



Automotive Seat Solutions

Belt & OCC Monitoring System, Premium Seat ECU Family
(Sensors, Controllers, Power Electronics Units)

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SENSORS / Seat Occupancy Radar Sensor

SAYKAL Seat Occupancy Radar Sensor is suitable for automotive applications, especially for Occupancy Detection on the seats. The Seat Occupancy radar sensor operates in the millimeter wave frequency band, effectively detecting living objects on the seat. Unlike capacitive weight-measuring occupancy pads, it distinguishes between living and inanimate objects, reducing false alarms from non-human objects placed on the seat.



*The card layout and dimensions can be customized based on specific customer requirements.

Hardware Features

- 3.3V – 38V DC Input
- Automotive Reverse Polarity Protection
- LIN or CAN
- 1 x Digital Output with OCP
- 1 x Digital Input

Software Features

- High Precision
- Dynamic/Static object detection
- Configurable FoV up to 60°
- Configurable sensor position and tilt
- Configurable sensing distance
- Configurable sensitivity
- Using machine learning algorithms to classification of the objects

SENSORS / Child Presence Detection Radar Sensor

High-precision radar sensor designed to detect the presence of children in vehicles. Ensures child safety and prevents accidents.



*The card layout and dimensions can be customized based on specific customer requirements.

Hardware Features

- 9V – 40V DC
- Reverse Connection Protection
- Over Current/Voltage/Temperature Protection
- CAN / FDCAN
- Temperature Sensing
- 1 x Output
- 4 x Input
- 60-66 GHz FMCW Radar

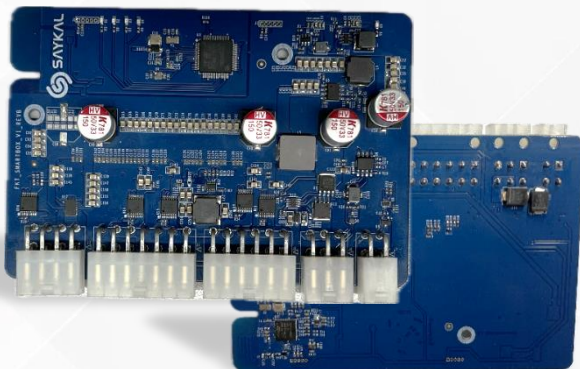
Software Features

- Firmware Update with CAN Bus
- High Precision
- Object Detection and Tracking
- Configurable Azimuth FOV up to 140°
- Configurable radar detection zone
- Configurable Sensor position and tilt.
- Presence Detection in-Cabin



CONTROLLERS / Seat Electronic Control Unit

The Seat Electronic Control Unit, developed by Saykal Electronics, is a state-of-the-art product designed to manage and control various functions in each seat. With one unit installed per seat, it oversees functions such as heating, ventilation, lumbar support, seatbelt, and seat occupancy detection. Equipped with a 1-amp motor driver technology, it efficiently handles the control of electric seats, ensuring a seamless and comfortable experience for the occupants.



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Hardware Features

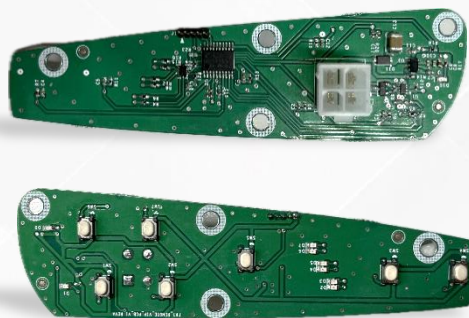
- 10V – 40V DC
- Reverse Connection Protection Automotive
- Over Current/Voltage/Temperature Protection
- CAN / FDCAN
- 24V 4 x High-Side Protected Output
- 12V 1 x High-Side Protected Output
- 12-24V 1 x Protected Fan Control Output
- 2 x Lumbar Control Output
- 2 x Low-Side Digital Input (Seat Belt, Occupancy)
- DC Motor Driver up to 12 A
- 2 x Encoder Input
- Bluetooth/Open thread Communication

Software Features

- Firmware Update with CAN Bus
- Wireless communication protocol support.
- Seat adjustable level heating and cooling control.
- Belt and passenger occupancy detection.
- Ability to work synchronously with Gateway.
- Reading lamp control.
- Supports for optional motor options.
- Mobile application.

CONTROLLERS / User Controller

The User Controller product, developed by Saykal Electronics, is an innovative solution designed to enhance the control of various features within each seat. With one unit installed per seat, the User Controller utilizes its integrated buttons to facilitate the management and control of seat-related functions. These functions include heating, ventilation, lumbar support, a reading lamp, and more. This user-friendly unit offers a convenient and efficient way to customize and adjust seat features, providing an enhanced and comfortable experience for the occupants.



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Hardware Features

- 5-12V DC
- Reverse Connection Protection
- RS485
- 7 x Output
- 7 x Input

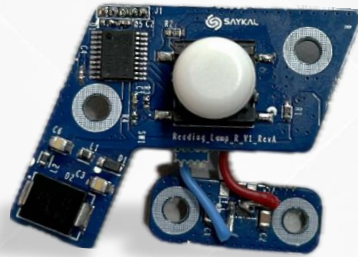
Software Features

- 7 x Button control.
- 7 x Led control.
- RS485 communication protocol support.



CONTROLLERS / Reading Lamp

The Reading Lamp product, developed by Saykal Electronics, is an innovative lighting solution designed to provide personalized illumination for each seat. With one unit installed per seat, the Reading Lamp offers individual passengers the convenience of personal lighting without causing discomfort to others. The integrated button on the lamp allows for adjustable LED brightness, providing a customizable lighting experience. The Reading Lamp is equipped with the functionality to be easily turned on and off, offering passengers control over their personal lighting preferences for a more comfortable and enjoyable journey.



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Hardware Features

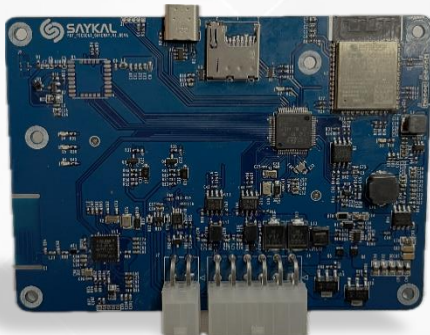
- 24V DC Bus Voltage
- 6500k, 3W Power Led
- Configurable Beam Angle
- Illuminated Button
- Configurable Button Color

Software Features

- Brightness control.
- Smart button control.
- Communication management with wired Seat Control Unit.

CONTROLLERS / Wireless Gateway

The Wireless Gateway product, crafted by Saykal Electronics, is an advanced component designed to enhance the connectivity of each vehicle. With one unit allocated per vehicle, the Wireless Gateway facilitates seamless data transmission to the cloud. This capability enables users to manage the features of the Seat Control Unit through a mobile application. The Wireless Gateway serves as a bridge between the vehicle's onboard systems and the cloud, allowing for efficient control and monitoring of Seat Control features remotely via a user-friendly mobile app.



*The card layout and dimensions can be customized based on specific customer requirements.

Hardware Features

- 7V – 40V DC / 4.5A
- Reverse Connection Protection
- CAN / FDCAN
- 2 x Low-Side Output
- 2 x Digital Input
- Openthread / Wifi / Sdcard
- GPS

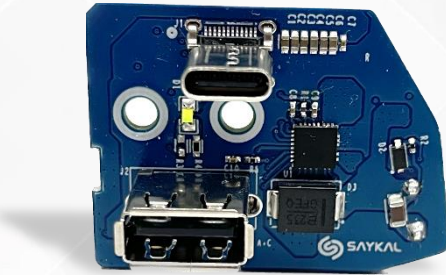
Software Features

- Firmware Update with CAN Bus
- Management and synchronization of Seat Control Unit.
- Wired and wireless(openThread) operation capability.
- Wifi connection manager.
- Changeable bus configuration management via SD card and USB.
- HMI screen display manager.
- RTC clock support manager.
- Runtime Tracking with GPS.



Power Electronics Units / USB Charger

The USB Charger product, innovatively developed by Saykal Electronics, offers versatile charging solutions with its TYPE A+C, TYPE A, and TYPE C versions. Specifically, the TYPE A+C variant boasts a robust 25W power capacity, ensuring efficient and rapid charging. The product's adaptability extends to customizable power levels, allowing it to meet diverse user preferences. Additionally, the supported certifications can be updated to align with evolving standards. Saykal's USB Charger stands as a cutting-edge solution, catering to the varying needs of users with its comprehensive range of features and adaptable design.



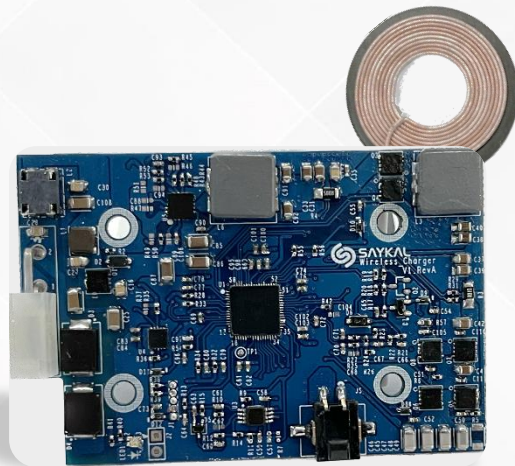
*The card layout and dimensions can be customized based on specific customer requirements.

Hardware Features

- 24V DC Battery input (Abs. Max 58V DC)
- USB 1.1/2.0/3.0 Compatible
- Charges 2 devices simultaneously.
- White LED indicator
- One single USB outlet can provide up to 2.4 A load.
- CDP/DCP Modes Per USB Battery Charging Specification 1.2

Power Electronics Units / Wireless Charger

Saykal Electronics' Wireless Charger offers a powerful 15W wireless charging capability, ensuring quick and efficient charging for Qi 1.3.2 certified devices. Compatible with a range of products, including phones, smartwatches, and headphones, this cutting-edge charger reflects Saykal's commitment to delivering innovative and high-quality charging solutions.



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Hardware Features

- 12-24V DC Bus Voltage Support
- Reverse Connection Protection AUTOMOTIVE
- Temperature Sensing
- Over Voltage Protection

Software Features

- Qi v1.3.2 compliant transmitter
- Supports MPP, EPP, BPP protocols.
- Up to 15W power
- Adaptive Foreign Object Detection (FOD)
- Zero voltage switching for high efficiency.
- 24V DC Battery input (Abs. Max 58V DC)
- Foreign Object Detection (FOD)

Belt & Occupancy Monitoring Systems / Master Board

Developed by Saykal Electronics, the Master Board comes in two versions, capable of wired and wireless communication with slave cards. Displaying occupancy and seatbelt information received from slave cards on a screen for the driver, it manages and oversees the operations of these slave cards. Additionally, equipped with a buzzer, the Master Board can issue alerts to the driver. This versatile product exemplifies Saykal's dedication to providing advanced solutions for effective vehicle management.





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Hardware Features

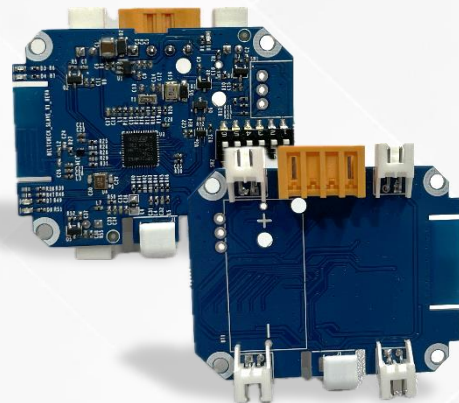
- 9V – 40V DC
- Reverse Connection Protection
- RS485
- CAN / FDCAN
- Analog Video Output
- Analog Camera Video Input
- Openthread / Wifi / Sdcard/Bluetooth/USB C
- 3 x Relay Output
- 4 x Digital Input
- 1 x Power Output 12V up to 2 A
- RTC

Software Features

- Firmware Update with RS485 Bus
- Management and synchronization of slave devices.
- Wired and wireless(openThread) operation capability.
- Wifi connection manager.
- Changeable bus configuration management via SD card and USB.
- PAL screen rendering management via external RAM.
- Long-term LOG management of in-bus passenger mobility into External FLASH.
- RTC clock support manager.
- Buzzer and bus horn, in-bus lamp warning system

Belt & Occupancy Monitoring Systems / Slave Board

Developed by Saykal Electronics, the Slave Board is offered in two versions enabling both wired and wireless communication with the master card. Additionally, it features a battery-powered variant. Transmitting seatbelt and occupancy information from the seats to the Master Card, one slave card can be utilized for each pair of seats. This versatile product showcases Saykal's commitment to providing efficient and reliable solutions for seamless vehicle management.



*The card layout and dimensions can be customized based on specific customer requirements.

Hardware Features

- 5V – 12V DC
- Reverse Connection Protection
- RS485
- 2 x Output
- 4 x Input
- Openthread / Bluetooth
- Buzzer

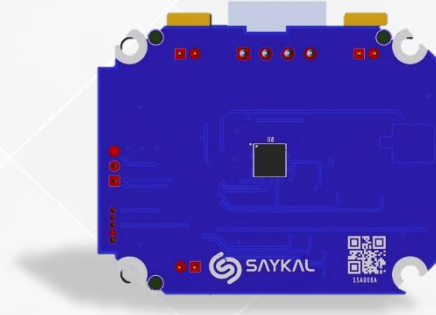
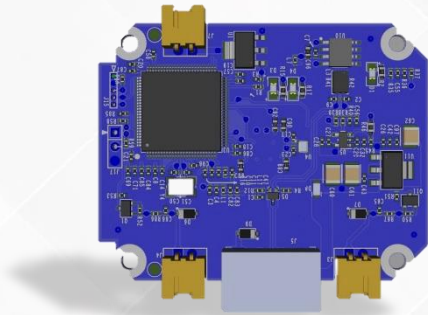
Software Features

- Belt and passenger presence detection.
- Gateway RS485/wireless(openThread) communication protocol management.
- Changeable ID and positioning.
- 2-seat seat installation support.
- Warning system with buzzer.



Belt & Occupancy Monitoring Systems / Radar Integrated Slave Board

Developed by Saykal Electronics, the Radar Integrated Slave Board shares similar features with the slave board that mentioned above. As an additional capability, this innovative product incorporates mmWave radar technology for occupancy detection. Designed to replace traditional weight-sensing pads, the radar sensor efficiently distinguishes between living and inanimate objects, providing accurate occupancy data. With one unit utilized per seat, the Radar Integrated Slave Board is a result of the combination of the Seat Occupancy Radar Sensor and the Slave Board product. This integration exemplifies Saykal's commitment to advanced technologies for enhanced vehicle safety and management.



*The card layout and dimensions can be customized based on specific customer requirements.



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