R A D I O N I C S

READYKEY® K2100/K1100 Door Controller

Installation Manual

Notice

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FCC Notice

This equipment generates and uses radio frequency energy. If not installed and used in accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been tested and found to comply with the specifications Subpart F of Part 15 of FCC rules for Field Disturbance Sensors. If this equipment causes interference to radio or television reception - which can be determined by turning the equipment on and off - the installer is encouraged to correct the interference by one or more of the following measures: 1) Reorient the antenna of the radio/television, 2) Connect the AC power cord to a different outlet so the control panel and radio/television are on different branch circuits, 3) Relocate the control panel with respect to the radio/television.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the "Interference Handbook" prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, stock no. 004-000-00450-7.

FCC Registration Number: IDHM32Y6K2000

Listing

UL 294   Access Control System Units

Table of Contents

About this Manual

This installation manual is intended to allow the installation and testing of the K2100 and K1100 door controllers. These door controllers will form part of a Readykey Access Control system. It is important that anyone installing these door controllers is aware of the whole system and how it is to be administered.

The following chapters explain the various ways in which the door controller may form part of a Readykey Access Control system. Each of these systems has its own installation and commissioning manual and user guide. These documents are listed with the description of each system. You should have copies of each appropriate document.

Important Note to Installers

Please read this manual **even if you are familiar with previous Readykey products** There is a great deal of new information contained in this document that should make installation and testing a lot easier. You are also advised to attend a Readykey Training Course before attempting installation.

Front Panel Administration

This Installation Manual is intended as a comprehensive reference to the K2100/K1100 door controller, irrespective of the type of Administration System being used. The different type of Administaration System are described in a later chapter. If you are installing a Door Controller to be administered from the Front Panel then you should refer to the *Front Panel QuickStart Appendix* at the end of this manual.

K1100

The K1100 is identical to the K2100 with the sole exception of having 2 reader channels and 2 lock outputs instead of 4 reader channels and 4 lock outputs. For clarity the term 'K2100' is used to describe both the K2100 **and** K1100 door controllers. Wherever a specific item needs to distinguish between the two types of controller, this will be made clear.

Compatibility

All references in this manual to Readykey products assume the following software version numbers, or higher:

K2100/1100	**v1.4**
K6000 Area Master Network Controller	**v1.41**
Readykey For Windows	**v1.5**
K6000-SS Network Controller	**SR931**
K6000-MS Network Controller	**SR932**
K6000-SS PC Software	**v2.6**
K6000-MS PC Software	**v2.6**
K2000-N	**SR825**
K2015 Alarm Module	**SR555**

Note that older products retain their original SR *nnn* numbers, while new or modified products have adopted a new version control system, v *N.N.*

If you are upgrading an existing system, then check with Readykey Technical Support that all the components are suitable and whether any upgrades are required.

Margin Notes

Throughout the manual wherever there are specific items referring to particular administration systems or particular models of door controller, a margin note will highlight the fact. For example:

K1100   A note specific to the K1100 2-door controller.

Front Panel   Whenever something applies to a particular administration system.

K2000-N   Sometimes reference will be made to older products.

The K2100 Door Controller

Background

Any Readykey access control system, very simply, consists of three components; Readers, Door Controllers and an Administration System.

The Readers will detect the unique code in a key and pass it directly to the Door Controller. The Door Controller compares the code to the information stored in its memory and, if the key is valid, will operate the lock and send a report to the Administration System. The Administration system is the means by which the user programs the system, who is allowed where and when etc., and where events are reported.
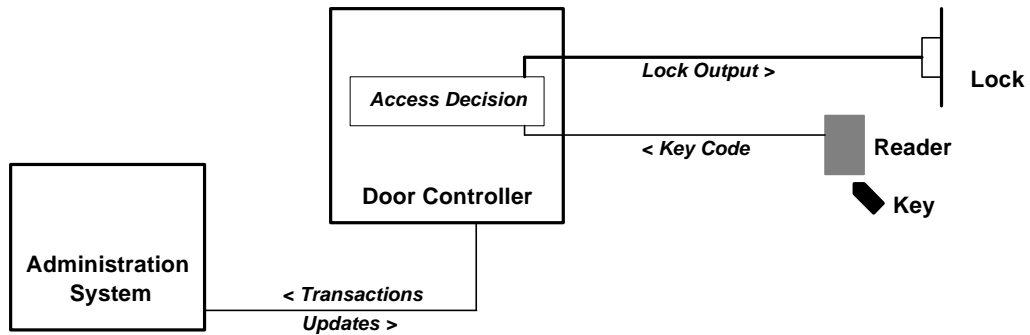
Components of a Readykey Access Control System

This document is concerned with the installation and testing of the K2100 and K1100 *Door Controllers*. These door controllers are multi-function, that is they can be configured to operate in a variety of different modes, depending on the overall system. Some features of the access control system are dependent on the type of *Administration System* used. Some features, such as Visitors, Transaction Searching and Reporting, Programming of Controller Relays etc., are only available on some of the PC based administration systems.

The diagram below shows then connections made to the door controller. See the section *Administration Systems* for full details of how door controllers are connected and administered.

Door Controller

Reader

Door Contact

Reader Channel 1

Lock Output 1

Door 2

Door 3 (K2100 only)

Door 4 (K2100 only)

Request to Exit

120/240v AC Input

DC Battery

4 Relay Outputs

Tamper Input

Override Input

RS 232 Port

Serial Printer (Front Panel Systems)

PSTN Modem (Multi Site Systems)

Administration PC

Network Controller

6 Wire Bus

Slave Door Controllers
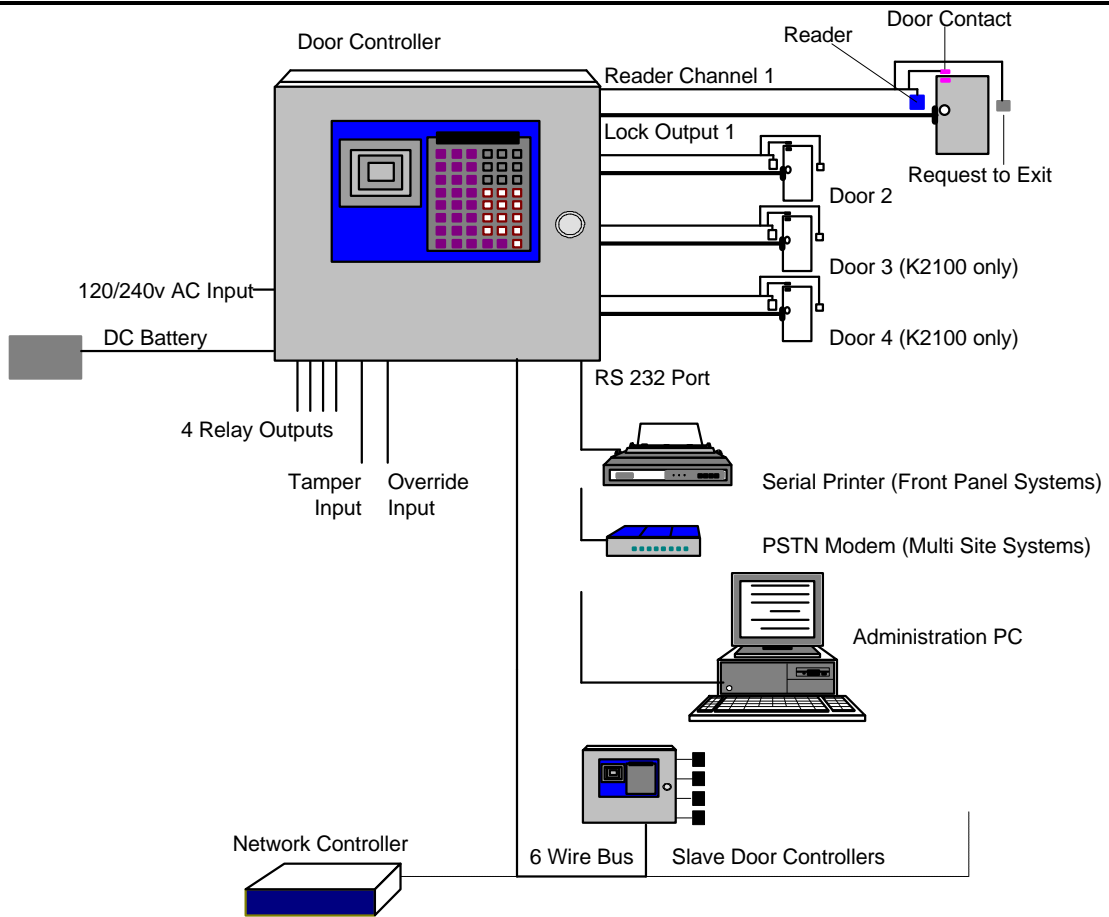
K2100 System Configuration

Before installing the door controller you should be aware of how it is going to be administered. There are two ways in which the door controller can operate, as a **Master** or as a **Slave**. Administration options, described in more detail below, are:

Operating as a **Master**, the door controller can be administered:

- from the door controller's own front panel, controlling up to 16 doors - 4 on board plus up to 3 Slave door controllers.

- from a PC running K6000-AM Area Master Network Controller software, controlling up to 16 doors - 4 on board plus up to 3 Slave door controllers.

- from a PC running Readykey For Windows administration software, controlling up to 16 or 32 doors - 4 on board plus up to 3 or 7 Slave door controllers (Readykey For Windows is supplied in 16 and 32 door versions).

Operating as a **Slave**, the door controller can be administered:

- from another K2100 Master as above.

- from a K6100-SS Single-Site Network Controller, administered by Readykey For Windows PC software.

- from a K6100-SS or K6100-MS Network Controller six-wire bus, administered by K6000 PC software.

Components

The door controller itself is made up of 4 individual components:

Secured to the metal base plate are the 110/240v **Power Supply** and **Main Circuit Board**. Fitted to the Main Circuit Board, under a perspex cover, is the **Memory Module** containing the software and database memory. Across the whole unit is a removable **Front Panel** with built-in key reader, keypad and display.

All connections are made to the door controller using **Removable Terminal Blocks**

UL 294   All connections should be made to the plug in **Surge Protection Modules** supplied with each door controller.

Readers

A reader is a device, usually installed close to the door, that detects the unique code in a key and passes it to the door controller where the access decision is made. There are several types of reader suitable for different purposes and environments.

K2001 Low Profile Reader

A reader suitable for interior or exterior use.

K2002 Vandal Resistant Reader

A stainless steel reader particularly suitable for exterior use, where resistance to abuse is important.

K2001-P PIN Reader

This device requires a PIN number to be entered, as well as a key to be presented, as an extra level of security. The need to use a PIN as well as a key can be controlled using a time profile.

K2012 Wiegand Interface

This device allows Readykey door controllers to receive codes from Wiegand compatible devices such as, card readers, 'hands-free' systems, infra-red card readers etc. Wiegand devices should only be used with PC based administration systems, as the front panel of the K2100 door controller can only read Readykey keys, therefore it is unable to administer other identity devices.

Door Controllers

The Door Controller is the heart of the system, these are its main functions:

- Decides whether a person has access at a particular door and at a particular time.
- Provides power to operate the lock.
- Monitors doors for unauthorized access or door left open.
- Automatically open and close doors at certain times.
- Detect tamper conditions at the reader or its own enclosure.
- Controls the 4 on-board relays.
- Programs and monitors any K2015 Alarm Modules that may be fitted.

The K2100 may have up to 4 readers connected, the K1100 may have up to 2 connected. In all other respects both door controllers are identical.

Connecting Door Controllers

What makes the K2100/K1100 door controllers so flexible is the ability to link controllers together to allow more than 4 doors to be administered. The number of doors that may be administered, and the maximum number of personnel that can be controlled, depends on the type of Administration System - see below.

Door controllers are connected together using Readykey's Six-Wire Bus. This is a proprietary communications link that uses standard six conductor signal or alarm cable. See the section *The Six-Wire Bus* later for full details. Each group of door controllers connected using the six-wire bus requires one **Master** controller and one or more **Slave** controllers.

- For smaller systems (16 or 32 door administration systems - see below) one K2100 controller is the Master with up to 3 or 7 Slave controllers.
- For larger systems (up to 128 doors) the K6100-SS Network Controller, either single or multi-site, becomes the 'Master' and **all** the door controllers (up to 32) on the six-wire bus are Slaves.

K2000-AM
K2000-N

If you have used previous K2000 door controllers then the K2000-N was a Slave controller, the K2000-AM was a Master.

Important: Every K2100 and K1100 can be configured as a Master **or** Slave. You do **not** need to purchase different types of door controller.

Administration Systems

There are several ways of administering Readykey access control systems. Different methods allow greater numbers of doors or personnel to be controlled, and door controllers to be at greater distances from the central point.

K2000-N   In most cases the K2000-N may be used as a Slave door controller.

Front Panel Administration - 16 door

See also: *K2100 User Guide*

All K2100 and K1100 door controllers are supplied with a front panel containing a 48-key keypad, a 16 character display and a key reader. The simplest way of administering an access control system is to use this panel to carry out all the programming. Keys are added by presenting them to the front panel reader, data is added, modified or deleted using the keypad and display.

When using this form of administration a serial printer may be connected to the Master controller, this will print events as they occur and can also be used to print the contents of the controller's database.

K2000-AM   This is exactly equivalent to the previous K2000-AM system.

Maximum Number of Personnel	4000
Maximum Number of Doors	16
Access Codes	128
Time Profiles	32
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller
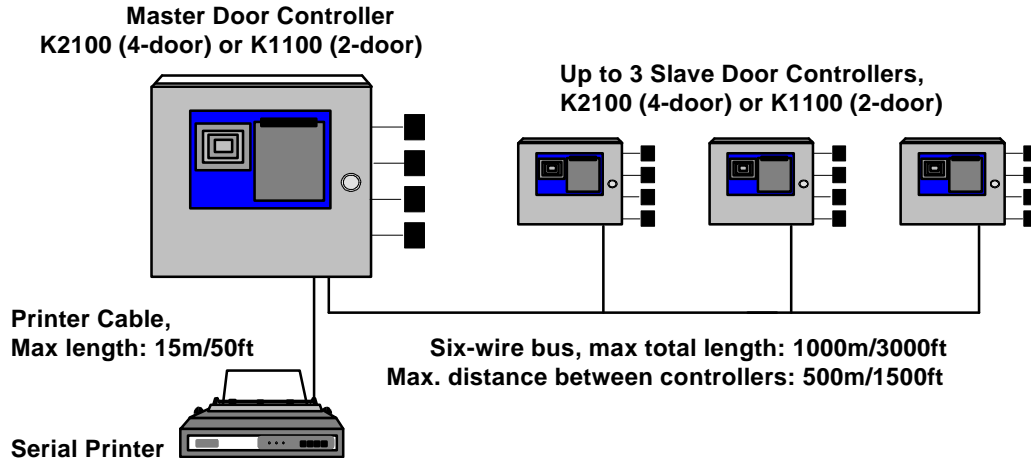
System Diagram - Front Panel Administration

K6000-AM Area Master Network Controller - 16 door

See also   *K6000-AM User Guide*

The K6000-AM allows a system of up to 16 doors to be controlled from a standard office PC (Personal Computer). The kit comprises; an interface unit, a desktop reader for key administration, a line driver for fitting to the Master controller, cables for connection of the interface to the PC and software for running on the PC.

Once connected, the system can only be administered from the PC. Additional features of the PC system include Visitors, searching and reporting on events, Audit Trail etc.

Maximum Number of Personnel	4000
Maximum Number of Visitors	750
Maximum Number of Doors	16
Access Codes	128
Time Profiles	32
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller

**Master Door Controller
K2100 (4-door) or K1100 (2-door)**

**Up to 3 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

**Six-wire bus, max total length: 1000m/3000ft
Max. distance between controllers: 500m/1500ft**

Max. distance: 1000m/3000ft

Interface Unit

PC

Desktop Reader

Parallel Printer
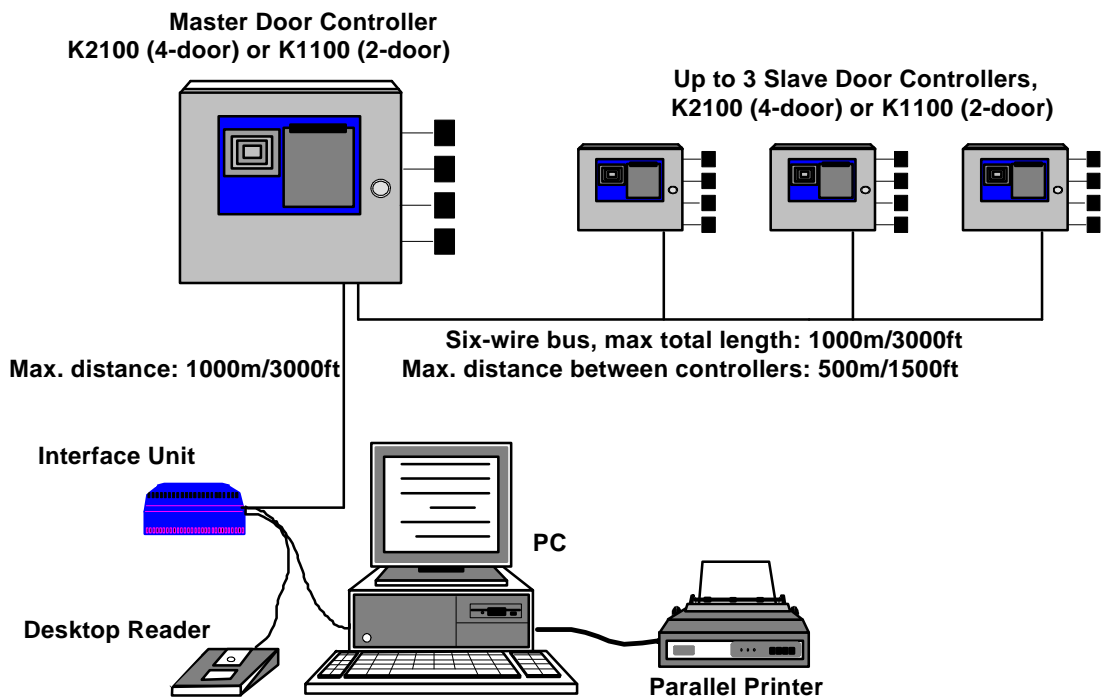
System Diagram - K6000-AM

Readykey For Windows - 16 or 32 door

See also   *Readykey For Windows System Overview*
             Readykey For Windows Installation Manual

This system allows up to 32 doors to be controlled from a PC running Microsoft For Windows, using the same Interface Kit as described above. The Readykey For Windows software, besides providing a much easier to use interface, also allows extra control of Door Controller relays and Alarm Module inputs and outputs.

Two versions are supplied, allowing up to 16 doors or 32 doors to be controlled. A special device, a security block fitted to the printer port of the PC, determines which version is being used.

Maximum Number of Personnel	4000
Maximum Number of Visitors	750
Maximum Number of Doors	32
Areas	32
Access Groups	128
Time Profiles	32
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller

**Master Door Controller
K2100 (4-door) or K1100 (2-door)**

**Up to 7 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

**Six-wire bus, max total length: 1000m/3000ft
Max. distance between controllers: 500m/1500ft**

Max. distance: 1000m/3000ft

Interface Unit

PC

Desktop Reader

Parallel Printer
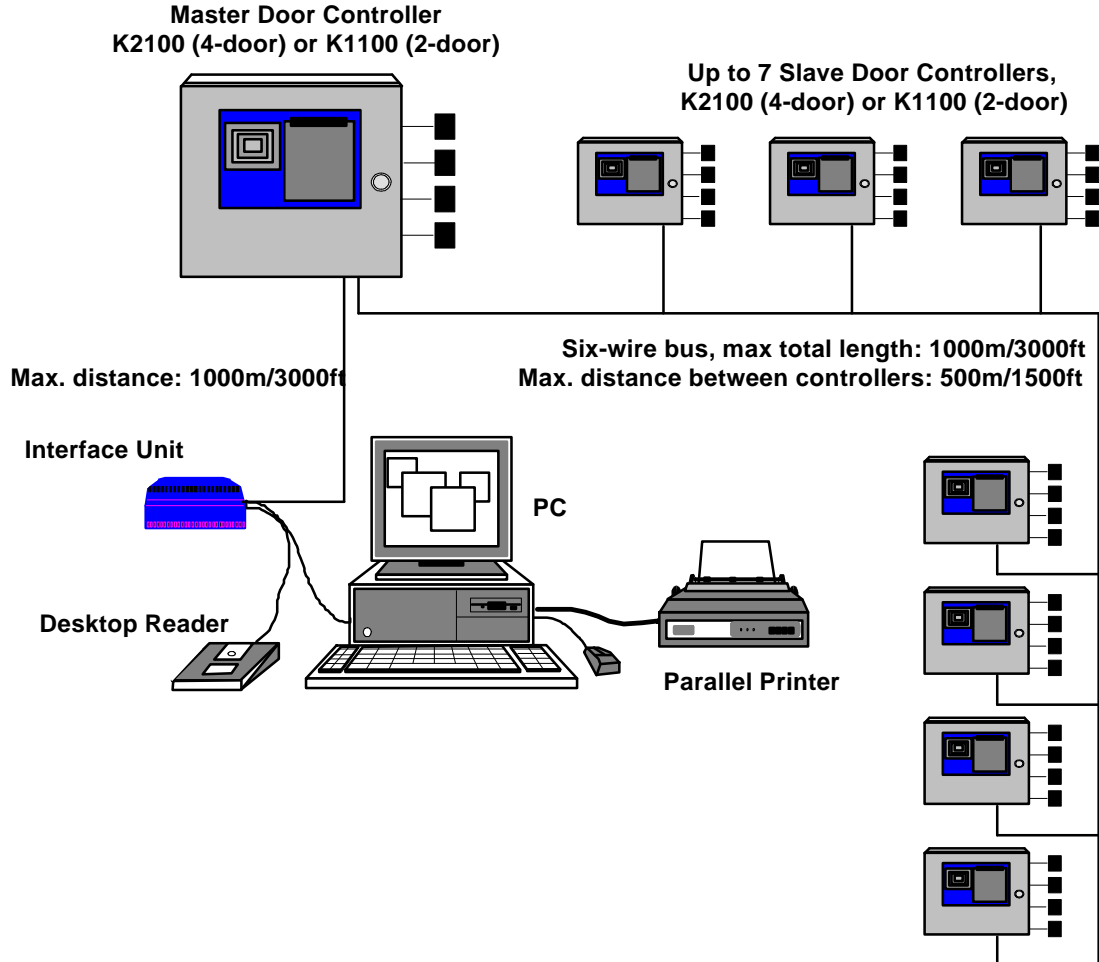
System Diagram - Readykey For Windows, 16 or 32 Doors

Readykey For Windows Single Site Network Controller - 128 doors

See also   *K6100-SS Installation Manual*
            Readykey For Windows System Overview
            Readykey For Windows Installation Manual

Using a K6100 Single Site Network Controller and Readykey for Windows software, up to 32 door controllers, all configured as Slaves, are connected using the six-wire bus. The Network Controller has an integral reader for key administration and connects directly to the PC's serial port using the cable supplied. The Readykey for Windows software, besides providing a much easier to use interface, also allows extra control of Door Controller relays and Alarm Module inputs and outputs.

Maximum Number of Personnel	9999
Maximum Number of Visitors	750
Maximum Number of Doors	128
Areas	32
Access Codes	128
Time Profiles	32
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller

**Up to 32 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

**Six-wire bus, max total length: 1000m/3000ft
Max. distance between controllers: 500m/1500ft**

PC

K6100-SS Network Controller   **Parallel Printer**
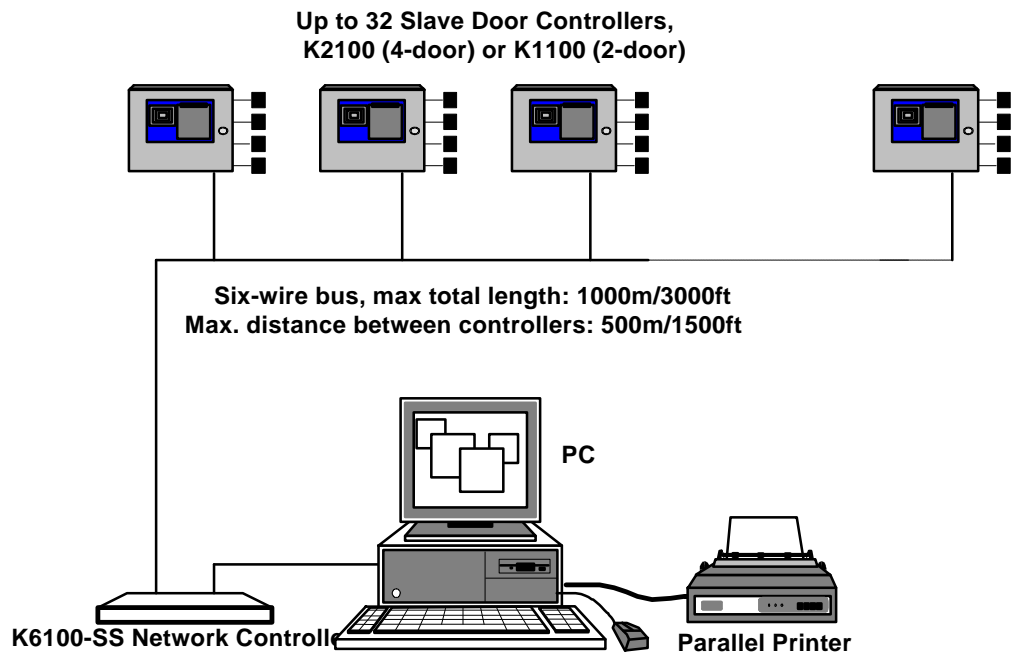
System Diagram - Single Site Network Controller with Readykey For Windows

K6000 Single Site Network Controller - 128 doors

See also   *K6000 Installation Manual*
            K6000 User Guide

Using a K6000 Single Site Network Controller and K6000 software, up to 32 door controllers, all configured as Slaves, are connected using the six-wire bus. The Network Controller has an integral reader for key administration and connects directly to the PC's serial port using the cable supplied.

Maximum Number of Personnel	9999
Maximum Number of Visitors	750
Maximum Number of Doors	128
Access Codes	128
Time Profiles	32
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller

**Up to 32 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

**Six-wire bus, max total length: 1000m/3000ft
Max. distance between controllers: 500m/1500ft**

PC

K6000SS Network Controller

Parallel Printer
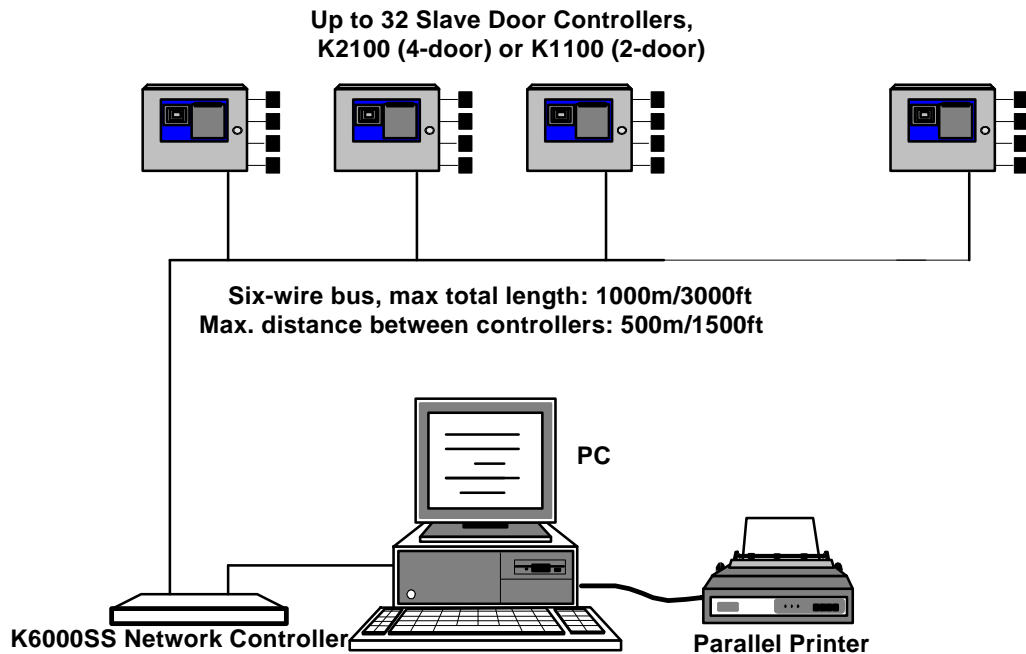
System Diagram - K6000 Single Site Network Controller

K6000-MS Multi Site Network Controller - 128 Sites

See also   *K6000 Installation Manual*
K6000 User Guide

A K6000-MS Network Controller allows up to 128 sites to be controlled. The first of these sites is the 128 door (32 door controller) six-wire bus, as described for the K6000-SS Network Controller above. The other sites are connected using RS-232 serial communication links.

There are 3 serial ports on the K6000-MS Network Controller, allowing up to 3 sites to be permanently connected. By using dial-up (PSTN) modems more than one site can be attached to each port. Once or twice a day the Network Controller will dial-up each site and send updates and receive transactions.

Note: The first 32 serial sites may have up to 8 connected door controllers on each site, the remaining 95 sites may have just one door controller.

Each site will consist of at least one K2100 (or K1100) with up to 7 Slave door controllers attached using the six-wire bus giving a maximum of 32 doors per site.

Data Switch   An alternative arrangement may be used when it is not possible to connect the door controllers at the remote site via the six-wire bus. This system involves using a code operated switch (COS), available in 4 and 8 port versions, to switch between door controllers. In this case each door controller is set as a Slave.

Maximum Number of Personnel	9999
Maximum Number of Visitors	750
Maximum Number of Doors	Site 1 (6WB) 128 (32 D/C)
	Sites 2-33 32 (8 D/C)
	Sites 33-128 4 (1 D/C)
Access Codes	128 per site
Time Profiles	32 per site
Editors	32 (plus Master)
Auxiliary Alarm Points	32 per Door Controller

**Up to 32 Slave Door Controllers using six-wire bus,
K2100 (4-door) or K1100 (2-door)**

**Master Door Controller
K2100 (4-door) or K1100 (2-door)**

**Up to 7 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

Six-Wire Bus

COS4/8

**Up to 8 Slave Door Controllers,
K2100 (4-door) or K1100 (2-door)**

PC

K6000MS Network Controller

Parallel Printer
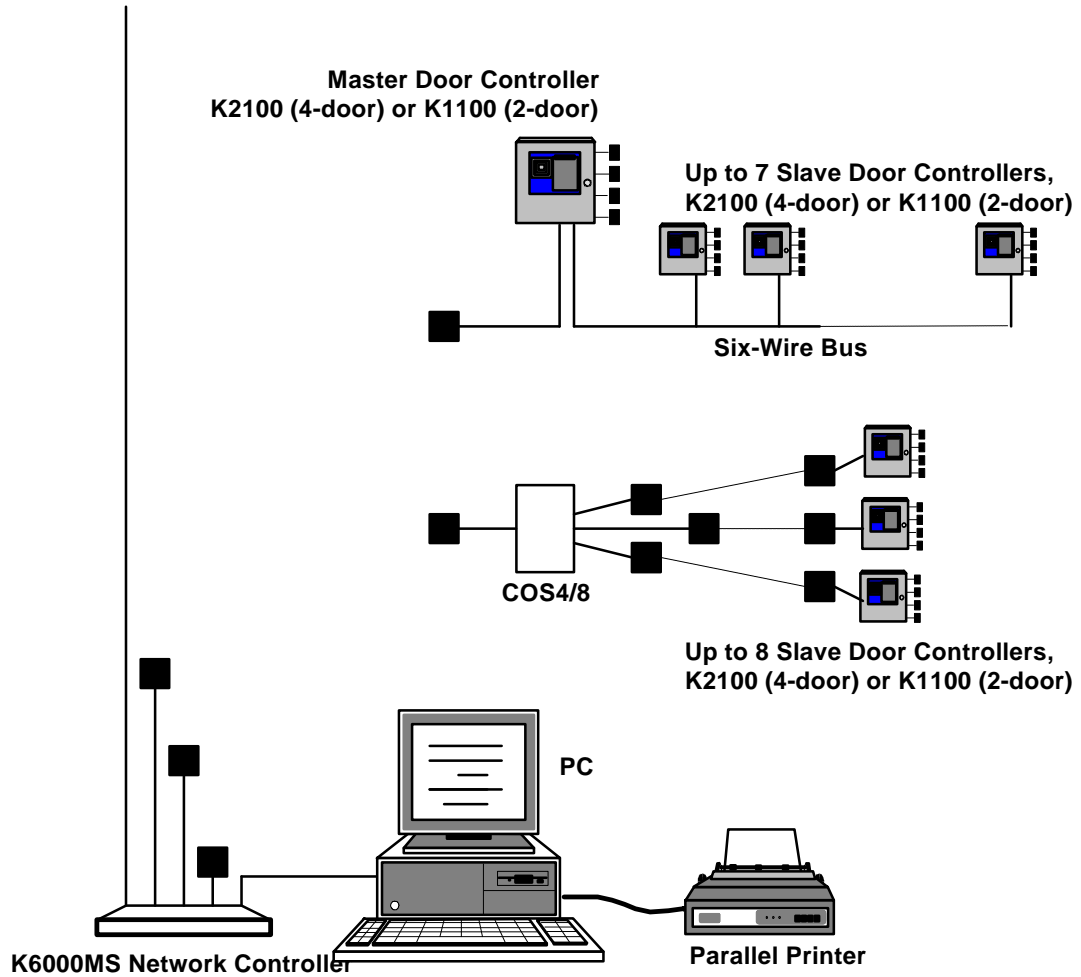
■ **Modem or Line Driver, only required when link is longer than 15m/50ft**

System Diagram - Multi Site Network Controller

New Features

This section is included as information for those who are familiar with previous Readykey door controllers, such as the K2000-N and K2000-AM.

There are several new features introduced with the K2100/K1100 door controllers. Some of these features only apply to certain types of administration system, these are indicated where appropriate.

Appearance

Overall there is very little physical difference between the K2100/K1100 and the previous K2000 door controllers.

Note: Older K2000 door controllers that have been upgraded to K2100 will retain the label, power supply etc., only the memory module will change.

Front Panel

All K2100/K1100 controllers have a new front panel label. This is black on grey with the Readykey logo, keyboard and reader area. It no longer says 'K2000'. Beware K2000 door controllers that may have been upgraded to a K2100. The only way of being absolutely certain is to check the EPROM label on the memory module, or press the **?** key - see below.

K1100

The K1100 looks identical with the exception that the connectors for channels 3 and 4 are missing. There are also several internal components removed - you cannot simply solder in a couple of connectors!

Software Version and Model Type

Pressing the **?** key on the front panel will produce a display similar to:

```
2100 M2   V1-6
```

where *2100* refers to the controller type (*2100* or *1100*), *Mn* refers to the operating mode, see below, (where *n=0,1,2,3*) and *Vx-y* refers to the software version number. In this case a K2100 with software version 1.0, running in mode 2.

Power Supply Unit

The new power supply unit, physically almost identical to previous units, is now provides the following new features:

Automatic Input Voltage Detection, the new power supply will operate from a mains input of between 85vAC and 250vAC. There is no longer a need for separate model for different mains supplies.

Lock Output Voltage - 12v or 24v DC, the lock output voltage can be set to 12v or 24v DC.

Power Indicator, a red LED within the power supply indicates the presence of AC input voltage.

Memory Module

A new memory module with increased capacity and a new replaceable backup battery is now used.

Memory Backup Battery

The backup battery is provided to maintain the systems memory when all power, mains and external battery backup, is removed. The backup battery can now be replaced without data loss. In order to replace the battery, the module..

- ..**must** be plugged into the door controller,
- ..the door controller **must** be powered from the AC power line.

Software Features

There are some differences you should be aware of in the software contained in the new door controllers. Most of these are described in greater detail later under headings for each administration system.

On- Board Relays

There have always been 4 relays fitted to the K2000-AM and K2000-N door controllers.

- Relay 1 was activated when any of the doors had an 'Unauthorized Access'.
- Relay 3 activated when any of the doors had 'Door Left Open'.

Until now relays 2 and 4 were not used, now:

- Relay 2 will changeover with time profile 1. You could use this for switching lighting or heating for instance.
- Relay 4 will operate with enclosure tamper, if the T+ and T- terminals on the door controller are opened then the relay will changeover.

Note: These relays can be fully programmed to respond to a wide range of events when being administered from Readykey For Windows. There is also some limited programming when programmed from the front panel or from the K6000-AM or K6000-SS/MS.

Alarm Modules

All Systems. It is now possible to program the relays on each K2015 Alarm Module to activate on certain events, including time profiles, door alarms etc. Because of this increased functionality the way the Alarm Module responses are programmed has changed. Depending on how the system is administered you may need to re-program any existing Alarm Module records. The details of the programming changes are described under each administration system.

Remote Acknowledgment

Readykey For Windows **Systems administered by Readykey For Windows** Previously if a door alarm occurred at a door controller a relay would be set. This relay would then be reset when the alarm was acknowledged. However the door controller itself considered the alarm acknowledged when it had successfully communicated the event to a Master controller, such as a K2000-AM, the Network Controller or a PC. When using Readykey For Windows it is possible to set alarms so that the relays are not reset until an operator accepts an alarm at the PC. This is particularly important if you are going to use the more extensive relay programming now available.

See *Engineering Mode* to set this feature. **Transaction Filtering**

All systems. On busy systems performance can be improved by filtering out the less important transactions such as Request to Exit, Free Exit etc. Now there are 4 groups of transactions that the door controller can 'forget', that is **not** send to the administration system.

See *Engineering Mode* to set this feature.

Compatibility with Previous Models

The K2100 replaces both the K2000-AM and the K2000-N. It achieves this by operating in one of 4 different operating modes. When operating as a 16 door controller administered from the front panel, it is installed and programmed like a K2000-AM. When operating as a slave door controller it is the equivalent of a K2000-N.

K2000-N
K2000-Ns may be used as Slave door controllers on the six-wire bus, along with K2100 door controllers operating as the Master or as other Slaves. However the following features will **not** be available on the K2000-N door controllers:

- On-board relay programming.

- Alarm Module relay programming.

- Power On, Power Off, Relay Set/Reset transactions.

- Remote Acknowledgment

Readykey For Windows
If using a Readykey For Windows administration system, you will be able to identify the type of each door controller and only valid programming options will be allowed.

Upgrading

All K2000 models may be upgraded to K2100 **software** by the installation of a replacement memory module. This provides all the new features **with the exception of those provided by the latest power supply i.e.:**

- 24v DC lock output.

- Variable AC power input.

Specifications

Environmental

Door Controller

Temperature 0ºC to +40ºC
Humidity 0% to 90% RH (non-condensing)

Readers

Temperature -40ºC to +40ºC
Humidity 0% to 90% RH (non-condensing)

Power Supply

The K2100 has an integral mains power supply. It is capable of automatically sensing the input voltage and therefore will operate on a 110-120v or 220-240v, 50Hz or 60Hz AC power supply without the need for switch setting.

The lock output is switch selectable between 12v DC and 24v DC. The lock output voltage applies to **all** the lock outputs.

AC Line Input

Voltage 85vAC to 250vAC 50/60 Hz power input
Fuse Rating 3.15Amp 20mm Fast-Blow Fuse (in AC connector)
Connector Standard IEC connector, right angle socket supplied

Lock Output

Output Voltage 12v DC or 24v DC, switch selectable.
Fuse Rating 1.0 Amp 20mm Fast-Blow Fuse, one per channel
Max. Current 1.0 Amp per channel at 12v DC
0.5 Amp per channel at 24v DC

Battery Backup

Input Voltage 12v DC or 24v DC, depending on lock output
Fuse Rating 10 Amp 20mm Fast-Blow Fuse

Cable Specifications

Reader Cable

Type 6 conductor, multi-stranded, unshielded cable
Distance/Gauge Up to 250m: 0.22mm² Up to 750ft: 24 AWG
Up to 500m: 0.50mm² Up to 1500ft: 20 AWG
Up to 1000m: 1.00mm² Up to 3000ft: 18 AWG

Lock Output

Type 2 conductor, multi-stranded
Distance/Gauge Depends on distance to lock and the current drawn by the lock.
Usually 0.5mm² or 1.0mm² / 20 AWG or 18 AWG will be sufficient.

Six-Wire Bus

Type 6 conductor, multi-stranded, unshielded cable.
Distance Overall length of bus (max): 1000m/3000ft
Between controllers (max): 500m/1500ft
Gauge 0.22mm² /24 AWG

Description
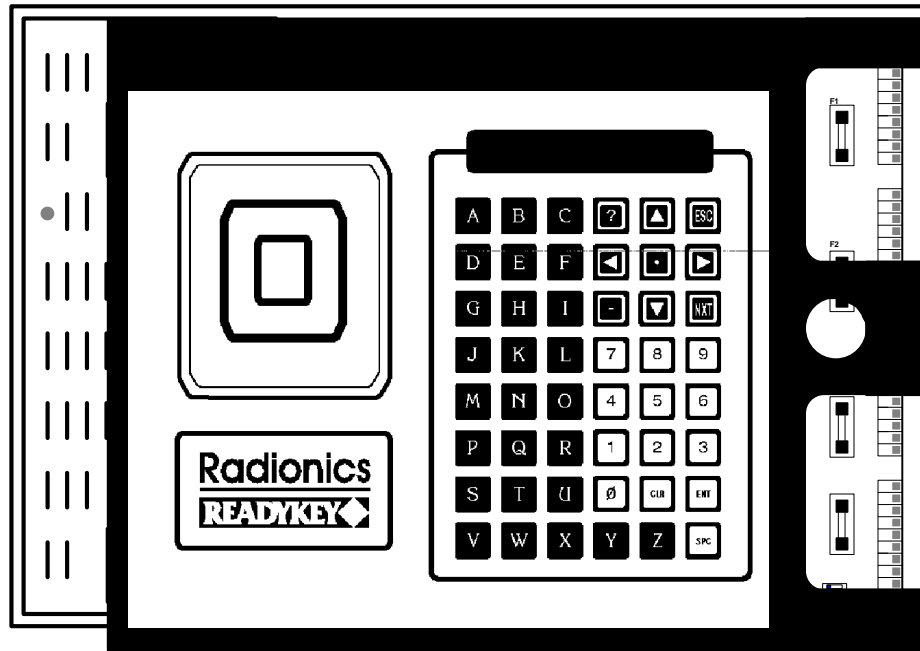
K2100 Door Controller with Front Panel fitted.
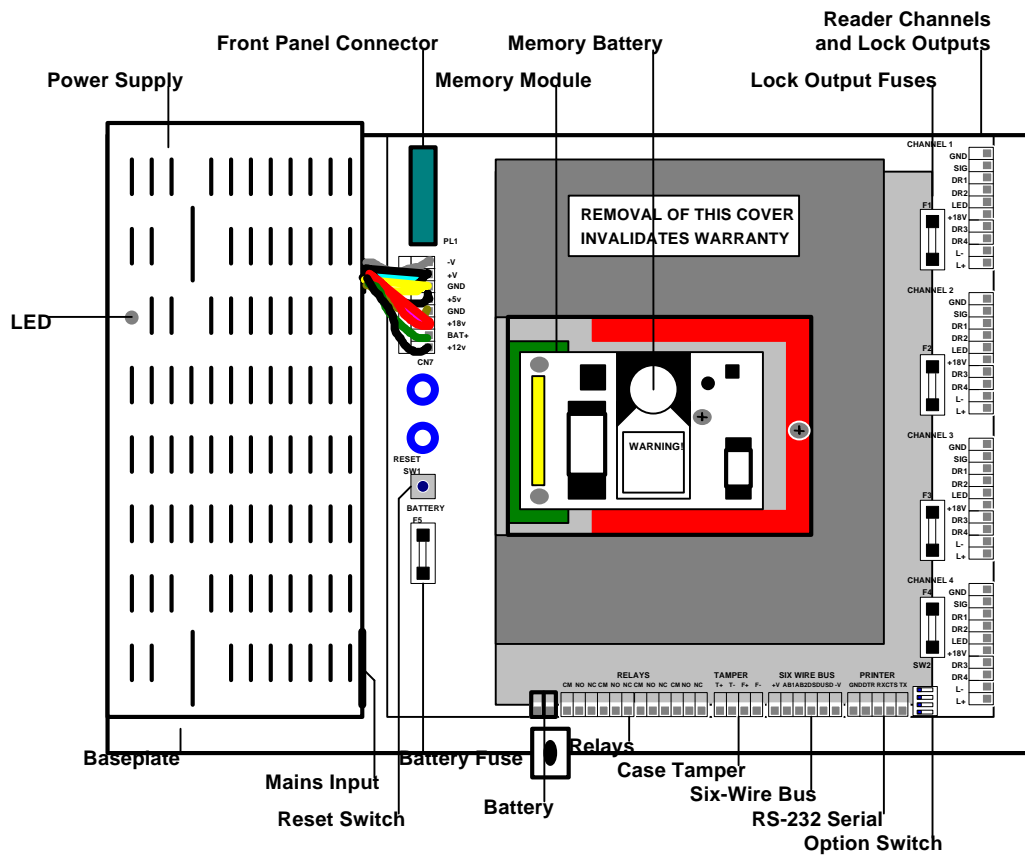
K2100 Door Controller with Front Panel removed.

The K2100 consists of a printed circuit board and power supply both fitted to a steel baseplate. A removable front panel fits to the power supply and baseplate connecting to the circuit board via a ribbon cable.

K1100   The K1100 is identical with the exception that there is only provision for two readers and two lock outputs.

The Power Supply

The metal cased power supply unit is fitted on the left-hand side of the baseplate. This unit will automatically adjust to the local AC power supply, accepting input voltages between 85v AC and 250v AC at 50/60Hz. The power input uses a standard IEC connector, a right-angle socket is supplied.

The output from the power supply is fed to the circuit board by an 8-pole connector.

The Front Panel

The removable front panel contains a key reader, on the left-hand side, a keypad and a 16 character display. The panel is secured by two tabs that fit into slots in the power supply on the left-hand side, and by two spring clips on the right-hand side that attach to the baseplate. A ribbon connector plugs into a socket on the circuit board at the top left, next to the power supply.

The Memory Module

Located under a clear plastic cover attached to the black internal cover. This small board contains the software and database memory. A small removable battery maintains the database memory in the absence of mains or battery power.

WARNING: The module is static sensitive. Ensure that the module does not come into contact with any conductive materials.

Installation and Testing - Introduction

This is a brief outline of the steps that will be taken in the following chapters. This describes the installation and testing of the door controller independently of the administration system.

It is possible to test all the reader and lock functions before making any network or communications connections. You are strongly advised to follow the order shown below. In this way you will be able to identify any problems before going on to the next stage.

1. **Siting and Installation of the Door Controller,** including installation of the Readykey metal enclosure if used.

2. **Installation of Readers,** including door contacts, request-to-exit switches.

3. **Wiring of Locks**

4. **Testing** of Readers, Locks etc.

5. **Network connections,** six-wire bus and/or serial links where applicable.

Front Panel   The installation and commissioning of the Front Panel administered system is included in *K2100 User's Guide*.

The following subjects are covered in the Installation Manuals for each administration system:

1. **Connecting to the Administration System,** Readykey For Windows K6000-AM, K6000 Network Controller, Modems etc. where applicable.

2. **Commissioning** the System.

Installing the Controller

The door controller may be mounted in the metal enclosure (K2120, supplied separately, see below) or in any suitable cabinet. Make sure that access can be gained to the door controller independently of the access control system itself.

If several door controllers are to be connected using the six-wire bus, then it is usually better to distribute the controllers so they are closer to the doors. This should reduce the length of cable needed for readers and locks.
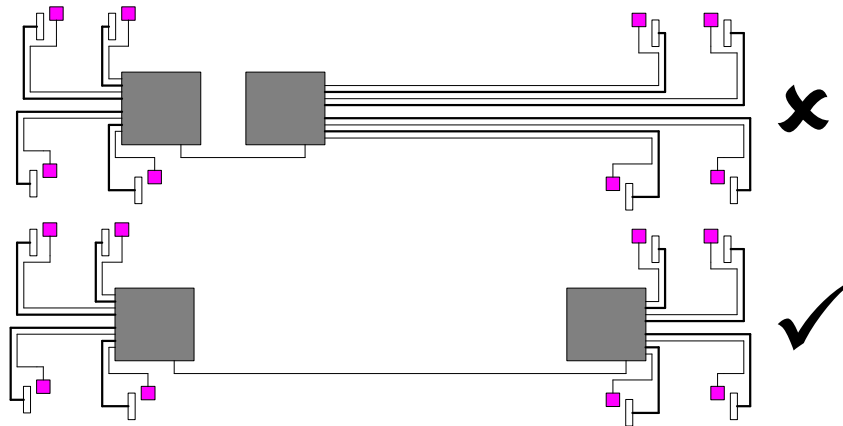
Front Panel　　**Important:** If the system is to be administered from the front panel then operators will be spending time programming at the controller. You should therefore ensure that the controller is mounted in a suitably warm, dry and well lit location. The display should be at about eye level for most comfortable use.

Metal Enclosure K2120

The metal enclosure should be fitted to a wall using appropriate fixing screws. Use the central keyhole slot to hang the enclosure initially, and use the remaining fixing holes as a template. There are several knockouts, shown in the diagram below, provided for cable routing. Use conduit or trunking when bringing surface mounted cables into the enclosure.

There is room in this enclosure for two 6/7Ah lead acid batteries.

All dimensions in mm/in

406/16.00

90/3.50

6/0.24

100/3.95   103/4.05   103/4.05   100/3.95

24/0.95

20/0.79

'Keyhole' slots for securing cabinet to wall.

Slots on door controller base fit over these tabs...

258/10.16

406/16.00

414/16.3

... and self tapping screw secures to higher bracket.

|40/1.57|

100/3.95

124/4.88

20/0.79

19/0.75   6/0.24

Circular knockouts - diameter:
40mm/1.6in on back of cabinet
25mm/1.0in at corners of top,
        bottom and each side

6/0.24

Bottom View, top has knockouts in same position

15/0.60   15/0.60

Metal Enclosure K2120

Note: Be sure to check the lock output voltage before installing the door controller in the enclosure. Check the switch, visible through the top of the power supply housing, that it is set for either 12v DC (factory setting) or 24v DC.

The door controller mounts in the metal enclosure using two slots that fit over tabs on the back of the enclosure. You should ease the tabs on the enclosure forward slightly to make locating the door controller easier. The base plate should then be secured using the single tab at the bottom of the baseplate using a self-tapping screw, supplied.

Mounting Direct to a Flat Surface

You may wish to fit the door controller in an enclosure or cabinet other than the K2120 Metal Enclosure. The diagram below indicates the position of screw slots and cable entry holes.

All dimensions in mm/in

Rectangular holes (25x13/1.00x0.50) may be used for cable entry

'Keyhole' slots for mounting to flat surface

60/2.40   380/15.00   60/2.40

8/0.40

Slots for mounting to metal enclosure

Power Supply
Mounting Screws

254/10.00

8/0.40

Tab for mounting to metal enclosure
or flat surface

190/7.50
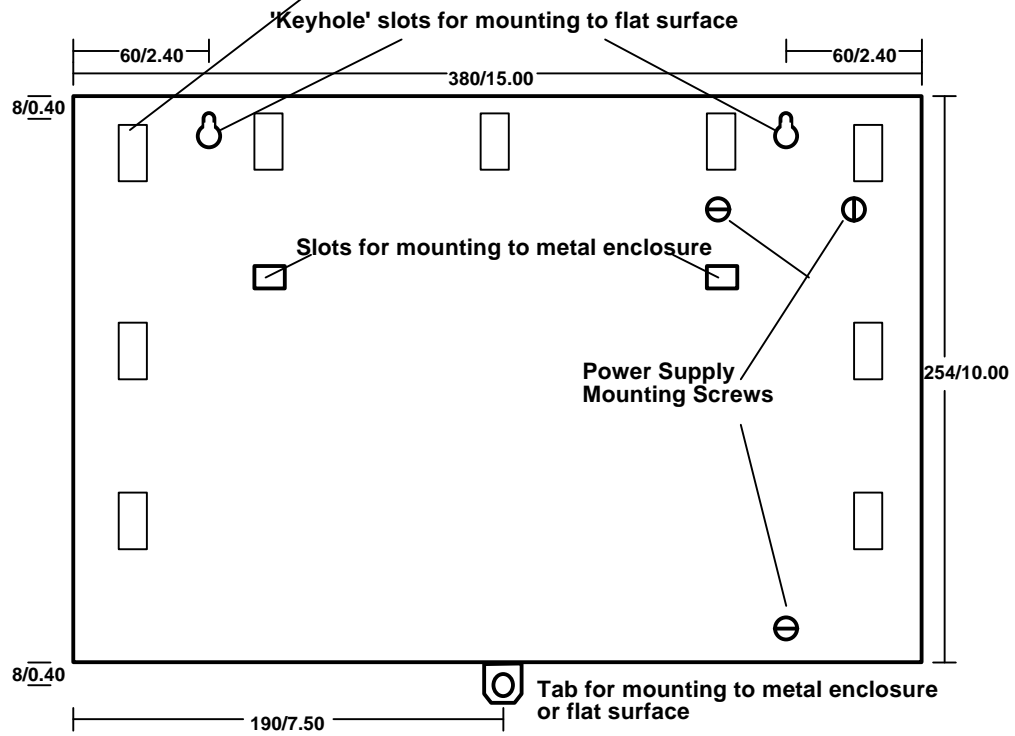
Rear View of Door Controller Base Plate

Power Supply

Important: The database is stored in battery-backed memory and will be preserved whether the controller is powered or not. This backup will last up to 5 years provided that the controller is normally powered. The battery, located on the memory module, can be replaced without losing data. This is recommended every 3 years.

Memory Retention Battery

This battery can be replaced without losing the contents of the database provided:

- the memory module remains plugged into the door controller, and
- the door controller is powered from the AC outlet.

CAUTION: there is a danger of explosion if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of batteries according to the manufacturer's instructions

AC Supply

AC power, single phase, between 85v AC and 250v AC, 50/60Hz, should be supplied to the controller through an unswitched outlet. A right angle IEC plug is supplied for wiring the mains lead.

A Panamax GNG 0200 surge protector must be used between the A/C input and the K2100/K1100. The receptacle must be UL listed and must comply as well as be installed by a licensed electrician per NFPA/NEC-70 (National Electrical Code). The voltage and current rating as well as the installation must comply with NFPA/NEC and be installed by a certified electrician.

Power Indicator

A red LED is situated within the power supply. It is visible through a small hole about 75mm/3in from the top on the left hand side of the power supply case.

- If the door controller is operating off the mains supply, whether the battery is connected or not, **then the LED will be lit**

- If the mains supply fails and the unit is running from the backup battery, **then the LED will be extinguished.**

Lock Output Voltage

The lock output voltage is set for all doors on the controller using a switch accessible through the top edge of the power supply.

The lock output for each channel must not exceed:
    1.0 Amp at 12v DC
or 0.5 Amps at 24v DC

This means you can use up to four 1 Amp continuous 12v DC locks or up to four 0.5 Amp continuous 24v DC locks.

Battery Backup

A battery charging facility is available that can provide up to 0.5Amp at 13.8v DC or 0.25Amp at 27.6v DC.

Important: The battery backup voltage **must** match the lock output voltage, i.e. 12v or 24v. You may use two 12v batteries in series to provide 24v DC.

The capacity of the battery required should be calculated based on:

- The current consumption of the door controller and readers, 1 Amp.

- The current consumption of the devices attached to the reader channels, up to 800 mA

- The current consumption of the locks when operating normally (up to 1 Amp each).

- The type of lock, continuous (fail-safe) or intermittent (fail-secure).

- The length of time the system should operate without mains power.

The following tables will help you estimate the current

Lock Supply Current

For continuous, or fail safe, locks the continuous lock supply current is the current drawn by the lock. For fail-secure locks, however, you need to estimate the equivalent continuous current by using the following equation:

CLC=(Lock Current Rating x LRT) x NOP / 3600

where: **CLC** = Equivalent Continuous Lock Current
        LRT = Lock Release Time (in seconds)
        NOP = Number of Operations per hour

The lock current rating should be indicated in the lock specification.

Example: A 500mA lock strike, with a 5 second Lock Release Time, operating 50 times an hour would give:

CLC=(500 x 5) x 50 / 3600 = **35 mA**

Note: If you have any doubt about the current drawn by a lock, then you should measure it at the controller using a meter.

The maximum current that should be drawn from each lock output is:

1.0 Amp at 12v DC
0.5 Amp at 24v DC

In the table below record the type and current consumption of each lock fitted:

Channel	Type: Continuous/Intermittent	Continuous Lock Current
1		
2		
3		
4		
Total		

Table 1, Continuous Lock Supply Current

Reader Supply Current

There is a maximum of 800mA available on the 18v supply. Readykey Readers, of all types, draw approximately 90mA each continuously. If you fit K2015 Alarm Modules or Wiegand Interfaces you should ensure that the maximum current available, 800mA, is not exceeded.

In the table below record a current consumption for each device fitted:

Channel	Reader Current 90 mA	Wiegand Interface 5 mA [1]	Alarm Module 20 mA	Module Relays 25 mA [2]	**Total**
1					
2					
3					
4					
Total (not to exceed 800mA)					

Table 2, Total Reader Channel Current

Notes

1 Only include a value for the reader current if the Wiegand device is powered from the Wiegand interface 5v output, or the 18v reader supply.
2 Include 25mA for each Alarm Module relay that is programmed to operate.

Determining Total Power

The door controller itself consumes 1 Amp before the addition of any readers or locks. For each 100mA of reader channel current, as determined above, 250mA should be allowed. This is due to several factors involved in the generation of the 18v DC supply.

Door Controller	1	Amp
Total Continuous Lock Current, see Table 1 above	_____	Amps
Total Reader Channel Current, see Table 2 above	_____	Amps
Total Current Requirement	_____	**Amps**

Note: that the above figures are all stated in Amps, (1 Amp = 1000 mA).

Standby Battery Requirement

IMPORTANT

The battery voltage should match the lock output voltage.

Use a Radionics Dual Battery Harness (D122) when using two batteries.

Now that you know the total continuous current requirement of the door controller plus readers, locks and ancillaries, you should multiply this figure by the number of hours standby needed.

Example: a door controller with a continuous current of 2 Amps will require at least a 4 Ah (AmpHours) battery to provide 2 hours cover (2 Amps x 2 hours = 4Ah).

Important: the Ah rating of a battery is usually determined when discharged over a 10 or 20 hour period. If a fully charged battery is discharged over a shorter period than this, as in the example above, then it will last for less time than its rating suggests. You should consult the battery manufacturer's correction factor charts to determine a more accurate figure. This means you will probably need a higher rated battery than expected.

Using an External Charger

In order that a fully discharged battery can recover to a fully charged state within 24 hours, you should consider using an external charger when using more than a 6 Ah battery. Use the wiring shown below.
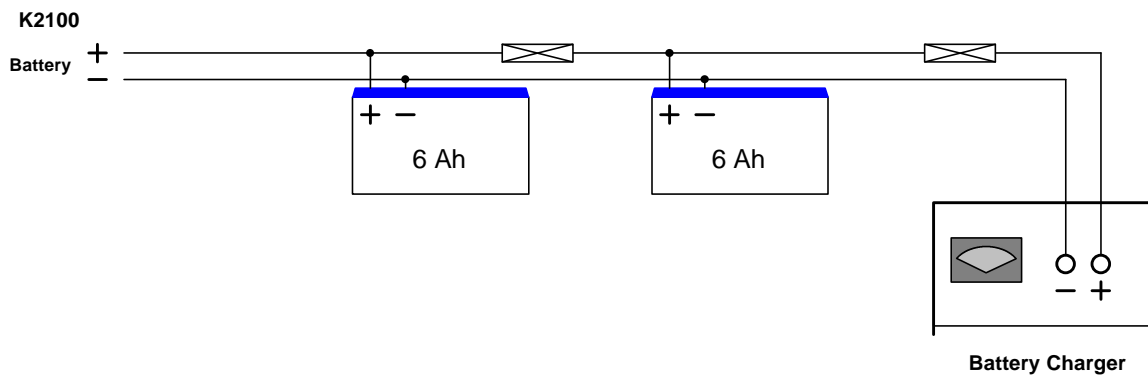
Installing Readers and Locks

IMPORTANT NOTE

All the features described below can be programmed and tested, where necessary, at the front panel. Details of how to do this are provided later in the manual. However if the door controller is going to be administered from a PC based system, then you will need to program these features from there as well. You are advised to use the front panel to test the installation of the door controller, readers and locks and then, once communications are established, you will initialize the door controller and program the features at the administration PC.

How to fully commission a PC based system is described in the Installation Manual for that system.

Readers

The K2100 has four reader channels, the K1100 has two. Each reader is wired independently using up to 3000 feet of six conductor cable.

Reader Wiring

Reader Wiring Diagram
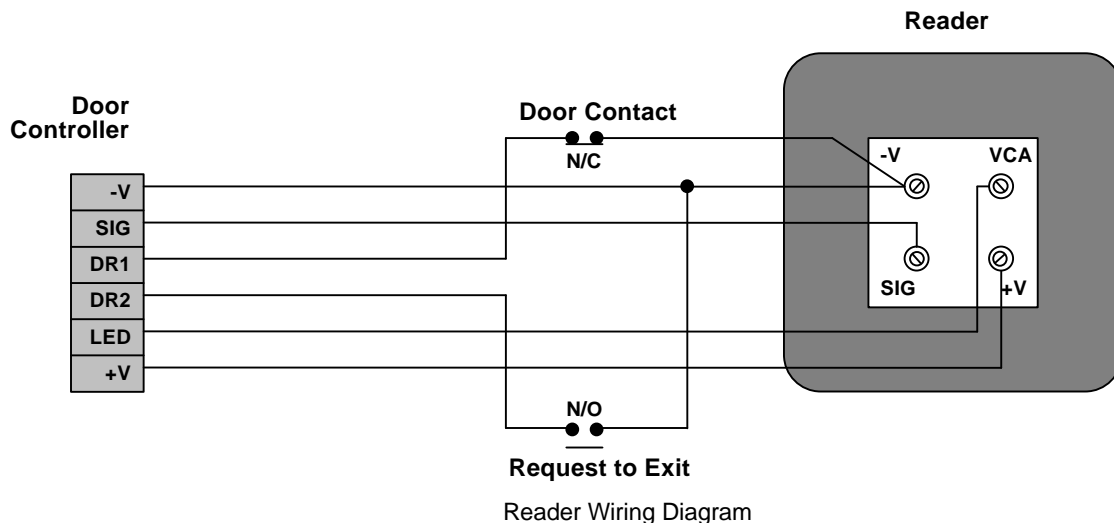
Use the most appropriate reader for the location bearing in mind, internal or external, vandal resistance, decor, panel mounting etc.

Reader Installation

See the data sheet supplied with each Readykey reader for specific details for installing that type of reader.

In general:

- Readers should be mounted at a convenient height, usually at about the height of a door handle, on the unhinged side of the door.

- Readers should be mounted at least 1m/3ft apart to prevent any interaction between them. Be particularly careful with this distance when placing readers on each side of the same door.

- Consider future service requirements such as access to cables etc.

Reader Cabling

Use unshielded, multistranded, tinned copper signal cable, the type commonly used in alarm installations. The gauge depends on the distance from the controller to the reader.

6-conductor cable should be used:

up to	250m	0.22mm²	up to	750ft	24 AWG
up to	500m	0.50mm²	up to	1500ft	20 AWG
up to	1000m	1.00mm²	up to	3000ft	18 AWG

4 conductors are used to connect the reader itself, the other 2 conductors are for the optional request to exit and door monitoring signals (see below).

The readers are not prone to electrical interference, however avoid routing cable close to heavy load switching cables and equipment. If this is unavoidable then cross the cable at right angles every 3 - 6 feet (1-2)m.

Reader Connections

All Readykey readers have 4 terminals, +V, VCA, SIG and -V. Each reader is connected to one of the 4 reader channel terminal blocks on the door controller. Each reader channel has 2 further connections, DR1 and DR2. These provide door/cable monitoring and Request to Exit inputs respectively.

Reader Marking	Description	Suggested Cable Color	Connects to Controller
Screw Terminals			6 pole Terminal block
+V	Supply: 18 volts.	Red	+V
VCA	Valid code accepted, illuminates the green LED at the reader.	Green	LED
	Request to Exit.	Yellow	DR2
	Door Monitoring.	White	DR1
SIG	The signal from the reader to the controller.	Blue	SIG
-V	Supply: 0 volts.	Black	-V

Request to Exit (DR2)

Wiring Detail
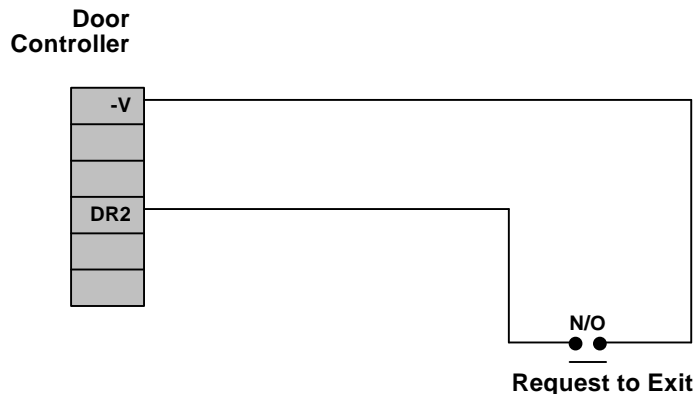
Request to Exit Wiring Diagram

As connecting DR2 to ground (-V) will always operate the lock, ensure that the request to exit wiring is not accessible from outside the secure area (for example, if the reader is removed from the wall then the request to exit wiring should not be exposed.)

The request to exit switch (RTE) allows persons within the secure area to leave by signaling the door controller to operate the lock without using a key. The switch is necessary when door monitoring is used (see below) to enable the controller to distinguish between a forced door and a valid exit.

- The switch should be 'normally open' which closes momentarily when pressed.

- It is quite possible to locate the switch away from the door, at a reception desk or as part of a door entry system. In which case it is possible to change the event report to `Request for Entry`.

- More than one switch can be used if wired in parallel.

- If an attempt is made to keep the door open by holding down the RTE button then the door will lock after 5 cycles of the lock release time and an `RTE Button Held Down` report is produced.

Door Monitoring (DR1)

Wiring Detail

Door Contact with Reader Tamper Detection

Reader Tamper Detection Only

Door Contact Wiring
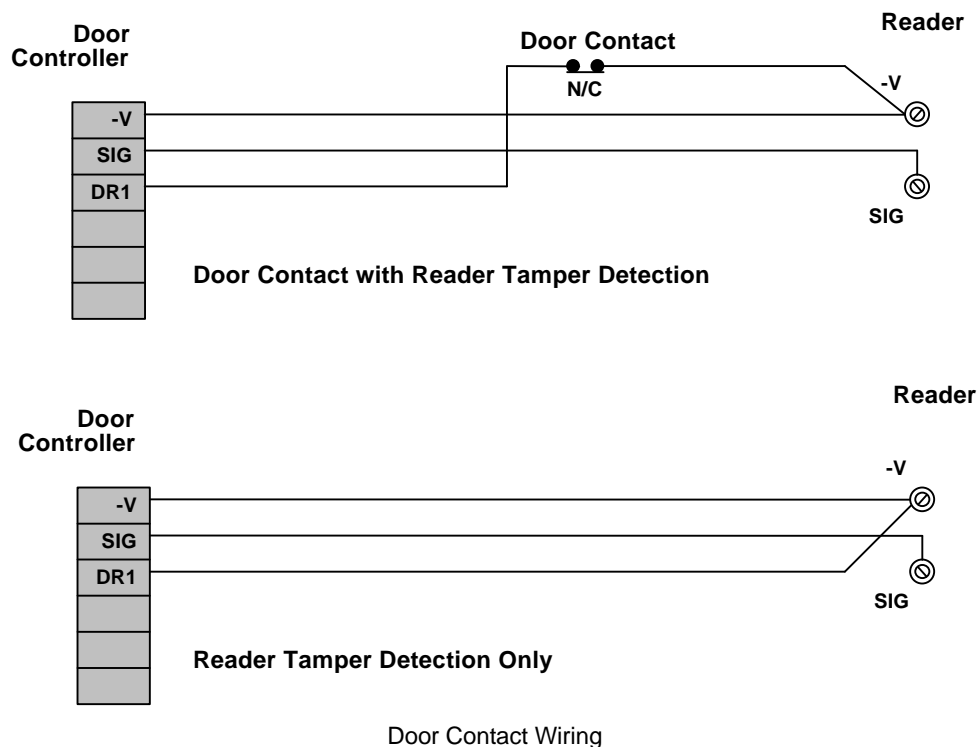
Door Contact Monitoring

The K2100 has the ability to monitor a door contact allowing:

- **Unauthorized Access Alarms** giving warning of a forced door.

- **Door Left Open Warning** after a set period of time. The time is set in the door database.

- **Cancellation of Lock Release Time** allows the door to lock after someone has passed through even though the lock release time has not expired.

The Door Contact

The door contact should be a normally closed switch that is open whenever the door is open. Care should be taken when installing door contacts to ensure that they operate only when the door is opened and close only when it is secure again.

To help prevent false alarms:

- Keep reed switches away from large magnetic fields, such as those generated by magnetic locks. This is a particular problem with metal door frames.

- Ensure that the switch does not operate if the door moves in its frame, in draught or windy conditions.

- An efficient door closer should be fitted that secures the door once someone has passed through.

Cable/Reader Anti-Tamper

In addition to monitoring a door contact the DR1 connection also provides a tamper detection function. Tamper is detected when the SIG line breaks at the same time as DR1 opening. This is achieved whether or not a door contact is fitted. To provide full protection of the cable and reader the DR1 conductor should be terminated at the reader -V terminal to ensure that the DR1 to -V circuit breaks when the reader is removed.

It is recommended that the anti-tamper wiring is used whether a door contact is monitored or not.

WARNING: Tamper detection does not operate when the door is manually unlocked, automatically unlocked via a time profile or while the door is open through the use of a key or RTE.

Emergency Override/Free Exit

There is a special case where both the DR2 and DR1 signals are interpreted differently to the way described above. The DR2 signal is used to monitor an emergency switch, such as a break glass, and DR1 provides a Free Exit report.

Note: when this feature is used there is no tamper detection and no door alarm monitoring.
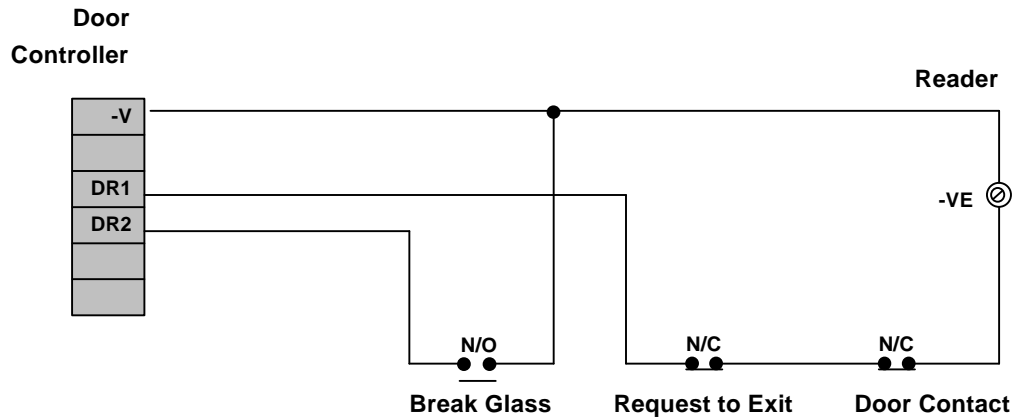
Special Case for Emergency Override and Free Exit

Emergency Override / Free Exit Wiring

Emergency Override

When connected as shown above, operating the break glass will open the door and produce an `Emergency Override On` report. When the switch is restored an `Emergency Override Off` report is produced and the door will be locked again.

Note: this feature should not be fitted as the sole means of escape see *Lock Output - Safety* below.

Free Exit

In the case of DR1, this will produce a `Free Exit` report when the switch is opened. The door contact will allow door left open warnings to be produced.

A normally closed switch may be used to operate as a request to exit switch, in addition to having a door contact switch in series. A additional special Lock Mode (Option 8) needs to be set to allow this feature. **Note:** using this arrangement the lock will operate whenever DR1 is opened - this means that care should be taken that the door contact cannot be broken from the secure side of the door .

Lock Output

Wiring Diagram

Door Controller   **Electric Release or Lock**

L-
L+   MOV   -
                                                        +

Fail-safe or Fail-secure lock

L-
L+   MOV   -
                                                        +

Fail-safe lock with safety Break Glass   N/C

Break Glass

Lock Output Wiring
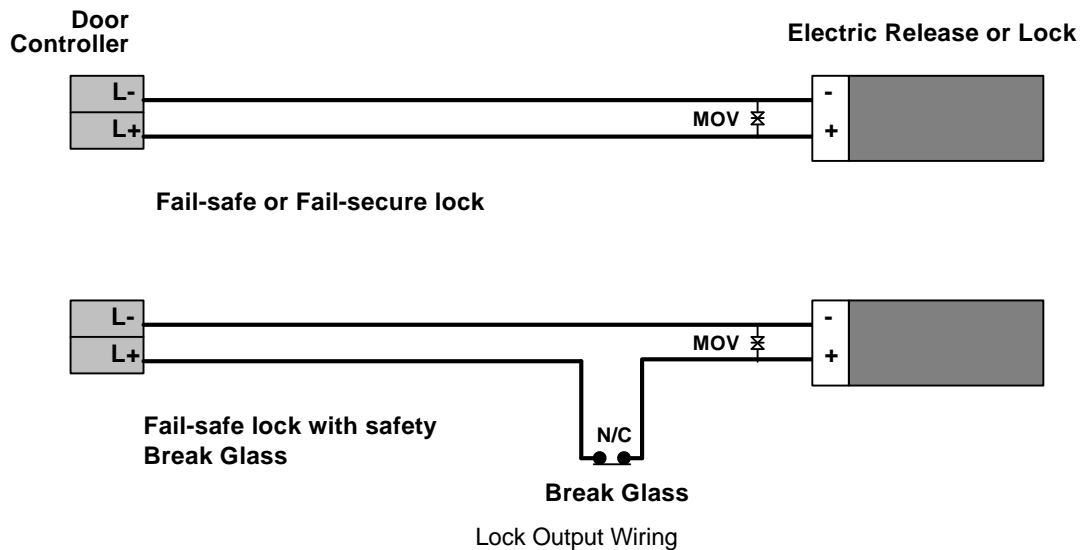
All locks should be fitted according to the manufacturer's instructions.

K2100
K1100
The K2100 provides a lock output for each reader channel. These outputs are capable of providing either 12v DC or 24v DC. The lock output on each channel must not be able to exceed 1.0 Amps at 12v DC or 0.5 Amps 24v DC. The lock voltage is set using a switch accessible through the top of the power supply unit

K2000
The K2000 series provides a lock output for each reader channel. These outputs are capable of providing 12v DC only. The lock output on each channel must not be able to exceed 1.0 Amps.

Each lock output is protected by a 20mm 1.0 Amp Fast-Blow fuse sited adjacent to each output connector.

Each output can be independently set as fail-safe (power to lock) or fail-secure (power to unlock).

The cable between the door controller and the lock should be of such a gauge as to provide at least the minimum voltage required to operate the lock. The resistance of the cable and the current drawn by the lock will determine the type of cable.

Lock Suppression

All locks **must** be fitted with a means of suppressing back e.m.f. ('spikes') generated by most electric releases, especially magnetic locks. All Readykey readers are now supplied with an MOV (metal oxide varistor). This device will prevent long term damage being done to the door controller.

Whenever possible this device should be fitted across the lock terminals. If for any reason the lock terminals are inaccessible then the MOV may be fitted across the door controller lock output.

Safety

Any door that is considered a fire door or is on an escape route **must** have some means of overriding the electric release in an emergency. Usually this is achieved by the use of fail-safe locks (power to lock) fitted with a normally closed break-glass **in the lock supply**. When the break-glass is operated the supply to the lock is broken and the door will be released without any intervention from the door controller.

Lock Sharing

When using a reader on each side of a door to monitor both entry and exit then it is only necessary to feed one lock. The same lock will be operated by both the entry and exit reader. To achieve this arrangement two reader channels are paired, channel 1 and channel 2 may be considered as entry readers, channel 3 and channel 4 are exit readers.

When using channel pairing, or interlock, in this way you will also generate `Entry Authorized` and `Exit Authorized` reports instead of `Access Authorized`.

Reader Channel	Operates...	Reports...
Channel 1	Lock Output 1	`Entry Authorized`
Channel 2	Lock Output 2	`Entry Authorized`
Channel 3	Lock Output 2	`Exit Authorized`
Channel 4	Lock Output 1	`Exit Authorized`

Each channel pair may be programmed independently.

If channel 1 and 4 are paired then lock 1 will operate when a valid key is presented to either channel 1 or channel 4, similarly lock 2 will operate if channel 2 and 3 are paired.

K1100   As the K1100 has only two reader channels, channel 1 may be considered an entry reader, channel 2 is the exit reader, both will operate lock output 1.

Anti-Pass Back

When two readers are used to control both entry into an area and exit out of the area then anti-pass back may be set. This will prevent a key being used again after it has entered the area. If an attempt is made to use the key to enter the area again a `No Entry: Pass Back` report will be generated.

Anti-Pass back may only be set to cover an area controlled by one door controller. As in lock sharing above, channels 1 and 2 and considered as entry readers, channels 3 and 4 are considered exit readers. You may set each pair independently, so that only channels 1 and 4 for instance were used for anti-pass back. Again, as with lock sharing, different reports are generated when anti-pass back is set on a pair of channels: `Entry Authorized` and `Exit Authorized` reports instead of `Access Authorized`.

Anti-Pass Back Time-out

Pass back may either be active until the key is used to leave the area, or a time limit may be assigned after which the key may be used to enter the area again. The time limit is useful if people are likely to leave the area without using their keys, without the time limit they would be unable to get back in the area.

Anti-Pass Back and Door Monitoring

If door monitoring is set up then anti-pass back is only activated when a key is presented **and** the door is opened. If the door is not opened the anti-pass back will not be set on that key.

Anti-Pass back on Exit

It is possible to program the door controller to prevent people **leaving** unless they came in using their key. A typical application may be a pay-on-exit car park where people are free to enter but must use a key to leave (or pay a fee). If this is set then an `No Exit: Pass Back` report will be generated.

K1100 As with lock sharing the K1100 pairs channel 1 as entry and channel 2 as exit readers.

K2001-P PIN Reader

A Readykey PIN reader operates exactly as a normal Readykey reader except that the user has to enter a PIN after presenting their key.

PIN Reader Time Profiles

It is possible to set a time profile so that a PIN is not required at certain times, during the day for instance, but is required at all other times.

Other Connections

This section includes Relay Outputs, Enclosure Tamper and Override Input. All these connections are made at removable terminal blocks along the bottom edge of the circuit board.

Relay Outputs

There are 4 relay outputs fitted to the door controller, each consists of a removable terminal block with Common, Normally Open and Normally Closed . Depending on the type of administration system these relays can be programmed to operate as a result of particular events.

Each relay is capable of switching 12v at 1 Amp or 24v at 0.5Amp.

Relay 1			**Relay 2**			**Relay 3**			**Relay 4**		
CM1	NO1	NC1	CM2	NO2	NC2	CM3	NO3	NC3	CM4	NO4	NC4
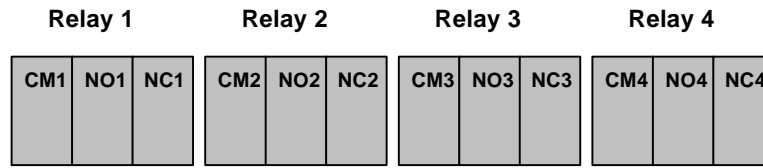
CMn - Common
NOn - Normally Open
NCn - Normally Closed

Relay Outputs

Without any programming they will respond as follows:

Relay 1
Will operate in the event of an `Unauthorized Access`   at **any** door on the door controller.

Relay 2
Will operate along with time profile 1.

Relay 3
Will operate in the event of a `Door Left Open`   at **any** door on the door controller.

Relay 4
Will operate in the event of a Enclosure Tamper (see below).

See the Installation Manual for the administration system you are using for full programming details.

Enclosure Tamper Input

This is a normally closed input that may be connected to a tamper switch fitted to the controller enclosure.

Tamper

T+	T-

N/C

Case Tamper Switch

Enclosure Tamper Wiring
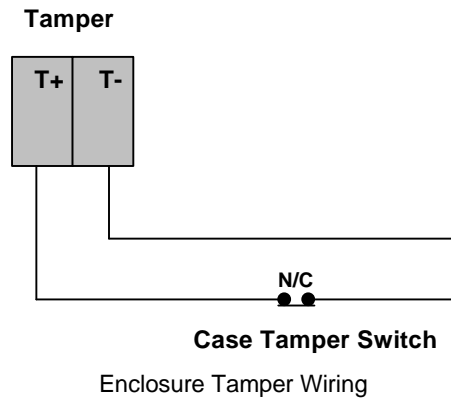
Note: This is a normally closed switch therefore you should use a short piece of cable to link the two terminals before powering up. If not you will get an immediate `Case Tamper` alarm.

Override Input

This is a normally open input that when closed will cause all the doors to open. This may be fitted to the output of a fire alarm system or to a manual emergency override switch. All the doors on the door controller will remain open until the switch opens again.

F+	F-

N/O

Emergency Override Switch

Override Input Wiring
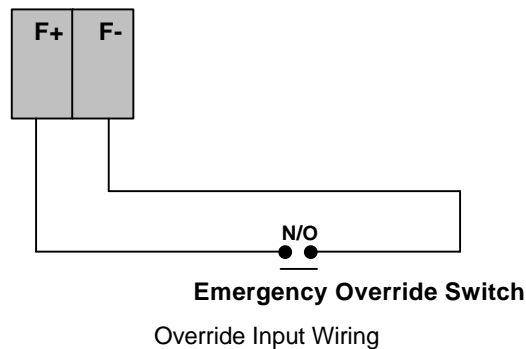
Warning: Any failure of the door controller or cabling will prevent this means of releasing the doors from working. Therefore this input should **not** be considered as a primary safety mechanism. See *Lock Output - Safety* above.

K2015 Alarm Module

See   *K2015 Alarm Module Installation Manual*

The K2015 Alarm Module is an extra device that connects to a reader channel between the controller and the reader. Each Alarm Module allows 8 points to be monitored and provides 4 relays for programmable responses. Power for the Alarm Module is taken from the reader channel. A normally closed tamper switch is provided.
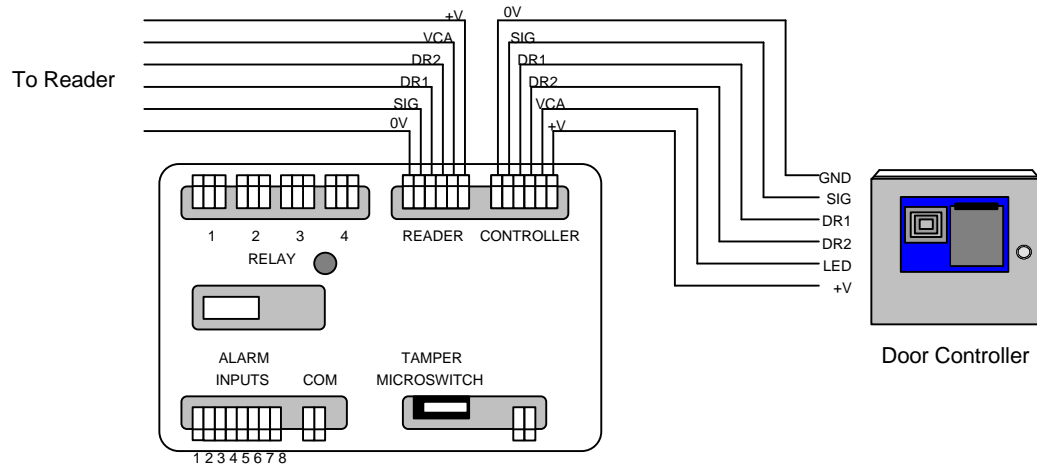
Readykey For Windows   Readykey For Windows allows more control of both inputs and outputs than other administration systems.

- Each of the 8 inputs can be enabled/disabled by a time profile or manually.

- Each of the 4 outputs can be activated by several type of events, including door forced, door left open, alarm zone activation etc.

K6000 K6000-AM
- Each input may activate an individual relay.

- Each relay may be activated by a limited number of events at the door controller.

See the Installation Manuals for each Administration System for details on how to program the Alarm Module.

Configuring the Door Controller

This section describes the steps you should follow when first powering up the controller. The following section describes how to test the reader and lock functions.

Whatever the type of door controller you will be commissioning, you should always first start it up as a Front Panel administered door controller (see *System Descriptions* at the front of this manual). You can then use the built-in editor commands to test the readers, locks (and Alarm Modules if fitted) before attempting to establish communications.

Option Switches

The option switches are fitted at the bottom right of the circuit board. Switch 4, the bottom switch, has a special purpose described later.

The top 3 switches **must** be set as shown below.

- If the door controller is a Master controller then the first 3 switches should be set to the right.

- If the door controller is a network Slave then the first 3 switches should be set to the left.

```
    OFF      ON          OFF      ON
  ┌───────────┐        ┌───────────┐
 1│  ▓▓▓▓│     1│ ▓▓▓▓  │
 2│  ▓▓▓▓│     2│ ▓▓▓▓  │
 3│  ▓▓▓▓│     3│ ▓▓▓▓  │
 4│  ▓▓▓▓│     4│  ▓▓▓▓ │
  └───────────┘        └───────────┘
  Slave Controller     Master Controller
```

Option Switch Settings
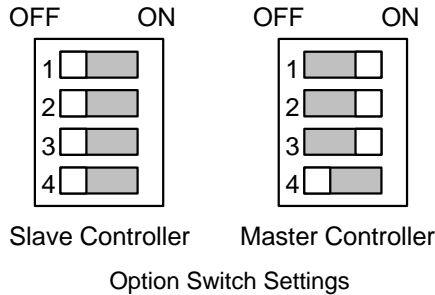
If the option switches are not set correctly then you will probably experience unreliable six-wire bus communications.

Powering Up - First Checks

Before applying power for the first time, loop the enclosure tamper (see above) terminals together (T+ and T- at the bottom of the circuit board). This will prevent a 'Enclosure Tamper Alarm' when you switch on.

Leave all readers, locks and any six-wire bus or serial port connectors disconnected.

Apply power to the door controller. There should be a short beep. The next response depends on whether the door controller has been programmed before or not.

- If this is a new door controller that has not been programmed before then it should beep continuously and display:

```
*NO MASTER KEY
```

- If the door controller has been programmed before then it may respond with an alarm indication, such as:

```
DOOR 01 ALARM
```

or:

```
CH1- A --------
```

If it detects several alarm conditions then the display will show each in turn.

- If the door controller contains a Master Key but there are no alarm conditions then the display will remain blank. In which case check that the door controller has started by pressing the ESC key on the keyboard - you should get a beep.

Check the front panel reader by presenting a key to the reader, a T should appear at the right of the display.

If there is no sound or display, then check the front panel ribbon cable is properly connected, otherwise continue with the *Engineer's Reset*.

Engineer's Reset

To get into the Editor and issue commands without an editor key, you need to perform the Engineer's Reset:

1. Press the Reset switch once (SW1, a small button about half way up the left edge of the circuit board next to the power supply).

2. After about 2 seconds and a few clicks there will be a long beep. Press the Reset switch again while the controller is beeping.

You will now see the display:

| `PASSWD  _` |

Type *PAC1990* at the keyboard and press ENT. (That is a zero at the end, not the letter O).

| `CMD _` |

You will now see the CMD prompt.

This will take you into the Editor and give you the *CMD* prompt. You may now issue any valid command.

If the door controller is being installed for the first time then you should initialize it with the *SYSTEM START* command.

The SYSTEM START Command

You should only use this command when you want to completely erase all data from a door controller. It is good practice to do this with any new installation. Once the door controller is initialized then the *INST* command is automatically started.

Dial-Up Modems

Important: It is essential that *SYSTEM START* is used on a door controller that is going to be used with a Dial-Up modem. The door controller will be set to System Type 2 or System Type 3 to allow use of the modem, but the only way of initialising the communications settings is by using *SYSTEM START*.

| `CMD _` |

This is the CMD Prompt. As this is a brand new controller type the command *SYSTEM START* and press ENT. (Press SPC between *SYSTEM* and *START*).
Note: If you get a message `INVALID SYS TYPE` then you will have to use the *INST* command (see below) to change the **System Type** to **0**. You will then be able to enter the *SYSTEM START* command.

| `ERASE ALL DATA _` |

Type *Y* and press ENT to initialize the door controller.

| `ERASING USR DATA` |

These two messages are displayed as the memory is cleared.

| `ERASING SYS DATA` |

| `E0  KEY  00000000` |

The first prompt of the INST command. This is fully described below.

When you leave the INST command and return to the CMD prompt, you should press ESC to leave the Editor. When you do this you will get a long beep indicating that initialization is complete.

Once the memory has been cleared the following settings are made. For full descriptions of these settings and what they mean, refer to the *K2100 User's Guide.*

- Every door (1 to 16) is given a lock release time (*LRT*) of 5 seconds (the *D* command).

- Access Level 1 is set to all doors (1-16) (The *AL* command).

- Access Code 1 is set to a Primary Access Level (PAL) of 1 (The *AC* command).

- The Master Key entered using *INST* below is made user number 1 with an Access Code (*AC*) of 1.

This results in the Master Key having access through all doors. If you need more keys to help test the system then use the *A* command to add some more keys. Use Access Code 1, (AC = 1), with access everywhere.

Note: the above settings only apply when you leave INST *after using the SYSTEM START command.* Normally use of the INST command will not affect any personnel or access data.

INST Command

You can use this command at any time on any system to change settings. Most of the settings below indicate in which type of system they are relevant. For instance the *ALPHA ID* setting is only relevant to systems controlled from the Front Panel (system type 0)

`E0  KEY  00000000`	This is where the Master key code will appear, there may already be a code here - it will consist of numbers 0-9 and letters A-F.

Present a key to the front panel reader.

`E0  KEY  3A33642A`	The key code will appear, replacing what was previously displayed.

Press NXT to go on to the next stage.

`PASSWD _`	You may enter a password, up to 8 letters and/or numbers. Every time you use the key, just entered, at this controller you will be asked for this password. Leave it blank for no password.

Press NXT to go on to the next stage.

`ID  _`	**Front Panel Only**

This is an Identity for the Master key. If you print transactions then this identity will appear against editor operations and alarm acknowledgments. E.g. type *MASTER* and press ENT.

Press NXT to go on.

`ALPHA ID      N`	**Front Panel Only**

If you type *Y* and press ENT you will be able to store alphanumeric names for all personnel, these will appear on reports along with ID numbers. If you leave it as *N* you will not be asked for names when adding or editing personnel.

Press NXT to go on.

`PRINTER TYPE    0`	**Front Panel Only**

Type *0* and press ENT if you are installing an Epson or IBM compatible printer.

Type *1* and press ENT if the printer is an OKI Microline.

Press NXT to go on. |
| `ENTER SYS TYPE 0` | **All Systems**

Type *0* and press ENT if you are going to administer the system from the Front Panel.

Type *1* and press ENT if you are going to administer the system from a K6000-AM.

Type *2* and press ENT if you are going to administer the system as a Master controller for Readykey For Windows 16/32

Type *3* and press ENT if this door controller is going to be a Slave (K2000-N equivalent).

Press NXT to go on. |
| `BAUD RATE   1200` | **All Systems**

Note: the baud rate can also be set when using the Option Switch, see later.

If the door controller will be using its serial port you will need to set the baud rate. Baud rate settings should be:

Printer attached to Front Panel administered controller (system type 0) : *4800*

Door controller attached to K6000-AM (system type 1) : *9600*

Door controller attached to Readykey For Windows Administration Kit (system type 2) : *9600*

Door controller attached to K6000-MS Network Controller (system type 3) : baud rate depends on the RS232 devices being used, modems, line drivers etc. : *300,1200, 2400, 4800, 9600*

Enter baud rate and press ENT

Press NXT to go on. |
| `POLL         ---` | **Front Panel Only**

The 'Poll Table' tells this door controller how many Slave controllers are connected via the six-wire bus. You should consider this controller as number 1, the slaves will be 2,3 and 4. To enter a door controller in the poll table type the appropriate number, *2,3* or *4.* As each number is pressed it will appear on the screen.

To remove a controller from the poll table, press its number again. The number will be replaced by a dash.

If there are any door controllers in the poll table that are not powered or connected you will get a message on the display -*D/C N   ERROR-1* . where *N* is *2,3* or *4* . |

| `DATE FORMAT     0` | **Front Panel** |

Sets the format in which dates appear in the system:

Type *0* and press ENT for 'dd-mm-yy' (European style).

Type *1* and press ENT for 'mm-dd-yy' (US style).

Type *2* and press ENT for 'yy-mm-dd' (Japanese/Swedish style).

Different System Types

Once the **System Type** is set (0,1,2,3) then only certain commands will work:

System Type 0, administered from the Front Panel.

| Access Editor using Master or Editor Key | **Yes** |
| Commands available | **All (depending on Editor Level)** |

System Type 1, administered from Office Administration Kit.

| Access Editor using Master or Editor Key | **No, Use Engineer's Reset** |
| Commands available | *INST, UL* |

System Type 2, administered from Readykey For Windows .

| Access Editor using Master or Editor Key | **No, Use Engineer's Reset** |
| Commands available | *INST* |

System Type 3, Slave door controller.

| Access Editor using Master or Editor Key | **No, Use Engineer's Reset** |
| Commands available | *INST* |

Warning: once you have configured a door controller using a particular system type, you should **not** change to another system type.

Engineering Mode

This is another feature to assist in the commissioning and configuration of K2100 door controller systems. This feature applies to all operating modes and at all times. There are two sections to Engineering Mode:

1. **Test Mode** - monitoring the state of all the channel inputs and the number of transactions stored.

2. **Setting Mode** - setting Address, Baud Rate and other parameters.

To enter Engineering Mode:

*   Locate the option switch, SW2, at the bottom right of the circuit board.

*   Move switch 4, the bottom one, to the right.

*   Press the Reset button **once.**

To leave Engineering Mode at any time:

*   Move switch 4 back to the left.

*   Press the Reset button **once**.

Test Mode

On entering Engineering Mode the controller will be in Test Mode. Press ESC at any time while in Test Mode to move to Setting Mode (see below).

You will now see a screen display similar to:

`1=DC RT      TK`

This is the test mode. By pressing + (plus) you will display the channel input status firstly for all 4 doors. You can use **-** (minus) to go back through each door.

The two-letter displays indicate the physical state of each input as follows. If the letters are showing then that circuit is closed.

DC   if DC displays then the DR1 circuit (door contact) is closed. If a door contact is fitted then DC means the door is closed.

RT   if RT displays then the DR2 circuit (request to exit) is closed. If a request to exit button is fitted then RT means it is being pressed.

TK   if TK displays then a key is being presented to the reader connected to that channel.

Press NXT to go on to next channel.

`2=DC RT      TK`

As above but for door 2. Press +.

`3=DC RT      TK`

As above but for door 3. Press +.

`4=DC RT      TK`

As above but for door 4. Press +.

`TRAN HI00 LO0000`

This shows you how many transactions are currently in the high priority queue (*HI*) and how many in the low priority queue (*LO*). If the door controller is communicating then both these values should be 0.

Press NXT to go on.

```
CTS OVRD TAMP @
```

OVRD   if OVRD displays then the terminals F+ and F- are closed, emergency override active.

TAMP   if TAMP displays then the terminals T+ and T- are close, enclosure tamper active.

CTS   if CTS displays then the serial port CTS signal is high.

@   this character represents the last command received from the PC or Network Controller. You may see *?* or */* at times.

See above for how to leave Engineering Mode.

Setting Mode

To reach this mode, follow the procedure as above, but press ESC from any point in Test Mode.

```
1=DC RT      TK
```

E.g. .Press ESC to get to Setting Mode.

Address Setting   **Slave Controller Only**

```
ADDRESS       1
```

Here you set the address of the Slave controller, this is only required when a controller is set to System Type 3 (K2000-N equivalent). All other system types will have a setting here of 1.

The values available for the address depend on the type of administration system:

- A Slave controller as part of a System Type 0 (Front Panel) or system type 1 (K6000-AM) will have an address or 2,3 or 4.

- A Slave controller as part of a System Type 2 (Readykey For Windows) will have an address of 2,3,4,5,6,7 or 8

- A Slave controller connected to a Network Controller six-wire bus (K6000-SS/MS system) will have an address of 1-32.

- A Slave controller connected directly to a K6000-MS Network Controller will have an address of 1.

- A Slave controller connected to a K6000-MS Multi Site Network Controller through a COS-4 or COS-8 data switch will have an address of 1-4 or 1-8.

Type the address and press ENT

Press NXT to go on.

| Baud Rate | All System Types. |

```
BAUD RATE   1200
```

Available baud rate settings are 300, 1200, 2400, 4800, 7200, 9600, 12000, 14400.

Depending on the system type the baud rate should be:

Printer attached to Front Panel administered controller (System Type 0) : *4800*

Door controller attached to K6000-AM (System Type 1) : *9600*

Door controller attached to Readykey For Windows (System Type 2): *9600*

Door controller attached to PAC Multi Site Network Controller (System Type 3): the baud rate depends on RS232 devices being used, modems, line drivers etc. *300,1200, 2400, 4800, 7200, 9600, 12000, 14400.*

Enter baud rate and press ENT

Press NXT to go on.

```
CONNECT MODEM    N
```

System Type 3

N   There is no dial-up modem connected to the door controller.

Y   Enter *Y* if there is a dial-up modem connected to this door controller.

This setting is important as it will ensure that a dial-up modem is correctly programmed to auto-answer. It is also important to ensure that if no modem is connected then this entry is set to *N*.

Press NXT to go on.

Setup -
Remote Acknowledge

`SETUP RDPHBP--`

System Type 3

R   Reserved

When administered by Readykey For Windows only.
This indicates whether **Remote Acknowledgment** is required for alarms. In this case if *R* is showing then a door alarm will only be cleared at the door controller if it is acknowledged by an operator at the administration system. This may be the Front Panel or a PC. If *R* is not showing then the alarm will be acknowledged at the door controller when it is passed to the master controller. This is important if you use the programmable on-board relays (Readykey For Windows systems only). These relays, and those on any attached K2015 Alarm Module, will only be reset when the alarm is accepted by an operator.

D   Reserved

P   Reserved

H   **For use with Multi Site Network Controller only Hardware Handshake.** Set this if the device being used to communicate with the READYKEY Network Controller requires a hardware handshake (CTS/DTR). The K2100 will not send, or stop sending, data when its CTS input is low.
See *RS232 Port, Connecting A Modem* below.

B   **For use with Multi Site Network Controller only Auto Baud Rate Select.** When a modem obtains a connection it returns a message stating the baud rate at which it will communicate. This rate is usually 'negotiated' between modems when a line is established. When this option is selected the K2100 will adjust its serial port baud rate to match the line speed.
See *RS232 Port, Connecting A Modem* below.

T   Reserved

Press NXT to go on.

Reserved

Reserved

`PROTECT COMMS   N`   Reserved

Modem Setup

System Type 3
For use with Multi Site Network Controller

Up to 16 Hayes compatible modem control characters can be entered here. You should only need to use these if the modem connected requires more than the standard programming provided by default. *Do not put any characters in here unless you understand their meaning, or are directed by someone who does.*

To enter characters not provided on the keypad you can use the • key, followed by the following letters:

• + **A** gives **&**	• + **D** gives **$**	• + **E** gives **=**
• + **P** gives **%**	• + **Q** gives **?**	• + **S** gives *****

See the section below: *RS232 Port, Connecting A Modem*

Press NXT to go on.

Transaction Filtering

All System Types.

The following 4 options can prevent certain types of transaction being sent by the door controller to the administration system. This can be useful in a busy system to speed up the communication of more important events, or on dial-up systems to keep connect times shorter. Below are described which transactions are **not** sent when *Y* is set against each option.

See the section *Transactions* at the end of this manual for a full description of all transaction types

`FRGT RTE        N`

Request to Exit, Request for Entry

Press NXT to go on.

`FRGT FREE EXIT N`

Free Exit

Press NXT to go on.

`FRGT TIME EVNT N`

Reports of all events controlled automatically by a time profile. Such as `Automatic Lock`, `Automatic Unlock`, `Automatic Isolate`, `Automatic Set` etc.

Press NXT to go on.

`FRGT POS TRANS N`

`Access Authorized`, `Entry Authorized`, `Exit Authorized`

`FRGT NEG TRANS N`

All `No Access : 'reason'` transactions.

Press NXT to go on.

See above for how to leave Engineering Mode.

Testing the Door Controller

This section describes how to test each reader channel and lock output.

Checking Reader Channels

Use the *Engineering Mode - Test* setting described above to test each reader channel in turn.

- Connect Reader Channel 1.

- Present a key to reader 1. *TK* should appear on the right of the display.

- Operate the Request to Exit switch. *RT* should appear **while the switch is closed**

- Operate the door contact, if fitted. *DC* should appear **while the contact is closed.**

Repeat for each reader connected to the door controller.

Programming Readers and Locks

Having verified the operation of the readers and door inputs, now you can verify the lock operation. To do this you will need to program some values against each door.

Get to the CMD prompt by presenting the MASTER key.

The *D* command

This command allows settings to be made for each door. You can use the up and down arrow keys to move between doors (the door number *DR n* will change). Use the NXT and - (minus) keys to move between settings. The values shown in the screen displays below are those immediately after a *SYSTEM START* command.

`CMD _`

Type *D* and press ENT.

If you get an *INVALID SYS TYPE* message then you will need to change to System Type 0 to continue (see above).

Press NXT to go on.

`DR 1    LRT   5`

Door 1, Lock Release Time.

`0-255` seconds.

This is the number of seconds for which the lock will operate. Type a new value, if required, and press ENT.

Press NXT to go on.

`DR 1    DOT   0`

Door 1, Door Open Time.

`0-255` seconds.

This is the amount of time, in seconds, after the lock release time has expired, at which a door left open warning will be given. Enter a value and press ENT.

This value also indicates whether a door contact is fitted or not. If you set this value to 0 the door controller will **not** monitor the door contact.

Press NXT to go on.

```
DR 1    TP    0
```
Door 1, Time Profile.

`0-32`

You may use a time profile to automatically open and close the door. Leave this value at 0 if there is to be no automatic control.

Enter a time profile number and press ENT.

Press NXT to go on.

```
DR 1   M --------
```
Door 1, Lock Mode (Options).

This display consists of 8 settings represented either by a number or a - (dash). Each setting is changed by pressing the number. When set the number will appear, when not set a - (dash) will replace the number. At start up all settings will be off.

1   **Set:** Fail-Safe. The locks will be continuously powered, power removed to unlock the door.
       Unset: Fail-Secure. Power will be supplied to unlock the door.

2   See Emergency Override/Free Exit in *Installing Readers* above.
       Set: Door contacts produce a `Free Exit` report.
       Request to Exit produces `Emergency Override On` when pressed, `Emergency Override Off` when released.
       Unset: Door contacts operate normally.
       Request to Exit operates normally.

3   **Set:** RTE produces `Request for Entry` report.
       Unset: RTE produces `Request to Exit` report.

4   Not used, must be **Unset**.

5   **Set:** K2015 Alarm Module attached.
       Unset: No Alarm Module.

6   Exit out of Hours. This allows personnel with access controlled by a time profile to use their keys outside the time profile if they are leaving through an exit door.
       Set: Exit out of hours allowed.
       Unset: Not allowed.

7   **Set:** K2001-P PIN Reader with Time Profiles attached.
       Unset: No K2001-P PIN Reader with Time Profiles.

8   This is a special setting that is used in combination with Option 2. Leave this **Unset** unless specifically required.
       Set: DR1 input will operate the lock output and generate a `Request to Exit` transaction.
       Unset: DR1 does not operate the lock, if used as a door contact it will generate a `Free Exit` transaction.

Press NXT to go on.

`ID _`

Door 1, Identity.

You may enter the name of the door here. This is what will appear on reports if the system is administered from the Front Panel.

Type any characters or numbers (up to 12), press ENT

Press NXT to go on.

`DR 1   PINTP 0`

Door 1, PIN Reader Time Profile.

`0-32`

A time profile entered here determines when a PIN reader may be used with a key **but without entering a PIN.** If no time profile is entered then a key + PIN must be used at all times.

Enter a time profile number and press ENT

Repeat the above for all 4 doors on the door controller.

Front Panel   If the system is being administered from the front panel then you can enter details for all the doors on the system (1-16) at this stage if you wish.

The *DC* Command

This command allows you to set up lock sharing and anti passback, if required.

This command allows settings to be made for each door controller. You can use the up and down arrow keys to move between controllers (the door controller number *D/C n* will change). Use the NXT and - (minus) keys to move between settings.

`CMD _`

Type *DC* and press ENT.

`PBC D/C 1    ---`

Passback Door Controller 1

See Lock Sharing and Anti Passback above.

1   To set up pass back control using door 1 as an entry reader and door 4 as an exit reader press *1*.

2   To set up pass back control using door 2 as an entry reader and door 3 as an exit reader press *2*.

3   To set pass back on exit press 3.

Press ENT.

Press NXT to go on.

`PB-TIM D/C 1  0`

Passback Time-out Door Controller 1

0-30 minutes.

This value sets a time after which pass back is canceled. This may be useful when personnel may leave without presenting their key. After so many minutes they will be allowed access again.

Press NXT to go on.

`RDR-LK D/C 1 --`

Lock Sharing Door Controller 1

1   Lock output 1 is operated by both readers 1 and 4.

2   Lock output 2 is operated by both readers 2 and 3.

Testing Readers and Locks

If you used the SYSTEM START command described above then the Master key will have access through all doors. You can now use this key to check the operation of readers and locks.

Readers

Present the key to each reader:

- The green LED should light on the reader and remain on for the duration of the lock release time, 5 seconds or whatever other value you may have set.

- The lock should operate for the duration of the lock release time.

- The door controller should display the following (the numbers indicating which doors are open):

```
DOORS OPEN 1
```

Request to Exit

Repeat the above using the request to exit switch, if fitted, to operate the lock instead of a key.

Door Monitoring

If door monitoring is being used then:

- Close the door before the lock release time expires, the green LED on the reader should go out and the door should lock.

- Leave the door open, the green LED on the reader will go out and the lock will lock. After the expiry of the door open time you should get a door left open warning:

```
CH-1- O --------
```

- Open the door without a key or request to exit. You should immediately obtain a door alarm, flashing and sounding, indicating which door has been forced:

```
DOOR 01 ALARM
```

- You should get exactly the same effect by disconnecting the reader terminal block - causing a tamper alarm.

Six-Wire Bus

The six-wire bus is a proprietary communications link for locally connecting door controllers. It uses up to 1000m/3000ft of standard, unshielded signal cable to connect door controllers. No single length of cable should be longer than 500m/.1500ft.

Cable Specification

Use multi-stranded, unshielded, 6-conductor 0.22mm²/24AWG alarm or signal cable. If you do use shielded cable then you should reduce the maximum distance by 2 to 3 times (depending on the capacitance of the cable).

The cable can be arranged in any pattern, straight line, star etc. as long as the total amount of cable does not exceed 1000m/3000ft, and no single length is longer than 500m/1500ft.

Linear

Maximum Total length of cable = 1000m/3000ft
Maximum Length between door controllers = 500m/1500ft

Star
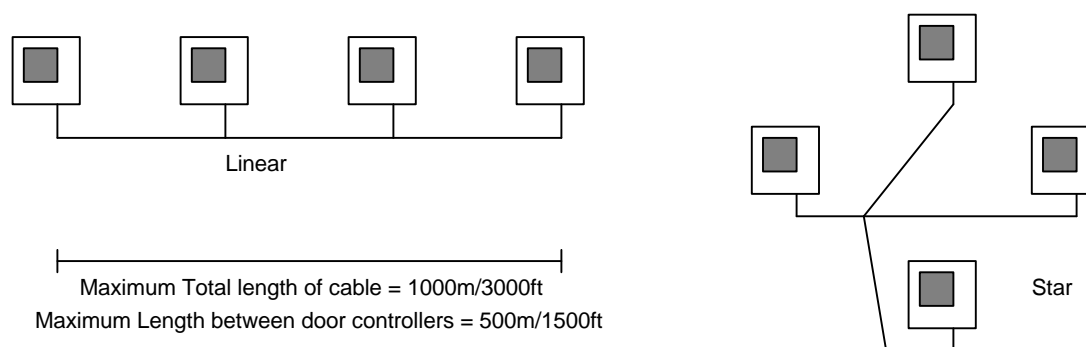
Possible Six-Wire Bus Wiring Systems

See the section at the beginning of this manual for a description of the different system configurations available.

Master Door Controller

SIX WIRE BUS

+V AB1 AB2 DSD USD -V

Slave Door Controller

SIX WIRE BUS

+V AB1 AB2 DSD USD -V

+V
AB1
AB2
DSD
USD
-V

Up to 6 Further Slave Door Controllers

Slave Door Controller

SIX WIRE BUS

+V AB1 AB2 DSD USD -V

Network Controller

1 2 3 4 5
6 7 8 9

1 2 3 4 5
6
+V
AB1
AB2
DSD
USD
-V

Up to 31 Further Slave Door Controllers
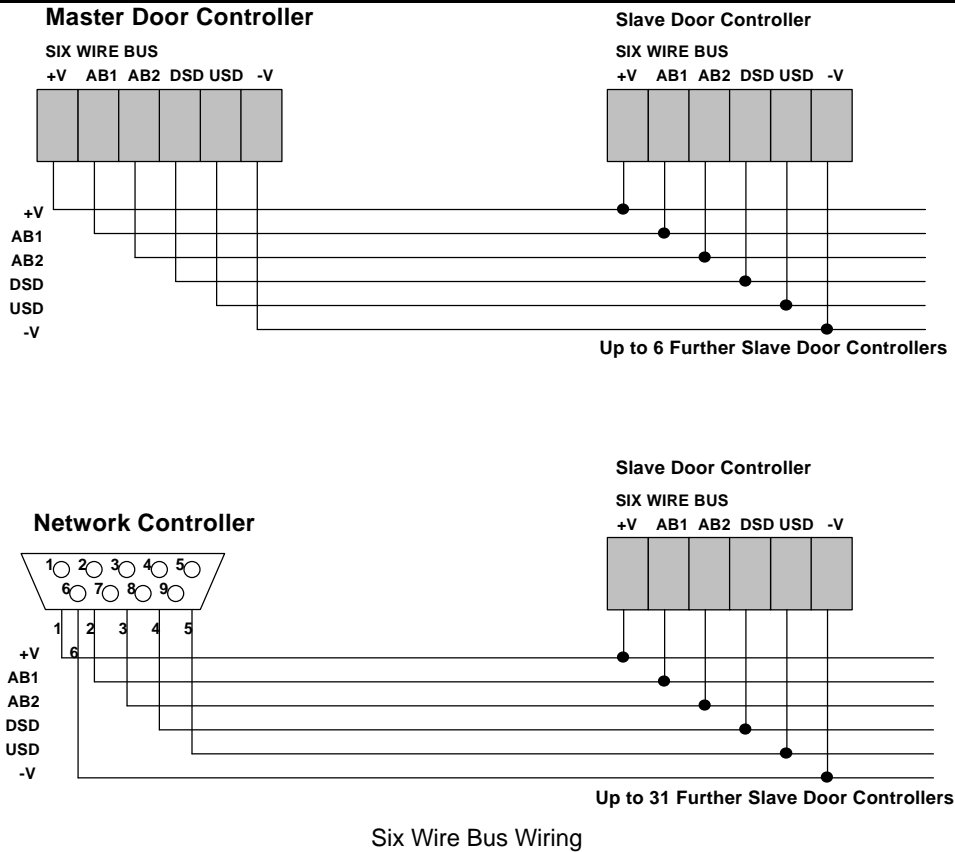
Six Wire Bus Wiring

Addresses

The six-wire bus works by each door controller having its own unique address. The order in which door controllers are addressed does not matter, neither do they have to be numbered consecutively. Depending on the type of administration the following are possible:

Front Panel Administration

One Master door controller (system type 0) and up to 3 slave door controllers, addressed 2,3 and 4.

K2000-AM Office Administration

One Master door controller (system type 1) and up to 3 slave door controllers, addressed 2,3 and 4.

RS232-Serial Port

The RS-232 serial port can be used to connect the door controller to a variety of devices.

Connecting a Printer

Front Panel   A printer can only be fitted when the system is being administered from the front panel. When administered from a PC then all printed output is generated by the PC itself.

Report Printing

All the information stored in the K2100 database can be printed. There are several printer commands, **P1** to **P9** (see *K2100 User Guide*), which will allow particular reports to be generated.

Transaction Printing

The K2100 can store about 2400 transactions in its memory. Each transaction is printed out if a printer is connected. If the printer is not connected for some reason then the transactions will be stored. Once the maximum number of transactions is reached then the oldest ones will be lost. When the printer is reconnected then printing will continue with the oldest unprinted transaction, and continue until all unprinted transactions have been output.

Printer Specification

An 80-column dot matrix printer with a **serial** interface is required. The serial interface must be set, using switches and/or jumpers, with the following parameters:

- 4800 baud
- 8 data bits, 2 stop bits
- No parity
- Hardware handshake using DTR/CTS. When the printer is busy then it should force DTR, usually pin 20, low.
- The printer must be capable of receiving at least 82 characters after a busy signal is sent (DTR going low).

The EPSON LX series and the OKI Microline 182 printers have been used successfully in the past.

Baud Rate

You must make sure that the baud rate at the K2100 is set to *4800*. See the **INST** command, or use the Engineering Mode described earlier.

Printer Cable

The following cable is required:

Use 0.22mm²/24AWG, 4-conductor, unshielded cable, maximum length: 15m/50ft

K2100			Printer
5-poleTerminal Block			25 pin male D-type connector
TXD	————	3	RX
CTS	————	20	DTR
RXD			
DTR			
GND	————	7	Signal Ground

Testing the Printer

Once the printer is connected and the parameters set as above, then switch on the printer and make sure that is 'on-line'. If everything is set correctly then you should immediately get some transactions printed out.

Possible Problems

If you do not get immediate printing of events then check the following:

- Check the cable, it should be wired as described above.

- Check that the printer's serial port is being used. Most printers are sold with a parallel port as standard - the serial port is supplied as an add-on option. There may be a switch that selects which port the printer should use.

- Check that both the K2100 and the printer are set to a baud rate of *4800*. If you get random characters on the printer then the baud rates may not match. The printer will usually have DIP switches or jumpers that need to be set to give the correct baud rate. **Always switch off the printer before you change any settings.**

- If you get normal printout but after one or two pages the lines break up or you get random characters then the 'handshaking' may not be working. Check that the printer is using pin 20 for its DTR signal. Some printers allow you to select a different pin number (often pin 11).

PC Interface

Description

K6000-AM Readykey For Windows 16/32

When a Readykey access control system is administered from a PC, such as when using the K6000-AM, an interface incorporating a line driver is used to connect the PC to the door controller. This involves connecting an interface unit to the PC, along with a desktop key reader, and connecting this, via a 4-conductor cable, to a small line driver unit plugged into the K2100

See the installation manuals for each administration system for connecting the Interface Unit to the PC and establishing communications.

This section describes the installation of the Line Driver at the K2100.

You **cannot** use any other type of communications devices such as line drivers, dial-up modems etc.

Cable Specification

Use multi-stranded, unshielded, 4-conductor 0.22mm²/24AWG cable.

Plugs into 'PRINTER' port on Door Controller
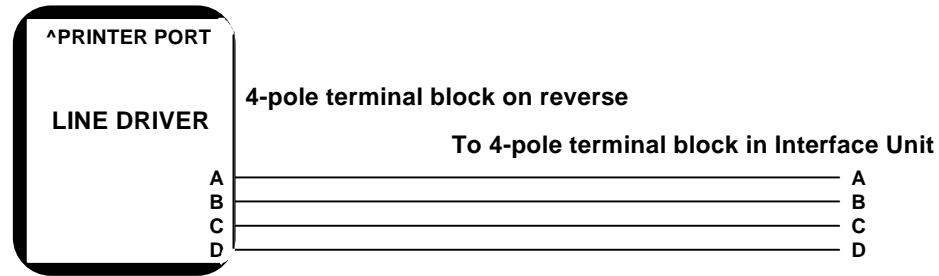
Door Controller Line Driver, Wiring Diagram

Installing the Line Driver

IMPORTANT: For effective communications you must ensure that both the interface unit and the K2100 door controller are properly earthed.

The line driver should be plugged directly into the K2100 'PRINTER' port, the 5-way socket at the bottom right of the circuit board.

The connection to the Interface Unit is made by connecting the terminals, labeled **A B C D**, to the corresponding terminals in the interface unit, using the 4-pole terminal blocks provided.

Programming the Door Controller

The following settings need to be made, see *Engineering Mode* above:

K6000-AM
- `System Type`   **1**
- `Address`   **1**
- `Baud Rate`   **9600**

Readykey For Windows
- `System Type`   **2**
- `Address`   **1**
- `Baud Rate`   **9600**

If communications are successfully established then you should a polling indication:

```
                   1
```
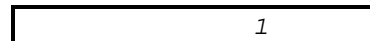
The *1* flashing at the right of the display means the PC system is communicating with the door controller. From now on:

- all updates must be made from the PC
- all transactions, including alarms, are sent to the PC

Mounting a Modem

Multi Site CNC See the *K6000* Installation Manual for details of communicating with a door controller over public (PSTN) phone lines, types of modem you can use and door controller configuration.

The modem should be installed close to the door controller and connected using the following cable:

Cable for connecting Modem to K2100, K2000-N

Use 0.22mm²/22AWG, 6-conductor, unshielded cable, maximum length: 15m/50ft

Modem   **K2100**

<pre>
                25 pin male D-type connector   5-pole Terminal Block
                        TX   2   ————————   TX
                        RX   3   ————————   RX
                       GND   7   ————————   GND
                       CTS   5   ————————   CTS
                       RTS   4   ┐
                       DTR   20   _|_____   DTR
</pre>
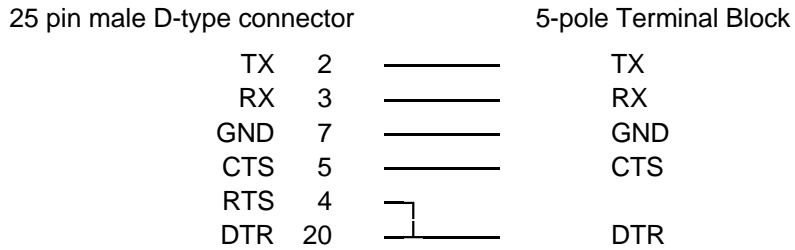
Settings for using a Modem

To use a modem for communicating with a K6000-MS Network Controller requires the following settings, see the section *Engineering Mode*:

- **System Type**   **3 (Slave)**

- **Connect Modem**   **Y**

- **Baud Rate**   **Must match that set at CNC**

K6000-MS Network Controller, serial link.

One Master door controller (system type 2) and up to 7 slave door controllers, addressed 2,3,4,5,6,7 and 8.

See the installation manuals for each administration system for further details on how to set up and test communications.

See the section *Engineering Mode* detailing the Setup Options - particularly the H (handshake) and B (follow baud rate) options.

Setting the Door Controller Address

See *Engineering Mode - Setting* above for details on how to set a door controller's address.

Troubleshooting

This section will help you establish if a fault exists within a door controller or not. To do this efficiently you should be equipped with following:

- A multi-meter capable of reading volts (0-300v AC, 0-30v DC), amps (0-3 Amps) and ohms.

- A READYKEY reader on a flying lead which can be plugged into a reader channel, this should also have buttons emulating a door contact (DR1-GND,normally closed) and the request to exit switch (DR2-Gnd, normally open).

- The usual collection of hand-tools, screwdrivers, wire strippers and cutters etc.

- Replacement fuses.

The door controller appears to be dead.

Before performing any of the following checks, remove any batteries and disconnect all readers, lock outputs, serial connections and six-wire bus, where fitted.

1. Press the ? key on the keypad. If the door controller is operating correctly there should be a beep, and the software version should be displayed on the screen. If there is no reaction then check the ribbon cable between the front panel and the main circuit board is properly connected.

2. Check the AC power supply. This should be between 85vAC and 250vAC.

3. Check the power supply fuse. This is found in a pull-out drawer just below the AC cable socket. Replace with a 3.15A, 20mm Fast-Blow fuse.

4. Check the Battery output voltage at the battery terminals, this should be 13.8v DC **or** 27.6v DC, depending on the lock output voltage.

5. Check the battery supply fuse, F5. This should be 10A, 20mm Fast-Blow.

6. Check the power supply outputs. These are indicated on the circuit board next to the 8-pole connector, CN7.

   - +V and -V (six-wire bus supply)   **12v** DC
   - Blue GND and +5V (logic supply)   **5v** DC
   - Black GND and +18v (reader supply)   **18v** DC
   - Black GND and BAT+ (battery supply)   **13.8v** DC or **27.6v** DC
   - Black GND and +12V (lock output supply) **12v** DC or **24v** DC

If the door controller fails on any of the above checks then the power supply is probably at fault, arrange for a replacement with your supplier.

If the door controller passes all the above tests then test each reader and lock output in turn, as described below.

One or more readers or locks fail to operate.

Before carrying out the following tests, disconnect **all** the readers and lock outputs. Refer to the section above on *Engineering Mode: Testing*, this contains details on how to check reader operation.
Each reader channel should be tested in turn.

Checking the Reader

1. With no reader connected, check the voltage between GND and +18V. This should be above **18v** DC.

2. Reconnect the reader. Check the voltage **at the reader**. This should be above **10.5v** DC. If not, then check the gauge is correct for the cable distance from the controller.

3. Check the reader operation by presenting a key, if the door controller is in Engineering Mode then a `TK` should appear on the display while the key is being read by the reader.

4. If no key is read then disconnect the reader and connect a known working reader and repeat step 3.

5. If the working reader operates correctly then suspect a faulty reader, or wiring between the door controller and reader. Go to step 8 to check the wiring and reader.

6. If the working reader does not operate then suspect a faulty reader channel on the door controller.

7. Connect the reader to another channel, if the reader now operates then the original channel is faulty. Arrange for the door controller to be repaired. Go to step 10.

8. Disconnect the suspect reader. Disconnect the reader connector at the door controller. Check the cable for short circuits between all conductors, and all conductors and ground.

9. If the cable is to the correct gauge and free from short circuits, then connect the known working reader in place of the suspect reader. If this reader operates then the original is faulty. Arrange for a replacement with your supplier.

10. Repeat for all four (two on a K1100) reader channels.

Checking the Lock Output

If all the reader channels are shown to operate correctly then you should check the lock outputs. You should know whether the lock is **fail-safe** (power is removed to operate the device) or **fail-secure** (power is applied to operate the device. You should also know whether the door controller has been set to provide **12v** DC or **24v** DC. If interlock has been set on a pair of readers, then channels 1 and 4 will operate lock output 1, and channels 2 and 3 will operate lock output 2.

For each lock output:
*   Make sure that the door is supposed to be secure. The door controller dis play should **not** indicate that the door is open.
*   Make sure a lock release time has been set, it should be at least 5 seconds to allow measurements to be reliably made.
*   Establish whether interlock has been set.

1. First, check the fuse (F1, F2 ,F3 or F4). This should be 1.0A 20mm slow-blow.

2. Check the voltage at the lock output (L-, L+). This should be **12v** or **24v** if the lock is **fail-safe**, or less than **0.5v** if it is **fail-secure**. (The K1100/2100 has solid state lock outputs, these will not show exactly 0v when off).

3. Operate the lock, operate the RTE or short the DR2 reader input to GND. The lock output should operate. Check the voltage at the lock output. This should now show the reverse of the previous measurement, i.e. less then **0.5v** for **fail-safe**, **12v** or **24v** for **fail-secure**. If not, then suspect the lock output to be faulty.

4. Repeat steps 2 and 3 above but this time measure the voltage **at the lock**. The lock should receive the minimum voltage required for it to operate (see the lock manufacturer's specifications). If the voltage is too low at the lock, then the lock supply cable gauge may be too small for the distance from the controller.

5. Disconnect the cable from the lock. Check the cable for short circuits between the conductors, and between the conductors and ground.

6. Ensure there is a metal-oxide varistor (MOV, supplied with all Readykey readers) fitted across the lock terminals. Reconnect the lock.

7. Check the current drawn by the lock. This should not exceed 1.0A (12v DC) or 0.5A (24v DC). If it significantly exceeds the nominal current specified by the manufacturer then the lock may be faulty.

8. If the lock still fails to operate when the door controller is switching the correct voltage then suspect a faulty lock. Try fitting a known working lock in place of the suspect device.

9. Repeat for all four (two on a K1100) lock outputs.

Appendix A: Front Panel QuickStart

Front Panel   This section applies only to access control systems administered from the Front Panel of the Master Door Controller.

This section is intended to help the installer connect and set up the system as rapidly as possible. Most of the commands are described in detail either this manual or the *K2100/K1100 User Guide*.

Before You Start

Before you continue with setting-up the K2100 access control system, you should have considered the following features. Some of these will need to be discussed with the end user of the system, such as *Alphabetic ID* etc.

All the items below can be adjusted at a later stage, however if you can establish the facts now, you will save a considerable amount of time in the future.

Door Controllers

- You should know which is the Master Controller, and which, if any, are the slaves. All the programming is performed at the Master controller.

- You should establish what the address of each slave controller will be, 2,3 or 4. This is important as door numbering is determined by the address of each door controller.

- Are two readers sharing the same lock output (in reader and out reader on the same door, for instance)?

- Will you be using anti-passback on a door controller?

Doors

For each door you should know:

- will door monitoring be used (essential for reporting alarms and door left open)?

- what type of lock is installed, fail-safe or fail-secure?

- what should be the lock release time?

- will the door open automatically at certain times?

Personnel Database

You need to determine the type of identification used for personnel keys. The choice is either 4-digit numeric (digits 0-9), or 12 digit alphanumeric (digits 0-9, A-Z and space). It is possible to change from one type of identification to the other at a later stage, but it is wiser to choose one method and stick to it.

4 Digit numeric

If you use 4-digit identification the Editor will automatically identify a key with the next available number between 1 and 4000, you will have no choice of the number assigned. For instance, if you have already added 85 keys, then the next key added will be 86. If you have deleted (voided) keys 29 and 44, then the next key added will be numbered 29 (the first available number), the next 44 and so on.

The advantage of this method is rapid addition of keys as the identification is automatic, the user must however ensure that a careful record is kept of the number assigned to each key.

12-digit alphanumeric

This method requires the user to enter a unique identity for each key. This may be the name of the keyholder, or a reference number such as a personnel or payroll reference. Although it is more time consuming to administer, the advantages are that real names will appear on the printer and reports and a key can be found, for editing or deleting, by entering a name.

Installing the Door Controllers

Using the K2100/1100 Installation Manual, complete the following stages:

- You should install the master door controller and any slave door controllers. Ensure mains supply is present - but do not power up yet.

- Make sure that the lock power supply is set to 12vDC or 24vDC.

- Connect readers and locks to the door controllers, including, where required, RTE switches, door contacts and any K2015 Alarm Modules.

- Connect any slave door controllers to the master using the six-wire bus.

- Make sure the Enclosure Tamper inputs (T+, T-) are linked - this will prevent any `D/C Tamper` alarms when first powered up.

At this point all the master door controller and any slaves should be ready to power up, all readers and locks should be connected, RTE and door contacts should be in place.

Configuring the Master Controller

You should have a key that will become the Master Key for the system. This is a normal key that will be presented to each door controller as part of its initialization.

- Un-plug all the reader, lock and six-wire bus terminal blocks.

- Power up the door controller.

```
*NO MASTER KEY
```

If this is the first time that the door controller has been started since manufacture then it should beep and display `*NO MASTER KEY`.

If it has been used before then it may display other messages, such as communication errors, or door alarms etc. Ignore these and go onto the next step.

Engineer's Reset

1. Press the Reset switch once. The Reset switch is a small button located half way up the left hand side of the p.c.b. just above the battery fuse.

2. Press the Reset switch again while the controller is beeping.

You will now see the display:

```
PASSWD  _
```

Type *PAC1990* at the keyboard and press ENT.

```
CMD _
```

You will now see the *CMD* prompt.

This will take you into the Editor and give you the *CMD* prompt. You may now issue any valid command.

SYSTEM START Command

You should only use this command when you want to completely erase all data from a door controller. It is good practice to do this with any new installation. Once the door controller is initialized then the *INST* command is automatically started.

`CMD _`	This is the *CMD* Prompt. As this is a brand new controller type the command *SYSTEM START* and press ENT. (Press SPC between *SYSTEM* and *START*). **Note:** If you get a message `INVALID SYS TYPE` then you will have to use the *INST* command (see below) to change the System Type to **0**. You will then be able to enter the *SYSTEM START* command.
`ERASE ALL DATA _`	Type *Y* and press ENT to initialize the door controller.
`ERASING USR DATA`	These two messages are displayed as the memory is cleared.
`ERASING SYS DATA`	
`E0  KEY 00000000`	The first prompt of the INST command. This is described below.

INST Command

You can use this command at any time on any system to change settings.

`E0  KEY 00000000`	This is where the Master key code will appear, there may already be a code here - it will consist of numbers 0-9 and letters A-F.
	Present the Master key to the front panel reader.
`E0  KEY 3A33642A`	The key code will appear, replacing what was previously displayed.
	Press **NXT** to go on to the next stage.
`PASSWD _`	You may enter a password, up to 8 letters and/or numbers. Every time you use the Master key at this controller you will be asked for this password. Leave it blank for no password.
	Press **NXT** to go on to the next stage.
`ID  _`	This is an Identity for the Master key. If you print transactions then this identity will appear against editor operations and alarm acknowledgments. E.g. type *MASTER* and press ENT.
	Press **NXT** to go on.
`ALPHA ID      N`	Type *N* to use 4-digit key identities, *Y* to use 12-digit alphanumeric identities. See above for a description of these identification methods. Press ENT.
	Press **NXT** to go on.
`PRINTER TYPE   0`	Type *0* and press ENT if you are installing an Epson or IBM compatible printer.
	Type *1* and press ENT if the printer is an OKI Microline.
	Press **NXT** to go on.

`ENTER SYS TYPE  0`

Type *0* and press ENT as you are going to administer the system from the Front Panel.

Press **NXT** to go on.

`BAUD RATE   1200`

Enter the baud rate for the printer, usually *4800*, and press ENT.

Press **NXT** to go on.

`POLL           ---`

The 'Poll Table' tells this door controller how many Slave controllers are connected via the six-wire bus. You should consider this controller as number 1, the slaves will be 2,3 and 4. To enter a door controller in the poll table type the appropriate number, *2,3* or *4.* As each number is pressed it will appear on the screen.

To remove a controller from the poll table, press its number again. The number will be replaced by a dash.

If there are any door controllers in the poll table that are not powered or connected you will get a message on the display -*D/C N ERROR-1* . where *N* is *2,3* or *4.*

You should enter any slave door controllers in the poll table now, even if they are not connected yet. This means that when they are connected, and have their address set, the master controller will immediately make contact.

Press **NXT** to go on.

`DATE FORMAT     0`

Front Panel

Sets the format in which dates appear in the system:

Type *0* and press ENT for 'dd-mm-yy' (European style).

Type *1* and press ENT for 'mm-dd-yy' (US style).

Type *2* and press ENT for 'yy-mm-dd' (Japanese/Swedish style).

Press ESC to return to the *CMD* prompt.

When you leave the *INST* command and return to the *CMD* prompt, you should press ESC to leave the Editor. When you do this you will get a long beep indicating that initialization is complete.

Once the memory has been cleared the following settings are made.

- Every door record (1 to 16) is given a lock release time (*LRT*) of 5 seconds (the *D* command).

- Access Level 1 is set to all doors (1-16) (The *AL* command).

- Access Code 1 is set to a Primary Access Level (PAL) of 1 (The *AC* command).

- The Master Key entered using INST above is made user number 1 with an Access Code (*AC*) of 1.

This results in the Master Key having access through all doors.

Note: the above settings only apply when you leave INST *after using the SYSTEM START command*. Normally use of the INST command will not affect any personnel or access data.

If you have set one or more door controllers in the Poll Table, then, if they are not yet connected you should get an error display:

```
D/C 2  ERROR-1
```
If one or more slave door controllers are not connected, but have been entered in the poll table, then an error message for each will appear in turn.

Testing the Master Controller

At this point you should verify that readers and locks on the master controller are operating correctly. Follow the procedures in the *K2100/1100 Installation Manual.*

Adding a Slave Door Controller

Most of this process is a repeat of the Master Controller Configuration described above.

To install one or more slave door controllers (maximum is three) repeat the following procedure for each:

- Un-plug all the reader, lock and six-wire bus terminal blocks.

- Power up the door controller.

```
*NO MASTER KEY
```
If this is the first time that the door controller has been started since manufacture then it should beep and display *NO MASTER KEY.

If it has been used before then it may display other messages, such as communication errors, or door alarms etc. Ignore these and go onto the next step.

Engineer's Reset

Perform the Engineer's Reset as described above.

SYSTEM START Command

Use the SYSTEM START command as described above.

INST Command

The INST command is now used to set the System Type and Address of the Slave. The System Type is always 3, the Address will be either 2, 3 or 4. The other settings do not apply to a Slave.

```
E0  KEY 00000000
```
This is where the Master key code will appear, there may already be a code here - it will consist of numbers 0-9 and letters A-F.

Present the Master key to the front panel reader.

```
E0  KEY 3A33642A
```
The key code will appear, replacing what was previously displayed.

Press **NXT** to go on to the next stage.

```
PASSWD _
```
Ignore this, it does not apply to a slave controller.

Press **NXT** to go on to the next stage.

```
ID  _
```
Ignore this, it does not apply to a slave controller.

Press **NXT** to go on.

```
ALPHA ID       N
```
Ignore this, it does not apply to a slave controller.

Press **NXT** to go on.

```
PRINTER TYPE   0
```
Ignore this, it does not apply to a slave controller.

Press **NXT** to go on.

`ENTER SYS TYPE  0`	Type *3* and press ENT. System type 3 is a slave controller.

Press **NXT** to go on.

`POLL          ---`	Ignore this, it does not apply to a slave controller.

Press **NXT** to go on.

`ADDRESS         1`	Set the address to 2, 3 or 4. All the slave door controllers must have a different address.

Press **NXT** to go on.

`DATE FORMAT     0`	Ignore this, it does not apply to a slave controller.

Note: the Address of the Slave can also be set using the Option Switch - see the *K2100/1100 Installation Manual* for details.

When you leave the *INST* command and return to the *CMD* prompt, you should press ESC to leave the Editor. When you do this you will get a series of beeps indicating that initialization is complete.

Connecting the Six-Wire Bus

Make sure that the six-wire bus connection between the master and the slave is in place.

Provided that the Poll Table in the Master was set to include the address you just entered in the slave, then, when the six-wire bus connection is made, you should see the door-controller address (2,3 or 4) appear on the right of the display.

`              2`	The door controller address (2,3 or 4) should appear each time the slave is polled by the master controller.

At the same time any `D/C 2 ERROR-1` message should stop being displayed at the master.

If a printer is connected at the master controller you may get some transactions appearing, this may be due to the slave containing events in its memory from a previous system.

Testing the Master Controller

At this point you should verify that readers and locks on the master controller are operating correctly. Follow the procedures in the *K2100/1100 Installation Manual.*

Adding Further Slave Door Controllers

Repeat the above steps for adding a slave door controllers, but make sure you enter a different address.

Initializing Slave Door Controllers

Once all the slave door controllers have been added, and are communicating correctly with the master, you should initialize each one. Once initialized you should then perform a Download. This will result in all the door controllers having the same database and provide a starting point from which the whole system can be programmed.

Setting the System Time

Use the C command to set the correct date and time.

The INITn Command

At the master door controller present the Master key to the front panel reader to enter the Editor. You must use the Master key - an ordinary editor key will not be allowed to issue the INIT command.

`CMD _`	At the *CMD* prompt, type *INIT2* to initialize slave controller 2, press ENT.

`INIT D/C NO 2  _`	Type *Y* and press ENT to confirm.
`CMD _`	You will be returned to the *CMD* prompt.

If you have other slave door controllers then used *INIT3* and *INIT4* to initialize them.

The DL Command

The DL (Download) command sends the contents of the master controller's database to all the slave controllers. Once this has been done you can be sure that all the door controllers have the same information.

At the master door controller present the Master key to the front panel reader to enter the Editor. You must use the Master key - an ordinary editor key will not be allowed to issue the DL command.

`CMD _`	At the *CMD* prompt, type *DL* to download to all controllers, press ENT.
`DLOAD TO ALL    _`	Type *Y* and press ENT to confirm.
`  SENDING DATA`	This message will appear briefly before you are returned to the *CMD* prompt.
`CMD _`	Press ESC to leave the Editor.
`DOWNLOAD  26-9`	You will see this message on the screen when you leave the Editor. It indicates the progress of the download, in this example 26.9%. The download will be complete when it reaches 100%.

Verification of Slave Controllers

You will recall that when the master controller was initialized, the Master key was added into the personnel database as key 1, and an access code, number 1, was created that gave access through all doors in the system. To check that all the door controllers are correctly programmed and communicating properly, use the Master key to gain access through all doors on the system. If a printer is connected then you should get `Access Authorized` reports from all doors.

Troubleshooting

The master controller displays `D/C n ERROR-1` (where `n` is `2,3` or `4`).

This means the master is trying to communicate with a slave door controller that has been entered in the poll table, but is getting no reply.

Check:

- The six-wire bus connection between the master and slave.

- Check the option switches (bottom right of door controller circuit board) are set correctly. The top three switches should be to the right on the master, to the left on a slave.

- Check the address of the slave, it should be set to 2,3 or 4. Make sure no other slaves have the same address.

- Disconnect any other slaves on the six-wire bus. If the fault goes away, then check the connections and addresses of the other slaves.

No error is displayed on the master but the slave still fails to communicate.

This probably means that the slave door controller is not in the master's poll table.

Check:

- The poll table should include the slave door controller number (2,3, or 4). Use the INST command to check the poll table.

Programming

This completes the installation and configuration of the K2100 access control system. At this point you should have a master controller plus communicating slaves all ready for programming.

To complete the programming of the system you should go through the following stages. All the commands are described in details elsewhere in this document.

Door Control, DC Command

This command sets up lock sharing (two readers sharing the same lock output) and anti-passback.

Door Options, D Command

This sets lock release time, door open time, time profile for automatic opening and lock mode options such as fail-safe/fail-secure etc.

K2015 Alarm Modules

At this point you should program any Alarm Inputs and Relay Outputs that you may be using. Use the MR, MS and RE commands.

Setting up Access Codes

Use the AL command to set Access Levels, the PR and T command to set up Time Profiles (if required), and the AC command to combine these into Access Codes.

Adding Keys

You are now in a position to add keys to the system. Use the A command to assign Access Codes and identities to keys.

Check Key Access

Confirm that keys work correctly, test at least one example of each Access Code at all readers. Ensure that keys are allowed or denied access at each reader according to their Access Code.

Appendix B: Transactions

The following pages show all the transactions generated by a K2100 or K1100 door controller. Other types of transaction may be generated by other parts of the system, such as the PC, a Network Controller etc. Each transaction described below shows:

Number, this is used as a reference, particularly in some PC based administration systems.

Description, this is the text produced on the printer or PC screen.

Priority, all **high priority** transactions will be sent to the administration system or printer, before any **low priority** transactions. A list of all high priority transactions is shown below.

Alarm Dial-Back, these transactions will cause the K2100 to dial-back to a Multi-Site Network Controller.

Forget? some types of transaction can be forgotten by the K2100, allowing other transactions to be sent faster. See *Engineering Mode - Setting* to see how to set this feature.

Number	Description	Priority	Dial-Back	Forget?
1	**Exit Authorized**	**low**		**positive**

A key has been allowed through an access point that was set as an exit point. This would be channel 3 or 4 on a K2100 or channel 2 on a K1100. Entry and exit points are only set by using Channel Interlock or Passback.

2	**Entry Authorized**	**low**		**positive**

A key has been allowed through an access point that was set as an entry point. This would be channel 1 or 2 on a K2100 or channel 1 on a K1100. Entry and exit points are only set by using Channel Interlock or Passback.

3	**Access Authorized**	**low**		**positive**

A key has been allowed through an access point. This transaction will always be generated unless the access point is set as entry or exit, when one of the two previous transactions will be produced.

4	**Free Exit**	**low**		**free exit**

This is a special condition where a door contact is fitted but no request to exit button is used. Every time the door opens without a key being used this transaction will be generated. A special lock mode option is required.

5	**Emergency Override Off**	**high**		

Using a special lock mode option, the request to exit input can be used to monitor an emergency break-glass (manual pull). This transaction occurs when the switch is restored.

6	**Emergency Override On**	**high**		

Using a special lock mode option, the request to exit input can be used to monitor an emergency break-glass (manual pull). This transaction occurs when the switch is broken.

7	**Request to Exit**	**low**		**RTE**

The Request to Exit switch has been used to open a door.

Number	Description	Priority	Dial-Back	Forget?
8	**Request for Entry**	**low**		**RTE**

A special lock mode option can be used to allow a Request for Entry transaction. This may be used when a button is used from inside an area to allow a person access.

9	**Unauthorized Access**	**high**	**yes**	

A door has been opened without a key being presented or the Request to Exit being pressed.

10	**No Access: Level**	**high**		

A key has been presented, but is not allowed through **this** door.

11	**No Access: Locked Out**	**high**		

A key has been presented, but it is not been given **any** access authority.

12	**No Access: Time**	**high**		

A key has been presented, but is not allowed through this door at **this** time.

13	**No Entry: PassBack**	**high**		

A key has been presented, but will not allowed through this door until it has left the pass-back area.

14	**No Access: Holiday**	**high**		

A key has been presented, but a holiday period has been assigned to this key.

15	**Door Left Open**	**high**		

A door has been left open beyond the time allowed.

16	**Door Closed**	**high**		

A door has been closed after being left open.

17	**Anti-Tamper Alarm**	**high**	**yes**	

A reader has been disconnected or its cable has been broken.

18	**Alarm Cleared**	**high**		

A door has been secured after an Unauthorized Access or a reader/cable has been restored after an anti-tamper alarm.

19	**Override Alarm**	**high**	**yes**	

An override alarm has opened all the doors attached to the door controller.

20	**Override Alarm Reset**	**high**		

The override input has been cleared, all the doors will close again.

21	**Manual Lock**	**high**		

An operator has manually locked a door open on a time profile, or previously opened manually.

22	**Manual Unlock**	**high**		

An operator has manually unlocked a door.

23	**Automatic Lock**	**low**		**time event**

A door has automatically locked on a time profile.

Number	Description	Priority	Dial-Back	Forget?
24	**Automatic Unlock**	low		time event

A door has automatically unlocked on a time profile.

25	**Editor Off**			

An operator has left the editor (either on the front panel or a PC administration system) or it has timed out.

26	**Editor On**			

An operator has entered the editor (either on the front panel or a PC administration system).

27	**Alarm Zone Active**	high	yes	

An Alarm Module input has activated.

28	**Zone Restored & ReArmed**	high		

An alarm module input has been restored, if reactivated it will cause another alarm.

29	**Auto Zone Disable**	low		time event

An alarm module input has been disabled with a time profile.

30	**Auto Zone Enable**	low		time event

An alarm module input has been enabled with a time profile.

31	**Local Alarm Accepted**	high		

An alarm has been accepted at the door controller by presenting an Editor key.

32	**No Access: Visit Time**	high		

A visitor key has been presented, but its visit time has expired.

33	**No Access: Unknown ID**	low		

A key has been presented, but it is unknown to the door controller.

34	**Manual Zone Disable**	low		

An alarm module input has been disabled by an operator.

35	**Manual Zone Enable**	low		

An alarm module input has been enabled by an operator.

36	**Alarm Acknowledged**			

An Unauthorized Access, Anti Tamper or Zone Alarm has been accepted by an operator.

37	**Override Alarm Accepted**			

An Override Alarm has been accepted by an operator.

38	**RTE Button Held Down**	high		

A Request to Exit button has been continuously operated 5 times and the door has closed.

39	**Repeated Key Use**	high		

The same key has been presented continuously to a reader for 5 lock operations and the door has closed.

40	**PIN Reader Duress**	high	yes	

A PIN duress code has been entered (PIN +1) and the door has opened.

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Number	Description	Priority	Dial-Back	Forget?
41	**Duress Alarm Accepted**	low		

A PIN Duress Alarm has been accepted by an operator.

| 42 | **Local Duress Alarm Acpt** | high | | |

A PIN Duress Alarm has been accepted by an operator at the door controller

| 45 | **No Exit: Passback** | high | | |

A key has been presented, but will not allowed through this door until it has entered the pass-back area.

| 46 | **Exit Out of Hours** | low | | positive |

A key has been allowed to pass through an exit door, although a time profile would not normally let the key through. A special lock mode option needs to be set on the door to allow this feature.

| 47 | **Editor Off (Panel)** | low | | |

An operator has left the Editor, or it has timed out, at the Front Panel.

| 48 | **Editor On (Panel)** | low | | |

An operator has entered the Editor at the Front Panel

| 49 | **Power Off** | high | yes | |

The door controller has had its power removed, or the Reset button has been pressed.

| 50 | **Power On** | high | | |

The door controller has been powered up, or the Reset button has been released.

| 54 | **Incorrect PIN Entry** | high | | |

A key holder has made 5 attempts to enter a PIN without success. That key will not be accepted for 2 hours.

| 55 | **Manual Relay Reset** | low | | |

A relay, either on the door controller or an Alarm Module, has been reset by an operator. This may occur by disabling a time profile controlling the relay, or switching off the relay record itself.

| 56 | **Manual Relay Set** | low | | |

A relay, either on the door controller or an Alarm Module, has been set by an operator. This may occur by enabling a time profile controlling the relay, or switching on the relay record itself.

| 57 | **Auto Relay Reset** | low | | time event |

A relay, either on the door controller or an Alarm Module, has been reset by a time profile.

| 58 | **Auto Relay Set** | low | | time event |

A relay, either on the door controller or an Alarm Module, has been set by a time profile.

Number	Description	Priority	Dial-Back	Forget?
74	**Comms Error Type 1**	**low**		

A Master Controller has polled a slave controller on the six-wire bus and failed to receive an acknowledgment. This could be caused by:

- The six-wire bus cable being broken

- The slave door controller not powered

- The slave controller having the wrong address

75	**Comms Error Type 2**			
76	**Comms Error Type 3**			
77	**Comms Restored**	**low**		

A previous Comms Error (1,2 or 3) has now cleared.

High Priority Transactions

These transactions are always sent to the printer or administration system before any other transactions.

5	Emergency Override Off	28	Zone Restored & ReArmed
6	Emergency Override On	31	Local Alarm Accepted
9	Unauthorized Access	32	No Access: Visit Time
10	No Access: Level	38	RTE Button Held Down
11	No Access: Locked Out	39	No Access: Repeated Use
12	No Access: Time	45	No Exit: Passback
13	No Entry: PassBack	49	Power Off
14	No Access: Holiday	50	Power On
15	Door Left Open	54	Incorrect PIN Entry
16	Door Closed		
17	Anti-Tamper Alarm		
18	Alarm Cleared		
19	Override Alarm		
21	Manual Lock		
22	Manual Unlock		
27	Alarm Zone Active		

'Forget' Transactions

The K2100 door controller will, if required, **not** send certain groups of transactions. You can choose which of the following groups are not sent.

Request to Exit

These transactions may form 40-50% of all the transactions in a system. By allowing the door controller to 'forget' these events, the throughput of more significant transactions can be improved.

7	Request to Exit
8	Request for Entry

Free Exit

4	Free Exit

Timed Events

These are reports of events that happen automatically as a result of a time profile being applied.

23	Automatic Lock
24	Automatic Unlock
29	Auto Zone Disable

30   Auto Zone Enable
57   Auto Relay Reset
58   Auto Relay Set

Positive Transactions

These are records of normal key usage. By allowing the door controller to 'forget' these events, throughput may be considerably improved.
Note: some administration system functions such as Presence in Area, Muster Mode, Current User etc., along with other functions that rely on detecting the movement of personnel, will not work if these events are not sent.

1   Exit Authorized
2   Entry Authorized
3   Access Authorized
46   Exit Out of Hours