ADDITION TO
# INSTALLATION AND OPERATION INSTRUCTION
FlowCon SM with BACnet actuator

The BACnet PICS document can be found at www .flowcon. com. Please see Installation and Operation Instruction for FlowCon SM 1/2"-1 1/2" or for FlowCon SM 2"-6" to learn about installation of the valve; fitting and orientation of the actuator; wiring instructions; basic functions and programming via the buttons on the actuator.

Important actuator setup.

At first start-up please make sure to enter the programming menu and setup/program steps 13 to 16 according to the BACnet system settings. Please note, that the number in step 16 must be unique to the network. The rest of the setup options can be programmed through the BACnet connection.

Wiring instructions for the BACnet connection


```
- - - - - - - •  Black    ⌒   Common
- - - - - - - •  Red      |   A +
- - - - - - - •  White    ⌄   B -
```
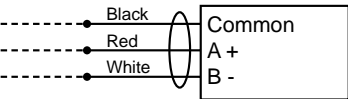
Programming menu (continued).

To enter the programming menu, please simultaneously press (→) and (←) for 6 seconds, until bottom line blinks. Generally press (→) to accept value and go to next step. To change value please press △ or ▽ keys. Press (→) and (←) simutaneously for 6 sec. to exit programming menu.

Step	Display	Description	Values
13	* BAUD / 76800	Select communication speed. *scrolling top: SELECT BAUD RATE*	Default: 9600. Options: 9600, 19200, 38400, 76800.
14	* MAC / 000	Select MAC address. *scrolling top: SELECT MAC ADDRESS*	Default: 000. Options: 000-254.
15	* DEVICE / NO	Change of device instance. *scrolling top: CHANGE DEVICE INSTANC*	Default: NO. Options: YES or NO. *Device instance is changed in step 16.*
16	* DEVICE / 0497000	Select device instance. *scrolling top: SELECT DEVICE INSTANC*	Default: 0497000. Change one digit at a time. Press (→) and (←) to move between digits.
17	* OUT OF / 15	Select out-of-service time-out. *scrolling top: OUT OF SERVICE IN MIN*	Default: 15. Options: 1-60. Please re-start actuator for changes to take effect.

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Programming
of the actuator through BACnet.

Please note that change of settings through BACnet is not available while one of the menus is entered on the actuator itself.

In this instruction:
AV = Analog Value
BV = Binary Value
MSV = Multi-State Value.
Default values are underlined.

Choose which valve the actuator is mounted on in MSV.38 (programming menu step 2).
Options:
    1 = SM.0.0 (no valve)
    2 = SM.1.1
    3 = SM.2.1
    4 = SM.3.0
    5 = SM.3.1
    6 = SM.3.2
    7 = SM.4.1
    8 = SM.4.2
    9 = SM.4.3
   10 = SM.5.1
   11 = SM.5.2

Choose relevant unit in MSV.39 (programming menu step 3).
Options:
    1 = l/sec
    2 = GPM
    3 = l/hr

Choose operational direction in BV.17 (programming menu step 10).
Options:
    0 = NO (normally open)
    1 = NC (normally closed)

Choose maximum flow rate in AV.62 (programming menu step 9).
The input will automatically be rounded off to the nearest available maximum flow rate for the chosen valve. Please see the relevant tech note for information about the maximum flow rates available for each valve.

Choose control signal type in MSV.40 (programming menu step 5).
Options:
    1 = V
    2 = mA
    3 = digital (2-position / 3-point-floating)
    4 = BACnet
If MSV.40=1 (V) or MSV.40=2 (mA), please check control signal range. Choose minimum value for the control signal in AV.138 (programming menu step 6) and maximum value for the control signal in AV.139 (programming menu step 7). The range must be at least 3.0V respectively 6.0mA and maximum ranges are 0-10V respectively 0-20mA.
If **MSV.40=4 (BACnet)**, please choose BACnet fallback timeout in AV.143 (options: 1-60 minutes, defalult:10) and BACnet fallback action (options: 1=close, 2=stop, 3=open, 4=midway) in MSV.43 to define the action to be taken if the actuator does not get a value for the control signal within the timeout period since the last time it received a control signal. Administrating the control signal through BACnet is done by writing the present-value of AV.141 in the range of 0.0-100.0%.

Choose feedback signal type and range in MSV.41 (programming menu step 8).
Options:
    1 = 2-10V
    2 = 0-10V
    3 = 4-20mA
    4 = auto
Option 4 is only available and default if control signal type is V or mA (this option sets feedback signal type and range to the same as control signal type and range). If control signal type is digital or BACnet, option 1 is default.

Choose whether or not to enable flush at startup in BV.53 (programming menu step 4). Flush enabled results in the actuator opening the valve almost fully if no control signal is registered at start-up.
This function is only available if control signal type is V or mA.
Options:

    0 = disable
    1 = enable

Choose whether or not to enable password protection of the actuator in BV.54 (programming menu step 11).
If password protection is enabled, the actuator requires a password to enter the programming menu via the buttons on the actuator.
Options:

    0 = disable
    1 = enable

If the actuator is of the type SM.0.0.0.6 (failsafe and BACnet), please choose the direction of the failsafe action in BV.18 (programming menu step 12).
Options:

    0 = open
    1 = close

Please note, that the settings and values cannot be altered through BACnet while the alarm menu or the programming menu is entered on the actuator.

Condition of the actuator through BACnet.

Besides checking the values of the objects already described, the following information is available through BACnet:

Check the current flow rate (not measured) in AV.68. If AV.68=0, the flow rate is less than the minimum defined flow rate (for information about minimum defined flow rate please see the tech note, which is always available at www .flowcon. com).

To know whether the valve is fully closed, please check the motor position in AV.98, if AV.98=0% the valve is fully closed.

Check the appropriate pressure range in MSV.44. Values:

          1 = NA
          2 = 32-320kPaD
          3 = 40-320kPaD
  4/5/7/10 = 35-400kPaD
          6 = 80-400kPaD
   8/9/11 = 60-400kPaD

Check the actuator state in MSV.45.
Values:

    1 = normal operation
    2 = calibration mode
    3 = flush mode
    4 = auto-stroke
    5 = alarm (at least one alarm has been activated)
    6 = failsafe (failsafe action has begun)

If MSV.45=5, please check for any alarms in BV.55 - BV.62.
Values:

    0 = no alarm
    1 = alarm activated

If MSV.40=1 or MSV.40=2, **check the control signal value** in AV.141. If MSV.40=3, check the control signal in MSV.42.

Check unit and value of the feedback signal in AV.164.

If the actuator is of the type SM.0.0.0.6 (failsafe and BACnet), **check the battery capacity** (0-100%) in AV.140.

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Problem solving.

In case there is any problem with the actuator and/or valve, pls. start with these procedures:

Verify that none of the actuator's objects are out-of-service (all out-of-service values are false).

Check actuator state in MSV.45. If MSV.45=5 check which alarm(s) have been activated and try to resolve the alarm issue(s).

Check all wiring to ensure that no loose connections are interrupting the signals.

Restart the actuator (cut power for a moment). If the actuator has failsafe (SM.0.0.0.6), pls. make sure that the failsafe action is completed and the actuator is shut off before restoring power.

Auto-stroke.

Trigger an auto-stroke sequence to re-calibrate the valve's closing point, by setting BV.63=1. The auto-stroke function will close the valve, then open the valve to fully open (regardless of chosen maximum flow) and return to the position specified by the control signal input. Please note that in cases where MSV.40=3 (control signal type is digital), the actuator finish the auto-stroke sequence in fully open position regardless of the chosen maximum flow. In these cases the auto-stroke sequence should be followed by giving the actuator control signal to close until the current flow rate is at or lower than the maximum flow rate.

The auto-stroke sequence cannot be cancelled. While the auto-stroke sequence is running; the actuator state will be MSV.45=4. When the auto-stroke sequence is complete, the state of the auto-stroke object will return to disabled: BV.63=0 and the actuator state will return to normal: MSV.45=1.

Failsafe mode (only SM.0.0.0.6).

If the power supply is out of range or lost, failsafe mode will be activated:

1. BV.59=1 and MSV.45=5, there is a delay on approximately 60 sec.
2. BV.59=1 and MSV.45=6, the actuator opens/closes the valve (according to fail-safe direction chosen in BV.18).
3. Actuator shuts off.

If the power supply is restored during 1. or 2., failsafe mode is deactivated.

BACnet fallback function.

If MSV.40=4 (control signal type is BACnet), the BACnet fallback function is activated:
1. When AV.141 is written to, a time counter starts.
2. If the counter reaches the value of AV.143, the action from MSV.43 starts. BV.62=1.
3. When AV.141 is written to the next time, the counter is reset and re-started. BV.62=0.

Please note, that the actuator state does not go into alarm mode (MSV.45≠5) when the BACnet fallback action is activated (BV.62=1). If no BACnet fallback action is wanted, please choose MSV.43=2.

General.

Water must always be suitable treated, clean and free of debris. It is recommended that a strainer be installed prior to the valve body to prevent damage or blockage due to debris. Ensure that the valve is not in the fully closed position when filling the system with water. Further, it is recommended not to exceed maximum differential pressure control range.

Warranty obligation.

Failure to abide by all recommendations as per this installation and operation instruction will void warranty.

Do not remove cover from actuator. Opening cover will void warranty.

When manually operating the valve (actuator disconnected) do not use more than 10 Nm torque. Using more than 10 Nm torque will void warranty.

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