Johnson Controls

S300

Series

S300-DIN-RDR2SA

Hardware Installation Manual

August, 2007
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www.johnsoncontrols.com

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Federal Communications Commissions Notice

This equipment, S300-DIN-RDR2S-A, has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

Canadian Notice

This Class B digital apparatus, S300-DIN-RDR2S-A, complies with Canadian ICES-003.

Cet appareil numerique de la classe B, S300-DIN-RDR2S-A, est conforme à la norme NMB-003 du Canada.

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CE

Declaration of Conformity

This product complies with the requirements of the European Council Electromagnetic Compatibility directive 89/336/EEC and amending Directive 92/31/EEC, the CE Marking Directive 93/68/EEC and the Low Voltage Directive 73/23/EEC.

This equipment must not be modified for any reason and it must be installed as stated in the Manufacturer’s instruction.

If this shipment (or any part thereof) is supplied as second-hand equipment, equipment for sale outside the European Economic Area or as spare parts for either a single unit or system, it is not covered by the Directives.

HARDWARE INSTALLATION

INTRODUCTION

The S300-DIN-RDR2SA module provides interface control for access and security devices associated with one or two doors.

NOTE

Throughout this manual the S300-DIN-RDR2SA module is also referred to as the RDR2S-A.

The key features of the RDR2S-A include:

- Wide range nominal voltage for power source (+12 to 24VDC, 16 to 24VAC)
- Support for RS-485 bus communications at 9600 or 19200 (Auto baud rate detection 9600/19200 baud)
- Two-door access control input/output interface, each door's interface consisting of:
  - Supervised door monitor switch input, normally open or normally closed, based on wired configuration

- Supervised auxiliary access or exit request switch input, normally open
- Supervised tamper and spare inputs
- Wiegand Data0 and Data1 interface
- Door strike relay, SPDT (Single Pole Double Throw)
- Alarm shunt relay, SPDT
- Red lamp driver and green lamp driver (open collectors)
- +12VDC 250mA reader power supply

Also, the following inputs are shared by *both* interfaces (one per unit):

- Calibration resistor input
- Supervised tamper and power fail inputs

APPLICATION

The S300-DIN-RDR2SA module is an interface for the CK722, CK721, and CK720/CK705 controllers using standard RS-485 communications. It supports up to two doors per unit.

The RDR2S-A provides the ability to configure supervised 4-state inputs and unsupervised 2-state inputs. When used with CK722 and interfacing to a single door, the unused points can be configured as general purpose input/output (I/O) points, possibly eliminating the need to purchase additional I/O modules for certain installations.

The RDR2S-A provides power for the card reader hardware. It does not provide power for door locking hardware.

INSTALLATION

Unpacking the Equipment

Carefully inspect the S300-DIN-RDR2SA shipping containers as soon as you receive them (with the delivery agent present). Some shipping companies want to have an agent present when a damaged container is opened. If a container is damaged, open it immediately, inspect the contents, and have the agent make note on the shipping document. Check the purchase order against the packing slips to ensure the order is complete. If the contents of a container are damaged in any way, notify the carrier and your Johnson Controls representative immediately. Report any discrepancies to your Johnson Controls representative. Save the packing materials for possible return shipments.

Package Contents

- S300-DIN-RDR2SA module
- Connectors set
- This manual

Tools Needed

Small, straight-blade screwdriver for securing wires in the terminal blocks.

Acceptable Switch/Relay Contact Inputs

Use only fine gold, gold flash, or reed switch/relay contacts. Do NOT use silver, coin silver, or nickel contacts, as these may oxidize and degrade over time, thereby causing the circuit to fail.

MOUNTING

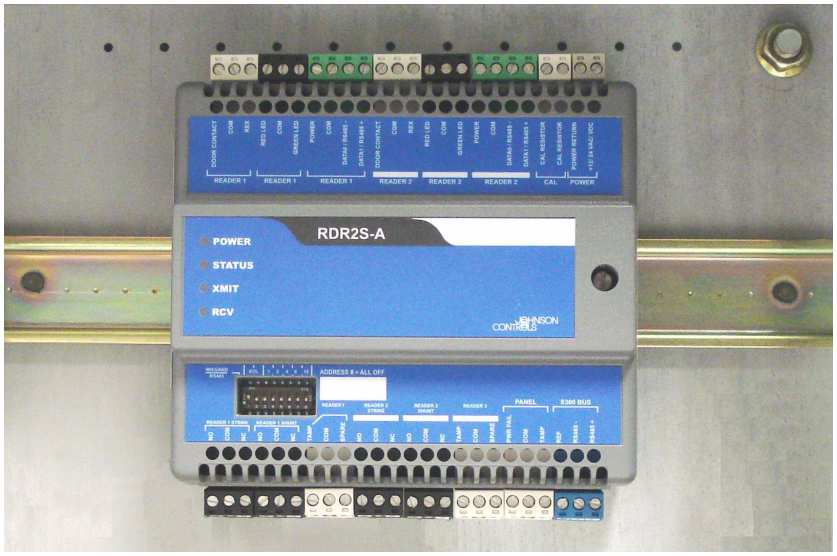
The S300-DIN-RDR2SA can be mounted on a flat surface, DIN rail, or in a Johnson Controls' approved enclosure (for example: S300-DIN).

For information on mounting the S300-DIN-RDR2SA in an enclosure, refer to the manual provided with the enclosure.

DIN Rail Mounting

➤ **To mount an RDR2S-A module on a DIN rail:**

1. Fully extend the white clips located on the bottom of the module.
2. Hook the module on top of the rail.
3. Push in the clips.



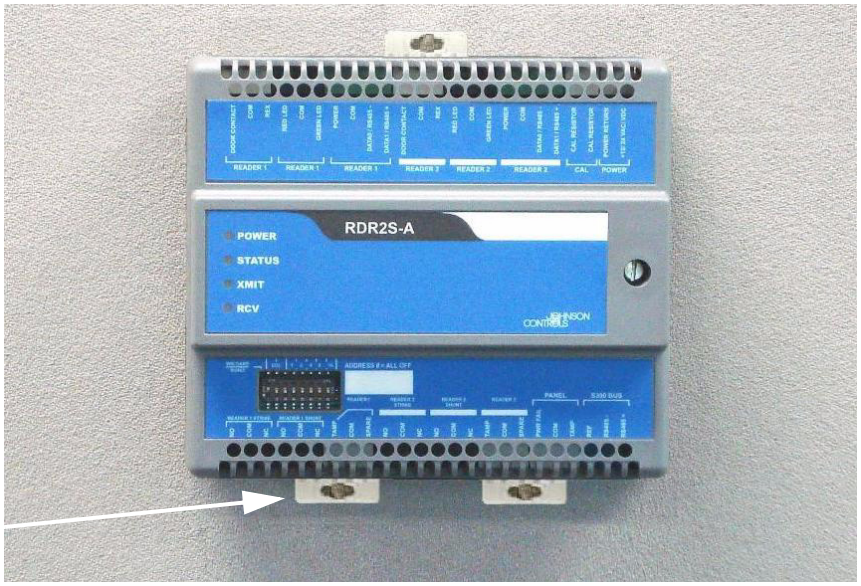
➤ **To remove a module from the DIN rail:**

1. Pull down the clips at the bottom of the module.
2. Pull the bottom of the module out and lift it up.

Flat Surface Mounting

➤ **To mount an RDR2S-A module on a flat surface:**

1. Make sure no connectors obstruct access to the clips on the bottom of the module. If necessary, remove the connectors.
2. Fully extend the bottom clips.
3. Mount the module to the surface with mounting screws.
4. Replace the connectors, if previously removed.



Fully extended clips (connectors are removed)

Power Source

See the following table for power requirements.

Parameter	Value
Input voltage	+12 to 24VDC, 16 o 24VAC
Input current	1A at 24V, 2A at 12V
Power	24W

Line Voltage Information

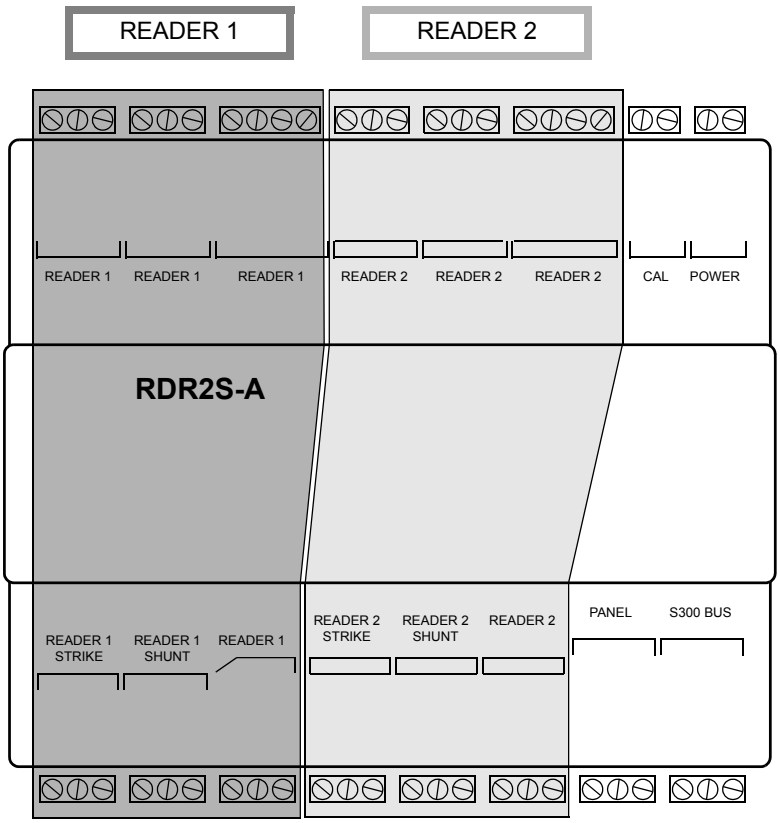
If the facility is located in an area where power lines are subject to frequent lightning strikes, verify with the electric company that the building transformer is equipped with surge protectors. These, as well as a "crowbar" type of protection, can be installed at the main service entrance if the building transformer is not equipped with lightning protection.

While lightning is one cause of power line transients, others can be internal or external to the building environment. The general application of transient surge suppression is low-cost insurance to ensure long life of the equipment being installed.

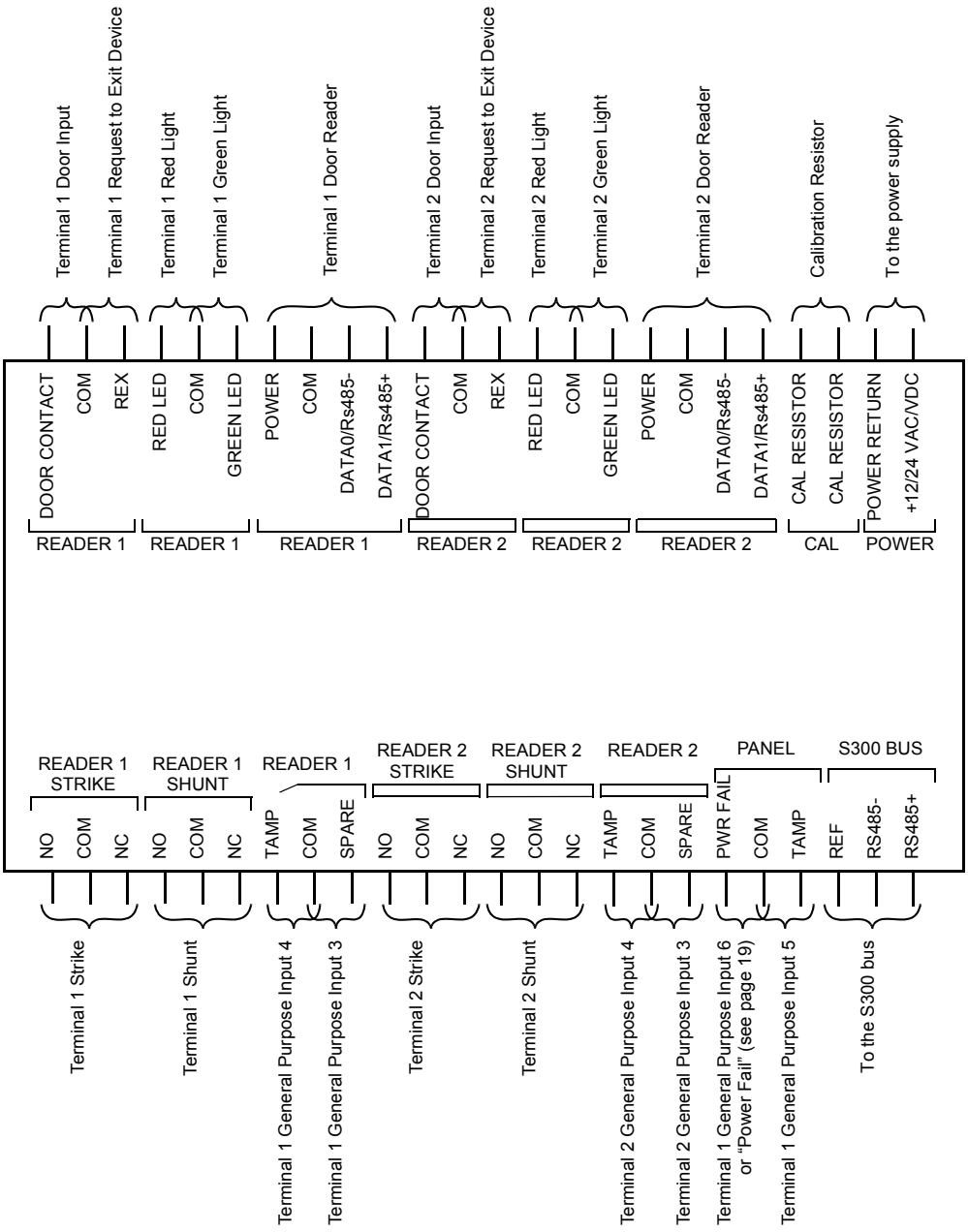
DESCRIPTION OF SIGNALS

All interface signals are connected via plug-in connectors. For a description of the RDR2S-A I/O interface signals, see "Input Point Signals" on page 18.

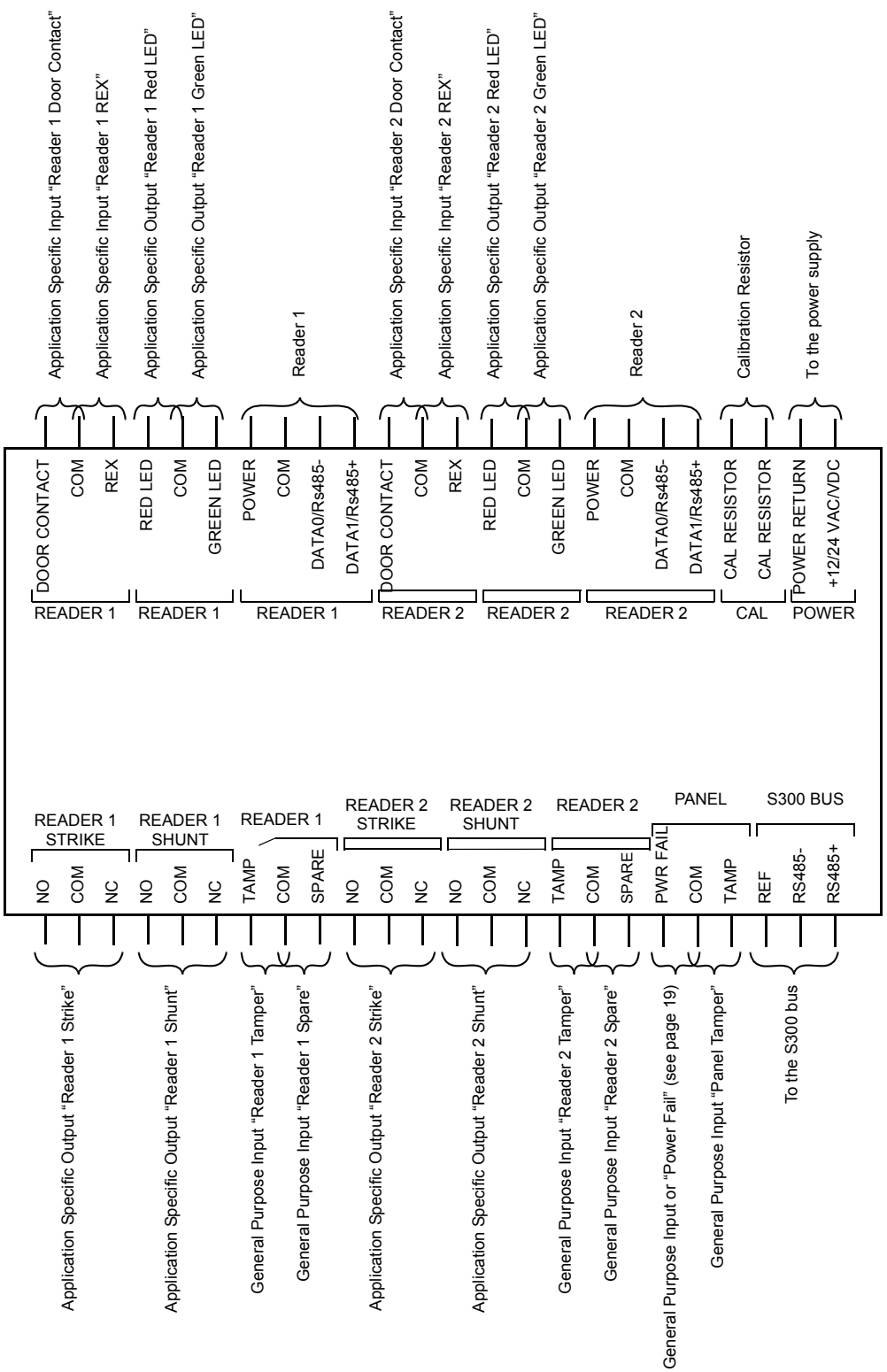
The figure below is an outline of the position of terminal blocks, followed by detailed drawings.



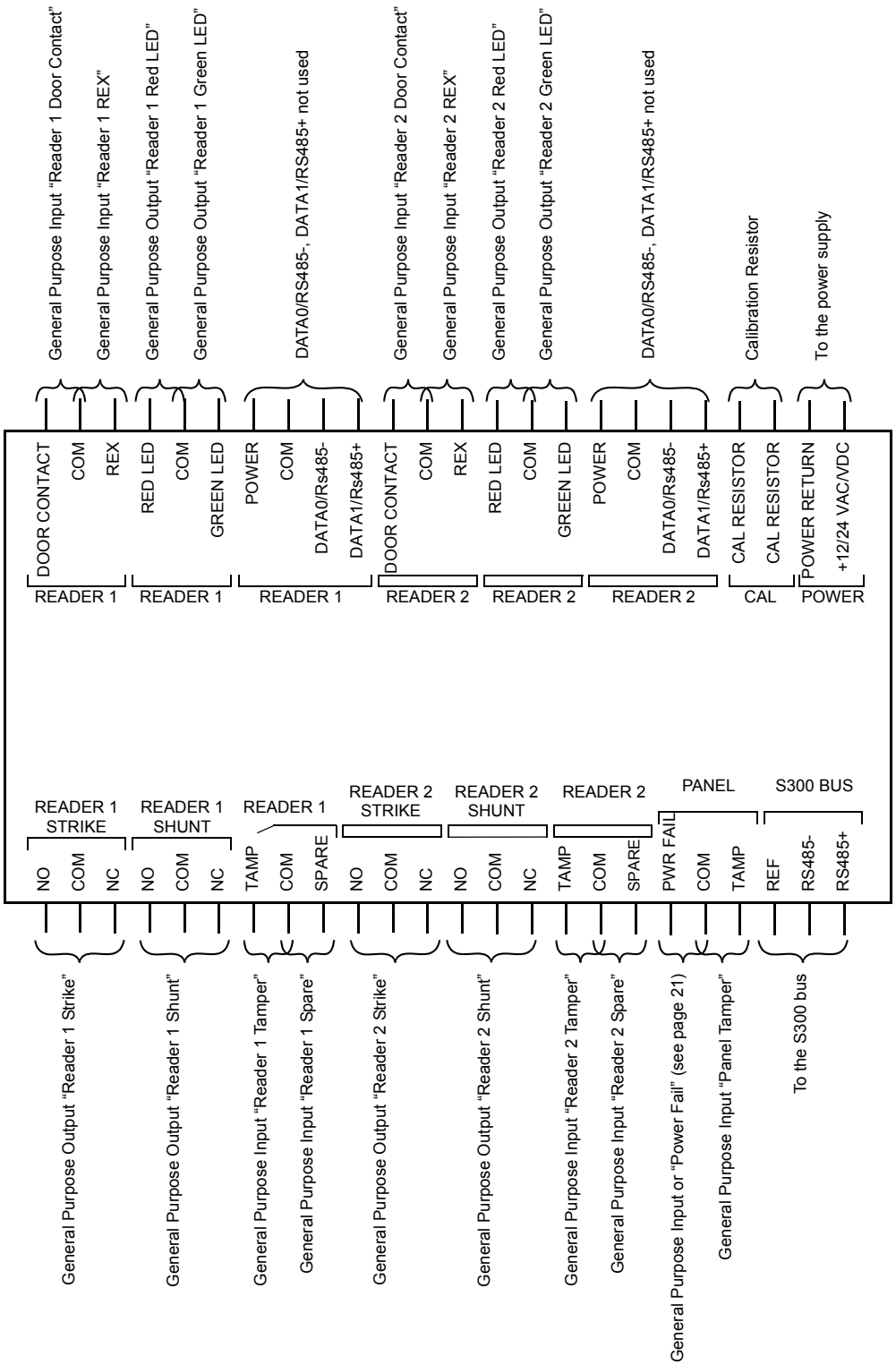
CK721/CK720/CK705 Controllers:
Reader Mode Enabled



CK722 Controllers:
Both Reader Terminal Objects Defined



CK722 Controllers:
No Reader Terminal Objects Defined



Wiegand Input

Description of Signals – DATA0/Rs485- and DATA1/Rs485+ from each reader, complying with the Wiegand interface specification. These signals are pulled up to 5VDC by internal 3.92 K Ohm resistors when the Wiegand/RS485 switch is on. See page 15 for information on Wiegand switch setting.

Reference – These signals are referenced to logic ground (COM).

Protection – Each signal has a 6 V transient voltage suppressor between it and COM.

Input Points

Description of Signals – The following are internally pulled up inputs:

- Reader 1 Door Contact
- Reader 1 REX
- Reader 1 Tamper
- Reader 1 Spare
- Panel Power Fail
- Panel Tamper
- Reader 2 Door Contact
- Reader 2 REX
- Reader 2 Tamper
- Reader 2 Spare
- Calibration Resistor

The allowable voltage range for these signals is 0-12VDC.

Reference – These signals are referenced to their associated COM input.

Protection – Each signal is protected with series resistors and dual clamping diodes.

External Circuits – Two external resistors and switch circuit connected between an input point and COM is required for 4-state operation. An external switch connected between an input point and COM is required for 2-state operation. For wiring details see “Wiring Input Devices” on page 13.

Open Collector Output Points

Description of Signals – The following are open collector outputs:

- Reader 1 Red LED
- Reader 1 Green LED
- Reader 2 Red LED
- Reader 2 Green LED

The allowable voltage range for these signals is 0-24VDC, limited to 50mA.

These open collector outputs can be damaged with the use of alternating current (AC) potentials as low as 1VAC. The LED outputs can only be connected to direct current (DC) loads up to 24VDC.

Reference – These signals are referenced to logic ground (COM).

Protection – Each signal has a 30V transient voltage suppressor between it and system ground.

Relay Output Points

Description of Signals – NC, NO, and COM are the three connections to a single pole, double throw relay.

The following are the relay outputs:

- Reader 1 Strike
- Reader 1 Shunt
- Reader 2 Strike
- Reader 2 Shunt

Reference – The relay is a dry contact relay rated at 1A at 24VDC/VAC, 25VA maximum.

Reader Power

Description of Signals – 250mA at 12VDC is provided for each reader.

Protection – There is a 750mA PTC (Positive Temperature Coefficient) re-settable fuse.

Cable Requirements

Description	Recommended Cable Type	Maximum Segment Length
RDR2S-A to Power Supply[1]	Listed, 18 AWG, hook-up wire	Wire should fit within the enclosure.
RDR2S-A to Controller	Listed, 18 AWG, 1 twisted pair	4000 feet (1219 m) maximum. All RDR2S-A modules connected to a single controller must be within 4000 feet of the controller.
RDR2S-A to RDR2S	Listed, 18 AWG, 1 twisted pair	4000 feet (1219 m) maximum
Door Contact	Belden 8442, 1 twisted, unshielded pair, 22 AWG	500 ft. (152 m)
Door Strike and Shunt	Belden 9740, 1 twisted, unshielded pair, 18 AWG	Depends on power requirements of the door strike. Voltage to the strike must not be reduced more than 10% over the 18 AWG wire, measured when energized.
Request to Exit	Belden 8442, 1 twisted, unshielded pair, 22 AWG	500 feet (152 m)
Reader Power[2]	Belden 9740, 1 twisted, unshielded pair, 18 AWG	Refer to reader manufacturer's specification for power requirements.
Reader Data0/Data1[2]	Belden 9744, 2 twisted, unshielded pair, 22 AWG	500 ft. (152 m). Refer to reader manufacturer's specification for data requirements.
General Purpose Input	Belden 8442, 1 twisted, unshielded pair, 22 AWG to each detector	500 feet (152 m)
General Purpose Output	Belden 9740, 1 twisted, unshielded pair, 18 AWG to each relay	Depends on load.

[1] When wiring more than one RDR2S-A, use the same type of hook-up wire and communications wire to connect subsequent modules.

[2] Refer to reader manufacturer's recommendations when using UL-listed readers. In the absence of other recommendations, consider these cable specifications taking into account the number of conductors that will actually be needed for installation.

Cable Routing

The cables should run in grounded conduit or at least two feet from AC power, fluorescent lights, or other high energy sources.

All data cables should be physically separated from power lines. If conduit is used, do not run data cables in the same conduit as power cables or certain door strike cables, e.g. strike voltage greater that 42V or Magnetic door locks without EMI suppression.

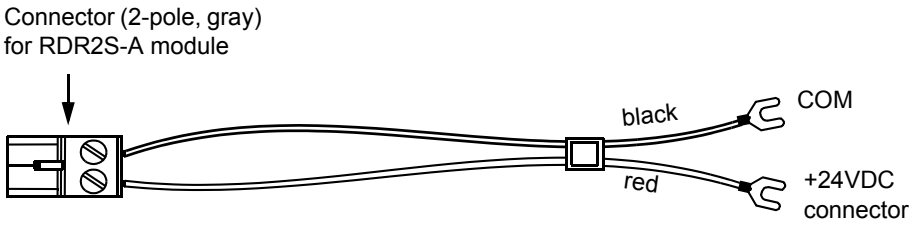
All cables must conform with the following regulations:

- National Electrical Code
- NFPA 70
- Local electrical codes
- Canadian Electric Code C22.1 (installations in Canada)
- BSI Standard BS7671, latest edition (installations in Great Britain)

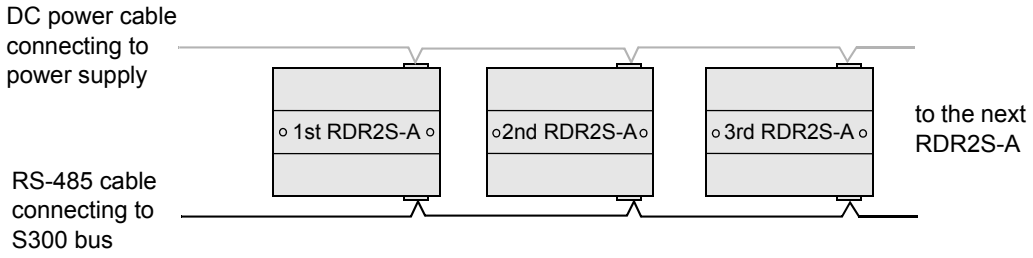
Cabling should be made using good wiring practices and should be long enough to allow service loops at their terminations in the enclosure.

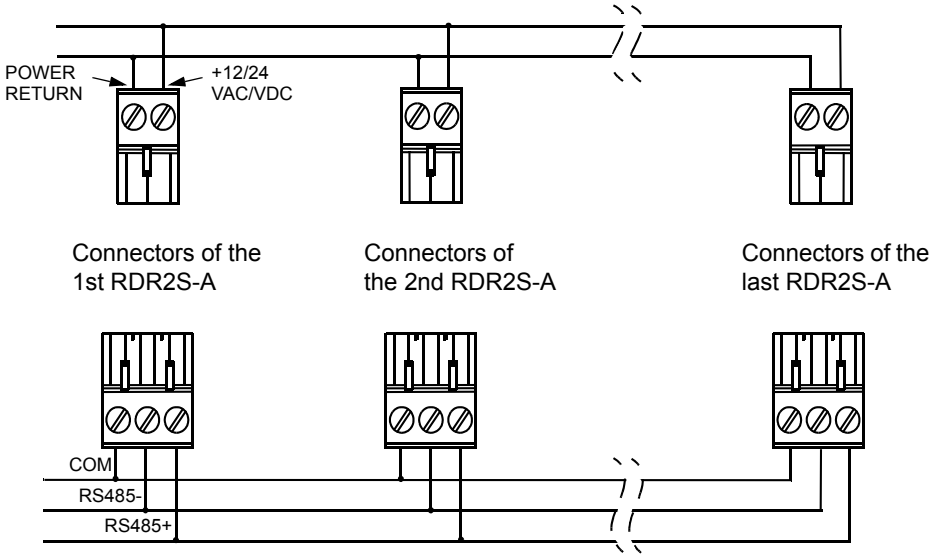
Power Supply

For power wiring with either the large or small enclosure, use the cable assembly shown in the following figure. For more information refer to the manual provided with the enclosure.



When connecting multiple RDR2S-A modules, wire the modules in parallel following the “daisy chain” pattern as shown in the following figures. To construct the power wiring, use listed 18 AWG wires.



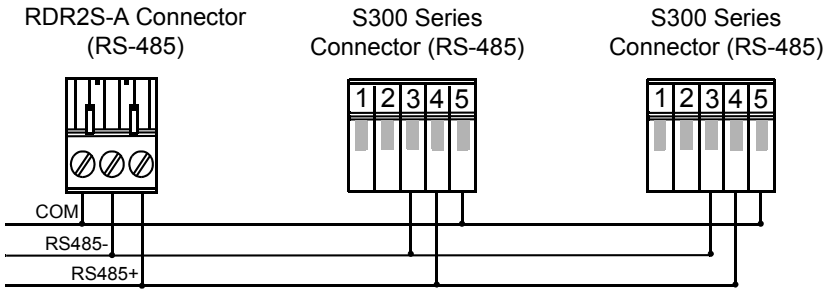


CAUTION

Do not connect the power cable to the RDR2S-A until all wiring is complete.

Connecting the COM (Ground) Wire

When daisy-chain connecting an RDR2S-A, wire the devices according to the following illustration:



Wiring Input Devices

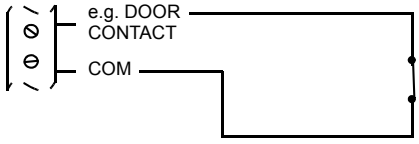
Tamper Switch Wiring

The tamper switch connects to a general purpose input point. To be operational, the tamper switch must be wired to one of the unused input points on any RDR2S-A in the enclosure, and programmed in the controller. Use the PANEL/TAMP connector for this function.

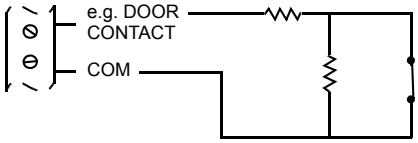
General Input Wiring

The inputs can be used as either 2-state or 4-state inputs. You should calibrate the inputs depending on the needs of your site.

2-State Inputs Wiring

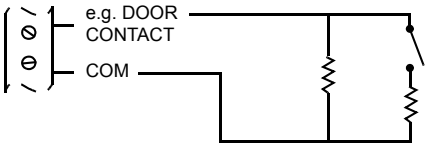


4-State Inputs Wiring: N/C Switch



Note: The 4-state wiring requires two resistors of the same value. The resistors can be 150-2000 Ohms, 1%, 1/4W. The recommended resistor is **1200 Ohms**.

4-State Inputs Wiring: N/O Switch



Note: The 4-state wiring requires two resistors of the same value. The resistors can be 150-2000 Ohms, 1%, 1/4W. The recommended resistor is **1200 Ohms**.

Ground

Every metal DIN enclosure in a Johnson Controls installation must have its chassis bonded to a verified electrical ground (earth).

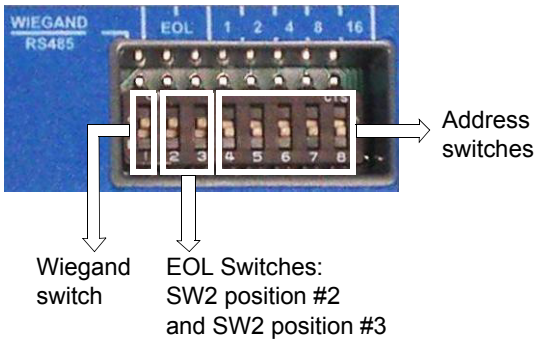
CAUTION

Conduit ground, cold water pipes, unbrazed joints or dissimilar metals are unacceptable in the path of either building or supplemental ground. Where grounding is required, connect only to the proven building electrical system ground (earth).

SETUP AND ADJUSTMENTS

RS485 Connection

The following figure shows a portion of the top cover of the RDR2S-A module with adjustable Wiegand, EOL, and address switches.



Note:
The Wiegand and EOL switches are ON (up) by factory default.
The address switches are OFF (down) by factory default.

Wiegand Switch

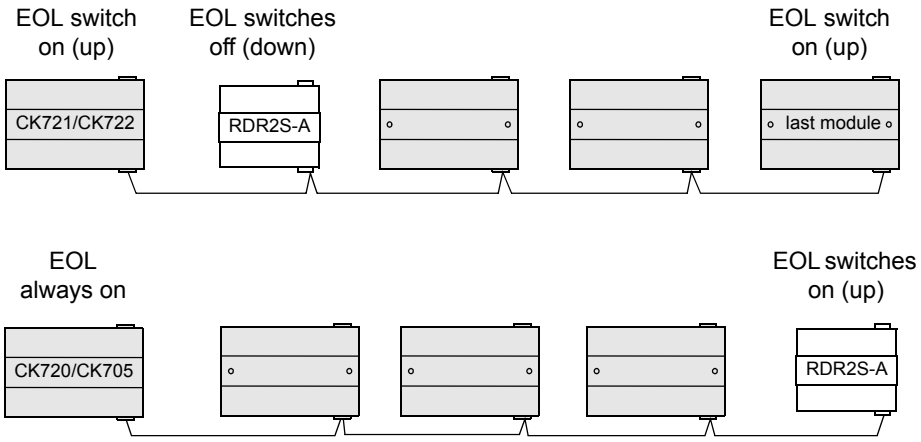
Wiegand Data0 and Data1 interface is enabled when the Wiegand/RS485 switch is on (up).

Setting the End-of-Line Switches

Network devices at either end of the RS485 network must be set as network terminated devices. This is done with the use of the End-of-Line (EOL) switches. The RDR2S-A module has two End-of-Line switches: SW2 position #2 and SW2 position #3.

Turn them both on (up) or both off (down) according to the position of the RDR2S-A module on the RS485 bus.

The RDR2S-A modules follow the same rules as other terminated devices. See the following figure to determine the appropriate EOL setting for each RDR2S-A module in your network.



Baud Rates

The RDR2S-A module supports autobaud operation between 9600 and 19200 bps and does not require any switch settings.

Address Switches

The RDR2S-A module has 5 address switches (see "Terminal Addressing for CK721/CK720/CK705 Controllers" on page 18).

- (CK721/CK720/CK705 Controllers) Positions 4 to 6: Module address
- (CK722 Controllers) Positions 4 to 8: Module address

Ensure that the address of the RDR2S-A does not conflict with the address of any other device on the RS485 bus.

NOTE

Before changing the position of the address switches, remove the 12/24 VDC supply power to the RDR2S-A and wait for the Power LED to go off. Changes will not take effect until after the power is restored.

Terminal Addressing for CK722 Controllers

Table 1: Settings of the RDR2S-A Address Switches

	DIP Switch Number							
	1	2	3	4	5	6	7	8
	Label on the Module							
Hardware Module No.	**Wiegand / RS485**	**EOL**		**1**	**2**	**4**	**8**	**16**
0	See page 9	See page 15		off	off	off	off	off
1				**ON**	off	off	off	off
2				off	**ON**	off	off	off
3				**ON**	**ON**	off	off	off
4				off	off	**ON**	off	off
5				**ON**	off	**ON**	off	off
6				off	**ON**	**ON**	off	off
7				**ON**	**ON**	**ON**	off	off
8				off	off	off	**ON**	off
9				**ON**	off	off	**ON**	off
10				off	**ON**	off	**ON**	off
11				**ON**	**ON**	off	**ON**	off
12				off	off	**ON**	**ON**	off
13				**ON**	off	**ON**	**ON**	off
14				off	**ON**	**ON**	**ON**	off
15				**ON**	**ON**	**ON**	**ON**	off
16				off	off	off	off	**ON**
17				**ON**	off	off	off	**ON**
18				off	**ON**	off	off	**ON**
19				**ON**	**ON**	off	off	**ON**
20				off	off	**ON**	off	**ON**
21				**ON**	off	**ON**	off	**ON**
22				off	**ON**	**ON**	off	**ON**
23				**ON**	**ON**	**ON**	off	**ON**
24				off	off	off	**ON**	**ON**
25				**ON**	off	off	**ON**	**ON**
26				off	**ON**	off	**ON**	**ON**
27				**ON**	**ON**	off	**ON**	**ON**
28				off	off	**ON**	**ON**	**ON**
29				**ON**	off	**ON**	**ON**	**ON**
30				off	**ON**	**ON**	**ON**	**ON**
31				**ON**	**ON**	**ON**	**ON**	**ON**

Terminal Addressing for CK721/CK720/CK705 Controllers

Table 2: Settings of the RDR2S-A Address Switches

	DIP Switch Number							
	1	2	3	4	5	6	7	8
	Label on the Module							
Terminal Number	**Wiegand / RS485**	**EOL**		**1**	**2**	**4**	**8**	**16**
1 & 2	See page 9	See page 15		off	off	off	Not used	
3 & 4				**ON**	off	off		
5 & 6				off	**ON**	off		
7 & 8				**ON**	**ON**	off		
9 & 10				off	off	**ON**		
11 & 12				**ON**	off	**ON**		
13 & 14				off	**ON**	**ON**		
15 & 16				**ON**	**ON**	**ON**		

RS-485 Isolation and Protection

Isolation and protection is provided by the following components:

- Three optical isolators (optocouplers)
- Two self-resetting switch thermistors
- Two transient voltage suppressors (TVSs)

Input Point Signals

Table 3: Input Point Signals (CK721/CK720/CK705 Controllers)

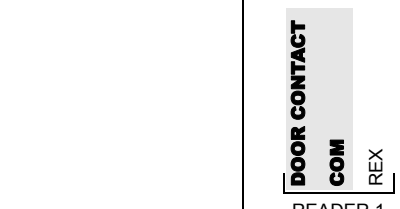
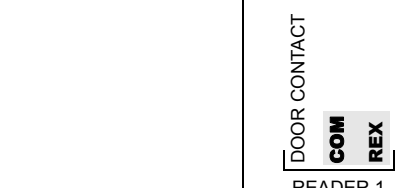
Signal Names	RDR Mode
	Reader 1 Door Input Configuration can be 2-state or 4-state. Input is associated with input point 18 (forced door) and 24 (propped door).
	Reader 1 Auxiliary Input Configuration can be 2-state or 4-state. 2-state auxiliary input is closed for the “request to exit” state. When calibrating the 4-state auxiliary input, ensure that the switch is in the inactive state (not in the “request to exit” state).

Table 3: Input Point Signals (CK721/CK720/CK705 Controllers)

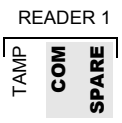
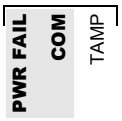
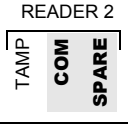
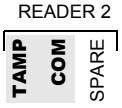
Signal Names	RDR Mode
	Input Terminal 1 Spare Input 3 Configuration can be 2-state or 4-state.
	Input Terminal 1 Spare Input 4 Configuration can be 2-state or 4-state.
	Input Terminal 1 Spare Input 5 Configuration can be 2-state or 4-state.
	Input Terminal 1 Spare Input 6 Configuration can be 2-state or 4-state.
Internal	Input Point 7 Internally derived, 2-state only input. In alarm only if the power fail point is also in alarm and power voltage has decreased more than 10% from either 12V or 24V (the system detects 12 versus 24 nominal voltage automatically). **Note:** For use only with 12VDC or 24VDC power supply. If used, “Input Terminal 1 - Spare Input 6” must be wired to a power fail monitoring circuit.
	Reader 2 Door Input Configuration can be 2-state or 4-state. Input is associated with input point 18 (forced door) and 24 (propped door).
	Reader 2 Auxiliary Input Configuration can be 2-state or 4-state. 2-state auxiliary input is closed for the “request to exit” state. When calibrating the 4-state auxiliary input, ensure that the switch is in the inactive state (not in the “request to exit” state).
	Input Terminal 2 Spare Input 3 Configuration can be 2-state or 4-state.
	Input Terminal 2 Spare Input 4 Configuration can be 2-state or 4-state.

Table 4: Input Point Signals (CK722 Controllers)

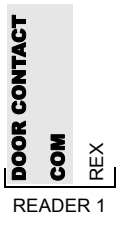
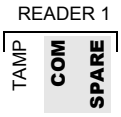
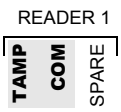
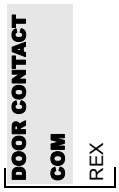
Signal Names	Reader Terminal Object Defined	Reader Terminal Object *NOT* Defined
	"Reader 1 Door Contact" Application Specific Input Can be calibrated to 2-state or 4-state. Wire this input normally closed.	"Reader 1 Door Contact" General Purpose Input Can be calibrated to 2-state or 4-state.
	"Reader 1 REX" Application Specific Input Can be calibrated to 2-state or 4-state. 2-state auxiliary input is closed for the "request to exit" state. When calibrating the 4-state auxiliary input, ensure that the switch is in the inactive state (not in the "request to exit" state). Wire this input normally open.	"Reader 1 REX" General Purpose Input Can be calibrated to 2-state or 4-state.
	"Reader 1 Spare" General Purpose Input Can be calibrated to 2-state or 4-state.	"Reader 1 Spare" General Purpose Input Can be calibrated to 2-state or 4-state.
	"Reader 1 Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.	"Reader 1 Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.
	"Reader 2 Door Contact" Application Specific Input Can be calibrated to 2-state or 4-state. Wire this input normally closed.	"Reader 2 Door Contact" General purpose input Can be calibrated to 2-state or 4-state.
	"Reader 2 REX" Application Specific Input Can be calibrated to 2-state or 4-state. 2-state auxiliary input is closed for the "request to exit" state. When calibrating the 4-state auxiliary input, ensure that the switch is in the inactive state (not in the "request to exit" state). Wire this input normally open.	"Reader 2 REX" General Purpose Input Can be calibrated to 2-state or 4-state.

Table 4: Input Point Signals (CK722 Controllers)

Signal Names	Reader Terminal Object Defined	Reader Terminal Object *NOT* Defined
READER 2 TAMP **COM** **SPARE**	"Reader 2 Spare" General Purpose Input Can be calibrated to 2-state or 4-state.	"Reader 2 Spare" General Purpose Input Can be calibrated to 2-state or 4-state.
READER 2 **TAMP** **COM** SPARE	"Reader 2 Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.	"Reader 2 Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.
PANEL PWR FAIL **COM** **TAMP**	"Panel Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.	"Panel Tamper" General Purpose Input Can be calibrated to 2-state or 4-state.
PANEL **PWR FAIL** **COM** TAMP	"Power Fail" General Purpose Input Can be calibrated to 2-state or 4-state.	"Power Fail" General Purpose Input Can be calibrated to 2-state or 4-state.
Internal	"Panel Battery Low" Internally derived, 2-state only input. In alarm only if the "Power Fail" point is also in alarm and power voltage has decreased more than 10% from either 12V or 24V (the system detects 12 versus 24 nominal voltage automatically). **Note:** For use only with 12VDC or 24VDC power supply. If used, "Power Fail" must be wired to a power fail monitoring circuit.	

Table 5: Output Point Signals (CK721/CK720/CK705 Controllers)

Signal Names	RDR Mode
RED LED **COM** GREEN LED READER 1 LED	Reader 1 Red Light Output Output is set every time an access deny occurs.
RED LED **COM** **GREEN LED** READER 1 LED	Reader 1 Green Light Output Output is set every time an access grant occurs.
READER 1 SHUNT **NO** **COM** **NC**	Reader 1 Shunt Output Output is set every time an access grant or request to exit occurs.

Table 5: Output Point Signals (CK721/CK720/CK705 Controllers)

Signal Names	RDR Mode
READER 1 STRIKE **NO** **COM** **NC**	Reader 1 Door Strike Output is set every time an access grant or request to exit occurs.
RED LED COM GREEN LED READER 2 LED	Reader 2 Red Light Output Output is set every time an access deny occurs.
RED LED COM **GREEN LED** READER 2 LED	Reader 2 Green Light Output Output is set every time an access grant occurs.
READER 2 SHUNT **NO** **COM** **NC**	Reader 2 Shunt Output Output is set every time an access grant or request to exit occurs.
READER 2 STRIKE **NO** **COM** **NC**	Reader 2 Door Strike Output is set every time an access grant or request to exit occurs.

Output Point Signals

Table 6: Output Point Signals (CK722 Controllers)

Signal Names	Reader Terminal Object Defined	Reader Terminal Object *NOT* Defined
RED LED **COM** GREEN LED READER 1 LED	“Reader 1 Red LED” Application Specific Output Output is set every time access deny occurs. Output is an open collector that switches to ground.	“Reader 1 Red LED” General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is an open collector that switches to ground.
RED LED **COM** **GREEN LED** READER 1 LED	“Reader 1 Green LED” Application Specific Output Output is set every time access grant occurs. Output is an open collector that switches to ground.	“Reader 1 Green LED” General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is an open collector that switches to ground.

Table 6: Output Point Signals (CK722 Controllers)

Signal Names	Reader Terminal Object Defined	Reader Terminal Object *NOT* Defined
READER 1 SHUNT NO COM NC	"Reader 1 Shunt" Application Specific Output Output is set every time access grant occurs. Output is a relay.	"Reader 1 Shunt" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is a relay.
READER 1 STRIKE NO COM NC	"Reader 1 Strike" Application Specific Output Output is set every time access grant or request to exit occurs. Output is a relay.	"Reader 1 Strike" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is a relay.
RED LED COM GREEN LED READER 2 LED	"Reader 2 Red LED" Application Specific Output Output is set every time access deny occurs. Output is an open collector that switches to ground.	"Reader 2 Red LED" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is an open collector that switches to ground.
RED LED COM GREEN LED READER 2 LED	"Reader 2 Green LED" Application Specific Output Output is set every time an access grant occurs. Output is an open collector that switches to ground.	"Reader 2 Green LED" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is an open collector that switches to ground.
READER 2 SHUNT NO COM NC	"Reader 2 Shunt" Application Specific Output Output is set every time access grant occurs. Output is a relay.	"Reader 2 Shunt" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is a relay.
READER 2 STRIKE NO COM NC	"Reader 2 Strike" Application Specific Output Output is set every time access grant or request to exit occurs. Output is a relay.	"Reader 2 Strike" General Purpose Output It can be timed, set, reset, fast flash, or slow flash. Output is a relay.

Input Point Calibration

Termination resistance ranges from 150 Ohm to 2000 Ohm (recommended: 1200 Ohm, 1%). Calibration command is launched from the host. Inputs can only be calibrated if proper external resistor network is connected and the input is in the secure state. See "General Input Wiring" on page 14 for reference.

TECHNICAL SPECIFICATIONS

The terminal is expected to operate at moderate temperature variation, non-condensing humidity variation, moderate vibration, and possible dust contamination.

Item	Specification
Input Power	+12 to +24VDC or 16 to 24VAC at24W
Reader Interface	• 2-wire Wiegand (up to 256 bits) • 12VDC, 250mA (typical), 500mA (peak) • Red indicator • Green indicator
General Purpose Inputs	Resistive load
Relay Outputs	1A max. 0-24VDC/VAC, 25VA max
Red LED/Green LED Outputs	50mA max. 0-24VDC. CAUTION: These open collector outputs can be damaged with the use of alternating current (AC) potentials as low as 1VAC. The LED outputs can only be connected to direct current (DC) loads up to 24VDC.
Communications	2 or 3-wire RS-485
Certifications	• FCC, Class B • CE Mark • C-Tick
Mounting Specifications	• DIN rail • Flat surface
Dimensions	5.7 H x 5.9 W x 2.2 D inches (14.4 cm x 15.0 cm x 5.5 cm)
Ambient Temperature	32º to 122ºF (0º to 50ºC)
Humidity	10 to 90% non-condensing
Ventilation	Cabinets require free movement of air over all exposed surfaces

MAINTENANCE

This section provides maintenance instructions, operational testing procedures, and information on replacement parts.

LEDs

The RDR2S-A module has 4 LEDs:

- Power (Power): On during normal operation.
- Status (STATUS): Blinks every second when unit is operational.
- Transmit (XMIT): Blinks when a character is transmitted to the controller's S300 bus.
- Receive (RCV): Blinks when a character is received from the controller's S300 bus.

Routine Maintenance

For the RDR2S-A maintenance, perform the operational testing monthly (see “Testing Procedure” on page 25).

Impaired Performance Conditions

Condition	Information Location
Unit environment not as specified	See “Technical Specifications” on page 24.
Unit power and grounding not as specified	See “Power Supply” on page 12 and “Ground” on page 14.
Cable length or type not as specified	See “Cable Requirements” on page 11.

Testing Procedure

➤ **To check for proper operation of the RDR2S-A:**

1. Verify that the “Power” LED is ON.
2. Verify that the “STATUS” LED flashes once per second.
3. Verify that the “XMIT” and “RCV” LEDs blink.
4. Present a valid card to each reader connected to the RDR2S-A reader interface and then verify that access is granted (green lamp lights).
5. Present an invalid card to each reader connected to the RDR2S-A reader interface and then verify that access is denied (red lamp lights).

Replacement Parts

There are no serviceable components inside the RDR2S-A plastic enclosure. Generic replacement terminal blocks can be ordered if lost. For more information on the parts listed, refer to the applicable catalog page.

Fuses

The RDR2S-A has no replaceable fuses.