LINK TechBox / TechCard

SSD DRIVES

Product Manual

HA470016

Safety Information

Please read this information BEFORE installing the equipment.

Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

Application Area

The equipment described is intended for industrial motor speed control using DC or AC motor controllers, with DC motors AC induction or AC synchronous machines.

Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

REFER TO YOUR MAIN PRODUCT MANUAL FOR SPECIFIC SAFETY INFORMATION ABOUT THE DEVICE YOU ARE CONTROLLING

IMPORTANT
It is required that the user be familiar with navigating through the drive MMI menus, be able to select functions and set values and options. For further reading on this topic, refer to the appropriate drive instruction manual. If using DSD, ConfigEd or ConfigEd Lite, it is required the user must be familiar with the software packages.

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Printed in the USA HA470016 Issue 5

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Chapter 1 - An Overview

The *LINK* TechBox/TechCard option allows standard drives to be a part of the *LINK* fiber optic network. A computer may be used to provide supervision and monitoring for each drive and other *LINK* modules in the system.

6053-LINK-00 TechBox

This techbox is to be used with the 605 and 690+ frame B. The 6053-L-00 fits into the same location normally occupied by the keypad. If the keypad is needed for the application, it may still be used with a remote mounting kit. An auxiliary 24VDC power supply input allows the techbox to be powered separately from the drive. If the drive shuts down, the network remains intact. A three-position switch provides adjustment of the light intensity transmitted through the fiber.

6055-LINK-00 TechBox

This techbox is to be used with the 590+ all frames, 605 and 690+ frames C and higher. The 6055-L-00 plugs into the right side technology box slot beneath the front cover of the drive. The left side location is reserved for feedback technology options. The keypad is unaffected by the presence of a techbox. An auxiliary 24VDC power supply input is provided allowing the techbox to be powered separately from the drive. In the event of a drive shut down, the network integrity remains intact. A three-position switch provides adjustment of the light intensity transmitted through the fiber.

LA463610U003 TechCard

For the 584SV, the technology option takes the form of a plug-in card that installs behind the front cover of the drive. The keypad is unaffected by the presence of a techcard. An auxiliary 24VDC power supply input allows the techbox to be powered separately from the drive. If the drive shuts down, the network remains intact. A three-position switch provides adjustment of the light intensity transmitted through the fiber.

Further Reading

605 Drive Instruction Manual.
690+ Drive Instruction Manuals.
590+ Drive Instruction Manual.
584SV Drive Instruction Manual.
LINK Overview Manual.

Advantages
***LINK* fiber optic system**

1. Inherently noise free since the transmission from module to module is fiber optic. No electrical noise and ground loops to contend with.
2. There is only one fiber that connects the whole network, in place of hundreds of wires. Eliminates wiring mistakes and results in efficient installation and start-up.
3. Network speed is 2.7 MBaud and latency is minimal.
4. Digital transmission is fundamentally less noise-prone than analog methods, and the accuracy of the transmitted data is unaffected by the transmission medium. The use of intelligent devices at either end of the data link allows error checking to be used. This virtually eliminates the effects of electrical noise on data integrity. It is therefore possible to issue setpoints to drives with much higher accuracy using this method.
5. Many hardware devices to choose from, like drives, racks, touchscreens and I/O cards.

Product Features

- Available for 605, 690+, 590+ and 584SV products
- Compact 5H x 3W x 1D inches
- Easy snap on installation
- Eliminates hard wired signal connections
- Standalone processing with built in macros
- Auxiliary power supply input for network backup
- Indicator LED's for Drive and Network status
- Direct tag access for all drive parameters

Part Number and Identification

The Option can be supplied with the drive or independently.

- 605 Drive:

  Supplied with the 605 drive: **605**/xxx/xxx/x/x/xxx**4**/xx/xxx

  Enclosed in a "Technology Box" for use with the 605 Sizes B: **6053-LINK-00**
  Enclosed in a "Technology Box" for use with the 605 Sizes C: **6055-LINK-00**

- 584SV Drive

  Supplied with the 584SV Inverter: **584SV**/xxxx/xxx/xxxx/xx/xxx/**LINK**/xxx/xx/xxx

  A "Technology Option" plug-in card for use with the 584SV drive: **LA463610U003**

- 590+ Drive

  Supplied with the 590+ drive: **590P**/xxxx/xxx/xxxx/xx/**LINK**/xxx/xxxx
  Enclosed in a "Technology Box" for use with the 590+ All Frames: **6055-LINK-00**

- 690+ Drive

  Supplied with the 690+ drive: **690PB**/xxxx/xxx/x/x/xxxx/xxxx/xxxx/**LINK**/xxx/xxxx

  690P/xxxx/xxx/xxxx/xx/xxx/ **LINK** /xxx/xxx /xxx/xxxx
  Enclosed in a "Technology Box" for use with the 690+ Size B: **6053-LINK-00**
  Enclosed in a "Technology Box" for use with the 690+ Sizes C+: **6055-LINK-00**

Chapter 2 - Installation

Installing the Option

WARNING

Before installing, ensure that the drive power is switched off and cannot be switched on accidentally by other personnel.

Wait 5 minutes after disconnecting power before working on any part of the system or removing the covers from the drive.

Wiring

Fiber optic Connections

Recommended Fiber optic Cable Specification CM056316U030	
Core Diameter	1000 micron
Cable Type	Acrylic
Bending radius	> 1 inch (25.4 mm)
Insulation	Vinyl > 1KV

For fiber optic connections, use standard 1000 micron acrylic cable (CM056316U030). Connect the fiber optic cable from blue transmit terminal on any one techbox or techcard, to the black receive terminal on the next module until the loop is closed, as shown in Figure 1.

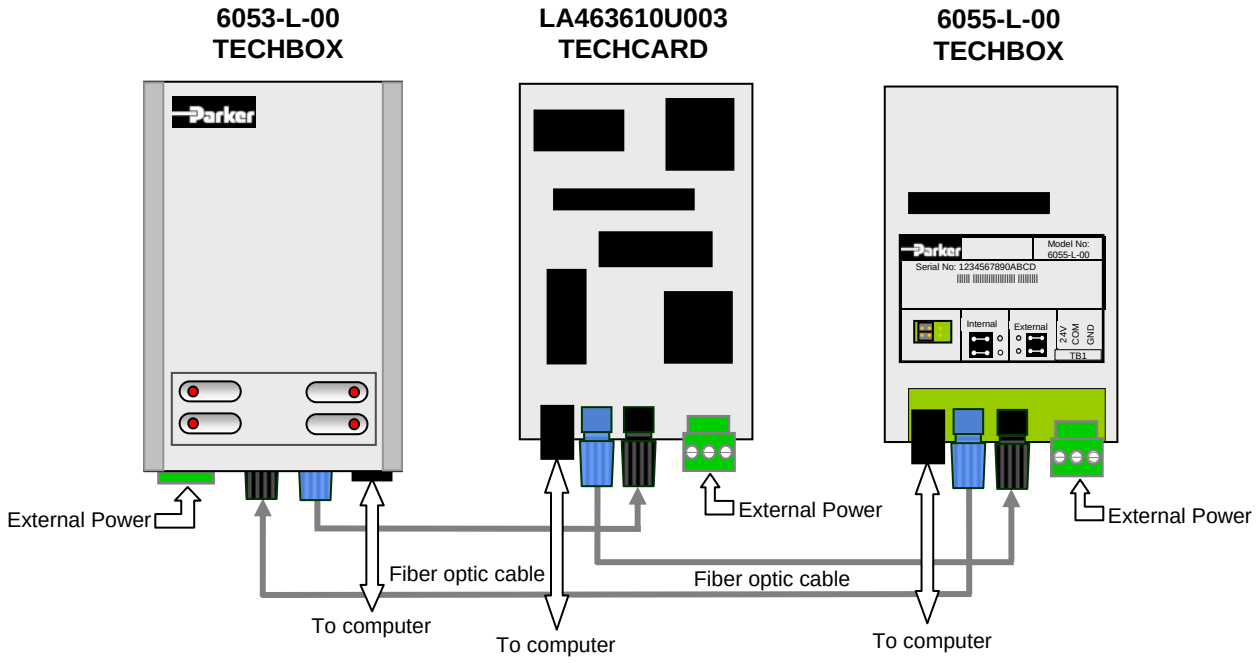


Figure 1–Sample *Link*

Computer Connections – Socket (J2)

A computer connected to the RJ15 socket on any *LINK* module can be used to configure or monitor any element within the Link network. SSD Drives graphic configuration software package Drive System Designer (DSD) version 1.07 or ConfigEd version 5.13 (database properties of platform rev. 14-0, library rev. 114-0, instruction rev. 9-0 and class rev. 904-0), and all subsequent versions supports this option. If you have an older version, updates may be obtained simply by contacting Parker SSD product support.

Use the cable that was supplied with your DSD or ConfigEd package. Plug the larger end into your computer serial port (using the DB9to RJ11 adapter supplied), and the other end (RJ15) into the socket on the *LINK* TechBox/TechCard.

External Power Connections (Optional)

Terminal Block (TB1)

The plug-in connectors for TB1 are physically different for the 6055-L-00 TechBox, LA463610U003 TechCard and the 6053-L-00 TechBox.

Note: Power requirements: 24vdc rated for 200ma inrush and 65ma steady state.

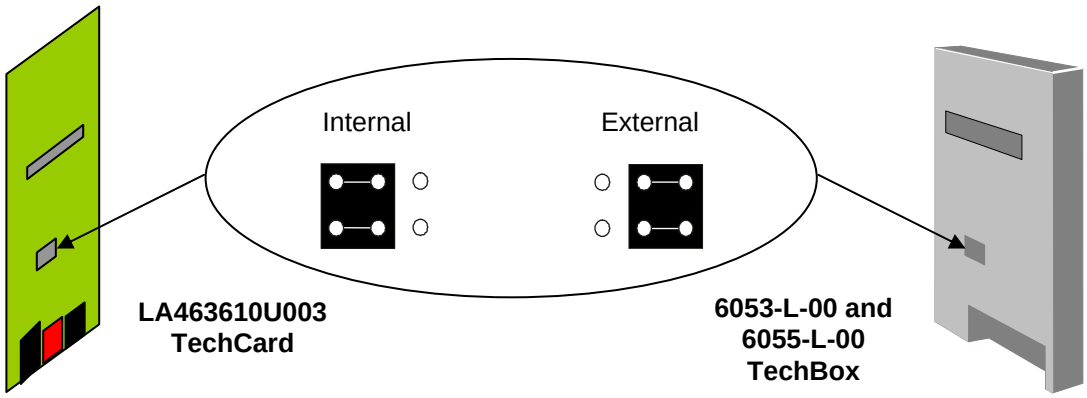
CAUTION

Terminal orientation will be different for 6055-L-00, LA463610U003 and 6053-L-00. The table below refers to "6055-L-00, LA463610U003 Position" and "6053-L-00 Position", as viewed from the front of the drive with the Technology Option fitted to the drive. Failure to heed this note will damage the card and void the warranty.

6055-L-00, Position	6053-L-00 Position	Terminal Description
LEFT	RIGHT	+24 VDC supply
CENTER	CENTER	COM (0V) supply
RIGHT	LEFT	GROUND

External Power Jumper (J3)

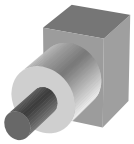
The "External Power" jumper (on the rear of the 6053-L-00 TechBox) (on the front of the 6055-L-00 TechBox and LA463610U003 TechCard) is factory set for "Internal Power". This jumper should be left in the "Internal Power" position, unless the techbox is being fed with an external 24 VDC power source. When external power is being selected, move the jumper from the INTERNAL (Left) position and reinsert the jumper in the EXTERNAL (Right) position. Connect the external power leads to TB1 according to the above-mentioned table.



Transmit Strength Settings – Switch (SW1)

Set this switch to select the transmission intensity of the light. Use the table below to choose the position after determining the approximate length of the 'transmit' fiber optic cable to the next *LINK* element.

6055-L-00, LA463610U00 Position	6053-L-00 Position	Intensity	Transmit Range
CENTER	CENTER	LOW	0 – 20 m (0 – 66 ft)
UP	DOWN	MEDIUM	21 – 40 m (67 – 132 ft)
DOWN	UP	HIGH	41 – 60 m (133 – 196 ft)



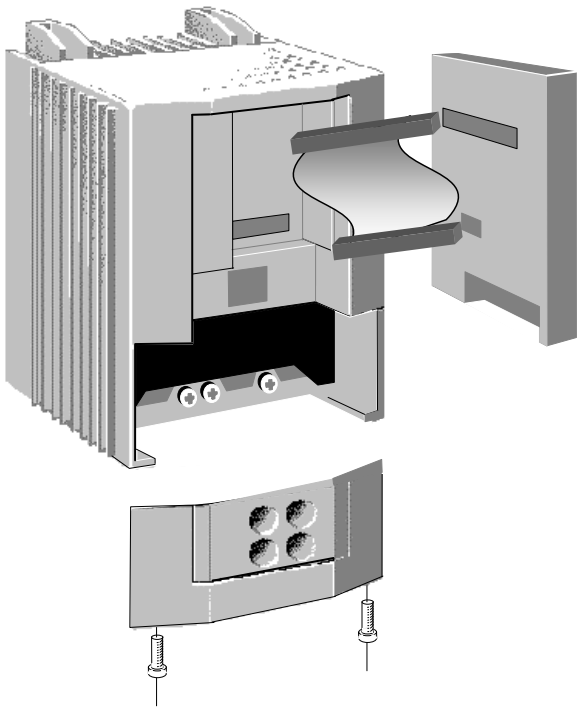
CAUTION

Switch orientation is different for 6055-L-00, LA463610U003 and 6053-L-00. The table above refers to "6055-L-00, LA463610U003 Position" and "6053-L-00 Position", as viewed from the front of the drive with the Technology Option fitted to the drive. Setting the transmit strength switch to the wrong setting will result in incorrect light intensity and may cause the *LINK* network to malfunction.

Fitting the TechBox to the frame B 605 and 690+ Drives

WARNING!

Ensure that all power is off prior to working on the drive



The option is supplied as a "6053-L-00 Technology Box" which fits into the front of the 605 and 690+ drive in place of the keypad or blank cover.

- Remove the terminal cover and screws.
- Plug the ribbon cable into the back of the TechBox and into the socket on the 605B or 690+B drive
- Snap the TechBox into place in the recess on the front of the 605B or 690+B
- Make all user-wiring connections. Connect all shields to the ground post on the chassis. Make a connection from the TechBox TB1 ground terminal to the ground post on the chassis.
- Re-install the terminal cover securely with the screws.

Note: *If permanently using the keypad with the Technology Box fitted, mount the keypad remotely using the Panel Mounting Kit with part number (6052). The connecting lead enters the 605 Inverter through the gland plate.*

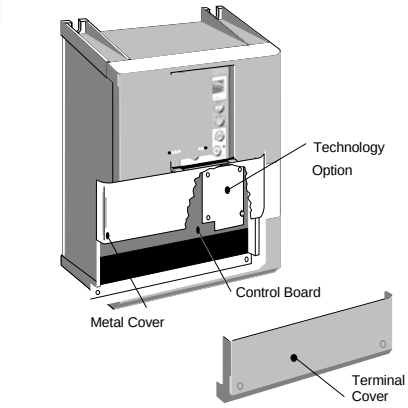
IMPORTANT: Remember to set the transmit strength setting on switch, SW1.

Fitting the TechCard to the 584SV

The option is supplied as a "Technology Option" board. It is factory-fitted to the control board inside the drive.

Warning
Ensure that all power is off prior to working on the drive.

Caution
When handling the board, observe electrostatic control precautions.



584SV Frames 4, 5 & 6

- Remove the terminal cover with the captive screws. Slide off the metal cover after removing the retaining screw. The technology option is fitted to the control board, as shown.
- When wiring connections have been made, reinstall the terminal cover and secure with screws.

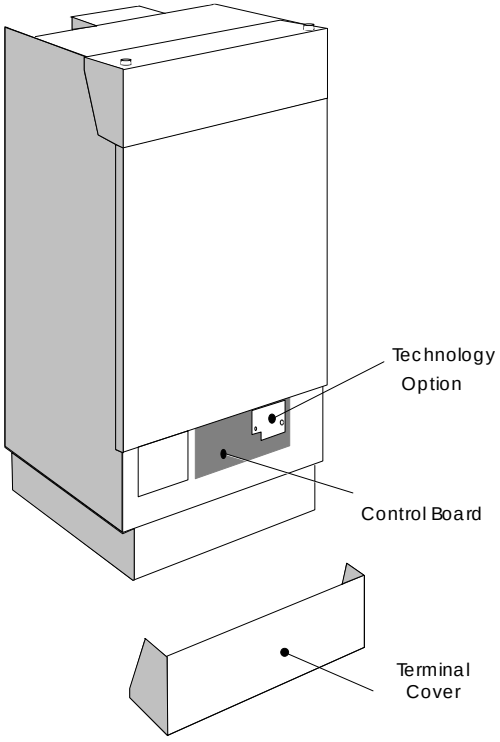
584SV Frames 7, 8, 9 & 10

- Remove the terminal cover with the captive screws.

  The Technology Option is fitted to the Control Board, as shown.

- When wiring connections have been made, refit the terminal cover and secure with screws.

IMPORTANT: Remember to set SW1 for the correct intensity.



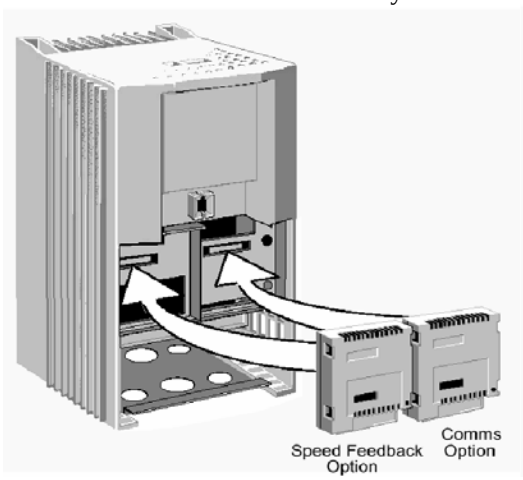
Fitting the TechBox to a 590+ and 605/690+frames C and above

The option is supplied as a "6055-L-00 TechBox" which fits into the lower right front of the 605C/690+C - F drive.

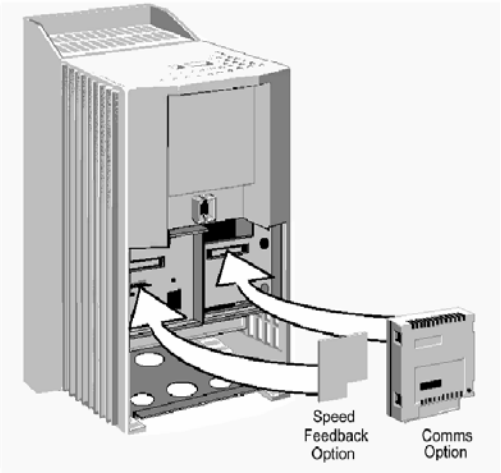
Note: *The 6055-L-00 TechBox does not affect the operation of the 6051/6901 keypad.*

WARNING!
Ensure that all power is off prior to working on the drive.

- Remove the terminal cover.
- Plug the techbox into the socket located in the lower right side 605C or 690+C-F drive.
- Tighten the screw to secure the techbox to the drive. This also serves as a ground connection for the TechBox.
- Make all user-wiring connections. Connect all shields to the ground post on the chassis.
- Re-install the terminal cover securely with the screws.



605C, 690+ C-F frames



590+ all frame sizes

IMPORTANT: Remember to set SW1 for the correct intensity.

Chapter 3 - Initial Set-up

Configuring the Drive

MMI Menu Map

1 SETUP PARAMETERS
2 FUNCTION BLOCKS
3 SERIAL LINKS
4 TEC OPTION
- TEC OPTION TYPE
- TEC OPTION IN 1
- TEC OPTION IN 2
- TEC OPTION IN 3
- TEC OPTION IN 4
- TEC OPTION IN 5
- TEC OPTION FAULT
- TEC OPTION VER
- TEC OPTION OUT 1
- TEC OPTION OUT 2

The first step in using the technology option is configuring the drive to accept the TechBox. The keypad (MMI), DSD/ConfigEd (*LINK* programming software) or ConfigEd Lite (SSD Drives' device level configuration software), must be used to configure the TEC OPTION function block parameters inside the drive before commissioning the *LINK* technology option.

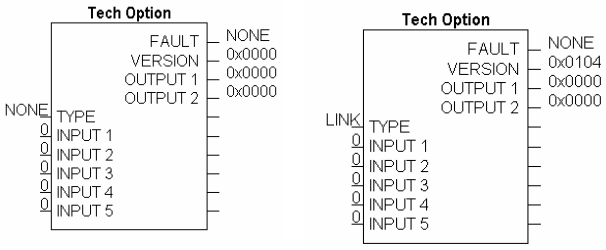
The parameter names/functions in this function block are inter-dependent and will change with different parameter values and various technology options.

The Function Block diagram below shows the DSD and ConfigEd Lite parameter names, which are also displayed on the MMI if no Option is fitted or an incorrect TYPE is selected for the fitted Option.

IMPORTANT

The user must be familiar with navigating through the drive MMI menus, be able to select functions and set values and options. For further reading on this topic, refer to the appropriate drive instruction manual. If using DSD/ConfigEd or ConfigEd Lite, the user must be familiar with the software package.

Under TYPE, select LINK.



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Parameter Descriptions

TYPE *Range: Enumerated - see below*

Selects the type of TechBox.

Enumerated Value : Technology Option

0 : NONE
1 : RS485
2 : PROFIBUS DP
3 : LINK
4 : DEVICENET
5 : CANOPEN
6 : LONWORKS
7 : TYPE 7

FAULT *Range: Enumerated - see below*

The fault state of the Technology Option card.

Enumerated Value : Fault State

0 : NONE: Normal operating mode.
1 : PARAMETER: Confirm that tag exists in the *LINK* Configuration.
2 : TYPE MISMATCH: Confirm that type of tag is valid.
3 : SELF TEST: The self test has failed. Replace TechCard/TechBox.
4 : HARDWARE: Hardware error. Replace TechCard/TechBox.
5 : MISSING: TechCard/TechBox not installed/

VERSION *Range: 0000 to FFFF*

The version of the Technology Option. If no option is fitted then the version is set to zero.

INPUTS (1–5) *Range: 0000 to FFFF*

Not used with the *LINK* Technology Option

OUTPUTS (1–2) *Range: 0 to 9999*

Not used with the *LINK* Technology Option

Other Function blocks

While configuring the "TEC OPTION", you may also insert other Link function blocks into the TechBox template. This can be done by using ConfigEd or DSD.

DSD and ConfigEd

When configuring the "TEC OPTION" function block using DSD the TechBox and drive can be programmed completely using the DSD software. Drive System Designer (DSD) provides the TechBox templates for the 590+ and 690+ only. When using ConfigEd to program the TechBox Tag Readers and Tag Writers are used.

Install

If using the MMI, remember to save the set-up via the Save Parameters or Save Config menu.
If using ConfigEd Lite install the configuration into the drive through the P3 port (RS232 configuration port), using the **Command/Install** pulldown menu. For more details on installing a configuration, refer to the ConfigEd Lite Instruction Manual (RG352747) Chapter 4 page 4-7.
If using ConfigEd or DSD, install the configuration using socket J2 on the Link TechBox (RS232 configuration port) **Command/Install** pulldown menu. For more details on installing a configuration, refer to the ConfigEd Instruction Manual (RG353792) Chapter 4 page 4-26.

Chapter 4 - Using DSD Macros and Templates

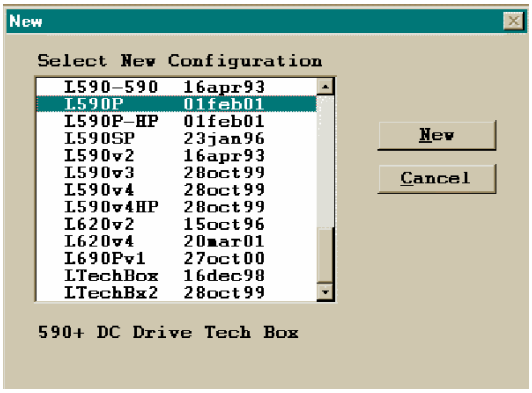
590+ and 690+ Macros/Templates

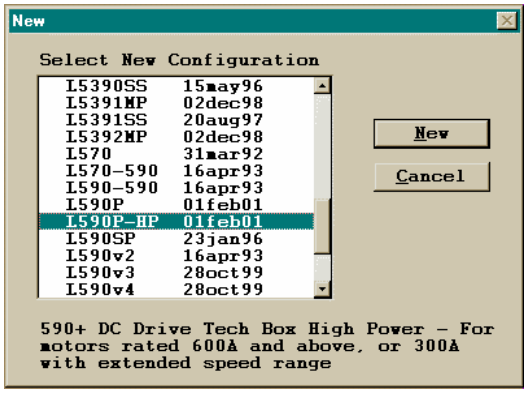
The DSD program has pre-configured macros for the 590+ and the 690+. These macros contain a template for the specific drive. The internal drive parameters are programmed via the template and are stored in the TechBox/TechCard. The macros are loaded every time the drive is energised; thus all drive parameters are loaded into the volatile memory. DSD database properties of platform rev. 14-0, library rev. 115-0, instruction rev. 9-0 and class rev. 604-0, and all subsequent revisions.

Additional *LINK* function blocks may be inserted into the Techbox/Techcard configuration. The Techbox/Techcard has approximately 2/3 of the memory capability of the L5300. In terms of storage units the Techbox/Techcard has 4 units. A Section Control block requires 1 unit of storage, SPW 3 winder block requires 2 units of storage.

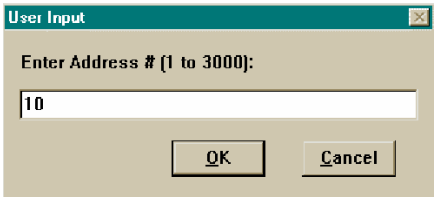
590+ Macro

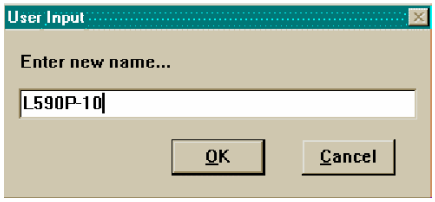
The 590+ macro is selected from the File/New drop down menu. There are two choices for the 590+, the L590P for armature current range 35 amps to 599 amps,and L590P-HP for armature current range of 600 amps and higher. The L590P-HP template is also used for field weakening applications when the armature currents are 300 amps and higher.

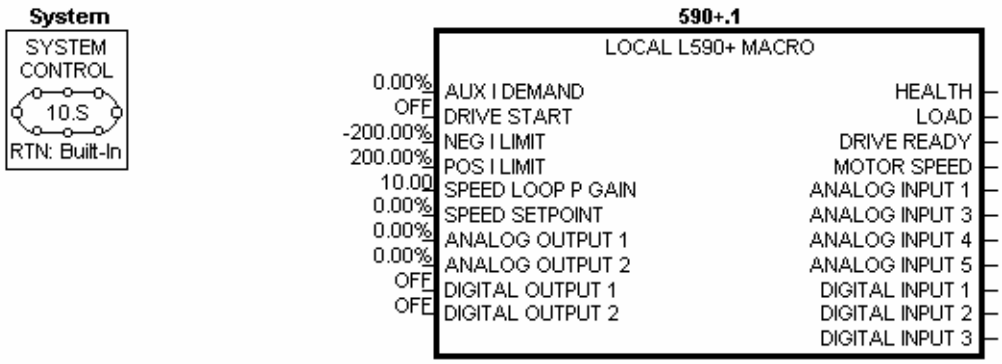




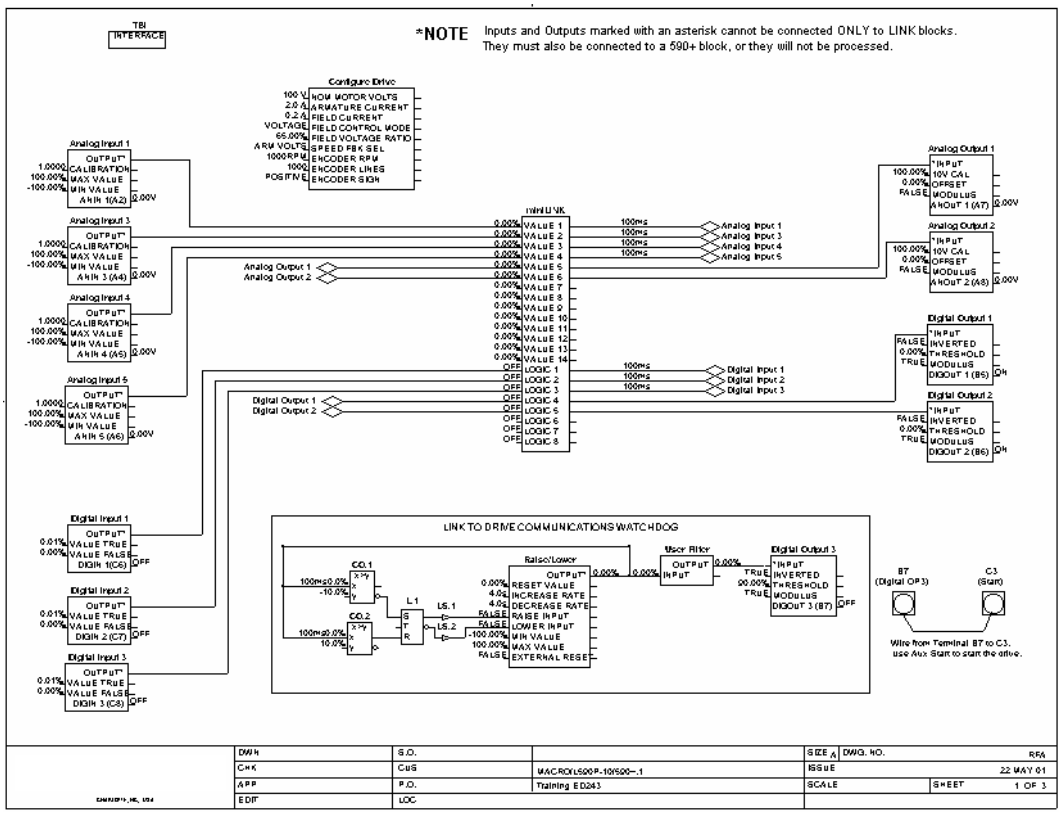
Select the applicable configuration for your drive. The program will prompt you for the address and module name.







The macro has some preconfigured inputs and outputs as default. If another tag or parameter is needed, it can be added inside the macro. It is possible to use both the drives' internal function blocks and the Link function blocks. Simply double-click on the macro to access the 590+ internal function blocks.



The macro has a built in Communications Watchdog. The Watchdog consists of *Link* system blocks and drive function blocks. If the *Link* network goes down, the drive will be disabled via digital output 3(B7) and start input (B3).

Modifying inside the macro

All the drive functions are available through the TechBox. When using some of the 590+ drive functions it may be necessary to use the Mini-Link block or a system block as the connection point to the TechBox. The purpose for doing this is to ensure proper triggering of non-system function blocks.

***Note**: The 690+ drive does not require the use of a system block to ensure proper triggering.*

Deleting and/or moving an internal connection

The connections inside the macro can be deleted or moved in the same fashion that is used in ConfigEd or DSD. When deleting the connection and the connection point be sure the connection outside the macro is deleted first. If the connection is only being moved from one block to another block it is not necessary to delete the external macro connection.

Inserting a new internal connection

Input connection points to the 590+ macro do not need to be connected to the Mini-Link block. When you are adding an output connection point to the 590+ macro it may be necessary to connect to the Mini-Link or system block. If the output connection point is originating from a system block it is not necessary to link the connection to the Mini-Link block. The connection is normalized so that scaling the signal is not necessary outside the macro.

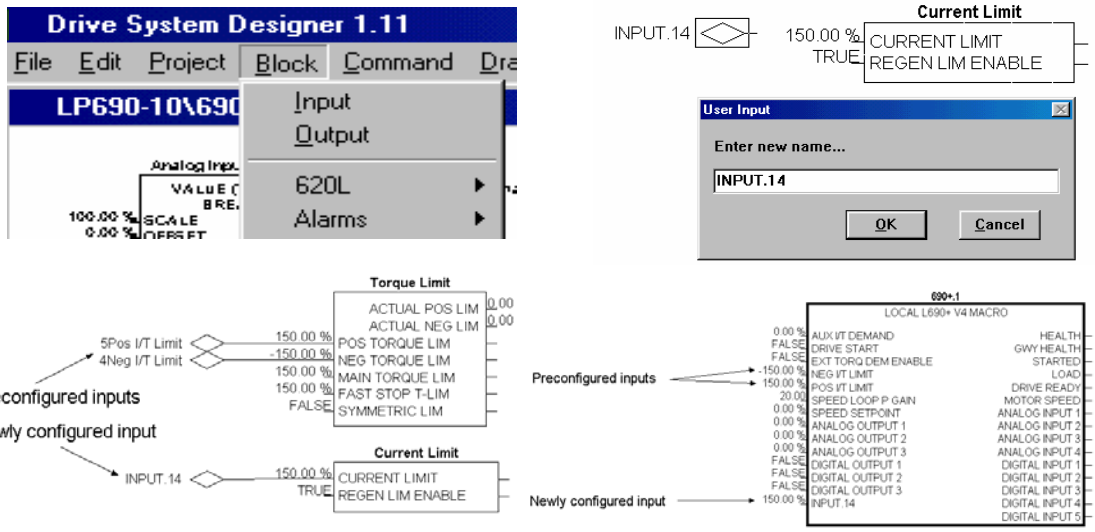
Inserting function blocks

Link function blocks may be programmed into the TechBox. *LINK* function blocks should be inserted outside the macro. Do not insert function blocks inside the drive macro. The macro inputs and outputs are normalized when connectioning to the drive through the macro. The function blocks are accessed in the same manner as other *Link2* modules.

Inserting and deleting macro inputs/outputs

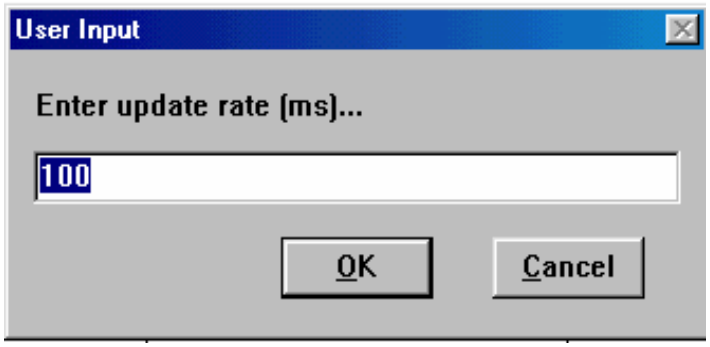
Connections in and out of the macros are made by the following methods.

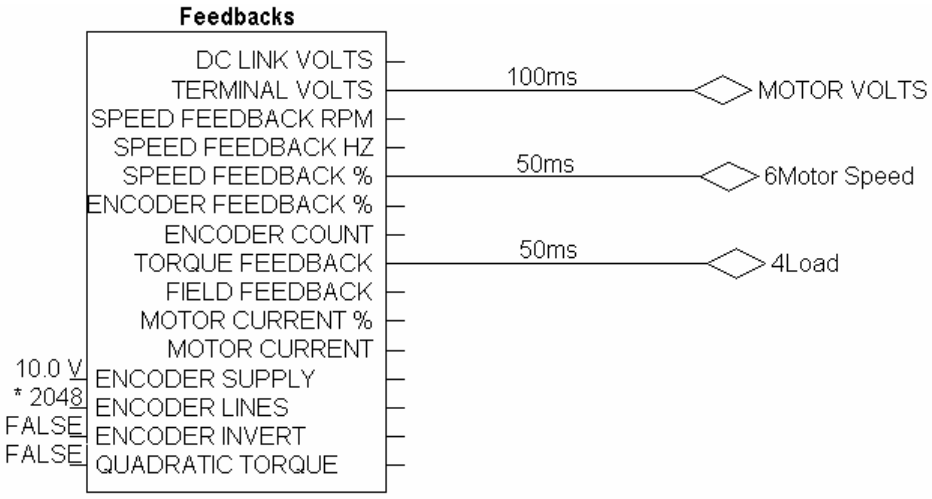
1. Selecting the inputs and outputs from the BLOCK menu will allow the I/O diamonds to be inserted into the macro. The diamond shaped input and output tags can be dropped anywhere inside the drive macro. Drawing a link from the input/output diamond to the desired connection point will make the connection to outside the macro.
2. Highlighting the tag and pressing the “DELETE” key will delete inputs or outputs. Prior to deleting the tag, be sure to disconnect all external connections to the macro.



***Note**: Internal tags do not get a module address or slot address. The tag appears as a connection point on the outside of the macro. Double clicking on the diamond will allow you to change the name of the tag. This name will appear inside and outside the macro. The number preceeding the tag name controls the order of appearance on the macro outside connection points. The number may be changed in the same manner as changing the name of the tag. Input connection points to the 590+ macro do not need to be connected to the Mini-Link block. When adding an output connection point to the 590+ macro it may be necessary to connect to the Mini-Link or system blocks.*

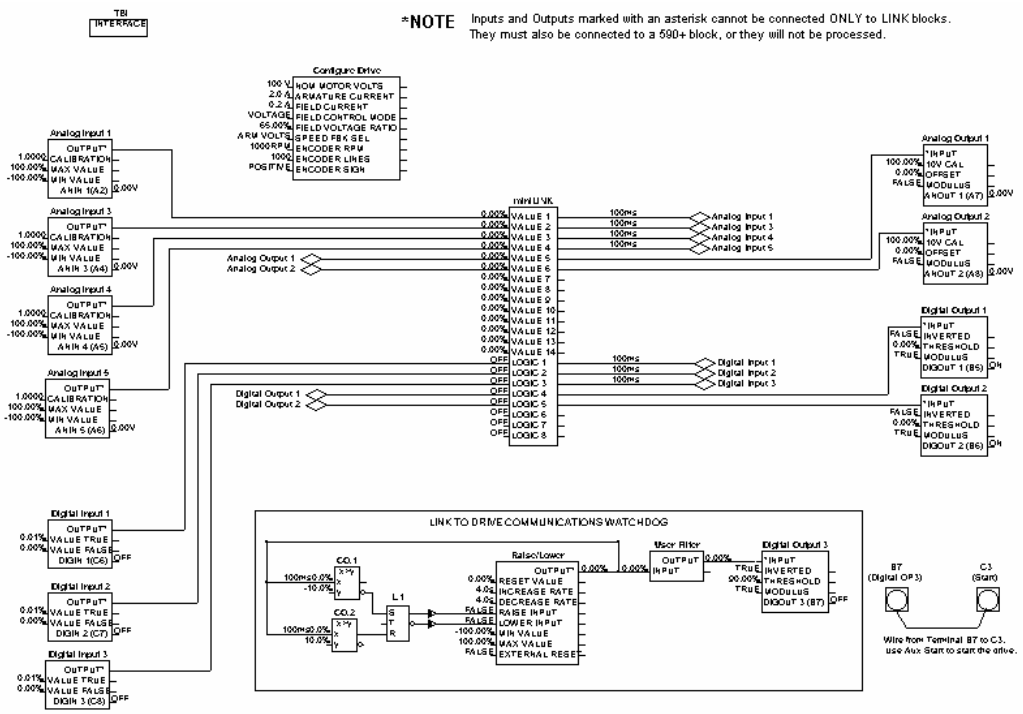
3. Certain output tags will require an entry for the connection speed. The faster connection speeds require more of the CPU heap usage. If too many fast connections are made, it may be possible to run out of CPU heap and cause an "L-Error" fault. Keep fast connections to a minimum.



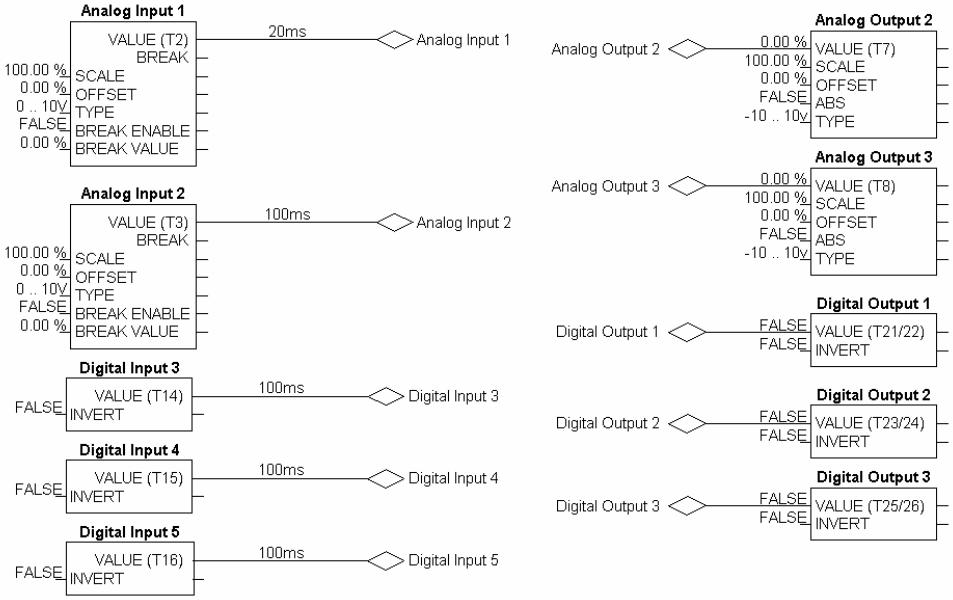


Using Drive I/O

Drive analog and digital inputs are available for use as I/O for the *Link* system. The 590+ drive requires the use of the MiniLink or system function blocks. The 690+ drive does not require the use of the MiniLink or system blocks.



590+ Analog and Digital I/O



690+ Analog and Digital I/O

Chapter 5 - Sample Projects

To demonstrate the use of a *LINK* Technology Option, here are two simple projects consisting of a 584SV drive, with a LA463610U003 TechCard, or 690+ drive with a 6053/6055 TechBox and an L5392 touchscreen. Our first example uses a 584SV, the second example uses a 690+. By configuring these pieces, we will build a *LINK* project that will**:**

- Start, stop and jog the drive from the touchscreen
- Display health status and trips
- Set line speed
- Monitor motor speed, frequency, voltage and current

Step 1 – Plan the project

Before any configurations are done, make list of parameters that need to be accessed in the drive. Go to the "Specification Table – Tag Number Order" section in the drive instruction manual to identify all tags. For this example they are:

TAG	R / W	Description	Type	Scaling
291	Write	Start Command	Ordinal	-
277	Write	Fast Stop	Ordinal	-
278	Write	Coast Stop	Ordinal	-
294	Write	Reverse Direction	Ordinal	-
280	Write	Jog Command	Ordinal	-
130	Write	Speed Setpoint	Value	1 = 120%
592	Read	Motor Volts	Ordinal	-
70	Read	Motor Load	Value	200% = 1
255	Read	Speed Feedback	Value	120% = 1
6	Read	Drive Status	Ordinal	-
591	Read	Output Frequency	Ordinal	-
52	Read	Drive Healthy	Ordinal	-
285	Read	Drive Running	Ordinal	-

Step 2 – Configure the Drive

584SV/605

Using the drive MMI, preferably ConfigEd Lite, configure the drive as shown in Figure 2. These instructions will also apply to the 690+ if using ConfigEd. The changes from default are**:**

- Drive Start Command goes to Sequencing Logic\Run Fwd. (Break the default connection to Run Fwd).
- Break all input connections to Value Function 1. (Speed Reference goes to Value Function 1\Input A).

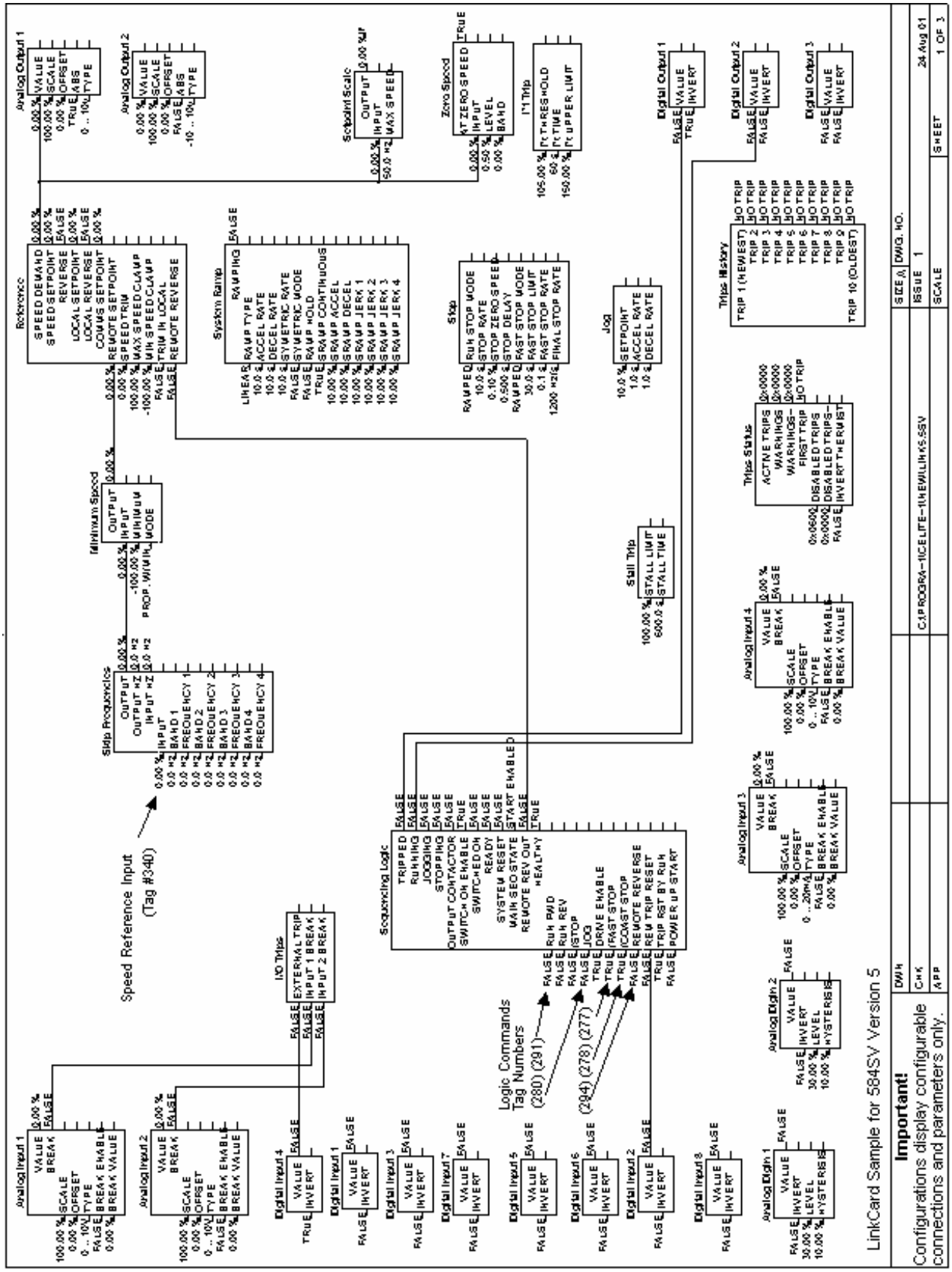


Figure 2 – (1 of 2)

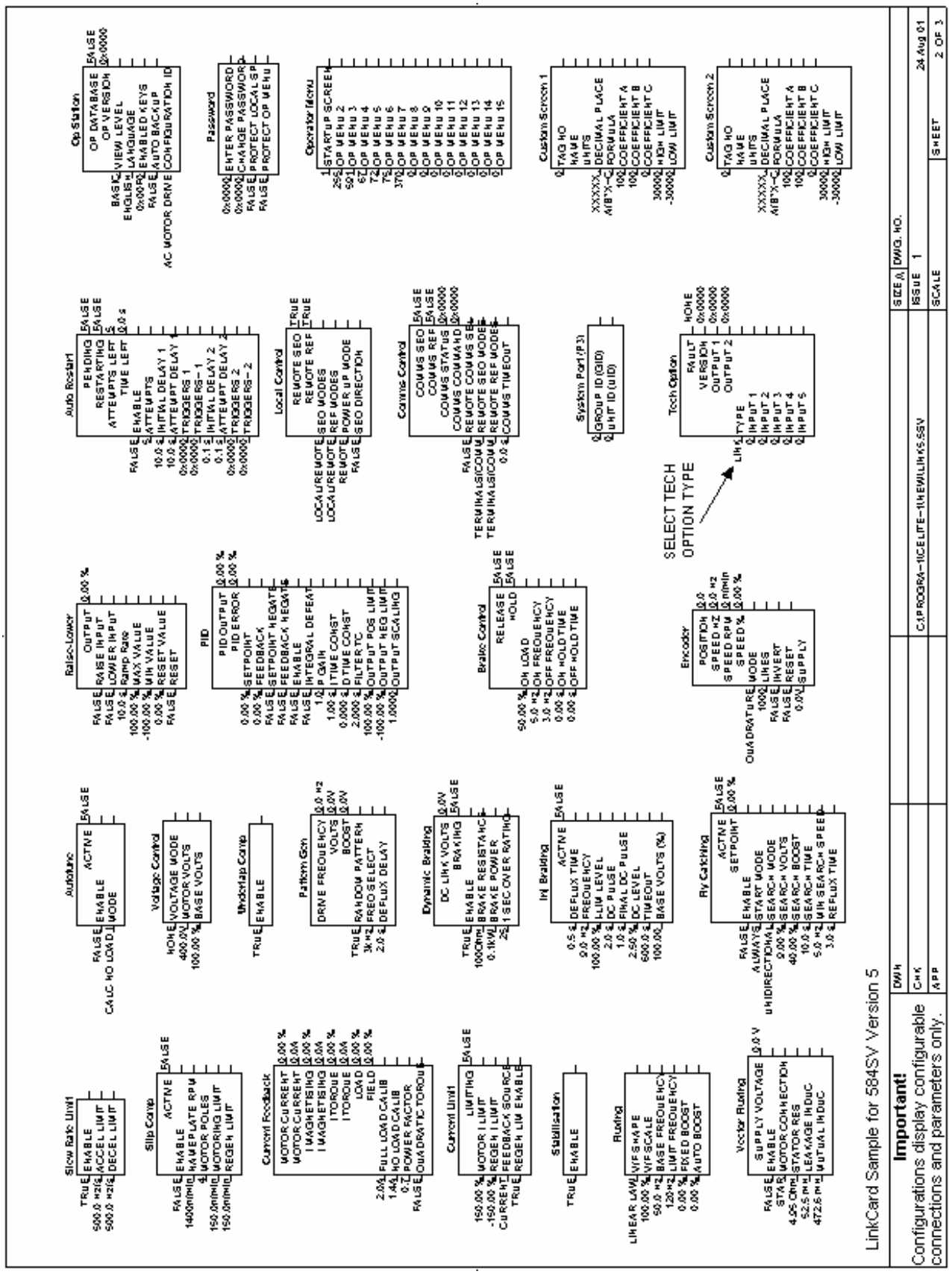


Figure 2 – (2 of 3)

Step 3 – Create a *LINK* Project

In ConfigEd, create a new project by using the **Project/Manage** menu. Refer to the ConfigEd instruction manual HA353792 for details.

Step 4 – Configure the TechCard

1. In the selected project, open a default Techbox template by going to **File/New/LtechBx2**.
2. Enter the address (in this case: 10) and the file name (in this case: SVL-10), when prompted.
3. Insert an Ordinal Writer block from the pulldown menu **Block/Techbox/Ordinal Writer.**
4. Give it a name OR1 (happens automatically) and double-click on it.
5. Under Tag Number, enter 592. Close the window.
6. Similarly, insert the other blocks required and connect them together as shown in Figure 3, to complete the configuration.

Step 5 – Configure the Touchscreen

1. In the correct project, open a default Multi-Page L5392 LinkScreen template by going to **File::New::L5392MP**
2. Enter the address (in this case: 11) and the file name (in this case: 5392-11), when prompted.
3. Insert the blocks required and connect them together as shown in Figure 4, to complete the configuration.
4. ANNC.1 is an annunciator block that will show fault messages, should they occur. These legend messages need to be entered in ANNC.1. Decoding information may be found in the "Specification Table: Tag Number Order/ Tag 6" in the drive instruction manual HA463617. Refer to figure 5.
5. The resulting touchscreen layout is shown below.

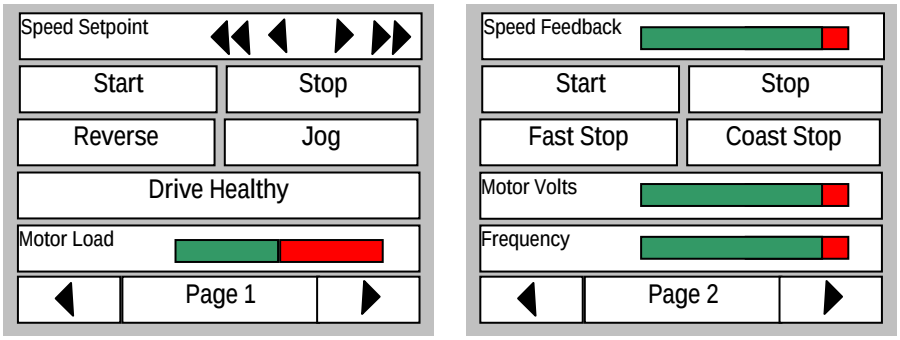


Figure 3

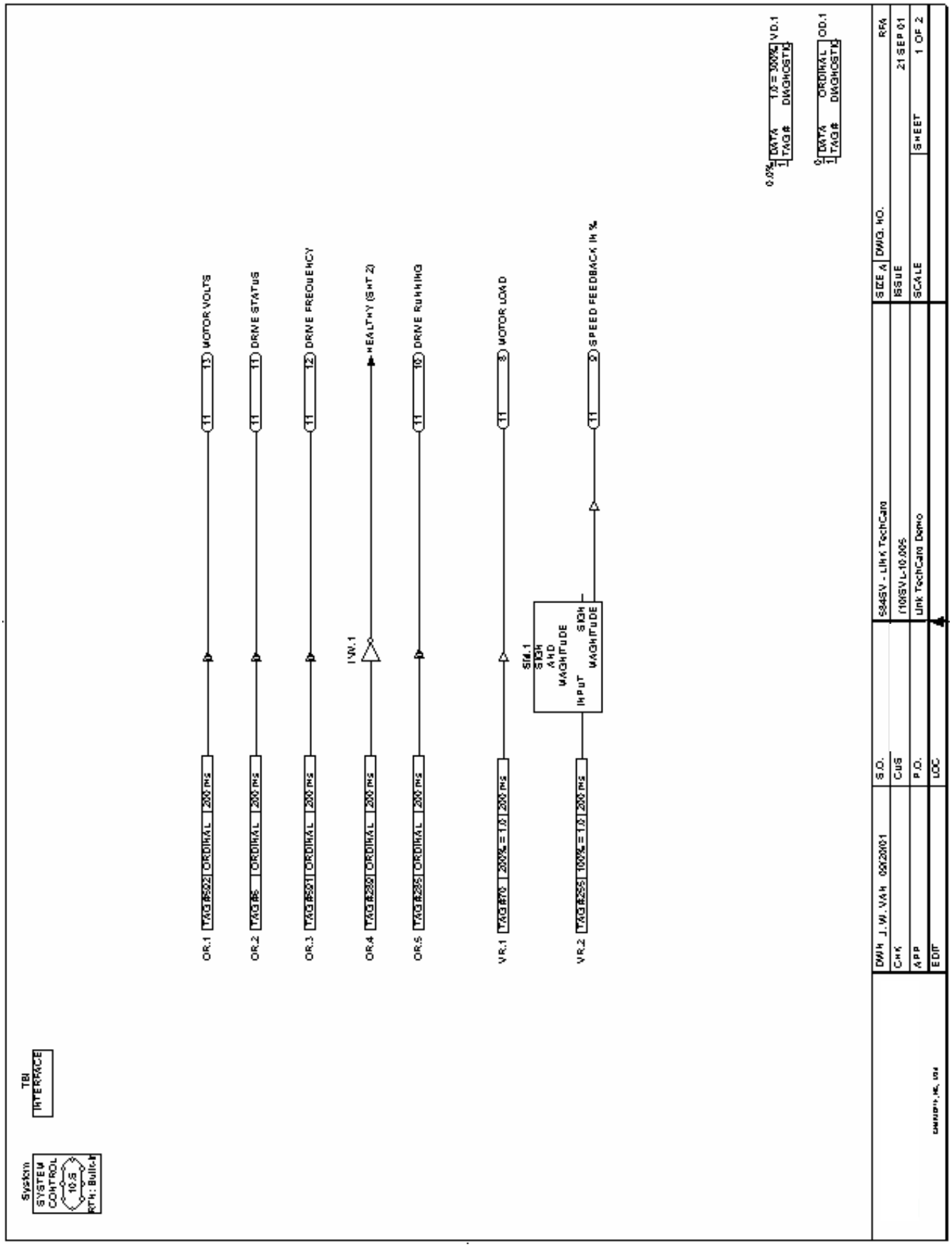


Figure 4 – (1 of 4)

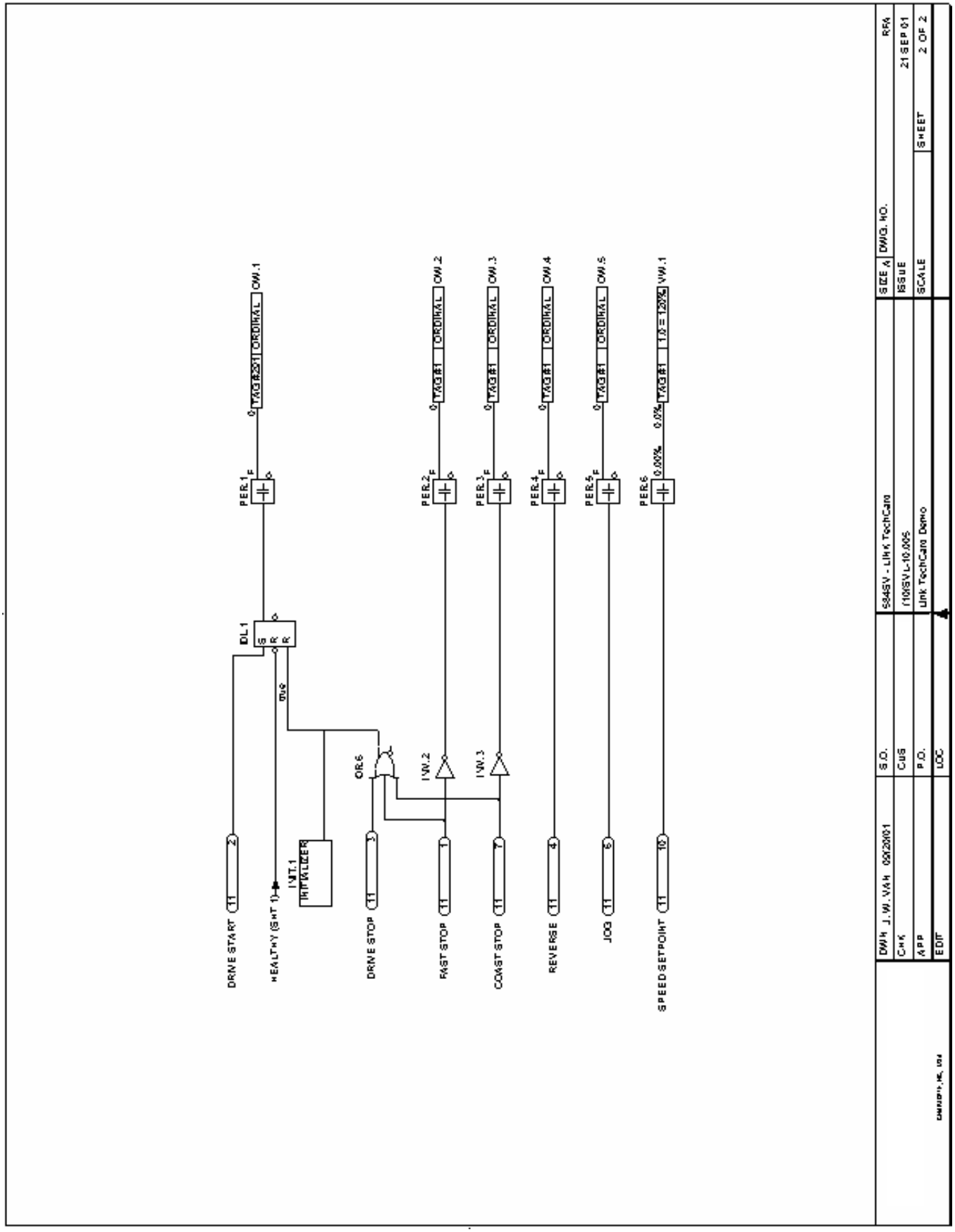


Figure 4 – (2 of 4)

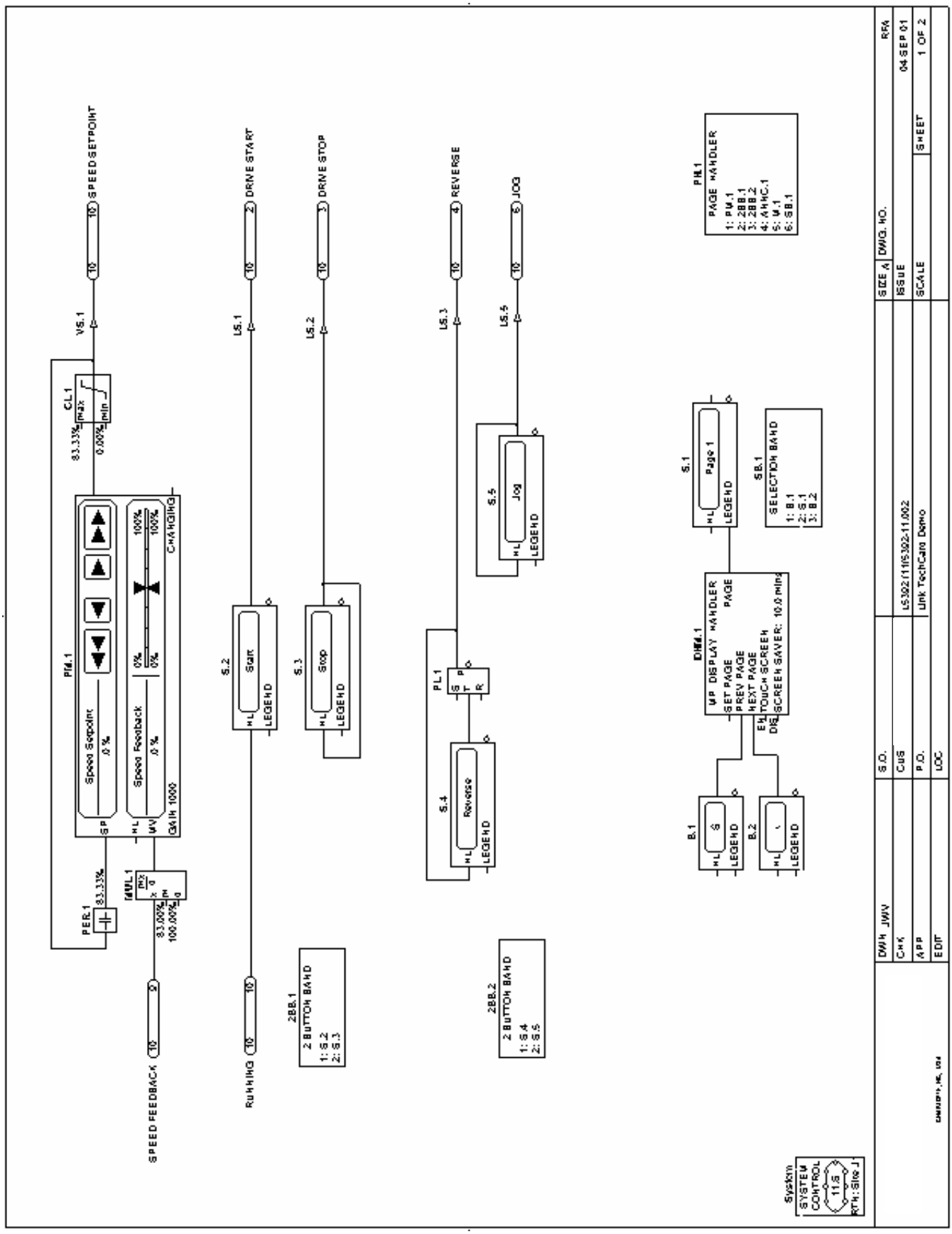


Figure 4 – (3 of 4)

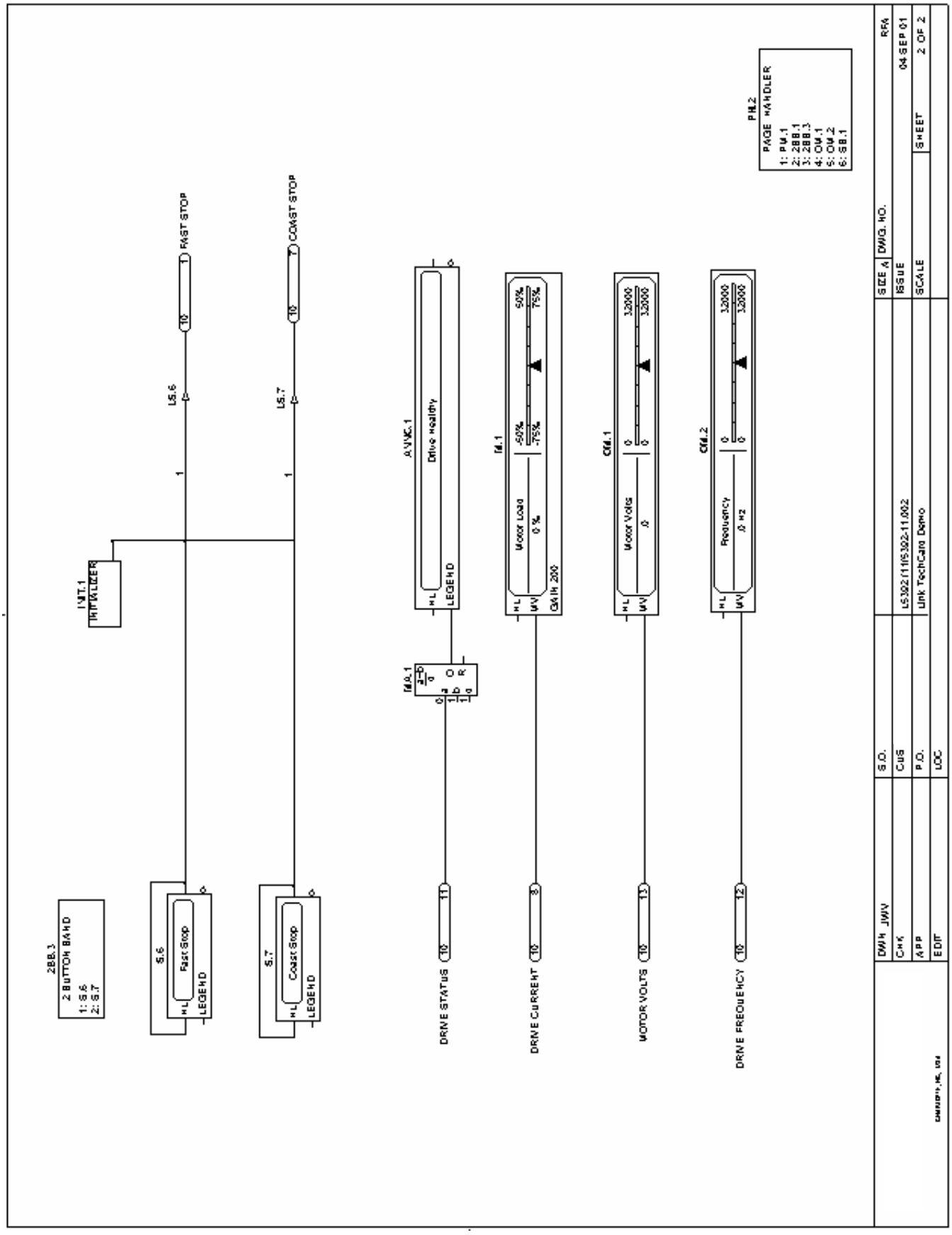


Figure 4 – (4 of 4)

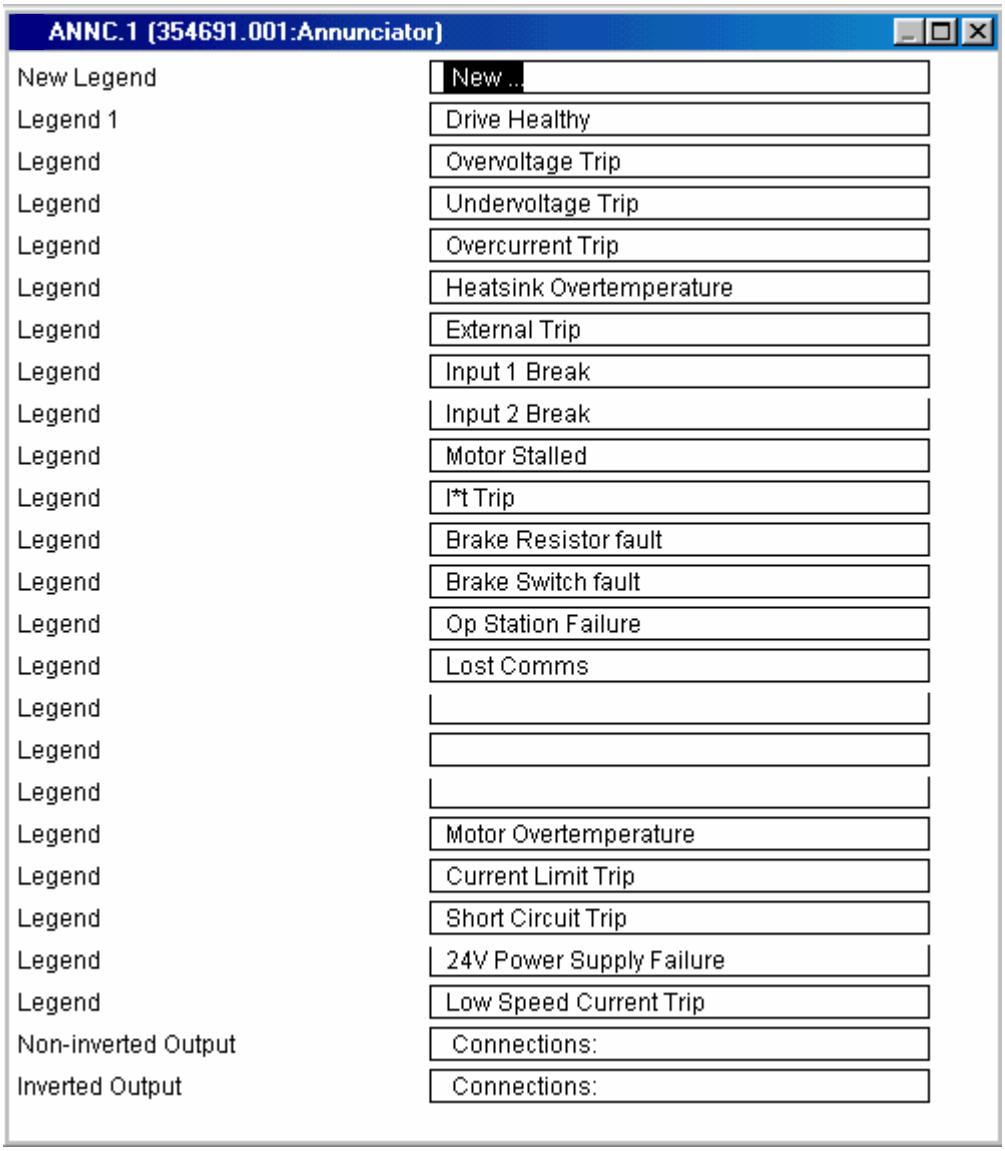
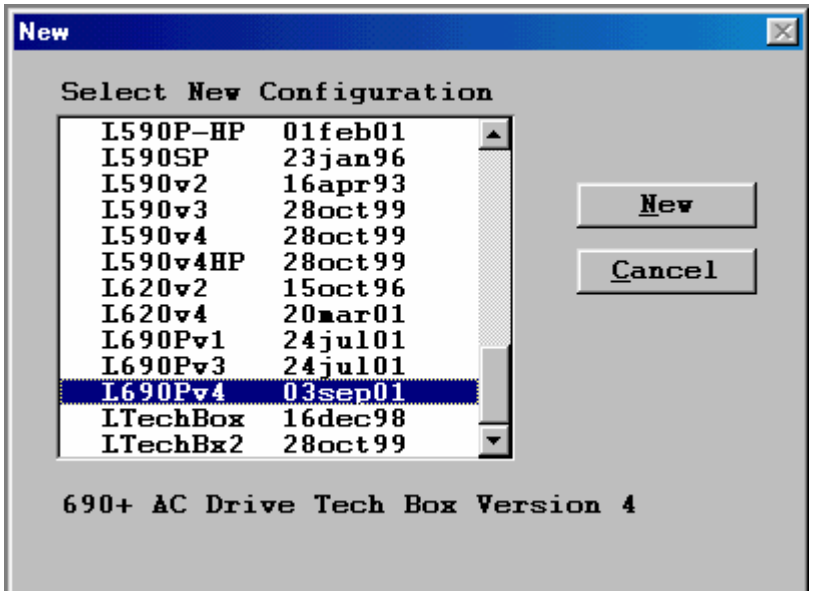
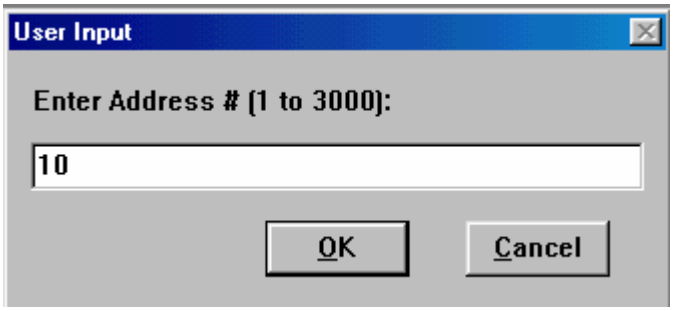

ANNC.1 (354691.001:Annunciator)
New Legend
New ...
Legend 1
Drive Healthy
Legend
Overvoltage Trip
Legend
Undervoltage Trip
Legend
Overcurrent Trip
Legend
Heatsink Overtemperature
Legend
External Trip
Legend
Input 1 Break
Legend
Input 2 Break
Legend
Motor Stalled
Legend
I*t Trip
Legend
Brake Resistor fault
Legend
Brake Switch fault
Legend
Op Station Failure
Legend
Lost Comms
Legend
Legend
Legend
Legend
Motor Overtemperature
Legend
Current Limit Trip
Legend
Short Circuit Trip
Legend
24V Power Supply Failure
Legend
Low Speed Current Trip
Non-inverted Output
Connections:
Inverted Output
Connections:

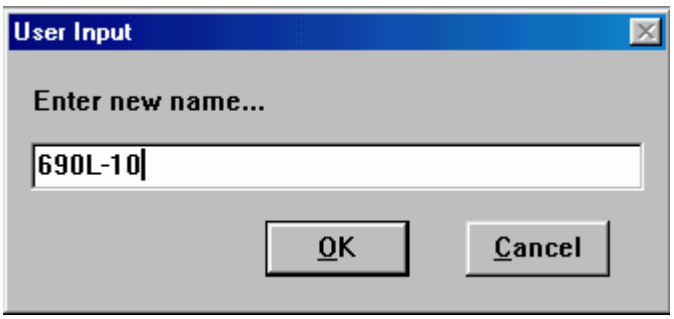
Figure 5

690+ Macro Sample Configuration

Select the 690+ template with the correct version firmware from the “NEW” menu.







After completing the above steps you should see the 690+ macro without any Link connections. Make the necessary connections and changes to make the configuration look like Figure 6.

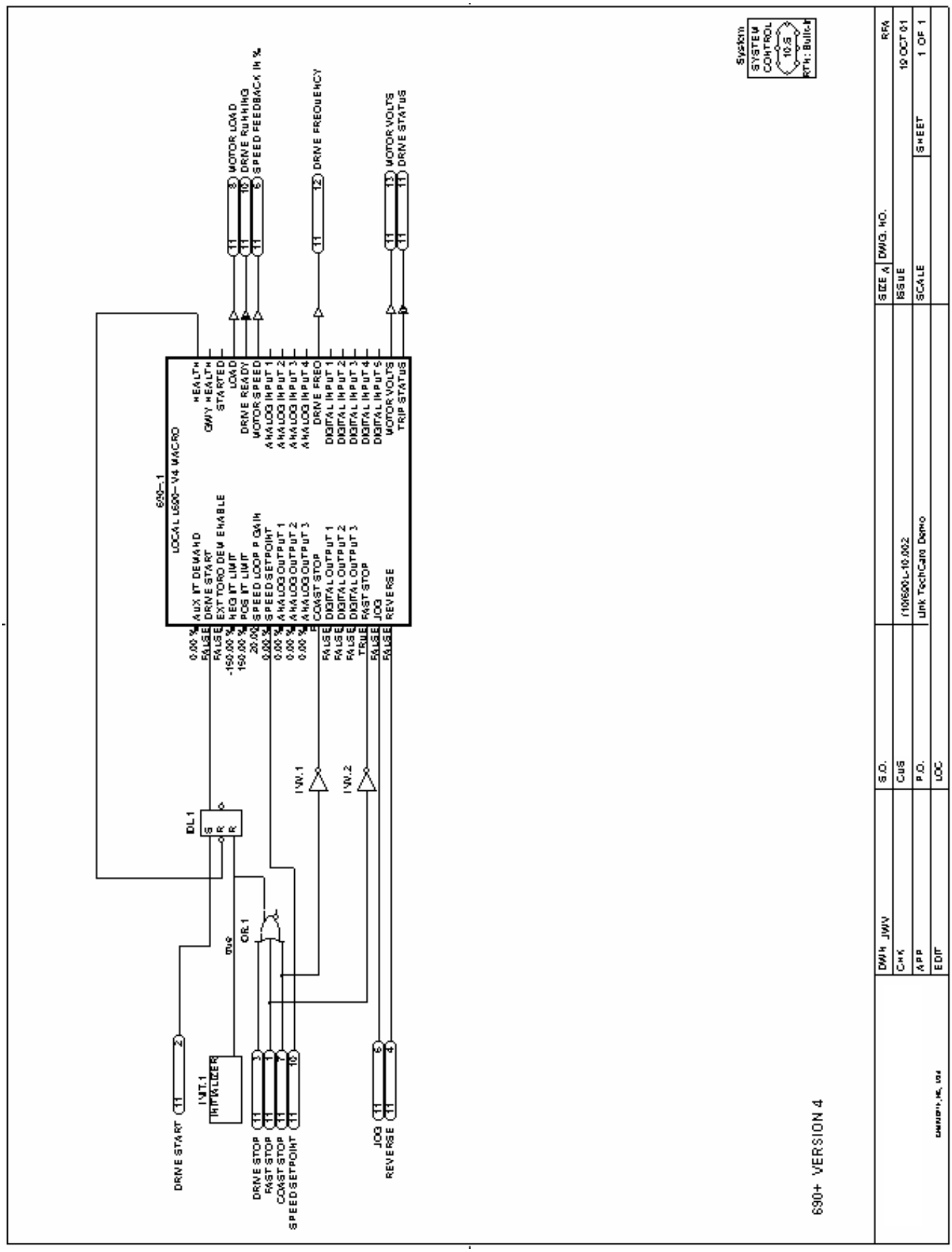


Figure 6 – (1 of 5)

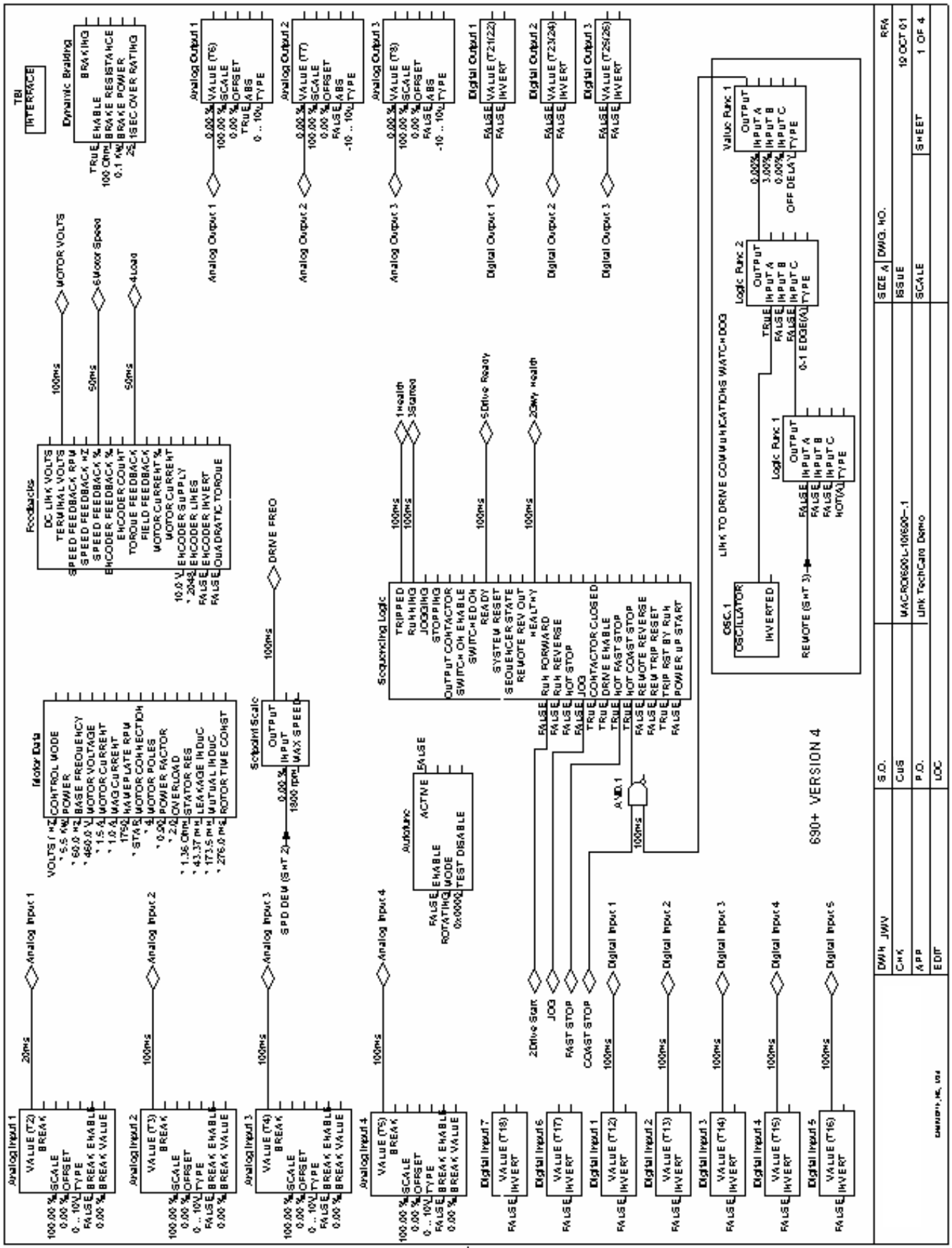


Figure 6 – (2of 5)

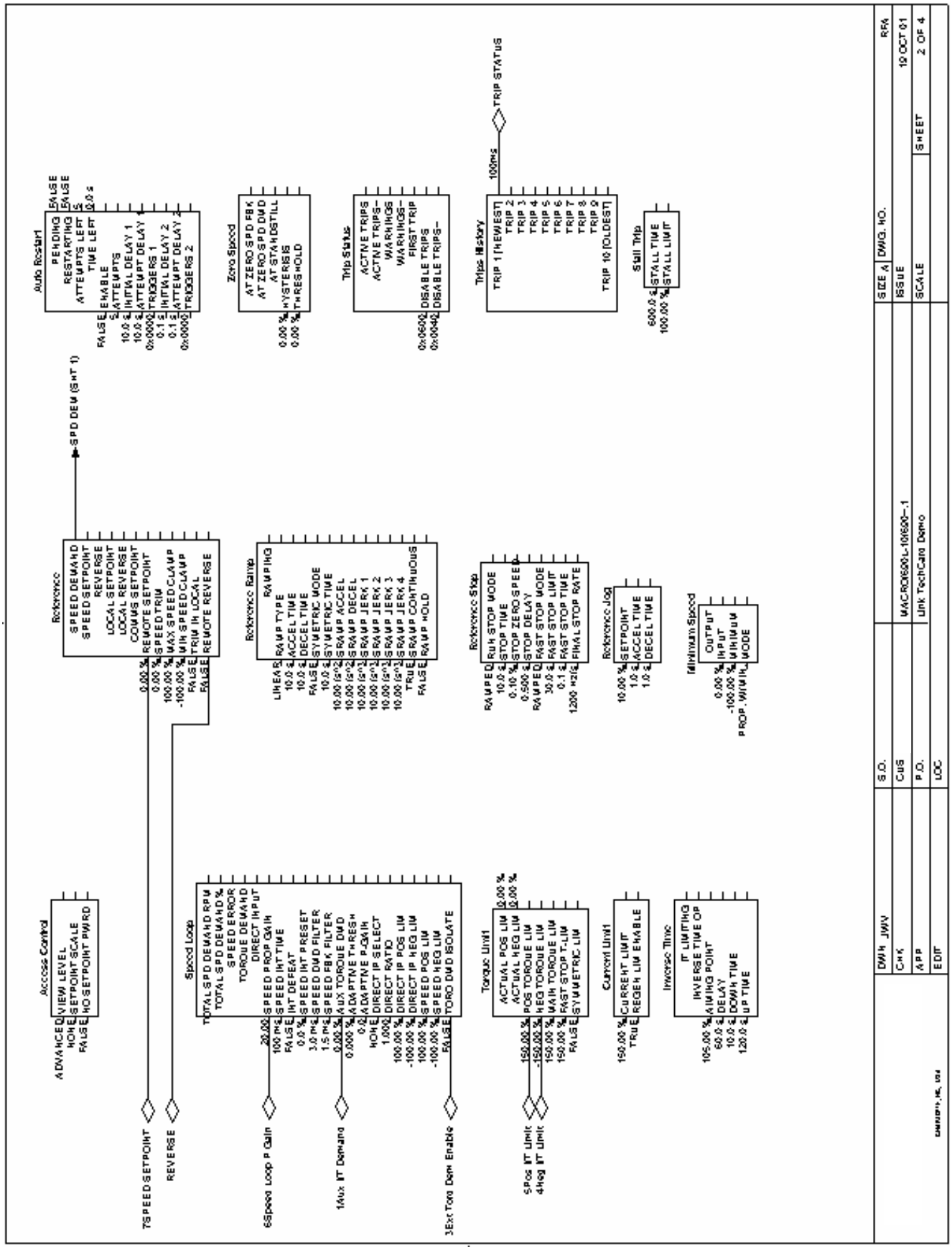


Figure 6 – (3of 5)

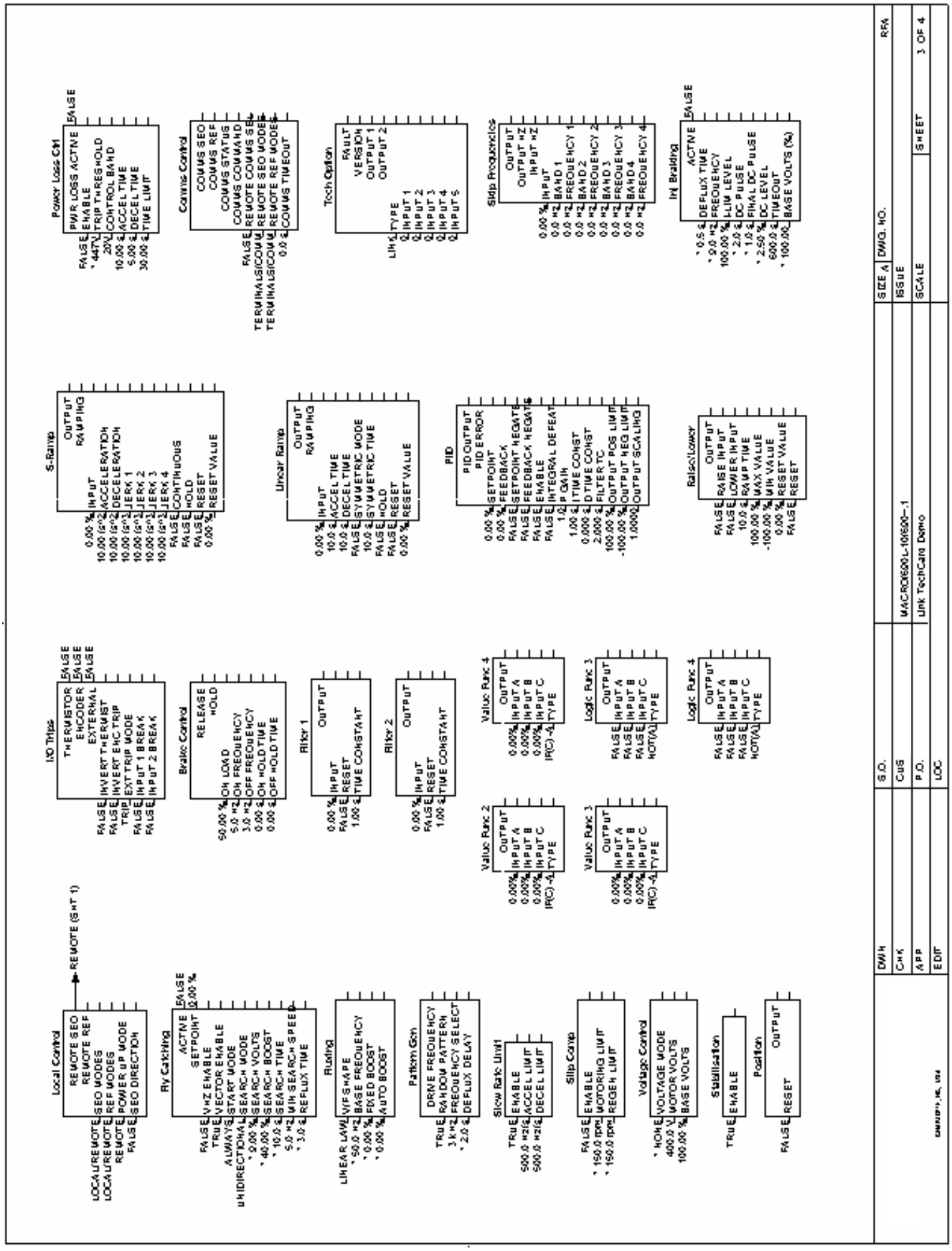


Figure 6 – (4 of 5)

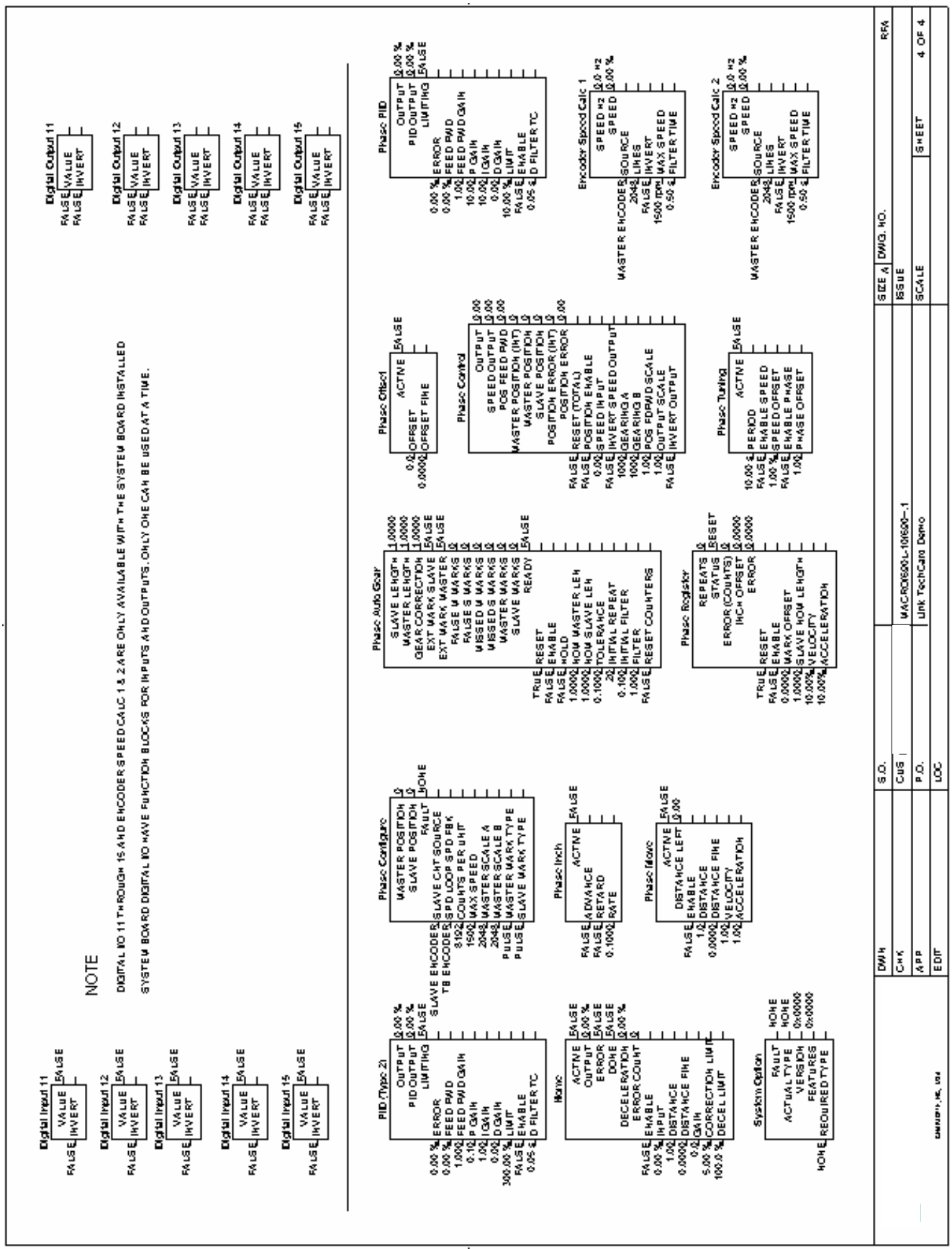
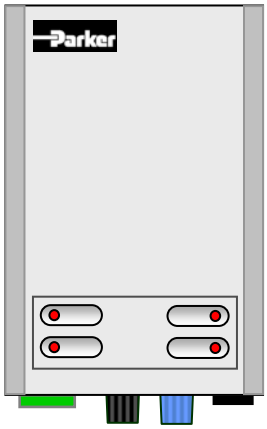


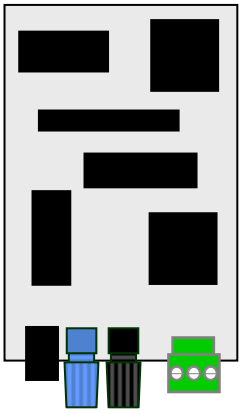
Figure 6 – (5 of 5)

Chapter 6 – Troubleshooting

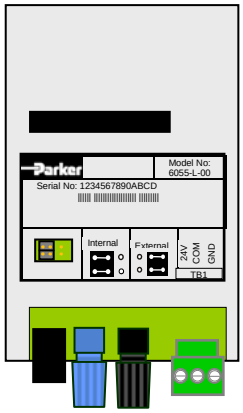
6053-L-00
TECHBOX



LA463610U003
TECHCARD



6055-L-00
TECHBOX



Health and Run LED's

Health and Run are drive functions and are not associated with the operation of the technology feature.

On the 605/690 frames A&B the techbox is mounted in place of the keypad or blank cover. The Run and Health LED's from the keypad are replicated on the face of the techbox. The bottom two LED indicators for the module and network status.

On the 584SV, 605C, 690 frames C and above, 590+ the Run and Health LED's are on the drive itself. Located on the TechCard and the TechBox are 2 LEDs that indicate the status of the module and the *LINK* network.

Module LED

This indicates the set-up state of the Technology Box/Option

LED STATE	FAULT	DESCRIPTION
OFF	No Power	If jumper J3 set for INT: Apply power to drive If jumper J3 set for EXT: Apply external power
SLOW FLASH (2 flashes/sec)	Fault during initialization	Self Test failure Module does not have a valid configuration
QUICK FLASH (4 flashes/sec)	Off *LINK* network	Module was halted (probably by LINK tools) Module is attempting to go on-line Problem in the configuration (L-error, H-error or duplicate address)
ON	None	Module is running its configuration and communicating over the *LINK* network

Network LED

This indicates the state of the connected network.

LED STATUS	DESCRIPTION
OFF	Network failure Module halted or initializing
ON	Network healthy Module peer halted or duplicate address

Note: *The NETWORK LED can only be in the ON state when the MODULE LED is ON continuously, indicating that the Option is ready for external communications.*

Note: *Early versions of the 584SV techcard may not have the LED's fitted.*

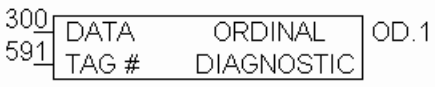
NCP STATE	Techbox State	Module LED	Network LED
0 Initializing	Initializing	Slow Flash	Off
1 Halt	Config	Fast Flash	Off
2 No Config	Fault	Slow Flash	*
3 L-error	Fault	Fast Flash	*
4 H-error	Fault	Fast Flash	*
5 Self Test Fail	Fault	Slow Flash	*
6 Shutdown	Stopping		
7 OK	Running	On	On
8 Network Warning	Running	On	On
9 Network Failure	Running	On	Off
A Checking Network	Starting	Fast Flash	*
B Peer Halted	Starting	Fast Flash	On
C Duplicate Address	Fault	Fast Flash	On

***** *LED state depends on whether the network is active at this node's receiver*

Ordinal Diagnostic Function Block

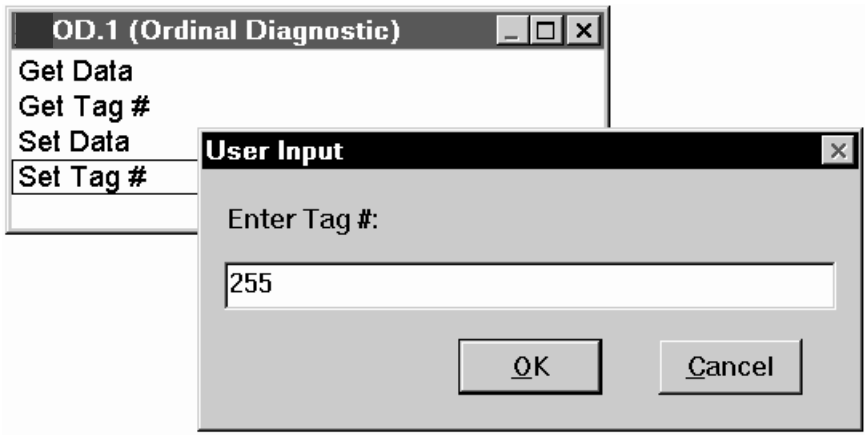
The Diagnostic Function block is inserted as any other block in ConfigEd mode. Later, while on-line in **S**etup **A**nd **M**onitor mode **(SAM)**, the tag number of the Diagnostic block may be edited (unlike regular function blocks) to display and monitor different drive parameters.

In ConfigEd mode: From the **Block/Techbox** menu select Ordinal Diagnostic. Drag and place it in the configuration.



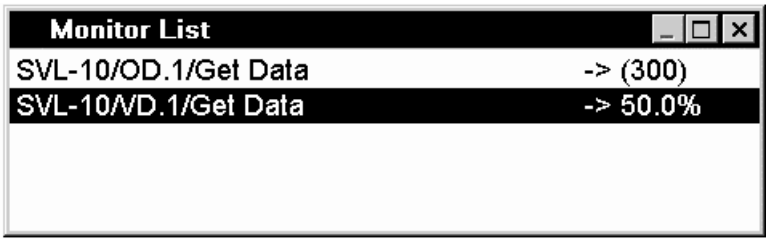
In the SAM mode: Click on **Update Full** under the **Window** menu. This accesses the *LINK* network and opens up a module list that contains all the elements on the ring. Double-click the techbox line and the configuration will open in SAM mode.

- Double-click the Ordinal Diagnostic function block. Selecting the **Set Tag #** option, enter the Tag number of the parameter you wish to monitor, as shown below.



- To read data from the tag just selected, click on **Get Data**. The instantaneous value (snap shot) will appear on the scratch pad.

- To monitor data , hold the **shift** key and double-click on **Get Data.** This opens up a Monitor List with the tag and its continuously updated value displayed, as shown below. Several parameters of different types and from different modules may be monitored on the same Monitor List.

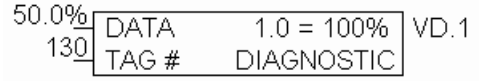


- The two above steps may be accomplished without opening the function block window. Take the mouse cursor to the **DATA** terminal of the function block until the cursor turns into a "x". Then click once to display the data value on the scratchpad, or shift double-click to put it on the Monitor List.

Value Diagnostic Function Block

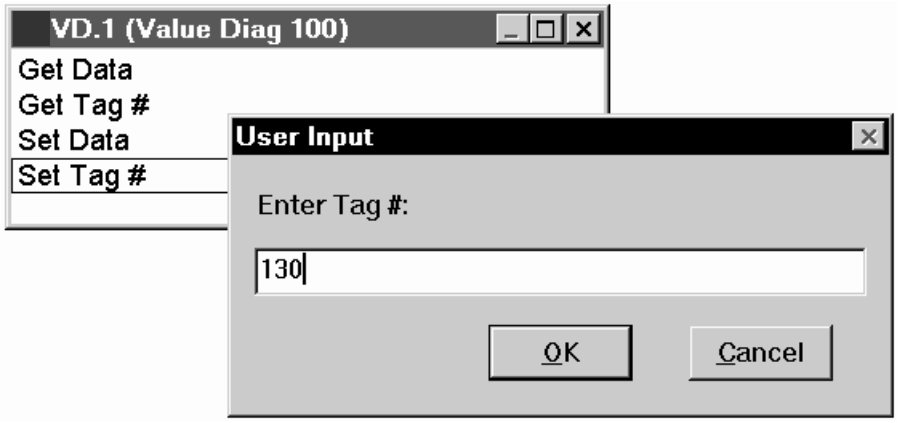
The Diagnostic Function block is inserted as any other block in ConfigEd mode. Later, while on-line in **S**etup **A**nd **M**onitor mode **(SAM)**, the tag number of the Diagnostic block may be edited (unlike regular function blocks) to display and monitor different drive parameters.

In ConfigEd mode: From the **Block/Techbox** menu select any Value Diagnostic block (There are different ones available, depending on the inherent scaling of the signal being monitored. The scaling of the selected block appears as "1.0 = 100%). Drag and place it in the configuration.



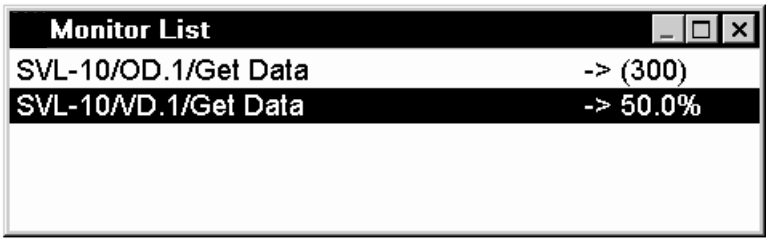
In the SAM mode: Click on **Update Full** under the Window menu. This accesses the *LINK* network and opens up a module list that contains all the elements on the ring. Double-click the techbox line and the configuration will open in SAM mode.

- Double-click the Value Diagnostic function block. Selecting the **Set Tag #** option, enter the Tag number of the parameter you wish to monitor, as shown below.



- To read data from the tag just selected, click on **Get Data**. The instantaneous value (snap shot) will appear on the scratch pad.

- To monitor data , hold the **shift** key and double-click on **Get Data.** This opens up a Monitor List with the tag and its continuously updated value displayed, as shown below. Several parameters of different types and from different modules may be monitored on the same Monitor List.



- The two above steps may be accomplished without opening the function block window. Take the mouse cursor to the **DATA** terminal of the function block until the cursor turns into a "x". Then click once to display the data value on the scratchpad, or shift double-click to put it on the Monitor List.

Macro/Drive Diagnostic Functions

The techbox allows you to monitor the drive inside the macro. The drive function blocks are accessed through the normal **S**etup **A**nd **M**onitor methods.

Appendix A-Using Tag Readers and Tag Writers

With the drive configured to accept the *LINK* Technology Option, the interface between the Techbox/Techcard, the drive and the *LINK* system needs to be programmed for the specific drive and application. The Techbox/Techcard can be perceived as a *LINK* processor, which treats the host drive as an I/O device. Drive parameters are accessed by tag numbers which are unique to each parameter and can be found under "Specification Table – Tag Number Order" in the drive instruction manual.

Function Blocks

ConfigEd has two types of function blocks for the *LINK* Techbox/TechCard:
Tag Reader block that reads a drive parameter; the Tag Writer block that writes to a drive parameter.

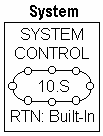
Each of these blocks can be subdivided into two classes, Ordinal and Value. Ordinal Readers and Writers handle integer or logic data and cannot be scaled. Value Readers and Writers handle continuous variables and have special scaling assigned to them. Scaling choices are representative of standard ranges found in a drive and include choices of 100%, 120%, 150% and 200%, each representing a full scale "1" within *LINK*.
You will need ConfigEd (version 5.13), or DSD with database properties of platform rev. 14-0, library rev. 115-0, instruction rev. 9-0 and class rev. 604-0, and all subsequent revisions, to build a configuration for the *LINK* techbox. For details on how to use this package, refer to the ConfigEd instruction manual RG353792.

Additional *LINK* function blocks may be inserted into the Techbox/Techcard configuration. The Techbox/Techcard has approximately 2/3 of the memory capability of the L5300. In terms of storage units the Techbox/Techcard has 4 units. A Section Control block requires 1 unit of storage, SPW 3 winder block requires 2 units of storage.

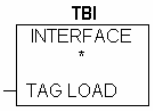
Loading a TechBox Function Block

WARNING

LINK configurations should be created by qualified personnel who have a thorough understanding of drive systems and who are *LINK* trained by Parker SSD Drives. Potentially dangerous configurations are possible and Parker SSD Drives is not responsible for any resulting consequences or damages.



System Control Block

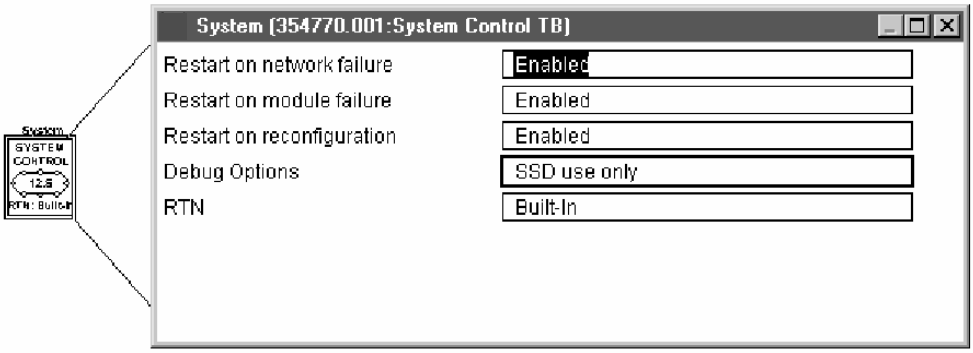


Manual Tag Load

Automatic Tag Load

- In ConfigEd, open up the project in which this techbox will appear.
- From the **File/New** menu, pick **LTechBx2**, the default template for a LINK techbox/techcard. This template contains an AUTO-TAG LOADER. The AUTO-TAG-LOADER will automatically access and load parameters into the drive during the power up sequence. (The **L TechBox** template contains a MANUAL-TAG-LOADER function block. The parameters in the tag readers and writers are manually triggered.)
- When prompted, furnish the node address and name for the techbox.
- Two blocks should be visible on a blank page, named **TBI** and **System.**

- No user settings are necessary for this block. When the **Tag Load** input goes high, the 'loadable' writers insert their current values to the respective drive tags.



Double-click on the System Control block to access the three restart preferences, as shown above. In most cases, the defaults are sufficient. For details, refer to the ConfigEd instruction manual (RG353792).

Link Data Types

The three types of data in *LINK* are Logic, Ordinal and Value.

Logic Signals

Used for all logic functions, they are True or False signals that take the form of 1 and 0.
True = 1, False = 0
All Logic function blocks in *LINK*, operate this way.

***Note**: Logic 1 = Ordinal 1, Logic 0 = Ordinal 0*

Ordinal Signals

Ordinals are whole, unsigned integers, used mainly for counters and enumeration. These numbers range from 0-32,767 or 0-65,535.

Value Signals

These are used for signal processing. The range of values is –1 to +1 in *LINK*, represented by –100% to +100% in DSD or ConfigEd.

Scaling

There is no over-range built into the *LINK* Value number. This means that the maximum value a number can take is 1.0. In drives and control systems, an over-range is necessary to allow feedback control of a variable when it is operating at full range. Therefore, an over-range must be built into the number range when the system is being configured. It is for this reason that *LINK* values for certain different variables have different scaling properties. These rules need to be followed in the *Link* system design when interfacing the techbox with other *LINK* function blocks.

Generic values

These are values that need no over-ranging.

100% of the variable = 100% in *LINK*

Example: A speed ratio signal. Range 75% to 100%
Use the Value Reader 100 and Value writer 100 blocks in your techbox configuration.

Speed values

A drive running at full line speed may need to exceed that speed to satisfy a controlled variable.

100% of drive speed = 83.3333% in *LINK* which is the same as
120% of drive speed = 100% in *LINK*

Example: A line speed signal from a LINK Master Ramp to a drive section. Range 0% to 83.3333%

When using speed values in *LINK* configurations, it is necessary to multiply the reference signal to the drive by 83.3333%. Some special function blocks like the Master Ramp already have this multiplier built in. Refer to specific function block help sheets for details.

Note: *While it is necessary to multiply the speed reference by 83.3333%, it follows that the speed feedback signal coming back from the drive needs to be divided by 83.3333%. Use the Value Reader 120 and Value Writer 120 blocks in your techbox configuration.*

Current values

A drive may occasionally need to exceed its rated continuous current and go into a short-term overload condition.

200% of drive current = 100% in *LINK*

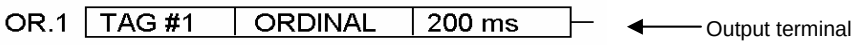
Example: A load indicating signal. Range -200% to +200%
When using current (torque/load) values in *LINK* configurations, it is necessary to multiply the reference signal to the drive by 50%.

Note: *While it is necessary to multiply the current (torque) reference by 50%, it follows that the current (torque, load) feedback signal coming back from the drive needs to be divided by 50%. Use the Value Reader 200 and Value Writer 200 blocks in your techbox configuration.*

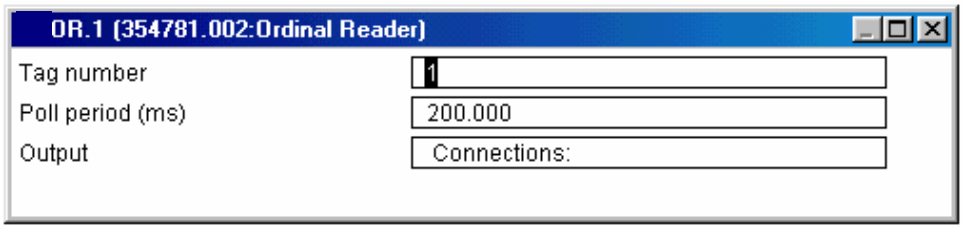
Tag Readers and Writers

Ordinal Reader Function Block

From the **Block/Techbox** menu select Ordinal reader. Drag and place it towards the left edge of your sheet.



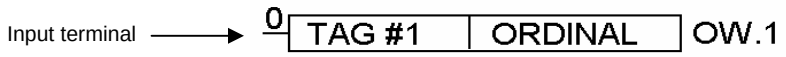
Double-click on it and select settings, as shown below.



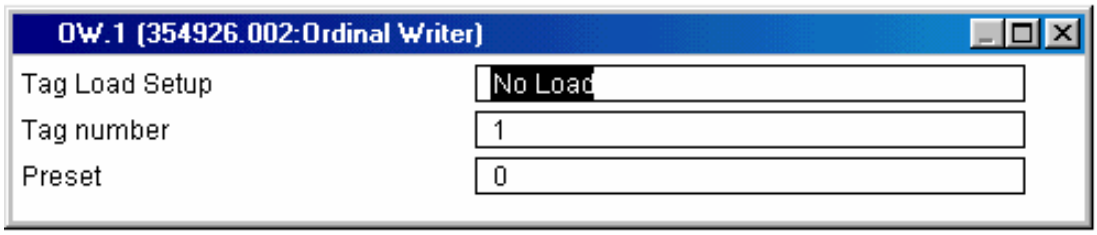
- Select the tag number associated with the parameter to be read. This may be found under "Specification Table – Tag Number Order" in the drive instruction manual.
- Poll period should be set to a realistic value, fast enough to be read continuously, yet not so fast, that it overloads the processor. Reads are typically recommended at 200 ms.
- Click the output terminal and drag it to the next *LINK* block in the configuration.

Ordinal Writer Function Block

From the **Block/Techbox** menu select Ordinal Writer. Drag and place it towards the right edge of your sheet.



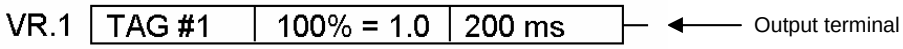
Double-click on it and select settings, as shown below.



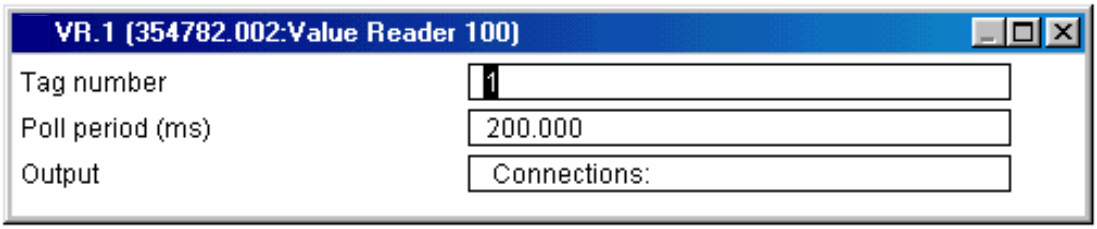
- Select the tag number associated with the parameter to be written to. This may be found under "Specification Table – Tag Number Order" in the drive instruction manual.
- If necessary, a preset value may be entered into the Preset field. Remember that this value will be overwritten when a new value comes over the input connection of the function block.

Value Reader Function Blocks

From the **Block/Techbox** menu select any Value reader. Drag and place it towards the left edge of your sheet.



Double-click on it and select settings, as shown below.

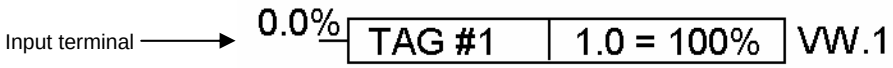


- Select the tag number associated with the parameter to be read. This may be found under "Specification Table – Tag Number Order" in the drive instruction manual.
- Poll period should be set to a realistic value, fast enough to be read continuously, yet not so fast, that it overloads the processor. Reads are typically recommended at 200 ms.
- Click the output terminal and drag it to the next *LINK* block in the configuration.

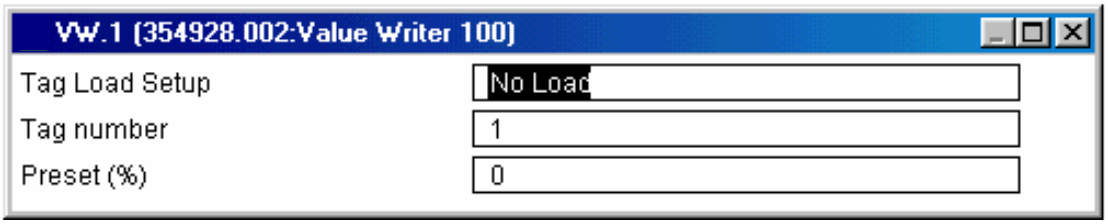
H I N T: *There are different value reader function blocks that can be selected, depending on the inherent scaling of the signal. For example, to read a generic parameter, pick the Value Reader 100 function block, which yields a 100% scaling equal to a full scale "1" in LINK. For a speed feedback signal, pick the Value Reader 120 function block, which yields a 120% scaling equal to a full scale "1" in LINK. Similarly, for a current feedback signal where 200% current equals a "1" in LINK, pick Value Reader 200.*

Value Writer Function Blocks

From the **Block/Techbox** menu select any Value writer. Drag and place it towards the right edge of your sheet.



Double-click on it and select settings, as shown below.



- Select the tag number associated with the parameter to be written to. This may be found under "Specification Table – Tag Number Order" in the drive instruction manual.
- If necessary, a preset value may be entered into the Preset field. Remember that this value will be overwritten when a new value comes over the input connection of the function block.

H I N T: *There are different value writer function blocks that can be selected, depending on the inherent scaling of the signal. For example, to write to a generic parameter, pick the Value Writer 100 function block, which yields a 100% scaling equal to a full scale "1" in LINK. For a speed reference signal generated by the* LINK *Master Ramp, pick the Value Writer 120 function block, which yields a 120% scaling equal to a full scale "1" in LINK. Similarly, for a current demand signal where 200% current equals a "1" in* LINK*, pick Value Writer 200.*

Notes

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