



## VAX-CR-35L AND VAX-CSR-6.4 MOBILE-READY CONTACTLESS SMARTCARD READERS

This Quick Start Guide is intended for experienced installing technicians. It is a basic reference to ensure all connections are properly made. It is for models VAX-CR-35L and VAX-CSR-6.4. For additional information please refer to Vicon's website [vicon-security.com](http://vicon-security.com).

### 1.0 Introduction

A key component of a physical security electronic access control system, a mobile-ready reader combining BLE and contactless smartcard technologies is based on RFID technology. In operation it is capable of reading data stored on a contactless smartcard credential via high frequency—or reading data from mobile credential stored in a smartphone's wallet app via BLE technology—and without physical contact, and then passing the data obtained to the physical access control system. Access control systems typically manage and record the movement of individuals through a protected area, such as a locked door.

### 2.0 Mounting Provisions

Each reader may be installed either indoors or outdoors. Mounting options shown in the table below. Use supplied #6 mounting screws, or equivalent security screws, for installation.

Model	Mullion Mount	Single-Gang Wall Mount*
VAX-CR-35L	•	•
VAX-CSR-6.4		•

\*Plastic or metal.

### 3.0 Reader Wiring

Wiegand		Magstripe	
Conductor	Function	Conductor	Function
Red	DC (8-14 VDC)	Red	DC (8-14 VDC)
Black	Ground	Black	Ground
Green	Data 0	Green	Clock
White	Data 1	White	Data
Brown	Red LED <sup>a</sup>	Brown	Red LED
Orange	Green LED <sup>b</sup>	Orange	Green LED
Yellow	Not Used	Yellow	Not Used
Blue	Beeper	Blue	Beeper
Violet	Read Mode <sup>c</sup>	Violet	Read Mode
Drain	Shield Ground	Drain	Shield Ground

### 4.0 Cable Requirements

24 AWG minimum, multi-conductor stranded with an overall foil shield, for example Belden 9535 or similar, supporting the five conductors comprising the physical layer of the Wiegand interface (power, ground, data 0, data 1, and/or beeper and LED). Alternatively, Belden 9539 or similar, for all reader functions. Contact your access control system manufacturer for their specific requirements. Per the SIA's Wiegand specification, maximum cable length is 500 feet (152 m).

### 5.0 Output Formats

- Wiegand (industry standard 26-bit Wiegand and custom Wiegand formats)
- Magnetic Stripe (ABA Track II, clock and data, with card present)

### 6.0 Grounding

Shield (drain) continuity must run from the reader to the access panel. Shield (drain) and reader ground must be tied together at the access panel and connect to an earth ground at one point.

### 7.0 Power

Reader may be powered by the access panel. A linear power supply is recommended for best operation.

### 8.0 Voltage and Current

Voltage: 8 to 14 VDC

Current Draw: 60mA typical, 250mA peak

### 9.0 Read Mode

For sector data reads, do not connect the Violet conductor (leave it high). For CSN reads, pull the Violet conductor low (connect the Violet conductor to ground).

### 10.0 Connection

Connection must be done in accordance with NFPA 70. Do not connect to a receptacle controlled by a switch. Connect to a power limited DC voltage source.

### 11.0 Troubleshooting

1. When the reader is first powered on it will beep 4-times, and the LED will shine red.
2. Presenting a supported access credential will result in the reader beeping and the LED flashing once.
3. Mobile operation is optimized for smartphones supporting BLE (Bluetooth LE) version 4.2 or newer. Further, for the downloading of mobile access credentials, a stable, high-quality internet connection is recommended.

NOTE: The access panel controls LED functionality, such as switching the LED to green.

#### WIRING NOTES:

**\*Single Line LED:** This is the standard operating mode and does not make use of the Orange conductor. The LED is Red when the reader is idle and flashes when a card is presented. The LED turns Green when the Brown Conductor is pulled low by the access control panel.

**<sup>b</sup>Dual Line LED:** This mode makes use of both the Brown and Orange conductors. The Brown conductor controls the Red LED and the Orange conductor controls the Green LED. LED states are determined by the access control system option and capability.

**<sup>c</sup>Read Mode:** In regards to contactless smartcard credentials, the reader will only read and output the credential's Card Serial Number (CSN) when the Violet conductor is pulled low (connected to ground). Otherwise, the reader will only read and output the credential's programmed Sector data.

Unused conductors should be trimmed, isolated and taped back to prevent unintended current flows. Apply positive voltage only to the Red DC Conductor.

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If the reader does not recognize the mobile credential or card or tag (no beep, no LED flash) or exhibits short read range, please see the table below for possible causes and solutions.

Possible Cause	Corrective Action
Incorrect cabling	Verify gauge, connections and cabling length
Not enough power	12 VDC recommended
Incorrect credential used	Verify if credential technology is supported
Reader/access panel not properly grounded	Earth ground needed—verify shield and reader ground are tied at access panel and connect to ground at one point
Supply generating interference	Linear power supply recommended, verify switching power supply before use

Should any of the corrective actions mentioned above not improve performance, disconnect the reader from the access panel and power it with a separate power supply or 9 VDC battery and re-test card functionality. By powering the readers separately, most variables that may lead to reduced performance can be eliminated. Should the problem persist, please contact Vicon Technical Support.

**Operating Temperature:** -31° F to +150° F (-35° C to +66° C)

**Operating Humidity:** 0% to 90% Relative Humidity

**IP Rating:** IP67-rated for outdoor use

**Access Control Performance Levels Conforming to UL STD 294:**

Model	Destructive Attack	Line Security	Endurance	Standby Power
VAX-CR-35L	Level I	Level I	Level IV	Level I
VAX-CSR-6.4	Level II	Level I	Level IV	Level I

**Grade Classification Certified to CAN/ULC STD 60839-11-1:**

Risk Level	Application	Skill/Knowledge of Attackers	Typical Examples
Grade 2	Grade 2	Grade 2	Grade 2

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Many Vicon Readers carry the following certifications:



**FCC Compliance Statement:** This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Caution:** Changes or modifications not expressly approved by Vicon Industries could void the user's authority to operate the equipment.

Product can be used without license conditions or restrictions in all European Union countries, including Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden, United Kingdom, as well as other non-EU countries, including Iceland, Norway, and Switzerland.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference. (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) L'appareil ne doit pas produire de brouillage; (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**For proper PIN security with keypad readers, please review [PIN Best Practices Reference Document](#).**

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