KAVAN Smart PRO SE4 4ch BUS servo decoder - Instruction manual

INTRODUCTION

Congratulations on purchasing the **KAVAN Smart PRO SE4 4ch BUS servo decoder**, a device that converts serial bus signals to standard PWM servo outputs. It offers up to four configurable servo outputs with optional period and fail-safe settings. The SE4 is a perfect choice for models with complex wing or tail mechanics where multiple servos may be connected to a primary receiver using just a single cable. In addition, if you are running out of receiver channels simply connect the SE4 to the receiver serial line and freely assign its own output channels.

SUPPORTED PROTOCOLS:

- Futaba: S.Bus/S.Bus2
- Graupner: SUMD, Hott telemetry for setting
- JETI: EX Bus
- Multiplex: SRXL 12ch, SRXL 16ch
- PowerBox: P²Bus

FEATURES

- Small dimensions and high current throughput via the integrated MR30 power connector
- 4-channel servo/EX Bus sensor expander
- Automatic detection of serial data/telemetry after startup
- Configuration through the transmitter, an external terminal (JETIBOX/SMART-BOX) or MAV Manager PC software
- Firmware updates via USB interface
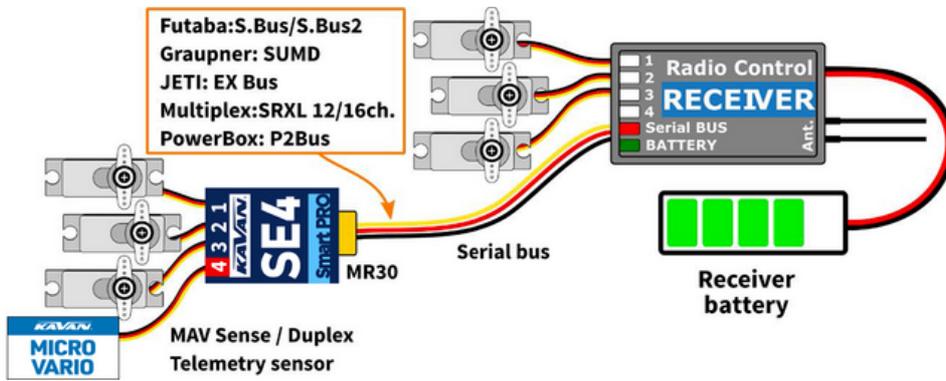
TECHNICAL SPECIFICATIONS

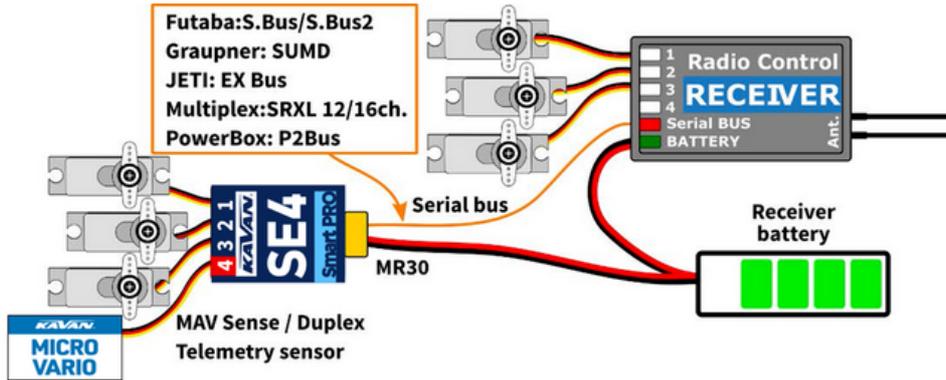|	SE4	SE6
Dimensions (including connectors)	34×14×9 mm	34×19×8 mm
Weight (including connectors)	4 g	4,5 g
Servo output channels	3 or 4	5 or 6
Operating current	15 mA	15 mA
Operating temperature	(-20)–85 °C	(-20)–85 °C
Supply voltage	4–14 V (recommended 5–8.4 V)	4–14 V (recommended 5–8.4 V)
Continuous current	15 A	15 A
Peak current	60 A (2 s)	60 A (2 s)
Supported protocols	JETI Duplex, Multiplex, Graupner Hott, Futaba S.Bus, PowerBox P²Bus	
Status LED	Yes	Yes
Sensor expander	EX Bus: up to 4 sensors	No

INSTALLATION

Attach the required servos to the SE4 servo expander. Connect the receiver – use its output port with the serial data option. The SE4 uses the MR30 connector for primary data input.

Turn on the transmitter and apply the appropriate power source to the receiver. The status LED starts blinking when the SE4 detects the signal on the serial line.
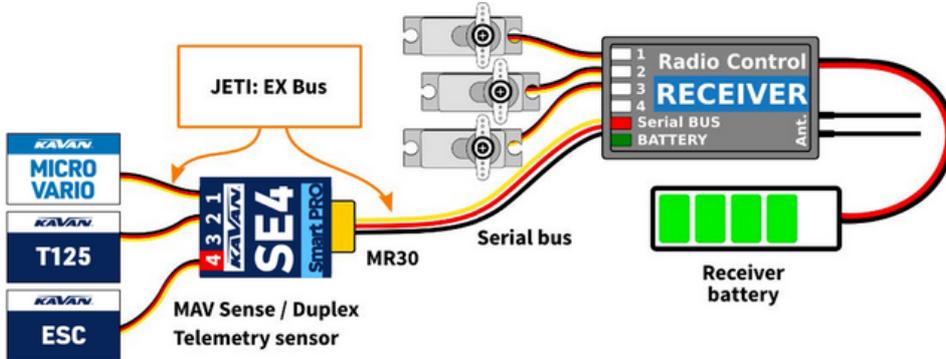
BASIC INSTALLATION

Futaba:S.Bus/S.Bus2
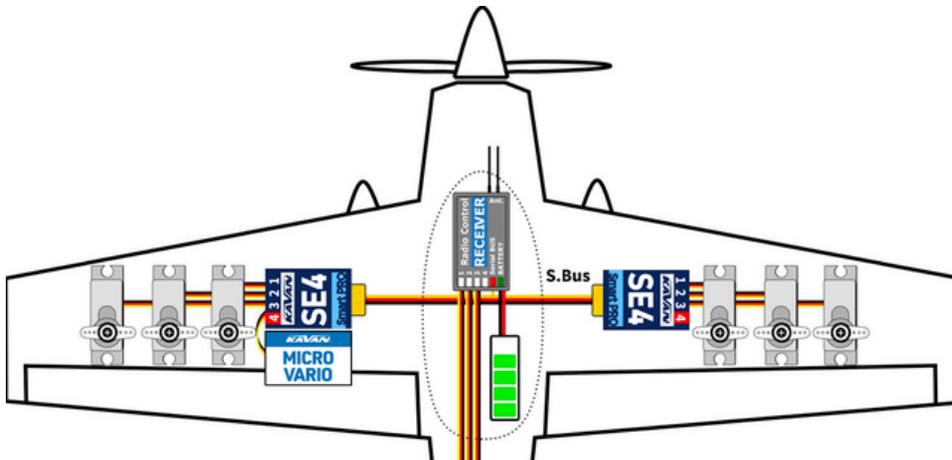Graupner: SUMD
JETI: EX Bus
Multiplex:SRXL 12/16ch.
PowerBox: P2Bus

Serial bus

MR30

MAV Sense / Duplex
Telemetry sensor

MICRO VARIO

Receiver battery

HIGH POWER INSTALLATION

Futaba:S.Bus/S.Bus2
Graupner: SUMD
JETI: EX Bus
Multiplex:SRXL 12/16ch.
PowerBox: P2Bus

Serial bus

MR30

MAV Sense / Duplex
Telemetry sensor

MICRO VARIO

Receiver battery

DEVICE MODE: CH1–CH4: EX BUS

- All extension ports are configured to the EX Bus protocol

JETI: EX Bus

MICRO VARIO

T125

ESC

MR30

MAV Sense / Duplex
Telemetry sensor

Serial bus

Receiver battery

MULTIPLE INSTALLATION IN A COMPLEX WING
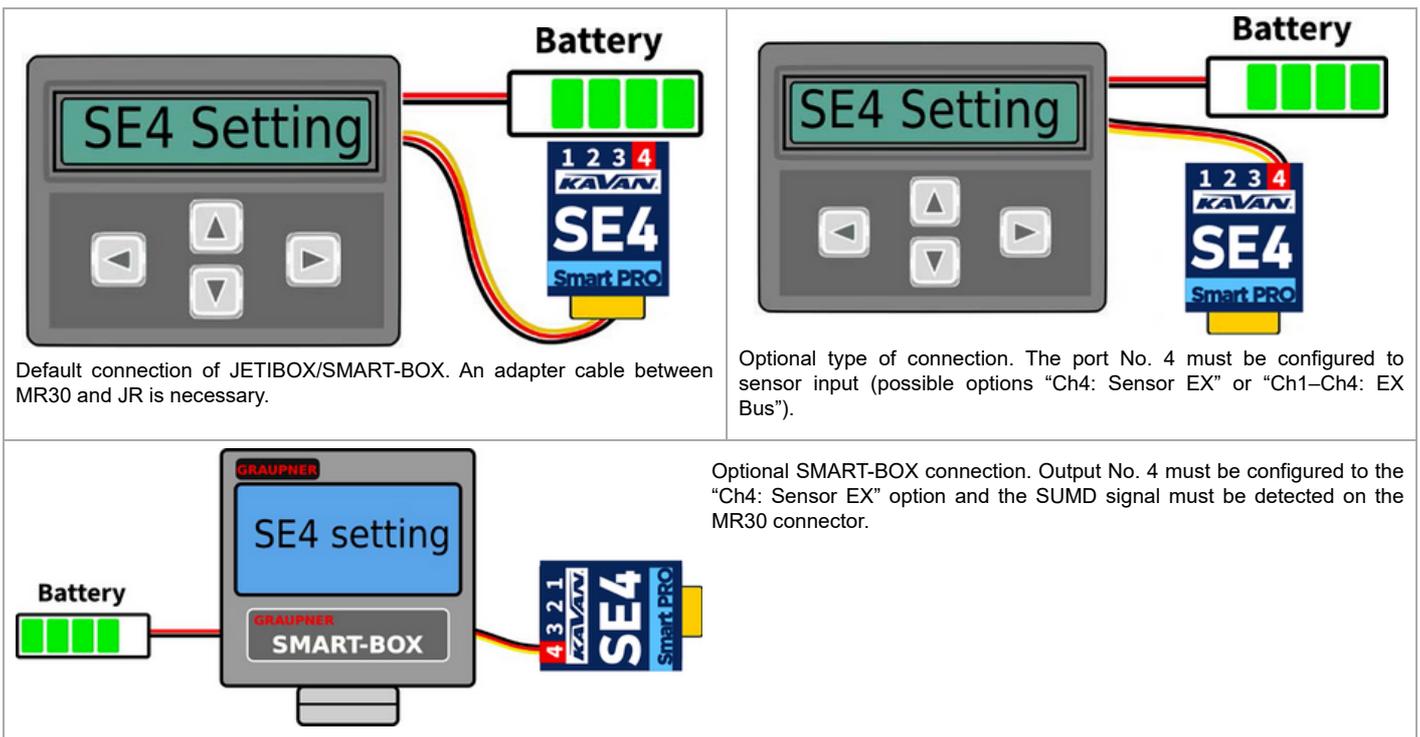

S.Bus

TELEMETRY AND SETTINGS

The device is compatible with JETIBOX for programming. The JETIBOX menu is divided into three sections:

- **Actual values** - Displays the latest telemetry values (voltage, temperature, system status) including minimums and maximums.
  - **System** - Shows the detected serial protocol and its average frame rate.
  - **Fadeouts/FS** - Number of frame misses and time spent in fail-safe mode. The number of frame misses increases every time the interval between two consecutive servo frames noticeably exceeds the average period.
  - **Reset Min/Max** - Press left+right buttons together to reset all minimums and maximums.
- **Settings** - Basic settings of the sensor.
  - **Language** - You can choose the language of the JETIBOX screen.
  - **Period** - You can specify a fixed servo output rate (5ms – 30ms), or automatic output rate synchronous to the serial input.
  - **Device mode** - Specify a function of the extension ports:
    - **Ch1–Ch4: Servo** - All extension ports are configured as servo outputs.
    - **Ch4: Sensor EX** - Ports 1–3 are configured as servo outputs while port 4 acts as a sensor expander (Duplex EX, EX Bus) or you can connect Hott SMART-BOX for setting in case of SUMD.
    - **Ch1–Ch4: EX Bus** - All extension ports are configured to the EX Bus protocol so that you can simply connect up to four EX Bus-compatible sensors to the device. This mode is compatible with the Duplex system.
  - **Fail-safe Delay** - Set the time period that must elapse before entering the fail-safe mode if there is no signal on the serial line.
  - **Ch.1–Ch.4** - Here you can set the properties of each output channel. You can modify the receiver channel assignment to the outputs of the SE4. By pressing both left+right buttons, you can change the behavior if there is no signal on the serial line:
    - **<Hold> (default)** - Repeat the last known servo position.
    - **<FS XX>** - Set the servo position to a fixed value XX %.
  - **Set Fail-safe Now** - By pressing both left+right buttons, the actual servo positions will be stored as fail-safe values.
- **Service** - In this menu you can view the device version and reset it to the default factory configuration.

JETIBOX OR SMART BOX CONNECTION

Plug the SE4 into the sensor slot of the JETIBOX/SMART-BOX. Power it up using a battery with appropriate voltage (4.5–8.4V). Now you can configure the device using the arrows on the JETIBOX/SMART-BOX.

Default connection of JETIBOX/SMART-BOX. An adapter cable between MR30 and JR is necessary.

Optional type of connection. The port No. 4 must be configured to sensor input (possible options "Ch4: Sensor EX" or "Ch1–Ch4: EX Bus").

Optional SMART-BOX connection. Output No. 4 must be configured to the "Ch4: Sensor EX" option and the SUMD signal must be detected on the MR30 connector.

GRAUPNER HOTT MENU STRUCTURE

SE4 offers text telemetry as a standard EAM telemetry module.

COMPLETE JETIBOX MENU STRUCTURE

```
┌─────────────────┐  Sensor expander  ┌─────────────────┐
│ SE4      5.00V  │──────────────────│ 1).............. │
│ SUMD    100.0Hz │                   │ 2 ............. │
└─────────────────┘                   └─────────────────┘
        │                     │                    │
┌─────────────────┐ ┌─────────────────┐ ┌─────────────────┐
│   SE4 MENU      │─│   SE4 MENU      │─│   SE4 MENU      │
│ ACTUAL VALUES > │ │  < SETTINGS >   │ │ <     SERVICE   │
└─────────────────┘ └─────────────────┘ └─────────────────┘
        │                   │                    │
┌─────────────────┐ ┌─────────────────┐ ┌─────────────────┐
│ Voltage   5.00V │ │   Language      │ │ Preset     < >  │
│ 4.50  <=> 5.50V │ │ <  English   >  │ │ Factory Defaults│
└─────────────────┘ └─────────────────┘ └─────────────────┘
        │                   │                    │
┌─────────────────┐ ┌─────────────────┐ ┌─────────────────┐
│ Temperature 23°C│ │    Period       │ │ SE4      V.X.XX │
│ 17°C <=> 25°C   │ │ <    10ms    >  │ │ ID XXXXX:XXXXX  │
└─────────────────┘ └─────────────────┘ └─────────────────┘
        │                   │
┌─────────────────┐ ┌─────────────────┐
│    System       │ │  Device mode    │
│ SUMD   100.0Hz  │ │ Ch1-Ch4: Servo> │
└─────────────────┘ └─────────────────┘
        │                   │
┌─────────────────┐ ┌─────────────────┐
│ Fadeouts / FS   │ │ Fail-Safe Delay │
│   0      0.0s   │ │ <    1.5s    >  │
└─────────────────┘ └─────────────────┘
        │                   │
┌─────────────────┐ ┌─────────────────┐
│ Reset Min/Max   │ │ Ch.1    <FS-100>│
│ Press   < >     │ │ <Input 1   32%> │
└─────────────────┘ └─────────────────┘
                            │
                    ┌─────────────────┐
                    │ Ch.2    <Hold > │
                    │ <Input 2    0%> │
                    └─────────────────┘
                            │
                          • • •
                            │
                    ┌─────────────────┐
                    │ Ch.4    <Hold > │
                    │ <Input 4    0%> │
                    └─────────────────┘
                            │
                    ┌─────────────────┐
                    │ Set FailSafe Now│
                    │   Press < >     │
                    └─────────────────┘
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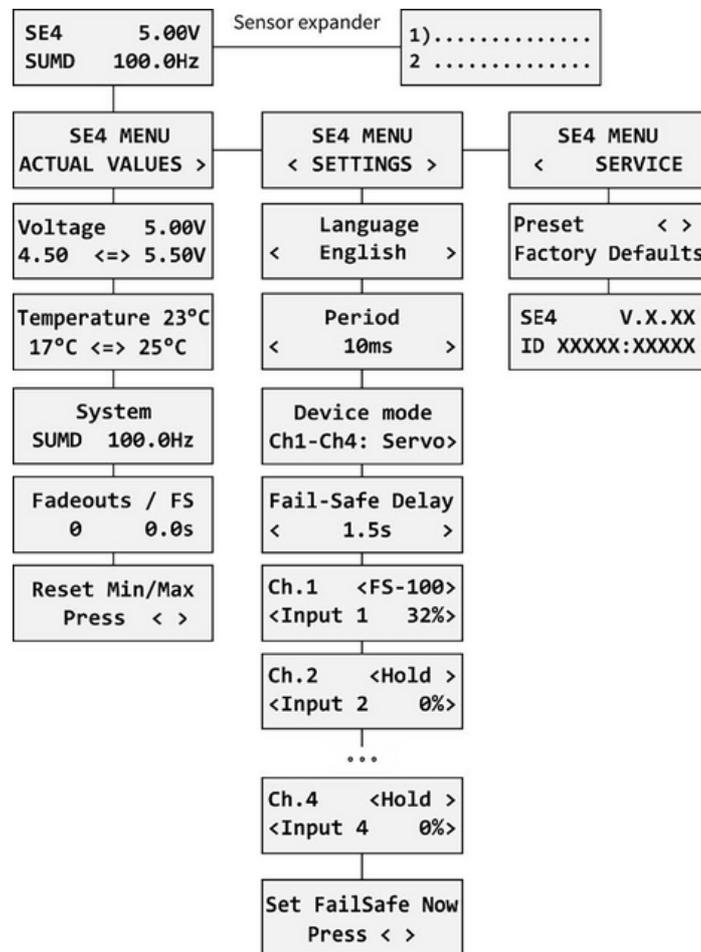
SAFETY INFORMATION

- Operate the SE4 always in a dry environment and within the device limits stated in this guide. Never expose the device to excessive heat or cold.
- Do not remove the heat shrink tube from the device and do not try to implement any changes or modifications. This can result in damage to the product and the denial of any warranty claims.
- Always check the polarity of the connection. Never inverse the polarity – this could result in damage to the product.
- Always use a sufficient power source according to the consumption of the attached servos. Never exceed the maximum allowed operating voltage of the attached servos.
- If you use analogue servos, please make sure the servo output period is not below 15 ms. Otherwise, the servos may behave unexpectedly.

FIRMWARE UPDATE

Firmware updates for the SE4 are transferred from a PC via the USB interface. The required programs and files are available at www.mavsense.com. (https://www.mavsense.com/).

Install the MAV Manager software and the USB drivers on your computer. Check the system requirements.

1. Disconnect all servos from SE4.
2. Connect the USB interface to your PC, run MAV Manager and select the correct COM Port.
3. Connect the SE4 according to the picture below.
4. Select the correct *.BIN file and press the Update button.

SE4	USB interface		MAV MANAGER
MR30	JR/SERVO CONNECTOR	MINI USB	USB
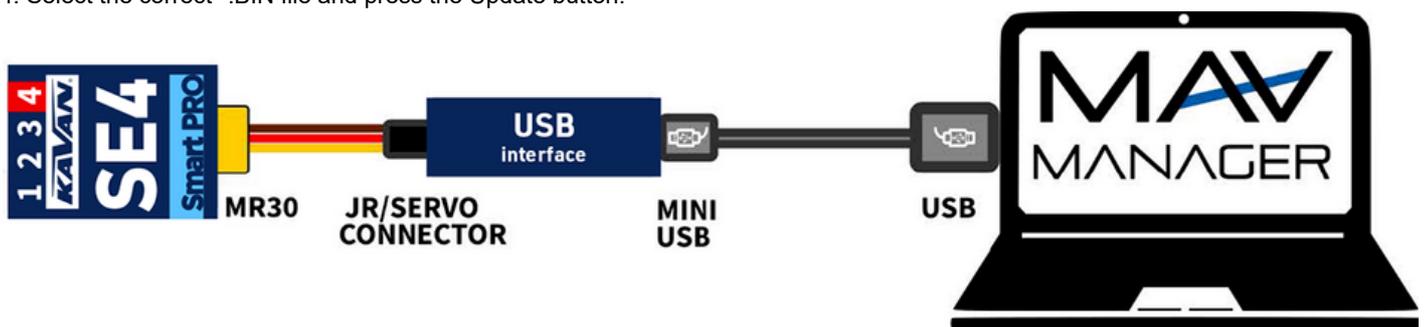
PC CONFIGURATION

It is possible to use the MAV Manager software (1.6.0 and later) to conveniently configure all device settings, display real-time telemetry and make a backup of the configuration. The configuration menu contains four buttons in the top toolbar:

- **Refresh** - Forces the configuration to be reloaded from the device.
- **Import** - Imports the settings from a file. If you have several devices and want identical settings, simply import the same settings to each device.
- **Export** - Exports the settings from the device to a file. You can easily create a backup configuration stored on your PC. After creating a backup, you may easily experiment with the settings and later revert back to the original configuration by pressing the "Import" button and choosing the original exported file.
- **Reset default** - Resets the device to factory defaults and reloads all the settings.
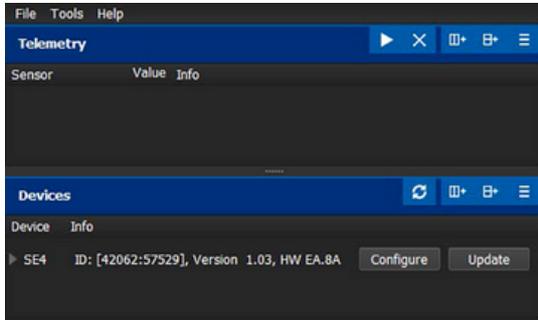
Connect the SE4 to your PC using the USB interface. The device will be automatically detected by the MAV Manager.

The device properties are available after pressing the "Configure" button.
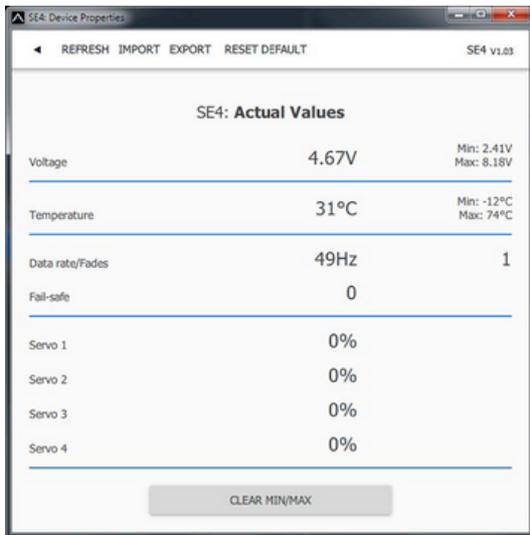
Real-time telemetry with min/max values. The MAV Manager is also able to create a log file from the real-time telemetry data, which can be viewed, analyzed, imported and exported.
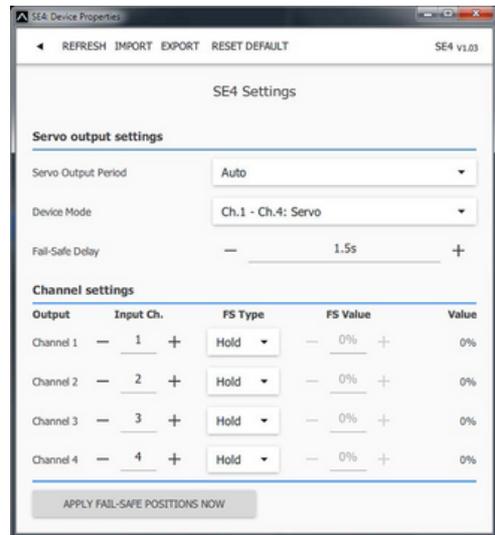
SE4 settings. Every time you make any change in the configuration, the new value is immediately transferred to the device and saved to memory. There is no need for additional confirmation.

MANUFACTURER

KAVAN Smart PRO SE4 4ch BUS servo decoder is made in Czechia by **MAV Sense s.r.o.**

E-mail: info@mavsense.com | Web: www.mavsense.com (https://www.mavsense.com/)

RECYCLING AND WASTE DISPOSAL NOTE (EUROPEAN UNION)

Electrical equipment marked with the crossed-out waste bin symbol must not be discarded in the domestic waste; it should be disposed of via the appropriate specialised disposal system. In the countries of the EU (European Union) electrical devices must not be discarded via the normal domestic waste system (WEEE - Waste of Electrical and Electronic Equipment, Directive 2012/19/EU). You can take your unwanted equipment to your nearest public collection point or recycling centre, where it will be disposed of in the proper manner at no charge to you. By disposing of your old equipment in a responsible manner you make an important contribution to the safeguarding of the environment.

EU DECLARATION OF CONFORMITY (EUROPEAN UNION)

Hereby, **KAVAN Europe s.r.o.** declares that the **KAVAN Smart PRO SE4 4ch BUS servo decoder** is in compliance with the essential requirements as laid down in the EU directive(s) concerning electromagnetic compatibility. The full text of the EU Declaration of Conformity is available at www.kavanrc.com/doc (http://www.kavanrc.com/doc).

GUARANTEE

The KAVAN Europe s.r.o. products are covered by a guarantee that fulfils the currently valid legal requirements in your country. If you wish to make a claim under guarantee, please contact the retailer from whom you first purchased the equipment. The guarantee does not cover faults which were caused in the following ways: crashes, improper use, incorrect connection, reversed polarity, maintenance work carried out late, incorrectly or not at all, or by unauthorised personnel, use of other than genuine KAVAN Europe s.r.o. accessories, modifications or repairs which were not carried out by KAVAN Europe s.r.o. or an authorised KAVAN Europe s.r.o., accidental or deliberate damage, defects caused by normal wear and tear, operation outside the Specification, or in conjunction with equipment made by other manufacturers. Please be sure to read the appropriate information sheets in the product documentation.

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