Blackboard transact™

Blackboard Wall Reader (WR5000)

Installation Guide

Table 1: Revision History

Bb Document Part Number	Rev.	Description	Date
403-003-000	A	ECO10418. Initial Release.	PENDING

CONTENTS

1 BLACKBOARD (WR5000) READER INSTALLATION GUIDE

2 Federal Communications Commission (FCC) statement

4 Hardware Kit and Parts List

5 Reader Installation Overview

5 Reader Wiring

5 Door Reader RS-485 Interface

6 Door Reader Wiegand Interface

7 Attendance Reader

8 Reader Mounting

10 Specifications

BLACKBOARD (WR5000) READER INSTALLATION GUIDE

The Blackboard Wall Reader, Model WR5000, is a device for reading Blackboard contactless cards and other credentials that use Near Field Communications (NFC) technology. The reader supports two modes of operation; a door reader that interfaces to either the Blackboard Security Access System or third-party control panels using a Wiegand interface. A second mode of operation is as an attendance reader.

Features:

- 4.0” LCD (480 x 800) with capacitive touch panel
- Configuration via touchscreen/display
- NFC technology
- RS-485 Serial Interface
- Bluetooth Low Energy (BLE)
- Host communications via 10/100 Base-T Ethernet (IP) or 802.11 b/g/n wireless
- Encrypted and authenticated IP communications

Figure 1-1 Blackboard WR500 Reader

FEDERAL COMMUNICATIONS COMMISSION (FCC) 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.
2.This device must accept any interference received, including interference that may cause undesired operation.

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 it is not installed and used in accordance with the instruction manual, it 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.

Modifications: Any modifications made to this device that are not approved by Blackboard Inc. may void the authority granted to the user by the FCC to operate this equipment.

IMPORTANT NOTE: This equipment complies with the FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Contains:

FCC ID: 2AFDI-ITCOQ410S	Intrinsyc Open-Q 410 System-On-Module
FCC ID: WAP2005	Cypress Semiconductor Bluetooth Low-Energy Module (CYBLE-222014-01)

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Contains:

IC: 9049A-ITCOQ410S	Intrinsyc Open-Q 410 System-On-Module
IC: 7922A-2005	Cypress Semiconductor Bluetooth Low-Energy Module (CYBLE-222014-01)

Contient des IC: 9049A-ITCOQ410S and 7922A-2005

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Radiation Exposure Statement

This equipment complies with radiation exposure limits set forth for uncontrolled environment. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Déclaration d'exposition aux radiations

Cet appareil se conforme aux limites d'exposition aux rayonnements pour un environnement non contrôlé. L'antenne (s) qui est utilisé pour cet émetteur doit être installé pour produire une distance de séparation d'au moins 20 cm de toutes personnes et ne doit pas être installé à proximité ou utilisé en conjonction avec une autre antenne ou émetteur.

HARDWARE KIT AND PARTS LIST

A hardware kit is included with the WR5000. These components are used for wire termination and installation to a single gang-box.

Figure 1-2 Hardware Kit

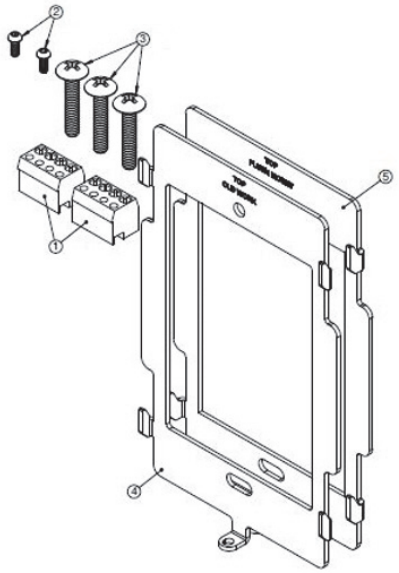


Table 1-1: Hardware Parts List

Item	Description	Use	Qty
1	1 x 4m 3,5mm Terminal Block	Attach wires to reader.	2
2	M2 x 5 Button-head Socket Cap Screw	Secure Reader to mounting plate.	2
3	6-32 x ¾" FH Machine Screw	Secure Mounting plate to gang-box.	3
4	Mounting bracket - Old Work	Old Work - gang-box tabs on wall surface.	1
5	Mounting bracket - Flush Mount	New Work - gang-box is flush with wall.	1

READER INSTALLATION OVERVIEW

When choosing a location to install the WR5000 reader, consider the following:

- Proximity to entry point
- Visibility and Access to Users
- ADA Requirements
- Protection of the reader from environmental elements
- Cable distance/path:

  1200 ft. maximum for RS-485 to Blackboard SA3032

  500 ft. maximum for Wiegand interface

  500 ft. maximum for Wiegand interface

  328 ft. maximum for Cat-5e cable

Reader Wiring

Based on the application of the reader, the wiring options are as follows:

- **Door Reader RS-485 Interface** (page 1-5)
- **Door Reader Wiegand Interface** (page 1-6)
- **Attendance Reader** (page 1-7)

The hardware kit includes two (1 x 4) terminal blocks. These terminal blocks provide electrical connections to signals on the pin headers.

Two WR5000 readers can be connected to the Blackboard Access SA3032 to support ingress and egress configurations. The administrator must login to each reader and set the address. Verify that the readers do not have the same assigned address (0 or 1).

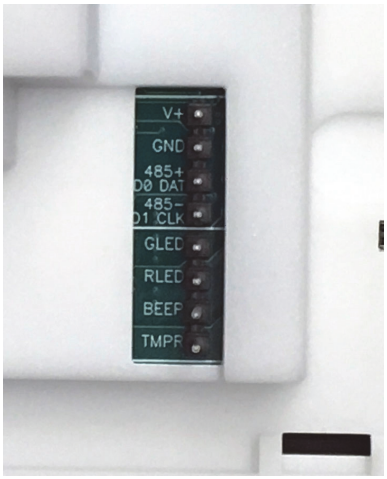
***Note**: To maintain UL compliance, install only 1 wire in each terminal block opening. If necessary, use an external splice when more than one wire is required.*

Install in accordance with the National Electrical Code (NEC), ANSI/NFPA 70, and local codes.

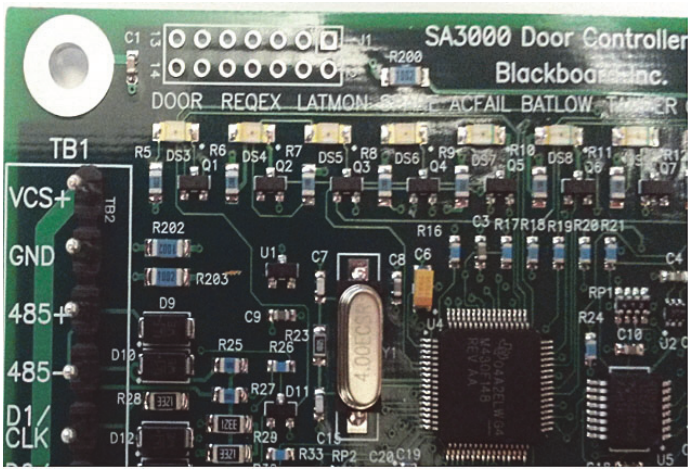
Door Reader RS-485 Interface

When using the RS-485 Interface option, only one terminal block is required. The connection points are shown in **Table 1-2**. The TB1 designation is for the top four pins shown in **Figure 1-3**.

Figure 1-3 Terminal Blocks



WR5000 Terminal Block



Door Controller Terminal Block

Table 1-2: RS-485 Connection Points

WR5000 Terminal Block	SA3032 Door Controller	Signal Name	Description
TB1-1	TB1-1	V+	Power Input +
TB1-2	TB1-2	GND	Power Return -
TB1-3	TB1-3	485+	Serial Interface +
TB1-4	TB1-4	485-	Serial Interface -

The reader must be configured by the administrator to operate in RS-485 mode. In addition to the wiring shown above, the reader can also be connected to a network using the RJ-45 connector. This provides a means of getting software updates for the Android OS.

Door Reader Wiegand Interface

When connecting the reader to a Third-party Controller using a Wiegand interface, both terminal blocks are required. Cable wiring should be a minimum of 24 AWG. If a shielded cable shield is used, ground the shield at the panel only. Grounding at both ends can cause ground loops which can be disruptive.

For Wiegand Connection Points, see: Table 1-3:.

Table 1-3: Wiegand Connection Points

WR5000 Terminal Block	Signal Name	Third-Party Controller connections
TB1-1	V+	Connect to regulated Power Supply (+6V to +24V)
TB1-2	GND	Connect to Ground
TB1-3	D0/DAT	Connect to Wiegand D0 input
TB1-4	D1/CLK	Connect to Wiegand D1 input
TB2-1	GLED	Connect to Green LED output
TB2-2	RLED	Connect to Red LED output
TB2-3	BEEPER	Connect to Beeper output
TB2-4	TAMPER	Connect to Tamper Input

The reader must be configured by the administrator to operate in Wiegand mode. In addition to the wiring shown above, the reader can also be connected to a network using the RJ-45 connector. This provides a means of getting software updates for the Android OS.

Attendance Reader

When using the WR5000 as an attendance reader, the device must be connected to a network.

The WR5000 can be powered using an external power supply, or a Power Over Ethernet (POE) switch. If using an external power supply, the power supply must have a regulated output of +12 Volts DC. If using POE, a CAT-5 cable must be connected between the POE switch and the RJ-45 connector on the WR5000 (cable length must not exceed 100 meters).

***WARNING**: When using a POE switch to power the WR5000, both the POE switch and WR5000 must be installed within the same building or structure.*

When using an external supply, wire the reader as shown in **Table 1-4:**

Table 1-4: Power Supply Wiring

WR5000 Terminal Block	Signal Name	External Power supply
TB1-1	V+	Connect to regulated Power Supply (+6V to +24V)
TB1-2	GND	Connect to Ground

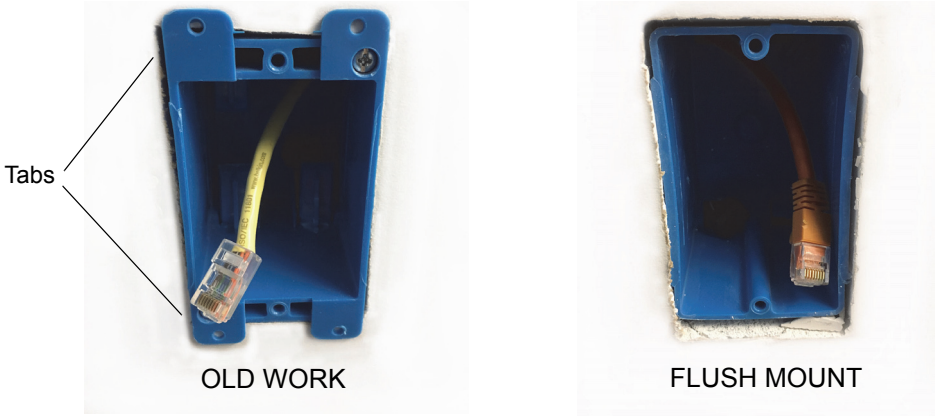
READER MOUNTING

The WR5000 is designed to mount to a single gang-box. Each reader ships with a hardware kit that includes screws and two mounting brackets. The mounting brackets are similar except for the height of the four ramped hooks which position the reader against the wall. The brackets are marked to show orientation and application.

To mount the reader

1 Use the bracket marked OLD WORK when the gang-box has tabs on the outside of the wall. Use the bracket marked FLUSH MOUNT when the gang-box is recessed or flush with wall (see: **Figure 1-4**).

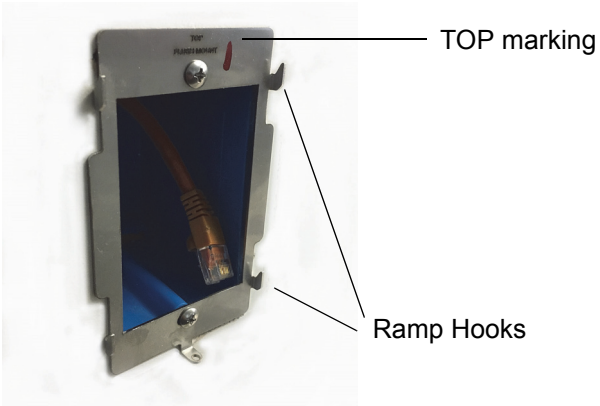
Figure 1-4 Flush Mount & Old Work



2 Choose the correct bracket for your application, and then install the bracket onto the gang-box using the two truss-head screws provided in the hardware kit.

*Be sure to orientate the bracket with the TOP marking as shown in **Figure 1-5**.*

Figure 1-5 Flush Mount Installation With Bracket



***Note**: The Flush Mount installation uses the mounting bracket with the taller ramp hooks.*

3 Connect wiring to the reader.

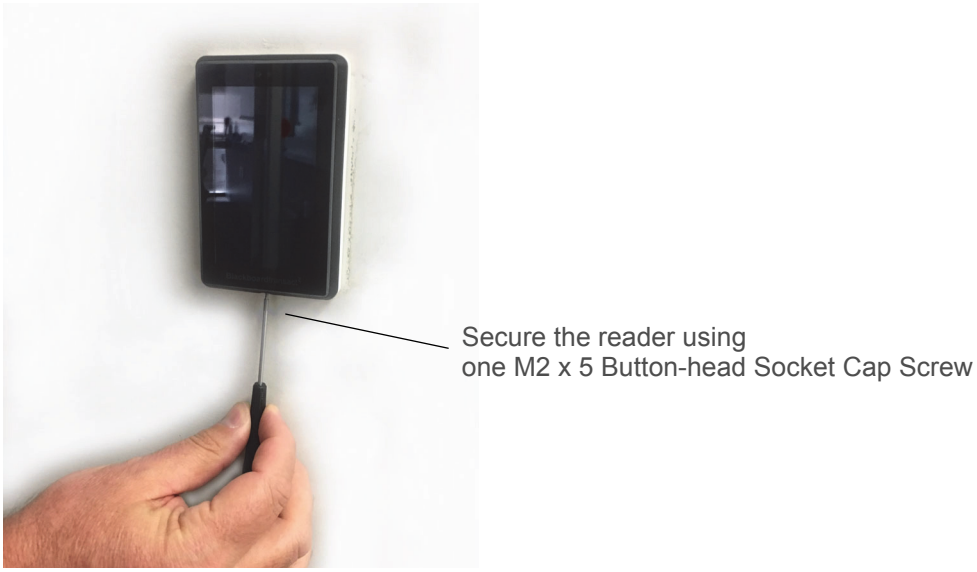
4 Place the reader on the mounting bracket by gently placing it over the ramp hooks, and then moving it downward until it stops.

Orientate the reader so that the Blackboard logo is at the bottom.

5 Using a Hex Driver, install one M2 x 5 Button-head Socket Cap Screw to secure the reader to the mounting bracket.

***Note**: Install the Socket Cap Screw from the bottom of the reader as shown in **Figure 1-6**.*

Figure 1-6 Securing Reader to the Bracket



6 Verify that the reader is securely in place.

SPECIFICATIONS

Physical Size	2.95” W x 4.55” H x 1.40”D (extends 0.6” from wall surface when mounted)
Input Power	6 to 24 VDC (3.6 W max.)
Operating Temperature	0 to +50 Celsius (Indoor Use Only)
Storage Temperature	-20 to +70 Celsius
Inputs (See Note 1)	0 to 5.5V
Wiegand Input Signals	RLED, GLED, BEEPER • 0 - 5.5V maximum • Active when < 2.5V (driver must be able to sink at least 1mA)
Wiegand Output Signals	D0, D1, TAMPER • Open-drain outputs, max sink current 100 mA • Internal 10K pullup to +5V • TAMPER output polarity is configurable