

OE2x Wireless Transceiver Module Operational/Technical Description.

The OE2x is a wireless transceiver module designed to allow peer-to-peer communications between equipped devices on a wireless network. The OE2x is intended to be installed as a component module, or daughter board on a parent device, typically a printed circuit board (PCB). The module is programmed with Paragon Robotics' Halo/S stack, which provides mechanisms for wireless connectivity, as well as various electronic input/output (I/O) capabilities and end-user customization.

In-range devices equipped with an OE2x module can communicate wirelessly amongst each other using the proprietary Halo/S wireless protocol. The OE2x's transceiver operates in the 902-928 MHz frequency band, and is realized via Silicon Labs' Si102x wireless MCU, which integrates a majority of the radio components. The frequency hopping protocol is controlled by the Halo/S stack and is entirely transparent to the end-user.

User accessible functions of the OE2x module include up to 49 digital I/O pins, up to 11 analog-to-digital inputs, 11 capacitive sense channels, 11 multiplexed comparator inputs, integrated temperature sensor, low-power digital pulse counter, I2C interface, UART, and programmable frequency I/O. These functions can be integrated into complete systems to perform any number of tasks. Data can be shared between devices and is accessed internally via the Halo/S API.

The OE2x is powered by +1.8-+3.6V input, which is in-turn regulated to +3.3V by an on-board charge pump regulator. The +3.3V regulated voltage supplies all active sections of the circuit, namely the wireless MCU and radio match circuitry. The OE2x incorporates a 32.768 kHz crystal, which is used by the real-time-clock (RTC), and a 30MHz crystal which serves as the system clock source for the MCU's integrated transceiver.

The transmit and receive ports of the MCU's transceiver are connected to a 50 ohm feed line via a matching/filter network and RF switch. A pi tuning network matches the on-board 50 ohm chip antenna to the feed line. Excluding the pi tuning network, all circuit components are enclosed under an RF shield connected to the system ground to prevent interference.