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Introduction

INSIGHTqc Precision Fastening Controllers are designed to control the fastening operation of threaded fasteners and communicate with external systems for data collection and control.

About this Manual

This manual provides detailed instructions on how to use the INSIGHTqc Precision Fastening Controllers.

Browser Settings

JavaScript and pop-ups must be enabled to view INSIGHTqc WebHelp contents.

Compatibility

Device	Browser	Version
Desktop	Google Chrome	35 or later
Desktop	Mozilla Firefox	37 or later
Desktop	Internet Explorer	11 or later
Ipad (IOS 8.1)	Google Chrome	47 or later
Mobile (Android OS V5.1.1)	Mozilla Firefox	42 or later

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Home

This screen gives an interface for the user to monitor Cycle Status, Batch Count, Angle or Torque values achieved against the defined limits, System Alarms, Trace, Cycle Results, and connection status of any external devices connected to the fastening controller.

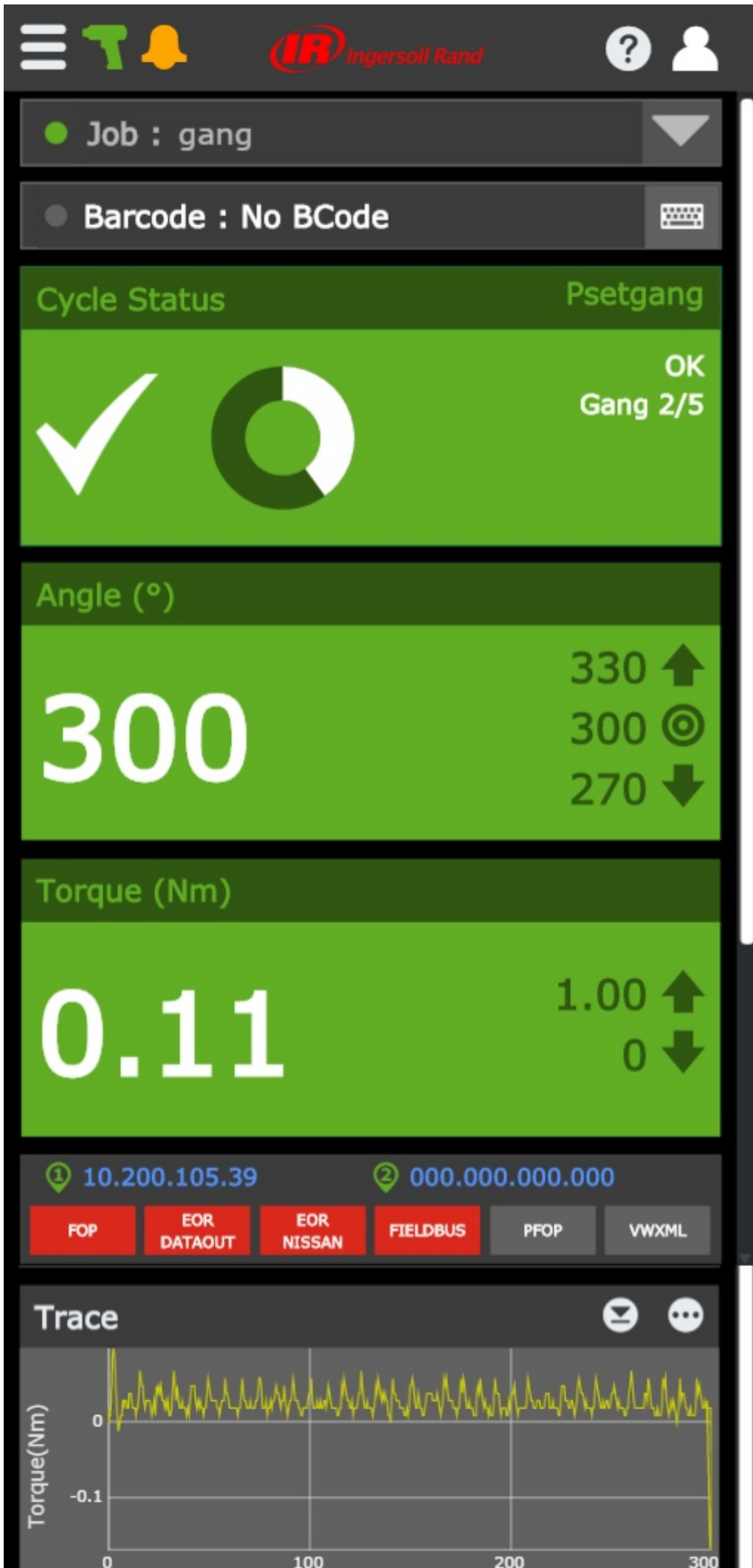





Figure A: Home Screen

Icons displayed at top left corner of the home screen are described as follows:

Icon	Description
	Select to view menu options.
	Green icon indicates that the tool is connected. Red icon indicates that the tool is not connected.
	Grey icon indicates no alarm. Red icon indicates System alarm has triggered to notify that the tool or controller is faulty. Yellow icon indicates Statistic alarm has triggered to notify a change in the statistical trend or Preventive Maintenance alarm has triggered to notify one or more maintenance activities are due for smooth functioning of the tool. NOTE: In case of any alarm, select the alarm icon to view log.

Selecting a Job

On the home screen, from Job field (refer to [figure A](#)), select a job from the drop down list. For information on creating or editing a job, refer to [Job](#) section.

NOTE: Job selection is enabled when the selection mode is set to internal. To identify the connection status using indicator icon, refer to [Status Indicators](#) .

Using Barcode

The barcode field displays barcode scanned by the user or supplied by the MES. In case the barcode scanner is unavailable, the supervisor can enable manual entry of barcodes. When enabled, this field allows edits. An operator can manually enter the barcode and associate with the results.

This feature can be enabled from [Barcode](#) settings. To identify the connection status using indicator icon, refer to [Status Indicators](#) .



Cycle Status

Parameters displayed on the cycle status area are described as follows:

Parameter	Description
Cycle Status	Indicates pass or fail status of the last tightening.
Total Batch Count	Specifies the total number of fasteners to be fastened in a group. NOTE : Graphical representation of Batch count and the numerical values will be displayed on configuration.
NOTE : For a quick identification of results using background colors in cycle status area, refer to Background Colors .	

Angle (°)

Parameters displayed on the angle (°) area are described as follows:

Parameter	Description
Angle	Angle in degrees that a fastener has turned past the torque threshold point.
Target Angle	Indicates the target value for the select configuration in degrees if the strategy is Angle Control. Must be less than or equal to 32000 degrees
 (Angle High Limit)	Indicates angle high limit set for the configuration. NOTE : It triggers when angle achieved is greater than or equal to the set limit.
 (Angle Low Limit)	Indicates angle low limit set for the configuration.

NOTE : It triggers when angle achieved is less than the set limit.

NOTE : For a quick identification of results using background colors in angle (°) area, refer to [Background Colors](#) .

Torque (Nm)


Parameters displayed on the torque (Nm) area are described as follows:

Parameter	Description
Torque	Force applied to a fastener.
Target Torque	Indicates the target value for the select configuration if the strategy is Torque Control. Must be less than or equal to max torque of the tool.
↑ (Torque High Limit)	Indicates torque high limit set for the configuration. NOTE : It triggers when torque achieved is greater than or equal to the set limit.
↓ (Torque Low Limit)	Indicates torque low limit set for the configuration. NOTE : It triggers when torque achieved is less than the set limit.
NOTE : For a quick identification of results using background colors in torque (Nm) area, refer to Background Colors .	

Cycle Results

Parameters displayed on the cycle results area are described as follows:

Parameter	Description
PSET	Indicates the Pset assigned for the current task.
Job Cycle	Incremental number of jobs run by the controller.

Spindle Cycle	Incremental number of fastenings performed by the connected tool.
<p>NOTE: For more details, from the right hand corner of the cycle results area, select .</p>	

Communication Protocol Status

This area displays the connection status of various communication protocols associated with the controller.


Communication protocols displayed on the communication status area are described as follows:


Communication Protocol	Description
Power Focus Open Protocol	Indicates connection status of Power Focus Open Protocol (PFOP) station with the computer.
Barcode	Indicates connection status of the barcode scanner.
EOR Data Out	Indicates connection status of EOR Data Out with the Client.
Nissan EOR Out	Indicates connection status of Nissan EOR Data Out with the Client.
Ford Open Protocol	Indicates connection status of Ford Open Protocol with the Client.
Fieldbus	Indicates connection status of Fieldbus protocol.
VWXML	Indicates connection status of VWXML protocol.
Toolsnet	Indicates connection status of Toolsnet protocol.
<p>NOTE: To identify the connection status using background colors displayed for these communication protocols, refer to Communication Status Indicators.</p>	

At the home screen, on the controller display unit, IP addresses are displayed near the communication protocol status area for reference. This feature is not available for remote access of

the controller.

Trace

This area will give graphical representation of the fastening operation result. The default view is Torque vs Angle. For other views, from the right hand corner of the Trace area, select . In the Trace Selection field, select a view from the drop down list.

To download trace result, select . The result displayed on the screen will be downloaded.

NOTE: User working on a local display must connect a USB pen drive to the controller before downloading. For remote access, a default location must be set in the browser settings.

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Cycle Results

This screen provides detailed results from each fastening performed by the tool connected to that controller. Filters are added to allow the user to easily search through the data to view specific records. Columns can be customized based on user requirements.

Parameters displayed on the cycle results screen are described as follows:




Parameter	Description
Cycle Pass/Fail	Indicates the overall pass/fail status of the fastening that generated the fastening results.
Measured Torque	Maximum value of torque achieved during fastening.
Date & Time	Date and time of completing the fastening operation.
Torque Result	Torque result is 'High Torque' failure, if the value of torque exceeds the maximum torque limit. Torque result is 'Low Torque' failure, if the value of torque is below the minimum torque limit. Otherwise, the Torque result is a Pass.
Angle Result	Angle result is 'High Angle' failure, if the value of angle exceeds the maximum angle limit. Angle result is 'Low Angle' failure, if the value of angle is below the minimum angle limit. Otherwise, the Angle result is a Pass.
Measured/Peak Angle (°)	Maximum value of angle achieved during fastening.
Reason for Shutdown	Indicates the cause for cycle abort or termination.
Spindle Cycle Number	Incremental number of fastenings performed by the connected tool.

	This is used to uniquely identify fastening results for a particular fastener.
Job Name	Indicates the name given for the user defined job.
Pset Name	Indicates the name given for the user defined Pset.
Job Cycle Number	Incremental number of jobs run by the controller. This is used to uniquely identify the fastening results associated with the execution of a particular job.
Barcode	If enabled, it displays barcode scanned from a scanner.
Operator Name	Indicates the name of the operator who performed the fastening.
Job ID	Matched with a job and is used for external job selection.


If available, user can select  on the result page, to view Trace related information. To get additional information on a specific result record, select . A pop-up with complete **Cycle Results** will be displayed. To refresh the cycle results, select .

Customizing Columns


Do the following to customize columns while displaying cycle results:



1. Select  Customize Columns.
2. To display all EOR parameters, check Select All. Else, proceed to step 3.
3. To display specific EOR parameters, un-check Select All and then check the required parameters from list.
4. To rearrange the EOR parameters, select the parameter and then select  or  to move up/down.
5. Select **Apply**.

Exporting to CSV

To download cycle results in CSV format, select  Export to CSV. The cycle results displayed on the screen will be downloaded. **NOTE**: User working on a local display must connect a USB pen drive to the controller before downloading.

Creating Filter

To expand **Filter** contents, select . User can select one or more filters from the filter type fields and then select **Apply**. The result will be displayed on the Cycle Results screen. To view unfiltered result, user can select **Clear** to remove the filters and then select **Apply**.

Filter Type	Action
Job Name	From the Job Name field, select a job from the drop down list.
Pset	From the Pset Name field, select a Pset from the drop down list.
Start date and End date	In the Start Date field, select  to choose a start date. In the End Date field, select  to choose an end date.
Start time and End time	In the Start Time field, enter a start time. In the End Time field, enter a end time.
Operator	From the Select Operator field, select an operator.
Barcode	If Barcode scanner is enabled, the scanned barcode details will be displayed.
Shutdown Reason	From the Shutdown Reason field, select a reason from the drop down list.
Result	Under Result, select any one.


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System Diagnostics

This screen provides the result for overall system status of the tool connected to the Fastening Controller.

To enable communication log, select Enable MCE Communication Log field to show indicator in **ON** position. Select **Save**. To update the diagnostic information of the controller, select .

Parameters displayed on the screen are described as follows:

Parameter	Description
Motor Temperature (°C)	Checks motor temperature and reports PASS or FAIL.
Heatsink temp (°C)	Checks heatsink temperature and reports PASS or FAIL.
Offset (% of ideal)	Tool Electronic's offset voltage (as % of Shunt Cal voltage).
Shunt Calibration (% of ideal)	Front-end electronics gain (as % of ideal Shunt Cal voltage).
Sine Offset A/D value	Offset in A/D counts of the resolver sine analog input signal used for angle measurement.
Cosine Offset A/D value	Offset in A/D counts of the resolver cosine analog input signal used for angle measurement.
Estimated motor Kt(N m/A)	Peak torque divided by peak current in the units of Nm/Amp.

In case of a failure, contact your nearest **Ingersoll Rand** office or distributor for assistance.

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Job Results

This screen provides the overall result for each execution of a specific job with the ability to view all the individual cycle results that constituted the execution of the job. User can create a filter to display results for a specific job.




Parameters displayed on the Job Results screen are described as follows:

Parameter	Description
Result	Result of the performed job.
Job Cycle Number	Incremental number of jobs run by the controller. This is used to uniquely identify the fastening results associated with the execution of a particular job.
Job ID	Matched with a job and is used for external job selection.
Job Name	Name given to identify the job.
Date & Time	Date and time of completing the fastening operation.
Job Failure Mode	Indicates the reason for a job failure.


To get additional information on a specific result record, select . Parameters displayed on the Pset results for the corresponding job are described as follows:

Parameter	Description
Cycle Pass/Fail	Indicates the overall pass/fail status of the fastening that generated the fastening results.
Measured Torque	Maximum value of torque achieved during fastening.
Date & Time	Date and time of completing the fastening operation.
Torque Result	Torque result is 'High Torque' failure, if the value of torque exceeds the maximum torque limit.


	Torque result is 'Low Torque' failure, if the value of torque is below the minimum torque limit. Otherwise, the Torque result is a Pass.
Angle Result	Angle result is 'High Angle' failure, if the value of angle exceeds the maximum angle limit. Angle result is 'Low Angle' failure, if the value of angle is below the minimum angle limit. Otherwise, the Angle result is a Pass.
Measured/Peak Angle (°)	Maximum value of angle achieved during fastening.
Reason for Shutdown	Indicates the cause for cycle abort or termination.
Spindle Cycle Number	Incremental number of fastenings performed by the connected tool. This is used to uniquely identify fastening results for a particular fastener.
Job Name	Indicates the name given for the user defined job.
Pset Name	Indicates the name given for the user defined Pset.
Barcode	If enabled, it displays barcode scanned from a scanner.
Operator Name	Indicates the name of the operator who performed the fastening.



If available, user can select  on the result page, to view Trace related information. To get additional information on a specific result record, select . A pop-up with additional information will be displayed. To refresh the job results, select .

Exporting to CSV

To download job results in CSV format, select  Export to CSV. The job results displayed on the screen will be downloaded. **NOTE** : User working on a local display must connect a USB pen drive to the controller before downloading.

Creating Filter

To expand **Filter** contents, select . User can select one or more filters from the filter type fields and then select **Apply**. The result will be displayed on the Job Results screen. To view unfiltered result, user can select **Clear** to remove the filters and then select **Apply**.

Filter Type	Action
Job Name	From the Job Name field, select a job from the drop down list.
Operator	From the Operator field, select an operator.
Start date and End date	In the Start Date field, select  to choose a start date. In the End Date field, select  to choose an end date.
Start time and End time	In the Start Time field, enter a start time. In the End Time field, enter a end time.
Result	Under Result, select any one

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Tool Diagnostics

This screen provides real time information about the tool connected to the Fastening Controller. **Tool Information** section gives information related to Tool Model Number and Tool Serial Number along with values for the listed parameters. **Tool Fault** section gives information related to errors along with date and time of the occurrence.

Select **Enter diagnostics** to start the tool diagnostics.

Select  to view Tool Information and Tool Fault contents.

Tool Information

Parameters displayed on the screen are described as follows:

Parameter	Description
Tool Model Number	Model number of the connected tool.
Tool Serial Number	Serial number of the connected tool.
Tool Max Torque (Nm)	Maximum allowable Torque for the connected tool.
Tool Max Speed (RPM)	Displays maximum allowable speed of the motor.
Tool Max Temperature (°C)	Maximum allowable temperature of the tool motor before alarm activation.
Tool Cycle Count	Total number of cycles that the tool has run. This is for the lifetime of the tool.
Warranty Start Date (mm/dd/yy)	Start date of the warranty for the tool.

Tool Fault

The information shown is related to tool faults.

Parameters displayed on the screen are described as follows:

Parameter	Description
	Date and time of the fault reported.

Date & Time	
Description	Description of the recorded fault.

Running Diagnostics Test

This test will examine the overall status of the tool connected to the Fastening Controller.

Do the following to run a diagnostic test:

1. Select **Enter Diagnostics** .
2. At the Warning screen, select **Yes** .

Display state on the screen are described as follows:

Display State	Description
Trigger	<p>Displays the Pulled/Released status of the trigger switch.</p> <p>Green indicates that the trigger is pulled.</p> <p>Grey indicates that the trigger is released.</p>
Direction	<p>Displays the CW/CCW status of the direction switch.</p>
Momentary Switch	<p>Green indicates that the switch is active.</p> <p>Grey indicates that the switch is inactive.</p>

Tool Test

In handheld mode, the user must pull the trigger to start the test. In machine mount mode, the screen has a **Start** button under Tool Test section. Selecting the **Start** button activates the tool and the values of the listed parameters will start updating. The **Start** button changes to a **Stop** button. Selecting the stop button deactivates the tool and the values of the listed parameters will stop updating. These results are displayed in a tabular form. For graphical representation, the user needs to select the Trace area twice.

NOTE : The tool I/O relates to handheld tools (QE) and not for fixtured tools (QM).

Parameters displayed on the screen are described as follows:

Parameter	Description
Current (A)	Dynamic Current value in Ampere while tool is running.

Torque (Nm)	Dynamic Torque value in Nm while tool is running.
Speed (RPM)	Dynamic Speed value in RPM while the tool is running.
Angle (°)	Total number of degrees of rotation while the tool is running.

Running LED Test

Do the following to run a LED test:

1. Under Tool Information, below LED Test, select **Start**.
LED lights on the tool connected to the Fastening Controller starts blinking for 5 seconds and switches between red, green and yellow.
2. To stop the LED test, select **Stop**.

To exit from Tools Diagnostics - Run Diagnostic screen, select **Exit Diagnostics**. At the Warning screen, select **Yes**. The Tool Information screen will be displayed.

NOTE: The tool I/O relates to handheld tools (QE) and not for fixtured tools (QM).

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Audit Logs

This screen logs records associated with user actions. For an example, value for a parameter updated by the user.

Parameters displayed on the Audit Log screen are described in the following table:

Parameter	Description
Date & Time	Date and time of the occurrence.
Username	Identify the person who performed the operation.
Description	Description of action performed by the user.
Field Modified	Name of the parameter that was modified.
New Value	New value entered by the user.
Old Value	Previous value of the parameter before the user modified.

To download audit logs, select .

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Event Log

This screen logs records associated with alerts and notifications.

Parameters

Parameters displayed on the Event Log screen are described as follows:

Parameter	Description
Date & Time	Date and time of the occurrence.
Description	Description of the event.

To download event logs, select .

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Spindle Management

This screen allows the user to configure the spindle settings.

Do the following to modify the settings:

NOTE: Tool type is a read only field. The tool type is read from the tool and presented to the user for reference.

1. From the Spindle Operation field, select from the drop down list:
 - **Handheld** : In this mode, the user needs to pull the trigger in order to run the tool.
 - **Machine Mount** : In this mode, the tool will run from an external input. This can be DIO or Fieldbus for automated operation.
2. From the Start Mode field, select from the drop down list:
 - **Throttle** : In this mode, the tool runs when the start signal is applied and stops when the signal is disabled.
 - **Pulse** : In this mode, the tool runs when the start signal is applied and continues to run even if the signal is removed, until the cycle completes or times out.
 - **Double** : In this mode, free speed and safety latch switch closures are needed. This applies to spindles that need the operator to activate two switches within a 2-second interval. This makes sure the hands are safely away from the machinery. If either of the inputs are not energized within the two-second interval, the spindle does not operate.
NOTE : Pulse mode and Double mode are available for machine mount operation only. In this application, the user has a remote handle that forces two handed operation for safety.
3. From the Remote Tool Enable Mode field, select from the drop down list:
 - **None** : In this mode, the remote tool enable mode is not available.
NOTE : Even if None is selected tool can be enabled/disabled from MES protocol.
 - **1 Line** : In this mode, the tool is enabled anytime the enable signal is activated and disabled when the signal is deactivated. Enabling or disabling of the tool is dependant on the proper interlock that is configured.
NOTE : Enabling or disabling the tool depends on proper configuration of the interlock.
 - **2 Line** : In this mode, the tool will be enabled when the Spindle Enable signal has pulsed high. The tool stays enabled until a high pulse is received on the Spindle disable line. The signals can come from DIO or Fieldbus.
NOTE : Enabling or disabling the tool depends on proper configuration of the interlock.
4. To enable or disable tubenut, select within the Enable Tubenut field to show indicator in **ON**

or **OFF** position.

NOTE: This can be enabled only when Handheld tools are configured to be in handheld mode. A handheld tool in machine mount mode cannot have tubenut enabled. When Enable Tubenut is **ON**, normal reverse operation of the tool is disabled.

a. If indicator is **ON**, from the Tubenut Operation Mode field, select from the drop down list:

- **Tubenut 0 (Default)**: In this mode, using the direction switch will place the tool in reverse direction. When the trigger is pulled, tool will run in reverse direction.
- **Tube Nut 1 (Momentary)**: In this mode, the tool will run in tubnut reverse direction when the momentary switch is activated.
- **Tube Nut 2 (Momentary + trigger)**: In this mode, the tool will run in tubnut reverse direction when momentary switch and trigger are activated simultaneously.
- **Tube Nut 3 (Trigger only)**: In this mode, the tool will run in forward direction on pulling the trigger. When the trigger is released and pulled again, the tool will run in tubnut reverse direction. Sequence of the tool running in forward or reverse direction will change when the trigger is pulled and released.

b. If indicator is **OFF**, from the Programmable Switch field, select from the drop down list:

- **None**: Activating the switch will have no effect on the system.
- **Batch Advance**: After a failed cycle, the user can use the momentary switch to skip that fastener and advance the batch count.
- **Batch Reset**: Resets the count at 0. Indicates that the user will start over.
- **Job Reset**: When momentary switch is activated, the controller will reset to the first fastener of the first PSET of the selected job. This indicates that the user has decided to start over the job.

5. To enable tact alert, select the Enable Tact Alert field to show indicator in **ON** position.

NOTE: This alert can be enabled for handheld tools only. Enabling Tact alert causes the tool to vibrate after a failed cycle.

6. Select **Save**.

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Power Focus Open Protocol

Power Focus Open Protocol (PFOP) is a communication protocol used to connect the controller with various MES systems. To enable PFOP, select the Enable field to show indicator in **ON** position. To enable logs, select within the Enable Logs field to show indicator in **ON** position.

Fields displayed on the PFOP screen are described as follows:

Field	Description
PFOP Version Information	Read only field containing the supported PFOP version.
Job ID	Number that uniquely identifies the controller on the PFOP system.
Controller Name	Name that uniquely identifies the controller. The name provided must be in plain ASCII text.
Port Number	Number that identifies the port. Default port number is 4545.
Retry Interval (Sec)	The amount of time to wait before sending the message again in case of no reply.
Number of Retries	The maximum number of times to retry sending a message before declaring that the communication is lost with the station computer.

Enter the information in the fields and then select **Save**.

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System Initialization

This screen lets the user give unique names for identification during system Initialization. Select the preferred language from the drop down list. Enter the information in the fields and then select **Save**.

Field names displayed on the system initialization screen are described as follows:


Field Name	Description
Plant Name	Name that uniquely identifies the plant.
Assembly Line	Name that uniquely identifies the assembly line.
Station Name	Name that uniquely identifies the station.
Job Name	Name that uniquely identifies the job.
Language	Default language for the fastening controller.
Rows per Page	Number of rows displayed in all tables. For example, Job Results and Pset Results.
Brightness	Sets the screen brightness using a slider.
Orientation	Sets the screen orientation.

Brightness and Orientation are two additional settings that are displayed on controller screen only.

Orientation settings displayed on controller screen are described as follows:

Orientation	Setting	Description
	0	Screen will be set to

		portrait mode with connectors facing downward - default.
	90	Screen will be set to landscape mode with connectors facing left side.
	180	Screen will be set to portrait mode with connectors facing upward.
	270	Screen will be set to landscape mode with connectors facing right side.

Select **Detect Controller** to identify the controller to which the current user is connected. The  indicator on the Display panel of the controller will be lit for 30 seconds. This will help the user at the plant to get visual confirmation that connection is established with the correct controller.

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Date & Time


This screen allows the user set date and time as follows:

- **Manual**: Manual adjustment of date and time.
- **Network Time Protocol (NTP)**: Automatic clock synchronization on networking protocol.

Manual

Do the following to manually set date and time:

1. Under Settings, select Manual.
2. From the Date Format field, select a format from the drop down list.
3. In the Set Date field, select  to choose the date and then select **Done**.
4. Under Time Format, select a format.
5. In Set Time field, enter hours and minutes.
 - a. For 12 Hrs time format, select AM/PM button to update.
6. In Set Time Zone field, select a time zone from the drop down list.\


NOTE: In a time zone that supports daylight savings, a  icon will be displayed next to Set Time Zone field indicating that DST is present.

7. Select **Save**.

Network Time Protocol

Do the following to automatically synchronize date and time:

1. Under Settings, select NTP and then enter the IP address or host name of the NTP server.
2. From the Date Format field, select a format from the drop down list.
3. Under Time Format, select a format.
4. In Set Time Zone field, select a time zone from the drop down list.

NOTE: In a time zone that supports daylight savings, a  icon will be displayed next to Set Time Zone field indicating that DST is present.

5. Select **Save**.

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EOR Data Out

EOR Data Out is a communication protocol that gives end of run data in a configurable format. This format is easily integrated with MES and data collection systems. The EOR data is transmitted through USB-Serial or Ethernet interface in ASCII text format.

To enable EOR Data Out, select the Enable field to show indicator in **ON** position. To enable logs, select the Enable Logs field to show indicator in **ON** position.

Selecting a Source

Do the following to enable EOR data out:

1. Under Select Source, select one:
 - a. **Ethernet** : Data will be communicated through the Ethernet port.
 - b. **Serial** : Data will be communicated over a serial connection using a serial to USB converter.
2. If Ethernet is selected, do as follows (else, move to step 6):
 - a. In the Port No field, enter the port number.

NOTE : Default port number is 1069.
3. In the Job ID field, enter a 4 digit job number to uniquely identifies the controller.
4. From the Delimiter field, select one from the drop down list:
 - Comma (,)
 - Semi-colon (;)
 - Colon (:)
5. From End of Record field, select one from the drop down list:
 - **Null**: This is a Null character placed at the end of the message to let the system know the message is complete.
 - **CR**: This is a Carriage Return character placed at the end of the message to let the system know the message is complete.
 - **LR**: This is a Line Feed character placed at the end of the message to let the system know the message is complete.
 - **CR/LF** : This is a Carriage Return character followed by a Line Feed character placed at the end of the message to let the system know the message is complete.
6. If Serial is selected, do as follows:

NOTE : Default communication settings are 9600, n, 8, 1.

- a. From the USB Port No field, select a port from the drop down list.
- b. From the Baud Rate field, select the rate from the drop down list.
- c. From the Data Bits field, select the number of data bits from the drop down list.
- d. From the Stop Bits field, select the number of stop bits.
- e. From the Parity field, select one from the drop down list:

- None
- Even
- Odd

7. In the Job ID field, enter a job number.



8. From the Delimiter field, select one from the drop down list:

- Comma (,)
- Semi-colon (;)
- Colon (:)

9. From End of Record field, select one:

- **Null**: This is a Null character placed at the end of the message to let the system know the message is complete.
- **CR**: This is a Carriage Return character placed at the end of the message to let the system know the message is complete.
- **LR**: This is a Line Feed character placed at the end of the message to let the system know the message is complete.
- **CR/LF** : This is a Carriage Return character followed by a Line Feed character placed at the end of the message to let the system know the message is complete.

10. To select the fields and rearrange the order in which the parameters needs to be transmitted, select EOR Parameter Selection and then do as follows:

- a. To transmit all EOR parameters, check Select All. Else, move to step b.
- b. To transmit specific EOR parameters, check the required parameters from the list.
- c. Select  and  to rearrange the order in which the parameters needs to be transmitted.

NOTE : To reset the EOR parameters to default order, select **Reset Default EOR**.

d. Select **Apply**.

11. Select **Save**.

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EOR Nissan

Nissan EOR is a serial protocol to interface with the data collection system for a particular Nissan plant. The user must connect a USB to serial converter to the controller on the specified USB port to use this feature. The data format and communications settings are fixed as per the protocol and cannot be changed by the user. For example, baud rate. This protocol is very specific to Nissan Motor Company.

To enable EOR Nissan, select the Enable field to show indicator in **ON** position. To enable logs, select the Enable Logs field to show indicator in **ON** position. From the USB Port No field, select a port from the drop down list and then select **Save**.

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Tool Calibration

This screen allows the user to calibrate the tool parameters. It is a process of maintaining accuracy of the tool. This involves configuring the tool parameters with values that are in acceptable range.

Do the following to modify the existing value of any parameter:

1. Enter a value in the New Value field.
2. Select **Apply**.

The current value of the parameter will be updated with the latest value.

User can select **Reset** under 'Reset to Factory' for restoring the values to factory default.

Do the following to calibrate Transducer Range:

1. Under Calibration, select **Start**.
Calibration window will be displayed.
2. Perform the fastening operation to obtain a value in the Internal Torque field.
3. In the External Torque field, enter a value measured from external device.
4. To obtain Resultant TR, repeat step 2 & step 3 at least 5 times and then select **Stop Calibration**.
5. To send the Resultant to the tool, select **Send**.
6. Select **Close**.

Do the following to calibrate KT Sensitivity:

1. Under Calibration, select **Start**.
Calibration window will be displayed.
2. Perform the fastening operation to update values on the screen.
3. To obtain the automatically calculated KT Sensitivity value, select **Stop Calibration**.
4. To send the KT Sensitivity to the tool, select **Send**.
5. Select **Close**.

Fields displayed on the tool calibration screen are described as follows:

Field	Description
Parameter Name	Name given to identify the

	parameter.
Last Calibration Date	Date on which the last calibration was performed.
Factory Value	TR value set at the factory.
Current Value	Present TR value.
New Value	User defined TR value.

Fields displayed on the calibration of transducer range screen are described as follows:

Field	Description
Cycle Counter	Number of cycles
Internal Torque	Torque value achieved by the tool.
External Torque	Torque measured by the external device.
Resultant TR	Calculated TR value.

Fields displayed on the calibration of KT Sensitivity screen are described as follows:

Field	Description
Current KT Sensitivity	Present KT Sensitivity value.
Cycle Counter	Number of cycles.
Measured Torque	Torque measured by the device.
Calculated Torque	Calculated torque value.
Resultant KT Sensitivity	Calculated KT Sensitivity value.

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Login

Login with valid [user](#) credentials to access the account.

Do the following at the Login screen:

1. In the Username field, enter a valid username.
2. In the Password field, enter a valid password.
3. From the Language field, select the preferred language from the drop down list.

NOTE: Language selected at the time of login will override the system language setting for the current session.

4. Select **Login**.

NOTE:

- On first login, the administrator must change the default password.
- If login is successful, [Home](#) screen will be displayed.

Service Login is provided for the service technicians to access the controller.

Alarms

Parameters displayed on the alarms screen are described as follows:

Parameter	Description
Date	Indicates the date and time when the alarm was triggered.
Type	Indicates the type of alarm.
Message	Describes the alarm that was triggered.

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Ford Open Protocol

Ford Open Protocol (FOP) is a communication protocol used to connect the controller with various MES systems.

To enable FOP, select the Enable Protocol field to show indicator in **ON** position. To enable logs, select the Enable Logs field to show indicator in **ON** position.

Fields displayed on the FOP screen are described as follows:

Field	Description
FOP Version Information	Read only field containing the supported FOP version.
Job ID	Number that uniquely identifies the controller on the FOP system.
Controller Name	Name that uniquely identifies the controller. The name provided must be in plain ASCII text.
Port Number	Number that identifies the port.
Retry Interval (Sec)	The amount of time to wait before sending the message again in case of no reply.
Number of Retries	The maximum number of times to retry sending a message before declaring that the communication is lost with the station computer.

Enter the information in the fields and then select **Save**.

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Barcode

This screen allows the user to enable or disable the use of a barcode scanner and to configure the settings. To enable use of barcode scanner, select within the Enable Barcode field to show indicator in **ON** position.

User has an option to manually enter barcode on the home screen. To enable manual entry, select Manual Barcode Entry under Barcode Settings.

Pre-requisites

Do the following for an initial setup of USB barcode scanner or serial barcode scanner with the controller:

NOTE : For more information on the scanner setup, refer to the Quick Start Guide provided by the barcode scanner manufacturer.

1. For a setup, do the following:
 - In case of an USB barcode scanner, configure the scanner as **USB Keyboard (HID)** device.
 - In case of a serial barcode scanner, configure the scanner as **Serial** device.
2. Configure the scanner to include an end of string terminator <CR> or <LF> or both.

Selecting a Source

Do the following to enable barcode scanner settings:

1. Under Select Source, select one:
 - Ethernet
 - Serial
 - USB
2. If Ethernet is selected, do as follows:
 - a. In the Ethernet Server Port field, enter the port number.
3. If Serial is selected, do as follows:
 - a. From the Serial Port field, select a port from the drop down list.
 - b. From the Baud Rate field, select the rate from the drop down list.
 - c. From the Data Bits field, select the number of data bits from the drop down list.
 - d. From the Stop Bits field, select the number of stop bits.

e. From the Parity field, select one from the drop down list:

- None
- Even
- Odd

4. If USB is selected, do as follows:

a. From the USB Port field, select a port from the drop down list.

NOTE: When selecting USB, the controller will consider all data from the scanner as keyboard data. Make sure that the barcode scanner is configured accordingly.

5. In Map Barcode Criteria section, do as follows:

NOTE: This section describes all criteria associated with the selected job. User can select same job for multiple Barcode strings.

a. In the Select Length field, select the length of the barcode string.

b. From Check Length field, select one from the drop down list:

- **None:** No length check will be done on the input barcode string.
- **Strict:** The length of input barcode string has to be exactly same as Select Length field or the barcode will be considered invalid.
- **Truncate Right:** The extra characters in right side of the barcode string will be truncated. Barcodes that are smaller than the length setting are considered invalid for truncate values.
- **Truncate Left:** The extra characters in left side of the barcode string will be truncated. Barcodes that are smaller than the length setting are considered invalid for truncate values.

c. In the Start Position field, enter the position number.

d. In the Stop Position field, enter the position number

e. To ignore duplicates, check Ignore Duplicate Scan.

NOTE: If selected, the controller will ignore all duplicate barcode strings.

If not selected, every valid barcode string will be attached to the results. If job selection is external barcode, then every valid barcode will be used for job selection irrespective of the previously scanned barcode string.

f. To add barcode map to an existing job, do as follows:

- From the Job Name field, select a job from the drop down list.
- In the Barcode String field, enter a string and select **Add**.

NOTE: A maximum of 32 barcode strings per job can be added.

6. In the Job Barcode Map section, select an existing job from the drop down list.

7. Select **Save**.

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IP Settings

This screen allows the user to configure Internet Protocol. The fastening controller is provided with 2 Ethernet ports. Ports can be identified as shown in [Figure A](#).



Figure A: View of Port 1 and Port 2 on fastening controller

Status of each port is described as follows:

Status Type	Description
Link Settings	Automatically measures the internet connection bandwidth. This is a read only field.
Link Status	Green: Connected Red: Not connected
Speed	Indicates speed of the connection (if connected).
MAC	Indicates MAC address of the port.

Port	OK: Connected Error: Not connected
------	---

Do the following to configure either one or both the ports:

1. Select from the following:

- **Static:** IP address along with the corresponding subnet mask needs to be manually assigned to the controller.
- **DHCP:** IP address along with the corresponding subnet mask is automatically assigned to the controller from the DHCP server in the network.

2. If Static is selected, manually enter the values for the following:

- IP Address
- Subnet Mask
- Gateway
- Primary DNS
- Secondary DNS

3. Select **Save**.

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Pset


This screen allows the user to create, edit or delete Psets.

Parameters displayed on the Pset screen are described as follows:

Parameter	Description
ID	Indicates the Pset ID.
Pset	Indicates the name given to identify the Pset. To edit the Pset, select the Pset.
Delete	Select to delete the created Pset. On deleting the Pset, associated jobs will be deleted.



Create Pset

Do the following to create a new Pset:

1. At the Pset List screen, select Create Pset.
The Create Pset screen will be displayed.
2. At Pset Name, select  to view the contents.
3. In the Name field, enter a name for this Pset.
4. In the Units field, select a unit type for measurement from the drop down list.
5. To define Step type, proceed to [Create Step](#). Else, proceed to Step 6.
6. To define Pset settings, proceed to [Advance Pset Settings](#). Else, proceed to Step 7.
7. Select **Save**.

Advance Pset Settings

Do the following to define advance Pset settings:

1. At the Create Pset screen, select  **Advance Pset Settings**.
The Advance Pset screen will be displayed.
2. At General Parameters, select  to view the contents:
 - a. Under Tool Motor Direction, select one:

- **Clockwise** : Sets tightening direction to Clockwise.
- **Counter Clockwise** : Sets tightening direction to Counter Clockwise.

b. In the Reserve Speed (RPM) field, enter a value for the maximum speed at which the tool will run in reverse direction.

c. In the Acceleration (%) field, enter a value for the tool motor acceleration at the start of tightening.

d. In the Torque Filter Break Point field, enter a value for the low pass filter used for filtering the torque signal.

e. In the Cycle Timeout (Sec) field, enter a value for the maximum allowable time to complete a cycle.

f. In the Plot Sample Duration (Sec) field, enter a value for the window of time during which 1000 samples of fastening data is used for graphical representation.

g. In the Cycle Delay (Sec) field, enter a value for the time interval between each fastening cycle.

h. In the Reverse Threshold field, enter a torque value at which the tool will begin counting angle in reverse, when Reverse EOR Enable is selected.

i. Select if applicable:

- **Disable Reverse** : Tool will not run in reverse direction.
- **Fail on Trigger Release** : Enables failure of a fastening operation when trigger is released even when torque and angle are within the acceptable limits.
- **Reverse EOR Enabled** : Enables end-of-run result when tool is running in reverse direction.



3. At Current Plausability, select  to view the contents:

a. Select if applicable:

- **Enable Current plausibility** : Maximum current used by the motor during a tightening is directly related to the maximum torque achieved.
- **Use Plausibility Defaults** : Default limits for low and high. Calculated using "Kt" and "Kt Window" for current plausibility check.
- **Continuos Monitoring** : Enables continuous monitoring for current plausibility.
- **Tool ShutDown** : Tool will stop in case of a current plausability high fault.


b. In the Low Limit Peak Current field, enter a value for current plausibility low limit.

c. In the High Limit Peak Current field, enter a value for current plausibility high limit.

4. At Tubenut Parameters, select  to view the contents:
 - a. In the Reverse Speed (RPM) field, enter a value for the maximum speed at which the tool will run in reverse direction.
 - b. In the Reverse Threshold (%) field, enter a value (percentage of max torque) at which the tubenut tool will stop while reversing to the home position.
5. At Total angle, select  to view the contents:
 - a. If enabled, do as follows:
 - In the Low Limit field, enter a value for the minimum acceptable limit.
 - In the High Limit field, enter a value for the maximum acceptable limit.
6. To save the advance Pset settings, select **Ok**.

Create Step

Do the following to create a new step:

1. At Torque, select  to view the contents.
2. In the Step Type field, select one from the drop down list:
 - **Torque** : Force applied to a fastener.
 - **Angle** : Angle in degrees that a fastener will turn past the torque threshold point.
 - **Prevailing Torque** : Applied torque will not provide clamp load prior to or in lieu of a final fastening step.

NOTE : The Prevailing Torque step must be followed by either a torque step or an angle step and advanced step settings are required.
3. If Torque is selected, in the Target (N m) field, enter the target value. Else, proceed to Step 4.
4. If Angle is selected, do the following (else, proceed to Step 5):
 - In the Target (°) field, enter the target value.
 - In the Torque High Limit field, enter a value for the maximum allowable torque.
5. To define step settings, proceed to [Advance Step Settings](#) . Else, proceed to Step 6.
6. Select **Save**.






Advance Step Settings

To view Advance Step screen, select  **Advance Step Settings**. These step settings are applicable for the following step types:

- [Torque](#)

- **Angle**
- Prevailing Torque
 - **Prevailing torque step – Angle method**
 - **Prevailing torque step – Slope method**

Do the following to define settings for torque step:

1. At Flags, select  to view the contents:
 - a. Select if applicable:
 - **EOR Data Enable** : If enabled, system will provide EOR message at the completion of tightening strategy.
 - **Torque Threshold Enable** :If enabled, includes cycle below torque threshold value.
2. At Speed (RPM), select  to view the contents:
 - a. In the Free Speed field, enter a value at which the tool will run before reaching the Torque downshift threshold.
 - b. In the Shift down Speed field, enter a value at which the tool will run after reaching Torque downshift threshold.
3. At Torque (N m), select  to view the contents:
 - a. In the Target field, enter a torque value required to be achieved for the fastening.
 - b. In the High Limit field, enter a value for the maximum acceptable limit.
 - c. In the Low Limit field, enter a value for the minimum acceptable limit.
 - d. In the Threshold field, enter a torque value at which the tool will start counting angle.
 - e. In the Downshift Threshold field, enter a torque value at which the tool slows down to the downshift speed.
 - f. In the Overshoot Compensation field, enter a value that will be subtracted from the Torque Target to compensate for any overshoot. This setting is normally used for hard joints with consistent final torques that exceed the target torque.
4. At Angle (Degree), select  to view the contents:
 - a. In the High Limit field, enter a value for high limit that a fastener can turn past the torque threshold point; beyond which the tool will automatically stop.
 - b. In the Low Limit field, enter a value for low limit that a fastener can turn past the torque threshold point; beyond which the tool will automatically stop.
5. At Yield field, select  to view the contents:


a. Select if applicable:

- **Override Enable**: If enabled, checks bolt yield condition by enabling slope monitoring.
- **Fail Yield Override**: If enabled, triggers failure during fastening operation when yield condition is detected.

b. In the Point of Peak Slope field, enter a percentage value to identify the drop in the Torque/Angle slope from the peak slope stored during the tightening, that will stop the tool at the yield point of the fastener.

c. In the Slope Interval field, enter a value for number of degrees of tool socket rotation over which the Torque/Angle gradient will be calculated.

d. In the Angle into Yield field, enter a value for number of degrees past yield detection that the bolt will be rotated.

6. At Gradient & Dual Slope, select  to view the contents:

a. If enabled, do as follows:

- Select any one:
 - **Single Slope Enable**: Gradient checks are performed using Slope A limits only.
 - **Dual Slope Enable**: Gradient checks are performed using Slope A and Slope B limits.

b. In the Slope Interval field, enter a value for number of degrees of tool socket rotation over which the Torque/Angle gradient will be calculated.

c. In the Slope A High Limit field, enter a value for high limit of slope in region 'A'.

d. In the Slope A Low Limit field, enter a value for low limit of slope in region 'A'.

e. In the Slope B High Limit field, enter a value for high limit of slope in region 'B'.

f. In the Slope B Low Limit field, enter a value for low limit of slope in region 'B'.

g. In the Torque Crossover Point field, enter a torque value that is used to transition from region A to region B during Dual slope monitoring.

h. In the Angle Crossover Point field, enter an angle value that signifies the start of transition from region A to region B.

7. At Stick Slip, select  to view the contents:






a. If enabled, do as follows:

- In the Threshold Torque (%) field, enter a percentage value where if torque decreases by this amount stick slip has started to occur.
- In the Occurrence field, enter a value to detect the number of times the measured

torque drops below then rises above the threshold torque.

8. To save the advance step settings for torque step, select **Ok**.
9. Select **Save**.

Do the following to define settings for angle step:


1. At Flags, select  to view the contents:
 - a. Select if applicable:
 - **EOR Data Enable** : If enabled, system will provide EOR message at the completion of tightening strategy.
 - **Torque Threshold Enable** :If enabled, includes cycle below torque threshold value.
2. At Speed (RPM), select  to view the contents:
 - a. In the Free Speed field, enter a value at which the tool will run before reaching the Torque Shift down Point.
 - b. In the Shift down Speed field, enter a value at which the tool will run after reaching Torque Threshold for Shift down.
3. At Angle (°), select  to view the contents:
 - a. In the Target field, enter a torque value required to be achieved for the fastening.
 - b. In the High Limit field, enter a value for high limit that a fastener can turn past the torque threshold point; beyond which the tool will automatically stop.
 - c. In the Low Limit field, enter a value for low limit that a fastener can turn past the torque threshold point; beyond which the tool will automatically stop.
 - d. In the Overshoot Compensation field, enter a value that will be subtracted from the Angle Target to compensate for any overshoot.
4. At Torque (N m), select  to view the contents:
 - a. In the High Limit field, enter a value for the maximum acceptable limit.
 - b. In the Low Limit field, enter a value for the minimum acceptable limit.
 - c. In the Threshold field, enter a torque value at which the tool will start counting angle.
 - d. In the Downshift Threshold field, enter a torque value at which the tool slows-down to the downshift speed.
5. At Yield field, select  to view the contents:
 - a. Select if applicable:

- **Override Enable** : If enabled, checks bolt yield condition by enabling slope monitoring.
- **Fail Yield Override** : If enabled, triggers failure during fastening operation when yield condition is detected.

b. In the Point of Peak Slope field, enter a percentage value to identify the drop in the Torque/Angle slope from the peak slope stored during the tightening, that will stop the tool at the yield point of the fastener.

c. In the Slope Interval field, enter a value for number of degrees of tool socket rotation over which the Torque/Angle gradient will be calculated.

d. In the Angle into Yield field, enter the number of degrees past yield detection that the bolt will be rotated.

6. At Gradient & Dual Slope, select  to view the contents.

a. If enabled, do as follows:

- Select one:
 - **Single Slope Enable** : Gradient checks are performed using Slope A limits only.
 - **Dual Slope Enable** : Gradient checks are performed using Slope A and Slope B limits.

b. In the Slope Interval field, enter a value for number of degrees of tool socket rotation over which the Torque/Angle gradient will be calculated.

c. In the Slope A High Limit field, enter a value for high limit of slope in region 'A'.

d. In the Slope A Low Limit field, enter a value for low limit of slope in region 'A'.

e. In the Slope B High Limit field, enter a value for high limit of slope in region 'B'.

f. In the Slope B Low Limit field, enter a value for low limit of slope in region 'B'.


g. In the Torque Crossover Point field, enter a torque value that is used to transition from region A to region B during Dual slope monitoring.

h. In the Angle Crossover Point field, enter an angle value that signifies the start of transition from region A to region B.





7. At Stick Slip, select  to view the contents.



a. If enabled, do as follows:

- In the Threshold Torque (%) field, enter a percentage value where if torque decreases by this amount stick slip has started to occur.
- In the Occurrence field, enter a value to detect the number of times the measured torque drops below then rises above the threshold torque.

8. At Miscellaneous, select  to view the contents.
 - a. If enabled, do as follows:
 - In Windup compensation field, enter a value that eliminates the problem of a reported Final angle being less than the Target angle.
 - b. Select if applicable:
 - Proximity Switch Enable: When enabled, the tool will stop receiving the proximity input.
9. To save the advance step settings for angle step, select **Ok**.
10. Select **Save**.

Do the following to define settings for prevailing torque step - angle method:



1. At Flags, select  to view the contents:
 - a. Select if applicable:
 - **EOR Data Enable** : If enabled, system will provide EOR message at the completion of tightening strategy.
 - **Torque Threshold Enable** :If enabled, includes cycle below torque threshold value.
2. At Cut-In Parameters, select  to view the contents:
 - a. In the Cut In Angle field, enter a value for the amount of socket rotation (once the Snug Torque is reached) to complete the Cut-In zone.
 - b. In the Cut In Torque High Limit field, enter a value for the maximum Peak Torque that can be encountered either during the Cut-In Zone or the Prevailing Zone.
 - c. In the Snug Torque field, enter a torque value that dictates when the Cut-In Zone section of the Prevailing Torque Step begins.
3. At Torque (N m), select  to view the contents:
 - a. In the High Limit field, enter a value for the maximum allowable average torque during the last 360 degrees of the Prevailing Zone.
 - b. In the Low Limit field, enter a value for the minimum allowable average torque during the last 360 degrees of the Prevailing Zone.
 - c. Select Angle Method.
 - d. At Angle Method (°), select  to view the contents:
 - In the Target Prevailing Angle field, enter a value for the tool socket angle rotation during the Prevailing Torque zone.





- In the Prevailing Angle High Limit field, enter a value for the maximum angle rotation allowed during the Prevailing Torque zone.
 - In the Prevailing Angle Low Limit field, enter a value for the minimum angle rotation acceptable during the Prevailing Torque zone.
4. At Stick Slip, select  to view the contents:
 - a. If enabled, do as follows:
 - In the Threshold Torque (%) field, enter a percentage value where if torque decreases by this amount stick slip has started to occur.
 - In the Occurrence field, enter a value to detect the number of times the measured torque drops below then rises above the threshold torque.
 5. At Miscellaneous, select  to view the contents:
 - a. If Enable Tare Compensation is enabled, do as follows:

NOTE: When enabled, the Average Prevailing Torque will be added to the Target Torque and High/Low Torque Limits of the Torque Step.

 - In the Free Speed field, enter a value for the speed at which the tool will run before reaching Torque Threshold for Shift down.
 6. To save the advance step settings for the Prevailing Torque step - angle method, select **Ok**.
 7. Select **Save**.

Do the following to define settings for prevailing torque step - slope method:

1. At Flags, select  to view the contents:
 - a. Select if applicable:
 - **EOR Data Enable**: If enabled, system will provide EOR message at the completion of tightening strategy.
 - **Torque Threshold Enable**: If enabled, includes cycle below torque threshold value.
2. At Cut-In Parameters, select  to view the contents:
 - a. In the Cut In Angle field, enter a value for the amount of socket rotation (once the Snug Torque is reached) to complete the Cut-In zone.
 - b. In the Cut In Torque High Limit field, enter a value for the maximum Peak Torque that can be encountered either during the Cut-In Zone or the Prevailing Zone.
 - c. In the Snug Torque field, enter a torque value that dictates when the Cut-In Zone section of the Prevailing Torque Step begins.

3. At Torque (N m), select  to view the contents:
 - a. In the High Limit field, enter a value for the maximum allowable average torque during the last 360 degrees of the Prevailing Zone.
 - b. In the Low Limit field, enter a value for the minimum allowable average torque during the last 360 degrees of the Prevailing Zone.
 - c. Select Slope Method.
 - d. At Slope, select  to view the contents:
 - In the Slope Chord Length field, enter a value for the number of tool socket degrees of rotation over which the Torque/Angle gradient is calculated in the Slope method of Seating Point detection. A larger number results in more Torque noise filtering but a delay in Seating Point recognition.
 - In the Slope Deviation field, enter a value for the slope that identifies the beginning of slope detection for Prevailing Torque.
 - In the Slope Deviation Persistence field, enter a value for the number of consecutive slope calculations over which the Torque/Angle gradient is greater than the Slope Deviation, in order to identify the Seating Point and exit the Prevailing Torque zone.
4. At Stick Slip, select  to view the contents:
 - a. If enabled, do as follows:
 - In the Threshold Torque (%) field, enter a percentage value where if torque decreases by this amount stick slip has started to occur.
 - In the Occurrence field, enter a value to detect the number of times the measured torque drops below then rises above the threshold torque.
5. At Miscellaneous, select  to view the contents:
 - a. If Enable Tare Compensation is enabled, do as follows:

NOTE: When enabled, the Average Prevailing Torque will be added to the Target Torque and High/Low Torque Limits of the Torque Step.

 - In the Free Speed field, enter a value for the speed at which the tool will run before reaching Torque Threshold for Shift down.
6. To save the advance step settings for Prevailing Torque step - slope method, select **Ok**.
7. Select **Save**.

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User Management

This screen allows an administrator to create, edit, or delete users.

Controller Settings

Do the following to update the controller settings:

1. Select Controller Settings.

The controller settings screen will be displayed.

2. To update the No Login Required settings:

- If **No Login Required** is selected, users need not login to the controller to view home screen. To access other screens, users must login to the controller.
- If **No Login Required** is not selected, users must login to the controller to access any screen.

3. Select **Save**.

Create New User

Do the following to create new user:

1. Select Create User.

The Create New user screen will be displayed.

2. In the Name fields, enter the first and last name for identification.
3. In the User Name field, enter a name that can be used at the time of login.
4. In the Alias Name field, enter a name that can be displayed in the logs.
5. In the Password field, enter a password that can be used to authenticate the user at the time of login.

NOTE : Password must have a minimum of eight characters.

6. In the Confirm Password field, re-enter the password for confirmation.
7. Under Select Role field, select any one from the drop down list:
 - **Administrator** : Access to view or configure any screen. This type of login gives privileged access to create, modify or delete user accounts.
 - **Supervisor** : Access to view or configure any screen except User Management screen. This type of login is provided for advanced business functionality.
 - **Viewer** : Access to view any screen except User Management screen. This type of login

is provided to access the application for viewing data only.

- **Operator** : Access to home screen only. This type of login is provided to perform fastening operations.

8. If Administrator or Supervisor is selected, select Timeout from the drop down list.

NOTE: Operator login and Viewer login does not get Timed out.

9. Select **Save**.

Search User

The search field allows the user to search using user name, first name or last name as a search criteria.

Edit Existing User

Do the following to edit existing user:

NOTE: This is not applicable for Administrator account.

1. From the User List, navigate to the specific user for which the fields need modification.

2. Under Edit User, select .

The Edit User screen will be displayed.

3. To edit any of the fields, update the existing values.

4. To change existing Password, select change Password.

The Password and Confirm Password fields will be displayed.

5. In the Password field, enter a password that can be used to authenticate the user at the time of login.

NOTE: Password must have a minimum of eight characters.

6. In the Confirm Password field, re-enter the password for confirmation.

7. After editing the required fields, select **Save**.

Delete Existing User

Do the following to delete an existing user:

1. From the User List, navigate to the specific user that needs to be removed.

2. At Confirm Delete prompt, select **Yes**.

NOTE: This is not applicable for default Administrator account.

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Statistics Settings

This screen allows the user to provide settings for calculating statistical data. To enable statistical calculation, select the Enable Calculation field to show indicator in **ON** position.

Edit Statistics Settings

Do the following to edit the statistics settings:

1. In the Sample Size field, enter a value for size of the sample to be used for calculation.
2. From the Sample Type field, select from the drop down list:
 - **All**: Allows sampling of all passed and failed cycles including failure due to hardware faults.
 - **Passed Cycles Only**: Allows sampling all passed cycles.
 - **All but Hardware Faults**: Allows sampling all cycles except failures due to hardware faults.
3. Select required parameters from the list.
4. Select **Save**.

Statistic types displayed on the Statistics Settings screen are described in the following table:

Statistic Type	Description
Mean	Average used to derive the central tendency of the data.
Capability	Calculated as $(6 * \text{sigma} / \text{Mean}) * 100$
Pass %	Indicates the pass status in percentage.
Fail %	Indicates the fail status in percentage.
Mean Shift	Mean - Target
Range	Indicates the (maximum – minimum) value.
Std Deviation (sigma)	Standard Deviation
PP	Capability Statistics parameter calculated as $(\text{Upper set limit} - \text{Lower set limit}) / (6 * \text{sigma})$

CAM	$(\text{Upper Limit} - \text{Lower Limit}) / (6 * (W/dS))$
PPK	Capability Statistics parameters calculated as $\text{Min} ((\text{mean} - \text{Lower set limit}) / (3 * \sigma) \text{ or } (\text{Upper set limit} - \text{mean}) / (3 * \sigma))$

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Statistics Summary

This screen allows the user to view a summarized statistical data.

Do the following to view the population and sample statistics:

1. To view statistics, select a Pset from the Pset Selection drop down list.

The calculated angle and torque values for population and sample statistics will be displayed as follows:

- Parameter
- Population Angle
- Sample Angle
- Population Torque
- Sample Torque

NOTE: Statistic calculations will be cleared when a Pset setting is changed. To create a new Pset, refer to [Creating Pset](#).

2. To edit Sample Size and Sample Type fields, select Edit Settings.

NOTE: Refer to [Edit Statistics Settings](#).




3. To clear sample statistics, select Clear Sample. At the prompt, select **Yes**.
4. To clear population statistics, select Clear Population. At the prompt, select **Yes**.

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Statistics Alarm Summary

This screen provides a summary of all Statistics alarms.

Icon	Description
	Alarm is not enabled
	Alarm is not active
	Alarm is active

To set Statistic alarms, refer to [Statistics Alarm Settings](#) .



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Fieldbus Settings





The screen allows setting I/O and controls for industrial fieldbus.

Do the following to enable fieldbus:

1. From the Type field, select from the following:
 - None
 - Ethernet Ip
 - Profinet
2. To enable fieldbus master to control a tool in machine mount mode, select within the Enable Bus Controls System field to show indicator in **ON** position.
3. To enable barcode data from fieldbus, select Enable Barcode Input.
4. For setting input assignment, do as follows:
 - a. Select Input Assignment.
The Fieldbus Assignment screen will be displayed.
 - b. Under Input Bit Assignment, select  to view Byte 0, Byte 1 or Byte 2 contents.
 - c. For Bit 0 - 7, do as follows:
 - From Select Data fields, select a behavior to assign to the bit. On completion, select **OK**.
 - From Polarity fields, select from the following:
 - Normally Open
 - Normally Close
 - d. Select **Ok**.
5. For setting output assignment, do as follows:
 - a. Select Output Assignment.
The Fieldbus Assignment screen will be displayed.
 - b. Under Output Bit Assignment, select  to view Byte 0, Byte 1 or Byte 2 contents.
 - c. For Bit 0 - 7, do as follows:
 - From Select Data fields, select a behavior to assign to the bit. On completion, select **OK**.

- From Polarity fields, select from the following:
 - Normally Open
 - Normally Close
- In the Timeout (Sec.) fields, enter values for time interval elapse.

6. Under Output Register Assignment, select the fastening data to be included in the fieldbus data stream.

- To add a new field, select .
- To change the order of a selected field, select  or .
- To remove a field from the data stream, select .

d. Select **Ok**.

7. Select **Save**.

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Digital IO

This screen allows the user to add, edit or delete Input / Output devices.

Adding Modules

Do the following to add I/O modules:

1. Select Add Module.
2. From the ADD Device IO field, select a device type from the drop down list:
 - QLight (0x4)
 - Light Tree (0x3)
 - Socket Tray (4x4)
 - DIO Box (4x4)
 - DIO Box (8x8)
3. From the Ports Available field, select a port to establish physical connection.
NOTE: Make sure to select the port to which the I/O device is connected.
4. To set IO Assignment, do as follows:
 - a. If QLight (0x4) or Light Tree(0x3) is selected from ADD Device IO field, select IO Assignment to view Output Assignment contents.
 - To edit the Output Assignment contents, select Edit.

- For point 0 - 3, do as follows:
 - From the Behaviour fields, select from a list of behaviours and then select **Apply**.
 - From the Polarity fields, select from the following:
 - Normally Open
 - Normally Close
 - In the Timeout (Sec.) fields, enter the duration for which the output needs to be active.
 - For activating LED notification, select Blink.
- Select **Ok**.

- b. If any other device is selected from ADD Device IO field, select IO Assignment to view

Input Assignment and Output Assignment contents.

NOTE: USB cable length should be limited to 3m. If longer cable is used, performance may differ.

In case of a **DIO Box (8x8)** device, the input assignment and output assignment points will be 0 - 7.

- To edit the Input Assignment contents, select Edit.
 - For point 0 - 3, do as follows:
 - From the Behaviour fields, select from a list of behaviours and then select **Apply**.
 - From the Polarity fields, select from the following:
 - Normally Open
 - Normally Close
- To edit the Output Assignment contents, select Edit.
 - For point 0 - 3, do as follows:
 - From the Behaviour fields, select from a list of behaviours and then select **Apply**.
 - From the Polarity fields, select from the following:
 - Normally Open
 - Normally Close
 - In the Timeout (Sec.) fields, enter values for time interval elapse.
 - For modifying the output toggle state to one per second, select Blink.
- Select **Ok**.

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Email Settings

This screen allows the user to configure outgoing emails.

Do the following to configure outgoing emails:

1. In the Email Address field, enter address that will be displayed as the from address for any email sent from the controller.
2. In the User Name field, enter username for the mail server.
3. In the Password field, enter password for the mail server.
4. In the Outgoing email server field, enter address of the mail server.
5. In the Port field, enter port number of the mail server.
6. For email validation test, enter an address of the email box and then select **Send Test Mail**.
7. Select **Save**.

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Statistics Alarm Settings

This screen allows the user to set Statistics Alarm.

Do the following for setting statistics alarm:

1. From the Pset Selection field, select a Pset from the drop down list.

To create a new Pset, refer to [Creating Pset](#).

2. To activate torque or angle alert for any of the listed parameters, select Enable Alarm corresponding to the parameter.

NOTE: For definitions of listed parameters, refer to [Statistics Settings](#).

3. In the Set Limit field, enter a value to trigger an alarm when the statistical computation for the tightening operations exceed the set limit.
4. In the Clear Limit field, enter a value to clear the alarm when the statistical computation for the tightening operations returns to normal limit.
5. To activate email alerts, select Email and then enter details in the following fields:
 - a. In To field, enter the address of the email box to which the email needs to be delivered.
 - b. In cc field, enter the address of the email box to which a carbon copy (cc) of the email needs to be delivered.
 - c. In bcc field, enter the address of the email box to which a blind carbon copy (bcc) of the email needs to be delivered. The address of this recipient will not appear in the email.
 - d. In Subject field, enter a headline to uniquely identify the email.
 - e. In Message field, enter details indicating the purpose of this email.
6. Select **Save**.

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Backup & Restore

This screen allows the user to backup controller information or restore previously backed up information.

Creating Backup

NOTE: When backup and restore operation is in progress, fastening operation will be disabled and all other users will be logged out.

Do the following to create a backup for the modules:

NOTE: If backup is performed from a local controller screen, make sure to connect a USB memory stick to the controller.

1. From the Modules List, select the modules that need a backup. This list include Settings, Results and Logs, License, and Firmware.
2. Select **Create Backup**.

When a backup is performed on a local controller screen, on successful completion, a window will be displayed to select the folder location on the USB memory stick for saving the backup file. When a backup is performed on a remote connection, on successful completion, backup file will be downloaded to the default location provided in browser settings. If backup operation fails, an error will be displayed.

Restoring Backup

NOTE: When backup and restore operation is in progress, fastening operation will be disabled and all other users will be logged out.

Do the following to restore modules:

1. To select the backup file, select Browse near the Select File field.

A pop-up window will be displayed.

2. Browse folder for the backup file, select the file and then select **Open**.

The backup file will be displayed in the Select File field.

3. Select **Upload**.

Once the upload is complete, the user is presented with modules that were included in the backup file. For example; Settings, Results and Logs and so on.

User can select one or more modules to restore. A notification that the restore is in progress and on completion, a success or failure notification will be displayed.

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Firmware Update

This screen allows the user to update the firmware of the controller. The current application version and MCE firmware version is listed on the screen.

Do the following to update the firmware:

NOTE: All other users will be logged out of the controller.

1. To select the update package file, select **Browse** near **Select File** field.

A pop-up window will be displayed.

2. Browse folder for the **.irb** file, select the file and then select **Open**.

The update file will be displayed in the **Select File** field.

3. Select **Upload**.

A progress bar will be displayed. On completion, a success or failure notification will be displayed. The system may reboot after an update.

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Digital IO Diagnostics

This screen provides real time information on the Input / Output devices connected to the Fastening Controller. Input diagnostics displays the status of all digital input signals as received by the fastening controller. Output diagnostics displays the status of all digital output signals as updated by the fastening controller.

Do the following to view or update the output values:

1. To view Input / Output Diagnostics screen for a specific device, at the right hand side of the listed Device IO, select **IO Diagnostics** .

NOTE: Status indicators display the status of the listed fields. Green indicates connected and red indicates disconnected.

2. To change the state of output signal, select **Force Outputs**. At the Warning screen, select **Yes** and then select **Toggle** .

NOTE: The output values will be changed to original values when user navigates away from the screen.

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License

This screen allows the user to update the software license.

Updating License

Do the following to update the license:

NOTE: If update is performed from a controller screen, make sure to connect a USB memory stick containing .dat file to the USB port of that controller.

1. To attach a .dat file, select Browse near the Update License field.

A pop-up window will be displayed.

2. Browse folder for the related file, select the file and then select **Open**.

The related file will be displayed in the Update License field.

3. Select **Upload**. "License file has been uploaded" message will be displayed on the screen.

NOTE: New license information will be displayed in [About](#) screen.

The controller is pre-loaded with the following license files:

- **Basic License**: Enables some of the basic functionalities of the controller. This license is active by default.
- **Demo License**: Enables all functionalities of the controller. To activate a demo license, select Activate License.

NOTE: Once activated, this license will be valid for a period of 30days. To renew a demo license, contact the sales representative.

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Factory Reset

This screen allows the user to restore the controller memory and database to the original system state. Any data stored on the controller memory and database will be erased, settings will be restored to default set by the manufacturer.

Do the following to do a factory reset:

NOTE: It is recommended to make backup before performing factory reset!!

1. Select **Factory Reset**.
2. At the confirm prompt, select **Yes**.

On completion, a success or failure notification will be displayed.

Factory reset operation does not reset IP address of the controller to default values. To reset IP address of the controller to default values, press the IP Address Reset Pin (1) for 10 seconds. Refer to [Figure A](#).



Figure A: View of IP Address Reset Pin on fastening controller

Once reset, the default values for Port 1 and Port 2 are as follows:

Port	Default Values
Port 1	IP Address - 192.168.5.5 Subnet mask - 255.255.255.

	0 Gateway - 192.168.5.1 Primary DNS Server - 0.0.0.0 Secondary DNS Server - 0.0.0.0
Port 2	IP Address - 192.168.5.6 Subnet mask - 255.255.255.0 Gateway - 192.168.5.1 Primary DNS Server - 0.0.0.0 Secondary DNS Server - 0.0.0.0

NOTE : After a factory reset, the port settings will be automatically set to Static IP. To update the settings after a factory reset, refer [IP Settings](#) .

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Discovery

This screen allows the user to search, view or connect with other fastening controllers. When Start Discovery is selected, it searches for the availability of all controllers over the network and establishes connections.

NOTE: This feature will list the controllers which are currently powered ON and connected to same network. It is available for remote connections only.

Do the following for connecting to other fastening controller:

1. Select **Start Discovery**.

A list of available controllers will be displayed on the screen. Refer to the [table](#) for descriptions of all listed parameters.

2. For navigating to any of the listed controllers, select the IP address.

NOTE: User will be logged out of the current controller session.

3. At the Warning prompt, select **Yes**.

4. At the login screen, enter the user credentials to access the account.

Parameters displayed on the Discovery screen are described as follows:

Parameter	Description
Job Name	Name that uniquely identifies the job.
Controller IP Address	IP Address assigned to the specific controller.
SATA Drive ID	Identifies the drive installed on the controller.
Application Version	Identifies the version of application installed on the controller.
MCE Version	Identifies the version of MCE installed on the controller.
Controller MAC Address	MAC address of the controller.
Plant Name	Name that uniquely identifies the plant.
Assembly Line Name	Name that uniquely identifies the assembly line.

Station Name	Name that uniquely identifies the station.
--------------	--

To download discovery results in CSV format, select  Export. The search result displayed on the screen will be downloaded.

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About

This screen provides information related to the fastening controller unit, software version, licensing and features enabled on the user interface.

Controller Information

This covers information related to the model and serial number of the controller.

Version Information

This covers information related to the OS version, application version, DB version, and firmware version.

License Information

This covers information related to SATA ID, license type, activation, and expiry.

Features Enabled

This covers information related to a list of features enabled on the user interface.

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Fieldbus Diagnostics

This screen provides real time information for the industrial fieldbus devices connected to the Fastening Controller. Tabulated **Input** represents the communication received from external devices. Tabulated **Output** represents the communication sent from the Fastening Controller.

Do the following to view or update the output values:

1. To view Fieldbus Diagnostics screen for a specific device, at the right hand side of the listed Devices, select **Fieldbus Diagnostics** .


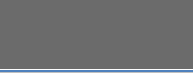

NOTE: Status indicators display the status of the listed fields. Green indicates connected and red indicates disconnected.

2. To change the state of output signal, select **Force Outputs**. At the Warning screen, select **Yes** and then select **Toggle** .

NOTE: The output values will be changed to original values when user navigates away from the screen.

Communication Status Indicators

Colors displayed for the status of these communication protocols are described as follows:

Color	Description
	Indicates communication protocol in connected state.
	Indicates communication protocol in disabled state.
	Indicates communication protocol in disconnected state.

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Job

This screen allows the user to create, edit, or delete jobs.

Parameters displayed on the job screen are described as follows:

Parameter	Description
Status	Indicates validity of the job with respect to connected tool.
ID	Indicates the Job ID. NOTE: A Job ID can be used for Job selection by DIO, Fieldbus or MES protocols.
Job	Indicates the name given to identify the job. To edit the job, select the job.
Interlocks	Information related to interlocks as set in the job.
Delete	Select to delete the job.

Setup Job

Do the following to create a new job:

1. To create a job, select **Setup Job**.

The Create Job screen will be displayed.

2. To enable or disable the tool based on user defined criteria, from the Interlocks, select if applicable:

NOTE: Interlocks aid the user in enforcing line controls.

- **Valid Job:** When a job is selected, the tool is enabled if there are no other interlocks preventing the tool from getting enabled. When the job is complete, the tool gets disabled and the job selection is cleared. The user must select a job in order to run the tool again. The user can select the same job or a different job.
- **Barcode:** The tool is disabled until a valid barcode is scanned. Once a barcode is scanned, the tool will run the selected job. Once the job completes or aborts, the tool will be disabled until the next valid barcode is scanned.

- **Tool Enable** : The tool is disabled until an enable signal is received. The tool is disabled when a disable signal is received. The enable or disable signals can come from MES protocols, DIO, or Fieldbus. DIO and Fieldbus are governed by the setting for either 1 Line or 2 Line Enable or Disable in the spindle settings.
- **Smart Socket** : The tool is disabled until the socket assigned to the Pset is selected from the socket tray. If wrong socket is selected, multiple sockets are selected or no socket is selected, then the tool will be disabled. The check for valid socket selection is done at the end of each tightening.

3. In the Name field, enter a name to identify the job.

4. In the ID field, the pre-populated number can be updated to any other number between 1 to 255. If the number is already in use for any of the existing jobs, an error will be displayed.

NOTE : A pre-populated number is displayed in the ID field based on the first available job id. User has the option to retain the pre-populated number or choose any other number between 1 to 255.

5. To select from the Existing Pset, select from the drop down list.

Else, continue to step 2 of **Create Pset**.

NOTE : A default Pset is generated when a job is created. This Pset can be modified or deleted to meet the user requirement. If required, an existing Pset can be added to the job.

6. To create sequence and link Psets, select **Rules**.

NOTE : For each Pset, separate rule can be setup based on success or failure result of the Pset. If Pset has a batch count set to 5, completing that batch of 5 is a success result.

- For success result, at Pass window, do the following:
 - In the Action field, select a rule from the drop down list:
 - **None** : No action.
 - **Jump to Pset** : Jump to specific Pset.
- For failure result, at Fail window, do the following:
 - In the Failure Types field, select a rule from the drop down list:
 - Hardware Fault
 - High Torque.
 - Low Torque
 - High Angle
 - Low Angle
 - High Torque and Low Angle
 - High Torque and High Angle

- Low Torque and High Angle
- Low Torque and Low Angle
- Cycle Timeout
- In the Action field, select a rule from the drop down list:
 - **Abort**: Cancel the job.
 - **Retry**: Retry the same Pset.
 - **Retry then Abort**: Retry the same Pset as specified in the count value. After exhausting the retries, the job will be aborted.
 - **Jump to Pset**: Jump to specific Pset.


7. Select **Save**.

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System Logs

This screen allows the user to download the Communication Logs and the Debug Logs. To download these logs, select . User working on a local display must connect a USB pen drive to the controller before downloading. For remote access, a default location must be set in the browser settings.

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Preventive Maintenance Alarm

This screen allows the user to set maintenance alarms for smooth functioning of the tools. These alarms notify the user when one or more maintenance activities are due. For description of any listed parameter, refer to the [table](#).

Modifying the Alarm

Do the following to modify the alarm settings:

1. From right side of the related alarm, select .
2. To enable or disable the alarm, select the Enable Alarm field.
If OFF is selected, select **Save** to close. If ON is selected, proceed to step 3.
3. From the Alarm Name field, select an alarm from the drop down list or manually enter a name.
NOTE: For first 3 alarms, user can select a name from the drop down list. For last 2 custom alarms, user needs to enter a name in ASCII text.
4. Select any one from the following:
 - **Cycle**: Allows selecting the number of cycles after which an alarm needs to trigger.
 - **Days**: Allows selecting the number of days after which an alarm needs to trigger.
5. If Cycle is selected, from the Cycle Count field, select # of cycles from the drop down list. Else, proceed to Step 6.
6. If Days is selected, from the Duration field, select # of days from the drop down list.
NOTE: Trigger Date will be displayed.
7. For an e-mail notification, select **Email** check box and do as follows:
 - a. In To field, enter the address of the email box to which the email needs to be delivered.
 - b. To enter the address of the email box to which a carbon copy (CC) of the email needs to be delivered, select **add CC**.
 - c. To enter the address of the email box to which a blind carbon copy (BCC) of the email needs to be delivered, select **add BCC**.
 - d. In Subject field, enter a headline to uniquely identify the email.
 - e. In Message field, enter details indicating the purpose of this email.
8. Select **Save**.

NOTE: User can select  to reset the Alarm.

Parameters displayed on the Preventive Maintenance screen are described as follows:

Parameter	Description
Alarms	Indicates the type of alarm.
Configured	Indicates whether the alarm is configured or not configured.
Enabled/Reset Date	Indicates the date on which the alarm was enabled or last reset.
Alarm Name	Indicates the name given to the alarm.
Date/Remaining Cycles	Indicates the pre-set date or remaining cycles at which the alarm needs to trigger. NOTE : A negative value of cycles indicates that the alarm has triggered.
Status	Indicates whether the alarm is active or inactive.

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Global Settings

Perform the following to update the global settings:

1. At the Job List screen, select **Global Settings** .

The Global Settings screen will be displayed.

2. To enable boot job, select the Boot Job field to show indicator in **ON** position.

NOTE: If enabled, boot job allows the user to resume a job that was interrupted by a power cycle/outage once the controller reboots. If disabled, the controller will consider the interrupted job as aborted and will be ready for the next job.

3. To enable queue barcode, select the Queue Barcode field to show indicator in **ON** position.

NOTE: If enabled, for the current job, the current barcode will be attached to all results and any new barcode will be used only after the current job completes. Only one barcode can be queued and will be the latest barcode scanned. If disabled, the controller will attach the new barcode scanned to any new results immediately.

4. From the Curve Logging field, select a curve logging type from the drop down list:

NOTE: All traces will be displayed on the home screen. This section is for the storage of trace data for retrieval from the cycle results screen only.

- **None:** Traces are not stored in the database.
- **All:** Traces are stored in the database and can be viewed on the cycle results screen.
- **Bad only:** Traces from failed cycles will be stored and can be viewed from the cycle results screen.

5. From the Job Selection field, select a job type from the drop down list:

- **Internal:** User can select the job to run from the home screen through the job select dropdown.
- **External - MES:** System will only allow job selection from external MES systems.
- **External - Barcode:** System will only allow job selection from scanning of a barcode.
- **External - Discrete:** System will only allow job selection from the discrete inputs where there is a one to one correspondence between the input and the job that are programmed.
- **External - Discrete - Field Bus:** System will only allow job selection from the Fieldbus inputs where there is a one to one correspondence between the input and the job that are programmed.
- **External - Binary:** Based on the pin configuration, the respective job will be selected. Whereas, in External - Discrete job selection, each pin is responsible for single job selection.

For example:

- If all job selection inputs are **OFF**, then the binary number will be 00000000, that is, job 1 will be selected (0 + 1).
- If job selection 1 is asserted and all other jobs are **OFF**, then the binary number will be 00000001, that is, job 2 will be selected (1+1).
- If job selection 2 is asserted and all other jobs are **OFF**, then the binary number will be 00000010, that is, job 3 will be selected (2 + 1).
- **External - Binary - Field Bus**: System will only allow job selection from the Fieldbus inputs where the job selected is based on a binary representation of the 8 job selection inputs.

6. Select **Save**.

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Advanced Cycle Result Parameters

Additional parameters displayed on the Cycle Results screen are described as follows:

Parameter	Description
Cycle Pass/Fail	Indicates the overall pass/fail status of the fastening that generated the fastening results.
Date & Time	Date and time of completing the fastening operation.
Torque Result	Torque result is 'High Torque' failure, if the value of torque exceeds the maximum torque limit. Torque result is 'Low Torque' failure, if the value of torque is below the minimum torque limit. Otherwise, the Torque result is a Pass.
Angle Result	Angle result is 'High Angle' failure, if the value of angle exceeds the maximum angle limit. Angle result is 'Low Angle' failure, if the value of angle is below the minimum angle limit. Otherwise, the Angle result is a Pass.
Measured/Peak Angle (°)	Maximum value of angle achieved during fastening.
Reason for Shutdown	Indicates the cause for cycle abort or termination.
Spindle Cycle Number	Incremental number of fastenings performed by the connected tool. This is used to uniquely identify fastening results for a particular fastener.
Controller Cycle Number	Incremental number of fastening performed on Controller.

Job Name	Indicates the name given for the user defined job.
Pset Name	Indicates the name given for the user defined Pset.
Barcode	If enabled, it displays barcode scanned from a scanner.
Operator Name	Indicates the name of the operator who performed the fastening.
Job ID	Matched with a job and is used for external job selection.
Step ID	Matched with a step.
Job Cycle Number	Incremental number of jobs run by the controller. This is used to uniquely identify the fastening results associated with the execution of a particular job.
Plausibility Check	Indicates whether or not current plausibility was enabled for the fastening that generated the fastening results.
Plausibility High Pass	Indicates whether or not the current plausibility check against the current plausibility high limit passed or failed.
Plausibility Low Pass	Indicates whether or not the current plausibility check against the current plausibility low limit passed or failed.
Gradient	Detects serious fluctuations in the coefficient of friction in rotating joint components during a tightening cycle.
Dual Slope	Indicates whether or not dual slope checks were enabled for the fastening that generated the fastening results.

Dual Slope B Low Limit Pass	Indicates whether or not the Slope check in region B against the Slope low limit for region B passed or failed.
Dual Slope B High Limit Pass	Indicates whether or not the Slope check in region B against the Slope high limit for region B passed or failed.
Dual Slope A Low Limit Pass	Indicates whether or not the Slope check in region A against the Slope low limit for region A passed or failed.
Dual Slope A High Limit Pass	Indicates whether or not the Slope check in region A against the Slope high limit for region A passed or failed.
Unusual Fault	Indicates whether an unusual fault was reported by the MCE for the fastening result.
Motor Torque Constant Test Pass	Indicates the motor torque constant test result.
Free Speed Test Pass	Indicates whether or not the free speed check passed or failed.
Angle Low Pass	Indicates whether or not the angle check against the angle low limit passed or failed.
Angle High Pass	Indicates whether or not the angle check against the angle high limit passed or failed.
Torque Low Pass	Indicates whether or not the torque check against the torque low limit passed or failed.
Torque High Pass	Indicates whether or not the torque check against the torque high limit passed or failed.
Peak Prevailing Torque	Maximum achieved value of torque in prevailing fastening

	zone.
Measured/Peak Angle (°)	Maximum value of angle achieved during fastening.
Peak Current (A)	Displays maximum current drawn during tightening cycle.
Peak Slope	Maximum value of slope achieved during fastening.
Final Slope	Final value of slope during fastening.
Cycle Time (Sec)	Total time taken to complete all fastening steps in a Pset.
Peak Cut-in Torque	Peak value of torque achieved in the Cut-in fastening zone of Prevailing Torque or Drag Torque Strategies.
Average Prevailing Torque	Average value of torque achieved in the prevailing fastening zone. It is calculated using a moving average of up to the last 360 degrees of running torque prior to the end of the prevailing fastening zone.
Angle At Seat (°)	Value of angle at seating torque in the prevailing zone.
Torque At Seat	Torque at which the head of the fastener is seated against the workpiece after rundown of the fastener or at which consolidation of joint components is achieved in the prevailing zone.
Total Angle (°)	Total angle achieved across all fastening steps in a Pset.
Measured Torque	Maximum value of torque achieved during fastening.
Prevailing Torque Slope	Measured slope of the torque curve during the prevailing zone.

Torque High Limit	Maximum acceptable torque value during the fastening step.
Torque Low Limit	Minimum amount of torque that must be reached during the fastening step.
Angle High Limit (°)	Maximum angle of rotation acceptable during the fastening step.
Angle Low Limit (°)	Minimum angle of rotation acceptable during the fastening step.
Control Point	Set-Point/Target to achieve for either torque or angle depending on the step type.
Down Shift Speed (RPM)	Displays the down shift speed in RPM.
Dual Slope A High Limit	High limit of slope in region 'A'.
Dual Slope A Low Limit	Low limit of slope in region 'A'.
Dual Slope B High Limit	High limit of slope in region 'B'.
Dual Slope B Low Limit	Low limit of slope in region 'B'.
Gradient High Limit	High limit of slope in region 'A'.
Gradient Low Limit	Low limit of slope in region 'A'.
Tare Compensation	If enabled, the Average Prevailing Torque is added to the Torque Step's Target Torque, High Torque Limit, and Low Torque Limit to compensate for the Prevailing torque. The modified Target is checked against the modified Torque Control's High/Low Torque Limits for violation. If outside the limits, the step declares an error.

	<p>NOTE: Tare Compensation is only available if the Final tightening step is Torque Control and must follow a Prevailing-Torque step.</p>
Total Batch Count	Specifies the total number of fasteners to be fastened in a batch.
Current Batch Count	Present value of batch count to indicate which fastener in the batch was fastened to generate the result.
Torque Display Units	Indicates the Torque unit. Nm is the default unit.
Free Speed (RPM)	Speed at which tool will run before reaching the Torque Shiftdown Point.
Transducer Range	Field represents a calibrated torque value that is used to scale the internal torque measurements.
Max. Tool Speed (RPM)	Displays maximum tool speed in RPM.
Tool Serial Number	Indicates serial number of the tool connected to the fastening controller that generated the fastening result.
Total Angle High Pass	Indicates the total angle high result.
Total Angle Low Pass	Indicates the total angle low result.

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Volkswagen XML

Volkswagen XML (VWXML) is a communication protocol used to connect the controller with Master server and sends the EOR results in the XML format. To enable VWXML, select the Enable field to show indicator in **ON** position. To enable logs, select within the Enable Logs field to show indicator in **ON** position.

Fields displayed on the VWXML screen are described as follows:

Field	Description
VWXML Version Information	Drop down list contains the supported VWXML versions. Default VWXML version is 2.1
Port Number A	Number that identifies the port A. Default port number is 4700
Port Number B	Number that identifies the port B. Default port number is 4710
Retry Interval (Sec)	The amount of time to wait before sending the message again in case of no reply. Default retry interval value is 3 seconds
Keep Alive Timer (Sec)	The timeout value for the keep alive message and master server. Default keep alive timer value is 7 seconds

Enter the information in the fields and then select **Save**.

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Toolsnet

Toolsnet is a communication protocol used to connect the controller with Toolsnet server to store the tightening records and curve data in the toolsnet database. The controller connects to PIM (Protocol Interface Module) server to obtain toolsnet server IP address and port number.

To enable Toolsnet, select the Enable field to show indicator in **ON** position. To enable logs, select within the Enable Logs field to show indicator in **ON** position.

Fields displayed on the toolsnet screen are described as follows:




Field	Description
System Type	Drop down list contains the supported System Type. Default system value is Ingersoll Rand
PIM IP Address	IP Address of the PIM server. Default value is 192.168.4.1
PIM Port Number	Port number of the PIM server. Default port number is 6575
Retry Interval (Sec)	The amount of time to wait before sending the message again in case of no reply from the server.
Keep Alive Timer (Sec)	The timeout value for the keep alive message and server.
Max Retries (Sec)	The maximum number of times to retry sending a message before declaring that the communication is lost with the station computer.
System Number	Number that identifies the system number. Default system value is 1
Station Number	Number that identifies the station number. Default station number value is 1

System Name	Identifies the system name.
Station Name	Identifies the station name.
Spindle Name	Identifies the spindle name.

Enter the information in the fields and then select **Save**.

Status Indicators

Status indicators displayed on the screen are described as follows:

Status	Description
	Indicates connected state.
	Indicates disabled state.
	Indicates disconnected state.

Background Colors

Colors displayed for the status of these communication protocols are described as follows:

Color	Description
Green [background color to be added instead of text]	Indicates pass state for a given task.
Blue [background color to be added instead of text]	Indicates torque or angle is within range for a given task.
Orange [background color to be added instead of text]	Indicates low torque or angle for a given task.
Red [background color to be added instead of text]	Indicates fail state for a given task.