



Operating Manual BKS015.EIP

Steering Frame with Digital Web Guide Controller with EtherNet/IP Interface

Version	2.15	03/2021 NS
Firmware Version	V2.21	



EtherNet/IP™

Diese Bedienungsanleitung ist auch in Deutsch erhältlich.
Bitte kontaktieren Sie Ihren nächstgelegenen FMS Vertreter.

Table of Contents

1	Safety Instructions	4
1.1	Description Conditions	4
1.2	List of Safety Instructions	4
2	System Description	5
2.1	Functional Description	5
2.2	Steering Frame	5
2.3	Web Guide Controller	5
2.4	Sensors	5
2.5	Cables	6
2.6	System Integration in an Ethernet Network	6
3	Quick Installation Guide.....	6
3.1	Preparations for Set-up	6
3.2	Installation Procedure	7
4	Installation and Wiring.....	8
4.1	Mounting the Steering Frame	8
4.2	Mounting the Sensors	8
4.3	Connecting the BKS015.EIP	9
4.4	Connector and Screw Terminal Arrangement	9
5	Configuring the System.....	11
5.1	Powering up the BKS015.EIP	11
5.2	Adjustment of the Sensors	11
6	Network Connection over EtherNet/IP	12
6.1	EtherNet/IP Specification:	12
6.2	Controller Functionality over EtherNet/IP	12
6.3	Integration of BKS015.EIP in an Ethernet Network	12
6.4	Configuration of the Web Guide Controller over EtherNet/IP	12
7	Integration in an Allen-Bradley PLC	14
7.1	Hardware Environment	14
7.2	IP Configuration	14
7.3	Integration in a Project	14
7.4	Access to the Status Information	17
8	Operation	19
8.1	Operation Panel	19
8.2	Basic Instructions for Operation and Parameter Setting	19
8.3	Operating the Web Guiding System via the Front Panel	19
8.4	Operation in Automatic Mode	21
8.5	Operation in Manual Mode	22
8.6	Entering the Parameter Setting Mode	22
8.7	Description of the LED-row	23
8.8	Sensor Detection Range and Reference Position	Fehler! Textmarke nicht definiert.
9	Description Parameters.....	25
9.1	Description Operation Parameters	25
9.2	Description of System Parameters	28



- 9.3 Reset to Default Parameter Set 30
- 10 Parameter Setting via a PC..... 31**
 - 10.1 Parameterization in a Network via Web Browser 31
 - 10.2 Parameterization via a PC (peer-to-peer connection) 35
- 11 Dimensions..... 39**
- 12 Trouble Shooting..... 41**
- 13 Technical Specification..... 42**

1 Safety Instructions

1.1 Description Conditions

a) Danger of health injury or loss of life



Danger

This symbol refers to high risk for persons to get health injury or loss life. It has to be followed strictly.

b) Risk of damage of machines



Caution

This symbol refers to information, that, if ignored, could cause heavy mechanical damage. This warning has to be followed absolutely.





c) Note for proper function



Note

This symbol refers to an important information about proper use. If not followed, malfunction can be the result.

1.2 List of Safety Instructions

-  *Proper function of the FMS web guide is only guaranteed with the recommended application of the components. In case of other arrangement, heavy malfunction can be the result. Therefore, the installation instructions on the following pages must be followed strictly.*
-  *Local installation regulations are to preserve safety of electric equipment. They are not taken into consideration by this operating manual. However, they have to be followed strictly.*
-  *Make sure that the sensor(s) are connected properly to the electronic unit by means of the delivered cables. For left / right orientation please refer to Fig. 2. If the connections are crossed over, malfunction can be the result.*
-  *System parameters are factory settings and should not be changed without contacting the service department of FMS. An unauthorised change can cause malfunctions in the system or damage in the machine*

2 System Description

2.1 Functional Description

Figure 1 shows the BKS015 web guiding system with its basic components. The sensors measure the position of the web edge and send this information as an analogue signal to the built-in web guide controller unit. The control compares the position feedback signal with the reference. If the difference of these two values is higher than the stored dead band value, the steering frame will be adjusted.

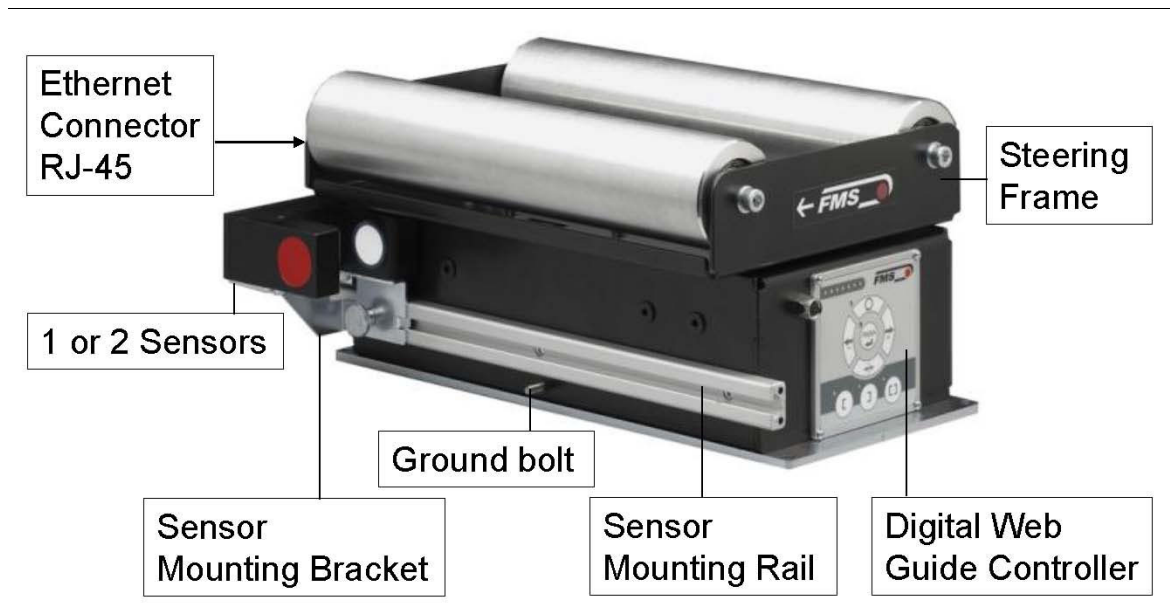


Fig. 1: Basic BKS015.EIP system

K015006e

2.2 Steering Frame

The steering frame consists of a fixed lower and a moveable upper frame that supports the rollers. The upper frame is activated by a stepper motor. The rollers are manufactured and balanced according to customer specification. End positions are controlled by hall sensors. The material sensors are mounted on the lower frame by means of a bracket array and are easily adjustable to the web width.

2.3 Web Guide Controller

The micro-processor based electronic control unit handles all calculations and communications tasks. Three buttons and a five key wind-rose serve as the man-machine interface. Parameter setting can be performed via the front panel or through a Web Browser (IE 7.0 or higher) or via the EtherNet/IP.

2.4 Sensors

Optical sensors (**AZS04**) and ultrasonic sensors (**US01B**) are available from FMS to work in conjunction with the BKS015.EIP system. These sensors provide a signal of 0...10V. With them edge and center applications can be covered. A wide range of

materials including opaque, transparent, open weave textiles and metallic webs can be detected.

2.5 Cables

The power supply cable enters to the web guide via a PG-gland connection. For each sensor a dedicated orange cable is delivered.

2.6 System Integration in an Ethernet Network

The web guide controller BKS015.EIP.EIP offers in addition to his standard features the possibility to be used as an EtherNet/IP device in a corresponding network. EtherNet/IP bases on the Ethernet TCP/IP and the UDP technology as well as on the CIP (Common Industrial Protocol). The web guide controller can be embedded in a standard Ethernet infrastructure. Its fast data rate with cycle times down to 2ms makes the device ideal for applications in automated assembly and production lines. Configuration of the web guide controller takes place either over the EtherNet/IP, a web browser or over the operating panel.

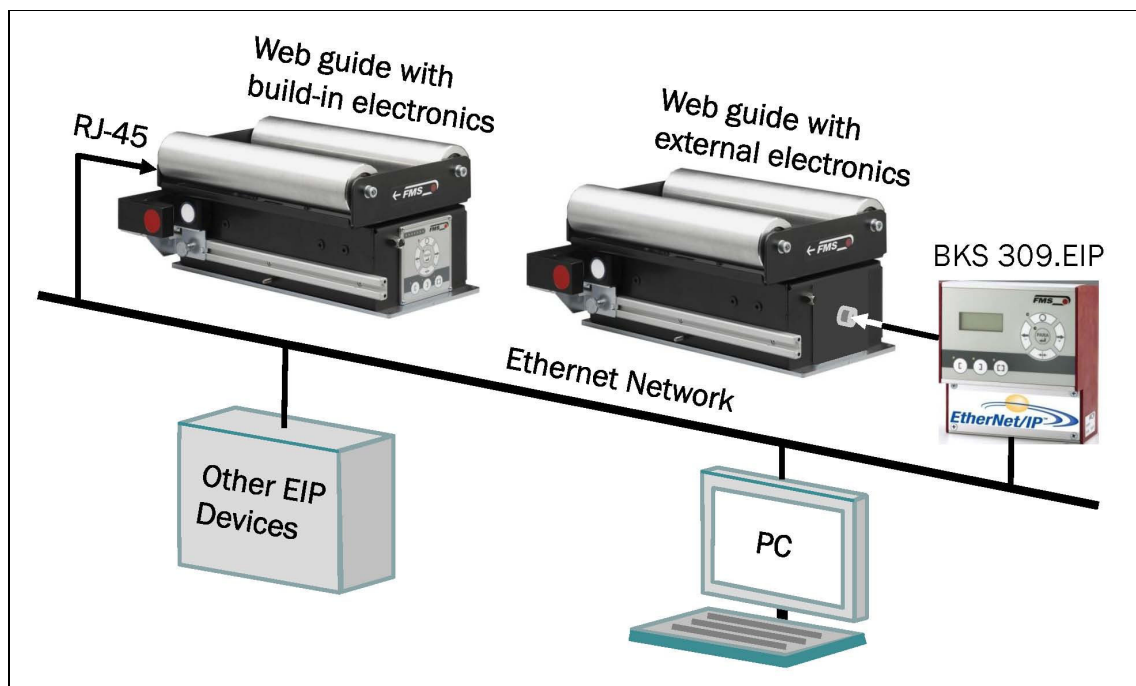


Fig. 2: BKS015.EIP in an Ethernet Network

K309EIP001e

3 Quick Installation Guide

The set-up of the BKS015.EIP web guide including controller unit is limited to only mounting the devices on the machine frame, wiring and powering up system.

3.1 Preparations for Set-up

1. Prepare your machine frame to integrate the BKS015.EIP web guide. The web guide is mounted on the machine by means of the 4 holes on its base plate.

Refer to **Fig. 21** for the mechanical dimensions and mounting holes of the BKS015.EIP.

2. Check your system requirements such as:
 - Desired guiding form (edge or centre guiding)
 - Supply conditions
3. Draw the wiring diagram for your configuration (ref. to **4.3** “Connecting the BKS015.EIP“ and chapter **4.4** “Connector and Screw Terminal Arrangement”)
4. If required, determine special parameters (ref. to **7.1** “Description Operation Parameters”)

3.2 Installation Procedure

1. Mount and adjust your material sensor(s) to the steering frame (ref. to **chapter 4.2**)
2. Mount the web guide to the machine frame
3. Connect the sensor(s) to the electronic unit.
4. Make sure the power supply voltage is in the range 18 to 36V DC ($V_{nom} = 24V$)
5. Power your system on
6. If required, make additional settings (ref. to **chapters 8.6** and **8.7**)

4 Installation and Wiring



Caution

Proper function of the FMS web guides and actuators is only guaranteed with the recommended application of the components. Other arrangements can cause heavy malfunctions. Therefore, the installation instructions on the following pages must strictly be followed.



Caution

Local installation regulations are to preserve safety of electric equipment. They are not taken into consideration by this operating manual. However, they have to be followed strictly.

4.1 Mounting the Steering Frame

The mounting orientation of the steering frame (indicated by an arrow), must correspond with the web running direction. The lower frame is mounted with four M5 screws to the machine frame. The machine must be prepared to accept the M5 mounting screws.

The steering frame must be connected to earth ground. Ensure that the base plate of the steering frame has direct contact with the grounded machine frame. In addition the ground bolt (see **Fig. 1**) must be connected to the machine earth.



Caution

Bad earth connection may cause electric shock to persons, malfunction of the total system or damage of the control unit. It is vital to ensure that there is a proper and secure earth connection.

4.2 Mounting the Sensors

The sensors will be mounted with brackets on a rail to the lower frame of the web guide

They have to be installed after the outbound roller. Mount them as close as possible to the steering frame (see **Fig. 3**). The sensors are connected to the web guide controller by means of the delivered orange cables. Refer to the operation manual AZS01, US01B for further information about the sensors.

Definition of Left and Right:

Left and right are always seen in direction of the running web (see Fig. 2).

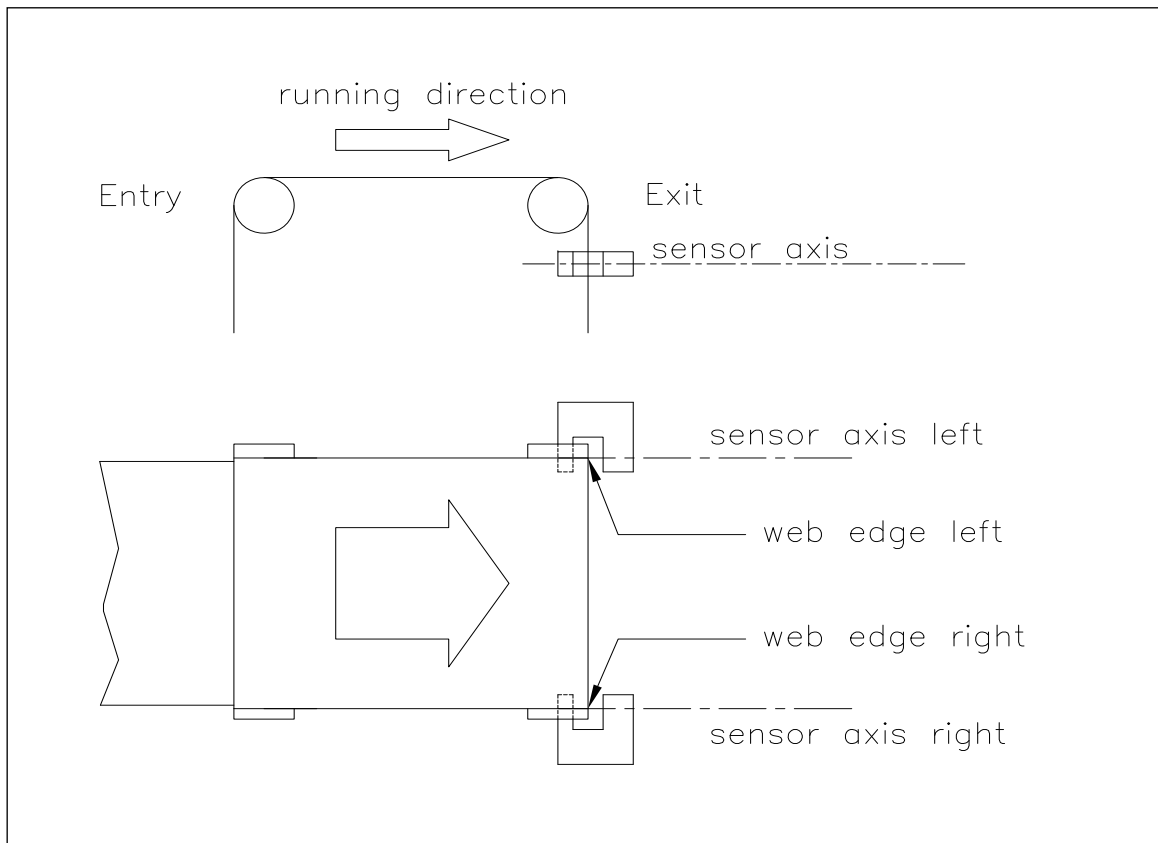



Fig. 3: Position of the sensors according to the web

K400005e

Sensors of the type AZS must be mounted with its narrow side (thinner leg) on the side of the steering frame



Caution

Make sure that the sensor(s) are connected properly to the electronic unit by means of the delivered orange cables. For left / right orientation please refer to Fig. 3. If the connections are crossed over, malfunction can be the result.

4.3 Connecting the BKS015.EIP

The power supply unit must deliver a voltage from 18 to 36V DC (Vnom= 24V). Connect the cable coming out of the PG-gland to your power supply unit.

Wire colour	Signal
brow	24 VDC
blue	GND

4.4 Connector and Screw Terminal Arrangement

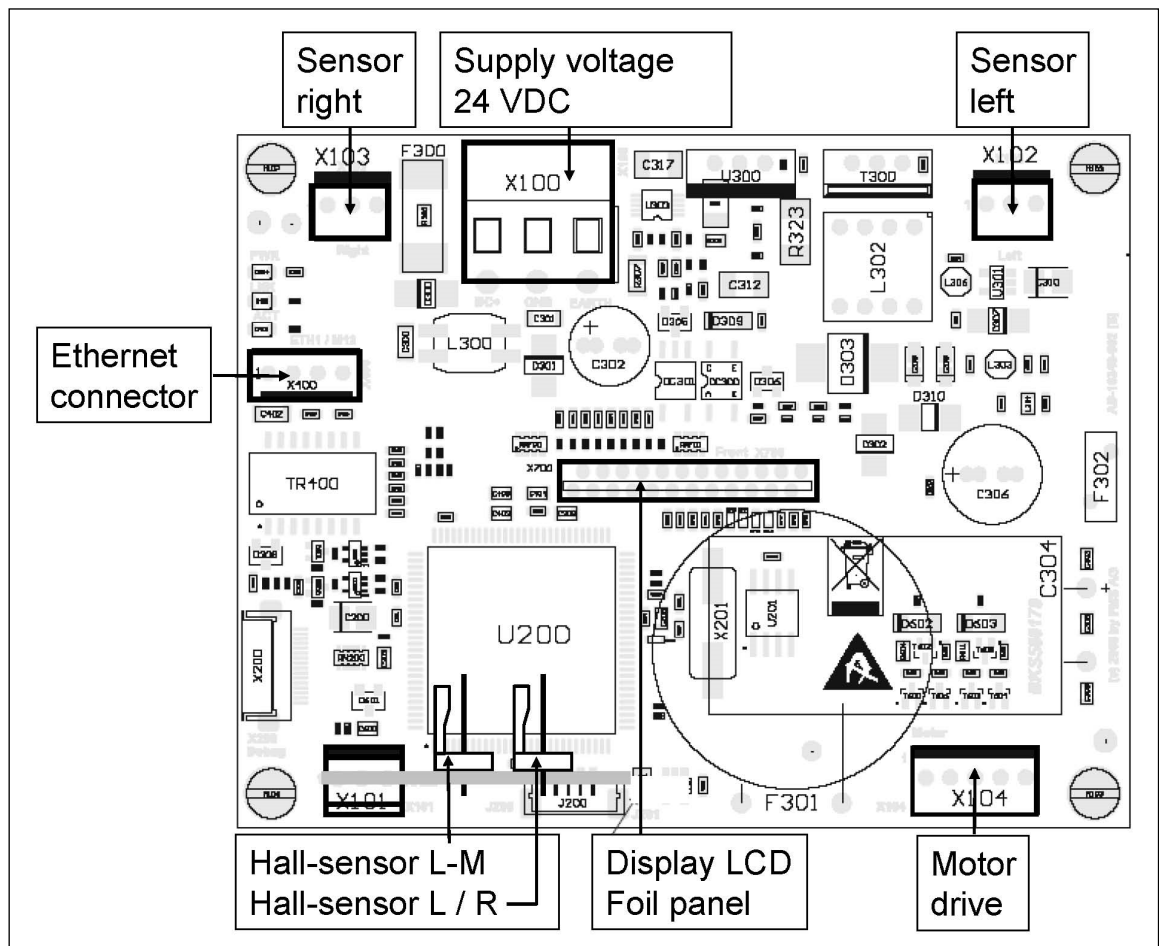


Fig. 4: Terminal arrangement on processor board

K015008e

Note
An Ethernet connector RJ-45 is also available on the back side of the housing.

5 Configuring the System

After having mounted and wired the web guide on the machine, the system can now be configured to the specific requirements of the application.

5.1 Powering up the BKS015.EIP

1. Make sure the power supply delivers a voltage of 18...36 VDC ($V_{nom} = 24V$)
2. Check, if the web is in the detection range of the sensors.
3. Switch-on your power supply
4. The web guide starts-up in Manual Operating Mode.

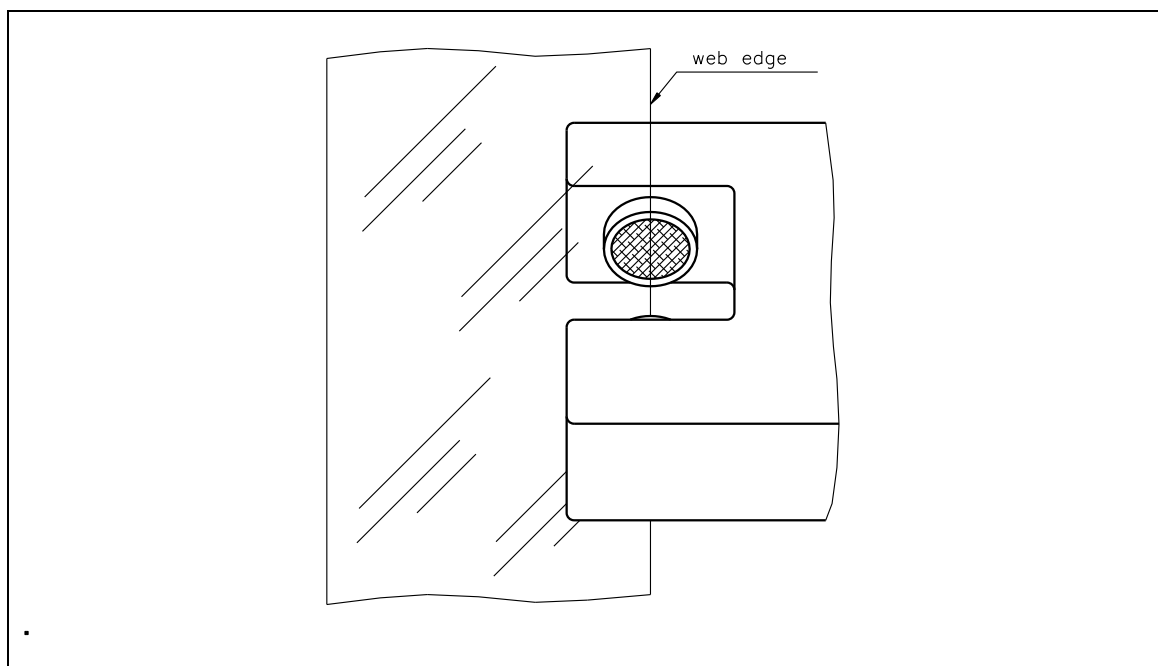
5.2 Adjustment of the Sensors

Align sensor axis to the web edge:

Loosen the fixing nut on the bracket and adjust the sensor. Fix the sensor in the new position. The sensor will be properly positioned, if the web edge goes through the sensor axis (center of active window; ref. to **Fig. 5**).

Fig 5: Alignment of the sensor axis to the web edge

K100004e



6 Network Connection over EtherNet/IP

The web guide controller BKS015.EIP is able to communicate with other devices over an Ethernet network. CIP (Common Industrial Protocol) is used as the protocol for the data link. The controller acts as a so called “Producer” and the machine control (or PLC) as the “Consumer”.

6.1 EtherNet/IP Specification:

Physical layer: Ethernet IEEE 802.3.

Transport protocol: TCP/IP und UDP

Standard: CIP IEC 61158

Conformity: CPF 2 (Communication Profile Family 2) IEC 61784-1

6.2 Controller Functionality over EtherNet/IP

Basically, all functions for configuration and calibration can be performed over EtherNet/IP. Furthermore, status information of the controller can be cyclically propagated over the network and made available to the Consumer (PLC).

6.3 Integration of BKS015.EIP in an Ethernet Network

In order to integrate the web guide controller in an Ethernet network and enable data transfer over it following conditions must be fulfilled:

- ✓ An BKS015 controller with the option EtherNet/IP (EIP) must be used.
- ✓ The IP-Address must be assigned in the fix address block and must be unambiguously. It may only exist once in the network.
- ✓ The network mask must correspond with the used device configuration.

If these prerequisites are given, the controller will recognise the amplifier as an EtherNet/IP device in the network and be able to communicate with it. The interface information for BKS015.EIP is defined in an EDS-file. The EDS file is only used as documentation and cannot be imported into RSLogix 5000.

EDS-files for BKS015.EIP can be downloaded from the FMS webpage.



Note

The device does not support the import of the EDS files. The import with development software e.g. RSLogix5000 will generate error messages.

Utilize “Messages” to change parameter values of the device. Details are explained in the sample file which is available for download on the FMS website.

6.4 Configuration of the Web Guide Controller over EtherNet/IP

BKS015.EIP may, but need not be configured via EtherNet/IP. It can be configured by means of a machine control unit. This unit is integrated in the same network. The communication between machine control and web guide controller is carried out with dedicated software (e.g. RSLogix5000 from Rockwell). Please refer to the operating manual of the respective machine controller.

If the configuration over EtherNet/IP is selected then messages from the PLC to the BKS015.EIP must be used.

How the messages are used, is described in the example project.

The example project BKS309_BKS015_EIP_Example_Project_Vx.xx is available for download on the FMS website.



Note

The configuration of the web guide controller via EtherNet/IP must be used as commissioning procedure. Continuously writing parameters on a cyclic base is not allowed and will lead to communication problems and reduced the lifetime of the device.

7 Integration in an Allen-Bradley PLC

Following chapters deal with the integration and operation of the BKS015.EIP controller with an Allen-Bradley PLC. The project software RSLogix5000 from Allen-Bradley is required to program the PLC. Furthermore, it is assumed that a development system with PC and corresponding development software RSLogix from Rockwell Automation is available and the programmer is familiar with these tools..

7.1 Hardware Environment

The BKS015.EIP must be connected to an Ethernet switch which in turn is in the same network as the PLC. Only in this way a communication between BKS015.EIP and PLC can take place. Several BKS015.EIP or other Ethernet/IP devices can be connected to the same network.

7.2 IP Configuration

In an industrial environment the IP addresses are normally assigned fix to the EIP devices. This holds also for the BKS015.EIP controller that needs a fix IP address in the network. The IP address configuration must take place before the BKS015.EIP is integrated in a network. This is done via the web interface (see **chapter 10.1, Fig. 19**)

7.3 Integration in a Project

Before starting the development system RSLogix5000 the PLC and BKS015.EIP need to be connected to the network and powered-up. Now a new project or an existing project can be opened in RSLogix5000. Search in the tree structure *Controller Organizer* for the listing **Ethernet** and make a right mouse click (see **Fig. 6**).

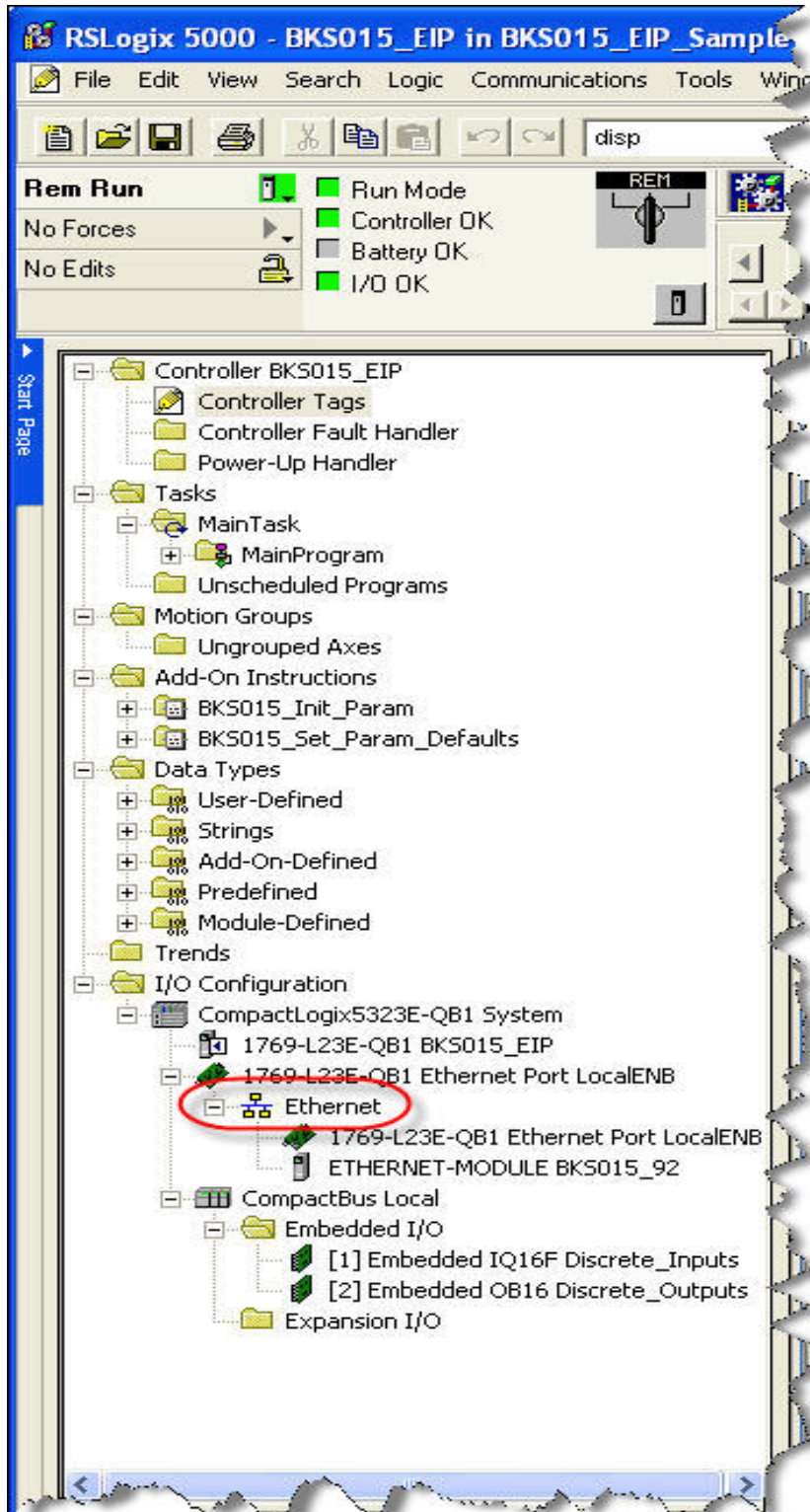
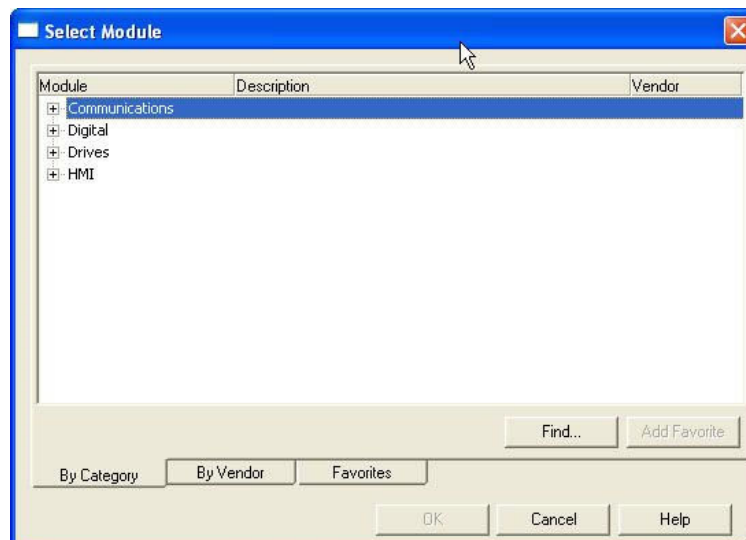


Fig. 6: Controller Organisation

K309EIP02

In this example CompactLogixL23E-QB1B is used. If a different hardware is used, one may find the listing *Ethernet* in another place. However, the principal approach is always the same. After a right mouse click on *Ethernet* a dialog window will open up. Left mouse click on *New Module...* and a new window will open up (see Fig.7).

Open plus-sign [+] in front of **Communications** to see all the other listings.



Select **ETHERNET-MODULE Generic Ethernet Module** and confirm with OK.

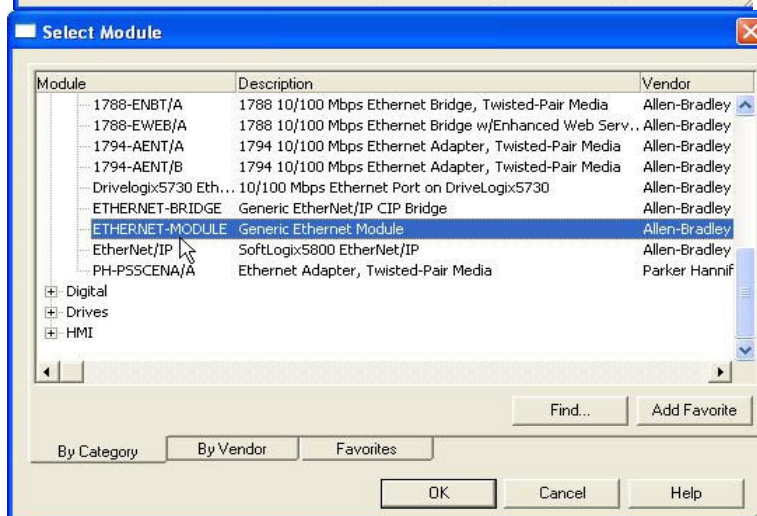


Fig. 8: Module Selection open

E309023

Following window opens up in which the **Name BKS309_91**, the **Comm Format Input Data - DINT** and the **IP Address** (eg. **192.168.0.91**) need to be entered. On the Connection Parameters side the values **Input=100** with **Size 2**, **Output=101** (leave empty) and **Configuration=102** with **Size 88** must be entered. Confirm with OK

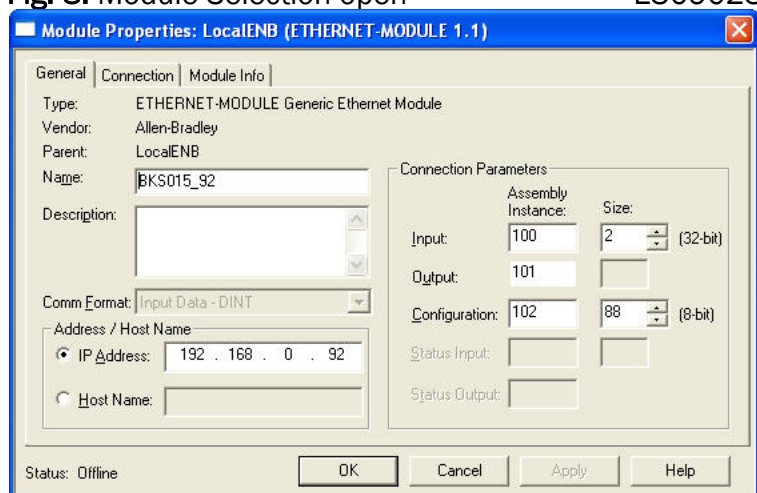


Fig. 9: New Module

K309EIP03

The dialog window (Fig. 15) will open up. Here, one can enter the cycle time. This determines how often the data will be propagated in the network. The minimal cycle time is 2 ms. Default setting is 10 ms. Basically the cycle time must be set so that the maximum speed requirements of the system are fulfilled. A fast cycle time leads to more data traffic in the network. That can create communication bottlenecks. Especially when using several BKS309 and other EIP devices in the same network a well-balanced data speed is important.

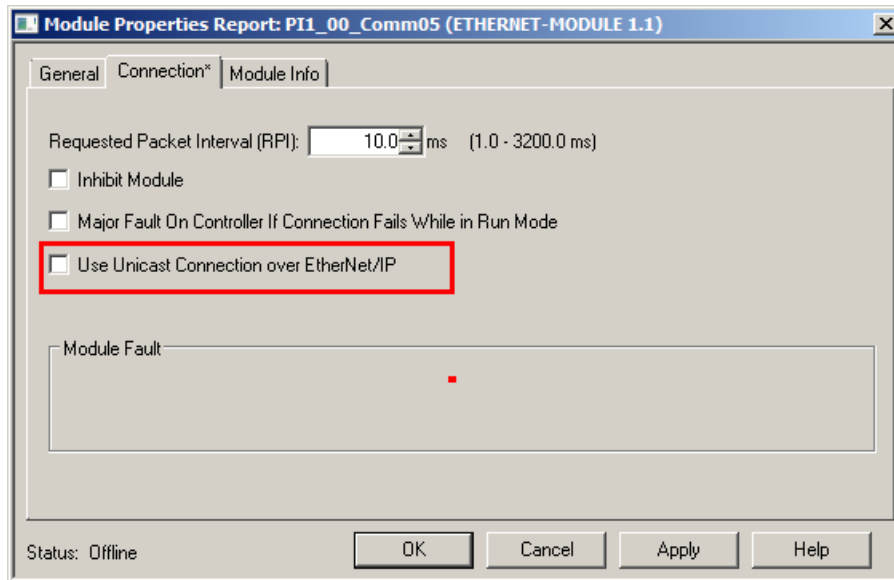


Fig. 10: Module Properties

Note
Untick the box „Use Unicast Connection over EtherNet/IP“. The use of this feature is not allowed as it will cause communication problems.

7.4 Access to the Status Information

After the integration of the BKS015.EIP in the network the status information are available in the global input tags and that in the defined cycle time. In our example the device was named **BKS309**. Operation Status information can be found under the controller tags **BKS309:I >> BKS309:I Data**

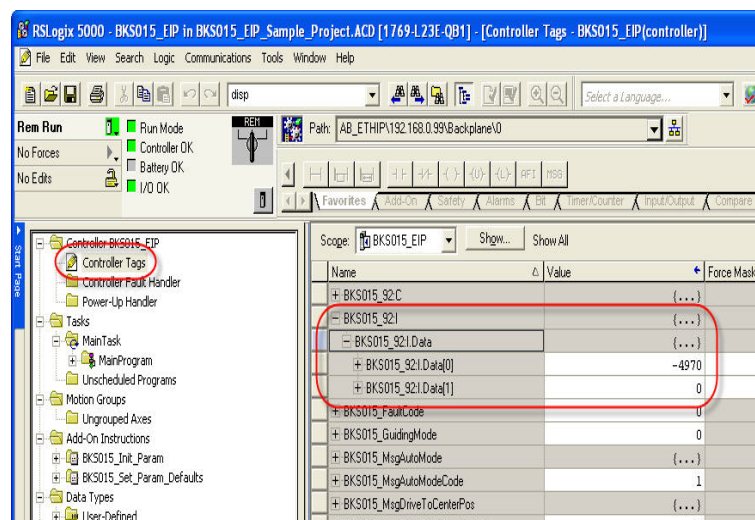


Fig. 11: RSLogix

K309EIP04

The data show in what operational state the device currently is.

A PLC can analyse the states and execute further actions.

Bit 0 set: Automatic Operation switched on

Bit 1 set: reserved

Bit 2 set: reserved

Bit 3 set: Web Guide or winderGLIDE actuator locked

Bit 4 set: Web Guide or winderGLIDE actuator was driven to the center

Bit 5 and **Bit 6** are not set: Left edge guiding

Bit 5 set and **Bit 6** not set: Right edge guiding

Bit 5 and **Bit 6** are set: Centre guiding

8 Operation

8.1 Operation Panel

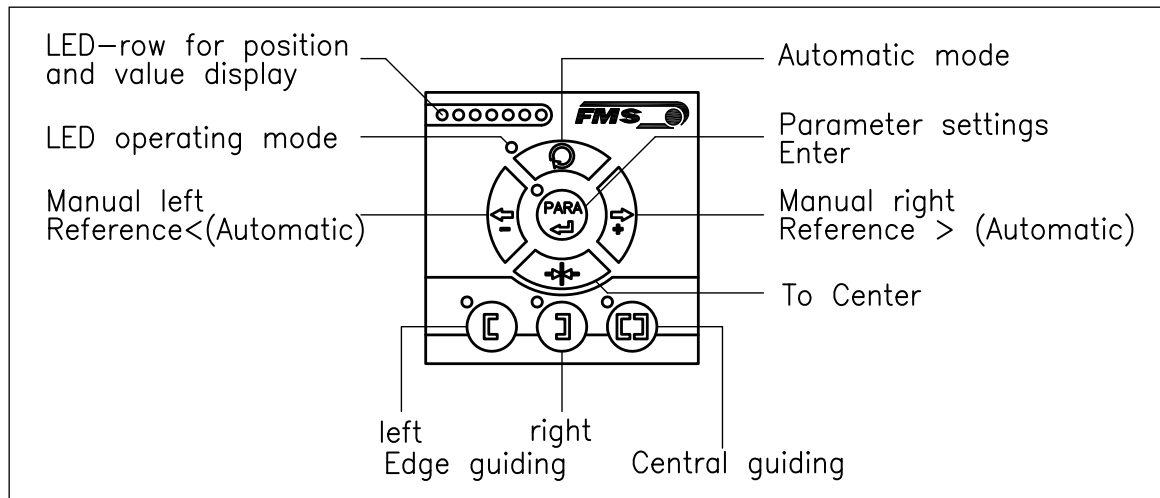


Fig. 12: View of the Operation Panel

K015003e

8.2 Basic Instructions for Operation and Parameter Setting

The web guide controller has three operation modi:

- Operation Mode
- Parameter Setting Mode (e.g. Dead Band)
- Change Mode (change of Reference Position)

Parameter setting can be performed via the keys on the front panel or via a web browser. When using the front panel, the user can toggle between these modi by pressing the corresponding key or key combination. The Parameters are described in **chapter 9.1** "Description of Operation Parameters". The keys have the following functions:

8.3 Operating the Web Guiding System via the Front Panel

Key	Key function during operation
	The sensor is mounted on the left side of the frame and controls the material on the left edge or on the line, if a line sensor is used. One sensor is necessary. The LED indicates the left edge guiding mode.
	The sensor is mounted on the right side of the frame and controls the material on right edge or on the line, if a line sensor is used. One sensor is necessary. The LED indicates the right edge guiding mode.
	Two sensors are mounted on both sides of the frame. The frame is controlled in a way that the material position is kept centered with regard to both sensor positions. The LED indicates the centre guiding mode.
	Key to enter the Parameter Setting Mode. Hold the key for longer then 3 sec. The LED above the PARA key lights. A

	second press for longer then 3 sec. on the PARA key will store the value (ref. to 8.6 "Entering the Parameter Setting")
	Automatic or Manual. With this key you can select between automatic or manual mode. The LED indicates the automatic mode.
	Drive to center position. The frame moves to the center Position. This function is only available in manual mode.
	In manual mode the frame will move to the left in 0.1mm steps by pressing the button once. By pressing the button longer than 1 sec. it will continuously move the frame to the left. In automatic mode the Reference Position will be adjusted to the left in 0.1 mm steps by pressing the button once. Pressing the button longer than 1 sec. it will continuously move the Reference Position to the left (see chapter 8.4 "Operation in Automatic Mode). In parameter setting mode: Pressing the button reduces continuously the parameter value.
	In manual mode the frame will move to the right in 0.1mm steps by pressing the button once. By pressing the button longer than 1 sec. it will continuously move the frame to the right. In automatic mode the Reference Position will be adjusted to the right in 0.1 mm steps by pressing the button once. Pressing the button longer than 1 sec. it will continuously move the Reference Position to the right. (see chapter 8.4 "Operation in Automatic Mode). In parameter setting mode: Pressing the button increases continuously the parameter value.

Fig. 13: Table of key functions







Note
To make the settings easier for the operator, there is visual help in form of LED row. The pattern on the LED row indicates the setting range (ref. to chapter 8.7 "Description of the LED row).

8.4 Operation in Automatic Mode

In Automatic Mode the web guide controller starts to guide the web to the Reference Position and to hold this guiding point.

For edge guiding operations the Reference Position is in the middle of the sensor detection range (Fig. 14). For centre guiding the Reference Position is in the middle between the two sensor axis.

This Reference Position can be adjusted as follows:

- Start automatic mode with the  key.
- The Reference Position can be adjusted in 0.1mm steps by using the  and  keys.
- For left sensor operation the  key causes the web moving inside the sensor. The  key causes the web moving outside the sensor. Using right sensor operation or center guiding the setting behaves contrariwise (refer also to Fig. 17, 18 and 19)
- Terminate the automatic mode by using the  key again.

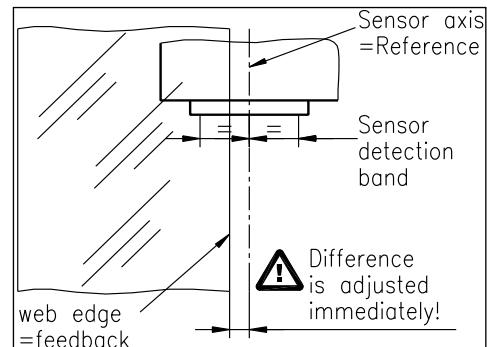


Fig. 14: Reference position at automatic start K100005e



Caution

If web is not running, it can't be guided properly to the Reference Position. The steering frame moves in the limit-of-travel position and may damage the web. Start automatic mode only when web is slowly running






Note

If the web leaves the sensor detection range, control is no longer effective. Hold the web edge strictly inside the sensor detection band.





8.5 Operation in Manual Mode

In Manual Mode several operations and settings can be carried out (see Fig. 13):

- *Center position* : The steering frame will return to center position.
- *Frame position*  and : The steering frame can be adjusted in 0.1mm steps. If key is held, the steering frame will move continuously to chosen direction.
- *Parameter Setting Mode*: The Parameter Setting Mode can only be entered in Manual Operation.

8.6 Entering the Parameter Setting Mode

To enter the Parameter Setting Mode the web guide controller must be in the Manual Mode. In the Automatic Mode only the reference value can be changed.

- Press the  key for longer then 3 sec. The LED above the key will light indicating that the controller entered the Parameter Setting Mode. In this mode the Dead Band parameter can be adjusted (see chapter 7 “Description of Operation Parameters”)
- With the keys  and  the desired band can be adjusted (see Fig. 16)
- Press the  key again to confirm the setting and leave the Parameter Setting Mode.

8.8 Description of the LED-row



$E_{Sens} = 0.5 \times \text{sensor detection range}$
 Example: sensor detection range US01 = 8 mm $\rightarrow E_{Sens} = 4$ mm

a) Automatic or manual mode. LED control of web position

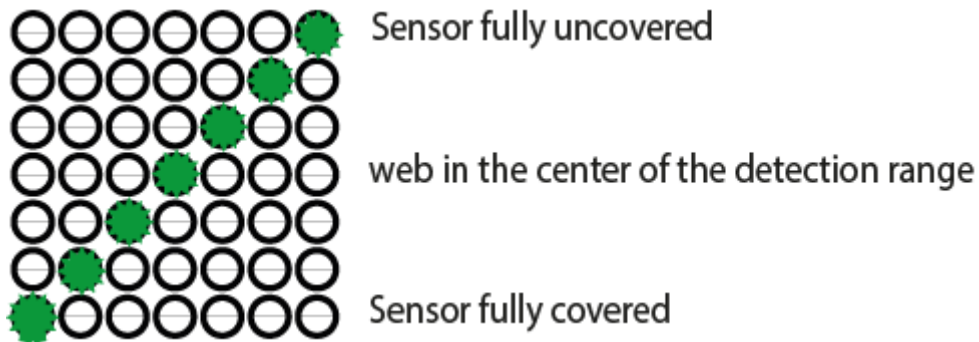


Fig 8: LED row indicates material position BKS015_BA_Manual.ai

b) Setup mode for the adjustment of Dead Band



Fig 9: LED indication of Dead Band values BKS015_BA_Manual.ai

c) Setup mode for the adjustment of the Reference Position for left sensor operation. Setup is only possible in automatic mode with the direction keys.

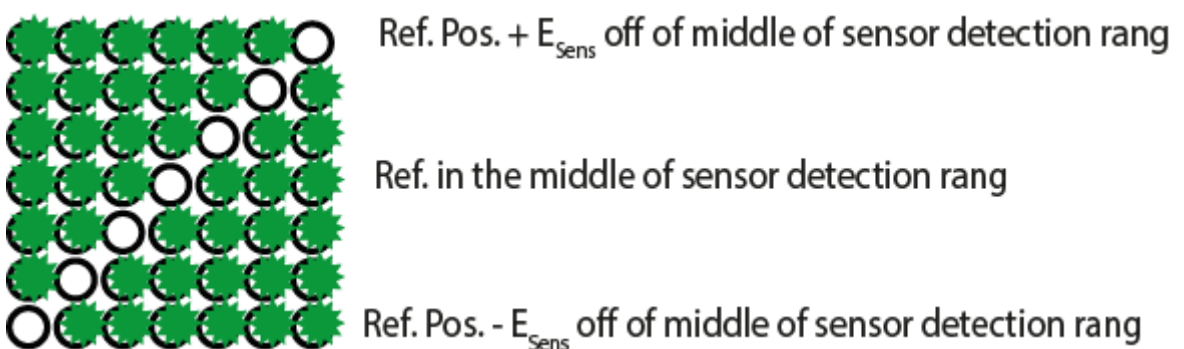


Fig 10: LED indication of Reference Position values (left sensor) BKS015_BA_Manual.ai

d) Setup mode for the adjustment of the Reference Position for right sensor operation and center guiding. Setup is only possible in automatic mode with the direction keys.

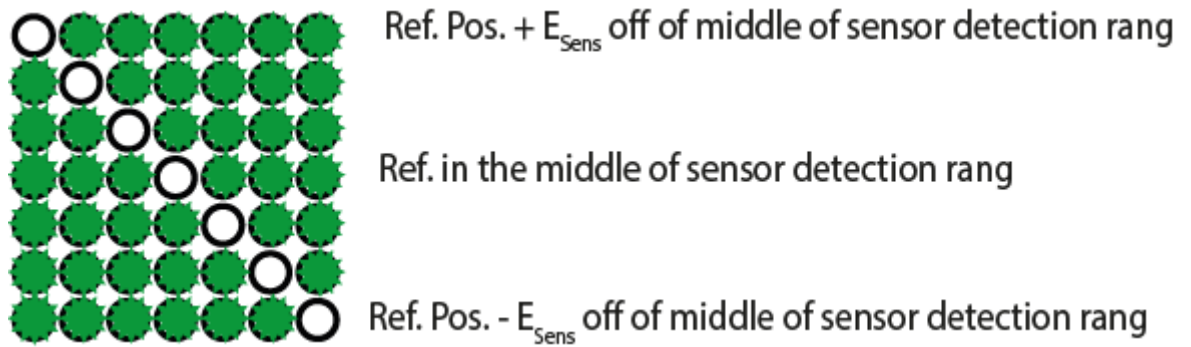


Fig 11: LED indication Reference Position values (right sensor)
 BKS015_BA_Manual.ai

8.9 Sensor Detection Range and Reference Position

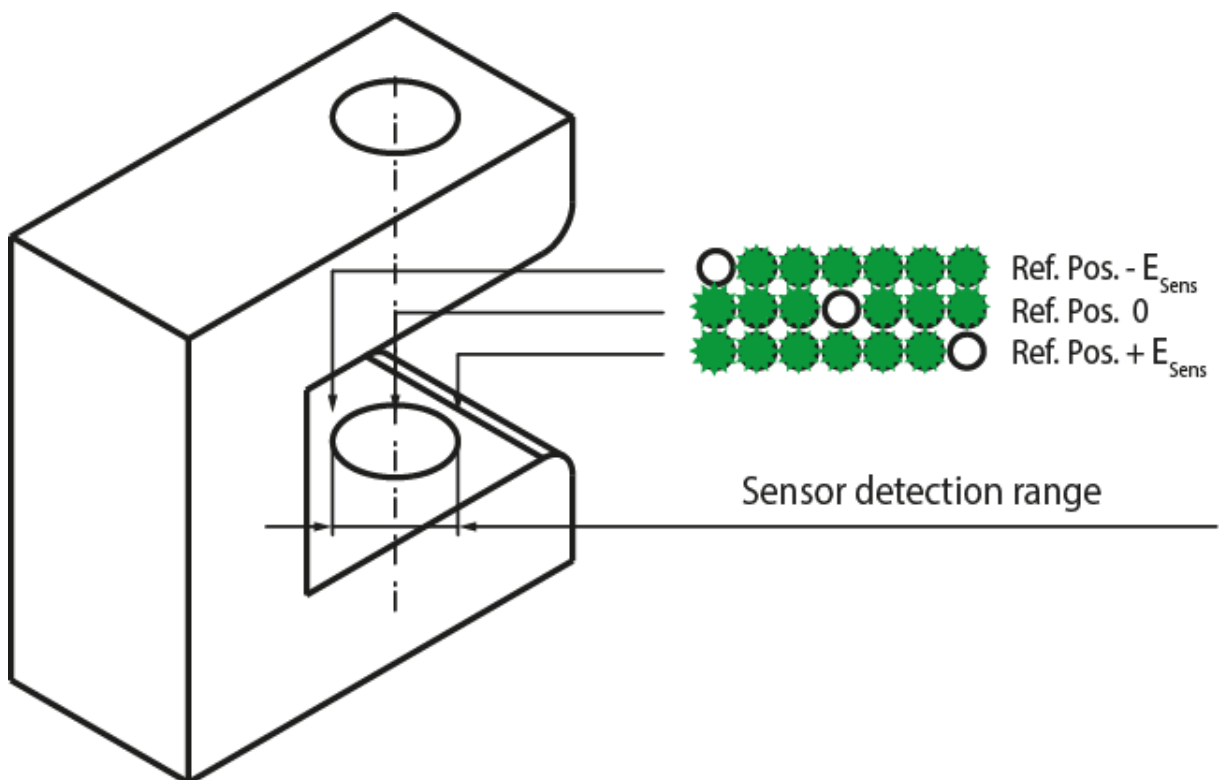


Fig. 12: View of the Sensor Detection Range

BKS015_BA_Manual.ai

9 Description Parameters

9.1 Description Operation Parameters



Note

The first three parameters [RefPos], [RefMode] and [DeadBand] in the parameter list below can be changed via the front panel (ref. to chapters 6.4 to 6.8). All other parameters can only be accessed and changed via the build-in web browser (ref. to chapter 8 "Parameter Setting via a PC")

Adjusting Reference Position [Ref Pos]

Purpose:	The [RefPos] parameter determines the reference position within the sensor detection range. This reference point can also be adjusted over the front panel as described in chapter 6.2 "Automatic Operation". The Reference Position is kept stored until the next power-on.		
Range:	-5.0 to	+5.0	Default: 0.0
Increment:	0.1		Unit: [mm]



Note

By pressing the keys  and  at the same time for longer then 1 sec., the Reference Position will reset to default

Setting Reference Mode [Ref Mode]

Purpose: This parameter determinates how the Reference Position is defined. This can either be the position that is defined with parameter [Ref Pos] or the actual material position within the sensor when the controller is switched to automatic operation.

Two settings are possible:

Setting:

Purpose: If [Manual] is chosen, the reference is taken from the parameter [RefPos].

Setting:

Purpose: If [Auto] behaviour is chosen then the reference is determent by taking the actual material position within the sensor when the controller is switched to automatic operation.


Dead band [DeadBand]

Purpose: This parameter defines the dead band tolerance. Dead band is a free programmable range, in which the web may move freely without the controller re-adjusting the frame. If the deviation is higher than the tolerance, the web will be re-adjusted into the range of the dead band. Keep in mind that: A [DeadBand] of e.g. 0.3mm“ results in a tolerance band of $\pm 0.3\text{mm}$.

Range: 0.0 to 2.0 **Default:** 0.0
Increment: 0.1 **Unit:** [mm]



Note

By pressing the two keys  and  at the same time for longer then 1 sec. will reset the Dead Band to default value.

Unit System [Unit Sys]

Purpose: This parameter determines the unit system that is used when the parameters are set via the web browser.

The user can choose between two settings.

Setting:

Purpose: Settings in the web browser are carried out in metric units.

Setting:

Purpose: Settings in the web browser are carried out in imperial units.

Gain Setting [Gain]

Purpose: This parameter defines the gain of the feed back value.

Range: 0.02 to 2.00 **Default:** 0.20
Increment: 0.01 **Unit:** [-]

Adjusting Correction Speed [AdjSpeed]

Purpose: This parameter determines the maximum used correction speed.

Range: 1 to 100 **Default:** 100
Increment: 1 **Unit:** [%]

Power Modes [Power ON]

Purpose: This parameter determines the operation mode after power on.

The user can choose between three behaviours.

Setting: [Manual]

Purpose: The controller goes to Manual Operation Mode after power on.

Setting: Automatic [Auto]

Purpose: The controller goes to Automatic Operation Mode after power on.

Setting: Last Setting Used [Last Set]

Purpose: The controller restores the operation mode that was previously chosen before power off.

Behaviour when leaving Automatic Mode [Auto→Man]

Purpose: This parameter determines the behaviour of the controller leaving the automatic mode.

The user can choose between two behaviours.

Setting: [Manual]

Purpose: The controller stops guiding. The web guide is locked at the current position (Manual Mode).

Setting: [Centre]

Purpose: The controller stops guiding. Afterwards the web guide moves to the centre.

[IP Addr]

Purpose: The parameter assigns an IP address to the controller. This enables the user to communicate via a web browser with the controller that is imbedded in a network. The IP address must be entered in 4 separate blocks (IP Bl. 1; IP Bl. 2; IP Bl. 3; and IP Bl. 4)

Range: 0 to 255 **Default:** 192.168.0.090

Increment: 1 **Unit:** [-]

[Subnet]

Purpose: The parameter assigns the Subnet Mask of the controller in the Ethernet network. This enables the user to communicate via a web browser with the controller. The Subnet Mask must be entered in 4 separate blocks (Sub. BI 1; Sub. BI 2; Sub. BI 3; and Sub. BI 4).

Range: 0 to 255 **Default:** 255.255.255.0

Increment: 1 **Unit:** [-]

[LANSpeed]

Purpose: [LANSpeed] determines the data speed of the web guide controller to communicate the receiver (Switch, Hub or PC).

Selection: 10 or 100 **Default:** 100

Unit: [MBPS]

9.2 Description of System Parameters



Caution

System parameters are factory settings and should not be changed without contacting the service department of FMS. An unauthorised change can cause malfunctions in the system or damage in the machine.

Offset Centre [Offset><]

Purpose: This parameter adjusts the position of a steering frame exactly to the centre.

Type: [One Hall]


Purpose: One hall sensor is used to detect the Home position, Middle Position and Maximum Position.

Type: [Two Hall]

Purpose: Two hall sensors are used to detect the Home position, Middle Position and Maximum Position.

Centre Position [CentrPos]

Purpose: The [CentrPos] parameter is only used with the position detection system based on hall sensors. For all other position detection system this parameter is not used and hence not displayed. The parameter determines the centre position of the actuator spindle in motor steps

(measured from the left reference position). The actuator stops at this position, if you press the centre key . In Automatic Operation this parameter has no meaning.

Range: 0 to 10'000 **Default:** Factory setting
Increment: 1 **Unit:** [Step]

Right Limit [RightLim]

Purpose:	The [RightLim] parameter is only used with the position detection system based on hall sensors. For all other position detection system this parameter is not used and hence not displayed. The parameter limits the maximum travel to the right side of the actuator spindle in motor steps (measured from the left reference position). In the operation or in manual mode this limit will never be exceeded		
Range:	0	to	10'000
Increment:	1		
		Default:	Factory setting
		Unit:	[Step]

Drive Direction [DriveDir]

Purpose: This parameter determines the guiding orientation of the controller. Usually stepper motors turn clockwise. This setting changes the turning direction of the motor. There are two other possibilities to change the guiding direction:

The user can choose between two settings

Setting: [Standard]

Purpose: [Standard] is chosen when standard motors and standard frames are used.

Setting: [Invers]

Purpose: [Invers] is chosen when motors are used that turn anticlockwise.

9.3 Reset to Default Parameter Set

Factory settings of your BKS015.EIP web guide controller can be re-established by pressing a combination of two keys.

Hold the two keys  +  while powering -up the controller

10 Parameter Setting via a PC

The BKS015.EIP web guide controller can be embedded in an Ethernet network and the parameter setting can be done over this network by means of a web browser (Internet Explorer 7). The devices have a static IP-address that can be set over the user interface. The IP-address is not automatically received over DHCP.

The parameter setting can also be carried out with a desktop- or laptop computer via a peer-to-peer connection (see **chapter 8.2**)

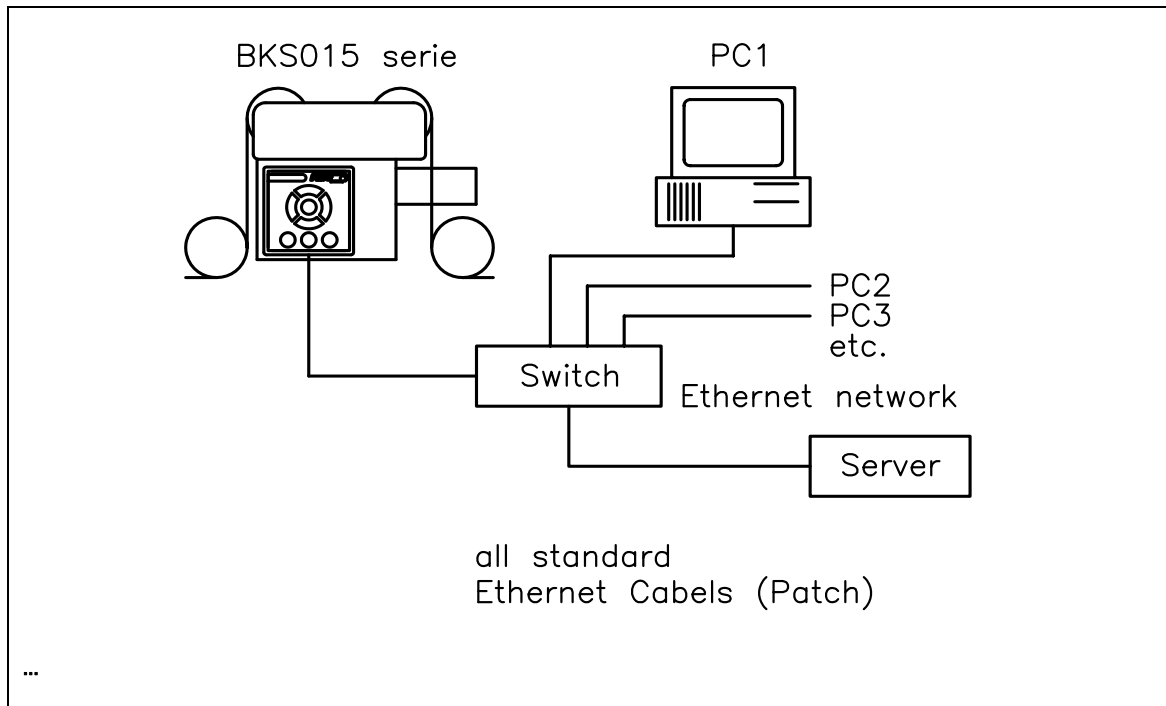


Fig. 20: BKS015.EIP configuration in a LAN (Local Area Network). K015009e

Fig. 21 and **22** show the peer-to-peer connection between PC und BKS015.EIP. Use for this configuration a cross-over-cable and not the standard patch Ethernet cable

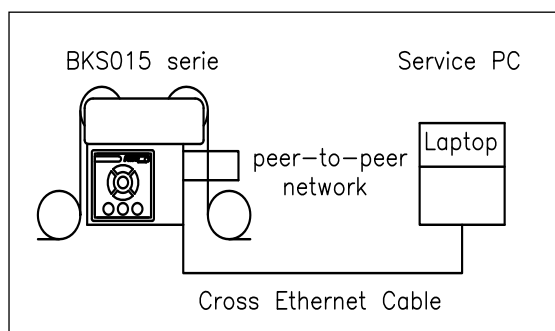


Fig. 21: Correct connection with cross-over-cable. K015010e

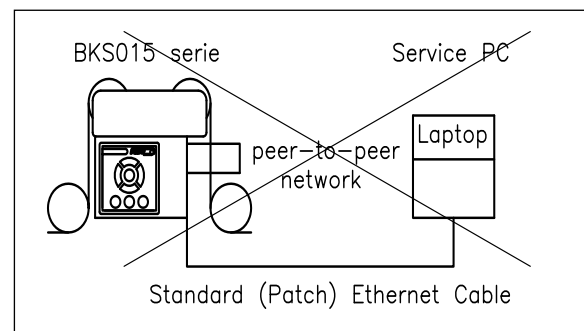


Fig 22: Connection with wrong cable K05011e

10.1 Parameterization in a Network via Web Browser

Before the parameterization of the BKS015.EIP is done it must be certain that the BKS015.EIP uses an IP address in a static block. For the integration of a BKS15

web guide controller in your Ethernet network please contact your IT system administrator.

Once the BKS015.EIP was integrated in the network you can address the device e.g. with <http://192.168.000.090> . After establishing the link, the screen Fig.23 will open up.



Fig. 23: Serial number and device information

Home.jpg

The menu on the left side of the screen allows navigating through the web page.

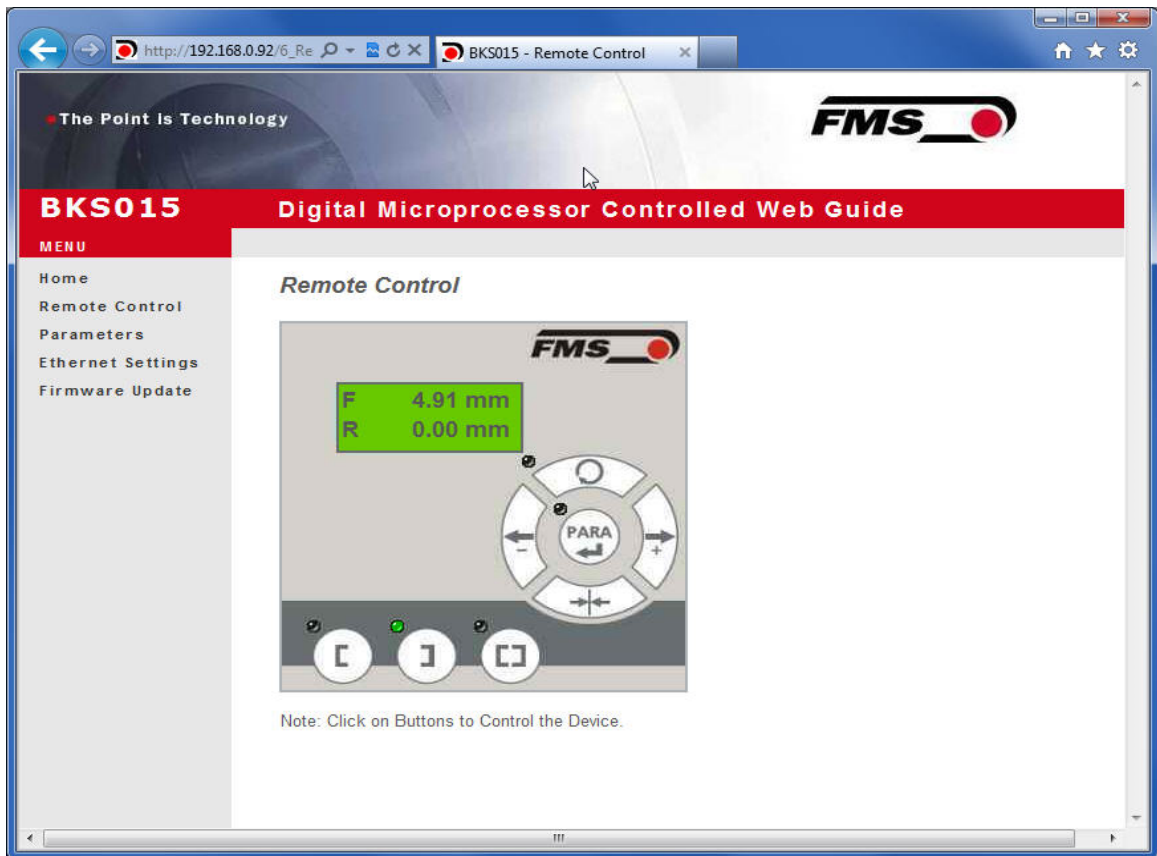


Fig. 24: Front panel for remote control purposes

Remote Control

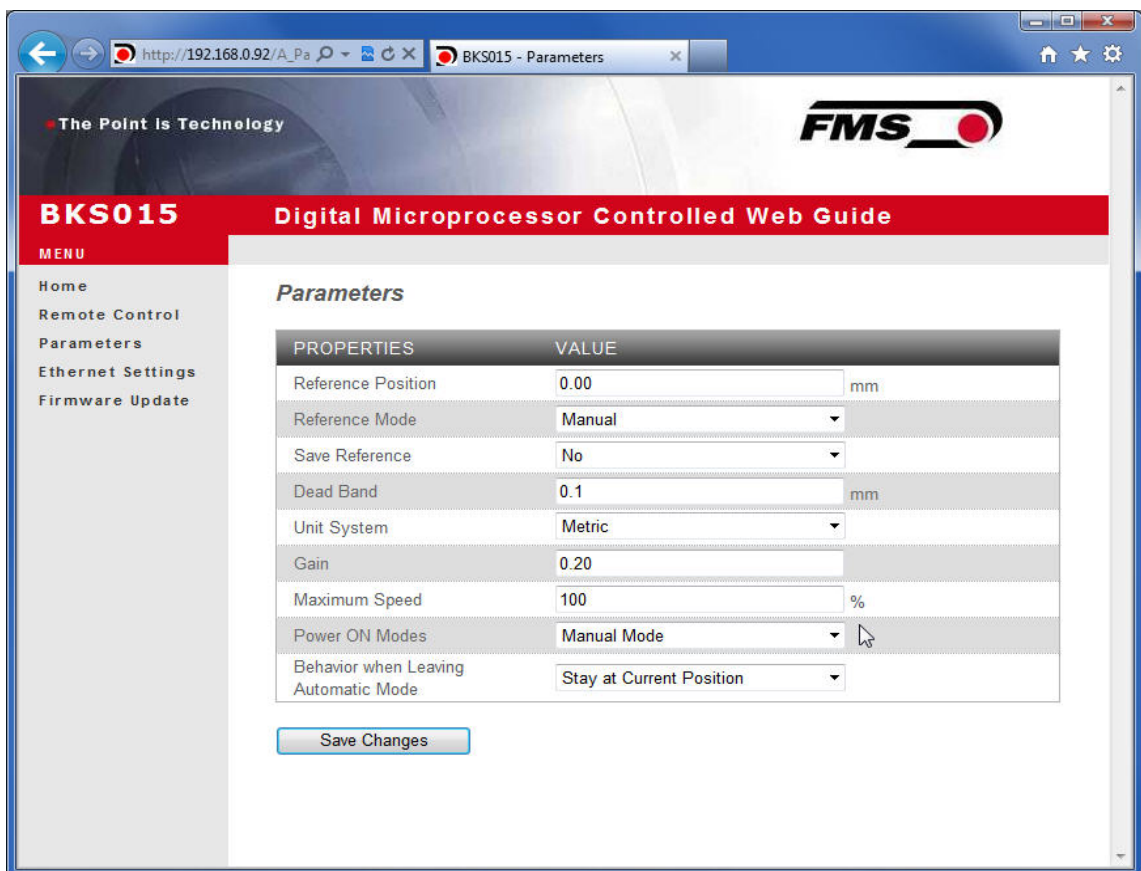


Fig. 25: Parameter list. Parameters can be changed

Parameters

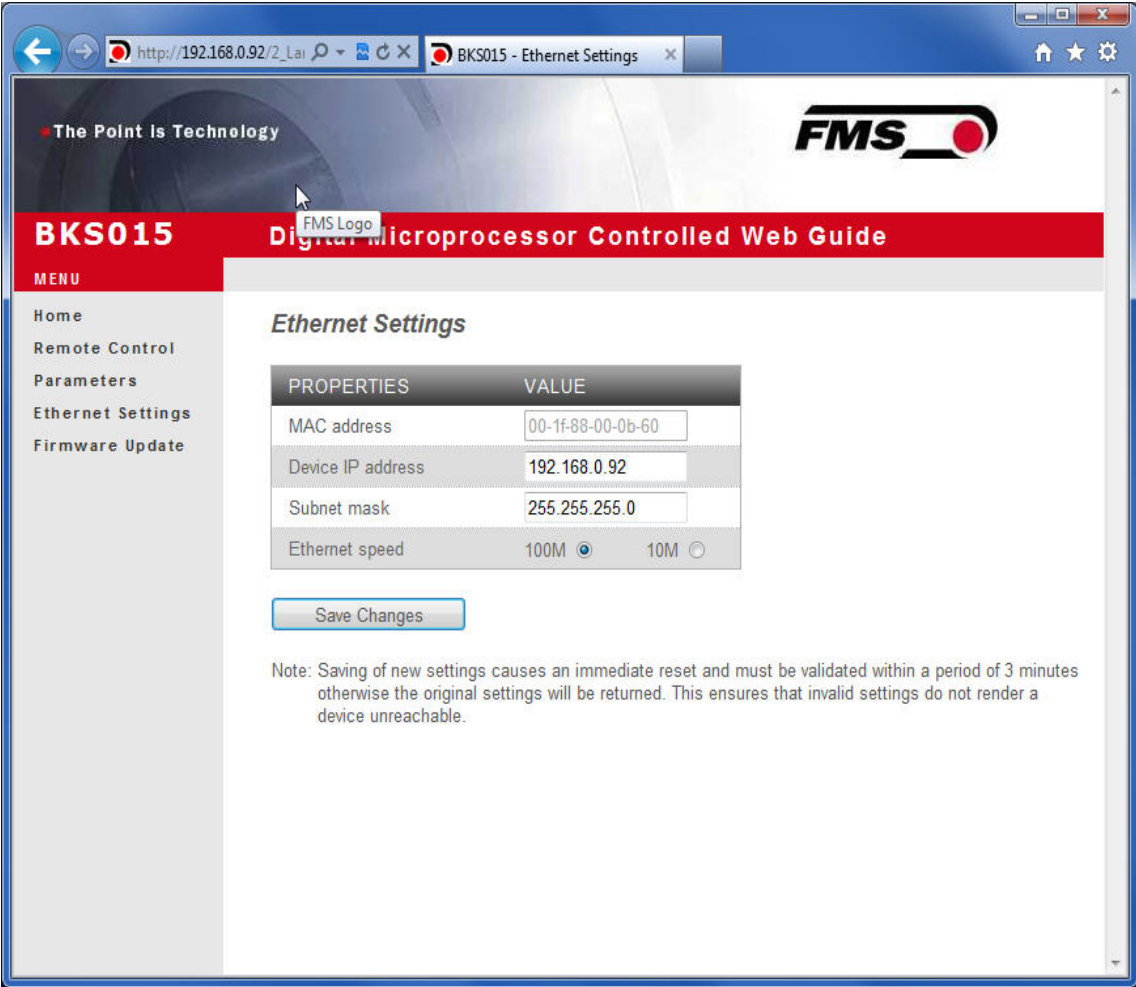


Fig. 26: Ethernet settings and device addresses

Ethernet Settings

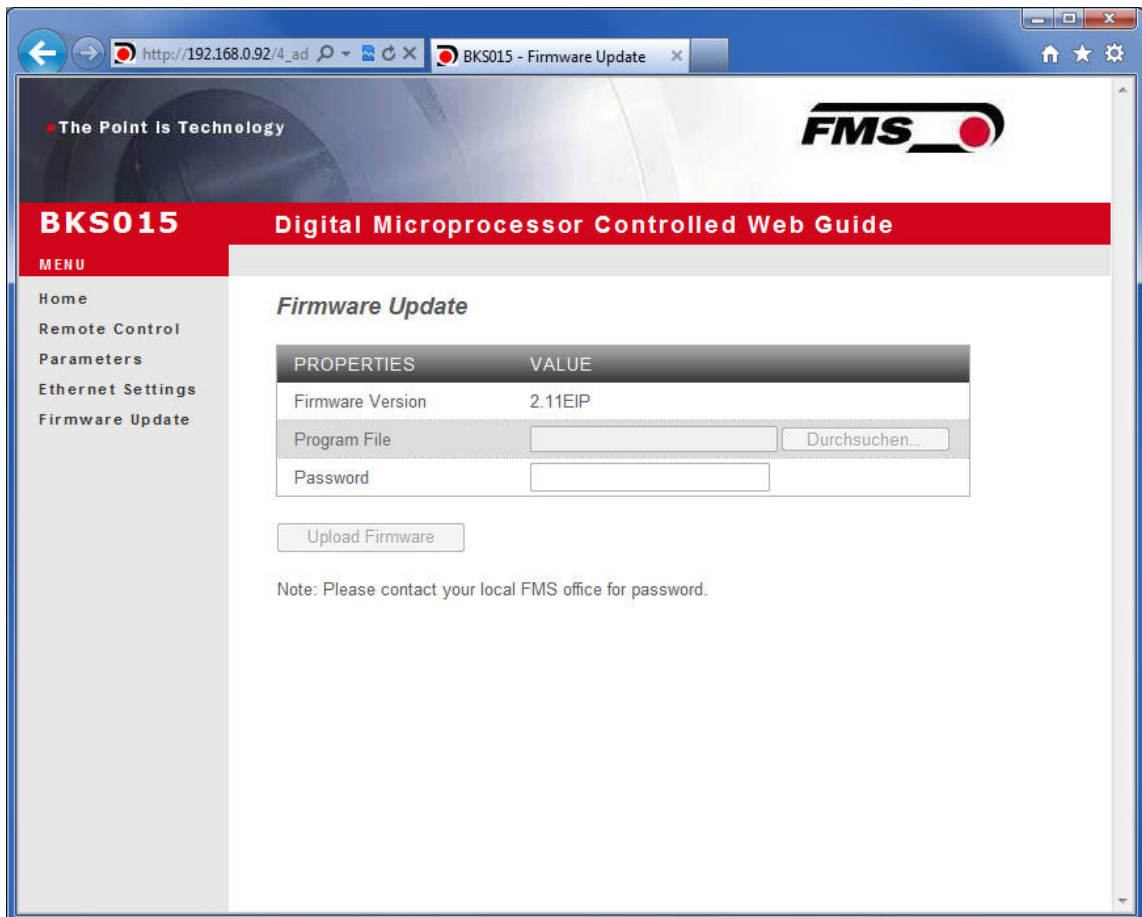


Fig. 27 Firmware update

Firmware Updates

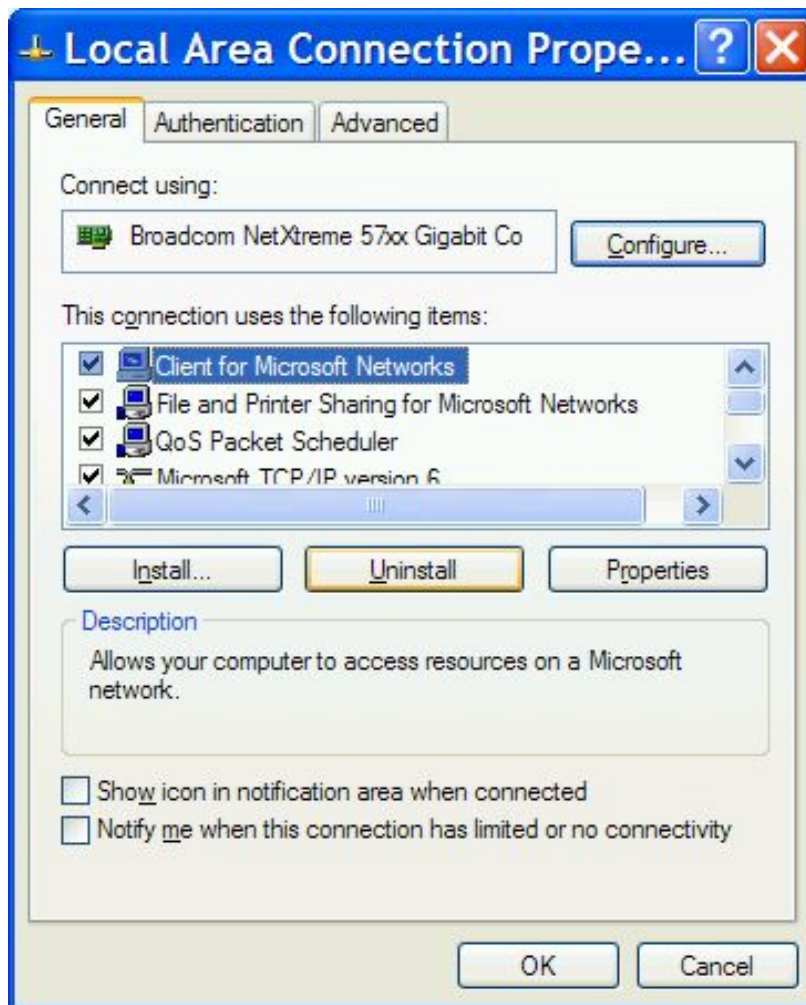
10.2 Parameterization via a PC (peer-to-peer connection)

This chapter describes the procedure for setting up a desktop or laptop computer to communicate with FMS BKS015.EIP web guide controller.

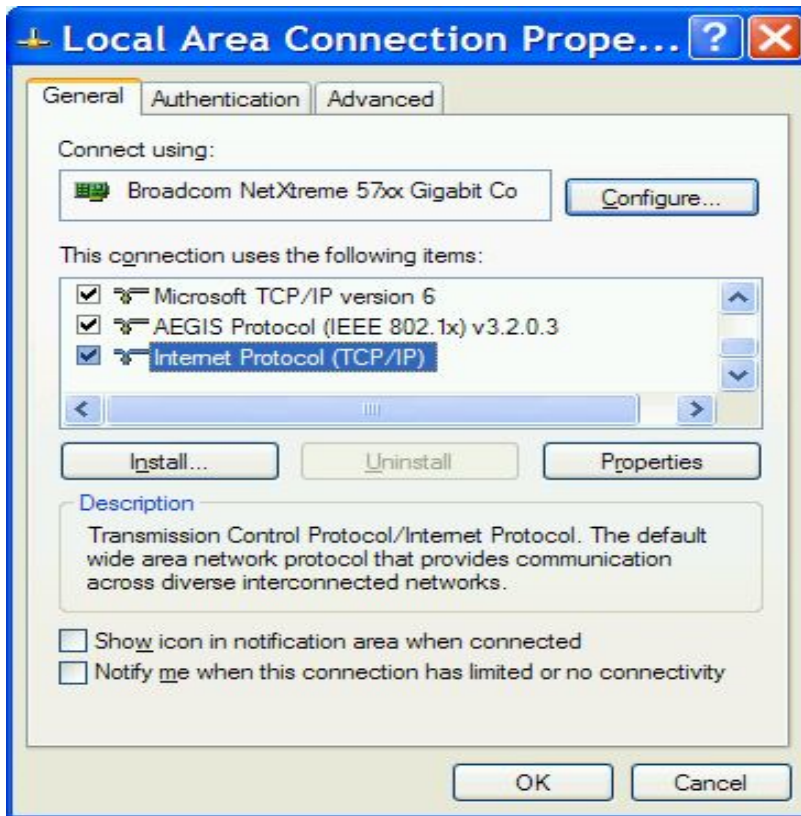
Before connecting the FMS BKS015.EIP controller with a “cross-over-cable” directly to a PC, the computer must be configured with a “static” IP address that lets it recognize the BKS015.EIP. If the BKS015.EIP controller is connected to a network by using e.g. a switch, the following procedure is not necessary. To establish the connection between your PC and the BKS015.EIP follow the steps below.

Setup in Microsoft Windows XP:

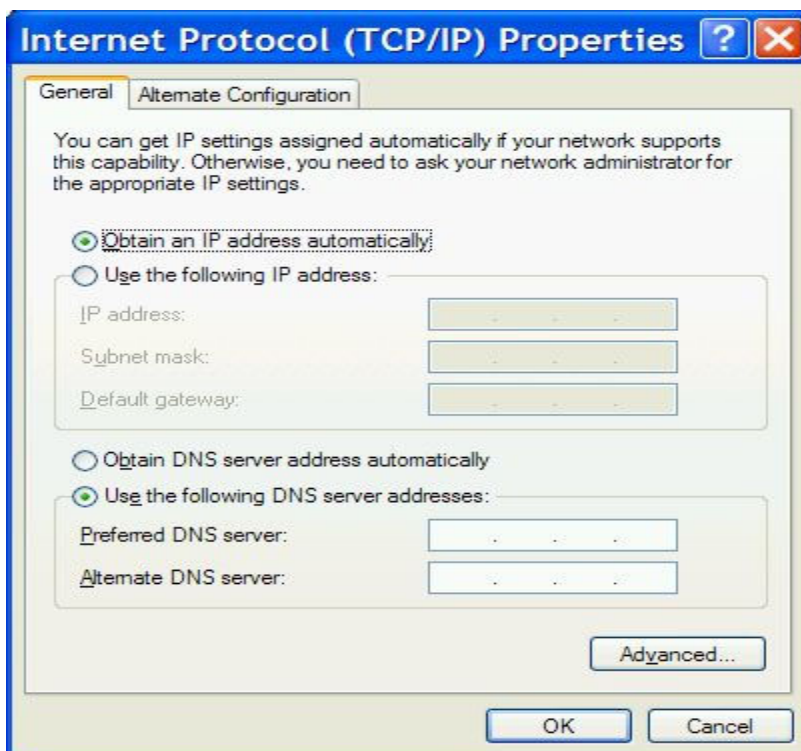
1. Click on the Start button (lower left-hand corner of the screen)
2. Click on Control Panel
3. Double click on Local Area Network
4. Right click on the network adapter that is used for the connection.
5. Click on Properties on the pop up menu, the following dialog box “Local Area Connection Properties” will appear.



In the box “This connection uses the following items:”, scroll down to “Internet Protocol (TCP/IP)”. Select the “Internet Protocol (TCP/IP)” and click “Properties”.



The following dialog box will appear. Make sure the “General” tab is selected.



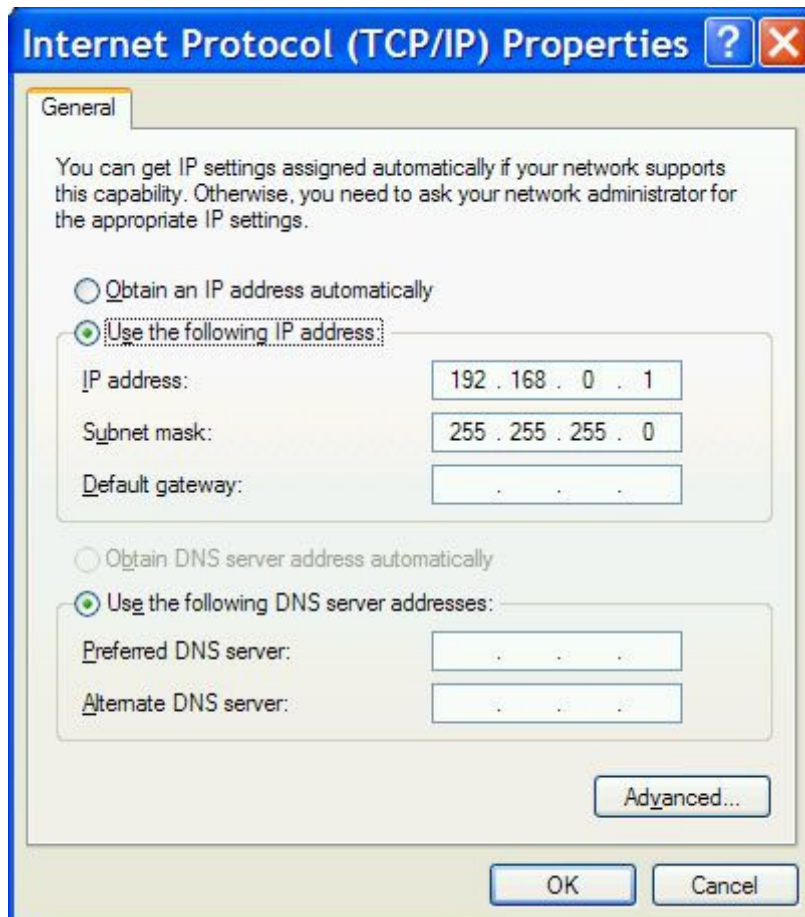
Select the radio button “Use the following IP address:”

In the IP address box enter the IP address for the computer that could be 192.168.0.1.

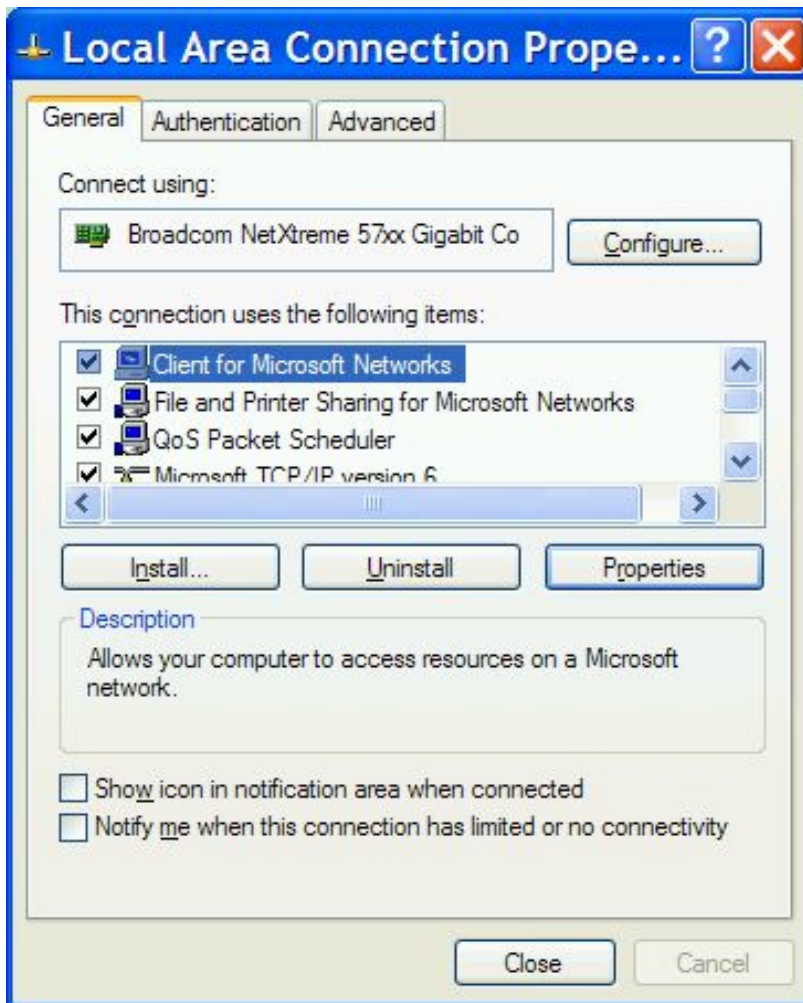
In the Subnet mask, enter 255 255 255 000, as shown below.

Notice that the “000” in both boxes will change automatically to “0”.

The dialog box will change to look like the following:



Click the “OK” button. The following dialog box will appear again:



Click on the “Close” button.
 Close the “Network Connection” window
 Close “Control Panel”

The computer is now ready to communicate with the BKS015.EIP controller:

1. Connect the “cross over cable” to both the BKS015.EIP and to the appropriate port on the desktop or laptop computer (see **Fig. 21** and **22**).
2. Open Microsoft Internet Explorer or Mizilla Firefox.
3. The default IP address for the BKS015.EIP is 192.168.000.090 as long as it was not changed over the operating penal. Enter the IP address in the address bar and hit the Enter key. If a different IP address and subnet mask is configured at the BKS015.EIP make sure that the computer is setup appropriate.
4. The screen (**Fig.23**) will open up. Continue then with the procedure described in **10.1** “Parametrization in a Network via a Web Browser”.

11 Dimensions

The BKS015.EIP series is available in three different roller length sizes:

- 100mm
- 200mm

- 250mm

The mechanical dimensions can be seen in the following drawing.

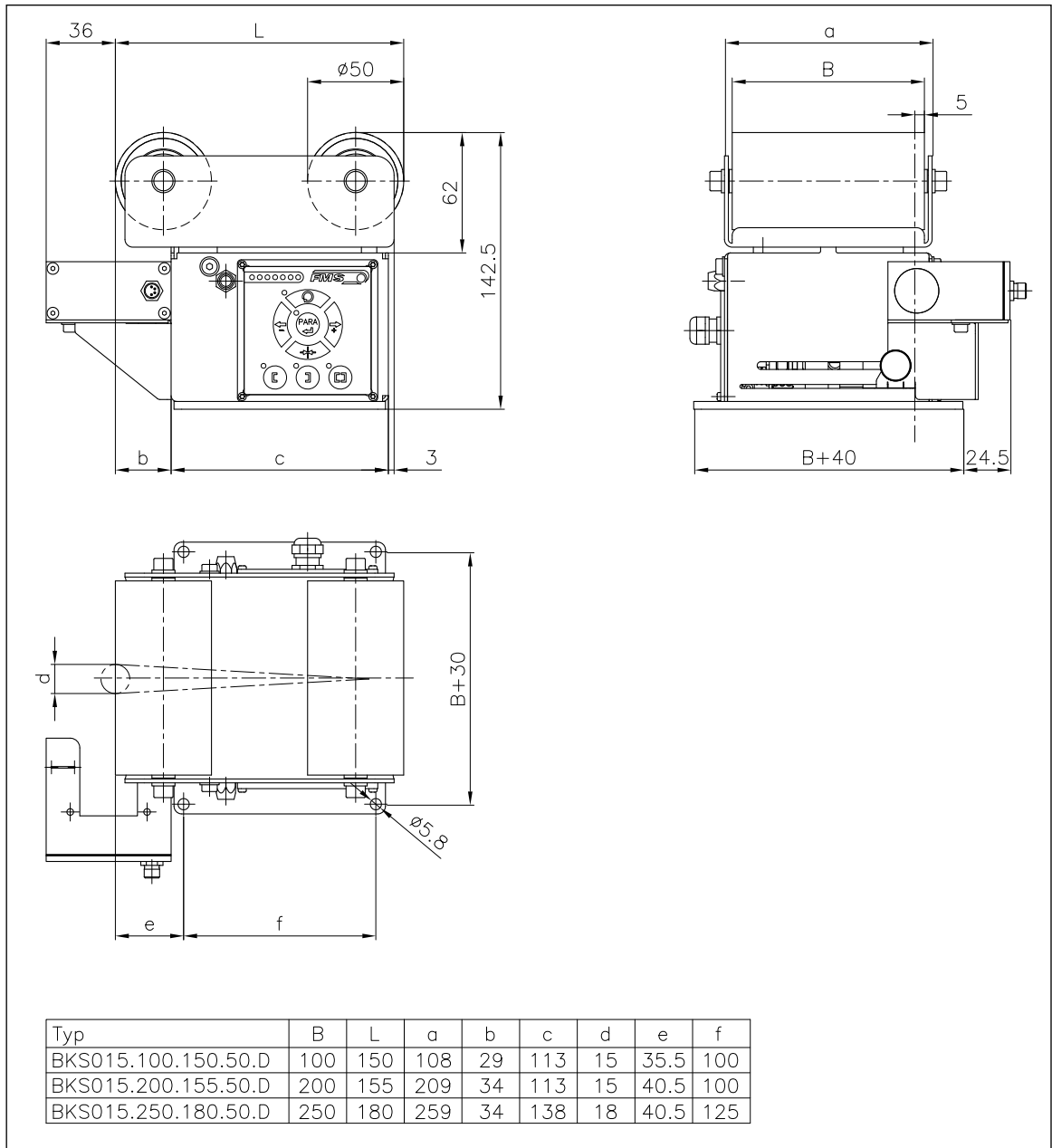


Fig. 28: Outline Drawing BKS015.EIP

K015002

12 Trouble Shooting

Error	Cause	Corrective action
Edge outside detection band	Edge has moved outside the sensor detection band	Adjust sensor more accurately to the web edge; Adjust reference position less during automatic operation
BKS guides web edge immediately out of the sensor	Sensor is mounted on the wrong side	Mount sensor to the correct side (right sensor for „Edge right“, etc.)
	Sensor is connected to the wrong socket	Connect sensor plug to the correct socket (left plug to left socket, etc.)
Steering frame does not move	No signal; sensor not correctly connected	Connect sensor correctly according to screw terminal arrangement and installation guide
	No signal; cable interruption	Replace cable or send sensor to FMS
	No signal; sensor defect	Send sensor to FMS; use other sensor
No response of the interface	Wiring not correct	Check wiring
LED-row shows nothing, frame doesn't react	Fuse blown	Replace Fuse on power supply board
	Power supply defect	Check or correct power supply installation
	Electronic control unit defect	Contact FMS customer service
Frame moves abrupt to one of the end positions	Stepper motor driver defective	Exchange actuator of the frame. Contact FMS service department for spare parts and installation guide.

13 Technical Specification

Cycle time	1ms
Drive of steering frame	Stepper motor. Power amplifier 24V integrated in housing
Dead band	0...2mm, adjustable in 0.1mm steps
Position reference	±5mm, adjustable in 0.1mm steps
Control modes	edge left / edge right / center guiding
Interface	Web browser Ethernet Explorer 7 or higher
Operation	3 keys and 5-key wind rose pad
Analogue inputs	2 inputs 0...10V (for sensors)
Supply voltage	24 (18 to 36) VDC
Temperature range	-10 to 60 °C (14 to 140 °F)
Protection class	IP 30





FMS Force Measuring Systems AG
Aspstrasse 6
8154 Oberglatt (Switzerland)
Tel. +41 44 852 80 80
Fax +41 44 850 60 06
info@fms-technology.com
www.fms-technology.com

FMS USA, Inc.
2155 Stonington Avenue Suite 119
Hoffman Estates, IL 60169 (USA)
Tel. +1 847 519 4400
Fax +1 847 519 4401
fmsusa@fms-technology.com

FMS (UK)
Aspstrasse 6
8154 Oberglatt (Switzerland)
Tel. +44 1767 221 303
fmsuk@fms-technology.com

FMS (Italy)
Aspstrasse 6
8154 Oberglatt (Switzerland)
Tel. +39 02 39487035
fmsit@fms-technology.com