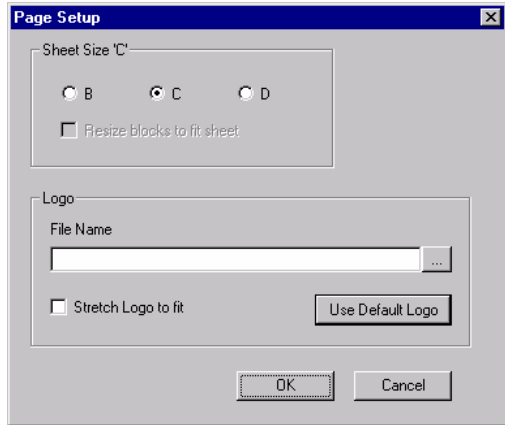
R00	Print the first reference sheet, R00
R*	Print all reference sheets, R00, R01, ...
1C2	Print second controller sheet for the first drive, 1C2
1C*	Print all controller sheets for the first drive, 1C1, 1C2, ...
C*	Print all controller sheets, 1C1, 1C2, ..., 2C1, 2C2, ...
1E2	Print second engineering sheet for the first drive, 1E2
1E*	Print all engineering sheets for the first drive, 1E1, 1E2, ...
E*	Print all engineering sheets, 1E1, 1E2, ..., 2E1, 2E2, ...
1C1-1E6	Print sheet range from 1C1 to 1E6
5-4E4	Print sheet range from fifth sheet to 4E4

Any of the above selections can be combined into the same export sequence by using commas. Please note that if a sheet is referenced twice (i.e. R00,R*), the sheet will be exported only once.

Chapter 6 – Printing Projects

Page Setup

To change these settings, click on **File** on the *Menu Bar* and select **Page Setup**. From this screen the page size and the title block logo can be changed.



Changing Sheet Size

Selecting the correct sheet size depends on your printer capabilities. More blocks can be placed on larger sheets, but once scaled to the printer's physical sheet size, the blocks maybe too small to read.

If the sheet size is decreased in size, any blocks located on the sheets will automatically be repositioned to fit the smaller sheet area. If the sheet size is increased, a checkbox is provided to choose whether to reposition the blocks.

Changing Title Block Logo

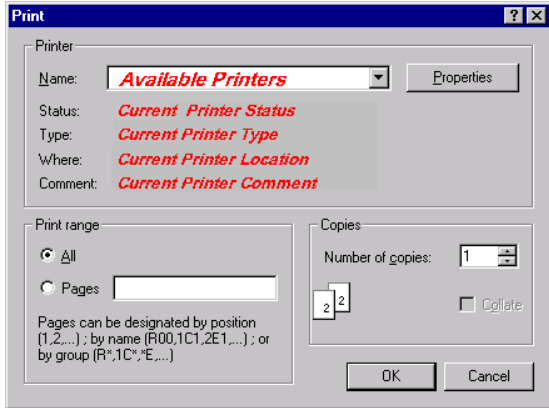
The default logo for the title block displays the KeoSoft logo. The logo setting is an application-wide setting; if you choose an alternate logo by selecting the **Page Setup...** menu item from the **File** menu on the *Menu Bar*, the new logo file will be displayed on all projects **loaded** or **created** by Drive Navigator. If the alternate file name is blank or the selected file is no longer available, Drive Navigator will revert to the KeoSoft logo.

Print Options

Drive Navigator provides several convenient options for printing reports to document your project. Reports can be generated for individual drawing sheets, individual drives, or a complete project.

To open the print dialog, click on **File**

→ **Print** on the *Menu Bar*. From this screen, you can then select a printer, set the paper size and orientation, and make any other changes as needed.



Before printing documentation verify that the printer is configured correctly. To access the printer setup, click on **Properties** on the print screen. The software will display the *Printer Properties* dialog box. From the *Printer Properties* dialog box, the printer size and orientation (typically landscape) can be changed.

Once the printer is setup, you may select to print the entire project, specific sheets, or sheet groups. All sheets can be specified by their sheet number (R00, 1C1, 2E3, etc) or by their position in the drawing set (1,2,3...).

Chapter 6 – Printing Projects

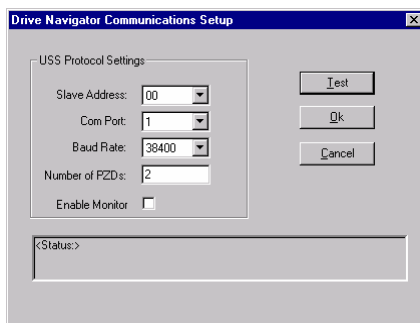
R00	Print the first reference sheet, R00
R*	Print all reference sheets, R00, R01, ...
1C2	Print second controller sheet for the first drive, 1C2
1C*	Print all controller sheets for the first drive, 1C1, 1C2, ...
C*	Print all controller sheets, 1C1, 1C2, ..., 2C1, 2C2, ...
1E2	Print second engineering sheet for the first drive, 1E2
1E*	Print all engineering sheets for the first drive, 1E1, 1E2, ...
E*	Print all engineering sheets, 1E1, 1E2, ..., 2E1, 2E2, ...
1C1-1E6	Print sheet range from 1C1 to 1E6
5-4E4	Print sheet range from fifth sheet to 4E4

Any of the above selections can be combined into the same print job by using commas. Please note that if a sheet is referenced twice (i.e. R00,R*), the sheet will be printed only once.

Chapter 7 - Communications

Communication Setup

This selection provides the setup window for USS Protocol communications. In this window, you may specify the following:



- | | |
|---------------|---|
| Slave Address | For USS Protocol, each drive should have its own slave address number 0 to 31. |
| Com Port | Identifies the COM Port number that the drive is connected to. Because of the slave address limitation, each COM Port can accommodate up to 32 drives. |
| Baud Rate | The Baud Rate is the speed at which data is transmitted and received through the COM Port. If the drive does not communicate, it is usually because the baud rate is not the same as the drive. |
| Number of PZD | As part of USS Protocol, the drive will tack on status and control words at the end of all transfers. This setting should reflect the drive settings. |
| Monitor | If checked, a monitor window will be used to display transfers. This is useful when tracking communication problems while online with the drive or performing upload/downloads. |
| Test | This function is useful to verify that the current settings are correct. |
| Ok | New communications settings are recorded. |
| Cancel | New communications settings are ignored. |

Upload

An upload function will get the current values of parameters of the drive and record them in Drive Navigator.

If upload changes only is selected, only those parameters in the drive and the software that are listed as non-defaulted are read from the drive. This significantly reduces the time to read the parameters out of the drive.

If upload all parameters is selected, then all read/write parameters are read from the drive. Also included are any read only parameters that record the drive's configuration or firmware.

Download

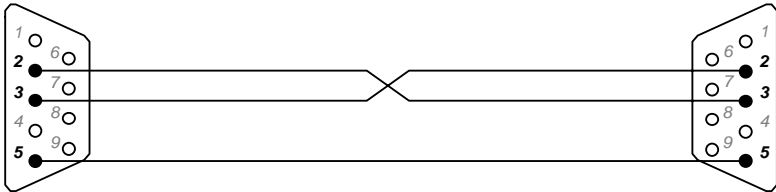
A download function will get the current values of parameters of Drive Navigator and write them the drive.

If download RAM is selected, the values are written to the drive's volatile memory. This means that the values of the parameters are lost when the drive loses power.

If download EEPROM is selected, the values are written to the drive's nonvolatile memory. This means that the values of the parameter are retained even after the power is lost. Be aware that there is a limit to the number of times a parameter value can be written to EEPROM. Check the drive manual for details.

Communicate with 6RA24 Drive

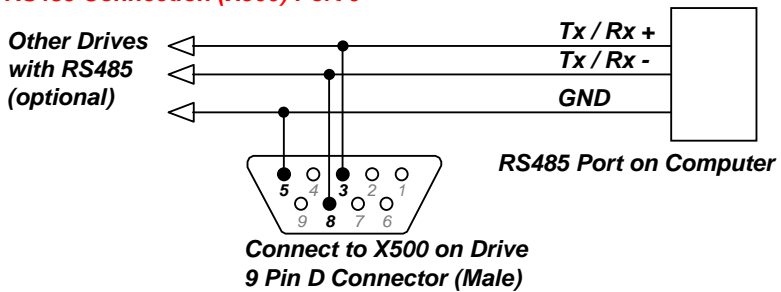
RS232 Connection (X501) Port 1



Connect to X501 on Drive
9 Pin D Connector (Male)

Serial Port on Computer
9 Pin D Connector (Female)

RS485 Connection (X500) Port 0



The RS232 cable used to upload and download parameters is NOT a standard serial cable and is NOT the same as the cable used to communicate with the DC MASTER or MASTERDRIVES. Other cables may have very similar pin out to the one shown above, but includes additional connections that may cause the drive port not to work.

6RA24 Communication Settings

If you are unable to communicate with the drive, compare the communication settings with the following parameter values. Some of the parameters correspond to the fields in the communication setup window.

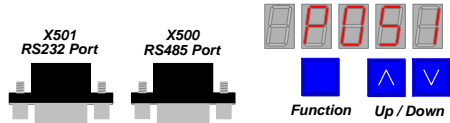
X501 – RS232	X500 – RS485	Value(s)
P790	P780	Protocol = 1192 (Recommend)
P791	P781	Number of PZD = 2 (Typical)
P793	P783	Baud Rate (*) 1: 300 Baud 2: 600 Baud 3: 1200 Baud 4: 2400 Baud 5: 4800 Baud 6: 9600 Baud 7: 19200 Baud 8: 38400 Baud (Recommend) 9: 93750 Baud 10: 187500 Baud
P796	P786	Slave Address = 0 (Typical)

- (*) If P793 is changed, P790 must also be changed or power cycled in the drive in order for the baud rate of the X501 port to change.
 If P783 is changed, P780 must also be changed or power cycled in the drive in order for the baud rate of the X500 port to change.

In the SIMOREG 6RA24 drive, the only way to change these parameters in the drive is through the function keypad on the drive. If you are to make any changes to these parameters make sure P51 = 20 and P52 = 3.

Get Access to the Drive Parameters (P51)

The function key selects between the parameter name and its current value. With a Pxxx viewed in the display, use the Up / Down Arrow keys to select P051. Select the function key to view its current value.



Use the Up / Down Arrow keys to change the value to 20.



Note: While holding one of the Arrow keys, if the function key is also pressed, the drive will cycle through its values at a faster rate.

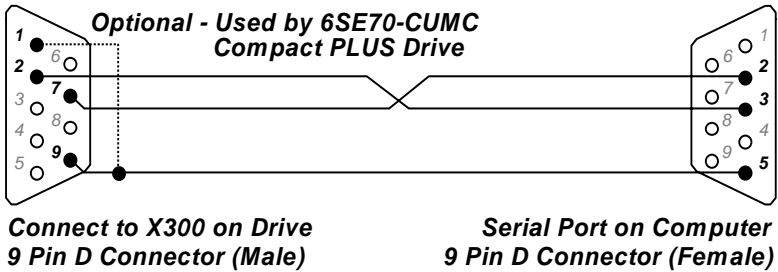
Start Serial Upload / Download

For the 6RA24 drive, the only upload option available is to upload all parameters.

Communicate with 6RA70 Drive

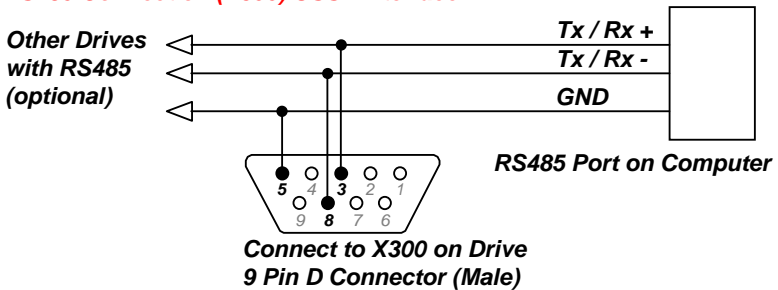
Note: The 6RA70 Drive has up to three USS communications ports. SCom1 is connected through a 9-pin D connector, X300. SCom2 is connected through a 5-position terminal, X172 on the controller board CUD1. SCom3 is connected through a 5-position terminal, X162 on the optional controller board CUD2.

RS232 Connection (X300) USS1 Interface

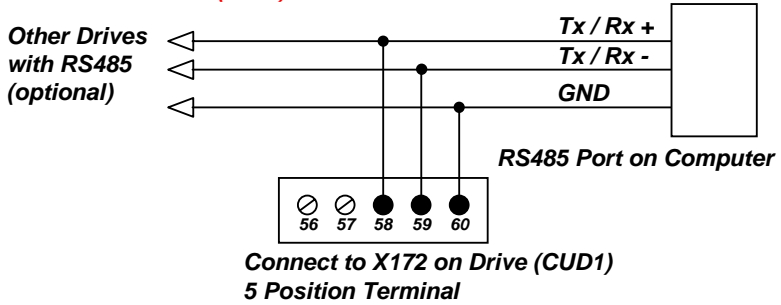


The RS232 cable used to upload and download parameters is NOT a standard serial cable and is NOT the same as the cable used to communicate with the 6RA24 drive. Other cables may have very similar pin out to the one shown above, but includes additional connections that may cause the drive port not to work.

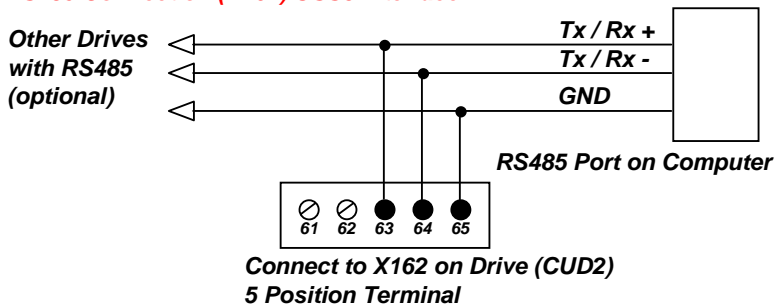
RS485 Connection (X300) USS1 Interface



RS485 Connection (X172) USS2 Interface



RS485 Connection (X162) USS3 Interface



6RA70 Communication Settings

If you are unable to communicate with the drive, compare the communication settings with the following parameter values. Some of the parameters correspond to the fields in the communication setup window.

X300-USS1	X172-USS2	X162-USS3	Value(s)
P780	P790	P800	Protocol = 2 (Recommend)
P781	P791	P801	Number of PZD = 2 (Typical)
P783	P793	P803	Baud Rate 1: 300 Baud 2: 600 Baud 3: 1200 Baud 4: 2400 Baud 5: 4800 Baud 6: 9600 Baud 7: 19200 Baud 8: 38400 Baud (Recommend) 9: 56700 Baud 11: 93750 Baud 13: 187500 Baud
P786	P796	P806	Slave Address = 0 (Typical)

6RA70 Parameterization Enable (Write Access)

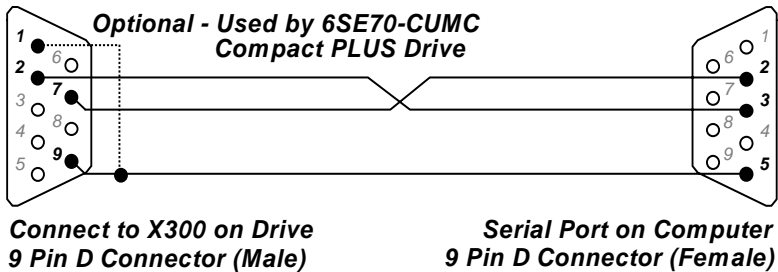
If you are able to read from the drive but get error when try to write a parameter value, verify that the Parameterization Enable (P927) is set properly.

X300-USS1	X172-USS2	X162-USS3
P927 = xxxx x1xx	P927 = xx1x xxxx	P927 = x1xx xxxx

Communicate with 6SE70-CUVC Drive

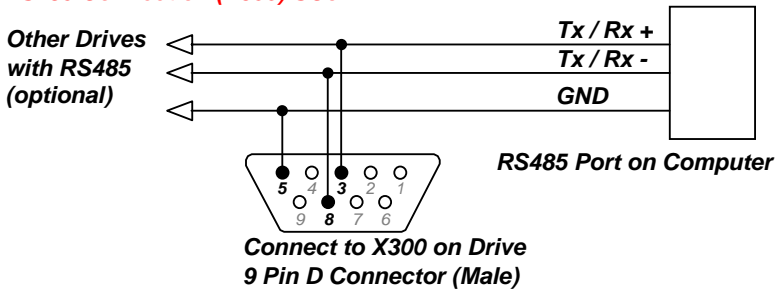
Note: The 6SE70-CUVC Drive has two USS communications ports. SCom1 is connected through a 9-pin D connector, X300. SCom2 is connected through a 12-position terminal, X101.

RS232 Connection (X300) SCom1

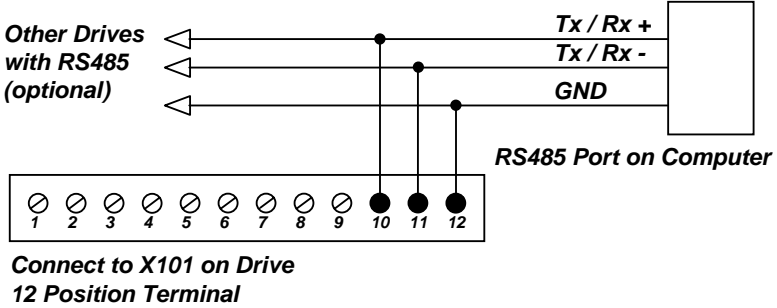


The RS232 cable used to upload and download parameters is NOT a standard serial cable and is NOT the same as the cable used to communicate with the 6RA24 drive. Other cables may have very similar pin out to the one shown above, but includes additional connections that may cause the drive port not to work.

RS485 Connection (X300) SCom1



RS485 Connection (X101) SCom2



6SE70-CUVC Communication Settings

If you are unable to communicate with the drive, compare the communication settings with the following parameter values. Some of the parameters correspond to the fields in the communication setup window.

X300 – SCom1	X101 – SCom2	Value(s)
P700.1	P700.2	Slave Address = 0 (Typical)
P701.1	P701.2	Baud Rate
		1: 300 Baud
		2: 600 Baud
		3: 1200 Baud
		4: 2400 Baud
		5: 4800 Baud
		6: 9600 Baud
		7: 19200 Baud
		8: 38400 Baud (Recommend)
		9+ For SCB Only
P703.1	P703.2	Number of PZD = 2 (Typical)

If you are able to read from the drive but get error when try to write a parameter value, verify that the Parameter Access (P053) is set properly.

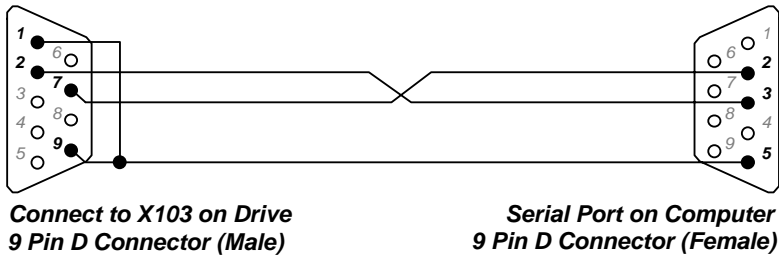
6SE70-CUVC Parameter (Write) Access

X300 – SCom1	X101 – SCom2
P053 = xxxx xxxx xxxx x1xx	P053 = xxxx xxxx xx1x xxxx

Communicate with 6SE70-CUMC Drive (Compact PLUS)

Note: The Compact PLUS drive has only one USS communications port (SCom1) that can be connected to a 9-pin D connector, X103, or to a 4-position terminal, X100.

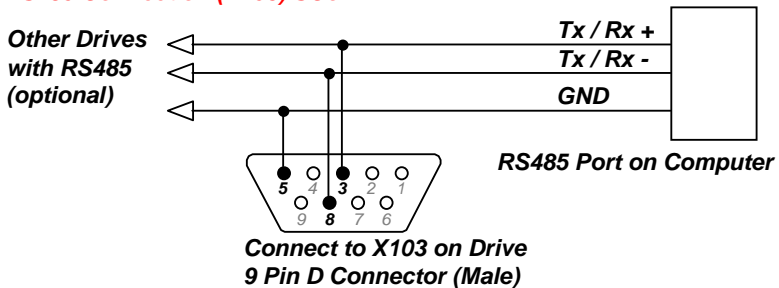
RS232 Connection (X103) SCom1



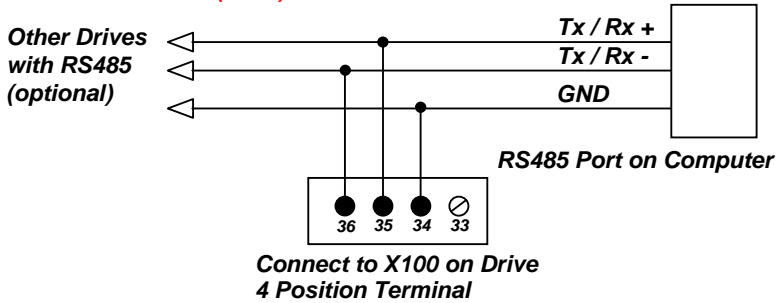
The RS232 cable used to upload and download parameters is NOT a standard serial cable and is NOT the same as the cable used to communicate with the 6RA24 drive. Other cables may have very similar pin out to the one shown above, but includes additional connections that may cause the drive port not to work.

WARNING: RS232 and RS485 cannot be used at the same time on the SCom1 port. This is true even when the X103 is connected as RS232 and X100 is connected as RS485. When the RS232 cable is used, any communication through the X100 port is disabled.

RS485 Connection (X103) SCom1



RS485 Connection (X100) SCom1



**6SE70-CUMC Communication Settings
(Compact PLUS)**

If you are unable to communicate with the drive, compare the communication settings with the following parameter values. Some of the parameters correspond to the fields in the communication setup window.

X100 or X103 - SCom1	Value(s)
P700.1	Slave Address = 0 (Typical)
P701.1	Baud Rate 1: 300 Baud 2: 600 Baud 3: 1200 Baud 4: 2400 Baud 5: 4800 Baud 6: 9600 Baud 7: 19200 Baud 8: 38400 Baud (Recommend) 9+ For SCB Only
P703.1	Number of PZD = 2 (Typical)

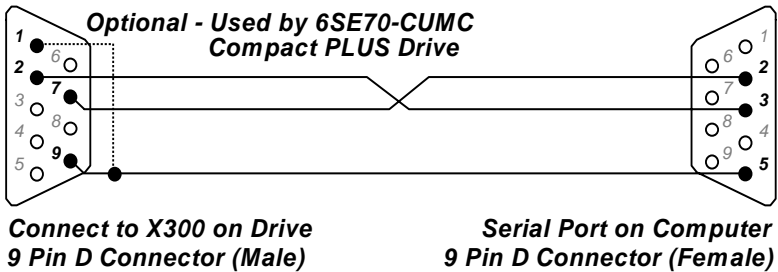
If you are able to read from the drive but get error when try to write a parameter value, verify that the Parameter Access (P053) is set properly.

P053 = xxxx xxxx xxxx x1xx

Communicate with 6SE70-CUMC Drive (Compact / Chassis)

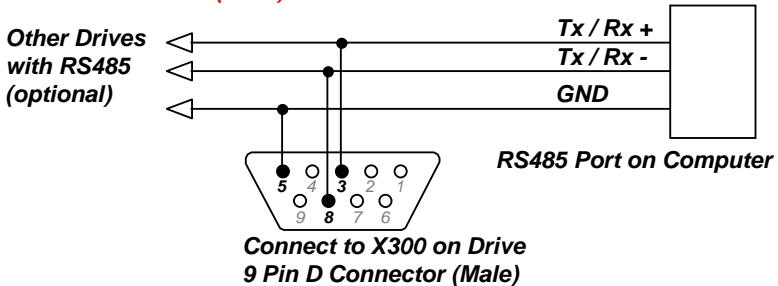
Note: The Compact and Chassis drive has two USS communications ports. SCom1 is connected through a 9-pin D connector, X300, or through a 6-position terminal, X103. SCom2 is also connected through the 6-position terminal, X103 (different terminals).

RS232 Connection (X300) SCom1

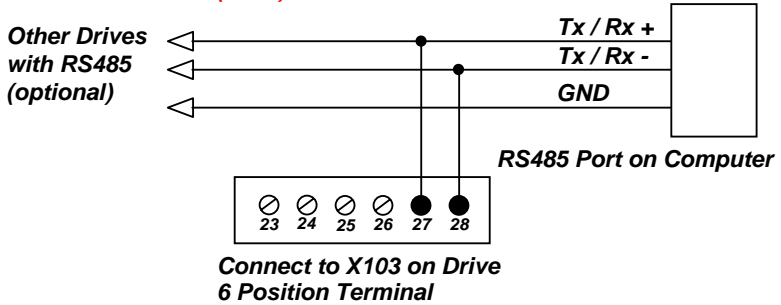


The RS232 cable used to upload and download parameters is NOT a standard serial cable and is NOT the same as the cable used to communicate with the 6RA24 drive. Other cables may have very similar pin out to the one shown above, but includes additional connections that may cause the drive port not to work.

RS485 Connection (X300) SCom1

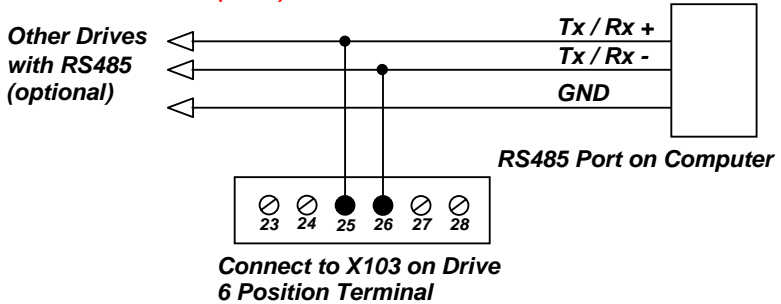


RS485 Connection (X103) SCom1



Both communication ports are available on terminal X103. Each port is connected to different terminals on X103.

RS485 Connection (X103) SCom2



**6SE70-CUMC Communication Settings
(Compact / Chassis)**

If you are unable to communicate with the drive, compare the communication settings with the following parameter values. Some of the parameters correspond to the fields in the communication setup window.

X300 or X103 - SCom1	X103 – SCom2	Value(s)
P700.1	P700.2	Slave Address = 0 (Typical)
P701.1	P701.2	Baud Rate
		1: 300 Baud
		2: 600 Baud
		3: 1200 Baud
		4: 2400 Baud
		5: 4800 Baud
		6: 9600 Baud
		7: 19200 Baud
		8: 38400 Baud (Recommend)
		9+ For SCB Only
P703.1	P703.2	Number of PZD = 2 (Typical)

**6SE70-CUMC Parameter (Write) Access
(Compact / Chassis)**

If you are able to read from the drive but get error when try to write a parameter value, verify that the Parameter Access (P053) is set properly.

X300 or X103– SCom1	X103 – SCom2
P053 = xxxx xxxx xxxx x1xx	P053 = xxxx xxxx xx1x xxxx

Chapter 8 – Moving Authorizations

Every time Drive Navigator is installed on a computer, the software generates a Site Code specific to that software installation. KeoSoft must provide an authorization number, which unlocks the features of the software.

The following features are protected:

- Save current work that can be read later
- Download parameters to the drive using the serial port
- Print the project
- 6RA24 Library
- 6RA70 Library
- 6SE70-CUVC Library
- 6SE70-CUMC Library

For more information about the authorization process, see [Authorizing Drive Navigator](#)

The authorization number is, of course, only good for one installation of the program. Once authorized, the “license” can be moved from one computer to another provided a demo version of the software is loaded on the other machine. To move the license to another computer, click on the **About Navigator...** menu item from the **Help** menu, then follow the instructions on the splash screen.

	Computer w/ Original Installation	Computer w/ New Installation
Current State	Drive Navigator is a licensed version.	Drive Navigator is in demo mode or is unlicensed.
Step #1.		
Select Get License on the computer with the new installation. Follow the instructions.		Authorization request is placed on a diskette or shared drive.
Step #2.		
Select Move License on the computer with the original installation. Follow the instructions.	Authorization is moved to the requested location. This computer's site code is now changed.	
Step #3.		
Complete operation started in step #1 on the computer with the new installation.		The Authorization number is accepted by this computer.
Result	Drive Navigator is no longer licensed.	Drive Navigator is a licensed version.

Appendix A – Documentation Services

KeoSoft can provide documentation services to those individuals who do not have the printing capabilities or who do not have the time to document their drives.

KeoSoft can provide color laser printed copies on A-Size and B-Size paper. High quality, color prints can be made on C-Size and D-Size paper as well.

Prints can be made from nothing more than a PCin or Simovis file. Therefore, Drive Navigator is not required for KeoSoft to provide these documentation services.

Please call 815-740-0860 and ask about the Keosoft Documentation Service.

Appendix B – Contact Information

Technical Support

For assistance with the installation and configuration of Drive Navigator, please call KeoSoft Technical Support at (815) 740-0860. For best service, please be at the computer with the Drive Navigator software.

Feedback

Comments or suggestions of possible improvements to the software and/or manual are appreciated and may be sent to the following addresses:

Phone:

815-740-0860

Fax:

815-740-0864

Email:

support@keosoft.com

Standard Mail:

Quad Plus, Inc.
PO Box 186
New Lenox, IL 60451
Attn: Keosoft Support

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Fax: (949) 462-0861

ATLANTA AREA

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Kennesaw, GA 30144
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SATELLITE FACILITIES

- Charlotte, NC - USA
- Bursa, Turkey

VISIT US ON THE WEB AT:
WWW.QUADPLUSINC.COM

OR CALL TOLL FREE:
(877) 870-QUAD



Quad Plus, Inc.