INSTRUCTION MANUAL

The Servo Expander SE6 is a device that converts serial bus signal to standard PWM servo outputs. It offers up to six configurable servo outputs with optional period and fail-safe setting. The SE6 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 SE6 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.
- Automatic detection of serial data/telemetry after startup.
- Configuration through the transmitter, external terminal (JETIBOX/SMART-BOX) or MAV Manager PC software.
- Firmware updates via USB interface.

	SE4	SE6
Dimensions (including connectors)	34x14x9mm	34x19x8mm
Weight (including connectors)	4g	4,5g
Servo output channels	3 or 4	5 or 6
Operating current	15mA	15mA
Operating temperature	-20 – 85°C	-20 – 85°C
Supply Voltage	4 – 14V (recommended 5-8.4V)	4 – 14V (recommended 5-8.4V)
Continuous current	15A	15A
Peak current	60A (2sec)	60A (2sec)
Supported protocols	JETI Duplex, Multiplex, Graupner Hott, Futaba S.Bus, PoweBox P²Bus	
Status LED	YES	YES
Sensor expander	EX Bus: up to 4 sensors	No

INSTALLATION

Attach the required servos to the SE6 servo expander. Connect the receiver – use its output port with serial data option. The SE6 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 as soon as the SE6 detects signal on the serial line.

Basic installation:

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

Radio Control RECEIVER
1 2 3 4
Serial BUS
BATTERY
Ant.

MAV SENSE SE6
RX/POWER
1 3 4 5 6

MR30

Serial bus

Receiver battery

MAV SENSE VARIO

MAV Sense / Duplex
Telemetry sensor

High power installation:

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

Radio Control RECEIVER
1 2 3 4
Serial BUS
BATTERY
Ant.

MAV SENSE SE6
RX/POWER
1 2 3 4 5 6

Serial bus

MR30

Receiver battery

MAV SENSE VARIO

MAV Sense / Duplex
Telemetry sensor

Multiple installation in a complex wing:

Radio Control RECEIVER
1 2 3 4
Serial BUS
BATTERY
Ant.

MAV SENSE SE6
RX/POWER
1 2 3 4 5 6

S.Bus

MAV SENSE SE6
RX/POWER
1 2 3 4 5 6

MAV SENSE VARIO

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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) together with 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 is increased 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.
    - **Data Port (6)** – specify a function of the data port – either servo or sensor/terminal can be set.
    - **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.6** – here you can set the properties of each output channel. You can modify the receiver channel assignment to the outputs of the SE6. 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.
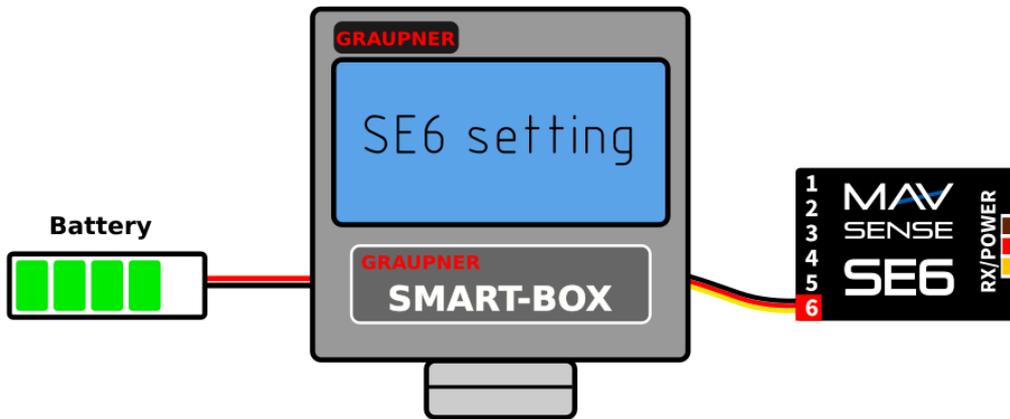

JETIBOX or SMART BOX Connection

Plug the SE6 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.
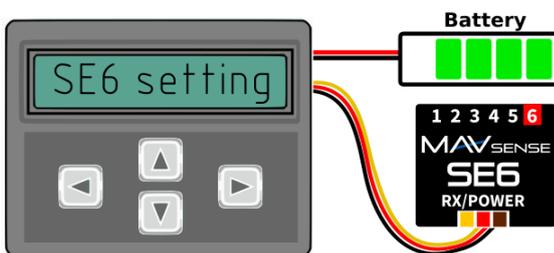
Default connection of JETIBOX/SMART-BOX.
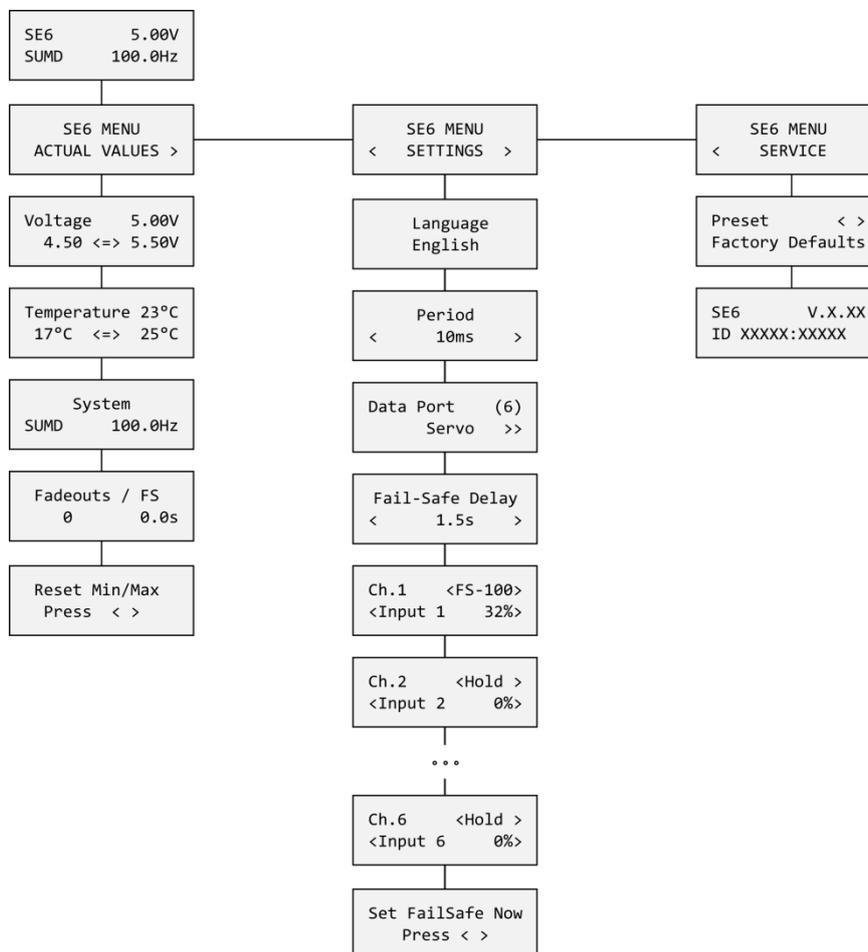An adapter cable between MR30 and JR is necessary.

Optional type of connection. The output No.6 must be configured to a "Sensor" option.

Optional SMART-BOX connection. The output No.6 must be configured to the "Sensor" option and SUMD signal must be detected on the MR30 connector.

Complete JETIBOX menu structure:

```
SE6        5.00V
SUMD      100.0Hz
```

```
   SE6 MENU                  SE6 MENU                    SE6 MENU
ACTUAL VALUES >           <   SETTINGS   >            <     SERVICE
```

```
Voltage    5.00V          Language                  Preset       < >
  4.50 <=> 5.50V          English                   Factory Defaults
```

```
Temperature 23°C             Period                 SE6        V.X.XX
 17°C  <=>  25°C          <     10ms     >          ID XXXXX:XXXXX
```

```
   System               Data Port     (6)
SUMD      100.0Hz            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.6       <Hold >
                         <Input 6     0%>
```

```
                         Set FailSafe Now
                             Press < >
```

Graupner Hott Menu Structure:

SE6 offers text telemetry as a standard EAM telemetry module.

```
 SE6        VX.XX        SE6           VX.XX        SE6        VX.XX
 VOLTAGE      5.0V      >LANGUAGE    English       >1) INPUT 1  <FS-100>
            4.5/5.5V     PERIOD         Auto        2) INPUT 2  <Hold >
 TEMPERATURE  24°C       FS DELAY     1500ms        3) INPUT 3  <Hold >
 FAIL-SAFE   0/ 0S       DATA PORT     SERVO        4) INPUT 4  <Hold >
                         FACTORY DEFAULTS           5) INPUT 5  <Hold >
>RESET MIN/MAX                                      6) INPUT 6  <FS  0>
              1/3                        2/3       Set FailSafe Now
```

- Operate the SE6 always in 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 lead to a total destruction and to the denial of any warranty claims.
- Always check the polarity of the connection. Never inverse the polarity – this could lead to total destruction.
- 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 analog servos please make sure that the servo output period is not below 15ms. Otherwise the servos may behave unexpectedly.

FIRMWARE UPDATE

Firmware updates for the SE6 are transferred from a PC via the USB interface. The required programs and files are available at www.mavsense.com

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

1) Disconnect all servos from SE6.
2) Connect the USB interface to your PC, run MAV Manager and select the correct COM Port.
3) Connect the SE6 according to the picture below.
4) Select the *.BIN file and press the Update button.
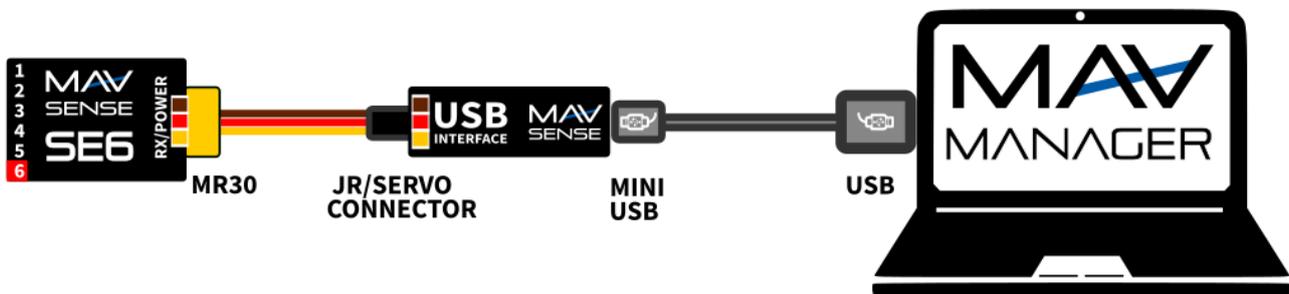
PC CONFIGURATION

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 configuration backup. 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 for all of them, 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 in 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.
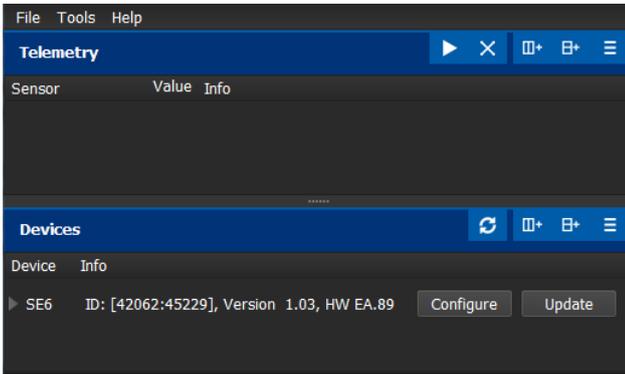
Connect the SE6 to your PC using the USB interface. The device will be automatically detected by the MAV Manager.
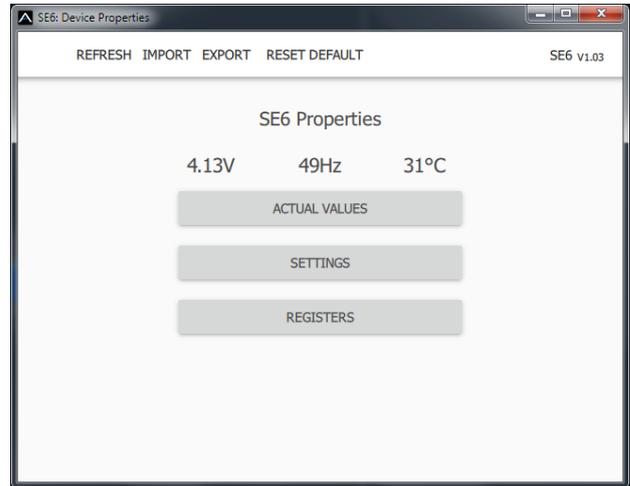
The device properties are available after pressing the "Configure" button.
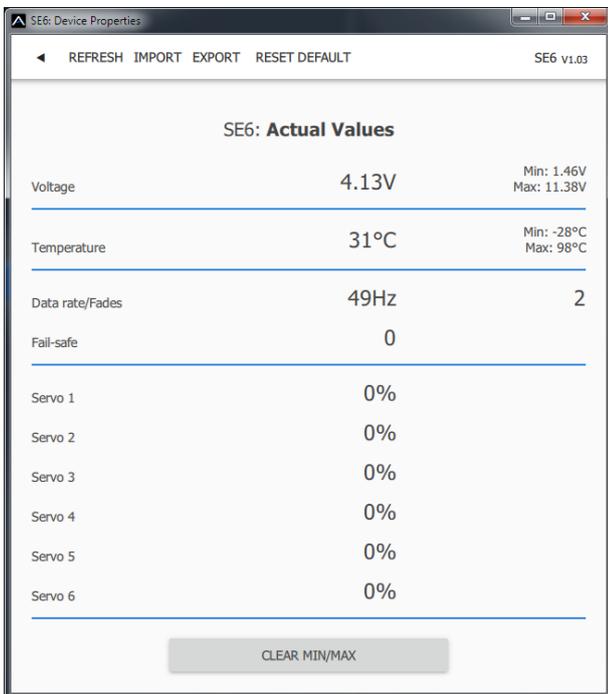
Real-time telemetry with min/max values. The MAV Manager is also able to create a log file from the real-time telemetry data, which can be viewed, analyzed, imported and exported.
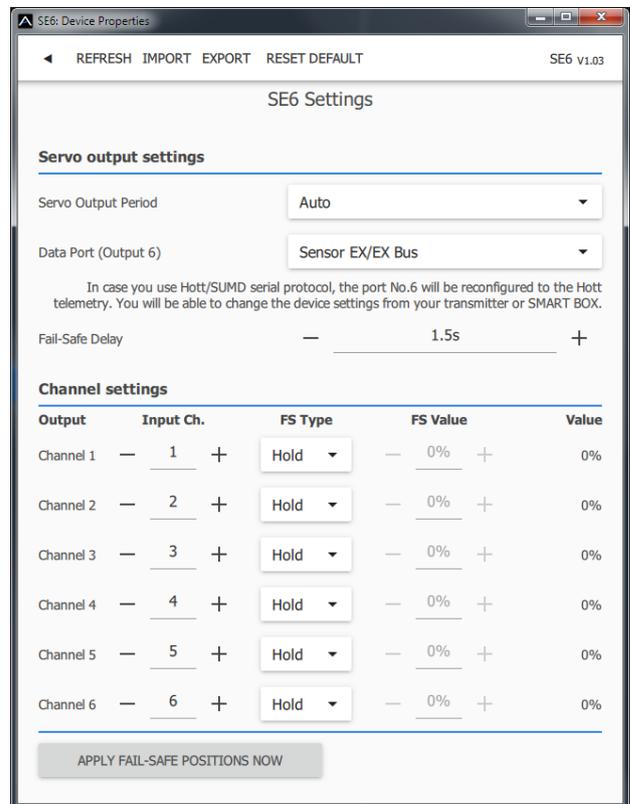
SE6 settings. Every time you make any change in the configuration, the new value is immediately transferred to the device and saved to memory. There is no need for additional confirmation.

WARRANTY

We grant a warranty of 24 months from the day of purchase under the assumption that they have been operated in conformity with these instructions at recommended voltages and that they were not damaged mechanically. Warranty and post warranty service is provided by the manufacturer.

Distributor

GB: ESG-JETI-FIALA UK, B M Jones, 15 London Road, Hassocks, West Sussex, BN6 9NT, United Kingdom.
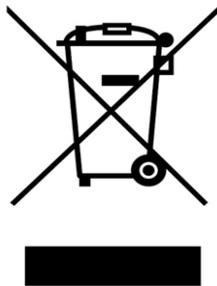E-mail: sales@esoaringgadgets.co.uk | Website: www.esoaringgadgets.co.uk | Phone: 44(0)7740181861

Manufacturer

MAV Sense s.r.o., Czech Republic.
E-mail: info@mavsense.com | Website: www.mavsense.com

Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)

This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.
If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.