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Chapter 1 - COMPONENTS

System Configuration
Below are the basic system configurations of the CASTLE-K Card Access System. The system is typically built from a few basic components, these are:

a. CASTLE-K Controller
b. Card Readers
c. Electric Door Lock
d. Door Sensors
e. Auxiliary Alarm Inputs and Outputs
f. Exit Push Button
g. Power Supply
h. PC Interfacing Unit
i. Online Parallel Printer (Available for Car Park Access)

a. CASTLE-S (2K, 4K, 8K) Controller
The CASTLE-K controller is normally referred to as "The Controller". This is the most important component of the system. It houses the Central Processing Unit (CPU) and performs all the control and validation functions.

The Controller has a Liquid Crystal Display (LCD) capable of showing 2 lines of 20 characters each. The user can interact with the Controller by means of a keypad, that simply a 16-key keypad.

b. Card Reader
The Card Reader is a reading device for the access cards. The Card Reader reads the data encoded on the access cards and sends it to the Controller for processing via a 2-wire RS485 links.

The keypad is provided to the user to key in their Personal Identification Number (PIN). This gives added security to the system.

Depending on the applications, card readers can be used to control doors with Anti-Passback.

c. Electric Door Lock
The electric door lock is an electromagnetic device for locking and unlocking the door. When the door lock is activated, the door released and the door can be opened; when the locked is deactivated, the door lock is locked and the door can not be opened.

The door lock is directly wired to the reader.

Depending on the type of the door and the level of the security, the user can select from the different types of electric door locks, such as
   a. Electric Door Latch
   b. Magnetic Lock
   c. Drop Bolt

d. Door Sensor
The door sensor is use for detecting whether the door is closed or opened. The door sensor is linked to the reader.
e. **Fire Alarm Inputs and Auxiliary Event Outputs**
   The controller has built-in fire alarm alarm system with 1 digital input and one relay auxiliary output. The user can make use of these inputs to monitor other alarm points. The auxiliary relay output is used as event trigger output. Door force open, duress alarm and reader down event will automatically trigger this relay. Additional 20 special events can be programmed to trigger this relay.

f. **Exit Push Button**
   The user can choose to press a button to exit the protected area. This exit push button is installed inside the protected area. The user merely presses the button to exit.

g. **Power supply**
   The CASTLE-S Card Access System operates from a 12 V\textsubscript{DC} supply with a battery backup. Typical power consumption is 12 V\textsubscript{DC}, 350mA.

h. **PC Interfacing Unit**
   You can link the CASTLE-S Controllers to a Personal Computer for total system control by the PC. The PC software allows you to perform a wide range of supervisory and control from your computer. The CASTLE-S PC software is running under Windows95 or higher and requires Pentium166MHz 32 RAM or better computer.
Chapter 2 - Operation Overview

Access Card

Each user of the Castle-S Card Access System is issued with an access card.

An access card is encoded with the following information:

a. User Card Number
b. Facility Code Number

The User Card Number is a 6-digit number that uniquely identifies each card holder.

The facility code is a 4-digit number. This number is used to differentiate the various installation sites of the Castle-S Card Access System.

The Personal Identification Number is a 4-digit number. This PIN code feature provides a higher level security by requiring the cardholder to swipe the card and to enter the PIN code to open the door. The Castle-K can be programmed to operate in CARD ONLY Mode or CARD + PIN Mode.

Access Granting

When the user swipes the card on the card reader, the reader will send the card information to the controller. The controller then decides whether to ‘activate’ the electric door or to reject the card. To be granted access, the user card number must be in the controller in controller database. It must be within a valid Time Zone for the card to be accepted.

Typically flow of access granting process:

*The flow will stop once the card is rejected.*

1. **The user swipes his/her card on the reader. Is the card information OK?**
   - If No, then reject.
   - If Yes, then continue.

2. **Is the card number is installed?**
   - If No, then reject.
   - If Yes, then continue.

3. **Is the card allowed to access at that time (Valid time Zone)?**
   - If No, then reject.
   - If Yes, then continue.

4. **Is Card + Pin Mode Enable at that time?**
   - If No, then the Door is unlock (end of flow).
   - If Yes, then the user has to key in his/her Pin number.

   4.1 **Is Pin Number correct?**
      - If No, then reject.
      - If Yes, then the Door is unlock.
Special Purpose Time Zone

CASTLE-K has special TimeZone, namely:

a. Door #1 to Door #8 Auto Lock Release TimeZone
b. Door #1 to Door #8 Local PIN Mode TimeZone
c. Door #1 to Door #8 Card + PIN Mode TimeZone
d. Pin Mode TimeZone
e. General Purpose Output TimeZone
f. Sensor / Alarm Arm TimeZone

a. Door #1 to Door #8 Auto Lock Release TimeZone
The Automatic Lock Release Time Zone can be programmed to lock or unlock the electric door for certain time periods. One of these features is to unlock the office main door during office hours. After office hours, the door will be locked and users will need to swipe their cards to enter the office.

b. Door #1 to Door #8 Local PIN Mode Time Zone
Each door (Door #1 to Door #8) can be set to its own PIN number separately. There are two sets of PIN number to be set into each reader. The Local PIN Mode Time Zone is used to specify the time periods when the user will need to enter the PIN number for the specify door to access the door. Outside the PIN Mode TimeZone, the user will not allowed to use the PIN to enter the premises.

c. Door #1 to Door #8 Card + PIN Mode TimeZone
The Card + PIN Mode TimeZone is used to specify the time periods when the users will need to swipe their cards AND enter the PIN numbers. Outside the CARD + PIN Mode TimeZone, the user will only need to swipe their card to gain entry. PIN entry is not required.

d. PIN Mode TimeZone
This is a Common PIN number set in the controller. All the readers are sharing this PIN number. The PIN Mode TimeZone is used to specify the time periods when the user can enter the secure area by entering a PIN number. Outside the PIN Mode TimeZone, the user will not allowed to use the PIN to enter the premises.

e. Auxiliary Output
This is a relay output that can be used for event trigger purposes.

f. Sensor / Fire Alarm Alarm
Fire Alarm is used to automatically release the pre programmed door during fire emergency.
Chapter 3 - Programming The Controller

This section is explaining the CASTLE-K programming environment. The CASTLE-K controller uses the LCD and keypad during the programming mode.

Programming Menu Structure
Key Functions in Programming Mode

The '0' to '9' keys are used for entering numbers as well as alphabets. The 'A', 'B', 'C', 'D', 'ENT' and 'ESC' keys are function key. Their usage is described in the following table.

<table>
<thead>
<tr>
<th>Key</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Scroll Menu to Left</td>
</tr>
<tr>
<td>B</td>
<td>Select Menu Item on the Left</td>
</tr>
<tr>
<td>C</td>
<td>Select Menu Item on the Right</td>
</tr>
<tr>
<td>D</td>
<td>Scroll Menu to Right</td>
</tr>
<tr>
<td>ENT</td>
<td>Accept data entry</td>
</tr>
<tr>
<td>ESC</td>
<td>Abort/Backspace</td>
</tr>
</tbody>
</table>

Once in the programming, choose the appropriate menu item by pressing in the corresponding number or use the 'B' or 'C' key as describe above.

Entering Programming Mode

To enter into the programming mode, press any key at the keypad. The backlit of the LCD will be turned ON (this is to indicate programming mode) and the LCD will show:

```
 dd/mm DDD hh:mm:ss
Password [ ******]
```

*Where dd/mm – current date; DDD – day of week; hh:mm:ss – current time*

Enter the 6 digits password. There are three levels of password.

The default passwords are:

1) Level 1 => 888888
2) Level 2 => 222222
3) Level 3 => 333333 (highest access level)

Level 1 password allows the user to only enter the Alarm Arm or Disarm Mode in the Programming Menu Structure.
Level 2 password allows the user to enter the view database, testing / maintenance and purposes menu items.
Level 3 Password allows user to access all the remaining items in the Programming Menu Structure.

All the password above can be changed via the Maintenance/Change Password Menu. If the user use level 1 password, the user only can change Alarm Arm / Disarm passwords only, then follow by the rest the same method.
After keying the password, the Main Programming Menu will be shown on the LCD.

Use the ‘A’ and ‘D’ keys to scroll the menu to left and right respectively. As you press the ‘D’ key, the display will be changed.
Chapter 4 – System Menu

System
- Date and Time
  - Lock Release Time
  - Door Open Time
- Door
  - Door Open Time
- Holidays
  - In Location Code
  - Out Location Code
- Timers
  - Emergency PIN
  - Auto-Lock Release TZ
- Time Zones
  - Card + Pin Time Zone
  - Emergency Mode
- Access Level
  - Use Common PIN
  - Local PIN 1
  - Local PIN 1 Time Zone
  - Local PIN 2
  - Local PIN 2 Time Zone
  - Security
- Clear Memory
  - Local PIN 2
  - PIN Mode
  - Card + PIN Mode
  - Master PIN
- Parameters
  - Lock Out
  - Check Expiry
  - Anti-PassBack
  - Auto-PIN 1 to Auto-PIN 10
  - Auto-PIN 1 to Auto-PIN 10 Time Zone
  - Facility Code
- Return to Main Menu
Under the System Menu, the user can change the Date and Time, Door Setting, TimeSets, TimeZones, Holidays, the system Parameters such as Facility Code, Auto-PIN number, Lock Out, Anti-PassBack and so on.

To enter the System Menu, press the ‘1’ key from the Main Menu.

The following will be displayed.

```
1-Date
2-Door
3-Holiday
4-Timers
5-T Zone
6-Acc Lvl
7-Clear
8-Param
0-Quit
```

**Setting Date and Time**

Press ‘1’ to select [1-Date] menu from the System Menu.
This menu item is for user to change the date and time setting on the system clock. When user select this menu item, the controller will display the current date and time as the following figure:

```
yr(2000) m[01] d[01]
```

Use the ‘0’ to ‘9’ keys to change Year, Month and Date.
User can delete the previous key using ESC key on the keypad.
After user has changed Date, the LCD will change to:

```
Yr[2000] M[01] D[01]
```
Door Setting

Press ‘2’ to select [2-Door] menu from System Menu. This menu item allows user to set the door setting. To set the specified door, user has to enter the number of door (1-2 for 2s series, 1-4 for 4s series, 1-8 for 8s series). To set the other door, user has to press the ‘2’ again at System Menu to enter to Door Setting Mode.

When the user select this menu item, the controller will step through each of the Door Setting. The key usage under this menu is listed below:

<table>
<thead>
<tr>
<th>Key</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 9</td>
<td>Set the digit</td>
</tr>
<tr>
<td>ESC</td>
<td>Skip the setting</td>
</tr>
<tr>
<td>ENT/D</td>
<td>Accept the setting</td>
</tr>
</tbody>
</table>

For ON/OFF value entries, use the ‘0’ key to toggle the value.

a. Lock Release Time
A value of 00-15 is allowed. This value determines the amount of time (in seconds) that the electric door-lock is activated after a valid user card has been swiped. If the door is not opened within this time period, the door will be deactivated. The default value is 05 seconds.

```
 dd/mm DDD hh:mm:ss
 Lock Rel Time [ 05 ]
```

b. Door Open Time
A value of 00-30 is allowed. This value determines the amount of time (in seconds) that the door takes to close. If the door is left opened for longer than this time period, the buzzer would sound. The default value is 10 seconds.

```
 dd/mm DDD hh:mm:ss
 Door Open Time [ 10 ]
```

c. In Location Code
A value of 00-99 is allowed. This value determines the door In Location Code of the Door. This setting will be used when the Anti-PassBack Mode at the Parameter Menu is ON.

```
 dd/mm DDD hh:mm:ss
 In Loc Code [ 00 ]
```
d. Out Location Code
A value of 00-99 is allowed. This value determines the door Out Location Code of the Door. This setting will be used when the Anti-PassBack Mode at the Parameter Menu is ON.

```
dd/mm DDD hh:mm:ss
Out Loc Code [ 00 ]
```

Example setting of Anti-Passback: -

<table>
<thead>
<tr>
<th>DOOR NO</th>
<th>IN LOCATION</th>
<th>OUT LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door 1</td>
<td>01</td>
<td>02</td>
</tr>
<tr>
<td>Door 2</td>
<td>01</td>
<td>02</td>
</tr>
<tr>
<td>Door 3</td>
<td>02</td>
<td>03</td>
</tr>
<tr>
<td>Door 4</td>
<td>01</td>
<td>03</td>
</tr>
</tbody>
</table>


e. Emergency PIN
4 digits of number are required to set the emergency PIN. When the controller is down, user can use this PIN number to access the door through the entry reader.

```
dd/mm DDD hh:mm:ss
Emer Pin [ 0000 ]
```

f. Auto-lock Release TimeZone
A value of 00-99 is allowed. This item is used to set the electric lock automatically released within the TimeZone setting.

```
dd/mm DDD hh:mm:ss
ALR Tz [ 00 ]
```

g. Card + PIN TimeZone
A value of 00-99 is allowed. This item is used to set the reader to prompt the card user for PIN number after the user swipe a valid card. This option will be activated within the TimeZone setting.

```
dd/mm DDD hh:mm:ss
Card + Pin Tz [00]
```
h. Emergency Mode
A value of 1-3 is allowed. This setting can only be used when the controller is down. The reader will follow the setting at the controller and will operate independently. The default value is set to 1.

```
dd/mm DDD hh:mm:ss
Emergency Mode [ 3 ]
```

Below is the configuration setting of each number:

<table>
<thead>
<tr>
<th>Function</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lock Release</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facility Code</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto-PIN</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 => The electric lock will automatically released when the controller is down.
2 => The reader will prompt user to swipe the card. It will release the lock when the facility code of the card is valid.
3 => Only Auto-PIN that set at the Emergency PIN Mode in the Controller is required.

i. Use Common PIN (Set the Common No. in Parameter Setting)
This item is used to set the reader to use the Auto-PIN number that set at the controller or use the Local Auto-PIN number that to the specify door. This only can be set to ON or OFF position.

```
dd/mm DDD hh:mm:ss
Use Common Pin [ON]
```

j. Local PIN 1
4 digits of number are required to set the Local Auto-PIN number. This is only can be used at the specify door and when the Use Common PIN Mode is OFF.

```
dd/mm DDD hh:mm:ss
Local Pin 1 [0000]
```

k. Local PIN 1 TimeZone
Set the TimeZone for the Local PIN 1, so that the Local Auto-PIN 1 can be used within the TimeZone setting.

```
dd/mm DDD hh:mm:ss
Local Pin 1 Tz [00]
```

l. Local PIN 2
4 digits of number are required to set the Local Auto-PIN number. This is only can be used at the specify door and when the Use Common PIN Mode is OFF.

```
dd/mm DDD hh:mm:ss
Local Pin 2 [0000]
m. Local PIN 2 TimeZone
Set the TimeZone for the Local PIN 2, so that the Local Auto-PIN 2 can be used within the TimeZone setting.

```
Example setting of Auto PIN Mode: -
```

<table>
<thead>
<tr>
<th>PIN MODE</th>
<th>USE COMMON</th>
<th>COMMON PIN (CP)</th>
<th>LOCAL PIN (LP)</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>YES</td>
<td>Use CP (Tz)</td>
<td>N/A</td>
<td>CP activated with Tz</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>N/A</td>
<td>Local Pin</td>
<td>LP activated</td>
</tr>
<tr>
<td>OFF</td>
<td>YES</td>
<td>N/A</td>
<td>N/A</td>
<td>Both deactivated</td>
</tr>
<tr>
<td>OFF</td>
<td>NO</td>
<td>N/A</td>
<td>Local Pin (Tz)</td>
<td>LP activated with Tz</td>
</tr>
</tbody>
</table>

n. Security
‘ON/OFF’ value. This option is used to enable or disable the security of the system. When the Security Mode is ON, the reader will prompt the user for the Card, Card + PIN or Auto-PIN to access the system; if the Security Mode is OFF, the electric lock will be released and the door is always opened until the Security Mode is set to ON again.

```
Example setting of Security: -
```

```
dd/mm DDD hh:mm:ss
Security [ON]
```

o. PIN Mode
‘ON/OFF’ value. When the PIN Mode is set to ON, the user has to key in the Auto-PIN to access the door; if it is set to OFF, the user will not be prompted to key in the Auto-PIN, but the user can swipe his/her card to access the door.

```
Example setting of PIN Mode: -
```

```
dd/mm DDD hh:mm:ss
Local Pin Mode [ON]
```

p. Card + PIN Mode
‘ON/OFF’ value. When the Card + PIN Mode is set to ON, the user has to key in the Card PIN after his/her card is valid. If it is set to OFF, depends on Card + PIN Mode TimeZone setting, the user will not be prompted to key in the Card PIN, only swipe a valid card.

```
Example setting of Card + PIN Mode: -
```

```
dd/mm DDD hh:mm:ss
Card + Pin Mode [ON]
```

q. Master PIN
6 digits of number are required to set the MASTER PIN. This is used to enter the Programming Mode at the reader when the controller is down. User can use this PIN number to program the reader. (The programming steps are shown in Chapter 11)

```
Example setting of Master PIN: -
```

```
dd/mm DDD hh:mm:ss
Master [000000]
```
Setting Holidays

Press ‘3’ to select [3-Holiday] menu from the System Menu.
This menu item sets the Holidays database. There are two types of holidays, Holiday_1 and Holiday_2. Holiday_1 is higher priority than Holiday_2. That’s mean Holiday_1 will be taken into consideration by the controller rather than Holiday_2.
When user select this menu, controller will prompt the user to choose which type of holiday they want.
The controller lets you enter up to 30 dates of holidays in each Holiday1 and Holiday2.

User has to press ‘1’ or ‘2’ to select Holiday_1 or Holiday_2.
After the selecting, the controller will display the first holiday date as in the following:

```
dd/mm DDD hh:mm:ss
Type ? (1/2) [ 1 ]
```

Use the ‘0’ to ‘9’ keys and the ‘ENT’ to enter the month of the holiday followed by the day. Press the ‘ENT’ key to accept the date and the display will show the next holiday date.

Continue until all the holidays have been entered. There are total of 30 holiday dates in each Holiday setting, which can be entered. To clear a holiday, enter ‘00’ for both month and day entries.
Setting TimerSet

TimeSet is the time period setting activation of an operation.

In cardholder database, you use TimeSet to specify the valid time periods for the card to access the system.

For example:
You may specify the TimeSet for the office as follows:

**TimeSet #2**

<table>
<thead>
<tr>
<th>Interval #</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>08:00 to 12:30</td>
</tr>
<tr>
<td>#2</td>
<td>13:30 to 18:00</td>
</tr>
<tr>
<td>#3</td>
<td>00:00 to 00:00</td>
</tr>
</tbody>
</table>

This allows the office staff accesses the system from 8:00am to 12.30 noon and from 1.30pm to 6pm. In other words, if the office staff accesses the system within these periods of time, he/she will be granted access. If it is outside these periods of time, he/she will not be granted access.

The Castle-S provides 98 TimeSet for you to program with. The TimeSet 00 and 01 is the pre-fixed TimeSet.

00 = no access time being set
01 = from 00:00 to 23:59

The TimeSet Setting can only specify the access time period for a particular day. To specify the access time period for different day, you may use the Time Zone Setting.

Time Zone Setting is made up of TimeSet. You specify 9 TimeSet in each TimeZone Setting (one for each day of the week plus 2 holidays). By specifying the Time Zone Setting of a card, the controller can then automatically control the different accessibility of the card from Sunday to Saturday an Holidays.

The example below shows the use of time zone and time set to control the accessibility of the card.

*Example:*

Time Set Sample :

<table>
<thead>
<tr>
<th>TimeSet #00</th>
<th>TimeSet #01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval #1</td>
<td>00:00 to 00:00</td>
</tr>
<tr>
<td>Interval #2</td>
<td>00:00 to 00:00</td>
</tr>
<tr>
<td>Interval #3</td>
<td>00:00 to 00:00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TimeSet #02</th>
<th>TimeSet #03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval #1</td>
<td>08:00 to 12:30</td>
</tr>
<tr>
<td>Interval #2</td>
<td>13:30 to 18:00</td>
</tr>
<tr>
<td>Interval #3</td>
<td>00:00 to 00:00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TimeSet #04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval #1</td>
</tr>
<tr>
<td>Interval #2</td>
</tr>
<tr>
<td>Interval #3</td>
</tr>
</tbody>
</table>
Press ‘4’ to select [4-Timers] menu from the system menu. This menu item sets the Timer database. When user select this menu item, controller will display the following: -

There are 100 timers available. Timer_00 and Timer_01 are *pre-fixed* sets, cannot be changed. Only from Timer_02 to timer_99 can be set by the user. User can use ‘0’ to ‘9’ to select which Timer he/she wants to update.

*For example:* -
To select Timer_12, press ‘1’ follow by ‘2’, the LCD will display as follow: -

This display shows the start time and the end time for the Timer_12, Interval_1. Each set of timer has 3 intervals of start and end times. They are used in conjunction with TimeZones.

Use ‘0’ to ‘9’ keys to enter the start time and the end time. Repeat the step to proceed to Interval_2 and Interval_3. To clear the interval, set the start and end time to ‘0000’.
Setting Time Zone

<table>
<thead>
<tr>
<th>Time Zone #</th>
<th>SUN</th>
<th>MON</th>
<th>TUE</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
<th>SAT</th>
<th>HOL1</th>
<th>HOL2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Zone #01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>Time Zone #02</td>
<td>00</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>02</td>
<td>03</td>
<td>04</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>Time Zone #03</td>
<td>00</td>
<td>02</td>
<td>00</td>
<td>02</td>
<td>00</td>
<td>02</td>
<td>00</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>

Each entry in the Time Zone setting above refers to the TimeSet no.
In the table above,
   a. The Time Zone #01 specifies that the card will use TimeSet #01 everyday where TimeSet #01 is 00:00 to 23:59 (24 hours access).
   b. The Time Zone #02 specifies that the card will use TimeSet #00 on Sunday and Holidays (non-access at all), TimeSet #02 on Monday till Thursday (08:00 to 12:30, 13:30 to 18:00), TimeSet #03 on Friday (08:00 to 12:00, 15:00 to 18:00) and TimeSet #04 on Saturday (08:00 to 13:30).
   c. The Time Zone #03 specifies that the card will use TimeSet #00 on Sunday, Tuesday, Thursday, Saturday and both two holidays (non-access at all) and TimeSet #02 on Monday, Wednesday and Friday.

Typically you can assigned the card of
   a. Manager/director with TimeZone #01,
   b. Normal staff with TimeZone #02 and
   c. Cleaners with TimeZone #03.

Since the Castle-S controller controls 8 doors, you need to specify the TimeZone Setting of a card for each door.

Press ‘5’ to select [5-Tzone] menu from System Menu.
This menu item sets the TimeZone database. When user select this menu item, controller will display the following: -

```
dd/mm DDD hh:mm:ss
TimeZone No ? [01]
```

There are 100 time zones available. TimeZone_00 and TimeZone_01 are pre-fixed sets, cannot be changed. Only from TimeZone_02 to timeZone_99 can be set by the user.
User can use ‘0’ to ‘9’ to select which TimeZone he/she wants to update.

*For example:*
To select TimeZone_11, press ‘1’ for twice, the LCD will display as follow: -

```
dd/mm DDD hh:mm:ss
Sun TimeSet   [01]
```

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]

dd/mm DDD hh:mm:ss
Sun TimeSet   [01]
Access Level

Press ‘6’ to select [6-Acc Lvl] menu from System Menu.
This menu item sets the Access Level for the card user.
When user select this menu item, controller will display the following: -

dd/mm DDD hh:mm:ss
Acc Lvl No ? [01]

There is 100 Access Level setting. AccessLevel_00 and AccessLevel_01 are pre-fixed sets, cannot be changed. Only from AccessLevel_02 to AccessLevel_99 can be set by the user.
User can use ‘0’ to ‘9’ to select which Access Level he/she wants to update.

For example: -
To set the AcessLevel_77, press ‘7’ for twice, the LCD will display as follow: -

dd/mm DDD hh:mm:ss
Date in dd/mm/yyyy

After that it will prompt the user to enter the data. The display as following: -

dd/mm DDD hh:mm:ss
St (00) / [00] / [0000]

This is the start of the Expiry Date setting. The earliest Start Date is 01/01/1998.
After keying the Start Date, the display will be changed as following: -

dd/mm DDD hh:mm:ss
Ed (00) / [00] / [0000]

This is the end of the Expiry Date setting. The latest End Date is 31/12/2030.
After keying the End Date, the display will be changed as following: -

dd/mm DDD hh:mm:ss
Door 1 Tz ( )

00-99 is available. This option lets user to set the TimeZone for the card user. The card user only can access the door within the TimeZone.

Repeat the step to proceed to Door_2_TZ (2s), Door_4_TZ (4s) or Door_8_TZ (8s).
Parameters

Press ‘8’ to select [8.Param] menu from the System Menu. This menu item sets the controller System Parameter. When user select this menu, the controller will step through each of the System Parameters.

The System Parameters are listed as below:

a. Card Lock-Out Mode
‘ON’ / ‘OFF’ value. When this option is set, the card user will only be allowed 3 invalid access attempts (Card & Pin Mode and Anti-Passback) after the user will be locked out from the system. Access will need to be manually granted. User cards that have been locked out can only be used again after resetting the Lock Out Flag. This is described in the DBASE Menu.

b. Check Expiry
‘ON’ / ‘OFF’ value. When this option is set, the system will check the Expiry Date Setting of the card that set at the Access Level. The system will not allow the card user to access the door when the card is EXPIRED.

c. Anti-Passback
‘ON’ / ‘OFF’ value. Anti-Passback is to ensure that if the person swipes at the IN-Reader of the door to go into the protected area, he/she mustswipes at the OUT-Reader of the door to go out from the protected area. After he/she has swiped out of the protected area, the next valid swipe is only at the In-Reader of the door.

d. Auto-PIN1 to Auto-PIN10 (Common PIN Setting)
4 digits of number are required to set the Auto-PIN numbers. There is 10 PIN numbers to be set. All the readers can share these PIN numbers. But the door must set the ‘Use Common PIN Mode’ to ‘ON’ position.
To disable the PIN number, user can set the PIN number to ‘0000’ or set the PIN TimeZone to ‘00’ (this is describe as below).

e. Auto-PIN1 TimeZone to Auto-PIN10 TimeZone
Set the TimeZone for each Auto-PIN, so that each Auto-PIN can be used within the TimeZone setting.

To disable the PIN number, user can set the PIN TimeZone to ‘00’.

f. Facility Code
A value of 0000-9999 is allowed. If ‘0000’ is entered, the controller will ignore the facility code encoded in the user cards. Otherwise, only user cards with the set facility code will be accepted. The default value is ‘0000’.
Under the database Menu, the user can install and delete user cards, view the Card Database and Log Transactions, and reset Anti-Passback Flag and Card LockOut Flag.

To enter the Database Menu, press the ‘2’ key at Main Menu. The following will be displayed: -

```
dd/mm DDD hh:mm:ss
1-Install  2-Delete
```

Press ‘A’ to scroll the menu to left and ‘D’ to scroll the menu to the right. As you press the ‘D’ key, the display will be changed to: -

```
dd/mm DDD hh:mm:ss
2-Delete  3-View DB
```

```
dd/mm DDD hh:mm:ss
3-View DB  4-View LG
```
Installing Card

Press ‘1’ to select [1-Install] menu from Database Menu. This menu item is to install cards. When user select this menu item, controller will display the following: -

Enter the starting card numbers that want to be installed.

For example: -

The card number ‘123456’ is to be installed. Press number of the card number using the keypad. The LCD display will then display: -

If the user wants to install 1 card, he/she just has to press the ‘ENT’ key to accept and go to next mode. If the user wants to install 50 cards from 123456, he/she has to add up 123456 with 50, that is 123506. Then he/she just keys in the number 123506 into the End Number.

After that, the LCD display will then display: -

This is where the Access Level of the card is set.

If the user wants to change the Access Level of the card that already installed, he/she just can re-install the card and select an Access Level again for the card.
Delete Card

Press ‘2’ to select [2-Delete] menu from Database Menu. This menu item is to delete user card one by one. When user select this menu item, the controller will display the following:

```
| dd/mm DDD hh:mm:ss |
| Card #[000000]     |
```

Key in the numbers of the card that wants to be deleted.

View Card Database

Press ‘3’ to select [3-View DB] menu from Database Menu. This menu item is to view the contents of the card database. When user select this menu item, the controller will display the following:

```
| dd/mm DDD hh:mm:ss |
| Page (1-4) ? [1]    |
```

If the user knows where is the card is installed, he/she just has to key in the digit ‘1’ to ‘4’ to select the page number to view the card info. To view another card, he/she just has to press ‘D’ key to select next card info; ‘A’ is for previous card info. To exit, press the ‘ESC’ key.

If the user want to search the card faster, he/she just key in any digit ‘1’ to ‘4’ then presses ‘ENT’. The controller will then display as following:

```
| dd/mm DDD hh:mm:ss |
| Find [000000]     |
```

Key in the number of the card. Then the controller will search the card for the user. If the card is installed in the controller, the controller will display the card info as follow:

```
| dd/mm DDD hh:mm:ss |
| 123456 ALVL01     |
```

For example card ‘123456’ is found:

```
123456 => card number  
ALVL  => Access Level of the card
```
View Log Transaction

Press ‘4’ to select [4-View Lg] menu from Database Menu.
This menu item is to view the transactions logged. Use ‘A’ and ‘D’ keys to scroll through the transaction log. To exit, press the ‘ESC’ key.

The Following Table Lists the Transaction Codes:

<table>
<thead>
<tr>
<th>Description</th>
<th>Transaction Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Entry Access</td>
<td>0</td>
</tr>
<tr>
<td>Anti-Passback Violation</td>
<td>1</td>
</tr>
<tr>
<td>Unknown Card Number</td>
<td>2</td>
</tr>
<tr>
<td>Wrong Facility Code</td>
<td>3</td>
</tr>
<tr>
<td>Reader Reset</td>
<td>4</td>
</tr>
<tr>
<td>Reader Up</td>
<td>5</td>
</tr>
<tr>
<td>Reader Down</td>
<td>6</td>
</tr>
<tr>
<td>Controller Reset</td>
<td>7</td>
</tr>
<tr>
<td>Enter Program Mode</td>
<td>8</td>
</tr>
<tr>
<td>Exit Program Mode</td>
<td>9</td>
</tr>
<tr>
<td>Memory Cleared</td>
<td>A</td>
</tr>
<tr>
<td>Reset Anti-Passback</td>
<td>B</td>
</tr>
<tr>
<td>Manual Lock Release</td>
<td>C</td>
</tr>
<tr>
<td>Wrong PIN Password</td>
<td>D</td>
</tr>
<tr>
<td>Door Left Open</td>
<td>E</td>
</tr>
<tr>
<td>Door Closed</td>
<td>F</td>
</tr>
<tr>
<td>Door Forced Open</td>
<td>G</td>
</tr>
<tr>
<td>Card Lock Out</td>
<td>H</td>
</tr>
<tr>
<td>Reset Lock Out</td>
<td>I</td>
</tr>
<tr>
<td>Wrong Time Zone</td>
<td>J</td>
</tr>
<tr>
<td>Duress Alarm</td>
<td>K</td>
</tr>
<tr>
<td>Door Interlocked</td>
<td>L</td>
</tr>
<tr>
<td>Alarm ON</td>
<td>M</td>
</tr>
<tr>
<td>Alarm OFF</td>
<td>N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Transaction Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Door Security</td>
<td>O</td>
</tr>
<tr>
<td>Alarm Delay Arm Start</td>
<td>P</td>
</tr>
<tr>
<td>Alarm Armed</td>
<td>Q</td>
</tr>
<tr>
<td>Alarm Trigger</td>
<td>R</td>
</tr>
<tr>
<td>Alarm Disarm</td>
<td>S</td>
</tr>
<tr>
<td>Alarm Isolated</td>
<td>T</td>
</tr>
<tr>
<td>Output ON</td>
<td>U</td>
</tr>
<tr>
<td>Output OFF</td>
<td>V</td>
</tr>
<tr>
<td>Output Isolated</td>
<td>W</td>
</tr>
<tr>
<td>Input ON</td>
<td>X</td>
</tr>
<tr>
<td>Input OFF</td>
<td>Y</td>
</tr>
<tr>
<td>Change PIN</td>
<td>Z</td>
</tr>
<tr>
<td>Valid PIN Access</td>
<td>a</td>
</tr>
<tr>
<td>Card Disable</td>
<td>b</td>
</tr>
<tr>
<td>Card Enable</td>
<td>c</td>
</tr>
<tr>
<td>Pulse Door Open</td>
<td>d</td>
</tr>
<tr>
<td>Door Open</td>
<td>e</td>
</tr>
<tr>
<td>Invalid PIN Access</td>
<td>f</td>
</tr>
<tr>
<td>Inactive Card</td>
<td>g</td>
</tr>
<tr>
<td>Card Expired</td>
<td>h</td>
</tr>
<tr>
<td>Valid Exit Access</td>
<td>i</td>
</tr>
<tr>
<td>Cold Start</td>
<td>j</td>
</tr>
<tr>
<td>Door Security ON</td>
<td>k</td>
</tr>
<tr>
<td>Door Security OFF</td>
<td>l</td>
</tr>
</tbody>
</table>
Clear Card Database

Press ‘5’ to select [5-Clr DB] menu from Database Menu. This menu item it to delete all the cards installed in the controller. After press ‘5’ at Database Menu, the controller will display as follow:

```
dd/mm DDD hh:mm:ss
Clear Card (Y=ENT) ?
```

The controller will prompt the user to confirm to clear the card database. If the user confirm to clear the database, he/she just has to press ‘ENT’ key. The controller will clear all the database in the controller. To cancel ‘Clear Card Database’, press ‘ESC’ key.

Reset Anti-Passback Flag

Press ‘6’ to select [6-Rst A/p] menu from Database Menu. This menu item is to clear the Anti-Passback flag. User cards with the Anti-Passback flag set cannot access the system. These cards can be reset by clearing the Anti-Passback flag. After press ‘6’ at Database Menu, the controller will display as follow:

```
dd/mm DDD hh:mm:ss
Rst A/p (Y=ENT) ?
```

Reset Lock Out Flag

Press ‘7’ to select [7-Rst L/o] menu from Database Menu. This menu is to clear the lock out flag. User cards with the lock out flag set cannot access the system. These cards can be reset by clearing the lock out flag. After press ‘7’ at Database Menu, the controller will display as follow:

```
dd/mm DDD hh:mm:ss
Rst L/o (Y=ENT) ?
```

Return to Main Menu

Press ‘0’ to select [0-Main] menu from Database Menu to return to Main Menu.
Chapter 6 – Auxiliary Event Output

Under General Purpose Output Menu, user can manually switch ON or OFF the Output and set the TimeZone for the Output.

To enter this menu, press the ‘3’ key at Main Menu.
The following will be displayed:

- **Auxiliary Event Output Time Setting**
  
  
  This menu item is to set the time for the output relay to trigger.
  
  When choosing this menu, the controller will display as follow:

  - **dd/mm DDD hh:mm:ss**
  - **1-Evt Op**
  - **2-Tr Code**

- **Event Transaction Code Setting**
  
  
  This menu item is to set the event code for the relay to respond.
  
  When choosing this menu, the controller will display as follow:

  - **dd/mm DDD hh:mm:ss**
  - **2-Tr Code**
  - **0-Main**

- **Return to Main Menu**
  
  Press ‘0’ to select [0-Main] menu from General Purpose Output Menu to return to Main Menu.

  n=> transaction code. Please refer to transaction code on page 26 & 32 for code entry reference.
Chapter 7 – Fire Alarm Sensor

Under Fire Alarm Sensor menu, user can manually select the door for release during fire emergency.

To enter this menu, press the ‘4’ key at the Main Menu.

The following will be displayed:

```
dd/mm DDD hh:mm:ss
Door No [?]
```

Select the door for release during emergency. Data entry ranging from 1-8. Following is the fire security mode option. User may select this mode by pressing on the '0' button on keypad to toggle “ON/OFF” option.

```
dd/mm DDD hh:mm:ss
Fire Security [ ON ]
```
Chapter 8 – Maintenance Menu

Under Maintenance Menu, user can change the Programming Password, set Display Message and Testing such as Test Keypad, Test WatchDog, Test Input and Test Output. To enter this menu, press the ‘5’ key at the Main Menu.

The following will be displayed: -

```
dd/mm DDD hh:mm:ss
1-CH Pass  2-Set Str
```

```
dd/mm DDD hh:mm:ss
2-Set Str  3-Test
```

```
dd/mm DDD hh:mm:ss
3-Test  0-Main
```
Changing Password

Press ‘1’ to select [1-CH Pass] menu from the Maintenance Menu. This menu item is to change the Programming password. The user can only change the password of their level. To change the password, user just keys in the new 6 digits password. ‘0’ to ‘9’ are available.

Set String

Press ‘2’ to select [2-Set Str] menu from the Maintenance Menu. This menu is to change the display message at the controller LCD display. The default is Cass Technology.

To enter numbers, press the ‘0’ to ‘9’ keys.
To enter the ‘A’ to ‘Z’ alphabets, press one of the ‘A’, ‘B’, or ‘C’ keys followed by the ‘0’ to ‘9’ keys. The ‘0’ to ‘9’ keys has the alphabets labeled at the bottom of the key.
- Pressing ‘A’ followed by the numbers key will select first alphabet labeled under this key.
- Pressing ‘B’ followed by the numbers key will select second alphabet labeled under this key.
- Pressing ‘C’ followed by the numbers key will select third alphabet labeled under this key.

Testing

Press ‘3’ to select [3-Test] menu from the Maintenance Menu. Then the controller will display the following:

```
dd/mm DDD hh:mm:ss
1-Test kpd       2-Test WD

dd/mm DDD hh:mm:ss
2-Test WD        3-Test IP

dd/mm DDD hh:mm:ss
3-Test IP        4-Test OP

dd/mm DDD hh:mm:ss
4-Test OP        5-Rd Stat

dd/mm DDD hh:mm:ss
5-Rd Stat       0-Main
```
**Test Keypad**

Press ‘1’ to select [1-Tst Kpd] menu from the Test Menu. Then the controller will display the following:

```
  dd/mm DDD hh:mm:ss
  1234567890*#abcd
```

This option is used to test the functioning of every keys of the keypad. User just has to press the letter follows the sequence as display.

**Test Watch Dog**

Press ‘2’ to select [2-Test WD] menu from the Test Menu. This option is to test the functioning of the WatchDog of the controller. After pressing ‘2’ at the Test Menu. The LCD should display as follow:

```
  dd/mm DDD hh:mm:ss
  WD : Waiting for reset
```

User just has to wait for few seconds until the controller reset. If the controller does not reset, that’s means the WatchDog is not functioning.

**Test Input**

Press ‘3’ select [3-Test IP] menu from the Test Menu. This menu item is to test the Input points. (First 4 input will be the Dip switch & last 4 is Sensor)

**Test Output**

Press ‘4’ select [4-Test OP] menu from the Test Menu. This menu item is to test the Output points.
Readers Status

Then the controller will display the following:

```
dd/mm DDD hh:mm:ss
Bus? (1/2) [1]
```

User has to key in ‘1’ or ‘2’ to select the Bus number.

Example:

A user chooses Bus number 2. Then the controller will display the following:

```
dd/mm DDD hh:mm:ss
 uuuudduu
```

u= Reader is working properly
d= Reader is not working properly

This menu item is let the user to view the Readers status. It will show all the reader that connected to Bus 2 in Up or Down conditions.

Return to Main Menu

Press ‘0’ to select [0-Main] menu from then Test Menu.
This menu item is to return to the Maintenance Menu.
Chapter 9 – Printer

Press ‘6’ to select [6-Prt] from the Main Menu.

Then the controller will display as following:

```
dd/mm DDD hh:mm:ss
1-ON / OFF
```

This menu item is used to switch ON or OFF the printer.

When the printer is ON, the installed printer will print out every transaction from the controller.

(Note: This features ONLY AVAILABLE for Car Park Access)
Chapter 10 – Information

Press ‘7’ to select [7-Info] from the Main Menu.

Then the controller will display as following:

```
 dd/mm DDD hh:mm:ss
 CASTLE K
```

This is the Product Series that are using.

```
 dd/mm DDD hh:mm:ss
 Addr = 00
```

This is the address setting of the controller.

```
 dd/mm DDD hh:mm:ss
 C8Kv6
```

This shows the version of the program of the Controller that is using.
Chapter 11 – CASTLE-S Reader

Programming During Emergency Mode At The Reader

When the controller is down, the readers will then automatically go into Emergency Mode. The readers will operate in "stand alone" system. But the features and the security level will be lesser. Even though, the user can still control the readers instead of Controller. It requires user to enter the Master PIN for the specify reader at the door. All the transaction would not be downloaded to controller on this event.

The command are tabulated as below:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Auto Pin mode ON/OFF</td>
</tr>
<tr>
<td>3</td>
<td>Facility Code ON/OFF</td>
</tr>
<tr>
<td>4</td>
<td>Lock release time</td>
</tr>
<tr>
<td>5</td>
<td>Door open time</td>
</tr>
<tr>
<td>10</td>
<td>Security ON/OFF</td>
</tr>
<tr>
<td>11</td>
<td>Change Facility Code</td>
</tr>
<tr>
<td>12</td>
<td>Change Master Pin</td>
</tr>
<tr>
<td>18</td>
<td>Change Emergency Pin</td>
</tr>
</tbody>
</table>

To enter the Programming Mode, user has to key in 6 digit of the Master PIN as the user set at the Individual Door Setting before the controller is down.

The steps are described below:

**02. Auto-PIN Mode ON/OFF**
1. Press * Button
2. Key in Mater PIN
3. Press 02
4. Press 1 to ON or 0 to OFF

**03. Facility Code ON/OFF**
1. Press * Button
2. Key in Mater PIN
3. Press 03
4. Press 1 to ON or 0 to OFF

**04. Lock Release Time**
1. Press * Button
2. Key in Mater PIN
3. Press 04
4. Key in Period Of Time (0-15)

**05. Door open time**
1. Press * Button
2. Key in Mater PIN
3. Press 05
4. Key In Period Of Time (0-30)

**10. Security ON/OFF**
1. Press * Button
2. Key in Mater PIN
3. Press 10
4. Press 1 to ON 0 to OFF

**11. Change Facility Code**
1. Press * Button
2. Key in Mater PIN
3. Press 11
4. Key in the Facility Code

**12. Change Master Pin**
1. Press * Button
2. Key in Mater PIN
3. Press 12
4. Key In New Master PIN in 6 digits.

**18. Change Emergency Pin**
1. Press * Button
2. Key in Mater PIN
3. Press 18
4. Key in the new Emergency PIN no in 4 digits.
Change Card PIN Number

Using the Reader, user can change his/her Access Card PIN number. Can change it anytime.

*For example:* -
First press the ‘*’ three times, you can see the indicator Green LED and Yellow LEDs Flashing, Red LED OFF. Then swipe in the Access Card, then swipe the access card at the reader. Finally, key in the old PIN number, follow by new PIN number for two times to verification.

If the user forgot or lost his/her changed Card PIN number, the user can go to the Controller to reinstall the Card again. The new Card PIN number will be the default PIN number as given by the supplier.

Duress Alarm

Press ‘##’ follow by normal operation to generate *Duress Alarm*.  
*For example:* -
First press the ‘#’ twice at a time, then key in the valid Auto-PIN or swipe the access card at the reader.

After key in the valid Auto-PIN or swipe the access card. The user can still open the door like normal. But the transaction on the controller will display “Duress Alarm” message as shown below:

```
dd/mm DDD hh:mm:ss
Duress Alarm
```

Card Reader LED Indicators

For the CASTLE-S Card Reader, there are 3 LEDs to indicate the status of the card reader. The following table describes the status of the card reader and the corresponding LED indications.

<table>
<thead>
<tr>
<th>Card Reader Status</th>
<th>LED Indications</th>
<th>Door Lock Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal, waiting to read card</td>
<td>Yellow LED Flashing, others OFF</td>
<td>Locked (If Auto Lock Release not enable)</td>
</tr>
<tr>
<td>Valid Card Swipe (without PIN)</td>
<td>Green LED ON, Yellow LED Flashing, Red LED OFF</td>
<td>Unlocked</td>
</tr>
<tr>
<td>Invalid Card Swipe</td>
<td>Green LED OFF, Yellow LED Flashing, Red LED ON</td>
<td>Locked</td>
</tr>
<tr>
<td>Valid Card Swipe, waiting for PIN</td>
<td>Green and Yellow LEDs Flashing, Red LED OFF</td>
<td>Locked</td>
</tr>
<tr>
<td>Correct PIN entered</td>
<td>Green LED ON, Yellow LED Flashing, Red LED OFF</td>
<td>Unlocked</td>
</tr>
<tr>
<td>Wrong PIN entered</td>
<td>Green LED OFF, Yellow LED Flashing, Red LED ON</td>
<td>Locked</td>
</tr>
<tr>
<td>Duress Alarm (waiting PIN or Access Card)</td>
<td>Green and Yellow LEDs Flashing, Red LED OFF</td>
<td>Locked (Unlocked when valid PIN or Access Card)</td>
</tr>
<tr>
<td>Controller Down</td>
<td>Yellow LED ON in long time, OFF in short time, others OFF</td>
<td>Depend on the Emergency Mode setting at the Controller</td>
</tr>
</tbody>
</table>