OPERATION MANUAL

WONDER
HC MOV ACTUATOR®

Manual Version	OM-MOV-24-03
Language	English

Please read the manual before use.

After reading the manual, please store it in an easily accessible place for later use. The manual is provided to protect the safety of the installer and user and to prevent damage to property.

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Introduction

This manual provides instructions on:

- Storage and installation of the Wonder HC Actuator®.
- Manual and Electrical (local and remote) Operation.
- Subsequent commissioning and adjustment of the initial configuration.
- Commission and adjustment of the Control Settings to suit site-specific control and indication requirements.
- Troubleshooting for the Wonder HC Actuator®.

Before using this product, please thoroughly familiarize yourself with the examples provided in this operation manual.

Please note that this manual was written for products with standard features. The specifications of customized products may vary from the content provided here. Product specifications and contents are subject to change without prior notice, which may result in inaccuracies and incompleteness. Wonder® assumes no responsibility or liability for any such situations

If you have any questions regarding the product specifications or any other part, our company and our customer support teams will be happy to assist you.

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Confidential Information

The material contained herein consists of information that is the property of Wonder® Engineering Technologies and intended solely for use by the purchaser of the equipment described in this manual. All specifications are subject to change without prior notice. Changes are made periodically to the information in this publication, and these changes will be incorporated in new editions.

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Trademark

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Safety Precautions

To ensure proper use and user safety, and to prevent damage to property, please take note of the following safety precautions before installation:

Precautions for installation

- Follow the manual's instructions during the product installation.
- Adhere to the proper procedure based on the product's weight to ensure safety during transportation and installation.
- If the Wonder HC Actuator® cannot be installed immediately, store it in a dry place until you are ready to connect incoming cables.
- When installation of the Wonder HC Actuator® is necessary but cabling is delayed, it is recommended to replace the plastic transit cable entry plugs with metal plugs sealed with PTFE tape.
- There is no need to remove any electrical compartment covers for commissioning the Wonder HC Actuator®.
- The actuator's double-sealed construction will protect internal electrical components if left undisturbed.

Precautions for operation

- Only individuals competent through training or experience should be involved in the installation, maintenance, and repair of the Wonder HC Actuator®. Ensure that all work adheres to the instructions in this manual and any other relevant manuals.
- Users and personnel working with this equipment should be familiar with their responsibilities under workplace health and safety regulations.
- Wonder® Engineering will not assume any responsibility for on-site deterioration once the covers are removed. Each Wonder HC Actuator® undergoes rigorous testing at the factory to ensure years of trouble-free operation when correctly commissioned, installed, and sealed.

WARNING: Motor Temperature

- Under normal operation, the temperature of the HC Actuator's motor cover surfaces can exceed 60°C above the ambient temperature.
- Users must ensure that the operating environment and materials surrounding the HC Actuator do not compromise its safe use or protection.
- Where necessary, users should take steps to protect the HC Actuator against its operating environment.

Content

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1 General

1.1 Information about the user manual

This manual provides important information that can be used as a work of reference for installing, operating, maintaining, aligning, and/or troubleshooting your Wonder® instrument. It is important that you carefully read the information contained in this manual and follow all safety procedures before you install or operate the system. If you are already familiar with this equipment you may to go directly to Section 2.0 Installation Procedure. To avoid handling errors, keep this manual in a location where it will be readily accessible.

This document will be updated with changes as necessary. You are encouraged to recommend and submit changes, additions, and/or corrections to make this document more useful.

1.1.1 Legend

	**Note**: Indicated tips and useful information in this manual. All notes should be read to effectively operate this instrument.
	**Caution**: Denotes information critical to avoiding instrument damage or a severe impact to processing. **When thiss symbol is found on the instrument it indicates a potential hazard. Consult the documentation before proceeding with any actions.**
	**Warming**: Denotes information critical to avoiding personal injury, such as when an electrical hazard is present. **When this symbol is found on the instrument it indicates a potential hazard. Consult the documentation before proceeding with any actions**.
	Protective Earth Ground connection.
	**Cautions Must be Followed**: reference supplied documents.
	**Electric Shock Hazard**: disconnect service before opening.
	Voltage Alternating Current (VAC)
	Voltage Direct Current (VDC).
	Danger: Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.

1.2 Safety

This manual provides important information on safety installing and operating your Wonder Instrument. Throughout this manual, you will find various sections containing important safety warnings, indicated by a warning symbol. Regardless of your prior experience with similar instruments or any manufacturer's training, it is imperative that you thoroughly read and understand the contents of this manual before operating the instrument.

It is also important to continually pay attention to all labels and markings on the instrument and to keep the labels and markings in a permanent readable condition.

1.2.1 Explosion-Proof Housing

The housing is designed to meet the explosion-proof requirements of the National Fire Protection Association (NFPA) Article 500 for hazardous locations. This instruments holds the following approvals:

- European ATEX certification
- International IECEX certification

To ensure safe operating conditions, it is recommended that you review the certification and area classifications that pertain to this system.

WARNING

Warning: Hazardous Location Safety Minder – Service personnel shall be qualified to install and service electrical equipment designed for areas classified as hazardous. At no time should the cover be removed unless power is switched off first. When it is necessary to service the instrument with the power applied, ensure the proper safe environmental conditions exist and that such maintenance is authorized and pursuant to safe conditions. See Chapter 15, Safety Assurance and Precautions for more information.

1.3 Limit of Liability and Warranty

All general information and notes for handling, maintaining, and cleaning this instrument are offered according to the best of our knowledge and experience.

Wonder® Engineering is not liable for any damages that arise from the use of any examples of the process mentioned in this manual or in case the content of this document should be incomplete or incorrect. Wonder® Engineering reserves the right to revise this document and make changes from time to time in the content hereof without obligation to notify any person or persons of such revisions or changes.

All instruments from Wonder® Engineering have an effective warranty period. Please check with your respective Sales Representative or email at support@wonder.com.sg for up-to-date warranty information. This warranty covers manufacturing defects and faults which arise during operations, only if there are the results of defects caused by Wonder® Engineering Technologies.

1.4 Unpacking and Inspection

Before unpacking the instrument, locate the packing invoice on the outside of the carton. The invoice lists every item that was included in your shipment. Each Wonder® Engineering instrument is configured to the default settings. After you have installed the instrument and reviewed the contents of this manual, you will need to configure the instrument to match your application.

When unpacking and inspecting your system, you need to do the following:

- Check all materials in the container against the enclosed packing list.
- Wonder® Engineering cannot be responsible for shortages against the packing list unless a claim is immediately filed with the carrier. Final claim and negotiations with the carrier must be completed by the customer.
- Carefully unpack and inspect all components for visible damage.
- Save all packing materials, including the carrier's identification codes, until you have inspected all components and find that there is no obvious or hidden damage.
- Before shipment, each instrument is assembled, calibrated, and tested at the Wonder® Factory. If you note any damage or suspect damage, immediately contact the carrier and Wonder® Engineering.

Once you have determined the unit you received is the unit you ordered and it is in acceptable condition, the unit is ready for installation.

1.5 Service Request, Repair, or Support

Contact Wonder® Engineering Support team in case of a malfunction or service request. Provide clearly stated details of the problem as well as the instrument model number and serial number. Upon receipt of this information, Technical Support will attempt to locate the fault and, if possible, solve the problem over the telephone.

If Technical Support concludes that the instrument must be returned to Wonder® Engineering for repair, they will issue a Return Material Authorization (RMA) number.

Return the instrument upon receipt of the RMA number, transportation prepaid. Clearly indicate the assigned RMA number on the shipping package exterior.

Technical Support can be contacted by telephone or email:
- Telephone: (65) 6686 0181
- Email: support@wonder.com.sg

For customers requiring language assistance, please contact your sales representative to facilitate support and repair.

1.6 Disposal / Decommissioning

Inoperable Wonder® instruments must be disposed of in compliance with local regulations for electronic or electronic material.

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2 Technical Installation

2.1. Actuator Mounting

2.2.1 Ensure the valve is secured before fitting the Electric Actuator as the combination may be top heavy and therefore unstable.

If it is necessary to lift the actuator using mechanical lifting equipment certified slings should be attached as indicated in Fig. 1 for vertical valve shafts and Fig. 2 for horizontal shafts.

Fig 1: for vertical valve shafts

Fig 2: for horizontal shafts

At all times, trained and experienced personnel should ensure safe lifting, particularly when mounting actuators.

WARNING

The HC Actuator should be fully supported until full valve shaft engagement is achieved, and the HC Actuator is securely fastened to the valve flange.

A suitable mounting flange conforming to ISO 5210 or USA Standard MSS SP101 must be attached to the valve. The actuator to valve fixing should adhere to Material Specification ISO Class 8.8, with a yield strength 628 N/mm^2.

Avoid lifting the HC Actuator and valve combination via the HC Actuator. Always lift the valve/actuator assembly by the valve.

2.1.1 Rising Stem Valve - Top Mounting

A. To assemble the HC Actuator and Base as a combined unit for all actuator sizes, follow these steps:

- Insert the machined drive bush into the thrust base, as described earlier.
- Lower the HC Actuator onto the threaded valve stem.
- Engage the 'hand' and turn the handwheel in the opening direction to secure the drive bush onto the stem.
- Continue turning until the HC Actuator is securely positioned on the valve flange.
- Rotate the handwheel two more turns.
- Attach the securing bolts and tighten them firmly

2.1.2 Fitting Thrust Base to Valve - HC Actuator Sizes 10 to 35 inches only

B. To assemble the HC Actuator and Base as a combined unit for all actuator sizes, follow these steps:

- As previously described, fit the machined drive bush into the thrust base.
- Remove the thrust base from the actuator, and place it on the threaded valve stem with the slotted end of the drive bush facing upward. Turn it in the opening direction to engage the thread. Continue turning until the base is correctly positioned on the valve flange.
- Attach the securing bolts, but do not tighten them at this stage.
- Lower the Actuator onto the thrust base and rotate the complete actuator until the drive dogs on the
- Actuator output shaft engage with the drive bush. The actuator flange should now align flush with the base flange.
- Continue turning the Actuator until the fixing holes align. Use the supplied bolts to secure the actuator to the thrust base and tighten them to the required torque.
- Open the valve by two turns and firmly tighten the fixings onto the valve flange to the required torque.

2.1.2 Valve with Gearbox - Side Mounting

Ensure that the mounting flange is positioned at right angles to the input shaft, and that the drive bush fits the shaft and key with sufficient axial engagement. Engage the 'hand' and position the HC Actuator near the input shaft. Rotate the handwheel to align the keyway and key. Securely tighten the mounting bolts

2.1.3 Non-Rising Stem Valve - Top Mounting

Treat it in a manner similar to side mounting, with one key difference: when thrust is absorbed by the HC Actuator, ensure that a thrust nut is placed above the drive bush and firmly tightened.

2.1.4 Hand-wheel Sealing

Ensure the sealing plug in the center of the hand-wheel (or spindle cover tube, depending on which is fitted) is sealed with PTFE tape and tightened completely to prevent moisture from passing down the center column of the HC Actuator.

2.1.5 HC-DM Linear Drive Unit

The HC-DM type of actuator comprises a lead screw assembly arrangement connected to the base of the actuator, designed to deliver a linear output stroke ranging from a minimum of 8mm (3/8 inch) to a maximum of 120mm (4 3/4 inches). The HC-DM can be provided with or without a yoke mounting adaptor. This adaptor includes four pillars and a base flange tailored to match the valve.

2.2 Cable Connection

Before removing the HC Actuator covers, make sure to isolate all power supplies.

Verify that the supply voltage matches the voltage specified on the HC Actuator nameplate. As part of the wiring installation for the HC Actuator, include a switch or circuit breaker. This switch or circuit breaker should be mounted as close to the HC Actuator as possible and clearly marked to indicate that it serves as the disconnecting device for that specific actuator.

WARNING

Do not use HC Actuators on supply systems with phase-to-phase voltages greater than 600VAC in cases where the supply system is of a floating or earth phase type, and where phase-to-earth voltages exceeding 600VAC could be present.

2.2.1 Earth/Ground Connections

A lug with a 6mm diameter hole is cast adjacent to the conduit entries for attachment of an external protective earthing strap by a nut and bolt. While an internal earth terminal is also available, it should not be used in isolation as the sole protective Earth Connection.

2.2.2 Removing Terminal Cover

Using a 6mm Allen key, evenly loosen the four captive screws. Do not attempt to pry off the cover with a screwdriver, as this can damage the 'O' ring seal and possibly harm the flame path in a certified unit.

Remove the red plastic transit plugs. Prepare the cable entries to match the cable type and size. Ensure that threaded adaptors, cable glands, or conduit connections are securely fastened and fully waterproof. Seal any unused cable entries with a steel or brass threaded plug. Refer to the wiring diagram located inside the terminal cover to identify the functions of the terminals. Verify that the supply voltage matches the voltage marked on the actuator nameplate Remove the power terminal screen. Start by connecting these cables and then replace the screen. Ensure that the wiring diagram is placed back inside the terminal compartment once all connections are complete

2.2.3 Replacing Terminal Cover

Ensure cover "O" ring seal and spigot joint in good condition and lightly greased before re-fitting cover.

3 Setting Tool

The Wonder HC Actuator® Setting Tool is a crucial component that facilitates the configuration of Wonder HC Actuator® control, indication, and protection functions to align with specific site requirements. It is essential to ensure the compatibility of all actuator settings with the valve, process, and control system requirements before commissioning the Wonder HC Actuator®.

By using the supplied infrared Setting Tool to access actuator setup procedures, non-intrusive adjustments of torque levels, position limits, and all other control and indication functions can be made efficiently and safely.

Standard diagnostics provide access to information about the control system, valve, and actuator status in the form of display text and help screens. The setup, alarm, and status text is available in English (default), and instantaneous valve torque and position can be conveniently monitored on the actuator with a single key press using the Setting Tool. The onboard Data logger captures operational and valve torque data, enabling informed maintenance decisions.

The Wonder HC Actuator® Inside software for PC and PDA allows the interrogation of the Data logger and the complete actuator setup configuration and recording.

Specification

Enclosure : IP67
Power supply : 9V Battery (supplied and fitted)
Operating range : 0.5m (from actuator display window)

Key	Description
▲	Up
▼	Down
◄	Left
►	Right
⏎	Confirm/Enter
-	Decrease
+	Increase
|◄► |	Close valve
|►◄|	Open valve
C	Return/Back/Stop

3.1 Setting Tool Battery Replacement

To check the battery status, look at the Infrared transmitter window while pressing any Setting Tool button. A flashing red indicator should be visible. The default battery alarm setting is 30%

When replacing the battery, ensure you are in a safe area. To access the battery, remove the six cap-head screws on the back of the Setting Tool and remove the back cover.

NOTE: When reassembling the cover, make sure the red indicator LED faces the transmitter window in the back cover.

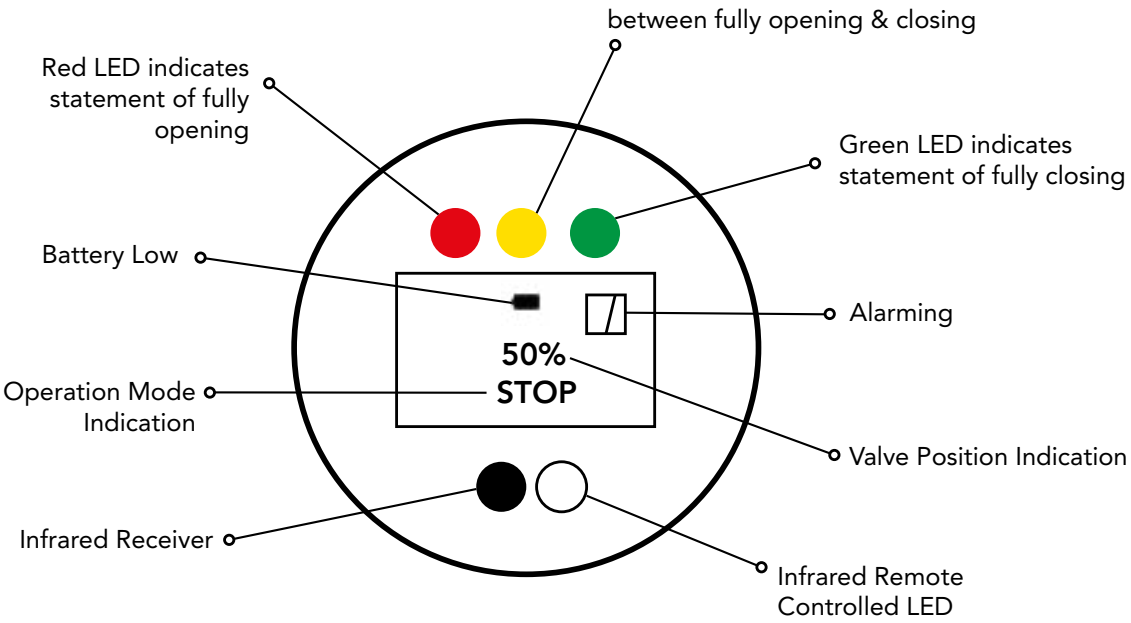
When pressing a button, the Setting Tool transmits instructions to the actuator via infrared pulses. It must be positioned directly in front of the HC Actuator's indicator window and within a distance of 0.5m.

4 Operation by Hand

WARNING: Regarding hand-wheel operation of Wonder HC Actuators®, it is crucial that no additional lever devices, such as a wheel-key or wrench, be applied to the hand-wheel under any circumstances. Attempting to exert additional force when closing or opening the valve in this manner may result in damage to the valve and/or Actuator, or it could cause the valve to become stuck in the seated or back-seated position.

Push the Hand/Auto lever into the "Hand" position. Turn the hand-wheel to engage the clutch. Release the lever, and it will return to its original position. The hand-wheel will remain engaged until the HC Actuator is operated electrically, at which point it will automatically disengage and return to motor drive. If needed, the Hand/Auto lever can be locked.

Display of Actuator



Operating Electricity

Verify that the power supply voltage matches the voltage specified on the Wonder HC Actuator® nameplate.

Turn on the power supply. It is not necessary to check phase rotation.

Before operating the Wonder HC Actuator® electrically, ensure that, at a minimum, the Basic Settings have been configured using the infrared Setting Tool.

Selecting Local/Stop/Remote

- Operation

The red selector allows for either Local or Remote control, and each position can be locked using a padlock with a 6.5mm hasp. Even when the selector is locked in the Local or Remote positions, the Stop facility remains accessible. The selector can also be locked in the Stop position to prevent electrical operation via Local or Remote control.

- Local Control

When the red selector is set to Local (anti-clockwise), the adjacent black knob can be turned to select 'Open' or 'Close.' To stop, turn the red knob clockwise.

- Remote Control

Rotate the red selector to the Remote position (clockwise) to enable remote control signals for operating the actuator. Local Stop remains accessible by turning the red knob anti-clockwise.

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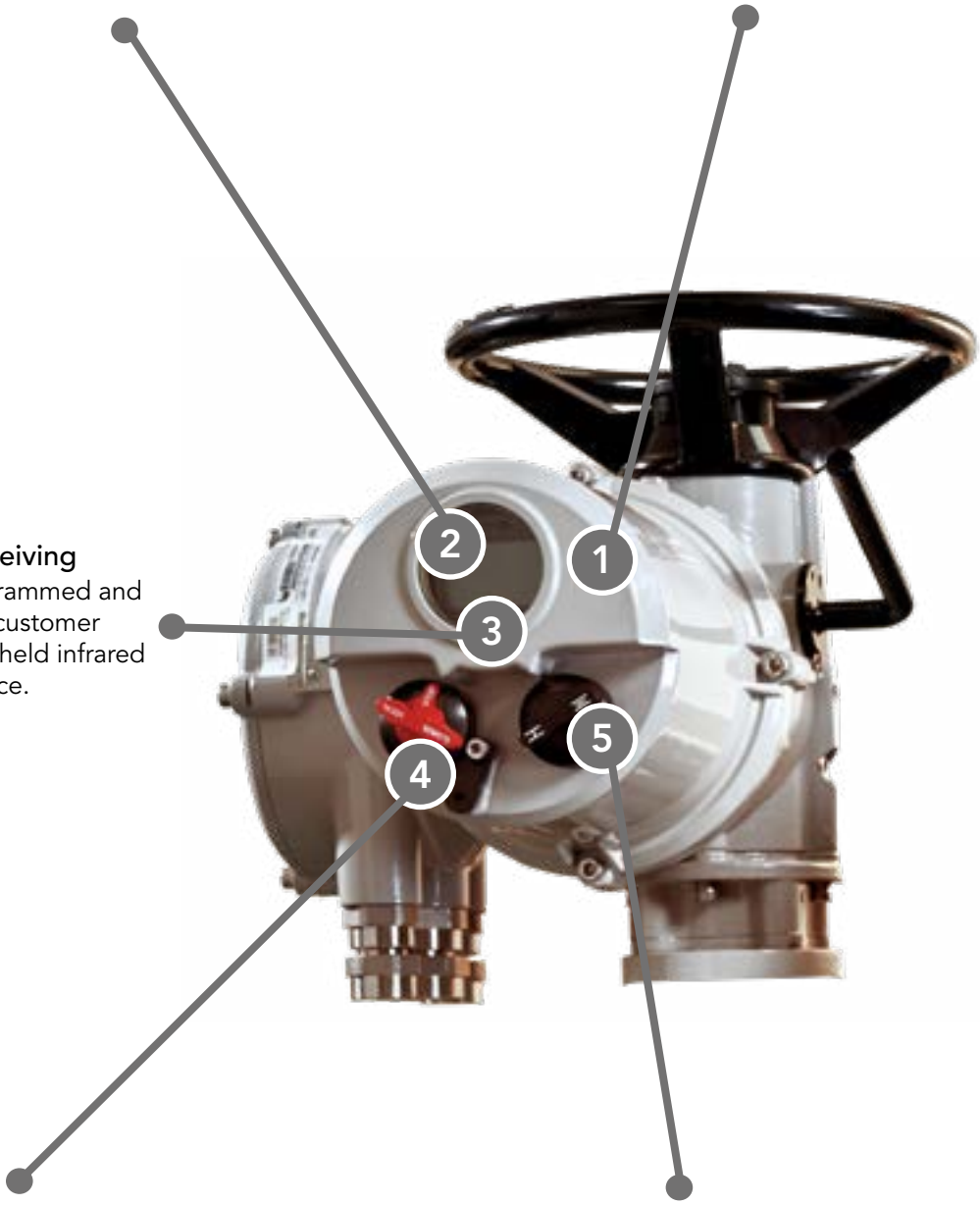
5 Display Panel

Indicator: Serving as a visual signal for displaying the actuator's status, the indicator boasts exceptional visibility in harsh environments. The LED indicator remains clear and recognizable, even during the night and at significant distances.

LCD Interface: The LCD interface is thoughtfully designed to align with users' visual and operational preferences, displaying torque, valve opening, limit settings, and failure alarm information in both textual and graphical formats.



Infrared/Bluetooth receiving Window: It can be programmed and configured according to customer preferences using a handheld infrared or Bluetooth setting device.

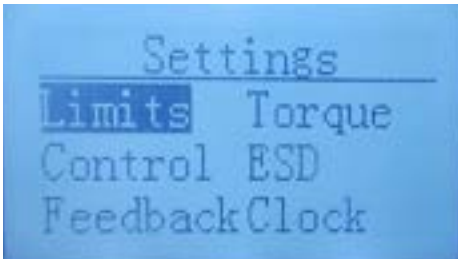
Selection of Control Mode: The selective switch, labeled 'remote,' 'halted,' and 'local,' on the local operating device provides options for remote operation (remote control from Distributed Control System (DCS), local operation (local control), or a halted mode.

Local Electric Operation: The operating switch, with 'on' and 'off' settings, on the local operating device allows for easy local opening and closing of the actuator.

5 Display Panel

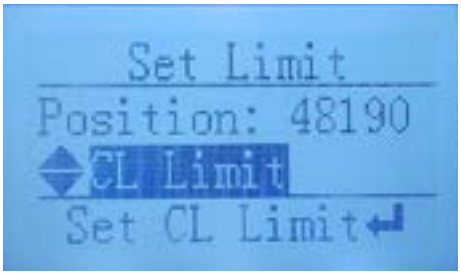
1. Main Menu

The main menu is categorized into Guide, Setup, Advance, and Information, offering the ability to adjust and configure the actuator's operational parameters.



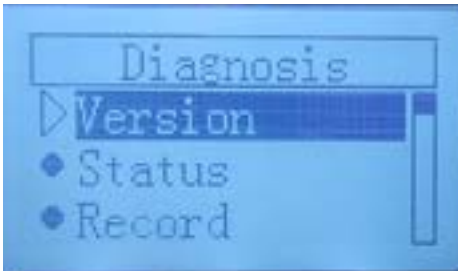
2. Setup Menu

The setup menu allows you to easily view and modify settings such as limits, torque protection, control methods, and feedback methods.



3. Menu Setup

Users can complete terminal position and torque setting on the LCD interface without the necessity of removing the end cover of actuator.



4. Diagnosis

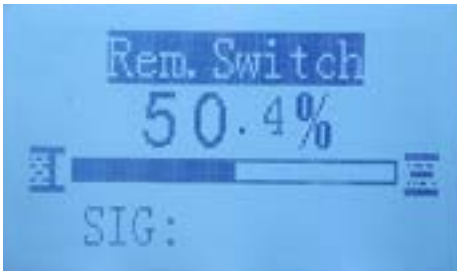
Conveniently inspect the actuator's operating state, operation history, alarm records, as well as its software and hardware versions.

5. Alarm

Continuous monitoring of environmental conditions and equipment status during operation ensures immediate warnings on the LCD interface for any deviations, like motor overheating.

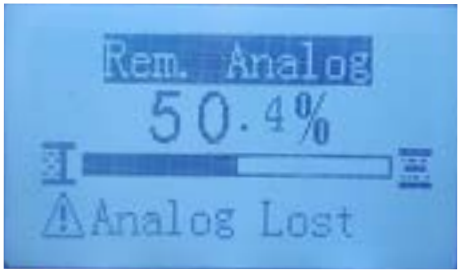
6. Valve Position

Even when observing from long distance, the valve position is still clearly indicated on the large-sized LCD interface.



7. Operating Command

Operating command issued by DCS system can be displayed on the LCD interface. The effective signal will be reversely displayed.



8. Operating Command

DCS adjustment operating commands and real-time signal values are conveniently displayed on the LCD interface, ensuring precise control.

6 Operation Guide

ELECTRICAL OPERATION MUST NOT BE TAKEN PLACE UNTIL THE BASIC SETTINGS HAVE BEEN MADE AND CHECKED.

The Basic Settings of the Wonder HC Actuator® play a crucial role in ensuring the correct operation of the valve. If the Actuator has been provided with the valve, the valve manufacturer or supplier may have already configured these settings. This instruction assumes that the setting mode has been accessed.

6.1 Password

6.1.1 Check Parameter

Point Infrared Setting Tool at the display window of actuator, press Down option key (▼) to check parameter values.

WARNING: At this stage, you do not need to enter the original password, and you cannot modify any parameter values.

PV: %
Password: [JD]
Press + 、 - upturn
Press ▼ to check

6.1.2 Change Parameter

If you want to modify parameter values, press Increase key (+) or Decrease key (-) to enter the original password "08", then press Down option key (▼) to access the Set Menu.

PV: %
Password: [08]
Need modify ►
No modify ▼

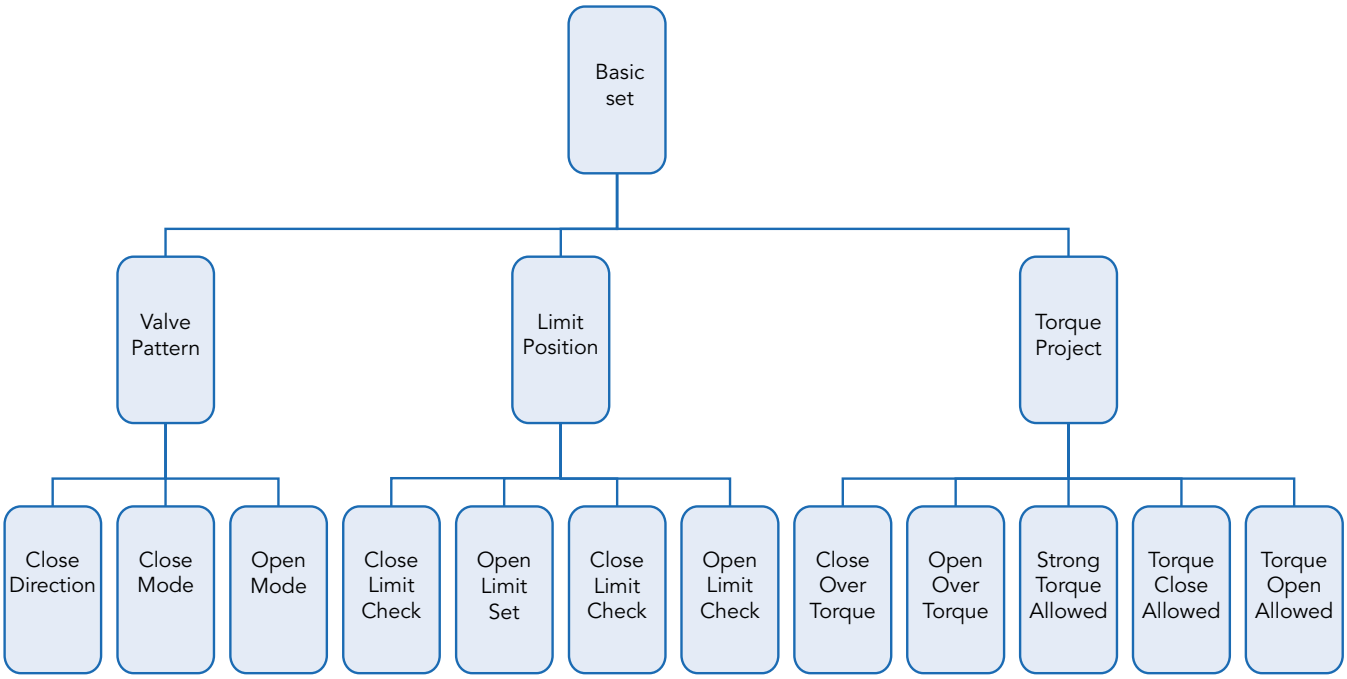
6.1.3 Modify Password

After entering the correct password "08", press Right option key (►). Then, use the Increase key (+) or Decrease key (-) to select a new password. Press Enter key (●) to confirm the new password, then press the Down option key (▼) to access the Set Menu.

PV: %
Password: [08]
Need modify ►
No modify ▼

6.1.4 Basic Set

Once the Actuator is mounted on the valve, the power supply is on, and Local/Stop control is selected, aim the Infrared Setting Tool at the Actuator's display window from a distance within 0.5m. Refer to the Set Chart to navigate through and display various functions, and their settings will be visible in the LCD window.



6.2 Valve Pattern

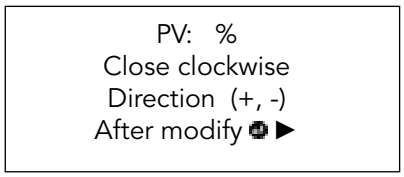
PV: %

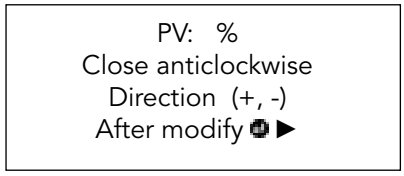
Basic Set ► ●
Press ● to enter

PV: %
Valve Pattern
Limit Position
Torque Protect ▼

6.2.1 Close Direction

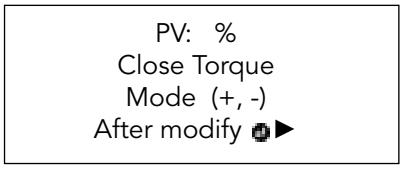
- The Electric Actuator can be configured to either close clockwise or anti-clockwise. To establish the correct closing direction, manually operate the actuator and valve. Conversion hand-wheel direction labels are provided for reference
- Use the Increase key (+) or Decrease key (-) to display the character corresponding to the correct closing direction.
- Once the display aligns with the established closing direction, press the Enter key (⏻). The displayed option will flash (stored), indicating that it has been set
- Press the Enter key (⏻) to confirm.

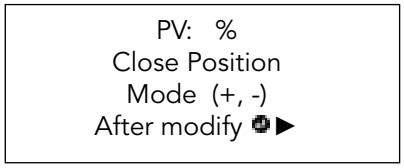




6.2.2 Close Mode

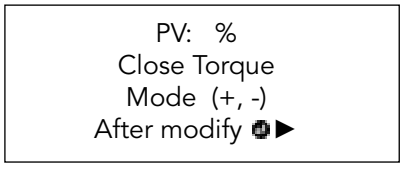
- The Electric Actuator can be configured to close on [torque] for seating valves and [position] for non-seating valves.
- Using Increase key (+) or Decrease key (-), display the required option.

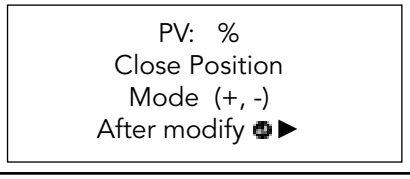




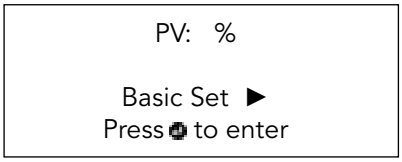
6.2.3 Open Mode

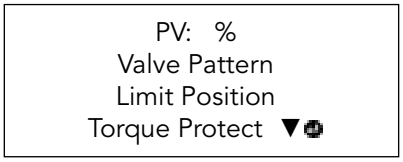
- The Electric Actuator can be configured to open on [torque] for seating valves and [position] for non-seating valves.
- Using Increase key (+) or Decrease key (-), display the required option.





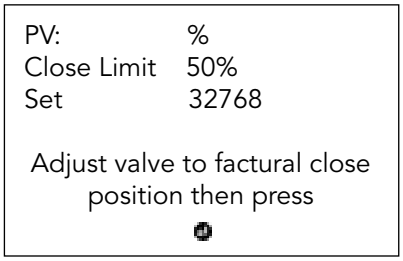
6.3 Limit Position

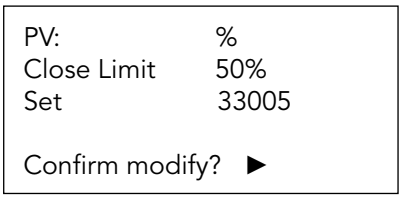


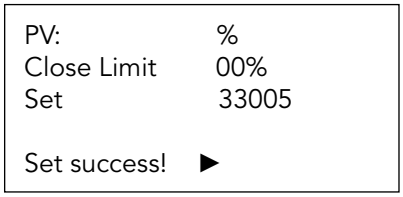


6.3.1 Close Limit Set

- Access the Close Limit Set Menu, use either the hand-wheel or remote controller (close valve or open valve) to adjust the actual close position of the valve. Confirm the adjustment by pressing the Enter key ( ).
- When manually adjusting the valve position, the valve position counter value (such as 32768) will change accordingly: it decreases when shaft rolls anti-clockwise and increase when it rolls clockwise.
- The green closing indicator lamp will illuminate, signifying that the close limit position has been set. Press the Right option key (►) to acess the Open Limit Set Menu.

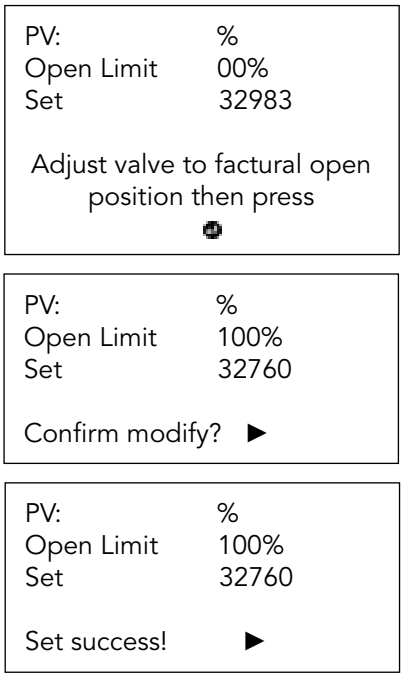






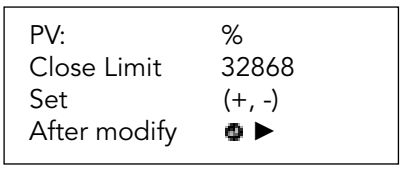
6.3.2 Open Limit Set

- Access the Open Limit Set Menu, and use either the hand-wheel or remote controller (close valve or open valve) to adjust the actual open position of the valve. Confirm the adjustment by pressing the Enter key (●).
- When manually adjusting the valve position, the valve position counter value (such as 33005) will change accordingly: it decreases when the shaft rolls anti-clockwise and increase when it rolls clockwise.
- The red open indicator lamp will illuminate, indicating open limit position has been set. Press the Right option key (►) to access Close Limit Check Menu.



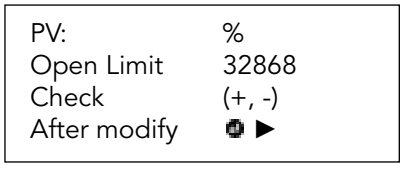
6.3.3 Close Limit Check

- After adjusting the valve close limit position, press the Right option key (►) to verify the close limit value.

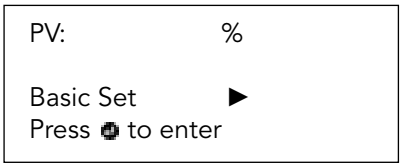


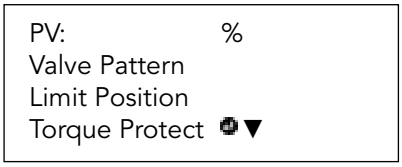
6.3.4 Open Limit Check

- After adjusting the valve open limit position, press the Right option key (►) to verify the close limit value.



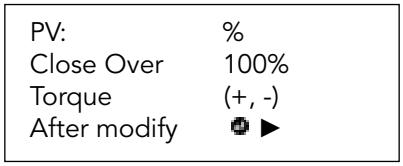
6.4 Torque Protect





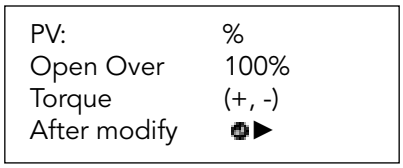
6.4.1 Close Over Torque

- This features allows you to set the maximum torque when closing the valve.
- You can adjust the close torque value within the range of 40% to Rated (100%) by using the Increase key (+) or Decrease key (-). If there's no recommended torque value, begin with a low setting and gradually increase it until you achieve satisfactory valve operation.
- When the displayed value flashes (stored), it indicates that the setting has been saved. If the set torque level is reached during closing, the Electric Actuator will torque trip and stop. Confirm the modification by pressing the Enter key ( ).
- **If the Actuator fails to complete a closed valve operation because the set torque is reached, this may indicate a valve and/or process issue or change. It is the user's responsibility to ensure that the valve and process conditions are within specified operational limits before increasing the Set Close torque value.**



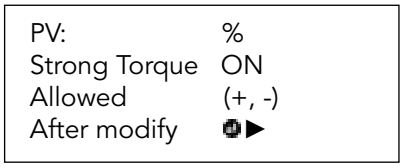
6.4.2 Open Over Torque

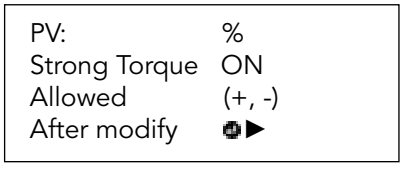
- This feature allows you to set the maximum torque when opening the valve.
- You can adjust the open torque value within the range of 40% to Rated (100%) by using the Increase key (+) or Decrease key (-). If there's no recommended torque value, begin with a low setting and gradually increase it until you achieve satisfactory valve operation.
- Confirm the modification by pressing the Enter key ( )
- **If the Actuator fails to complete an open valve operation due to reaching the set torque, this may indicate a valve and/or process issue or change. It is the user's responsibility to ensure that the valve and process conditions are within specified operational limits before increasing the Set Open torque value.**



6.4.3 Strong Torque Allowed

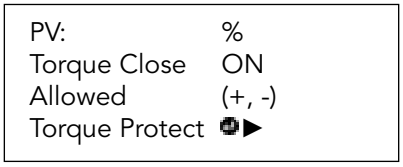
- Unique feature for precise control of valve last 5% stroke is available, this feature is designed for special application; It is usually used in a DCS system for precise control of valve's last 5% stroke to guarantee the flow control.
- Using Increase key (+) or Decrease key (-) to select [ON] or [OFF].

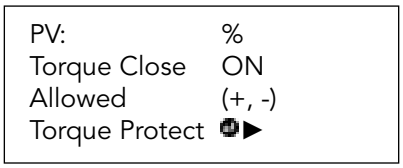




6.4.4 Torque Close Allowed

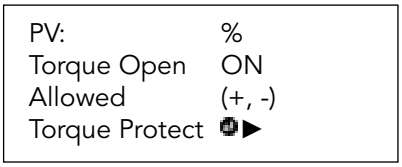
- This feature enables the closure of the valve using the torque close mode.
- Using the Increase key (+) or Decrease key (-) to select either [ON] or [OFF].

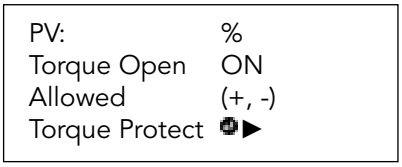




6.4.5 Torque Open Allowed

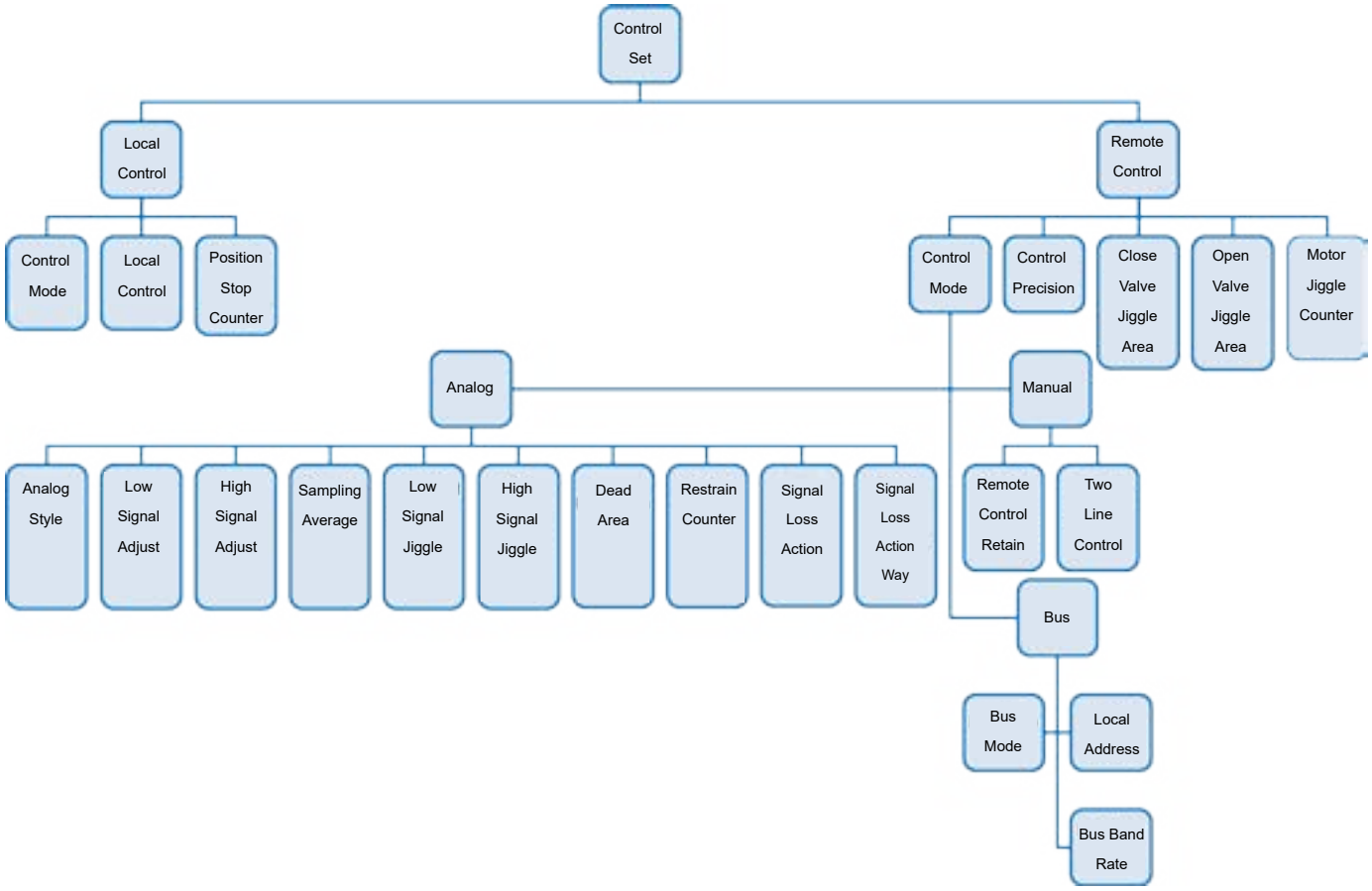
- This feature enables the closure of the valve using the torque open mode.
- Using Increase key (+) or Decrease key (-) to select either [ON] or [OFF].



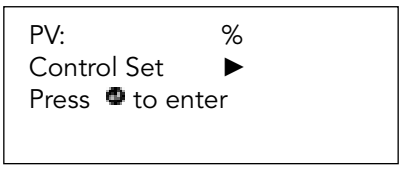


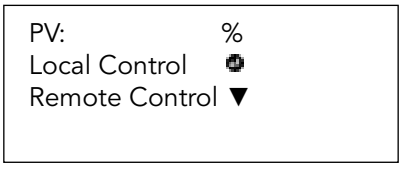
6.5 Control Set

The Control Set affects how the actuator will respond under conditions of Local Control, Remote Control.



6.5.1 Local Control





6.5.1.1 Control Mode

- This feature allows you to configure the actuator to work in a special mode. Use the Increase key (+) or Decrease key (-) to change the control mode:
- [Default]: Allow operation of the control panel selection and valve on/off
  [Remote]: Enforces remote control
  [Stop]: Enforces stop control
  [Local]: Enforces local control

PV:	%
Control	default
Mode	(+, -)
After modify	⏎▶

PV:	%
Control	remote
Mode	(+, -)
After modify	⏎▶

PV:	%
Control	stop
Mode	(+, -)
After modify	⏎▶

PV:	%
Control	local
Mode	(+, -)
After modify	⏎▶

6.5.1.2 Local Control Retain

- The default setting for Local Actuator Knob Control is self-maintained [Yes]. If non-maintained actuator knob control is required (jogging, inching, push to run), use the Increase key (+) or Decrease key (-). The display will change to [No]. Confirm the change by pressing Enter key (⏎).
- The displayed option will flash (stored) indicating that it has been set.

*When set to **[No]**, only the "open valve" and "close valve" knob should be in their respective positions for the Electric Actuator to function normally. Otherwise, it will stop working.*

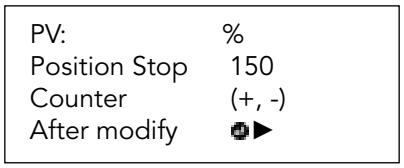
*When set to **[Yes]**, the 'open valve' and 'close valve' knobs will be effective when touched.*

PV:	%
Local Control	yes
Retain	(+, -)
After modify	⏎▶

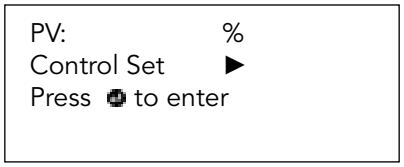
PV:	%
Local Control	no
Retain	(+, -)
After modify	⏎▶

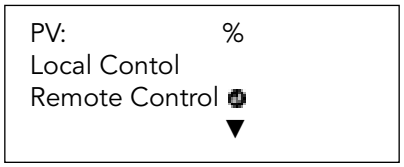
6.5.1.3 Position Stop Counter

- The setting for the main shaft's stopping and turning can be configured with this feature. The Position Stop counter will start counting if the main shaft's status changes from turning to stopping. When the counter reaches its upper limit value, it indicates that the main shaft has genuinely stopped working.
- Use the Increase key (+) or Decrease key (-) to adjust the value. The recommended (default) value is 150.



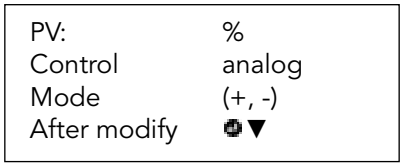
6.5.2 Remote Control





6.5.2.1 Control Mode

- The model of remote control source can be configured as:
  1. [Manual]: Indicates remote manual control with on/off type signal.
  2. [Analog]: Indicates remote analog control mode (both I/P and O/P are analog signals).
  3. [Bus]: Indicates remote bus signal control.
- To access the Manual/Analog/Bus Menu, press the Down option key (▼).



6.5.2.1.1 Manual

6.5.2.1.1.1 Remote Control Retain

- The default setting for Remote Actuator Knob Control is self-maintained [Yes]. If non-maintained actuator knob control is required (jogging, inching, push to run), use the Increase key (+) or Decrease key (-). The display will change to [No]. Confirm the change by pressing the Enter key (●).
- The displayed option will flash (stored) indicating that it has been set.

When set to [No], only the remote signal should remain effective continuously for the Electric Actuator to work normally. Otherwise, it will stop working.

When set to [Yes] The remote signal will be maintained.

PV:	%
Remote	yes
Control Retain	(+, -)
After modify	●►

PV:	%
Remote	no
Control Retain	(+, -)
After modify	●►

6.5.2.1.1.2 Two Line Control

- Configure the operation priority for 2-line Remote Control using the Increase key (+) or Decrease key (-) to change the setting:

  [Inhibit]: This feature is disabled;
  [Close]: Prioritizes closing the valve.
  [Stop]: Prioritizes stopping the valve.
  [Open]: Prioritizes opening the valve.

PV:	%
Two Line	inhibit
Control	(+, -)
After modify	●►

PV:	%
Two Line	close
Control	(+, -)
After modify	●►

PV:	%
Two Line	stop
Control	(+, -)
After modify	●►

PV:	%
Two Line	open
Control	(+, -)
After modify	●►

6.5.2.1.2 Analog

6.5.2.1.2.1 Analog Style

- Select the style of remote analogue signals: [4-20mA], [0-10mA] and [0-20 mA].
- To choose the desired signal, use the Increase key (+) or Decrease key (-) based on the corresponding code.

PV:	%
Analog	4-20mA
Control	(+, -)
After modify	⏎▶

PV:	%
Analog	0-10mA
Control	(+, -)
After modify	⏎▶

PV:	%
Analog	0-20mA
Control	(+, -)
After modify	⏎▶

6.5.2.1.2.2 Low Signal Adjust

- Adjust the value of the low signal by using the Increase key (+) or Decrease key (-) to select a value that corresponds with the LOW set point signal.
- Press the Enter key (⏎) to confirm.

PV:	%
Low Signal	15%
Adjust	145
Please press enter key after input analog low signal	

6.5.2.1.2.3 High Signal Adjust

- Adjust the value of the high signal by using the Increase key (+) or Decrease key (-) to select a value that corresponds with the HIGH set point signal.
- Press the Enter key (⏎) to confirm.

PV:	%
Low Signal	73%
Adjust	730
Please press enter key after input analog high signal	

6.5.2.1.2.4 Sampling Average

- Sampling average is used for precision control of the analogue signal. To adjust it, use the Increase key (+) or Decrease key (-) to change the value. The range is from 0 to 199, with the default value set at 31.
- *Note: Overly precise control may result in a slower response time. The response time is equal to the product of the Sampling average and 10 milliseconds.*

PV:	%
Sampling	31
Average	(+, -)
After modify	◉▶

6.5.2.1.2.5 Low Signal Jiggle

- This feature allow view and fine-tune the low analog signal sampling value.
- Use the Increase key (+) or Decrease key (-) to adjust the value.

PV:	%
Low Signal	145
Jiggle	(+, -)
After modify	◉▶

6.5.2.1.2.6 High Signal Jiggle

- This feature allow view and fine-tune the high analog signal sampling value.
- Use the Increase key (+) or Decrease key (-) to adjust the value.

PV:	%
High Signal	145
Jiggle	(+, -)
After modify	◉▶

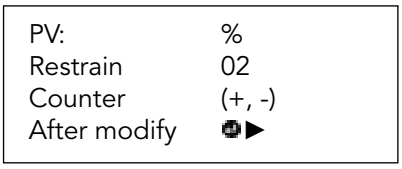
6.5.2.1.2.7 Dead Area

- If the actuator exhibits hunting or unnecessary responses to a fluctuating input signal, consider adjusting the dead area. To achieve more precise control, decrease the dead area, or increase it to reduce hunting. Use the Increase key (+) or Decrease key (-) to select the dead area width.
- The default dead area value is set at 1%.
- When the displayed value flashes (stored), it indicates that the setting has been saved. Confirm the change by pressing the Enter key (◉).
- ***Note: The maximum dead area is 9.9% of the valve stroke. Typically, the minimum dead area should not be set lower than 1%.***

PV:	%
Dead Area	1.0%
	(+, -)
After modify	◉▶

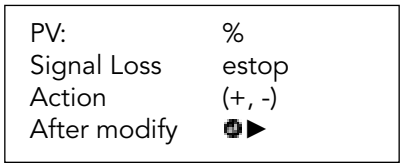
6.5.2.1.2.8 Restrain Counter

- This function is used to verify the signal and prevent erroneous operations.
- You can configure the time interval for the Electric Actuator's action, with a range from 0 to 99 seconds. The default value is set at 02.



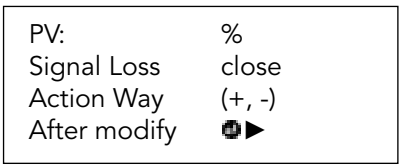
6.5.2.1.2.9 Signal Loss Action

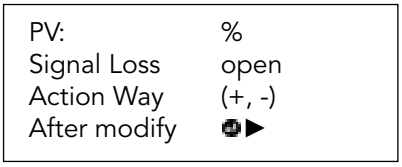
- The default setting is [Allow], which can be changed by using the Increase key (+) or Decrease key (-) to select either [Allow], or [Estop].



6.5.2.1.2.10 Signal Loss Action Way

- [Close], [Stop] and [Open] are available for selection, with the default setting set to [Stop].





6.5.2.1.3 Bus

6.5.2.1.3.1 Bus mode

- The mode of bus-mastering can be configured as [MODBUS] or [PROFIBUS], with the the default setting set to [Modbus].

PV:	%
Bus Mode	Modbus
	(+, -)
After modify	◀▶

PV:	%
Bus Mode	Profibus
	(+, -)
After modify	◀▶

6.5.2.1.3.2 Local Address

- To assign a unique address to the MODBUS module, use the Increase key (+) or Decrease key (-) to display the desired address within the range of 1 to 247.

PV:	%
Local	17
Address	(+, -)
After modify	◀▶

6.5.2.1.3.3 Bus Baud Rate

- Bus Baud Rate can be configured at the following options:
  100, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400.
- ***Note: This feature is only available for [MODBUS].***

PV:	%
Bus Baud	9600
Rate	(+, -)
After modify	◀▶

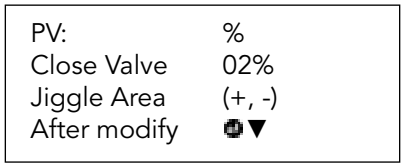
6.5.2.1.3.4 Control Precision

- The control precision option is designed for precise control. When the control mode is set to [Analog], this feature allows to set the allowable error between the target valve position and the current position. The range for this error allowance is from 0.1% to 9.9%. The default value is set at 1%.
- To adjust this value, use the Increase key (+) or Decrease key (-).

PV:	%
Control	1.0%
Precision	(+, -)
After modify	◀▼

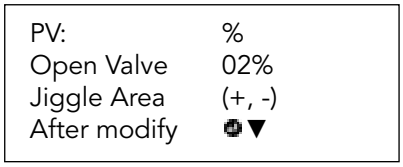
6.5.2.2 Close Valve Jiggle Area

- The Close valve Jiggle area represents the inertial area for motor operation when it begins to close. When the control mode is set to [Analog], jiggle closing is utilized if the error between the target valve position and the current position falls within the specified limit. Otherwise, the valve is closed normally.
- Use the Increase key (+) or Decrease key (-) to adjust the value of the Close Valve Jiggle Area. The range is from 0% to 99%, with the default value set at 2%.



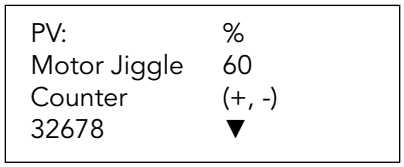
6.5.2.3 Open Valve Jiggle Area

- The Open valve Jiggle area represents the inertial area for motor operation when it begins to open. When the control mode is set to [Analog], jiggle opening is employed if the error between the target valve position and the current position falls within the specified limit. Otherwise, the valve is opened normally.
- Use the Increase key (+) or Decrease key (-) to adjust the value of the Opem Valve Jiggle Area. The range is from 0% to 99%, with the default value set at 2%.

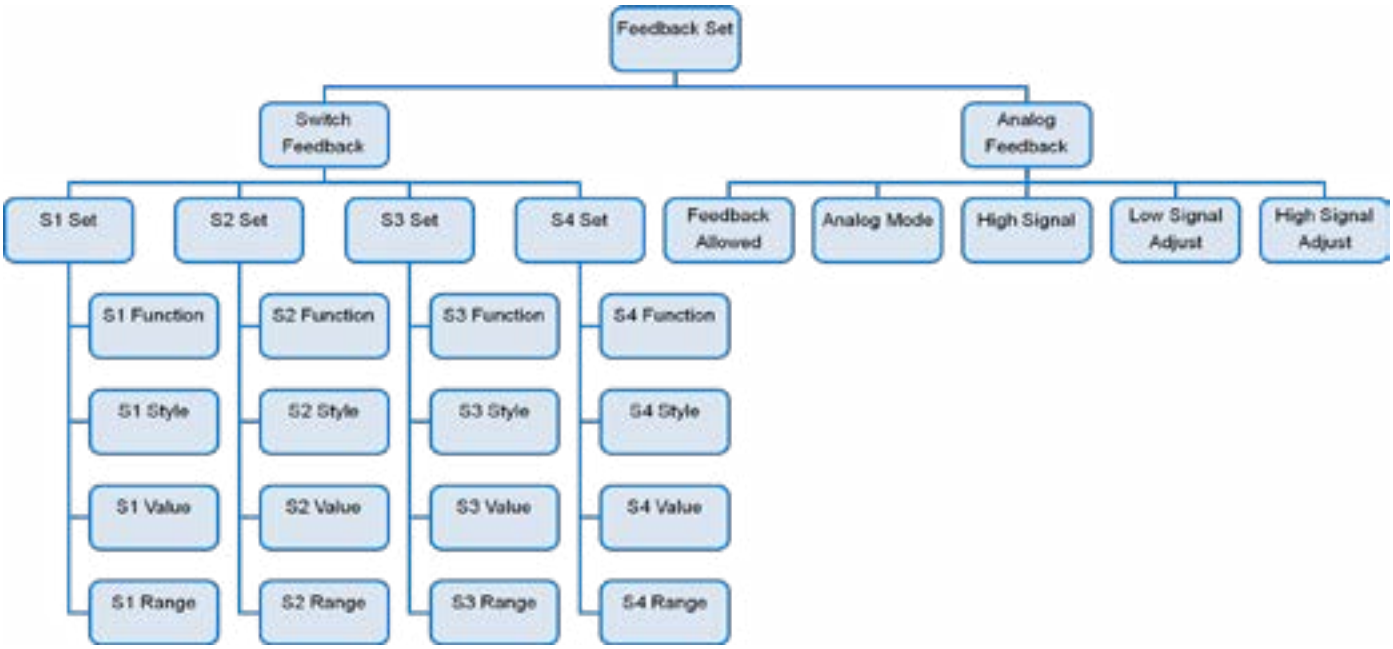


6.5.2.4 Motor Jiggle Counter

- The Motor current-on time can be configured in the Jiggle Area. The default value is set at 60.
- Use the Increase key (+) or Decrease key (-) to adjust the value.
- Each change should be within the range of 1 to 2, and should not exceed 5.



7 Feedback Set



7.1 Switch Feedback

- There are four contact relays (S1-S4) designed to indicate valve status. Each relay has a passive capacity of 5A/250VAC or 5A/30VDC. These relays can be configured to be pulled in or broken at specific functions (as shown in Section 4.1.5). The contact style can be set as either [normally open] or [normally closed].
- ***When the Contact function is set to [Any position], the Contact value and Contact range Menu become available for use. The Contact function can be adjusted from 0% to 100% in 1% increments and the Contact range can be adjusted from 0% to 15%.***
- S1~S4 relays do not require a power supply, and will retain their last position when power loss occurs.
- Additionally, there is one monitor contact relay (S0) that indicates valve-related issues such as power loss or power off. It has a passive capacity of 8A/250VAC or 8A/30VDC.
- The factory setting for these five contact relays are as follows:

Contact Relay	Contact Function	Contact Style
S1	Full close position	Normally Open
S2	Full open position	Normally Open
S3	Select remote	Normally Open
S4	Colligate alarm	Normally Open
S0	Power fault	Normally Open

7.1.1 S1 Set

- Access the S1 Func Menu.
- Use the Increase key (+) or Decrease key (-) to select [full close position].
- Press Enter key (●) to confirm.
- Press the Left option key (►) to access S1 Style Menu.
- Use the Increase key (+) or Decrease key (-) to select [normally open] option.
- Press the Enter key (●) to confirm.

PV:	%
S1 Func.	full close position (+, -)
After modify	● ►

PV:	%
S1 Style	normally open (+, -)
After modify	● ▼

PV:	%
S1 Value	30% (+, -)
After modify	● ►

Only S1 Func being set at [Any position]

PV:	%
S1 Range	03% (+, -)
After modify	● ▼

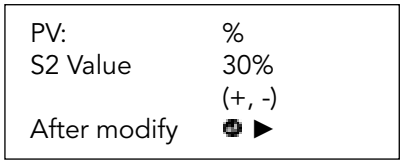
Only S1 Func being set at [Any position]

7.1.2 S2 Set

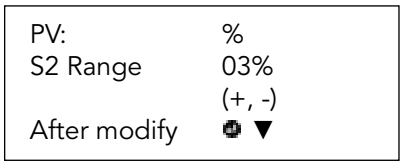
- Access the S2 Func Menu by pressing the Down option key (▼).
- Use the Increase key (+) or Decrease key (-) to select [full open position].
- Press Enter key (●) to confirm your selection.
- Press the Left option key (►) to access S2 Style Menu.
- Use the Increase key (+) or Decrease key (-) to select [normally open].
- Press the Enter key (●) to confirm.

PV:	%
S2 Func.	full open position (+, -)
After modify	● ►

PV:	%
S2 Style	normally open (+, -)
After modify	● ▼



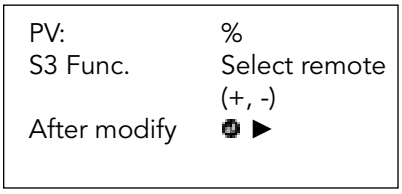
Only S2 Func being set at [Any position]

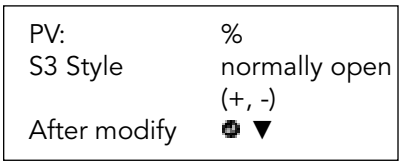


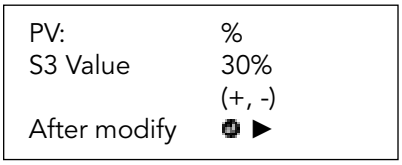
Only S2 Func being set at [Any position]

7.1.3 S3 Set

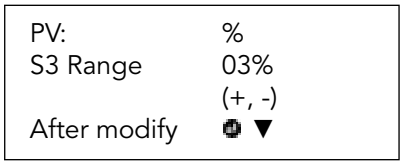
- Access the S3 Func Menu by pressing the Down option key (▼).
- Use the Increase key (+) or Decrease key (-) to choose [select remote].
- Press the Enter key (◉) to confirm.
- Press the Left option key (►) to access S3Style Menu.
- Use the Increase key (+) or Decrease key (-) to select [normally open].
- Press the Enter key (◉) to confirm.







Only S3 Func being set at [Any position]



Only S3 Func being set at [Any position]

7.1.4 S4 Set

- Access the S4 Func Menu by pressing the Down option key (▼).
- Use the Increase key (+) or Decrease key (-) to select [colligate alarm].
- Press Enter key (◉) to confirm.
- Press Left option key (►) to access S4 Style Menu.
- Use the Increase key (+) or Decrease key (-) to select [normally open].
- Press the Enter key (◉) to confirm.

PV:	%
S4 Func.	Colligate Alarm
	(+, -)
After modify	◉ ►

PV:	%
S4 Style	normally open
	(+, -)
After modify	◉ ▼

PV:	%
S4 Value	30%
	(+, -)
After modify	◉ ►

Only S4 Func being set at [Any position]

PV:	%
S4 Range	03%
	(+, -)
After modify	◉ ▼

Only S4 Func being set at [Any position]

7.1.5 Contact Function

Any Position	Full close position	Full open position	Close over torque	Open over torque
Start overtime	Any over torque	Close action	Open action	In action
Hand-wheel action	ESD signal	Close interlock	Open interlock	Interlock action
Select stop	Select local	Select remote	Battery lack	Motor over heat
Power loss	Power fault	Actuator alarm	Valve alarm	Colligate alarm

7.2 Analog Feedback

7.2.1 Feedback Allowed

- [Yes] feedback is allowed;
- [No] feedback is not allowed.

PV:	%
Feedback	yes
Allowed	(+, -)
After modify	◉ ►

PV:	%
Feedback	no
Allowed	(+, -)
After modify	◉ ►

7.2.2 Analog Mode

- The style of analog can be configured as [4-20mA], [0-10mA] or [0-10V]. The default setting is [4-20mA], and it is not necessary to modify.

PV:	%
Analog	4-20mA
Mode	(+, -)
After modify	⏎▶

PV:	%
Analog	0-10mA
Mode	(+, -)
After modify	⏎▶

PV:	%
Analog	0-10V
Mode	(+, -)
After modify	⏎▶

7.2.3 High Signal

- [Full open]: High signal (20mA) corresponds 100% open;
- [Full close]: Low signal (4mA) corresponds 100% open.

PV:	%
High Signal	Full open
	(+, -)
After modify	⏎▶

PV:	%
High Signal	Full close
	(+, -)
After modify	⏎▶

7.2.4 Low Signal Adjust

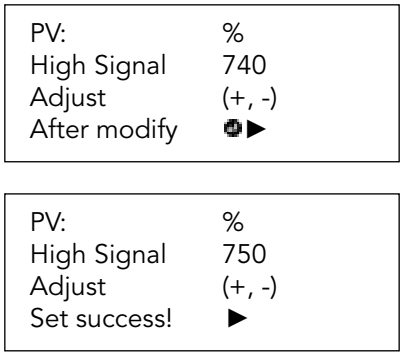
- Indicate the low feedback signal. When the valve is in the full close position, the feedback signal should be set to the low signal (4mA).
- Use the Increase key (+) or Decrease key (-) to modify the actual value, and then press the Enter key (⏎) to confirm.

PV:	%
Low Signal	147
Adjust	(+, -)
After modify	⏎▶

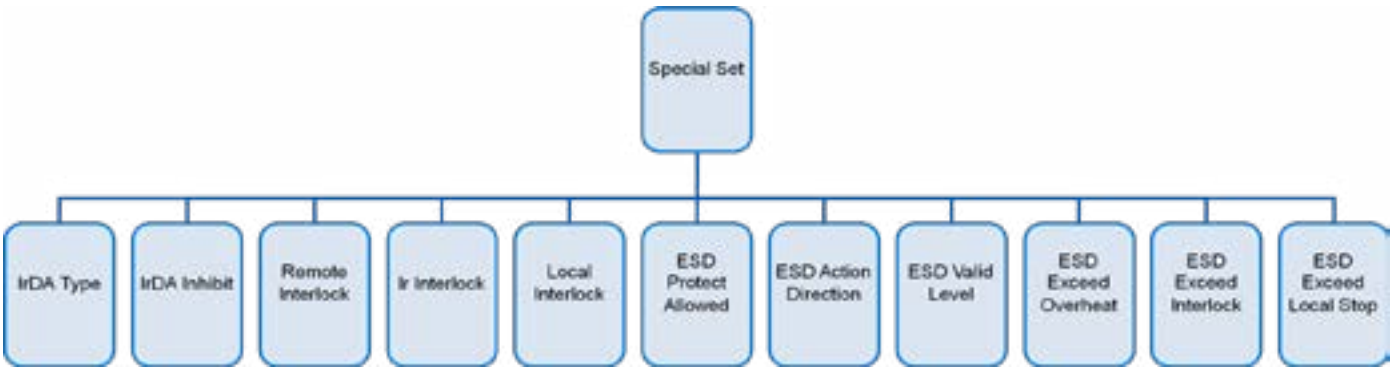
PV:	%
Low Signal	150
Adjust	(+, -)
Set success!	▶

7.2.5 High Signal Adjust

- Indicate the high feedback signal. When the valve is in the full open position, the feedback signal should be set to the high signal (20mA).
- Use the Increase key (+) or Decrease key (-) to modify the actual value, and then press the Enter key (●) to confirm.



8 Special Set



8.1 IrDA (Infrared Remote Controller) Type

- Use the Increase key (+) or Decrease key (-) to to select [new] or [old], and then press the Enter key (●) to confirm.

PV:	%
Special Set	▶
Press ● to enter	

PV:	%
IrDa Type	new
	(+, -)
After modify	● ▶

PV:	%
IrDa Type	old
	(+, -)
After modify	● ▶

8.2 IrDA Inhibit

- Use the Increase key (+) or Decrease key (-) to to select [Yes] or [No], and then press the Enter key (●) to confirm.

PV:	%
IrDa Inhibit	yes
	(+, -)
After modify	● ▶

PV:	%
IrDa Inhibit	no
	(+, -)
After modify	● ▶

8.3 Remote Interlock

- Use the Increase key (+) or Decrease key (-) to select [Yes] or [No], and then press the Enter key (●) to confirm.

PV:	%
Remote	yes
Interlock	(+, -)
After modify	● ▶

PV:	%
Remote	no
Interlock	(+, -)
After modify	● ▶

8.4 Ir Interlock

- Use the Increase key (+) or Decrease key (-) to select [Yes] or [No], and then press the Enter key (●) to confirm.

PV:	%
Ir Interlock	yes
	(+, -)
After modify	● ▶

PV:	%
Ir Interlock	no
	(+, -)
After modify	● ▶

8.5 Local Interlock

- Use the Increase key (+) or Decrease key (-) to select [Yes] or [No], and then press the Enter key (●) to confirm.

PV:	%
Local	yes
Interlock	(+, -)
After modify	● ▶

PV:	%
Local	no
Interlock	(+, -)
After modify	● ▶

8.6 ESD Protect Allowed

- Use the Increase key (+) or Decrease key (-) to select [Yes] or [No], and then press the Enter key (●) to confirm.
- ***Note: Only when ESD Action Direction is set to [Yes], the following functions are effective.***

PV:	%
ESD Protect	Yes
Allowed	(+, -)
After modify	● ▶

PV:	%
ESD Protect	No
Allowed	(+, -)
After modify	● ▶

8.7 ESD Valid Level

- Use the Increase key (+) or Decrease key (-) to select [High] or [Low], and then press the Enter key (●) to confirm.

PV:	%
ESD Valid	High
Level	(+, -)
After modify	● ▶

PV:	%
ESD Valid	Low
Level	(+, -)
After modify	● ▶

8.8 ESD Action Direction

- Use the Increase key (+) or Decrease key (-) to select [Close], [Remain] or [No], and then press the Enter key (●) to confirm.

PV:	%
ESD Action	Close
Direction	(+, -)
After modify	● ▶

PV:	%
ESD Action	Remain
Direction	(+, -)
After modify	● ▶

PV:	%
ESD Action	No
Direction	(+, -)
After modify	● ▶

8.9 ESD Exceed Overheat

- Use the Increase key (+) or Decrease key (-) to select [Yes] or [No], and then press the Enter key (⏻) to confirm.

PV:	%
ESD Exceed	Yes
Overheat	(+, -)
After modify	⏻ ▶

PV:	%
ESD Exceed	No
Overheat	(+, -)
After modify	⏻ ▶

8.10 ESD Exceed Interlock

- The default setting for ESD Exceed Interlocks is [No]. ESD action will not exceed an active interlock applied to the actuator. If an applied ESD signal is required to exceed active interlocks, causing the ESD action change,follow these steps:
  1. Use the Increase key (+) or Decrease key (-) to select [Yes].
  2. Press the Enter key (⏻) to confirm.
- The displayed option will flash (stored), indicating that it has been set.

PV:	%
ESD Exceed	No
Interlock	(+, -)
After modify	⏻ ▶

PV:	%
ESD Exceed	Yes
Interlock	(+, -)
After modify	⏻ ▶

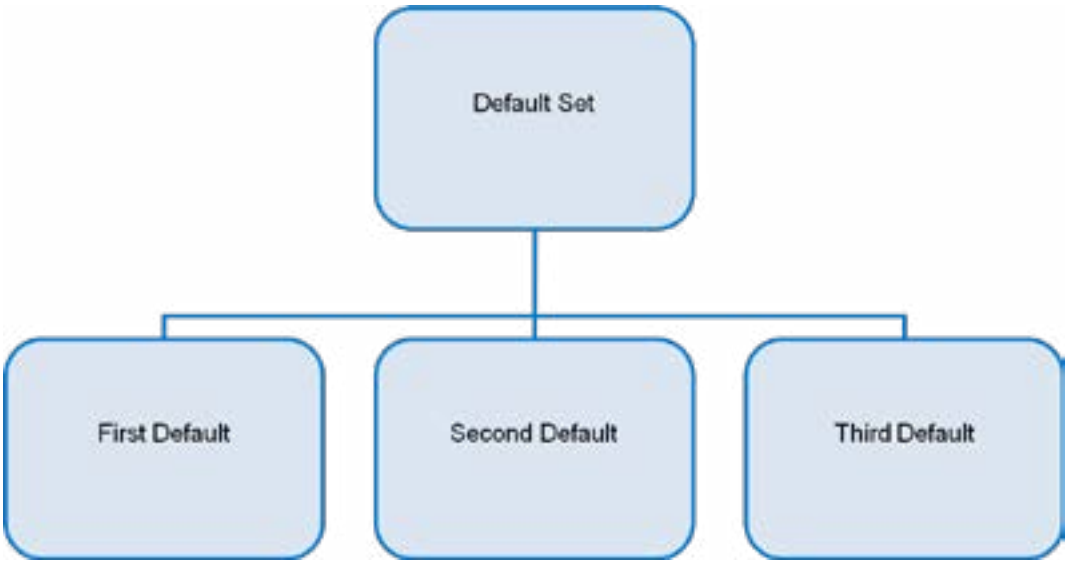
8.11 ESD Exceed Local Stop

- The default setting for ESD Exceed Local Stop during an ESD event is [No]. If you want to change this setting, follow these steps:
  1. Use the Increase key (+) or Decrease key (-) to select [Yes].
  2. Press the Enter key (⏻) to confirm.
-

PV:	%
ESD Exceed	No
Local Stop	(+, -)
After modify	⏻ ▶

PV:	%
ESD Exceed	Yes
Local Stop	(+, -)
After modify	⏻ ▶

9 Default Set



9.1 First Default

- Factory parameters resume except for Contact relay, Analog input/output, Ir controller type, IrDA inhibit, Bus, High level settings.

PV: %

Default Set ▶
Press ● to enter

PV: %
First Default ●
Second Default
Third Default ▼

PV: %
Resume First
Factory Set ●
Press ● to enter

PV: %
Resume First
Factory Set ●
Confirm resume?

PV: %
Resume First
Factory Set ●
Resume success!

9.2 Second Default

- Factory parameters resume except for Contact relay, Analog input/output, Ir controller type, IrDA inhibit, Bus, High level settings (including limit position).

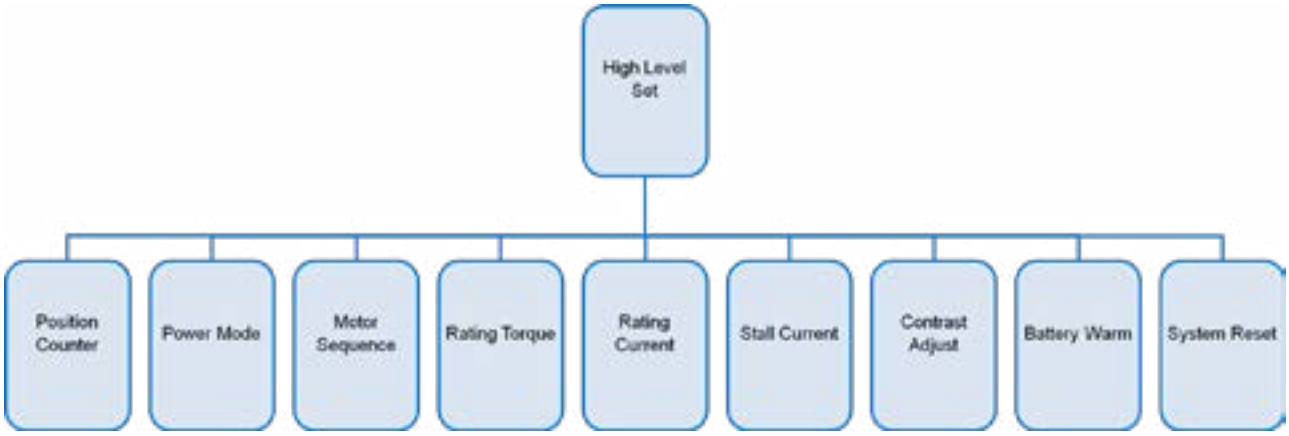
9.3 Third Default

- Factory parameters resume only for Contact relay, Analog input/output, Ir controller type, IrDA inhibit, Bus, High level settings.

10 High Level Set

High level parameters can be configured by this feature.

Note: Select the menu of System reset to restart the Wonder HC Actuator®. It's better to deny access to the high level settings.



10.1 Position Counter

- Press the Right option key (►) to enter High Level Set Menu.

PV:	%
High Level Set	
Press ● to enter	

- Press the Enter key (●) to enter Position Counter Menu.

PV:	%
Position	01
Counter	(+,-)
After modify	●

- Use the Increase key (+) or Decrease key (-) to change the value from 01 to 03 (24 RPM), 04-05 (48 RPM), 07-08 (96 RPM), then press the Enter key (●) to confirm.

PV:	%
Position	03
Counter	(+,-)
Set succeed!	

24 RPM

PV:	%
Position	04
Counter	(+,-)
Set succeed!	

48 RPM

PV:	%
Position	07
Counter	(+,-)
Set succeed!	

96 RPM

Motor Speed (RPM)	Position Counter Setting
24	2, 3
26	2, 3
48	4, 5
52	4, 5
96	6, 7

10.2 Rating Torque

- Use the Increase key (+) or Decrease key (-) to change the value 5% at a time, then press Enter key (⏻) to confirm.

PV:	%
High Level Set	
Press ⏻ to enter	

PV:	%
Rating	40%
Torque	(+,-)
After modify	⏻

PV:	%
Rating	45%
Torque	(+,-)
After modify	⏻

10.3 Rating Current

- Use the Increase key (+) or Decrease key (-) to change the value 5% at a time, then press Enter key (⏻) to confirm.

PV:	%
Rating	40%
Current	(+,-)
After modify	⏻

PV:	%
Rating	45%
Current	(+,-)
After modify	⏻

10.4 Stall Current

- Use the Increase key (+) or Decrease key (-) to change the value 5% at a time, then press the Enter key (●) to confirm.

PV:	%
Stall	40%
Current	(+,-)
After modify	●

PV:	%
Stall	45%
Current	(+,-)
After modify	●

10.5 Rating Torque/ Rating Current/ Stall Current Setting

The default setting for Rating torque and Rating current is around 40~45%.The stall current default setting is around 45~50%. And these three settings were under the high level set.

These 3 data should be set accordingly on site by customer or engineer for commissioning if end-users want this protection function.

Please follow the steps below to set this on site:

1. When pipeline is ready, supply the water and let the pump work on its rated head.
2. Open the valve by electric actuator and record the sampling value shows on the LCD display.(this sampling value is normally between 200~300.The range is between 0~1000)
3. Run the valve from fully close to fully open 2 or 3 times and record the maximum sampling value that you can get.
4. Use the remote controller to enter the menu, go to the high-level setting and set the over-current, over-torque and stall current.
5. In case, we get the Maximum sampling data are 200, 300, 400 by 3 times operation of the valve. That means 20%, 30%, 40% in high level setting. It is the same logic for the sampling value that you get from the LCD.
6. In high level setting menu, for over-current and over-torque setting, we can add 7% on the sampling value for these two settings. i.e. if we get the sampling value is 300, that is to say we get 30%.Then we need set the data as 37% for these new settings. For stall current setting, we need to add another 8%,so we will set the 45% as the stall current setting.

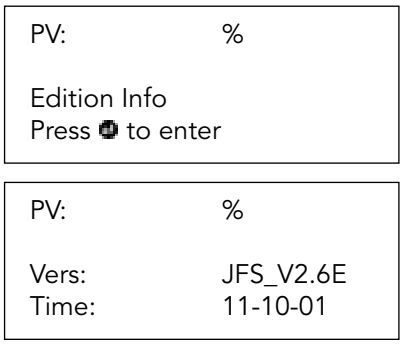
11 Alarm Info

Press the Enter key (●) to view the Alarm Information.

All kinds of alarm signal are as follows:

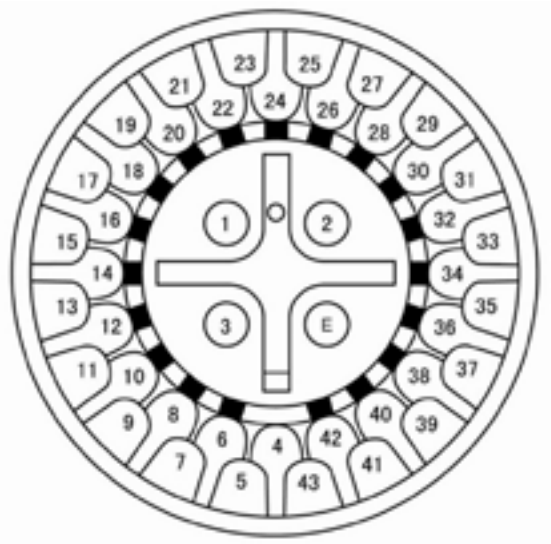
Signal	Description
Data Error	Error on internal parameter of the actuator
Motor Over Heat	Motor is over-heat
Motor Over Current	Motor is over-current
Open Over Torque	Open torque to the valve is too much
Close Over Torque	Close torque to the valve is too much
Start Over Time	Electric actuator starts over time
Analog Loss	Analog is lost
Power Loss	Shortage of power
Power Fault	Power is failed
ESD Signal	ESD signal is valid
Limit Error	Error on Limit data
Battery Low	Battery power is low

12 Edition Info



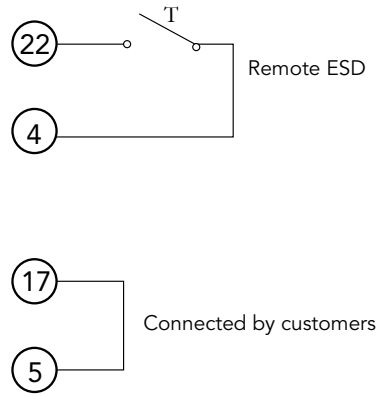
- The feature of "Torque and valve opening percentage constant display on the main interface" (PV: %) is available as an option upon request.
- To navigate through the interface and return to the Sub-Menu at any point, simply press the Return/Back key (C).

13 Wiring Diagram

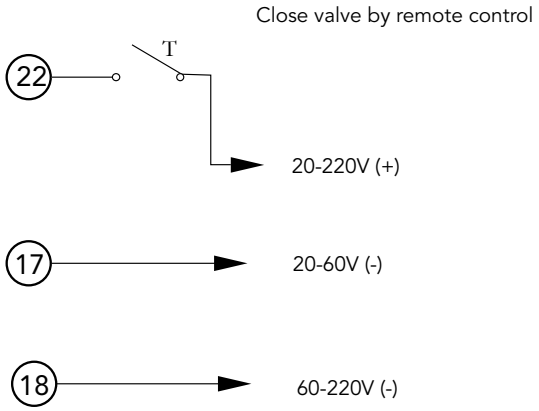


No.	Description	No.	Description
(E)	Grounding	(22)	Remote Control/ Input for ESD
(1)	3 phase power A/ single phase L1 Line (220V)	(23)	Remote Control/ Input for CL Interlock
(2)	3 phase power B/ single phase N Line (220V)	(24)	Remote Control/ Input for OP Interlock
(3)	3 phase power C	(25)	Remote Control/ Input (common) -ve 20-60VAC/DC
(4)	Internal power source, 24V DC (+)	(26)	Remote Control/common of Input -ve 60-220VAC
(5)	Internal power source, 24V DC (-)	(27)	Mal/ Auto Input -ve 60-220VAC
(6)	Limit Switch S1-1	(28)	Mal/ Auto Input -ve 20-60VAC/DC
(7)	Limit Switch S1-2	(29)	Mal/ Auto Input Control (+)
(8)	Limit Switch S2-1	(30)	Valve Torque Switch CTT (-)
(9)	Limit Switch S2-2	(31)	Valve Torque Transmitter CTT Voltage (+)
(10)	Limit Switch S3-1	(32)	Valve Torque Transmitter CTT Current (+)
(11)	Limit Switch S3-2	(33)	Valve Position Transmitter CPT (-)
(12)	Limit Switch S4-1	(34)	Valve Position Transmitter CPT Voltage (+)
(13)	Limit Switch S4-2	(35)	Valve Position Transmitter CPT Current (+)
(14)	Remote Monitoring Switch S0-1 (N.C)	(36)	24VDC Input (-)
(15)	Remote Monitoring Switch S0-2 (common)	(37)	24VDC Input (+)
(16)	Remote Monitoring Switch S0-3	(38)	Analogue Signal (0~10V, 0~5V) Input (-)
(17)	Remote Control/Input (common) -ve 20-60VAC/DC	(39)	Analogue Signal (0~10V) Input (+)
(18)	Remote Control/Input (common) -ve 60-220VAC	(40)	Analogue Signal (0~5V) Input (+)
(19)	Remote Control for Valve Close	(41)	Analogue Signal (0~20mA, 4~20mA) Input (-)
(20)	Remote Control for Stop/Stay	(42)	Analogue Signal (0~20mA, 4~20mA) Input (+)
(21)	Remote Control for Valve Open	(43)	Cable Shield

13.1 ESD Wire Diagram LED

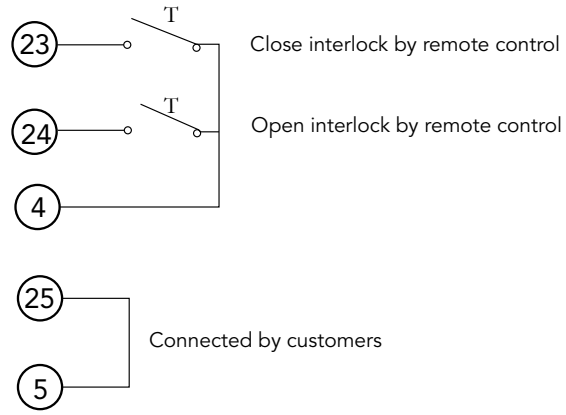


ESD control by internal power source

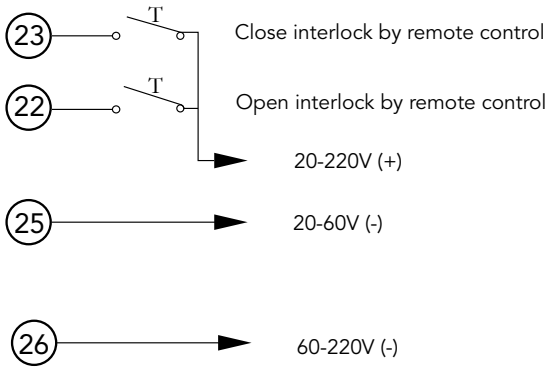


ESD control by external power source

13.2 Interlock Control Wire Diagram

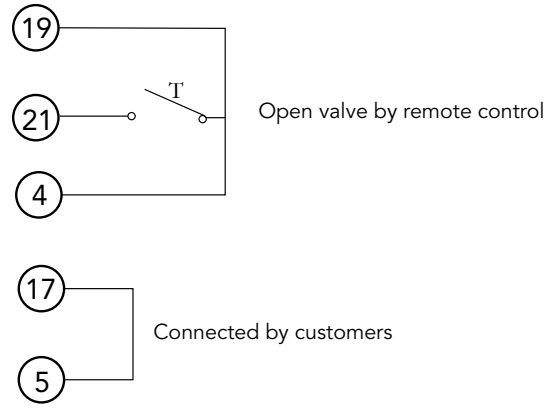


Interlock control by internal power source

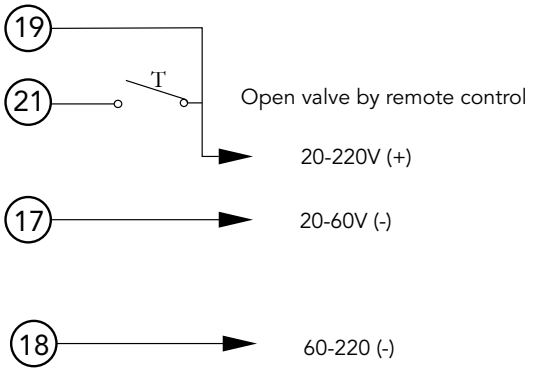


Interlock control by external power source

13.3 2 Wires Control Wire Diagram

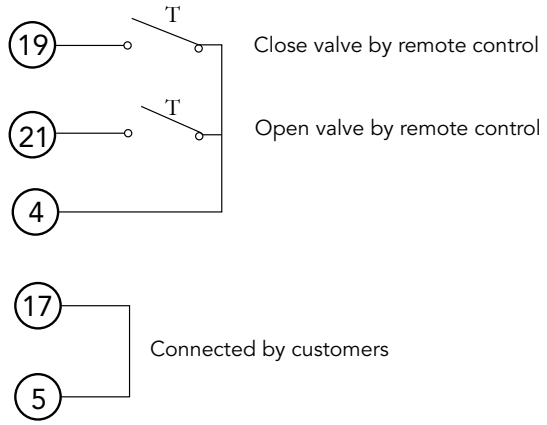


2 wires control by internal power source

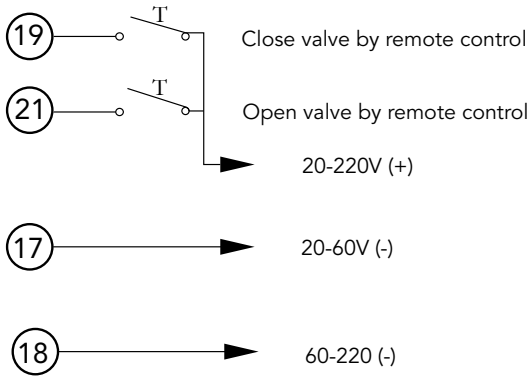


2 wires control by external power source

13.4 3 Wires Control Wire Diagram

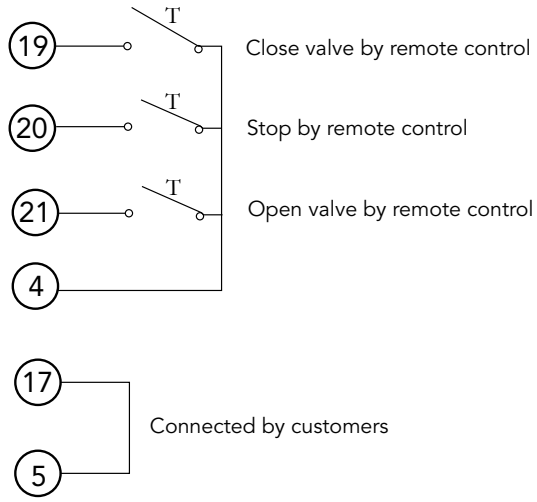


3 Wires control by internal power source

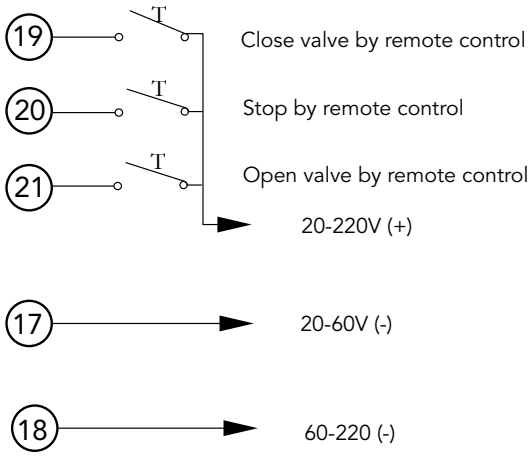


3 Wires control by external power source

13.5 4 Wires Control Wire Diagram

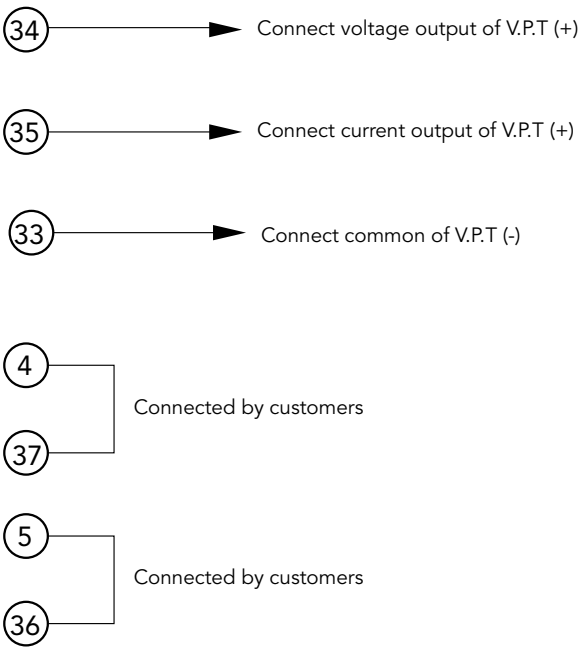


4 Wires control by internal power source

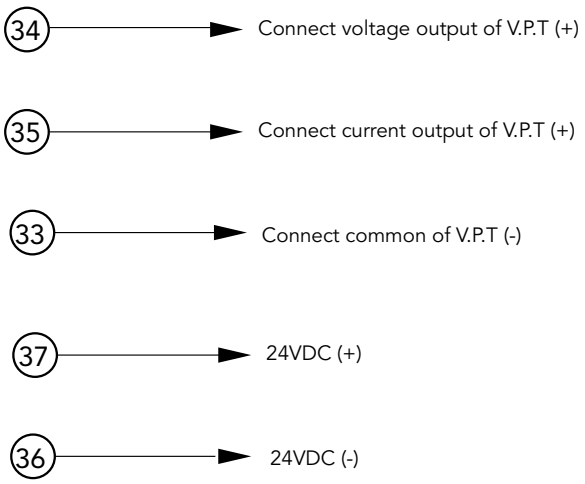


4 Wires control by external power source

13.6 Valve Position Transmitter Control Diagram

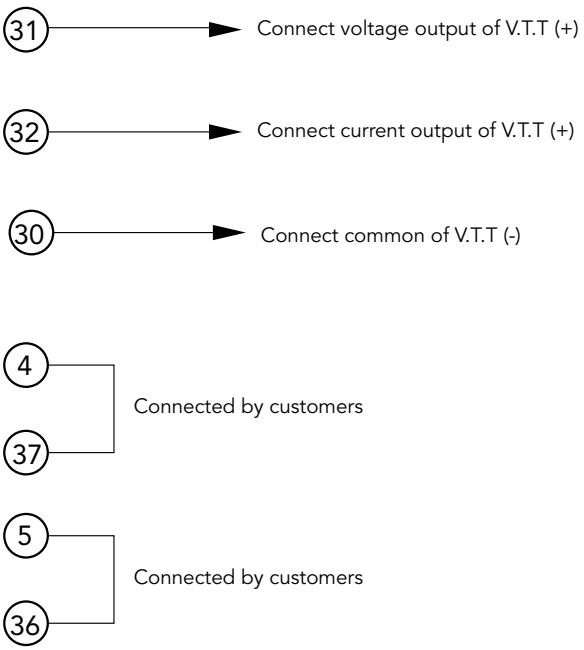


V.P.T using internal power source

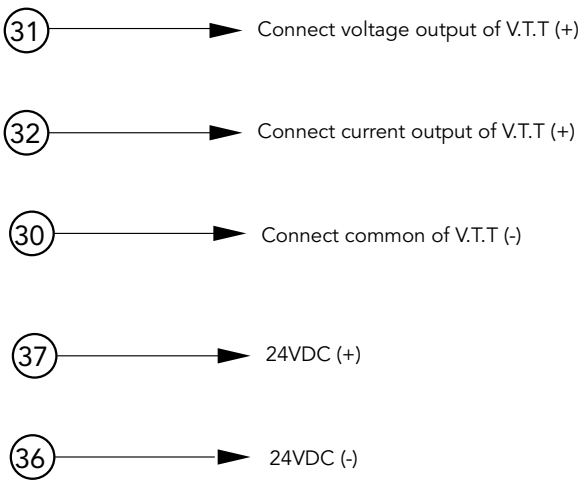


V.P.T using external power source

13.7 Valve Torque Transmitter Control Diagram

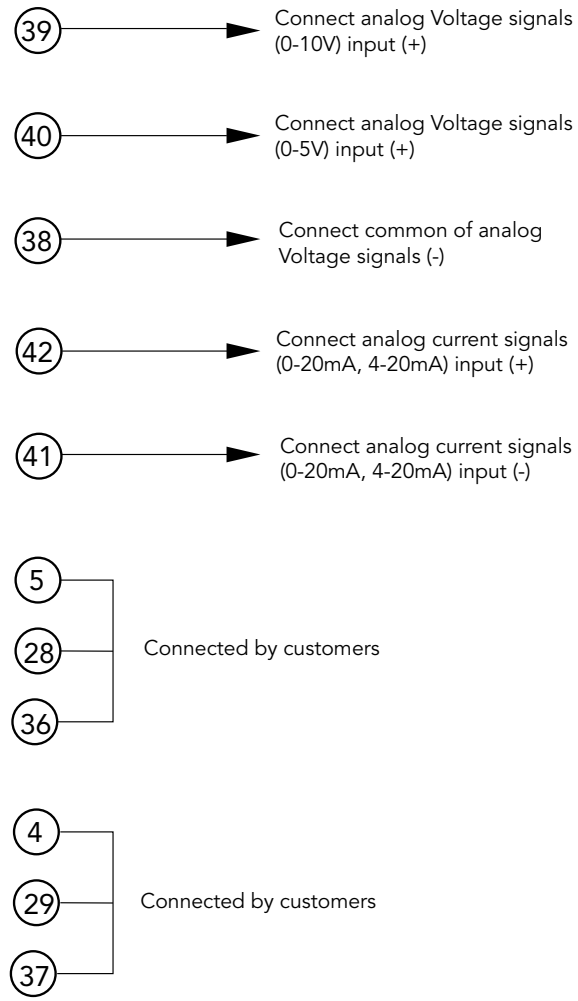


V.T.T using internal power source

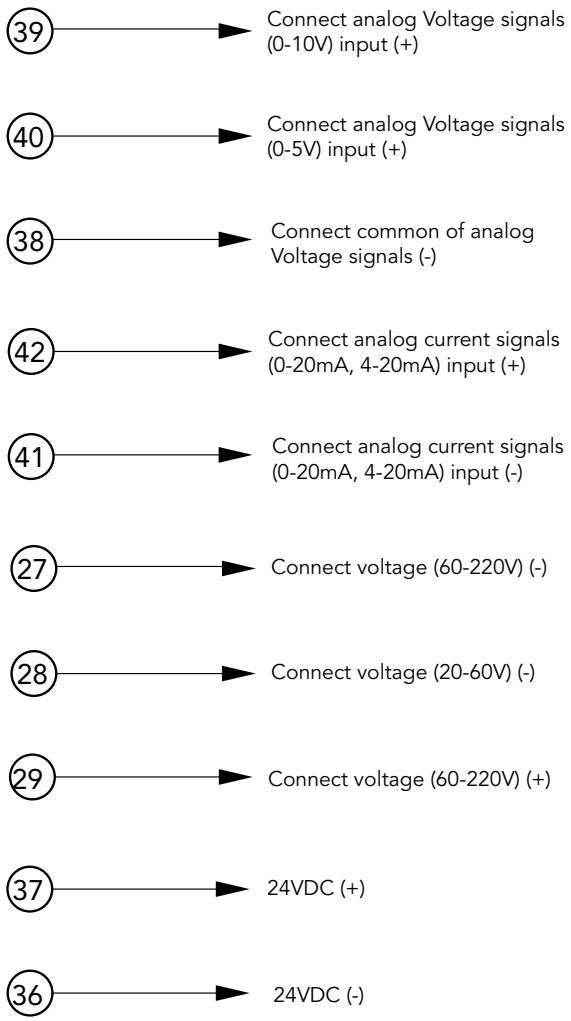


V.T.T using external power source

13.8 Remote Analog Signals Control

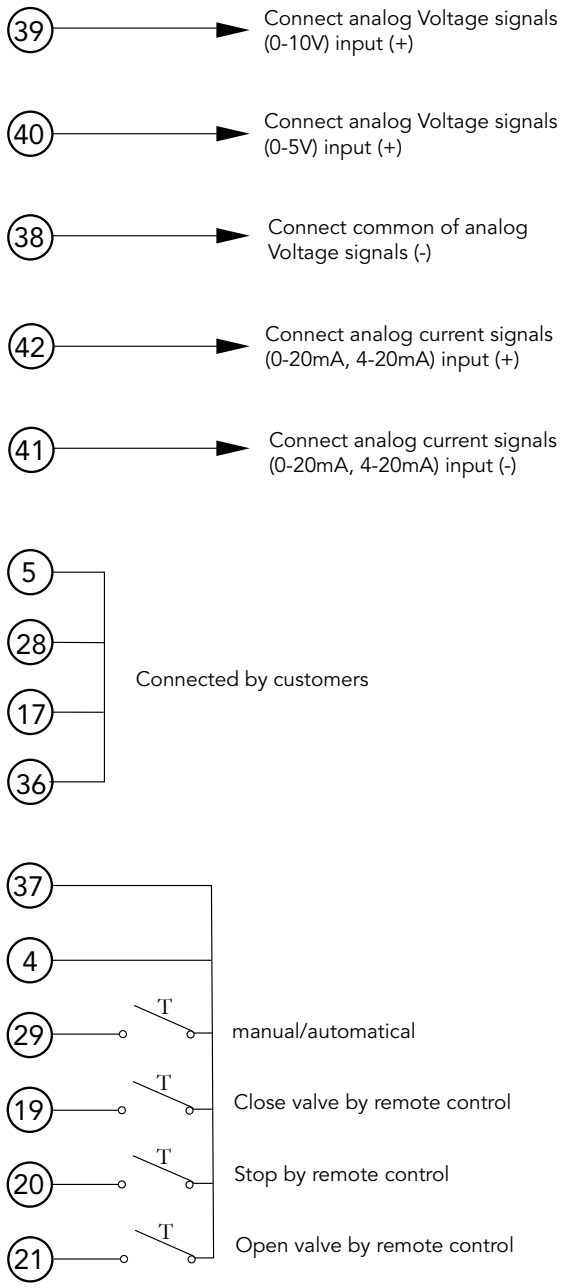


Remote analog signals control, using internal power source

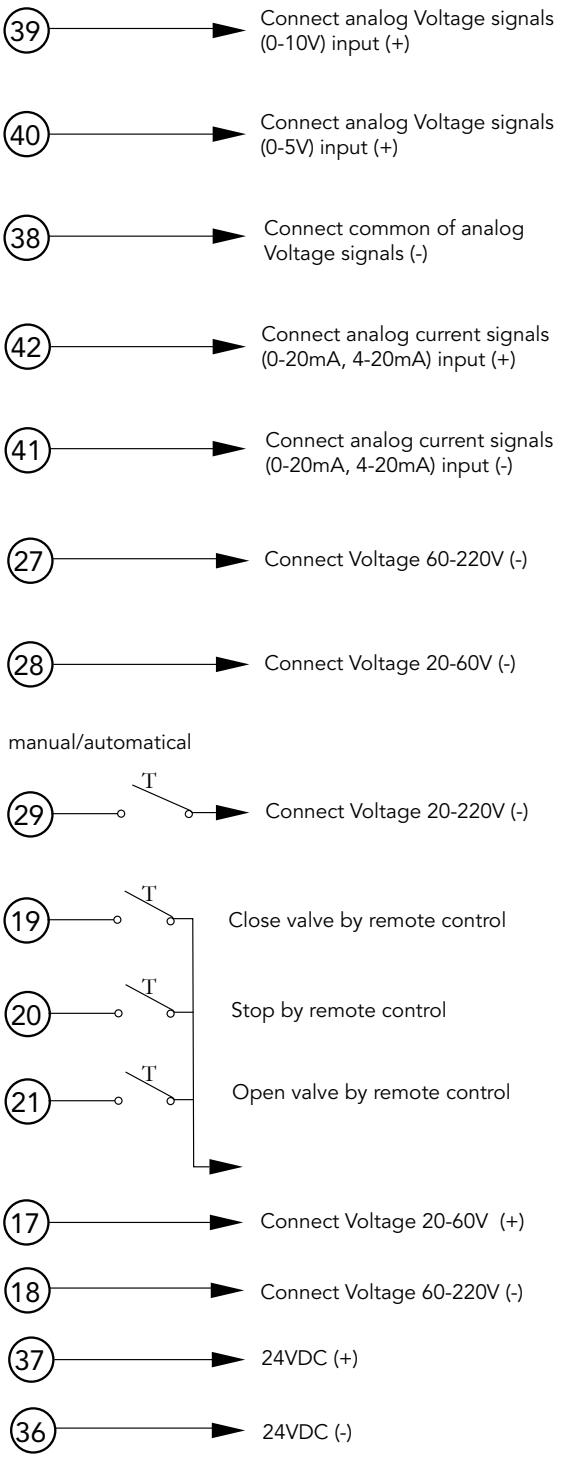


Remote analog signals control, using external power source

13.9 Remote Analog Signals Control and Switch Control

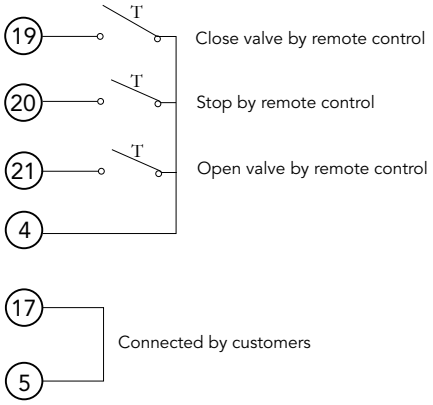


Remote analog signals control, using internal power source

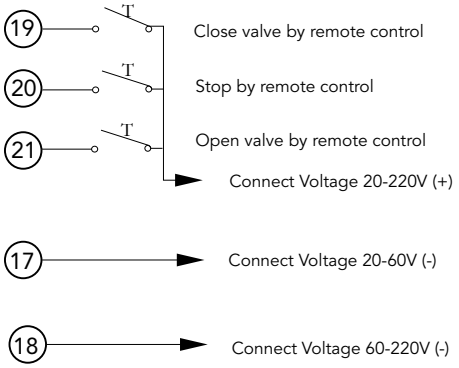


Remote analog signals control, using external power source

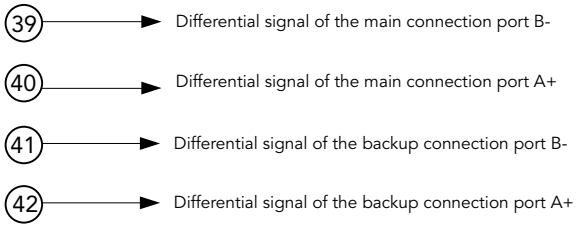
13.10 Remote MODBUS Signals Control and Switch Control

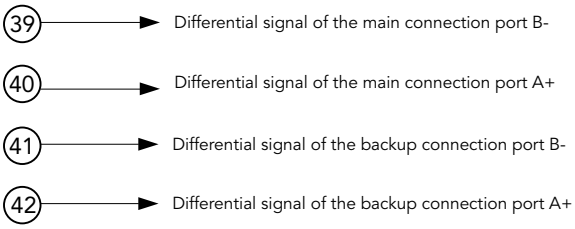


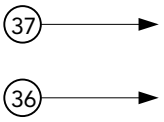
Four-line control (internal power source)



Four-line control (external power source)







14 Customer Service

Wonder® wants to assist you in keeping your instrument online and active. Should you need for service or repair arise, please follow these steps:

- Call (65) 6686 0181 and ask for Customer Service.
- Explain the problem; we may be able to solve it over the phone. The person handling your call will ask for some pertinent information to try to determine the nature of the problem.
- If the problem cannot be solved over the phone, the Customer Service/ Sales representative team will schedule a date and time, and send over our Engineer team for an onsite checking before ask to return the unit to the factory for further inspection.

15 Maintenance

WARNING

Prior to commencing any maintenance procedures, it is imperative to ensure that the main power supply and all other service voltages connected to the terminal board are turned off.

Perform an annual check on your Wonder HC Actuator® to ensure its continued proper functioning. Follow these steps:

1. Disconnect all electrical power to the actuator.
2. Open the electrical enclosure.
3. Inspect and tighten all electrical connections.
4. Visually inspect the actuator for any electrical or mechanical damage.
5. Replace any worn or damaged components.
6. If necessary, contact the Wonder® Engineering or your local sales representative to schedule an on-site visit by the Services Engineering team.

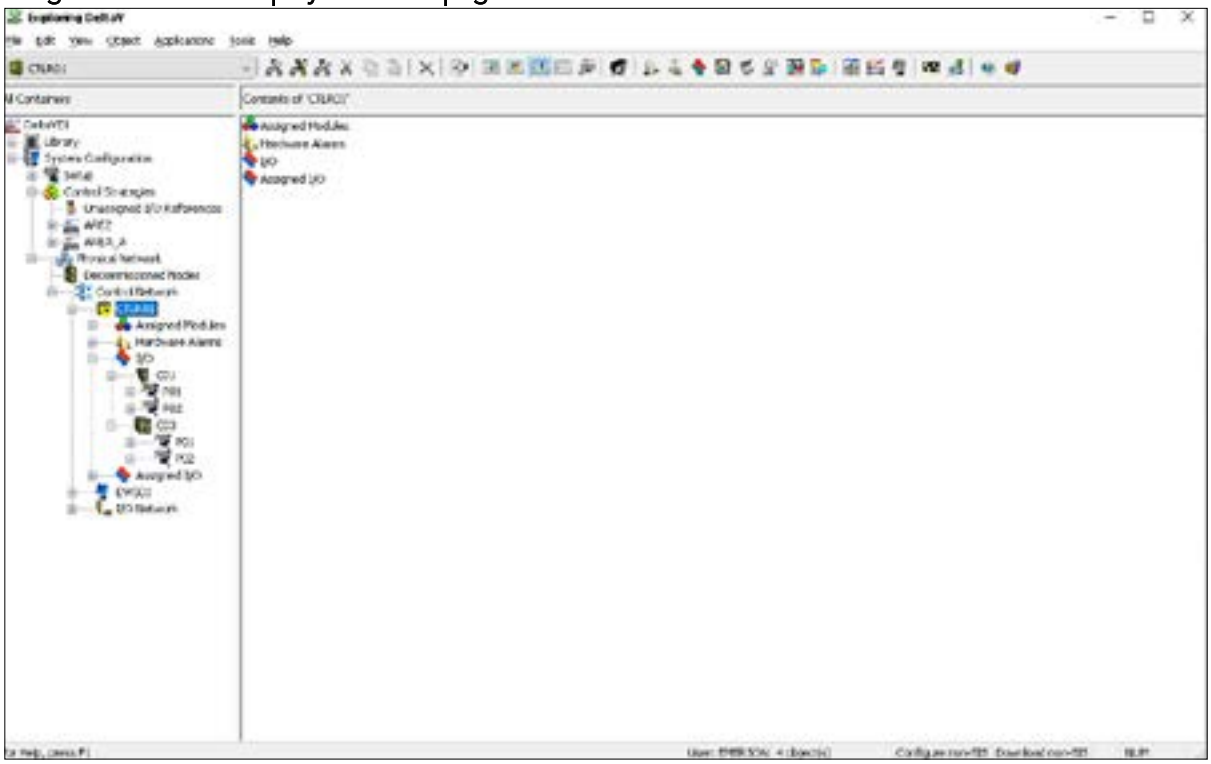
	**Warning:** Do not open when an explosive atmosphere may be present.
	**Caution:** At no time should the cover be removed unless electrical power is disconnected.
	**Warning: Hazardous Location Safety Minder:** At no time should the cover be removed unless power is switch off first. When it is necessary to service the instrusment with the power applied, ensure that proper safe environmental conditions exists and that such maintenance is authorized and pursuant to safe conditions.

16 Communication

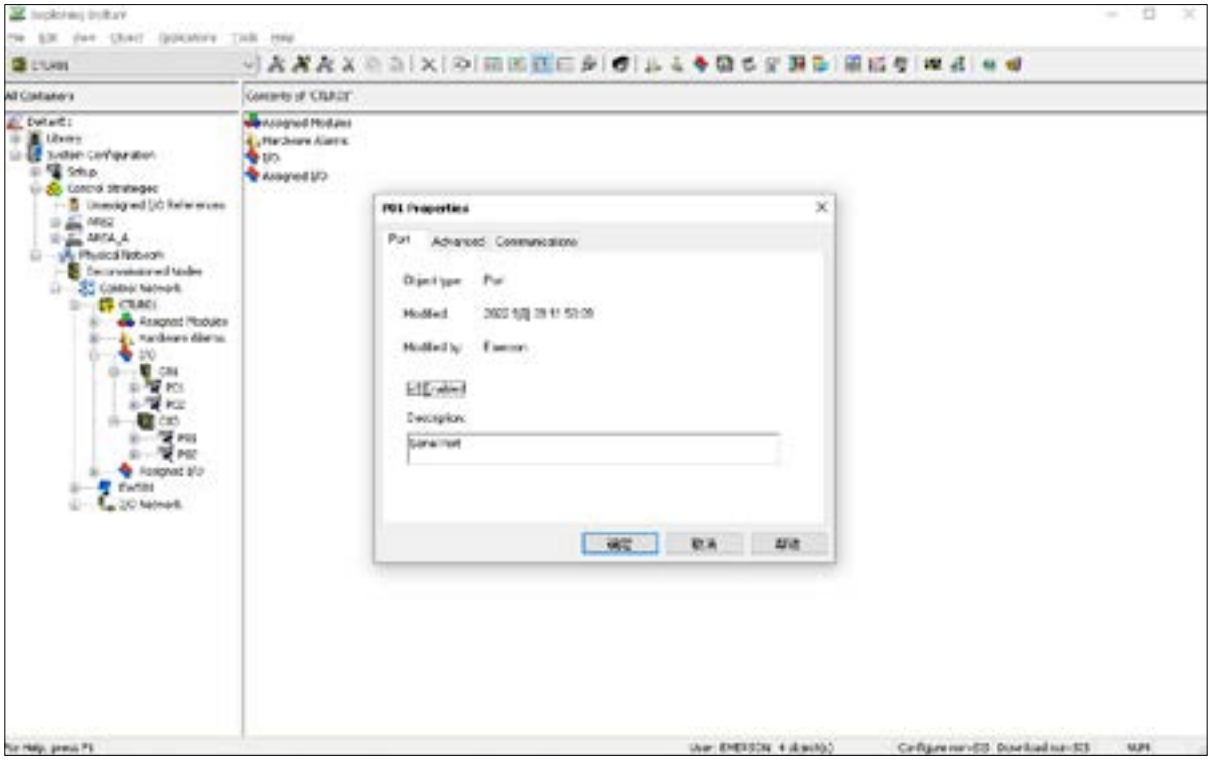
16.1 MODBUS Setting

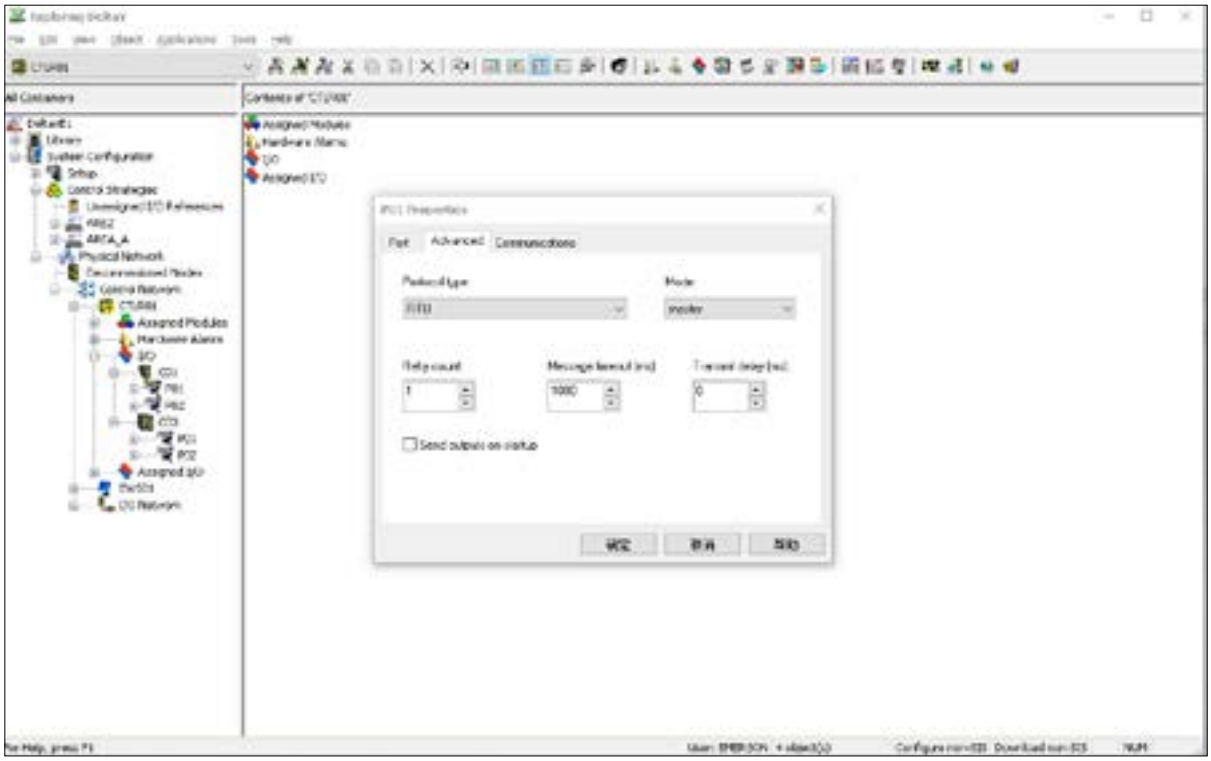
16.1.1 Start Delta V Explorer

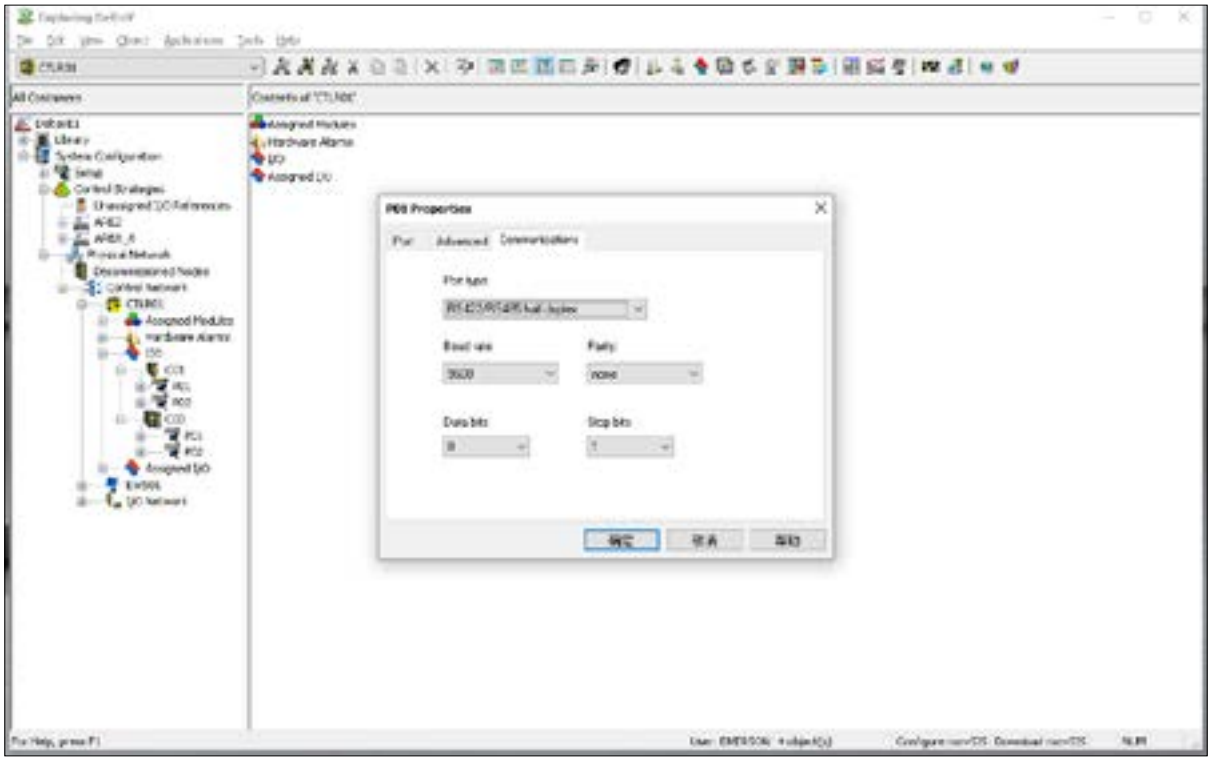
Drag the controller displayed on the page to the left menu bar.



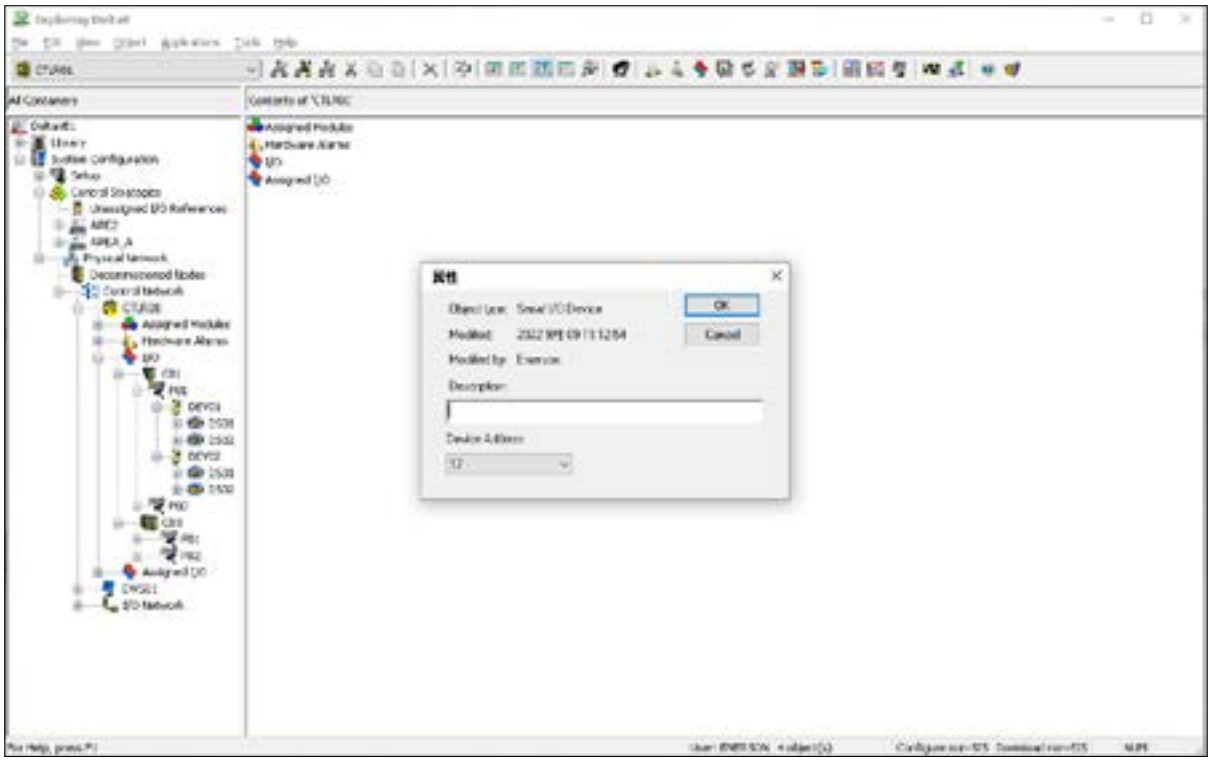
16.1.2 Set P01 Properties



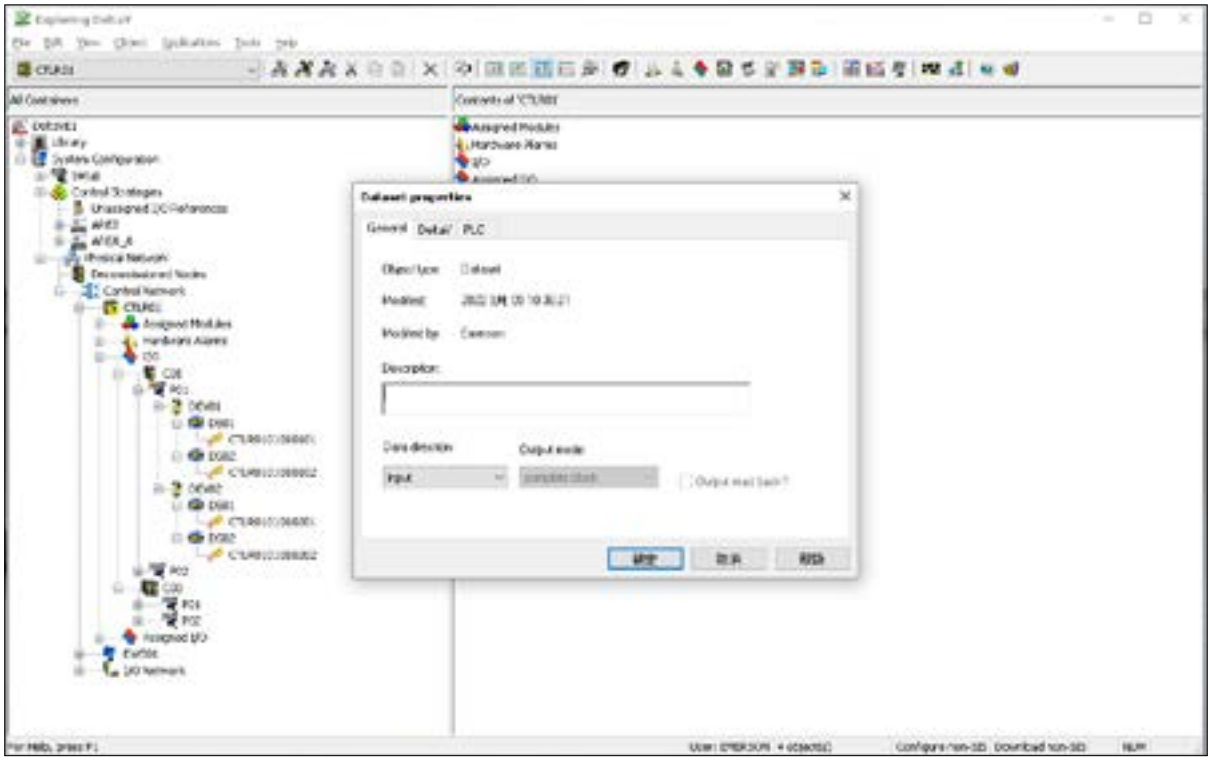


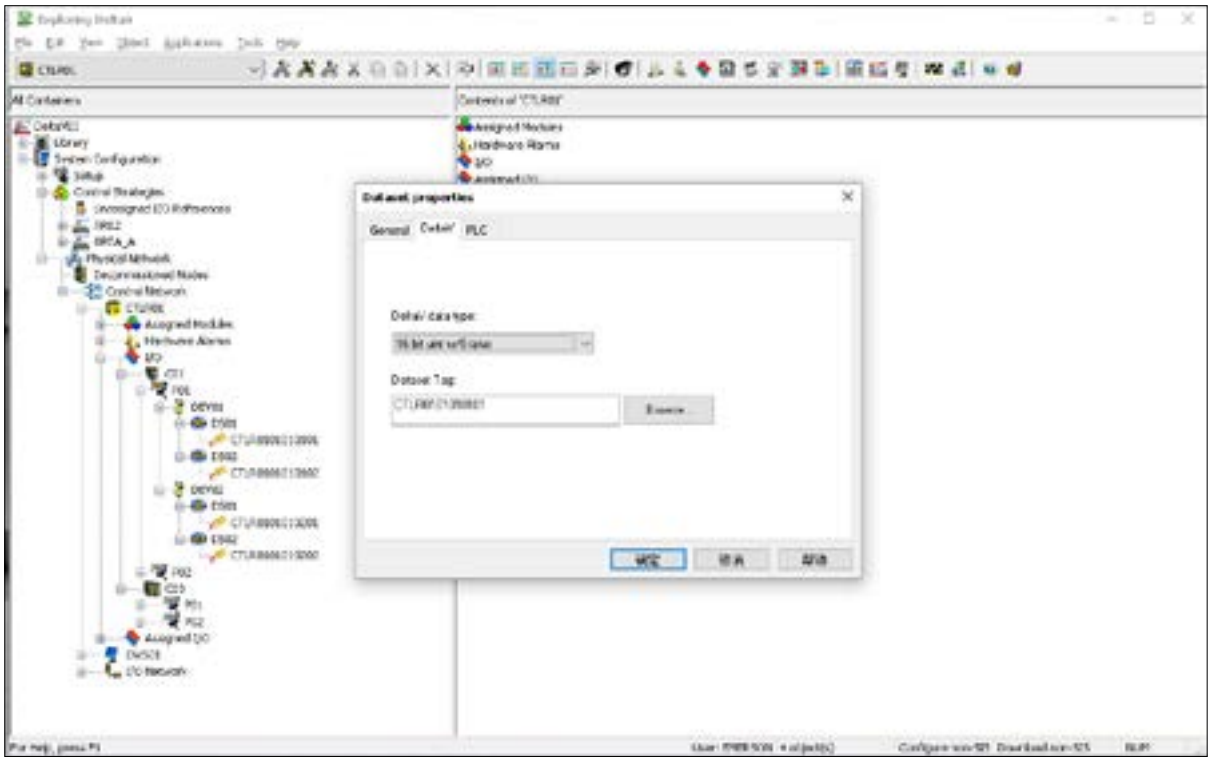


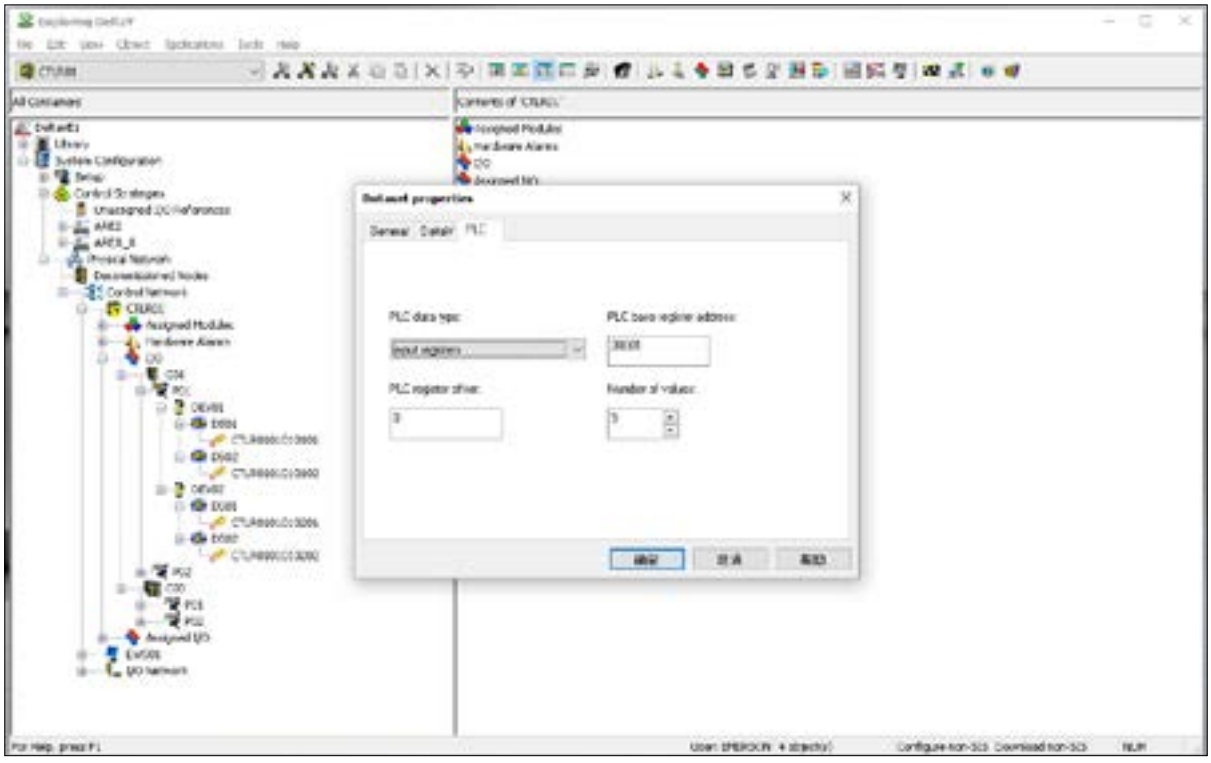
16.1.3 Set the Corresponding device address

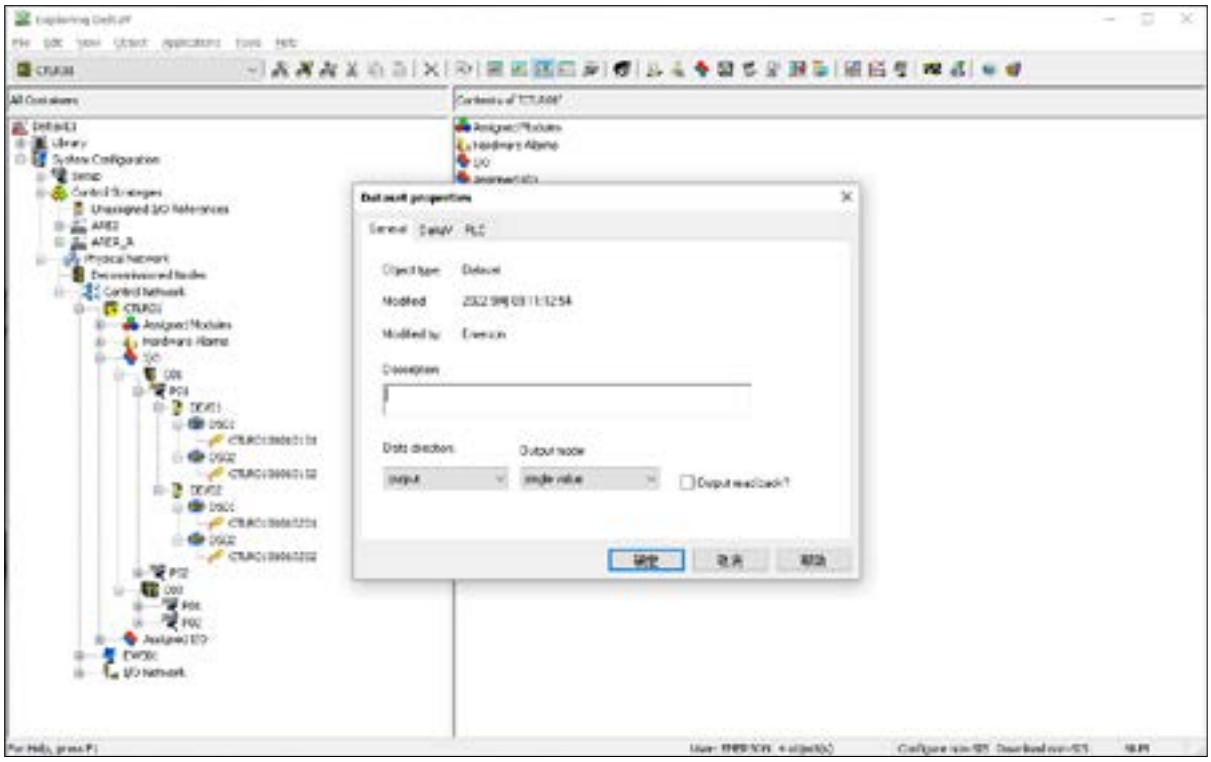


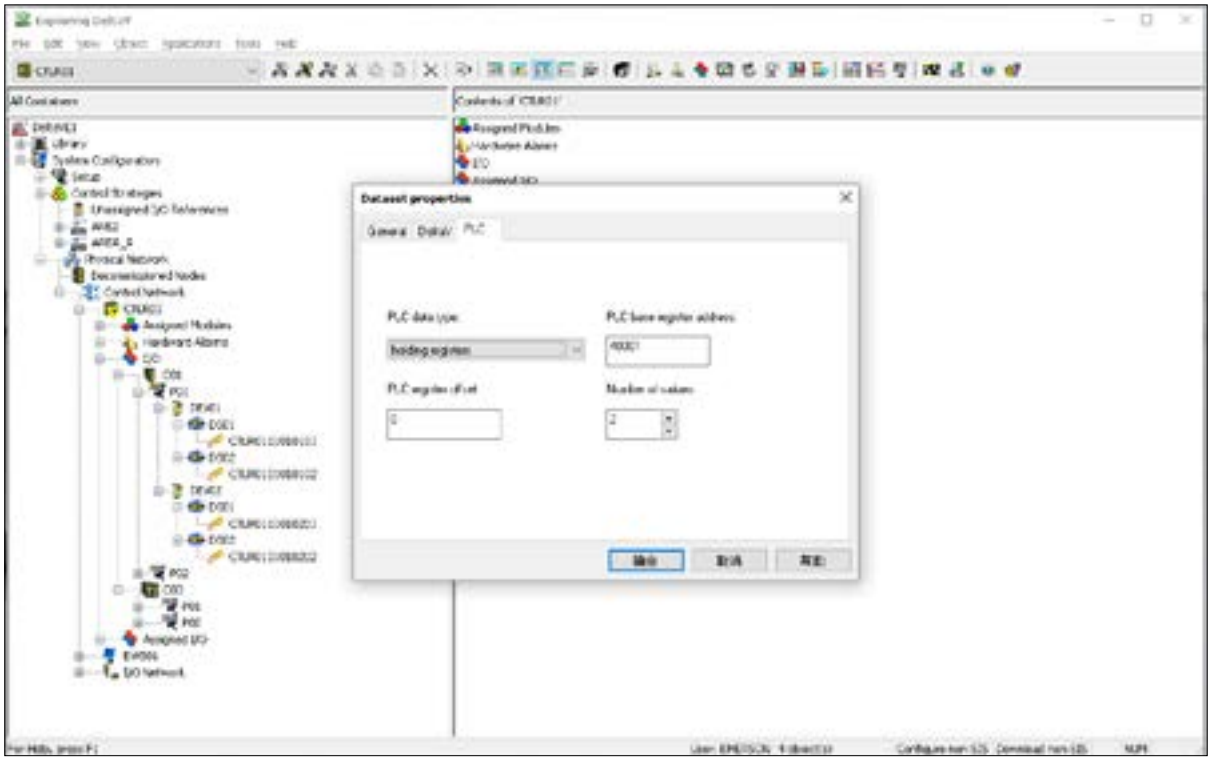
16.1.4 Set the "Dataset Properties"



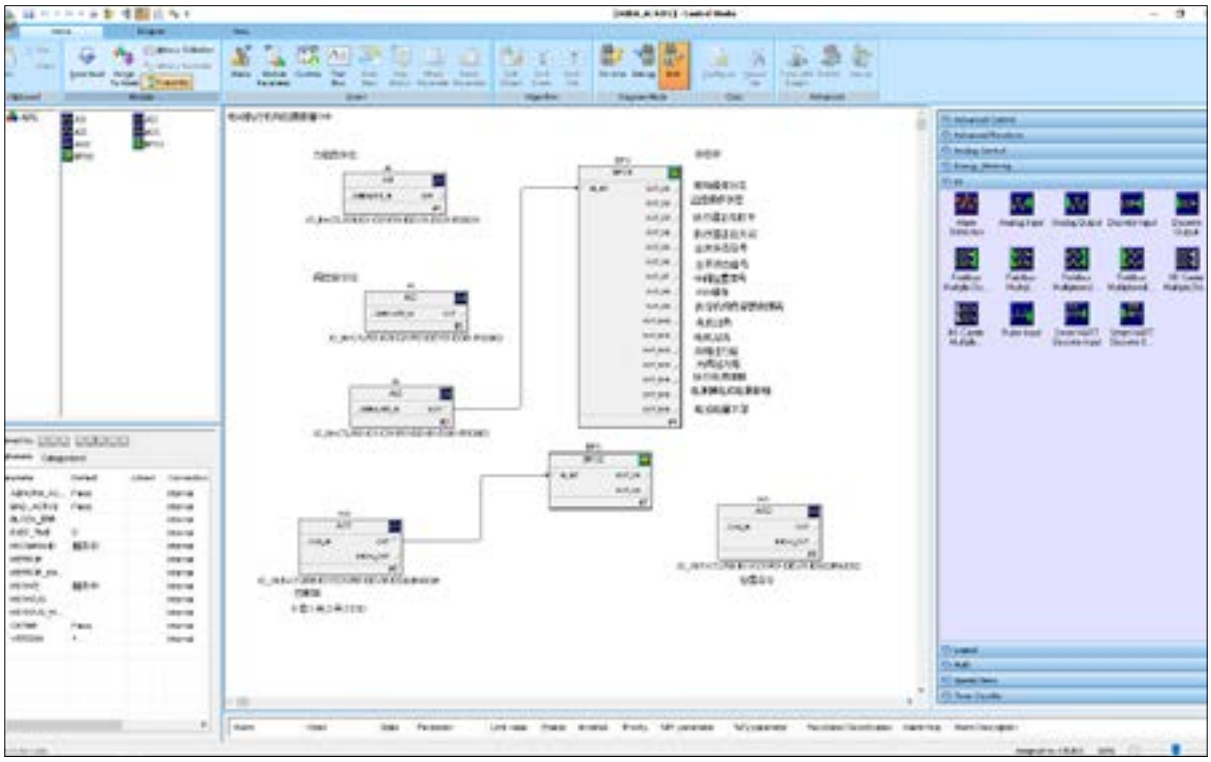








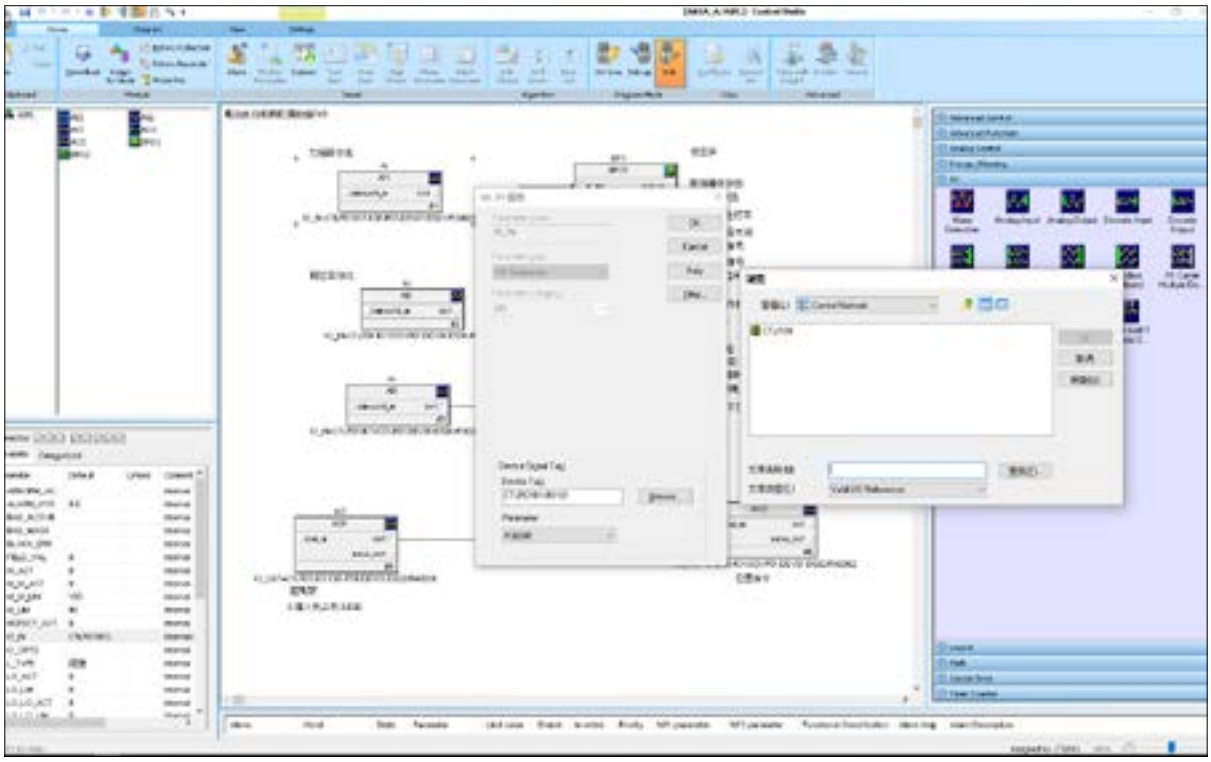
16.1.5 Configuration in Control Studio

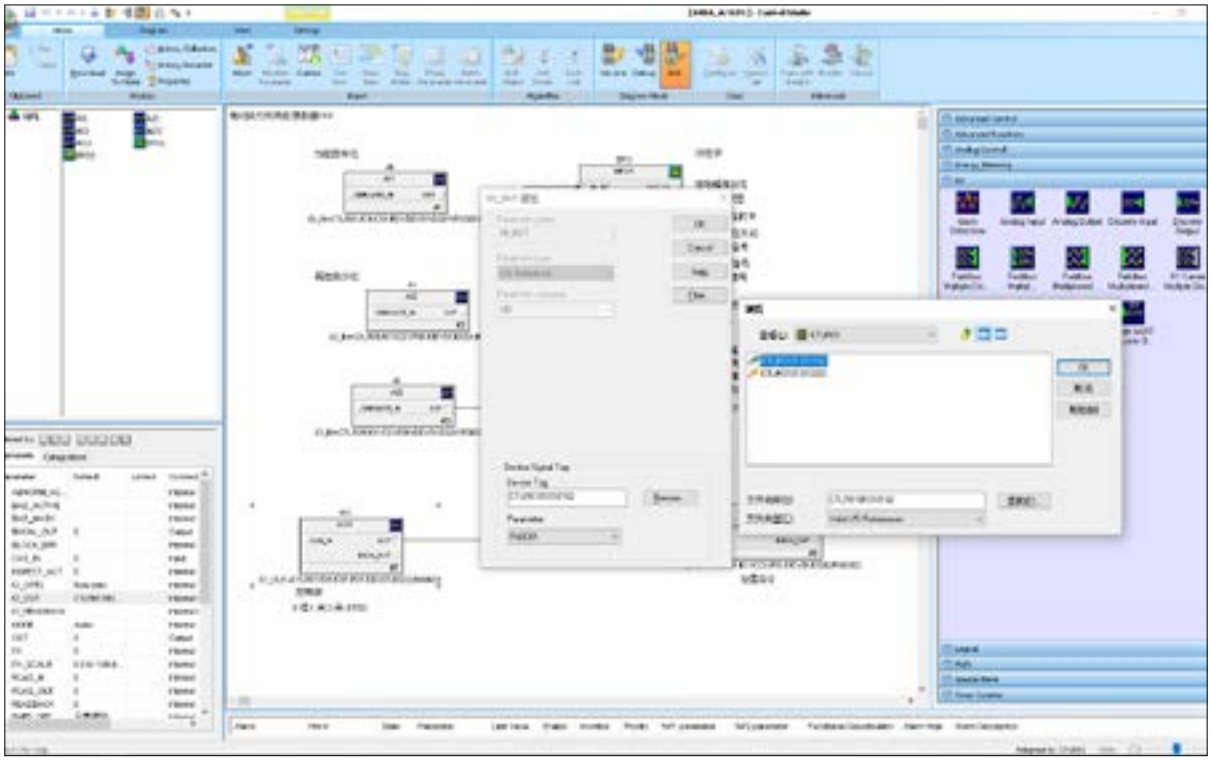


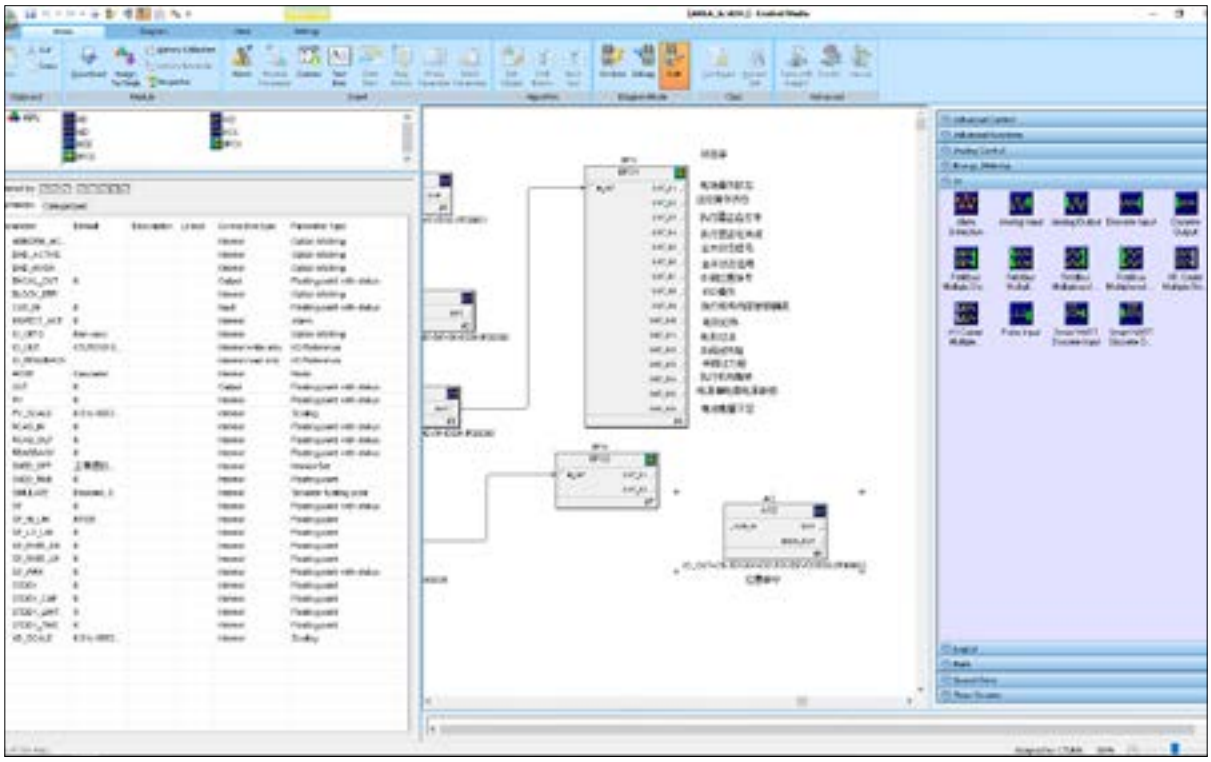
Remark:

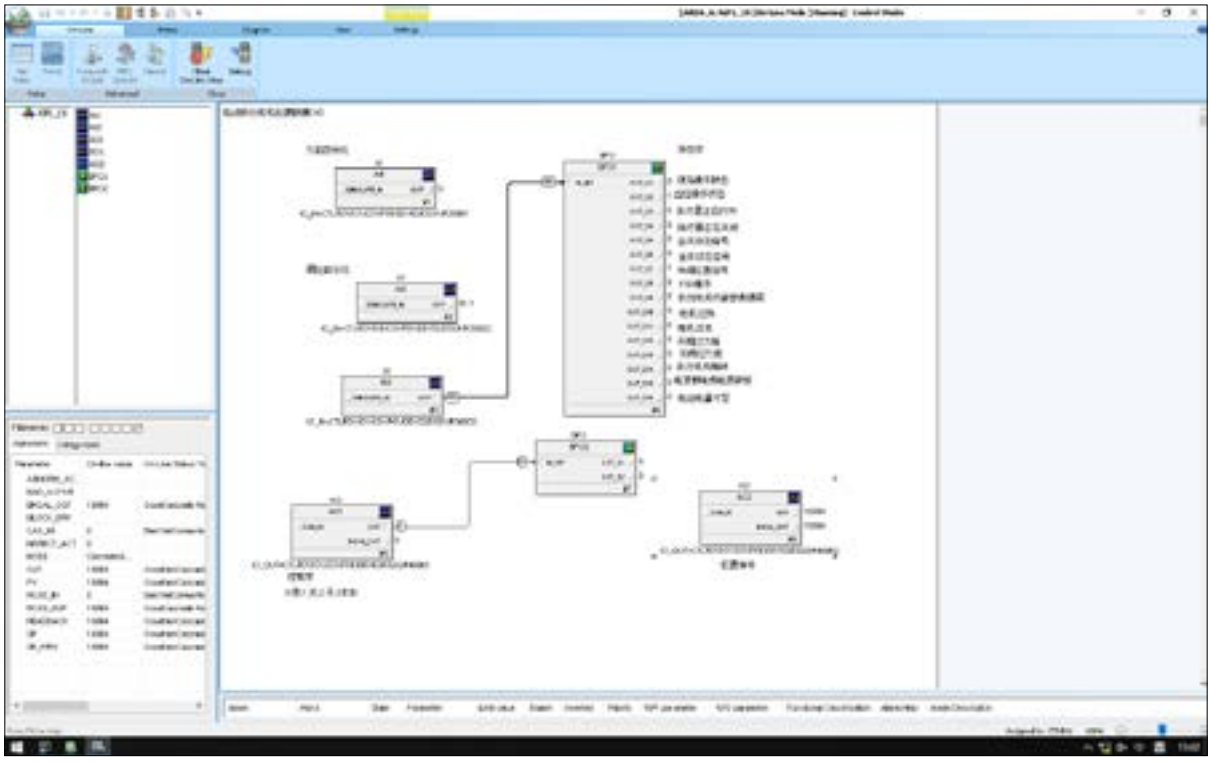
- Actuator Status Fedback (two bytes, high byte first)
  B15 B14 B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1 B0

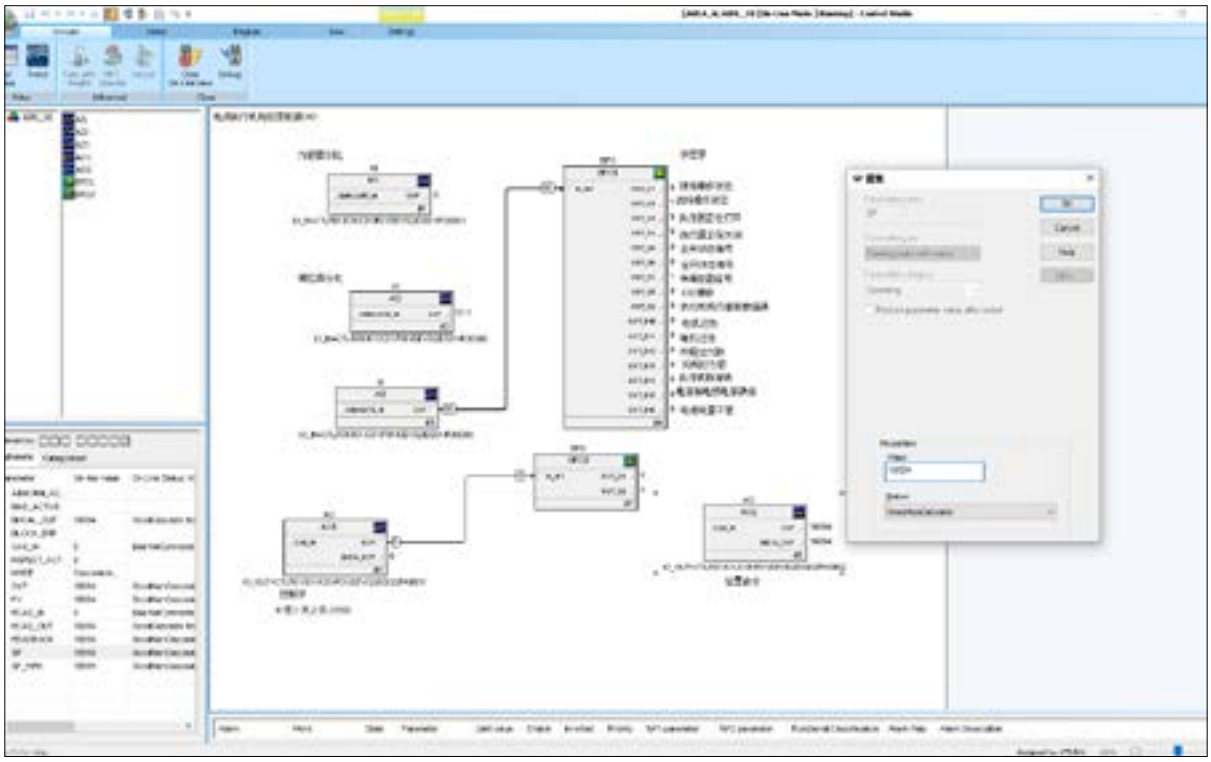
B15	Low Battery Level	1: Valid
B14	Power Loss or Phase Loss	1: Valid
B13	Actuator blocked	1: Valid
B12	Off valve over torque	1: Valid
B11	Open valve over torque	1: Valid
B10	Motor overcurrent	1: Active
B9	Motor overheating	1: Active
B8	Internal parameter error of the actuator	1: Valid
B7	ESD operation	1: Valid
B6	Middle position signal	1: Valid
B5	full-open status signal	1: Valid
B4	Closed status signal	1: Active
B3	Actuator is closing	1: Valid
B2	Actuator is opening	1: Valid
B1	Remote Control Operation Status	1: Valid
B0	On-site operating status	1: Active



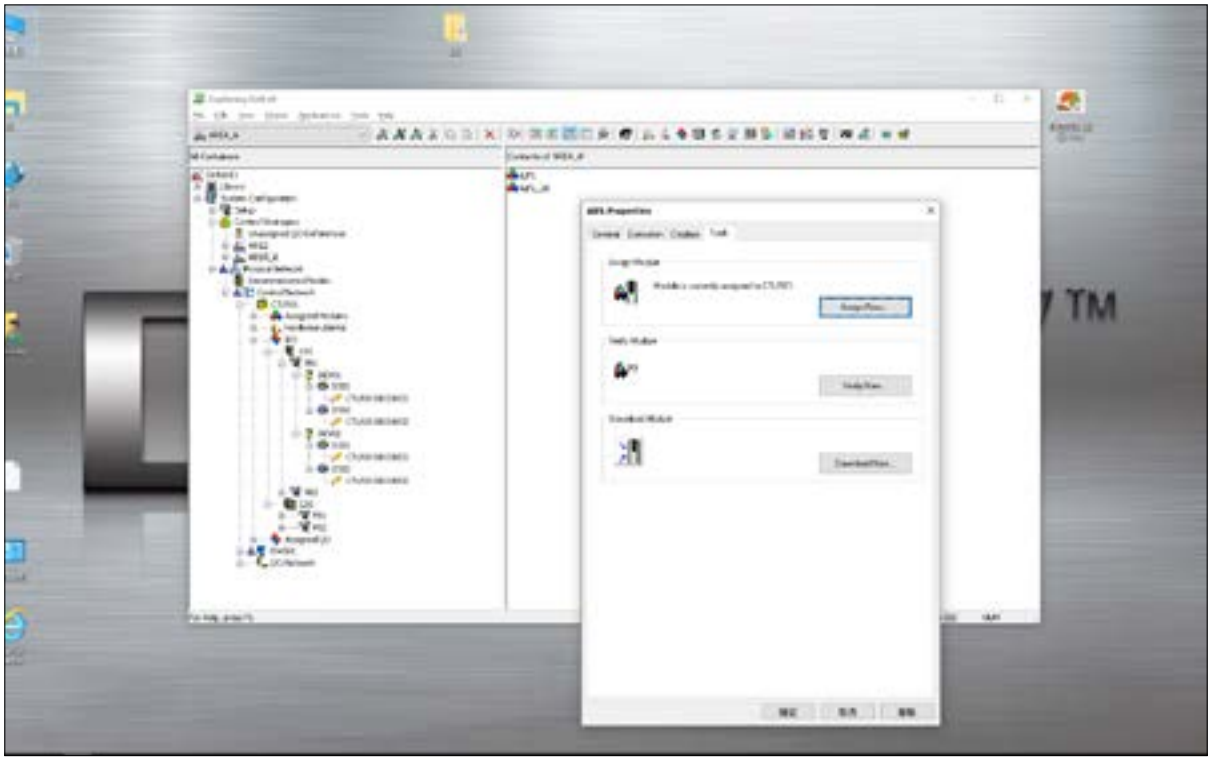


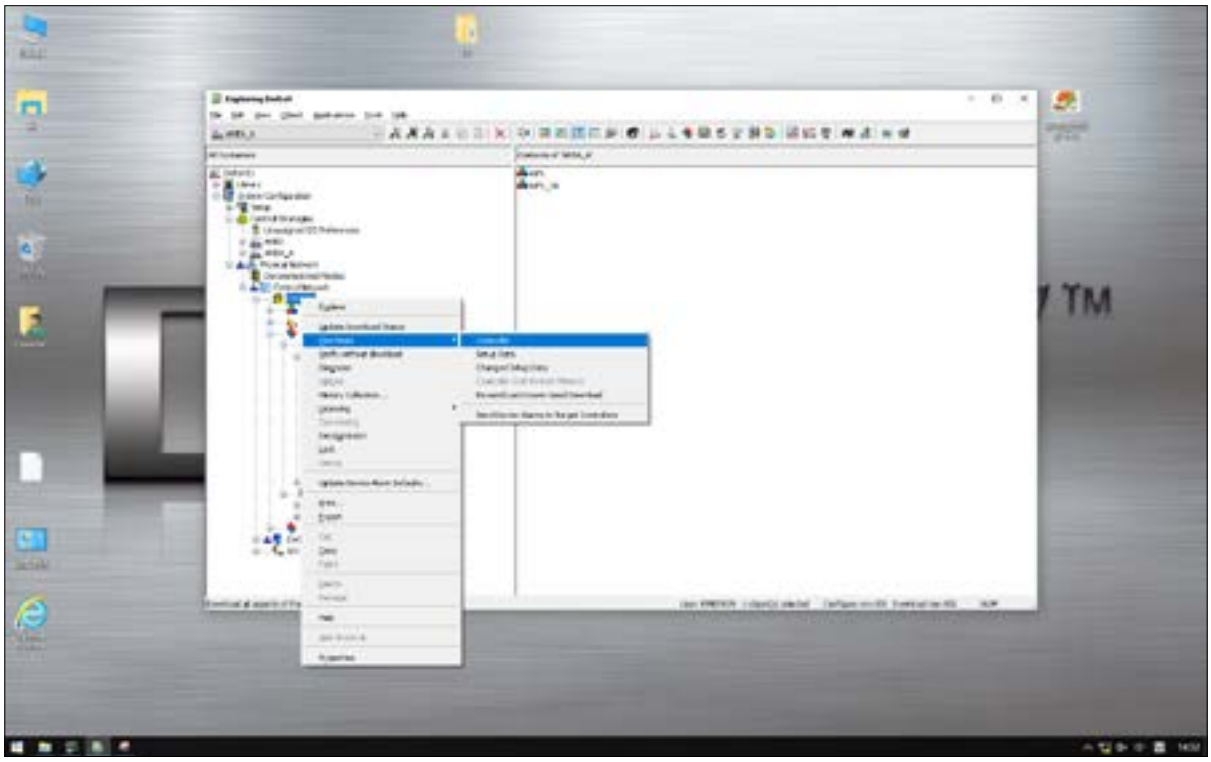




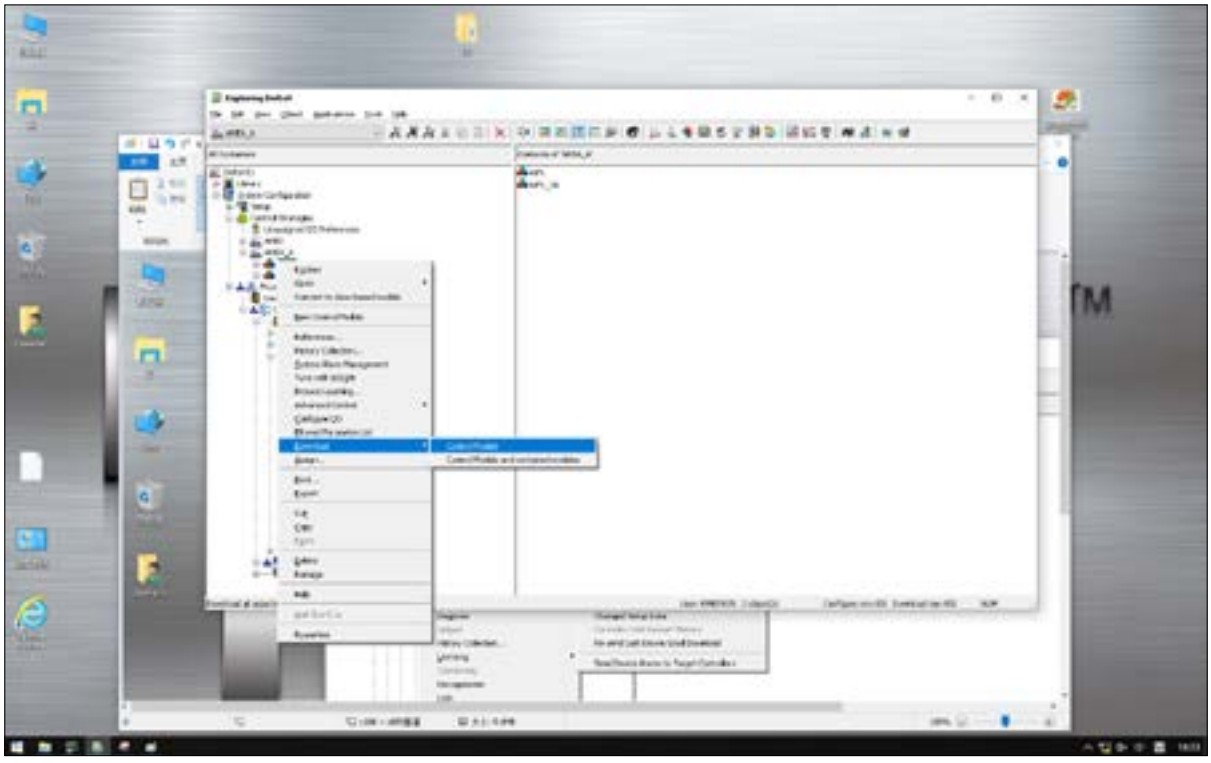


16.1.6 Assign the Module



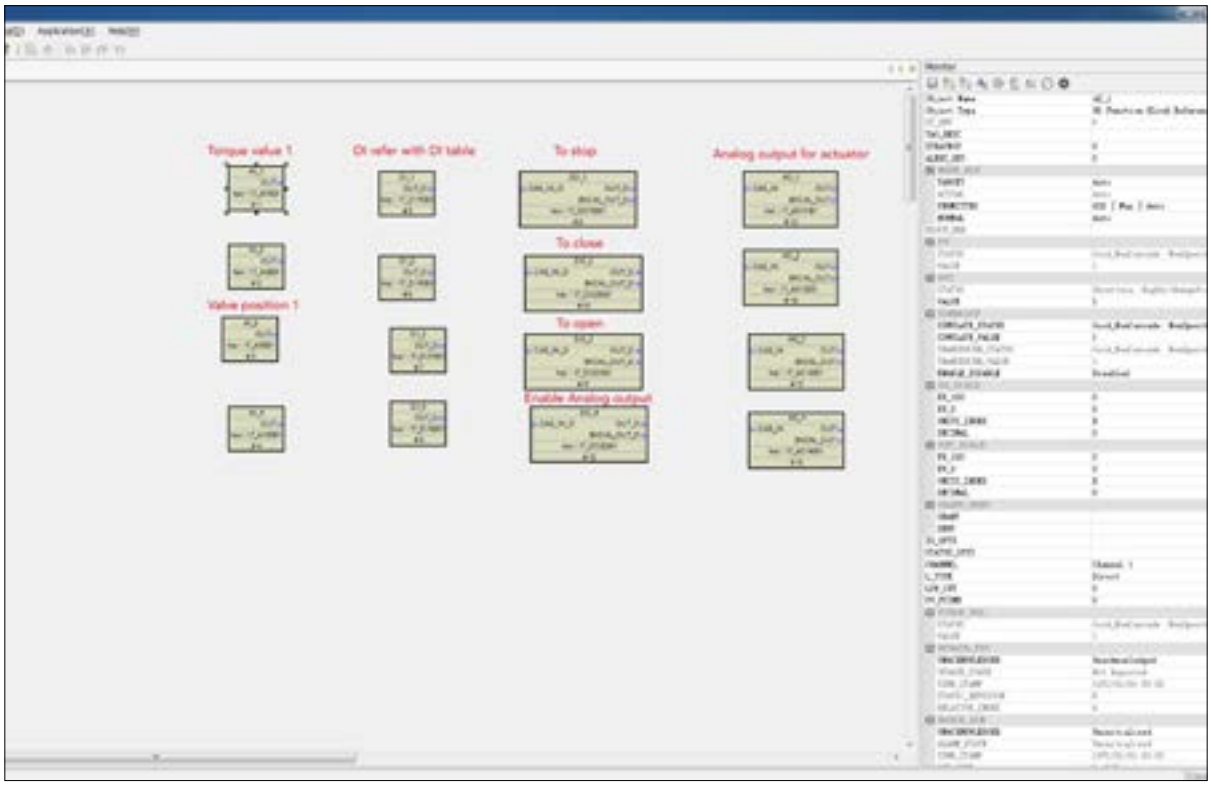


16.1.7 Download Control Module



16.2 FOUNDATION Fieldbus Parameter Setting

- To use analog output to control the HC Actuator, do enable "Do4" first, then adjust the value of "AO01".

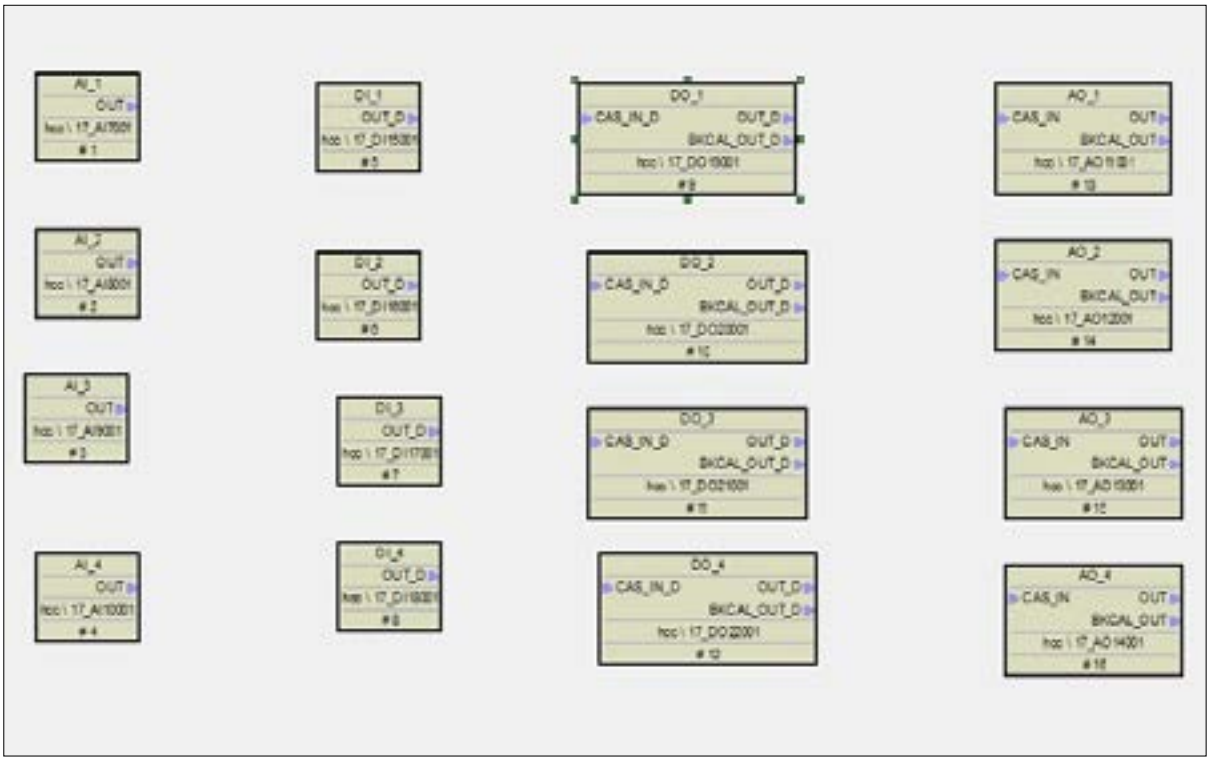


- Please refer to the following table for the control command.
- For DI block, the value needs to convert to binary type to indicate the HC Actuator status. For example, if "OUT_D Value" = 156, which is 1 0 0 1 1 0 0".

	BIT0	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7
DI 1	Fully Closed	Fully Open	Analog Enable	Remote	Common Alarm	Moving	ESD Valid	50% Position
DI 2	Fully Open	50% Position	Fully Closed	Analog Enable	Common Alarm	Moving	Remote Mode	ESD Valid
DI 3	Common Alarm	Fully Open	50% Position	Fully Cosed	Analog Enable	Moving	Remote Mode	ESD Valid
DI 4	Analog Enable	Common Alarm	Fully Open	50% Position	Fully Closed	Moving	Remote Mode	ESD Valid

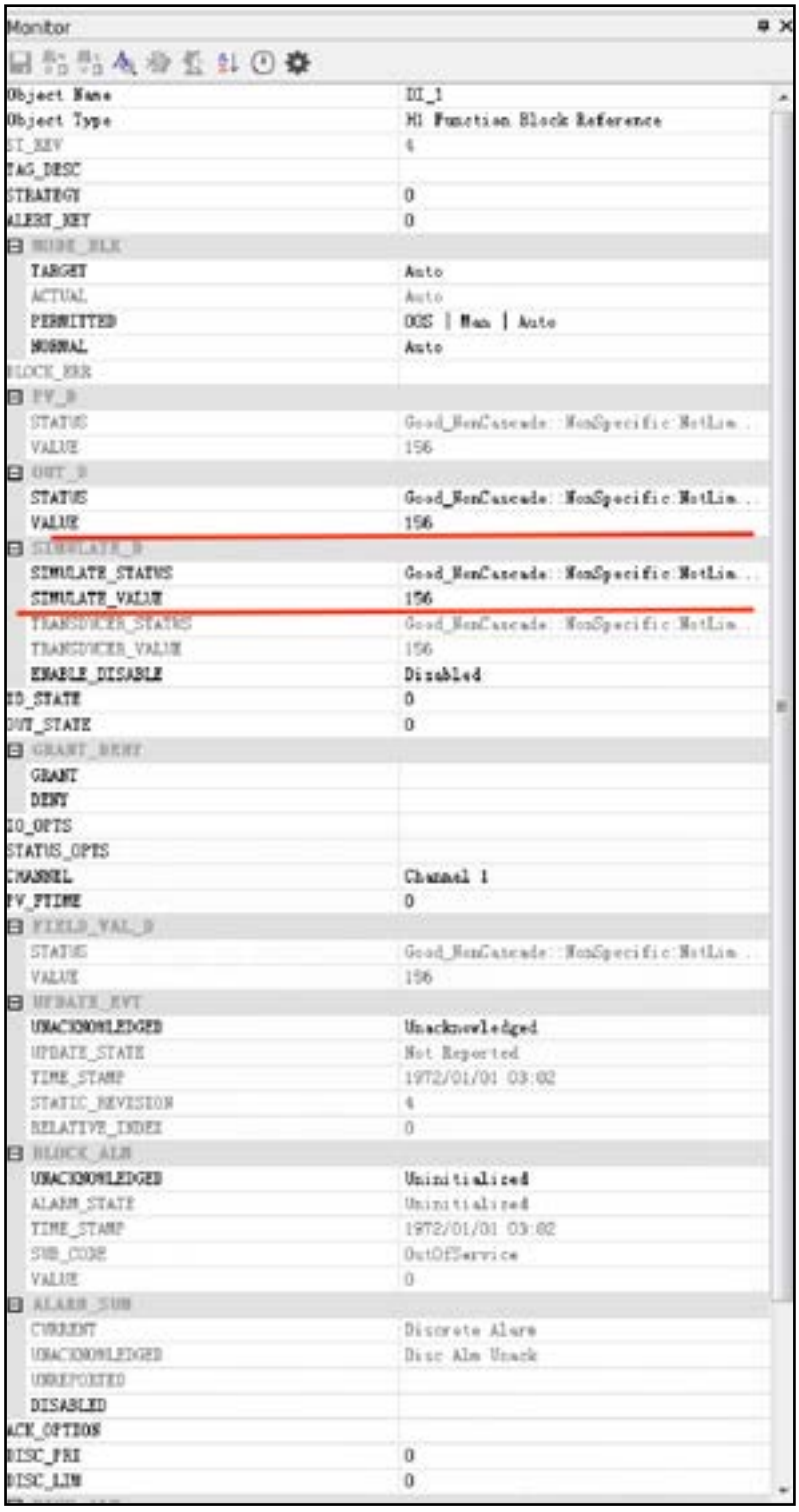
1	0	0	1	1	1	0	0

- Field Command:



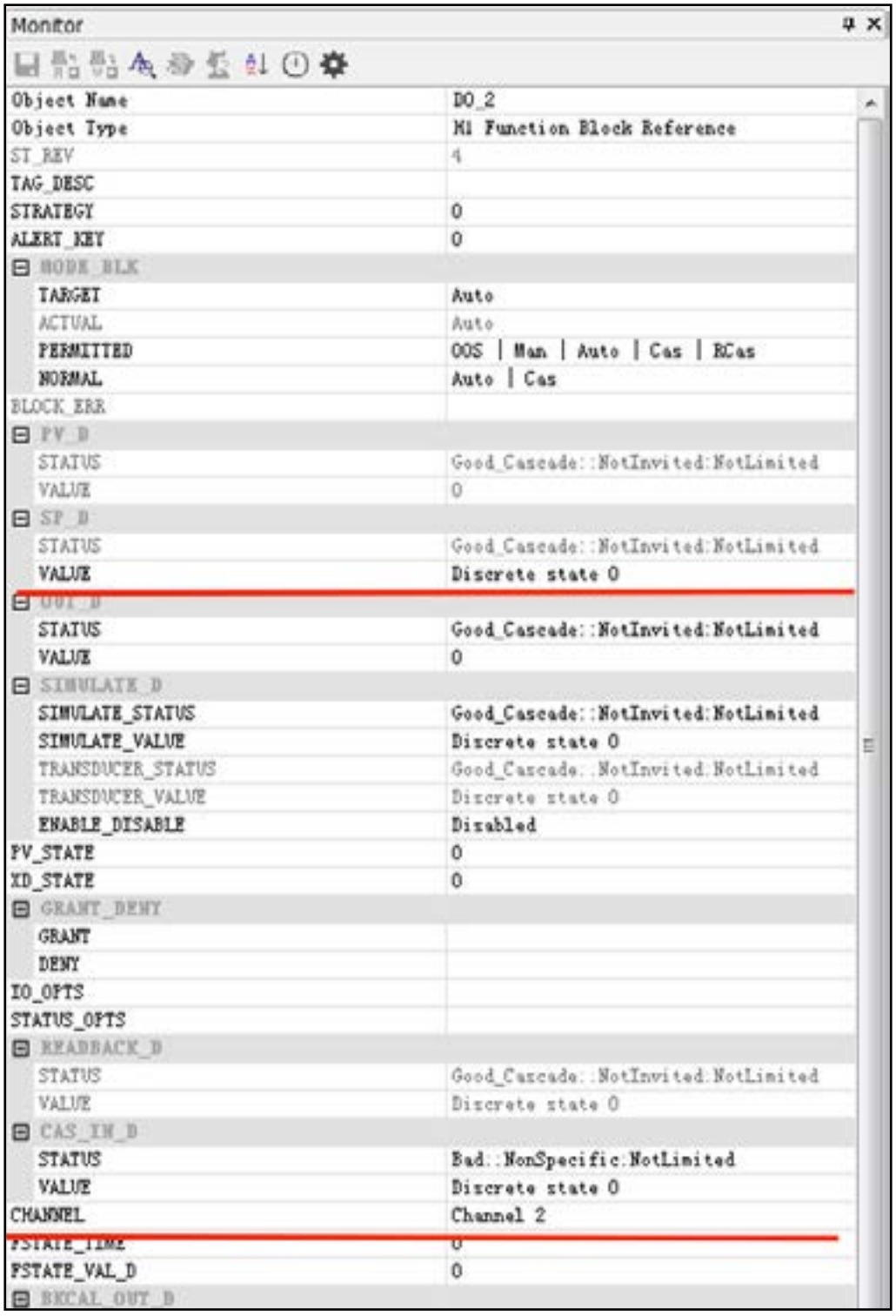
A. DO 1 - Wonder HC Actuator® Stop:

1. Click on the DO1 module.
2. In the MODE_In BLK section, click on "Actual," and change the status to "Auto" from the drop-down options.
3. Ensure that when testing the "DO 1 -- DO 3" module, it remains in the "Auto" status.
4. In the SP_D VALUE section, change "Discrete State 0" to "Discrete State 1" from the drop-down box.
5. Download or save the configuration.
6. As a result of these changes, the Wonder HC Actuator® is expected to stop.



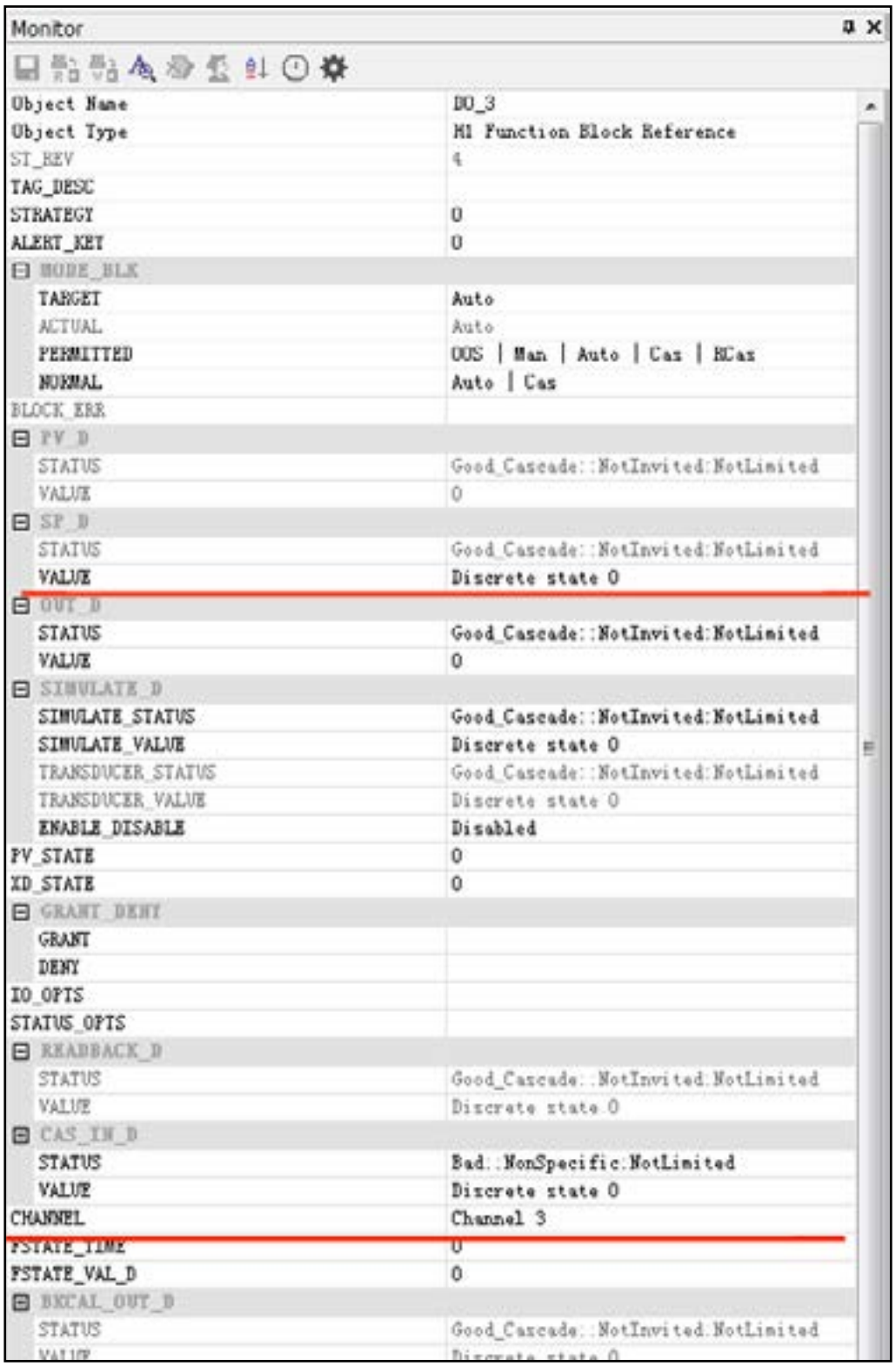
B. DO 2 - Wonder HC Actuator® Close:

1. Click on the DO2 module block.
2. In the SP_D VALUE section, select "Discrete State 1" from the drop-down options.
3. Download the configuration.
4. As a result of these changes, the Wonder HC Actuator® shall close.
5. After performing the intended action, set the Discrete value back to 0.



C. DO 3 - Valve Open:

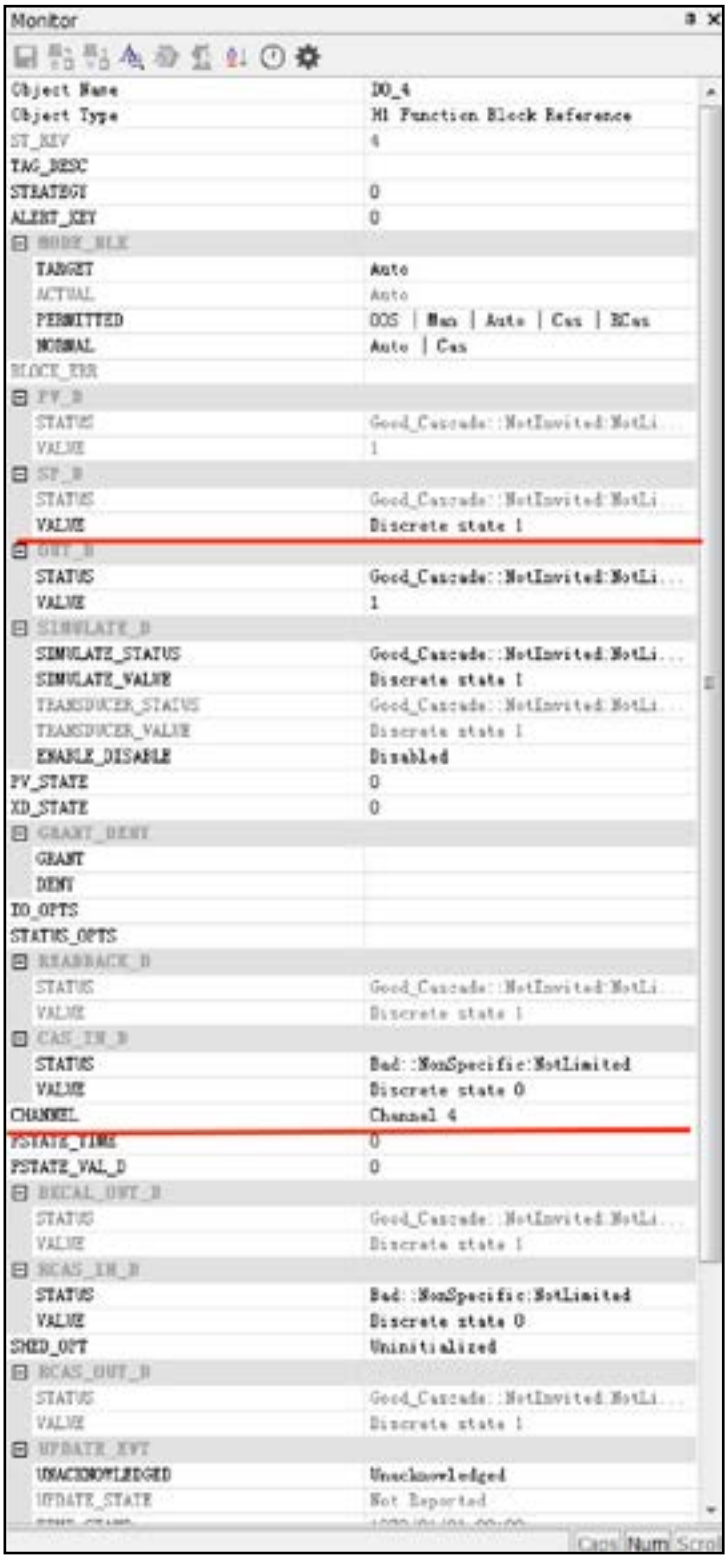
1. Click on the DO3 module.
2. In the SP_D VALUE section, change it from "0" to "1".
3. Download the configuration.
4. As a result of these changes, the Wonder HC Actuator® shall open.
5. Download or save the configuration.
6. As a result of these changes, the Wonder HC Actuator® is expected to stop.



D. DO 2 - Enable AO Control:

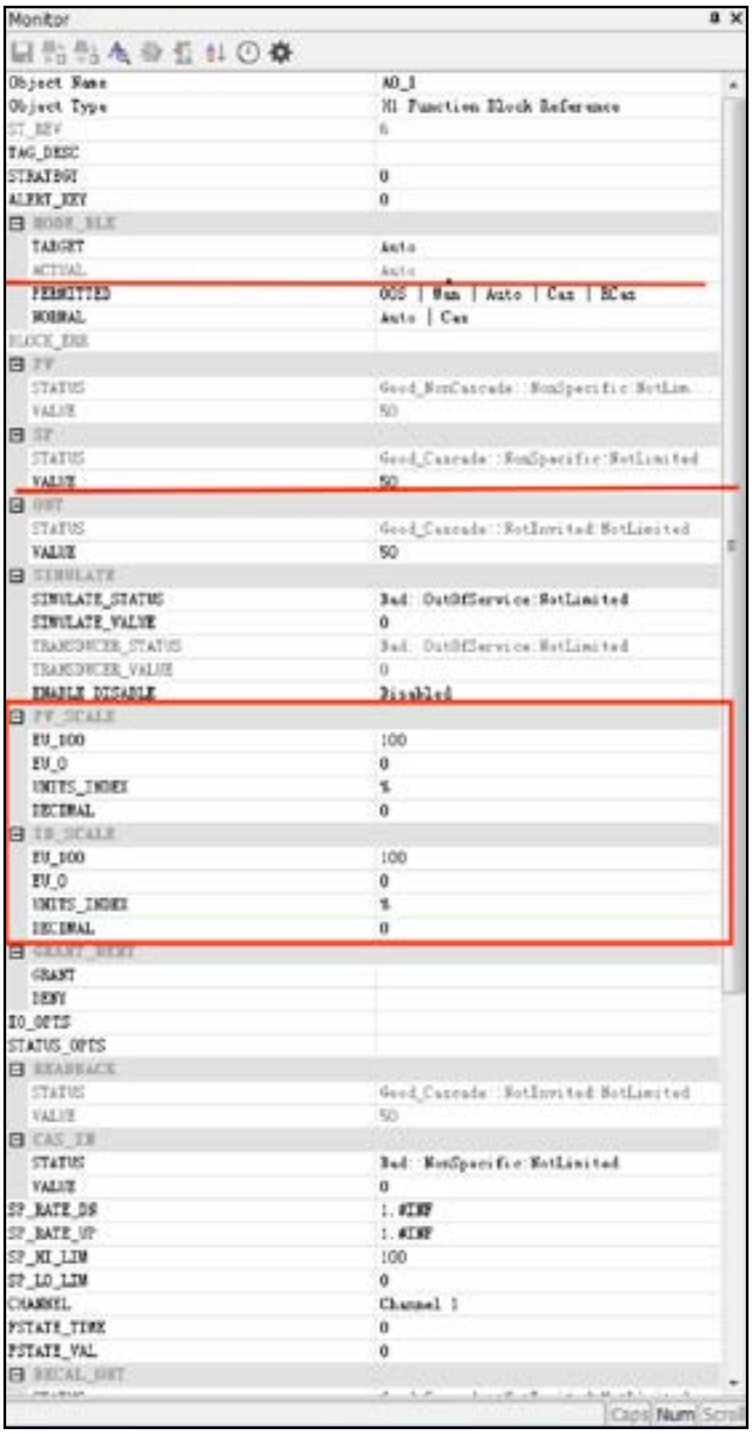
1. Select the DO4 module.
2. Click on SP_D VALUE.
3. Change the Discrete State from 0 to 1.
4. Download the configuration.

NOTE: Ensure that DO4 is set to "1" for Analog Control. (If DO4 is set to "0," it is in ON/OFF control mode).



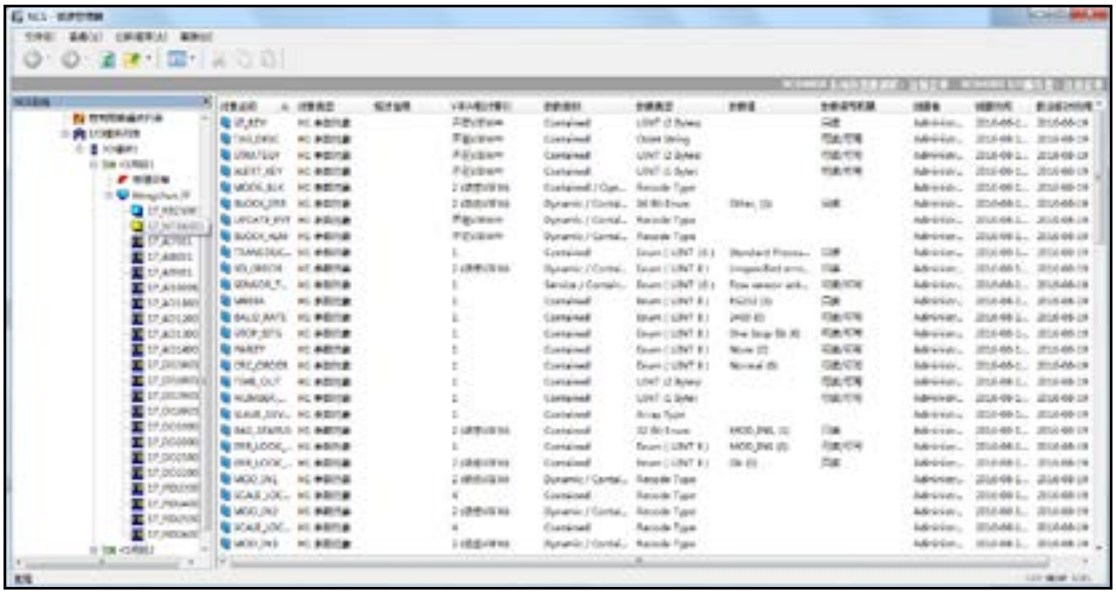
E. Analog Control WONDER HC Actuator:

1. Click on the AO1 module.
2. In the MODE_In BLK section, click on Actual and change the status to "OOS".
3. In the PV_SCALE & XD_SCALE option:
   - Set the EU (Engineering Units) value to "100."
   - Change the DECIMAL value to "0."
   - Change the UNITS symbol of INDEX to "%."
4. Back in the MODE_In BLK section, click on Actual and change the status to "Auto".
5. In the SP (Set Point) section, modify the required valve position value in VALUE, such as "50."
6. Download the configuration.
7. The Wonder HC Actuator® should open to the desired position as set, 50%

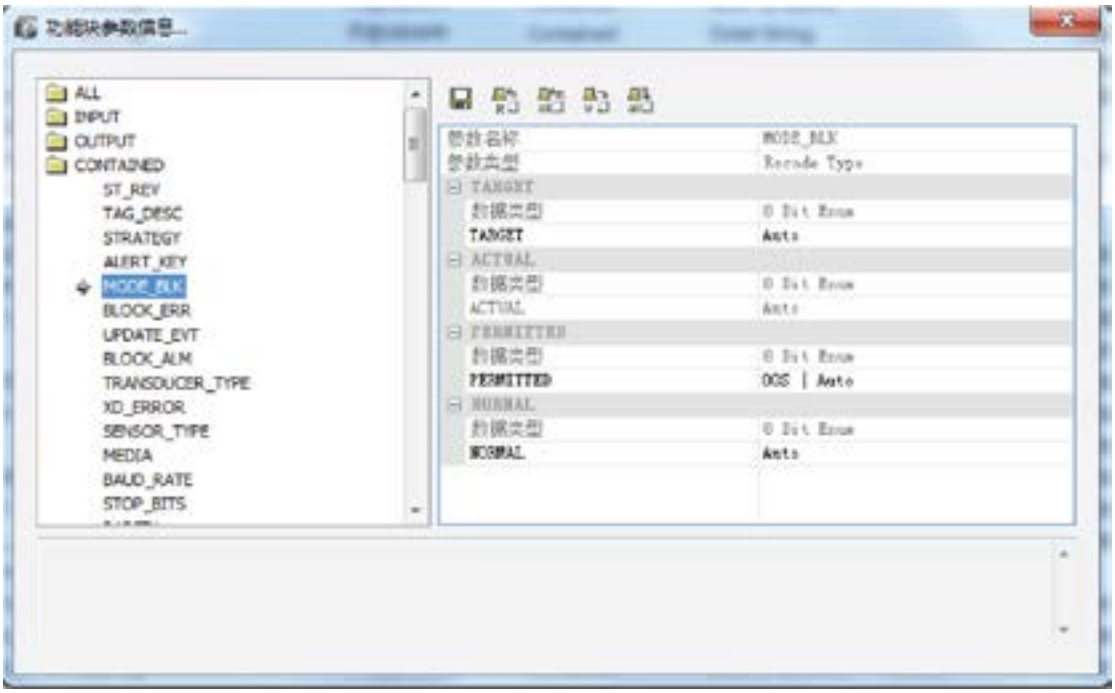


- For Wonder HC Actuator® FF setting in DCS, the typical communication configuration are as follows:

1. Select "17_MTB6001" on the left, and then click any parameter on the right.



2. (I) Select "MODE_BLK ".
   (II) Set the "TARGET" parameter to "OOS" mode only (it needs have to be set to "OOS" mode in order to change the parameter),
   (III) Once the "TARGET" parameter is in "OOS" mode, proceed to make the desired parameter settings and configurations.
   (IV) Once all settings are configured, enter the running state.
   (V) Set the "TARGET" parameter back to "Auto" mode.
   (VI) Save all the parameter adjustments, including any FF (Foundation Fieldbus) - Modbus configurations, to retain your settings.
   (VII) With the configurations saved, you can initiate FF communication, allowing the actuator to communicate and function based on the new settings.



3. FF - Internal MODBUS Communication Port Setting:

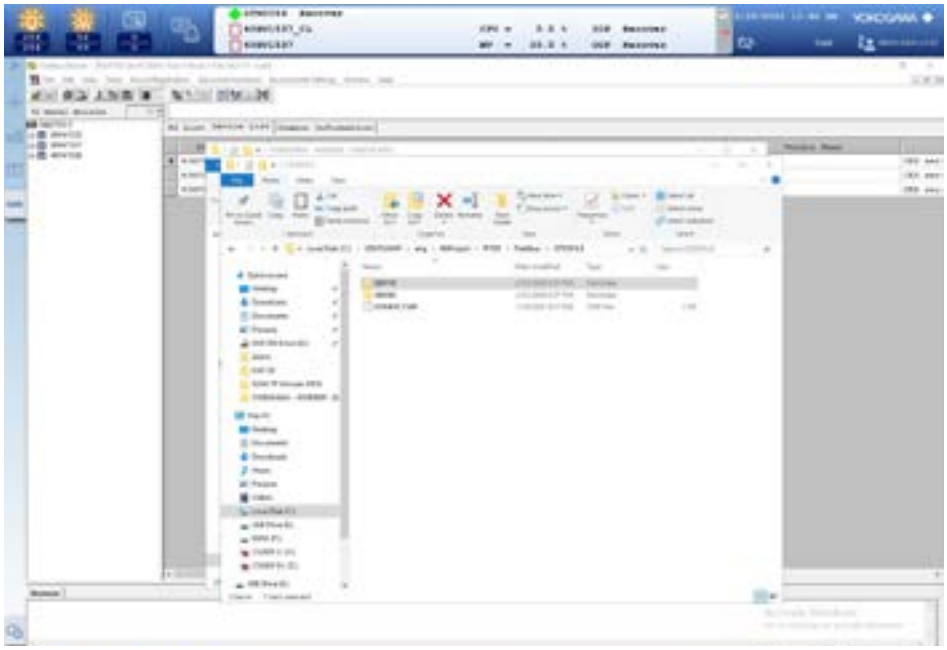
BAUD RATE:	9600
STOP_BITS:	One Stop Bit
PARITY:	None
NUMBER_OF_RETRY:	1
SLAVE_DEVICE_ADDRESS:	17/17/17/17

4. FF - Module Block Configuration

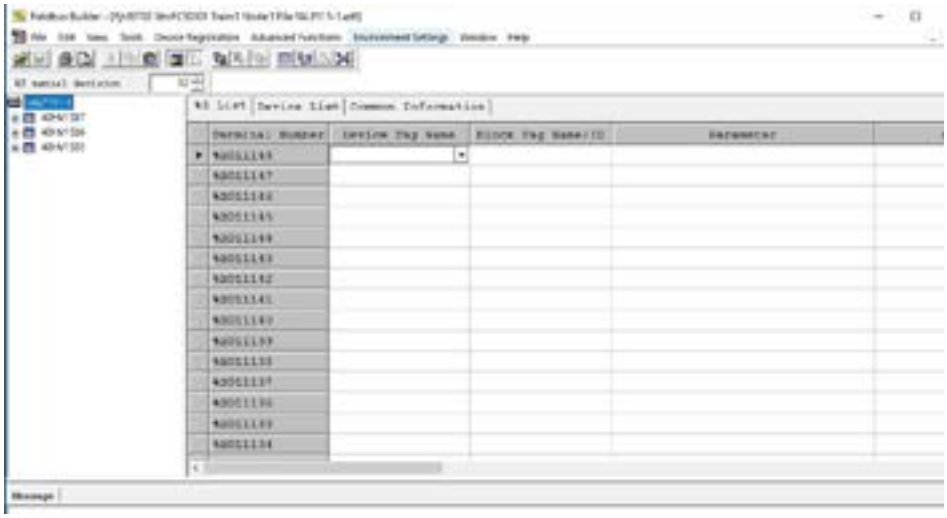
Module Block Name	Description	Setting
AI1	/*Actuator torque value*/	--SCALE_LOC_IN1 DATA_TYPE:Float_3210 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:100 REGISTER_ADDR_OF_STATUS:0
AI2	/*Actuator torque value*/	--SCALE_LOC_IN2 DATA_TYPE:Float_3210 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:100 REGISTER_ADDR_OF_STATUS:0
AI3	/*Actuator value position percentage*/	--SCALE_LOC_IN3 DATA_TYPE:Float_3210 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:104 REGISTER_ADDR_OF_STATUS:0
AI4	/*Actuator value position percentage*/	--SCALE_LOC_IN4 DATA_TYPE:Float_3210 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:104 REGISTER_ADDR_OF_STATUS:0
AO1	/*Actuator opening adjustment*/	--SCALE_LOC_OUT1 DATA_TYPE:Float_3210 Function_Code:FC16 REGISTER_ADDR_OF_VALUE:108 REGISTER_ADDR_OF_STATUS:0 Add: FROM-EU100 current value 100, TO-EU100 current value 100
DI1	/*Alarm and status 8-bit DI1*/	--SCALE_IN_D1 DATA_TYPE:Usigned8_0 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:2 REGISTER_ADDR_OF_STATUS:0
DI2	/*Alarm and status 8-bit DI2*/	--SCALE_IN_D2 DATA_TYPE:Usigned8_0 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:3 REGISTER_ADDR_OF_STATUS:0

Module Block Name	Description	Setting
DI3	/*Alarm and status 8-bit DI3*/	--SCALE_IN_D3 DATA_TYPE:Usigned8_0 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:4 REGISTER_ADDR_OF_STATUS:0
DI4	/*Alarm and status 8-bit DI4*/	--SCALE_IN_D4 DATA_TYPE:Usigned8_0 Function_Code:FC04 REGISTER_ADDR_OF_VALUE:5 REGISTER_ADDR_OF_STATUS:0
DO1	/*DO1 - Stop*/	--LOC_Out_D1 DATA_TYPE:Usigned8_0 Function_Code:FC05 REGISTER_ADDR_OF_VALUE:0 REGISTER_ADDR_OF_STATUS:0
DO2	/*DO2 valve closing*/	--LOC_Out_D2 DATA_TYPE:Usigned8_0 Function_Code:FC05 REGISTER_ADDR_OF_VALUE:1 REGISTER_ADDR_OF_STATUS:0
DO3	/*DO3 valve opening*/	--LOC_Out_D3 DATA_TYPE:Usigned8_0 Function_Code:FC05 REGISTER_ADDR_OF_VALUE:2 REGISTER_ADDR_OF_STATUS:0
DO4	/*DO4 regulation enable*/	--LOC_Out_D4 DATA_TYPE:Usigned8_0 Function_Code:FC05 REGISTER_ADDR_OF_VALUE:3 REGISTER_ADDR_OF_STATUS:0

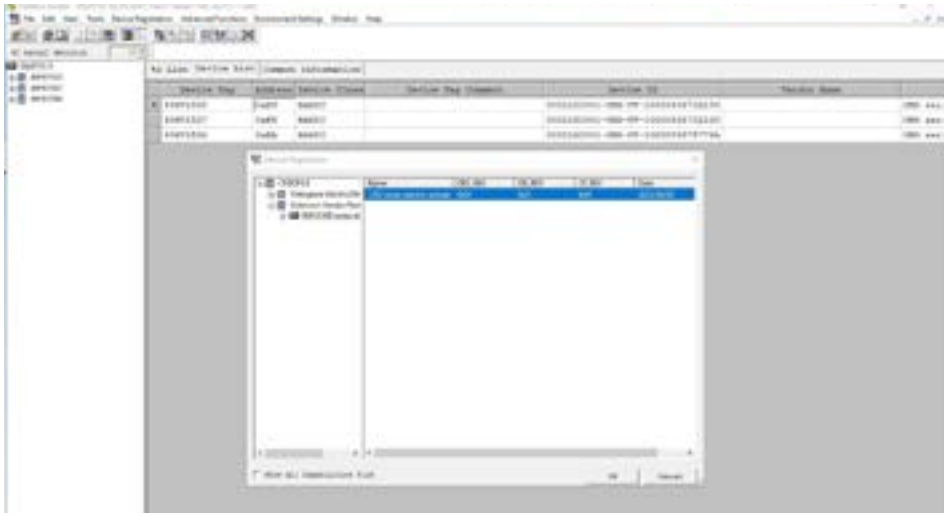
16.3 FOUNDATION Fieldbus Configuration Based on Yokogawa DCS System Centum VP R6.09



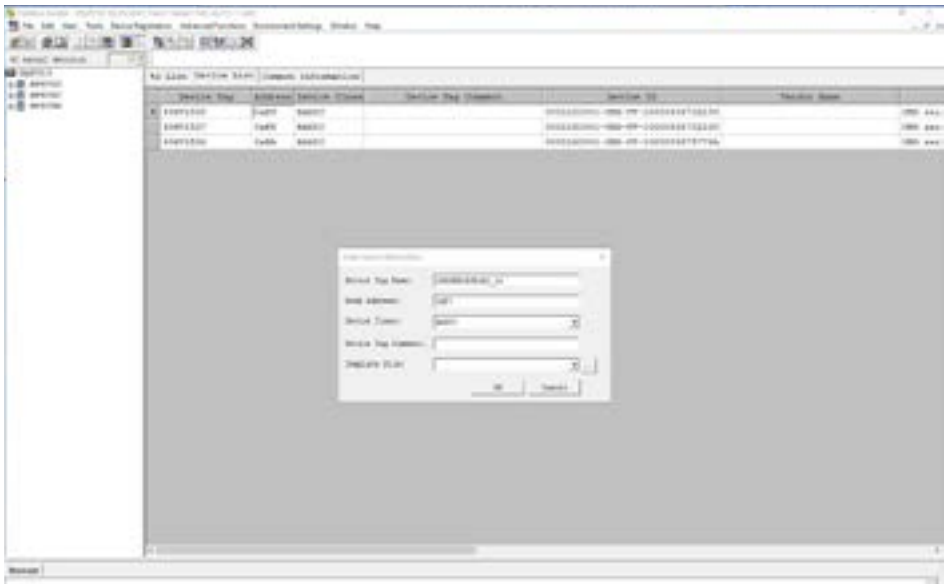
1. Ensure that the DD file (from manufacturer) is installed in the fieldbus destination before registering the device.



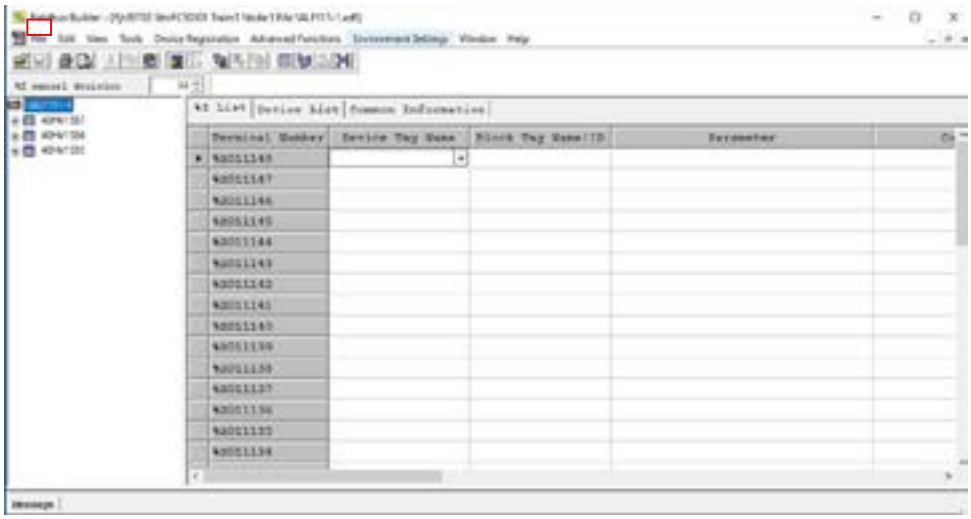
2. Go to the Fieldbus Builder and click on 'Device Registration' from the menu bar to register device.



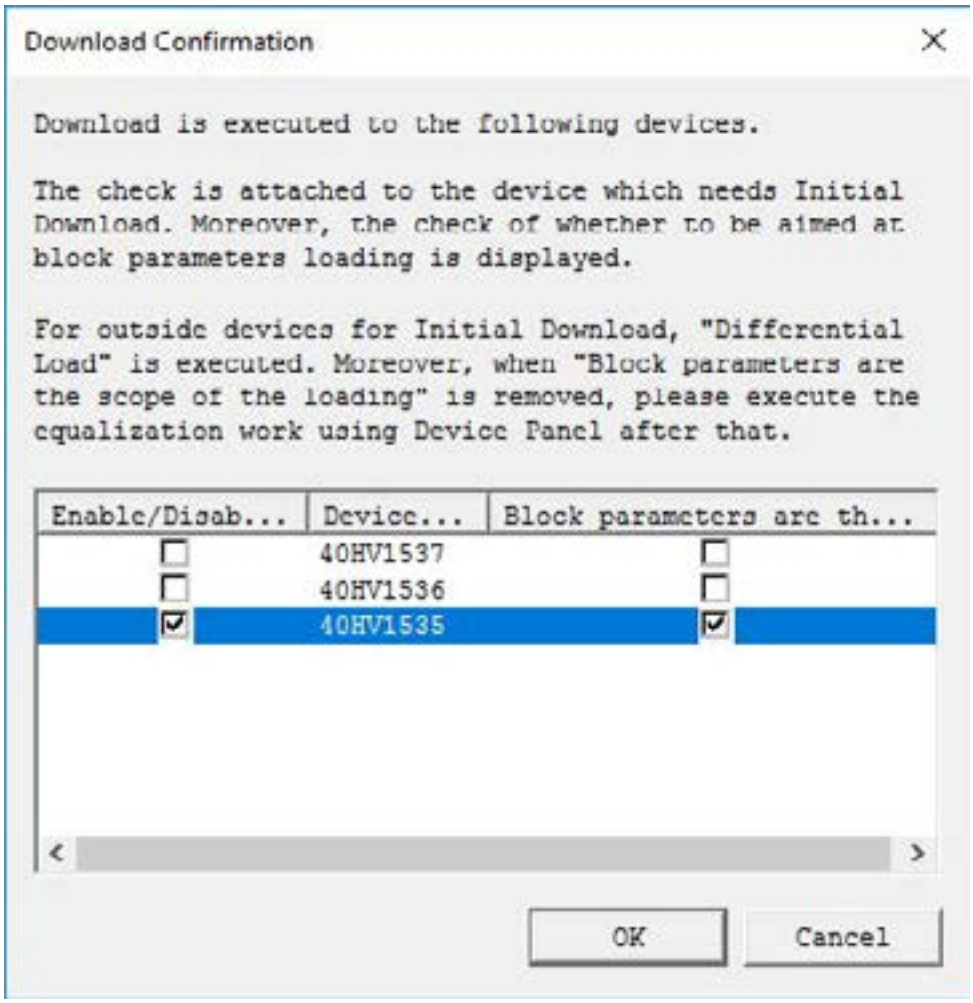
3. Select the CKD Series actuator to register.



4. You can edit the Device Tag Name as per site requirement. Node address to be input as required. Device Class to be input as basic unless the user requires the valve to work independently (away from the host DCS).

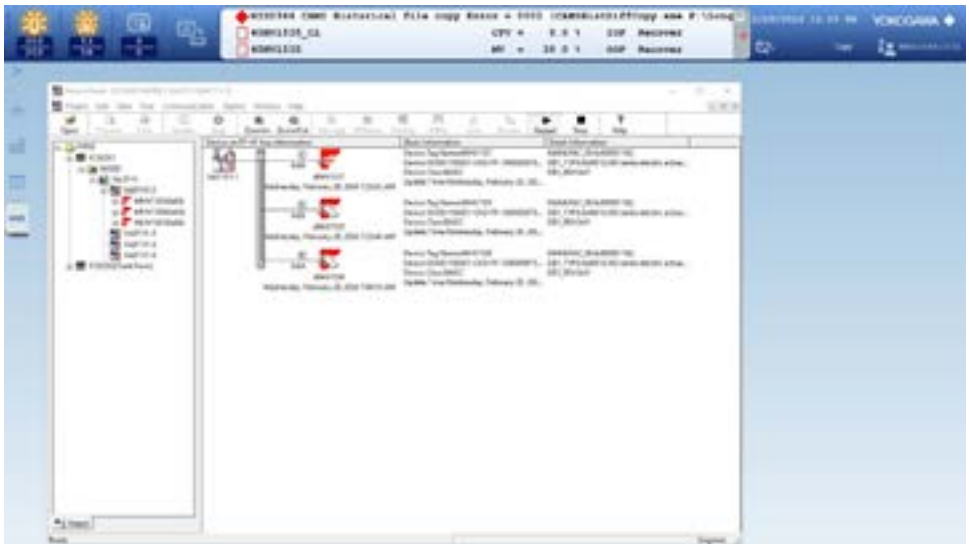


5. Click 'File' on the menu and select download for downloading of the devices.

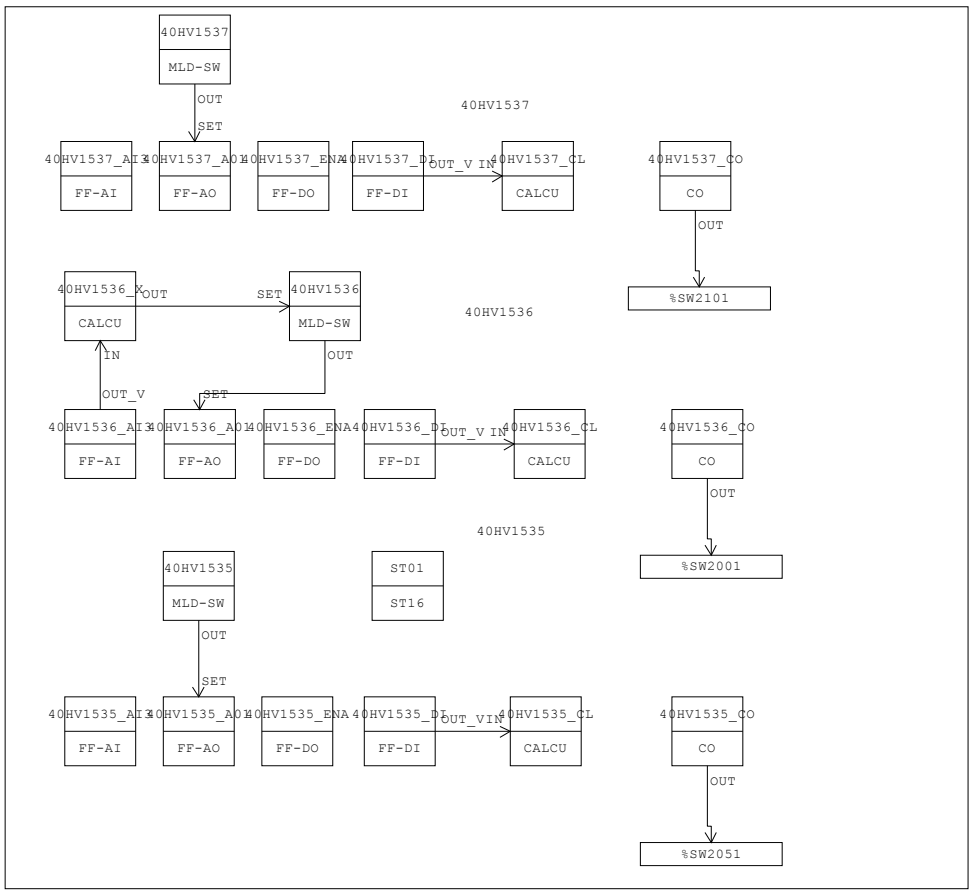


6. For first download to FCS, ensure that both boxes (Enable/Disable and Block parameters) are checked. Subsequently, only the block parameters boxes need to be ticked for future downloads. Select 'OK' to proceed the next step.

   Click 'Yes' to download to FCS.



7. After downloading, you will be able to view the device in the device panel. If the device cannot be viewed, you may change the node addresses and repeat the downloading step.



(3) Analog Input

	Meaning
AI1	Torque percentage. Range 0%-100%.
AI2	Torque percentage. Range 0%-100%.
AI3	Percentage of valve position opening. Range 0%-100%. 0% indicates fully closed position, 100% indicates fully open position.
AI4	Percentage of valve position opening. Range 0%-100%. 0% indicates fully closed position, 100% indicates fully open position.

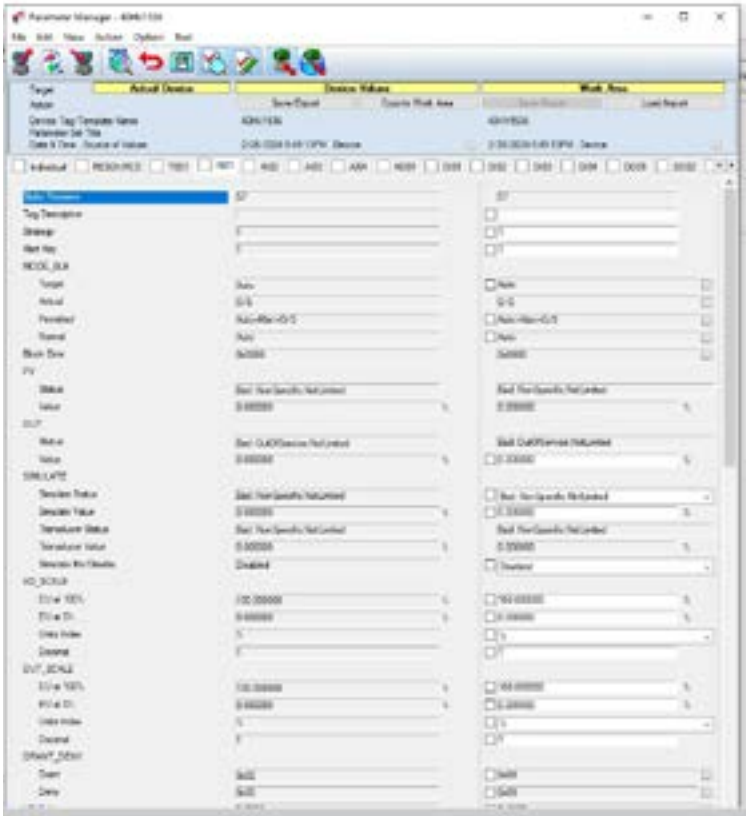
(4) Analog Input

	Meaning
AO1	Actuator opening percentage requirement. Only if DO4 adjustment enable is set to 1, the actuator will act toward the percentage value of opening demand set by AO1.

8. Control logic is to be built based on user requirements. A typical cascade analog control logic is as follows: You may refer to the FF debugging manual for the function of the inputs/outputs for setting up the logic. (e.g., DO4 is to be enabled for AO to be used).

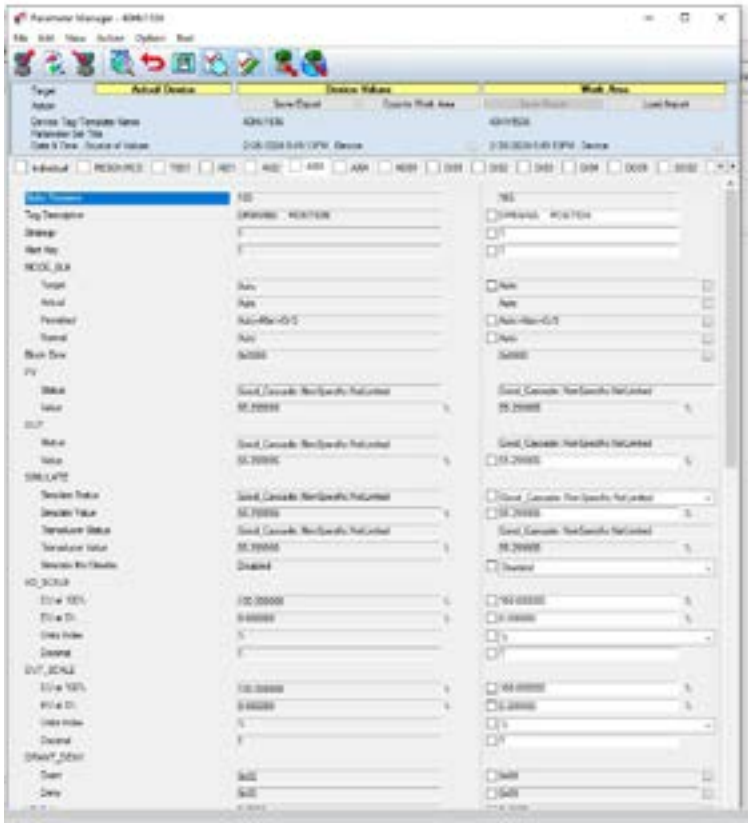
The parameters setting for AI01 to AI04, AO1, DI01 to DI04, DO01 to DO04 and TB blocks are as follows:

AI01

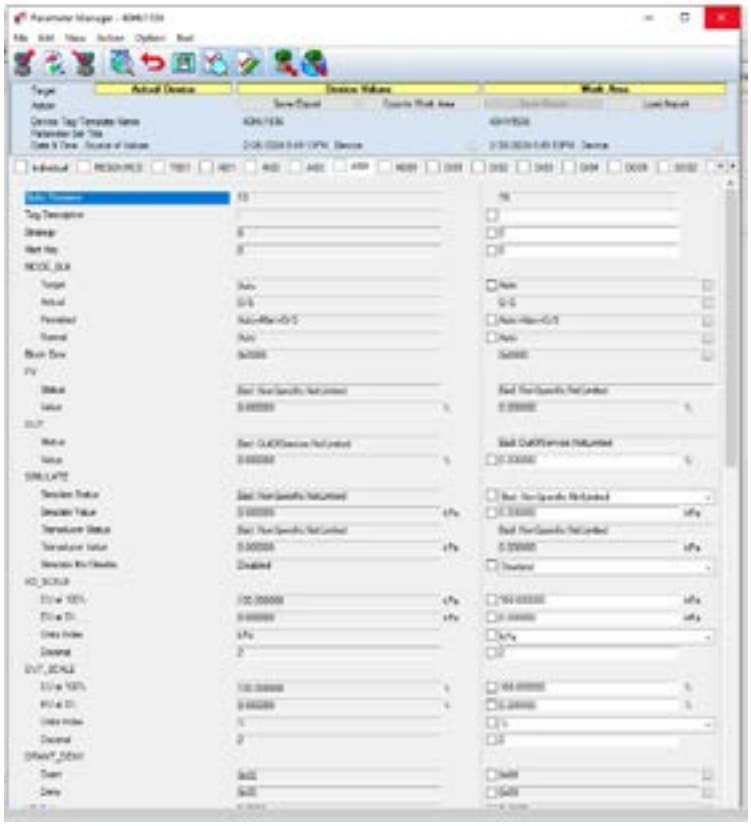


AI02

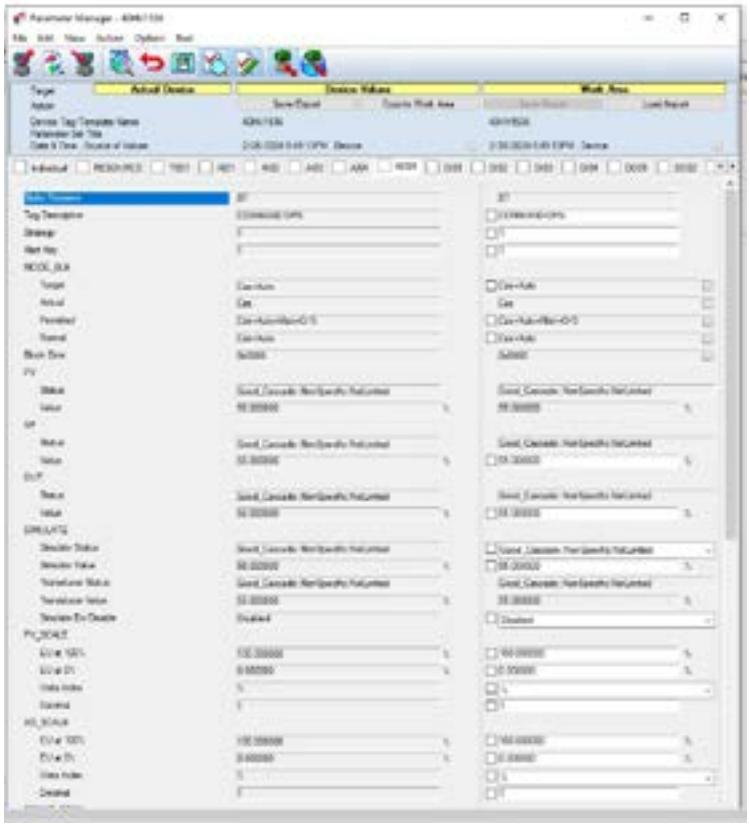
AI03



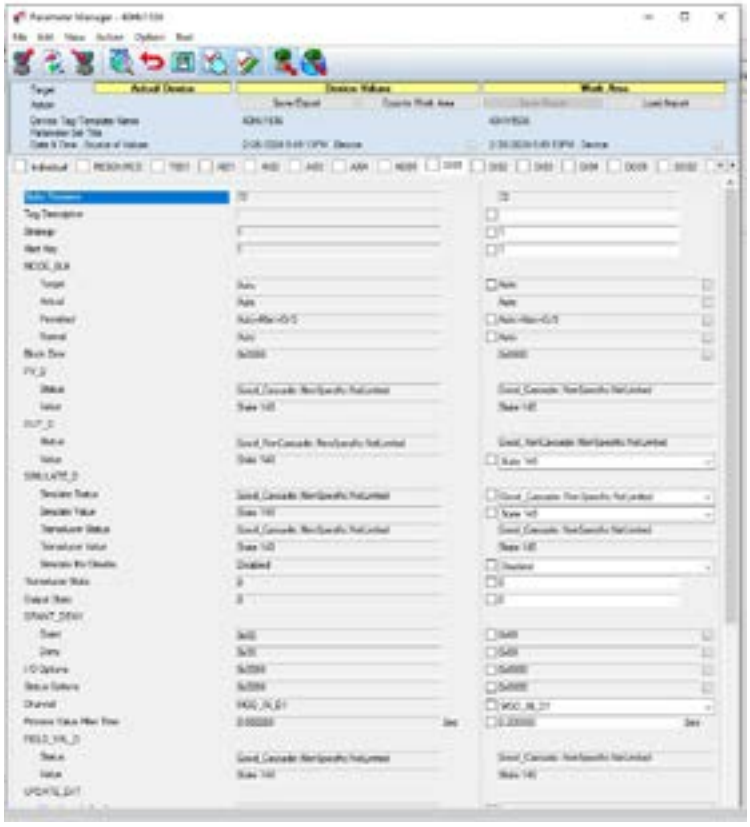
AI04



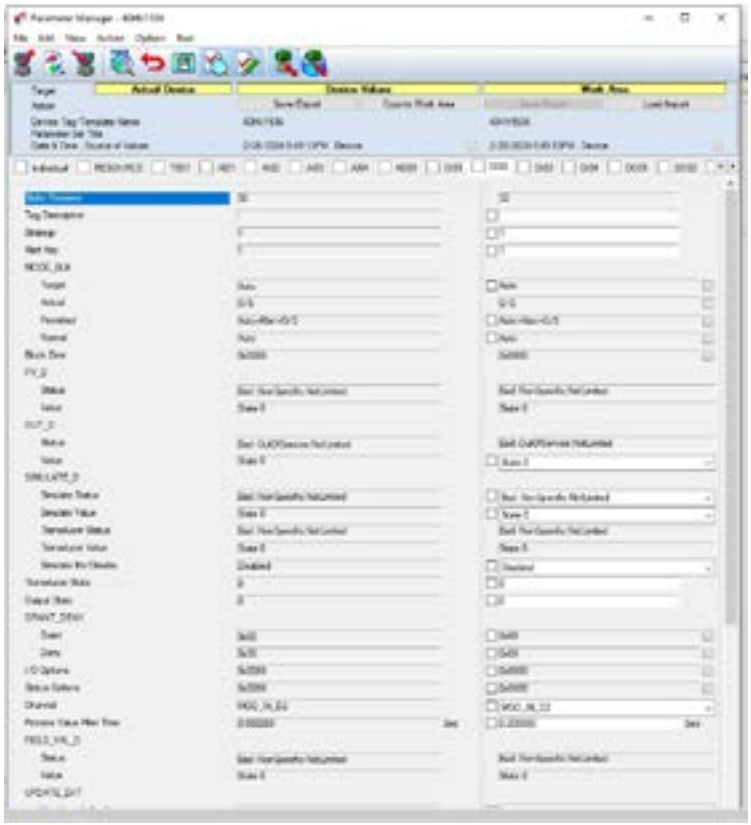
AO01



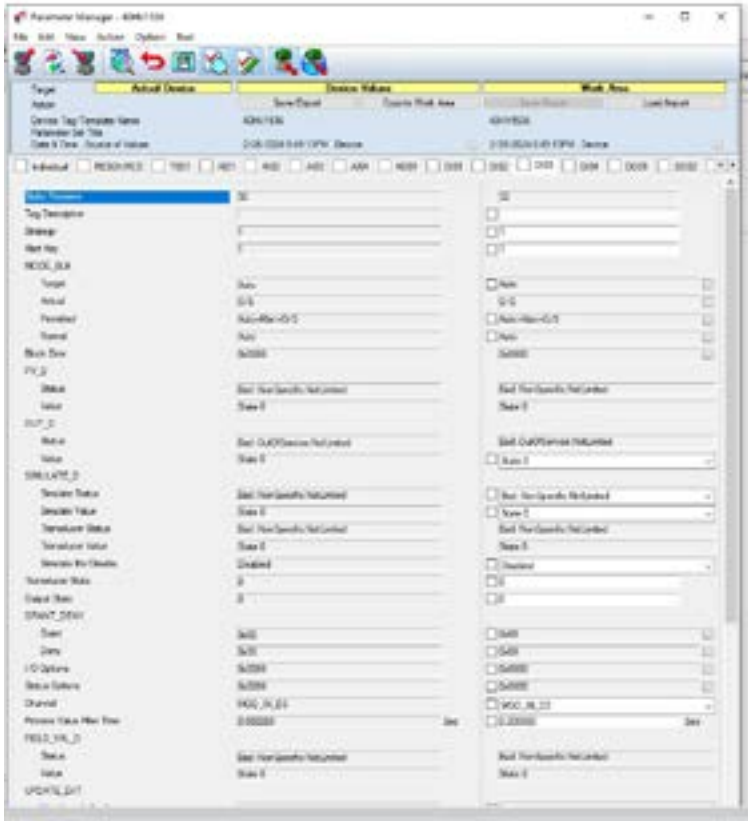
DI01



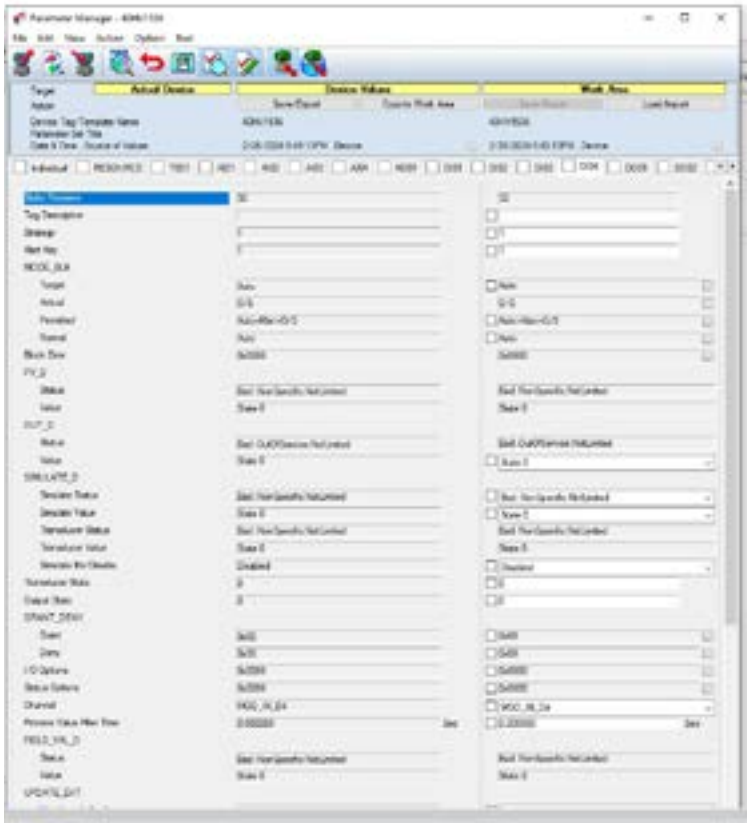
DI02



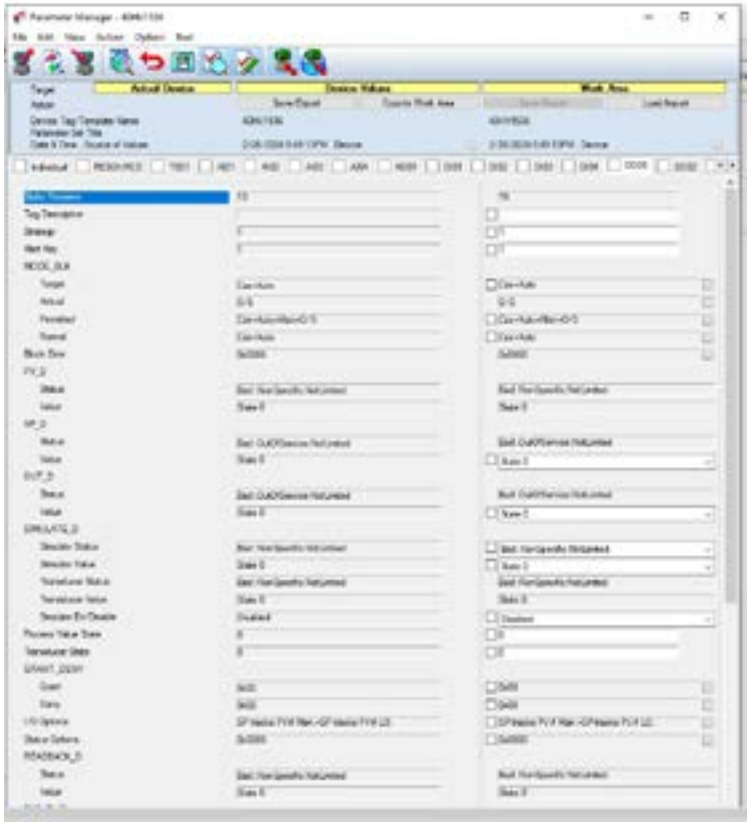
DI03



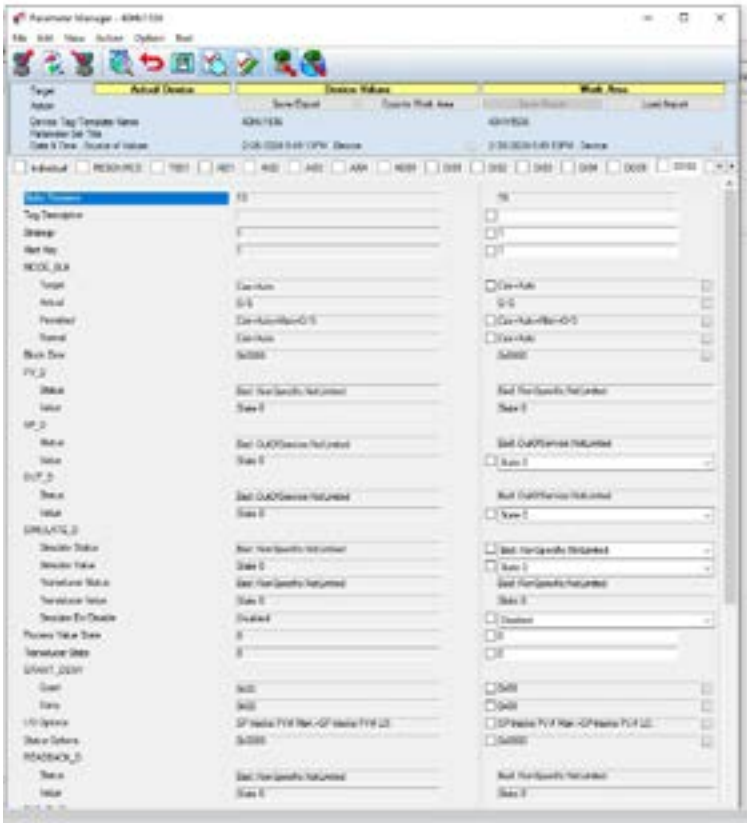
DI04



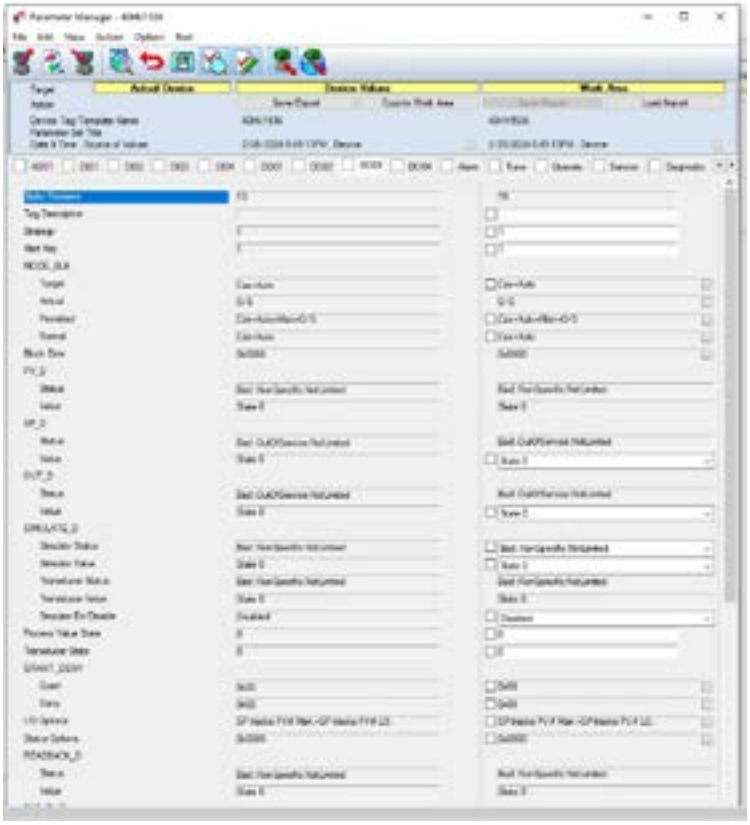
DO01



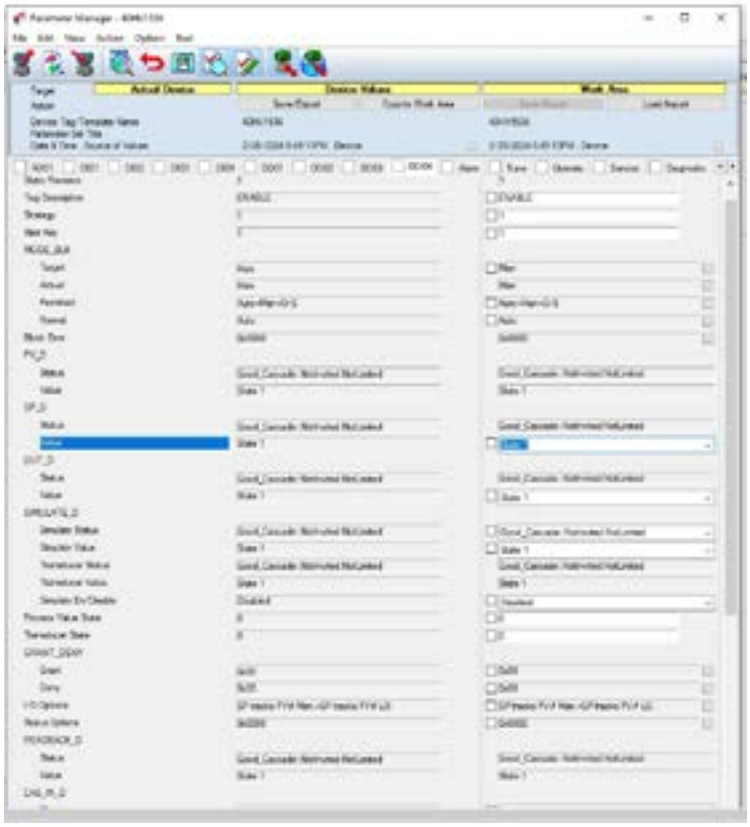
DO02



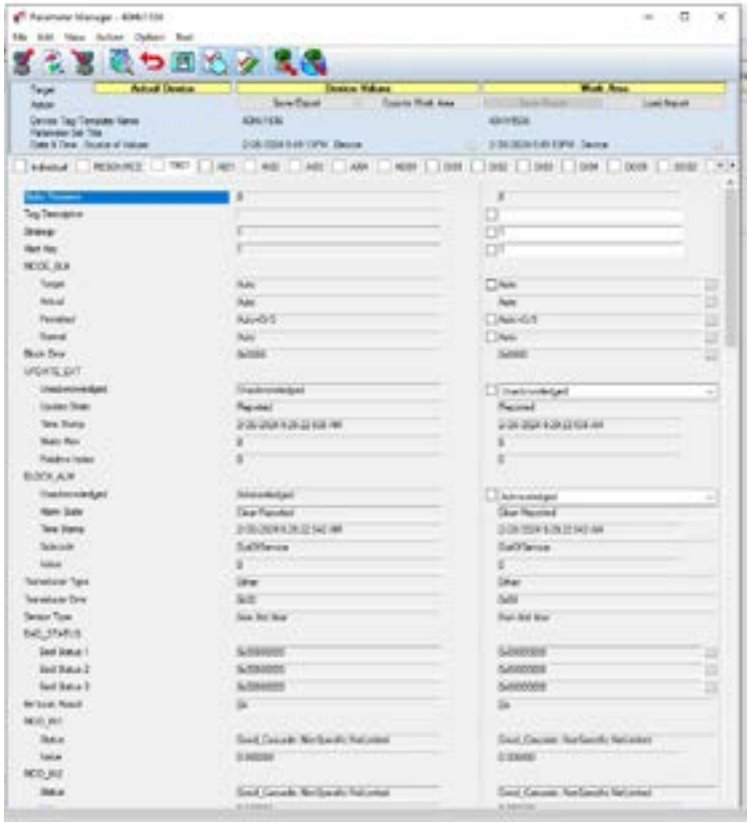
DO03



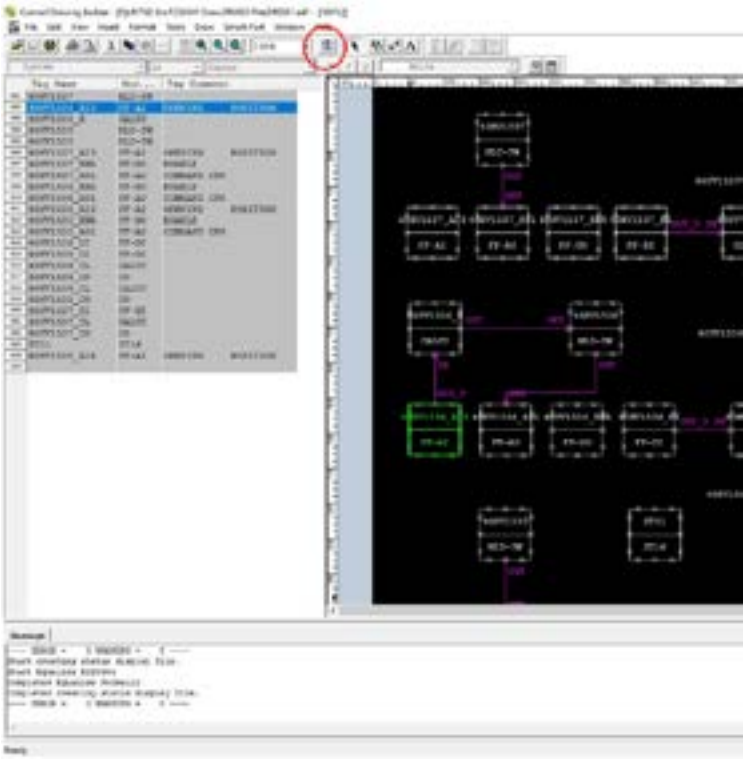
DO04



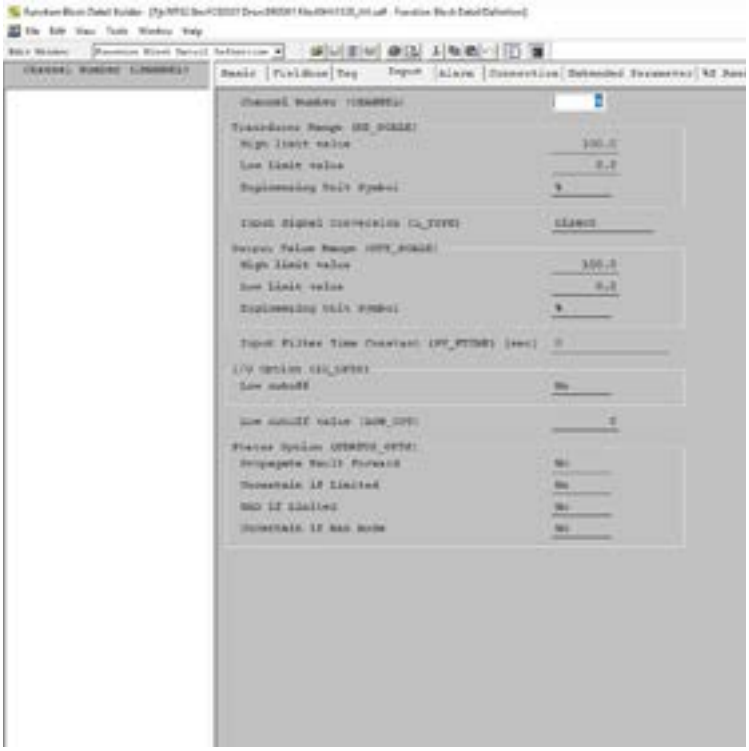
TB



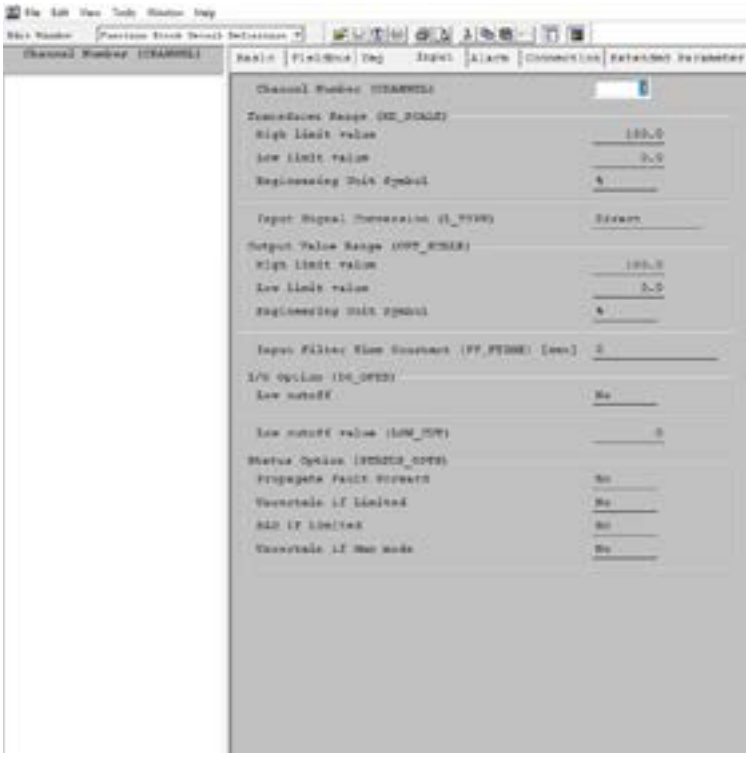
You may view the individual blocks settings by clicking the block highlighted in blue and the icon circled in red.



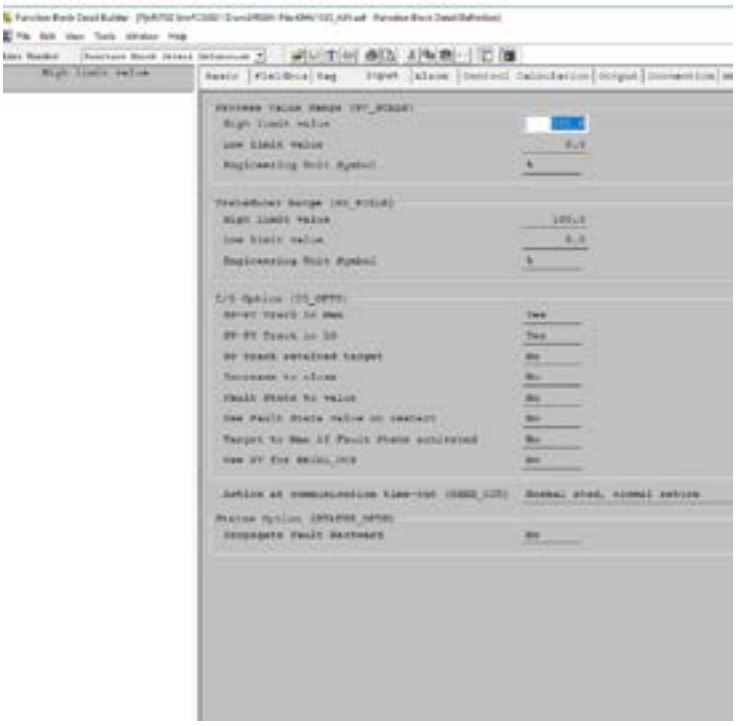
AI04 Input Setting



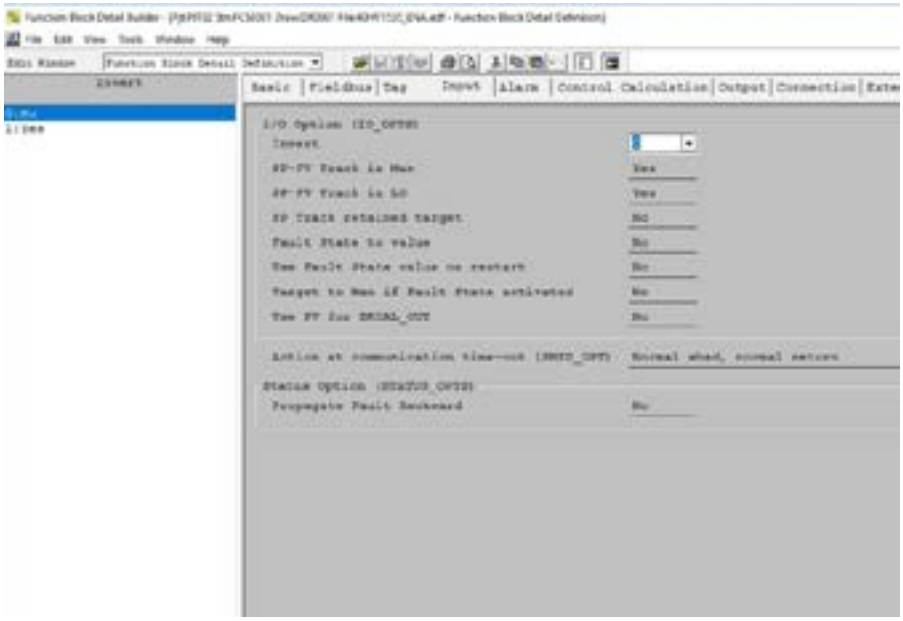
AI03 Input Setting



AO01 Input Setting

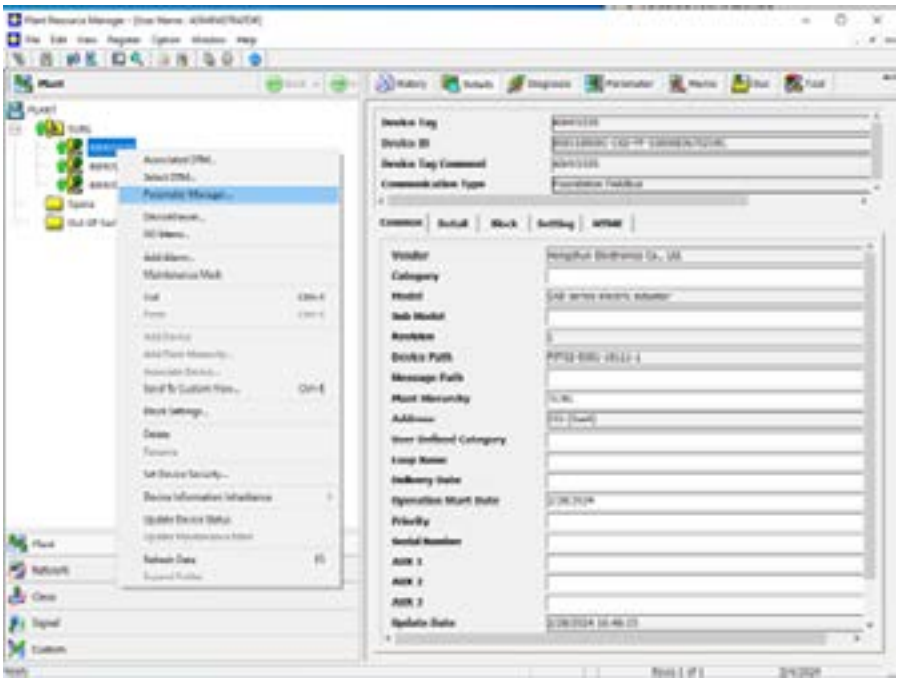


DO04

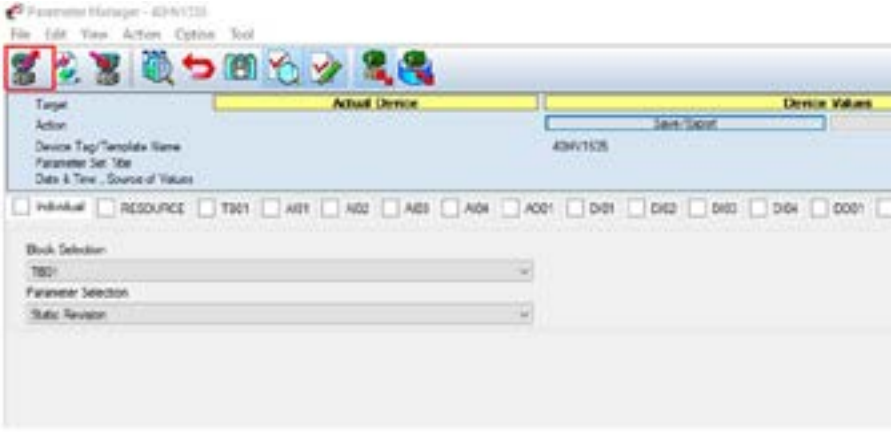


DCS screen are as follows once completed:

To check on the block parameters, enter Plant Resource Manager and click on the parameter manager.



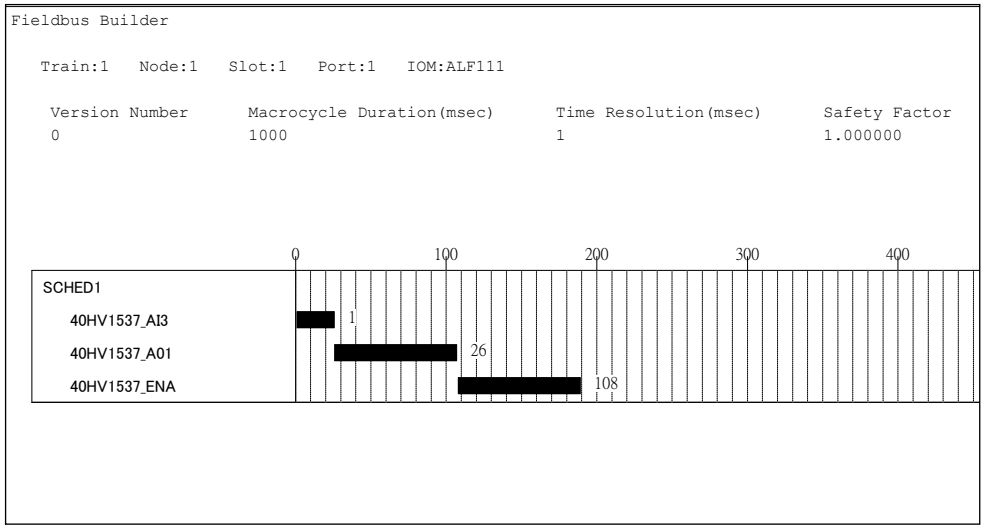
Click on the update device value to read/update all the parameter block.

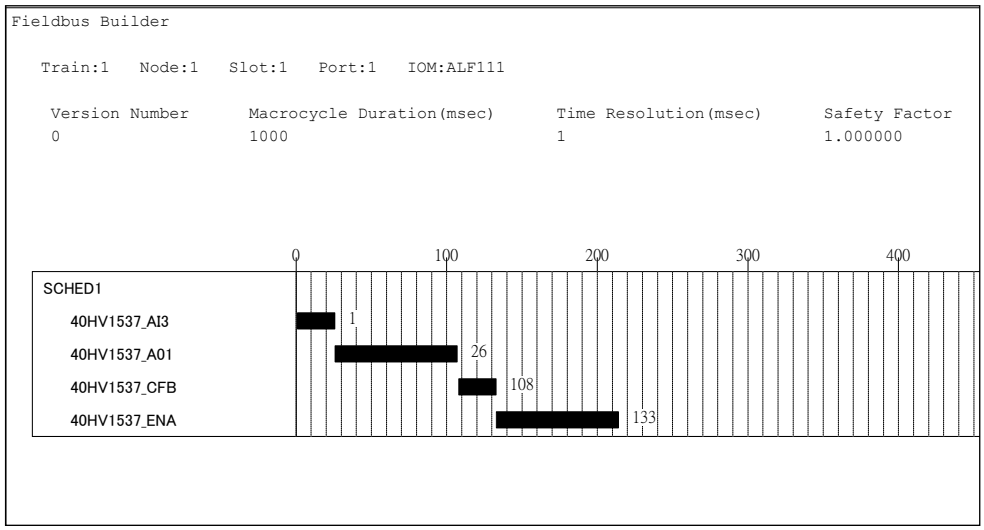


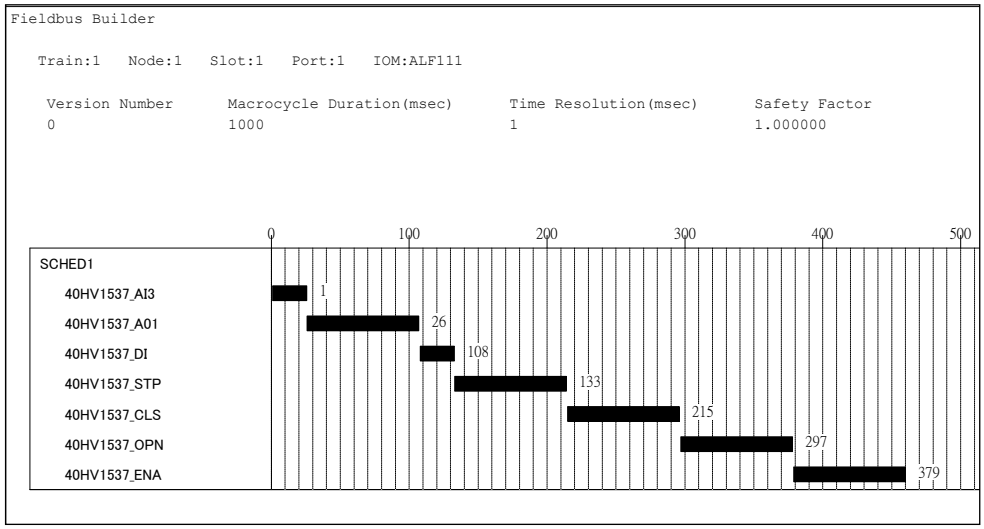
There are two criteria for the FF segment:

1. Power: 24V
2. The macrocycle of each segment must be below 1000 msec.

Failure to comply with either of the above will result in communication failure. Below are the macrocycle for different numbers of input blocks.







17 Appendix A: Accessories Lists

For Ordering Wonder HC Actuator® Accessories:

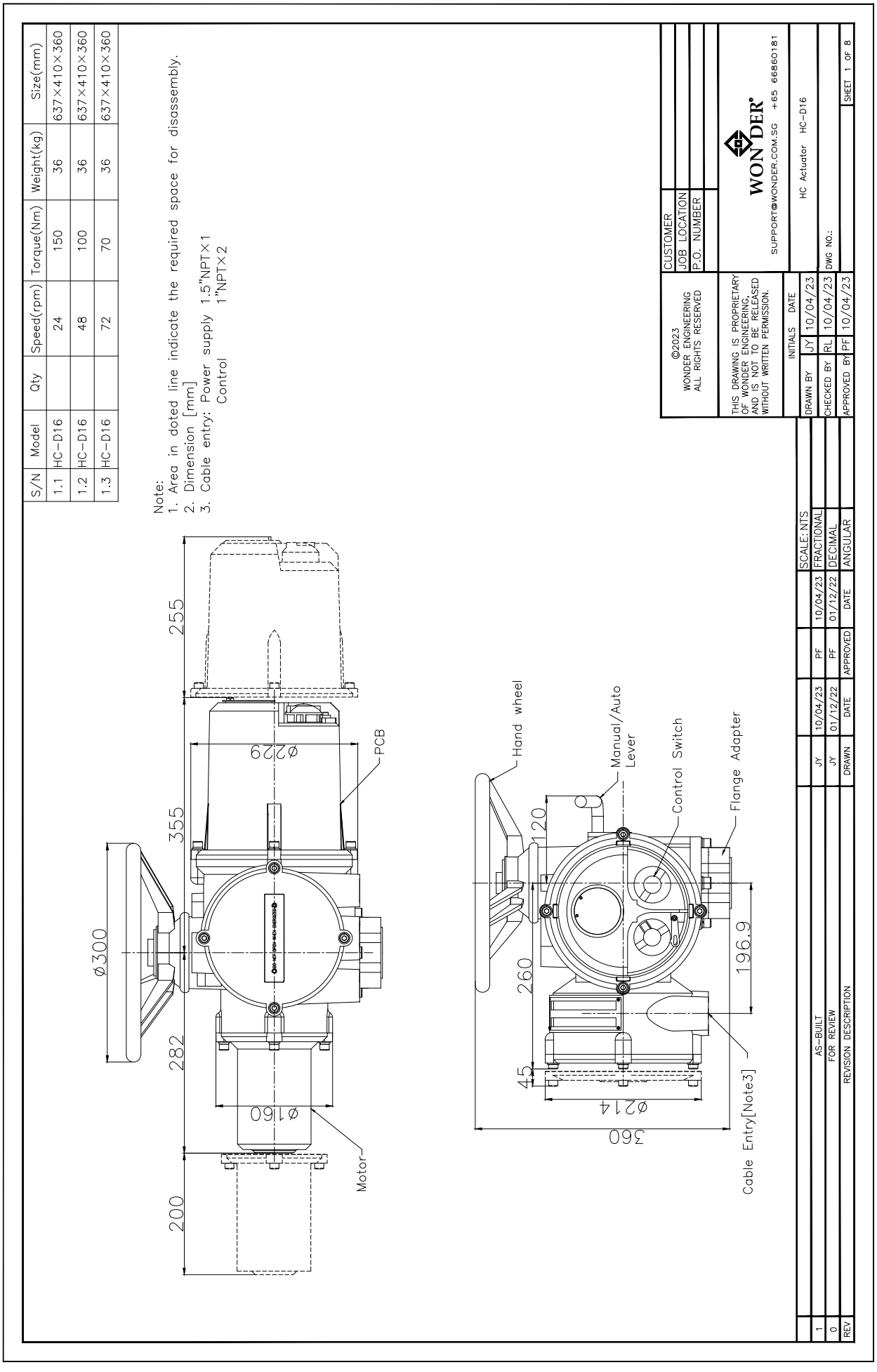
Should you wish to order accessories for your Wonder HC Actuator®, please get in touch with your local sales representative. Alternatively, you can send an email to our support team at support@wonder.com.sg, specifying your accessory requirements and contact details.

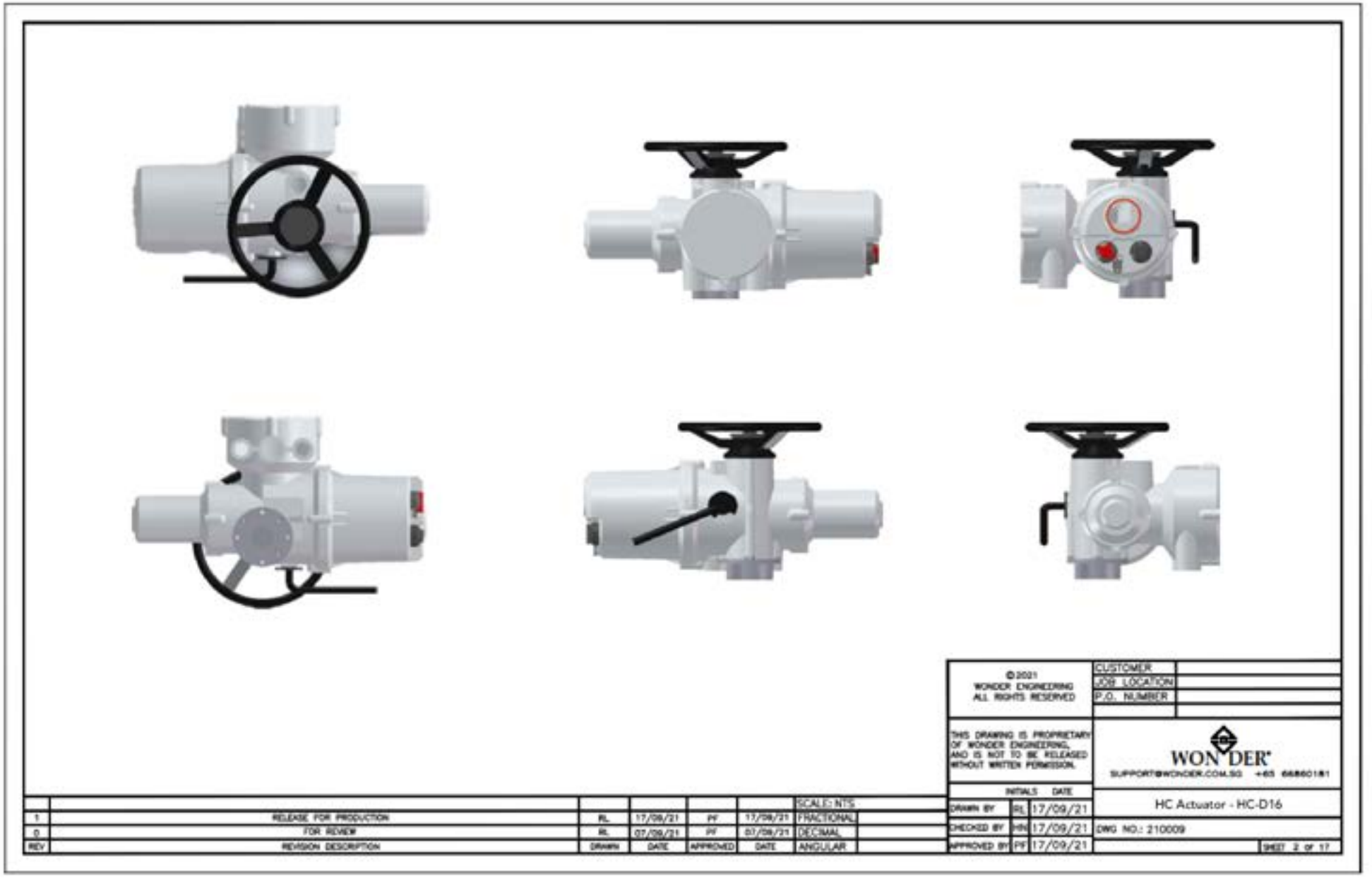
Customized Configurations:

If you require a customized configuration to meet your specific needs, please don't hesitate to reach out to our customer support team at support@wonder.com.sg. They will be happy to provide you with more information and assist you in tailoring a solution that fits your requirements.

Product Code	Product Description
A-HCCB01	Wonder HC Actuator Control Board
A-HCFB01	Wonder HC Actuator Function Board
A-HCNP01	Wonder HC Actuator Knob Plate
A-HCPB01	Wonder HC Actuator Power Board
A-HCRB01	Wonder HC Actuator Repeater Board
A-HCVP01	Wonder HC Actuator Valve Position Card
A-HCMC01	Wonder HC Actuator Remote Controller

18 Appendix B: Engineering Drawing

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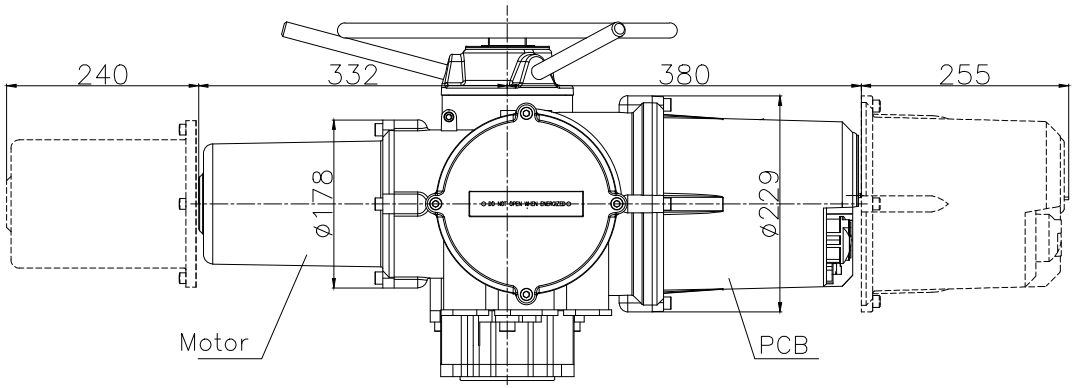
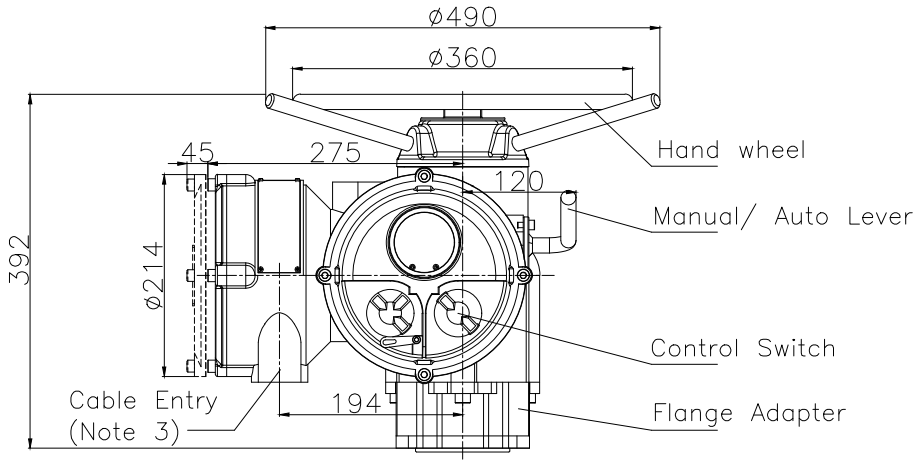
CUSTOMER
JOB LOCATION
P.O. NUMBER
WONDER
SUPPORT@WONDER.COM.SG +65 66860181
INITIALS DATE
DRAWN BY RL 17/09/21
CHECKED BY HN 17/09/21
APPROVED BY PF 17/09/21
HC Actuator - HC-D16
DWG NO.: 210009
SHEET 2 of 17
SCALE: NTS
FRACTIONAL
DECIMAL
ANGULAR
1 RELEASE FOR PRODUCTION RL 17/09/21 PF 17/09/21
0 FOR REVIEW RL 07/09/21 PF 07/09/21
REV REVISION DESCRIPTION DRAWN DATE APPROVED DATE

S/N	Model	Qty	Speed(rpm)	Torque(Nm)	Weight(kg)	Size(mm)
2.1	HC-D25		24	250	55	712×520×392
2.2	HC-D25		48	200	55	712×520×392

Note:
1. Area in doted line indicate the required space for disassembly.
2. Dimension [mm]
3. Cable entry: Power supply 1.5"NPT×1
   Control 1"NPT×2





CUSTOMER	
JOB LOCATION	
P.O. NUMBER	

WONDER®
SUPPORT@WONDER.COM.SG +65 66860181

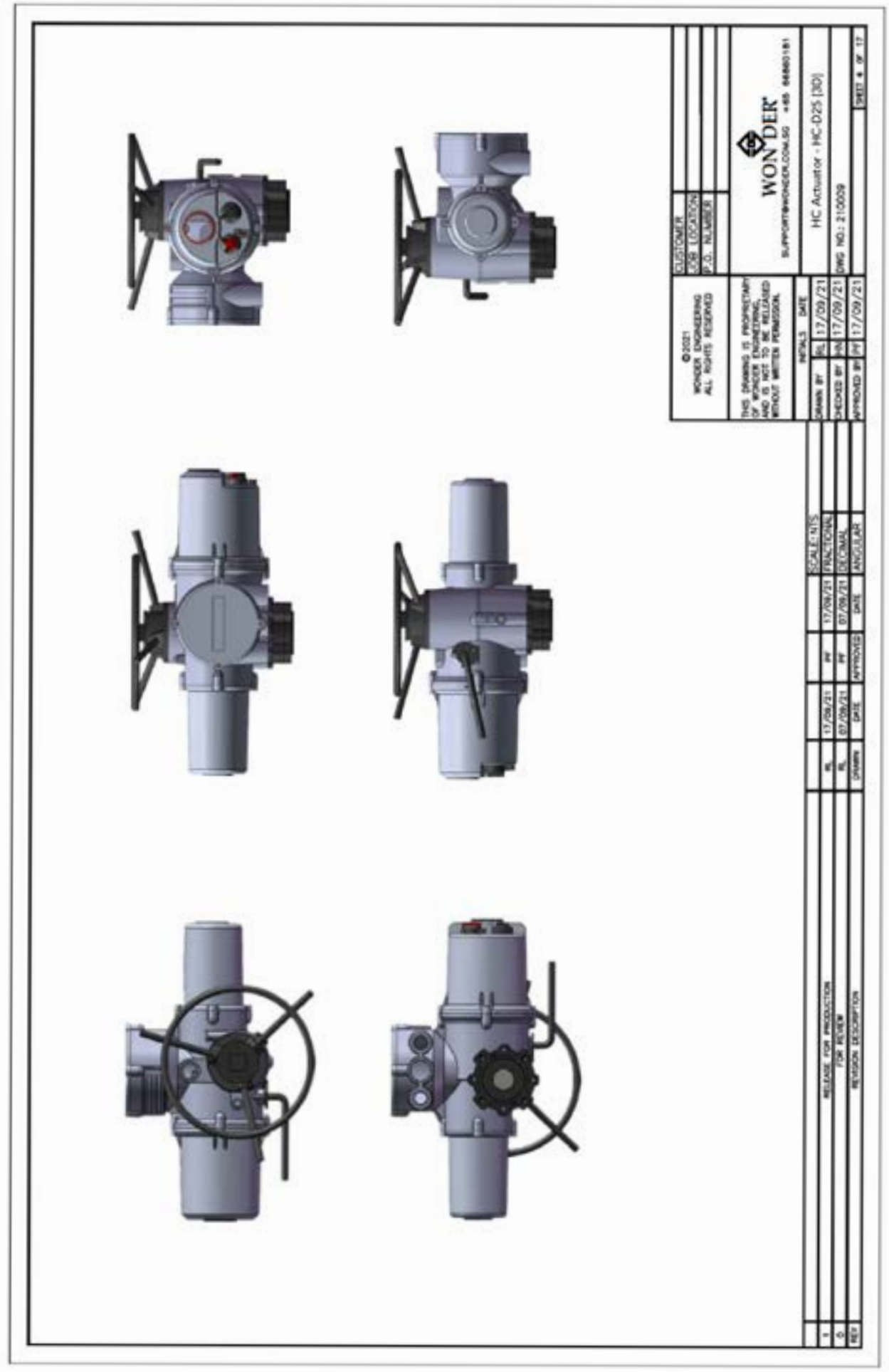
						SCALE: NTS
1	AS-BUILT	JY	10/04/23	PF	10/04/23	FRACTIONAL
0	FOR REVIEW	JY	01/12/22	PF	01/12/22	DECIMAL
REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE	ANGULAR

	INITIALS	DATE
DRAWN BY	JY	10/04/23
CHECKED BY	RL	10/04/23
APPROVED BY	PF	10/04/23

HC Actuator HC-D25

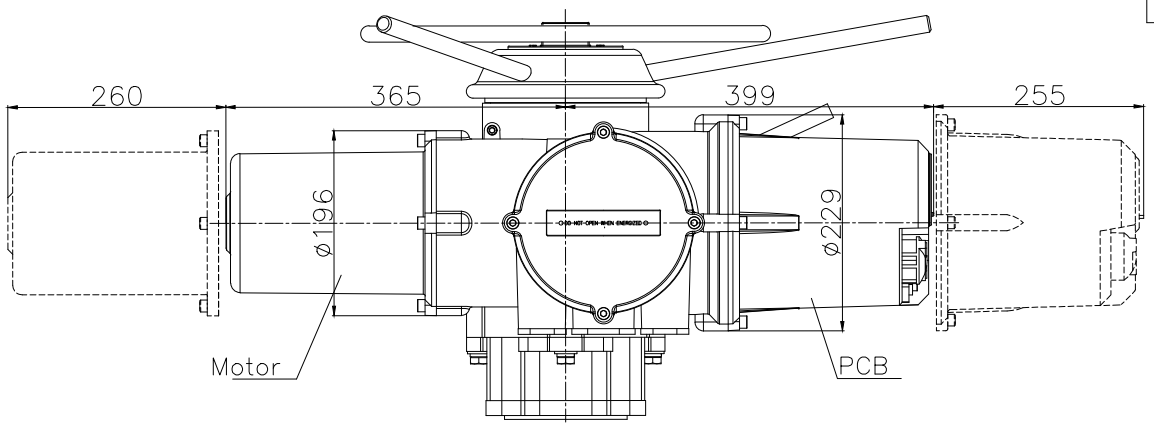
DWG NO.:

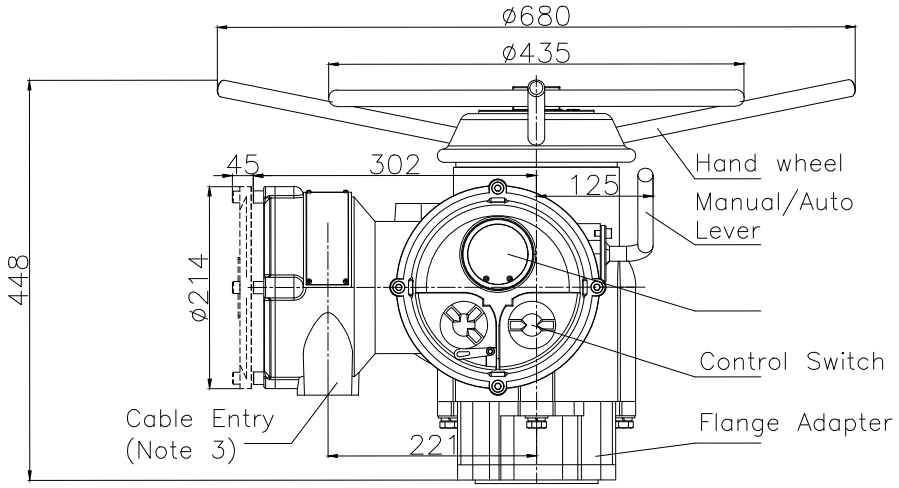
SHEET 2 OF 8


WONDER
HC Actuator - HC-025 (3D)
DWG NO.: 210009
SHEET 4 OF 17

S/N	Model	Qty	Speed(rpm)	Torque(Nm)	Weight(kg)	Size(mm)
3.1	HC-D40		24	400	85	764×642×448
3.2	HC-D60		24	600	88	764×642×448

Note:
1. Area in doted line indicate the required space for disassembly.
2. Dimension [mm]
3. Cable entry: Power supply 1.5"NPT×1
   Control 1"NPT×2





		CUSTOMER	
		JOB LOCATION	
		P.O. NUMBER	

WONDER®
SUPPORT@WONDER.COM.SG +65 66860181

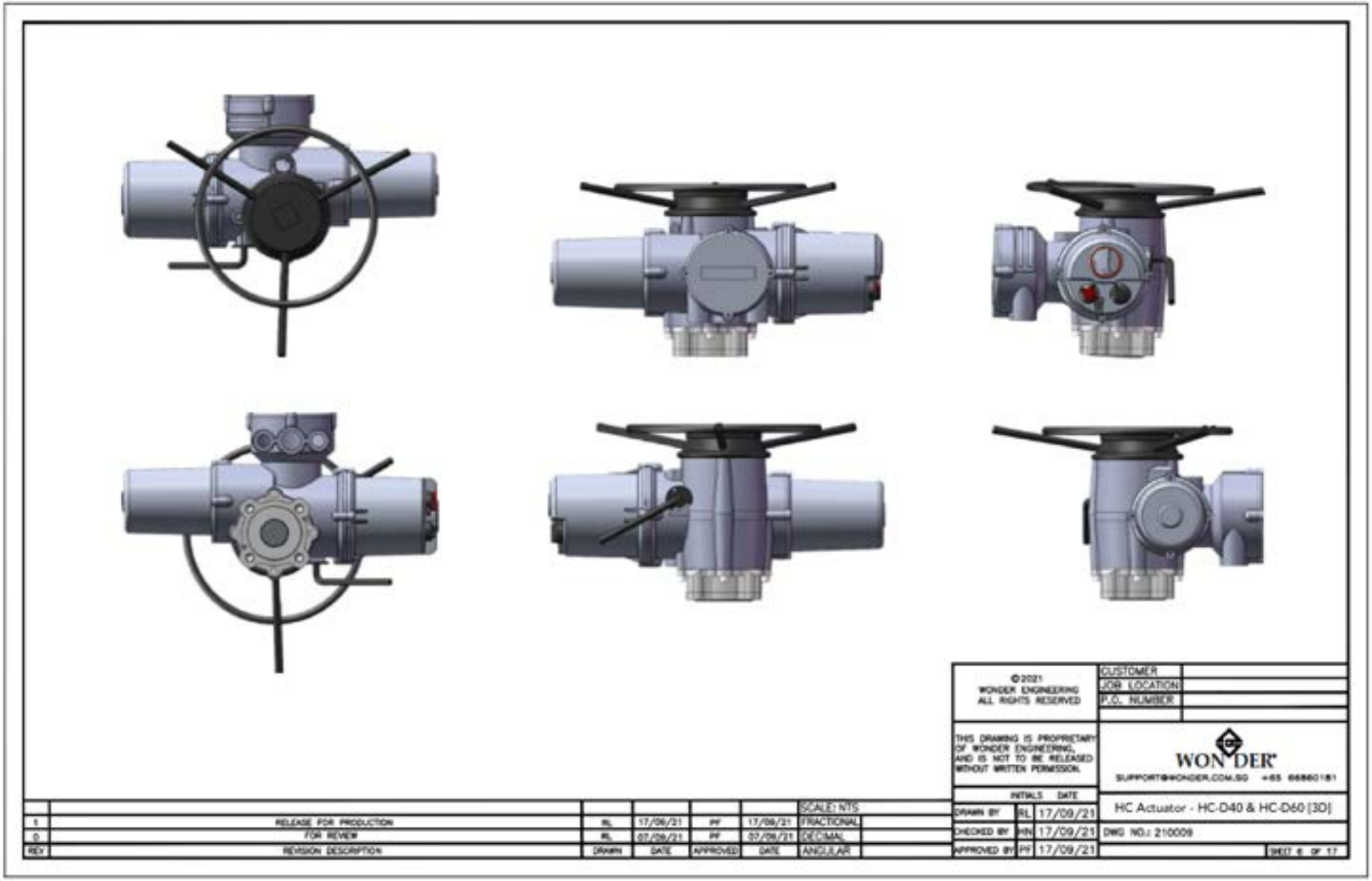
REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE	SCALE: NTS
1	AS-BUILT	RL	10/04/23	PF	10/04/23	FRACTIONAL
0	FOR REVIEW	RL	01/12/22	PF	01/12/22	DECIMAL
						ANGULAR

	INITIALS	DATE
DRAWN BY	RL	10/04/23
CHECKED BY	HN	10/04/23
APPROVED BY	PF	10/04/23

HC Actuator HC-D40 & HC-D60

DWG NO.:

SHEET 3 OF 8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CUSTOMER
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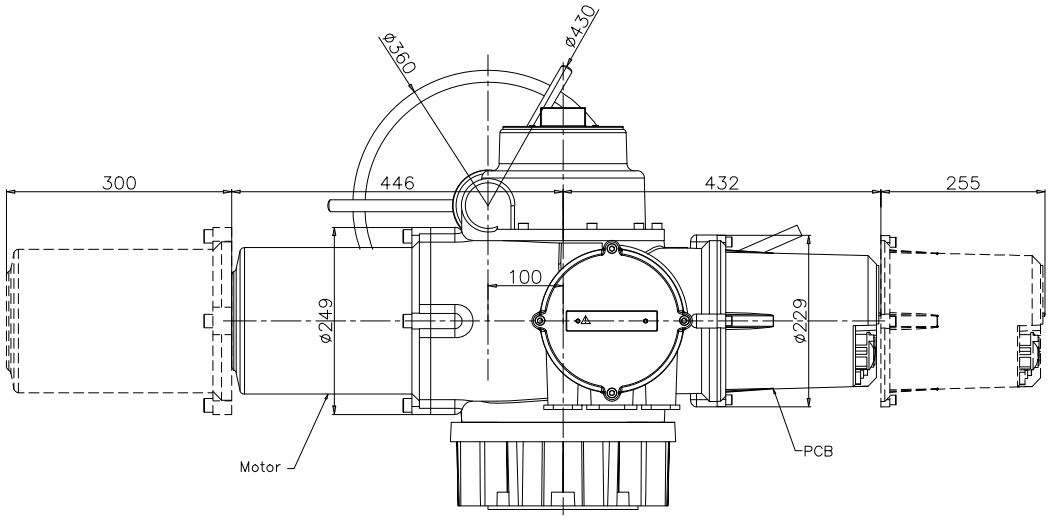
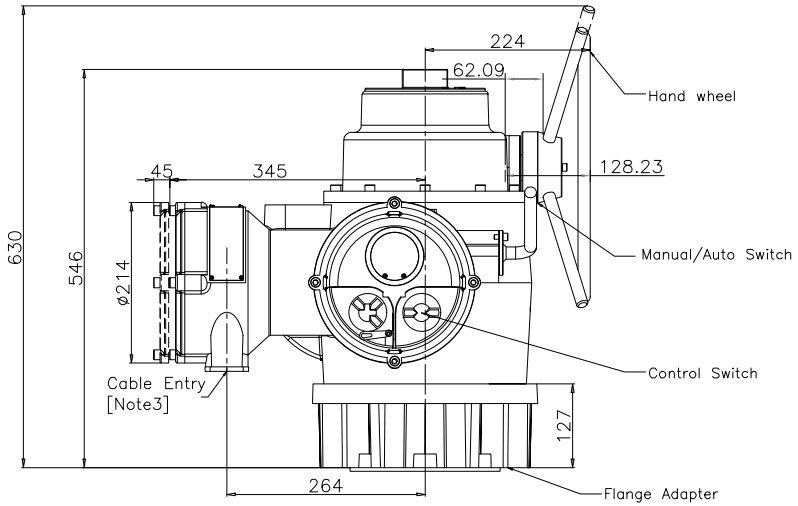
P.O. NUMBER
WONDER
SUPPORT@WONDER.COM.SG +65 66840181
INITIALS DATE
DRAWN BY RL 17/09/21
CHECKED BY HN 17/09/21
APPROVED BY PF 17/09/21
SCALE: NTS
FRACTIONAL
DECIMAL
ANGULAR
HC Actuator - HC-D40 & HC-D60 [3D]
DWG NO.: 210009
SHEET 6 OF 17
REV REVISION DESCRIPTION DRAWN DATE APPROVED DATE
1 RELEASE FOR PRODUCTION RL 17/09/21 PF 17/09/21
0 FOR REVIEW RL 07/09/21 PF 07/09/21





S/N	Model	Qty	Speed(rpm)	Torque(Nm)	Weight(kg)	Size(mm)
4.1	HC-D150		24	1500	85	878×568×630
4.2	HC-D150		36	1500	85	878×568×630
4.3	HC-D150		144	1500	85	878×568×630

Note:
1. Area in doted line indicate the required space for disassembly
2. Dimension [mm]
3. Cable entry: Power supply 1.5" NPT×1
   Control 1" NPT.×2
4. CKD150 actuator handwheel need to extend 70mm as per Fire Proof Jacket requirements.

REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE
1	AS-BUILT	RL	10/04/23	PF	10/04/23
0	FOR REVIEW	RL	01/12/22	PF	01/12/22

SCALE: NTS
FRACTIONAL
DECIMAL
ANGULAR

CUSTOMER
JOB LOCATION
P.O. NUMBER

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	INITIALS	DATE
DRAWN BY	RL	10/04/23
CHECKED BY	HN	10/04/23
APPROVED BY	PF	10/04/23

HC Actuator HC-D150
DWG NO.:
SHEET 4 OF 8






						SCALE: NTS
1	RELEASE FOR PRODUCTION	RL	17/09/21	PF	17/09/21	FRACTIONAL
0	FOR REVIEW	RL	07/09/21	PF	07/09/21	DECIMAL
REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE	ANGULAR

	INITIALS	DATE
DRAWN BY	RL	17/09/21
CHECKED BY	HN	17/09/21
APPROVED BY	PF	17/09/21

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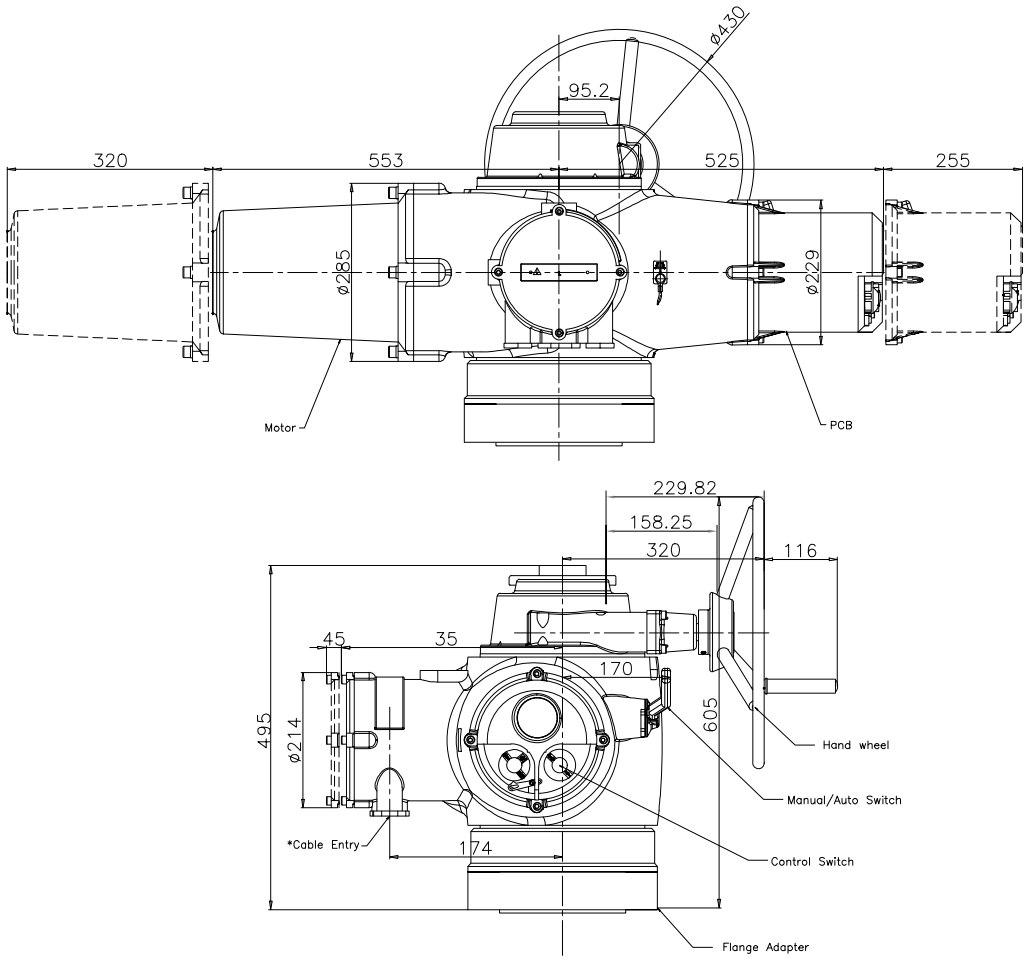
HC Actuator - HC-D150 (3D)

DWG NO.: 210009

SHEET 8 OF 17

S/N	Model	Qty	Speed(rpm)	Torque(Nm)	Weight(kg)	Size(mm)
5.1	HC-D300		144	1500	220	1078×791×735

Note:
1. Area in doted line indicate the required sp
2. Dimension [mm]
3. Cable entry: Power supply 1.5" NPT×1
   Control 1" NPT.×2 ace for disassembly



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APPROVED BY	PF	10/04/23

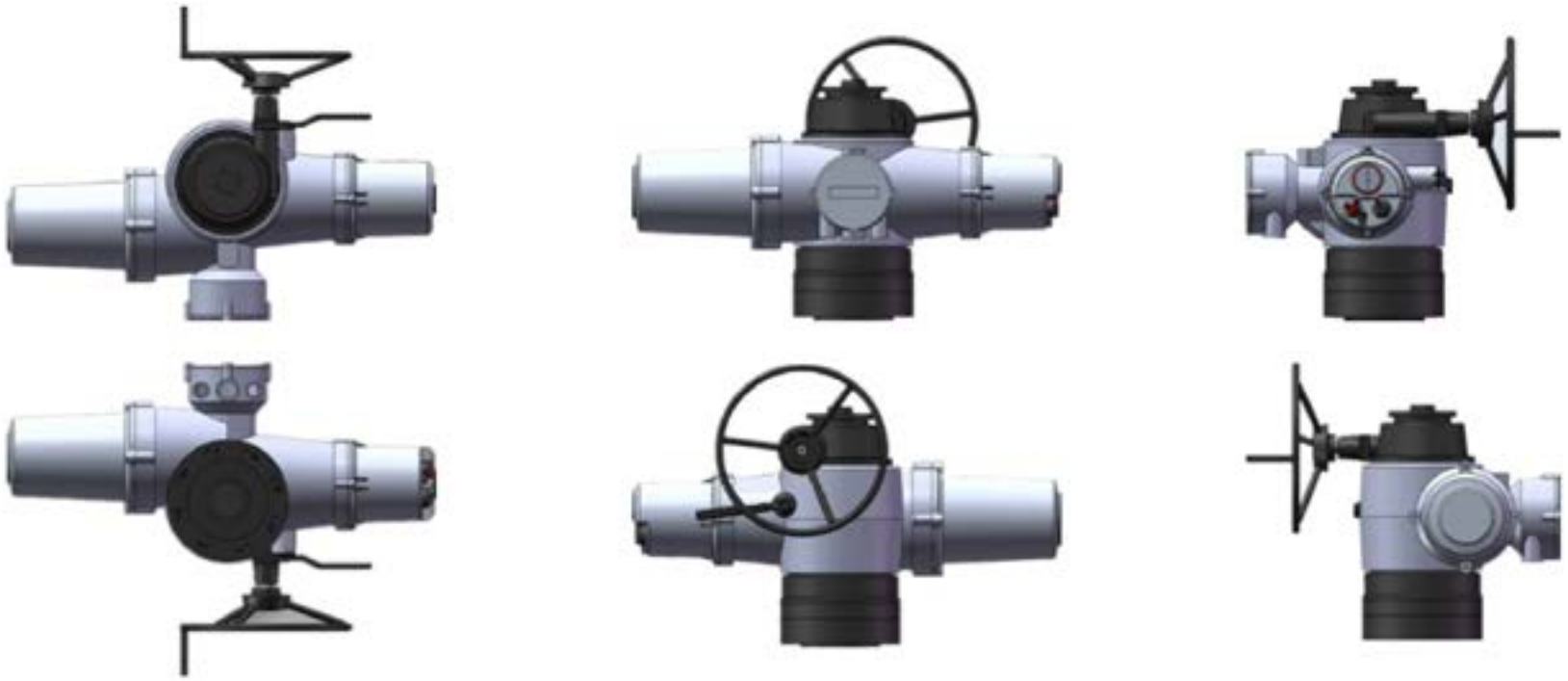
HC Actuator HC-D300

DWG NO.:

SHEET 5 OF 8

REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE
1	AS-BUILT	RL	10/04/23	PF	10/04/23
0	FOR REVIEW	RL	01/12/22	PF	01/12/22

SCALE: NTS
FRACTIONAL
DECIMAL
ANGULAR



						SCALE: NTS
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0	FOR REVIEW	RL	07/09/21	PF	07/09/21	DECIMAL
REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE	ANGULAR

		INITIALS	DATE
DRAWN BY		RL	17/09/21
CHECKED BY		HN	17/09/21
APPROVED BY		PF	17/09/21

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HC Actuator - HC-D300 (3D)

DWG NO.: 210009

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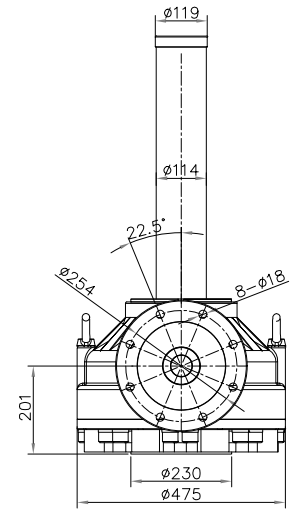

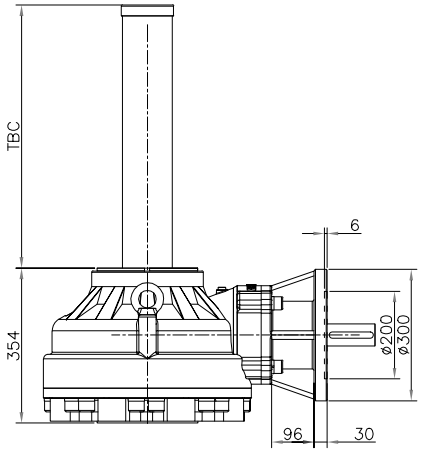

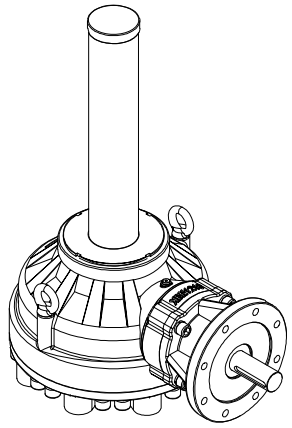

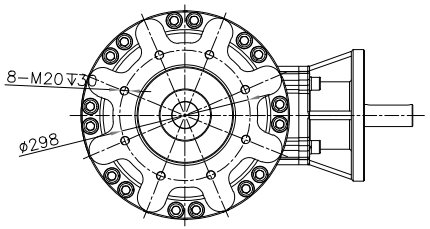

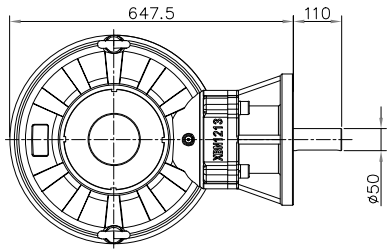

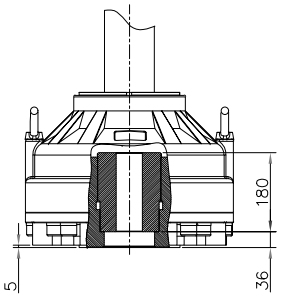

Model	Ratio	Output Torque (Nm)	Input Flange	Output Flange	Max stem dimension(mm)		Refer Weight (kg)
					TW	KEY	
IB10	8:1	7500	F25	F30	95.25	85	293

Note: Dimension [mm]

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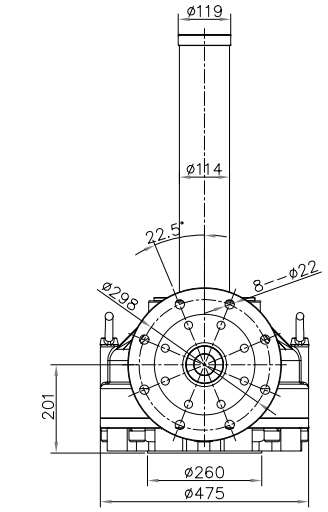
0	FOR REVIEW	JY	01/12/22	PF	01/12/22	DECIMAL
						SCALE: NTS

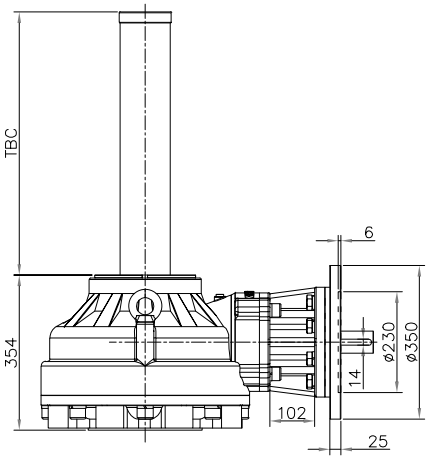
	INITIALS	DATE
DRAWN BY	JY	10/04/23
CHECKED BY	RL	10/04/23
APPROVED BY	PF	10/04/23

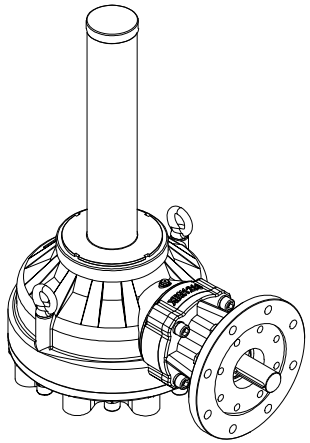
IB-10 Gearbox

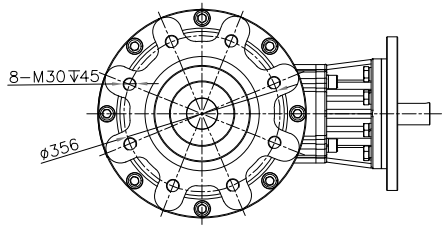
DWG NO.:

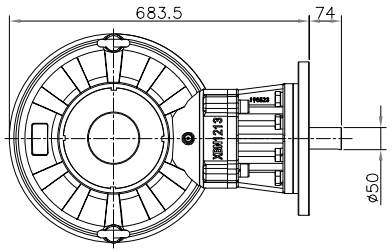
SHEET 6 OF 8

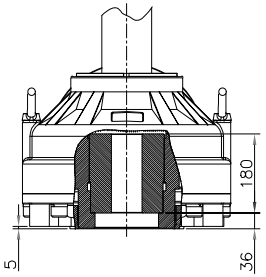












Model	Ratio	Output Torque (Nm)	Input Flange	Output Flange	Max stem dimension(mm)		Refer Weight (kg)
					TW	KEY	
IB12	6:1	8500	F30	F35	125	110	311

Note: Dimension [mm]

						SCALE: NTS	
1	AS-BUILT	JY	10/04/23	PF	10/04/23	FRACTIONAL	
0	FOR REVIEW	JY	01/12/22	PF	01/12/22	DECIMAL	
REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE	ANGULAR	

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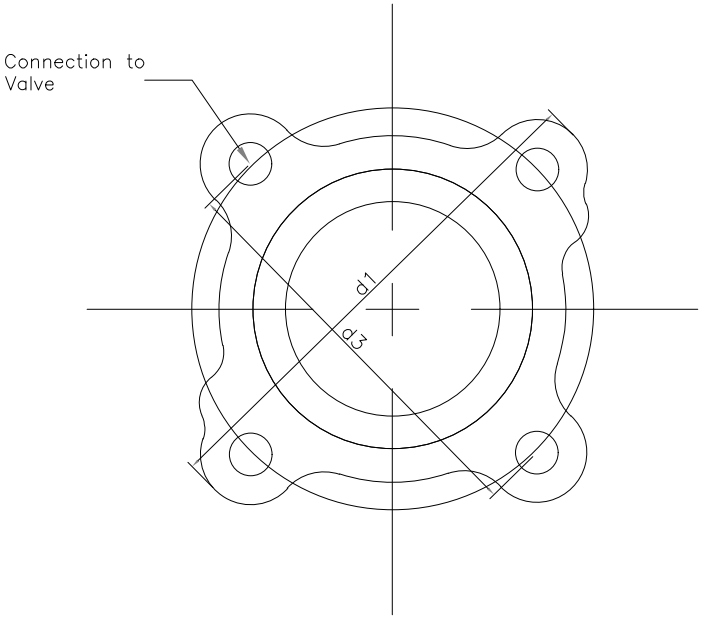
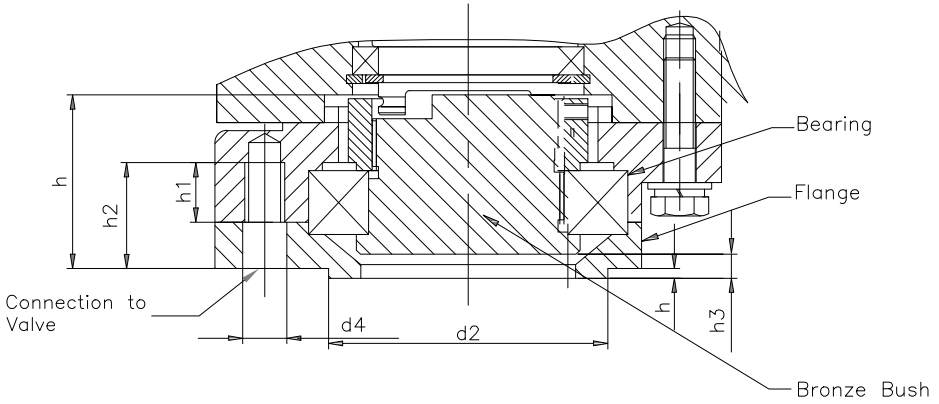
IB-12 Gearbox

DWG NO.:

SHEET 7 OF 8

Model	Speed (rpm)	Torque (Nm)	Qty	Flange Adapter	ød1	ød2	ød3	ød4	h	h1	h2	h3	L	Maximum hole size of bush	Remark
HC–D16	24	150	3	F10	125	70	102	4–M10	3	16	25	2.5	61	32	
HC–D16	48	100	4	F10	125	70	102	4–M10	3	16	25	2.5	61	32	
HC–D16	72	70	5	F10	125	70	102	4–M10	3	16	25	2.5	61	32	
HC–D25	24	250	5	F14	175	100	140	4–M16	4	28	45	5	79	38	
HC–D25	48	200	3	F14	175	100	140	4–M16	4	28	45	5	79	38	
HC–D40	24	400	4	F16	210	130	165	4–M20	5	32	48	7	90	60	
HC–D60	24	600	4	F16	210	130	165	4–M20	5	32	48	7	90	60	
HC–D150	24	1500	1	F25	300	200	254	8–M16	5	30	30	5	116	68	
HC–D150	36	1300	2	F25	300	200	254	8–M16	5	30	30	5	116	68	
HC–D150+IB10	18	6000	5	F30	475	230	298	8–M20	5	30	30	3	180	95	
HC–D300+IB12	24	8000	1	F35	475	260	356	8–M30	5	45	45	3	180	125	





Note: Bush will be drilled on site by user according to field service valve stem O.D., as valve stem size is not available for factory production.

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REV	REVISION DESCRIPTION	DRAWN	DATE	APPROVED	DATE
1	AS–BUILT	JY	10/04/23	PF	10/04/23
0	FOR REVIEW	JY	01/12/22	PF	01/12/22

SCALE: NTS
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	INITIALS	DATE
DRAWN BY	JY	10/04/23
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APPROVED BY	PF	10/04/23

Flange Adapter

DWG NO.:

SHEET 8 OF 8

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T

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