Hardware Manual

Industrial Cellular Router
SmartFlex SR309

Used symbols

Important

Important — Indicates a risk to personal safety or potential damage to the router. Follow these instructions precisely to prevent injury or equipment damage.

Warning

Warning — Highlights conditions that may cause malfunction, loss of data, or unexpected behavior in specific situations. Read carefully before proceeding.

Info

Info — Provides helpful tips, context, or references that improve understanding but are not strictly required to complete the task.

Code Example

```
Code Example - Copy-pasteable configuration snippets or CLI commands.
```

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1. Router Description

   SmartFlex SR309 is an industrial cellular router intended for the **South Korean** markets (**SKT carrier only**). 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 150 Mbps (download) and up to 50 Mbps (upload) is this router 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 (ATM) 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 Wi-Fi module, but this must be part of the initial configuration – it cannot be assembled to the router at some point in the future.

   The router can be equipped with PoE PSE (Power over Ethernet – Power Source Equipment), which lets the router to power other devices via Ethernet. The SmartFlex router can also be configured with a wide variety of port options. These can be SWITCH – three switched Ethernet ports; RS232-RS485/422 – combination of serial interfaces. The router can be provided only in a metal casing.

   Configuration of the router may be done via a password-protected Web interface. Web interface provides detailed statistics about the router's activities, signal strength, detailed system log 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, backup primary connection and many other functions are supported.

   The router provides diagnostic functions which include automatically monitoring the PPP connection, automatic restart in case of connection losses, and a hardware watchdog that monitors the router status. The user may insert Linux scripts which are started on various actions. It is possible to create up to four different configurations for the same router. These configurations can be switched whenever necessary via Web interface, SMS or binary input status. The router can automatically upgrade its configuration and firmware from your central server. This allows for mass reconfiguration of numerous routers at the same time.

   This model is fully compatible with *WebAccess/DMP*, Advantech's powerful, flexible, and secure remote device management platform. WebAccess/DMP enables comprehensive remote management, monitoring, and troubleshooting of network devices without the need for on-site access. The platform supports features such as VPN management, digital twin functionality, customizable dashboards, multi-tenancy, and strict security controls including PKI, two-factor authentication, auditing, permission management, and alerts.

ℹ Examples of possible applications

- mobile office
- fleet management
- security system
- telematic

- telemetric
- remote monitoring
- vending and dispatcher machines

1.1 Usage of the Router

The router is primarily intended for these four basic situations:

I. Access to the Internet from LAN
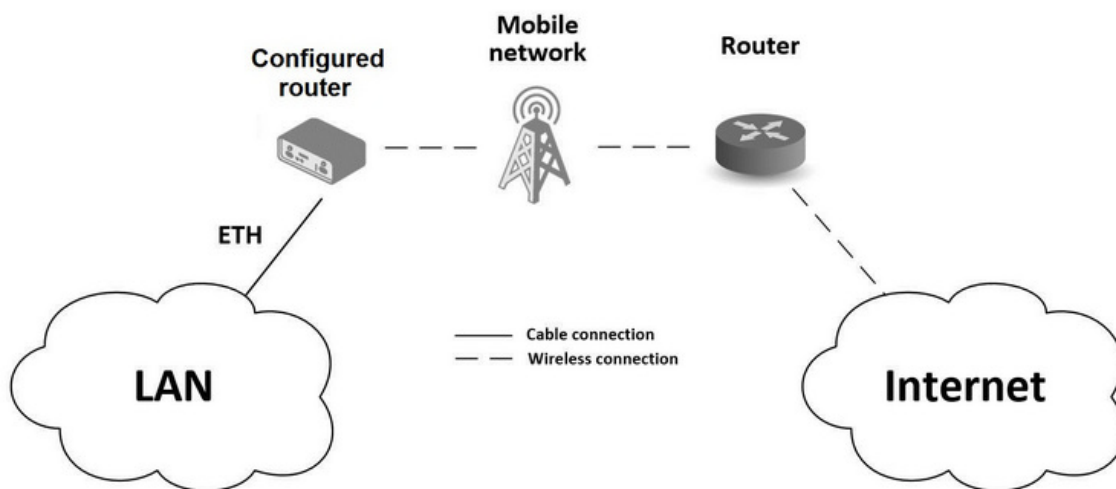
Figure 1: Access to the internet from LAN

II. Backed up access to the Internet (from LAN)
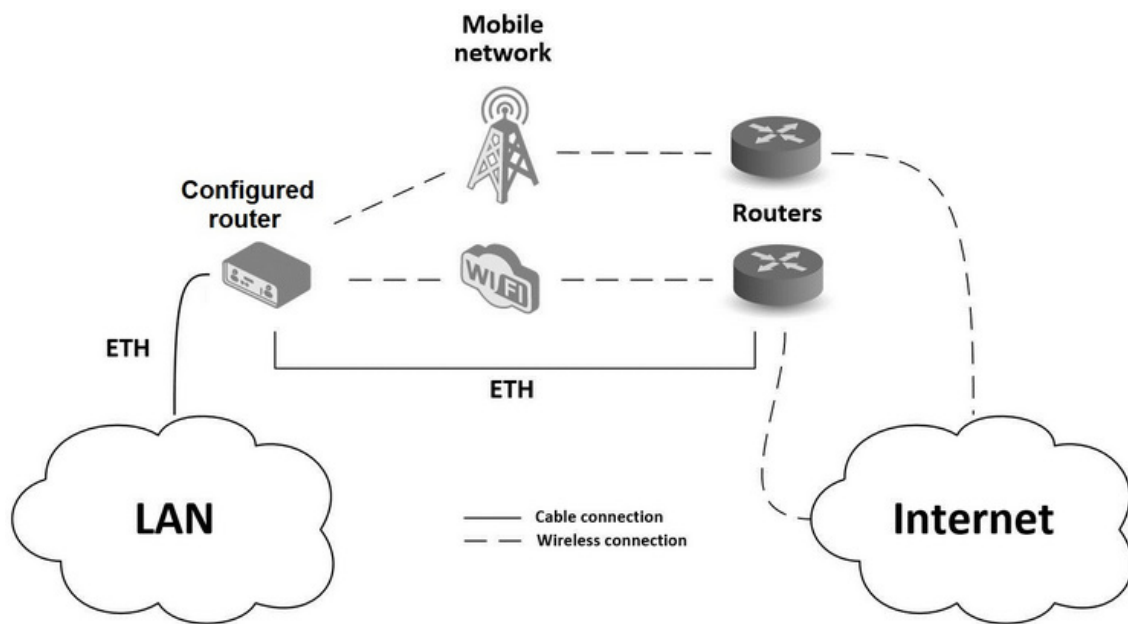
Figure 2: Backup access to the internet

III. Secure networks interconnection or using VPN
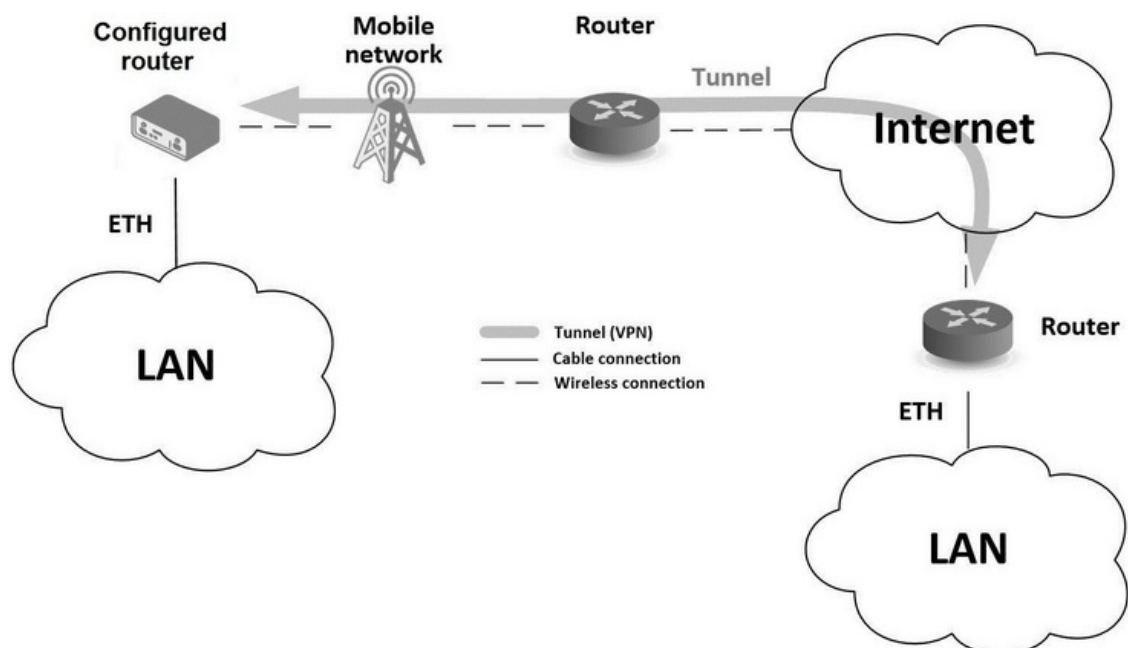
Figure 3: Using VPN tunnel

IV. Serial Gateway
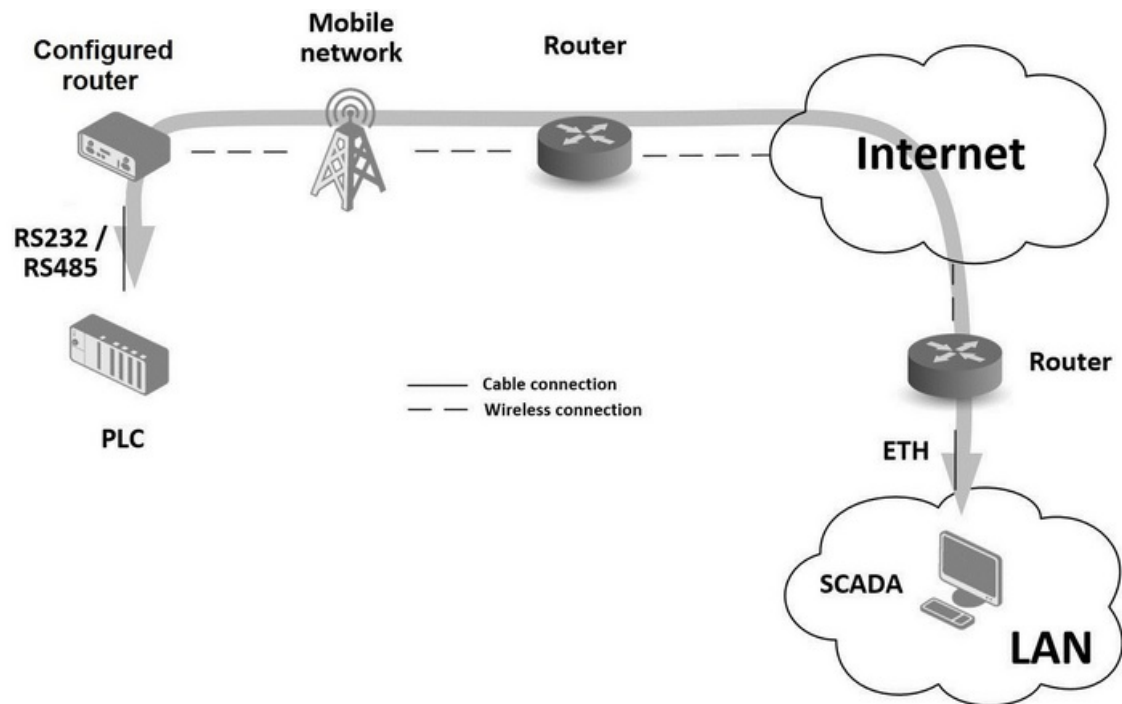
Figure 4: Serial gateway

2. Package Contents

Basic delivered set of router includes:

- router,

- power cable (1.5 m long),

- loose power and I/O connector (+8 pins[1]),

- 4-pins and 5-pins terminal block for RS485 and RS232
  (**only for version with interface RS232-RS485/422**),

- clip for the DIN rail,

- printed *Quick Start Guide Leaflet*.

Figure 5: Package contents

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[1]These pins are designed for cables with a diameter from 0.2 to 0.8 mm^2

3. Router Design

3.1 Router Versions

ℹ️ Check with your local Advantech sales representative for available options and HW configurations.

SmartFlex SR309 router is supplied in the following versions (see table below). All versions are available in plastic or metal box according to customer requirements. All versions are available with PoE PSE (power source equipment) so you can power other devices by the router.

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

Table 1: Router versions

Figure 6: Basic version (metal)
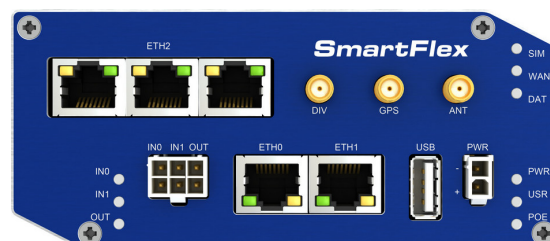
Figure 8: Switch version (metal)

Figure 7: Basic version with Wi-Fi (metal)
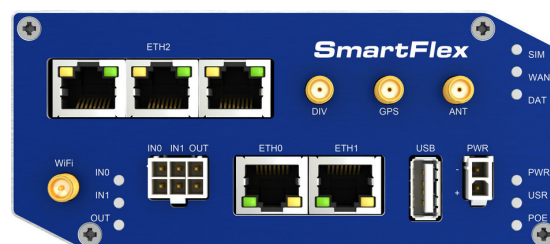
Figure 9: Switch and Wi-Fi version (metal)
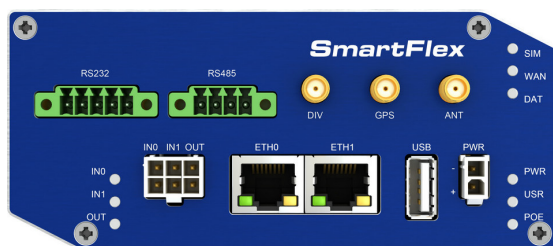
Figure 10: Version RS232-RS485 (metal)
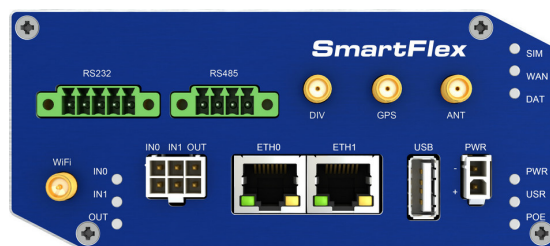
Figure 11: Version RS232-RS485 & Wi-Fi (metal)
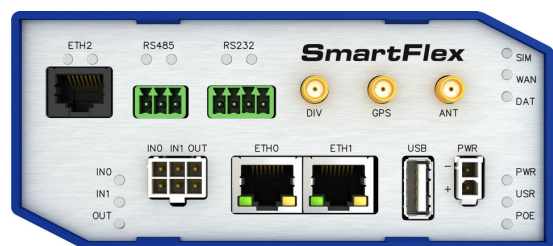
Figure 12: Version RS232-RS485-ETH (plastic)
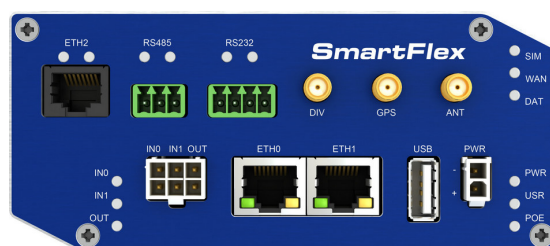
Figure 14: Version RS232-RS485-ETH (metal)
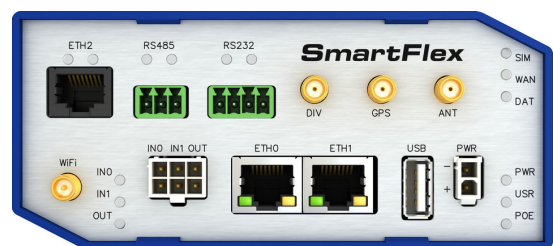
Figure 13: RS232-RS485-ETH & Wi-Fi (plastic)
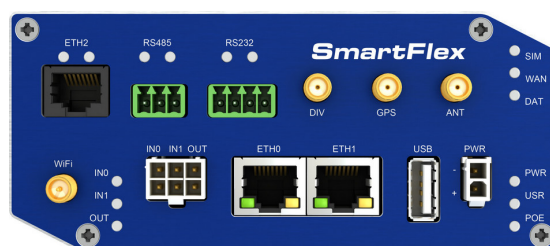
Figure 15: RS232-RS485-ETH & Wi-Fi (metal)

3.2 Product Revisions

For the product revision history of the entire product platform, refer to the table below. Please note that some revisions may not be available for certain order codes. The revision number is printed on both the packaging and product labels.

The router GUI can also display the product revision under *Status → General → System Information → Product Revision*. Please note that the default revision (Rev. 1.0) may not be available here.

Rev.#	Description
1.0	Initial version (revision number not printed on the labels).
2.0	New SIM slot type; see PCN-2022-03 for details.

Table 2: HW revision history

3.3 Identification of Delivery

Trade name	Product name	Description
SmartFlex SR309	SmartFlex	Router in a metal box

Table 3: Identification of delivery

Figure 16: Label examples

3.4 Order Codes

The table below provides an overview of the order codes.

Order code	Features – interfaces	Box
BB-SR30900020-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader	Metal
BB-SR30900120-SWH	LTE module, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader	Metal
BB-SR30900320-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, RS232, RS485	Metal
BB-SR30908020-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, PoE PSE	Metal
BB-SR30908120-SWH	LTE module, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, PoE PSE	Metal
BB-SR30908320-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, PoE PSE, RS232, RS485	Metal
BB-SR30910020-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi	Metal
BB-SR30910120-SWH	LTE module, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi	Metal
BB-SR30910320-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, RS232, RS485	Metal
BB-SR30918020-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, PoE PSE	Metal
BB-SR30918120-SWH	LTE module, 5x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, PoE PSE	Metal
BB-SR30918320-SWH	LTE module, 2x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, PoE PSE, RS232, RS485	Metal
BB-SR30908410-SWH	LTE module, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, PoE PSE, RS232, RS485	Plastic
BB-SR30908420-SWH	LTE module, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, PoE PSE, RS232, RS485	Metal
BB-SR30918410-SWH	LTE module, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, PoE PSE, RS232, RS485	Plastic
BB-SR30918420-SWH	LTE module, 3x ETH, 1x USB, 2x BI, 1x BO, 1x microSD reader, 2x SIM reader, Wi-Fi, PoE PSE, RS232, RS485	Metal

Table 4: Order code overview

3.5 Basic Router Box Dimensions
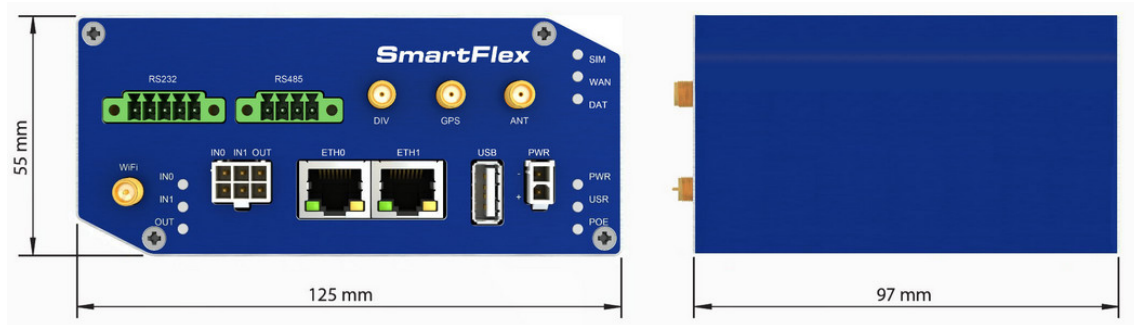
Figure 17: Basic router box dimensions

3.6 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 the 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.

> 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 (the 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 $\sim$ 230 V/50 Hz or $\sim$ 120 V/60 Hz.

- Sufficient space must be left between each connector for the handling of cables,

- To ensure the 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.

3.7 Removal From the DIN Rail

The DIN rail clip is suitable for a DIN rail according to EN 60715 standard only. The default position of metal rail clip, which is used for mounting the router on a DIN rail, is shown in the following figure. Its position can be changed on some models (back or bottom). When changing the position of the DIN rail clip, tighten the screws with max. 0.4 Nm torque.

Figure 18: Default position of metal DIN rail clip

To remove the router from the DIN rail, push the router down lightly, so the bottom part of the DIN rail clip (hitched to the DIN rail) gets out of the rail and then pull out the bottom part of the router away from the DIN rail.
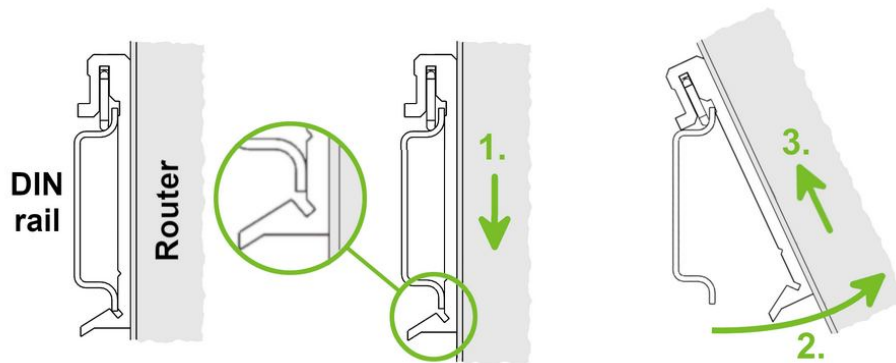
Figure 19: Removal from the DIN rail

3.8 Description of the Rear Panel

The rear panel contains two holders for SIM cards (*SIM1* and *SIM2*), a holder for microSD card (*SD*) and an *RST* button used to restore the default configuration and reboot the router.

3.9 Description of the Front Panel

On the front panel is the following:

Caption	Connector	Description
PWR	2-pin	Connector for the power supply
ETH0	RJ45	Connector for connection into the computer network, PoE (only for PoE PSE or PoE PD versions)
ETH1	RJ45	Connector for connection into the computer network, PoE (only for PoE PSE or PoE PD versions)
ANT	SMA	Connector for main antenna
DIV	SMA	Connector for diversity antenna
GPS	SMA	Connector for GPS antenna
Wi-Fi	R-SMA	Connector for Wi-Fi antenna (**only for versions with Wi-Fi module!**)
USB	USB-A 2.0 Host	Connector for connection of USB devices to the router. Supports devices with PL-2303 and FTDI USB/RS232 converters.
I/O	6-pin	Connector for connection of the binary inputs and output

Table 5: Front panel description
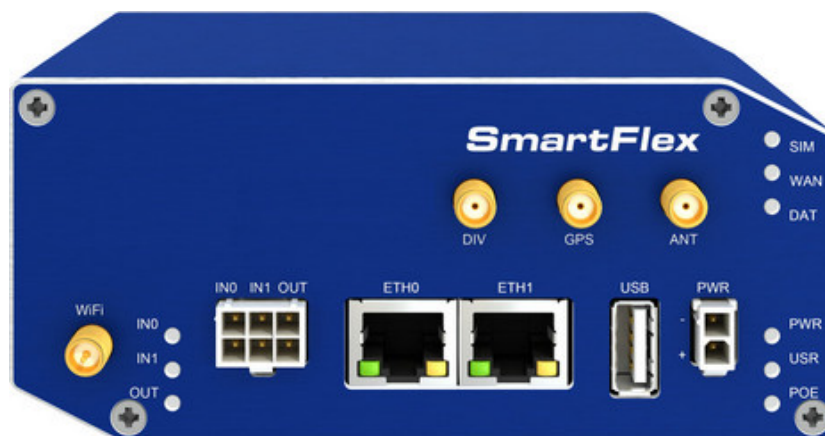
Figure 20: SmartFlex front panel

3.9.1 Status Indication

There are status LEDs on the front panel to provide router status information. Each ETH port has two additional LEDs that provide information about the port status.

Caption	Color	State	Description
PWR	Green	On Blinking Fast blinking	The router is booting up. The router booted up and is ready. The router firmware is being updated.
USR	Yellow	—	The function of this LED is user-defined.
POE	Yellow Green	On Blinking On Blinking Off	PSE: The insufficient voltage on the PWR connector. PSE: The powered device takes too much power.[1] PD: The power supply is present on an ETH port. PSE: A correct power supply on the PWR connector. PSE: A device is powered via one of the ETH ports. PD: The power supply is not present on an ETH port. PSE: The PoE disabled in the Ethernet configuration.
SIM	Green Yellow	On (Green color) On (Yellow color)	The first SIM card is active. The second SIM card is active.
WAN	Yellow	Fades out 1x/5 s Fades out 1x/2 s Fades out 1x/1 s	Signal strength is good. Signal strength is fair[2]. Signal strength is poor[3]. For value ranges of signal strength see *Configuration manual*, chapter *Mobile WAN Status*.
DAT	Red	Blinking	Cellular communication is in progress.
IN0	Green	On	The first binary input is active.
IN1	Green	On	The second binary input is active.
OUT	Yellow	On	The binary output is active.
ETH0 ETH1	Green	On Off	Selected 100 Mbps. Selected 10 Mbps.
ETH0 ETH1	Yellow	On Blinking Off	The network cable is connected. Data transmission. The network cable is not connected.

Table 6: LED status indication

i The status indication of the WAN LED is updated every 10 seconds.

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[1]Additionally it can indicate a device without PoE support connected on the other side of the cable. In this case the indication is caused by low impedance (lower than 500 Ω) of the device without PoE support. This can be solved by disabling the PoE PSE feature on the relevant ETH port in the router's Web interface, see *Configuration manual* [1].

[2]Or the difference between neighbouring cells is exactly 3 dBm.

[3]Or the difference between neighbouring cells is smaller than 3 dBm.

3.9.2 Power Connector PWR

Panel socket 2-pin.

Pin number	Signal mark	Description
1	GND(-)	Negative pole of DC supply voltage
2	VCC(+)	Positive pole of DC supply voltage

<div align="center">Table 7: Connection of power connector</div>
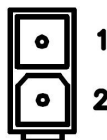
<div align="center">Figure 21: Power connector</div>

The unit must be supplied by a power supply specified as a Limited Power Source (LPS) according to Annex Q of IEC 62368-1. If the power supply or cable provided with the device is not used, always use cables with a minimum wire size (nominal cross-section) of 0.5 square mm for the power supply connection.

For the power supply parameters, see chapter *5.1 Basic Technical Parameters*. Protection against reversed polarity, without signaling, is built into the router.

Note: The protection against reversed polarity is lost if the negative pole is grounded!
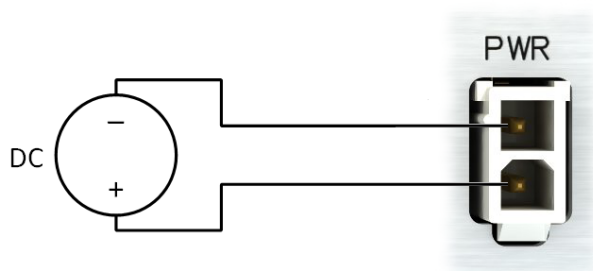
<div align="center">Figure 22: Power supply connection</div>

Note for PoE: See Chapter 3.9.7 for information on how PoE versions of the router impact the power supply usage. The power supply for a PoE router has to meet other specific requirements.

All metal parts are connected together with the negative pole of power supply (common pole).

Low Power Mode

> ⚠ In applications requiring low power consumption (such as solar power - not 7/24 mode) is strictly recommended to use LPM mode prior to powering down the entire router.

LPM (Low Power Mode) is a router mode where the router is in sleep mode with minimal power consumption. The router can be woken up from this mode by a signal applied to the BIN1 input or after a predetermined period of time. Putting the router into LPM mode can be done using the `lpm` command, see *Command Line Interface* application note for more details. Consumption in LPM mode may vary depending on the configuration of the router.

3.9.3 Antenna Connector ANT, DIV, GPS and Wi-Fi

The main, diversity and GPS antennas are connected to the router using the SMA connector on the front panel. There is also an R-SMA antenna connector available, through which an additional antenna can be connected, if the router is equipped with a Wi-Fi module.

The *ANT* connector is used to First, connect the main antenna to the router. To connect the diversity antenna, the second antenna connector *DIV* is used. The third connector (*GPS*) is intended for a GPS antenna (the router supports active GPS antennas). An R-SMA connector named *Wi-Fi* is designed for the connection of a Wi-Fi antenna (available only for versions with a Wi-Fi module).

> **!** The router can not operate without a main antenna connected through the port marked as *ANT*!

i The DIV celullar antenna is required for the MIMO DL functionality.

i An SMA connector is used for the connection of the antenna. The antenna is connected by screwing this antenna to the SMA connector on the router's front panel (see the figure below).
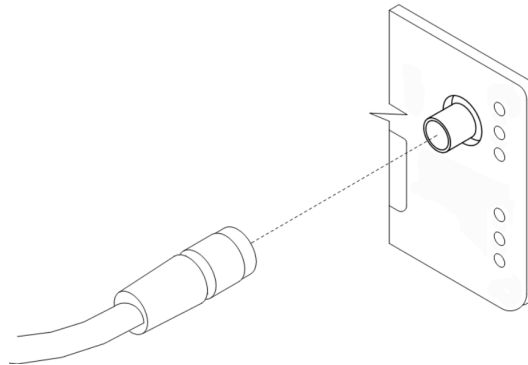
Figure 23: Connecting the antenna

i A diversity antenna improves the radio capability of the router at low signal strength.

3.9.4 SIM Card Slot

Two SIM card slots for 3 V and 1.8 V SIM cards are located on the rear panel of the router. In order for the router to function, it is necessary to insert an activated SIM card with an unblocked PIN code. The SIM cards may have different APNs (Access Point Names) adjusted.

i Supported type of SIM cards: **Mini SIM** (2FF), dimensions 25.0 x 15.0 x 0.76 mm.

Changing the SIM card:

- Always disconnect the router from the power supply before handling the SIM card.
- To remove the SIM card, use the flat end of a spudger, or your fingernail, press the SIM card slightly into its slot until you hear a click.
- After hearing this click, release the card, and it will pop out of its slot.
- Remove the SIM card and push any other SIM card into the slot until it clicks into place.
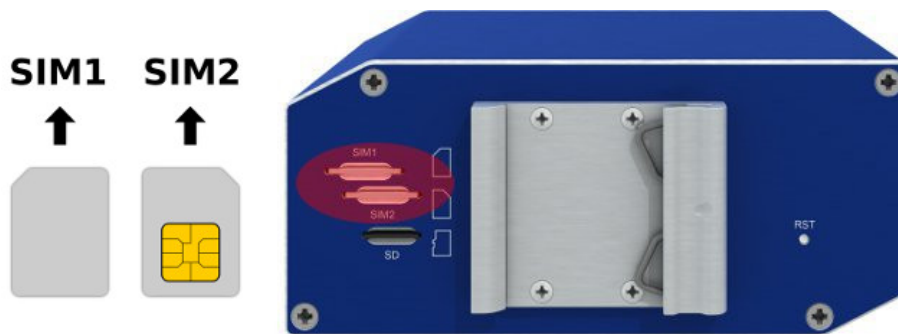
Figure 24: SIM card

3.9.5 microSD Card Reader

The microSD card reader is located on the router's rear panel (the third slot). This card reader allows the router to operate with microSD memory cards. The technical specifications are stated in the table below. The microSD card changing procedure is described below.

Technical specifications of microSD card		
Supported technologies		SDHC, SDXC
Supported capacity	SDHC	up to 32 GB
	SDXC	from 32 GB to 64 GB
Supported microSD card filesystems		vfat, ext2, ext3, ext4

Table 8: Technical specifications of the microSD card

Changing the microSD card:

- To remove the microSD card, use the flat end of a spudger, or your fingernail, press the microSD card slightly into its slot until you hear a click.
- After hearing this click, release the card, and it will pop out of its slot.
- Remove the microSD card and push any other microSD card into the slot until it clicks into place.

Figure 25: microSD card

Mounting microSD Card to the System

It is necessary to mount the microSD card to be able to access it in the system of the router. Follow these steps to mount the card:

- Use the *dmesg* command to see the list of recently connected devices.

- In the output of the command find out the entry for the microSD card, for example:
  `mmcblk0: p1`

- To mount the card to to *mnt* directory, use the *mount* command:
  `mount /dev/mmcblk0p1 /mnt`

For more information about the commands for creating, mounting, checking and unmounting a file system on a microSD card, see the application note for *Ext4 Filesystem Utilities* router app.

3.9.6 Ethernet Ports (ETH0 and ETH1)

The panel socket RJ45 is used for this interface. The isolation barrier of the Ethernet signal ports against the ground is 1500 V.

Pin	10base-T & 100base-T	PoE (Mode B)
1	Tx+ (Transmit Data+)	—
2	Tx- (Transmit Data-)	—
3	Rx+ (Receive Data+)	—
4	—	PoE + (positive pole)
5	—	PoE + (positive pole)
6	Rx- (Receive Data-)	—
7	—	PoE - (negative pole)
8	—	PoE - (negative pole)

Table 9: Ethernet connection
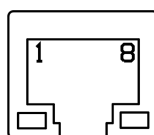
Figure 26: Ethernet connector

The crossover UTP cable (Ethernet cable) plugs into the RJ45 connector labeled as ETH0 or ETH1 (see the figure below).
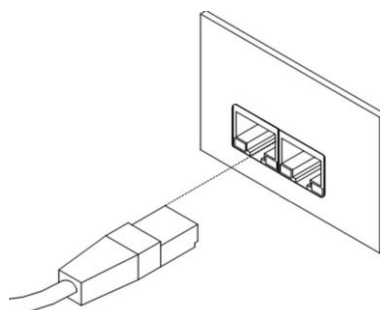
Figure 27: Ethernet cable connection

The insulation strength of Ethernet ports from each other and from the rest of the router (grounding) is dependent on the router version:

Router Version	Insul. Strength from Router	Insul. Strength between Ports
Without PoE	1.5 kV	1.5 kV
PoE PD	1.5 kV	none
PoE PSE	none	none

Table 10: Ethernet port insulation strength

3.9.7 Power over Ethernet (PoE) PSE

The PoE PSE version allows the router to power other devices over the Ethernet.

> ⚠ The power supply voltage for a PoE-equipped router must be between **24 – 60 V DC** for the router to boot up correctly.

ℹ
- Available only for models with PoE feature; see Chapter 3.4 for the order codes.
- The *IEEE 802.3af/PoE* (Type 1) and *IEEE 802.3at/PoE+* (Type 2) standards are supported. The device is Mode B compliant.
- You can use the `pse` command to control the PoE functionality; see the *Command Line Interface* application note.

PoE PSE
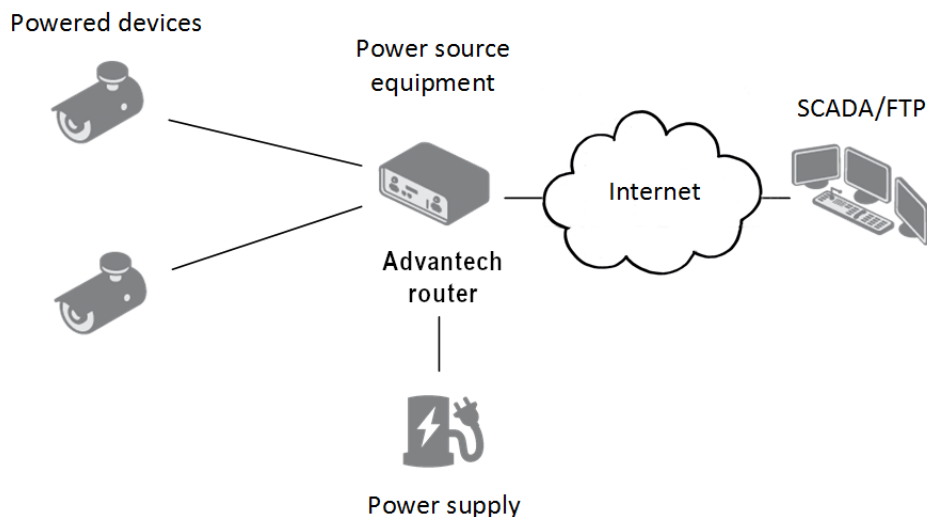
Figure 28: PoE PSE use

> ⚠ The power supply used with the PoE PSE router has to provide voltage from **44 to 57 V DC** and the output power has to be at least **65 W** for full PoE+ use (Class 4) in both Ethernet ports (ETH0 and ETH1).

The PoE PSE parameters can be found in Chapter 5.8. The PoE state is indicated by the POE LED on the front panel of the router, see Chap. 3.9.1. When sufficient voltage (44 to 57 V) and power is available is indicated by the green light. A yellow POE LED indicates insufficient power or voltage through the PWR connector. When a device is being powered from the router, the POE LED is will show blinking green. Yellow blinking is shown for an overload (the powered device is using too much power) or a short circuit (incorrect wiring of the cable or of the device without PoE support).

You can enable or disable the PoE PSE feature separately on the ETH0 and ETH1 ports via the Web interface of the router. This can be found in the *LAN* configuration pages (*Primary* for ETH0, *Secondary* for ETH1). When PoE PSE is enabled, you can find the current, voltage, power and power class information on the *General* page of the router's Web interface; see the *Configuration manual* [1].

3.9.8 USB Port

Panel socket USB-A.

Pin	Signal mark	Description	Data flow direction
1	+5 V	Positive pole of 5 V DC supply voltage, 0.5 A	
2	USB data -	USB data signal – negative pole	Input/Output
3	USB data +	USB data signal – positive pole	Input/Output
4	GND	Negative pole of DC supply voltage	

Table 11: Connection of USB connector

Figure 29: USB connector

i The USB port is disabled on overload to prevent its damage (connected device is trying to get too high current). The port is enabled again after the reboot of the router.

Mounting USB Flash Drive to the System

It is necessary to mount the USB flash drive to be able to access it in the system of the router. Follow these steps to mount the drive:

- Use the *dmesg* command to see the list of recently connected devices.

- In the output of the command find out the entry for the microSD card, for example:
  ```
  sda: sda1
  ```

- To mount the card to to *mnt* directory, use the *mount* command:
  ```
  mount /dev/sda1 /mnt
  ```

i For more information about the commands for creating, mounting, checking and unmounting a file system on a USB Flash Drive, see the application note for Ext4 Filesystem Utilities router app.

3.9.9 I/O Port

Panel socket 6-pin.

Pin	Signal mark	Description
1	IN0	Binary input 0
2	IN0	Binary input 0
3	IN1	Binary input 1
4	IN1	Binary input 1
5	OUT	Binary output
6	OUT	Binary output

Table 12: Connection of I/O port
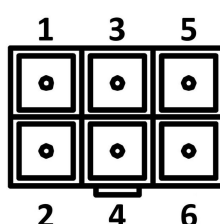
Figure 30: I/O connector

The I/O user Interface is designed for the processing of binary input and control (setting) of binary output. Binary output is open in the default configuration. The isolation strength is 1.5 kV. The pins are isolated from each other with the same strength.

The input circuits are bipolar and allow connection as needed with common plus or minus (according to the connection of an external voltage).

Binary inputs

• Characteristics of inputs:

Logical 0 / 1*	Voltage	Current	Web interface status
log. 1 max	3 V	0.4 mA	Off
log. 0 min	5 V	0.7 mA	On
log. 0 type	12 V	2 mA	On
log. 0 max	60 V	7 mA	On

Table 13: Characteristics of inputs

* The binary input status in the Shell is returned via `io get bin0` or `io get bin1`.

Binary output

- Binary output parameters:
    - 60 V AC / 300 mA
    - 60 V DC / 300 mA

- The current of the binary output is limited by a resettable fuse (300 mA).

Binary inputs and output connections

Binary inputs and output connections example:
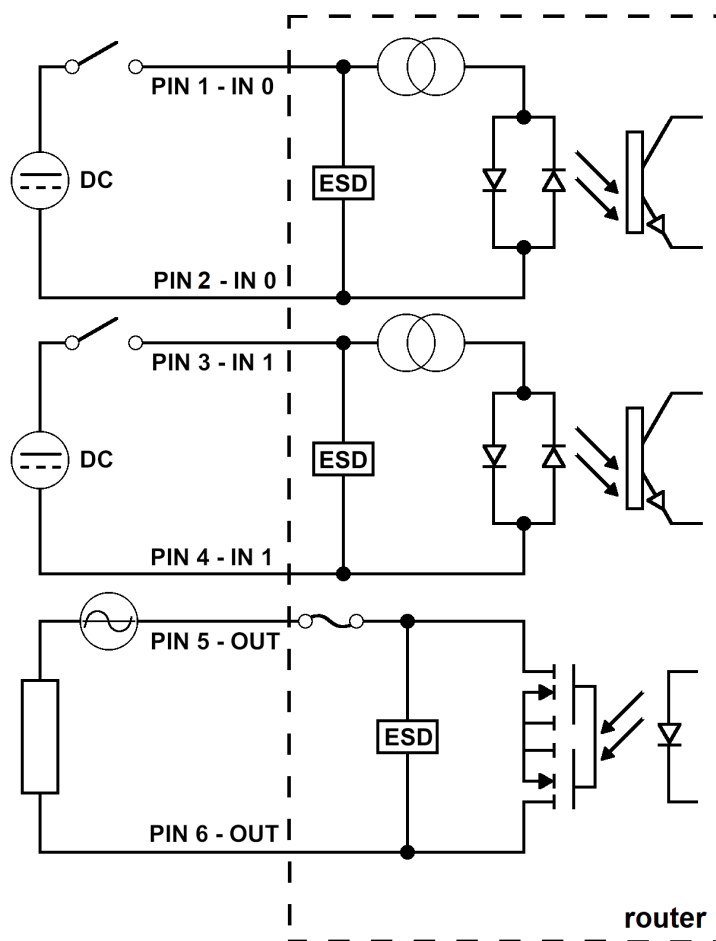
Figure 31: Functional block diagram of the digital interface

3.9.10 Reset

When the *PWR* LED starts flashing on the front panel, it is possible to restore the default configuration of the router by pressing the *RST* button on the rear panel. After pressing this button the default configuration will be restored and the router will reboot (after which the green LED will be on).

> It is necessary to use a narrow screwdriver or any other small tool to press the *RST* button.
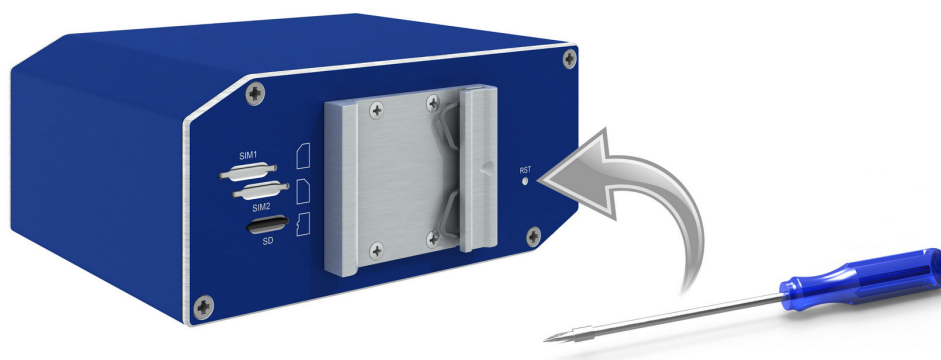
Figure 32: Router reset

> Before resetting the router, it is recommended to back up the router configuration settings (see *Configuration manual*) because resetting the router will return all configuration settings to their default states.

It is important to distinguish between the router reset and reboot.

Action	Router behavior	Invoking events
Reboot	Turns off and then turns on the router	Disconnect and reconnect the power, press the *Reboot* button in the web configuration
Reset	Restores the default configuration and reboots the router	Press the *RST* button

Table 14: Description of router reset and restart

3.10 Interfaces Description

Besides the basic version of SmartFlex router there are available versions with one of the following interfaces:

- SWITCH interface
- RS232-RS485/422 interface
- RS232-RS485-ETH interface

> ❗ Note that only the Advantech service center can do the jumpering inside the router.

3.10.1 SWITCH Interface

The three LAN ports of the SWITCH interface for SmartFlex routers (RJ45 connectors for connecting Ethernet devices) act as a typical switch device. This means that the router reads Ethernet frames (data packets on an Ethernet link) from any port on the SWITCH interface and transmits them on other ports of the SWITCH interface. Each port can transmit frames independently on the other ports. State indication is displayed separately on each connector. These router versions comply with the standards and temperature ranges stated in Chap. 5.1 except for having a lower maximum operating temperature, which is +70 °C.
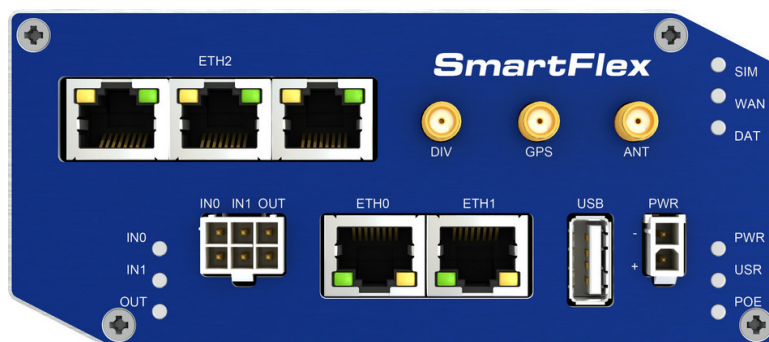
Figure 33: Version with switch board

State indication of the interface:

Description of indication		
Green LED	On	Selected 100 Mbps
	Off	Selected 10 Mbps
Yellow LED	On	The network cable is connected
	Blinking	Data transmission
	Off	The network cable is not connected

Table 15: Switch interface state indication

Technical specification of Ethernet IEEE 802.3:

Ethernet interface, IEEE 802.3 standard	
Maximum data rate	100 Mbps
Max. total cable length (300 Bd, 200 nF/km)	100 m

Table 16: Switch interface parameters

3.10.2 RS232-RS485/422 Interface

These interfaces are physically connected through the 5-pin and 4-pin terminal block connectors. The insulation strength is up to 2.5 kV. **Attention, connectors are not isolated from each other!** No state indication is displayed for this interface. These router versions comply with the standards and temperature ranges stated in Chap. 5.1.
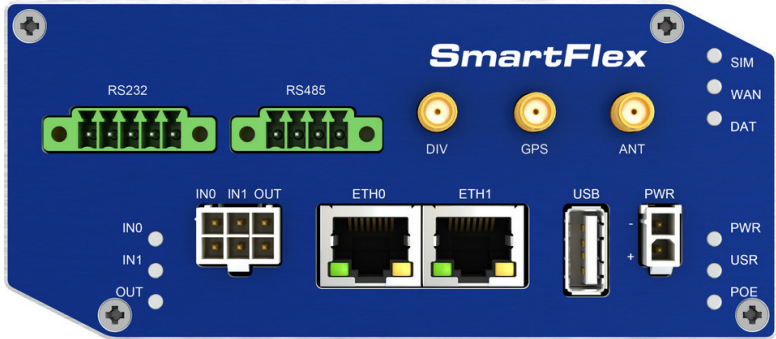
Figure 34: Version with RS232-RS485/422 interface

When connecting counterpart terminal block connectors (included in package with the router), use cables with nominal cross section 0.2 to 1.0 square mm (30 to 16 AWG). Recommended stripping length is 5 mm. For M2 captive screws the screw driver 0.5 x 3 mm is recommended. Tighten the screws with 0.3 Nm torque.

Figure 35: RS232 connector

Connection of RS232 connector:

Pin	Signal	Description	Direction
1	$\overline{\text{CTS}}$	Clear To Send	Output
2	$\overline{\text{RTS}}$	Request To Send	Input
3	GND	Signal ground*	—
4	RXD	Receive Data	Input
5	TXD	Transmit Data	Output

Table 17: Connection of RS232 connector

* *Both connectors (RS232 and RS485/422) have a common ground connection.*

The board allows for the selection between RS485 and RS422 interfaces, which can be configured using jumpers. For guidance on configuring the jumpers, refer to the instructions printed directly on the board. Additionally, the termination resistor can be enabled on the port board using a jumper; note that the termination resistor is integrated into the port board itself.

i The default configuration is set to RS485 with the termination resistor turned off.
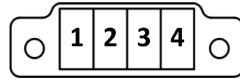
Figure 36: RS485/422 connector

Connection of RS485 connector:

Pin	Signal	Description	Direction
1	TxRx+	RS485 B (+)	Input/Output
2	TxRx-	RS485 A (-)	Input/Output
3	TxRx+	RS485 B (+)	Input/Output
4	TxRx-	RS485 A (-)	Input/Output

Table 18: Connection of RS485 connector

Connection of RS422 connector:

Pin	Signal	Description	Direction
1	RxD+	RS422 (+)	Output
2	RxD-	RS422 (-)	Output
3	TxD+	RS422 (+)	Input
4	TxD-	RS422 (-)	Input

Table 19: Connection of RS422 connector

Technical specification of RS232 and RS485 bus:

RS232 and RS485 interface	
Max. operating RS232 bus current	15 mA
Max. number of devices on RS485 bus	32
Max. output current on RS485 bus	60 mA
Max. data rate	230400 bps on RS232 230400 bps on RS485
Max. total cable length (300 Bd, 200 nF/km)	RS232 20 m, RS485 1200 m

Table 20: Technical specification of RS232 and RS485

3.10.3 RS232-RS485-ETH Interface

This interface board includes a panel RJ45 connector for Ethernet connection (ETH2 in the figure), and four-pin and three-pin terminal block connectors for RS232 and RS485 connection. The insulation strength is up to 2.5 kV between the ETH2 and RS485 interfaces and from the rest of the router, too. The RS232 interface is not insulated from the rest of the router. State indication is displayed by LEDs above each connector, as shown in the table below. These router versions comply with the standards and temperature ranges stated in Chap. 5.1.
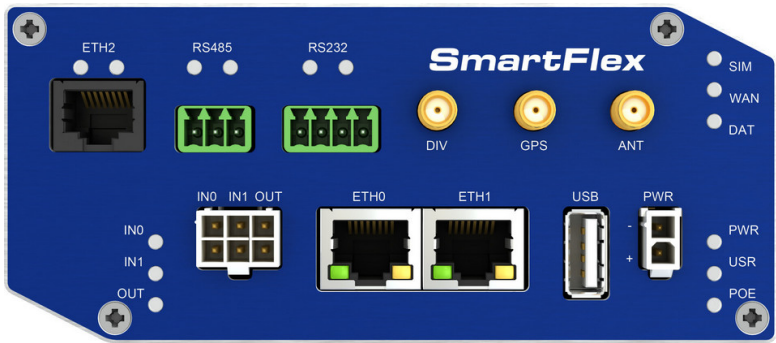
Figure 37: Version with RS232-RS485-ETH interface

Connection of ETH connector:

Pin	Signal	Description	Direction
1	TXD+	Transmit Data – positive pole	Input/Output
2	TXD-	Transmit Data – negative pole	Input/Output
3	RXD+	Receive Data – positive pole	Input/Output
4	—	—	—
5	—	—	—
6	RXD-	Receive Data – negative pole	Input/Output
7	—	—	—
8	—	—	—

Table 21: Connections of the Ethernet connector
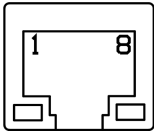
Figure 38: Ethernet connector

i When connecting counterpart terminal block connectors (included in package with the router), use cables with nominal cross section 0.2 to 1.0 square mm (30 to 16 AWG). Recommended stripping length is 5 mm. For M2 captive screws the screw driver 0.5 x 3 mm is recommended. Tighten the screws with 0.3 Nm torque.
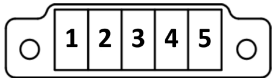
Connection of RS485 connector:
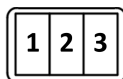
Figure 39: RS485 connector

Pin	Signal	Description	Direction
1	GND	Signal ground*	—
2	TxRx+	RS485 B(+)	Input/Output
3	TxRx-	RS485 A(-)	Input/Output

Table 22: Connections of terminal block connector RS485

* Signal ground is isolated from the router's ground.

i The termination resistor can be activated directly on the port board using a jumper (termination resistor is part of the port board).

Connection of RS232 connector:
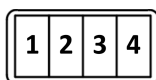
Figure 40: RS232 connector

Pin	Signal	Description	Direction
1	AUX	+5 V/500 mA	—
2	GND	Signal ground*	—
3	RXD	Receive Data	Input
4	TXD	Transmit Data	Output

Table 23: Connections of terminal block connector RS232

* Common with router's signal ground.

State indication of the interface:

Description of indication		
ETH2 – green LED	On Off	Selected 100 Mbps Selected 10 Mbps
ETH2 – Yellow LED	On Blinking Off	The network cable is connected Data transmission The network cable is not connected
RS485, RS232 – green LED		Indicates Receive data
RS485, RS232 – yellow LED		Indicates Transmit data

Table 24: State indication of the RS232-RS485-ETH interface

Technical specification of RS232, RS485 bus and Ethernet IEEE 802.3:

ETH2, RS485 and RS232 interface	
Max. operating RS232 bus current	15 mA
Max. number of devices on RS485 bus	32
Max. output current on RS485 bus	60 mA
Max. data rate	230400 bps on RS232 230400 bps on RS485 100 Mbps on ETH2
Max. total cable length (300 Bd, 200 nF/km)	RS232 20 m RS485 1200 m ETH2 100 m

Table 25: Technical specification of RS232, RS485 and Ethernet

UK
CA

4. First Use

4.1 Connecting the Router before First Use

You can perform the initial configuration of the router using a web browser on your PC. This interface enables router monitoring, configuration, and administration.

> ⚠️
> - Before putting the router into operation, ensure that all components required for running your applications are connected.
> - Do not operate the router without an antenna connected to the main antenna connector. Transmitted energy will be reflected by an open connector, which could potentially damage the equipment.
> - This device utilizes radio frequency bands that may be subject to specific usage restrictions in certain European Union countries (e.g., indoor use only). Please refer to Appendix C for detailed regulatory information before operation.

The procedure for connecting to a new router is described in the *Configuration Manual* [1], Chapter *Getting Started → Configuration Environments → Web Interface Initial Setup*. This manual also provides detailed descriptions and examples of router configuration using the web interface.
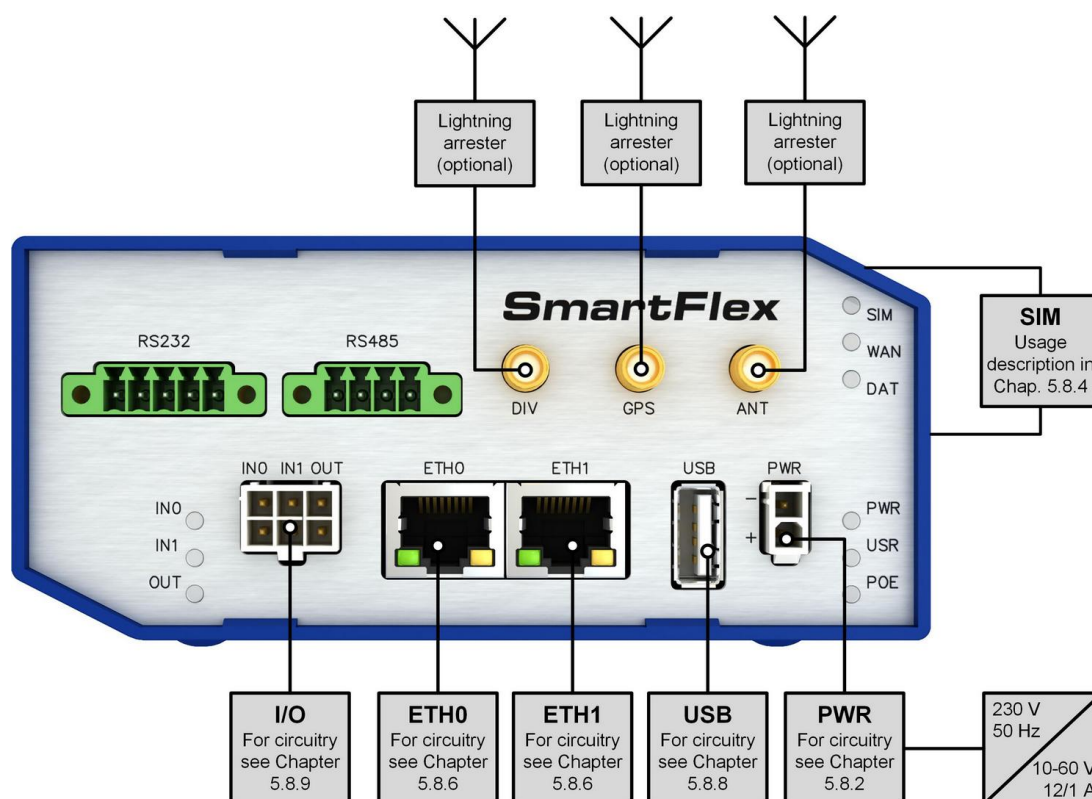
Figure 41: Router connection

4.2 Start

The router will start when a power supply is connected to the router. By default, the router will automatically start to log on to the default APN. The DHCP server will start to assign addresses for devices connected through the Ethernet port ETH0. Router's behavior can be changed via the web interface. This is described in detail in the *Configuration manual for SmartFlex routers*.

4.3 Configuration

! If no SIM card is inserted in the router, it is not possible for the router to operate. Any inserted SIM card must have active data transmission.

4.3.1 Configuration by Web Browser

For status monitoring, configuration and administration of the router a web interface is available which can be accessed by entering the IP address of the router into the web browser. The default IP address of the router is 192.168.1.1. **Attention, it is necessary to use HTTPS protocol for secure communication over a network!**
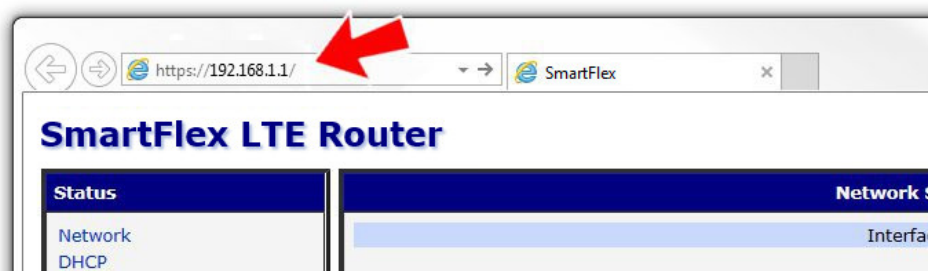
Figure 42: Entering the IP address of the router

By default, configuration may be performed only by the user "root". The default password is printed on the router's label.[1] Change the default password as soon as possible!

! All routers have the *WebAccess/DMP* client pre-installed by default. The activated client periodically uploads router identifiers and configuration to the *WebAccess/DMP* server. See the configuration manual [1], chapter *Basic Information → WebAccess/DMP Configuration*, for more information.

Figure 43: Entering login information

After successfully entering login information, the user will have access to the router web interface via their browser.

---

[1]If the router's label does not contain a unique password, use the password "root".

Figure 44: Router web interface

A detailed description of the router settings in the Web interface can be found in the *Configuration manual for SmartFlex routers*.

5. Technical Parameters

5.1 Basic Technical Parameters

SmartFlex Router		
Temperature range	Operating Storage	-40 °C to +75 °C (-40 °F to +167 °F) -40 °C to +85 °C (-40 °F to +185 °F)
Cold start	-35 °C -40 °C	Data transfers via mobile network are available immediately Data transfers via mobile network are available approximately five minutes after the start of the router. Everything else is functional immediately.
Humidity	Operating Storage	0 to 95 % relative humidity non condensing 0 to 95 % relative humidity non condensing
Altitude	Operating	2000 m / 70 kPa
Degree of protection		IP30
Supply voltage		10 to 60 V DC (for PoE version see 3.9.7)
Battery for RTC		CR1225
Consumption	Idle Average Peak Sleep mode	2.5 W 4 W 11 W 10 mW
Dimensions		55 x 97 x 125 mm (2.17" x 3.82" x 4.92") (DIN 35 mm, EN 60715)
Weight	Plastic box Metal box	approximately 170 g (0.37 lbs) (depends on interface) approximately 380 g (0.83 lbs) (depends on interface)
Antenna connectors		3x SMA – 50 Ω 1x R-SMA – 50 Ω (only for versions with Wi-Fi)
User interface	2x ETH USB I/O Micro SD	Ethernet (10/100 Mbps) USB 2.0 6-pin panel socket SDHC, SDXC

Table 26: Basic parameters

5.2 Standards and Regulations

The router complies with the following standards and regulations.

Parameter	Description
EMC	KN 301 489-1, KN 301 489-17, KN 301 489-24
Cybersecurity	EN 18031-1
National	KC (South Korea)

Table 27: Standards and regulations

5.3 Type Testing and Environmental Conditions

Phenomena	Test	Description	Test levels
ESD	KN 61000-4-2	Enclosure contact Enclosure air	± 4 kV (crit. B) ± 8 kV (crit. B)
RF field AM modulated	KN 61000-4-3	Enclosure	3 V/m (crit. A) (80 – 2700 MHz)
Fast transient	KN 61000-4-4	Signal ports Power ports Ethernet ports	± 0.5 kV (crit. B) ± 1 kV (crit. B) ± 0.5 kV (crit. B)
Surge	KN 61000-4-5	Ethernet ports Power ports I/O ports	± 1 kV (crit. B), shielded cab. ± 0,5 kV (crit. B) ± 1 kV, L to L (crit. B) ± 0,5 kV, L to GND (crit. B)
RF conducted	KN 61000-4-6	All ports	3 V/m (crit. A) (0,15 – 80 MHz)
Dry heat	EN 60068-2-2	+75 °C *, 40 % rel. humidity	
Cold	EN 60068-2-1	-40 °C *	
Damp heat	EN 60068-2-78	95 % rel. humidity (+40 °C)	
Vibration	EN 60068-2-64 ed. 2	Vibration spectrum A.3 (rolling stock)	Category 1 (3 axis, 8 hours per axis)
Shock	EN 60068-2-27 ed. 2	half-sine, 50 g peak, 11 ms	

Table 28: Type testing and environmental conditions

* The temperatures given are for the basic version of the router. These can vary for other versions.

5.4 Parameters of Cellular Module

Technical Parameters of the Cellular Module	
LTE parameters	**LTE:** Cat.4, 3GPP E-UTRA Release 11 **FDD frequencies:** B20 (800 MHz), B5 (850 MHz), B8 (900 MHz), B3 (1800 MHz), B1 (2100 MHz), B7 (2600 MHz) **TDD frequencies:** B40 (2300 MHz), B41 (2500 MHz), B38 (2600 MHz) **LTE FDD bit rates:** 150 Mbps (DL) / 50 Mbps (UL) **LTE TDD bit rates:** 130 Mbps (DL) / 35 Mbps (UL) **Supported bandwidths:** 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz **Maximum output power:** 23±2 dBm
HSPA+ parameters	**HSPA:** 3GPP R8 DC-HSPA+ **Supported frequencies:** B5 (850 MHz), B8 (900 MHz), B1 (2100 MHz) **Bit rates:** 42 Mbps (DL) / 5.76 Mbps (UL) **Maximum output power:** 24+1/-3 dBm
UMTS parameters	**Supported frequencies:** B5 (850 MHz), B8 (900 MHz), B1 (2100 MHz) **Bit rates:** 384 kbps (DL) / 384 kbps (UL) **Maximum output power:** 24+1/-3 dBm
TD-SCDMA parameters	**Supported frequencies:** B5 (850 MHz), B8 (900 MHz), B1 (2100 MHz) **Bit rates:** 4.2 Mbps (DL) / 2.2 Mbps (UL) **Maximum output power:** 24+1/-3 dBm
EDGE parameters	**Supported frequencies:** 900 MHz, 1800 MHz **Data throughput:** max. 236.8 kbps **Maximum output power:** 27±3 dBm
GPRS parameters	**Supported frequencies:** 900 MHz, 1800 MHz **Data throughput:** max. 85.6 kbps **Maximum output power:** 33±2 dBm

Table 29: Technical parameters of the cellular module

5.5 Parameters of GNSS

Parameter	Description
Antenna	Connector type: SMA 50 Ω – active
Protocols	NMEA 0183
GNSS Systems	GPS, GLONASS, BeiDou, Galileo, QZSS
Frequency	GPS/Galileo/QZSS: 1575.42 $\pm$ 1.023 MHz GLONASS: 1597.5 – 1605.8 MHz BeiDou: 1561.1 $\pm$ 2.046 MHz
Sensitivity (autonomous)	Tracking: -157 dBm Reacquisition: -157 dBm Cold start: -146 dBm
Acquisition time (autonomous)	Hot start: 2.5 s Warm start: 26 s Cold start: 35 s
Accuracy	< 1.5 m

Table 30: Technical parameters of GNSS

5.6 Parameters of Wi-Fi

> **!** The 5 GHz Wi-Fi interface operates in frequency bands (specifically 5150–5350 MHz) that are restricted to **indoor use only** in certain EU member states. Please refer to Appendix C for detailed regulatory information.

Wi-Fi	
Antenna connector	R-SMA – 50 Ω
Supported Wi-Fi band	2.4 GHz, 5 GHz
Standards	802.11a, 802.11b, 802.11g, 802.11n
2.4 GHz supported channels	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
5 GHz supported channels [1]	36, 38, 40, 42, 44, 46, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 149, 153, 157, 161, 165
Type of device	Access point, station
Max. clients in AP mode	10
TX Power[1]	Max. 16.5 dBm @ 2.4 GHz Max. 18 dBm @ 5 GHz
RX Sensitivity	-96,3 dBm
AP maximum users	10 users (Wi-Fi module supports multi-role operation in STA and AP. Multi-role does not affect the maximum number of users).

Table 31: Technical parameters of Wi-Fi

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[1] Depends on selected Country Code.

5.7 Parameters of I/O Ports

- Characteristics of inputs:

Logical 0 / 1*	Voltage	Current	Web interface status
log. 1 max	3 V	0.4 mA	Off
log. 0 min	5 V	0.7 mA	On
log. 0 type	12 V	2 mA	On
log. 0 max	60 V	7 mA	On

Table 32: Characteristics of inputs

* The binary input status in the Shell is returned via `io get bin0` or `io get bin1`.

- Binary output parameters:
    - 60 V AC / 300 mA
    - 60 V DC / 300 mA

5.8 Parameters of PoE

Standards IEEE 802.3at-2009 (PoE+) and IEEE 802.3af-2003 (PoE) are supported. Cabling needed is Category 5, up to 12.5 Ω. It is possible to use a passive PoE injector.

PoE PD: parameters for opposite PSE	
Input voltage range	42.5 – 57 V
Power available	25.50 W
Maximum current	600 mA

Table 33: PoE PD: parameters for corresponding PSE

PoE PSE parameters	
Power supply needed	44 – 57 V, 65 W
Power available	2x 25.50 W (ETH0, ETH1)

Table 34: PoE PSE parameters

5.9 Other Parameters

Parameter	Description
CPU power	2 DMIPS per MHz
Flash memory	256 MB
RAM	512 MB
M-RAM	128 kB

Table 35: Other technical parameters

Appendix A: Troubleshooting

> If you cannot connect to the router from your PC, your network card may be configured in a way that prevents a connection. Try one or more of the following steps to resolve the issue:
>
> • Ensure your PC's network card is configured to obtain an IP address automatically from a DHCP server (the router's DHCP server is enabled by default).
>
> • Connect the router to the PC via a network switch.
>
> • Connect the PC directly to the router, but start the router first and wait for it to initialize completely before starting the PC.

✎ **Ethernet Connection Fails or Is Unstable**

- On the router's *Configuration → LAN* page, you can disable auto-negotiation and manually set a specific link speed and duplex mode. This can resolve compatibility issues with some network devices.

✎ **Mobile WAN Connection Fails or Is Intermittent**

- Check the signal strength on the *Status → Mobile WAN* page. If the signal is weak, a more powerful antenna is required. If neighboring cells have similar signal strength, a directional antenna may be necessary to lock onto the optimal cell tower.

- Enable the connection check feature on the *Configuration → Mobile WAN* page in the *Check connection* section. Select the *Enable + bind* option. This will send periodic pings to check connectivity and restart the connection if it fails. The "bind" option ensures the ping is always sent through the Mobile WAN interface.

✎ **Cannot Establish Mobile WAN Connection**

- Verify all settings on the *Configuration → Mobile WAN* page, including the *APN*, *username*, *password*, and *IP address*. For many public networks, these fields can be left blank.

- Check if the SIM card requires a PIN. If so, enter it on the *Administration → Unlock SIM Card* page.

- For private APN networks, it is often not recommended to obtain DNS server addresses from the operator. Disable this option on the *Configuration → Mobile WAN* page.

- Check the *Status → System Log* for error messages that can help diagnose the issue.

✎ **Cannot Connect to a Device Behind the Router from the Internet (NAT)**

- The device behind the router must be configured to use the router's IP address as its default gateway.

✎ **Cannot Access a Web Server Behind the Router via NAT**

- Remote HTTP access to the router itself must be disabled. This can be done on the *Configuration → NAT* page.

- On the same page, enable the *Send all remaining incoming packets to default server* feature and enter the IP address of your web server.

- Ensure the web server's default gateway is set to the router's IP address.

✎ **DynDNS Does Not Work**

- DynDNS will not work with a private APN if the router's IP address is not publicly accessible.
- If your DynDNS hostname resolves to the same private IP address that is assigned to the router, it means your mobile operator is using NAT or a firewall, preventing direct connections.
- You can verify operator NAT by pinging a server with a static public IP and comparing the source IP (seen by the server) with the IP address shown on the router's status page.
- You can test for a firewall by trying to access the router's web interface remotely.
- The operator may not be providing DNS server addresses. Without DNS, the router cannot resolve the DynDNS service hostname. The System Log would show errors like:
  - `Error resolving hostname: no such file or directory`
  - `Connect to DynDNS server failed`

✏ L2TP or IPsec Tunnel Fails to Establish

- Check the *Status → System Log* for specific error messages related to the VPN tunnel negotiation.

✏ IPsec Tunnel Establishes, but No Data Is Transferred

- This is typically caused by incorrect routing rules or a misconfigured default gateway on either the client device or the remote network.

✏ Router Reverts to Online Mode After a Reboot, Despite Being Set to Offline via SMS

- State changes made via SMS commands are temporary and do not alter the saved configuration. They remain in effect only until the router is rebooted.

✏ Serial Communication Is Not Working

- Verify that your router model is equipped with a serial port. Check the serial communication settings on the *Configuration → Expansion Port* page.

✏ Is the Router Cisco Compatible?

- No. The router's operating system (ICR-OS) is based on Linux, not Cisco IOS. Therefore, Cisco configuration commands cannot be used.
- However, since all network connections are based on open standards, the router is fully compatible and can be connected to Cisco devices or any other standard networking equipment.

✏ FTP or SFTP Does Not Work

- **FTP** is available on v2 platform routers only. Ensure it is enabled in *Configuration → Services → FTP*. Connect using any FTP client to port `21` with the same username and password as the web interface.
- **SFTP** (SSH File Transfer Protocol) is available on all routers. Ensure SSH is enabled in *Configuration → Services → SSH*. Connect using any SFTP-capable client (like FileZilla or WinSCP) to port `22` with the same credentials as the web interface.

✏ How to Access the Router's Command Line

- You can connect to the router's command line using SSH (all routers) or Telnet (v2 routers only).
- **SSH** is enabled by default. You can verify this in *Configuration → Services → SSH*. Use any SSH client to connect to the router's IP address on port `22`.
- **Telnet** can be enabled on v2 routers in *Configuration → Services → Telnet*.
- For both methods, use the same username and password as for the web interface.

Appendix B: Customer Support

Customer Support for Europe

Advantech Czech s.r.o.
Sokolska 71
562 04, Usti nad Orlici
Czech Republic

Phone: +353 91 792444
Fax: +353 91 792445
E-mail: iiotcustomerservice@advantech.eu
Web: www.advantech.com

Customer Support for NAM

Advantech North America
707 Dayton Road
Ottawa, IL 61350 USA

Phone: +1-800-346-3119 (Monday – Friday, 7 a.m. to 5:30 p.m. CST)
Fax: +1-815-433-5109
E-mail: support.iiot.ana@advantech.com
Web: www.advantech.com

Customer Support for Asia

Phone: +886-2-2792-7818 #1299 (Monday – Friday, 9 a.m. to 5:30 p.m. UTC+8)
Fax: +886-2-2794-7327
E-mail: icg.support@advantech.com.tw
Web: www.advantech.com

Appendix C: Regulatory & Safety Information

Safety Notices

For your safety and proper operation of the device, please observe the following instructions:

- The router must comply with all applicable international, national, and local regulations, including any specific restrictions concerning its use in designated applications and environments.

- To avoid personal injury or damage to the device, use only accessories that are approved or supplied by the manufacturer. Unauthorized modifications or the use of non-approved accessories may damage the router, violate regulations, and void the warranty.

- Do not attempt to open the router enclosure under any circumstances.

- Before handling the SIM card, always switch off the router and disconnect it from the power supply. Handle the SIM card with care to avoid damage or electrostatic discharge.

> ⚠️ This equipment is not suitable for use by or near young children. Small children could accidentally swallow the SIM card.

- Always ensure that the power supply voltage does not exceed 48 V DC.

- Do not expose the router to harsh environmental conditions. Protect it from dust, moisture, and excessive temperatures.

- Use only routers with proper certifications and markings in areas containing flammable or explosive materials (such as gas stations, chemical plants, or locations with explosives). In these environments, always follow the applicable restrictions regarding the use of radio devices.

- When traveling by airplane, always switch off the router. Using the router on board may endanger flight safety, interfere with mobile networks, and violate local regulations. Non-compliance can result in suspension or cancellation of telecommunications services or legal penalties.

- Take special care when operating the router in close proximity to personal medical devices such as cardiac pacemakers or hearing aids. If in doubt, consult the manufacturer of the medical device or your physician.

- This device may cause interference if used near television sets, radio receivers, or personal computers.

- Maintain a minimum separation distance of at least 20 cm between the router and the human body during operation.

- It is strongly recommended to regularly back up all critical configuration data stored in the router's memory.

- **Specific Usage Restrictions for 5 GHz Wi-Fi:** This device operates in the 5150–5350 MHz frequency band, which is restricted to **indoor use only** within the European Union, EFTA countries, and Northern Ireland. Outdoor use in this frequency band is prohibited to prevent harmful interference with other radio services.

AT	BE	BG	CY	CZ	DE	DK	EE	EL	ES	FI
FR	HR	HU	IE	IT	LT	LU	LV	MT	NL	PL
PT	RO	SE	SI	SK	IS	LI	NO	CH	TR	UK

Product Disposal Instructions

The WEEE directive (Waste Electrical and Electronic Equipment: 2012/19/EU) ensures the environmentally responsible recycling and recovery of electronic products. This device contains high-quality materials and components suitable for recycling. At the end of its life, **do not dispose of this product with ordinary commercial waste**. The router also contains a battery. Remove the battery before disposing of the device, and ensure the battery is disposed of separately and in accordance with local regulations. For detailed information on product and battery disposal, consult your supplier's terms and conditions.

Appendix D: Related Documents

[1] Configuration Manual for SmartFlex Routers

[EP] Product-related documents and applications can be obtained on **Engineering Portal** at *https://icr.advantech.com/download* address.