SAFETY PRECAUTIONS

This section describes the safety precautions related to the use of Cyril Bath VTL750 Stretch press Machine. It is essential that these precautions be observed by users to ensure the safe operation of machines equipped with a CNC unit (all descriptions in this section assume this configuration). Users must also observe the safety precautions related to the machine, as described in the relevant manual supplied by Microtrol Engineering. Before attempting to operate the machine or create a program to control the operation of the machine, the operator must become fully familiar with the contents of this manual and relevant manual supplied by the machine tool builder.

WARNING
Never attempt to stretch a workpiece without first checking the operation of the machine. Before starting a production run, ensure that the machine is operating correctly by performing a trial run using, for example, the single block, feedrate override, or machine lock function or by operating the machine with neither a tool nor workpiece mounted. Failure to confirm the correct operation of the machine may result in the machine behaving unexpectedly, possibly causing damage to the workpiece and/or machine itself, or injury to the user.

Before operating the machine, thoroughly check the entered data. Operating the machine with incorrectly specified data may result in the machine behaving unexpectedly, possibly causing damage to the workpiece and/or machine itself, or injury to the user.

Ensure that the specified feedrate is appropriate for the intended operation. Generally, for each machine, there is a maximum allowable feedrate. The appropriate feedrate varies with the intended operation. Refer to the manual provided with the machine to determine the maximum allowable feedrate. If a machine is run at other than the correct speed, it may behave unexpectedly, possibly causing damage to the workpiece and/or machine itself, or injury to the user.

When using a tool compensation function, thoroughly check the direction and amount of compensation. Operating the machine with incorrectly specified data may result in the machine behaving unexpectedly, possibly causing damage to the workpiece and/or machine itself, or injury to the user.

The parameters for the CNC and PAC are factory-set. Usually, there is not need to change them. When, however, there is not alternative other than to change a parameter, ensure that you fully understand the function of the parameter before making any change. Failure to set a parameter correctly may result in the machine behaving unexpectedly, possibly causing damage to the workpiece and/or machine itself, or injury to the user.

Immediately after switching on the power, do not touch any of the keys on the MDI panel until the position display or alarm screen appears on the

CNC unit.

Some of the keys on the Operator panel are dedicated to maintenance or other special operations. Pressing any of these keys may place the CNC unit in other than its normal state. Starting the machine in this state may cause it to behave unexpectedly.

The User's Manual and programming manual supplied with a CNC unit provide an overall description of the machine's functions, including any optional functions. Note that the optional functions will vary from one machine model to another. Therefore, some functions described in the manuals may not actually be available for a particular model. Check the specification of the machine if in doubt.

Some functions may have been implemented at the request of the machine-tool builder. When using such functions, refer to the manual supplied by the machine-tool builder for details of their use and any related cautions.

The liquid-crystal display is manufactured with very precise fabrication technology. Some pixels may not be turned on or may remain on. This phenomenon is a common attribute of LCDs and is not a defect.

Programs, parameters, and macro variables are stored in nonvolatile memory in the CNC unit. Usually, they are retained even if the power is turned off. Such data may be deleted inadvertently, however, or it may prove necessary to delete all data from nonvolatile memory as part of error recovery. To guard against the occurrence of the above, and assure quick restoration of deleted data, backup all vital data, and keep the backup copy in a safe place.

ME-1250 Control Description

Control Description

The ME-1250 CNC is a state of the art, multi axis stretch press control system that provides reliable stretching function with easy to use programming and operation functions. The system uses industrial style computer with PLC reliability to give the customer the best stretching solution.

The ME-1250 consists of 3 major components that allow the stretchpress to form parts per the programmable input. These systems are the main PC, PAC automation controller and the 7 remote I/O stations that are distributed throughout the machine
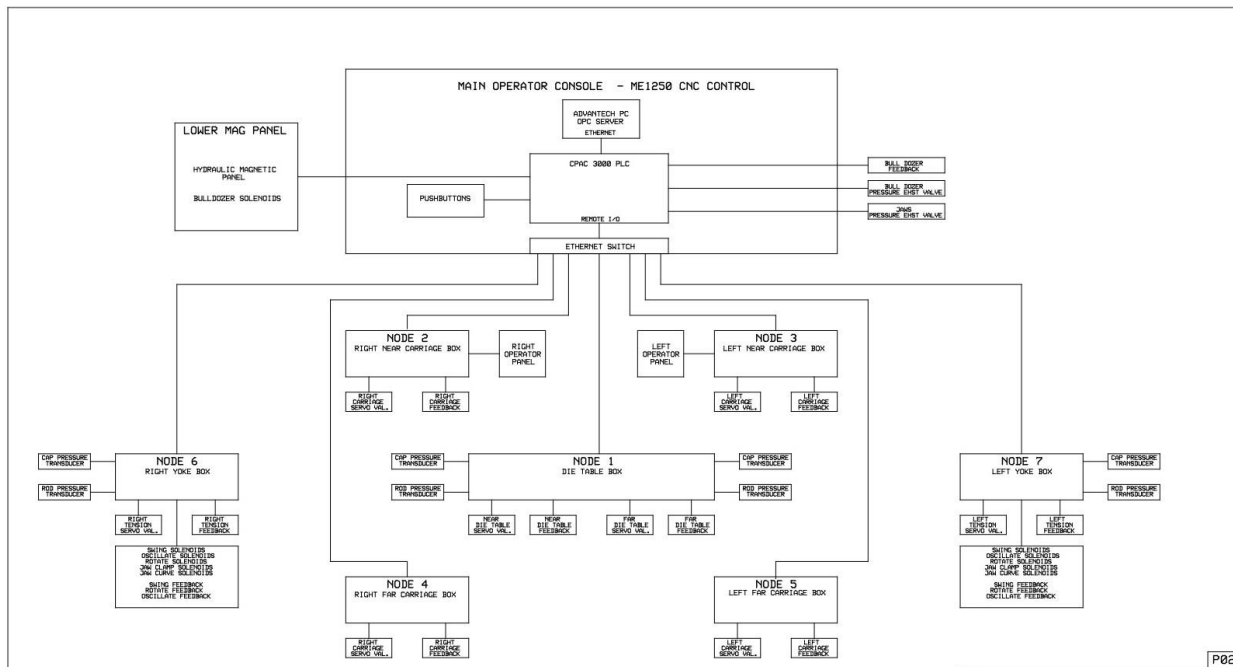
System PC:
The system PC is a windows style computer utilizing industrial computer hardware for reliability and ease of maintenance. The computer runs a custom VB HMI interface that allows the operator to program several operations and functions to perform the needed stretching operations. The PC communicates servo info and I/O though a OPC server interface to the PAC Controller through an Ethernet connection.

PAC Controller:

The PAC controller controls the basic operations and servo systems of the machine as well as handling the remote I/O communication to the 7 distributed Nodes. Communication to the PAC from the PC is handled by a OPC interface that allows axis commands, parameters and I/O functions.

Remote I/O stations:

These units control the solenoids, servos controller and analog I/O to each of the controlled axes. The communication is handled though a high speed Ethernet switch to each of the Nodes. There are 7 basic units that are:

Left Carriage Far control
Left Carriage Near control
Right Carriage Far control
Right Carriage Near control
Die Table Control
Left Yoke Head Control
Right Yoke Head Control

Operator Control Panel

The main operator control panel is made up of four different panels that allow the operator to program, operate and move the machine. These panels are:

LCD screen
This panel is located in the upper center of the operator panel and displays the HMI program and user interface.

Machine On/Control On Panel
This panel is located in the upper left of the main console and has 4 pushbuttons to turn on the control and hydraulics.

Main Operator Control Panel
The panel hold the pushbuttons that are used by the operator to manually jog, run automatic cycle, and input data to the control

Machine Keyboard
This contains a qwerty styled keyboard for operation input.

Pushbutton Descriptions

Machine On/Control On Panel

Control On Pushbutton
When pressed, this pushbutton turns on the ME-1250 Control power and boots up the PC and Pac controllers.

Control Off Pushbutton
When pressed, this button turns off the ME-1250 Control.

Machine On Pushbutton
When pressed, this button starts the main hydraulic system.

Machine Off Pushbutton
When pressed, this button turns off the main hydraulic system.

Operator Control Panel

RESET Pushbutton
This button is used to reset the control and will clear alarms and reset the program back to the start. If this button is pressed while the machine is in operation, the axes will stop motion and the control will be placed in the non cycle mode.

PAUSE Pushbutton
This Pushbutton is used to pause the axis motion during the automatic cycle on the carriages, die table and tension cylinders. When the button is pressed, the axis motion will stop. If it is pressed again, the machine will resume movement.

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CYCLE START Pushbutton
This Pushbutton is used to start the forming cycle based on the current program. If the machine is in the automatic mode and the jaws are closed, pressing this button will start and run the Snug, Pre, Form, Post and Relax cycle sequentially (If programmed).

CYCLE STOP Pushbutton
This Pushbutton is used stop the cycle after the current step has completed it motion. To stop the axes during motion, use the PAUSE pushbutton. To continue the cycle, press the cycle start again.

Feedrate Override
This control is used to adjust the programmed feedrate of the machine during operation and jogging. If set to 0, the carriages, die table and tension cylinders will stop moving.

It does not have any effect on the swing, rotate, oscillate and bulldozer axes. It is based on percentage of programmed IPM.

ALARM Lite

This Lamp indicates that the machine has encountered a machine warning or fault. To display the message, press the ALARM softkey at the bottom of the HMI. To clear an alarm, press the RESET Pushbutton.

LOAD Pushbutton

The LOAD pushbutton start the programmed loading cycle if the jaws are open and the machine is not currently in cycle. It is only enabled to work if the auto or semi auto modes have been selected.

SNUG Pushbutton

The SNUG pushbutton starts the snug section of the part program if the machine in in the semi auto mode and the jaws are clamped. This function is used to form parts with individual cycles instead of the auto form mode.

PRE Pushbutton

The PRE pushbutton starts the pre form section of the part program if the machine in in the semi auto mode and the jaws are clamped. This function is used to form parts with individual cycles instead of the auto form mode.

FORM Pushbutton

The FORM pushbutton starts the form section of the part program if the machine in in the semi auto mode and the jaws are clamped. This function is used to form parts with individual cycles instead of the auto form mode.

POST Pushbutton

The POST pushbutton starts the post form section of the part program if the machine in in the semi auto mode and the jaws are clamped. This function is used to form parts with individual cycles instead of the auto form mode.

RELAX Pushbutton

The RELAX pushbutton starts the relax section of the part program if the machine in in the semi auto mode and the jaws are clamped. This function is used to form parts with individual cycles instead of the auto form mode.

UNLOAD Pushbutton

The UNLOAD pushbutton start the programmed loading cycle if the jaws are open and the machine is not currently in cycle. It is only enabled to work if the auto or semi auto modes have been selected.

ESTOP Pushbutton

This Pushbutton is a locking pushbutton that shuts down all hydraulics and motion of the machine in case of an emergency or danger to personnel or the machine.

TENSION IN/OUT Selector Switch (Left and Right Side)
This selector switch is used to move the tension cylinder in or out. When used, the tension cylinder continues to move even after the switch is released until the TENSION stop pushbutton is pressed.

TENSION STOP Pushbutton (Left and Right Side)
This pushbutton when pressed will stop the tension cylinder from moving after the selector switch is used.

JAW CURVE/STRAIGHT Selector Switch (Left and Right Side)
This selector switch is used to move the jaw curve up or down. When used, the tension cylinder continues to move even after the switch is released until the TENSION stop pushbutton is pressed.

JAW OPEN/CLOSE Selector Switch (Left and Right Side)
This selector switch is used to open and close the jaws on the machine. This switch will not operate if the machine is in automatic cycle and running a program

SWING UP/DOWN Selector Switch (Left and Right Side)
This selector switch is used to jog the swing motion up or down manually. The motion will be continued until the switch is released or the axis limit of the axis.

ROTATE CW/CCW Selector Switch (Left and Right Side)
This selector switch is used to jog the rotate motion clockwise or counterclockwise manually. The motion will be continued until the switch is released or the axis limit of the axis.

OSCILLATE CW/CCW Selector Switch (Left and Right Side)
This selector switch is used to jog the oscillate motion clockwise or counterclockwise manually. The motion will be continued until the switch is released or the axis limit of the axis.

JAW PRESSURE POTENTIOMETER
This control is used to adjust the jaw clamping pressure when closed. This pot is a 10 turn pot and the current value that is set is displayed on the HMI screen in PSI.

JAW Hi/Lo PRESSURE Selector Switch
This selector switch is used to set the jaw range from low settings to high. This feature may or may not be implemented on the machine based on the type of pressure control system used.

YOKE TRACKING 3 Position Selector Switch
This selector switch is a 3 position switch to select the 3 types of yoke conditions. Yoke Float will cause the machine to run the swing in a counter balanced motion that when a force is applied to the yoke, it will move until the motion from the die table is stopped. The machine is generally always in the float mode of operation. The Lock setting is only used with the strongbacks attached. This mode will resist any force pushed against it and is normally used for bull nosing operations. The tracking motion uses the tracking valve and linkages to cause the swing motion to tangency track the die table motion of the machine.

CARRIAGE JOYSTICK Switch (Left and Right Side)
This joystick switch is used to manually jog the carriage in or out, cw or ccw motion. The motion will continue until the switch is released of the axis reaches an axis limit.

DIE TABLE JOYSTICK Switch
This joystick switch is used to manually jog the die table up or down, cw or ccw motion. The motion will continue until the switch is released of the axis reaches an axis limit.

BULLDOZER JOYSTICK Switch
This joystick switch is used to manually jog the bulldozer in or out, up or down motion. The motion will continue until the switch is released of the axis reaches an axis limit. The in/out motion will not be allowed unless the bulldozer is in the UP position. The down motion will not be allowed unless the bulldozer is in the IN position or the position moved to exceeds the limit set in the HMI program. The bulldozer up operation is always allowed until the UP limits have been activated.

BULLDOZER PRESSURE POTENTIOMETER
This control is used to adjust the bulldozer clamping pressure when the bulldozer is clamped. This pot is a 10 turn pot and the current value that is set is displayed on the HMI screen in PSI.

BULLDOZER PRESSURE Pushbutton
This Pushbutton commands the bulldozer to clamp down on to the die and will stay clamped until the stop pushbutton or up joystick activation.

BULLDOZER STOP Pushbutton
This Pushbutton stops the pressure clamp mode and also stops the motion downward during program operation.

Left/Right Remote Operator Panels

ESTOP Pushbutton
This Pushbutton is a locking pushbutton that shuts down all hydraulics and motion of the machine in case of an emergency or danger to personnel or the machine.

TENSION IN/OUT Selector Switch (Left and Right Side)
This selector switch is used to move the tension cylinder in or out. When used, the tension cylinder continues to move even after the switch is released until the TENSION stop pushbutton is pressed.

JAW CURVE/STRAIGHT Selector Switch (Left and Right Side)
This selector switch is used to move the jaw curve up or down. When used, the tension cylinder continues to move even after the switch is released until the TENSION stop pushbutton is pressed.

JAW OPEN/CLOSE Selector Switch (Left and Right Side)
This selector switch is used to open and close the jaws on the machine. This switch will not operate if the machine is in automatic cycle and running a program

SWING UP/DOWN Selector Switch (Left and Right Side)
This selector switch is used to jog the swing motion up or down manually. The motion will be continued until the switch is released or the axis limit of the axis.

ROTATE CW/CCW Selector Switch (Left and Right Side)
This selector switch is used to jog the rotate motion clockwise or counterclockwise manually. The motion will be continued until the switch is released or the axis limit of the axis.

OSCILLATE CW/CCW Selector Switch (Left and Right Side)
This selector switch is used to jog the oscillate motion clockwise or counterclockwise manually. The motion will be continued until the switch is released or the axis limit of the axis.

CARRIAGE IN/OUT Selector Switch (Left and Right Side)
This selector switch is used to move the carriage in or out. The motion will be continued until the switch is released or the axis limit of the axis.

CARRIAGE CW/CCW Selector Switch (Left and Right Side)
This selector switch is used to move the carriage clockwise or counter clockwise motion. The motion will be continued until the switch is released or the axis limit of the axis.

HMI Screens

Screen Descriptions

The ME-1250 CNC control uses several screens to display a variety of information to the operator during the machine operation.

The basic screens are:

- Main Operator Screen
- Program Edit Screen
- Alarm Screen
- Diagnostics Screens
- Machine Parameter Screens
- Machine Calibration Screen

At the bottom of all the screens is a softkey menu that allows the operator to display different screen. These softkeys change depended on the screen is set to allow different function specific to that screen.

Auto Mode Select	Semi Mode Select	Manual Mode Select		Programming Cycle Wizard	Edit		Alarms	Diagnostics	Parameters	Calibration

All program navigation is performed by these easy to use pushbuttons but there is also a menu bar system at the top of the screen to select different screen operations

ME1250 Stretchpress CNC Control   PROGRAM: ipmcheck

Mode   Main   Edit   Diagnostics   Parameters   Calibration   Exit

Main Operator Screen

When the machine first starts up, the main screen is displayed and is used when the machine is running the part programs. There are several different controls and indicators shown on the screen to let the operator know where they are in the operation.

Program Information Section
This section shows the current part program information of the loaded NC program. There are 6 fields that display the Part Number, Tool Number, Part Width, Length, Material and desired elongation. The information displayed here is updated when a Part program is loaded into the control.

PART NUMBER	
TOOL NUMBER	
PART WIDTH	
PART LENGTH	
MATERIAL	
ELONGATION	

Machine Indicators Section
This section shows different lighted indicators that show the status of the machine including which mode is selected and feedrates.

AUTO MODE	SEMI AUTO	MANUAL MODE	ALARM ACTIVE
IN CYCLE	CYCLE PAUSED	SINGLE BLOCK	ESTOP ACTIVE
INCREMENT POSITIONING	ABSOLUTE POSITIONING	PROGRAM STOP	MACHIN INPOS
HYDRAULICS ON	BULL DOZER UP	BULL DOZER IN	DWELL

HYD TEMP	ACT IPM	PROG IPM	DWELL
0.0	2.50	5.00	0.0

AUTO MODE
When lit, the machine is in the automatic mode

SEMI AUTO
When lit, the machine is in the Semi-automatic mode of operation.

MANUAL MODE
When lit, the machine is in the manual jogging mode

ALARM ACTIVE
When lit, the machine has encountered an alarm.

IN CYCLE
When lit, the control is currently running a NC program.

CYCLE PAUSED
When lit, the pause PB has been pressed and the machine is currently is pause mode.

SINGLE BLOCK
When lit, the machine is in single block mode and the operator must repeatedly press the cycle start for each program block.

ESTOP ACTIVE
When lit, the tells the operator that either a hard limit or estop pushbutton is active.

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INCREMMENTAL POSITIONING
When lit, the control is in incremental mode for all commands to the die table, carriages, and tension cylinders.

ABSOLUTE POSITIONING
When lit, the control is absolute mode for all commands to the die table, carriages, and tension cylinders.

MACHINE INPOS
When lit, all of the axes on the machine are in the commanded position.

HYDRAULICS ON
When lit, the main hydraulic system is up and running with no faults.

BULLDOZER UP
This indicates that the bulldozer is in the UP position.

BULLDOZER IN
This indicates that the bulldozer is in the IN position.

DWELL
When lit, the machine is currently waiting a programmed amount to continue.

HYD TEMP
This field displays the current temperature of the hydraulic oil.

ACT. IPM
This field displays the actual IPM programmed feedrate based on the command and the override.

PROG. IPM
This field displays the programmed feedrate for the current move.

DWELL
This field shows the remaining time of the dwell before returning to cycle.

Machine Command and Position Section

This section of the screen displays the current commands and positions of the machine axes. The command fields are in green and the positional fields are in yellow.

MACHINE POSITION

	LEFT		RIGHT	
	COMMAND	POSITION	POSITION	COMMAND
CARRIAGE AXIS	27.50	27.63	27.63	27.50
CARRIAGE ANGLE	0.0	0.00	0.00	0.0
TENSION POSITION	6.00	6.00	6.00	6.00
TENSION PRESSURE	0.0	0.0	0.0	0.0
SWING POSITION	0.0	0.0	0.0	0.0
ROTATION POSITION	0.0	0.0	0.0	0.0
OSCILLATE POSITION	0.0	0.0	0.0	0.0

CALCULATED IPM RATE

LEFT TEN	LEFT CAR	D TABLE	RIGHT CAR	RIGHT TEN
5.00	0.63	5.00	0.63	5.00

RIGHT HEAD STATUS

JAW CLOSED	SWING TRACK ACTIVE	RIGHT SHEET JAW ON
TENSION FULL RETRACT	STRONG BACK ON	HEAD IN POSITION

LEFT HEAD STATUS

JAW CLOSED	SWING TRACK ACTIVE	LEFT SHEET JAW ON
TENSION FULL RETRACT	STRONG BACK ON	HEAD IN POSITION

DIE TABLE

DIE TABLE POSITION	36.92	38.00
DIE TABLE ANGLE	0.00	0.0
DIE TABLE FORCE	0.1	30.0

BULLDOZER

VERTICLE POSITION	0.0	55.4
PRESSURE FORCE	0	

Machine Cycle Section

This section of shows the current cycle type running and which step of that cycle is being processed. The seven cycle indicators below the sequence counters show which cycle steps are currently used in the loaded NC program. In the case below, the form and unload cycles have no current steps thus will not be run by the main program. The other part is the display of the current jaw pressure commanded by the operator control on the main panel. The pressure is displayed in PSI to the jaws.

SEQUENCE			JAW PRESSURE	SETTING
CYCLE	STEP			0
PRE	1			
LOAD	SNUG	PRE	FORM POST	RELAX UNLOAD

Machine Head Status Indicators Section

This section of shows the current status of the left and right yokes of the machine. This section is useful for the operator to see what the current jaw status of the hear.

```
┌─────────────────────────────────────┐
│          RIGHT HEAD STATUS          │
│  ┌─────────┐ ┌─────────┐ ┌─────────┐│
│  │  JAW    │ │ SWING   │ │ RIGHT   ││
│  │ CLOSED  │ │ TRACK   │ │SHEET JAW││
│  │         │ │ ACTIVE  │ │   ON    ││
│  └─────────┘ └─────────┘ └─────────┘│
│  ┌─────────┐ ┌─────────┐ ┌─────────┐│
│  │ TENSION │ │         │ │         ││
│  │  FULL   │ │ STRONG  │ │ HEAD IN ││
│  │ RETRACT │ │ BACK ON │ │POSITION ││
│  └─────────┘ └─────────┘ └─────────┘│
└─────────────────────────────────────┘
┌─────────────────────────────────────┐
│          LEFT HEAD STATUS           │
│  ┌─────────┐ ┌─────────┐ ┌─────────┐│
│  │  JAW    │ │ SWING   │ │  LEFT   ││
│  │ CLOSED  │ │ TRACK   │ │SHEET JAW││
│  │         │ │ ACTIVE  │ │   ON    ││
│  └─────────┘ └─────────┘ └─────────┘│
│  ┌─────────┐ ┌─────────┐ ┌─────────┐│
│  │ TENSION │ │         │ │         ││
│  │  FULL   │ │ STRONG  │ │ HEAD IN ││
│  │ RETRACT │ │ BACK ON │ │POSITION ││
│  └─────────┘ └─────────┘ └─────────┘│
└─────────────────────────────────────┘
```
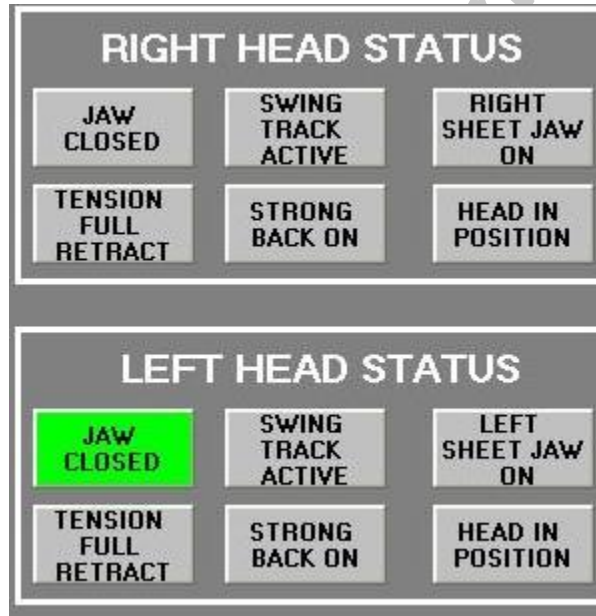
JAW CLOSED

This shows the current jaw clamping state of the head.

SWING TRACK ACTIVE

This shows the swing axis tracking status and displays which type of swing motion is currently being used (FLOAT, TANGENCY, LOCK).

RIGHT SHEET JAW ON

This indicator is lit when the sheet jaws of the machine have been installed.

TENSION FULL RETRACT

This shows that the tension cylinder is in the full retract position.

STRONGBACK ON

This indicator is lit when the machine strong back is installed on the head. If the strong back is installed, the tension, rotate, oscillate and the jaw curves will not move when jogged.

HEAD IN POSITION

This indicator is lit when all of the axes on the yoke head are in position and ready for the next motion command.

Main Menu for Auto Screen Section

This section of holds the softkeys for navigating to different HMI screens as well as setting the current machine operating mode. The three most left softkeys are used to select the operator modes and the seven to the left switch the display to different screens.

Auto Mode Select	Semi Mode Select	Manual Mode Select		Programming Cycle Wizard	Edit		Alarms	Diagnostics	Parameters	Calibration

Auto Mode Select
When this softkey is pressed, the machine will go in to the automatic operating mode. If the machine is currently in cycle, this button will not function.

Semi Mode Select
When this softkey is pressed, the machine will go in to the semi-automatic operating mode. If the machine is currently in cycle, this button will not function.

Manual Mode Select
When this softkey is pressed, the machine will go in to the manual operating mode. If the machine is currently in cycle, this button will not function.

Edit
When this softkey is pressed, the HMI screen will switch to the edit mode screen for program loading, saving and editing.

Diagnostics
When this softkey is pressed, the HMI will switch to the diagnostic screen and the softkey bar will display new options for the diagnostics.

Parameters
When this softkey is pressed, the HMI will switch to the parameter screen and the softkey bar will display new options for the parameters.

Calibration
When this softkey is pressed, the HMI will switch to the calibration screen and the softkey bar will display new options for the calibration system.

Edit Screen

The main edit screen is used to program the motion needed to form a part on the machine. Each cycle step has 15 programmable steps that are also teachable.

Edit Softkey Menu Bar Section

The softkey menu bar at the bottom of the edit screen allows the operator to navigate to the different programming cycle step section. There are 7 cycles that are LOAD, SNUG, PRE, FORM, POST, RELAX and UNLOAD. Each cycle has 15 possible steps for sequential motions. The main screen softkey will return the HMI back to the Main operator screen.

LOAD CYCLE	SNUG CYCLE	PRE FORM CYCLE	FORM CYCLE	POST CYCLE	RELAX CYCLE	UNLOAD CYCLE		Main Screen

Edit Cycle Step Section

The cycle step section is a 15 step field editable programming section that the operator can ender data into for each of the cycle types. The steps allow programming of all of the NC axes on the machine as well as adding dwells, IPM rates and force rates.

STEP	LEFT CARRIAGE POSITION	LEFT CARRIAGE ANGLE	TENSION POSITION	TENSION ANGLE	SWING ANGLE	ROTATE ANGLE	OSCILL ANGLE	DIE TABLE POSITION	DIE TABLE ANGLE	RIGHT CARRIAGE POSITION	RIGHT CARRIAGE ANGLE	TENSION POSITION	TENSION ANGLE	SWING ANGLE	ROTATE ANGLE	OSCILL ANGLE	IPM Rate	DWELL	Force
1	28.00							34.00		28.00							20.0	1.0	
2			5.00									5.00							

STEP

This field holds the step sequence number. It can be entered manually of added automatically during the teach mode.

LEFT CARRIAGE POSITION

This filed holds the commanded position. In the LOAD and UNLOAD cycle, this command is in absolute coordinates. For the forming operation, this command is in incremental coordinate system.

LEFT CARRIAGE ANGLE

This field holds the commanded angular position. This command is always in the absolute coordinate system

LEFT TENSION

This filed holds the commanded position. In the LOAD and UNLOAD cycle, this command is in absolute coordinates. For the forming operation, this command is in incremental coordinate system.

LEFT SWING

This field holds the commanded angular position. This command is always in the absolute coordinate system

LEFT ROTATE

This field holds the commanded angular position. This command is always in the absolute coordinate system

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LEFT OSCILLATE
This field holds the commanded angular position. This command is always in the absolute coordinate system

DIE TABLE POSITION
This filed holds the commanded position. In the LOAD and UNLOAD cycle, this command is in absolute coordinates. For the forming operation, this command is in incremental coordinate system.

DIE TABLE ANGLE
This field holds the commanded angular position. This command is always in the absolute coordinate system

RIGHT CARRIAGE POSITION
This filed holds the commanded position. In the LOAD and UNLOAD cycle, this command is in absolute coordinates. For the forming operation, this command is in incremental coordinate system.

RIGHT CARRIAGE ANGLE
This field holds the commanded angular position. This command is always in the absolute coordinate system

RIGHT TENSION
This filed holds the commanded position. In the LOAD and UNLOAD cycle, this command is in absolute coordinates. For the forming operation, this command is in incremental coordinate system.

RIGHT SWING
This field holds the commanded angular position. This command is always in the absolute coordinate system

RIGHT ROTATE
This field holds the commanded angular position. This command is always in the absolute coordinate system

RIGHT OSCILLATE
This field holds the commanded angular position. This command is always in the absolute coordinate system

IPM RATE
This field holds the commanded feedrate to be used for this step. For the LOAD and UNLOAD cycle steps, this defaults to the maximum rapid IPM rate of the axis set by the axis parameters. For the form cycles, this rate can be set from .01 to 20 IPM

DWELL
This field holds the desired dwell time after the step competes and is programmed in seconds.

FORCE
This field holds the desired force command limit to be used when either the tension or die tables are used.

Edit Current Position Section

The current position section displays the current positions of all of the axes. These positions are used to allow the operator to see where they are at for programming. These fields can also be set to the program steps during the teaching operation.

CURRENT POSITIONS		
	LEFT	RIGHT
CAR POS	27.50	27.50
CAR ANG	0.00	0.00
TEN POS	6.00	6.00
SWING	0.0	0.0
OSCIL	0.0	0.0
ROTATE	0.0	0.0
DIE TABL	38.00	0.00
BULL	0.0	

Edit Step Programming Section
The step programming section contains several program editing pushbutton to assist with programming the machine.

RECORD STEP
When the edit teach mode is enabled, pressing this button will cause the control to use the current axis positions and add them to the next available program step. If a position has not changed since the last teach move, no motion will be recorded. This button is hidden when the teach mode in not active.

TEACH MODE
Pressing this button will cause the control to enable the teach mode for the current cycle type. This button will lite and the record step button will become visible. When the button is pressed again, the control will save the current steps to the internal memory. You cannot change to another cycle screen when the teach mode is active.

CLEAR PROGRAM
Pressing this button will display a warning message to confirm if you want to clear all of the internal program step memory. Pressing OK will cause the control to clear out any step programming.

SAVE EDITS
When the operator finished teaching or editing steps on the current cycle screen, pressing this button will tell the control to store the edits to the internal cycle memory.

DELETE STEP
This button allows the operator to delete a step from the screen and will move any steps that are after it upward. The step field will be adjusted as well.

INSERT STEP
This button allows the operator to insert a blank step between and steps. The step count field will be adjusted.

Edit Defaults Section
The defaults section allows the operator to set certain defaults to be used during the teach operation such as dwells and feedrates. These can be changed anytime during the programming operation. The force and dwell defaults have check boxes next to them to disable them if they are not needed for the steps. The IPM is always active.

DEFAULTS

IPM RATE
7.0

FORCE TONS
500

DWELL
1.0

IPM RATE
Sets the inches per minute default rate.

FORCE TONS
This sets the force value.

DWELL
This sets the dwell time default in seconds.

Edit Program Load/Save Section

The program load and save section allows the operator to load a program from the disk, save a program to the disk or create a new program.

LOAD PROG

When this button is pressed, the control will display a file dialog box and ask for the operator to select a program to run.

NEW PROG

When this button is pressed, the control will display a confirmation box and if the operator clicks YES, the control will clear the current program and then display a input window asking for the operator to set the part, tool material and other info for the program.

SAVE PROG

When this button is pressed, the control will display a file dialog box asking the operator to enter a filename to save on the disk.

Edit Program Information Section
The program information section displays the current info on the program that is loaded.
It is similar to the main operator screen information.

Diagnositics Screens

The diagnostics screen allows maintenance personell to monitor of all I/O on the machine. When the diagositc screen is displayed, the softkey menu at the bottom of the screen changes to allow viewing of each remote node as well as the main console. Clicking on any status box will cause a description of the field to be displayed in the I/O Descriptions field. (In the screen below, its showing the status of the SS23 selector switch Tension In).

Diagnostics Menu Bar
The diagnostics menu bar allows the operator to display the I/O for each remote station.

Sample I/O Screen

Parameter Screens

The parameters screen allows authorized personell to make changes to the way the control operates and positions. When the parameters screens are selected, the softkey menu bar changes to new fields to navigate the parameters of the machine.

Parameter Menu Bar
The Parameter menu bar allows the operator to display the parameters for the axis and control systems.

| General Parameters | Die Table Parameters | Left Carriage Parameters | Right Carriage Parameters | Left Yoke Parameters | Right Yoke Parameters | | Main Screen |

Left Yoke Parameters

Calibration Screen

The calibration screen is used by the maintenance personell to calibrate the axis resolutions for all of the programmable axes. The description and usage for this screen is discussed in the maintenance section of this manual.

ALARM Screen

The alarm screen displays any current alarms that the control has encountered. The 24 line fields show the date, time and message of the alarm. Red high lighted alarms are critical errors and the yellow are warnings. To clear the alarms from the field, the operator would press the RESET pushbutton on the control panel. Pressing the ALARM HISTORY softkey on the lower left will cause the control to display the last 200 messages that are stored on the disk.

Turning On the Machine

Turning On Control System
To turn on the ME-1250 CNC control, press the CONTROL ON pushbutton. The CONTROL ON light will illuminate and the control system will start the boot up sequence to establish communications with all of the remote systems. After a minute or so, the main operator control HMI screen will appear and the machine hydraulics are ready to start.

Turning On Hydraulics System
After the ME-1250 control has successfully booted up, the operator can now start the machine hydraulics. Press the RESET pushbutton to clear the control and then press the MACHINE ON pushbutton to start the hydraulics system up. Once the hydraulics start up and are up to pressure, the HYDRAULICS ON indicator button on the HMI will light.

If the machine will not start, check to make sure that the machine in not in the ESTOP mode or that an alarm is active. Check the main screen ESTOP status button for illumination. If it is, check all of the Estop pushbuttons, gimbal switches or die table mercury switches
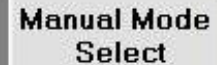The machine is now ready for operation.

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Manual Operations

Selecting the Manual Mode
To Jog any of the axes on the machine, first place the machine into the Manual mode of operation by pressing the Manual Mode softkey located at the bottom left of the main operation screen. When the key illuminates to green, the manual mode is selected and the operator can now use the selector switches and joysticks to move the machine.

Jogging Carriages
To Jog the machine carriages, use the carriage joystick controls located on the main operator panel. Moving the joystick to the IN position will cause the selected carriage to move toward the die table. Selecting the OUT position will move the carriages away from the die table. To rotate the carriage, move the joy stick to the CW position to move the carriage in a clockwise motion and use the CCW position to move it counter clockwise. When moving the carriages in an angular motion. The centerline of the position will remain the same but the angular position will change. The operator can also use the remote operator station selector switches to move the carriages.

Jogging the Die Table
To Jog the machine die table, use the die table joystick controls located on the main operator panel. Moving the joystick to the UP position will cause the die table to move in an upward motion. Selecting the DOWN position will move the die table in a downward motion. To rotate the die table, move the joy stick to the CW position to move the die table in a clockwise motion and use the CCW position to move it counter clockwise. When moving the die table in an angular motion. The centerline of the position will remain the same but the angular position will change.

Jogging the Tension Cylinders
To Jog the machine Tension cylinders, use the tension selector switch controls located on the main operator panel. Selecting the IN position of the selector switch will cause the tension cylinder to move in toward the die table. To move out, select the OUT position. When the selector switch is released, the tension cylinder will continue moving until the Tension Stop pushbutton is pressed or the RESET pushbutton is pressed. The selector switches on the remote operator stations can also move the tension cylinders but when released, the motion will stop.

Jogging the Swing Cylinders
To Jog the machine Swing motion, use the swing selector switch controls located on the main operator panel. Selecting the UP position of the selector switch will cause the swing to move to the 0 degree or horizontal position. To move down, select the DOWN position. When the selector switch is released, the swing will stop the motion. The selector switches on the remote operator stations can also move the swing cylinders but when released, the motion will stop.

Jogging the Rotate Cylinders

To Jog the machine rotation motion, use the rotate selector switch controls located on the main operator panel. Selecting the CW position of the selector switch will cause the rotate cylinder to move in a clockwise motion. Select the CCW to move it in a counter clockwise motion. When the selector switch is released, the rotate cylinder will stop the motion. The selector switches on the remote operator stations can also move the rotate cylinders but when released, the motion will stop.

Jogging the Oscillate Cylinders

To Jog the machine oscillation motion, use the oscillate selector switch controls located on the main operator panel. Selecting the CW position of the selector switch will cause the oscillate cylinder to move in a clockwise motion. Select the CCW to move it in a counter clockwise motion. When the selector switch is released, the oscillate cylinder will stop the motion. The selector switches on the remote operator stations can also move the oscillate cylinders but when released, the motion will stop.

Semi-Automatic Operations

Semi-Automatic mode allows the operator to run individual forming cycles on the machine. The control still uses the NC programming steps to perform each cycle type. Pressing one of the seven cycle pushbuttons on the main operator panel will cause the machine to perform that step. This mode is different in that the cycle start pushbutton is not used to run all of the forming operation together in sequence. The Semi mode is useful to perform singe part runs or testing.

Semi LOAD Operation

If the machine is not currently running in cycle and the jaws are open, pressing the LOAD pushbutton will cause the control to run the load cycle steps. While the cycle is running, the LOAD lamp will flash until finished and then stay illuminated.

Semi UNLOAD Operation

If the machine is not currently running in cycle and the jaws are open, pressing the UNLOAD pushbutton will cause the control to run the unload cycle steps. While the cycle is running, the UNLOAD lamp will flash until finished and then stay illuminated.

Semi SNUG Operation

If the machine is not currently running in cycle and the jaws are closed, pressing the SNUG pushbutton will cause the control to run the Sung cycle steps. While the cycle is running, the SNUG lamp will flash until finished and then stay illuminated.

Semi PRE Operation
If the machine is not currently running in cycle and the jaws are closed, pressing the PRE pushbutton will cause the control to run the pre cycle steps. While the cycle is running, the PRE lamp will flash until finished and then stay illuminated.

Semi FORM Operation
If the machine is not currently running in cycle and the jaws are closed, pressing the FORM pushbutton will cause the control to run the form cycle steps. While the cycle is running, the FORM lamp will flash until finished and then stay illuminated.

Semi POST Operation
If the machine is not currently running in cycle and the jaws are closed, pressing the POST pushbutton will cause the control to run the post cycle steps. While the cycle is running, the POST lamp will flash until finished and then stay illuminated.

Semi RELAX Operation
If the machine is not currently running in cycle and the jaws are closed, pressing the RELAX pushbutton will cause the control to run the relax cycle steps. While the cycle is running, the RELAX lamp will flash until finished and then stay illuminated.

Automatic Operations

Automatic mode allows the operator to run a part program through all the steps for the forming cycles. The load and unload operations still work the same as the semi mode for loading and unloading parts on the machine.

Loading the machine
When a part is needed to be loaded, the operator will run the load operation of the control to run the load cycle programming steps. Pressing the LOAD pushbutton will cause the control to run the load cycle steps. While the cycle is running, the LOAD lamp will flash until finished and then stay illuminated. The load cycle will only operate when the jaws are open on the machine.

Running the Forming Cycle
After the material has been loaded by the load cycle and the jaws are closed, the automatic forming operation can be performed. Press the CYCLE START pushbutton on the main operator panel to start the forming cycle. The control will run all of the programmed cycles (5 total) in a sequential manner.

As the cycles are processed, the semi pushbutton lamps will flash during the cycle being run and will stay on when the cycle finished. The cycle start lamp will also illuminate when the machine is running the program.

IN CYCLE

Unloading the machine
When the part has been formed by the form cycle, the operator will run the unload operation of the control to run the unload cycle programming steps. First the jaws must be opened and then by pressing the UNLOAD pushbutton will cause the control to run the unload cycle steps. While the cycle is running, the UNLOAD lamp will flash until finished and then stay illuminated. The load cycle will only operate when the jaws are open on the machine

Stopping the Cycle

If the operator wishes to stop the forming process or loading steps, there are 2 ways to stop the machine with different results.

STOP PUSHBUTTON

The stop pushbutton will stop the control from processing the next step in the program. If a step is being processed while this button is pressed, it will complete the axis motions of the current step before stopping. To restart the cycle, the operator would press the CYCLE START pushbutton again.

RESET PUSHBUTTON

Pressing the RESET pushbutton will reset the control operation and stop all axis motion immediately. The program step counter will be reset back to 1 and the program will have to be re-run again from the start.

Pausing the Cycle

While the control is processing the part, the operator can pause the forming and loading cycles by pressing the PAUSE Pushbutton. When this button is pressed, the control will perform a feed hold on the servo axes of the machine. Pressing the button again will release the servos to start moving once again. The pause function will NOT stop the solenoid style axes (swing, rotate, oscillate) and they will finish their commanded position.

When the pause function is active, the PAUSE lamp will flash and the HMI will indicate the machine is in pause mode.

CYCLE
PAUSED

Single Block

If the control is placed into the single block mode, the operator must press the CYCLE START pushbutton each time to process one step at a time. This is useful when debugging a part program. To place the control into the single block one, click on the SINGLE BLOCK indicator on the HMI screen. It will highlight to green color when it is active.

SINGLE
BLOCK

Entering a MDI Command

In Some cases, it is desirable to run a single command on the machine to position several axes without having to jog them. This can be achieved by clearing out any existing program and using the LOAD cycle first step to enter the position needed to go to. To enter a MDI command, follow these steps:

1. Place the control into the semi auto mode.
2. Select the Edit screen by pressing the Edit softkey.
3. Make sure the existing program has been saved and press the Program Clear screen softkey to clear the program.
4. The control will prompt you to confirm the clear, answer yes.
5. All of the program step fields should now be empty.
6. Enter into the fields for the first step including adding 1 to the step count.
7. Press the SAVE EDITS HMI button to save the command to the control internal memory.
8. Press the LOAD Pushbutton on the main operator panel to start the movement.

Loading a Part program

To load a part program from the control hard disk, follow these steps

1. Place the control into the manual mode
2. Select the Edit screen by pressing the Edit softkey at the bottom of the HMI menu bar
3. Press the LOAD PROGRAM screen button and the control will display a file dialog window.
4. Select the NC part file you wish to load and press the OPEN button on the dialog window.
5. All of the programming fields will now be populated from the data in the NC program.

Saving a Part program

To save a part program from the control hard disk, follow these steps

1. Place the control into the manual mode
2. Select the Edit screen by pressing the Edit softkey at the bottom of the HMI menu bar.
3. Make sure to save any edits that may have changed by pushing the SAVE EDIT Button.

4. Press the SAVE PROGRAM screen button and the control will display a file dialog window.
5. Enter the name of the file to use for the NC part file you wish to save and press the Save button on the dialog window.
6. The program is now saved on the hard drive of the control.

Programming

Programming Description

The ME-1250 CNC control uses a field programming system that allows the program to have 7 forming cycles that in turn have 15 steps to perform the required motions for stretching parts. These fields are identical to each other except for certain differences that are described below.

LOAD CYCLE
The load cycle group can program all of the controlled axes and is used to place the machine into the location to clamp up the material using only positioning motion. It uses the following rules.

- All axis program positions are absolute coordinates
- The IPM Feedrates are set to the Rapid amount of the axis
- This operation cannot be started unless the jaws are open

SNUG CYCLE
The Snug cycle group can program all of the controlled axes and is used to tension the part prior to stretching the material. It uses the following rules:

- The Carriages, Die Table and Tension cylinders program position are in incremental coordinates.
- All remaining axis program positions are in absolute coordinates
- All Carriages and Die Table angular program positions are in absolute coordinates
- The IPM feedrate from the program steps are used for all servo axis motion.
- This operation cannot be started unless the jaws are closed.

PRE CYCLE
The Pre cycle group can program all of the controlled axes and is used to wrap the part prior to stretching the material. It uses the following rules:

- The Carriages, Die Table and Tension cylinders program position are in incremental coordinates.
- All remaining axis program positions are in absolute coordinates
- All Carriages and Die Table angular program positions are in absolute coordinates
- The IPM feedrate from the program steps are used for all servo axis motion.
- This operation cannot be started unless the jaws are closed.

FORM CYCLE

The Form cycle group can program all of the controlled axes and is used to stretch the part material. It uses the following rules:

- The Carriages, Die Table and Tension cylinders program position are in incremental coordinates.
- All remaining axis program positions are in absolute coordinates
- All Carriages and Die Table angular program positions are in absolute coordinates
- The IPM feedrate from the program steps are used for all servo axis motion.
- This operation cannot be started unless the jaws are closed.

POST CYCLE

The Post cycle group can program all of the controlled axes and is used to perform the final yield stretch of the material. It uses the following rules:

- The Carriages, Die Table and Tension cylinders program position are in incremental coordinates.
- All remaining axis program positions are in absolute coordinates
- All Carriages and Die Table angular program positions are in absolute coordinates
- The IPM feedrate from the program steps are used for all servo axis motion.
- This operation cannot be started unless the jaws are closed.

RELAX CYCLE

The Relax cycle group can program all of the controlled axes and is used to relax the part after stretching the material. It uses the following rules:

- The Carriages, Die Table and Tension cylinders program position are in incremental coordinates.
- All remaining axis program positions are in absolute coordinates
- All Carriages and Die Table angular program positions are in absolute coordinates
- The IPM feedrate from the program steps are used for all servo axis motion.
- This operation cannot be started unless the jaws are closed.

UNLOAD CYCLE

The Unload cycle group can program all of the controlled axes and is used to place the machine into the location to remove the material using only positioning motion. It uses the following rules.

- All axis program positions are absolute coordinates
- The IPM Feedrates are set to the Rapid amount of the axis
- This operation cannot be started unless the jaws are open

Navigating the Program Steps

As discussed above, there are 7 different program cycles but the Edit screen can only show one at a time. Using the menu bar softkeys at the bottom of the edit screen, the operator can press a cycle and the data for that cycle will be displayed. At the top of the edit screen, a banner notifies the operator which cycle they are currently working on.

LOAD CYCLE	SNUG CYCLE	PRE FORM CYCLE	FORM CYCLE	POST CYCLE	RELAX CYCLE	UNLOAD CYCLE		Main Screen

If the Teach mode is active, the navigation softkeys will not work until the teach mode is turned off. Anytime an edit is made to the fields of the program cycle, they are not stored into the control's internal memory until the SAVE EDITS screen button is pushed.

Creating a New Part Program

When the operator wants to start a new program, care must be taken to make sure that there are no commands left in the fields. To Alleviate this condition, the operator should use the New program method which clears all exiting fields from all the cycle steps. To create a new program, follow these steps:

1. Place the control into the Manual operating mode by pressing the MANUAL MODE softkey.
2. Press the EDIT menu softkey to display the edit screen.
3. Make sure that the program that is currently active is saved if you need to.
4. Press the NEW PROGRAM screen softkey.

5. An operator message box will appear asking the operator to confirm creating a new program.
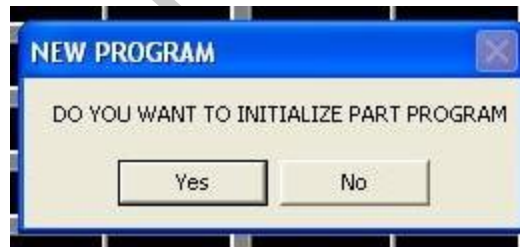
6. Click or press YES to create the new program and the message will clear.
7. A new input dialog box will appear asking for the part information. There are six fields that are:
   1. Part Number
   2. Tool Number
   3. Material Type
   4. Material Width
   5. Material Length
   6. Elongation Percentage

8. After the information has been entered, press of click the SAVE SETUP button to create the program.

The edit screen will show the new part setup info in the lower left of the screen and all of the cycle step fields will be empty.

Editing an Existing Part Program

Editing Fields
To edit and of the displayed fields, click on the field you wish to and change the displayed info through the keyboard entry.

Deleting a Step
Sometime the operator may wish to combine a couple of steps or delete a single step from the program. The operator could delete the info from one of the steps but then would have to manually move up the lower steps up. The controller has a feature to do this automatically and save the operator from adjusting several lines. To delete a step from a program:

1. Press the DELETE STEP button on the screen.
2. The control will display an input box asking the operator which step number to delete from the cycle.
3. Enter the step number you wish to delete and press the OK button
4. The step will be deleted and the lower remaining steps will be adjusted up with the step counter.

Inserting a Step
Steps can be inserted into the program if there is less than 15 total steps used in the current cycle. The controller will adjust the step lower to insert an empty step into the program. To insert a step:

1. Press the INSERT STEP button on the screen
2. The control will display an input box asking the operator which step to insert after.
3. Enter the step number you wish to insert after and press OK.
4. An empty step will be added into the program at the step entered and the remaining steps will be adjusted downward.

After the operator is satisfied with all of the edits, press the SAVE EDITS screen button to save the changes to the controller's internal memory. If the operator does not save the edit before navigating to another page, the edits will be lost. If the operator saves the program to the hard disk, the edits will be automatically saved.

NOTE: The Step fields are the only group to have rules that they must start with 1 and be sequential from there.

Teaching a New Part Program

The teach mode of the ME1250 control allows the operator to teach steps of the program by manually moving the machine to the locations for the forming and record the motion of any axis that has changed since the last teach motion. This feature allows the operator to easily program the machine with minimal data entering of the program. When the teach mode is activated for the first time and for the load cycle, all the current axis positions are recorded internally as a base location to start with. Each successive cycle uses the last info from the previous cycle last position.

For the forming cycles, a default IPM forming rate can be added automatically during teaching by entering it in the default boxes. Dwells can be added as well to the step if the check box has been set. For the load/unload cycle, the IPM defaults to the axis rapid speed set by parameters.

DEFAULTS
IPM RATE
7.0
FORCE TONS
500
DWELL
1.0

To teach a new part program, follow these steps:

1. Create a new program (see create new program section)
2. Select the cycle that you wish to teach, Load, Snug, Etc
3. Press or click on the TEACH MODE screen button to turn on the teach mode.
4. Move the axes that you want to program for the step to the desired location.
5. Press the RECORD STEP button on the screen to record the commands. Any axes not move will be empty.
6. Repeat steps 4 and 5 until all the desired steps have been programmed.
7. Click or press the TEACH MODE button to turn off the teach mode. When the teach mode exits, it automatically saves the programed steps into the CNC internal memory.
8. Repeat steps 2-7 for each cycle that needs to be programmed.
9. When all of the cycles have been programmed, press the SAVE PROGRAM button to save the program to the hard drive.

Maintenance

Software Parameters

Setting System Parameters
For a description of these parameters, refer to the appendix in this manual. To change a system parameter, follow these steps:

1. Press the MANUAL Softkey on the HMI to change to the Manual mode.

2. Push or click on the Parameters menu softkey to show the system parameters.

3. When the page changes, select which of the parameter pages you wish to navigate to by pressing or clicking the softkey menu bar at the bottom of the HMI.

| General Parameters | Die Table Parameters | Left Carriage Parameters | Right Carriage Parameters | Left Yoke Parameters | Right Yoke Parameters | | Main Screen |

4. Click on the parameter text box you wish to change and enter the new value you wish to use.

5. After all the changes have been done for the page, press the SAVE PARAMETERS softkey on the HMI to save the parameters to the hard disk and to the control parameter memory.

```
LOAD GENERAL          SAVE GENERAL
  PARAMETERS            PARAMETERS
```

Warning: Incorrect settings of the system parameters can cause damage to the machine and injury to the operator. Caution should be used when changing these parameters.

Loading System Parameters

To load the parameters for a selected section, press the LOAD PARAMETERS softkey and the last saved parameters from the hard disk will be loaded. To save them the control, you must use the SAVE PARAMETERS softkey button to save them to the controller.

AXIS Calibration

Axis Calibration Screen Description
The axis calibration screen allows the maintenance personnel to calibrate the axis ranges used in the machine.

START CALIBRATION Pushbuttons
The screen contains several red pushbuttons on the left side of the screen that start the calibration process. Each one represents one of the major axis systems to calibrate. The dual position axes have just one button as the when one of these units are calibrated, both have to be done at the same time.

AXIS SELECT
The buttons in the center of the screen are used to select which axis the set min and set max button will record the position value to. When they are pushed, any other select button will be unselected.

SET MINIMUM VALUE
This button will record the current analog position of the selected axis when pressed into the minimum range in parameter.

SET MAXIMUM VALUE
This button will record the current analog position of the selected axis when pressed into the maximum range in parameter.

LOAD CURRENT PARAMETERS Pushbutton
When this button is pressed, the current active parameter values for the ranges will be loaded into the fields. This will overwrite any existing edits to the fields.

SAVE AXIS PARAMETERS Pushbutton
When this button is pressed, all of the updates to the field ranges will be written to the PLC. Caution should be used when this is performed as the servo axis may move an amount.

There are 4 basic parameters used to set the range and they are:

FEEDBACK IN MINIMUM
This is the analog raw position from the machine position sensors in analog counts and represents the minimum position range of the cylinder axis. The count ranges from 0 to 32767 counts.

FEEDBACK IN MAXIMUM
This is the analog raw position from the machine position sensors in analog counts and represents the maximum position range of the cylinder axis. The count ranges from 0 to 32767 counts.

FEEDBACK OUT MINIMUM
This is the position from the machine position sensors in floating point and represents the minimum position range of the cylinder axis. The count ranges from 0 to 100.00 counts.

FEEDBACK OUT MAXIMUM
This is the position from the machine position sensors in floating point and represents the maximum position range of the cylinder axis. The count ranges from 0 to 100.00 counts.

Calibrating Die Table Axes

When calibration is performed on the dual axis Die Table system, both near and far cylinders need to be calibrated at the same time as the axes are tied together and when moving to the extreme limits, both axes need to be done or a tilt angle error over travel may occur. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Die Table calibration, follow these steps:

1. Place the machine into the Manual mode
2. Move the die table to the mid center of its travel (approximately 40 inches).
3. Select the calibration screen by clicking on the Calibration softkey on the HMI.
4. Click on the Start Die Table Calibration button to start the calibration sequence.
5. The HMI will ask if you want to continue, press OK.
6. The control will set both the far and near calibration to the extreme analog in values (0 and 32767). The machine will move a small amount due to the values changing.
7. Press the RESET pushbutton to clear the registers.
8. Using the die table jog joystick, move the die table down until both cylinders bottom out to the minimum position.
9. Press the SELECT button for the Die Table Far and click on the set minimum Analog in button to set the minimum value.
10. Press the SELECT button for the Die Table Near and click on the Set Minimum Analog in button to set the minimum value.
11. Move the Die Table to the move upward position until both cylinders stop moving or bottom out.
12. Press the SELECT button for the Die Table Far and click on the set maximum Analog in button to set the maximum value.
13. Press the SELECT button for the Die Table Near and click on the Set Maximum Analog in button to set the maximum value.
14. Jog the Die Table to the middle of the travel.
15. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC. The Die Table may move a small amount and pressing the RESET pushbutton will stop any motion.
16. Die Table axis is now calibrated.

Calibrating Carriage Axes (Left or Right)

When calibration is performed on the dual axis Carriage system, both near and far cylinders need to be calibrated at the same time as the axes are tied together and when moving to the extreme limits, both axes need to be done or a gimble angle error over travel may occur. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Carriage calibration, follow these steps:

1. Place the machine into the Manual mode
2. Move the Carriage to the mid center of its travel (approximately 40 inches).
3. Select the calibration screen by clicking on the Calibration softkey on the HMI.
4. Click on the Start Carriage Calibration button to start the calibration sequence.
5. The HMI will ask if you want to continue, press OK.
6. The control will set both the far and near calibration to the extreme analog in values (0 and 32767). The machine will move a small amount due to the values changing.
7. Press the RESET pushbutton to clear the registers.
8. Using the Carriage jog joystick, move the Carriage out until both cylinders bottom out to the minimum position.
9. Press the SELECT button for the Carriage Far and click on the set minimum Analog in button to set the minimum value.
10. Press the SELECT button for the Carriage Near and click on the Set Minimum Analog in button to set the minimum value.
11. Move the Carriage to the move retracted position until both cylinders stop moving or bottom out.
12. Press the SELECT button for the Carriage Far and click on the set maximum Analog in button to set the maximum value.
13. Press the SELECT button for the Carriage Near and click on the Set Maximum Analog in button to set the maximum value.
14. Jog the Carriage to the middle of the travel.
15. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC. The Carriage may move a small amount and pressing the RESET pushbutton will stop any motion.
16. Carriage axis is now calibrated.

Calibrating Tension Axis (Left or Right)

This section describes the procedure for calibrating the Tension cylinder system. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Tension calibration, follow these steps:

1. Place the machine into the Manual mode
2. Move the Tension Cylinder to the mid center of its travel (approximately 6 inches).
3. Select the calibration screen by clicking on the Calibration softkey on the HMI.
4. Click on the Tension Cylinder Calibration button to start the calibration sequence.
5. The HMI will ask if you want to continue, press OK.
6. The control will set calibration to the extreme analog in values (0 and 32767). The machine will move a small amount due to the values changing.
7. Press the RESET pushbutton to clear the registers.
8. Using the Tension Cylinder selector switch, move the tension cylinder in toward the die table until the cylinder bottoms out to the minimum position.
9. Press the SELECT button for the Tension Cylinder and click on the set minimum Analog in button to set the minimum value.
10. Move the Tension Cylinder to the out position away from the die table until cylinder stop moving or bottoms out.
11. Move the Tension Cylinder back in a small amount (1mm) so that the tension section is slightly away from the stop block.
12. Press the SELECT button for the Tension Cylinder and click on the set maximum Analog in button to set the maximum value.
13. Jog the Tension Cylinder to the middle of the travel.
14. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC. The Tension Cylinder may move a small amount and pressing the RESET pushbutton will stop any motion.
15. Tension Cylinder axis is now calibrated.

Calibrating Swing Axis (Left or Right)

This section describes the procedure for calibrating the Swing system. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Tension calibration, follow these steps:

1. Place the machine into the Manual mode
2. Select the calibration screen by clicking on the Calibration softkey on the HMI.
3. Click on the Swing Calibration button to start the calibration sequence.
4. The HMI will ask if you want to continue, press OK.
5. The control will set calibration to the extreme analog in values (0 and 32767).
6. Using the Swing Cylinder selector switch, move the Swing cylinder upward until the cylinder bottoms out to the minimum position.
7. Press the SELECT button for the Swing Cylinder and click on the set minimum Analog in button to set the minimum value.
8. Move the Swing to the downward to the 90-degree positon.
9. Press the SELECT button for the Swing Cylinder and click on the set maximum Analog in button to set the maximum value.
10. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC.
11. Swing Cylinder axis is now calibrated.

Calibrating Rotate Axis (Left or Right)

This section describes the procedure for calibrating the Rotate system. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Tension calibration, follow these steps:

1. Place the machine into the Manual mode
2. Select the calibration screen by clicking on the Calibration softkey on the HMI.
3. Click on the Rotate Calibration button to start the calibration sequence.
4. The HMI will ask if you want to continue, press OK.
5. The control will set calibration to the extreme analog in values (0 and 32767).
6. Using the Rotate Cylinder selector switch, move the Rotate cylinder to the minimum position or cylinder bottoms out to the minimum position.
7. Press the SELECT button for the Rotate Cylinder and click on the set minimum Analog in button to set the minimum value.
8. Move the Rotate to the maximum angle positon.
9. Press the SELECT button for the Rotate Cylinder and click on the set maximum Analog in button to set the maximum value.
10. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC.
11. Rotate Cylinder axis is now calibrated.

Calibrating Oscillate Axis (Left or Right)

This section describes the procedure for calibrating the Oscillate system. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Tension calibration, follow these steps:

1. Place the machine into the Manual mode
2. Select the calibration screen by clicking on the Calibration softkey on the HMI.
3. Click on the Oscillate Calibration button to start the calibration sequence.
4. The HMI will ask if you want to continue, press OK.
5. The control will set calibration to the extreme analog in values (0 and 32767).
6. Using the Oscillate Cylinder selector switch, move the Oscillate cylinder to the minimum position or cylinder bottoms out to the minimum position.
7. Press the SELECT button for the Oscillate Cylinder and click on the set minimum Analog in button to set the minimum value.
8. Move the Oscillate to the maximum angle positon.
9. Press the SELECT button for the Oscillate Cylinder and click on the set maximum Analog in button to set the maximum value.
10. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC.
11. Oscillate Cylinder axis is now calibrated.

Calibrating Bulldozer Axis

This section describes the procedure for calibrating the Bulldozer system. When the calibration mode is active, the control will disable the following error alarm section on the control. Care must be taken to make sure that there are no obstructions to the axis being moved. To start the Tension calibration, follow these steps:

1. Place the machine into the Manual mode
2. Select the calibration screen by clicking on the Calibration softkey on the HMI.
3. Click on the Bulldozer Calibration button to start the calibration sequence.
4. The HMI will ask if you want to continue, press OK.
5. The control will set calibration to the extreme analog in values (0 and 32767).
6. Using the Bulldozer joystick switch, move the Bulldozer up to the minimum position or cylinder bottoms out to the minimum position.
7. Press the SELECT button for the Bulldozer and click on the set minimum Analog in button to set the minimum value.
8. Move the Bulldozer down to the maximum positon.
9. Press the SELECT button for the Bulldozer and click on the set maximum Analog in button to set the maximum value.
10. Click on the SAVE AXIS PARAMETERS button to store the new ranges to the PLC.
11. Bulldozer axis is now calibrated.

Appendix

Machine Parameters

The machine parameter changes the way the control calculates position, pressures, alarm warnings and other aspects of the control system. Below are the descriptions of these parameters grouped by the axis sections or general parameters.

General Parameters
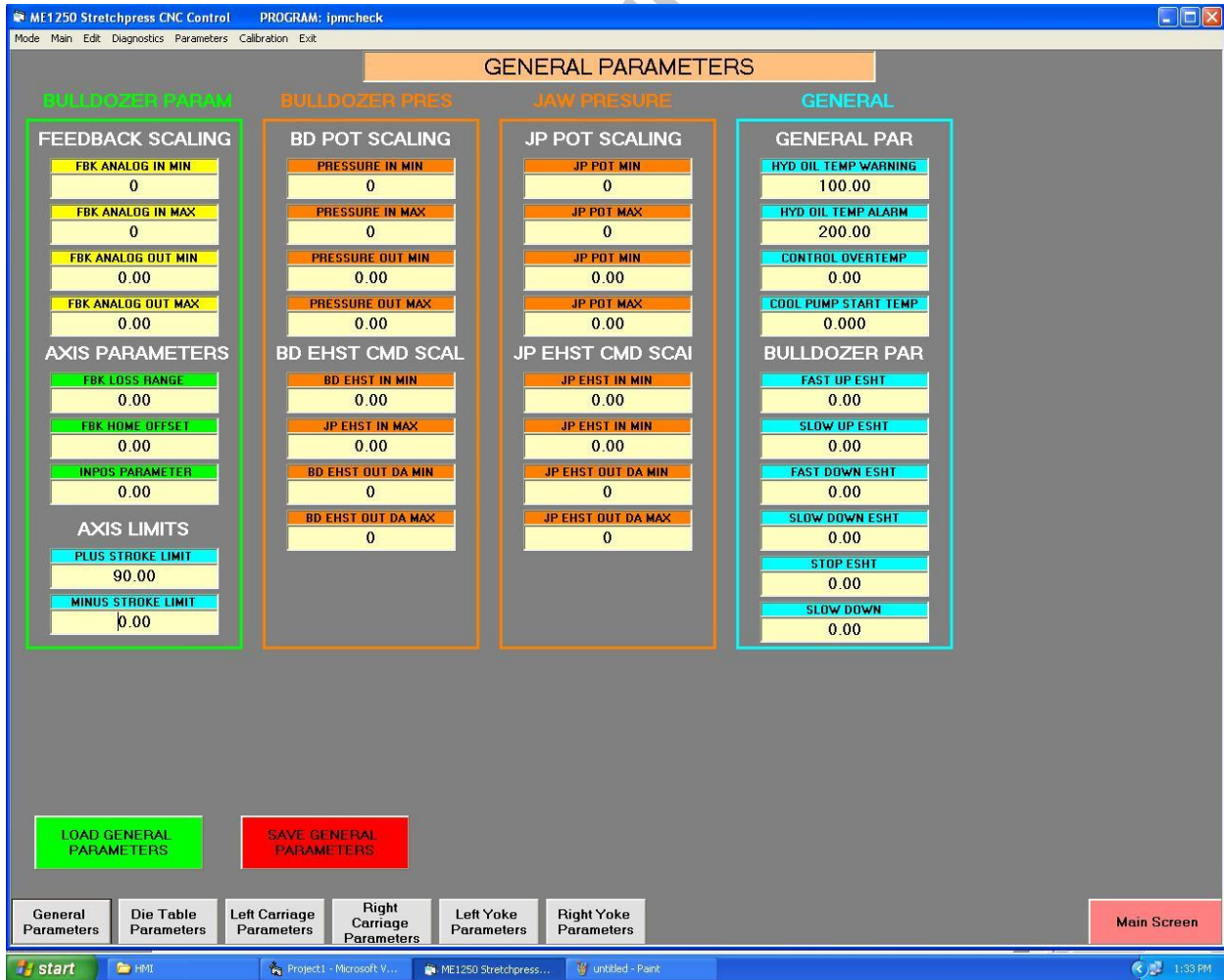
BULLDOZER POSITION PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

BULLDOZER PRESSURE PARAMETERS

Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 .0 to 99999.99

Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99.

BD EHST In Minimum
This value holds the floating point low end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99

BD EHST In Maximum
This value holds the floating point high end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99 .

BD EHST Out Minimum
This value holds the D/A low end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

BD EHST Out Maximum
This value holds the D/A high end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

JAW PRESSURE PARAMETERS

Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 .0 to 99999.99

Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the potentiometer pressure. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99.

BD EHST In Minimum
This value holds the floating point low end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99

BD EHST In Maximum
This value holds the floating point high end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0.0 to 99999.99 .

BD EHST Out Minimum
This value holds the D/A low end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

BD EHST Out Maximum
This value holds the D/A high end value for the ESHT range. It is part of the scaling calculation for the potentiometer on the control panel. The setting range for this parameter is 0 to 32767.

GENERAL PARAMETERS

HYD OIL TEMP WARNING
This value is the temperature in Celsius that the hydraulic oil reaches to generate the hydraulic warning alarm. The setting range for this parameter is 0.0 to 200.0

HYD OIL TEMP ALARM
This value is the temperature in Celsius that the hydraulic oil reaches to generate the hydraulic critical alarm and will shut the machine down. The setting range for this parameter is 0.0 to 200.0

CONTROL TEMP WARNING
This value is the temperature in Celsius that the cabinet reaches to generate the control overtemp warning alarm. The setting range for this parameter is 0.0 to 200.0

COOL PUMP START TEMP
This value is the temperature that will cause the oil circulation pump in the pit to turn on. The setting range for this parameter is 0.0 to 200.0

FAST UP EHST
This value is used when the bulldozer is command up at fast speed and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

SLOW UP EHST
This value is used when the bulldozer is command up at slow speed and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

FAST DOWN EHST
This value is used when the bulldozer is command down at fast speed and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

SLOW DOWN EHST
This value is used when the bulldozer is command down at slow speed and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

STOP EHST
This value is used when the bulldozer is at a stopped condition and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

SLOW DOWN
This value is used when the bulldozer is commanded to pressurize against the die and sent to the EHST valve. The setting range for this parameter is 0.0 to 99999.99.

Die Table Parameters

FEEDBACK SCALING PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

SERVO D/A SCALING PARAMETERS

D/A In Minimum
This value holds the floating point low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99

D/A In Maximum
This value holds the floating point high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99 .

D/A Out Minimum
This value holds the D/A low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

D/A Out Maximum
This value holds the D/A high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

AXIS LIMITS PARAMETERS

PLUS STROKE LIMIT
This parameter holds the plus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS STROKE LIMIT
This parameter holds the minus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

PLUS ANGULAR STROKE LIMIT
This parameter holds the plus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS ANGULAR STROKE LIMIT
This parameter holds the minus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

ROD PRESSURE SCALING PARAMETERS

ROD Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

ROD Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

CAP PRESSURE SCALING PARAMETERS

CAP Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

CAP Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

GENERAL CYLINDER PARAMETERS

CYLINDER BORE DIAMETER
This parameter holds the diameter value for the bore of the cylinder. It is used to calculate the actual force used when the cylinder is advancing. The setting range for this parameter is 0.0 to 99.99.

CYLINDER ROD DIAMETER
This parameter holds the diameter value for the ROD of the cylinder. It is used to calculate the actual force used when the cylinder is retracting. The setting range for this parameter is 0.0 to 99.99.

DIST BETWEEN CYLINDERS PARAMTETER
This value is used to calculate the angular position of the dual cylinder machines. The value is set from the centerline of each of the two hydraulic cylinders. The setting range for this parameter is 0.0 to 999.99.

AXIS GENERAL PARAMETERS

RAPID IPM RATE
This parameter sets the speed value of the axis when running the load and unload cycles as well as the maximum rate that the cylinders can move. The setting range for this parameter is 0.0 to 40.00.

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

MAX FOLLOWING ERROR
This parameter sets the maximum value the axis can lag behind the control interpolation , If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

SERVO OFFSET
This parameter is used to set a D/A offset to the servo modules to compensate for out of null servo system. This value can also adjust the balance of the following error when at a standing position. The setting range is 0-512.
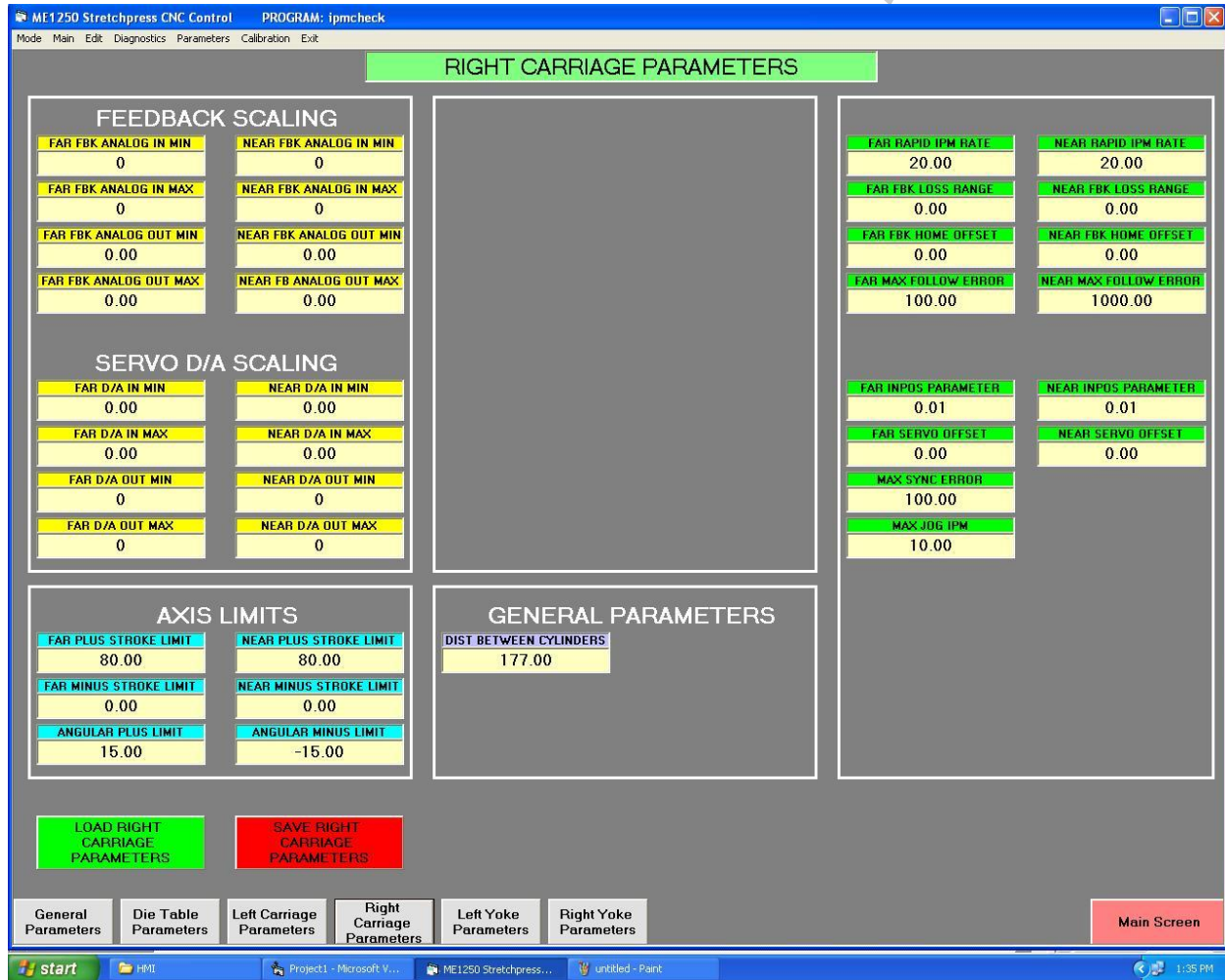
MAX SYNC ERROR
This parameter sets the maximum value the dual axis system cylinders can be out of sync with each other, If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

MAX JOG IPM
This parameter sets the speed value of the axis when jogging the servo axes. The setting range for this parameter is 0.0 to 40.00.

Right Carriage Parameters

FEEDBACK SCALING PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

SERVO D/A SCALING PARAMETERS

D/A In Minimum
This value holds the floating point low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99

D/A In Maximum
This value holds the floating point high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99 .

D/A Out Minimum
This value holds the D/A low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

D/A Out Maximum
This value holds the D/A high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

AXIS LIMITS PARAMETERS

PLUS STROKE LIMIT
This parameter holds the plus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS STROKE LIMIT
This parameter holds the minus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

PLUS ANGULAR STROKE LIMIT
This parameter holds the plus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS ANGULAR STROKE LIMIT
This parameter holds the minus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

GENERAL CYLINDER PARAMETERS

DIST BETWEEN CYLINDERS PARAMTETER
This value is used to calculate the angular position of the dual cylinder machines. The value is set from the centerline of each of the two hydraulic cylinders. The setting range for this parameter is 0.0 to 999.99.

AXIS GENERAL PARAMETERS

RAPID IPM RATE
This parameter sets the speed value of the axis when running the load and unload cycles as well as the maximum rate that the cylinders can move. The setting range for this parameter is 0.0 to 40.00.

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

MAX FOLLOWING ERROR
This parameter sets the maximum value the axis can lag behind the control interpolation. If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

SERVO OFFSET
This parameter is used to set a D/A offset to the servo modules to compensate for out of null servo system. This value can also adjust the balance of the following error when at a standing position. The setting range is 0-512.

MAX SYNC ERROR
This parameter sets the maximum value the dual axis system cylinders can be out of sync with each other, If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

MAX JOG IPM
This parameter sets the speed value of the axis when jogging the servo axes. The setting range for this parameter is 0.0 to 40.00.

Left Carriage Parameters

FEEDBACK SCALING PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

SERVO D/A SCALING PARAMETERS

D/A In Minimum
This value holds the floating point low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99

D/A In Maximum
This value holds the floating point high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99 .

D/A Out Minimum
This value holds the D/A low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

D/A Out Maximum
This value holds the D/A high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

AXIS LIMITS PARAMETERS

PLUS STROKE LIMIT
This parameter holds the plus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS STROKE LIMIT
This parameter holds the minus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

PLUS ANGULAR STROKE LIMIT
This parameter holds the plus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS ANGULAR STROKE LIMIT
This parameter holds the minus angular range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

GENERAL CYLINDER PARAMETERS

DIST BETWEEN CYLINDERS PARAMTETER
This value is used to calculate the angular position of the dual cylinder machines. The value is set from the centerline of each of the two hydraulic cylinders. The setting range for this parameter is 0.0 to 999.99.

AXIS GENERAL PARAMETERS

RAPID IPM RATE
This parameter sets the speed value of the axis when running the load and unload cycles as well as the maximum rate that the cylinders can move. The setting range for this parameter is 0.0 to 40.00.

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

MAX FOLLOWING ERROR
This parameter sets the maximum value the axis can lag behind the control interpolation. If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

SERVO OFFSET
This parameter is used to set a D/A offset to the servo modules to compensate for out of null servo system. This value can also adjust the balance of the following error when at a standing position. The setting range is 0-512.

MAX SYNC ERROR
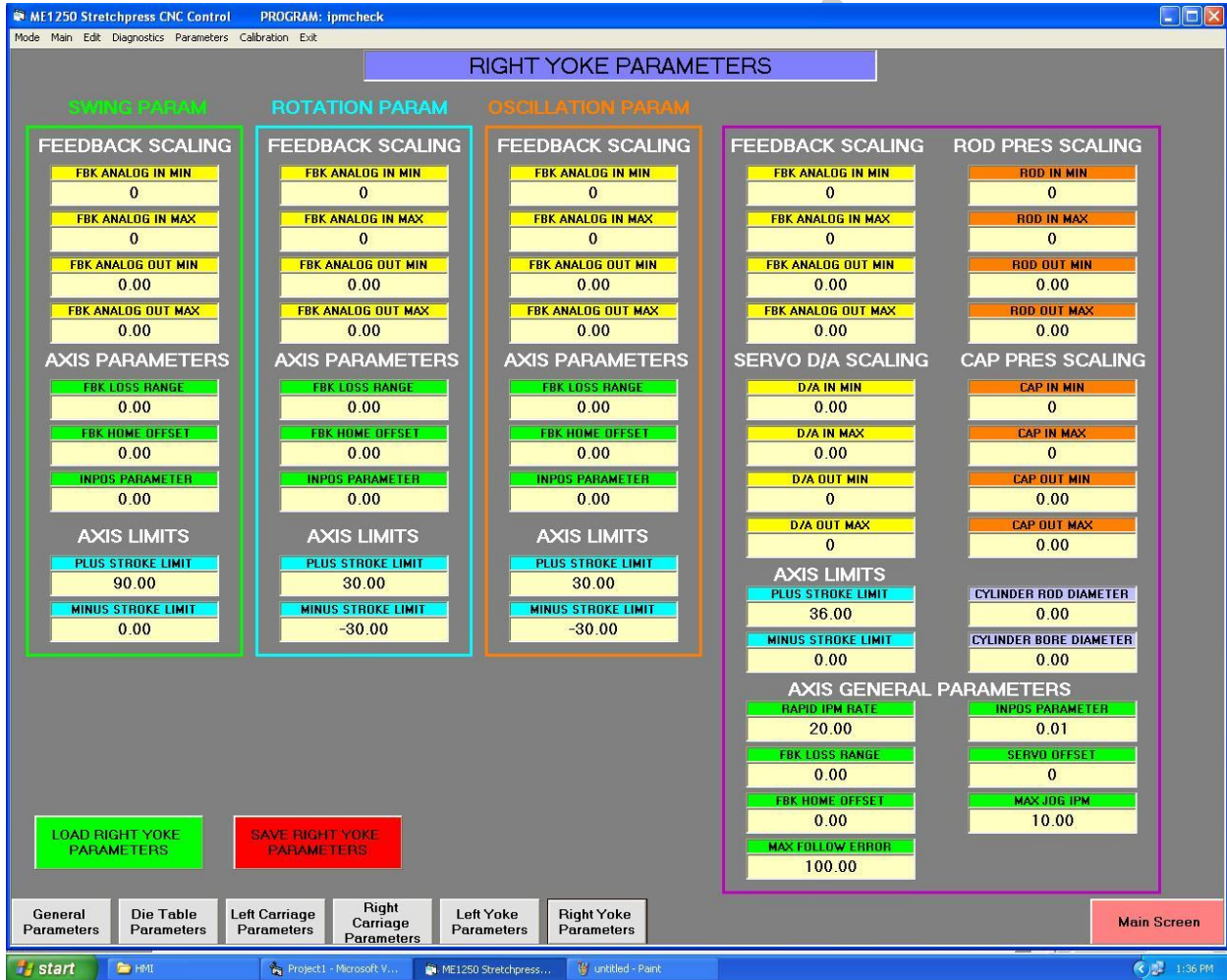This parameter sets the maximum value the dual axis system cylinders can be out of sync with each other, If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

MAX JOG IPM
This parameter sets the speed value of the axis when jogging the servo axes. The setting range for this parameter is 0.0 to 40.00.

Right YOKE Parameters

FEEDBACK SCALING PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

SERVO D/A SCALING PARAMETERS

D/A In Minimum
This value holds the floating point low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99

D/A In Maximum
This value holds the floating point high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99 .

D/A Out Minimum
This value holds the D/A low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

D/A Out Maximum
This value holds the D/A high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

AXIS LIMITS PARAMETERS

PLUS STROKE LIMIT
This parameter holds the plus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS STROKE LIMIT
This parameter holds the minus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

ROD PRESSURE SCALING PARAMETERS

ROD Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

ROD Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

CAP PRESSURE SCALING PARAMETERS

CAP Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

CAP Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

GENERAL CYLINDER PARAMETERS

CYLINDER BORE DIAMETER
This parameter holds the diameter value for the bore of the cylinder. It is used to calculate the actual force used when the cylinder is advancing. The setting range for this parameter is 0.0 to 99.99.

CYLINDER ROD DIAMETER
This parameter holds the diameter value for the ROD of the cylinder. It is used to calculate the actual force used when the cylinder is retracting. The setting range for this parameter is 0.0 to 99.99.

AXIS GENERAL PARAMETERS

RAPID IPM RATE
This parameter sets the speed value of the axis when running the load and unload cycles as well as the maximum rate that the cylinders can move. The setting range for this parameter is 0.0 to 40.00.

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

MAX FOLLOWING ERROR
This parameter sets the maximum value the axis can lag behind the control interpolation , If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

SERVO OFFSET
This parameter is used to set a D/A offset to the servo modules to compensate for out of null servo system. This value can also adjust the balance of the following error when at a standing position. The setting range is 0-512.

MAX JOG IPM
This parameter sets the speed value of the axis when jogging the servo axes. The setting range for this parameter is 0.0 to 40.00.

Left YOKE Parameters

FEEDBACK SCALING PARAMETERS

FBK Analog In Min
This parameter holds the minimum analog in servo counts for the minimum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog In Max
This parameter holds the maximum analog in servo counts for the maximum travel position of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0 to 32767.

FBK Analog Out Min
This parameter holds the minimum floating point position for the minimum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

FBK Analog Out Max
This parameter holds the maximum floating point position for the maximum travel of the axis position. It is part of the axis scaling calculation for the positions on the machine. The setting range for this parameter is 0.0 to 99.99

SERVO D/A SCALING PARAMETERS

D/A In Minimum
This value holds the floating point low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99

D/A In Maximum
This value holds the floating point high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0.0 to 99999.99 .

D/A Out Minimum
This value holds the D/A low end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

D/A Out Maximum
This value holds the D/A high end value for the axis position range. It is part of the scaling calculation for the axis command. The setting range for this parameter is 0 to 32767.

AXIS LIMITS PARAMETERS

PLUS STROKE LIMIT
This parameter holds the plus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

MINUS STROKE LIMIT
This parameter holds the minus position range of the axis to stop when reached by either jogging or command. The setting range for this parameter is 0.0 to 99.9.

ROD PRESSURE SCALING PARAMETERS

ROD Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

ROD Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

ROD Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

CAP PRESSURE SCALING PARAMETERS

CAP Pressure In Min
This parameter holds the minimum analog in D/A counts for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure In Max
This parameter holds the maximum analog in D/A counts for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 to 32767.

CAP Pressure Out Min
This parameter holds the minimum floating point pressure value for the minimum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0 .0 to 99999.99

CAP Pressure Out Max
This parameter holds the maximum floating point pressure value for the maximum setting of the transducer pressure. It is part of the scaling calculation for the force exerted. The setting range for this parameter is 0.0 to 99999.99.

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This parameter holds the diameter value for the bore of the cylinder. It is used to calculate the actual force used when the cylinder is advancing. The setting range for this parameter is 0.0 to 99.99.

CYLINDER ROD DIAMETER
This parameter holds the diameter value for the ROD of the cylinder. It is used to calculate the actual force used when the cylinder is retracting. The setting range for this parameter is 0.0 to 99.99.

AXIS GENERAL PARAMETERS

RAPID IPM RATE
This parameter sets the speed value of the axis when running the load and unload cycles as well as the maximum rate that the cylinders can move. The setting range for this parameter is 0.0 to 40.00.

FBK Loss Range
This parameter holds the value that the control considers out of the analog range of the position travel. It is usually set to a value lower than the feedback min in analog number. The setting range is 0-32767.

FBK Home Offset
Not currently used.

MAX FOLLOWING ERROR
This parameter sets the maximum value the axis can lag behind the control interpolation , If the following error exceeds this value, the machine will generate a critical axis alarm and shut down. The setting range for this parameter is 0.0 to 99.00.

Inpos Parameter
This parameter sets the range the control uses to determine if the axis is in position of the commanded value. The setting range is .01 to .5

SERVO OFFSET
This parameter is used to set a D/A offset to the servo modules to compensate for out of null servo system. This value can also adjust the balance of the following error when at a standing position. The setting range is 0-512.

MAX JOG IPM
This parameter sets the speed value of the axis when jogging the servo axes. The setting range for this parameter is 0.0 to 40.00.

Machine Error Codes

Summary

This section describes the machine generated alarms. These EX type alarms come from the system PLC.

List:

EX001 Die Table Far Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX002 Die Table Near Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX003 Left Carriage Far Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX004 Left Carriage Near Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX005 Right Carriage Far Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX006 Right Carriage Near Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX007 Left Tension Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX008 Right Tension Servo Not Ready Alarm

This error is generated when servo ready signal from the CES module has not come on. Check the CES module located in the node box for proper operation or replace module if defective.

EX009 Left Tension Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0010 Right Tension Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0011 Left Carriage Far Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0012 Left Carriage Near Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0013 Right Carriage Far Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0014 Right Carriage Near Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0015 Die Table Far Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0016 Die Table Near Following Error Alarm

This error is generated the axis following error becomes larger that the parameter setting check value. When the servo axis cannot keep up to where the CNC control is commanding, this error occurs. Check the following error parameter for the selected axis and check the servo valve and hydraulic system for proper operation.

EX0017 Die Table Far Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0018 Die Table Near Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0019 Left Carriage Far Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0020 Left Carriage Near Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0021 Right Carriage Far Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0022 Right Carriage Near Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0023 Left Oscillate Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0024 Left Rotate Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0025 Left Swing Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0026 Right Oscillate Feedback Loss Alarm

This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0027 Right Rotate Feedback Loss Alarm
This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0028 Right Swing Feedback Loss Alarm
This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0029 Left Tension Feedback Loss Alarm
This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0030 Right Tension Feedback Loss Alarm
This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0031 Bulldozer Feedback Loss Alarm
This error is generated cable transducer analog voltage has fallen below the actual position range of the axis. This alarm is caused either by the senor wiring failure, the cable transducer sensor or the cable has broken on the sensor.

EX0032 Hydraulic Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0033 Die Table Far Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0034 Die Table Near Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0035 Left Carriage Far Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0036 Left Carriage Near Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0037 Right Carriage Far Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0038 Right Carriage Near Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0039 Left Tension Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0040 Right Tension Filter Clogged Warning
This warning is generated when the cartridge hydraulic filter clog pressure switch has activated. Check the status of the pressure switch and wiring or replace the filter.

EX0041 CB3 Console I/O Power Circuit Breaker Tripped
This error is generated when I/O power circuit breaker has tripped in the main console. Check for shorts on the 24 section and reset the circuit breaker to clear.

EX0042 CB4 Ethernet Switch Circuit Breaker Tripped
This error is generated when the 24vdc power circuit breaker to the Ethernet switches has tripped. Check for shorts on the switch and reset the circuit breaker.

EX0043 CB12 Node 1 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0044 CB22 Node 2 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0045 CB32 Node 3 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0046 CB42 Node 4 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0047 CB52 Node 5 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0048 CB62 Node 6 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0049 CB72 Node 7 Circuit Breaker Tripped
This alarm occurs when the node 24vdc feed I/O power circuit breaker has tripped. Check for shorts on the selected node wiring and reset the circuit breaker to clear.

EX0050 Hydraulic Oil Level Low
This warning is generated when hydraulic oil level in the main hydraulic tank is below the minimum operating level. The machine will continue to run but no new operation cycles will be able to be run until the level has been restored.

EX0051 Hydraulic Starter System Failed
This alarm occurs when the hydraulic starting system fails to finish the soft start cycling of the motors in time. Check the status of the 3 soft starts in the main magnetics panel.

EX0052 Hydraulic Overheat Taz Alarm
This alarm occurs when the hydraulic temperature has become too hot for machine operation and has triggered the TAZ sensor. Turn off the hydraulics pump to let the oil cool and check the status of the oil heat exchanger system for proper operation.

EX0053 Hydraulic Oil Overtemp Alarm
This alarm occurs when the hydraulic temperature has become too hot for machine operation and has triggered the control parameter set point for the temp. Turn off the hydraulics pump to let the oil cool and check the status of the oil heat exchanger system for proper operation and the PT100 sensor.

EX0054 ME1250 Cabinet Overtemp Alarm
This alarm occurs when the control cabinet temperature has exceeded the safe operation zone for the control. Check the cabinet air conditioner for proper operation.

EX0055 Hydraulic Oil Overheat Warning
This alarm occurs when the has exceeded the parameter set temperature for the oil. The machine will continue to operate until the oil temp exceeds the error parameter level. Check the heat exchangers for proper operation.

EX0063 Main Console Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0064 Main Console Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0065 Node 5 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0066 Node 5 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0067 Node 4 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0068 Node 4 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0069 Node 3 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0070 Node 3 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0071 Node 2 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0072 Node 2 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0073 Node 7 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0074 Node 7 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0075 Node 6 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0076 Node 6 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0077 Left Yoke Fuse 1 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0078 Left Yoke Fuse 2 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0079 Right Yoke Fuse 1 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0080 Right Yoke Fuse 2 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0081 Main Console Slot 3 Fuse 1 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0082 Main Console Slot 3 Fuse 2 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0083 Main Console Slot 4 Fuse 1 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0084 Main Console Slot 4 Fuse 2 Blown Alarm
This alarm occurs when the internal fuse on the relay card has failed. Check for shorts to the relay card and replace the blown fuse on the selected board.

EX0085 Main Console Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0086 Main Console Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0087 Node 5 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0088 Node 5 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0089 Node 4 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0090 Node 4 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0091 Node 3 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0092 Node 3 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0093 Node 2 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0094 Node 2 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0095 Node 1 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0096 Node 1 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0097 Node 7 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0098 Node 7 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0099 Node 6 Analog In Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0100 Node 6 Analog Out Board Failure
This alarm occurs when selected analog card shows an internal failure. Replace defective card.

EX0101 Node 1 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0102 Node 2 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0103 Node 3 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0104 Node 4 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0105 Node 5 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0106 Node 6 Not Ready Alarm
This alarm occurs when the machine has activated the This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0107 Node 7 Not Ready Alarm
This alarm occurs when the selected node fails to communicate with main PLC. Check the Ethernet wiring to the node for correct operation, node power supplies or replace the P3-RX communication module in the selected node.

EX0108 Node 1 Analog In 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.

EX0109 Node 1 Analog Out 24VDC Missing
This alarm occurs when the supplied 24VDC to the analog card in the rack is missing. Check for the 24v feed to the selected card or replace the card if defective.