Welcome to the ABB STOTZ KONTAKT training program on ABB i-bus KNX. This module will give you basic information about the blind/roller shutter actuators JRA/S. If you need help navigating through this module please click the Help button. To view the presenter notes as text, click the Notes button at the bottom right-hand corner. In addition to this, you can download this presentation in printable format by clicking the attachment button in the top right-hand corner.
Learning objectives

At the end of this eLearning module you will have detailed knowledge of ...

- the product family of ABB’s new blind/roller shutter actuators
- special functions of these devices
- applications in sun protection
Modern building installation with ABB i-bus KNX enables a high degree of functionality and simultaneously complies with increased security and comfort. Modern sun protection devices have a significant role, as they must fulfil many demands:

- Glare protection (e.g. at PC workstations)
- Utilization of daylight by tracking the sun's position for the blind louvres and re-directing the available daylight,
- Protecting furniture and carpets from fading
- Temperature regulation (heat protection in Summer; energy harvesting on cold days)
- Providing protection from people looking in from the outside,
- Protection against intruders

With the new Blind/Roller Shutter Actuators JRA/S, the complex requirements on a sustainable and energy efficient automatic sun protection control can be implemented in offices, residential and functional buildings via ABB i-bus® KNX.
Blind and roller shutter actuators are suitable for drives in the area of sun protection, such as:

- roller shutters
- blinds
- curtains
- awnings.

However, climate control products can also be controlled using blind/roller shutter actuators, e.g.:

- electric windows
- skylights
- roof hatches
- ventilation flaps

and other products with drives for controlling e.g.:

- partitions
- garage doors
- screens
ABB offers you a new generation of blind/roller shutter actuators for ABB i-bus KNX, which boast many different improvements in hard and software, such as

- automatic travel detection for exact positioning of the drive
- comprehensive diagnostics for setup and on malfunction
- manual operation and display with plastic foil keypad
- Universal head screw terminals for safe, simple wiring
The range of blind/roller shutter actuators consists of 10 devices in 3 product lines:

- **"Premium":** for 230 V drives with 2, 4 and 8 channels and a 4-channel device for DC actuators up to 24 V with manual operation, display and automatic travel detection
- **"Standard":** for 230 V drives with 2, 4 and 8 channels with manual operation and display
- **"Basic":** for 230 V drives with 2, 4 and 8 channels without manual operation

All the devices have the same high-performance application apart from the functions for travel detection and manual operation. All the devices also have universal-head screw terminals and power supply by the KNX-Bus.
The behaviour of the manual operation is as follows:

- This button switches manual control off and on.
- To activate the device the switch must be pressed until the yellow LED glows continuously. Pressing the button again switches off manual operation.

Each channel has separate buttons and display LEDs:

- With this button the drive moves up (a long push) or stops (a short push). When the drive is stationary, repeated short pushes will move the drive in steps, e.g. for louvre adjustment
- This button moves the drive down with the same functionality we have just seen

The LEDs of the channels provide a lot of information:

- 1 LED on: end position up/down
- 2 LEDs off: drive is in an intermediate position
- 1 LED flashing: blind/shutter moving upwards/downwards
- 2 LEDs on: safety function active, e.g. wind alarm
- 2 LEDs flash alternately: malfunction, drive error, e.g. no current flow or invalid travelling times

This function is available for blind actuators with current detection
One interesting function is that it is possible within a device to copy or exchange channels. This applies to the parameter settings and, if required, the group addresses when implementing KNX projects especially in multi-channel devices. This saves time and money.

This functionality can also be found in other KNX components from ABB.
Here are some software innovations and characteristics of ABB’s new blind/roller shutter actuators:

- **Time-delayed switching of the drives:**
  In large KNX systems starting all the drives simultaneously, triggered by central commands, creates a large starting current. To limit this starting current, central drive commands can be time-delayed.

- **Default state and change in direction on bus voltage failure:**
  In the event of bus voltage failure the drive can be moved to any desired position. If the motor is still in operation at this time, the direction of travel can also be changed.

- **Forced operation:**
  In this case, with a 1-bit command or, in special cases, via a 2-bit telegram of a visualization, a shutter or blind can be moved with maximum priority into a defined position, e.g. for window cleaning.
One important characteristic of the actuators with current detection is the automatic travelling time detection, which is important for the exact positioning of the blind.

Travel detection is effected using current detection and can be determined during operation or triggered by a telegram. The benefit: simple, precise detection of the travelling time, whereby changes in blind length or mechanical sluggishness caused by e.g. low temperatures in Winter are compensated automatically.

As the times for the raising and lowering the blind can vary, these can also be set separately.

Another function available through current detection is drive error recognition.
The movement range limitation allows the drive to move within defined limits e.g. in Summer when the shutters can not be fully extended because of a window box. This function can now be used not only for direct movement commands such as local push buttons but also for automatic functions such as automatic sun screening.
In practice the mechanism of the shutter/blinds with their inaccuracies is always a challenge. ABB's blind/roller shutter actuators have some new parameters which can be very helpful in these cases:

- When several identical drives have to be positioned on a facade as accurately as possible, mechanical tolerances can be compensated with the help of dead times for blind height and louvre angle. The mounting of the louvres in a blind can also have a different mechanical slackness. Turning a louvre can lead to different louvre angles, which can be improved by the parameter slippage of slat on change of direction.

- It is often necessary when lowering joint awnings to retract the drive a little after the stop in order to tighten the material.

- This function can also be used for roller shutters, to open the ventilation and light slits after lowering. Here the parameter tensioning blinds/shutter or slot positioning comes into play.
Travel commands in conjunction with safety and automatic functions or on bus voltage recovery can now make use not only of the known settings, but also of a new, definable position for the blind height as well as for louvre adjustment, which is independent of the other functions.

The extended status messages in a 2-Byte communication object contain a great deal of information, such as drive errors or operation of the drive.
Scenes are important functions in KNX which are often used in conjunction with the lighting. Up to 64 scenes in 8-Bit format with blind height and louvre position can be adjusted in the parameters. Scenes with changed settings can also be stored by the user himself.
One new function in automatic control is over-heating protection.

During the heating period of modern buildings with extensive facades, because of the sun’s heat the temperature can exceed an acceptable value even when the room heating is switched off.

In this case the blind is moved into the optimal position when the blind actuator receives the current temperature from the KNX room thermostat. This function is activated when the set limit value of the blind/roller shutter actuator is reached.
Together with blind/roller shutter actuators ABB has developed optional software, the i-bus tool, which enables rapid, easy operation of the devices as well as displaying the operating status even without the ETS. This software enables basic functions such as raise/lower, stop or move in position, but it can also simulate events such as wind alarm or sun.

This tool makes it possible e.g. at setup, to check the direction of motion or control and improve the settings of positions and scenes. The graphic display also simplifies diagnosis, e.g. in the event of a malfunction.

The only requirement for this software is to program the physical address of the blind actuator with the ETS. The i-bus tool is available free of charge and in the future it will also be available for more KNX-devices with the appropriate user and display interfaces.
There is a direct interdependence of lighting control and blind control when controlling the incidence of direct sunlight into the room.

If it becomes too dark in an office because a blind is closed, for example, the lighting will be switched on to compensate for the lack of brightness. As a result, the lighting consumes electrical energy when there is actually enough daylight available.

A more efficient solution is the automatic control of the angle of the louvres to take account of the position of the sun. The louvres are opened just enough to ensure that sufficient daylight enters the room and direct glare is prevented. Using special light-guiding louvres the incidence of light is improved. The external light is diverted by the reflecting louvres onto the ceiling of the room, which gives a very pleasant, indirect light.

In conjunction with constant light control, which merely offsets the difference in brightness of the lighting at the workspace, a large share of the electrical energy can be conserved. An automatic blind control can be implemented in conjunction with a presence-dependent constant light control providing potential savings up to 40% compared to manual operation of the lighting system.

This function is included in ABB’s blind/roller shutter actuators together with the shutter control unit JSB/S 1.1.
Closing the blinds on the facades of the building on which the sun is shining in summer, can prevent the rooms from heating up – saving energy that would be needed to cool the working areas. In winter the opposite is true. Here it is useful to capture as much solar heat as possible in the rooms – this saves energy when heating rooms.

In both cases it is necessary to balance the “climate control” of the blinds with the presence of people in a room. As long as someone is working in a room, the light-dependent blind control should have priority, particularly with PC workstations, but also in schools or conference rooms.

All ABB i-bus® KNX blind actuators feature a heating/cooling automatic as standard for climate control of the blinds.
Concerning the question of energy efficiency in buildings, blind control also plays an important role with regard to climate control.

An intelligent blind control system has an optimizing effect on building climate control and supports the user in a conservative and cost-optimized energy usage. The best results come from networking blind control and room air conditioning systems.

As is evident in studies from the Biberach University of Applied Sciences, a climate control involving the blinds reduces the electrical energy required by the air conditioning system by up to 30%.

The following functions in conjunction with blind control have proved themselves in practice:

- automatic blind control with automatic twilight control and timer programs
- dependent on external lighting
- with louvre adjustment (louvre adjustment dependent on the position of the sun)
- louvre adjustment dependent on position of the sun and occupancy-controlled constant lighting control
What have we learnt so far?

- Blind/roller shutter actuators for many applications
- New functions of ABB / blind/roller shutter actuators e.g.
  - Automatic travelling time detection
  - Parameters to allow for mechanical tolerances
  - Slat position for roller shutters and canvas tightening for awnings
  - Comprehensive status messages
- Optional i-bus tool
- Numerous applications e.g. in
  - Daylight re-direction
  - Climate control
  - Enhancement of energy efficiency in buildings

Have you understood everything so far? If you have, please click the „Yes“ button to continue or, “No” if you would like to repeat the topic.
Thank you very much for taking this first unit of the eLearning course about the blind/roller shutter actuators. We hope that this course has been interesting and helpful in extending your knowledge of our blind/roller shutter actuators, the technologies involved and their areas of operation.