



**Human Machine Interface
Application Specification**

Global Common

SD-1020

ISSUED July 01, 2004
REVISED July 14, 2014

© 2014 Nexteer Automotive Corporation

All rights reserved

TABLE OF CONTENTS

1. SCOPE	2
SPECIFICATIONS.....	2
2. GENERAL	2
3. GENERAL SCREEN REQUIREMENTS	3
4. COMMON (GLOBAL) SCREEN FEATURES	4
HMI REQUIRED SCREENS	7
5. DIRECTORY SCREEN	8
6. MANUAL CONTROL SCREEN.....	9
7. AUTOMATIC CYCLE SCREEN.....	11
8. COUNTERS SCREEN	13
9. I/O MONITOR SCREEN	14
10. CLEAN SCREEN.....	16
11. FAULT HISTORY SCREEN.....	17
HMI ADDITIONAL SCREENS.....	18
12. START-UP SCREEN.....	18
13. MODEL SELECT SCREEN.....	20
14. MODEL SETUP SCREEN.....	21
15. CODE READER SCREEN	22
16. SERVO AXIS SCREEN	23
17. LOT TRACKING SCREEN	25
18. TRACEABILITY QUEUE & STATION SCREENS.....	26
19. RFID TAG READ SCREENS.....	28
20. MULTIPLE HMI STATION EQUIPMENT	29

1. SCOPE

- 1.1. Manufacturers in their design of programmable operator interfaces, also known as Human-Machine Interfaces (HMI's). This document establishes common screen layouts for improved operator familiarity with equipment interfaces. The intent of this document is to provide specifications to Original Equipment (OEM).
- 1.2. The screens listed on this document shall be standard in all equipment designed and built by OEMs. Modifications to these screens shall be done only when the application requires it.
- 1.3. These standard screens were developed for HMI's with only "touch screen" capabilities. Consequently, all functions are assigned to touch screen buttons.
- 1.4. HMI templates are located on www.nexteerdataexchange.com for various HMI's called out on our preferred components list. These templates provide the basis for implementing the requirements stated in this document. In addition, these templates were created to work in conjunction with the PLC templates also located on the website.
- 1.5. This document is not intended for off-the-shelf equipment (SD-010) or for HMI's associated with CNC equipment, as those HMI's are typically equipment specific.
- 1.6. The general principles embodied in this specification are applicable to the different brands of HMI's currently available in the market.
- 1.7. The use of the word "shall" indicates requirements and the use of the word "should" indicates recommendations. The use of the word "may" indicates permission or allowance and the use of the word "can" indicates a possibility.
- 1.8. Any deviation from a "shall" statement requires the approval of the Nexteer Controls Engineer for the project.

SPECIFICATIONS

2. GENERAL

- 2.1. Some operator interface functions shall always be done by means of hardwired control devices. Typically, these include:
 - Master Start Pushbutton (Control Power On)
 - Master Stop Pushbutton (Control Power Off)
 - Control Power On Light
 - E-Stop Pushbutton(s)
 - Fault Reset Pushbutton

2.2. The HMI model and programming software version(s) specified in SD-007, Approved Components List, shall be used.

2.3. The file names shall include the asset tag number (SD number) of the machine. The as-shipped archive (.APA) and runtime (.MER) HMI files shall be provided.

2.4. Screen-saver timeout setting, if used, shall be set to a minimum of 60 minutes.

2.5. Cursor shall be turned off (disabled).

2.6. Access to the HMI configuration shall be provided. This shall be on the directory screen and password protected.

2.7. User login/logout (password protection) when required, shall be provided by using a String input object on the HMI working in conjunction with the Login routine from the logic template. FactoryTalk Runtime Security feature shall not be used for user login/logout. Implementation of this shall be determined by the Nexteer engineer in charge.

2.8. Date & Time shall be synchronized with the PLC clock. Global Connections shall be setup to pull from appropriate PLC tags. The values are originated in the DateTime routine from the logic template.

2.9. The Panelview Plus 6 Compact model is limited to 25 screens, 200 alarms, and a single PLC connection. The application shall be shipped with 10% spare screens and alarms for future expansion.

2.10. The HMI application shall be provided with dual language. English and the native language of the machine's destination shall be selectable using a language switch button located on the directory screen.

2.11. The Max Tag Update Rate (refresh time) for objects shall remain at the default setting of 1 second, unless the application requires a faster response time. When changing this setting, caution should be used so as not to negatively impact communications.

3. GENERAL SCREEN REQUIREMENTS

3.1. The HMI shall be programmed so upon power up the initial screen is the Directory Screen. The directory screen shall be accessible from every screen.

3.2. Pop-up Windows shall not be used. This does not apply to built-in pop-ups like keypads for settable values or password entry.

3.3. All screens shall have their names put in a screen name box at the top, left-hand corner of the screen.

3.3.1. When multiple screens are used for the same display function the screen name box shall also include “SCREEN X OF Y”. Screen access pushbuttons, Previous Screen and Next Screen, shall be added to the right of the screen name box to navigate between the screens.

3.4. Faults and machine messages shall appear on the bottom of every screen, unless specifically detailed otherwise below.

3.5. Changes in machine state shall not be indicated by changes in color alone. Machine states (conditions) shall be indicated by both color and unique text.

3.6. The colors used for pushbuttons, pilot lights, and screens shall conform to the current version of IEC 60204-1. In the absence of clear direction, pushbuttons should be gray in color. Any exceptions to this rule will be illustrated throughout this document.

3.7. Text font type shall be Arial with a minimum font size of 8pt. Equipment destined for China shall use a minimum font size of 9pt.

3.8. Pushbuttons shall be momentary. Maintained or latched pushbuttons shall not be used.

3.9. All descriptions used on the operator interface shall agree with the descriptions used in the PLC. For example, if the HMI has a pushbutton labeled “RAISE DRILL SLIDE”, the PLC input bit description shall be “Raise Drill Slide HMI-PB”. The use of abbreviations should be avoided.

4. COMMON (GLOBAL) SCREEN FEATURES

4.1. The following display boxes, pushbuttons, and lights shall be present on all screens, except the Cleanscreen and Fault History Screen. They shall have the same colors and appear at the same location on every screen. Any exceptions to this will be explained in the individual screen descriptions section. See Figure A.

- Directory Screen Pushbutton
- Current Model Text Object
- Manual Mode Pushbutton
- Auto Mode Pushbutton
- PSDI Mode Pushbutton (remove when not applicable)
- Return All Motions Pushbutton
- Fault History Screen Pushbutton
- Fault Display
- Machine Messages Display
- User Login Pushbutton

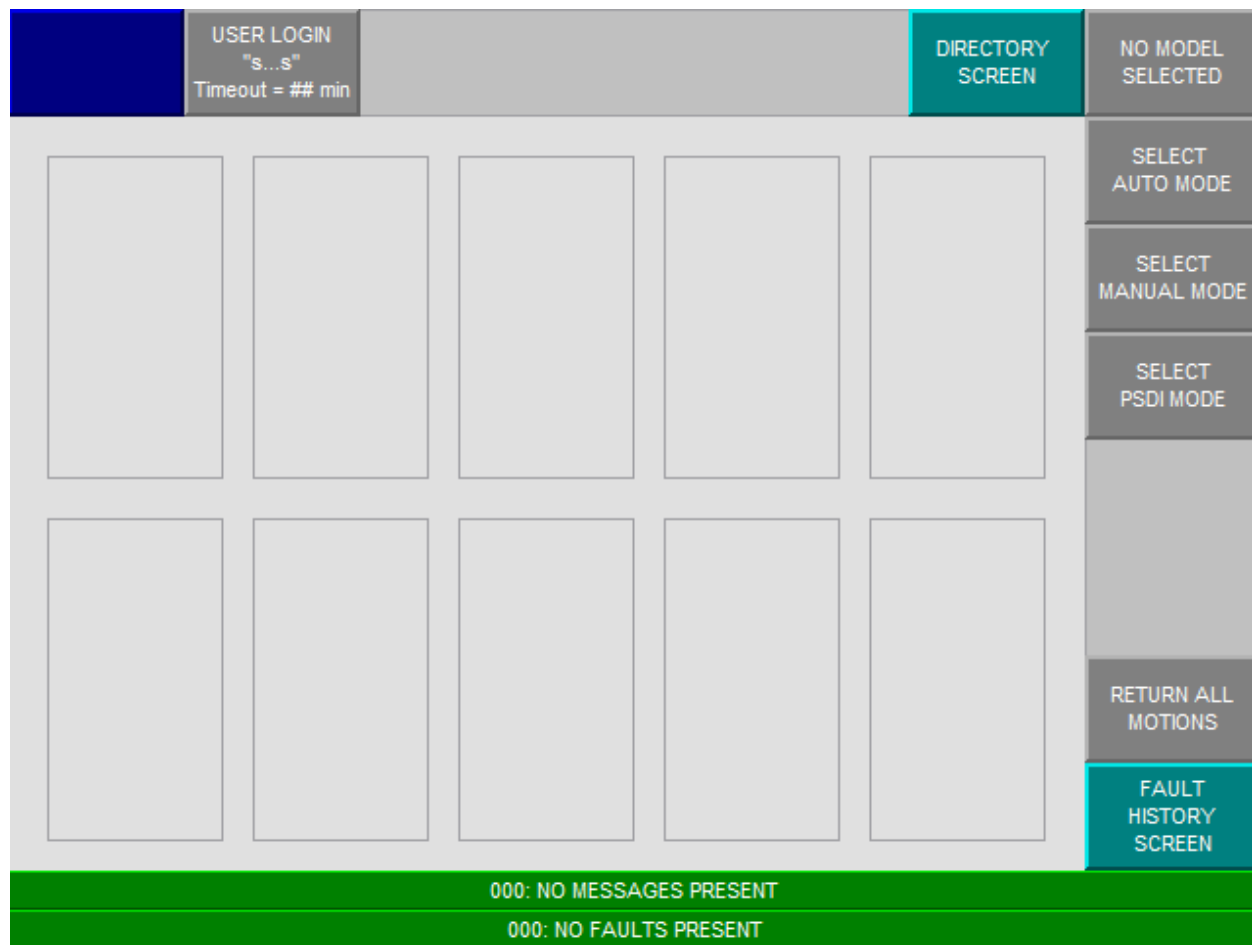


Figure A: Global Objects

4.2. A pushbutton that provides access to the Directory Screen shall be provided. This shall be located to the right of the screen name box and to the left of the current model display object.

4.3. An indicator in the upper right-hand corner of the screen shall be provided to indicate the current model selected.

4.4. Two pushbuttons shall be provided for selecting auto or manual mode of the machine. **If PSDI mode is required, a third pushbutton for PSDI mode shall be provided.**

4.4.1. A Manual Mode button shall be provided to request a change to manual mode. When manual mode is enabled in the PLC, the pushbutton shall change color and indicate "MANUAL MODE SELECTED". *Note: When manual mode is selected the PLC may command the HMI to display the first Manual Screen.*

4.4.2. An Automatic Mode button shall be provided to request a change to automatic mode. When automatic mode is enabled in the PLC, the pushbutton shall change color and indicate "AUTOMATIC MODE SELECTED". *Note: When automatic mode is selected the PLC may command the HMI to display the Automatic Cycle Screen.*

4.4.3. If PSDI mode is required a PSDI Mode button shall be provided to request a change to PSDI mode. When PSDI mode is enabled in the PLC, the pushbutton shall change color and indicate “PSDI MODE SELECTED”. *Note: The PSDI mode button should only be provided for equipment requiring the use of PSDI mode.*

4.4.4. A PSDI “ARMED” status indicator may be added to the HMI screen as needed. *Note: This indicator is also required to be a hardwired light per SD-011.*

4.5. A Return All Motions pushbutton shall be included to return the machine to its home or start position.

4.6. A pushbutton that provides access to the Fault History Screen shall be provided. It shall be located in the lower right side of the screen.

4.7. A single-line fault indicator across the entire length of the bottom of the screen shall be provided.

4.7.1. When no faults are present, the box shall have white text with a green background and the text “NO FAULTS PRESENT” indicated. *Note: This is a static text display layered on top of the fault banner with conditional visibility.*

4.7.2. When a fault is present, the box shall have white text with a red background and the specific fault indicated. *For example: “001: Emergency Stop Detected”, “002: Air Pressure Low”, “003: Light Curtain Blocked During Cycle”.*

4.7.3. The fault text shall include the fault number for debug purposes.

4.7.4. The logic requirements for fault control and display are covered in SD-1032. *Note: Fault Reset is a hardwired pushbutton.*

4.8. A single-line machine message indicator shall be across the entire length of the screen just above the fault indicator.

4.8.1. When no messages are present, the box shall have white text with a green background and the text “NO MESSAGES PRESENT” indicated.

4.8.2. When a message is present, the box shall have black text with a yellow background and the specific message indicated. *Typical message examples: “001: Control Power Is Off”, “002: PLC Battery Low”, “003: Bowl Feeder Low”, “004: Part Conveyor Full”, “005: Lube Level Low”.*

4.8.3. When control power is turned OFF, a “CONTROL POWER IS OFF” message shall be indicated.

4.8.4. The message text shall include the message number for debug purposes.

4.8.5. The logic requirements for message control and display are covered in SD-1032.

4.9. A user login pushbutton shall be provided, when required, enabling users to login with a password prior to allowing modification of restricted values. These values may include for example model setup parameters or process control limits. *Note: The login user names and passwords shall be hard coded on the PLC program.*

4.9.1. The user Login pushbutton shall appear next to the screen name box on as many screens as possible. The currently logged in user shall be displayed as text on this button. The user login shall be setup to automatically log out after a time set by the Nexteer Engineer in charge. *Note: The default time is set to 10 minutes*

HMI REQUIRED SCREENS

The following is a list of required screens. Other screens may need to be developed for process related control. Each required screen and its objects will be described in detail below.

- Directory
- Manual Control
- Automatic Cycle
- Counters
- PLC I/O Monitor
- Clean Touch-Screen
- Fault History

5. DIRECTORY SCREEN

5.1. This section refers to the Directory Screen. See Figure B.

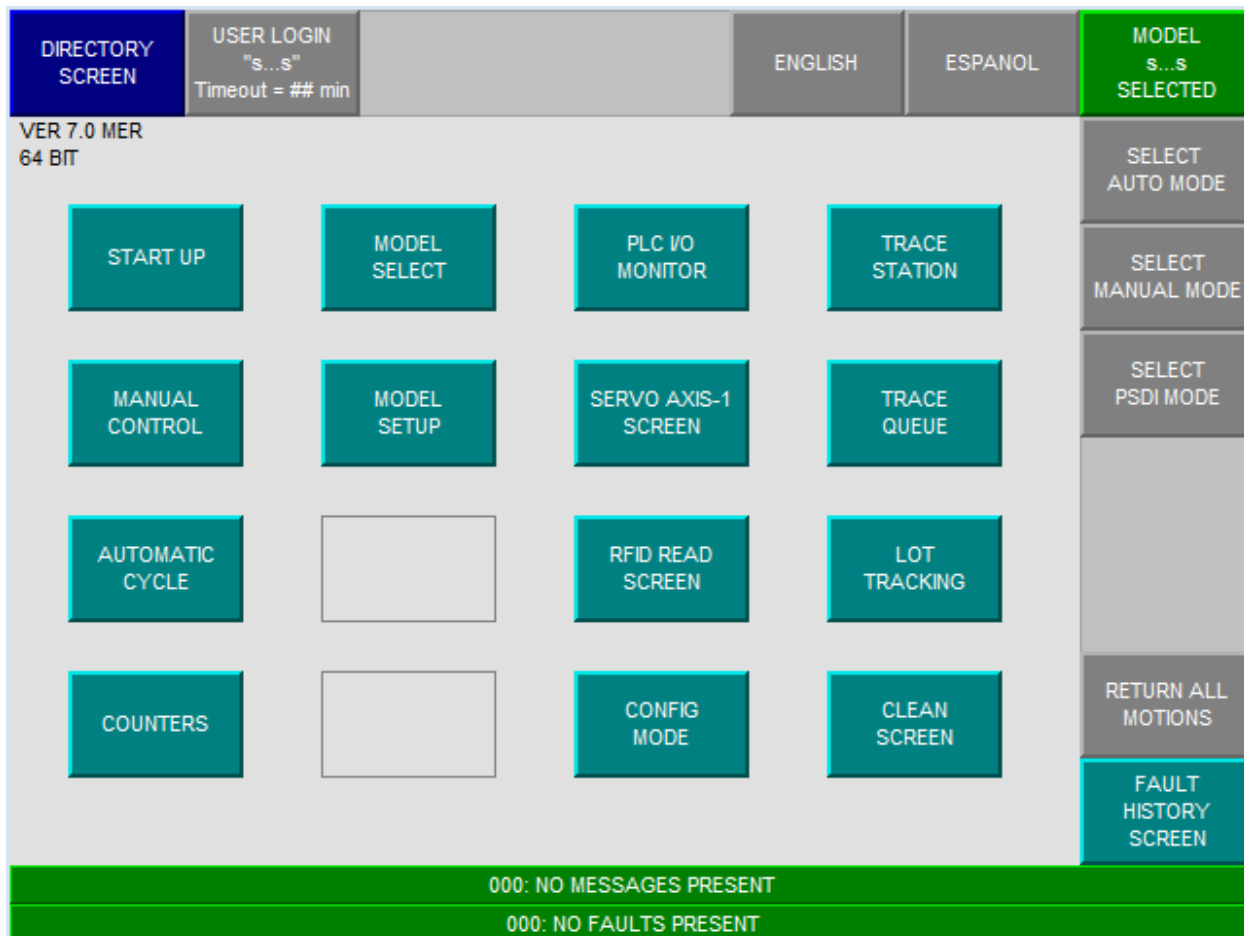


Figure B: Directory Screen

5.2. The HMI shall be programmed so upon power up the initial screen is the Directory Screen.

5.3. The screen name box, in the upper left-hand corner of the screen, shall contain the text “DIRECTORY SCREEN”.

5.4. Screen change pushbuttons, with appropriate and descriptive labels, shall be provided to access all screens or at a minimum the first screen of a multiple screen set for similar functions.

5.5. The version number of the MER runtime file and the operating system type (32 or 64 bit) of the computer it was created on shall be noted below the screen name box.

5.6. The Language Control buttons shall be shown to the right of the screen name box.

6. MANUAL CONTROL SCREEN

6.1. This section refers to the Manual Screen. See Figure C.

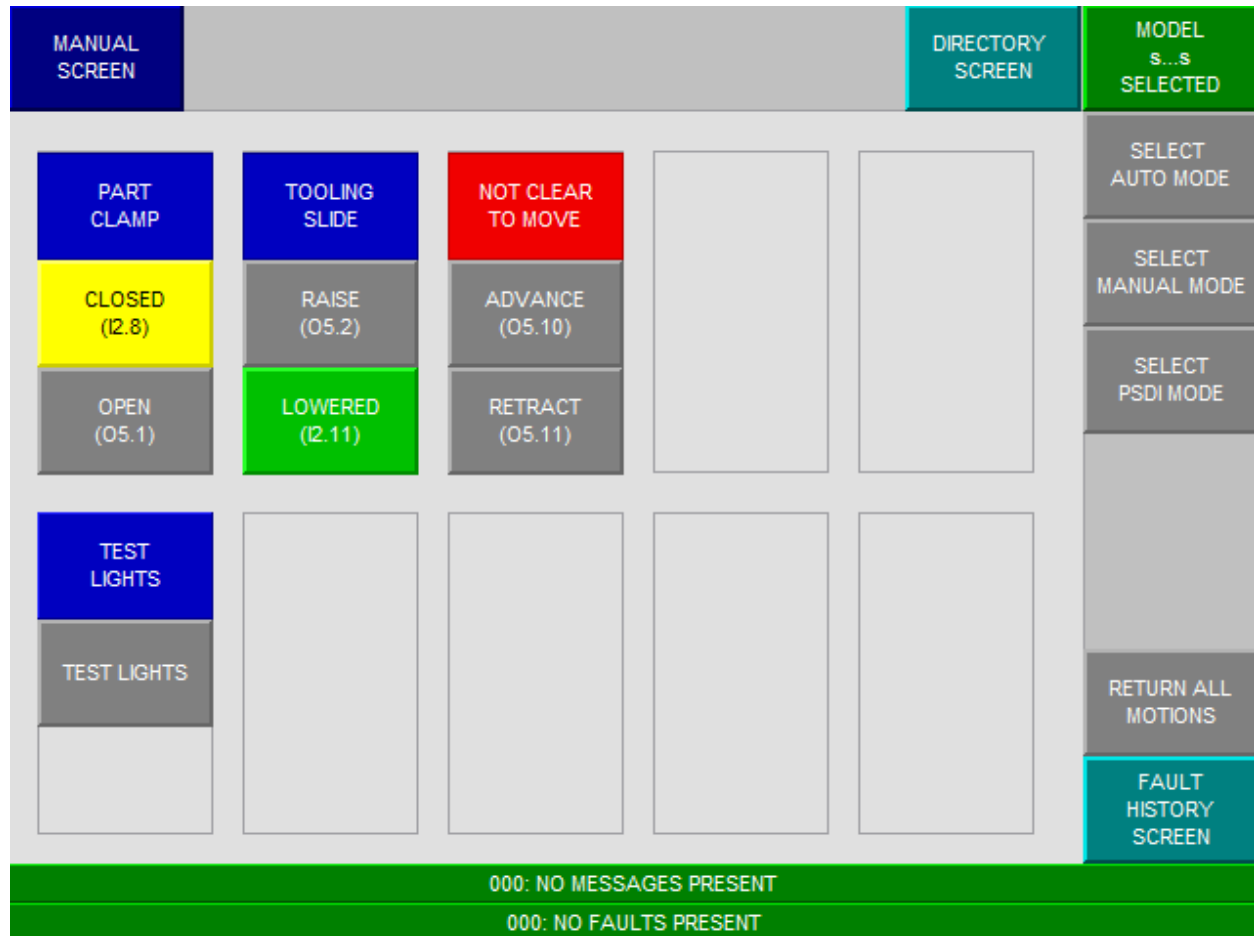


Figure C: Manual Screen

6.2. The screen name box, in the upper left-hand corner, shall contain the text “MANUAL CONTROL SCREEN 1 of x”.

6.3. The typical manual function consists of three (3) objects grouped vertically. The behavior of each object shall be as follows:

6.4. The top object shall be a multistate indicator and have two states.

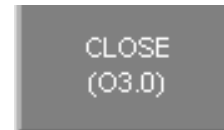
6.4.1. State “0” shall use white text on a blue background to indicate the description of the motion matching the description on the electrical drawings.

6.4.2. State “1” shall use white text on a red background to indicate the motion is not clear to move only when the motion is requested.



6.5. The middle object shall be a momentary pushbutton used to command motion and have two states based on the motion's sensor. Both states shall include the motion's I/O address.

6.5.1. State "0" (sensor OFF) shall use white text on a gray background to indicate the motion it commands and that the motion sensor is OFF.

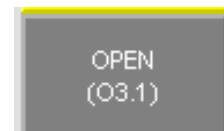


6.5.2. State "1" (sensor ON) shall use black text on a yellow background to indicate the motion commanded has completed and the motion sensor is ON.



6.6. The bottom object shall be a momentary pushbutton used to command motion and have two states based on the motion's sensor. Both states shall include the motion's I/O address.

6.6.1. State "0" (sensor OFF) shall use white text on a gray background to indicate the motion it commands and that the motion sensor is OFF.



6.6.2. State "1" (sensor ON) shall use white text on a green background to indicate the motion commanded has completed and the motion sensor is ON.



6.7. The manual control functions should be organized based on the sequence of a normal automatic cycle of the machine.

6.8. A Test Lights pushbutton shall be provided on this screen for machines that include hardwired pilot lights and/or operator indicator lights. This button shall appear on the first manual screen.

7. AUTOMATIC CYCLE SCREEN

7.1. This section refers to Automatic Cycle. See Figure D.

AUTOMATIC CYCLE SCREEN	USER LOGIN "s...s" Timeout = ## min			DIRECTORY SCREEN	MODEL s...s SELECTED
MACHINE STATUS: READY TO CYCLE					SELECT AUTO MODE
PART STATUS: READY TO CYCLE					SELECT MANUAL MODE
LOT TRACKING: READY TO CYCLE					SELECT PSDI MODE
CYCLE TIME: ##.## SECONDS		RESULT ID sssssssssssssss	STATUS sssssssss		
PART-TO-PART TIME: ##.## SECONDS		PART RUN PERMISSIONS			
OPERATOR PROMPT: LOAD PART INTO FIXTURE					RETURN ALL MOTIONS
PAUSE CYCLE		ABORT CYCLE		FAULT HISTORY SCREEN	
000: NO MESSAGES PRESENT					
000: NO FAULTS PRESENT					

Figure D: Automatic Cycle Screen

7.2. The screen name box, in the upper left-hand corner, shall contain the text “AUTOMATIC CYCLE SCREEN”.

7.3. As a minimum, this screen shall indicate the following:

7.3.1. A Machine Status indicator that should include the following states. “FAULTED” in red text. “NOT AT HOME POSITION”, “AUTOMATIC MODE NOT SELECTED”, “PART NOT LOADED”, and “IN CYCLE” in yellow text. “READY TO CYCLE” and “CYCLE COMPLETE” in green text.

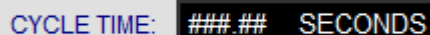
MACHINE STATUS: READY TO CYCLE

7.3.2. A Part Status indicator that should include the following states. “REJECT” in red text. “NOT PRESENT” and “BEING PROCESSED” in yellow text. “PRESENT” and “ACCEPT” or “GOOD” in green text.




PART STATUS: READY TO CYCLE

7.3.3. An overall machine Cycle Time numeric display labeled, “CYCLE TIME” The last value of machine cycle time shall be displayed until the next cycle begins. The value should be to two decimal point accuracy as shown below.



CYCLE TIME: ###.## SECONDS

7.3.4. A machine Takt time numeric display labeled, “Part-To-Part Time”. The last part-to-part time shall be displayed until the next cycle begins. The value should be to two decimal point accuracy as shown below.



PART-TO-PART TIME: ###.## SECONDS

7.4. Depending on the application, additional indicators or pushbuttons may be included. The template provides additional indicators and pushbuttons. The following are some examples.

7.4.1. A Lot Tracking status indicator provides the operator with an indication on the status of material quantities being used to build the part. For example, “UPPER SHAFT LOW” in yellow text, “MAGNETS EMPTY” in red text. “ENABLED AND READY” in green text.

7.4.2. The Traceability status indicators: Result ID, Part Status, and Operation status indicator are added for applications that require traceability or part tracking.

7.4.3. An Operator Prompt indicator giving instructions as to what needs to be done next. For example, “LOAD PART INTO FIXTURE”, “HIT CYCLE START SWITCH”, “REMOVE PART FROM FIXTURE”. The current prompt message shall be displayed until the process step is completed. Responses to incorrect process steps by operators shall not be displayed in this window. Faults and machine message indicators shall be used for such communication. The prompt indicator messages shall be black text on white background.

7.4.4. A Cycle Pause pushbutton may be included to allow the cycle to be paused at the end of a sequence step. The cycle can then be resumed from the step it was paused at by normal cycle initiation.

7.4.5. A Cycle Abort pushbutton may be included to stop the machine cycle immediately. The machine shall be returned to home position, to be restarted from initial sequence step.

7.4.6. A Cycle Start pushbutton may be included on automatic cycling machines that do not have a hardwired start button.

7.4.7. A Cycle Stop pushbutton may be included to stop the machine at its normal start or home position at the end of its current cycle. *Note: This applies to continuous cycle machines.*

7.4.8. A Reset Operator Sequence pushbutton is used to abort the operator process immediately and allows re-start of the sequence of operations. *Note: This typically only applies to manually intensive assembly benches.*

7.4.9. An Operator Reject pushbutton is used to stop the processing of the part, and allows the operator to assign a reject status to the part. *Note: This typically applies to manually assembly stations on an assembly line.*

8. COUNTERS SCREEN

8.1. This section refers to Counters Screen. See Figure E.

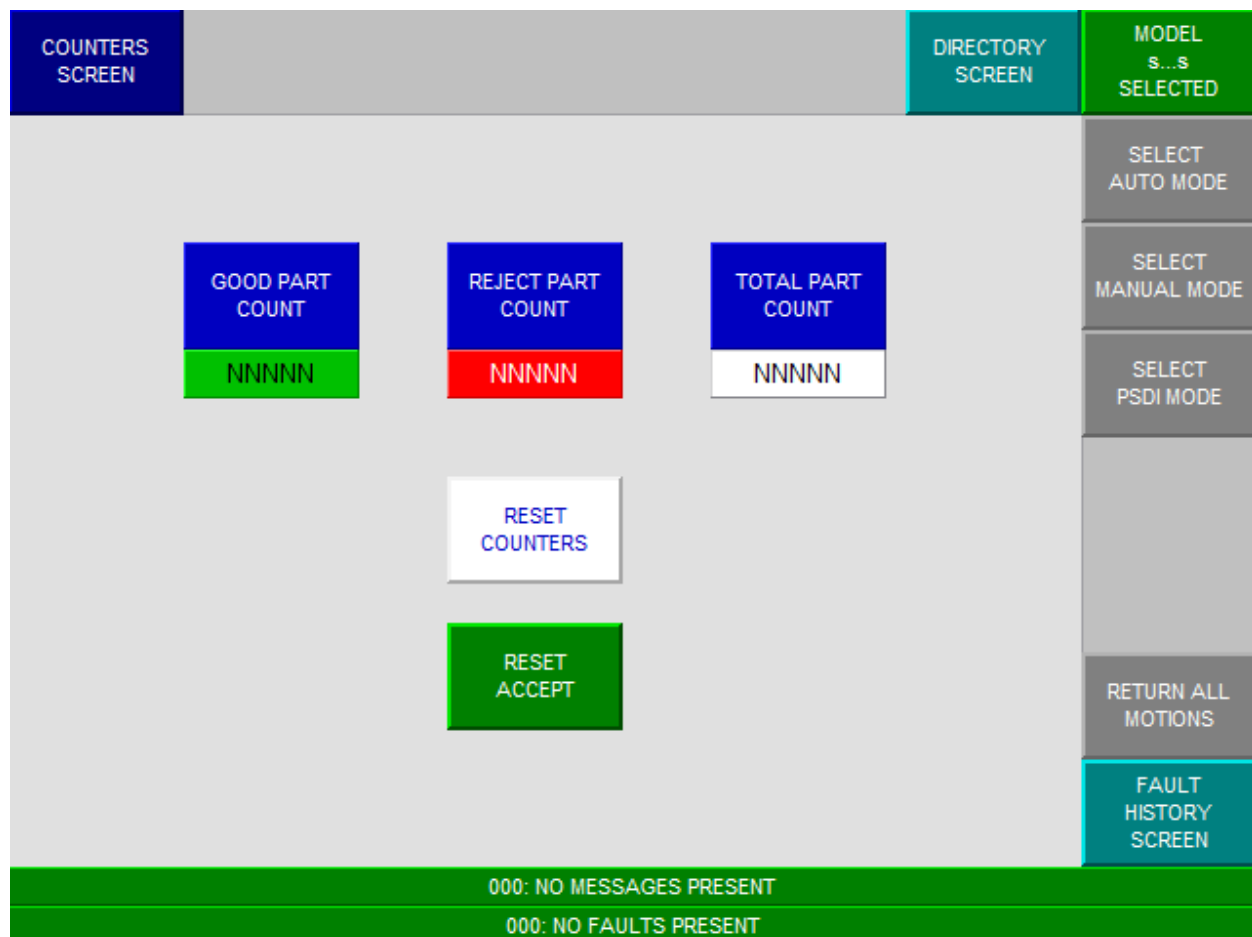


Figure E: Counters Screen

8.2. The screen name box, in the upper left-hand corner, shall contain the text “COUNTERS SCREEN”.

8.3. This screen shall have the following reset-able counters: Good Parts, Reject Parts, and Total Parts.

8.4. A reset part counters pushbutton shall be provided. A reset accept pushbutton shall be used to accept counter resets.

9. I/O MONITOR SCREEN

9.1. This section refers to PLC I/O Monitor Screen. See Figure F.

I/O MONITOR SCREEN 1 OF X		NEXT SCREEN		DIRECTORY SCREEN		MODEL s...s SELECTED	
<div> <div> LOCAL SLOT 1 #1769-IQ16 (I1.x) </div> <div> LOCAL SLOT 2 #1769-IQ16 (I2.x) </div> <div> LOCAL SLOT 3 #1769-IF4 (I3Chx) </div> <div> LOCAL SLOT 4 #1769-OB16 (O4.x) </div> <div> LOCAL SLOT 5 #1769-OB16 (O5.x) </div> </div>						SELECT AUTO MODE	
						SELECT MANUAL MODE	
						SELECT PSDI MODE	
						RETURN ALL MOTIONS	
						FAULT HISTORY SCREEN	
000: NO MESSAGES PRESENT							
000: NO FAULTS PRESENT							

Figure F: PLC I/O Monitor

9.2. The screen name box, in the upper left hand corner, shall contain the text “I/O MONITOR SCREEN 1 OF x”

9.3. The screen or set of screens shall display the status of all inputs and outputs used by the PLC.

9.4. The status indicator for digital I/O shall have two states. State “0” (sensor OFF) shall be a solid gray background. State “1” (sensor ON) shall be a solid green background.

9.5. The indicator for analog I/O shall display the raw and scaled values.

9.6. The I/O module location, type, and address shall be updated in the description above each set of module indicators.

9.7. The connection for each I/O point shall use a parameter (or variable) as part of the address

9.7.1. In the *General* properties tab of the *Goto-Display* button there is the Parameter List setup.

9.7.2. The section of text before the first comma will take the place of the (#1) variable on this display. The section of text after the first comma and before the next comma will take the place of the (#2) variable, and so on.

9.7.3. Referring to Figure G below, the first section of text below, {[PLC1]I1}, will take the place of (#1) on this display wherever it occurs. Therefore, {#1.15} connection represents the status of I1.15. *Note: These include PLC I/O monitoring, Previous, and Next Screen page change pushbuttons and shall be configured when setting up the I/O monitoring screens.*

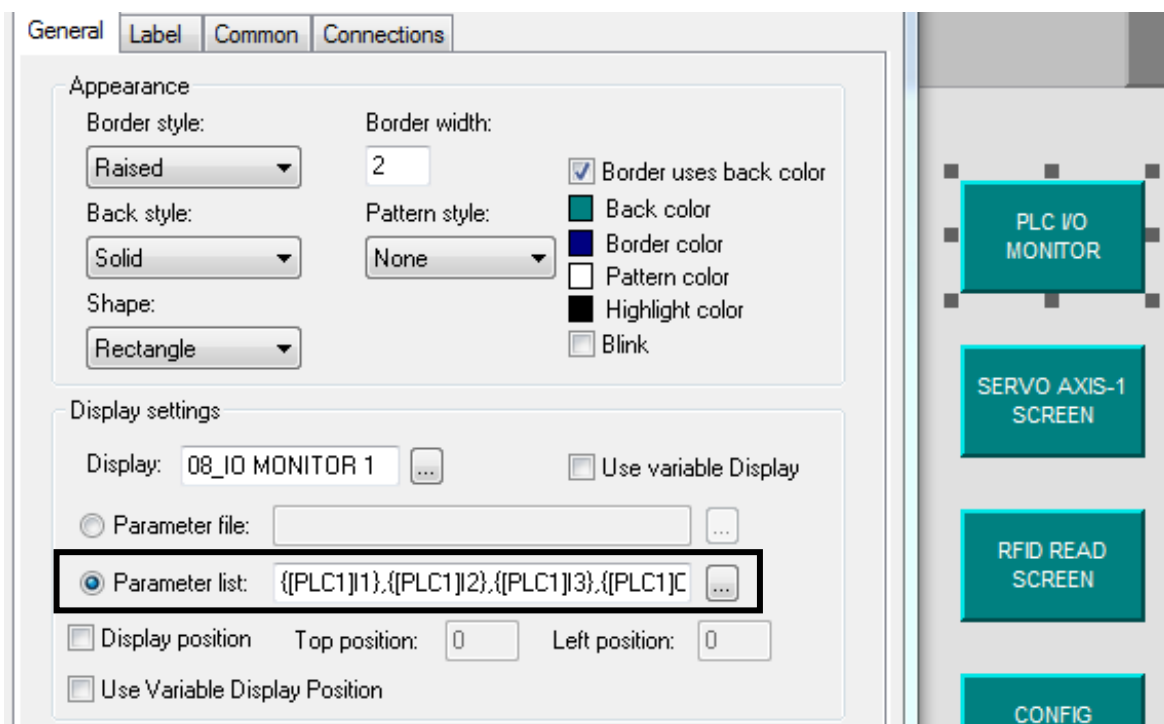


Figure G: I/O Parameter List

10. CLEAN SCREEN

10.1. This section refers to Clean Screen. See Figure H.

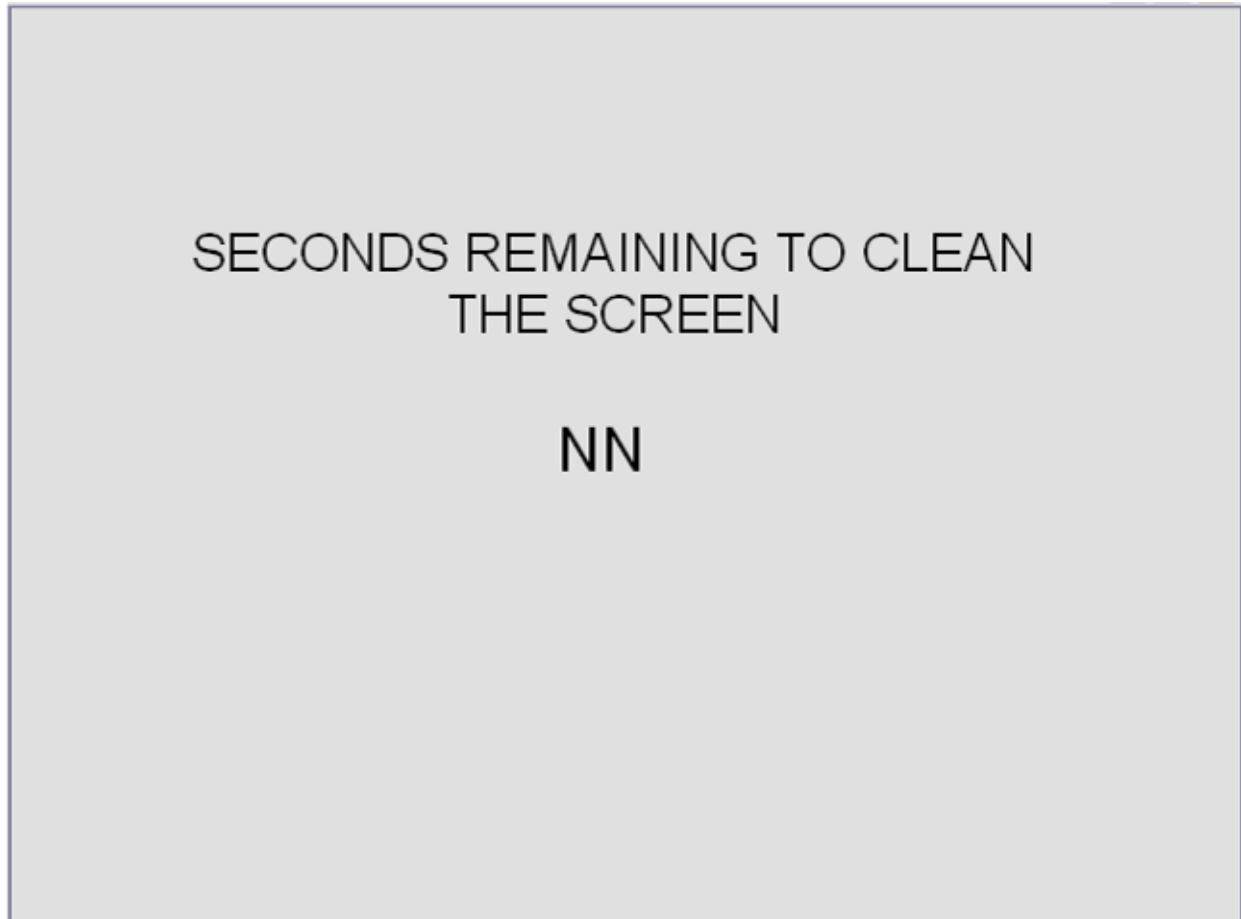


Figure H: Clean Screen

10.2. This screen has no pushbuttons. Its purpose is to allow the operator to wipe the touchscreen clean with a cloth without accidentally operating an object on the screen.

10.3. The screen shall have a completely blank background with the following sentence centered on the screen: "SECONDS REMAINING TO CLEAN THE SCREEN:"

10.4. When the operator selects this screen from the Directory Screen, the PLC needs to initialize a count-down timer of 15 seconds. As the timer decreases towards zero, the number of remaining seconds shall be indicated as shown on the Clean Screen above.

10.5. When the timer reaches zero seconds, the PLC shall command the HMI to return to the Directory Screen.

11. FAULT HISTORY SCREEN

11.1. This section refers to the Fault History Screen. See Figure I.

FAULT HISTORY SCREEN	CURRENT PLC TIME 5/15/2014 1:28:04 PM	DIRECTORY SCREEN	MODEL S...S SELECTED
DATE / TIME	MESSAGE		
5/15/2014 1:28:04 PM	ABCDE FGHIJ LMNOPQ RSTUV WXYZ ABCDE FGHIJ LMNOPQ RSTUV WXYZ		
		SELECT AUTO MODE	
		SELECT MANUAL MODE	
		SELECT PSDI MODE	
		CLEAR ALARM HISTORY	
		PAGE UP	
		PAGE DOWN	
000: NO MESSAGES PRESENT			
000: NO FAULTS PRESENT			

Figure I: Fault History Screen

11.2. The screen name box, in the upper left hand corner, shall contain the text “FAULT HISTORY SCREEN.”

11.3. The active faults shall be displayed with white text on a red background. The inactive faults shall be displayed with blue text on a white background.

11.4. Fault messages should be fixed, edited in the HMI alarm setup area. Fault messages using embedded variable stored in the PLC are allowed on applications for North America only.

11.5. A Clear Alarm History pushbutton shall be provided. This button shall not be displayed when a fault is active.

11.6. Page Up and Page Down pushbuttons shall be provided to navigate through the fault history.

11.7. Being each fault has a time stamp from the PLC clock; a current PLC clock time shall be displayed next to the screen name box to provide a reference time for fault occurrence.

HMI ADDITIONAL SCREENS

Additional screens may be required to meet the application requirements. If the application requires additional machine functionality, for example: model selection, traceability, lot tracking, servo axis, and camera inspection, the provided template screens shall be used. Modifications to these screens are expected based on application requirements. Contact the Nexteer Engineer to determine the applicable screens.

12. START-UP SCREEN

12.1. This section refers to Start-Up Screen. See Figure J.

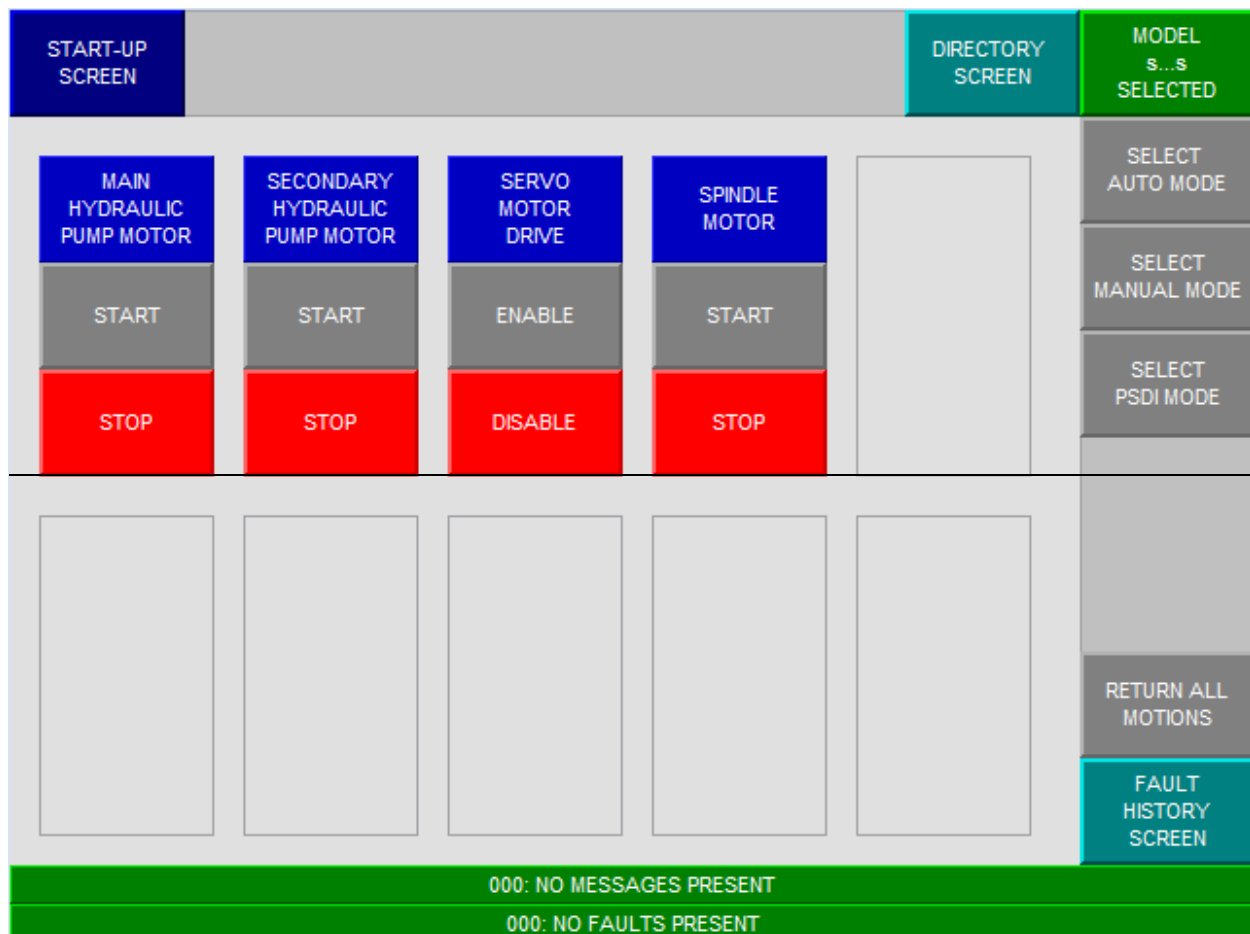


Figure J: Start-Up Screen

12.2. The screen name box, in the upper left-hand corner, shall contain the text “START-UP SCREEN.”

12.3. The Start-Up Screen, whenever used, shall be the first screen in the Directory Screen layout hierarchy.

12.4. Start-stop functions are used to turn ON/OFF devices such as motors, variable frequency drives, and servo drive amplifiers. These devices are typically in one of three states: ON, OFF, or ERROR. (An error may occur, say, when the thermal overloads on a motor starter trip.)

12.5. Each Start/Stop function shall consist of three (3) objects grouped vertically together. The behavior of each object shall be consistent with the Manual Screen in section 14. In this case, the STOP or DISABLE button does not indicate the status of the device, only the START or ENABLE button does.

13. MODEL SELECT SCREEN

13.1. This section refers to Model Change-Over Screen. See Figure K.

MODEL SELECTION SCREEN	USER LOGIN "s...s" Timeout = ## min				MODEL SETUP SCREEN	DIRECTORY SCREEN	MODEL s...s SELECTED
<div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> </div>							SELECT AUTO MODE
<div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> </div>							SELECT MANUAL MODE
<div> <div>SELECT MODEL s...s</div> <div>SELECT MODEL s...s</div> <div></div> <div></div> <div></div> </div>							SELECT PSDI MODE
<div> <div>COPY MODEL</div> <div>PASTE MODEL</div> <div>ERASE MODEL</div> <div></div> <div></div> </div>							RETURN ALL MOTIONS
<div> <div></div> <div></div> <div></div> <div>CONFIRM</div> </div>							FAULT HISTORY SCREEN
000: NO MESSAGES PRESENT							
000: NO FAULTS PRESENT							

Figure K: Model Select Screen

13.2. The screen name box, in the upper left-hand corner, shall contain the text “MODEL SELECTION SCREEN”.

13.3. This screen shall be used to allow the operator to change from one model to another. In the event that only one model is produced on the equipment or changing from one model to another has no effect on the processing of the part, this screen will not be required.

13.4. The preferred method of model selection would be a series of labeled pushbuttons covering all models. The template is configured to display the part number stored in the PLC on the button. If desired, the model description such as: Ford Model xyz, GM abc, BMW xyz, Chrysler abc may be used.

13.5. A model change shall be allowed only when the machine is not in cycle.

13.6. Copy, Paste, and Erase Model pushbuttons shall be provided and function as programmed in the logic template. The ability to use these pushbuttons requires the user to be logged in.

14. MODEL SETUP SCREEN

14.1. This section refers to Model Setup Screen. See Figure L.

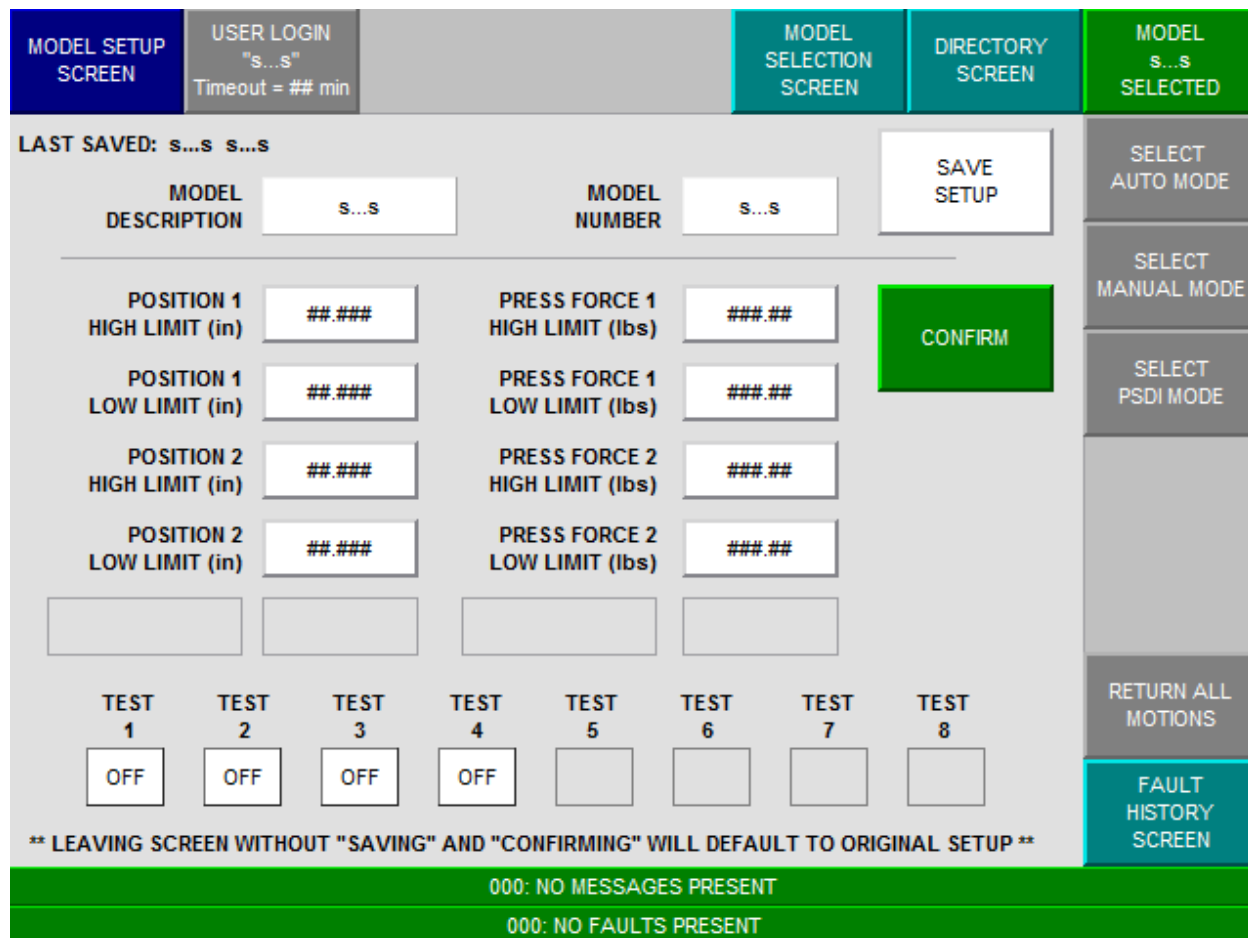


Figure L: Model Setup Screen

14.2. The screen name box, in the upper left-hand corner, shall contain the text “MODEL SETUP SCREEN”.

14.3. The initial model setups displayed are the current setups stored in the PLC.

14.4. This screen shall be used to allow the operator to view model setup information and process control related parameters.

14.5. This screen shall be used to allow engineering to view and edit model setup parameters as needed within pre-defined limits. The ability to save edits requires the user to be logged in.

14.9. Parameter changes, on the currently running model, shall be allowed only when the machine is not in cycle.

15.2. The screen name box, in the upper left-hand corner, shall contain the text “CODE READER SCREEN.”

15.3. Manual trigger pushbutton for all fixed mount code readers shall be provided. The pushbuttons for these functions shall indicate the functions status (Read Complete). *Note: A manual trigger is not required for all handheld readers, but may be provided.*

15.4. The scanned character data received shall be displayed. The scanned data may be extracted on this screen to display part number, serial number, lot number, or similar information.

15.5. The length of the scanned data shall also be displayed.

16. SERVO AXIS SCREEN

16.1. This section refers to Servo Axis Screen. See Figure N.

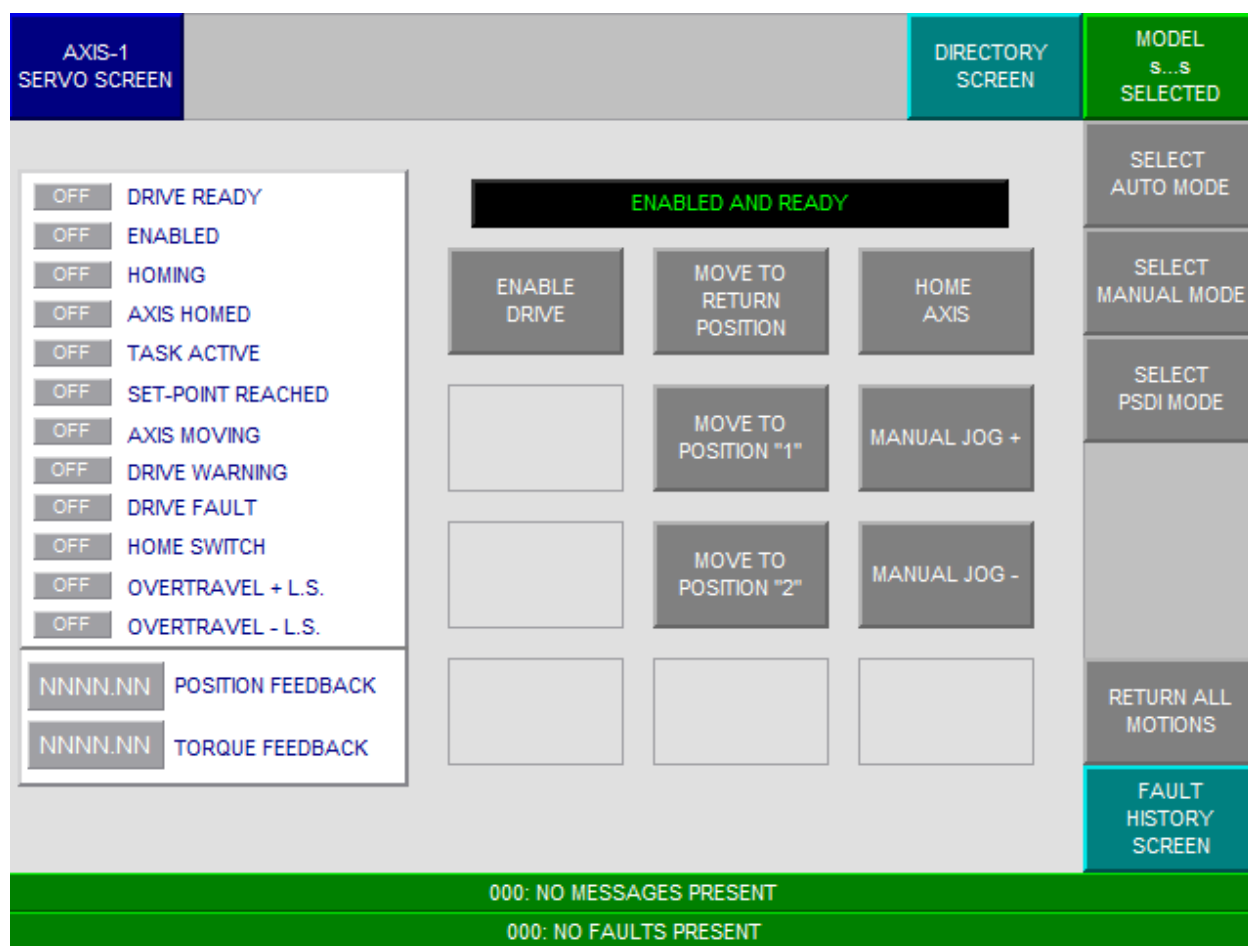


Figure N: Servo Axis Screen

16.2. The screen name box, in the upper left-hand corner, shall contain the text “AXIS-X SERVO SCREEN.”

16.3. The current position and velocity of the axis shall be indicated.

16.4. The status of important servo drive functions shall be indicated. These functions include such things as drive enabled or drive in position.

16.5. Manual control functions for the servo axis shall be provided. The pushbuttons for these functions shall indicate the functions status. The typical manual functions are as follows:

16.5.1. Jog axis plus (+) and minus (-). Indicate the direction that the axis moves or rotates.

16.5.2. Move axis to Home position.

16.5.3. Move axis to some alternate position(s).

17. LOT TRACKING SCREEN

17.1. This section refers to Lot Tracking Screen. See Figure O.

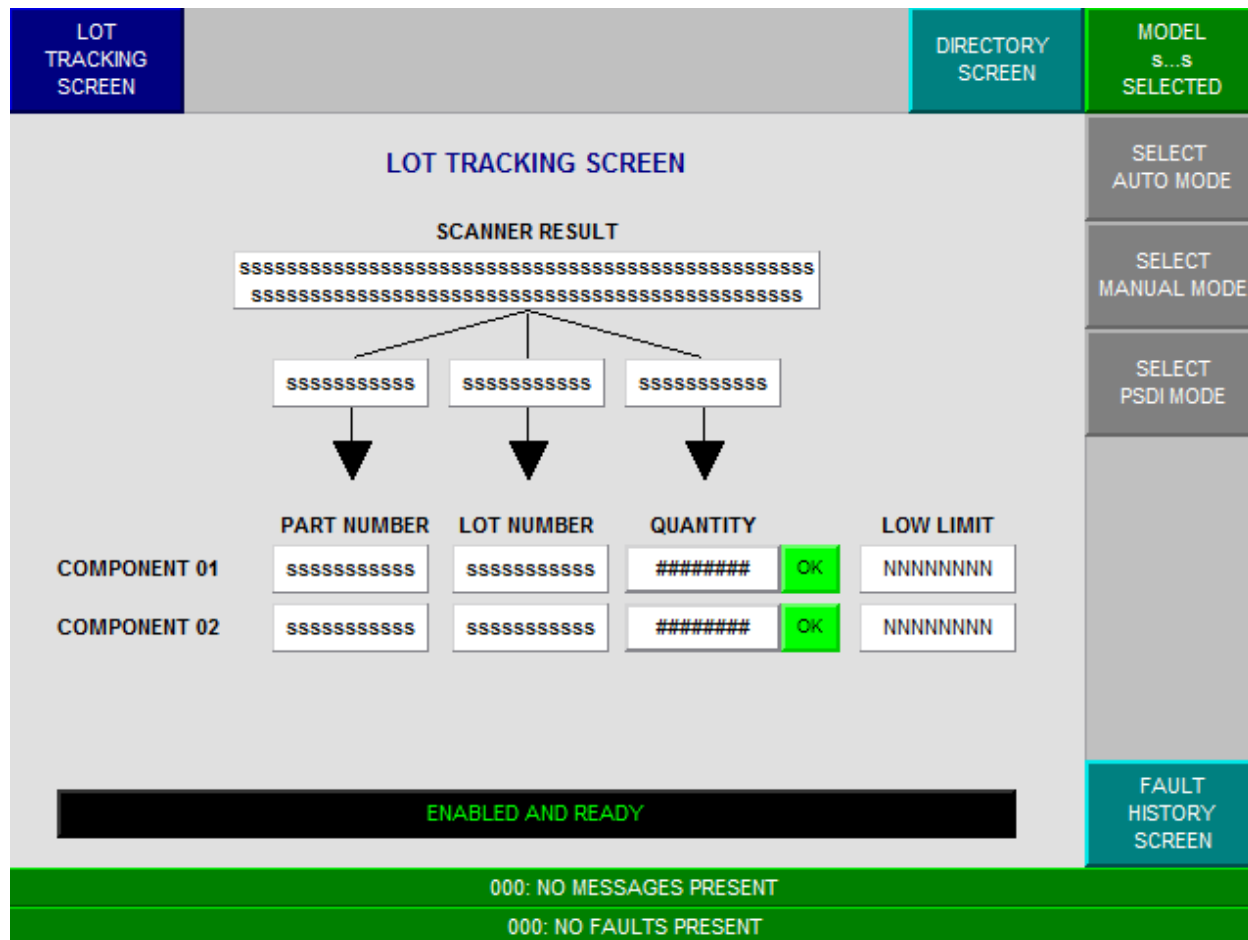


Figure O: Lot Tracking Screen

17.2. The screen name box, in the upper left-hand corner, shall contain the text “LOT TRACKING SCREEN.”

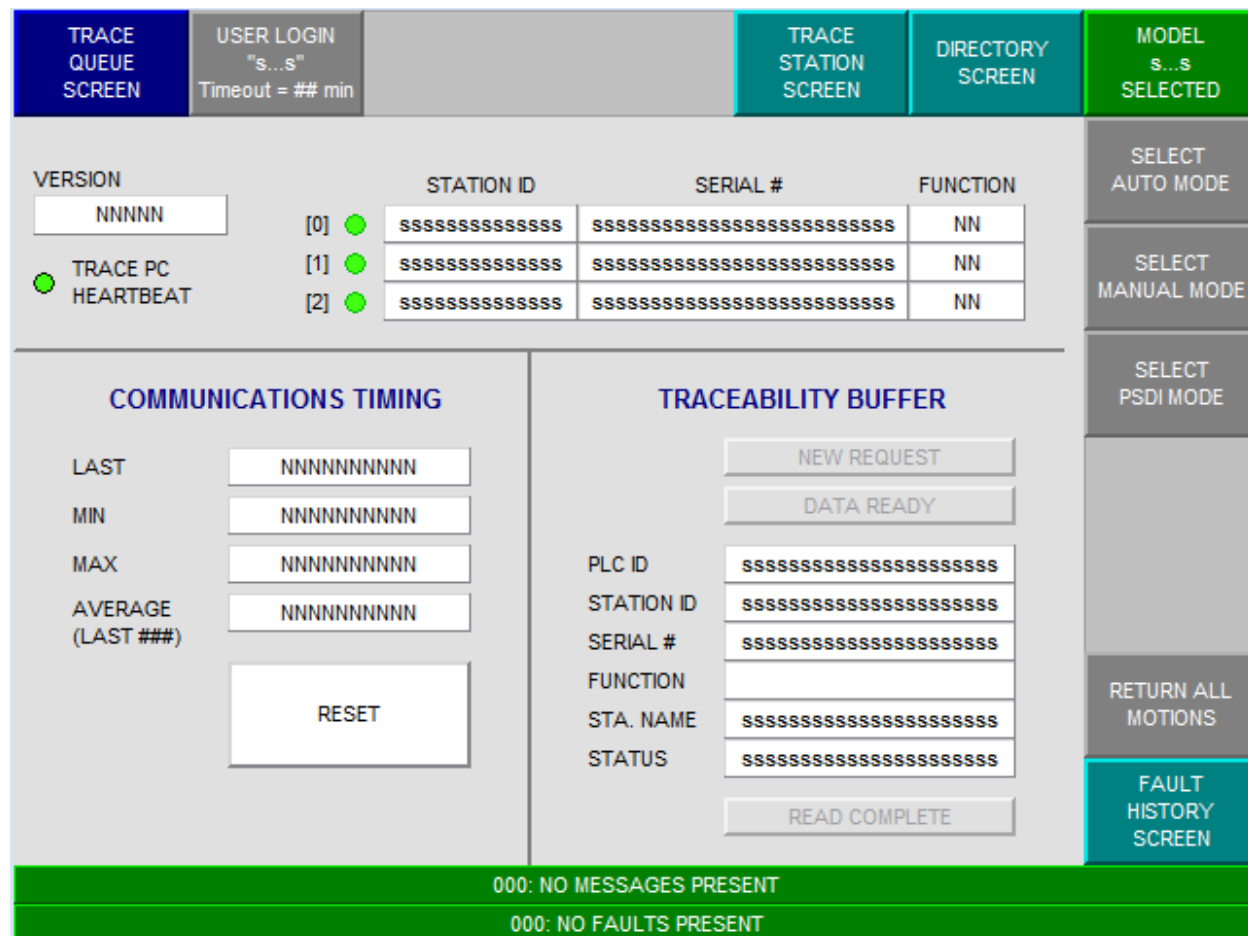
17.3. Each component that is being scanned and tracked on the machine or station needs to be shown on this screen.

17.4. The Part Number, Lot Number, Quantity, and Low Limit on the quantity must be viewable by the operator.

17.5. The scanner result area is required to show what data is being scanned in each scan of the bar code. Depending on the prefix of the bar code data, the information scanned will be loaded in the part number, lot number, or quantity fields.

18. TRACEABILITY QUEUE & STATION SCREENS

18.1. This section refers to Traceability Screens. See Figures P and Q.



VERSION	STATION ID	SERIAL #	FUNCTION
NNNNN	[0] ● sssssssssssss	ssssssssssssssssssssssssssssss	NN
<input checked="" type="radio"/> TRACE PC HEARTBEAT	[1] ● sssssssssssss	ssssssssssssssssssssssssssssss	NN
	[2] ● sssssssssssss	ssssssssssssssssssssssssssssss	NN

COMMUNICATIONS TIMING

LAST:

MIN:

MAX:

AVERAGE (LAST ###):

TRACEABILITY BUFFER

PLC ID:

STATION ID:

SERIAL #:

FUNCTION:

STA. NAME:

STATUS:

000: NO MESSAGES PRESENT
 000: NO FAULTS PRESENT

Figure P: Traceability Queue Screen

18.2. The screen name box, in the upper left-hand corner, shall contain the text “TRACEABILITY QUEUE SCREEN.”

18.3. The Traceability Queue screen is intended to show the pending requests to/from the traceability PC, the current request Buffer the queue is working on, and the communications timing.

18.4. The screen shows the version of the *R27_Trace_VI_Queue* logic routine in the PLC as well as the traceability PC heartbeat status.

18.5. The Traceability Queue shall show the Station ID, Serial #, and the Function of the request.

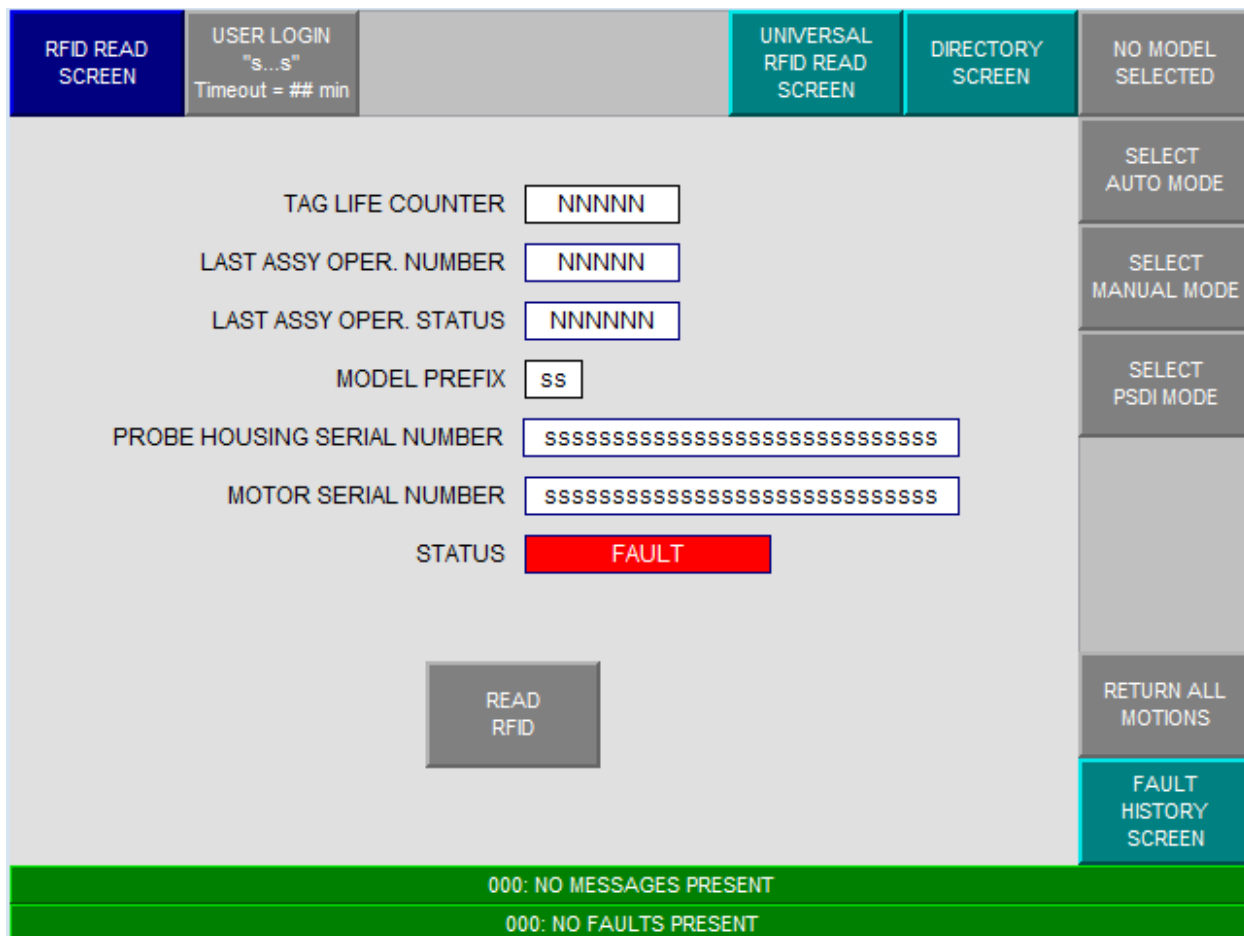
18.6. The Communications Timing sections units are in milliseconds. A reset button shall be present to allow resetting the values when desired.

Figure Q: Traceability Station Screen

18.12. The information along the left side: PLCID, StationID, Station Name, Model, and LookupID's are all pertaining to the station this screen represents.

19. RFID TAG READ SCREENS

19.1. This section refers to the RFID Screen(s). See figure R.



The screenshot displays the 'RFID READ SCREEN' interface. At the top, there is a navigation bar with buttons for 'RFID READ SCREEN' (highlighted in blue), 'USER LOGIN' (with a sub-label 's...s' and 'Timeout = ## min'), 'UNIVERSAL RFID READ SCREEN', 'DIRECTORY SCREEN', and 'NO MODEL SELECTED'. The main area contains several data fields: 'TAG LIFE COUNTER' (NNNNN), 'LAST ASSY OPER. NUMBER' (NNNNN), 'LAST ASSY OPER. STATUS' (NNNNNN), 'MODEL PREFIX' (ss), 'PROBE HOUSING SERIAL NUMBER' (a long string of S's), and 'MOTOR SERIAL NUMBER' (a long string of S's). Below these is a 'STATUS' field showing 'FAULT' in a red box. A 'READ RFID' button is positioned below the status field. On the right side, there is a vertical column of buttons: 'SELECT AUTO MODE', 'SELECT MANUAL MODE', 'SELECT PSDI MODE', 'RETURN ALL MOTIONS', and 'FAULT HISTORY SCREEN' (highlighted in blue). At the bottom, a green status bar shows '000: NO MESSAGES PRESENT' and '000: NO FAULTS PRESENT'.

Figure R: RFID Read Screen

19.2. The screen name box, in the upper left-hand corner, shall contain the text “RFID READ SCREEN.”

19.3. If there is more than one RFID antenna on an assembly line or cell that is, there will need to be one of these screens for each antenna in the PLC program.

19.4. The screen layout of the values shall follow the part RFID memory map values that apply to this machine or station on an assembly line or cell. If this screen is displaying values of pallet RFID tags, the same approach applies.

19.5. These values shall be extracted and formatted appropriately to properly display meaningful values read from the RFID tag.

19.6. A manual read pushbutton shall be provided to trigger the request. The read status shall be displayed above the read pushbutton, as shown. The triggering of this read request shall only occur in Manual mode.

19.7. An RFID Universal Read Screen button may be provided to the left of the Directory screen button. This screen is provided in our HMI template file for addition use as needed to provide a means to read the RFID tag in whatever memory location desired. *Note: If this screen is not determined to be necessary, it shall not be provided in the HMI application.*

19.8. An RFID WRITE screen may be added to the HMI application for development use only. This screen shall be removed, along with its logic, prior to MQ1. *Note: Nexteer has a template WRITE screen for use if desired, contact the Nexteer Controls Engineer for this screen.*

20. MULTIPLE HMI STATION EQUIPMENT

20.1. This section applies to multi-station, multiple HMI, synchronous-transfer systems, where machine motion can be initiated from more than one HMI. *Reference SD-1032 for logic requirements.*

Note: This section does not apply to asynchronous transfer systems such as pallet-and-free conveyor lines. These requirements also do not apply to HMI stations included solely for remote display purposes.

20.2. Main control console shall have a screen(s) to indicate “STATION RETURNED”, “STATION CYCLED”, and Manual/Off/Auto indication for each station.

20.3. Manual control of any indexing or transfer mechanism shall be located at, but not limited to, the main control console.

20.4. Remote station consoles shall have the required screens as detailed in HMI Required Screens section.

20.5. In addition, each remote control console shall have the following functions as a minimum:

- Manual/Off/Auto selection (Required on each HMI station that can initiate motion).
- Cycle Stop (For entire machine - required only on continuous cycle equipment)
- Indication of Cycled (or Full Depth)

20.6. Additional screens may be required at remote station consoles for process related control. Consult the Nexteer Engineer to determine the applicable screens.

RECORD OF REVISIONS

Revision #	Date	Section	Description
001	01JUL04	ALL	ORIGINAL ISSUE
002...017	15 DEC04 ... 02DE11	ALL	REVISION RECORDS CONSOLIDATED. SEE REV 02DE11 FOR REVISION RECORDS.
018	14JL14	ALL	UPDATE PER CENTRAL CSE BPI-2, 2014
019			
020			
021			
022			
023			
024			
025			
026			
027			
028			
029			
030			
031			
032			
033			
034			
035			