



# GenIV Controller on PI Line Control Network

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Date: April 24, 2019

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## 1. Introduction

The Gen IV family of controllers fully support the PI line control protocol. Communication with the PI line control is accomplished through a serial connection (RS-232). This document describes the configuration and behavior of the controller while connected to the PI line control system.

## 2. Configuring the Controller

### Serial Port

The PI line control system communicates with the controller via a standard serial port. The Gen IV controller need to be configured the same as the PI line controller.

- Serial "Port Mode" be set to "PI Line Control"
- Serial port "Baud" set to 9600
- Serial port "Data Bits" set to 8
- Serial port "Stop Bits" set to 1
- Serial port "Parity" set to "Odd"

Port Mode	PI Line Control ▼
Baud	9600 ▼
Data Bits	8 ▼
Stop Bits	1 ▼
Parity	Odd ▼

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### Barcode Identifiers

When the part enters the work station the PI line control sends work instructions to the torque controller. This work instruct contains the following information.

- 5-digit assembly sequence number
- 20-digit VIN
- 4-digit Tool ID
- Sequence of parameter sets that are to be used on the part in the station.

Because the assembly sequence, VIN and Tool ID are different lengths they can all be stored in their own barcode ID. This allows the information to be displayed on the run screen and stored with each fastening result.

Configuring three masks in the barcode configuration to capture the different lengths will sort each to a unique identifier.

Mask	ID	Action	#	1	2	3	4	
.....	#1	Do Nothing	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
....	#2	Do Nothing	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
...	#3	Do Nothing	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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## JOBS

The use of JOBS is not recommended for controllers used in the PI Line Control environment.

### 3. PI Line Control Run Screen

Once the serial port mode is set to "PI Line Control" a new run screen will be available.

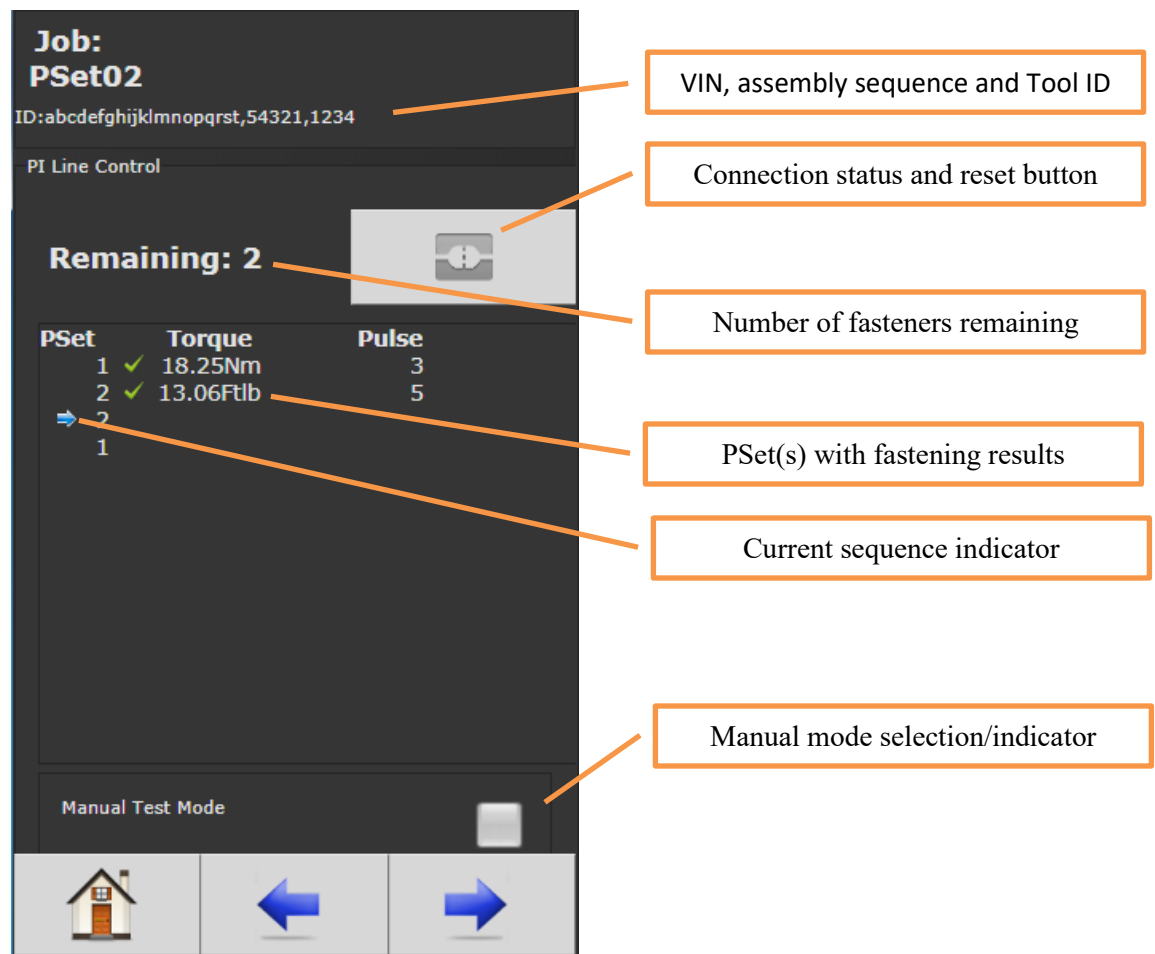
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The screenshot shows the PI Line Control Run Screen with the following elements:

- Job: PSet02**
- ID: abcdefghijklmnopqrst,54321,1234** (Callout: VIN, assembly sequence and Tool ID)
- PI Line Control**
- Remaining: 2** (Callout: Number of fasteners remaining)
- Connection status and reset button** (Callout: Connection status and reset button)
- Table of PSet, Torque, and Pulse:**



PSet	Torque	Pulse
1	✓ 18.25Nm	3
2	✓ 13.06Ftlb	5
2		
1		
- PSet(s) with fastening results** (Callout: PSet(s) with fastening results)
- Current sequence indicator** (Callout: Current sequence indicator)
- Manual Test Mode** (Callout: Manual mode selection/indicator)

#### VIN Assembly Sequence and Tool ID

The ID in the status header for all run screens will contain the part information from the PI control system.

#### Connection Status

The connection status is indicated by one of two icons.

-  Connected
-  Disconnected. When the Disconnected the status icon can be pressed to reset the communications.

### Fasteners Remaining

The number of fasteners remaining is for the part currently in the work station. It starts with the number of PSets that is to be ran and decrements by one for each acceptable fastening. When it hits zero the tool is disabled.

### PSet(s) with Fastening Results

As fastenings are completed the results are displayed for the current sequence.

### Current Sequence Indicator


The current sequence is indicated with an arrow. As acceptable fastenings are completed the indicator will move down the list of PSets. Once the PI control sends “Notification of Normal Work Completion” or “Notification of Forced Work Completion” the indicator is removed.

### Manual Mode

Manual mode is used to enable the tool for testing. Entering manual mode will enable the tool, clear the PSet and results list. It will also clear the IDs (this will result in fastening results being stored without vehicle information). Fastening performed in manual mode will not be displayed on this run screen but can be observed on other screens. Manual mode is only allowed when a part is not in process. If a new work instruction is received from the PI control system, manual mode is canceled.

## 4. Run Screen Icons

While running the controller on the PI line control system the tool can be disabled for several reasons. Whenever it is disabled the run screen icon(s) and LED display will give the reason.

Run Screen Stop Icon	LED Display	Reason
	“DONE”	The list of PSets from the PI control has been completed



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	"PI"	There is a communication error to the PI line control system.
	"PSET"	The active PSet does not match the PSet sent by the PI line control system. This can occur if the PSet number is changed contrary to the PI line control.

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