BERNARD® CONTROLS

Invest in Confidence

BT INTELLI+ v3
RANGE

Start Up Guide

SUG_18002_EN - Ind. B
Art: 5100639

TABLE OF CONTENTS

1 SAFETY

This device complies with current applicable safety standards.

Installation, maintenance, and use of this unit require a skilled and trained personnel.

Please carefully read this whole document before mounting and powering the actuator.

2 PACKAGING, STORAGE AND MAINTENANCE

2.1 Packaging

The BT actuator packaging is comprised of a corrugated, double wall cardboard box strapped on a pallet. For certain non-EU countries or upon request, the pallets are heat treated to the NIMP 15 standard and IPPC-stamped.

This packaging is identical for shipping by road, air or sea, unless otherwise mentioned in the contract.

2.2 Storage

Actuators should be stored under a shelter, in a clean and dry place and at a stable ambient temperature.

- Avoid placing the actuator directly on the floor
- Check that the cable entry plugs are correctly tightened.
- Check that the cover screws are correctly tightened to ensure weatherproof sealing of the cover

BT actuators include electrical components and lubricated gears. If the actuator is incorrectly stored, regardless of its weatherproof enclosure, alterations may occur, such as oxidation, galling, and other.

Heating resistance should be connected to the power supply especially if the storage environment is humid.

What to check before mounting on the valve, after storage

1. Visually check the electrical equipment for traces of corrosion, humidity, etc.
2. Check that there are no oil leaks.

3. Manually operate buttons, selectors, etc., to ensure proper mechanical functionality.
4. Manually operate the actuator in both directions for a couple of turns.

What to check on pre-installed actuators

If you expect a long delay between actuator valve mounting and electrical wiring:

1. Put desiccant packets in the actuator or replace the existing ones.
2. Visually check that the cable entries and cover are tightly closed.

2.3 Maintenance

All BT actuators feature lifetime lubrication. They require no specific maintenance under the condition that they were correctly commissioned and operated under its intended use.

3 ACTUATOR INSTALLATION

3.1 Mounting the actuator on the valve

The actuator should be secured directly to the valve using proper bolts or via a proper interface.

After assembly, the actuator can operate in any position.

However:

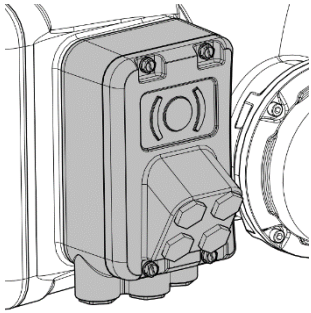
- do not lift or handle the actuator by its handwheel to avoid shaft and gear damage.
- cable glands must not be oriented upwards (loss of watertightness).
- It is recommended not to position the motor downwards.

3.2 Preparing the wiring

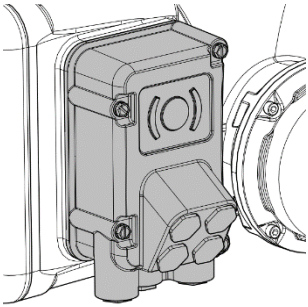
3.2.1 Connection types

According to the need, the actuator can be wired either:

- On the actuator through the connection compartment, or
- Using a Quick Connector previously wired



Connection compartment



Quick Connector

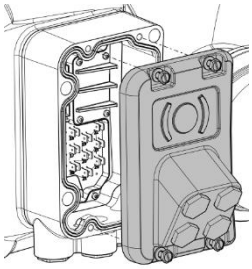
Both feature 3 cable entries on their bottom (ISO version: 2×M20, 1×M25; NPT version: 3x3/4") and 4 cable entries on their front (ISO version: 4xM20; NPT version: 4x1/2").

Do not supply electrical power to the actuator until wiring is finished and the connection compartment is closed, or the Quick Connector plugged into the actuator.

If you need to open the connection compartment or Quick Connector after wiring, cut off the power supply to the actuator.

3.2.2 Accessing the terminal connections in the connection compartment

To access the terminal connections, the connection compartment needs to be opened.

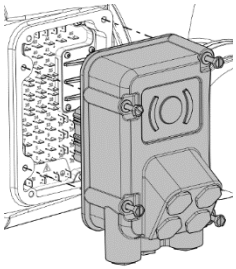


How to open the connection compartment

1. Using a 10mm wrench or a 10×1.5mm flat blade screwdriver, unscrew the 4 hex head screws securing the cover to the housing.
2. Remove the cover.

3.2.3 Accessing the connections in Quick Connector

As the wiring is done inside the Quick Connector, the connector needs to be removed first before it can be opened.

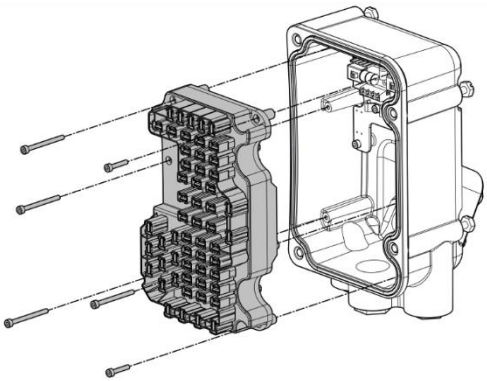


How to remove the Quick Connector

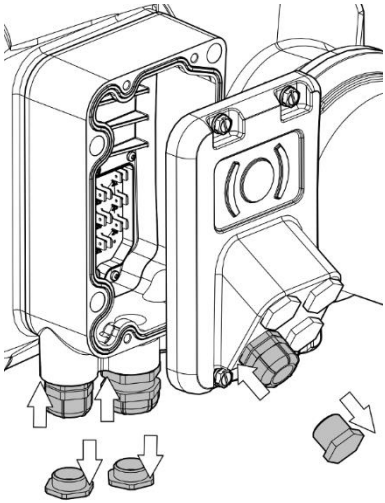
1. Using a 10mm wrench or a 10×1.5mm flat blade screwdriver, unscrew the 4 Hex head screws securing the cover to the housing.
2. Pull the Quick Connector off the housing.

How to open the Quick Connector

1. Using a 2.5mm Allen key, unscrew the 6 screws fixing the terminal plate on the Quick Connector's enclosure.
2. Remove the terminal plate.



3.3 Installing the cable glands



How to install the cable glands

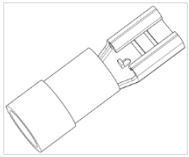
For each cable entry used

1. Remove the plug from the cable entry with a wrench.
2. Separate the sealing nut from its cable gland.
3. Screw and tighten the cable gland into the cable entry.
4. Insert the sealing nut on the cable and pass the cable through the cable gland.

Unused entries must be kept closed using plugs as they are part of the components allowing the actuator to be rated with IP67 protection.

3.4 Wiring power and control cables

Crimping the wires

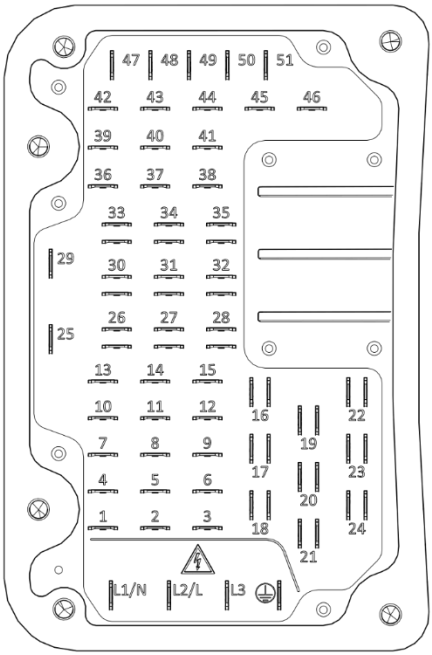


The terminal plate is equipped with male spade terminals, compatible with 6.35mm female spade quick-disconnect connectors.

These connectors allow wires between 1.5 and 2.5mm², or 14 and 16 AWG.

➔ **Once cables are installed in the cable glands, crimp the end of every wire with a female spade connector that needs to be connected to a male spade terminal.**

Terminal plate



Control terminals

They are numbered from 1 to 51.

Terminals 16 to 24, 26 to 28 and 30 to 35 each have 2 male spades to create shunts between terminals if needed.

Power terminals (3Ph/1Ph)

- **3Ph: L1, L2, L3** with phase correction
- **1Ph: L** (Live), **N** (Neutral)

How to wire the actuator

The wiring must be done according to the wiring diagram of the actuator.

1. Make sure that the power supply voltage matches the information on the nameplate located on the side of the actuator.
2. Connect the power supply on terminals marked L1, L2 & L3 (3Ph) or L, N (1Ph) according to the power supply phase.
3. Secure the ground cable to the ground terminal.
4. Connect the control and signaling wires on terminals 1 to 51.
5. Tighten the sealing nut on the cable gland when the wiring is complete.
6. Ensure all cable glands are correctly tightened.

3.5 Closing the connection areas

Check that the seal is clean and well inserted in its groove.

How to close the connection compartment

1. Reinstall the cover on the connection compartment or plug back the Quick Connector on the actuator.
2. With a 10mm wrench, tighten the cover on the housing with its 4 screws.

3.6 Wiring the external ground terminal

The external ground terminal is located at the bottom right of the actuator's connection area.

How to connect the external ground terminal

1. Crimp the end of the ground cable with a 6mm stud hole tubular lug.
2. Install the spring lock washer then the lug on the 6 mm screw.
3. Screw this assembly in the tapered hole with a 10mm wrench.

3.7 Other equipment

Relays

The BT INTELLI+ actuator is equipped with 3 relays. A 4-relay board can be added as an option.

The function of each relay can be set.

➔ **To see possible settings and set relays, see §5.7.**

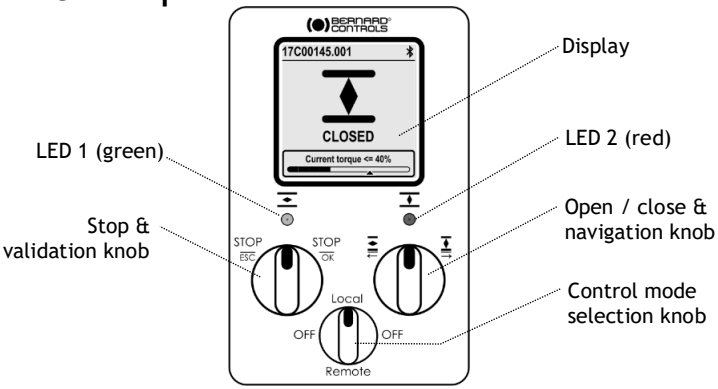
Heating resistance

Each actuator includes a heating resistance.

As soon as the actuator is installed in the field, it is required to supply power to the heating resistance to prevent condensation.

4 ACTUATOR CONTROLS

4.1 Control panel



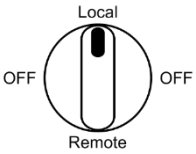
The BT INTELLI+ control panel consists of a **screen**, **2 control knobs**, **1 control selection knob** and 2 configurable **LEDs**.

Screen	The screen displays operating status or INTELLI+ menu
Control selection knob	The control selection knob allows to choose the one of the following control modes: • **Local**: the actuator is controlled using this Control panel, or with a Smartphone via Bluetooth® • **Remote**: the actuator is controlled remotely • **OFF**: the controls are deactivated The actuator is set to **Local** at startup. The control mode can be locked with an optional padlock at the bottom of the control panel.
Knobs	The knobs are used for **operation** (upper function) or **menu navigation** (lower function). Once released, these knobs return to the center position.
LEDs	The LEDs indicate the actuator status (CLOSED ⤓ or OPEN ⤒). Default colors are red for CLOSED and green for OPEN. They can be set according to the country's standard (see §5.4.4). One LED will blink during operation according to the travel direction, and both during Bluetooth® connection.

4.2 Control modes

BT INTELLI+ can be locally or remotely controlled.

The control mode is set using the **Control selection knob** on the control panel. It can be locked using a padlock located at the bottom of the control panel.



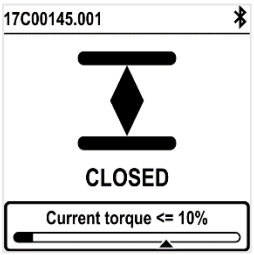
Modes are:

- Local mode with the control panel or with Smartphone via Bluetooth® connection
- Remote mode
- Forced local mode when in Remote mode using the Application

  ➔ **This mode requires first to be authorized, see §5.8.**

4.3 Local control with the Control panel

4.3.1 Operation



Operation screen indicates…

- **Top**: actuator ID and status icons

  ⚠: warning / ⊗: alarm

  : Bluetooth® activated

  : Bluetooth® activated with device connected

  : Local command inhibited
- **Center**: current position of the valve, either CLOSED, current percentage between 0 and 100% depending on the travel direction, or OPEN
- **Bottom**: torque level with a torque gauge and an arrow marker to indicate the set torque limit

Knobs use

Minimum pulse duration is 100 ms.

Left knob	**STOP**	**Opening**	**Right knob**
	STOP	**Closing**	

4.3.2 Menu

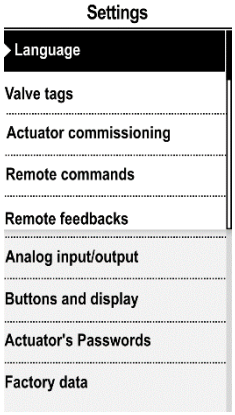
The Menu screen has 2 main sections:

- Diagnostic and Alarms
- Settings

The Menu screen has 2 main sections:

- **Diagnostic and Alarms**

- **Settings** is used to check or change the actuator's settings: valve tag, password, torque limits, Bluetooth®, etc. The **Factory data** submenu contains the actuator's characteristics (see Appendix IV).



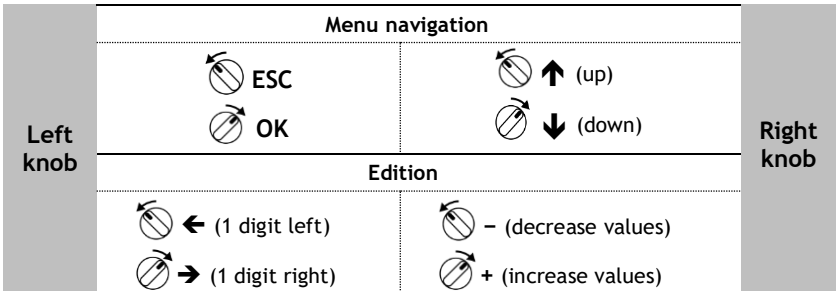
Diagnostic and Alarms

In the Diagnostic & Alarms section you can access 3 sub-sections:

- Alarm & Warning
    - All active and inactive alarms & warnings can be visualized (up to 50 alarms & warnings are available)
- Total actuator life operation
    - Number of starts from last reset
    - Total number of starts since the beginning of the operation
    - Number of starts the actuator is designed to operate
    - Partial operating time (operating time from last reset)
    - Total operating time since the beginning of the operation
- Measured torque data

  The last 50 torque values (~200 points) are plotted in both directions:
    - Opening direction
    - Closing direction

How to use the knobs



4.4 Local control with the Smartphone application

Using the Bluetooth® connection of the actuator, it can be operated with the Bernard Controls smartphone application (**BC App**).

- Bluetooth® is active on the actuator at delivery.
- Using the Local controls with BC App requires to have Bluetooth® activated on your smartphone

The application needs to be downloaded and installed on a phone to connect to the actuator by entering an access code.

See Appendix I for preliminary steps.

4.4.1 Operation screen

Before operation

During operation

Status screen indicates:

- **Top**:
  1. Access to main menu
  2. Alternately valve tag and mainboard reference, or control mode
  3. Warnings or alarms (if any)
- **Center**: current position of the valve, either CLOSED, opening percentage between 0 and 100%, or OPEN.

  The following functions are used to operate the actuator:

  − decreases / **+** increases the opening target with one or several taps

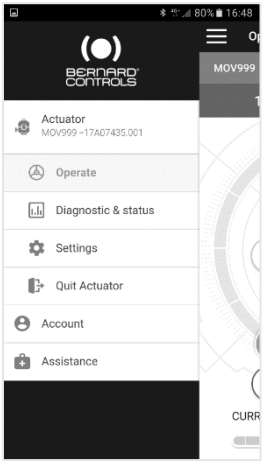
  ⊼ closes / ⊻ opens the valve

  Only with the Positioner option:

  <> drag to define the target position on the dial
- **Bottom**: torque level with a torque gauge

4.4.2 Main menu

You can access the main menu anytime by tapping on .

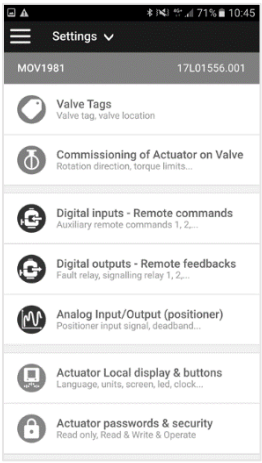


The Main Menu has 3 main sections:

- Actuator
  - Operate: actuator operation
  - Diagnostic & status: status and alarms used
  - Settings: actuator settings
  - Quit Actuator
- Account: account data
- Assistance: assistance information

4.4.3 Settings screen

From the main menu, you can access the settings.



The Settings Menu has 2 main sections:

- **Top Section**: access to main menu, then valve tag and mainboard reference
- **Settings list:**
  - Valve identification
  - Commissioning of valve
  - Inputs / Outputs / Bus
  - Actuator local settings
  - Access code definition
  - Reset to factory data

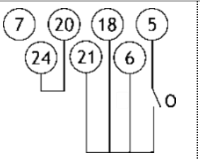
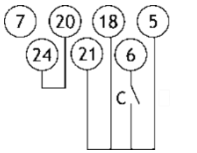
4.5 Remote controls

The BT INTELLI+ remote control system can be operated using an external or internal voltage supply.

The input circuits are fully opto-isolated. The pulse command system requires 4 connecting wires on the client terminal strip: Common, STOP, OPEN, CLOSE. If the STOP local command button is not used, do not connect the STOP wire. The OPEN (or CLOSE) contact must be maintained to operate the actuator.

4.5.1 Single switch control (Dry Contact)

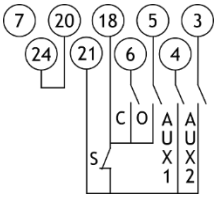
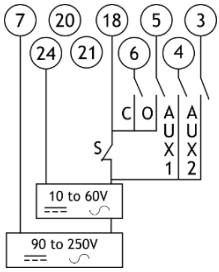
The actuator can be controlled via a single external switch.

Opening	Closing
 **O**: Open	 **C**: Close
• Switch closed: valve opens • Switch open: valve closes	• Switch closed: valve closes • Switch open: valve opens

➔ **The actuator must be configured for the priority type required (open or close), see §5.5.3.**

4.5.2 Remote commands

The open and close commands are self-holding (pulse commands) as a standard configuration.
To remove self-holding, remove wire to terminal 18.

Dry contact control	Voltage control
	
S - Stop **C** - Close **O** - Open	**S** - Stop **C** - Close **O** - Open
A jumper must be fitted across customer terminal **20-24**.	Remote commands can be used either in AC or DC voltage: ➔ Use terminal **24** for voltage from 10 to 60V ➔ Use terminal **7** for voltage from 90 to 250V

! It is imperative to comply with the voltage ranges mentioned above, otherwise components will not function or will be damaged. For AUX1 & AUX2 auxiliary commands, these commands can be assigned to specific functions (see §5.5.1).

4.6 Analog Input/Output (OPTION)

4.6.1 Analog signal types

Some actuator configurations can perform control functions in response to a control signal.

Possible signals	Input impedance (ohms)
4-20 mA **0-20 mA** **4-12 mA** **12-20 mA**	260
0-10V	10000

4.6.2 Positioner configuration

To use this function, Positioner mode must be activated:

- using INTELLI+ menu - **see §5.6.1**
- using Auxiliary Commands set with Proportional/ON-OFF - **see §5.5.1**

The input signal is automatically calibrated on the stroke of the actuator (0 - 100%). There is no need to adjust the operating range of the actuator.

The input signal is isolated from the ON/OFF commands and from the remote position signal.

The actuator can still be operated in ON/OFF mode with the Open, Close and Stop commands or using Proportional control. One of the auxiliary commands must be used to select between these 2 control modes.

In the standard configuration, Auxiliary Command is set on Proportional/ON-OFF to allow the control mode to be selected remotely:

➔ Proportional = Analog control

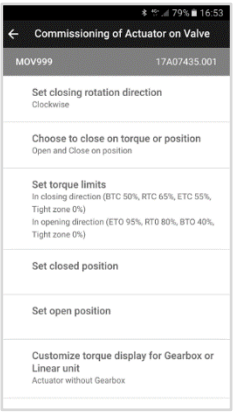
➔ ON/OFF = ON/OFF control.

➔ **For Analog Input/Output settings (e.g. Dead band), see §5.5.**

5 COMMISSIONING

This section describes the commissioning steps using the Control panel, except otherwise mentioned.

The commissioning can be done through the App in the menu **Settings** > **Commissioning of Actuator on valve**.



In order to modify the actuator settings, the control mode must be set to **Local mode**.

Accessing the actuator menu

To change the actuator's settings or check the active warnings and alarms, use the Control Panel or the BC App to access the actuator's menu.

It is your responsibility to set the security of the Local Commands (Control Panel or Smartphone Application) for your process:

- The default position of the **Control selector** button should be on **Remote**
- The **Access Code** of the actuator should have been changed
- The remote command "Local Command Inhibition" (from DCS) should be active

To access the actuator menu, enter the access code.

If you are the end-user:

At the first on-site start, we strongly advise you to modify the default **Bluetooth®** access codes. To proceed to these changes, please follow the 2 following procedures.

Initial access codes are 0000 to check settings or 9000 to modify them.

How to enter the access code with Control panel

1. Turn the left knob to the right and hold.
2. Turn the right knob to the left and to the right.

   The following screen appears.

3. Enter the access code
   a. Set the digit value with ↓ and ↑ on the right knob.
   b. Select with **OK** on the left knob when the value is right.
   c. Set the following digit: 9000.

   If you validate an incorrect value, choose **ESC** with the left knob to reset it.
   d. Once you have set all digits, confirm with **OK** at the bottom of the screen.

   The following screen appears.

How to reset the access codes

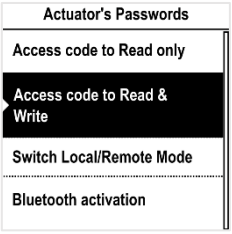
1. If the actuator powered ON for more than 10 minutes, switch it OFF and switch it back ON.
2. When on the operation display, *h*old both the left knob and the right knob during 10s.
   The following screen appears.

3. Select **YES** then validate with **OK**.
   The access codes are now reset to 0000 and 9000 and can be reprogrammed.

How to change the access codes

The Bluetooth® access codes can only be changed using **Read & Write mode**.

1. Go to **Settings** > **Actuator's Passwords**.
   The following screen appears.

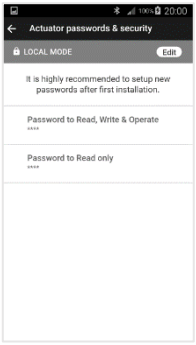


2. Choose the correct access code option to change:
   - **Access code to Read & Write**, or
   - **Access code to Read only**
3. Set each digit value with ↓ or ↑ on the right knob and validate with **OK** on the left knob.

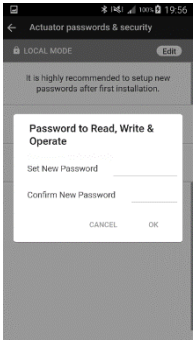
4. When all digits are set, select **Save** and validate with **OK** on the left knob.
5. Return to the main menu or quit the settings with several **ESC**.

How to change the access codes with BC App

1. Go to Main Menu
2. Select **Settings** > **Actuator passwords and security.**
   The following screen appears.



3. Select the Password you want to change.



4. Enter your new password and confirm it.
5. Tap on **OK** to validate.

5.1 Setting the display language

How to change the display language

1. Enter the menu, then navigate to **Settings** > **Language.**
   The following screen appears.

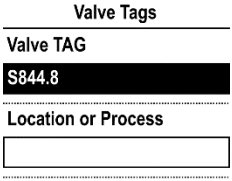
2. Select the language with ↓ or ↑ on the right knob then confirm with **OK** on the left knob.
3. Go to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.2 Valve tags

The actuator valve TAG name and its location or process can be set in **Settings > Valve Tags**.

5.2.1 How to change the valve TAG

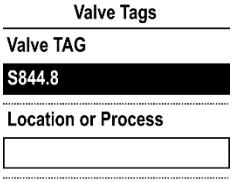
1. Enter the menu, then go to **Settings > Valve Tags.**
   The following screen appears.



2. Select the **Valve TAG** box.
3. Define the **Valve TAG** with ↓ or ↑ on the right knob.
4. Go to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.2.2 How to change the location or process

1. Enter the menu, then go to **Settings > Valve Tags**
   The following screen appears.



2. Select **Location or Process** box.
3. Define the **Location or Process** with ↓ or ↑ on the right knob.
4. Go to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

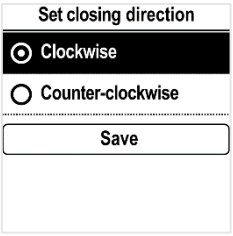
5.3 Actuator Commissioning setting

5.3.1 Setting closing direction

Default setting for closing direction is clockwise. Depending on the application, the closing direction may change.

How to change closing direction

1. Enter the menu and navigate to **Settings** > **Actuator commissioning** > **Set closing direction**.



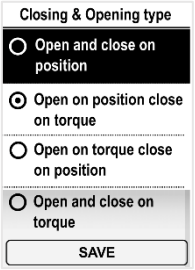
2. Choose the closing rotation direction required, **Clockwise** or **Counter-clockwise** with ↓ or ↑ on the right knob then confirm with **OK** on the left knob.
3. Go to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.3.2 Setting the closing and opening type of end of travel

This section shows the option for the actuator's end of travel setting in both direction (Open and Close): **Position** or **Torque** can be selected.

How to set the closing and opening type

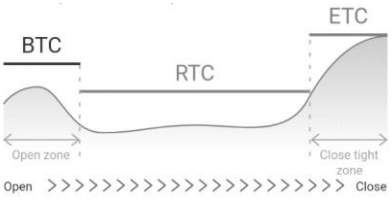
1. Enter the menu, then go to **Settings** > **Actuator commissioning** > **Closing & Opening type**.

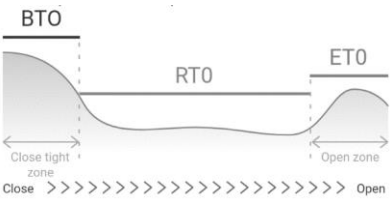


2. Select your option with ↓ or ↑ on the right knob then confirm with **OK** on the left knob.
3. Select **Save** then validate with **OK** on the left knob.

5.3.3 Setting the torque limits

This setting allows to set torque limits at the main steps of the travel: at the beginning (**Break**), during the travel (**Run**) and at the end of the travel (**End**).





Limits are:

- In closing direction:

Break to Close (**BTC**), Run to Close (**RTC**), End to Close (**ETC**), Tight zone

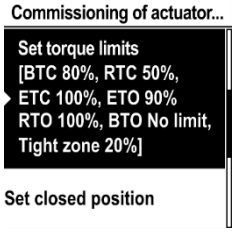
- In opening direction:

Break to Open (**BTO**), Run to Open (**RTO**), End to Open (**ETO**), Tight zone

To ensure unseating, the Break percentage should be superior to the Tight zone percentage.

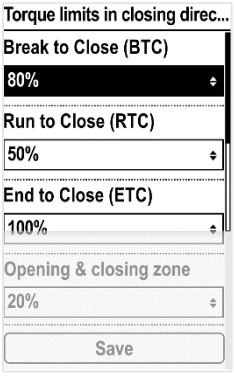
How to set torque limits

1. Enter the menu, then navigate to **Settings** > **Actuator Commissioning.**
2. Select **Set torque limits** and validate with **OK** on the left knob.



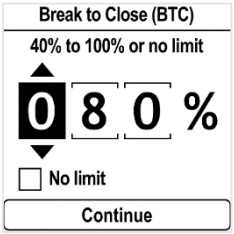
3. Select closing or opening direction and validate with **OK** on the left knob.

   The following screen appears.



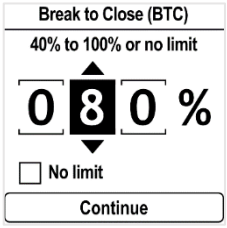
4. Select the limit to modify with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

   The following screen appears.

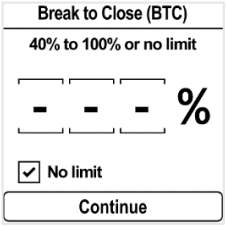


5. To set the **Break** limits

   - Set the 1st digit on **0** or **1** with ↓ or ↑ on the right knob then validate with **OK**



   - Set the 2nd & 3rd digits with ↓ or ↑ on the right knob then validate each with **OK.**
     The **No limit** checkbox is filled in when the option is selected.
   - To set **No limit**, make sure the checkbox is filled in, validate with **OK** and confirm using **OK** again.

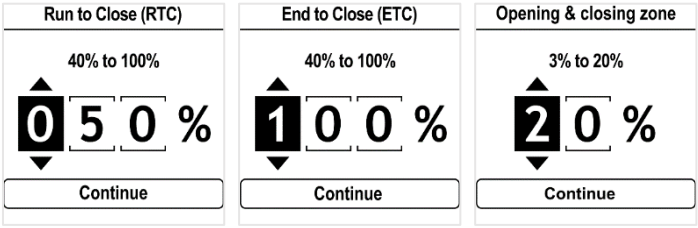


   To correct the set value, go to the 3rd digit with ↑ then to the previous digits with **ESC** and review **a.** or **b.** sub-steps to set a new value.

   When done, go to **Continue** with ↓ then validate with **OK** on the left knob.

The torque limit settings page appears.

6. To set the **Run** limit, the **End** limit, and the **Tight zone:**



Set each digit value with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

Validate **Continue** with **OK** on the left knob.

7. When all limits are set, select **Save** and validate with **OK** on the left knob.

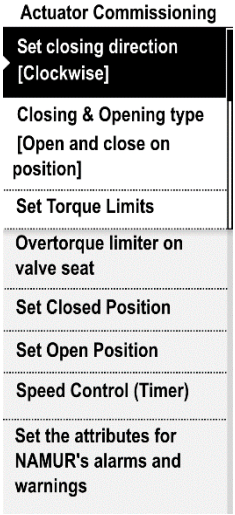
5.3.4 Setting the over-torque limiter

The over torque limiter allows to stop the actuator in anticipation of the set torque limit. If the actuator is stopped at the torque limit, the effect of the inertia could lead to an actual torque on the valve seat higher than the limit set.

How to set the over torque limiter

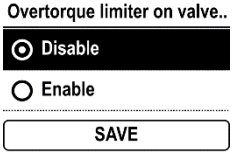
1. Enter the menu, then navigate to **Settings** > **Actuator Commissioning.**

   The following screen appears.



2. Select **Overtorque Limiter on valve seat.**

   The following screen appears.



3. Select **Enable** / **Disable** then confirm with **OK** on the left knob.
4. Go to **Save** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.3.5 Setting the open and closed positions

The BT INTELLI+ features a position sensor. To set end positions, the OPEN and CLOSED positions need to be set one after another, depending on the first one set.

How to set CLOSED and OPEN position

1. Enter the menu, then navigate to **Settings** > **Actuator Commissioning** > **Set closed position** (depending on your needs).

   The following screen appears.

2. Close the valve using the closing knob.
3. When the valve is closed, validate **Save** with **OK** on the left knob.

   The following screen appears.

4. Select **Confirm** with **OK** on the left knob.

   The following screen appears.

5. Open the valve using the opening knob.

An indication of stroke angle appears.

The position can be set with **OK** on the left knob at any moment.

However, if the stroke you set is too small, the following error screen appears.

Select **Try again** with **OK** on the left knob and continue to open the valve.

When the correct position is reached, select **Save** with **OK** on the left knob.

The following screen appears.

6. Select **Confirm** with **OK** on the left knob.

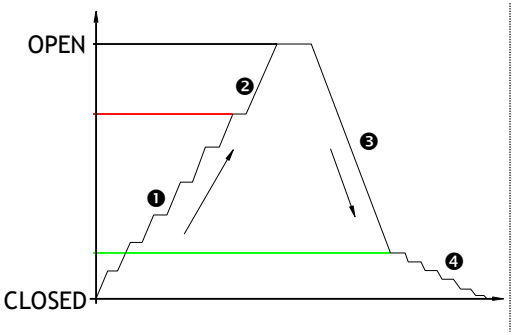
Closing and opening positions are set.

➔ **Once end positions are set, proceed to an operation in each direction to check the settings.**

5.3.6 Setting the speed control (Timer)

Speed control allows to reduce the actuator's operation speed, for instance to protect a pipe from water hammering.

You can set travel sections with reduced opening or closing speed.



The following options are available.

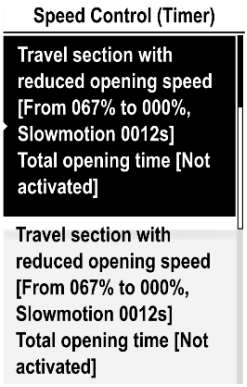
- Beginning of slow-motion zone (opening/closing direction)
- End of slow-motion zone (opening/closing direction)
- Slow-motion duration

Total opening/closing time is the result of slow-motion duration and normal speed duration.

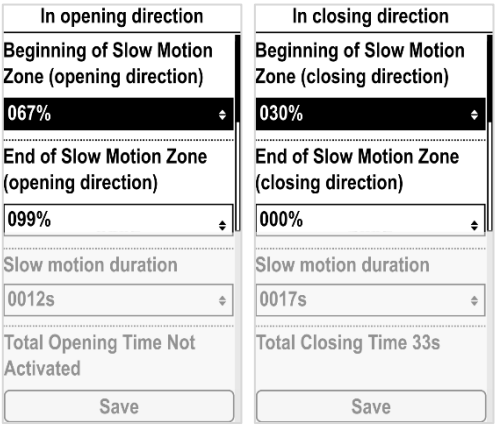
How to set the timer

1. Enter the menu, then navigate to **Settings** > **Actuator Commissioning** > **Speed Control (Timer)**.

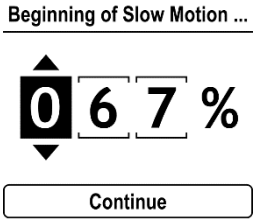
   The following screen appears.



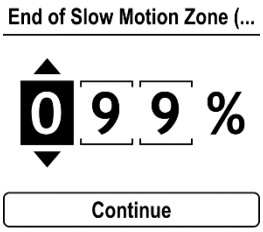
2. Select either opening or closing direction and confirm with **OK** on the left knob.
   The following screen is displayed.



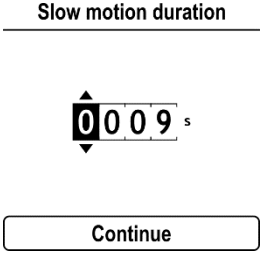
3. Select **Beginning of Slow-Motion Zone**.
   The following screen appears.



4. Set the position in % between Closing (0%) and Opening (100%) and confirm with **Continue**.
5. Select **End of Slow-Motion Zone**.
   The following screen appears.



6. Set the position in % between Closing (0%) and Opening (100%) and confirm with **Continue**.
7. Select **Slow motion duration**.
8. The following screen appears.



9. Set the duration then confirm with **Continue**.

The total operating time will be calculated and is shown in the Total Opening Time screen (for total opening or closing time).

If “not activated” is displayed, the slow-motion duration defined is too short.

10. Go to **Save** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.3.7 Setting NAMUR alarms and warnings

For each alarm or warning, the following setting options are available:

Failure

High severity: Signal invalid due to malfunction in of the device, sensor or actuator.

Out of specification

Medium severity: Permissible ambient or process conditions exceeded or the measuring uncertainty of sensors or deviations from the set value in actuators is greater than expected.

Maintenance required

Low severity (advisory): Although the signal is valid, the remaining life is nearly exhausted, or a function will soon be restricted due to operational conditions.

Check function

Signal temporarily invalid due to on-going work on the device.

How to set any alarm or warning

1. Enter the menu, then go to **Settings** > **Actuator Commissioning** > **Set the attributes for NAMUR's alarms and warnings.**

2. Select an alarm or warning among the list of configurable faults below and validate with **OK** on the left knob:

- Memory Configuration Fault
- Memory Activity Fault
- Valve jammed
- Partial Stroke error
- Lost Phase
- Position Fault
- Error in Closing Direction
- Error in Opening Direction
- Motor blocked in closing direction
- Motor blocked in opening direction
- Motor is hunting
- Low Battery Error
- Position Sensor Fault
- Torque Sensor Fault
- Loss of 4-20 mA signal
- Overtravel
- Temperature out of specification
- Mainboard-HMI communication
- Thermal overload
- Handwheel action
- Fieldbus Redundancy Error
- Fieldbus communication
- Vibration Overload Error
- 24V Auxiliary Supply Fault
- Excessive Number of Starts
- Auxiliary Command 2
- Power outage
- Fault on Local Command Buttons
- Phases non-conformity
- Selector in LOCAL mode
- Selector in OFF position
- Torque approaching the limit

3. The following screen appears.

4. Choose the desired setting with ↓ or ↑ on the right knob, then navigate to **Save** and validate with **OK** on the left knob.
5. Choose **YES** to confirm when on the confirmation screen.

5.4 Setting the buttons and display

The buttons and display settings can be selected in **Settings > Buttons and display**.

5.4.1 How to change the language

In addition to the **Settings > Language** screen, the language display can be selected in this menu.

1. Enter the menu, then go to **Settings** > **Buttons and Display**. The following screen appears.

2. Select **Language** and validate with **OK** on the left knob**.**
   The following screen appears.

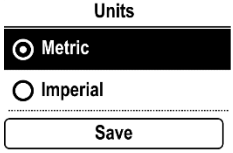
3. Choose the desired language with ↓ or ↑ on the right knob and confirm with **OK** on the left knob.
4. Go to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.4.2 How to change the units between metric and imperial

The unit of measure can be changed between metric or imperial.

1. Enter the menu, then navigate to **Settings** > **Buttons and Display**.
   The following screen appears.

2. Select **Units** and validate with **OK** on the left knob.
   The following screen appears.



3. Choose the appropriate units with ↓ or ↑ on the right knob and validate with **OK** on the left knob.
4. Go to **Save** with ↓ or ↑ on the right knob and confirm with OK.

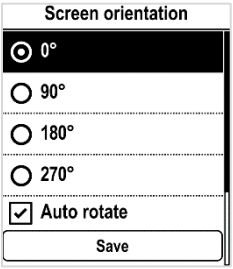
5.4.3 How to change the orientation of your display

The display orientation can be modified according to the physical orientation of your actuator.

1. Enter the menu, then go to **Settings** > **Buttons and Display**. The following screen appears.

2. Select **Screen orientation** and validate with **OK** on the left knob**.**

   The following screen appears.



3. Select the rotation angle matching the actuator orientation or select **Auto rotate**.

Angle values are counterclockwise.

4. Validate with **OK** on the left knob, then **Save** and confirm.
   The following screen appears.

5. Select **YES** then validate with **OK** on the left knob.
   The display rotates accordingly.

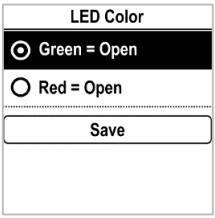
5.4.4 How to choose green or red LED color for open position

The LED color configuration can be adjusted depending on the local standards.

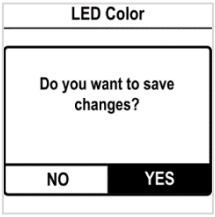
How to set LEDs configuration

1. Enter the menu, then go to **Settings** > **Buttons and Display.**
   The following screen appears.

2. Go down in the menu to **LED color** and validate with **OK** on the left knob.
   The following screen appears.



3. Select the corresponding setting and validate with **OK** on the left knob.
4. Go to **Save** and validate it.
   The following screen appears.

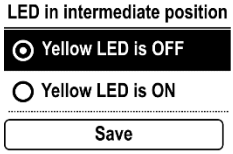


5. Select **YES** and validate.

5.4.5 How to activate yellow LEDs for intermediate position

1. Enter the menu, then go to **Settings** > **Buttons and Display.**
   The following screen appears.

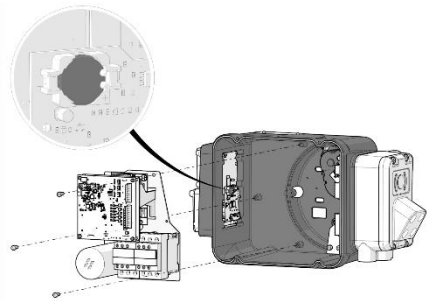
2. Go down in the menu to **LED in intermediate position** and validate with **OK** on the left knob.
   The following screen appears.



3. Select the appropriate setting then validate with **OK** on the left knob.

4. Got to **Save** and validate.
   The confirmation screen appears.
5. Select **YES** and validate.

5.4.6 How to set the date



A battery located under the INTELLI+ board allows the date to be saved.

The battery's life cycle is 10 years. When it is almost empty (> 1.95 V), the "Low Battery error" alarm will appear.

The date of the actuator can be configured in **Setting > Date set-up**.

1. Enter the menu, then navigate to **Settings** > **Buttons and Display.**
   The following screen appears.

2. Navigate down the menu to **Date set-up** and validate with **OK** on the left knob.

   The following screen appears.

3. Select the Day, Month and Year, configure them with ↓ or ↑ on the right knob and confirm with **OK** on the left knob.
4. Go to **SAVE** with ↓ or ↑ on the right knob and validate with **OK** on the left knob.

5.4.7 How to set the time

Similarly to the date, the time is also saved internally as long as the battery is in good working condition (see §5.4.6).

The time can be configured in the actuator in **Setting > Set Time**.

1. Enter the menu and navigate to **Settings** > **Buttons and Display.**

   The following screen appears.

2. Go down in the menu to **Set Time** and validate with **OK** on the left knob**.**

   The following screen appears.

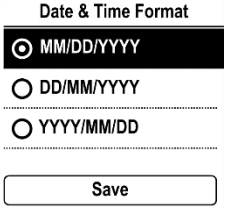
3. Select the hour, minute and second with ↓ or ↑ on the right knob and confirm with **OK** on the left knob.
4. Navigate to **SAVE** with ↓ or ↑ on the right knob then validate with **OK** on the left knob.

5.4.8 How to set the date and time format

The date and time format can be configured in **Setting > Date & Time Format**.

1. Enter the menu, then go to **Settings** > **Buttons and Display.**
   The following screen appears.

2. Go down in the menu to **Date & Time Format** and validate with **OK** on the left knob**.**
   The following screen appears.



3. Select the desirable format with ↓ or ↑ on the right knob and confirm with **OK** on the left knob.
4. Navigate to **SAVE** with ↓ or ↑ on the right knob and validate with **OK** on the left knob.

5.4.9 How to set the button mode

The button mode can be configured in **Setting > Button mode**.

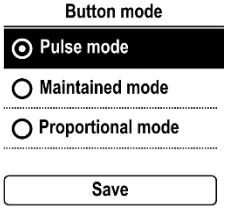
The following modes are available:

- **Pulse mode**: turn and release the knob to send a command.
- **Maintained mode**: turn and hold the knob to send a command. The command will stop when the knob is released.
- **Proportional mode**: turn the knob to define a precise target percentage of opening.

1. Enter the menu and navigate to **Settings** > **Buttons and Display.**

   The following screen appears.

2. Go down in the menu to **Button mode** and validate with **OK** on the left knob.
   The following screen appears.

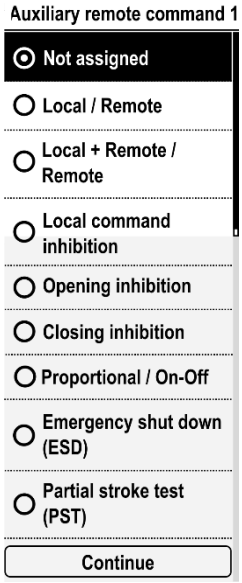


3. Select the desirable format with ↓ or ↑ on the right knob and confirm with **OK** on the left knob.
4. Go to **SAVE** with ↓ or ↑ on the right knob and validate with **OK** on the left knob.

5.5 Setting Remote commands

5.5.1 Setting Auxiliary Remote commands

To set Auxiliary Remote commands, navigate to **Settings** > **Remote Commands > Auxiliary Remote Commands 1** or **2.**



The following options are available:

- **Local / Remote** option enables remote control or local control from a remote location.
- **Local + Remote / Remote** option enables remote and local control from a remote location.
- **Local command inhibition** option allows a remote command to override local commands, even if Local/Remote selector is on Local on the actuator.
- **Opening inhibition** prevents the actuator from opening.
- **Closing inhibition** prevents the actuator from closing.
- **Proportional / On-Off** allows to control the equipment either with the positioner function (e.g. 4-20 mA), or with Open / Close / Stop controls.
- **Emergency Shutdown (ESD)** option allows to set up the ESD, which is a security command. You can choose between open, close, or stayput.
- **Partial Stroke test (PST)** option allows to set up the PST, which triggers a small stroke in the direction of your choosing. You can choose the percentage of travel, and the duration of this travel (e.g. 10% in 30 sec).

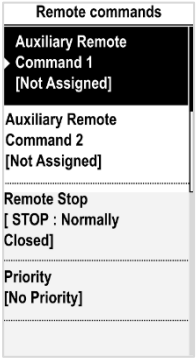
5.5.2 Setting Remote Stop command

Only in hardwired control mode (i.e. not in bus mode), remote stop allows to stop the actuator both in normally open and normally closed configurations. Remote stops are performed by opening a contact (whereas the open or close command is made by closing a contact).

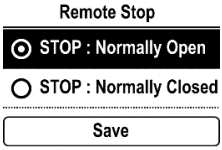
> The open and close commands have priority over the stop command.

How to set the remote stop command

1. Navigate in the menu to **Settings > Remote Commands.**
   The following screen appears.



2. Go down in the menu, select **Remote Stop** and validate with **OK** on the left knob.
   The following screen appears.



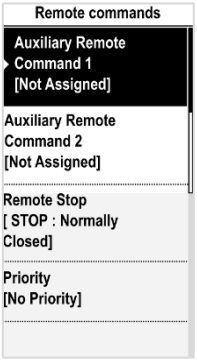
3. Select the **STOP** mode: **Normally opened** or **Normally closed**.
4. Go down to **Save** and validate with **OK** on the left knob.
   The confirmation screen appears.
5. Select **YES** and validate.

5.5.3 Setting Priority for remote commands

Priority allows to reverse the direction of travel when an operation is in progress without having to stop the actuator.

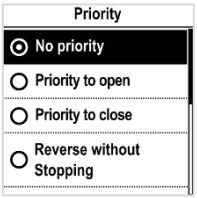
How to set priority for remote command

1. Navigate in the menu to **Settings** > **Remote commands**. The following screen appears.



2. Go down in the menu list, select **Priority** and validate with **OK** on the left knob.

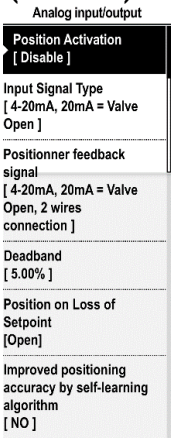
   The following screen appears.



3. Select the priority action in the list then validate with **OK** on the left knob.
4. Go down to **Save** and validate with **OK** on the left knob. The following screen appears.

5. Select **YES** and validate.

5.6 Setting the Analog Input/Output function (OPTION)



If you have an optional analog input/output board or double analog input/output board, go to **Settings** > **Analog input/output** to activate and configure the different necessary functions.

5.6.1 Analog Input/Output - Activating the positioner

If present, the actuator can operate in positioner mode using a proportional command such as a 4-20 mA analog signal.

How to activate the positioner function

> If you are using an auxiliary remote command, the positioner function is automatically activated or de-activated depending on the auxiliary command.

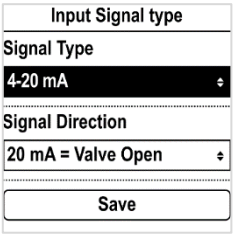
1. From the **Analog Input/Output** menu, enter **Positioner Activation**.
   The following screen appears.

2. Select **Enable** and confirm with **OK** on the left knob.
3. Go to **Save** then validate with **OK** on the left knob.
   The confirmation screen appears.
4. Select **YES** then validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

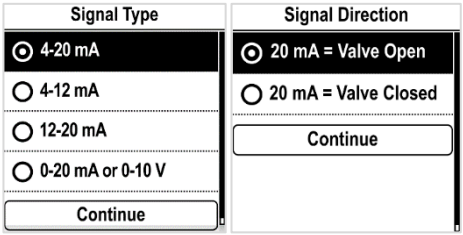
5.6.2 Setting the Analog Input/Output signal

How to set the Input Signal

1. From the **Analog Input/Output** menu, enter **Input Signal Type**.
   The following screen appears.

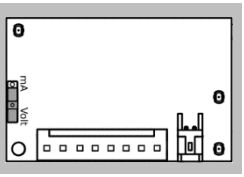


2. For the **Signal Type** and **Signal Direction** settings:
   - Select the setting to adjust and validate with **OK** on the left knob.
     The corresponding setting screen appears.



   - Select the desired option and validate with **OK** on the left knob.

> If you choose **0-20mA or 0-10V**, the switch on the positioner board needs to be switched from the **mA** to the **Volt** position.



   - The **Continue** button is highlighted, validate with **OK** on the left knob.
   - The display goes back to **Input signal type** screen.

3. Navigate to **Save** and validate with **OK** on the left knob.

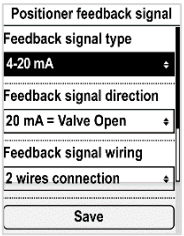
The confirmation screen appears.

4. Select **YES** then validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

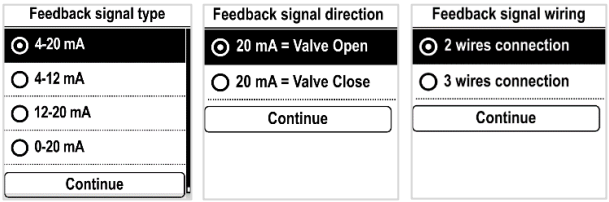
5.6.3 Setting the Analog Input/Output positioner feedback signal

How to set Positioner Feedback signal

1. From the **Analog Input/Output** menu, enter **Positioner feedback signal**.
   The following screen appears.



2. For the **Feedback Signal Type**, **Feedback Signal Direction** and **Feedback Signal Wiring** settings:
   - Select the setting to adjust and validate with **OK** on the left knob.
     The corresponding setting screen appears.



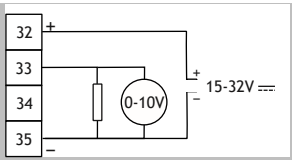
   - Select the desired value and validate with **OK** on the left knob.
   - The **Continue** button is highlighted, validate with **OK** on the left knob.
     The display goes back to **Input signal type** screen.

3. Navigate to **Save** and validate with **OK** on the left knob.
   The confirmation screen appears.

4. Select **YES** and validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

The 0-10V signal can be obtained using a 0-20mA combined with a 500-ohm (or 499 ohm 1%) resistor.

The power supply needs to be 15 to 32V.



5.6.4 Setting the Analog Input/Ouput dead band

The dead band value represents the range over which the actuator allows the input signal to deviate from the actual actuator position without making any correction. This setting is made at the factory, but it is possible to adjust it.

➔ If the dead band is too narrow, the actuator could hunt, moving back and forth in an attempt to reach the input signal value without stopping within the dead band.

➔ If the dead band is too wide, positioning operations are less precise.

The default dead band is 1%.

How to set the dead band

1. From the **Analog Input/Output** menu, enter **Deadband**.
   The following screen appears.

2. For each digit
   - Select the digit to adjust.
   - Adjust the digit with ↓ or ↑ on the right knob.
   - Validate with **OK** on the left knob.

   When the last digit is validated, **Save** is highlighted.

3. Validate with **OK** on the left knob.
   The confirmation screen appears.
4. Select **YES** then validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

5.6.5 Analog Input/Output Fail-Safe position

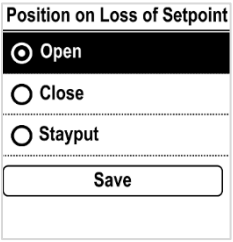
When a 4-20 mA input signal is used, it is possible to set up a fail-safe position if the input signal is lost.

This function cannot be used with 0-20 mA signals, as the system cannot discern a lost signal from a 0-mA value.

This function is active in the standard configuration and the actuator remains in its position if the input signal is lost.

How to set the Position on Loss of Setpoint

1. From **Analog Input/Output** menu, enter **Position on Loss of Setpoint**.
   The following screen appears.



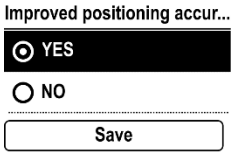
2. Select the desired value and validate with **OK** on the left knob.
3. Navigate to **Save** and validate with **OK** on the left knob.
   The confirmation screen appears.
4. Select **YES** and validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

5.6.6 Analog Input/Output Improved positioning accuracy

It is possible to improve the actuator's positioning accuracy over time with its self-learning algorithm.

How to set the improved positioning accuracy by self-learning algorithm

1. From the **Analog Input/Output** menu, enter **Improved positioning accuracy by self-learning algorithm**.
   The following screen appears.



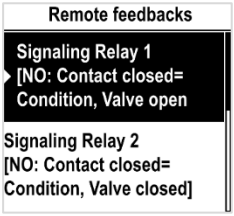
2. Select YES or NO and validate with **OK** on the left knob.
3. Go to **Save**, then validate with **OK** on the left knob.
   The confirmation screen appears.
4. Select **YES** then validate with **OK** on the left knob.
   The **Analog Input/Output** menu is then displayed.

5.7 Setting the Relays configuration

There are four available relays that can be configured for specific signaling functions: one fault relay and three signaling relays.

How to set fault relay

1. Navigate in the menu to **Settings > Remote Feedbacks**.
   The following screen appears.



2. Select **Fault Relay** and validate with **OK** on the left knob.

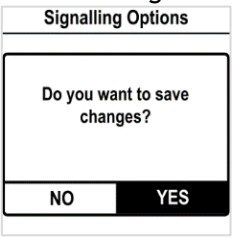
The **Fault Relay** screen appears.

Select the fault options among the list below:

- Overtravel
- Memory Configuration Fault
- Memory Activity Fault
- Excessive Number of Starts
- 24V Auxiliary Supply Fault
- Fault on Local Command Buttons
- Position Fault
- Motor is hunting
- Phases non-conformity
- Auxiliary Command 2
- Handwheel action
- Temperature out of specification
- Torque Sensor Fault
- Position Sensor Fault
- Motor blocked in opening direction
- Motor blocked in closing direction
- Error in Opening Direction
- Error in Closing Direction
- Lost Phase
- Thermal Overload
- Valve jammed
- Loss of 4-20 mA signal
- Mainboard-HMI communication
- Fieldbus communication
- Power outage
- Partial stroke error
- Low Battery error
- Fieldbus Redundancy Error
- Vibration Overload Error
- Selector in LOCAL mode
- Selector in OFF position
- Torque approaching the limit

3. Several options can be selected by navigating to the options and selecting each one with **OK** on the left knob.

4. Go to **Save** and validate with **OK** on the left knob.
   The following screen appears.

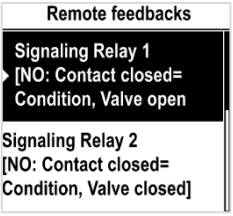


5. Select **YES** and validate with **OK** on the left knob.

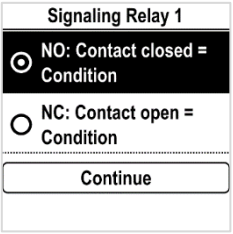
How to set the signaling relays configuration

Following procedure runs through the procedure for the 3 standard relays installed. Apply the same procedure for optional relays.

1. Navigate in the menu to **Settings** > **Remote feedbacks**.
   The following screen appears.



2. To set a signaling relay, select it and validate with **OK** on the left knob.
3. The following screen appears.



4. To set the condition, select **Contact closed** or **Contact open** option then validate with **OK** on the left knob.

5. Select **Continue** and validate with **OK** on the left knob.
   The following screen appears.

6. Select an option in the below list.
   For standard relays, the available options are:

- Valve open
- Valve closed
- Torque limiter – Opening direction
- Torque limiter – Closing direction
- Actuator is opening
- Actuator is closing
- Actuator is running
- Intermediate position indication
- ESD command received
- OFF mode
- Local mode
- Remote mode
- Stopped in intermediate position
- Motor Thermal Overload
- Jammed Valve
- Phase Loss
- Power ON
- Handwheel action
- Actuator controlled by Fieldbus
- Overtravel
- Signaling battery is low
- PST in progress
- PST fault
- Namur: Maintenance Required
- Namur: Function Check
- Namur: Out of Specifications
- Namur: Failure
- Loss of Analog setpoint signal
- Relay operated by Fieldbus

7. Several options can be selected by navigating to the option and selecting each one with **OK** on the left knob.

8. Go to **Save** and validate with **OK** on the left knob.
   The following screen appears.

9. Select **YES** and validate with **OK** on the left knob.

5.8 Setting the forced local mode with BC App

The feature allows you to use BC App to switch from Remote to Local mode without physically switching the position of the selector from Remote to Local.

2 conditions are necessary to use Forced local mode:

a) Allowing the switch to Local mode with the actuator button OR Bluetooth

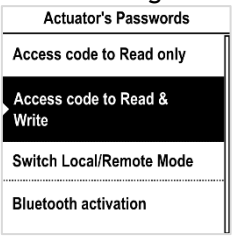
b) Switch to Local mode within BC App

5.8.1 Switch Local/Remote Mode

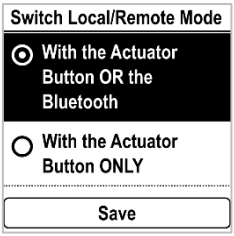
How to allow switch local/remote mode

1. Navigate in the menu to **Access code to Read and Write**
2. Go to **Settings** > **Actuator's Passwords.**

   The following screen appears.



3. Go down in the menu to **Switch Local/Remote Mode** and validate with **OK** on the left knob.
4. The following screen appears.



5. To allow switch to Local/Remote control with BC App, select **With the Actuator Button OR the Bluetooth** or **With the Actuator Button ONLY**, then validate with **OK** on the left knob.

6. Go to **Save** and validate it.
   The following screen appears.

7. Select **YES** and validate with **OK** on the left knob.

5.8.2 Switching to Local control within BC App

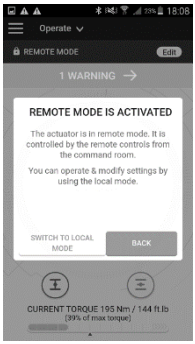
You can only proceed to this operation if the **Control selector** is on **Remote** on the actuator and the actuator's **Switch Local/Remote Mode** is set to **Switch to local mode allowed**.

How to switch to Local control with App

1. Navigate to the **Operate** screen.

If the switch is inhibited, an **Info** button replaces the **Edit** button.

2. Tap on **Edit**. The App asks for confirmation.



3. Tap on **Switch to Local Mode**.

   Remote mode becomes **Local mode**.

   The actuator can now be operated as if it was set on **Local mode**.

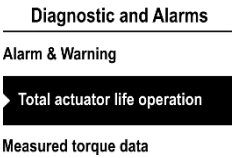
ⓘ To get back to **Remote mode**, simply tap again on the **Edit** button.

6 OPERATION

6.1 Diagnostic & Alarms

The Local control panel features a **Diagnostic & Alarms** section which includes:

- Alarms and Warnings
- Total actuator life operation
- Measured torque data



6.1.1 Alarms and Warnings

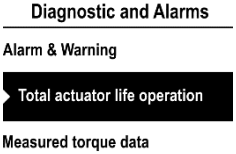
There are two types of alarms and warnings that can be visualized: active and inactive alarms & warnings. Up to 50 recent alarms & warnings are available on the display.

On INTELLI+, alarms and warnings are based on the NAMUR standard.

You can configure the alarms and warnings based on the four types of status signals defined by this standard (see §5.3.7).

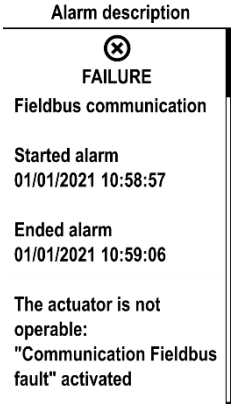
How to obtain information on an alarm or warning

1. Navigate in the menu to **Diagnostic and Alarms**.
   The following screen appears.



2. Select **Alarm and Warning**.
3. Select the alarm or warning in question and validate with **OK** on the left knob.

4. An **Alarm Description** screen appears:

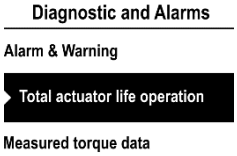


5. On this screen, the following information is available:
   - NAMUR status signal icon with its indication
   - A brief description of the alarm/warning
   - Date and time of start and end of alarm
   - Details of the alarm/warning

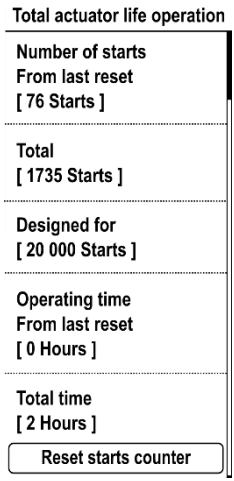
6.1.2 Total actuator life operation

How to see the total actuator life operation

1. Navigate in the menu to **Diagnostic and Alarms**.
   The following screen appears.



2. Select **Total actuator life operation**.
   The following screen appears.

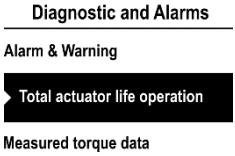


3. On this screen, the following information is available:
   - Number of starts from last reset
   - Total number of starts since the beginning of the operation
   - Number of starts the actuator is designed to operate
   - Partial operating time (operating time from last reset)
   - Total operating time since the beginning of the operation

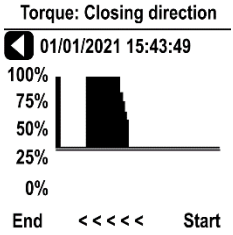
6.1.3 Measured torque data (torque logging)

How to see the measured torque data graphs

1. Navigate in the menu to **Diagnostic and Alarms**.
   The following screen appears.



2. Select **Measured torque data** and validate with **OK** on the left knob.
3. Choose either **Opening direction** or **Closing direction**.
4. The 50 last torque graphs (~200 points) can be visualized in both directions. To see the next graph, use **OK** on the left knob.



6.2 Emergency Manual Command

The BT actuators feature a handwheel for emergency operation.

To avoid potential protruding parts during electrical operation that could lead to injury, the BT handwheel feature a foldable handle: it can be folded during electrical operation and unfolded it manual operation is necessary.

!

- Beware, the declutch is automatic. Use the Manual Command only when the electric motor commands are inactive or the local knob is on **OFF**.
- When using the Positioner option, all movement superior to 5% with the handwheel will start an alarm and will prevent electrical operation.
  To correct this, return to the previous position.

6.3 Local control operation

To use:

- Local control mode with Control panel
  ➔ **see §4.3**
- Local control mode with Smartphone
  ➔ **see §4.4**
- Forced Local control mode from Remote mode, with Smartphone:
  ➔ **see §5.8 - how to allow modes switch then switch modes, and §4.4 to use Local mode with Smartphone**

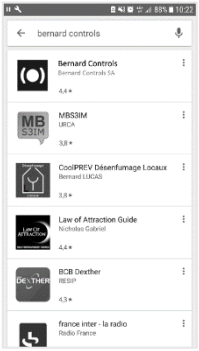
APPENDIX

I. Starting with BC App

Installing the application

An Internet connection is required on your smartphone.

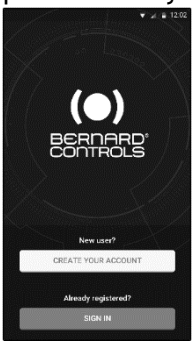
1. Go to your app store and search for **“Bernard Controls”.**



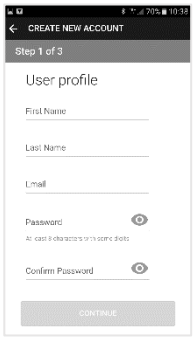
2. Once found, download and install **BC App**.

Once installed, start the App. Log in or follow the free account creation screen sequence if it is your first start.

>



>

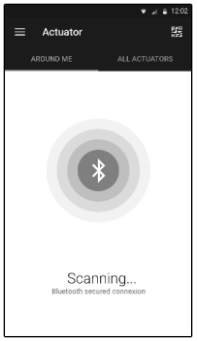


>...

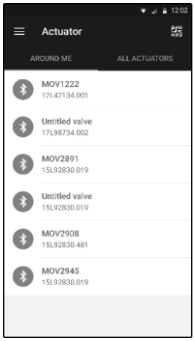
Connecting to the actuator

Once the account is confirmed, your smartphone is ready to connect to the actuators. Connection to the actuators is achieved with Bluetooth®.

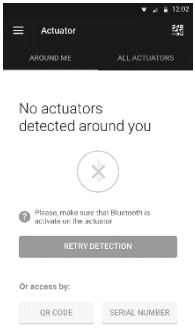
1. Start the App and log into your account.
2. Once logged in, the App will start to scan for nearby actuators.
3. If the desired actuator is found, select it.
   If not, retry, or scan the actuator QR code on the sticker, or enter its serial number.



>

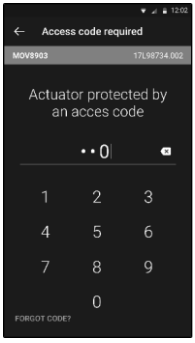


or



4. Check that you are connected to the correct actuator (the 2 LEDs in front of the actuator should blink and the Bluetooth icon on the screen has between +), then enter the Access code.

>



II. Alarms and Settings menu tree (options not detailed)

Level 1	Level 2	Level 3
Diagnostic and Alarms	Alarm and Warning	
	Total actuator life operation	
	Measured torque data	
Settings	Language	
	Valve tags	• Valve tag • Location and process
	Actuator commissioning	• Set closing direction • Closing & Opening Type • Set torque limits • Overtorque Limiter on valve seat • Set closed position • Set open position • Speed Control (Timer) • Set the attributes for NAMUR's alarms and warnings
	Remote commands	• Auxiliary remote commands 1 • Auxiliary remote commands 2 • Remote stop • Priority
	Remote feedbacks	• Fault Relay • Signaling relay 1 • Signaling relay 2 • Signaling relay 3

OPTIONS	Analog input/output	• Position Activation • Input Signal Type • Positioner feedback signal • Deadband • Position on loss of setpoint • Improved positioning accuracy by self-learning algorithm
	Profibus	*Refer to appropriate guide*
	Modbus	*Refer to appropriate guide*
	HART	*Refer to appropriate guide*
	Buttons and display	• Language • Units • Screen orientation • LED Color • LED in intermediate position • Date set-up • Set Time • Date & Time Format • Button mode
	Actuator's Passwords	• Password to Read only • Password to Read & Write • Bluetooth Local/Remote security • Bluetooth activation
	Factory data *(For more detail, see Appendix IV.)*	• Actuator type • Mechanical features • Motor features • Electrical features • Firmware

III. Diagnostic and Alarms list

This list can be modified, see §5.7.

System alarms (Fault Relay)	Warnings
• Locked motor in open direction • Locked motor in close direction • Torque sensor fault • Position sensor fault • Abnormal rotation direction in Opening • Abnormal rotation direction in Closing • Configuration memory fault • Lost phase (3-phase motor) • Thermal overload • Valve jammed • Lost signal 4-20mA • Communication fault between main board and HMI • Communication Fieldbus fault • Loss of main power • Communication between the Main board and the Fieldbus board	• Overtravel • Activity memory fault • Excessive number of starts • Auxiliary power supply fault for external circuits • Local Button fault • Selector Off activated • Selector Local activated • Position fault (<-10% and >110%) • Auxiliary command 2 internal error • Actuator hunting action detected • Handwheel action

IV. Factory data menu tree

Level 1	Level 2
Actuator Type	• Type • Control type • Serial number • Manufacturing date
Mechanical features	• Max Torque • Output Speed (rpm) • Operating time • Protection Type • Protection • Ex Certificate • Duty Class • Max Temperature • Min Temperature • Output Flange • Environment Corrosivity • Lubricant Type • Lubricant Quantity
Motor features	• Supply • Voltage (V) • Frequency (Hz) • Motor speed (rpm) • Motor power (kW) • Motor Duty • Nominal Current (A) • Starting Current (A)
Electrical features	• Wiring Diagram • Dimensional Drawing • AI/AO Board • 4 Extra Relay Board • Bus type
Firmware	• Profibus/Modbus/HART board version (OPTIONS) • Main board version • HMI board version • INTELLI+ version

NOTES

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