Auto Configure

Instruction Manual

for use with Drive System Designer

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Chapter 1   Introduction

Auto Configure is an Expert System. It is an optional feature in Drive System Designer (DSD) that provides a simple user interface to automatically generate the software configuration for a drive system. Instead of starting with a blank sheet, the user chooses the type of drive, the control type and selects from a list of options for each drive section. Once the selection is complete the program generates the configurations for the drives, I/O, operator interfaces and gateway to a PLC or supervisor. In addition, Auto Configure generates an Overview that displays the system in a simple, logical block diagram with real-time monitoring.

ABOUT THIS MANUAL

This manual is intended for users of DSD who purchase the Auto Configure option. It is assumed that the user is familiar with DSD or ConfigEd and understands the LINK fiber optic network. Please read all safety information before using Auto Configure.

NOTE

Purchasers of the AutoConfigure option to DSD will receive a hardware key. To use AutoConfigure, the key must be inserted into the parallel port of the computer before launching DSD. Without the key, DSD will operate normally, but it will not be possible to view the AutoConfigure menu pick in the File menu. If the key is removed after launching DSD, and AutoConfigure is selected, a reminder dialog box will appear. The Key does not inhibit the use of the PC's parallel port, for instance a printer can be plugged into the Key's socket.

CAUTION

The Key is valuable and should be kept securely. A lost Key will only be replaced by purchasing another Auto Configure option. If a Key fails it should be returned to Eurotherm Drives for replacement.

WARNING

Auto Configure is a powerful software tool specifically designed to configure Eurotherm LINK drive systems. Auto Configure will generate configurations for a functional drive system but depending on the installation and machinery the result could be potentially dangerous to equipment and personnel. The user of Auto Configure assumes all liability and risk for the performance, application, reliability, and safety of drive systems implemented using this tool. It is the responsibility of the user of this software to understand thoroughly and check indepently the software configuration prior to installation and operation of any Eurotherm LINK equipment. Eurotherm Drives, Inc. can accept no liability for the use of this software.

WARNING

Auto Configure does not provide any safety interlocks to protect personnel and machinery. It is the responsibility of the user to understand the safety interlock requirements and implement them in hardware or software as appropriate.

Caution

Auto Configure generates up to 95% of a final configuration depending on the type of drive system. Some additions and changes will always be required. These are configured manually using DSD. Drive protection is provided, but Process and Machine interlocks are not provided as these may be implemented in hardware, PLC program or in the LINK configuration. If interlocks are required they must be added by the user.

Chapter 2   Using Auto Configure

PLANNING THE DRIVE SYSTEM

The drive system must be planned in the format of a one-line. The function, control type, drive type and operator interface must be decided for each drive section.

CREATING A PROJECT

A new project must be created as Auto Configure can only be used in an empty project. Create a project using the PROJECT::MANAGE menu.

In the Manage dialog, select NEW PROJECT. This brings up the dialog below. Enter the project name and fields. The fields shown are for the standard Eurotherm form, a custom user form may have different fields. When complete, select Change and then Done in the Manage dialog. It is possible to edit the name and fields by CHANGE PROJECT INFO in the manage dialog.

Figure 1 –Title Block Information Dialog Box

AUTO CONFIGURE

To start Auto Configure, select PROJECT::AUTO CONFIGURE.
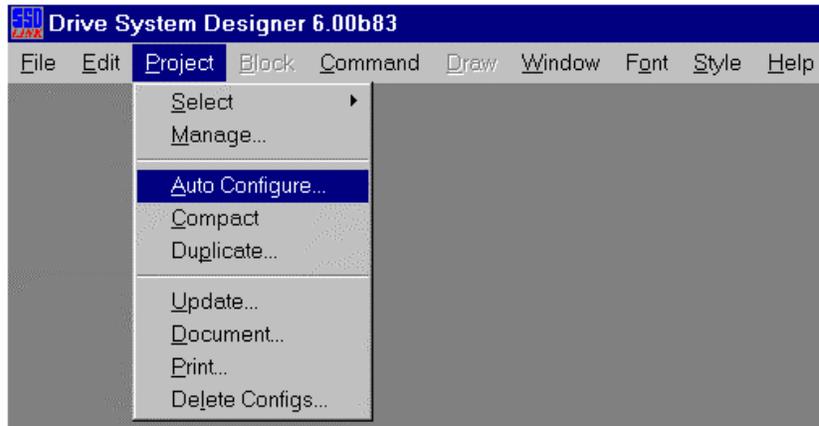
Figure 2 – Select Auto Configure to Start Project

This brings up the main Auto Configure screen (see Figure 3).

Note: If there are already configurations in the project a warning dialog will appear: "Cannot Auto Configure project that contains configurations".

Clicking on OK will open the Auto Configure screen but the Configure button in the bottom right hand corner will be grayed out, to indicate that Auto Configure is not possible. If Auto Configure is required in this project, then click Cancel and delete the existing configurations using Delete Configs in the Project menu.

Figure 3 – Auto Configure Dialog Box

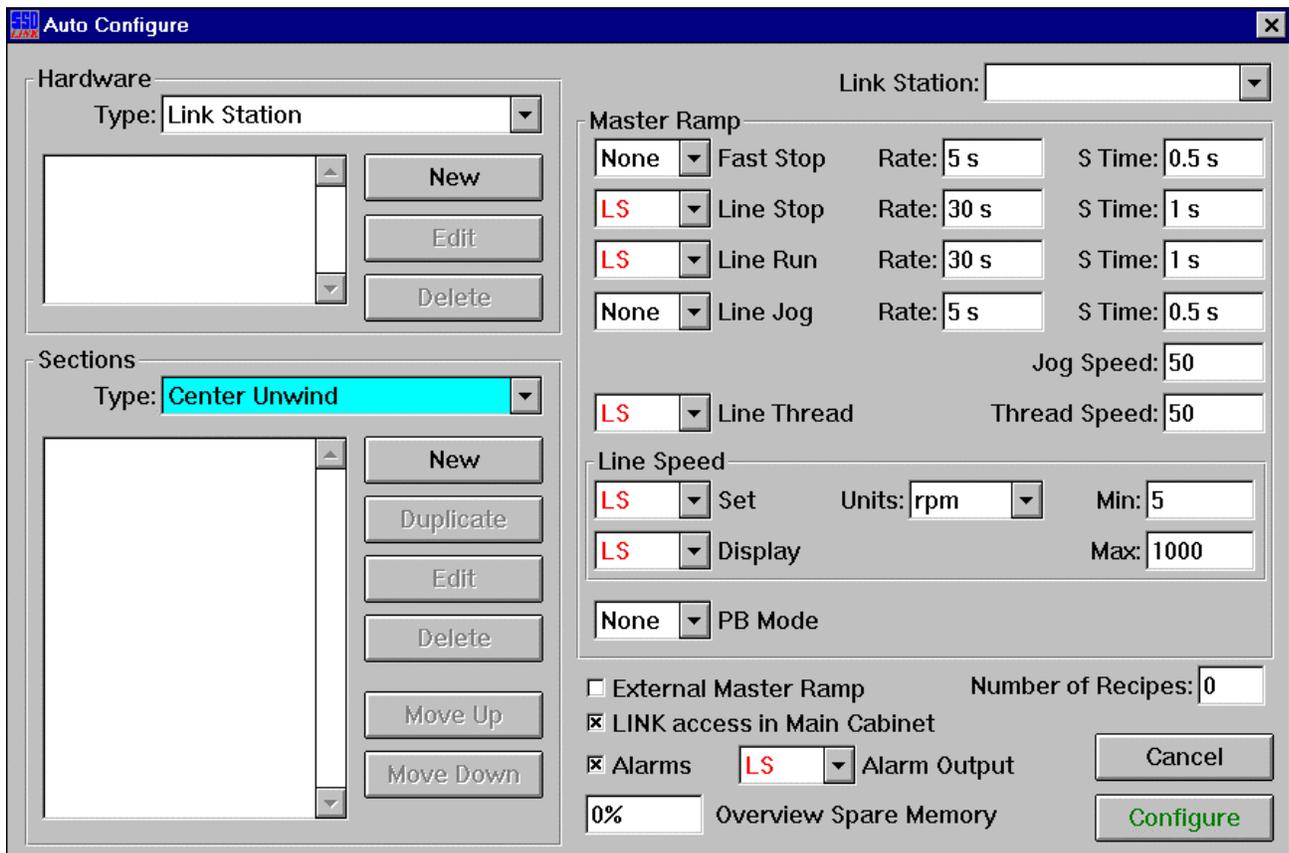The next part involves entering the data, defined in the planning stage, into the Auto Configure dialog screens. The prior planning makes this much simpler as all of the data has already been determined. If this is not the case then some choices may not be known; for example, the base speed of a motor.

It is possible to save the Auto Configure settings at any stage using FILE::SAVE. Selecting Auto Configure loads the previously saved settings. If a new blank Auto Configure screen is required, hold down the <Ctrl> key when Auto Configure is selected.

Auto Configure generates configurations for the Drives, the LinkStations and I/O in a LinkRack. An Overview is produced which provides a simple graphical block diagram. The Overview is saved in the L5300 LinkRack unless a LinkStation is specified as the Overview.

First Select the Hardware

The hardware type combobox allows the user to select the system interface devices, either the LinkStation as the MMI or various gateways to PLCs or supervisors. As each device is selected, it is added to the listbox by name.
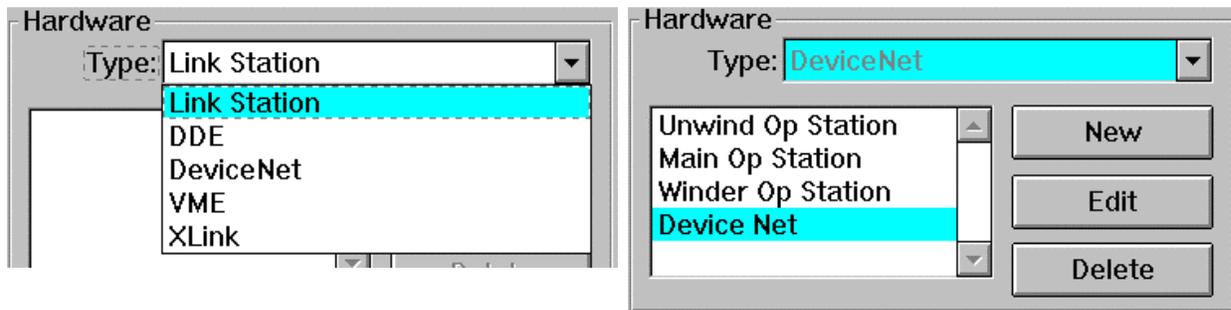

Figure 4 – Hardware Selection Combobox and Listbox

LinkStation is the Eurotherm Color Touch Screen operator station type L5392. Any number of LinkStations can be selected and named as required. Each LinkStation has multiple pages for controlling multiple sections.

The other hardware options are gateways between Link and other networks. Only one gateway interface may be used in a system.

DDE is used for interfacing to Windows using the L5204 card for supervisory products such as Wonderware. Auto Configure configures the Link to DDE interface but the Supervisor must be configured separately using separate software tools

DeviceNet uses a DeviceNet Link Card, L5351, in the rack to communicate with Rockwell and other Plcs. The DeviceNet Link Card is a DeviceNet Slave and is controlled by a DeviceNet scanner card in the Plc. Auto Configure configures the DeviceNet Link Card but the DeviceNet Scanner and Plc must be programmed separately using separate software tools.

VME interfaces to GE Plcs and other VME based systems using a Link VME card, L5211 ,that plugs into the VME back-plane. Auto Configure configures the Link to VME interface but the Plc must be programmed separately using separate software tools.

Xlink interfaces to the SST X-Link gateway with a Link L5204 card, which provides communications to many other protocols via third party cards. Auto Configure configures the Link to Xlink interface but the X Link and third party card must be configured separately using separate software tools.

Next the Drive Sections

First, the type of section is selected. This opens a drive screen:

Figure 5 – Section Selection Combobox
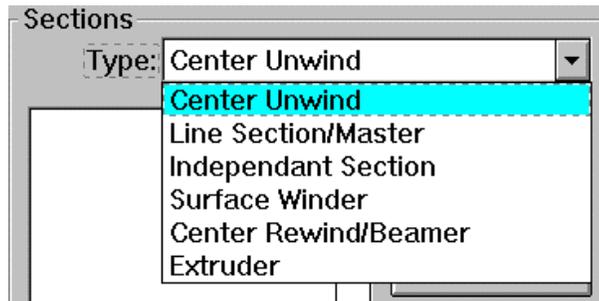
This is the Drive section screen for the Line/Master, showing the Control Types available.
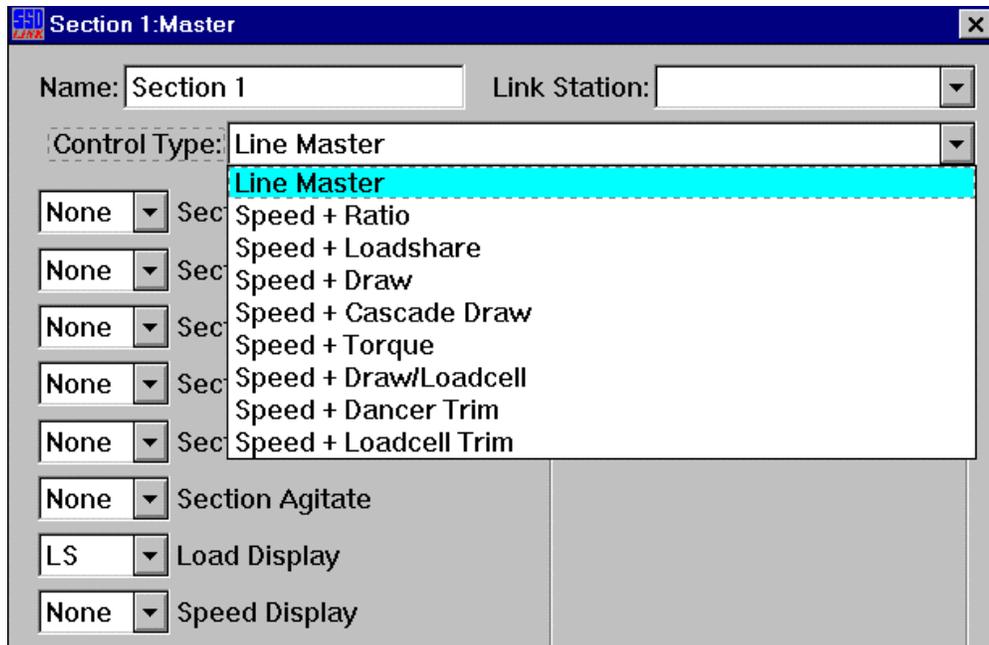

Figure 6 – Drive Section Dialog Box Showing Control Types

The Name can be edited to read the section name, for example Treater Roll, and the Link Station is selected from the hardware previously created. The Control Type is selected and this will determine which other options are available.
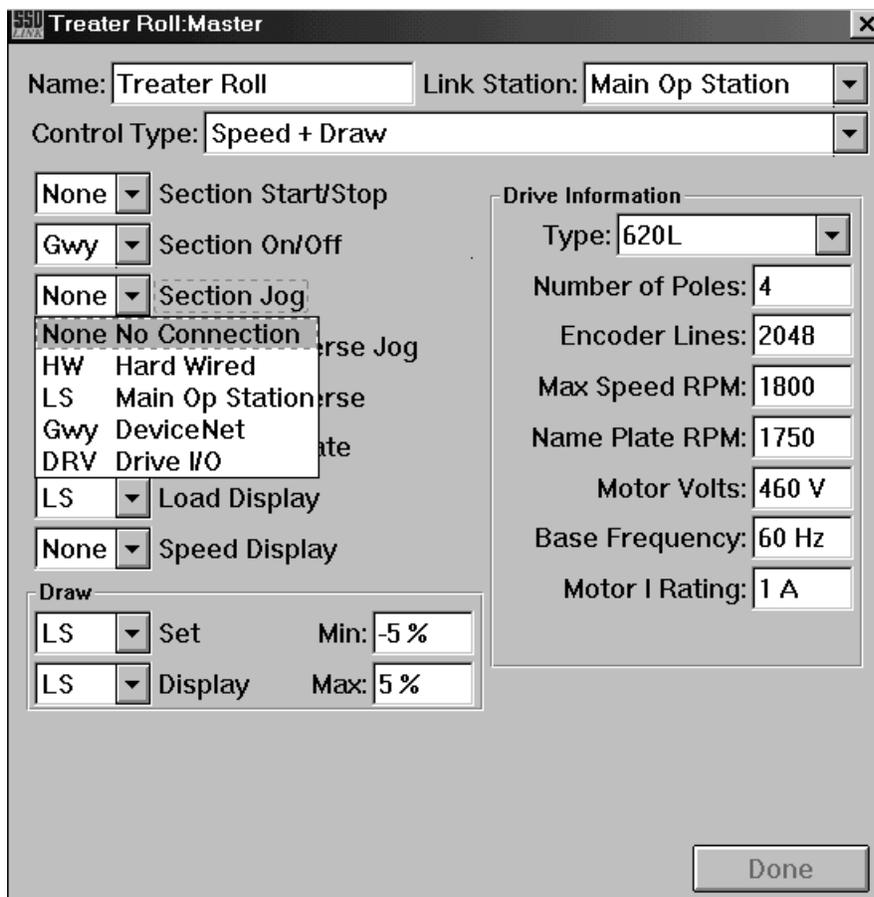
Figure 7 – Drive Section Dialog Box Showing Source/Destination Selection

The Drive Section optional features shown in figure 7 are selected by chosing the source or destination. The options are listed below:

    None: This option is not selected.

    HW: This option is via a LinkCard in the LinkRack; Analog for values and Digital for bits.

    LS: This option is from the LinkStation, in this case the Main Op Station.

    Gwy: This is from the Gateway, in this case a DeviceNet Link Card in the rack.

    DRV: This is from I/O on the drive, in this case the 620L

If the source appears in Red this indicates the Hardware has not been selected.

In this example the Logic inputs come from a PLC via DeviceNet and the Values from LinkStations.

Clicking DONE returns to the main Auto Configure screen.

Figure 7a – Main Auto Configure Screen

Five Sections have been created. Section Buttons provide easy editing functions:

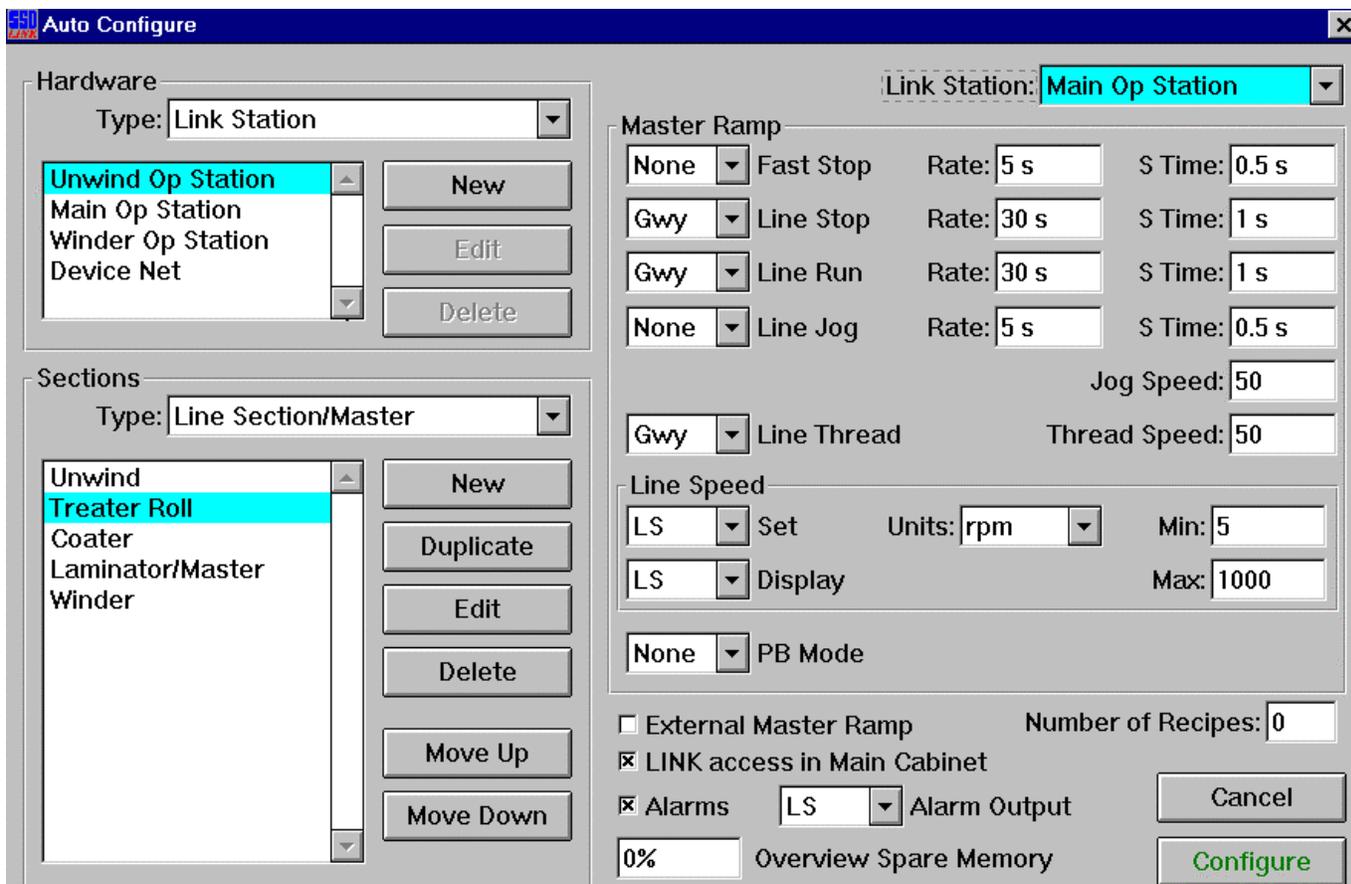**New:**   This generates a new section of the type selected.

Duplicate: This will generate an exact copy of a selected section.

Edit: This re-opens the Section screen of the selected section so that changes can be made.

Delete: This deletes the selected section.

CAUTION

There is no UNDO for the Delete function.

Move Up/ Move Down: Sections will appear in the configuration in the order that they appear in the list, so to move a section use the Move Up and Down buttons.

Line Controls

The right hand side of the Auto Configure screen has the global Line Controls. At the top is the LinkStation hardware selection. This is where any LS selections will be placed. Next are the options and parameters for the Master Ramp. At the bottom are additional options that are described below.

External Master Ramp: This will be selected if a Master Ramp is not required, for example, a drive system that follows another machine. Selecting this option grays out all the Master Ramp selections except for the Line Speed Set and Display. This permits selection of the source of the Line Speed Set and provision for Line Speed display.

Number Of Recipes: A recipe handler can be provided in the LinkStation that stores recipes for all Set values e.g Line Speed, Tension, Draw, Ratio etc. Setting the Number of Recipes to more than zero creates the recipe handler and determines the number of recipes available. The Recipes are selected, saved and retrieved by buttons on the LinkStation. The initial Set values are 50% of the selected range for all recipes. These must be set to the required values, by the operator, from the LinkStation.

Link Access in Main Cabinet: This adds a LinkRack in the main drive cabinet if one is not automatically generated. This might occur if the Overview is selected in a LinkStation.

Alarms: Selecting Alarms provides an Alarm handler which annunciates the Drive Fault alarms with an Acknowledge feature. The destination of the Alarm output is selectable. If the Alarm handler is used with the Master Ramp an unacknowledged alarm will cause a line stop. Acknowledging the alarm permits a restart.

Overview Spare Memory: Auto Configure calculates the memory requirement of the configuration and generates additional L5300 LinkRacks as required. If the user wishes to add additional custom configuration after the Auto Configure it is wise to specify some spare memory.

Configuring the Project

Before configuring the project carefully check all selections. Check the Hardware, any selection appearing in red indicates the hardware selected has not been created . Check each Section screen including the Drive selection and calibration. Check the LinkStation selections on each screen.

To configure the project click the Configure Button. The program will now save the Auto Configure settings, and generate the configurations for all the Drives, LinkStations and LinkRacks required. When complete go to the File Open menu to display the configurations.
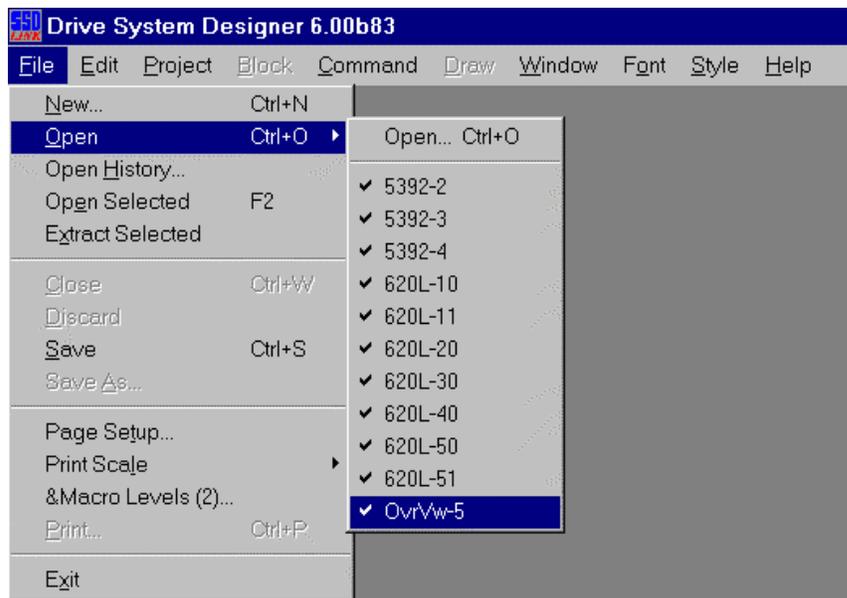

Figure 7 – Open Configuration Menu Selection

Auto Configure has generated three LinkStations L5392, seven 620L Vector drives (there were five sections but the Unwind and Winder were selected as Twin Turret thus producing two drives each) and an Overview LinkRack, L5300, containing I/O and the DeviceNet LinkCard. All configuration names are the hardware and the address, except for the Overview, which is named OvrVw so that it can be easily identified.

Select the OvrVw-5 and page through the project configuration. The complete seven drive system is contained in 6 pages. Page 1 is the Hardware I/O, page 2 the DeviceNet interface, page 3 the Line Control including the Master Ramp and Alarms and pages 4, 5 and 6 contain all the drive sections.

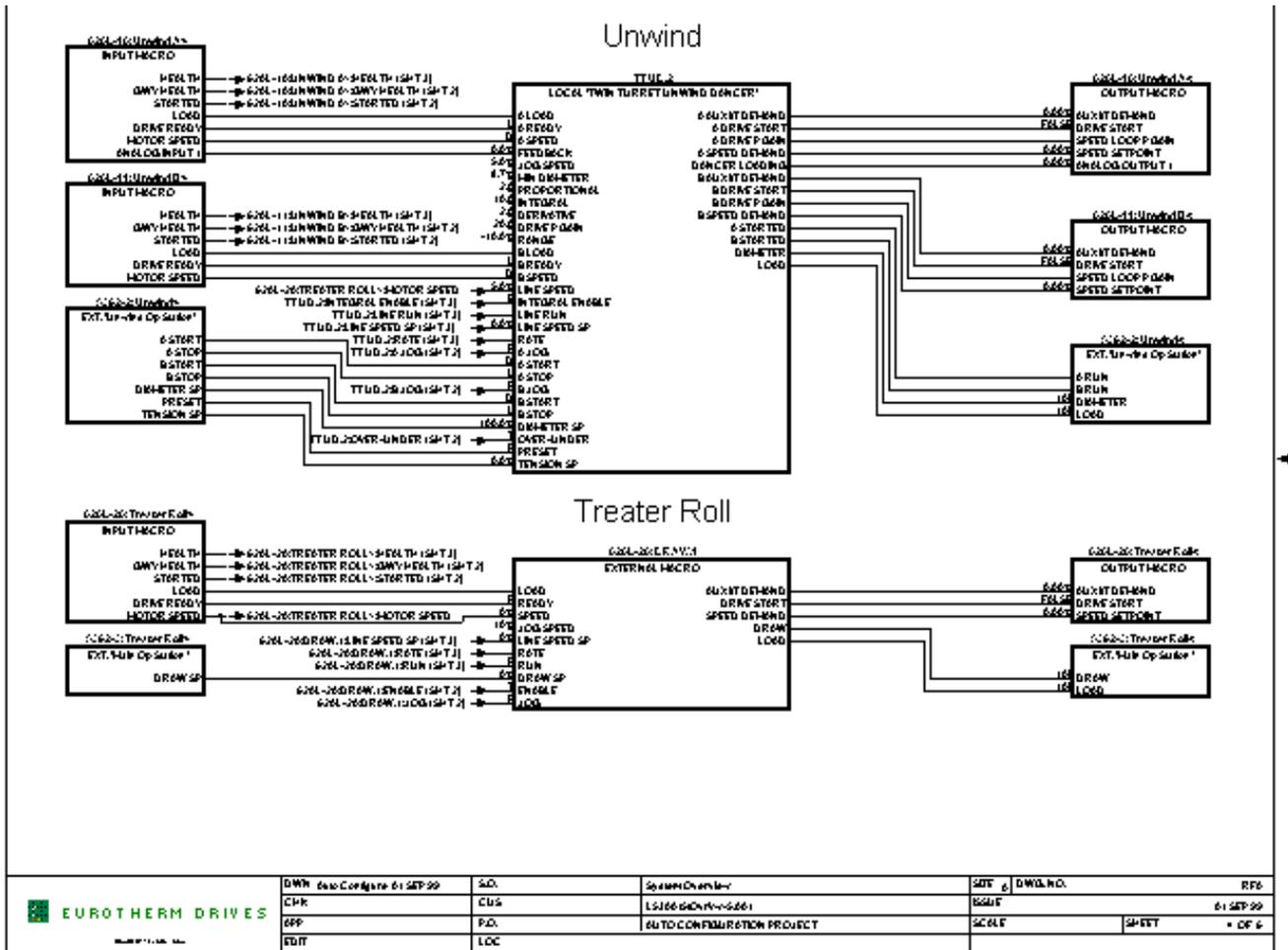The Unwind and Treater Sections look like this figure.

Figure 8 – Sample DSD Drive Section Page

Each box is a macro containing the configuration but only showing the inputs, outputs and parameters that are actually used. The drives and LinkStations are split into macros of the outputs and the inputs to produce an easy to understand signal flow from left to right.

Consider the Treater Roll. At the top left is the 620L Vector drive outputs. These include the Health, Drive Ready, Motor Speed and Load. In the center is the application macro. It receives the Line Run and Line Speed signals from the Master Ramp (on a previous sheet) and Draw Setpoint from the LinkStation. The outputs from the macro are the Drive Start and Speed demand to the Drive inputs and Draw and Load to the LinkStation for display.

For more information on macros see Appendix A.

Editing the Project

After the configuration has been generated it can be edited using DSD.

Before editing, carefully check that the automatically generated configuration matches as closely as possible the actual drive system requirements. It is possible to return to the Auto Configure screen to add, delete or change any of the selections but once the configuration is edited, returning to Auto Configure will overwrite any edits.

The Auto configure settings are saved when the Configure button is pressed (also by selecting FILE::SAVE).

To return to the Auto Configure screen just to view the previous settings, load the saved settings by selecting Auto Configure. It is not possible to Configure as there are already configurations in the project. Pressing CANCEL, closes the screen.

To return to the Auto Configure to make changes, first the configurations must all be deleted, using the PROJECT::DELETE CONFIGS selection. Then load the previous settings by selecting Auto Configure. Make the changes and press the CONFIGURE button to recreate the modified configurations.

Editing the Configurations

The configurations can be modified either in the individual configurations or through the Overview. When working in the Overview, the individual configurations are automatically opened when an External macro is opened and any changes are saved in the individual configurations as well as the Overview.

Installing Configurations

The configurations can be installed individually or by using COMMAND::INSTALL CHANGES in the menu. If INSTALL CHANGES is used the modules must be addressed to match the configurations. This is done with the COMMAND::RE-ADDRESS function in the menu.

Online Monitoring

Once the configurations are installed the drive system can be monitored from the overview. To access the External Macros a Full Update of the module list must be performed. If a Full Update has not been performed the dialog, "Could not locate specified module in module list", may appear.

To monitor the overview, double click on the OvrVw in the Module List and place the cursor over the input or output of the macro. Click when the cursor changes into a cross hair, the value will be displayed in the scratch Pad. Pressing the <Shift> key while clicking will add the value to a Monitor List. Pressing the <Ctrl> key while clicking brings up a Set dialog to set the value (as long as Read Only is disabled in COMMAND::SAM::READ ONLY).

Appendix A – Macros

Macros are a feature in DSD not previously available in ConfigEd.

Macros are designed to provide a more compact and understandable graphical presentation of LINK configurations. A macro is a block, as in a block diagram.

The block has a Name and Inputs and Outputs. The size of the block is determined by the number of input and outputs and not the size of the configuration. Consequently large configurations can be displayed in a small area which provides better understanding and accessibility.

There are two types of macro, a Local Macro which is actually in the configuration in which it appears, and an External Macro which is actually in another configuration.

Drive and application macros are generated by Auto Configure. In the configuration, select the macro and press the <Enter> key (or double-click) to open the configuration in the macro. Double-click with <Shift> key pressed to open the macro parameters only.

CREATING EXTERNAL MACROS

An external macro is a copy of a local macro in another configuration. To copy a macro into a configuration, the configuration containing the local macro must be open. Select the configuration in which the external macro is to be placed.

Select BLOCK::MACRO and the open configuration containing the macro(s) will appear.

Figure 9 - Creating External Macros

Selecting the macro will produce a complete external macro. Pressing the <Shift> key while selecting will produce a left hand macro with outputs only. Pressing the <Ctrl> key while selecting will produce a right hand macro with inputs only. It is only possible to have one copy, of each external macro, in any one configuration.

EDITING MACROS

Macros can be edited by opening the macro configuration and making changes as in any LINK configuration.

Adding Inputs and Outputs

If an Input or Output is required, select BLOCK::INPUT, or BLOCK::OUTPUT. This will produce a diamond shaped connector that requires a unique name. The Input or Output will appear on the Macro block when the macro configuration is closed.

590L and 590SPL Macros

The 590L and 590SPL drive macros are special cases. They are NOT configurable but only provide connections to the network and to set parameters. The 590L and 590SPL drive macros enable connections to the drive without the user having to know the slot number. These connections should NOT be edited inside the drive macro. If a macro input must be changed, delete the input and create a new input with a new name.

If the same name is required, delete the input, close the configuration, re-open and create a new input with the same name.

Connecting Macros

Connections between macros should be created, and if required, deleted in the Overview. A connection made in the Overview will automatically generate the slot in the source configuration when the Overview is closed. Deleting the slot will not remove the connection in the Overview but will obviously render it inoperative, which may cause confusion. If the Overview connection is deleted the slot will be removed and the connection in the Overview, without any confusion.

MONITORING MACROS WITH SAM

In Run Time mode the inputs and outputs on a macro will return the value of the function block to which they are connected inside the macro. These can be seen in the graphical overview. To access External Macros a Full Update must be performed.

CONFIGURATION ARCHITECTURE

Auto Configure generates configurations following set rules. Understanding these rules can simplify initial choices and subsequent editing.

Types of macros: Currently there are three main types of macros, Drives, LinkStation sections and Application macros.

LinkStations: LinkStation operator controls are grouped into macros for each drive section or Line control. Each macro is on a separate page (or pages if more than one page is required for a section).

The Overview is in an L5300 LinkRack configuration except when the LINKStation is selected as the overview.

The Application macros for 590L and 590SPL drives are in a L5300 LinkRack configuration. The Application macros for 620L drives are in the 620L configuration except for SPWand CPW winders which are in a LinkRack. All application macros for the 584SV and 590+ are in the Techbox configurations except for twin turret winders.