80-5700-10
Rev. 1

SUPPLEMENT TO MANUAL:
• 80-5700-00

GROUP 57 ACTUATORS EQUIPPED WITH Wi-Fi

Beck Group 57 actuators are available with an optional Wi-Fi interface that allows nonintrusive setup and configuration of the actuator. Use of the Wi-Fi interface requires a Beck Wi-Fi equipped actuator and any Wi-Fi capable device, such as a phone, tablet or computer equipped with a web browser (Chrome, Edge, Firefox, Safari, etc.).

Establishing the Wi-Fi connection is easily accomplished. Each Beck actuator creates its own unique Wi-Fi network. The Wi-Fi network name will be shown with the word “Beck” followed by the actuator serial number; e.g., “Beck_57-109-189400-00-00”. This serial number is also shown on the nameplate attached to the side of the actuator.

If needed, detailed connection instructions are shown in the Appendix on page 8.

GENERAL INFORMATION

All Beck actuators are shipped from the factory configured and tested to the customer purchase specification.

A write enable jumper, connected between terminals 34 and 41 on the terminal block, must be installed in order to allow Wi-Fi changes to be made to the actuator. With this jumper in place, changes are then only accepted when the “Update DCM” button on that specific menu screen is pressed.

When the write enable jumper is not installed, Wi-Fi is viewable, but no changes can be made. Note that this jumper may also be used in conjunction with customer wiring to create a local Wi-Fi enable, such as a key switch.

Menus also have “Zoom In” and “Zoom Out” buttons. Pushing these buttons will increase or decrease the display size of the items on the screen. Also, a “back” button is at the top of each menu screen and, if pressed, will return to the last menu.

Some menus with real time data from the actuator have a “Freeze Readings” button. Pressing this button will freeze the data and prevent updates to allow the screen data to be copied. When in freeze mode, an “Allow Updates” button will appear. Pressing this button will allow the data to be updated in real time again.

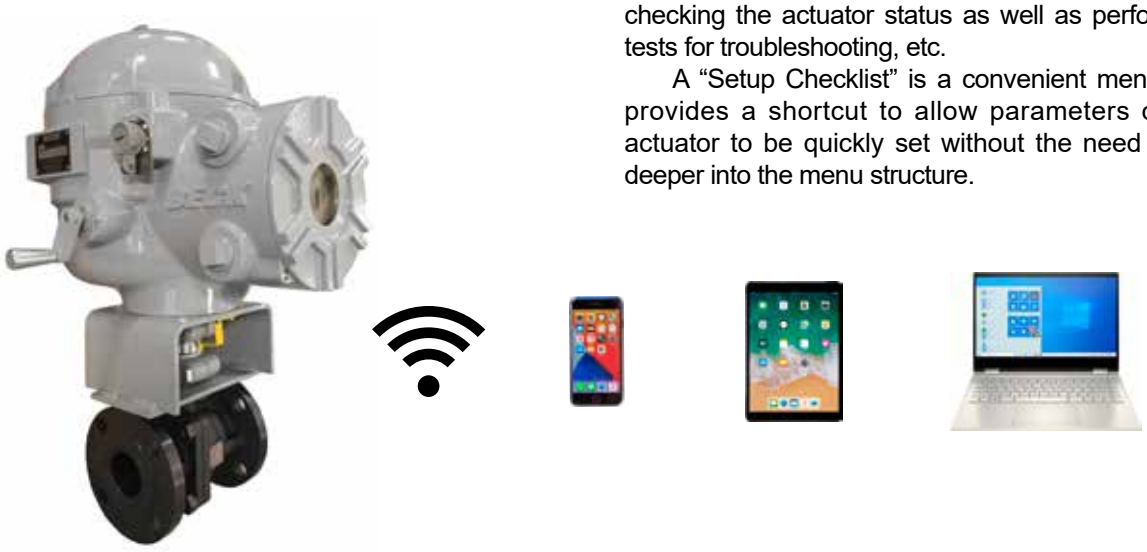
The following menu overview and descriptions provide a summary of the functions available through Wi-Fi communication. The menu system is structured to provide logical access to the functionality of the actuator, including:

A “Home” menu that provides basic, dynamic information about the actuator, as well as a path to the rest of the menu tree through the “Functions” menu.

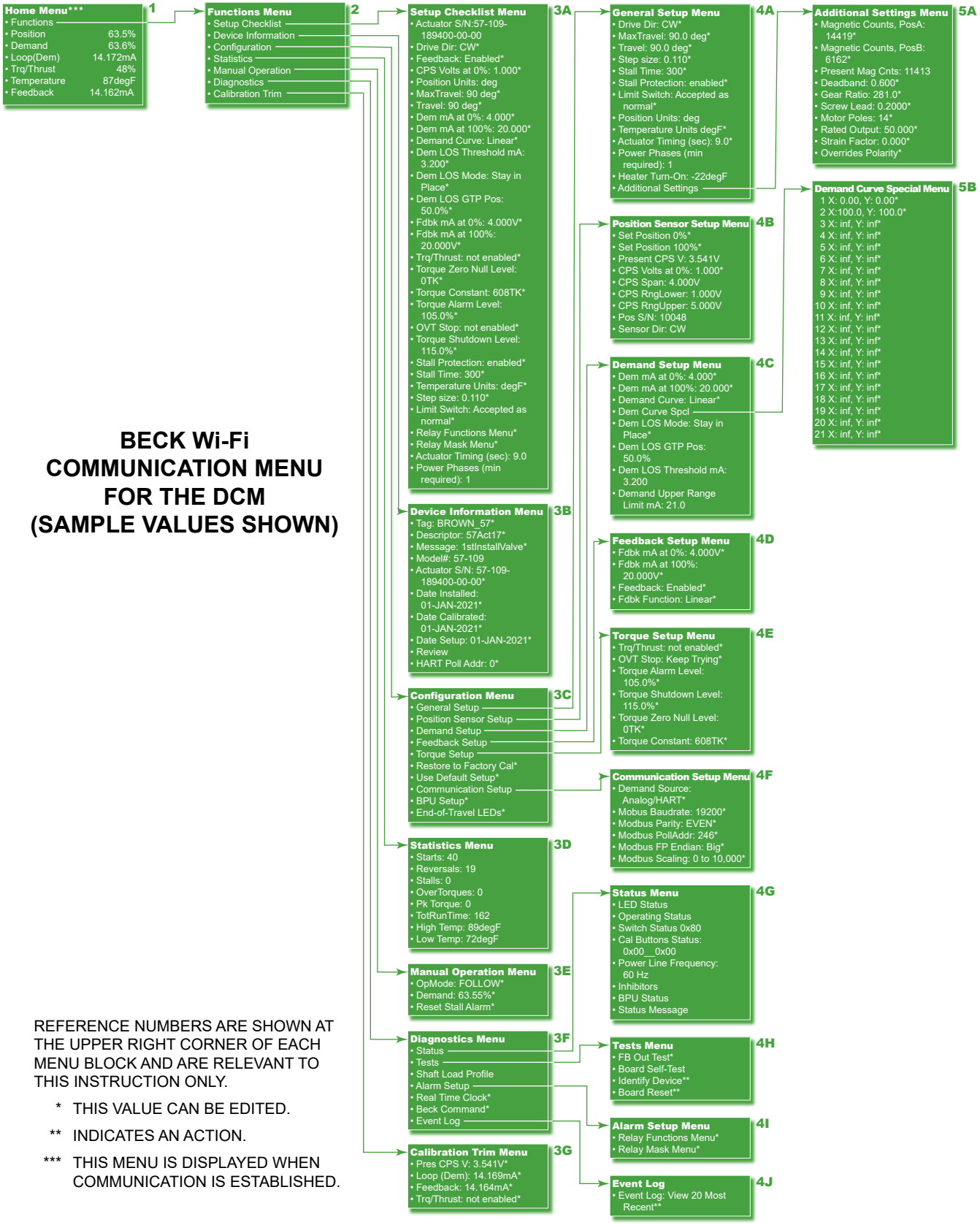
A “Configuration” menu that allows access to editable parameters related to the following actuator functions: “General Setup”, “Position Sensor Setup”, “Demand Setup”, “Feedback Setup”, “Torque Setup” and “Communications”.

A “Diagnostics” menu provides a gateway to checking the actuator status as well as performing tests for troubleshooting, etc.

A “Setup Checklist” is a convenient menu that provides a shortcut to allow parameters of the actuator to be quickly set without the need to go deeper into the menu structure.



Wi-Fi Communication Menu Overview



BECK Wi-Fi COMMUNICATION MENU FOR THE DCM (SAMPLE VALUES SHOWN)

REFERENCE NUMBERS ARE SHOWN AT THE UPPER RIGHT CORNER OF EACH MENU BLOCK AND ARE RELEVANT TO THIS INSTRUCTION ONLY.

* THIS VALUE CAN BE EDITED.

** INDICATES AN ACTION.

*** THIS MENU IS DISPLAYED WHEN COMMUNICATION IS ESTABLISHED.

Wi-Fi Communication Menu Descriptions

MENU DESCRIPTIONS

(See Wi-Fi Communication Menu Overview, p. 2)

MENU 1 -- Home Menu

When communications are established with the communicator, the Home Menu is displayed.

- Functions: Link to the menu.
- Position: The output shaft position displayed as a percent of range.
- Demand: The Demand signal displayed as a percent of range.
- Loop (Dem): The Demand signal measured in mA.
- Trq/Thrust: The present torque value (%) as applied to the output shaft (optional).
- Temperature: The ambient temperature of the DCM.
- Feedback: The milliamp output signal representing the present position of the output shaft.

MENU 2 -- Functions

From the Functions menu, any of the DCM menus can be selected and accessed. The menus are organized into seven major categories: Setup Checklist, Device Information, Configuration, Statistics, Manual Operation, Diagnostics, and Calibration Trim.

MENU 3A -- Setup Checklist

The Setup Checklist provides a quick way for the user to setup the most important items necessary for basic actuator operation without having to access any other menus.

MENU 3B -- Device Information

The Device Information menu provides information about the actuator. There are ten useful information entries that may be viewed and/or edited.

- Tag: An 8 character entry that can be used to identify a specific field device label.
- Descriptor: A 16 character field used to provide any description desired.
- Message: A 32 character field used to provide any message desired.
- Model#: Displays the model number of the actuator in which the DCM is installed.
- Actuator S/N: The Serial number as shown on the actuator nameplate. When configured, this will automatically change the actuator model number (see previous item).
- Date Installed: The installation date has no affect on actuator operation.
- Date Calibrated: The calibration date has no affect on actuator operation.
- Date Setup: The setup date has no affect on actuator operation.
- Review: Link to a single menu snapshot of the actuator configuration in a read-only format. This menu may help ensure that the DCM is configured as desired.
- HART Poll addr: Used to find the actuator. Most configurations should use "0".

MENU 3C -- Configuration

The Configuration menu serves as the gateway to the operating parameters that can be used to configure the actuator based on the desired operation.

- General Setup**:** Link to the menu.
- Position Sensor Setup**:** Link to the menu.
- Demand Setup: Link to the menu.
- Feedback Setup: Link to the menu.
- Torque Setup: Link to the menu.
- Restore to Factory Cal: Restores field-configurable parameters back to the settings in effect when the DCM was shipped from the factory.
- Use Default Setup: Changes the DCM position sensing voltage ranges to the proper ranges for the actuator model.
- Communication Setup: Link to the menu.
- BPU Setup: Allows customization of the internal BPU to determine what will happen if external power is lost and the BPU is temporarily powering the actuator. The settings of the BPU are: “Maintain Control, no alarm”, “Maintain Control and alarm”, “Go to Position”, and “Stay in Place”. The BPU activates if the input voltage drops below the voltage threshold of the actuator. The voltage threshold may be adjusted, if necessary. Also, the time delay before action is 300 ms, which may also be adjusted. “Go to Position” mode defaults to 0%, but may be adjusted. If the BPU mode is set to “Go to Position”, but the Position Sensor is not working, you may set the subsequent action to “Stay in Place”, “Run CCW” or “Run CW”.

Wi-Fi Communication Menu Descriptions

MENU 3C -- Configuration *(cont'd)*

- End-of-Travel LEDs: Allows selection of the desired action for the End-of-Travel (E-O-T) LEDs. These actions include "E-O-T Red Enable", "E-O-T Green Enable", "E-O-T Yellow Enable", "Red Toward 100%" or "Green Toward 100%". The threshold for the Red and Green LEDs may also be changed.

MENU 4A -- General Setup

This menu sets actuator parameters. The parameter entries are as follows:

- Drive Dir: The direction the output shaft rotates (looking into the output shaft) in response to an increasing Demand signal.
- MaxTravel: The maximum available travel distance of the output shaft in degrees. This number corresponds to the actuator design—if the correct Serial Number is entered, this parameter is set to 90° or 100° and should not be changed.
- Travel: The number of degrees of output shaft travel for 100% signal span (adjustable).
- Step size: The smallest Demand change that will cause an output shaft movement (0.1%–2.5%).
- Stall Time: The amount of time the motor will run (30–300 seconds) before Stall Protection is initiated and power removed from the motor.
- Stall Protection: This entry allows selection of the desired action for Stall Protection; "Stop" or "Keep Trying".
- LimitSwitch: This entry defines if contacting a limit switch causes an alarm. Selections are: "Accept as normal" or "Alert as alarm".
- Position Units: The numeric unit of measure for the output shaft position is set for angular degrees. Value cannot be changed.
- Temperature Units: The unit of measure for temperature sensing. May be "degF" (fahrenheit) or "degC" (celsius).
- Actuator Timing (sec): Typically 9 seconds per 90° for model 57-109 and 14 seconds per 90° for 57-209 (Vdc model) and 20 seconds per 90° for 57-209 (Vac model). These values may be configured for lower speeds.
- Power Phases (min required): This value is set at 1. Value cannot be changed.
- Heater Turn-On: Sets the temperature at which the internal heater activates.
- Additional Settings: Link to the menu.

MENU 5A -- Additional Settings

- Magnetic Counts, PosA: Sets the magnetic counts of the Position sensor at "Pos A".
- Magnetic Counts, PosB: Sets the magnetic counts of the Position sensor at "PosB".
- Present Mag Cnts: This value is generated by the position sensor and is read only.
- Deadband: Sets the value of the deadband. The default is 0.6.
- Gear Ratio: Ensures the correct motor speed for the desired actuator timing. This value is 281 for the 57-109 and 766 for the 57-209.
- Screw Lead: Not applicable.
- Motor Poles: Set at 14 for both the 57-109 and 57-209.
- Rated Output: Not applicable.
- Strain Factor: Not applicable.
- Overrides Polarity: Allows choice of polarity for the Control Override inputs: "CCW", "CW" and "STOP". Typically, these polarities are set to "APPLIED", so when the contact is closed, current causes a signal to be active in the actuator. Conversely, if a polarity is set to "OPEN", an open contact (no current) causes the signal to be active in the actuator. Note that only one polarity should be set to "OPEN" at any time, otherwise conflicting signals may result in the actuator not moving.

MENU 4B -- Position Sensor Setup

This menu contains parameters that determine how the DCM interprets the output shaft position signal from the magnetic vector position sensor (also referred to as the "CPS").

- Set Position 0%: Sets the 0% position to match the present output shaft position. This does not change the 100% position.
- Set Position 100%: Sets the 100% position to match the present output shaft position. Also instructs the DCM to change travel span based on the 0% position. This does not change the 0% position.
- Present CPS V: Displays the CPS signal voltage at the present output shaft position. Not editable.
- CPS Volts at 0%: Displays the CPS voltage at the 0% output shaft position. May be edited to define the voltage at the lowest operating point of travel. For CW actuator configuration, this voltage should be 1.3 V and for CCW configuration, 3.7 V. The DCM will automatically adjust when the direction of travel is changed.

- CPS Span: Displays the voltage signal span from the CPS for maximum possible rotation of the output shaft. This is the upper range voltage minus the lower range voltage (typically 2.4 V). Not editable.
- CPS RngLower: Displays the CPS voltage signal at the lowest possible point of travel. Not editable.
- CPS RngUpper: Displays the CPS voltage signal at the highest possible point of travel. Not editable.
- Pos S/N: Displays the Serial number of the CPS and has no effect on actuator function.
- Sensor Dir: The direction of output shaft rotation that causes the CPS signal to increase. This direction is typically CW and is not editable.

MENU 4C -- Demand Setup

The parameters on this menu determine the range and characterization of the Demand signal. It also includes parameters that determine behavior when the Demand signal is absent.

- Dem mA at 0%: Sets and displays the signal value in mA that represents 0% Demand (default is 4.00 mA, minimum is 0.5 mA). This value should be set above "Dem LOS Threshold mA".
- Dem mA at 100%: Sets and displays the signal value in mA that represents 100% Demand (default is 20.00 mA, maximum is 21.00 mA). This value should be set below "Demand Upper Range Limit mA".
- Demand Curve: Determines the relationship between the Demand signal and the position of the output shaft. Typically set to “Linear”, but may also be set to “Square”, “SqRoot” or customized “Special Curve”.
- Dem Curve Spcl: Link to the "Dem Curve Spcl" menu.
- Dem LOS Mode: Sets the action that will take place if the Demand signal is lost. Options are: “Stay in Place”, “Go to Position” and “Stay-No Alarm”.
- Dem LOS GTP Pos: If the "LOS Mode" has been set to "Go to Position", this defines where the output shaft will move (in percent of travel) during loss of Demand signal conditions.
- Dem LOS Threshold mA: Sets the threshold (in mA) below which the Demand signal is considered lost. This value should be set below "Dem mA at 0%".
- Demand Upper Range Limit mA: This is the threshold (in mA) above which the Demand signal is considered invalid. The Demand alarm will activate until the signal is brought below this level. Set at 21.0 mA, this value is not editable.

MENU 5B -- Dem Curve Spcl

This menu allows setting the Demand signal characterization curve.

MENU 4D -- Feedback Setup

This menu is where the Feedback signal related actuator parameters are set.

- Fdbk mA at 0%: The value of the Feedback signal (in mA) that corresponds to a 0% output shaft position. This value can range between 3.00 mA and 16.00 mA (default = 4.00 mA).
- Fdbk mA at 100%: The value of the Feedback signal (in mA) that corresponds to a 100% output shaft position. This value can range between 7.00 mA and 21.00 mA (default = 20.00 mA).
- Feedback: Enables or Disables the Feedback signal.
- Fdbk Function: Allows a choice in the relationship between the Feedback output signal and the actual position of the actuator. Choices are: “Linear” and “Inverse of Dem”.

MENU 4E -- Torque Setup

This menu is where the Torque related actuator parameters are set.

- Trq/Thrust: Enables or disables torque sensing.
- Ovt Stop: Enables or disables overtorque protection. In “Stop” mode, power will be removed from the motor if excessive torque is detected. “Keep Trying” mode will maintain power to the motor.
- Torque Alarm Level: Sets the value that, if exceeded, will cause an alarm (20–105% of actuator rating). Does not affect actuator performance.
- Torque Shutdown Level: Sets the output shaft torque that, if exceeded, will remove power from the motor (25–115% of actuator rating).
- Torque Zero Null Level: The torque sensor value that represents 0% output shaft torque. This value is unique for each actuator and may be found on a label inside the actuator.
- Torque Constant: The internal DCM signal span associated with the output shaft torque. This value is determined during manufacture and is noted on a label inside the actuator.

Wi-Fi Communication Menu Descriptions

MENU 4F -- Communication Setup

This menu is where the type of control interface is selected and associated communication parameters are configured.

- Demand Source: May be set to “ON” for “Analog/HART” or “Modbus”.

Also, Modbus parameters including: Baudrate, Parity, Polling Address and data formats.

MENU 3D -- Statistics

This menu is where all the actuator’s stored operating statistics are available.

- Starts: The total number of motor starts.
- Reversals: The total number of times the motor has started in the direction opposite to the previous start.
- Stalls: The total number of times the stall time has been exceeded.
- OverTorques: The total number of times that a Torque Alarm was issued.
- Pk Torque: The highest recorded torque on the output shaft.
- TotRunTm: Total amount of time the motor has been powered (in seconds).
- High Temp: Highest temperature recorded in the DCM compartment (in degrees fahrenheit or celsius depending upon the temperature units setting in “General Setup”).
- Low Temp: Lowest temperature recorded in the DCM compartment (in degrees fahrenheit or celsius depending upon the temperature units setting in “General Setup”).

MENU 3E -- Manual Operation

This menu is used to allow manual operation using Wi-Fi communications. There are three manual operation procedures available. ***Caution: this setting can override the control loop***.

- Op mode**:** Selects the operating mode of the DCM. There are six possible choices: “FOLLOW”, “HOLD”, “DIRCW”, “DIRCCW”, “STAY” and “STOP”. “FOLLOW” mode is the normal state of operation and allows DCM control in response to the analog input Demand signal. “HOLD” mode forces the DCM to position according to the Demand value (see “Demand”, this menu). “DIRCW” mode forces the actuator to move CW. “DIRCCW” forces the actuator to move CCW. The “STAY" and “STOP” modes force the actuator to maintain its present position. Note that the Handswitch overrides all operating modes.
- Demand: This procedure sets the effective Demand signal. If "Op mode" is set to "HOLD", entering a valid value (-5% to 105%) will control the motor. If "Op mode" is set to "FOLLOW", the analog Demand signal is displayed (unless an alarm condition exists).
- Reset Stall Alarm: Pressing the “Update DCM” button, will reset normal actuator operation after a stall condition has caused the motor to shut down. Note that stall conditions can also be reset by simply reversing the input Demand signal or cycling the actuator AC power.

MENU 3F -- Diagnostics

Provides paths to menus and settings that allow investigation of actuator problems.

- Status: Link to the menu.
- Tests: Link to the menu.
- Shaft Load Profile: Displays the peak load (%) of CW and CCW movement for each of ten segments representing full travel of the actuator.
- Alarm Setup: Link to the menu.
- Real Time Clock: Used for time stamping the event log and does not affect actuator performance.
- Beck Command: Allows any Beck Serial command to be initiated by entering it into this field. Beck Serial commands are an alternate method for configuring the actuator and are described in the Beck Group 57 instruction manual (80-5700-00).
- Event Log: Link to the menu.

MENU 4G -- Status

This menu provides links to status displays that monitor the operational status of the actuator.

- LED Status: Lists the current state of all the actuator LEDs (“ON” or “OFF”).
- Operating Status: Shows whether or not (“ON” or “OFF”) parameters of the actuator are outside of “normal” range; including, “Demand Out of Limits”, “Position Out of Limits”, “Temp Out of Limits”, “Torque Out of Limits”, “Overtorque Stop”, “Stall Timeout”, Feedback Loop Open” and “Under Voltage”.
- Switch Status: Displays the status of the actuator switches as “ON” or “OFF”. These switches include the CCW & CW limit switches; the Override CCW, CW & STOP switches; and Handswitch CCW, CW & AUTO.

- Cal Buttons Status: Displays the current status of the DCM pushbuttons as “ON” or “OFF”, including Calibrate, Set Pos 100% & 0%, Set Dem 100% & 0%, Dir Select and Factory. “Use Network Def” is not applicable to Group 57 actuators.
- Power Line Frequency: The power line frequency as measured by the DCM. Read only.
- Inhibitors: Allows viewing of DCM conditions as “ON” or “OFF” that are preventing the motor running in the CW or CCW direction. Note: “ON” indicates condition is blocking motor operation.
- BPU Status: Displays the status of the Backup Power Unit as “ON” or “OFF”, including “Installed”, “In Power Lost, BPU Active”, “In Power Lost, BPU Pending”, “Charge Timeout”, “Maint Date Past”, “Manual Discharge”, “Low Output Volts” and “Low Capacitor Volts”.
- Status Message: Displays a message based on highest priority of function, that shows the reason the actuator is or is not running. This is a dynamic function updated every few seconds.

MENU 4H -- Tests

This menu provides access to some routines that will help determine if the actuator is functioning properly.

- FB Out Test: Allows to choose the desired actions for the Feedback mA output, including “Set FB Out to 4mA”, “Set FB Out to 20mA”, “Set FB Out to chosen mA” - which also requires the chosen mA to be entered into the appropriate field, and “Set FB follow Position”.
- Board Self-Test: A built-in self-test runs continuously in the background.
- Identify Device: Pressing the “Rapid Blink” button causes the ACKN LED on the DCM to temporarily blink rapidly. This function ensures that the Wi-Fi is addressing the correct actuator.
- Board Reset: Pressing the “Update DCM” button will cause the DCM to reset. Actuator control and Wi-Fi will temporarily be lost.

MENU 4I -- Alarm Setup

The Alarm Setup menu parameters allow modification of the behavior of the alarm outputs.

- Relay Functions: Allows the choice of which function will actuate which of the three relays, including “Relay Not Used”, “Relay Closes at Shaft Angle”, “Relay Opens at Shaft Angle”, “Relay Opens on Alarm” and “Relay Closes on Alarm”. If the relay action is angle dependent, the shaft position as a percentage may be set for each of the three relays.
- Relay Mask: Allows the choice of which alarms will actuate which of the three output relays. Each of the three relay masks is also shown as a hexadecimal value for quick reference at the bottom of the page.

MENU 4J -- Event Log

- Event Log: View 20 Most Recent: When selected, will display the 20 most recent events.

MENU 3G -- Calibration Trim

The Calibration Trim menu sets and displays actuator calibration values. **Note that changing the calibration trim can cause signal measurement difficulties if performed improperly.**

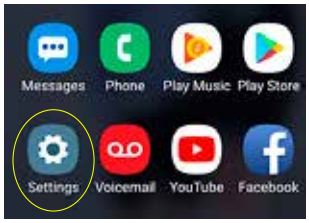
- PresCPS V: Not applicable.
- Loop(Dem): Displays the Demand signal as measured at terminals (35 & 36). This value can be edited to trim the Demand to ensure accurate measurement of the analog signal. Demand can only be trimmed at 4.0 mA and 20.0 mA. When the Demand control loop signal is being overridden by a special mode of operation, the effective Demand will not correspond to the mA value.
- Feedback: Displays the mA signal and allows the signal to be adjusted to ensure an accurate 4 to 20 mA output as measured at terminals (37 & 38).
- Trq/Thrust: Displays the load measured at the output shaft as a percentage of rated torque. This is also a shortcut to set the 0% torque parameter (“Torque Zero Null Level”) by removing load from the output shaft, then setting this value to “0”.

APPENDIX Wi-Fi Connection

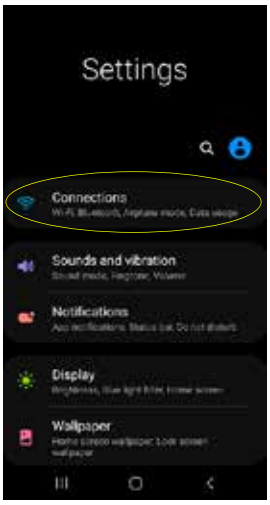
In the connection instructions below, graphics are shown for reference and will not match those of every connecting device.

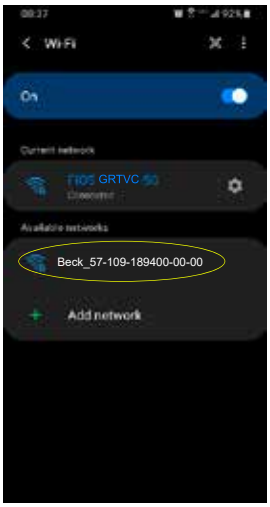
CONNECT TO THE BECK Wi-Fi ACTUATOR

1. Click on the “Settings” icon.

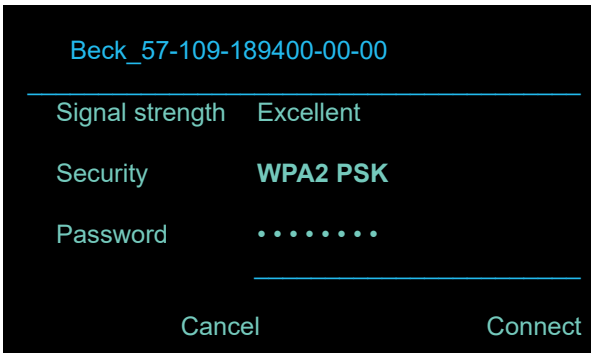


2. Click on “Connections”, then “Wi-Fi” to see the list of available networks. From the list, choose the network that begins with Beck and includes the actuator serial number.

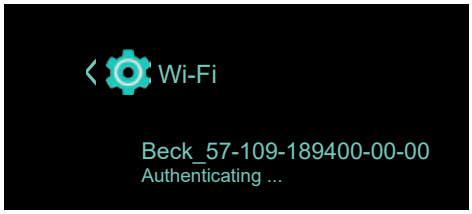




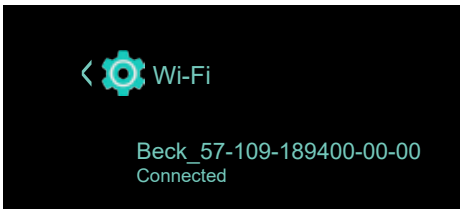
3. After selecting the Beck Actuator, a password prompt will appear. The password is the unique DCM number with enough leading zeros to make an eight digit password; e.g., “00012345”.



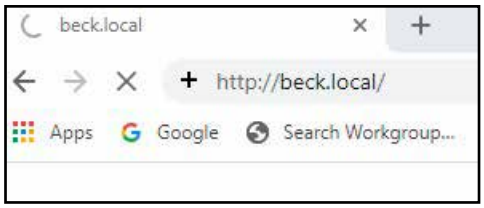
4. After entering the Password, the Wi-Fi network will appear with the word “Authenticating”.



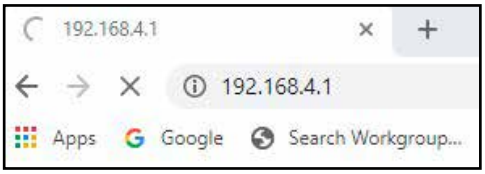
5. The word “Connected” will then appear. At this point, the actuator is available for access with a web browser.



6. Start the web browser. In the address bar, type “http://beck.local/”.



7. Older versions of Android may require the IP address to be entered in the address bar.



8. The home page of the actuator will then appear.

APPENDIX Troubleshooting

The following table provides information on troubleshooting basic issues related to Wi-Fi. For guidance regarding any other problems, see the Troubleshooting section of manual 80-5700-00.

CONDITION	POSSIBLE CAUSES	CORRECTIONS
1. The Beck Wi-Fi network does not appear on the list of available networks (on the connecting device).	a. The actuator is not powered. b. Connecting device is too far from the actuator.	a. Apply proper operating voltage to the actuator (see manual 80-5700-00). b. Move the connecting device in closer proximity to the actuator.
2. The Beck Wi-Fi network name is incomplete on the list of available networks (on the connecting device); i.e., “Beck_0”, and keeps dropping out.	a. The Beck Wi-Fi board is not able to communicate with the DCM.	a. Ensure the DCM is receiving power. Check the “POWER” LED on the DCM board. Check all connections.
3. Cannot connect to the Beck Wi-Fi network.	a. Incorrect password.	a. Confirm that the standard eight digit password is correct. The standard password consists of a unique number assigned to the DCM by the factory, along with leading zeros; e.g., “00012345” . The DCM number is shown on a label on a square, black component near the middle of the DCM board.
4. Wi-Fi menus and settings are viewable, but cannot be changed.	a. The write enable jumper is not installed between terminals 34 & 41 on the terminal block. b. Failure to press the “Update DCM” button on the menu screen.	a. Without this jumper, no parameters can be changed. Provide a hardwire connection between terminals 34 & 41 on the terminal block. b. In order for any parameter change to take effect, the “Update DCM” button on that menu screen must be pressed.

Notes

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