

# S610S

*Serial Access Control Card Reader*

## Hardware Installer Manual



| Date       | Revision Number   | Modifications                                                          |
|------------|-------------------|------------------------------------------------------------------------|
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**Warning**

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.

**Warning**

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 an interference received, including interference that may cause undesired operation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Installation of this device shall be performed by a qualified person in accordance to all local regulations.

This system must be installed within the protected premise in accordance with the National Electrical Code (NFPA70), and the local authorities having jurisdiction

Equipment changes or modifications without the approval of the party responsible for compliance could void the user's authority to operate the equipment and could create a hazardous condition.

**Warning (English)**

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

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.

**Warning (French)**

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada.

Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

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.

# Index

|     |                                                                                   |    |
|-----|-----------------------------------------------------------------------------------|----|
| 1   | Introduction                                                                      | 5  |
|     | ▪ How to use an S610S reader .....                                                | 7  |
|     | ▪ LED Card Response table .....                                                   | 7  |
| 1.1 | Cabling requirements .....                                                        | 7  |
| 1.2 | Typical S610S Access Control network.....                                         | 8  |
|     | ▪ Using an Ethernet Control Module (ECM) .....                                    | 8  |
| 1.3 | S610S/S600S PCB layout .....                                                      | 8  |
| 2   | Quick Guide to setting up S610S                                                   | 9  |
| 3   | Connecting an S610S Master Reader                                                 | 11 |
| 3.1 | Open the S610 reader case .....                                                   | 11 |
| 3.2 | S610S Master Reader 12V Power and Data connections.....                           | 11 |
| 3.3 | Extra settings required, made on the reader .....                                 | 11 |
|     | ▪ Reader Address .....                                                            | 11 |
|     | ▪ Door Mode .....                                                                 | 11 |
|     | ▪ Card Type.....                                                                  | 12 |
|     | ▪ Read Head.....                                                                  | 12 |
|     | ▪ Auxiliary Devices .....                                                         | 12 |
| 3.4 | Addressing an S610S master reader.....                                            | 12 |
|     | ▪ S610S Reader in Normal Operation.....                                           | 13 |
|     | ▪ Telnet or HyperTerm serial network controller .....                             | 13 |
| 3.5 | S610S Connecting Master Reader Inputs.....                                        | 13 |
|     | ▪ Test I/O states using reader's diagnostic mode .....                            | 14 |
| 3.6 | Monitoring Inputs for Cable Tamper.....                                           | 14 |
|     | ▪ Enable 4-state tamper detect .....                                              | 15 |
| 3.7 | Using an external read head .....                                                 | 15 |
| 3.8 | S610S Lock and spare output relay connections.....                                | 15 |
|     | ▪ Connecting a lock.....                                                          | 15 |
|     | ▪ Using a Fail secure lock connected to a reader .....                            | 16 |
|     | ▪ Connecting a Sounder to a spare output relay.....                               | 16 |
|     | ▪ Invert relay output.....                                                        | 16 |
| 4   | Connecting an S610S to an Exit Reader                                             | 17 |
| 4.1 | S610S Master Reader 12V Power and Data connections.....                           | 17 |
|     | ▪ Setting the Master S610S Exit reader configuration.....                         | 17 |
|     | ▪ Devices Application - Setting the S610S Exit reader configuration.....          | 18 |
| 4.2 | S610S Master with Slave input connection table .....                              | 18 |
| 5   | Connecting an S610S to a DIU                                                      | 19 |
| 5.1 | Connecting an S610S to a DIU210 .....                                             | 19 |
| 5.2 | Connecting a powered lock to a DIU .....                                          | 20 |
|     | ▪ Using a Fail secure lock connected to a DIU .....                               | 20 |
|     | ▪ S610S with DIU Input connection table .....                                     | 20 |
|     | ▪ Set up the S610S with DIU .....                                                 | 21 |
|     | ▪ Devices Application - Setting the S610S Exit reader and DIU configuration ..... | 21 |
|     | ▪ Local Sounder output.....                                                       | 21 |
| 6   | AC2000 Devices Application tasks                                                  | 23 |
| 6.1 | Add the S610S reader to the AC2000 system .....                                   | 23 |
|     | ▪ Add S610S Exit/slave reader .....                                               | 23 |
|     | ▪ Enable Read head – S610S only .....                                             | 23 |
| 6.2 | Changing reader Door Mode TIME duration settings.....                             | 23 |
| 6.3 | Changing other reader settings .....                                              | 24 |

|      |                                                           |    |
|------|-----------------------------------------------------------|----|
| 6.4  | Access control using PIN Only .....                       | 26 |
| 6.5  | Card, Cardswipe and PIN or PIN ONLY options .....         | 27 |
| 6.6  | Extended Timezone configuration .....                     | 28 |
| 7    | Door Modes .....                                          | 30 |
| 7.1  | Door mode.....                                            | 31 |
| 7.2  | Verification 24, Verification 32 .....                    | 31 |
|      | ▪ Desfire Verification.....                               | 31 |
|      | ▪ Encrypted verification – Mifare Finch.....              | 31 |
| 7.3  | Passenger mode .....                                      | 31 |
|      | ▪ Interlocking Passenger mode (Lobby Mode).....           | 32 |
| 7.4  | Control Post mode .....                                   | 32 |
| 7.5  | PIR mode.....                                             | 32 |
| 7.6  | Passenger-staff exit mode.....                            | 33 |
|      | ▪ Air-Bridge with Passenger-Staff exit mode .....         | 33 |
|      | ▪ Second Swipe Action configuration.....                  | 34 |
| 7.7  | Trolley mode .....                                        | 35 |
| 7.8  | Turnstile Mode .....                                      | 35 |
|      | ▪ Selecting S610S Turnstile Mode.....                     | 35 |
|      | ▪ Single S610S reader – Fail Secure/Fail Safe.....        | 35 |
|      | ▪ Controlling power to a turnstile .....                  | 36 |
|      | ▪ Wiring a bidirectional turnstile .....                  | 36 |
|      | ▪ S610E/S610S Inputs and Outputs .....                    | 36 |
|      | ▪ AC2000 – Configuring Turnstile Mode .....               | 38 |
| 7.9  | Equipment Enable mode .....                               | 39 |
|      | ▪ Setting Timing controls on equipment.....               | 39 |
|      | ▪ Functionality .....                                     | 39 |
|      | ▪ Automatic equipment disable feature.....                | 40 |
|      | ▪ Equipment Enable - Time settings .....                  | 40 |
|      | ▪ Equipment Enable card usage outcome codes .....         | 40 |
|      | ▪ Connection Diagram for Equipment mode .....             | 41 |
|      | ▪ AC2000 software settings for equipment mode.....        | 41 |
|      | ▪ Equipment Mode; Input configuration.....                | 41 |
|      | ▪ Alarm Configuration .....                               | 42 |
| 7.10 | Multiple badge access .....                               | 42 |
| 8    | Interlock .....                                           | 43 |
| 8.1  | Interlock in Door Mode .....                              | 43 |
|      | ▪ Configure the reader's interlock input .....            | 43 |
|      | ▪ Configure the reader's interlock output .....           | 43 |
|      | ▪ Configuring Interlock Input IP 3, or IPB (if DIU) ..... | 43 |
| 8.2  | Passenger mode interlock – Lobby Mode .....               | 44 |
|      | ▪ Without a Valve Lobby Controller .....                  | 44 |
|      | ▪ No access on interlock .....                            | 44 |
|      | ▪ With a Valve Lobby Controller.....                      | 44 |
| 9    | Other AC2000 software configurations .....                | 45 |
| 9.1  | To Edit or Add an input for AED alarm management .....    | 45 |
|      | ▪ S610E input table – No DIU .....                        | 45 |
|      | ▪ S610E with DIU Input table.....                         | 45 |
| 9.2  | Disabling an Input using AC2000 software .....            | 45 |
| 9.3  | Input/output Mapping.....                                 | 46 |
|      | ▪ Mapping an input to an output .....                     | 46 |
| 9.4  | Configuring a spare Output Relay.....                     | 46 |
|      | ▪ Connecting a Sounder. ....                              | 47 |
| 9.5  | Other AC2000 configuration options.....                   | 47 |

|      |                                              |    |
|------|----------------------------------------------|----|
|      | ▪ Access Levels.....                         | 47 |
| 10   | S610S onboard diagnostic mode                | 49 |
| 10.1 | Using Diagnostic Mode.....                   | 49 |
| 10.2 | S610S menu tree.....                         | 49 |
| 10.3 | Information Menu.....                        | 50 |
|      | ▪ Network.....                               | 50 |
|      | ▪ Versions .....                             | 50 |
|      | ▪ Database.....                              | 50 |
|      | ▪ System.....                                | 50 |
| 10.4 | Test Menu.....                               | 51 |
|      | ▪ Local Device .....                         | 51 |
|      | ▪ Aux Device .....                           | 51 |
|      | ▪ Testing Reader Inputs .....                | 51 |
| 10.5 | Configure Menu .....                         | 52 |
| 10.6 | Setting the correct readhead technology..... | 52 |
|      | ▪ Prox: .....                                | 52 |
|      | ▪ Card Definition (or Card format) .....     | 52 |
|      | ▪ Smarthead.....                             | 52 |
| 10.7 | Adjusting optical Tamper Thresholds .....    | 53 |
| 10.8 | Disable diagnostic mode pin .....            | 53 |
| 10.9 | Updating Firmware.....                       | 53 |
|      | ▪ AC000 web configuration tool.....          | 53 |
|      | ▪ Other options may include .....            | 54 |
| 11   | Appendix                                     | 55 |
| 11.1 | Check List/Commissioning Sheet .....         | 55 |
| 11.2 | S400 Exit Reader Connections.....            | 55 |
| 11.3 | CLK Air Bridge.....                          | 55 |
| 11.4 | S610S Specification Sheet.....               | 56 |

# Illustrations

|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| S610S readers can be used on an RS485 serial chain as Master and Exit readers.                 | 8  |
| Shows S610S, RS485 data and power connections.                                                 | 11 |
| Example of used Reader addresses.                                                              | 12 |
| A screen shot of an S9064 controller Hyper Term session.                                       | 13 |
| S610S inputs, (when no DIU present).                                                           | 13 |
| Sensor fitted with resistors, monitoring Open Closed and tamper conditions.                    | 14 |
| Relay Connector J12 showing typical Maglock configuration.                                     | 15 |
| Connecting a Sounder.                                                                          | 16 |
| Shows S610S, RS485data, power and Exit Reader connections.                                     | 17 |
| Shows the AC2000 Devices application, Device Type, being updated.                              | 18 |
| Power & RS485 serial connections to a Master Reader                                            | 19 |
| Lock and a choice of 12V or 24V lock power                                                     | 20 |
| AC2000 Door Mode door cycle time sequence of events.                                           | 24 |
| During 9-5 MON-FRI only the global PIN is required to gain access.                             | 26 |
| Example of Timezone (TZ) options, AC2000 workstation Time Zone application                     | 27 |
| Reader Time Zones.                                                                             | 27 |
| Shows Device Configuration – Door Time Zone.                                                   | 28 |
| S610S Time Zone Active options group.                                                          | 28 |
| AC2000 Passenger Mode card transaction time sequence                                           | 32 |
| PIR mode input assembly, normal Request to Exit (REX) behaviour is disabled.                   | 32 |
| Typical wiring for two turnstiles                                                              | 36 |
| Sample wiring for a uni-directional turnstile barrier with external PSU.                       | 36 |
| Shows an S610E or S610S Master reader connected to a sample bi-directional turnstile.          | 36 |
| Shows an S610E or S610S Master and Exit reader connected to a sample bi-directional turnstile. | 36 |
| Pulse Turnstile, one second or more pulse output                                               | 38 |
| Timed Output sequence of S610S reader in Equipment Mode                                        | 40 |
| An example of S610S PCB connections used for Equipment Mode.                                   | 41 |
| An example of S610S PCB connections used for Equipment Mode.                                   | 41 |
| The relays on the S610S change state when powered up.                                          | 44 |
| Select an Output, and then enable it.                                                          | 46 |
| Mapping an input signal to a relay switch. Ensure Local output disabled is unchecked.          | 47 |
| Sounder connected to a spare relay                                                             | 47 |
| S610S Menu tree.                                                                               | 49 |
| The address of the reader in the example above is B                                            | 50 |
| Connector J5 on S610S is connected to J16 on the S400 exit reader.                             | 55 |

# S610S Hardware Installer Manual

## 1 Introduction

The S610S reader from CEM Systems is an intelligent ID card reader, designed to integrate with an AC2000 SE or webEntry Access Control system. The S610S is an S600S with re-designed two part case design and integral 125kHz read head. The S610S serial master reader is connected to a serial controller, an S9064 for example. Other serial controllers include S9020, S9040 and the S9032. The S610S serial reader can support and exit reader and a CEM Door Interface Unit.

### READER MEMORY

Memory capacity is dependent on the type of card record. An 8-byte database stores the Card ID along with the associated PIN, card status and time zone, up to 225,000 card records and transactions held.

### OFFLINE CARD VALIDATION AND ALARM BUFFER

During normal operation, the card holder database is downloaded to the reader and held in RAM; this data is used to verify cards only if communications to the controller is disrupted. Alarms and transactions are also held in memory and forwarded when communications are restored. Up to 8000 offline transactions, 256 time zones, 80 holidays are supported.

During extended offline periods the reader memory may be filled to capacity, then the oldest alarms and transactions will be overwritten and the most recent will continue to be stored.

### CARD TECHNOLOGY TYPES

The S610S family of readers can support the following access control card technologies.

### CEM READER - PART NUMBERS

| Description |                    | 125kHz HID Prox | 13.56MHz MiFare  | HID Prox & MiFare   | 13.56MHz HID iClass SE               | Picopass           | External Read Head |
|-------------|--------------------|-----------------|------------------|---------------------|--------------------------------------|--------------------|--------------------|
| S610S       | Model              | S610S Prox      | S610S MiFare     | S610S Multitech     | ** S610S multi smart card reader     | S610S Picopass     | S610S External     |
|             | Grey Product Code  | RDR /611/101    | RDR /611/105     | RDR /611/104        | RDR/611/608                          | RDR/611/606        | RDR /611/109       |
|             | Black Product Code | RDR /611/111    | RDR /611/115     | RDR /611/114        | RDR/611/618                          | RDR/611/616        | RDR /611/119       |
| S610s Exit  | Model              | S610 Prox Exit  | S610 Mifare Exit | S610 Multitech Exit | ** S610 multi smart card reader Exit | S610 Picopass Exit | S610 Exit External |
|             | Grey Product Code  | RDR /612/101    | RDR /612/105     | RDR /612/104        | RDR/612/608                          | RDR/612/606        | RDR /612/109       |
|             | Black Product Code | RDR /612/111    | RDR /612/115     | RDR /612/114        | RDR/612/618                          | RDR/612/616        | RDR /612/119       |

\*\* Indicates that the product is FCC Compliant

### DOOR MODES

The S610S reader is used to control access at a standard entry/exit point but it can also be used for a number of special operational modes; Control Post mode, Door mode, Passenger mode, Trolley mode and Turnstile mode.

### SMARTCARD TECHNOLOGY

Also available is the S610SP which has been specifically modified to use the Inside Technologies PicoPass™ card. A full manual is available for this model of reader. Please contact your supplier if Pico technology is required to integrate with your access control system.

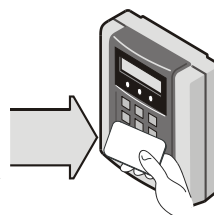
### HIGH SECURITY ENVIRONMENTS

CEM readers must be used in conjunction with a tamper protected DIU (Door Interface Unit) and alarm when tampered. Where a DIU is supplied without an enclosure, the installer must fit an enclosure and connect a tamper sensor. DIUs must be fitted on the secure side of the door or other secure location. A battery backup power supply must be provided to ensure no false release on mains fail. Current examples include DIU200, DIU210 or DIU230 PoE. The DIU enclosure can only be accessible with the use of tools, e.g. screwdrivers or lock and key; flip open covers are not acceptable.

Where a reader is located at a point of access, the master reader must be located on the secure side with the slave reader located on the unsecure side.

## How to use an S610S reader

**SWIPE CARDS  
OVER KEYPAD  
AREA**



Swipe a card over the keypad area, then enter a keypad command or PIN if required to do so.

### LED Card Response table

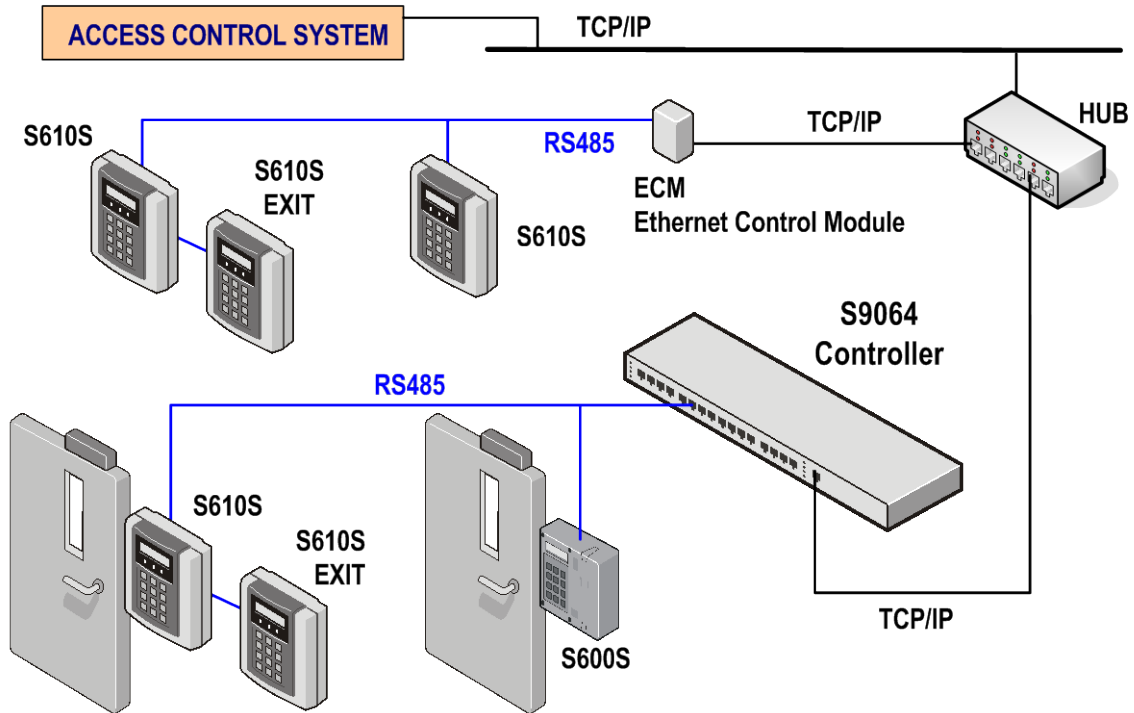
|                    |                                                                |                                                                                                                                                                                              |
|--------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green              | Card Valid                                                     | Description                                                                                                                                                                                  |
| Flashing Green     | Card Expiring                                                  | Consult System Admin to extend Card Expiry date                                                                                                                                              |
| Amber              | Wrong Zone<br>Wrong Time zone<br>Passback failure<br>Wrong PIN | Door not in card holder's Access Level.<br>Door is in Card Holders Access level but not Time Zone.<br>Card holder must comply with site access policy.<br>Swipe again and enter correct PIN. |
| Red – Invalid card | Card error - retry<br>Card not in system<br>Card expired       | Try again; if fault persists consult your system administrator.<br>Consult your system administrator or site security office.<br>Consult your system administrator or site security office.  |
| Flashing Red       | Lost or Stolen Card                                            | Consult your system administrator or site security office.                                                                                                                                   |

### 1.1 Cabling requirements

| Cable needed                                          | Connector type                          |
|-------------------------------------------------------|-----------------------------------------|
| 2 pair (Belden 8723) cable, DataA, DataB, GND and 12V | 4 way JST – J15                         |
| 6 pair (Belden 8723) maximum Inputs and Outputs       | 8 way JST – J6 and<br>6way socket – J12 |
| 2 pair (Belden 8723) power/comms to Exit reader       | 4 way JST – J5 to J5                    |

## 1.2 Typical S610S Access Control network

S610S readers are connected to an RS485 serial chain from an AC2000 serial network controller, e.g. an S9064. Also S610S readers are used as an Exit Reader when connected to an S600E Ethernet reader; Ethernet readers cannot be used as exit readers.

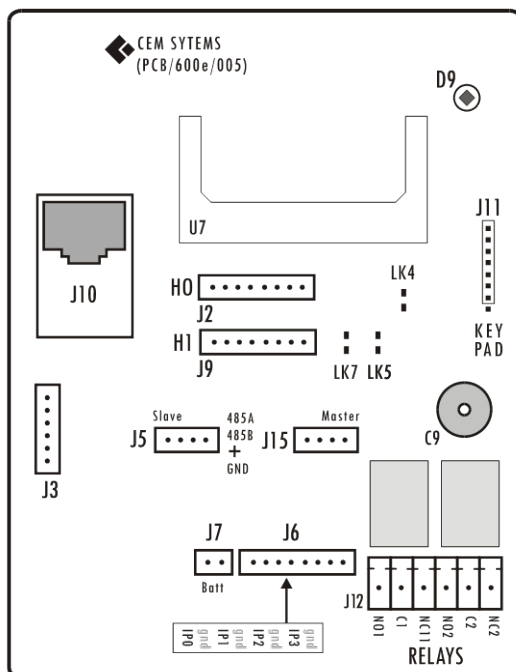


S610S readers can be used on an RS485 serial chain as Master and Exit readers.

### Using an Ethernet Control Module (ECM)

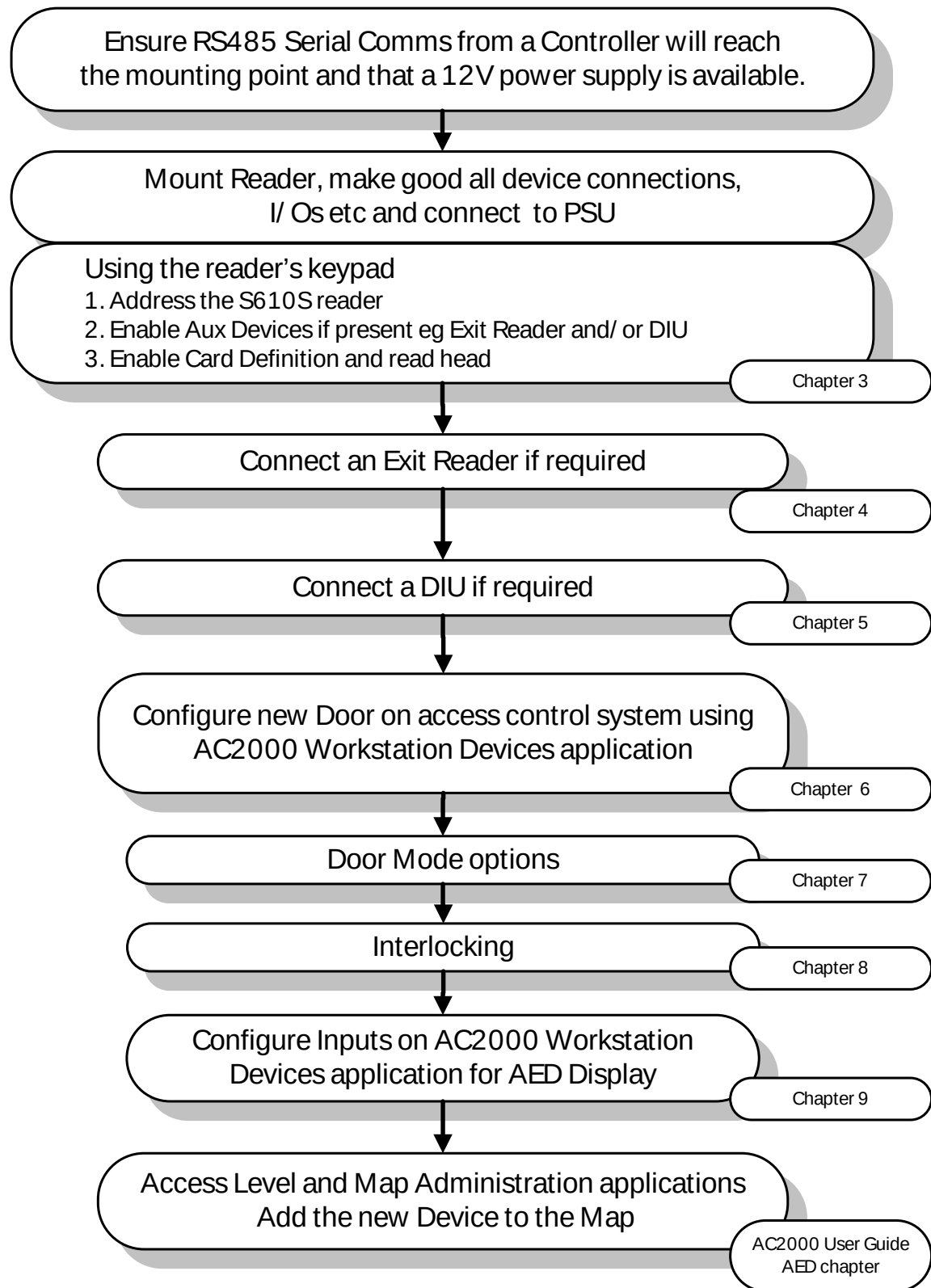
If it is necessary to connect an S610S serial device to an Ethernet access control system (RTC) use an ECM. This CEM signal bridge converts duplex Ethernet RS485 data. Please consult the ECM manual for more information.

## 1.3 S610S/S600S PCB layout



- C9 Buzzer
- D9 Light/Tamper sensor
- J2 H0 - Master Read Head, 8-way JST plug
- J3 Smart card or Biometric Interface, 6-way JST
- J5 RS485 to Exit Reader, 4-way JST
  - RS485A, Pin1
  - RS485B, Pin 2
  - 12V, Pin 3
  - 0V, Pin 4
- J6 Input terminals 0-3, 8-way JST plug
- J7 Backup Power Battery connection, 2-way JST
- J9 H1 - Exit/Slave Read Head, 8-way JST plug
- J10 Ethernet, RJ45 (Not used on S610S or S600S)
- J11 Reader Keypad
- J12 Relays 1 and 2
- J15 Master Data Connector
  - RS485A, Pin1
  - RS485B, Pin 2
  - 12V, Pin 3
  - 0V, Pin 4
- LK4 Not used
- LK5 Not used
- LK7 Not used
- U7 Connect Flash locator

## 2 Quick Guide to setting up S610S





### 3 Connecting an S610S Master Reader

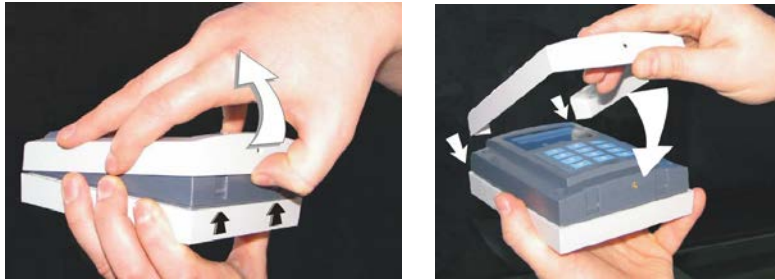
#### 3.1 Open the S610 reader case

Remove the retaining screw located on the underneath of the reader case.

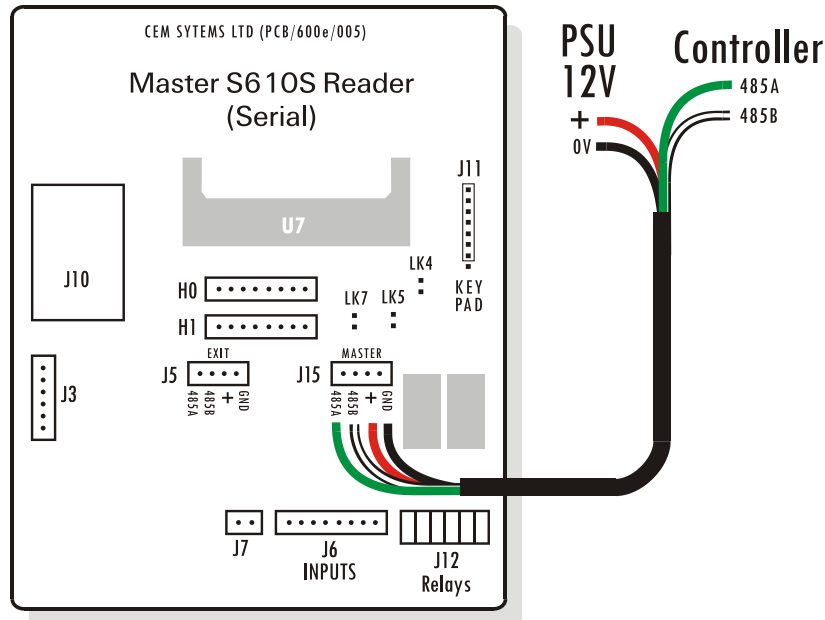
Place your thumb underneath the screw hole and lift the lining plate off the reader case.

X4 screw holes will be exposed. Remove the screws and the reader case will come apart.

Reverse the process to re-assemble the reader case.



#### 3.2 S610S Master Reader 12V Power and Data connections



Shows S610S, RS485 data and power connections.

#### 3.3 Extra settings required, made on the reader

Using the reader's diagnostic keypad a serial reader must be configured with the following:-

##### Reader Address

The Reader will have to be uniquely addressed (0-F), no other reader on the channel or port can share the same address.

##### Door Mode

In addition to an address, the reader will need to have the correct Door Mode set, and the read head and card type enabled. See Door Mode chapter in this manual.

## Card Type

See Diagnostic Mode sections. [Card Definition \(or Card format\)](#) paragraph 10.6 in this manual

## Read Head

See Diagnostic Mode sections, [Setting the correct readhead technology](#) paragraph 10.6

## Auxiliary Devices

An Exit Reader and/or a DIU must be set as present using the reader's diagnostic keypad.

### 3.4 Addressing an S610S master reader

Use the reader's keypad to access the diagnostic menu to address an S610S.

Enter **[\*][\*][\*]** followed by the reader PIN code. (Factory Default PIN 0000, or 9999 if the reader has been added to the AC2000 Devices table and come online).

Default Reader PIN codes may have been changed, consult your System Administrator.

If incorrectly entering a pin, wait 5 seconds before trying again, to allow for timeout.

The following details will appear on the LCD panel: -

**S600S Diags**  
**< \* 0 # >**

#### ADDRESSING AN S610S READER

On the master reader, use the **[#]** key to navigate to the Configuration menu.

**S600S Diags**  
**Configure**

Press **[0]** key.

**Configuration**  
**RDR address**

Press **[0]** key again.

Enter the Decimal address value of the reader in two digits e.g. 02 for reader 2 or 14 for reader 14.

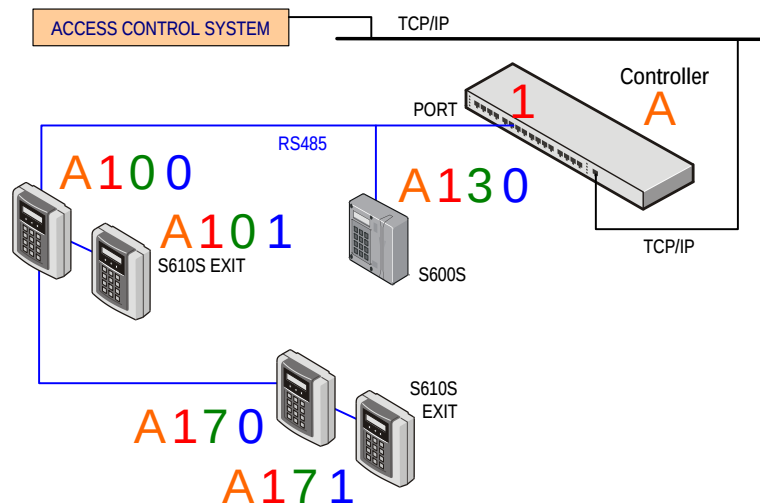
**Enter Address**  
**Add = xx 0 OK**

After entering the reader address, Press the **[0]** key to enter OK.

**RDR Address = 2**  
**0 OK**

Do nothing to cancel and start over, or press **[0]** to confirm OK new address.

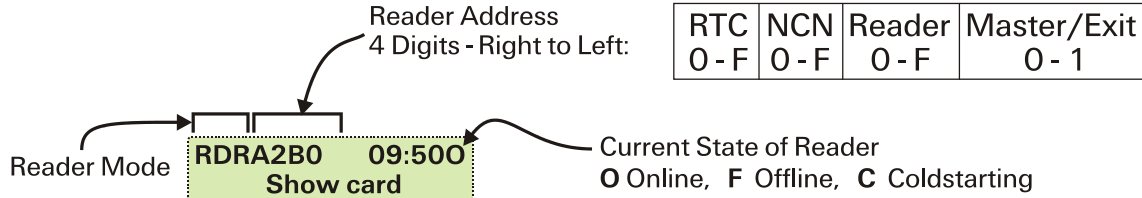
Illustration below shows Reader addresses 3, 0 and 7 are used on Port 1, Controller A



Example of used Reader addresses.

## S610S Reader in Normal Operation

The Reader's address is a four digit address, reading from left to right, the first digit is the Controller address, the second digit is the NCN or Network Connection Node. The NCN is the physical serial channel from the controller the reader is connected to. The third digit is the actual reader's address on that channel; each reader must be addressed uniquely, and the address is directly applied to the reader using the reader's keypad command menu. The last digit indicates a Master Reader if 0 or an Exit reader if 1.



### NORMAL OPERATION

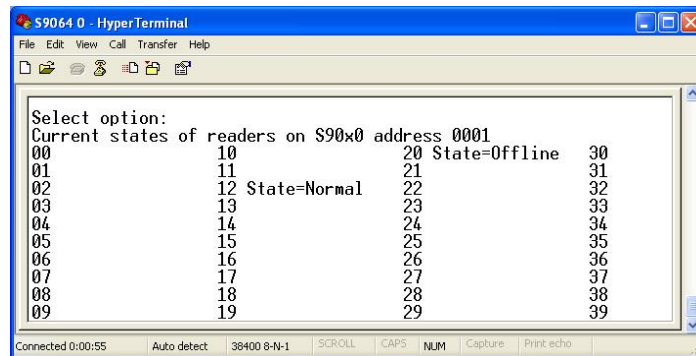
The character after the time in the standard LCD message will change to O, C or F.

- O – The reader is Online (normal)
- C – Coldstart (rebooting or Firmware update)
- F – The Reader is Off line or has not received a configuration

If the F is present the reader may not be added to AC2000 Devices application table.

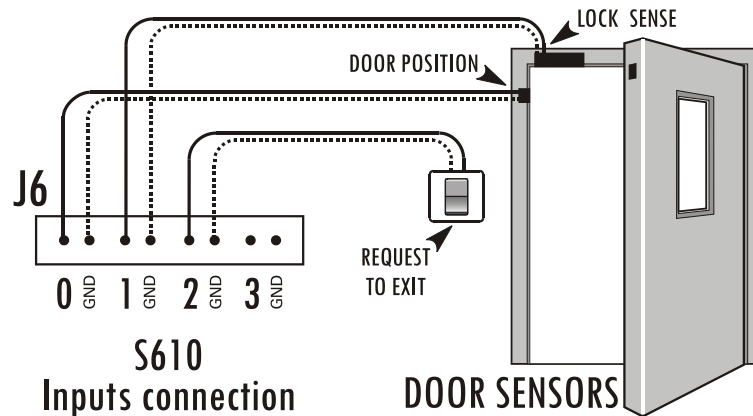
### Telnet or HyperTerm serial network controller

For further information about the state of a serial reader, use Telnet or Hyper Term to log on the reader's controller. Use the controller's diagnostics to view reader states.



A screen shot of an S9064 controller Hyper Term session.

## 3.5 S610S Connecting Master Reader Inputs



S610S inputs, (when no DIU present).

## Test I/O states using reader's diagnostic mode

To access S610S diagnostic mode, use the keypad. Enter **[\*][\*][\*]** followed by 0000 (Default) or 9999 (old Default). After the reader has been added to a system using the AC2000 workstation Devices application the default PIN will be downloaded to the reader. Default Reader PIN codes may have been changed, consult your System Administrator. If the pin number is lost, contact CEM Systems, Support Dept. If incorrectly entering a pin, wait 5 seconds before trying again, to allow for timeout.

Use the **[\*]** and **[#]** to scroll through menu, use **[0]** to select displayed option.

Select the TEST then INPUTS sub menu. Then open/close each input in turn in order to test their functionality.

## 3.6 Monitoring Inputs for Cable Tampers

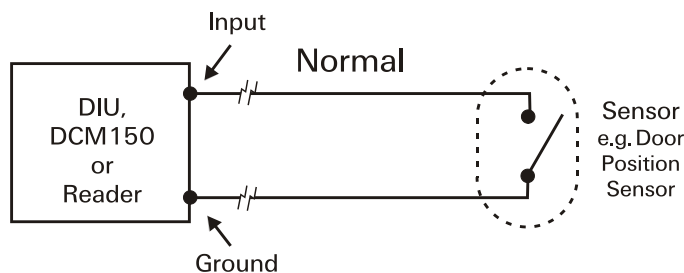
4 State - Used to enable input monitoring: Open, Closed, Tamper Short and Tamper Cut. If this option is selected, cable tampering of 'short' and 'cut' will also be detected. Different types of tamper are not distinguished, but simply reported as tamper. If a Tamper condition has occurred on an input cable, e.g. a cut or short, then a subsequent alarm will not be detected, or appear on an AC2000 Alarm Event Display.

THIS OPTION IS ONLY VALID IF RESISTORS HAVE BEEN ADDED TO THE INPUT SENSOR WIRES.

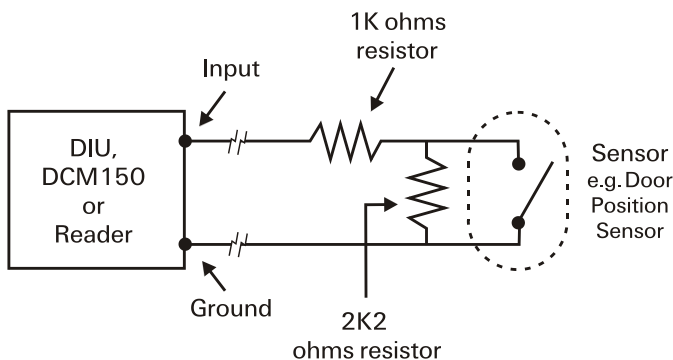
Tamper detect is achieved by taking two additional steps:-

- Install a resistor network across the cabling at the input sensor.
- On an AC2000 Workstation Devices Application
  - Enable 4-state tamper detect
  - Configure the input to display a Tamper Alarm for any attempted tamper

### INSERTING RESISTORS TO AN INPUT SENSOR



Normal Input sensor monitoring Open and Closed Conditions.



Sensor fitted with resistors, monitoring Open Closed and tamper conditions.

### **Note: Resistors must be fitted close to the sensor**

The 1k resistor should be fitted in line with the input wire and the 2.2k resistor should be placed across the wiring pair. This will ensure that the S610S will detect Open, Closed, Tamper Short and Tamper Cut circuits.

**Note: Other inputs, including lock status can be fitted with a resistor network in the same way.**

### Enable 4-state tamper detect

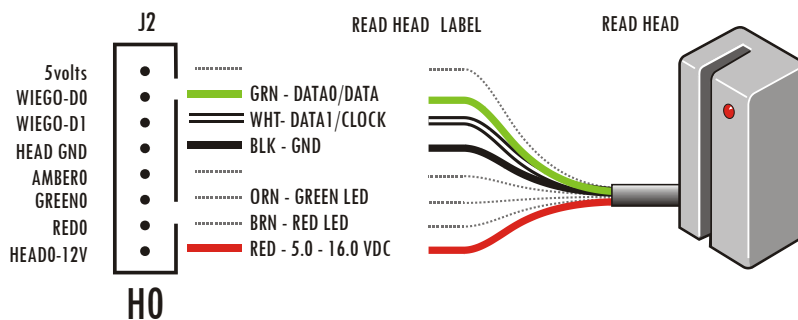
Use the workstation AC2000 Devices application. From the table, select the device the sensor is connected to.

Under Configuration select the Inputs tab. Select Each Input that needs to be configured for 4 state from the list and check 4 state.

### 3.7 Using an external read head

In some exceptional circumstances it may be necessary to connect an external read head to the reader for dual technology access. For example a barcode reader can be connected to H0 to allow access to barcode type cards, as well as Prox card holders.

To connect an external read head to the secure side of a door use H0 head connection found on the reader PCB. H0 pin order is shown below; the reader wires are for a sample only.



To connect a read head for an Exit reader use H1. See connecting an Exit Reader later in this manual.

### 3.8 S610S Lock and spare output relay connections

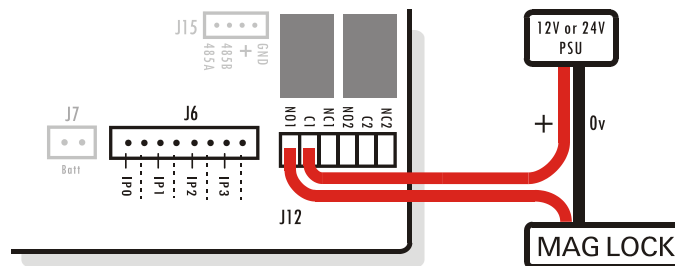
The S610E reader has two volt-free changeover relays.

The following S610S parameters may be changed using the Devices application if required: -  
lockopentime (sec) - maximum time to open the door after a valid card presentation  
doorcloseafter (sec) - maximum time for door to remain open before an alarm is generated

#### Connecting a lock

In normal door mode Relay 0, the first relay, is reserved for a door lock. A door lock controlled by Relay 0 does not require any AC2000 workstation software configuration; unless changes to the default five second Lock open time is necessary. Relay 1, the second relay, (if not used for Interlocking) is spare and can be used to activate an external device e.g. sounder or strobe light.

Connect a maglock or a lock that is secure when electrically energised to the relay output connector J12 as follows:



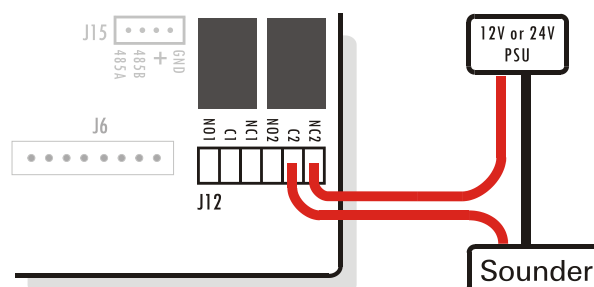
Relay Connector J12 showing typical Maglock configuration.

## Using a Fail secure lock connected to a reader

If using a fail secure type lock, i.e. the lock is secure when the power is down. Mortise or fail secure type locks will normally be terminated using NC1 and C1, the opposite state to a maglock. If required the relay output can be inverted using software.

## Connecting a Sounder to a spare output relay

Check your OEM sounder documentation for signal requirements. The S610S output relay provides *normally open* or *normally closed* connection options.



Connecting a Sounder.

Remember that the PCB legend applies when the PCB is un-powered. When the PCB is powered the relay states become inverted.

## Invert relay output

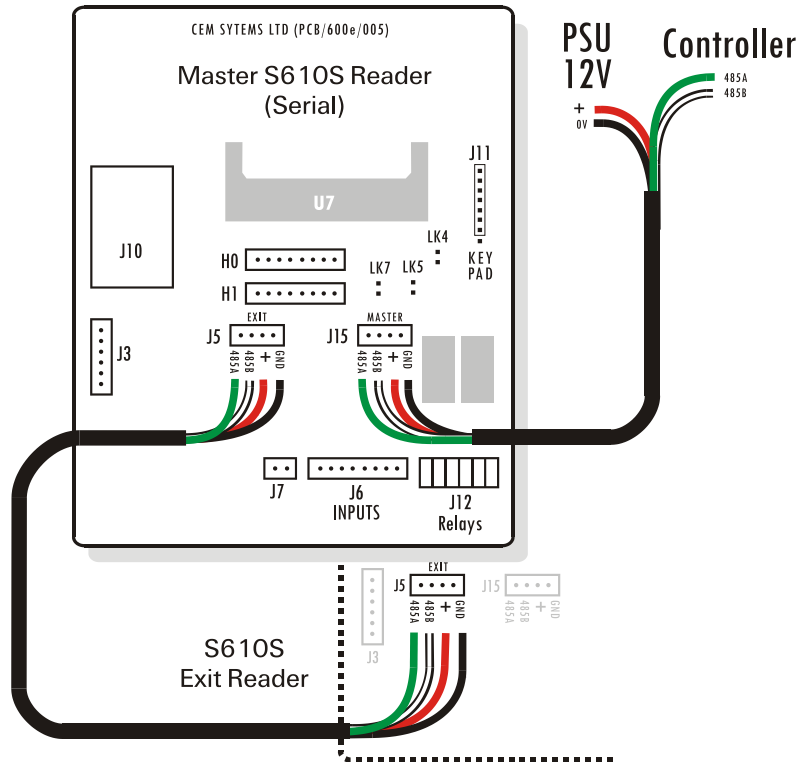
The relay legend on an S610S PCB reflects the relay state when the reader is powered down. As soon as the S610S reader receives 12v power, the relay states become inverted. Therefore NO (Normally Open) becomes CLOSED allowing voltage to a connected maglock.

If using a fail secure type lock, i.e. the lock is secure when the power is down, the connections on J12 should be physically moved to the normally open connections on the relay in preference to a software configuration. However, the relay state can be inverted using the Devices, Configuration, Relay 0 normally open. The same applies to Relay 1.

A DIU lock output cannot be inverted using software settings.

## 4 Connecting an S610S to an Exit Reader

### 4.1 S610S Master Reader 12V Power and Data connections



Shows S610S, RS485 data, power and Exit Reader connections.

If Exit Reader present; check required Slave reader settings in Devices configuration.

If an S400 Exit reader is present ensure S400 PCB J11 jumper 7 is ON. (Do not confuse with LK7)

### Setting the Master S610S Exit reader configuration

Wire an Exit reader to the master as shown above.

A Master serial reader does not automatically connect to the Exit Reader or DIU after receiving its configuration, set by using the AC2000 workstation Devices Application.

The installer must also set the reader to communicate with the Exit Reader DIU using the reader's onboard keypad.

#### REQUIRED SETTINGS MADE AT THE MASTER READER

On the master reader, use the **#** key to navigate to the Configuration menu.

**S600S Diags**  
**Configure**

Press **0** key, then the **#** key to navigate to the AUX Device(s) menu

Select EXIT READER or NO EXIT READER accordingly.

After the setting has been accepted, press **\*** repeatedly until the reader exits diagnostic mode.

Do the same for a DIU if present.

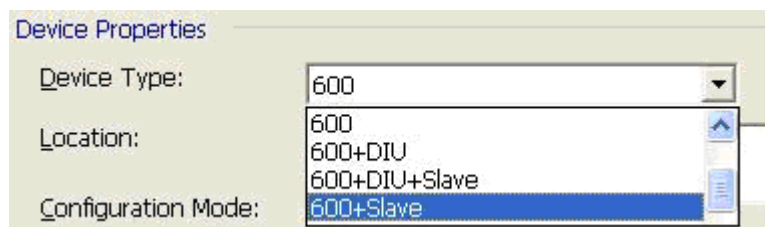
For more information on using the reader's Diagnostic mode S610S onboard diagnostic mode see Chapter 10 in this manual.

## Devices Application - Setting the S610S Exit reader configuration

Wire an Exit reader to the master as shown above.

A Master reader does not automatically connect to the Exit Reader or DIU.

The Master reader's configuration must be updated to include an Exit Reader on the AC2000 workstation Devices Application.



Shows the AC2000 Devices application, Device Type, being updated.

Select S600+DIU+Slave if a DIU and Exit reader are present.

### 4.2 S610S Master with Slave input connection table

| AC2000 Workstation                |                                                            | Connector on<br>S610S<br>Reader<br>J6 | Description             |
|-----------------------------------|------------------------------------------------------------|---------------------------------------|-------------------------|
| Devices<br>application<br>INPUT # | Input Configuration<br>Normal setting<br>Checked/Unchecked |                                       |                         |
| Master S610S Reader               |                                                            |                                       |                         |
| IP 0                              | Unchecked                                                  | J6 Pin IP0                            | Door position sensor    |
| IP 1                              | Unchecked                                                  | J6 Pin IP1                            | Lock Status Sensor      |
| IP 2                              | Unchecked                                                  | J6 Pin IP2                            | Request to Exit button  |
| IP 3                              | Checked<br>(Uncheck for Interlock)                         | J6 Pin IP3                            | Interlock control or GP |
| Exit/Slave S610S Reader           |                                                            |                                       |                         |
| IP 4                              | Checked                                                    | J6 Pin IP0                            | GP                      |
| IP 5                              | Checked                                                    | J6 Pin IP1                            | GP                      |
| IP 6                              | Checked                                                    | J6 Pin IP2                            | GP                      |
| IP 7                              | Checked                                                    | J6 Pin IP3                            | GP                      |

NOTE: A Normal or Checked setting means the Input is free for GP Use

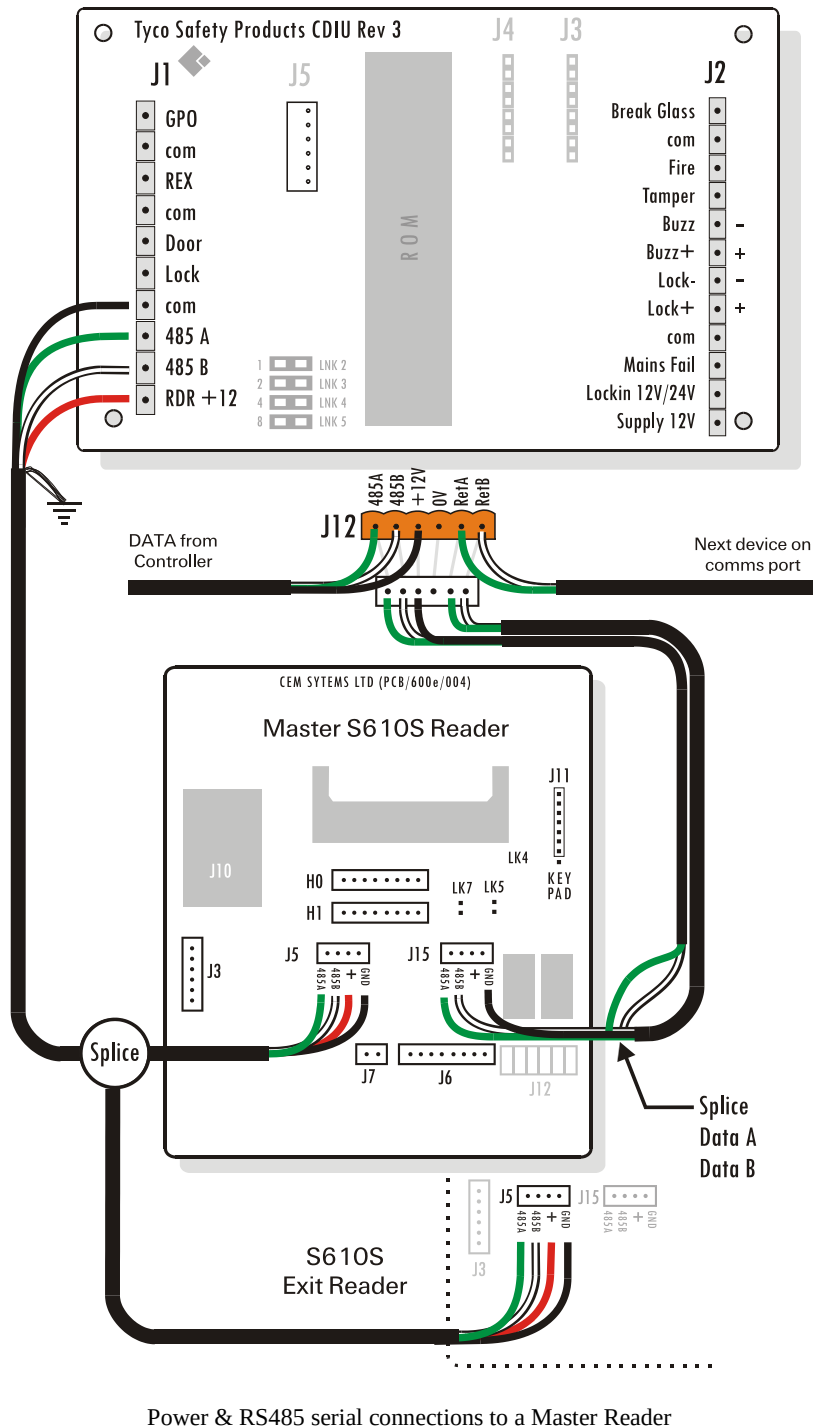
NOTE: A GP (General Purpose) input AED alarms can be customised using AC2000 software Devices and Alarm Config application. See AC2000 Devices and Alarm Config manuals for further information. Connecting S610S with DIU

For more information on using a DIU please consult the relevant DIU manual.  
See <http://www.cemsys.com>

## 5 Connecting an S610S to a DIU

For more information on the DIU please consult the DIU manual.

### 5.1 Connecting an S610S to a DIU210



Power & RS485 serial connections to a Master Reader and RS485 channel connections to and from a DIU210 backplane

**ENSURE THE EXIT READER AND THE DIU ARE ENABLED  
USING THE MASTER READER'S KEYPAD OPTIONS MENU**

Note: If the Exit reader fails to read a valid card (when the Master reader reads successfully) ensure the Auxiliary Devices, Exit Reader and DIU are enabled, using the Diagnostic keypad menu, and that the Reader with Exit and DIU is correctly configured in the Devices application. See *Setup the S610S with DIU* below.

## 5.2 Connecting a powered lock to a DIU

The DIU has been designed to pass through either 24V or 12V for lock operation.

It is important to make the correct connections to enable the correct voltage for the connected lock.

### DIU200

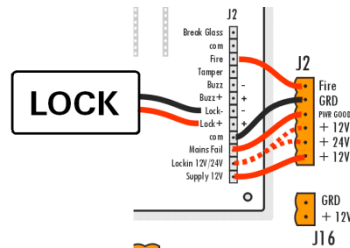
A DIU200 can support 12V or 24V locks. The correctly rated PSU (1.2A max) must be connected to the DIU200 Lockin12V/24V connection, see the DIU module J2.

### DIU210

The connection Supply 12V shown in the illustration provides a voltage supply used by any readers connected to the board.

### DIU220

The S610S can be configured only as an Exit reader when connected to a DIU220.



Lock and a choice of 12V or 24V lock power

Above, shows lock and a choice of 12V or 24V lock power connections (J2) on the DIU v3 PSB and the larger (J2) on the DIU210 backplane.

### SELECTING 12V OR 24V FOR LOCK SUPPLY

When making connections for Lock power, locate the connections as shown in the figure above; work from the bottom up. The dotted lines indicate a choice of 12V or 24V power. Make your selection according to the power rating of the door lock to be controlled.

J16 - J16 is an auxiliary 12V power take off point.

### Using a Fail secure lock connected to a DIU

It is not possible to invert the DIU lock output using software settings. To enable fail secure lock configuration it is recommended to connect the lock to the Holder output, and the Holder to the Lock output, if present.

### S610S with DIU Input connection table

When a DIU is present Inputs are not connected to the reader. Connect Inputs to the DIU, leaving inputs on the Readers as spare.

| Input #          | Input Description | Normally Open / Normally Closed | Connection                   |
|------------------|-------------------|---------------------------------|------------------------------|
| 0                | Door Position     | Normally Closed                 | J1 - CDIU - Door             |
| 1                | Lock Status       | Normally Closed                 | J1 - CDIU - Lock             |
| 2                | Request to Exit   | Normally Open                   | J1 - CDIU - REX              |
| 3                | Break Glass       | Normally Closed                 | J2 - CDIU - BGlass           |
| 4                | Fire              | Normally Closed                 | J2 - DIU200 or J x - DIU210  |
| 5                | Power Fail        | N/A <sup>+</sup>                | J2 - CDIU - Fail             |
| 6                | Battery Low       | N/A <sup>+</sup>                | N/A                          |
| 7                | DIU Tamper        | Normally Closed                 | J2 - CDIU - Tamp             |
| 8,9,A,B (Master) | General Purpose   | N/A <sup>+</sup>                | J6 - Master Reader 8-way JST |
| C,D,E,F (Exit)   | General Purpose   | N/A <sup>+</sup>                | J6 - Exit Reader 8-way JST   |

\* Any 4-State inputs must be configured in the AC2000 Devices application as 4 state inputs if AED alarms from these inputs are required. See fig 4.2, note 4 state check option.

<sup>†</sup>N/A Not Applicable – these are system inputs, no user configuration is required.

## Set up the S610S with DIU

The installer must also set the reader to communicate with the DIU using the reader's onboard keypad. A Master serial reader does not automatically connect to the DIU after receiving its configuration set on the AC2000 workstation Devices Application.

Use the reader's keypad to access the diagnostic menu to address an S610S.

Other S610S reader settings are also locally made at the reader using the keypad: an Exit Reader and/or a DIU must also be set as present using this method. Inputs and outputs configured remotely from an AC2000 workstation.

Enter [\*][\*][\*] followed by the reader PIN code. (Factory Default PIN 0000).

Default Reader PIN codes may have been changed or disabled by your System Administrator.

If incorrectly entering a pin, wait 5 seconds before trying again, to allow for timeout.

On the master reader, use the [#] key to navigate to the Configuration menu.



Press [0] key, then the [#] key to navigate to the AUX Device(s) menu

Select DIU or NO DIU accordingly.

After the setting has been accepted, press [\*] repeatedly until the reader exits diagnostic mode.

## Devices Application - Setting the S610S Exit reader and DIU configuration

A Master reader does not automatically connect to the Exit Reader or DIU.

The Master reader's configuration must be updated to include an Exit Reader on the AC2000 workstation Devices Application.

For Device type, select S600+DIU+Slave if a DIU and Exit reader are present.

## Local Sounder output

A S610s with DIU and slave will use the local sounder for door forced, held, etc only when the sounder action configuration is enabled locally in the reader configuration menu.

For more information on DIU and Backplane please consult the DIU with Backplane manual.



## S610S – Software Configuration

Adding a reader to an AC2000 access control system is a two stage operation, requiring the reader to be physically fitted to the network, and then configured using the AC2000 workstation Devices application, and afterwards the System Administrator must assign the reader to appropriate Access Level, Map location and alarm AED settings.

Note: Ensure the S610S read head is turned on in the configuration settings.

## 6 AC2000 Devices Application tasks

Adding an S610S to the network using AC2000 Devices Application, then setting Input to enable AED alarms.

### 6.1 Add the S610S reader to the AC2000 system

Log on to an AC2000 workstation and click once on the Devices (  ) icon to run the application.

From Overview select the controller the reader will be connected to.

NOTE: An S610S can not be a master reader connected to an RTC NCN.

Highlight the 90xx NCN number (0-4) that the S610S will be or is physically connected to.

Note: The NCN on the controller MUST be the port to which the RS485 channel the S610S reader is physically connected to.

Right- click with the mouse and select Add Device.

#### PROPERTIES

Address – Enter the reader Address to be used (from 0 to 9 or A-F.)

Location – Enter a meaningful description in the field provided.

Device Type – Select from the following: -

600 – S600SP or S600S standalone with REX switch for secure side exit

600+Slave – S600SP or S600S plus S610S Slave/Exit reader

600+DIU – S600SP or S600S plus a Door Interface Unit

600+DIU+Slave – S600EP or S600E plus a DIU plus S610S Slave/Exit reader

Select the default Configuration Mode from the drop-down menu.

Restricted Reader – N/A. When a card becomes Parked, access is revoked from Restricted Readers. The S90xx controllers does not support Card Parking.

#### EXTENDED PROPERTIES

None

#### OFFLINE DATABASE

The S610S offline database is set to Card Number, Timezone, Status and PIN by default.

### Add S610S Exit/slave reader

If adding an S610S Exit reader at a later date, the S610S reader device type must be updated to S600+Slave and DIU if fitted. A Location description will also be required.

### Enable Read head – S610S only

If the S610 fails to read cards then the head must be turned on.

Select 125KHz head, click on Edit, select Turn on 125KHz head.

### 6.2 Changing reader Door Mode TIME duration settings

The following S610S parameters may be changed using the Devices application if required: -

Lock open time - (Sec) Maximum time to release the lock after a valid card presentation

Lock open time2 - (Sec) Time lock stays de-energised after a door is opened.

Try LockOpenTime 2 if interleaved double doors are used. This additional time setting allows the second door to open before the door's locks re-engage. Normally door locks will re-engage as soon as the first door is opened, locking the second door before it has opened.

Door close after - (sec) Maximum time for door to remain open before a door holder releases the door.

Close Time - (sec) After *Door Close After* has passed a door has this time to close, this allows a door to slowly swing shut after a door has released it, avoiding an unnecessary alarm..

Pre Alarm - (sec) The time duration the Pre Alarm sounder on the reader will sound. The alarm warns a person to close the door before an actual alarm is reported to the system.

Alarm Time - (sec) The time duration the sounder on the reader will sound

Debounce - (.5 sec) Settling time after a door has closed. Debounce avoids a door forced alarm when a door bounces open before finally remaining closed.

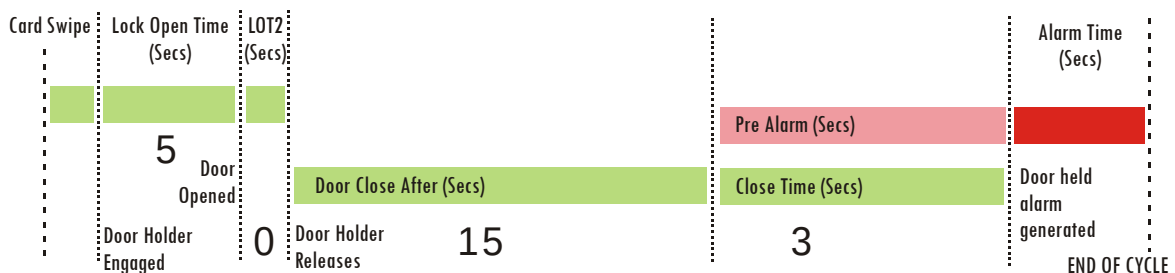
Display on time - (sec) Time the LCD backlight remains lit after a transaction or alarm.

PIN time - (sec) Time allowed to enter a PIN

Passenger Time - (sec) Maximum time for door to remain open in Passenger Mode before a door holder will release it.

Occupancy swipe time - (sec) - automatic equipment disable period (if LockOpenTime2 =0)

Confirmation Time - (sec) Retinal scan setting – not supported by S610S readers



AC2000 Door Mode door cycle time sequence of events.

### 6.3 Changing other reader settings

Configuration status - enable Smart Keys special card defs etc

Output level - Use these options to invert a selection of outputs

Input level - Use these options to invert a selection of inputs

Second swipe action - Use to configure reader action when a second card swipe at the reader occurs, while the first card swipe action is still active.

Global Pin - Set a pin number for this reader, the same PIN will be used by all for access during a PIN only Timezone.

Database size - used to change the off line data record set held on the reader

Site code - Used to change a site code on a reader. A special option only used if extended access control encompasses a new set of cards with a site code different from normal. Only cards with this site code will be valid on this reader.

Site code position - Only used for BAMC LED codes on Broadcast.

#### CONFIGURATION STATUS

| Configuration status                             |                                            |                                             |
|--------------------------------------------------|--------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Enable RTD mode         | <input type="checkbox"/> Enable smart keys | <input checked="" type="checkbox"/> Enabled |
| <input type="checkbox"/> Enable card definitions | <input type="checkbox"/> Enable messages   | <input type="checkbox"/> Enable freeload    |

Enable RTD mode - Passenger lock open time must be triggered by a Oneshot from RTD

Enable Card Definitions - check if using downloadable card definitions.

Enable smart keys - Check if Pico or embedded keys are used on the card type.

Enable messages - this must be checked if custom Reader Messages are to be down loaded to this reader. See manual on AC2000 Reader Messages, workstation application.

Enable freeload - Offline DB “Card Number only” is augmented with Time Zone data.

## OUTPUT LEVEL

| Output level                                  |                                               |                                               | <input checked="" type="checkbox"/> Enabled |
|-----------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Invert Amber 0       | <input type="checkbox"/> Invert Green 0       | <input type="checkbox"/> Invert Red 0         |                                             |
| <input type="checkbox"/> Invert Relay 0       | <input type="checkbox"/> Invert Relay 1       | <input type="checkbox"/> Invert Slave Red 0   |                                             |
| <input type="checkbox"/> Invert Slave Green 0 | <input type="checkbox"/> Invert Slave Amber 0 | <input type="checkbox"/> Invert Red 1         |                                             |
| <input type="checkbox"/> Invert Green 1       | <input type="checkbox"/> Invert Amber 1       | <input type="checkbox"/> Invert Slave Relay 0 |                                             |
| <input type="checkbox"/> Invert Slave Relay 1 | <input type="checkbox"/> Invert Slave Red 1   | <input type="checkbox"/> Invert Slave Green 1 |                                             |

Inverts the state of the output, e.g. Normally OPEN becomes normally Closed, or Normally ON becomes Normally OFF. Note: the physical state of the output changes, and can be checked using a multi metre.

## INPUT LEVEL

| Input level                             |                                         |                                         |
|-----------------------------------------|-----------------------------------------|-----------------------------------------|
| <input type="checkbox"/> Invert input 0 | <input type="checkbox"/> Invert input 1 | <input type="checkbox"/> Invert input 2 |
| <input type="checkbox"/> Invert input 3 | <input type="checkbox"/> Invert input 4 | <input type="checkbox"/> Invert input 5 |
| <input type="checkbox"/> Invert input 6 | <input type="checkbox"/> Invert input 7 |                                         |

Inverts the state of the inputs, e.g. Normally OPEN becomes Normally Closed. Note: The logic state (or perceived state) of the input changes. AC2000 does not have control over the actual input device.

## SECOND SWIPE ACTION

| Second swipe action                                                                                                    |                                                                                                     |                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| <div> <div>Re-enable mode</div> <div>Re-enable mode</div> <div>Disable mode</div> <div>Ignore card swipes</div> </div> | <input type="checkbox"/> No access on interlock<br><input type="checkbox"/> Ignore PIN in door mode | <input type="checkbox"/> Make relay 0 active<br><input type="checkbox"/> Don't end mode on close |

## GLOBAL PIN

Current Element Value - Enter a PIN number for this reader. Global PIN means the same PIN number will be used by all for access during a PIN only Timezone. Each reader can have a different Global PIN.

## DATABASE SIZE

Select Card Number, Timezone, Status and PIN (25000 card records approx.) as the offline database mode to be used with the S610S. CEM recommend this option if 25,000 card holders easily covers your site requirements. Only select Card Number (100000 card records approx.) if the memory on the Master reader becomes exhausted. If so, a compromise is required, this situation is rare. Selecting Card Number only means for example; If the reader is Off Line, a card holder will be able to get access outside of their Timezone.

## 6.4 Access control using PIN Only

Set PIN Only Time Zone if no card swipe is required for a period. For example set a Global PIN of "5678" and a PIN Only Timezone between 9-5 Mon to Sat, and enforce a card swipe outside of that Time Zone.

This means any person can enter using the PIN between 9-5 but a card is needed after hours. Outside the 9-5 MON-FRI Timezone a card holder must swipe their card and enter their private PIN

| Device Configuration                             |         |         |         |             |                    |
|--------------------------------------------------|---------|---------|---------|-------------|--------------------|
| Current Configuration                            |         |         |         |             | Filter: Time zones |
| Element                                          | Minimum | Maximum | Default | Value       |                    |
| PIN only time zone                               | -1      | 256     | -1      | 9-5 MON-FRI |                    |
| Card only time zone                              | -1      | 256     | -1      |             |                    |
| Door time zone                                   | -1      | 255     | -1      |             |                    |
| Element Description: Time zone for PIN only mode |         |         |         |             |                    |
| Current Element Value                            |         |         |         | 9-5 MON-FRI | Edit ...           |

During 9-5 MON-FRI only the global PIN is required to gain access.

Card only time zone - Where a reader has had it's keypad enabled, use this option to set card only action if you do not require card holders to enter a PIN for a period. Use an existing Time Zone period or create a new one. Use the AC2000 workstation application, Time Zones.

## 6.5 Card, Cardswipe and PIN or PIN ONLY options

### NO TIMEZONE APPLIED

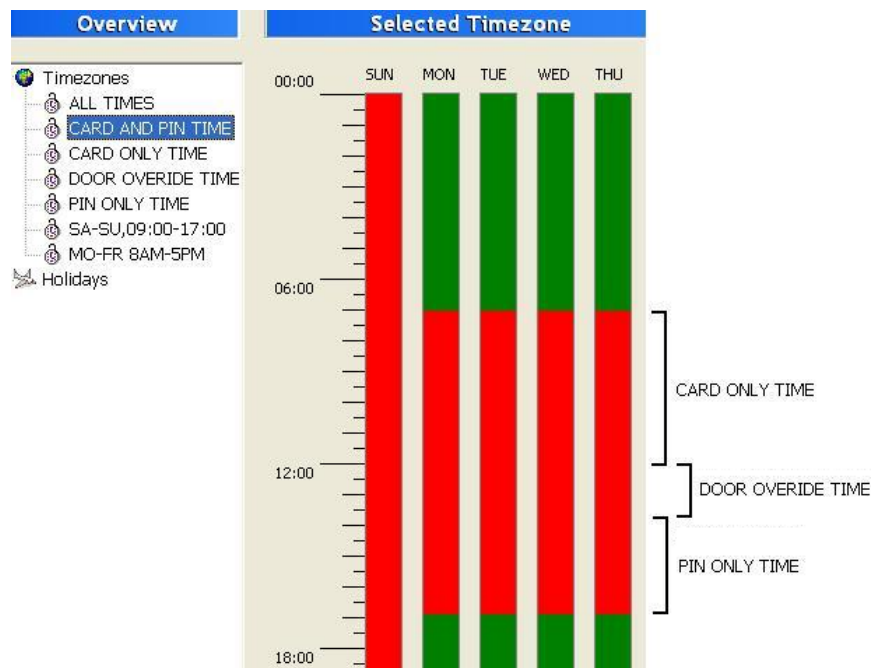
Using the master reader keypad menu options, the master reader can be set to NO KEYPAD for Cardswipe Only or KEYPAD for Cardswipe and PIN. The same must be done for the Exit Reader using the master reader keypad.

### WITH A TIMEZONE

The following options can be configured to apply during a time zone (TZ)

- Pin Only TZ      Card only TZ      or      Door Override TZ.

Use the AC2000 application suite to create a Time Zone then edit the Device configurations to change the reader's Time Zone options.



Example of Timezone (TZ) options, AC2000 workstation Time Zone application

Above, make sure Time Zones do not overlap.

### EDIT DEVICE CONFIGURATION

The screenshot shows the 'Device Configuration' window with the 'Time zones' tab selected. The window has tabs for Inputs, Other, Outputs, Time zones, and Times. Below the tabs is a table with columns: Element, Minimum, Maximum, Default, and Value. The table lists several time zone elements: PIN only time zone (Value: PIN ONLY TIME), Card only time zone, Door time zone, Master t/s time zone, Slave t/s time zone, and Time Zone Active (Value: Disabled). Below the table, there is a 'Description' section with the text 'Time zone for PIN only mode' and an 'Element Value' dropdown menu set to 'PIN ONLY TIME'.

Reader Time Zones.

Note: Door Time Zone can be further configured using Extended Time Zone mode.

PIN only time zone - Select, then Edit to apply the Time Zone you have created for PIN only

Card only time zone - Select, then Edit to apply the Time Zone you have created for CARD only

Door time zone - Select, then Edit to apply the Time Zone you have created for DOOR OVERRIDE, the door will be unlocked during this Time Zone. Read heads are disabled and door input alarm monitoring is disabled.

Master t/s time zone - Edit, to disable Master Turnstile during this Time Zone

Slave t/s time zone - Edit, to disable Slave Turnstile during this Time Zone

Time Zone Active - Enable if you want to used Extended Time Zone mode.

#### WHAT IF THE READER IS OFFLINE ?

The settings described above are also stored on the reader, so if a reader becomes off line, the time zone operations will remain in place, and access control continues as programmed. If Door Override is configured to open a door for a set Timezone then the door will continue to unlock when the reader is off line. A broadcast to open a door, while a reader is off line will fail.

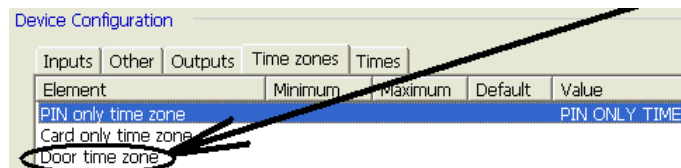
For PIN ONLY see paragraph 7.7 PIN Only, in this manual.

For options to separate Master and Exit PIN requirements see 7.8, Extended Timezone configuration.

## 6.6 Extended Timezone configuration

Introduced to the S600S reader firmware version1.00.034. Extended time zone allows access control between Master and Exit reader to differ according to Timezone settings. It is not possible to have different time zones applied to each Master and Exit reader.

For example: between 9am to 5pm PIN only may be required to gain access at the reader, but after hours, a CARD+PIN would be required to gain access, but to leave the area it can be always PIN ONLY.



Shows Device Configuration – Door Time Zone.

Above, Extended Time Zone settings apply to this configured Time Zone.

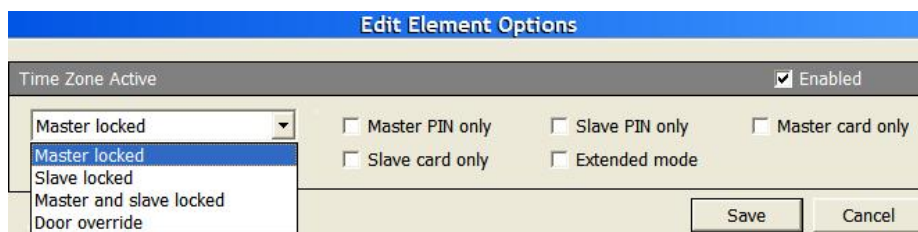
Using AC2000 workstation Devices application, select a configured S600 type reader.

From the Configuration table filter TimeZones, select Time Zone Active.

If needed the function will need to be Enabled.

#### TIME ZONE ACTIVE

See Door Time Zone above.



S610S Time Zone Active options group.

Master locked - For the duration of Door Time Zone the Slave reader will respond, but Master read head and keypad are disabled.

Slave Locked - For the duration of Door Time Zone the Master reader will respond, but Slave read head and keypad are disabled.

Master and Slave Locked - This option will LOCK DOOR and disable read head and keypad for the duration of Door Time Zone.

Door Override - This option will UNLOCK DOOR for the duration of Door Time Zone. The read head and keypad are disabled.

Master Pin only - During the Door Time Zone only the Key Pad is enabled. The Master read head is disabled. Key pad must be enabled using the reader's onboard diagnostic menu.

Slave Pin only - During the Door Time Zone the Exit read head is disabled the Key pad must be enabled using the reader's onboard diagnostic menu.

Master card only - During the Door Time Zone only the master read head is enabled.

Slave card Only - During the Door Time Zone only the Exit read head is enabled

Extended Mode - MUST be checked to enable any of the above setting to take place.

## 7 Door Modes

The S610S supports a number of door modes that determine what actions are taken when a card transaction is made. Reader inputs, outputs, transactions and alarms may all be affected.

**Configuration  
Doormode**

**DOOR RDR  
0 OK # Next**

Press **#** to scroll through available modes, press **0** to OK selected mode.

### DOOR MODE

Select the operational mode that the reader will use.

**Door Rdr** - This is the most common operational mode for interfacing the reader with door lock circuitry.

**Turnstile** - Turnstile mode allows the reader to control a powered turnstile. The reader output sends a pulse of one second or more to trigger the Turnstile equipment. For a shorter pulse see **P Turnstile**, below. Anti Pass back settings are commonly utilised with Turnstile mode.

**Verification 24** - Use this mode to display 24bit card details or when the reader is being used as a Card Validation Reader, see AC2000 System Guide Personnel application.

**Passenger** - Allows a cardholder with special permissions to open a door for Passenger open time using the S610S for a fixed period. Passenger door mode commonly utilises Interlocking (IP3) either as a pair of readers or as part of a CEM Interlock PLC configuration.

**P Turnstile** - Pulse Turnstile mode allows the reader to control a powered turnstile triggered by a single short pulse (0.5 Secs).

**Trolley** - Trolley mode allows extended Door Open times, only Special card status card holders are allowed access. Trolley door mode commonly utilises Interlocking (IP3) either as a pair of readers or as part of a CEM Interlock PLC configuration.

**Equipment Enable** - Select this option if using a reader output to enable 3<sup>rd</sup> party equipment.

**Verification 32** - Use this mode to display 32bit card details or when the reader is being used as a Card Validation Reader, see AC2000 System Guide Personnel application.

**Desfire Verification** - Use this mode to display Desfire card details or when the reader is being used as a Card Validation Reader, see AC2000 Personnel application.

**Type AE, AG, CC, CE, CG, HG, JE, JG,JK** - not generally available. (Vancouver modes)

**Control Post** - The reader's sole purpose is to record card transactions to the access control system. The reader does not control any door lock or other equipment.

**PIR Reader** - Master Reader only is present at door. A special kind of door handle is used on the insecure side of the door. When the handle is turned, lock power is dropped mechanically, and the door can be opened. AC2000 will interpret the door opening as a *door forced* event and so a PIR sensor, connected to the REX input (IP2) is mounted on the insecure side of a door to mask door forced alarms, the PIR signal does not cause the lock power to drop.

**Multi Badge Access** – More than one card must be swiped to gain access, a maximum of five cards can be required. The same number of cards is required on the exit reader.

**Lift Reader** – In this mode the reader must be connected to a CEM Lift controller such as the S9032LC. Please refer to the CEM S9032LC installation manual for more information on Lift Reader functions.

## 7.1 Door mode

The most common mode for access control readers; on presentation of a valid card, access is granted.

Open AC2000 Devices application; select the reader from the Overview table.

From the Current configuration table select Door Mode and click Edit, select Door and Save.

See also Interlock in Door mode, Interlock chapter in this manual.

## 7.2 Verification 24, Verification 32

Verification mode can be used to display cards embedded numbers on the reader's LCD. Reader address must be 15, otherwise only a Card Read message is displayed.

Swiped card transactions are not stored on the AC2000 system. All compatible cards will be read and the card number and site code displayed.

Verification mode is used on Validation readers. For more information on card validation, consult the CEM AC2000 System Guide, or the S610S validation reader Quick Guide available from the CEM website.

### Desfire Verification

As above, but only applies to Desfire technology. The Mifare Desfire contactless smart cards operate in the 13.56 MHz frequency range with read/write capability. The Desfire card type uses encryption. Currently only supported by the S610S reader model. Verification mode is used on Validation readers. Contact CEM for more information. Desfire verification is not supported in the current firmware version B1.00.049.

### Encrypted verification – Mifare Finch

Custom mode: Please contact CEM for more details. Card Number is transmitted from the S600s Reader to the Workstation as an encrypted 6 characters (24 bit) or 8 characters.

32 bit Encrypted Verification mode is activated by choosing [ENCRYPTED VER 32] door mode. When the Reader address is set to 8 to 15, Encoded 8 Characters will be displayed on S600s LCD. When reader address is set to 1, information will be transmitted through only COM0

24 bit Encrypted Verification mode is activated by choosing [ENCRYPTED VER 24] door mode. As soon as card is swiped, Card Number is encoded and S600s Reader transmits Encoded 6 characters through selected output ports.

When the Reader address is set to between 8 and 15, Encoded 6 characters will be displayed on S600s LCD. Note, In this mode, first two numbers are encoded and displayed only on LCD for SITE.

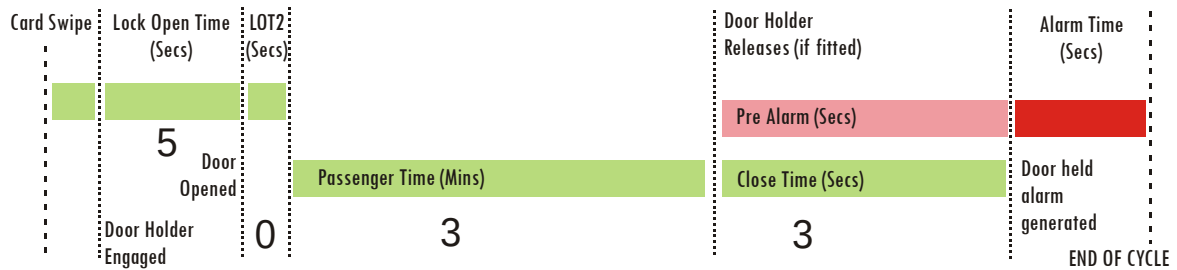
## 7.3 Passenger mode

Passenger mode extends the normal door open time to Passenger time, set in Minutes. Passenger mode can only be activated by a card holder with Special Usage card status (set in the Personnel application). The Special Usage card holder must press the reader keypad [\*] for normal door open time or [#] for Passenger Time door open time. Ordinary card holders remain unaffected by this mode, and will get ordinary access if their access level allows.

### CONFIGURE PASSENGER MODE

Open AC2000 Devices application; select the reader from the Overview table.

From the Current configuration table select Door Mode and click Edit, select Passenger and Save. The Passenger Mode configuration will be downloaded to the reader by the system. A Special or Staff Card will be required at the reader to activate Passenger door opening time.



AC2000 Passenger Mode card transaction time sequence

## Interlocking Passenger mode (Lobby Mode)

Passenger mode commonly works in conjunction with Interlocking to create a Valve Lobby; Arrivals/Departure doors for example. Valve Lobby interlocking can be between a pair of interlocked readers, or using a CEM Interlock Unit, two or more doors can be interlocked. The master reader Interlock Input; Input 3 or Input B (if DIU is being used) must be set in the Devices application, putting the reader into Lobby Mode.

Interlocking two readers together in passenger mode requires extra cabling.

See [Passenger mode interlock – Lobby Mode](#) Chapter 8.2 for more details on Interlocks.

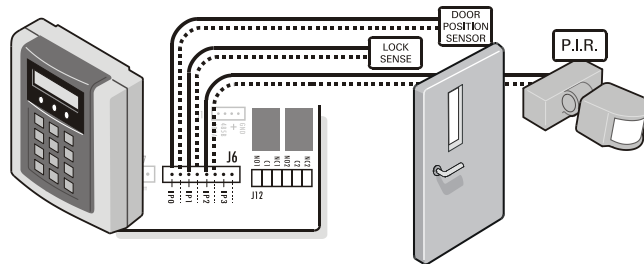
## 7.4 Control Post mode

Simply a post where passing card holders swipe their cards, no door or other barrier is present except perhaps a security guard.

Note: All inputs and outputs are available for GP use, i.e. Panic Button and sounder.

## 7.5 PIR mode

Master Reader only is present at door. A special kind of door handle is used on the insecure side of the door. When the handle is turned, lock power is dropped mechanically, and the door can be opened. AC2000 will normally interpret the door opening as a *door forced* event; so a PIR sensor, connected to the REX input (IP2) is mounted on the unsecure side of a door to mask door forced alarms. In this mode, the PIR signal does not cause the lock power to drop.



PIR mode input assembly, normal Request to Exit (REX) behaviour is disabled.

## 7.6 Passenger-staff exit mode

### PASSENGER-STAFF EXIT MODE

Passenger-staff exit is the newly created door mode. This mode is based on “Passenger Mode” and includes the new features described below. Minimum reader firmware B1.0.0.43 for S600E and B1.0.0.49 for S600S is needed and a patch to AC2000 6.1 or earlier is needed.

|                           | Passenger Mode                                                                                              | Passenger-Staff Exit Mode                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| REX                       | REX starts Passenger Access Mode and door is held for extended door open time                               | Door is held for normal door open time.                                                           |
| Card swipe on exit Reader | No difference with swipe on master reader. Card swipe on Exit reader is also able to start Passenger Access | Card swipe on Exit reader is not able to start Passenger Access working as per normal card swipe. |
| Full interlock            | Supported since version 39                                                                                  | YES                                                                                               |

### FULL INTERLOCK FEATURE

Please refer to “Passenger mode full interlock.doc”

## Air-Bridge with Passenger-Staff exit mode

### INTERLOCKING

Door interlock feature is active when Reader is in Lobby mode. When “Normal input” of input-3 configuration is cleared and Reader is in Passenger-staff exit mode, Lobby mode will be automatically activated.

As input-3 is active, when reader is interlocked, reader may disable its head and prevent any card swipe depending on the configuration status - “No access on interlock” in Second swipe Action (0x04).

When “No access on interlock” configuration is cleared, Reader works as described in the table below.

Present states are listed under the Air-Bridge state column and the state that any of the three door sets may be switched to is listed under the relevant door type column.

| Door Interlocking, Privilege Card |                             |                             |                             |
|-----------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Air bridge State                  | Arrival Door                | Departure A                 | Departure B                 |
| Idle state                        | Passenger or Staff Access   | Passenger or Staff Access   | Passenger or Staff Access   |
| Arrival door passenger access     | Cancel Mode or Restart Mode | Staff Access Only           | Staff Access Only           |
| Departure door A passenger access | Staff Access Only           | Cancel Mode or Restart Mode | Passenger or Staff Access   |
| Departure door B passenger access | Staff Access Only           | Passenger or Staff Access   | Cancel Mode or Restart Mode |

| Door Interlocking, Non-Privilege Card |                                 |                                 |                                 |
|---------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Air bridge State                      | Arrival Door                    | Departure A                     | Departure B                     |
| Idle state                            | Staff Access Only               | Staff Access Only               | Staff Access Only               |
| Arrival door passenger access         | No action, Door is already open | Staff Access Only               | Staff Access Only               |
| Departure door A passenger access     | Staff Access Only               | No action, Door is already open | Staff Access Only               |
| Departure door B passenger access     | Staff Access Only               | Staff Access Only               | No action, Door is already open |

**IDLE STATE**

In the idle state all doors are closed and locked and the Air-Bridge lobby is secured. The Air-Bridge lobby may change to either passenger access or staff access from the idle state.

**STAFF ACCESS**

Staff Access feature is designed to allow single person access. When reader is in the idle state, the normal card swipe de-energises electro-magnetic door lock for door open time while the special usage card swipe de-energises door lock for extended door open time.

These door open times are configurable.

**PASSENGER ACCESS**

When a special usage card is swiped during Passenger Access mode active, the option to either Cancel or Restart the Passenger Access mode will be given. Cancelling the mode will energise electro-magnetic door lock and make reader ready to generate the door open alarm displaying "CLOSE DOOR !!" message on LCD. If door is not closed for a configured time, Reader will generate the door open alarm.

Restarting the mode will re-initialise and extend the mode for the extended door open time.

**REX**

Using a REX which interrupts the Passenger Access mode will cancel the mode.

When Reader is in the idle state and Door mode is Standard Passenger Mode, REX will start the Passenger Access mode de-energising door lock for the extended door open time.

When Reader is in the idle state and Door mode is Passenger-staff exit Mode, REX will work as per a normal card swipe (door open time).

**Second Swipe Action configuration**

Second Swipe Action contains three special options to define the action of the card swipe during the Passenger Access mode is ON. Note that Second Swipe Action is basically designed for a special usage card swipe. In some cases, however, a normal card swipe will get the same effect.

**RE-ENABLE MODE**

Re-enable mode = 0x00

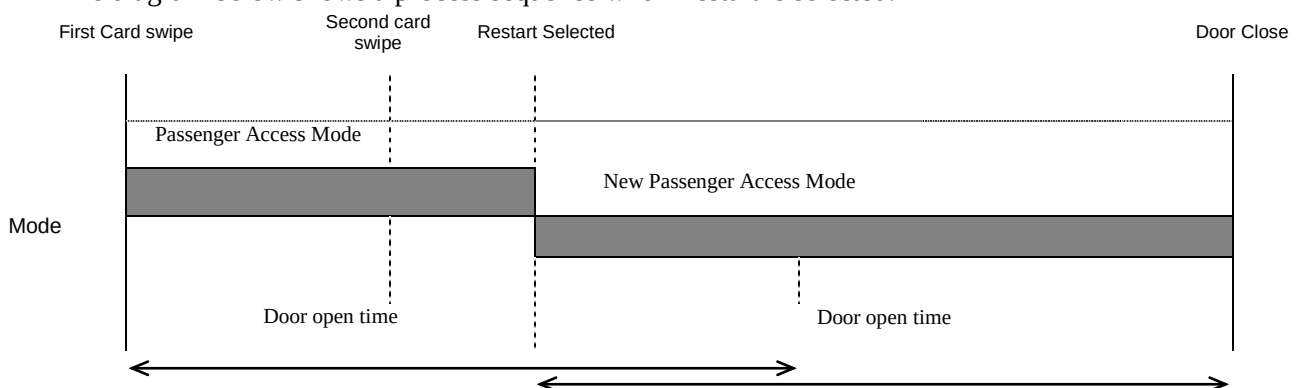
This is the default value of Second swipe action configuration.

Special usage card swipe:

When a special usage card is swiped during the Passenger Access mode, The reader displays Mode Extension Menu [ End \* Restart # ] and this will allow card holder to either Cancel or Restart the mode.

The second card swipe doesn't affect the Passenger Access mode until one of options is selected and the mode is still on process counting down timer even though Mode Extension Menu is being displayed on the LCD.

The diagram below shows a process sequence when Restart is selected.



#### Normal card swipe:

When Reader is in the Passenger Access Mode, the normal card swipe doesn't affect the Passenger Access mode and Reader displays "Door Open !" with the valid card swipe buzz.

#### DISABLE MODE

Disable mode = 0x01

#### Special card swipe:

If Reader is in the Passenger Access mode, the Mode will be immediately terminated.

#### Normal card swipe:

The normal card swipe doesn't affect the Passenger Access mode and Reader displays "Door Open !" with the valid card swipe buzz.

#### IGNORE CARD SWIPES

Ignore Card Swipes = 0x02

When this is configured Reader disables its heads after the first card swipe. Reader displays "No Access" during the mode ON.

## 7.7 Trolley mode

Trolley mode will allow a Staff Card holder to hold open a door for the throughput of goods handling machines (fork-lifts for example) or other bulky items that require a secure powered door to be held open for an extended period. An ordinary access card when swiped at a reader in Trolley mode will be refused access, even though the reader may indicate to the contrary. This option has been designed to restrain normal card holders accessing loading bay or outdoor concourse areas where heavy machinery or airside airport restrictions apply. For more information on assigning Staff Card permissions refer to the AC2000 VIPPS manual.

#### CONFIGURE TROLLEY MODE

Open AC2000 Devices application; select the reader from the Overview table.

From the Current configuration table select Door Mode and click Edit, select Trolley and Save. Use Passenger Time (minutes) for time trolley door is open.

#### TROLLEY MODE INTERLOCKING

Trolley mode commonly works in conjunction with Interlocking. Interlocking can be between a pair of interlocked readers or between readers and a CEM Interlock Unit, each interlock solution requires extra cabling to be in place.

## 7.8 Turnstile Mode

### Selecting S610S Turnstile Mode

Using the reader's key pad enter the readers setup mode.

From the Configure menu scroll to Door mode then select either, Turnstile or P Turnstile mode.

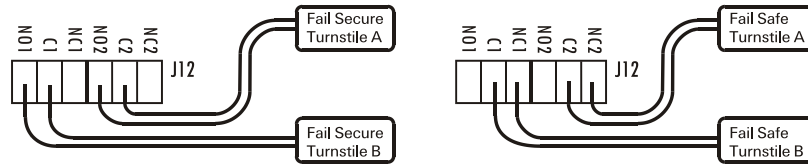
Turnstile - Use this option unless the turnstile being used required a trigger pulse of less than one second. In this mode LockOpenTime2 can be set by the installer. If the pulse required is less than One Second then the installer must select Turnstile (fast pulse) mode, see below.

P Turnstile - Use this option if the turnstile being used requires a trigger pulse of less the one second. In this mode LockOpenTime2 must be set to "0" (Zero time)  
Turnstile (fast pulse) is not currently available on the EtherProx reader.

### Single S610S reader – Fail Secure/Fail Safe

IMPORTANT- the labelling on the S610S and S610E series reader J12 connection, indicates the state of the relay when the reader is powered down. When the reader is powered up the relays change to the opposite state, therefore Normally Closed becomes OPEN.

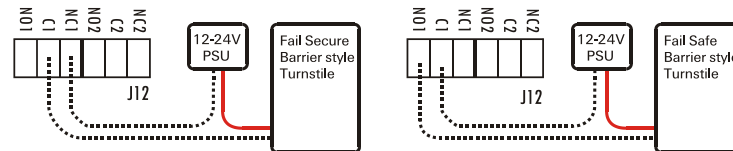
When wiring up your turnstile to the reader outputs, always test the state of the relays to ensure the correct output connections are made.



Typical wiring for two turnstiles

Above, typical wiring for two turnstiles/speed-gates or one bidirectional unit with two restrictors fitted.

### Controlling power to a turnstile



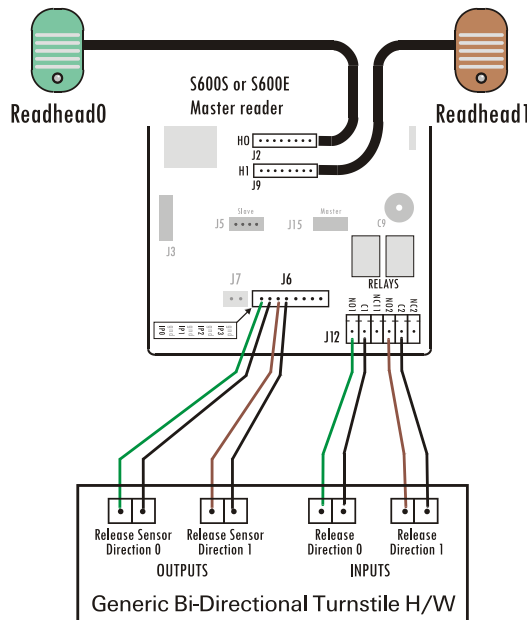
Sample wiring for a uni-directional turnstile barrier with external PSU.

NOTE: S610E and S610S reader dry contact relay outputs support up to 24V.

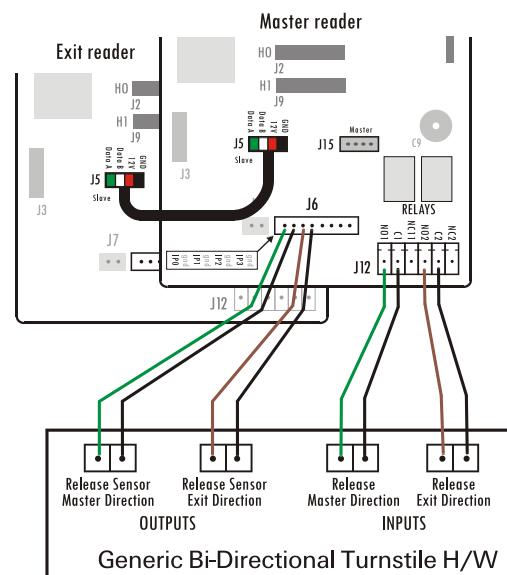
Unless set otherwise the default relay states on a reader are Fail Safe.

- When power fails to a reader the Normally Open position becomes in a Closed state.
- If the reader output is configured to operate in Fail Secure mode, power failure to the reader will result in Normally Open remaining in the Open position.
- An installer should always check Relays states using a multi-meter.

### Wiring a bidirectional turnstile



Shows an S610E or S610S Master reader connected to a sample bi-directional turnstile. Request to Exit buttons can also be connected to J6 inputs ID2 and ID3 if required



Shows an S610E or S610S Master and Exit reader connected to a sample bi-directional turnstile. Request to Exit buttons can also be connected to J6 inputs ID2 and ID3 if required

### S610E/S610S Inputs and Outputs

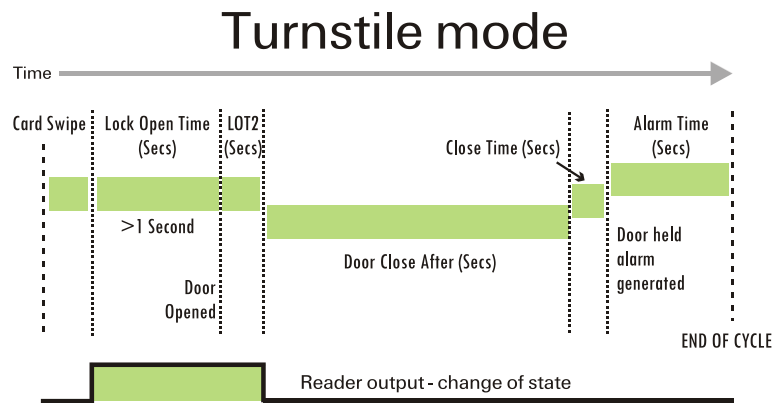
| S610S or S600E master reader Inputs and outputs in Turnstile modes |       |                                                             |
|--------------------------------------------------------------------|-------|-------------------------------------------------------------|
| IP0                                                                | Input | Used to record Turnstile position after Readhead0 cardswipe |

|        |        |                                                                                                                                                                                                                          |
|--------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |        | Configure in AC2000 Devices application if an Alarm is required.                                                                                                                                                         |
| IP1    | Input  | Used to record Turnstile position after Readhead1 cardswipe<br>Configure in AC2000 Devices application if an Alarm is required                                                                                           |
| IP2    | Input  | REX Button (Head0 side of Turnstile, triggers Relay0)<br>(Optional)                                                                                                                                                      |
| IP3    | Input  | REX Button (Head1 side of Turnstile, triggers Relay1)<br>(Optional)                                                                                                                                                      |
| Relay0 | Output | Dry contact relay. Note the Relay changes state on reader power up.<br>Choice of Normally Open or Normally Closed contacts.<br>Release signal to Turnstile for Direction0<br>Actioned by a valid cardswipe on Readhead0  |
| Relay1 | Output | Dry contact relay. Note the Relay changes state on reader power up..<br>Choice of Normally Open or Normally Closed contacts.<br>Release signal to Turnstile for Direction1<br>Actioned by a valid cardswipe on Readhead1 |

## AC2000 – Configuring Turnstile Mode

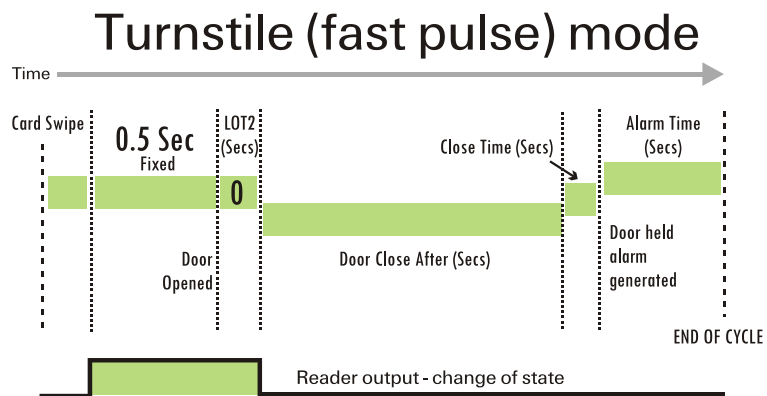
### TIME CONFIGURATION

NOTE: For Fast Pulse Turnstile mode, Lock open time two MUST be set to Zero.



Pulse Turnstile, one second or more pulse output

Correct for Firmware revision B1.00.023. LOT2 indicates “Lock open time 2”



NOTE: In Turnstile (Fast pulse) mode LOT2 MUST be set to “0” (Zero time)

Fast Pulse Turnstile, fixed half second pulse output.

Correct for Firmware revision B1.00.023

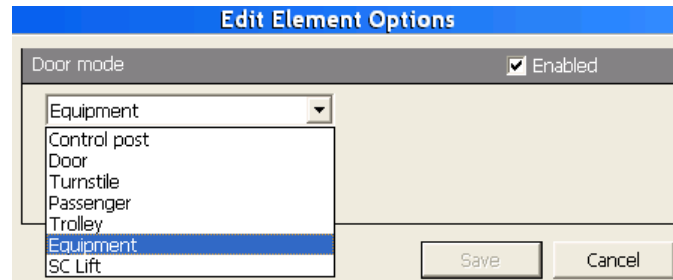
LOT2 indicates “Lock open time 2” which MUST be set to Zero for Fast Pulse operation.

## 7.9 Equipment Enable mode

### INTRODUCTION

A reader configured for equipment enable must not be used to control a door lock.

The S610S Equipment Enable door mode is used to independently control a maximum of two external pieces of equipment e.g., check-in-desks. The control of the external equipment is provided by the relay outputs on the S610S. One input on the S610S is available for each piece of equipment under control to provide a feedback signal from the external equipment to the S610S. The S610S can be configured to ignore the feedback signal during the enable period. Connecting a feedback input is optional.



### Setting Timing controls on equipment

By configuring suitable values for LockOpenTime and LockOpenTime2 equipment mode can be used to provide either single pulse output to enable and disable external equipment or to provide a latched output during the enable period.

### Functionality

#### OUTPUT ACTION ON A VALID CARD SWIPE

Whenever a valid card swipe occurs on the master (slave) head the S610S will energise relay0 (relay1) for LockOpenTime seconds.

#### FEEDBACK FROM EXTERNAL EQUIPMENT

If a feedback signal is provided from an output on the external equipment to the S600 this should be connected to input0 (or input2 if the second relay is to be triggered) of the master reader. The S610S will monitor this input during the LockOpenTime period to ensure that the external equipment has in fact been enabled. If a state change occurs on the relevant input, the S610S will enable the amber LED on the master and slave head and maintain the energised state of relay0 (relay1) for LockOpenTime2 seconds and transmits a Equipment Enabled signal to the host controller. The S610S is now in the Equipment Enabled state.

If no state change is detected on the relevant input the S610S transmits an Equipment Enable Failure signal to the host controller.

If no feedback signal is provided from the external equipment the S610S will enable the amber LED on the master and slave head and maintain the energised state of relay0 (or relay1 if head two is being used, see figure13.5a) for LockOpenTime2 seconds and transmits a Equipment Enabled signal to the host controller. If the S600E is not online to the host controller, all the above alarms are stored as offline transactions.

#### S610S IN EQUIPMENT ENABLED STATE

Whenever a valid card swipe occurs on the read head one (or read head 2) the S600S will energise relay0 (or relay1 if read head two is used) for LockOpenTime seconds.

If a feedback signal is provided from the external equipment to the S610 this should be connected to input0 (input2) of the S610S. The S610S will monitor this input during the LockOpenTime period to ensure that the external equipment has in fact been disabled. The S610S will disable the amber LED on the master and slave head and transmit an Equipment Disabled signal to the host controller. The S610S returns to the IDLE state. If no state change is detected on input0 (input2) the S610S de-energises relay0 (relay1) after LockOpenTime seconds and transmits an Equipment Disabled Failure signal to the RTC and the S610S returns to the IDLE State.

If no feedback signal is provided from the external equipment the inputs must be disabled, otherwise the reader will wait for a response before continuing. In the S610S will disable the amber LED on the master and slave head, disable relay0 (relay1) and transmit a Equipment Disabled signal to the host controller. If the S610S is not online to the host controller, all the above alarms are stored as offline transactions.

### Automatic equipment disable feature

The external equipment can be automatically disabled after a configurable period. This timeout is initialised every time the piece of equipment is enabled. An automatic disable will occur if the piece of external equipment is not disabled before the timeout expires. Whenever this timeout occurs, a card usage packet will be transmitted to the host controller (the card number used to enable the equipment will be in the packet) and the S610S will perform the functions outlined in “**S610S in EQUIPMENT ENABLED state**” above. The timeout period is set by LockOpenTime2. If pulsed operation is needed i.e., LockOpenTime2 =0, then the timeout period is set by the configurable parameter OccupancySwipeTime (seconds).

If the S610S is offline (whenever the timeout occurs) an offline transaction with outcome code hex 1E is stored for later transmission to the host controller.

### Equipment Enable - Time settings

LockOpenTime (Secs) – time output relay is initially pulsed

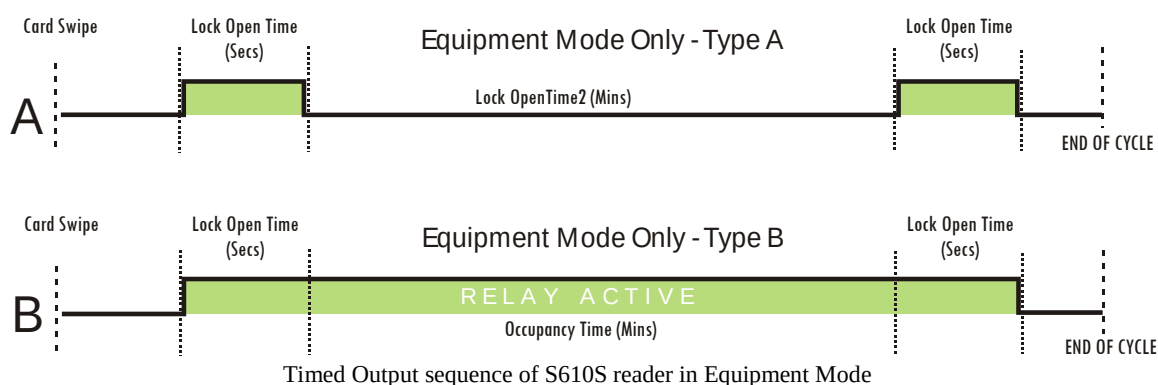
LockOpenTime2 (Mins) – time output relay is held in the enabled state

I/P-MAP0 – used to enable input monitoring for equipment enabled for swipes originating on master head. Input0 must be disabled if not used.

I/P-MAP2 – used to enable input monitoring for equipment enabled for swipes originating on slave head. Input2 must be disabled if not used.

OccupancySwipeTime (Mins) – automatic equipment disable period (if LockOpenTime2 =0)

DOOR-MODE (type) – value of 09 configures reader as Equipment Enable Mode



Equipment type A – One second Pulse each for start and stop, either side of LockOpenTime2

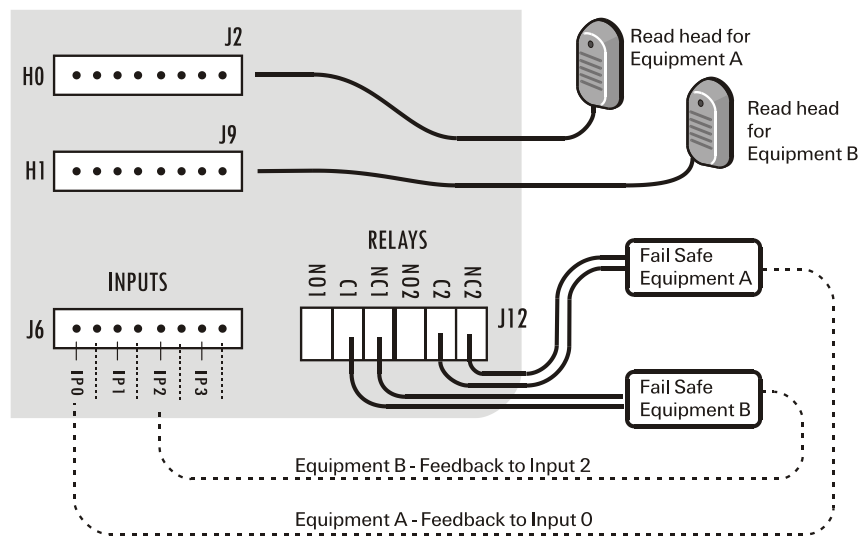
Equipment type B – Relay output changes state for duration of cycle, Occupancy time.

### Equipment Enable card usage outcome codes

| Outcome Code | Event                        |
|--------------|------------------------------|
| Hex 1C       | Equipment Enabled            |
| Hex 1E       | Automatic Equipment Disabled |
| Hex 1D       | Equipment Disabled           |

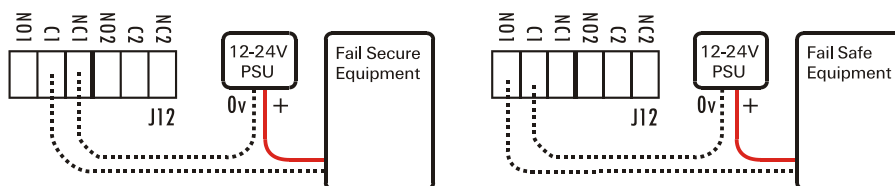
## Connection Diagram for Equipment mode

Please note the S610SP Pico Reader does not support a second read head.



An example of S610S PCB connections used for Equipment Mode.

The relay connections, Normally Open or Normally closed will be specific to the equipment being controlled.



An example of S610S PCB connections used for Equipment Mode.

The relay connections, e.g. Normally Open or Normally closed will be specific to the equipment being controlled.

Note: Unless set otherwise the default relay states on a reader are Fail Safe.

- When power fails to a reader the Normally Open position becomes in a Closed state.  
When power is restored to the Reader the relay states become opposite to the legend marked states on the PCB.
- S610S readers equipment feedback inputs are 0 and 2.

## AC2000 software settings for equipment mode

### WORKSTATION APPLICATION –HOLDER RECORD

No additional Personnel/Card Holder application settings are required for a card holder to enable equipment using an S610S reader in Equipment Enable mode.

### WORKSTATION APPLICATION – ACCESS LEVELS

Any S610S reader set to Enable Equipment mode must be placed into an Access Level.

Any card holder enabling controlled equipment must be a member of that Access Level.

## Equipment Mode; Input configuration

Any Equipment Enable reader inputs used will be set to Normal. See Chapters 12 and 13 of this manual. If not used inputs 0 and 2 must be disabled.

## Alarm Configuration

Any Alarm required for notification on an Alarm Event Display (AED) as a result of an Equipment Enable reader input changing state will have to be setup in an AC2000 workstation application Alarm configuration.

### 7.10 Multiple badge access

Multiple badge access, or No Lone Zone, allows the reader to be configured to require more than one valid card transaction, before access is granted. The purpose is to deny individuals being alone in restricted or highly secure areas, and to ensure persons can only enter or exit the area when escorting each other. Two or more different valid card transactions are required, up to a maximum of five. The biometric S610F fingerprint reader also supports this configuration. Reader firmware version B1.00.030 or higher is needed.

Two configurations are required:

AC2000 Device application: select the reader, then configured > other> multi swipe mode

1. Set the number of different valid cards required to allow access
2. Set the time allowed for all the required entry or exit transactions to take place.

When the time allowed is set to 0 Multiple Badge Access is turned OFF, i.e. the reader will release the lock with a single card swipe.

Where an Exit reader is fitted the rule applies to that also. If two cards are swiped and one person leaves the area, the other person will be unable to leave on their own. To open the door it will require two different transactions on the "Entry" reader to release the person on the secure side.

## 8 Interlock

### 8.1 Interlock in Door Mode

Interlock in door mode enables the second output Relay (Relay1) on the reader to be usefully activated; the output is used to notify another reader, logic control device or interlock controller the door is active. Options like, Special Cards, REX and Oneshot can apply. This mode can not be selected from the Door Mode option table. The following settings need to be made. This mode is supported on Firmware version B1.00.042 or later. For Passenger Mode interlocking, consult the paragraphs on Passenger Mode interlocking in this manual.

#### TO APPLY INTERLOCK IN DOOR MODE

Use the workstation Devices application to configure the reader settings. When two readers are joined to create a “mantrap” or “airlock” both readers must be configured.

#### Configure the reader’s interlock input

Select the reader from the Devices > Configuration > Inputs

1. Edit Input 3 (or IPB if DIU present) and ensure Normal setting is clear.  
When input 3 (or IPB) is in the open condition the reader will be interlocked and all card transactions will be denied. Oneshot and REX commands will be allowed.

#### Configure the reader’s interlock output

2. Edit Configuration > Other > Second Swipe Action check No Access on Interlock.

If checked, Oneshot & REX commands to this Master reader and Slave will be denied.

3. Edit Configuration > Other > Second Swipe Action check Disable Special Door Mode.

Place a check to disable door open for Passenger Time. If this check is clear, a Special card used at the door will cause the door to be open for Passenger time. Use the dropdown box to select Re-Enable mode if you want a second card swipe to restart Passenger Time; select Disable Mode if you want a second card swipe to end Passenger Time early.

Times: The interlock output will be active for the duration of:-

LockOpenTime,+LockopenTime2+Door Close after ( or Passenger Time if enabled) .

Select the reader from the Devices > Configuration > Times and edit according to your needs.

#### Configuring Interlock Input IP 3, or IPB (if DIU)

An interlock input signal from the other door’s second door position sensor must terminate at Input 3 or Input B (if DIU is being used). Only two readers can be interlocked in this way, for larger interlock zones with more than two readers a CEM PLC Interlock device must be used.

A CEM Interlock PLC device will be connected to all the readers in the interlock zone, and will use input 3.

Using an AC2000 workstation, open the Devices application and locate the required reader, expand the reader options. From the Input Table select Input 3, (or Input B if a DIU is present as the software will have renamed that contact on the reader) click on Edit.

Ensure the Normal input option is clear or unchecked; exit edit mode and close the Devices application for the new setting to take effect.

## 8.2 Passenger mode interlock – Lobby Mode

Passenger mode interlock is called Lobby Mode. It is recommended to install a CEM Valve Lobby Controller, though it is possible to create interlocking in Passenger Mode without one.

### Without a Valve Lobby Controller

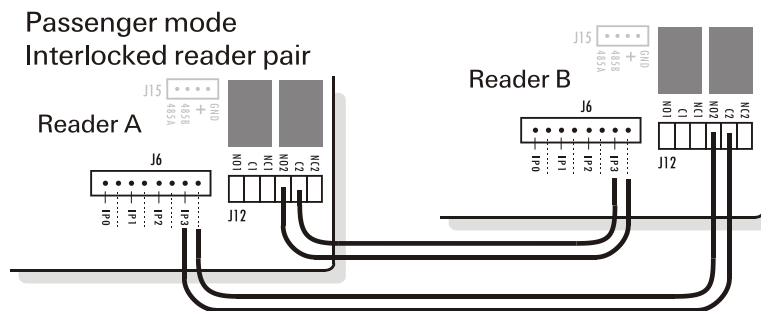
Using the AC2000 Devices application first set the S610S reader to door mode.

Next configure the Inter lock IP3 (or IPB if DIU present) by removing the Normal setting. See the paragraph above, Configuring Interlock Input IP 3, or IPB (if DIU).

Wire the two master readers to be interlocked as shown below.

#### IMPORTANT

Normally the interlock Input (IP3) is CLOSED; the Input going OPEN will create the interlocked condition on the local reader. Note the S610S and S610E relays change state when the reader is powered ON.



The relays on the S610S change state when powered up.

The relays on the S610S change state when powered up. Therefore NO (Normally Open) becomes CLOSED, going OPEN when triggered.

### No access on interlock

Devices application: Configuration > Second swipe action > No access on interlock – this will prevent Staff card holder access while the door is interlocked in Passenger Mode. Passenger Mode interlocking normally allows Staff card holders to pass through the door.

One-shot and the REX input will also be disabled while the door is interlocked.

### With a Valve Lobby Controller

A Valve Lobby Controller is a pre-programmed PLC two door interlock controller, available from CEM. Please consult the CEM Valve Lobby Controller manual.

Other pre-programmed PLC units are available from CEM for more complex interlocking requirements.

Make relay 0 active – This setting only applied to readers in Passenger Mode. Normally Relay1 changes state when the Door is opened in Passenger Mode. This setting changes that from Relay 1 over to Relay 0.

Don't end mode on close – Normally when a door is closed the Door Position sensor changes state and that causes a Door cycle to halt and the door to be locked. Another valid card swipe will be required to open the door again. Use this setting if you have "swinging" doors, and want Door Open Time or Passenger Mode to run until timeout before the door locks again. A second swipe action will cause the doors to lock

## 9 Other AC2000 software configurations

### 9.1 To Edit or Add an input for AED alarm management

Fully configuring an AED is outside the scope of this S610EP manual. For more information on AED setup Refer to the AC2000 Getting Started manual. See chapter on Devices.

Before attempting to configure an input you must know:-

- The device address
- The input number the sensor is connected to
- The relay or sensor “change of state” which triggers the signal, i.e. Normally Open or Normally Closed.

#### S610E input table – No DIU

| Device | Input # | Description          | Sensor State | Typical AED Alarm |
|--------|---------|----------------------|--------------|-------------------|
| Master | Input 0 | Door Position        | Closed       | Door Closed       |
| Master | Input 0 | Door Position        | Open         | Door Forced       |
| Master | Input 1 | GP or Lock Condition | Closed       | Lock Engaged      |
| Master | Input 1 | GP or Lock Condition | Open         | Lock Not Engaged  |
| Master | Input 2 | REX                  |              |                   |
| Master | Input 3 | GP or Interlock      |              |                   |
| Slave  | Input 4 | GP                   |              |                   |
| Slave  | Input 5 | GP                   |              |                   |
| Slave  | Input 6 | GP                   |              |                   |
| Slave  | Input 7 | GP                   |              |                   |

#### S610E with DIU Input table

| Device | Input # | Description             | Sensor State | Typical AED Alarm |
|--------|---------|-------------------------|--------------|-------------------|
| DIU    | Input 0 | Door Position           | Closed       | Door Closed       |
| DIU    | Input 0 | Door Position           | Open         | Door Forced       |
| DIU    | Input 1 | GP or Lock Condition    | Closed       | Lock Engaged      |
| DIU    | Input 1 | GP or Lock Condition    | Open         | Lock Not Engaged  |
| DIU    | Input 2 | REX                     |              |                   |
| DIU    | Input 3 | Breakglass              | Closed       | Breakglass Reset  |
| DIU    | Input 3 | Breakglass              | Open         | Breakglass        |
| DIU    | Input 4 | Fire Alarm              | Closed       | Fire Alarm Reset  |
| DIU    | Input 4 | Fire Alarm              | Open         | Fire Alarm        |
| DIU    | Input 5 | Mains Power fail        | Closed       | Mains OK          |
| DIU    | Input 5 | Mains Power fail        | Closed       | Mains Power Fail  |
| DIU    | Input 6 | Battery Low             | Open         | DIU Battery Low   |
| DIU    | Input 7 | Enclosure tamper Switch | Open         | Enclosure Tamper  |

Master Reader      8,9,A,B      Spare General Purpose Inputs on Master Reader

Slave Reader      C,D,E,F,      Spare General Purpose Inputs on Exit Reader

### 9.2 Disabling an Input using AC2000 software

Open the AC2000 Devices application and expand the Overview table. Locate the device from the table and expand its options. Select Configuration.

#### DISABLE AN INPUT

From the Configuration table highlight an Element, then select Edit you will then be presented with Edit Element Options, uncheck the Enabled box if the Input is to be disabled.

Typically, if not used, a REX input may be disabled to avoid tampering.

### 9.3 Input/output Mapping

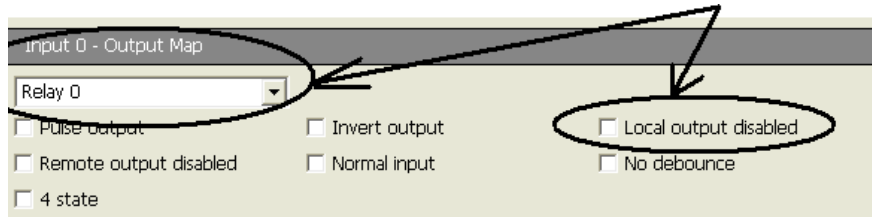
Input mapping enables a local input to activate a local output. This option is typically used when a local sounder or flashing light is needed for an alarm condition.

#### Mapping an input to an output

Open the AC2000 Devices application and expand the Overview table. Locate the Reader from the table and expand its options. Select Configuration.

Use the Device Configuration, Inputs tab and select the input to be mapped to an output.

After selecting the input, click Edit, then select from the dropdown dialog the output needed. Remember to clear the Local output disabled box. For other options, see below.



Select an Output, and then enable it.

#### INPUT – OUTPUT MAP

The Input-Output Map option box offers possible output options. If you select an Input the settings can be viewed or edited. This dialog is most often used to enable Normal input, to trigger a relay or to map an input to trigger a sounder attached to the DIU. Output options are listed in the dropdown list (see fig: 8.1c below).

**Pulse output** – causes the output signal to pulse at 1Hz, e.g. If output is LED it will flash on/off when triggered.

**Remote output disabled** – If this option is checked alarms will not be passed to the RTC, and consequently not recorded by the Access Control system

**4 State** – Used to enable input monitoring: Open, Closed, Tamper Short and tamper Cut. If this option is selected, cable tampering of ‘short’ and ‘cut’ will also be detected. Different types of tamper are not distinguished, but simply reported as tamper. This option is only valid if resistors have been added to the input cable. See Appendix 16.4 of this manual for information on resistor/cable configuration.

**Invert output** – Inverts the out put state. E.g. if your LED is normally OFF going ON, then the LED will be ON going OFF when the output is triggered.

**Normal input** – If checked the Normal input is available as a normal or general purpose input. If this input setting is unchecked then the input is reserved by the AC2000 system.

**Local output disabled** – Disables the output selected in the drop down box. Clear this option if mapping to a local output.

**No Debounce** – For example, if a door slams the door may bounce open again before finally closing firmly. The first time the door closes will be reported by the system as door closed, if No Debounce is checked the second time or bounce will set off a door forced alarm. Leaving No Debounce clear allows the default debounce time configuration to function.

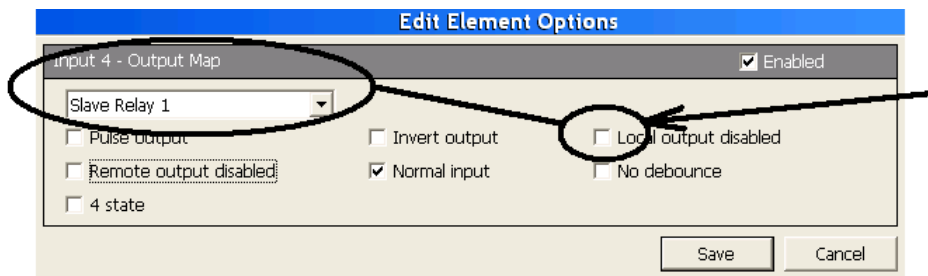
For more information on configuring Devices on an AC2000 system please see the AC2000 Devices online help or manual.

### 9.4 Configuring a spare Output Relay

Note: AC2000 software writers refer to relays 0 and 1, but CEM hardware designers often label relays 1 and 2, as on the S610EP PCB. If a DIU is present the Lock Relay on the DIU backplane

will be Relay 0. The readers then provide up to four additional spare relays, one and two on the master, numbers three and four on the exit.

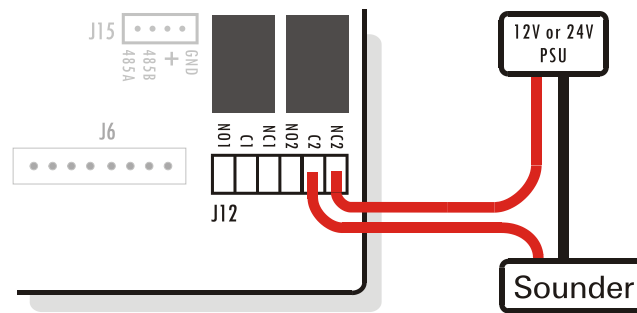
Ensure all related relay cabling requirements have been met. A GP or general purpose input can be configured to trigger a relay switch, which can be wired to a sounder or a light for example.



Mapping an input signal to a relay switch.  
Ensure Local output disabled is unchecked.

### Connecting a Sounder.

If a S600S reader is part of an interlock system, the second relay on the Master reader may be used to emit an interlock signal. A sounder can be connected to relays on an Exit reader.



Sounder connected to a spare relay

Diagram above shows Normally Open going Closed to trigger sound caused by an Input signal.

Remember that the PCB legend applies when the PCB is powered OFF.

When the PCB is powered the relay states become inverted

## 9.5 Other AC2000 configuration options

### Access Levels

For an S610S reader to function as part of an AC200 Access control system it is necessary to add the reader to a Group of readers that are part of an Access Level.

A Valid Card swiped on a reader that is NOT in any Access level will cause the LDC to display WRONG ZONE.

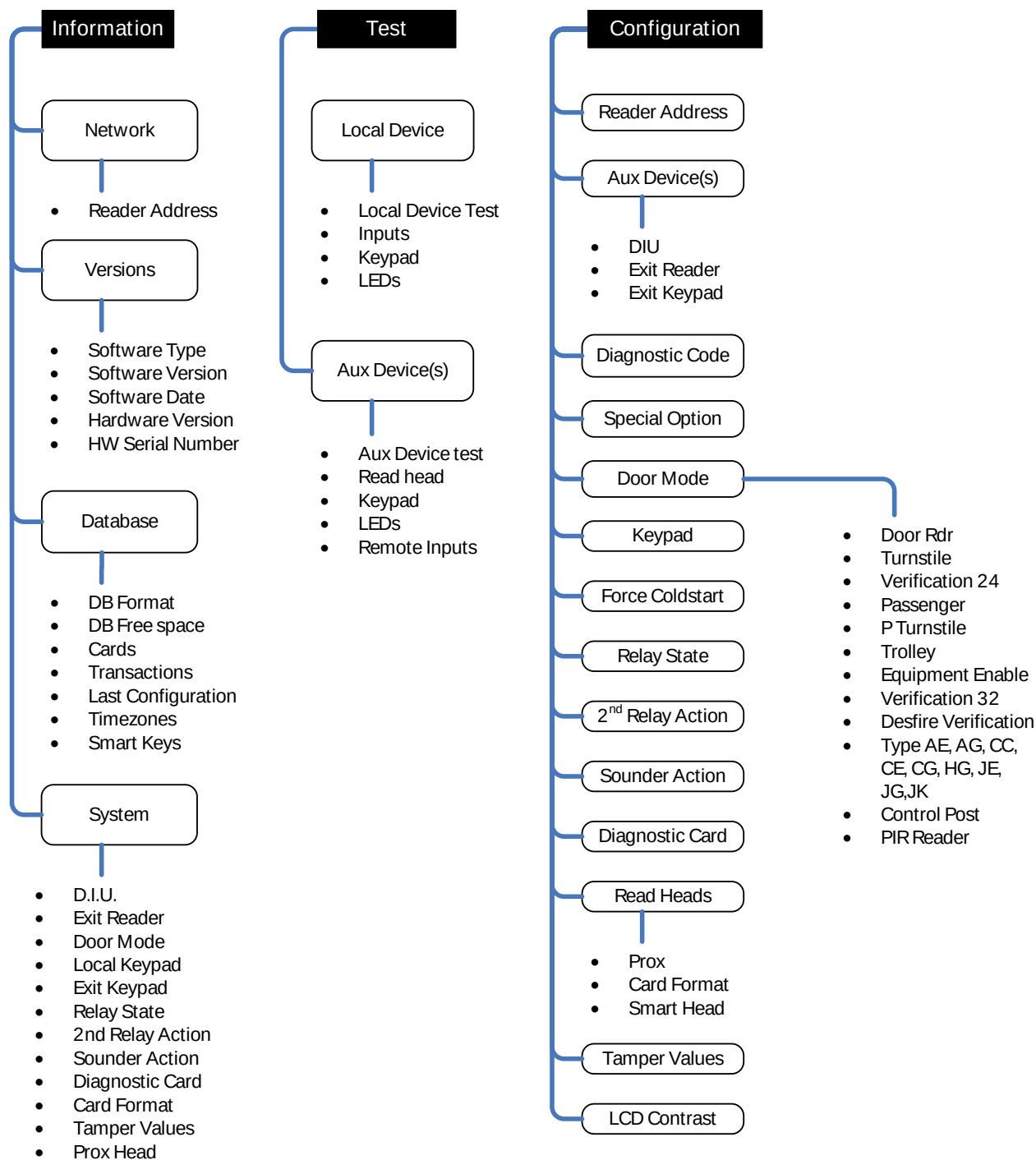


## 10 S610S onboard diagnostic mode

### 10.1 Using Diagnostic Mode

To access S610S or S610SP diagnostic enter **\*\*\*** followed by 0000 (Default) or 9999 on system older the AC2000 server version 5.5. A reader's pin number can be checked by logging on to an AC2000 access control workstation and locating the device configuration table using the Devices application. If the pin number is lost, contact CEM Systems, Support Dept.

### 10.2 S610S menu tree



S610S Menu tree.

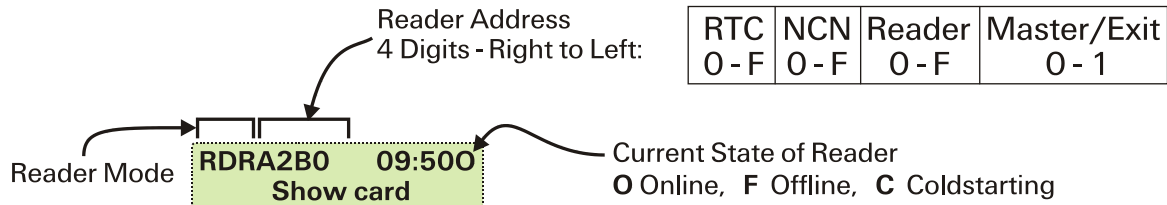
Note – Menu details will vary on readers with different Firmware revisions.  
 Door Mode – Desfire Verification, Firmware B1.00.041 required.

## 10.3 Information Menu

Use this menu to easily read the IP address, MAC address, RTC and Web addresses the reader is using.

### Network

RDR address - entered by an installer using the Diagnostic Keypad. The third digit from the right is the actual address of the reader, *B* in the example below.



The address of the reader in the example above is B

### Versions

Software Type - Indicates the reader type, determined by the firmware, e.g. S610S

Software version - Firmware version, currently, B1.00.041

Software date - Release date of the firmware currently installed on the reader

Hardware version - Version of reader hardware as at manufacturing

HW serial No - Hardware serial number

### Database

DB Format - 3 & 4 byte indicated only card numbers are held in the reader's Off Line database, "8 byte" indicates the Card Number, Timezone, status and PIN are all held in the readers Off Line database.

DB free space - 223424

Cards - Number of card details held in Off Line database

Transactions - Number of transactions held in Off Line database

Last Configuration time - "Not configured" means that the reader has not yet successfully received a configuration from the controller, other wise the time of the last configuration from the controller is displayed.

Timezones - PZ - CZ - OZ

SMART Keys - No KEYS Loaded

### System

DIU - yes/no

Exit Reader - active/inactive

Door Mode - current mode of reader is reported

Local Keypad - enabled/disabled

Exit Keypad - enabled/disabled

Relay State - reports current state of master and Exit reader relays, 0, 1, 2, 3.

2<sup>nd</sup> Relay Action - not supported

Sounder Action - Sounder enabled/Disabled

Diagnostic card - enabled/disabled. Installers can use special cards which allow direct access to the diagnostic mode. Normally disabled.

Card Format - current card Format read by readhead is reported

Tamper values - High and Low tamper values reported

Prox Head - shows Prox Head ON or Off, and whether SmartHead enabled/disabled.

All other configurations listed can be checked, this is most useful when the reader may be working in off-line mode. The configuration being used for access control during off-line mode can be checked at the reader while it is still off-line.

## 10.4 Test Menu

The Test menu allows the user to perform diagnostic tests on certain aspects of the reader's features.

Use the **[\*]** key to toggle through the various test screens. The routine allows the user to test either the master reader or the exit reader (if fitted). Select the local device option for the master, or the aux device (s) option for the exit reader.

### Local Device

The Local Device is normally the Master reader

Local device Test –

Inputs - shows current inputs states, O open C closed or c short circuit.

Keypad - press each reader keypad button in turn to confirm a response on the reader's LCD.

LEDs - Check LED responses

### Aux Device

The Auxiliary Device is normally the Exit reader

Aux devices test –

Read Head –

Keypad - press each Exit reader keypad button in turn to confirm a response on the Master reader's LCD.

LEDs - Check LED responses

Remote inputs - DIU and Exit reader Input states can be checked here

## Testing Reader Inputs

### Local tests Inputs

Using the reader's keypad; enter Diagnostic mode. See chapter on Diagnostic Mode in this manual.

Select the **[0]** key to move to the Inputs test screen. Press the **[0]** key again to hold the screen (an H will appear on the right)

### Local Input Test CcOO

Activate / deactivate each input *open* or *closed* to test, note the response on the reader's LCD. When the test is complete, press the **[\*]** key to return to the test menus.

Input\_0 (door position) and input\_1 (lock status) are normally C (Sensor is closed) when the door and lock are closed; these inputs will normally show O for open when the door (sensor is in the open state) and lock are open. Input\_2 should not be O (Open) unless the push button is pressed.

Note: Some door hardware may have sensors fitted that work in reverse (rarely), so input states may be reversed.

## 10.5 Configure Menu

Reader Address - an installer must apply an address to the reader using the keypad configure menu. Only then can a configuration and offline data base be downloaded to the reader by the controller.

Aux Device(s) - Enable or Disable a DIU, Exit Reader or Exit Keypad. If a card holder is requested to enter a pin number

Diagnostic Code - used to change the diagnostic PIN used to access the reader diagnostic mode.

Special Option - Manufacturers use only

Door Mode - scroll through the options to select the S610S door mode. This must be done at the reader as the mode can not be downloaded from the system.

Keypad - select No Keypad if PIN numbers are not required.

Force Coldstart - force coldstart refreshes the Off Line database from the controllers.

If problems persist, make sure the controller has a fresh copy of the database before coldstarting the reader.

Relay State - reverses the state of the relay output0 on the master reader

2<sup>nd</sup> Relay Action - reverses the state of the relay output1 on the master reader

Sounder Action - enable or disable the readers onboard sounder.

A S600s with DIU and slave will use the local sounder for door forced, held, etc only when the sounder action configuration is enabled locally in the reader configuration menu.

Diagnostic Card - enable or disable the use of a diagnostic card, used to access diagnostic mode instead of a PIN.

Read Heads - scroll through options. If the reader is failing to read cards, ensure the correct Card Format is set, only enable a SmartHead, if one present. If a smarthead is connected to the reader it must be enabled using this menu. See paragraph [10.6](#) below.

Tamper Values - Adjust optical tamper sensitivity. See paragraph [10.7](#) below.

LCD Contrast - use to adjust the LCD contrast if required.

## 10.6 Setting the correct readhead technology

If a reader has stopped reading cards correctly or a new reader will not read cards check the read head configuration.

If the reader is failing to read cards, ensure the correct Card Format is set, only enable a SmartHead, if a smarthead is present.

### Prox:

Prox head ON or OFF. This is for an antenna connected internally.

H0 and H1 readhead connections are unaffected by this setting.

### Card Definition (or Card format)

CEM 26, CEM37, Simplex36, Vancouver34, Watermark (also used for Diester), CEM26, Wiegand26, Sensormatic37, HID1000, Wiegand34, Wiegand32, Kantech, Sensormatic32.

The correct definition MUST be selected for the card definition being used at the reader.

### Smarthead

No Smart head - default, unless you are using a Mirefare reader model.

IEP 14443A - For EXTERNAL (to the reader) Mifare read head

CLRC632 - This is the setting for reading Mifare cards using INTERNAL read head

PICOREAD - If a PICO smarthead is connected to the reader it must be enabled using this menu.

## 10.7 Adjusting optical Tamper Thresholds

Firmware revision B1.00.018 onwards.

This allows the installer to set a low and high threshold for tamper.

The lower threshold (set in the Tamper Low menu) should be set *while the unit is mounted properly on its case or enclosure*.

The upper threshold should be set so that it doesn't trigger while on the case.

In the setup menus enter, Configure -> Local settings -> Tamper Values

TAMPER LOW

The LCD will show:

|                                   |
|-----------------------------------|
| Tamp LO (001)<br>Cur=002 xxx 0 OK |
|-----------------------------------|

The number in the brackets is the current light level being monitored. The brighter the ambient conditions the higher the number.

Cur shows the current value the sensor is configured too.

Xxx is the field where the new value can be entered. A leading 0 is necessary if only two digits are to be entered e.g. to enter a value of 8 press 008 then  to OK.

The low tamper value is the normal light conditions in the closed case used to reset the sensor after it has been triggered.

TAMPER HIGH

The LCD will show:

|                                   |
|-----------------------------------|
| Tamp HI (001)<br>Cur=002 xxx 0 OK |
|-----------------------------------|

The number in the brackets is the current light level being monitored. The brighter the ambient conditions the higher the number.

Cur shows the current value the sensor is configured too.

Xxx is the field where the new value can be entered. A leading 0 is necessary if only two digits are to be entered e.g. to enter a value of 8 press 008 then  to OK.

The high tamper value is the amount of light needed to trigger a tamper alarm. This can be compared to the value in the brackets which is a snapshot of the light level when the Tamper High config is selected.

## 10.8 Disable diagnostic mode pin

On and AC2000 workstation using the Devices application, select a configured S610S reader, select Configuration, from the Device Configuration table select Element Diagnostic PIN as shown below. Click on the Edit button and set the value to -1. This will disable any access to diagnostic mode from the reader. If an S610S has the value 10000 change this to -1 to keep diagnostic mode disabled, or to another value to enable diagnostic mode.

## 10.9 Updating Firmware

Firmware upgrades, or defrosting, can be carried out in different ways depending on the software you are using and the operational constraints existing on your system.

Normally the AC2000 web configuration tool is used to download a firmware update to a selected S600E reader. The reader must already be configured using the AC2000 workstation Devices application, and must be online to receive the new firmware.

### AC000 web configuration tool

You will be prompted for a User name and Password, the User must have Authorisation Level 4. Ensure you have the upgrade \*.dat file available.

Use an AC2000 workstation, start an MS Internet Explorer browser session.  
type <http://cdc0>



Select Device Defrost

Select Upload Firmware, and browse to the firmware \*.dat file. When the upgrade file has been uploaded select the firmware from the options list and select the reader to be upgraded.

Click Upgrade Firmware button. Note: Access Control at the door will stop while the reader is being upgraded. Normally for an Ethernet reader this may take up to ten minutes for the reader to receive the new configuration, reboot, and be reconfigured with the AC2000 devices application settings. If the reader is a serial reader, connected via an ECM or a serial controller allow for up to an hour.

Sounder activated

S600S firmware version B1.0.0xx and above will warn users that defrost is in progress by activating card reader buzzer output.

Other options may include

- Place the upgrade file on the RTC and have the RTC upgrade all compatible devices on the network. (Refer to your AC2000 system software manual)
- Connect upgrade equipment to the hardware and upgrade firmware directly. (Refer to your supplier or CEM Systems Support Dept.)

## 11 Appendix

### 11.1 Check List/Commissioning Sheet

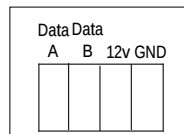
TBA

### 11.2 S400 Exit Reader Connections

**IMPORTANT:** Ensure that J11 JUMPER 7 (do not confuse with LK7) is fitted on the S400 exit reader for use with the S600E master reader.

The S400 exit reader is connected to the master reader through an RS485 port. The connection is made from connector J5 on the master reader PCB to connector J16 on the exit reader (as above) and terminated at both ends by way of a 4-way JST socket.

Note: the S400 exit reader differs from the S610S in that it does not contain any RAM, RAM backup battery or clock chip.



Connector J5 on S610S is connected to J16 on the S400 exit reader.

### 11.3 CLK Air Bridge

CLK has used AC3000 system with DAC and S400 card readers to secure the Air-Bridge facility and AC2000 system containing S610E and S610S card readers will replace AC3000 system. CLK has requested new feature of Passenger mode to be implemented to card readers. To satisfy this new door mode called “Passenger-Staff exit” has been created.

#### PASSENGER-STAFF EXIT MODE

Passenger-staff exit is the newly created door mode to support AC2000 system to be used to secure the CLK Air-Bridge facility. This mode is mainly based on “Passenger Mode” and includes the new features requested from CLK.

## 11.4 S610S Specification Sheet

|                                      |                                                                                                                                                                                      |             |             |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| S610 Series (Grey) – Product Codes   | Model                                                                                                                                                                                | Reader      | Exit Reader |
|                                      | S610S Prox                                                                                                                                                                           | RDR-611-101 | RDR-612-101 |
|                                      | S610S Mifare                                                                                                                                                                         | RDR-611-105 | RDR-612-105 |
|                                      | S610S Multitech                                                                                                                                                                      | RDR-611-104 | RDR-612-104 |
|                                      | S610S PicoPass                                                                                                                                                                       | RDR-611-606 | RDR-612-606 |
|                                      | S610S multi smart card reader                                                                                                                                                        | RDR-611-608 | RDR-612-608 |
|                                      | S610S No Head                                                                                                                                                                        | RDR-611-109 | RDR-612-109 |
| S610 Series (Black) – Product Codes  | Model                                                                                                                                                                                | Reader      | Exit Reader |
|                                      | S610S Prox                                                                                                                                                                           | RDR-611-111 | RDR-612-111 |
|                                      | S610S Mifare                                                                                                                                                                         | RDR-611-115 | RDR-612-115 |
|                                      | S610S Multitech                                                                                                                                                                      | RDR-611-114 | RDR-612-114 |
|                                      | S610S PicoPass                                                                                                                                                                       | RDR-611-616 | RDR-612-616 |
|                                      | S610S multi smart card reader                                                                                                                                                        | RDR-611-618 | RDR-612-618 |
|                                      | S610S No Head                                                                                                                                                                        | RDR-611-119 | RDR-612-119 |
| Power                                | 7-14V dc<br>200mA – passive consumption<br>320 mA – peak consumption                                                                                                                 |             |             |
| Reader Enclosure Size (HxWxD)        | 142 x 115 x 44mm (5.6 x 4.5 x 1.7")                                                                                                                                                  |             |             |
| Liquid Crystal Display               | 32 x 122 monochrome LCD<br>Backlit and heater element                                                                                                                                |             |             |
| LED Indicators                       | Green – Accept<br>Red – Reject<br>Amber – Invalid                                                                                                                                    |             |             |
| Keypad                               | 0-9 plus  and  |             |             |
| Security features                    | Read head and electronics sealed to IP65 in polycarbonate enclosure.<br>Protected by tamper sensor.                                                                                  |             |             |
| Offline database                     | Up to 194,000 transactions and card details                                                                                                                                          |             |             |
| Internal Memory                      | 2 Mbytes<br>32 Mbytes with optional Compact Flash                                                                                                                                    |             |             |
| Biometrics interface                 | Two RS232/RS485                                                                                                                                                                      |             |             |
| HEAD TYPE                            | SUPPORTED CARDS                                                                                                                                                                      |             |             |
| Read Head -125 KHz .....             | CEM37<br>HID Licenced, Corporate 10000<br>Kantech                                                                                                                                    |             |             |
| Inside Technologies PicoPass™ .....  | PicoPass™ (S610SP only)                                                                                                                                                              |             |             |
| Mifare Read Head -13.56Mhz .....     | Mifare / Mifare PS21                                                                                                                                                                 |             |             |
| Two spare weigand interfaces         | H0 Master, H1 optional Read Out read head.                                                                                                                                           |             |             |
| Supported Default Card Formats ..... | SENSORMATIC32 / SENSORMATIC37<br>SIMPLEX36, HID1000, VANCOUVER34                                                                                                                     |             |             |
| Supported External readheads .....   | KANTECH                                                                                                                                                                              |             |             |
| MagStripe.....                       | WIEGAND26 / WIEGAND32                                                                                                                                                                |             |             |
| Wiegand .....                        | WIEGAND26 / WIEGAND32                                                                                                                                                                |             |             |
| Legic .....                          | WATERMARK                                                                                                                                                                            |             |             |
| Communications Interfaces            |                                                                                                                                                                                      |             |             |
| To Host                              | RS485                                                                                                                                                                                |             |             |
| To Exit Reader                       | RS485, 19200 Baud                                                                                                                                                                    |             |             |
| Cable specification                  | Belden 8723                                                                                                                                                                          |             |             |
| Outputs                              | Two Relays fitted, rating 30Vdc @5A.<br>Change over volt free contacts<br>with programmable duration.                                                                                |             |             |

|                                                                                                                                                                                             |                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Inputs                                                                                                                                                                                      | 4 Analogue – voltage supplied                  |
| Operational temperature range                                                                                                                                                               | -20°C to +50°C (-4°F to 122°F)                 |
| Humidity                                                                                                                                                                                    | Unlimited, also condensing. IP65.              |
| Reader Power Backup battery                                                                                                                                                                 | 9V NmH rechargeable (Not Included)             |
| RAM Memory Backup battery                                                                                                                                                                   | Rechargeable Lithium-Ion battery fitted on PCB |
| Other requirements                                                                                                                                                                          | AC2000 or webEntryII access control system     |
| Emmissions: <b>WARNING</b> 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. |                                                |





Products: S610S      Revision #: 1.6

|                                       |                     |              |                |
|---------------------------------------|---------------------|--------------|----------------|
| Author                                | File Name           | Approved by: | Date approved: |
| Michael Tuke - CEM<br>Systems Belfast | S610S_IM-6-1.6.docx |              |                |

Front Piece and Specifications Page correct..... Y / N

Drawings/ Wire Diagrams OK ..... Y / N    Signed

Comments .....

Read By: Name ..... Delivered (Date) .....

Received back.....

Name ..... Delivered (Date) .....

Received back.....

Name ..... Delivered (Date) .....

Received back.....

Comments:

[illegible]