

Program Book & Guidelines for *eHMI with MEL-FACS*

Version D1.0

Document: eHMI User Manual

The screenshot displays the eHMI control interface with the following components:

- Header Fields:** MODEL TYPE: ABCDEFGHIJKL, SERIAL: ABCDEFGHIJ, PALLET: ABCD, WORK POSITION: AB
- Task List Table:**

TASK #	TASK DESCRIPTION	BUILD?	STATUS	TASK MODE
3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
01 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
02 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
03 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
04 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
05 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
06 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
07 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
08 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
09 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
10 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
11 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
12 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
13 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
14 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
15 3456	ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstu			
- Cycle Progress:** A green progress bar is shown at 60.0% completion.
- Control Buttons (Right Side):** ENABLE TASK, CONT BYPASS (PART NOK), REJECT PART, ACCEPT PART, CYCLE RESET, WORK POS SELECTION.
- Task Status Buttons (Bottom):** TASK STATUS, MELFACS SIM, Training ERROR PROFING, Training PICK SENSOR, Training STITCHING TOOL, Training SOCKET TOOL, Training MULTI-SPINDLE, Training STITCHING TOOL FB.

Version D1.0

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Document Version History

Date	Version No.	Document Name	Revision	Revised By
March 04, 2013	D0.1	Program Book & Guidelines - eHMI	First Draft	eFlex Systems - Integration Team
June 06, 2016	D1.0	Program Book & Guidelines - eHMI	Modifications from May 2016 program changes.	eFlex Systems – Integration Team

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Content

Section 1)

<i>An Introduction to the eHMI</i>	5
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Section 2)

<i>Screens of Special, or Common Functions (Apply to Manual, Auto, and Special Stations)</i>	6-11
2.1 Main Screen	6
2.2 Task Navigation Screen	8
2.3 eHMI Setup/ Maintenance Screen.....	9
2.4 Task Selection Pop-Up Window	10
2.5 Result Description Toggle	11

Section 3)

<i>Manual & Auto Station Screen Overview</i>	12-25
3.1 Stitch Task Screen	12
3.2 Stitch w/Socket Task Screen	13
3.3 Multispindle Task Screen	14
3.4 Camera Task Screen	16
3.5 Universal (Generic) Task Screen	17
3.6 Error Proofing Sensor Screen	18
3.7 Pick Sensor Task Screen	20
3.8 Barcode Task Screen	21
3.9 Lubrication Task Screen	22
3.10 Test Task Screen.....	23
3.11 Press Task Screen	24
3.12 Robot Task Screen.....	25

1 An Introduction to the eHMI

Scope of this document:

This document was created to assist the system integrator in obtaining a deeper understanding of the eHMI, as well as how it ties into the MelFACS structure. In this document you will read through detailed descriptions of what each function does, and where its potential application is.

What the eHMI will do for you:

The eHMI is an application that runs on a standard dedicated hardened HMI not a PC based HMI, i.e. Mitsubishi GOT (The current supported range is the GOT2000 series). Our eHMI was developed to leverage the dynamic flexible environment of eFlex Assembly to support Lean flexible assembly. Previously things like symbolic information and communications addressing were hardcoded into the HMI which the eHMI platform now eliminates. The eHMI has a master user screen that presents the operator with all of the important information required for their work in station i.e. Task indicators and sequencing, Part status, task status, cycle time, model code, and manual operation buttons for all of the different task types that are configured in eFlex for that station. With this, it is now possible to consistently mimic what is seen in eFlex Assembly on the HMI. As changes are made in the eFlex configuration, they are instantly reflected in all subsystems including eHMI. This makes life easier for all users: Production, engineering and maintenance. Just like we have common logic for the stations, we can now have a universal baseline for all HMI projects that is tied into eFlex Framework. OEMs now have an HMI that is plug and play ready to support any MelFACS line. They will take our eHMI package and add on as they see fit. Everyone on the plant floor now has the ability to easily see exactly what the configuration, and status is in each station via the eHMI.

2 Common functionality

2.1 Main Screen

This is the standard screen for the operator to use. It summarizes all of the “behind the scenes” information being processed by the PLC, and displays it in an intuitive, comfortable format.

This screen is the first to appear after Boot-up.

The screenshot displays the Main Screen interface. At the top, there are input fields for MODEL TYPE (ABCDEFHIJKL), SERIAL (ABCDEFHIJ), PALLET (ABCD), and WORK POSITION (AB). Below these is a table with columns: TASK #, TASK DESCRIPTION, BUILD?, STATUS, and TASK MODE. The table contains 15 rows of task data. To the right of the table is a CYCLE PROGRESS section with buttons for various stages: CFG RECEIVED, PALLET PRESENT, RF READ CMP, PRE-REQ OK, PRE-REQ NOK, MODEL FOUND, MODEL UNKNOWN, TASKS ENABLED, WORK POS ALL TASKS DONE, CYCLE COMPLETE, RF WRITE CMP, MELFACS UPDATED, and ROY TO RELEASE. Further right are buttons for ENABLE TASK, CONT BYPASS (PART NOK), REJECT PART, ACCEPT PART, CYCLE RESET, and WORK POS SELECTION. At the bottom left, there is a RUNNING CYCLE TIME (PERCENTAGE %) bar graph showing 60.0%. At the bottom, there is a row of buttons for TASK STATUS, MELFACS SIM, Training ERROR PROFING, Training PICK SENSOR, Training STITCHING TOOL, Training SOCKET TOOL, Training MULTI-SPINDLE, and Training STITCHING TOOL FB. Red circles A-I highlight specific features: A (Task Description), B (Build?), C (Status), D (Task Mode), E (Cycle Progress), F (Enable Task), G (Model Type), H (Task List Navigation), and I (Running Cycle Time).

A) Task Descriptions

- Column of text that displays task descriptions as they are configured, and sequenced in eFACS. This will update any time a change is made to the station configuration. There is no need to reprogram and hardcode information into the GOT.
- Each row of descriptions is selectable by pressing over the text. This will enable special functions for that specific task.

B) Build/No Build

- Column of text that informs the operator of whether or not the task needs to be completed for the current (in station) model type.
- In a not required condition, the box corresponding to that task is red and will display “N”.
- When the task is required for completion, this box will be green and displays “Y”.

C) Status

- Column of text that describes the current status of that task.
EX: “STARTED”, “PREREQ-NOK”, “REJECTED”, “ACCEPT”, “BYPASSED”, etc.
(See description of status codes for more detail: “MIFACS4.0_Cfg_For Nissan.xls”)

D) Task Mode

- a. Column of text indicating the task's position in sequence.
- b. When a task is ready to be worked, this box will read "ENABLED".
- c. When a task is bypassed, either manually or in eFACS, this box will read "SNGL BYP" or "CONT BYP".
 - "SNGL BYP" condition indicates part still ok for Nissan.
 - "CONT BYP" condition indicates rejected part for Nissan.

E) Cycle Progress

- a. Think of this as a gauge that fills as the MelFACS sequence progresses through the station cycle.
- b. If anything happens, this is a quick useful tool for determining where in the sequence you are, and will pinpoint you to what portion of the cycle you need to troubleshoot.

F) Operator Control

- a. Column of buttons that give an operator control over the station.
 - If the selected task is not configured to allow bypassing, "ENABLE TASK", and "CONT BYPASS (PART NOK)" will be greyed out and their functionality removed.
- b. "ENABLE TASK" – Allows the operator to forcibly enable a task. (In the event of a manual bypass reversal is required.)
- c. "CONT BYPASS (PART NOK)" – If the task is configured to allow a bypass, this button marks the selected task as bypassed for each new part (when the task is buildable). This is marked as "Reject".
 - **It is recommended that the OEM add security to this button.**
- d. "REJECT PART" – Marks a part as reject
 - **It is recommended that the OEM add security to this button.**
- e. "ACCEPT PART" – Marks a part as accept
 - **It is recommended that the OEM add security to this button.**
- f. "CYCLE RESET" – MelFACS sequence reset.
 - **It is recommended that the OEM add security to this button.**
- g. "WORK POS SELECTION" – Toggles through display of configured work positions in the station.

G) Current Model Banner

- a. Displays current model type, serial number, pallet number, and the current work position.

H) Task Display buttons

- a. Buttons that allow you to switch between task windows. The default display is set for tasks 1-15.
 - We currently allow you to view up to 90 configured tasks.
- b. Pressing either of the two single arrows will move the display up or down.
- c. Pressing the double down arrow jumps to the last page of tasks (76-90). Pressing the double up arrow jumps to the first display of tasks (1-15).
 - **Note that the Station Task will always display on the top of every task page.**

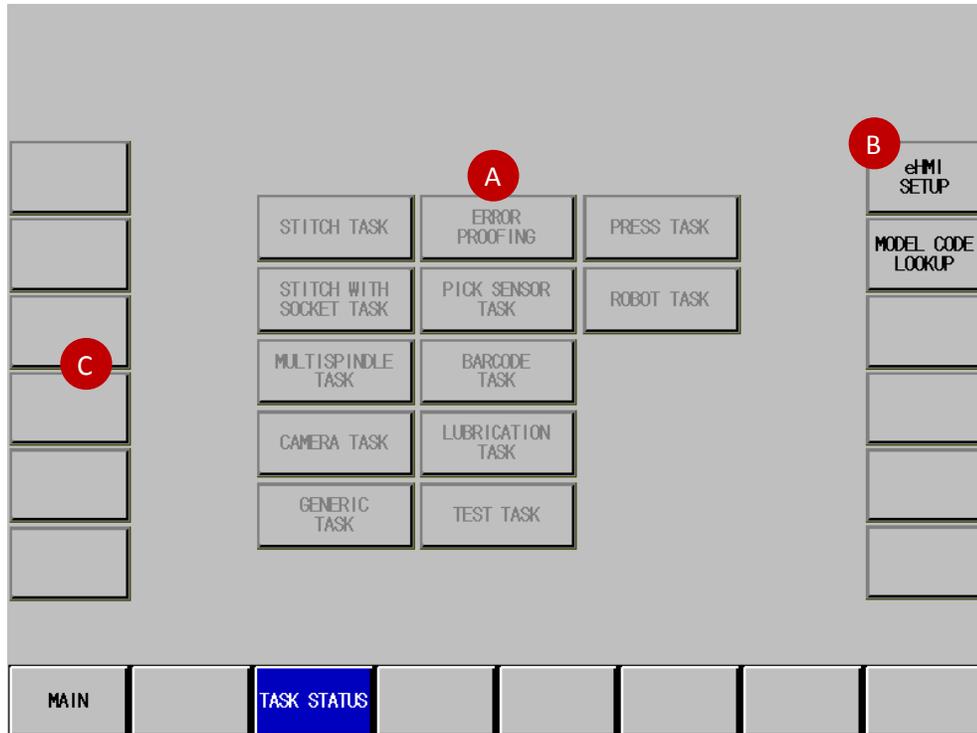
I) Cycle Progress

- a. Takes the configured station cycle time, and scales it into a percentage of which will display here.
 - 0-75%, Cycle progress bar fills as green.
 - 76-98%, Cycle progress bar fills as yellow.
 - 99-100%, Cycle progress bar fills as red.

2.2 Task Navigation Screen

This serves as the link between the Main Screen, and the deeper detail of the individual task status screens. Any time you choose to look at a task in depth, this screen will assist in navigating you to that task.

This screen is accessible from the Main Screen, eHMI Maintenance Screen, and any of the Task Status screens.



A) Task Navigation Buttons

- Assortment of navigation buttons that allow the operator to navigate to a new window.
- Tasks not configured for that station are greyed out, and have their functionality removed.
- Each of the task screens are organized by task type, and are designed to mimic how eFACS handles separation of the individual tasks.
 - Each main task gets its own screen, accessible from this window.
 - In order to access sub tasks, you must first enter the desired task's parent screen first.

B) eHMI Maintenance Button

- Opens up the eHMI maintenance screen.
 - It is recommended that the OEM add security to this button.**

C) Blank Navigation Buttons

- Blank button templates left for the OEM to utilize if desired.

2.3 eHMI Maintenance Screen

Used to troubleshoot, monitor, override, and configure settings for the functionality of the eHMI description parsing.

- It is recommended that this be added to the OEM maintenance directory.

A) eHMI Debug Tool

- Used by eFlex software developers to diagnose issues, or help implement new features.

B) eHMI Data Control

- “FORCE TEXT FILE” - Allows the maintenance operator to force the GOT into parsing the eHMI.csv text file. This creates a clean slate and starts the scan from fresh.
- “INTERRUPT TEXT FILE” – Gives the maintenance operator the ability to stop the text file from being parsed any further.
- “eHMI STATUS” – Displays information to show when the eHMI is updating, and when it has finished.

C) eHMI Progress Indicators

- As the eHMI moves through its sequence, each step appears momentarily on an indicator. If the process is stuck, this will show where, which aids in diagnostics.

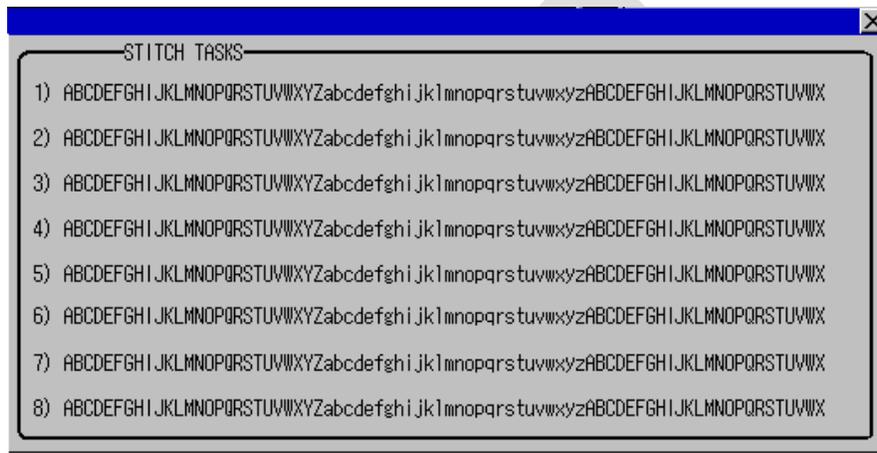
D) Version Information

- Displays current eHMI package version information

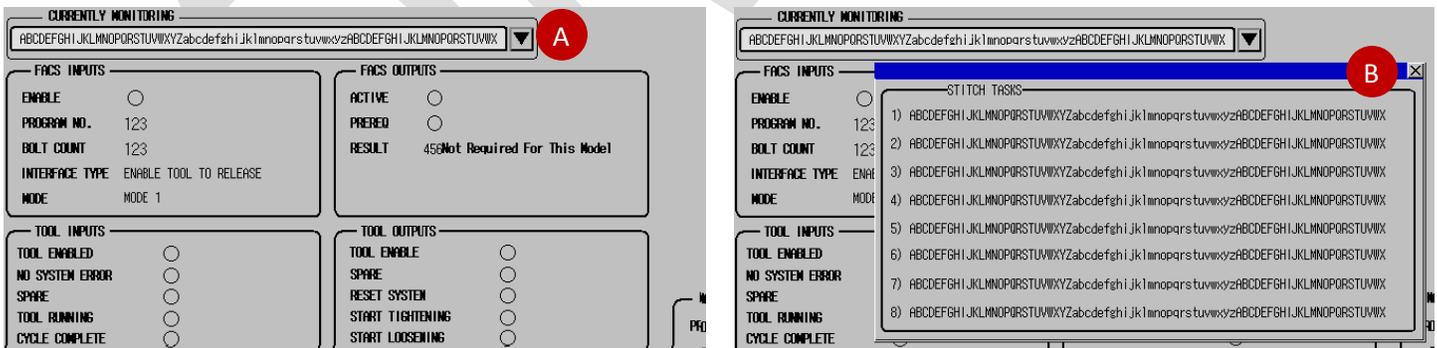
2.4 Task Selection Pop-Up Window

The task selection pop-up window allows you to choose which one of the configured main tasks you would like to display. Between MelFACS and the OEM, there is a lot of potential information to display to the operator. We typically like to present all of the information for one task on one screen. Switching between tasks to monitor is handled via indirect pointers. You select the desired task from the drop down, and the code will switch the display for you.

This pop-up window is common to many of the task status screens. More specifically, you can expect some variant of this window to appear on any task that has either an external controller, or configurable sub-tasks. In the example provided below we will look at stitch tasks. (There are up to eight configurable tasks.)



Example

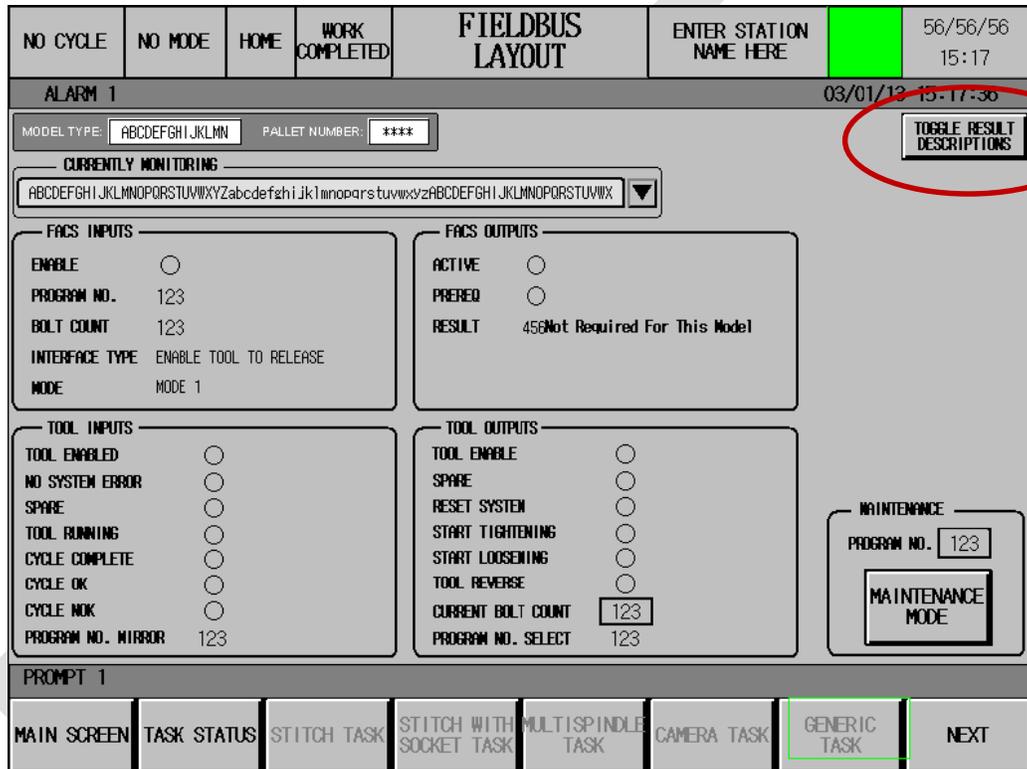


- 1) Entire screen is dedicated to one specific stitch task.
- 2) Pressing the drop down (A) will bring up the task selection window (B).
- 3) After pressing the stitch task drop down (A), the stitch task selection window (B) appears.
- 4) You are now able to choose a new task to monitor.

2.5 Result Description Toggle

The eFlex Assembly architecture utilizes result descriptions to track, monitor, debug, diagnose, repair, and report part history. Result descriptions tell the operator, maintenance, and engineers exactly what happened during any part of the station cycle.

There is a result code field on just about every task status screen, for just about every task. Because both the code and the description of that result are so critical, we've introduced a toggle button that is common to every task screen. This button does exactly what its name implies, toggles the display of the result. (Code to description.)



3 Manual & Auto Station Screen Overview

3.1 *Stitch Task Screen*

Allows an operator to monitor the status of individually configured Stitch tool tasks.

The screenshot shows the 'STITCH TOOL TASK' screen. At the top, there is a 'CURRENTLY MONITORING' dropdown menu (A) with a list of alphanumeric characters. To the right is a 'TOGGLE RESULT DESCRIPTIONS' button (B). Below these are four main panels: 'FACS OUTPUTS' (C) containing 'SEQUENCE ENABLE' (radio button), 'REQUIRED' (radio button), 'PROGRAM NO.' (123), 'BOLT COUNT' (123), 'INTERFACE TYPE' (ENABLE TOOL TO RELEASE), and 'MODE' (STITCH TOOL (NOT FOR REPAIR)); 'FACS INPUTS' (D) containing 'RESULT' (Not Required For This Model); 'TOOL INPUTS' (E) containing 'TOOL ENABLED' (radio button), 'NO SYSTEM ERROR' (radio button), 'SPARE' (radio button), 'TOOL RUNNING' (radio button), 'CYCLE COMPLETE' (radio button), 'CYCLE OK' (radio button), 'CYCLE NOK' (radio button), and 'PROGRAM NO. MIRROR' (123); and 'TOOL OUTPUTS' (F) containing 'TOOL ENABLE' (radio button), 'SPARE' (radio button), 'RESET SYSTEM' (radio button), 'START TIGHTENING' (radio button), 'START LOOSENING' (radio button), 'TOOL REVERSE' (radio button), 'CURRENT BOLT COUNT' (123), and 'PROGRAM NO. SELECT' (123). To the right of the tool outputs is a 'MAINTENANCE' panel (G) with 'PROGRAM NO.' (123) and 'MAINTENANCE MODE' (checkbox). At the bottom is a navigation bar with buttons: MAIN, TASK STATUS, STITCH TASK, STITCH WITH SOCKET TASK, MULTISPINDLE TASK, CAMERA TASK, GENERIC TASK, and NEXT.

- A) **Task Selection Pop-up (Common, will not be repeated in further sections)**
 - a. (See section 2.4 for details)
- B) **Toggle Result Descriptions (Common, will not be repeated in further sections)**
 - a. (See section 2.5 for details)
- C) **eFACS Outputs (Common, will not be repeated in further sections)**
 - a. "Sequence Enable" Indicates the task is enabled by the MelFACS sequencer.
 - b. "Required" Indicates that the task is configured for this model.
 - c. "Program Number" indicates the program that the tool needs to run, as configured in eFACS.
 - d. "Bolt Count" displays the number of bolts to be run-down by the tool, as configured in eFACS.
 - e. "Interface Type" shows the method configured to communicate with the station PLC.
 - f. "Mode" displays the configured tool mode for the selected task.
- D) **eFACS Inputs (Common, will not be repeated in further sections)**
 - a. "Result" shows the result of the current task.
- E) **Tool Inputs (Common, will not be repeated in further sections)**
 - a. This memory map should be supplied by the tool manufacturer, and populated by OEM.
- F) **Tool Outputs (Common, will not be repeated in further sections)**
 - a. This memory map should be supplied by the tool manufacturer, and populated by OEM.
- G) **Maintenance Mode (Common, will not be repeated in further sections)**

- a. Maintenance mode provides the ability to go in and override the configured program number for a specific tool.
 - It is recommended that the OEM add security to this button.
 - Because this screen uses an indirect pointer to handle device switching, you can use the word value of system label w:<FHMI_Sel_Stitch> to know which task is being monitored.

3.2 Stitch w/Socket Task Screen

The Stitch w/Socket Task screen allows an operator to monitor stitch tasks that include the use of socket tray error proofing. In this format there are up to eight configurable sockets per stitch tool task. The sockets are represented as individual sub tasks under a single stitch task.

STITCH TOOL TASK W/ SOCKET TRAY

TOGGLE RESULT DESCRIPTIONS

CURRENTLY MONITORING

ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI JKLMNOPQRSTU VWIX ▼ B

SOCKET NAME	SEQUENCE ENABLE	REQUIRED	PROGRAM NUMBER	BOLTS COUNT	ACTUAL COUNT	RESULT
1) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	456	N66 Required For This Model
2) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	456	N66 Required For This Model
3) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model
4) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model
5) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model
6) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model
7) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model
8) ABCDEF GHI JKLMNOPQRSTU VWXYZ abcdefghi jklmnopqrstu vwxyz ABCDEF GHI	<input type="radio"/>	<input type="radio"/>	123	123	123	N66 Required For This Model

FACS INPUTS

SEQUENCE ENABLE REQUIRED PROGRAM NUMBER 123 BOLTS COUNT 123

OVERALL RESULT FROM OEM N66 Required For This Model

MAINTENANCE

PROGRAM NO. 123

MAINTENANCE MODE

MAIN

TASK STATUS

STITCH TASK

STITCH WITH SOCKET TASK

MULTISPINDLE TASK

CAMERA TASK

GENERIC TASK

NEXT

A) Socket Names

- a. List of configured sockets for the selected main stitch task.
 - The main task is always displayed on the “Currently Monitoring” pane.

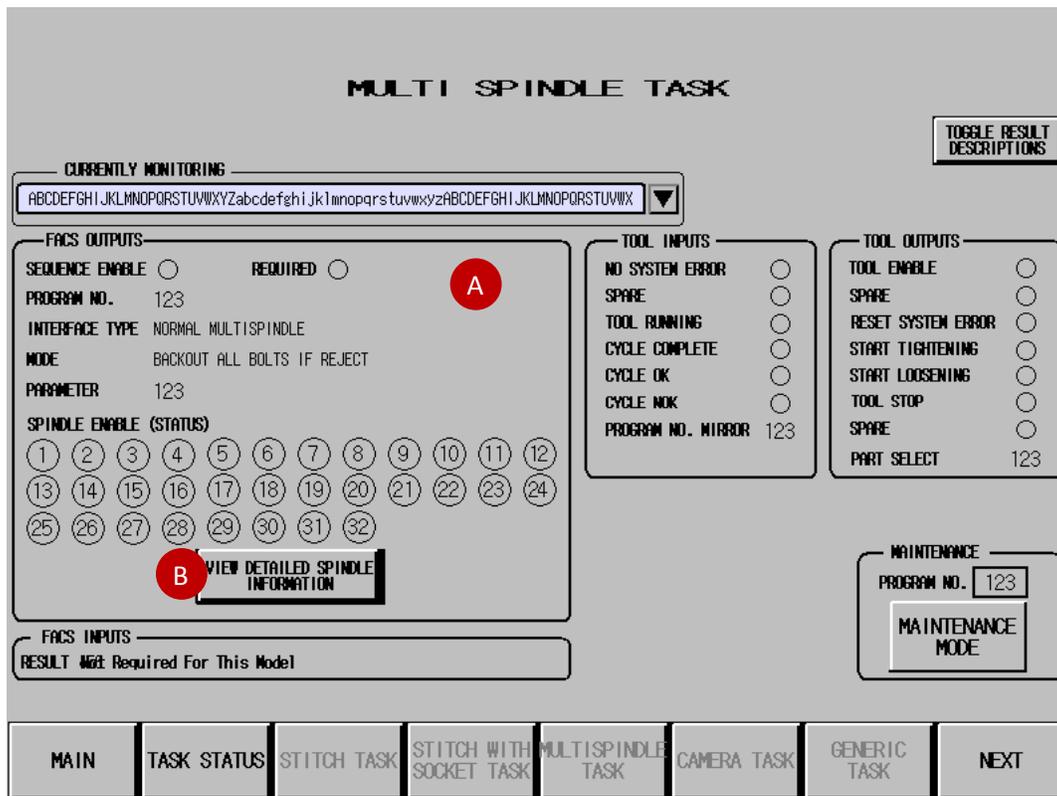
B) Actual Count

- a. “Actual Count” displays the current bolt count for the enabled socket task
 - See section “3.1: Stitch Task Screen” for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.3 Multispindle Task Screen

This screen is a summary of all of the individual spindles (up to 32) for any of the four configurable Multispindle tasks.

A separate screen displaying detailed spindle information is available.



A) FACS Outputs

- a. "Parameter" is a multispindle specific value configured in eFACS.

B) View Detailed Spindle Information

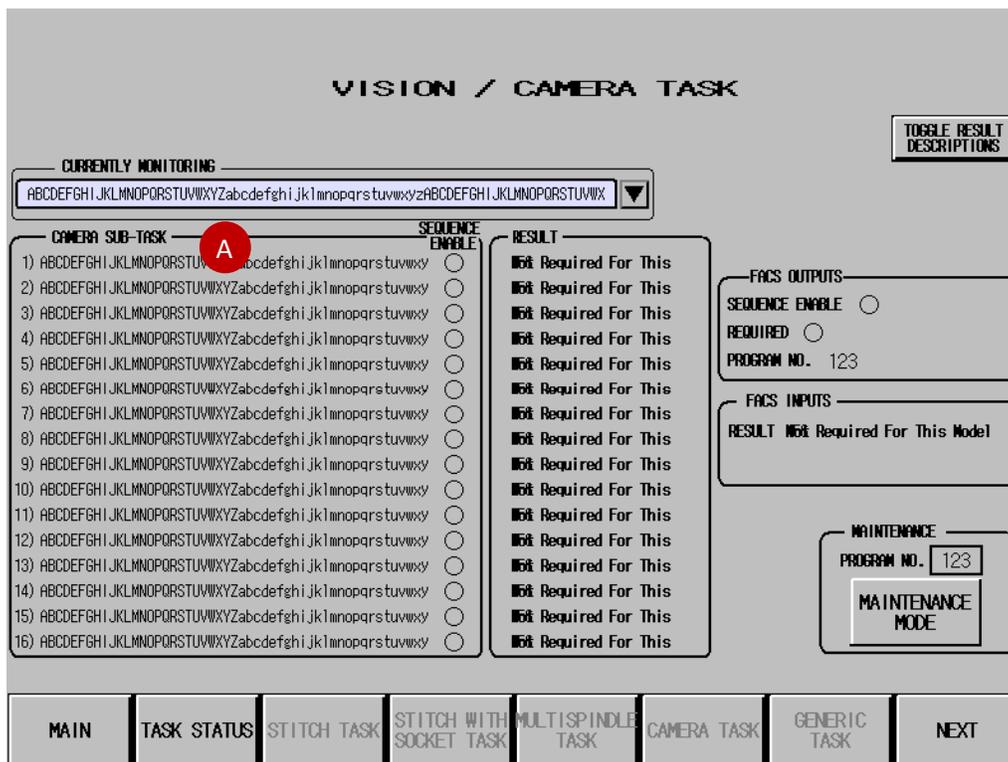
- a. Button that navigates the operator to a separate screen dedicated to the display of detailed spindle information.
- b. (1) It is possible to switch the main Multispindle task from this view.
- c. (2) This new screen is a complete sub-environment of the Multispindle task screen. On it, you will find:
 - "Spindle Description" - List of configured spindles.
 - "Enable" - Indicator displaying whether or not the spindle is ready to run.
 - "Bypass" - Indicator displaying whether or not the spindle is in bypass mode.
 - "Result" - Text field displaying the result status of the spindle.
- d. (3) Special navigation bar allowing the operator to switch pages (Spindles 1-16, and 17-32), return to the main Multispindle task screen, and navigate out back to the main or task index screens.

NO CYCLE	NO MODE	HOME	WORK COMPLETED	FIELD BUS LAYOUT	ENTER STATION NAME HERE	56/56/56 10:36																																																																				
ALARM 1						03/04/13 10:36:35																																																																				
MODEL TYPE: ZR1000001JKLMN		PALLET NUMBER: ZR100000		68220 TABLE RESULT DESCRIPTIONS																																																																						
CURRENTLY MONITORING																																																																										
GD2100GH IJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI JKLMNOPQRSTUWVX 1																																																																										
SPINDLE DESCRIPTION																																																																										
<table border="1"> <thead> <tr> <th>SPINDLE DESCRIPTION</th> <th>ENABLE</th> <th>BYPASS</th> <th>RESULT</th> </tr> </thead> <tbody> <tr> <td>1) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>2) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>3) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>4) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>5) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>6) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>7) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>8) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>9) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>10) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>11) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>12) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>13) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>14) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> <td><input type="radio"/></td> <td>456Not Required For This Model</td> </tr> <tr> <td>15) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI</td> <td><input type="radio"/></td> 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ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	6) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	7) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	8) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	9) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	10) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	11) ABCDEFGHIJKLMNOPQRSTUWVWXYZabcde fgh i jklmnopqrs tuvwx yz ABCDEFGHI	<input type="radio"/>	<input type="radio"/>	456Not Required For This Model	12) 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PROMPT 1																																																																										
MAIN SCREEN	TASK STATUS	3		PREVIOUS	NEXT	RETURN																																																																				

- See section "3.1: Stitch Task Screen" for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.4 Camera Task Screen

Camera (Vision) tasks are displayed here. Similar to previous formats, the main camera task screen summarizes the status of all sub inspection tasks and displays it here for the operator.



A) Camera Sub Tasks

- List of configured sub inspection tasks.
- Also displayed here is the sequence enable of the sub task, and each corresponding result.

- See section "3.1: Stitch Task Screen" for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.5 Universal (Generic) Task Screen

This screen allows the operator to monitor the status of individually configured generic tasks.

GENERIC / UNIVERSAL TASK

TOGGLE RESULT DESCRIPTIONS

CURRENTLY MONITORING

ABCDEFGHIJKL... ▾

FACS OUTPUTS

SEQUENCE ENABLE REQUIRED

PROGRAM NO. 123

PROCESS VALUE 234567.0

FACS INPUTS

RESULT Not Required For This Model

MAINTENANCE

PROGRAM NO. 123

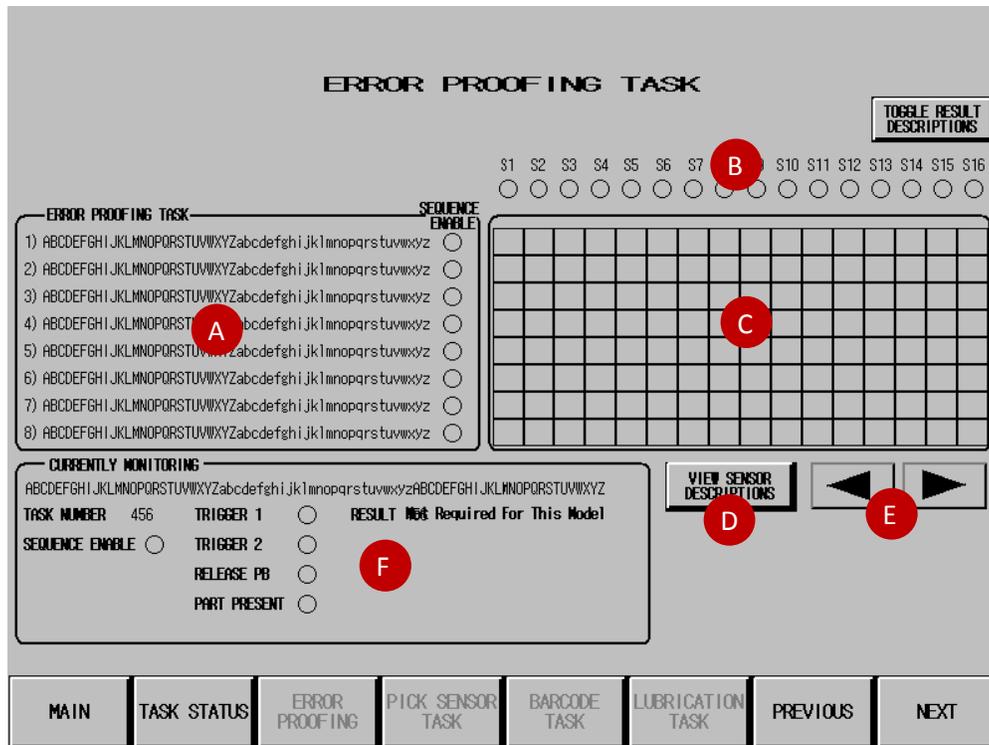
MAINTENANCE MODE

MAIN
TASK STATUS
STITCH TASK
STITCH WITH SOCKET TASK
MULTISPINDLE TASK
CAMERA TASK
GENERIC TASK
NEXT

- See section "3.1: Stitch Task Screen" for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.6 Error Proofing Sensor Screen

The Error Proofing screen allows an operator to monitor the progress of error proofing tasks. This screen is actually split into two separate portions. The first section shows Error Proofing tasks one through eight, while the second section shows tasks nine through sixteen. The screen format of this particular task type is much different from what we've seen prior to this. Let's look at that in more depth.



A) Error Proofing Task Status

- a. Column of text displaying configured Error Proofing tasks.
 - Page one lists tasks 1-8.
 - Page two lists tasks 9-10.
- b. Enable column allows you to see which task is currently ready to run.

B) Sensors

- a. Row of configurable sensors, one through sixteen along with a representation of their current physical state.
- b. In order to see detailed sensor information, press (D) to bring up the Sensor Description pop-up window.

C) Error Proofing Matrix

- a. This matrix shows you exactly what the configured state for that sensor needs to be in order to satisfy the requirements of that task.
- b. Right now the matrix is displaying a null value, or no-care condition. There are three possible states that each box could be in: "ON", "OFF", or empty.
 - i. Let's assume we wanted to troubleshoot Error Proofing task number 4. We would first look in that row to check for an enable condition. This would tell us that the task is ready to run. Once we know the task is enabled, we scan over the matrix looking at the row of boxes corresponding to that task. Our goal is to match the status of what we read in that box with

the status of the real world sensors. If Sensor 5 was configured to be off, while 6 and 7 were required to be on, we would want to see the boxes in that row read: “OFF”, “ON”, “ON” with blank boxes everywhere else.

D) View Sensor Descriptions

	INPUT	SENSOR DESCRIPTION		STATUS
	SENSOR - ADDRESS			
S1)	X1030	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S2)	X1031	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S3)	X1032	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S4)	X1033	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S5)	X1034	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S6)	X1035	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S7)	X1036	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S8)	X1037	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S9)	X1038	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S10)	X1039	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S11)	X103A	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S12)	X103B	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S13)	X103C	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S14)	X103D	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S15)	X103E	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○
S16)	X103F	ABCDEFGHIJKLMN	OPQRSTUVWXYZ	○

- Pop-Up window showing details of the configured sensor.
 - **Note that this is for the actual Sensors, not the Error Proofing tasks.**
- (1) The first column “Sensor” shows the abbreviation given to sensors on the main Error Proofing task screen. (Ex: S1, S5, S10, S16)
- (2) “Input Address” is a column showing the address assigned to the sensor within the PLC.
- (3) “Sensor Description” lists descriptions of the sensors.
- (4) “Status” is a field of indicators that show the operating status of the sensor.

E) Page Navigation

- Allows the operator to navigate between the two Error Proofing task screens.
 - The only difference is in the fact that we display eight tasks per page.
 - Page 1: Tasks 1-8
 - Page 2: Tasks 9-16

F) Current Sensor Details

- Pressing on the text for one of the eight visible error proofing tasks will activate that tasks display of detailed information.
- *See section “3.1: Stitch Task Screen” for details on standard MelFACS information. (Sequence enable, required, result, etc.)*

3.7 Pick Sensor Task Screen

This screen allows an operator to monitor the status of Pick Sensor tasks.

PICK SENSOR TASK							TOGGLE RESULT DESCRIPTIONS
PICK SENSOR TASK	SEQUENCE ENABLE	SENSOR ACTIVE	INPUT SIGNAL	LIGHT ACTIVE	OUTPUT SIGNAL	RESULT	
1) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
2) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
3) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
4) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
5) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
6) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
7) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
8) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
9) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
10) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
11) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
12) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
13) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
14) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
15) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					
16) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="checkbox"/>	N56 Required For This Model					

MAIN	TASK STATUS	ERROR PROOFING	PICK SENSOR TASK	BARCODE TASK	LUBRICATION TASK	PREVIOUS	NEXT
------	-------------	----------------	------------------	--------------	------------------	----------	------

A) Pick Sensor Task

- a. Column of text displaying configured Pick Sensor tasks.

B) Sensor Active

- a. Configuration option in eFACS that determines what condition the input needs to be in order to complete the task.

C) Input Signal

- a. Physical state of the dedicated Pick Sensor input address.

D) Light Active

- a. Configuration option in eFACS that determines what condition the output needs to be.

E) Output Signal

- a. Physical state of the dedicated Pick Sensor output address.

- See section "3.1: Stitch Task Screen" for details on standard MELFACS information. (Sequence enable, required, result, etc.)

3.8 Barcode Task Screen

This screen allows an operator to monitor the status of barcode, and barcode sub-tasks.

BARCODE TASK

TOGGLE RESULT DESCRIPTIONS

CURRENTLY MONITORING
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNORSTUVWX

FACS OUTPUTS

SEQUENCE ENABLE REQUIRED **A**

INTERFACE TYPE RS-232

SCANNED STRING ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNORST

DESCRIPTION	SEQUENCE ENABLE	REQUIRED CHARACTERS	CHARACTERS FOUND
1) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
2) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
3) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
4) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
5) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
6) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
7) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
8) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
9) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ
10) ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz	<input type="radio"/>	ABCDEFGHIJ	ABCDEFGHIJ

FACS INPUTS

OVERALL RESULT
Not Required For This Model

REQUIRED	RESULT
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model
<input type="radio"/>	Not Required For This Model

MAIN **TASK STATUS** **ERROR PROOFING** **PICK SENSOR TASK** **BARCODE TASK** **LUBRICATION TASK** **PREVIOUS** **NEXT**

A) FACS Outputs

- “Scanned String” shows the string found by the reader.
- “Required Characters” will display the string you are searching for.
- “Characters Found” will display the string you have found.

- See section “3.1: Stitch Task Screen” for details on standard MelFACS information.
 (Sequence enable, required, result, etc.)

3.9 Lubrication Task Screen

The lubrication task screen shows you the status, and summary of the lube tasks as configured in eFACS.

LUBRICATION TASK

TOGGLE RESULT DESCRIPTIONS

CURRENTLY MONITORING
 ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ ▼

FACS OUTPUTS

SEQUENCE ENABLE

REQUIRED

PROGRAM NO. 123

FACS INPUTS

RESULT Not Required For This Model

MAINTENANCE

PROGRAM NO. 123

MAINTENANCE MODE

MAIN
TASK STATUS
ERROR PROOFING
PICK SENSOR TASK
BARCODE TASK
LUBRICATION TASK
PREVIOUS
NEXT

- See section “3.1: Stitch Task Screen” for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.10 Test Task Screen

The test task screen allows you to monitor each test task individually, along with all eight of the sub test tasks for each of the main tasks.

TEST TASK

TOGGLE RESULT DESCRIPTIONS

CURRENTLY MONITORING

ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzaBCDEFGHIJKLMNORSTUVWX

FACS OUTPUT

REQUIRED **HIGH LIMIT** **LOW LIMIT** **PRG NUM.** **RESULT**

SEQUENCE ENABLE 123456 123456 123 ABCDEFGHIJKLMNORST

SUB TASK DESCRIPTION	SEQUENCE ENABLE	HIGH LIMIT	LOW LIMIT	PRG NUM.	RESULT
1) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyza	<input type="radio"/>	123456	123456	123	Not Required For This Model
2) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzb	<input type="radio"/>	123456	123456	123	Not Required For This Model
3) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzc	<input type="radio"/>	123456	123456	123	Not Required For This Model
4) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzd	<input type="radio"/>	123456	123456	123	Not Required For This Model
5) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyze	<input type="radio"/>	123456	123456	123	Not Required For This Model
6) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzf	<input type="radio"/>	123456	123456	123	Not Required For This Model
7) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzg	<input type="radio"/>	123456	123456	123	Not Required For This Model
8) ABCDEFGHIJKLMNORSTUVWXYZabcdefghijklmnopqrstuvwxyzh	<input type="radio"/>	123456	123456	123	Not Required For This Model

MAIN
TASK STATUS
ERROR PROOFING
PICK SENSOR TASK
BARCODE TASK
LUBRICATION TASK
PREVIOUS
NEXT

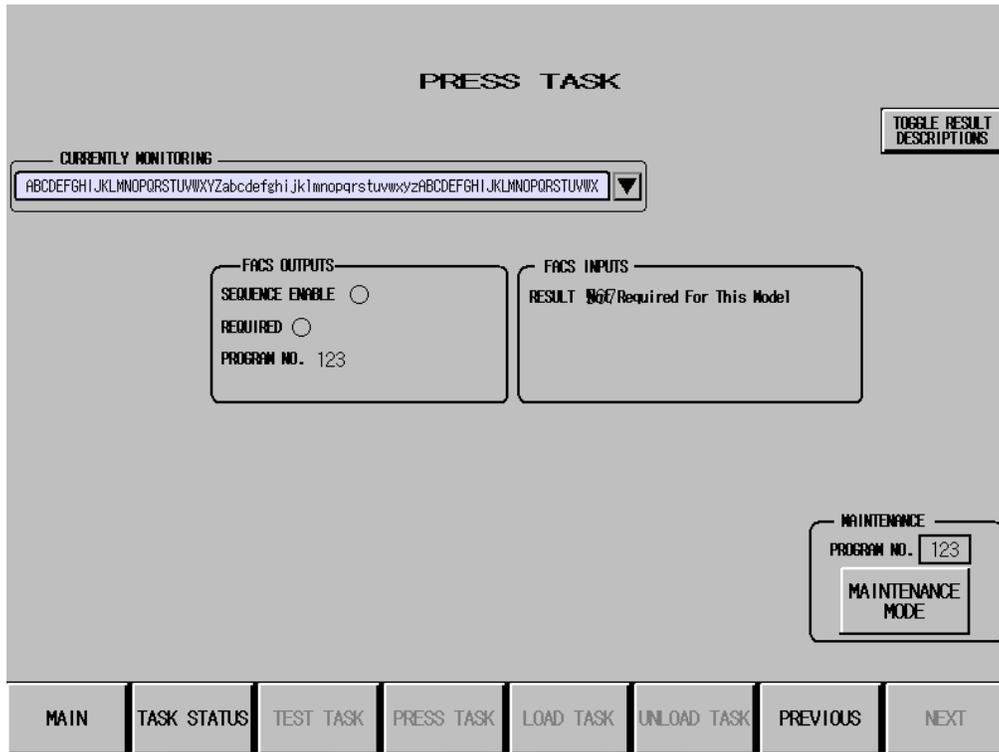
A) FACS Outputs

- a. "High Limit" specifies the overall upper limit of the testing unit as configured in eFACS.
- b. "Low Limit" specifies the overall lower limit of the testing unit as configured in eFACS.
- c. High and Low limits, along with Program Numbers for the sub tasks run on a similar principle as the main tasks.

- See section "3.1: Stitch Task Screen" for details on standard MelFACS information.
(Sequence enable, required, result, etc.)

3.11 Press Task Screen

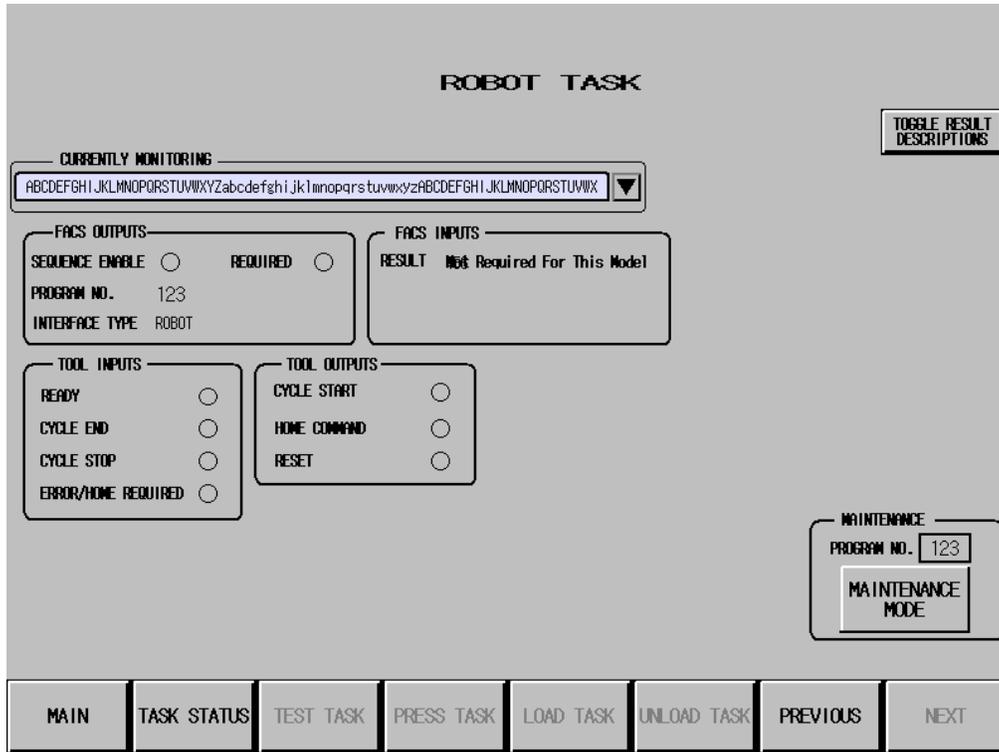
Typically for an Auto Station, the press task screen allows maintenance to monitor the status of the press tasks configured for that station.



- See section "3.1: Stitch Task Screen" for details on standard MelFACS information. (Sequence enable, required, result, etc.)

3.12 Robot Task Screen

Typically for an Auto Station, this screen allows maintenance to monitor the status of robot, or servo tasks.



- See section "3.1: Stitch Task Screen" for details on standard MelFACS information. (Sequence enable, required, result, etc.)