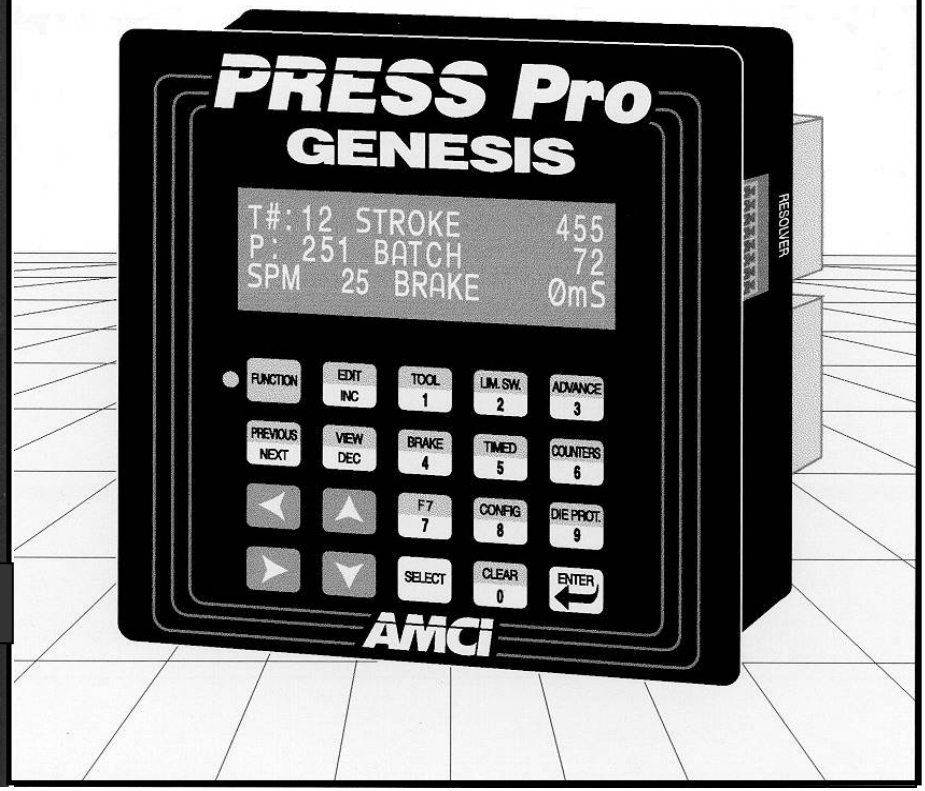
User Manual

HELM



Manual 940-0P011

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CAUTIONS tell you when equipment may be damaged if the procedure is not followed properly.

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ABOUT THIS MANUAL

Introduction

This manual explains the operation, installation, and programming of the PRESSPro Genesis PLS Controller. It is strongly recommended that
you read the following instructions. If there are any unanswered questions after reading this manual, call the factory. An applications engineer will be available to assist you.

Manuals at HELM are constantly evolving entities. Your questions and comments on this manual and the information it contains are both welcomed and necessary if this manual is to be improved.

Revision Record

The following is the revision history for this manual. In addition to the information listed here, revisions will fix any known typographical errors and clarification may be added.

940-0P011: April 3, 2003: Added Surge Suppression information to installation chapter.
940-0P010: Feb. 12, 2002: Initial release.

Notes

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GENESIS CONTROLLER INTRODUCTION

Overview

The PRESSPro Genesis PLS Controller includes an operator display/keypad with software to control Programmable Limit Switch (PLS) outputs for crankshaft synchronization and Die Monitor (DM) inputs to protect press dies and machinery. The software can also monitor an optional brake input, and output a fault signal if unexpected conditions occur. You may use the display/keypad to program a variety of software data screens, creating custom tool setups for all your press control applications.

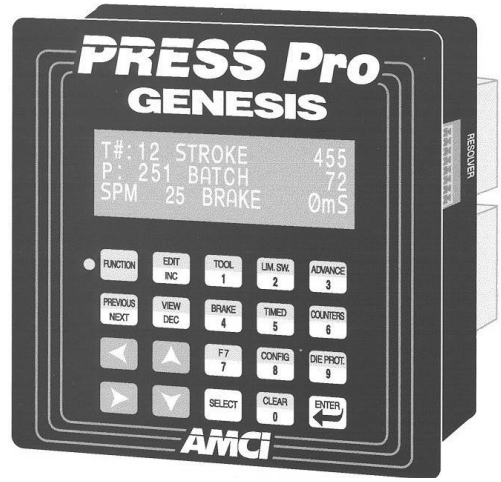


Figure 1.1 PRESSPro Genesis Controller

Six PLS outputs and four DM inputs are available for each tool setup. The Genesis controller connects to a single-turn brushless resolver-based transducer for position feedback, and generates up to six PLS outputs based on the transducer's position, programmed setpoints, and speed compensation advances. If a deviant condition is detected on a DM input channel, the controller will output a fault signal and a Top Stop or Die Fault warning to the operator display. One of the DM inputs provides part count data for each batch and job. The brake monitor function checks and displays optional brake input data, and will output a fault signal if appropriate.

Note: In addition to controlling stamping press machinery, you may use the Genesis unit as a mechanical cam switch replacement for other types of machinery such as packaging equipment.

Genesis Software

The PRESSPro Genesis software basically performs programmable limit switch and die monitoring functions. The software also allows you to:

Enter configuration data and detailed parameters for multiple tool setups.

Monitor batch and job duration with a parts counter.

Enter a resolver stopping time parameter that triggers a fault output if exceeded.

Enter a time interval when resolver motion should start after brake input is OFF.

Monitor error messages that appear on the operator display.

How PLS Channels Operates

After you enter parameters for a PLS channel, the Genesis software will time or sequence outputs over the channel according to precise and repeatable positions of a crankshaft. The Genesis controller interfaces to a resolver-based transducer that monitors the crankshaft positions.

To program a PLS output, you first enter the rotational position or preset angle where the PLS output should be turned ON. You then enter the appropriate parameters to specify if you want the PLS output to turn OFF at a preset angle or a preset time. "Advance data" can also be entered to compensate for fixed delays in the stamping press system. A typical crankshaft rotation, programmed for a specific PLS output is shown below:

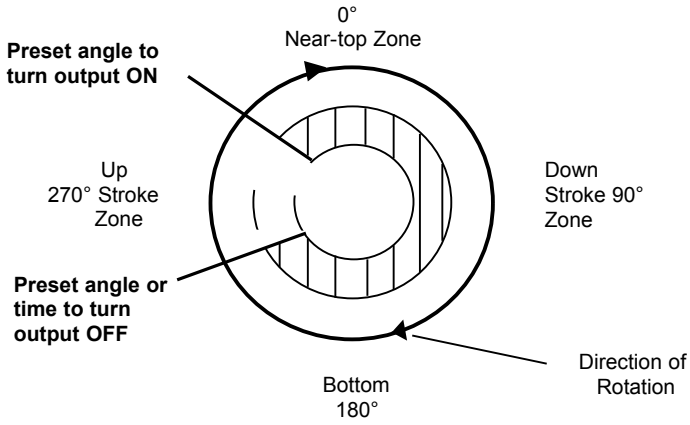


Figure 1.2 Entering Angle & Time Presets for a PLS Output

How Die Monitor Channels Operate

You may also enter parameters for DM input channels to request the Genesis software to monitor the operation of your stamping press system based on crankshaft positions. The DM input channels can detect the misalignment, absence, or unwanted presence of parts moving through an automated stamping system. If a deviant condition is detected, the software will output a fault signal and an appropriate error message to the Genesis operator display.

You may select one of the following modes for a DM input channel:

Cyclic

Single part (SPART)

In position (IN POS), or

Static

For a detailed description of each DM input mode, see Chapter 4 describing *Die Monitor Input Requirements* on page 7.

PLS OUTPUT REQUIREMENTS

This chapter describes how you can enter setpoints, advance data, and timing parameters to program each PLS output required to control your stamping press system. It explains how PLS outputs operate, and how you can set up each output channel.

Genesis PLS Outputs

The Genesis PLS control function will turn outputs ON or OFF over each PLS channel according to precise and repeatable positions of a crankshaft monitored with a resolver-based transducer. For each channel, you can program up to two pairs of ON/OFF setpoints at counts from 0-999, enter advance data to compensate for fixed delays in the stamping press system, and define an optional timing parameter to turn the output OFF.

You control when the output over each PLS channel turns ON or OFF by entering specific parameters on the Genesis data screens. For example, you can turn a PLS output ON by defining a preset crankshaft angle (i.e., an ON setpoint). You may turn a PLS output OFF by entering a crankshaft angle (i.e., an OFF setpoint) and an optional timing parameter (to turn the signal OFF after a set time interval). When you program a timed output, the output will turn off after the programmed condition that occurs *first*. That is, the output will turn off if: a) the crankshaft passes through the OFF setpoint before the end of the programmed time interval, or b) the timer reaches its programmed value before the crankshaft rotates through the OFF setpoint.

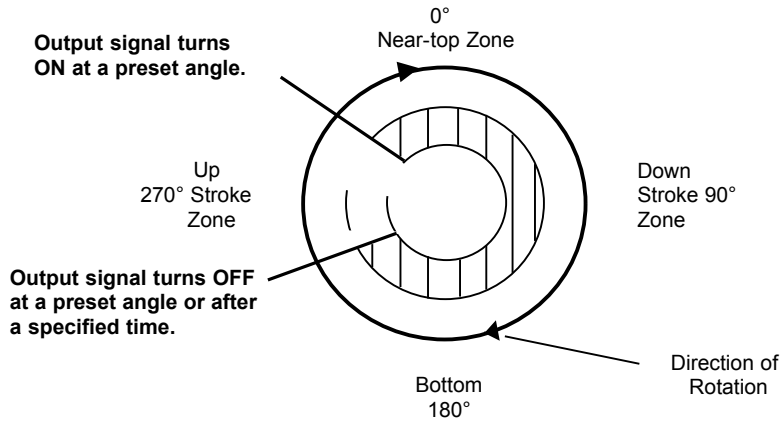


Figure 2.1 PLS Output Requirements

Genesis PLS Outputs (continued)

Note that you may also enter advance data to compensate for fixed delays in the stamping press system. For example, an advance value will force the output to turn on and off earlier in the cycle as a function of speed.

The *Controller Programming* chapter, starting on page 33, provides detailed instructions describing how to enter the appropriate parameters or data words on Genesis data screens to control all of your PLS output channels.

Setting Up Your PLS Channels

Before you begin to enter the appropriate PLS output parameters on Genesis data screens, you should determine the number of channels required for your specific press-control application. The Genesis controller supports a total of six PLS channels.

Gather the information described in the following list to decide how to use each PLS channel to meet the needs of your application. This list will also help you determine how to set up each channel.

1. The function that will be performed by the PLS channel.
2. Angular location of the ON and OFF setpoints.
3. The type of limit switch output appropriate for the channel (i.e., Normal if the output should be turned ON and OFF at pre-programmed crankshaft positions, or Timed to set up a timed output channel).
4. Any advance data required to compensate for fixed delays in the system.
5. If the output is Timed, the correct time parameter to enter for the channel.

BRAKE INPUT PROCESSING

This chapter describes how Genesis software uses optional brake input. It covers basic brake input processing, the brake monitor and motion detect functions driven by brake input, and how to clear a brake fault.

Overview

The Genesis controller has the ability to measure the time between when a 110Vac or 24Vdc braking signal is received and when the resolver stops turning. If the measured time interval exceeds a user-programmed value, then the brake fault output is triggered. The software will not only output a fault signal and halt controller operations if you remove the brake input; it will also perform these actions if the brake input connection is severed or power is lost to the connection. This safety feature is designed to add an additional safeguard to protect your stamping press machinery. Another brake monitor feature is the Motion Detect feature. Once the brake is released, motion must begin within your programmed motion detect time, or a motion detect fault will occur.

NOTE The two brake fault signals are used with external circuitry that you must design for your specific press-control application. For example, when a brake fault signal is received, you may want to stop press operation.

Since the brake monitoring functions are only triggered by transitions on the brake input, you are not required to supply power to the input if you choose not to use the brake monitor functions.

Brake Input Functions

The brake input controls both the brake monitor and motion detect software functions described in this section. A separate Genesis data screen is provided for each function to allow you to enter the parameters required to control both functions.

Brake Monitor Function

A Brake Monitor screen displays the current status of the brake input, and the time required for the resolver to stop the last time the brake input status turned from OFF to ON (generating a brake cycle). You may also enter a parameter on this screen to specify the longest acceptable stopping time for the resolver. When the resolver stopping time exceeds this parameter value, the software will output a brake fault and the error message STOP TIME EXCEEDED to the operator display.

Note: For a detailed description of the Brake Monitor screen, refer to the *Brake Monitor & Counter Data* section on page 36 in Chapter 8, titled *Controller Programming*.

Motion Detect Function

You may enter a motion detect parameter to specify the time it should take for the resolver to detect crankshaft motion after the brake input status goes from ON to OFF. If this time is exceeded, the software will output a brake fault and the error message MOTION TIME EXCEEDED on the operator display. The software will also perform these actions if the crankshaft motion begins after the brake input status goes from ON to OFF, and the motion *stops* without the input status turning ON (which would normally generate a brake fault). The second error condition may indicate that the transducer cable may be severed or compromised in some way.

Clearing a Brake Fault

When either the brake monitor or the motion detect function outputs a fault, the normal operations of the Genesis controller will cease and the software will trigger a stop fault. After the condition that caused the fault is corrected, you must press the FUNCTION key on the operator keypad followed by the CLEAR key to clear the fault output.

DIE MONITOR INPUT REQUIREMENTS

This chapter describes how to select the parameters for each Die Monitor input channel required to protect your stamping press machinery. It covers the Die Monitor input modes, the available outputs, and how to set up each of input channel.

Die Monitor Input Modes

Each DM channel is set up to verify if an expected condition took place during your stamping press operations. When a deviant condition (i.e., a fault condition) occurs, the software executes the specific output you requested on the Genesis data screens. The software provides a total of four DM input modes. You may use any of the first three modes listed below when input signals are synchronized with the rotation of a crankshaft and detectable within a specific zone of rotation or window. Use the Static mode if the input signals are independent of the press stroke.

The four available DM input modes perform the specific functions listed below:

1) **Cyclic** – Verifies that a part moved past a monitor.
2) **Single part (SPART)** – Determines if a part is ejected or inserted at the correct moment during the press stroke.
3) **In position (IN POS)** – Verifies that the ejector and other automation parts were retracted to the home position.
4) **Static** – Determines if an event has taken place independent of the press stroke (e.g., this input mode may be used to detect the end of stock).

Defining a Crankshaft Rotation Zone

Input signals for the Cyclic, Single part, and In position modes are synchronized with the rotation of a crankshaft and must be detected within a crankshaft rotation zone. This zone is called a "window". To verify that a part is inside a die before it is hit by a stroke, you may program a DM input channel to expect a part detect signal within a specific window (e.g., from 70° to 120°). In the diagrams provided in the following sections, each window is shown between an ON and OFF setpoint with an input signal illustrated as follows:

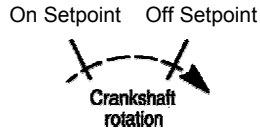


Figure 4.1 Rotation Zone Window

Figure 4.2 Input Signal Transition

Cyclic Mode

This is one of the most basic input modes that you may select to verify that parts are moving correctly through an automated stamping process. You may use this mode to determine if an OFF-ON-OFF pulse from the input sensor occurs within the rotation window once during each press stroke. For example, this mode will detect if a part moved past a monitor. The conditions that apply to this input mode are listed below:

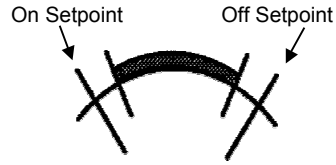


Figure 4.3 Cyclic Transition

For these Expected Conditions:	A problem is detected when the Input Signal:	If a problem is detected, the fault output is sent after:
Input signal turns ON then OFF within the window.	1. Stays ON beyond the window.	The end of the window.
	2. Turns ON outside the window.	Input signal turns ON.
	3. Remains OFF for the entire cycle.	The end of the current window.

Single Part (SPART) Mode

This input mode will detect if a part is ejected or inserted at the correct moment during each press stroke in an automated stamping process. Use this mode to verify that the input signal was ON within the rotation window, and OFF at any point before re-entering the window. That is, the signal can turn ON within the window (Figure 4.4) or before it enters the window (Figure 4.5), but it must always turn OFF before the on setpoint occurs again during the next cycle. The conditions that apply to this input mode are listed below:

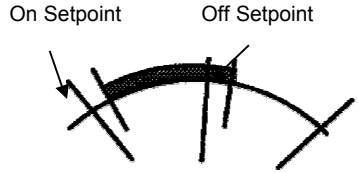


Figure 4.4 Single Part Transition (a)

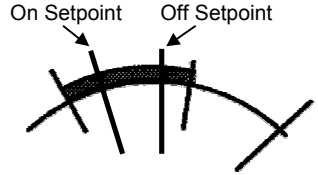


Figure 4.5 Single Part Transition (b)

For these Expected Conditions:	A problem is detected when the Input Signal:	If a problem is detected, the fault output is sent after:
Input signal is ON within the window, then OFF at any point before re-entering the window.	1. Remains ON into next window.	The beginning of the next window.
	2. Remains OFF for the cycle.	The end of the current window.

In position (IN POS) Mode

This input mode will detect if ejector and other automation parts are retracted to the correct home position during the stamping process. You may use this mode to determine if the input signal remained ON within the entire rotation window once during each press stroke. Note that the signal must turn OFF outside the window. The conditions that apply to this input mode are listed below:

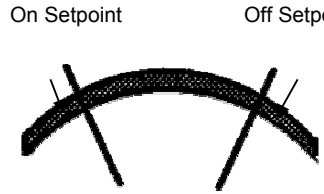


Figure 4.6 In Position Transition

For these Expected Conditions:	A problem is detected when the Input Signal:	If a problem is detected, the fault output is sent after:
Input signal turns ON before and OFF after the window.	1. Turns OFF before the window goes OFF.	Input signal turns OFF.
	2. Does not turn OFF outside the window.	Next window begins.
	3. Does not turn ON before window goes ON.	Current window begins.

Static Mode

This input mode may be used to output a warning message if an event occurs independent of the press stroke during the stamping process. When the input signal on a static mode channel turns OFF, the programmed output for the channel will be turned ON. For example, you may use this mode to detect the end of stock.

Outputs for Die Monitor Channels

If a fault is detected on any of the DM input channels, the Genesis software will execute the output you requested on the Genesis data screens. A fault is defined as any condition that deviates from the expected conditions defined for a DM channel. You may request the software to generate a Stop Fault output and display the STOP FAULT error message on the operator display, or a Top Stop output and the TOP STOP FAULT error message.

The *Controller Programming* chapter, starting on page 33, describes how to request either type of fault output for a DM input channel using the Die Monitor data screens.

Setting Up Your Die Monitor Channels

Before you begin to program the Genesis software, you should determine the number of DM input channels required for your specific press-control application. The controller supports a total of four DM channels.

Note: The first DM channel (i.e., DM Input 1) is reserved for counting parts.

Gather the information described in the following list to decide how to use each DM channel to meet the needs of your press-control application. This list will also help you determine how to set up each channel.

1. The function that will be performed by the channel.
2. Type and location of the input switch or analog device that will supply the input signal for the channel.
3. The appropriate input mode for the channel.
4. The appropriate output response if a fault is detected on the channel.

INSTALLATION

This chapter describes how to install all of the components required to operate the Genesis controller. It covers installing the controller unit and transducer cable, and how to connect wiring for the PLS outputs, fault outputs, DM inputs, brake input, and an external power supply.

Installing the Genesis Controller

WARNING

Remove system power before removing or installing the controller unit. Failure to observe this warning may result in damage to the controller's circuitry and/or undesired operation with possible injury to personnel.

The controller may be mounted on a panel using the four screws located at the corners of the unit. Refer to Figure 5.1 for the location of the mounting screws, and the dimensions of the controller.

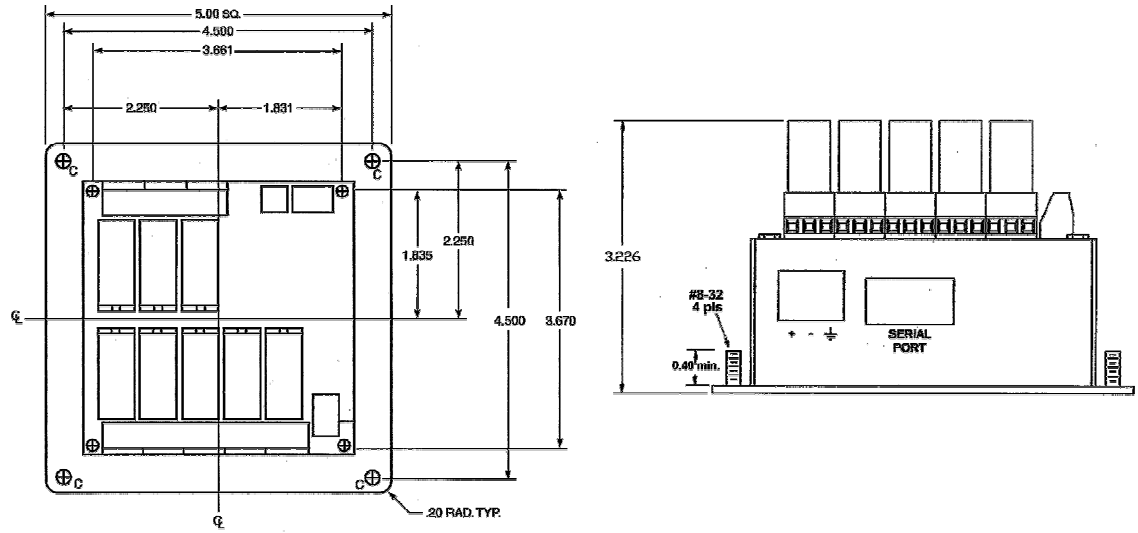


Figure 5.1 Genesis Controller Outline Drawing

CAUTION

The Genesis controller must be connected to Earth Ground. HELM recommends that you run a heavy gauge wire from both the CH GND pin on the TB3 terminal block and from the power supply ground pin (see Figure 5.4 for the location of this pin) to your ground bus.

Installing the Transducer Cable

It is recommended that you connect the Genesis controller to any single resolver package available from HELM (e.g., any of the H25 or HT-20 packages, or HT-400). Connecting the controller to other resolver-based transducers requires additional hardware. For a complete list of compatible transducers, visit our web site at www.HELM controls.com.

A pre-assembled and tested transducer cable may be ordered from HELM under part number *C1TG-X*, where (x) is the length in feet. If you wish to make your own cables then mating connectors may be ordered from HELM .

NOTE

1) Resolvers are low voltage, low power devices. A resolver may be installed in conduit along with other low power cabling such as communication cables and low power ac/dc I/O lines. It can not be installed in conduit with ac power lines or high power ac/dc I/O lines.

2) The shields of the transducer cable must be grounded at the Genesis controller *only!* When installing the cable, treat the shield as a signal conductor. Do not connect the shield to ground at any junction box or the transducer. This will eliminate ground loops that could damage the controller.

Use the following wiring diagram if you make your own cables and order the mating connectors from HELM :

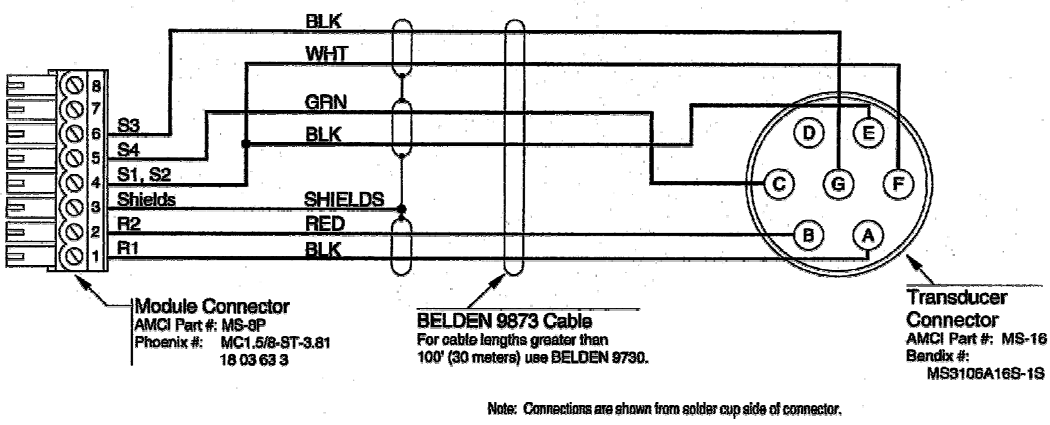


Figure 5.2 C1TG-X Wiring Diagram

Installing the Transducer Cable (continued)

After you make your own transducer cable or order the C1TG-X cable from HELM , insert the cable's controller connector into the connector labeled RESOLVER on the right side of the Genesis unit. (Refer to the illustration shown here.) Note that the controller connector is keyed and can only be inserted the correct way into the RESOLVER connector.

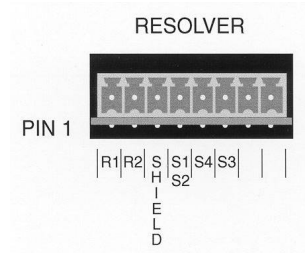


Figure 5.3 Resolver Connector

Connecting the External +24Vdc Supply

An external, isolated +24Vdc, 500mA supply is required to run the controller's inputs and relay switches. The power connector pins are located on the bottom of the controller unit. The appropriate connections to these pins are shown below along with the maximum current draw. Note that these measurements are for the Genesis unit and relay switches only. If you are powering the DM inputs with the same supply, you must add in the current requirements of each input to determine the power supply size.

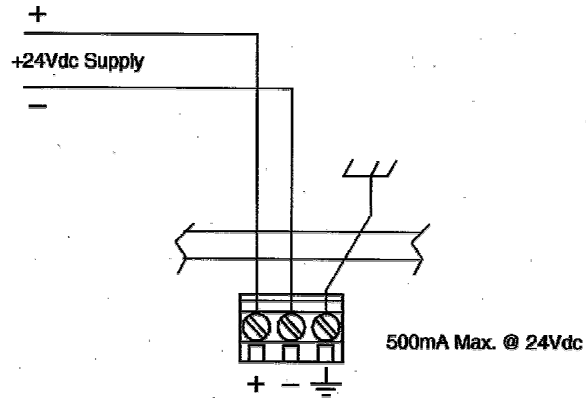


Figure 5.4 Power Supply Connections

Chassis Ground

When the Genesis controller is panel mounted, the case is usually connected to chassis ground through the mounting hardware. However, HELM recommends that you run a heavy gauge wire from both the CH GND pin on the TB3 terminal block and the power supply ground pin shown above to your ground bus. Refer to the following *Connecting Output/Input Wiring* section for the location of the CH GND (Chassis Ground) pin.

Connecting Output/Input Wiring

This section describes how to connect wiring for the PLS outputs, the fault outputs, DM inputs, and the optional brake input. A diagram of the Genesis controller output board with callouts for all of the outputs and inputs is provided below.

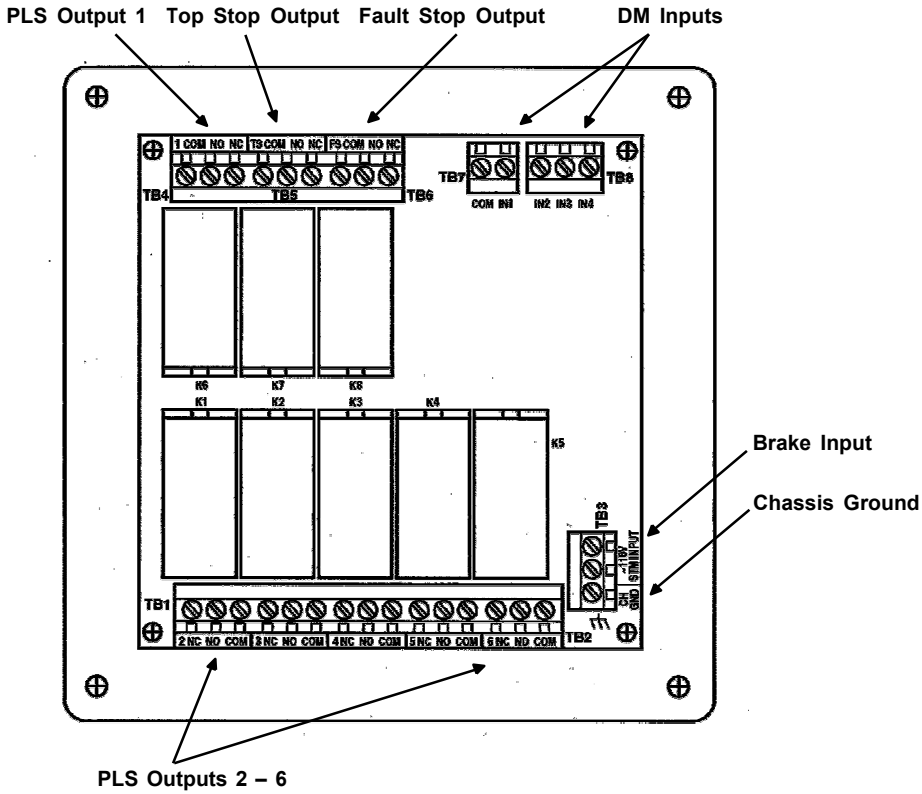


Figure 5.5 Controller Circuit Board

Surge (EMI) Suppression

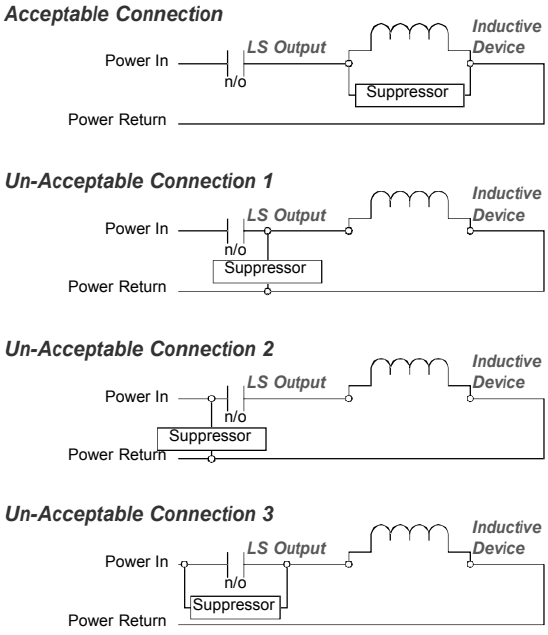
NOTE All inductive devices in the system, such as relays, contactors, solenoids, motor starters, and motors, must have surge suppression devices installed across their *coils*. This includes all devices that share a power supply with the PressPro Genesis, have wiring in the unit's enclosure, or wiring that is run in the same conduit as wiring connected to the unit. DC loads are typically suppressed with a flyback diode, while AC loads are typically suppressed with a RC network or varistor.

RC Networks are the preferred suppressor for AC loads.

Connecting Output/Input Wiring (continued)

Surge (EMI) Suppression (continued)

The figure below shows where surge suppression devices should be placed in the circuit.



The acceptable connection supresses noise at its source. The wiring that connects the load to the power supply and contact will not radiate noise when the load is switched and noise will not be coupled into the power supply.

This connection protects the power supply and LS output, but allows noise to radiate through the load's wiring where it can be coupled into other cables around it.

This connection protects the power supply but nothing else. Noise can radiate through the load's wiring where it can be coupled into other cables around it and the LS Output relay may eventually be damaged by high voltage inductive spikes.

This connection protects the LS Output but nothing else. Noise can radiate through the load's wiring where it can be coupled into other cables or into the power supply. Noise in the supply may affect any device powered by it. Also, if the suppressor shorts out, the load will always receive power.

Figure 5.6 Installing Surge Suppression Devices

Surge Suppression: DC Outputs

All inductive DC loads require a commutating, or "fly-back" diode across the load. Inductive DC loads include relays, solenoids, and DC motors.

Unlike resistors, diodes have a polarity and only conduct current in one direction. Therefore, care must be taken when installing diodes. As shown in the figure below, the *cathode* of the diode, which is denoted by the white or black band on one end of the diode, must be installed on the positive side of the load. If you install the diode backwards, it will most likely destroy itself as soon as you apply power to the load.

Connecting Output/Input Wiring (continued)

Surge Suppression: DC Outputs (continued)

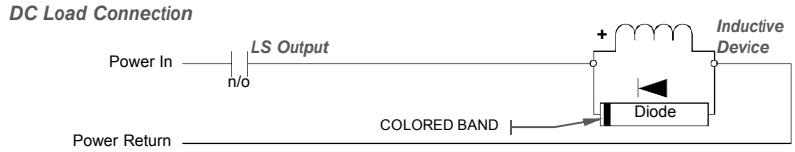


Figure 5.7 DC Output Surge Suppression

The diode must be sized to handle the inductive surge of the load when it turns off.

Some devices can be ordered with built in fly-back diodes, or the device manufacturer will offer suppressors designed specifically for the device. These types of devices are strongly recommended.

The fly-back diode will slightly increase the device's turn off time by maintaining the magnetic field while it shunts energy back into the device. If needed, this additional delay can be compensated for by adjusting the *Advance* data available on the PressPro Genesis.

Surge Suppression: AC Outputs

Whenever you switch an AC load with a hard contact such as a mechanical relay or contactor, you must install a suppression network on the load switched by those hard contacts. This includes AC loads switched by the PressPro Genesis. The two most common suppressors for AC loads are varistors and R-C networks.

HELM strongly suggests R-C networks for all AC applications.

A varistor is a solid state device that turns on and conducts when the voltage across its terminals exceeds its rated value. Herein lies the problem with using a varistor as an AC suppressor. The voltage (problem) must be generated before the varistor responds. In our testing we have found that hard contacts will still arc when a varistor is placed across the AC load. This arcing is due to the fact that the breakdown voltage of the air between the contacts when they first open can be less than the rated voltage of the varistor. If the instantaneous AC voltage applied to the contacts is above the breakdown voltage of air, but less than the rated voltage of the varistor, the contacts will arc.

On the other hand, an R-C network acts as a low-pass filter, instantaneously dampening fast transients when they occur. The main drawback of R-C networks is that they are harder to correctly specify than varistors. Varistors only require you to specify breakdown voltage and power dissipation ratings. R-C networks require you to balance the need of suppression when the contacts open against the amount of surge current the relay can tolerate when the contacts close. Table 5.1 shows the trade-offs you must be aware of when specifying R-C networks.

Connecting Output/Input Wiring (continued)

Surge Suppression: AC Outputs (continued)

	When Contacts Close	When Contacts Open
Low Resistance, High Capacitance	Higher surge current through relay contacts to charge capacitor. (Negative)	Lower transient voltage spike. (Positive)
High Resistance, Low Capacitance	Lower surge current through relay contacts to charge capacitor. (Positive)	Higher transient voltage spike. (Negative)

Figure 5.8 R-C Network Trade-offs

In general, capacitor values range from 0.1 to 1.0 µF and resistor values range from 150 to 680 ohms.

The easiest way to specify a R-C network is by following the recommendations of the load's manufacturer. Most manufacturers have tested and specify standard R-C networks, and many sell networks that are designed to integrate with their products. If you cannot get help from your load's manufacturer, feel free to contact HELM for assistance.

PLS Outputs

The location of the connector pins for the PLS outputs is shown in Figure 5.5 on page 14. Three pins are provided for each output labeled NC to identify the Normally Closed contact, NO for the Normally Open contact, and COM for the Output Common. All the PLS outputs are mechanical relay outputs with a maximum current rating of 10A @ 30Vdc and 10A @ 250Vac. Refer to wire code specifications for the correct gauge wire to use for each output.

NOTE Because these are mechanical relays, surge suppression devices must be placed across any inductive loads switched by these outputs.

Fault Outputs

The Genesis controller provides two fault outputs as follows:

1) **Fault Stop (FS)** - Reserved for both Stop Fault output generated as specified for fault conditions on DM input channels, and brake fault output indicating a brake input fault.
2) **Top Stop (TS)** - Provided for Top Stop faults generated as specified (on the Genesis data screens) for fault conditions that occur on DM input channels.

Refer to Figure 5.5 on page 14 for the location of the connector pins for each output. Three pins are provided for each output labeled NC to identify the Normally Closed contact, NO for the Normally Open contact, and COM for the Output Common.

Connecting Output/Input Wiring (continued)

Die Monitor Inputs

The location of the connector pins for the DM inputs is also shown in Figure 5.5 on page 14. There are five pins, one for each input and an Input Common (labeled COM). All inputs are opto-isolated and floating. That is, they are configured as sinking or sourcing inputs by connecting Input Common to a power supply. Typically, the +24Vdc supply (described under Connecting the External +24Vdc Supply on page 13) that powers the output relays is also used to power the inputs. Each input requires 10-30Vdc with a maximum current draw of 3.8mA@24Vdc. When Input Common is attached to +Vdc, the inputs will source current into the sensors attached to them. When Input Common is attached to the power supply GND, the inputs will sink current from the sensors attached to them.

Brake Input

There are two connector pins for the 110Vac or 24Vdc brake input identified in Figure 5.5 on page 14. Note that these pins are labeled STM Input on the controller circuit board for Stop Time Monitor input. The current draw for this input is 8mA rms. The previous chapter Brake Input Processing, starting on page 5, describes how the controller handles brake input.

NOTE The Genesis controller does not require a brake input.

SOFTWARE INTRODUCTION

This chapter lists the Genesis data screens and password access levels, explains how to use the operator display/keypad, and describes the basic operation modes and the Main Display screen.

Genesis Data Screens

You may use the data screens displayed by the Genesis software to program custom tool setups and monitor the operation of your stamping press system. Each screen is listed below along with the operations commonly performed on each screen. Note that the Main Display screen is described in this chapter, the Select Tool and Configuration screens are described in the *Initial Tool Setup* chapter (starting on page 25), and all the other screens are covered under *Controller Programming* (starting on page 33).

Data Screen	**Commonly Used to:**
Main Display Screen	View current status data.
Select Tool	Select, create, copy, and edit tool setups.
Configuration Screen #1	Define transducer setup parameters.
Configuration Screen #2	Enter counter multiplier and motion detect parameters.
Configuration Screen #3	Modify password data.
Configuration Screen #4	Enter operator access data.
Limit Switch	Select the type of output for each PLS channel and enter ON/OFF setpoints.
Advances	Enter speed compensation data for PLS outputs.
Timed Output	Enter duration parameters for timed PLS output channels.
Brake Monitor	Check brake input status and enter a stopping time parameter for the resolver.
Parts Counter	Enter desired batch and job part counts and view actual part count data.
Machine Maintenance	View tool (or stamping press) and stroke counter data.
Die Monitor Screen	Enter parameters for the DM inputs.

Table 6.1 Genesis Data Screens

Password Access Levels

The Genesis software provides a Master, Set-Up, and Operator password access level. When you initially begin to program the controller, you may enable the Genesis password function on Configuration Screen #3, then enter a password for one user at the Master access level and another for users at the Set-Up level. (A password is not required for users at the Operator level.) The following table lists the specific functions and data screens that may be accessed by users at each level.

Screens/Functions	**Master Level**	**Set-Up Level**	**Operator Level**
Main Display Screen	View	View	View
Configuration	Edit/View	View[1]	View[1]
Limit Switch	Edit/View	Edit/View	Edit[2]/View
Advances	Edit/View	Edit/View	View
Timed Output	Edit/View	Edit/View	View
Brake Monitor	Edit/View	Edit/View	View
Parts Counter	Edit/View	Edit/View	Edit[2]/View
Die Monitor	Edit/View	Edit/View	View
Select Tool Setups	Yes	Yes	Yes[2]
Create/Edit Tool Setups	Yes	Yes	No
Clear Error Messages	Yes	Yes	Yes[2]

[1] A user assigned to the Set-Up or Operator access level can not view Configuration Screen #3: Password Data (the menu sequence will skip over this screen). Only the Master user can view the password data displayed on this screen.

[2] The Master user can enable or disable a user at the Operator level from editing this information. The default value is to disable edits.

Table 6.2 Access Level Privileges

Using the Operator Display/Keypad

All the Genesis data screens appear on the operator display on the front of the controller unit. You may use the keypad located under the display to enter all the data words required to program custom tool setups for your press-control application.

Display Layout

The operator display provides four lines with up to 20 characters on each line. The type of information that generally appears on each line is described below, followed by a sample data screen.

Line 1 – Identifies the title of the screen.

Lines 2 and 3 – Contain the data words or parameters entered to program each tool setup.

Line 4 – Specifies the current operation mode (i.e., EDIT or VIEW), the number of the current tool setup, the resolver position "P" (i.e., the angular position of the crankshaft), and a Strokes per Minute or "SPM" value indicating the speed of the stamping press. If the software detects an error, the appropriate error message will be displayed on this line.

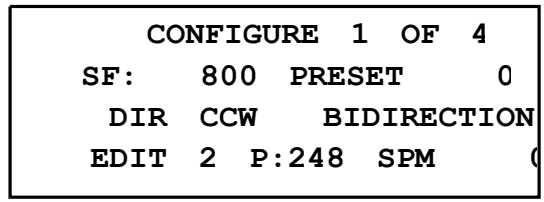


Figure 6.1 Sample Genesis Data Screen

Using the Operator Keypad

The Genesis operator keypad is illustrated below. Most of the keys, shaded in two colors, may be used to enter data or request specific functions. For example, the key in the top right corner of the keypad may be used to enter the number "3" or request the ADVANCE function. The separate groups or types of keys are listed below:

Function Activation Key – This key, labeled FUNCTION, is located in the top left corner of the keypad. If you press FUNCTION to illuminate the red LED next to the key, you may press any of the "Function keys" shaded in two colors to request the function identified at the top of each key.

Function Keys – As noted above, if you press the Function Activation key, you may press any of these keys (shaded in two colors) to request the function identified at the top of each key. Otherwise, you may press a function key to enter the data or request the function specified at the *bottom* of the key. A list of all the function keys is provided on the next page.

Arrow Keys – These keys are located in the bottom left corner of the keypad. Press these keys to move the cursor in the indicated direction on the operator display. For example, press the left or right arrow key to move the cursor to the previous or next data field respectively, or the up or down key to move the cursor up or down one line.

SELECT – Press this key to select different available options in a specific data field.

ENTER – You must press this key to enter new data words. If you enter a new data word and press an arrow key to move the cursor to a different field, the new word will not be recorded.

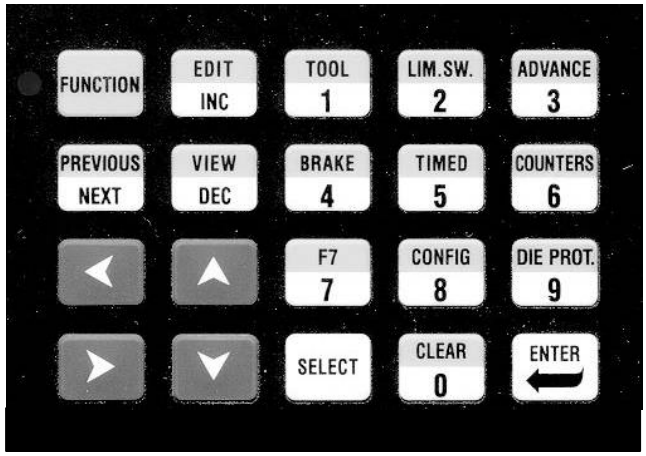


Figure 6.2 Genesis Operator Keypad

The specific function or data screen requested by each function key on the operator keypad is listed in the following table. All of these keys are shaded in two colors with the function performed by each key identified by the word or code at the top.

Key Code	Function/Data Screen
EDIT	Activates the Edit operation mode.
TOOL	Select Tool screen
LIM. SW.	Limit Switch screen
ADVANCE	Advances screen
PREVIOUS	Goes to the previous line or screen.[1]
VIEW	Activates the View operation mode.
BRAKE	Brake Monitor screen
TIMED	Timed Output screen
COUNTERS	Parts Counter & Machine Maintenance screens
F7	Main Display screen.
CONFIG	Configuration Screen #1.
DIE PROT.	Die Monitor screen
CLEAR	Clears a fault condition and resets counters. [2]

[1] Depending upon the screen that is currently displayed.

[2] Counters cannot be cleared on the Main Display screen. The counters can only be cleared from the Parts Counter and Machine Maintenance screens.

Table 6.3 Genesis Function Keys

Basic Operation Modes

The Genesis software has two basic operation modes. You may use the View mode to view information displayed on all the data screens, except for the password screen, Configuration Screen #3. The Edit mode may be used to view and edit information displayed on specific data screens. The operation mode that is currently active will be identified in the bottom left corner of the operator display.

Note: If the Genesis password function is enabled on Configuration Screen #3, only users at the Master or Set-Up level can access the Edit mode.

View Mode

When power is applied to the Genesis controller, the software will start up in this operation mode. The software will also return to this mode if the resolver is moving or if no changes are made for 10 minutes in the Edit mode. To enter the View mode if the Edit mode is currently active, press the FUNCTION key in the top right corner of the operator keypad followed by the VIEW key.

Edit Mode

To enter this mode from the View mode, press the FUNCTION key on the operator keypad followed by EDIT. If the Genesis password function is enabled on Configuration Screen #3, the message ENTER PASSWORD: will appear on the operator display. Press the appropriate keys to enter your password followed by the ENTER key. If you enter an invalid password, the error message INVALID ACCESS will appear on the last line of the display. If the password is valid, you may edit the data on specific screens based on your access level. (Refer to Table 6.2 for more information.)

Note: If the resolver is in motion (i.e., the stamping press machinery is running), you can only increment or decrement setpoints on the Limit Switch screen using the INC and DEC keys in the Edit mode. Note that you must be authorized to use these keys based on access data entered on Configuration Screen #4.

To exit the Edit mode, press the FUNCTION key followed by VIEW. The software will also return to the View mode if no changes are made for 10 minutes in the Edit mode.

Main Display Screen

This screen will appear the first time that you power up the Genesis controller. It will also appear during normal operations if no keys are pressed on the operator keypad for 10 minutes in the Edit mode. As illustrated below, the Main Display screen has a different format than the typical Genesis data screen. This screen provides updated status data in the following fields:

T# – Identifies the current tool setup.

STROKE – Current number of strokes completed by the stamping press machinery.

P: – Reports the angular position of the crankshaft.

BATCH – The actual number of parts processed in the current batch. When the first input channel (DM Input 1) transitions from LO to HI, the part count value is multiplied by the Counter Multiplier value specified on Configuration Screen #2.

SPM – The current speed of the stamping press machinery displayed in Strokes per Minute.

BRAKE – Displays the total time in milliseconds required for the resolver to stop during the last braking cycle.

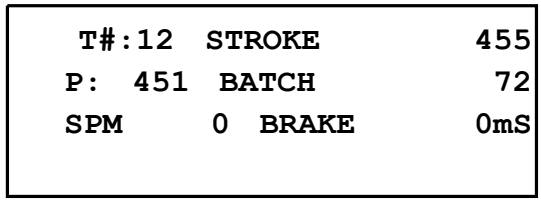


Figure 6.3 Main Display Screen

INITIAL TOOL SETUP

This chapter describes how to select a tool setup and enter configuration data including transducer setup parameters, counter and motion parameters, password data, and operator access data.

Selecting a Tool Setup

If the Select Tool screen illustrated below is not displayed on the Genesis controller, press the FUNCTION key on the operator keypad followed by the TOOL key. You may make changes on this screen if the Edit mode is active (as indicated by the word EDIT in the bottom left corner of the screen). If VIEW is displayed at the bottom of the screen, press the FUNCTION key followed by EDIT and the appropriate password. You can then perform any of the operations described in the following sections.

Note: The Genesis controller is shipped with a default tool setup #1. You may change this setup or use it as a tutorial to familiarize yourself with the operation of the software.

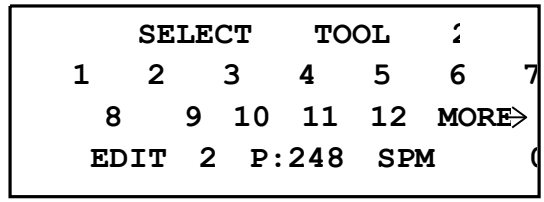


Figure 7.1 Sample Select Tool Screen

Select an Existing Tool Setup

You may select an existing tool setup as follows:

1. Make sure that SELECT is displayed in the top left corner of the Select Tool screen. If this word is not displayed, press the SELECT key until this word appears.
2. Press the ENTER key to move the blinking cursor to the current tool setup number in the top right corner of the screen (e.g., the number 2 above).
3. Press the appropriate number keys to select an existing tool setup. Note that if the number of programmed setups exceeds the number of setups that can be displayed on the middle two lines of the screen, **MORE** →will appear on the screen as shown above. Press the down arrow key or the NEXT key to display the next sequence of tool setups.
4. After you enter the number of the tool setup that you want to select, press ENTER.
5. If you entered a tool setup number that does not exist, the error message TOOL # INCORRECT will appear at the bottom of the screen. After this message disappears and the blinking cursor returns to the current tool setup number, repeat Steps 3 and 4.

Create a New Tool Setup

There are two different methods that may be used to create a new tool setup. If you want to create a new setup that is very similar to an existing setup, refer to the following *Create a Tool Setup from an Existing Setup*. You may also create a completely new tool setup as follows:

1. When the Select Tool screen is initially displayed, the word SELECT will blink in the top left corner of the screen. Press the SELECT key until the word NEW appears.
2. Press ENTER to move the blinking cursor to the current tool setup number in the top left corner of the screen.
3. Press the appropriate number keys to enter a number to identify the new tool setup.
4. After you enter the number for the new tool setup, press ENTER again.
5. If you entered a tool setup number that already exists, the error message TOOL ALREADY IN USE will appear at the bottom of the screen. After this message disappears and the blinking cursor returns to the current tool setup number, repeat Steps 3 and 4.

Create a Tool Setup from an Existing Setup

A new tool setup may be created from an existing setup as follows:

1. When the Select Tool screen is initially displayed, the blinking cursor will be positioned on SELECT in the top left corner of the screen. Press the SELECT key until SAVE AS appears.
2. Press ENTER to move the blinking cursor to the current tool setup number in the top left corner of the screen.
3. Press the appropriate number keys to enter a number to identify the new tool setup.
4. After you enter the number for the new tool setup, press ENTER again.
5. If you entered a tool setup number that already exists, TOOL ALREADY IN USE will appear at the bottom of the screen. After this message disappears and the blinking cursor returns to the current tool setup number, repeat Steps 3 and 4.

Delete an Existing Tool Setup

If you are no longer using a tool setup, you may delete it as follows:

1. When the Select Tool screen is initially displayed, the blinking cursor will be positioned on SELECT in the top left corner of the screen. Press the SELECT key until DELETE appears.
2. Press ENTER to move the blinking cursor to the current tool setup number in the top left corner of the screen. If you want to delete the current setup, skip to Step 4.
3. Press the appropriate number keys to enter the number of the tool setup that you want to delete.
4. When the number of the correct tool setup is displayed, press ENTER.
5. The following message will appear on the second line of the display:

   ARE YOU SURE? YES

6. To delete the tool setup identified at the top of the screen, press ENTER again.
7. If you are not sure that you want to delete the tool setup, press SELECT to replace YES in the above message with NO, then press ENTER.
8. If you enter YES to delete a tool setup and the setup number that you keyed in does not exist, TOOL # INCORRECT will appear at the bottom of the screen. After this message appears and the blinking cursor returns to the current tool setup number, repeat Steps 3 through 6.

Note: You cannot delete the tool that is currently being edited or viewed. Trying to delete the current tool will cause the TOOL ALREADY IN USE message to be displayed.

Entering Configuration Data

The Genesis software provides four screens that allow you to enter a variety of configuration data. All the configuration screens are described in the following sections.

Note: You can not change the values displayed on any configuration screen in the View operation mode. If VIEW appears in the bottom left corner of a screen, press FUNCTION followed by EDIT to enter the Edit mode.

Transducer Setup Parameters

These parameters affect the position data reported at the bottom of each data screen. You may enter transducer setup parameters on the first configuration screen as follows:

1. Press FUNCTION followed by CONFIG to request the first configuration screen illustrated below.

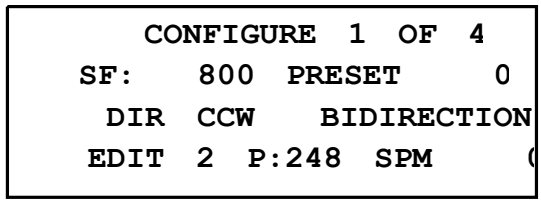


Figure 7.2 Configuration Screen #1

2. When Configuration Screen #1 first appears, the blinking cursor will be positioned on the value entered for the Scale Factor (SF). This parameter, which defaults to 360, sets the position resolution for the Genesis controller. Key in any value between 2 and 1000 counts per turn, and press ENTER to move the blinking cursor to the PRESET value.

3. The PRESET value sets the initial value for the Machine Position. This position is the angular position of the crankshaft reported at the bottom of each screen. The PRESET value defaults to zero. You may enter any value between zero and (Scale Factor –1) and press ENTER. Pressing ENTER on the PRESET parameter changes the resolver position to the preset value.

4. The DIR parameter sets the direction the transducer shaft must rotate to increment the position count. Press SELECT to toggle between the clockwise (CW) and counterclockwise (CCW) direction. When the correct value is displayed, press ENTER to move the cursor forward.

5. When the blinking cursor is on BIDIRECTION or UNIDIRECTION, press SELECT to toggle between these two values. If set to BIDIRECTION, the outputs will fire regardless of the direction of rotation of the crankshaft. If set to UNIDIRECTION, the output will only fire when the position value is incrementing, provided that the crankshaft does not complete 180° of travel in the reverse direction.

Counter & Motion Parameters

These parameters include a Counter Multiplier that allows you to multiply the part counter input and a Motion Detect parameter that may be used to select a motion detect time interval. You may enter both parameters on the second configuration screen as follows:

1. Press FUNCTION followed by CONFIG to request the first configuration screen.
2. Press NEXT to page forward to the second configuration screen shown below.

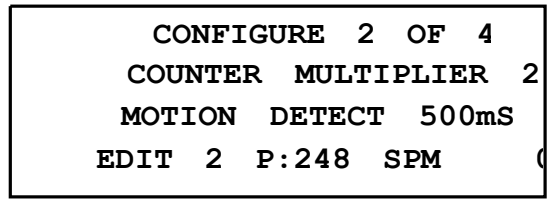


Figure 7.3 Configuration Screen #2

3. When Configuration Screen #2 first appears, the blinking cursor will be positioned on the Counter Multiplier value. This parameter allows you to multiply the actual counter values reported on the Parts Counter screen and the Main Display screen if more than one part is stamped during each press stroke. You may enter a Counter Multiplier of 1, 2, 3 or 4 (the default value is 1). For example, if you enter a value of 2, the actual part counters will be incremented by 2 after each transition of input 1. Key in the appropriate value and press ENTER to move the blinking cursor to the Motion Detect value.
4. If you are supplying a brake input to the Genesis controller, the Motion Detect parameter specifies the time it should take for the resolver to detect crankshaft motion after the brake is released (input status goes from ON to OFF) to resume normal operations. If this time is exceeded, a brake fault will be output and the error message MOTION TIME EXCEEDED will appear on the operator display. You may press the SELECT key to select a motion detect value of .125, .250, .375 or .500 milliseconds. After you choose the appropriate value, press ENTER.

Password Programming

You may use the third configuration screen to enable or disable the password function, and enter passwords for users at both the Master and Set-Up levels.

Note: Only a user at the Master access level can change data on this configuration screen when the password function is enabled and the software is in the Edit mode.

The password data on Configuration Screen #3 may be changed as follows:

1. Press FUNCTION followed by CONFIG to request the first configuration screen.
2. Press NEXT twice to page forward to the configuration screen illustrated below.

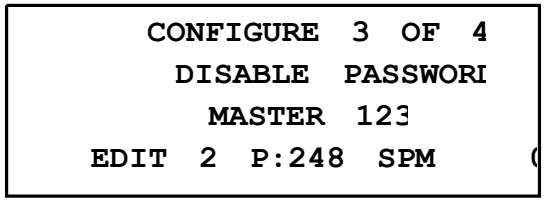


Figure 7.4 Configuration Screen #3

3. When Configuration Screen #3 first appears, the blinking cursor will be positioned on the DISABLE or ENABLE value. Press SELECT to toggle between these two values to disable or enable the Genesis password function. When the correct value is displayed, press ENTER to move the cursor forward to the MASTER or SET UP value.
4. When the blinking cursor is on either MASTER or SET UP on the third line of the screen, press SELECT to toggle between these two values to view the password for either the Master or the Set-Up access level. When the correct value is displayed, press ENTER to move the cursor forward to the password.
5. You may then change the password for the selected access level (i.e., the password that must be entered by each user at either the Master or the Set-Up level). After you key in any four-digit number for the password, press ENTER. The value is accepted and the blinking cursor returns to the DISABLE/ENABLE position.

Note: All the Genesis controllers are shipped with a default Master password of 1234.

Operator Access Programming

You may use the last configuration screen to define the software functions that operators may access to program the current tool setup. Specific parameters may be entered on this screen as follows:

1. Press FUNCTION followed by CONFIG to request the first configuration screen.
2. Press NEXT to page forward to the final configuration screen illustrated below.

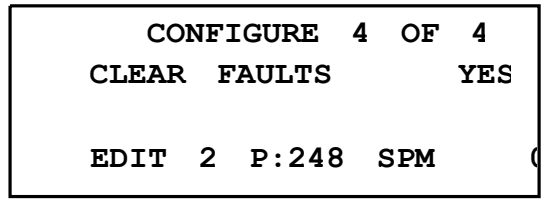


Figure 7.5 Configuration Screen #4

3. When Configuration Screen #4 first appears, the blinking cursor will be positioned on the CLEAR FAULTS phrase displayed on the second line shown above. You may press the SELECT key to choose between this phrase, SELECT TOOL #, INC / DEC and CLEAR COUNTERS. These phrases identify software functions that allow operators to clear fault conditions; select a tool setup; use the INC/DEC keys to change setpoints on the Limit Switch screen; and clear actual counters on the Parts Counter screen.
4. When a specific software function is displayed, press ENTER to go to the next data value and press SELECT to choose between YES or NO to determine if operators can access the identified function for the current tool setup. After you select YES or NO, press ENTER to record the access value. The value is accepted and the blinking cursor returns to the phrase position.

Notes

CONTROLLER PROGRAMMING

This chapter describes how to program PLS output channels, enter brake monitor and counter data, and program Die Monitor input channels.

PLS Output Programming

Each PLS output channel may be programmed by entering basic limit switch information, advance data, and any required timing parameters as described in the following sections. The Limit Switch screen can also be used to monitor the status of the outputs.

Limit Switch On/Off Setpoints

You may use the Limit Switch screen to select a specific type of limit switch for each output channel and up to two pairs of ON/OFF setpoints for each channel as follows:

1. If the Limit Switch screen is not displayed, press FUNCTION followed by LIM.SW. to request this screen. Note that the columns on the top line identify an output channel (CH), the STATUS of the channel, and the first ON setpoint (FROM) and OFF setpoint (TO) entered for the channel. The arrow on the right side of the second line below indicates that additional setpoints have been entered for Channel 1.

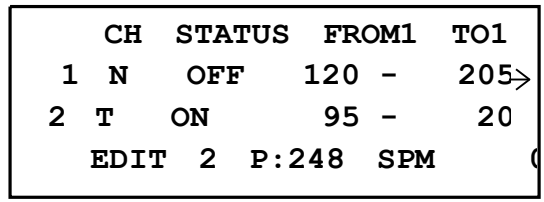


Figure 8.1 Sample Limit Switch Screen

2. When this screen first appears, the blinking cursor will be positioned on the number (1) for the first channel. To program another channel, enter the number (from 2 to 6) of the channel and press ENTER.

3. When the cursor is on the correct channel number, press the right arrow key to move the cursor to the next field and select a specific type of output for the channel. Press SELECT to toggle between Normal (N), Timed (T) and Output Disabled or "Channel Not Used" (-). When the correct value is displayed, press ENTER to move the cursor to the FROM column.

4. If you selected Normal or Timed output, enter the angular position for the first ON setpoint in the FROM column then press ENTER twice to move the cursor to the TO column and enter an angular position for the OFF setpoint. *If the crankshaft is moving, you can only press INC or DEC to change the setpoint values.* When an invalid setpoint is entered, an error message will appear for three seconds and the cursor will return to the rightmost digit of the ON setpoint.

5. Press ENTER again to enter the OFF setpoint into memory. If you selected Normal output, you may specify another setpoint pair or press the right arrow when you are done to go to the Advances screen. If you selected Timed output, the Advances screen will appear immediately after you enter the first OFF setpoint.
6. Pressing NEXT will move the cursor to the channel number for the next channel. This allows you to skip the Advances and Timed Output screens if you do not need these screens.

Note: Placing the cursor on either the ON setpoint or the OFF setpoint and pressing the INC or DEC key will increase or decrease the selected setpoint by one. Placing the cursor on the dash between the ON/OFF setpoints and pressing the INC or DEC key will increase or decrease both setpoints by one.

Advance Data

You may use the Advances screen to enter advance data (to compensate for fixed delays in your stamping press system) as follows:

Note: If the crankshaft is moving, you can NOT change any of the data on the Advances screen.

1. If the Advances screen is not displayed, press FUNCTION followed by ADVANCE to request this screen.

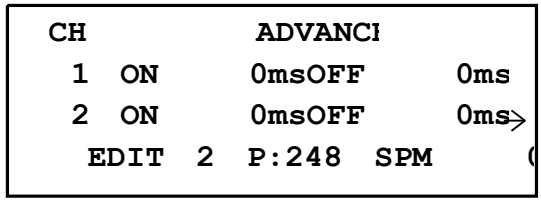


Figure 8.2 Sample Advances Screen

2. When the Advances screen first appears, the blinking cursor will be positioned on the number (1) for the first channel or the number of the channel that you were editing/viewing on the Limit Switch screen. If you want to change the advance data for another channel, either press the down/up arrow key or enter the number of the other channel and press ENTER.
3. When the cursor is positioned on the correct channel number, press the right arrow key to move the cursor to the ON field. The maximum compensation value that may be entered on the Advances screen is 999 milliseconds (ms). Enter the correct value for your stamping press system and press ENTER to move the cursor to the OFF field.
4. Enter the correct compensation value (up to 999ms) for your stamping press system and press ENTER to continue. If you selected Normal (N) output for the current channel, the Limit Switch screen will appear. If you selected Timed (T) output for the current channel (as indicated by a right arrow at the end of the Advances display line), the Timed Output screen will appear.

Note: Placing the cursor on either the ON setpoint or the OFF setpoint and pressing the INC or DEC key will increase or decrease the selected setpoint by one. Placing the cursor on the dash between the ON or OFF setpoints and pressing the INC or DEC key will increase or decrease both setpoints by one.

Timed Output Parameters

You may use the Timed Output screen to enter duration parameters for each timed output channel as follows:

Note: If the crankshaft is moving, you can NOT change any of the data displayed on the Timed Output screen.

1. If the Timed Output screen is not displayed, press FUNCTION followed by TIMED to request this screen.

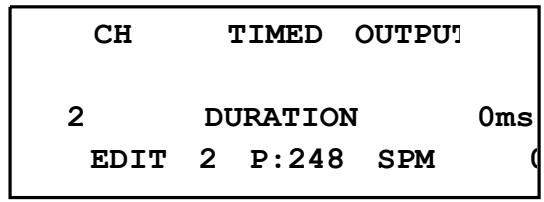


Figure 8.3 Timed Output Screen

2. When the Timed Output screen first appears, the blinking cursor will be positioned on the number (1) for the first channel or the number of the channel that you were editing/viewing on the previous screen. To move to another channel, press the down/up arrow key or enter the number of the other channel and press ENTER. If a line for a specific channel is blank (see Channel 1 line above), indicating that Normal output has been selected for the channel, move the cursor to a line displaying the DURATION parameter. (This parameter indicates that Timed output has been selected for the channel.)
3. When the cursor is positioned on a line with the DURATION parameter, press ENTER to move the cursor to the number field.
4. The maximum duration value that may be entered on the Advances screen is 9999 milliseconds (ms). This parameter sets the amount of time that the output will be ON for the current channel. Key in the correct value for your stamping press system and press ENTER to record the duration value in the setup data. The cursor will then return to the Limit Switch screen to allow you to enter setup data for another PLS output channel.

Note: If the Limit Switch OFF setpoint is reached before the programmed duration value expires, the output will turn off when the programmed OFF setpoint is reached.

Brake Monitor & Counter Data

This section describes how to enter a stopping time or brake fault parameter on the Brake Monitor screen, and how to use the Parts Counter and Machine Maintenance screens.

Brake Monitor Data

You may use the Brake Monitor screen to check the current status of the brake input and to enter a stopping time parameter for the resolver.

Note: The Genesis controller does not require a brake input. The *Brake Input Processing* chapter, starting on page 5, describes how the controller handles this input.

1. If the Brake Monitor screen is not displayed, press FUNCTION followed by BRAKE to request this screen. The second line displays the current status of the brake input (ON or OFF) and the total time it took for the resolver to stop during the last braking cycle. The default status for the brake input is ON.

```
        BRAKE  MONITOI
STATUS  ON  TIME      0mS
BRAKE  FAULT        690mS
EDIT  2  P:248  SPM      (
```

Figure 8.4 Sample Brake Monitor Screen

2. When this screen first appears, the blinking cursor will be positioned on the value specified for the BRAKE FAULT parameter. Key in a value to define the longest acceptable stopping time allowed for the resolver. When the resolver stopping time exceeds the programmed value, a brake fault will be output and the error message STOP TIME EXCEEDED will appear on the operator display.
3. Press ENTER to enter the brake fault parameter.

Note: A “Brake Warning” message will appear on the main screen when the stopping time is within 90% of the programmed stopping time.

Counter Data

The two screens described in this section allow you to enter desired batch and job part counts, and view actual part counts and machine maintenance data as follows:

1. If the Parts Counter screen is not displayed, press FUNCTION followed by COUNTERS to request this screen. Note that you may enter desired part counts for each batch and the total job, and view the actual batch and job part counts.

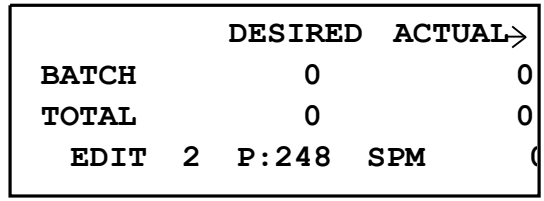


Figure 8.5 Sample Parts Counter Screen

2. When this screen first appears, the blinking cursor will be positioned on the desired part count specified for each batch. Key in the appropriate value and press ENTER to move the cursor to the number field for the desired total job count.

3. Key in the appropriate value for the desired total job count in the TOTAL field and press ENTER.

4. Press NEXT to go to the Machine Maintenance screen illustrated below. You may only view or clear the data displayed on this screen. The TOOL field displays the total number of stamps made by the press to monitor tool wear, and the STROKE field specifies the total number of strokes completed by the press. Typically, you may want to change the stamping die or tool after a certain number of stamps and perform machine maintenance (lubricate and/or change parts) after a specific number of strokes. To clear either of these counters when the screen is displayed, use the up or down arrow keys to select the counter value and press the CLEAR key.

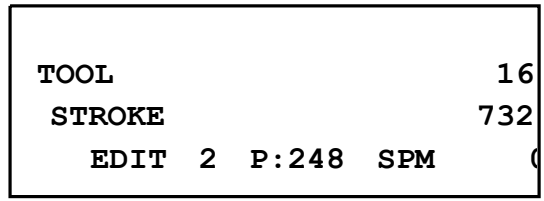


Figure 8.6 Sample Machine Maintenance Screen

Die Monitor Input Programming

You may use the Die Monitor screen to enter data for each DM input channel including a DM input mode, the active state of the input, any required ON/OFF setpoints, and an appropriate fault output as follows:

1. If the Die Monitor screen is not displayed, press FUNCTION followed by DIE PROT. to request this screen.

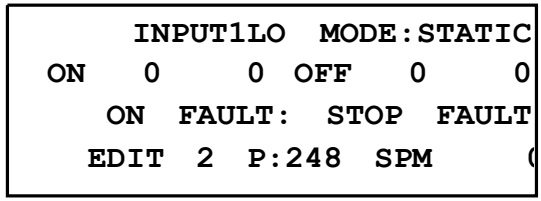


Figure 8.7 Sample Die Monitor Screen

2. When this screen first appears, the blinking cursor will be positioned on the number of the current INPUT channel on the top line. Key in a value to select one of the input channels (from 1 to 4) and press ENTER to begin entering parameters for the channel.

3. The blinking cursor will move to the LO or HI value next to the channel number. Press SELECT to toggle between LO and HI. When the correct value is displayed, press ENTER. The LO and HI values define the input active state for the channel. If you select LO, the channel must transition from a positive voltage to zero volts for the input to turn ON and back to a positive voltage to turn OFF. If you select HI, the channel must detect a positive voltage to turn ON and transition back to zero volts to turn OFF.

4. Press SELECT to choose the STATIC, S.PART (Single Part), IN POS (In position), or the CYCLIC mode for the input channel. Note that the *Die Monitor Input Requirements* chapter describes each mode, starting on page 7. Remember that the first input channel is normally reserved for counting parts. After you select an appropriate mode for the current channel, press ENTER to move the cursor to the ON setpoint value.

5. Unless you selected the Static input mode, enter an angular position for the ON setpoint and press ENTER to move the cursor to the OFF setpoint value.

6. Enter an angular position for the OFF setpoint and press ENTER to move the cursor to the type of FAULT output.

7. Press SELECT to choose between the STOP FAULT (also called the brake fault or the Die Fault) output and the TOPSTOP output, then press ENTER to complete the programming entries required for the input channel.

8. Repeat Steps 2 through 7 to program each DM input channel. Up to four input channels may be programmed.

SOFTWARE ERROR MESSAGES

This chapter describes each error message that may be output by the Genesis software on the last line of the operator display.

Error Messages

Each error message is listed in the following table, along with the type of message (i.e., if the message occurred due to a programming error, a machine problem, or a hardware problem), and the exact conditions that caused the message.

ERROR MESSAGE	TYPE	CAUSE
SCALE FACTOR ERROR	Programming	Value > 1000 or < 2
PRESET VALUE ERROR	Programming	Value >= Scale Factor
MULTIPLIER ERROR	Programming	Value > 4 or < 1
LIMIT SWITCH ON ERR	Programming	Value > Scale Factor -1
LIMIT SWITCH OFF ERR	Programming	Value > Scale Factor -1
CHANNEL # ERROR	Programming	Value > 6 or < 1
TOOL # INCORRECT	Programming	Selected tool setup # not programmed.
TOOL ALREADY IN USE	Programming	Entered an *existing* tool number during the NEW or SAVE AS function.
INCORRECT ACCESS	Programming	Attempted to edit data in the View mode or entered an incorrect password.
EDITS NOT AVAILABLE	Programming	Attempted to edit data while the resolver position was changing.[1]
INPUT POSIT ON ERR	Programming	Attempted to enter an ON setpoint greater than (Scale Factor – 1) on the Die Monitor screen.

[1] If the resolver is in motion (i.e., the stamping press machinery is running), you can only increment or decrement setpoints on the Limit Switch screen using the INC and DEC keys in the Edit mode. Note that you must be authorized to use these keys based on access data entered on Configuration Screen #4.

Table 9.1 Genesis Error Messages (Page 1)

ERROR MESSAGE	TYPE	CAUSE
INPUT POSIT OFF ERR	Programming	Attempted to enter an OFF setpoint greater than (Scale Factor – 1) on the Die Monitor screen.
INPUT # ERROR	Programming	Value < 0 or > 4
STOP FAULT	Machine	Parameters defined for a DM input channel triggered this message and a Fault Stop signal.
TOP STOP FAULT	Machine	1. Parameters defined for a DM input channel triggered this message and a Top Stop signal. 2. TOTAL DESIRED part count value specified on the Parts Counter screen was reached.
BRAKE MONITOR ERROR	Machine	BRAKE FAULT value was exceeded on the Brake Monitor screen, defining the longest acceptable stopping time for the resolver.
MOTION DETECT ERROR	Machine	MOTION DETECT value was exceeded on Configuration Screen #2, specifying the time it should take for resolver motion to start after brake input goes from ON to OFF.
TRANSDUCER FAULT	Hardware	Possible causes: 1. Faulty wiring, 2. EMF noise, or 3. A defective resolver.
EEPROM FAULT	Hardware	EEPROM failure.
DEVICE NEEDS FACTORY INITIALIZATION	Hardware	EPROM failure.
NON-VOLATILE MEMORY HAS TO BE INITIALIZED	Hardware	EEPROM failure.

Table 9.1 Genesis Error Messages (Page 2)

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