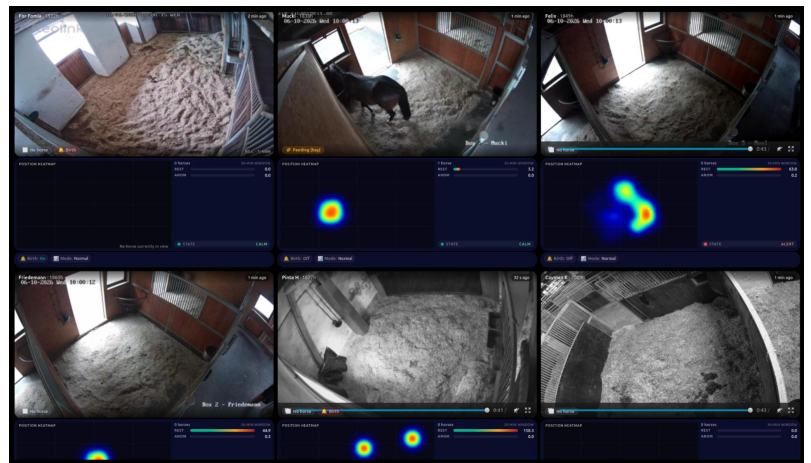




SMARTBOX - Product information and technical specifications

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ACARiS SMARTBOX

AI-Based Horse Health and Security System

The ACARiS Smartbox is the intelligent processing unit of the ACARiS horse-monitoring system.

The Smartbox does not contain an integrated camera. It connects to a compatible third-party IP camera through the local network and processes the camera's RTSP video stream for AI-based horse-health monitoring and stable security.

The system is designed to monitor **one horse within the camera's field of view**.

Two Smartbox versions are available:

1. **Smartbox PoE+** — power and network data through one Ethernet cable
2. **Smartbox Ethernet** — network data through Ethernet and power through the included USB-C power supply

Key Technical Requirements

Category	Requirement
Camera stream	Authenticated RTSP stream with H.264 encoding
Recommended resolution	1920 × 1080 pixels — 1080p
Minimum resolution	1600 × 1200 pixels
Frame rate	10–30 fps
Smartbox PoE+ power	IEEE 802.3af/at PoE+, 30 W per port recommended; PoE power source not included
Smartbox Ethernet power	Included 27 W USB-C power supply, 5.1 V / 5 A
Internet connection	Permanent and stable internet access required for full operation
Monitoring capacity	One horse per configured camera view

1. System Architecture

A complete ACARiS monitoring installation consists of:



- One ACARiS Smartbox
- One compatible third-party IP camera
- A stable local Ethernet network
- A suitable power source for the IP camera
- Continuous internet access
- A PoE+ power source for the PoE+ Smartbox version
- The included USB-C power supply for the standard Ethernet Smartbox version

The Smartbox receives the live video stream directly from the IP camera using RTSP.

The third-party IP camera is not included unless explicitly specified as part of the selected product package.

Internet Requirement

A permanent and stable internet connection is required for full Smartbox operation.

Internet access must remain available at all times for functions such as:

- AI service communication
- System status communication
- Remote monitoring
- Alerts and notifications
- Software and security updates
- Service configuration
- Remote support

An internet interruption may temporarily restrict monitoring functions, remote access, alerts, or other Smartbox services.

2. Compatible IP Camera Requirements

The ACARiS Smartbox works with compatible third-party IP cameras that meet the following requirements.

Video Resolution and Frame Rate

- Recommended resolution: **1920 × 1080 pixels — 1080p**
- Minimum resolution: **1600 × 1200 pixels**
- Supported frame rate: **10 to 30 frames per second**
- Recommended frame rate: **15 to 25 frames per second**



Higher frame rates and resolutions can work but are not recommended.

Video Encoding

- Required video codec: **H.264**
- The camera must provide an H.264-encoded RTSP video stream.
- H.265-only cameras are not compatible unless they can also provide an H.264 stream.
- Compatibility with other video codecs is not guaranteed.

RTSP Streaming

The IP camera must provide:

- A standard RTSP video stream
- H.264 video encoding
- Username and password authentication
- A fixed or DHCP-reserved local IP address
- Continuous access to the configured RTSP stream
- A stable network connection between the camera and Smartbox

The camera's RTSP address, username, and password must be available during system configuration.

Example RTSP address format:

`rtsp://username:password@camera-ip-address:554/stream-path`

The exact RTSP address and stream path depend on the camera manufacturer and model.

RTSP Authentication

The RTSP stream must support authenticated access using:

- Username
- Password

The camera should not provide an unauthenticated video stream on an unsecured network.

Camera credentials must be configured during Smartbox installation.

3. Field of View and Horse-Monitoring Area

The camera must be positioned so that the **complete horse stable, stall, or monitored area is visible**.

The camera view should include:

- The horse's complete body
- The horse's normal standing area
- The horse's resting or lying area
- Feeding areas where possible
- Drinking areas where possible
- The floor area required for movement and behaviour analysis

One-Horse Monitoring Requirement

The ACARiS Smartbox is designed to monitor **one horse per configured camera view**.

Only one horse should normally be visible in the monitored area. Multiple horses within the same camera view may reduce identification accuracy and monitoring reliability.

A separate camera view and Smartbox configuration may be required for each additional horse.

Camera Positioning

The required field of view depends on:

- Stable dimensions
- Camera mounting position
- Camera mounting height
- Lens focal length
- Distance between the camera and monitored area

A wide-angle camera is generally recommended.

The selected camera and installation position must provide full coverage without significant blind spots.

A fixed minimum viewing angle is not specified because the required angle depends on the dimensions and layout of the stable.

The camera should be:



- Mounted securely
- Positioned above the horse's normal reach
- Protected against impact, biting, pulling, and moisture
- Positioned so that walls, beams, doors, or other structures do not obstruct the horse
- Installed without significant blind spots
- Aimed so that the horse's complete body remains visible during normal movement
- Protected from strong direct light, reflections, or glare
- Capable of providing suitable image quality under expected daytime and nighttime lighting conditions

Where nighttime monitoring is required, the selected third-party camera must provide suitable low-light or night-vision performance.

4. Network Requirements

A stable connection between the IP camera and Smartbox is required for reliable continuous operation.

Recommended Network Configuration

- Wired Ethernet connection for the Smartbox
- Wired Ethernet connection for the IP camera
- Gigabit Ethernet network
- Cat 5e or higher Ethernet cabling
- Cat 6 recommended for new installations
- Fixed or DHCP-reserved IP address for the camera
- Fixed or DHCP-reserved IP address for the Smartbox
- Smartbox and camera connected to the same local network
- Continuous access between the Smartbox and the camera's RTSP port
- Permanent internet access for the Smartbox

Wireless IP cameras are not recommended where the Wi-Fi connection may be unstable, congested, or obstructed by stable structures.

Connection Stability

The camera-to-Smartbox connection must support a continuous H.264 RTSP stream without frequent:

- Packet loss
- Stream interruptions
- Network timeouts



- IP address changes
- Wi-Fi disconnections
- Router or switch restarts
- Bandwidth restrictions

An unstable camera stream may interrupt AI processing and reduce the reliability of horse-health or security monitoring.

Network Security

The installation should use:

- Strong camera passwords
- A protected local network
- Current camera firmware
- Restricted external access
- Firewall rules where appropriate
- No direct public exposure of the camera's RTSP port

Port forwarding of the camera's RTSP service to the public internet is not recommended.

5. Shared Smartbox Specifications

Processing Functions

Depending on the selected ACARiS service configuration, the Smartbox performs functions including:

- Receiving the IP camera's RTSP stream
- Decoding the H.264 video stream
- AI-based horse monitoring
- Health-related behaviour analysis
- Stable security monitoring
- Event detection
- System status communication
- Local and remote alert processing
- Communication with ACARiS online services

The Smartbox is an intelligent processing unit and is not itself an IP camera.

Operating Environment



- Operating temperature: **-20°C to +35°C**
 - Intended placement: **office, technical room, or server room**
 - The Smartbox should be operated indoors under stable environmental conditions.
 - The installation location should be dry, ventilated, and protected from dust, moisture, and temperature extremes.
 - Do not expose the Smartbox directly to water.
 - Do not install it beside heaters, heat lamps, or concentrated heat sources.
 - Ensure sufficient ventilation around the enclosure.
 - Keep ventilation openings unobstructed.
 - Install the Smartbox outside the horse's reach.
 - Protect all connected cables against pulling, crushing, biting, and moisture.
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6. Physical Specifications

Smartbox PoE+ Version

- Enclosure type: **KKSB HAT Case for Raspberry Pi 5**
- Material: **anodised aluminium**
- Mounting: **wall-mounting openings**
- Height: **approximately 56 mm**
- Length: **TBD — final assembled-unit measurement required**
- Width: **TBD — final assembled-unit measurement required**
- Weight of enclosure: **approximately 136 g**
- Complete assembled Smartbox weight: **TBD**
- Enclosure protection rating: **no certified IP rating currently specified**

The linked product information confirms the KKSB enclosure model and a listed enclosure weight of 136 g. A Raspberry Pi case review identifies the enclosure height as 56 mm, but the linked manufacturer and retailer pages do not provide verified length and width measurements.

Smartbox Ethernet Version

- Enclosure type: **JOY-IT aluminium Raspberry Pi enclosure**
- Material: **aluminium**
- Dimensions: **91 × 65 × 34 mm**
- Complete assembled Smartbox weight: **TBD**
- Enclosure protection rating: **no certified IP rating currently specified**

The dimensions are taken from the specified enclosure product data.

7. Smartbox PoE+ Version

Network and Power

- Network interface: **Gigabit Ethernet**
- Network connector: **RJ45**
- Smartbox power method: **Power over Ethernet Plus — PoE+**
- Supported PoE standards: **IEEE 802.3af/at**
- PoE input voltage: **37–57 V DC**
- Recommended switch-port allocation: **30 W or higher per Smartbox**
- Required equipment: **IEEE 802.3af/at-compatible PoE+ switch or injector**

The PoE+ version receives network data and electrical power through one Ethernet cable.

Power Equipment Included

A PoE+ switch, router, injector, or other PoE power source is **not included** with the PoE+ Smartbox.

The customer or installer must provide compatible PoE+ network equipment.

PoE Switch Requirements

Each Smartbox should be connected to a PoE+ port capable of supplying at least **30 W**.

The network switch must also have a sufficient total PoE power budget for all connected PoE devices.

Examples:

- One Smartbox: minimum recommended PoE budget of 30 W
- Two Smartboxes: minimum recommended PoE budget of 60 W
- Four Smartboxes: minimum recommended PoE budget of 120 W

A four-port PoE+ switch with a total power budget of 60 W can provide the recommended 30 W allocation to a maximum of two Smartboxes.

Third-Party PoE Camera Power



The Smartbox's 30 W allocation does not include the power required by the separate IP camera.

When a PoE-powered IP camera is connected to the same switch, its power requirement must be added to the total required PoE budget.

Example:

- One Smartbox requiring a 30 W port allocation
- One IP camera requiring a 15 W port allocation
- Minimum switch budget of at least 45 W, plus an appropriate safety margin

The exact camera power requirement depends on the selected camera model.

Cabling

- Minimum recommended cable category: **Cat 5e**
 - Recommended for new installations: **Cat 6**
 - Maximum standard Ethernet cable length: **100 m**
 - Moisture-resistant or installation-rated cable should be used where environmental conditions require it.
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8. Smartbox Ethernet Version

Network

- Network interface: **Gigabit Ethernet**
- Ethernet speed: **10/100/1000 Mbps**
- Network connector: **RJ45**
- Power over Ethernet: **not supported**
- Ethernet is used for network communication only.

Included USB-C Power Supply

The USB-C power supply required to operate the standard Ethernet Smartbox is **included with the product**.

- Power connector: **USB-C**
- Included power supply: **27 W USB-C power supply**
- Smartbox power input: **5 V / 5 A DC**
- Power-supply output for the Smartbox: **5.1 V / 5 A**



- USB Power Delivery support: **yes**
- Maximum output at 5.1 V: **25.5 W**
- Power-supply AC input: **100–240 V AC**
- AC frequency: **50–60 Hz**

Raspberry Pi recommends a high-quality 5 V / 5 A USB-C power supply for Raspberry Pi 5, and its official 27 W supply provides up to 5.1 V at 5 A.

Required Connections

The standard Ethernet version requires:

1. An Ethernet cable between the Smartbox and network switch or router
2. The included USB-C power supply connected to a suitable mains socket

Camera Power

The included USB-C power supply powers only the Smartbox.

The third-party IP camera requires its own power source, such as:

- A camera-specific DC adapter
- A separate PoE switch port
- A PoE injector
- Another manufacturer-approved power source

9. Version Comparison

Specification	Smartbox PoE+	Smartbox Ethernet
Smartbox network interface	Gigabit Ethernet	Gigabit Ethernet
Network connector	RJ45	RJ45
Smartbox data connection	Ethernet	Ethernet

Specification	Smartbox PoE+	Smartbox Ethernet
Smartbox power connection	Ethernet	USB-C
Smartbox power standard	IEEE 802.3af/at PoE+	USB-C Power Delivery
Recommended power source	PoE+ switch or injector — not included	Included 27 W USB-C power supply
Smartbox power equipment included	No	Yes
Recommended power allocation	30 W per PoE port	5 V / 5 A
Number of Smartbox cables	One	Two
Enclosure dimensions	Length and width TBD; approximately 56 mm high	91 × 65 × 34 mm
Integrated camera	No	No
Third-party IP camera required	Yes	Yes
Required camera stream	RTSP with H.264	RTSP with H.264
Camera authentication required	Yes	Yes
Continuous internet required	Yes	Yes

Specification	Smartbox PoE+	Smartbox Ethernet
Number of horses per camera view	One	One
Camera power included	No	No

10. Minimum IP Camera Compatibility Checklist

Before installation, confirm that the selected IP camera provides:

- RTSP streaming
- H.264 encoding
- Username and password authentication
- Minimum resolution of 1600 × 1200 pixels
- Recommended resolution of 1920 × 1080 pixels
- Frame rate between 10 and 30 fps
- Stable wired or sufficiently reliable network connectivity
- A fixed or DHCP-reserved local IP address
- An RTSP address accessible from the Smartbox
- A field of view covering the complete horse stable
- Full visibility of one horse
- Suitable image quality under expected daytime and nighttime conditions
- Its own suitable power source
- Manufacturer support for continuous video streaming

Camera compatibility should be confirmed before permanent installation.

11. Installation and Safety Requirements

- Install the Smartbox in an office, server room, technical room, or similarly protected indoor location.
- Operate the Smartbox under stable temperature and humidity conditions.



- Install the camera securely within or near the stable.
- Keep the camera, connectors, and cables outside the horse's reach.
- Protect cables against biting, pulling, crushing, and moisture.
- Do not expose the Smartbox directly to water.
- Do not install the Smartbox beside concentrated heat sources.
- Use a camera position that displays the complete monitored stable area.
- Ensure that only one horse is normally present within the configured camera view.
- Avoid significant visual obstructions and blind spots.
- Use secure camera usernames and passwords.
- Confirm that the RTSP stream remains stable before activating monitoring.
- Confirm that the camera and Smartbox retain their assigned IP addresses after network restarts.
- Confirm that continuous internet access is available.
- Confirm that the PoE switch has sufficient power capacity for all connected PoE Smartboxes and cameras.
- Use only correctly rated and certified network and power equipment.

Compliance and disposal instructions

The HORSE PROTECTOR complies with the relevant provisions of the RoHS Directive 2011/65/EU for the European Union.

ACARiS GmbH hereby declares that the HORSE PROTECTOR complies with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
https://acaris.net/de_de/help/#acaris-service



The HORSE PROTECTOR operates in accordance with the harmonized standard EN 300 328 v2.1.1 and transmits and receives in the frequency band 2400 MHz to 2483.5 MHz and, as specified in section 4.3.2.2 for broadband modulation devices, operates with a maximum EIRP of 20 dBm. The HORSE PROTECTOR also operates in accordance with the harmonized standard EN 301 893 v2.1.1 and transmits and receives in the frequency bands 5150-5250 MHz, 5250-5350 MHz, and 5470-5725 MHz and, as specified in section 4.2.3.2 for broadband modulation devices, operates with a maximum EIRP of 23 dBm (5150-5350 MHz) and 30 dBm (5450-5725 MHz). In accordance with Article 10.10 of the Radio Equipment Directive and the country codes listed below, the operating bands 5150-5350MHz are intended exclusively for indoor use.

This product has been tested and it complies with the limit values for Class B information technology equipment according to the European standard EN 55022.

Like all other electrical and electronic products (EEE), the HORSE PROTECTOR and its electronic accessories must not be disposed of as household waste.

Safety instructions and care

Ensure that the lens of your IP camera is always free of dust and dirt. The cleaner the lens, the better the images/videos and analysis results. Use a cotton cloth for cleaning without water or cleaning agents.

The HORSE PROTECTOR and its accessories are electronic devices that must be operated away from water. Do not expose the device, cables, power supply, or electronic accessories to water or high humidity. Additionally, ensure that no dirt or dust accumulates on the devices. Ensure adequate ventilation of the device and accessories. Take care that the devices, cables, and power supply do not overheat due to insulation or poor ventilation.



To prevent overheating, do not place the HORSE PROTECTOR and its accessories near heat sources, and avoid direct sunlight or strong artificial light. Insufficient heat dissipation can damage the devices.

ACARiS is not liable for damages resulting from the improper use of the HORSE PROTECTOR.

Ensure that the HORSE PROTECTOR is only operated with the supplied power cable or power adapter. Other power sources can lead to system instability and damage to your HORSE PROTECTOR unit. The power supply should always provide 5.1 V DC and a minimum rated current of 5 A.

Data protection and data storage

Generally speaking, data storage is subject to country-specific data protection regulations. Our top priority is data security. Therefore, we have set up our entire infrastructure on European Google Cloud servers. As part of Google's guarantee, we ensure that only ACARiS employees and you have access to your data. At the same time, we leverage the reliability of Google services and the security of Google's infrastructure to offer you the best possible service.

You always retain control over your data. This means you can request access to your stored data or have it deleted at any time. Simply send an email with the subject line "Data Access" to info@acaris.net. Briefly describe your request and include your registered email address. A member of our team will then contact you.

Legal Notice

You are legally required to clearly indicate the area you are monitoring with your camera by displaying a warning sign. We therefore recommend that you attach the supplied warning sign to your horse stall in a clearly visible location.

Furthermore, they are obliged to film only areas for which they have obtained explicit permission or which they themselves own.

Disclaimer and Warranty

This user manual was prepared with the utmost care. However, should you notice any omissions or inaccuracies, please inform us by email at info@acaris.net.

ACARiS GmbH accepts no liability for technical or typographical errors and reserves the right to make changes to the product and/or the operating instructions at any time without prior notice. No warranty is given for the content of this document.

ACARiS GmbH is not liable or responsible for any direct or indirect consequential damages arising in connection with the equipment, performance, and use of this product.

The warranty is void if damage is caused by failure to follow these operating instructions. We accept no liability for consequential damages! We accept no liability for property damage or personal injury caused by improper handling or failure to observe the safety instructions. In such cases, all warranty claims are void!

In particular, ACARiS assumes no guarantee or liability if the installation instructions have not been followed and this results in damage to people, animals or other property.

The HORSE PROTECTOR's horse health advice is based on algorithms that we are constantly improving. Nevertheless, we explicitly point out that ACARiS does not guarantee the horse's well-being. Should one of your horses unexpectedly become ill, ACARiS does not guarantee that every illness will be detected.

ACARiS does not claim to replace personal assessment or expert examination by a veterinarian.

Security of your user account

Always ensure that only you know your ACARiS user account password. Choose a password that is at least 10 characters long and includes numbers, uppercase and lowercase letters, and special characters to protect against misuse.

In case of loss or theft of your user account or password, please contact ACARiS Support at info@acaris.net with the subject line "Account Security". If you are unsure whether your password is still secure, we recommend that you reset it immediately at <https://acaris.net/reset-password/>.

Should you no longer have access to your registered email address, please contact ACARiS Support immediately at support@acaris.net with the subject line "Account Security". You will need to provide a different email address to regain access to your account.

