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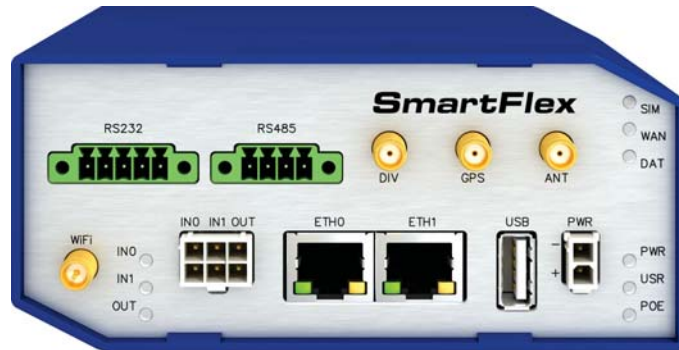
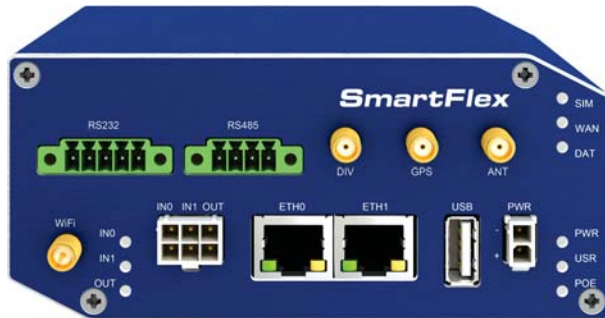
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LTE Industrial Router

SmartFlex SR305

USER MANUAL



B+B SMARTWORX

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Used symbols



Danger – Information regarding user safety or potential damage to the router.



Attention – Problems that can arise in specific situations.



Information, notice – Useful tips or information of special interest.

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1. Safety Instructions



Please, observe the following instructions:

1.1 Hazardous Locations Installation Instructions

These devices are open-type devices that are to be installed in an enclosure suitable for the environment and can only be accessed with the use of a tool or key.

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, AND D OR non-hazardous locations only.

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN REMOVED OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.

WARNING – EXPLOSION HAZARD – SUBSTITUTION OF ANY COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

WARNING – EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA FREE OF IGNITIBLE CONCENTRATION.

All antennas, antenna cables and wiring have not been evaluated as external wiring.

Cet équipement est convenable en Classe 1, Division 2, Groupes A, B, C, et D endroits dangereux OU endroits non dangereux seulement.

AVERTISSEMENT – RISQUE D'EXPLOSION – NE DÉCONNECTEZ PAS L'ÉQUIPEMENT, SAUF SI L'ALIMENTATION A ÉTÉ COUPÉE OU SI L'ENVIRONNEMENT EST CLASSÉ NON DANGEREUX.

AVERTISSEMENT – RISQUE D'EXPLOSION - SUBSTITUTION DE TOUTE COMPOSANTE RISQUERAIT LA QUALITÉ POUR CLASSE 1, DIVISION 2.

AVERTISSEMENT - RISQUE D'EXPLOSION - LES BATTERIES DOIVENT ÊTRE REMPLACÉES DANS UN ENDROIT EXEMPT DE CONCENTRATIONS INFLAMMABLES.

This equipment shall be mounted in an ATEX Zone 2 certified enclosure with a minimum ingress protection rating of at least IP54 (as defined in EN 60529) and used in an environment of not more than Pollution Degree 2 (as defined in EN 60664-1) when applied in Zone 2 environments. The enclosure must be accessible only by the use of a tool.

Provision shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 140 % of the rated voltage when applies in Zone 2 environments.

1.2 Other Safety Instructions

- The router must be used in compliance with all applicable international and national laws and in compliance with any special restrictions regulating the utilization of the router in prescribed applications and environments.
- To prevent possible injury and damage to appliances and to ensure compliance with all relevant provisions, use only the original accessories. Unauthorized modifications or the use of unapproved accessories may result in damage to the router and/or a breach of applicable regulations. Unauthorized modifications or use of unapproved accessories may void the warranty.
- The router can not be opened.
- Turn off the router and disconnect it from power supply before handling the SIM card.



- **Caution!** The SIM card could be swallowed by small children.
- Power supply must not exceed 60 V DC max.
- Do not expose the router to extreme ambient conditions. Protect the router against dust, moisture and high temperature.
- Only routers with appropriate certification and labelling should be used in locations where flammable and explosive materials are present, including gas stations, chemical plants, or locations in which explosives are used. We remind users of the duty to observe the restrictions concerning the utilization of radio devices at such places.
- Switch off the router when travelling by plane. Utilization of the router on a plane may endanger the operation of the plane or interfere with the mobile telephone network, and may be unlawful. Failure to observe these instructions may result in the suspension or cancellation of telephone services for the respective client and/or may result in legal sanctions.
- When using the router in close proximity to personal medical devices, such as cardiac pacemakers or hearing aids, you must proceed with heightened caution.
- The router may cause interference when used in close proximity to TV sets, radio receivers or personal computers.
- It is recommended that you create an appropriate copy or backup of all important settings that are stored in the memory of the device.

2. Directives and Statements

2.1 Product Disposal Instructions

The WEEE (Waste Electrical and Electronic Equipment: 2002/96/EC) directive was introduced to ensure that electrical/electronic products are recycled using the best available recovery techniques in order to minimize impact on the environment. This product contains high quality materials and components which can be recycled. At the end of its life this product **MUST NOT** be mixed with other commercial waste for disposal. Check the terms and conditions of your supplier for disposal information.

2.2 FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following 2 conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important: Changes or modifications to this product not authorized by Advantech B+B SmartWorx could void the electromagnetic compatibility (EMC) and wireless compliance and negate your authority to operate the product. This product has demonstrated EMC compliance under conditions that included the use of compliant peripheral devices and shielded cables between system components. It is important that you use compliant peripheral devices and shielded cables between system components to reduce the possibility of causing interference to radios, televisions, and other electronic devices.

3. Router Description

SmartFlex SR305 is an industrial cellular router intended for the North American market (NAM). This router is an ideal device for wireless communication in mobile networks that make use of LTE, HSPA+, UMTS, EDGE or GPRS technology. Due to the high speed of data transfer (up to 100 Mbps download and up to 50 Mbps upload) this router is an ideal solution for specialized M2M devices and IoT as well as for wireless connection of traffic and security camera systems, individual computers, LAN networks, automatic teller machines (ATMs) and other self-service terminals.

The standard configuration includes two Ethernet 10/100 ports, one USB 2.0 Host port, two binary inputs and one output (I/O connector). The device also has two readers for 3 V and 1.8 V SIM cards, which are located on the rear panel of the router. The router also includes a microSD card port that supports up to 64 GB card storage (32 GB in the case of SDHC cards). The router can be equipped with a WiFi module, but this must be part of the initial configuration – it cannot be added to the router at later date.

The router can be equipped with PoE PD (Power over Ethernet – Powered Device), which allows the router to be powered via Ethernet. It can also be equipped with PoE PSE (Power over Ethernet – Power Source Equipment), which enables the router to power other devices via Ethernet. The SmartFlex can also be configured with a wide variety of port options. Options include SWITCH – three switched Ethernet ports; RS232-RS485/422 – combination of serial interfaces; RS232-RS485-ETH – combination of serial interfaces and an Ethernet port with higher insulation. The router can be supplied in either plastic or metal casing, depending on customer requirements.

The router can be configured using a password-protected Web interface. The Web interface provides detailed statistics about the router's activities, signal strength, detailed system logs etc. The router supports the creation of VPN tunnels using IPSec, OpenVPN and L2TP to ensure safe communication. DHCP, NAT, NAT-T, DynDNS, NTP, VRRP, control by SMS, primary connection backups and many other functions are also supported.

The router performs diagnostic functions including automatic monitoring of the PPP connection, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status. It is possible to insert Linux scripts in order to perform various actions. It is also possible to create up to four different configurations for the same router. These configurations can be switched between at any via the Web interface, SMS or binary input status. The router can automatically upgrade its configuration and firmware from a central server, allowing for the mass reconfiguration of numerous routers at the same time.

The router also supports additional software such as R-SeeNet for permanent traffic monitoring of routers.



Examples of possible applications

- mobile office
- fleet management
- security systems
- telematic
- telemetric
- remote monitoring
- vending and dispatcher machines

3.1 Usage of the Router

The router is primarily intended for these four basic situations:

I. Access to the Internet from LAN

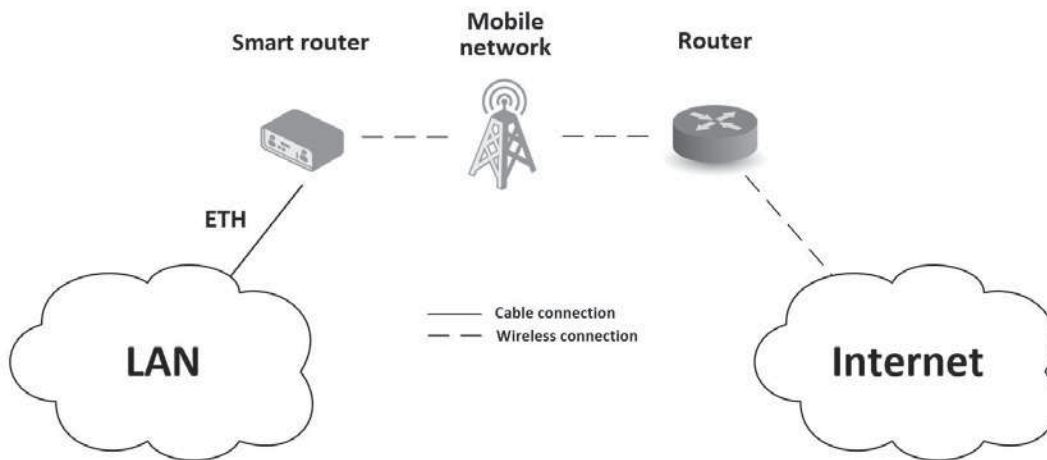


Figure 1: Access to the Internet from LAN

II. Backed up access to the Internet (from LAN)

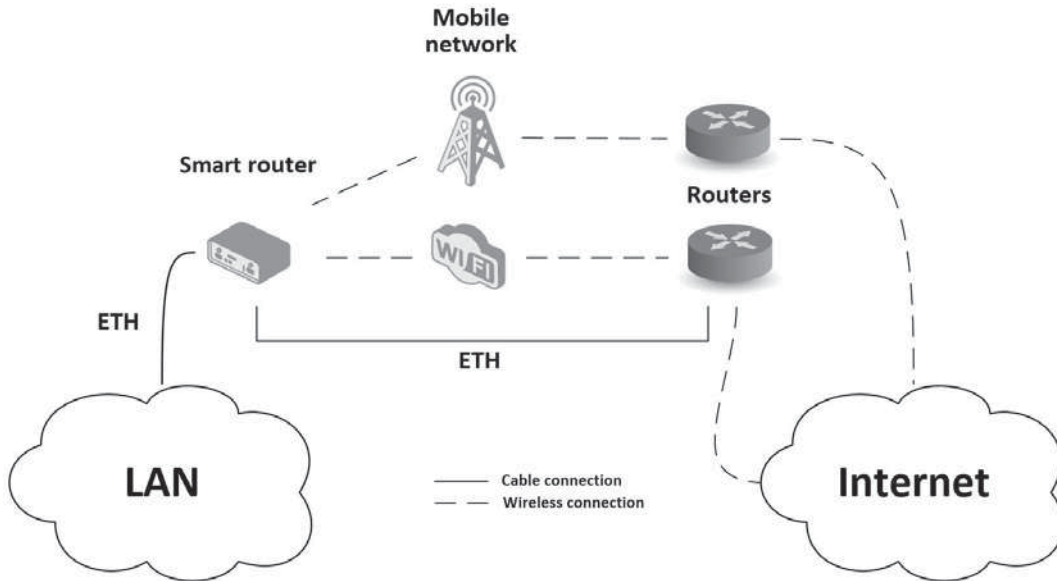


Figure 2: Backed up access to the Internet

III. Secure networks interconnection or using VPN

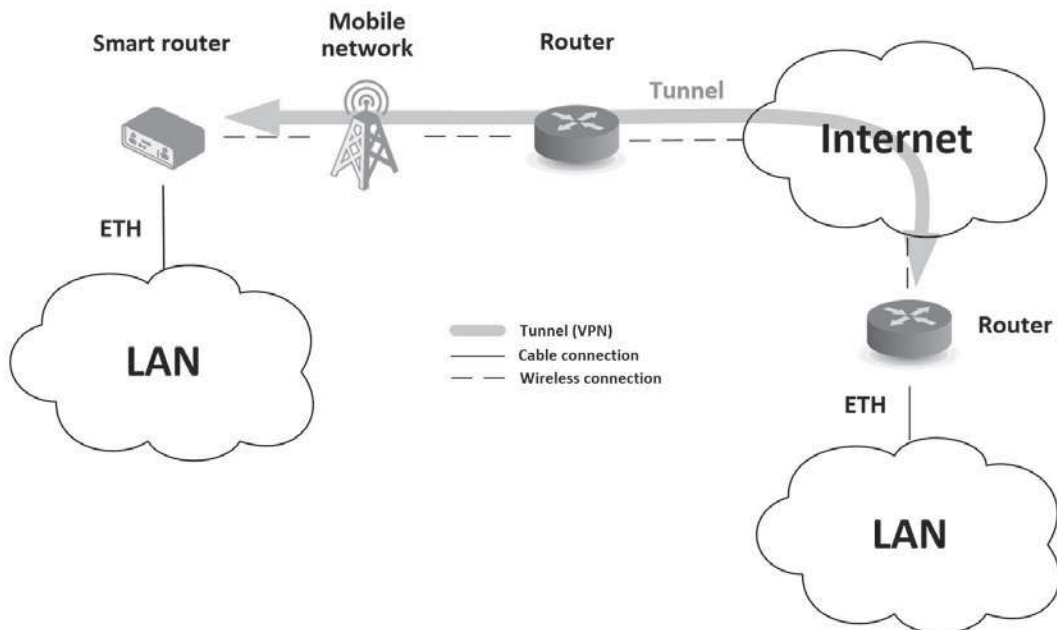


Figure 3: Using a VPN tunnel

IV. Serial Gateway

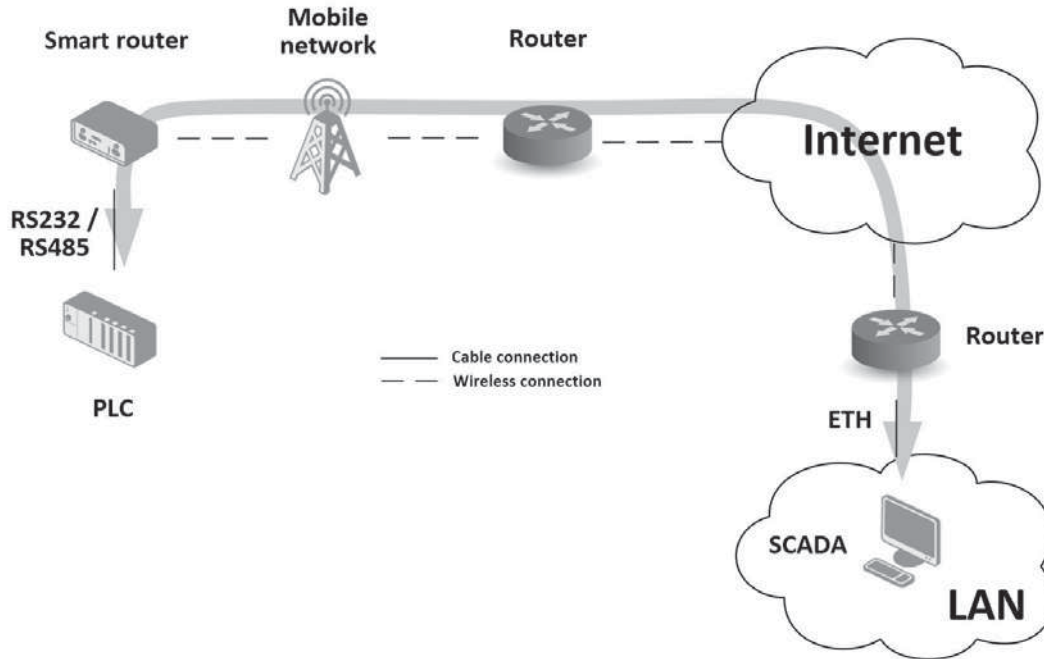


Figure 4: Serial Gateway

4. Contents of Package



The basic delivered router set includes:

- router,
- twin cable with power connector (BB-KN-v3-MO2-3),
- extra 6-pin I/O connector (+ 8 pins¹),
- 4-pin and 5-pin terminal block for RS485 and RS232 (**only for version with interface RS232-RS485/422**),
- 3-pin and 4-pin terminal block for RS485 and RS232 (**only for version with interface RS232-RS485-ETH**),
- DIN rail clip,
- Start guide for SmartFlex routers.

¹These pins are designed for cables with diameters from 0.2 to 0.8 mm²

4.1 Recommended Accessories

The following list contains recommended accessories. **These accessories are not included in the basic package!**

- LTE antennas:
 - Terminal antenna Taoglas TG.30.8113, order code: BB-TG.30.8113
- WiFi antenna:
 - Sectron, order code: BB-AW-A2458G-FSRPK
- Power supplies:
 - Regular power supply with universal set of power cords, order code: BB-RPS-v3-MO2-M
 - Power supply for use with PoE PSE versions with US power cord, order codes: BB-RPS-v3-PSE and BB-PWRCORD-US

5. Router Design

5.1 Router versions

The SmartFlex SR305 router is supplied in the following versions (see table below). All versions are available in plastic or metal casing according to customer requirements. All versions are available with PoE PD (Power over Ethernet – powered device) allowing the router to be powered using both ETH0 and ETH1 interfaces, or with PoE PSE (power source equipment) allowing the router to power other devices.

Router versions	SIM	BIN	BOUT	USB	SD	ETH	WiFi	232	485	SM IP
Basic version	2x	2x	1x	1x	1x	2x				
Basic version with WiFi	2x	2x	1x	1x	1x	2x	1x			
Version with SWITCH board	2x	2x	1x	1x	1x	5x				
Version with SWITCH board & WiFi	2x	2x	1x	1x	1x	5x	1x			
Version with RS232-RS485/422 board	2x	2x	1x	1x	1x	2x		1x	1x	
Version with RS232-RS485/422 & WiFi	2x	2x	1x	1x	1x	2x	1x	1x	1x	
Version with RS232-RS485-ETH board	2x	2x	1x	1x	1x	3x		1x	1x	
Version with RS232-RS485-ETH & WiFi	2x	2x	1x	1x	1x	3x	1x	1x	1x	

Table 1: Router versions



Figure 5: Basic version (plastic)



Figure 7: Basic version (metal)



Figure 6: Basic version with WiFi (plastic)



Figure 8: Basic version with WiFi (metal)



Figure 19: RS232-RS485-ETH & WiFi (plastic)



Figure 20: RS232-RS485-ETH & WiFi (metal)

5.2 Delivery identification

Trade name	Product name	Description
SmartFlex SR305	SmartFlex	Router in a plastic or metal box

Table 2: Delivery identification



Figure 21: Label examples

5.3 Order codes

The table below shows an overview of order codes.

Product Name	Order code	Features – interfaces
SR305	BB-SR3050x0y0*	LTE module for NAM, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader
SR305	BB-SR3051x0y0*	LTE module for NAM, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, WiFi
SR305	BB-SR3050x1y0*	LTE module for NAM, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader
SR305	BB-SR3051x1y0*	LTE module for NAM, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, WiFi
SR305	BB-SR3050x3y0*	LTE module for NAM, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, RS232, RS485
SR305	BB-SR3051x3y0*	LTE module for NAM, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, WiFi, RS232, RS485
SR305	BB-SR3050x4y0*	LTE module for NAM, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, RS232, RS485
SR305	BB-SR3051x4y0*	LTE module for NAM, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, WiFi, RS232, RS485

Table 3: Order codes overview



* Replace the letters "x" and "y" with the values from the following tables:

Letter "x" – Power over Ethernet (PoE)

Power over Ethernet (PoE)	Number "x" in code
Version without PoE	0
PoE PSE – Power Source Equipment – powers other devices	8
PoE PD – Powered Device – can be powered via Ethernet	9

Table 4: Power over Ethernet

Letter "y" – type of the router box

Type of box	Number "y" in code
Plastic	1
Metal	2

Table 5: Type of router box

Examples of complete order codes:

Order code	Features – interfaces	Box	Power supply
BB-SR30500010	LTE module for NAM, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader	plastic	None
BB-SR30510120	LTE module for NAM, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, WiFi	metal	None

Table 6: Examples of order code

5.4 Basic dimensions of the router box

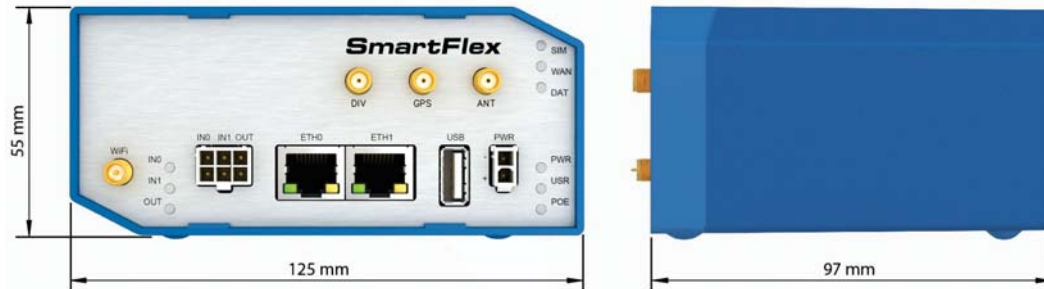


Figure 22: Basic dimensions of the router box

5.5 Mounting recommendations

- It is possible to place the router on a flat surface,
- DIN rail EN 60715 with the included plastic or metal clip.

For most applications with a built-in router within a switchboard it is possible to recognize two kinds of environments:

- A non-public, industry environment of low voltage with high interference,
- A public environment of low voltage and without high interference.

For both of these environments it is possible to mount router to a switchboard, after which there is no need to have examination immunity or issues in connection with EMC according to EN 61439-1:2011.



Attention: If the negative pole of the router is grounded, there is no protection against reversed polarity!



In compliance with the EN 61439-1:2011 specification it is necessary to observe the following assembly instructions for a router attached to a switchboard:

- For whip antennas it is recommended to observe a minimum distance of 6 cm from cables and metal surfaces on every side in order to avoid interference. When using an external antenna separate from the switchboard it is necessary to fit a lightning conductor.
- When mounting a router on sheet-steel we recommend using a "cable" antenna.
- For all cables we recommend to bind the bunch, and for this we recommend:

- The length of the bunch (combination of power supply and data cables) should be a maximum 1.5 m. If the length of data cables exceeds 1.5 m or if the cable is leading towards the switchboard, we recommend installing surge protectors.
- Data cables must not have a reticular tension of ~ 230 V/50 Hz or ~ 120 V/60 Hz.
- Sufficient space must be left between individual connectors for the handling of cables,
- To ensure correct functioning of the router we recommend the use of an earth-bonding distribution frame for the grounding of the power supply of the router, data cables and antenna within the switchboard.

5.6 Removal of the DIN rail

The DIN holder is suitable for a DIN rail according to EN 60715 standard only. The default position of of plastic or metal holder, which is used for mounting the router on a DIN rail, is shown in the following figure:



Figure 23: Default position of DIN holder

In order to remove the DIN rail it is necessary to lightly push the router upward so that the top part of the DIN holder hitched to the DIN rail comes out of this rail, then fold the top of the router away from the DIN rail.

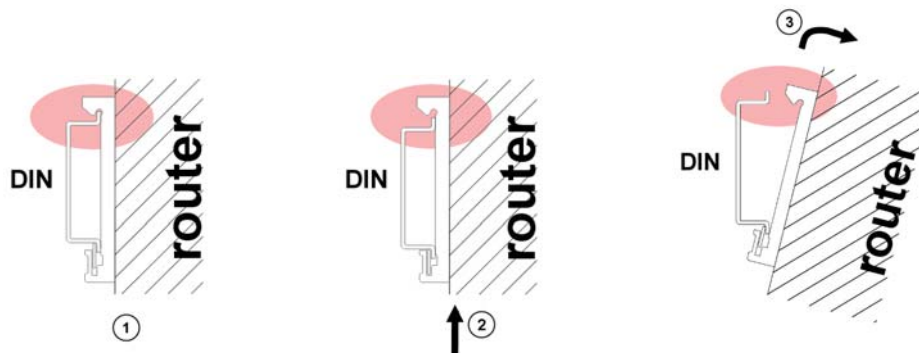


Figure 24: Removal of the DIN rail