

WRS-485 Description

The WRS-485 is a secure wireless RS-485 cable replacement solution for access control systems, specifically designed to provide a low cost, plug-and-play alternative to traditional cabling between difficult to reach door controllers.

The WRS-485 devices may typically be used in place of the conventional RS-485 wired connection, to eliminate the need to run costly cables to access doors, for example to remote doors in large warehouses, to remote buildings or to car park entry barriers.

A pair of WRS-485 modules provide transparent bi-directional communications over a range of up to 250m* using the licence-exempt 868MHz band for short-range devices.

The WRS-485 consumes very little power so can usually be powered from the access control equipment simplifying installation. Typically, there will be a 4-wire interconnection between the WRS-485 and the access control equipment comprising Data-A, Data-B, Power, and Gnd.

* line-of-sight between antennas and antennas 2metres above ground

Demonstration Unit Features

Connection Type: the WRS-485 provides point-to-point connectivity as shown in Figure 1.

Authentication: The WRS-485 module authenticates one another before establishing communications between WRS-485 modules.

Power supply: the WRS-485 accepts an input voltage ranging between 9V and 25V. The power source should be capable of supplying 150mA.

SAM card: a SAM card provides module configuration parameters including the unique ID, required for authentication with another WRS-485.

LED indicators:

- Link-OK (green) – indicates whether a WRS485 has established a reliable communications link with another WRS-485
- TX-Data (amber) – WRS-485 is transmitting data
- Rx-Data (amber) – WRS-485 is receiving data
- No Comms (red) – illuminated if there is no communications with another WRS-485
- Fault LED (red) – indicates that there is either a fault with the WRS-485 or the SAM card is missing.

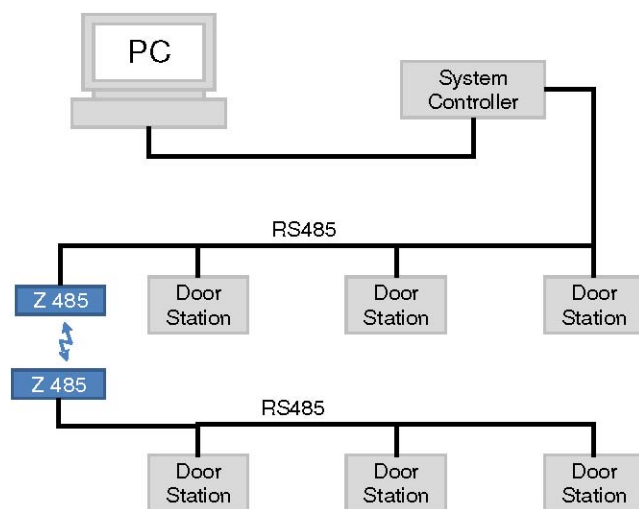
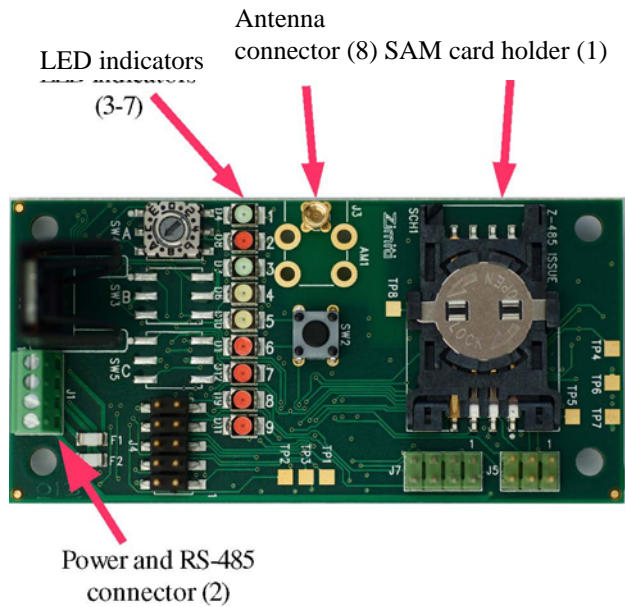


Figure: 1: Typical System Architecture

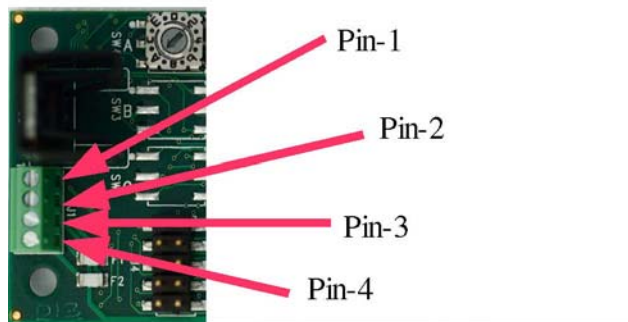
WRS-485 Module Components



1. SAM card holder
2. RS-485 (A&B) and power connector (J1)
3. Fault indicator (LED 2)
4. Link-OK indicator (LED 3)
5. Tx-Data indicator (LED 4)
6. Rx-Data indicator (LED 5)
7. No Comms indicator (LED 6)
8. Antenna connector (J3)

Interconnections

Connect the J1 connector to the system/door controller as follows:



- Pin-1 to positive supply rail (+9V to +25V)
- Pin-2 to ground supply rail (0V)
- Pin-3 to RS-485 Data-B or '-' terminal
- Pin-4 to RS-485 Data-A or '+' terminal

Note: there is no separate RS-485 ground connection. If required, RS-485 Gnd may be connected to Pin-2 (0V).

WRS-485 Operation

When power is applied to the WRS-485 the red No Comms LED will initially be illuminated. When a second WRS-485 is within range, with power applied, and is configured with a matching SAM card, the green Link OK LED will be illuminated on both WRS485 modules and the red No Comms LEDs will be extinguished.

When there is data on the RS-485 bus to which a WRS485 is connected the WRS-485 will transmit this data and the amber Tx-Data LED will flash to indicate that data is being transmitted. When the WRS-485 module receives data from another WRS-485 the amber Rx-Data LED will flash and the data will be relayed to the RS-485 bus.

The only actions required of the user are to correctly connect the WRS-485, install the SAM card, apply power, and set the channel number (see below). No other action is required.

Channel Selection

The HEX DIP switch must be set to 1, 2 or 3. This selects the channel that the modules use for communication. The WRS-485 modules must be set to the same channel number. If more than one pair of WRS-485 modules is used in the same vicinity they must be set to different channels.

User Guide

SAM Card

The purpose of the SAM cards is to provide a WRS-485 with a unique ID requiring authentication before a communications link can be established with another WRS-485. They also provide the specific configuration for operation with each vendors' equipment.

SAM cards can be removed and replaced whilst the WRS-485 is powered. The SAM card is inserted by rotating the catch, lifting the lid of the holder, sliding the card into the lid and replacing the lid ensuring that the catch is fully rotated back again.

When the SAM card is first installed, all LEDs except the Fault LED are illuminated for 3-4 seconds whilst the SAM configuration is registered.

When a SAM card is removed communications is halted, the green Link-OK LEDs will be extinguished and the red No Comms LEDs will be illuminated at both ends of the link.

The red Fault LED will also flash twice every 8 seconds to indicate that the SAM card is missing. If the SAM card is re-inserted the link will be re-established.

For a link to be established between two WRS-485 modules the SAM cards in each must be a 'matching' pair. This can be tested by placing non-matching SAM cards in each WRS-485.