

FeeMaster Smart Exit Station

INSTALLATION MANUAL & USER GUIDE



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1. INTRODUCTION

1.1 Overview

The FeeMaster Smart Exit Station is a steel roadside pedestal that incorporates a motorised card capture reader and associated Exit Station Controller. It may also include a barcode scanner. These components are used in association with the FeeMaster Smart Encoder. The Encoder encodes smart cards with a Site Code, Card Number, Start Time & Date and End Time & Date, and encodes barcode exit tickets with Site Code, Ticket Number, Issuing Station Number, Issue Time & Date and Grace Period. This information is used by the FeeMaster Smart Exit Station to determine whether to permit exit and whether to capture or return a smart card.

The Exit station may also be used to control entry into a restricted parking area, leisure facility or any controlled area that requires a permit.

IMPORTANT INFORMATION

The FeeMaster Smart system can support other exit control devices such as a smart card reader (where card capture is not required) and a standalone barcode reader (where a pedestal is not practical). Please contact Nortech's sales team for information on other exit control options.

1.2 Operation

The validity of cards and barcodes are controlled by the CRC-FMS Exit Station Controller. This can control up to two card readers and a barcode ticket scanner.

1.2.1. Smart Card Reading

When a card is inserted into a card reader, the card details are sent to the controller. The controller's response will depend upon whether or not the card number is set to zero (exit token) and the information programmed onto the card.

If the card number is zero, the card acts as a simple single-use exit token. Here, the controller will take one of two actions:

- If the card has not expired it will be captured and the relay will operate to open the associated door/barrier.
- If the card has expired it will be returned and the relay will not operate.

If the card number is not zero, the card is for multiple use, and the way the reader responds will depend upon the data with which it has been programmed. See section 3.2.1 for information on programming cards into the reader controller.

1.2.2. Barcode Scanning

When a barcode is scanned, the barcode details are sent to the controller. The time and date of issue of the ticket and the grace period are used to determine whether or not the ticket is still valid. If the ticket is valid, relay 1 will operate to open the door/barrier associated with reader 1.

Other details in the barcode, such as the site code, are also used to confirm validity. The ticket contains an issuing station number and a ticket serial number. This information allows the option of applying anti-passback to the tickets so that it can only be used once.

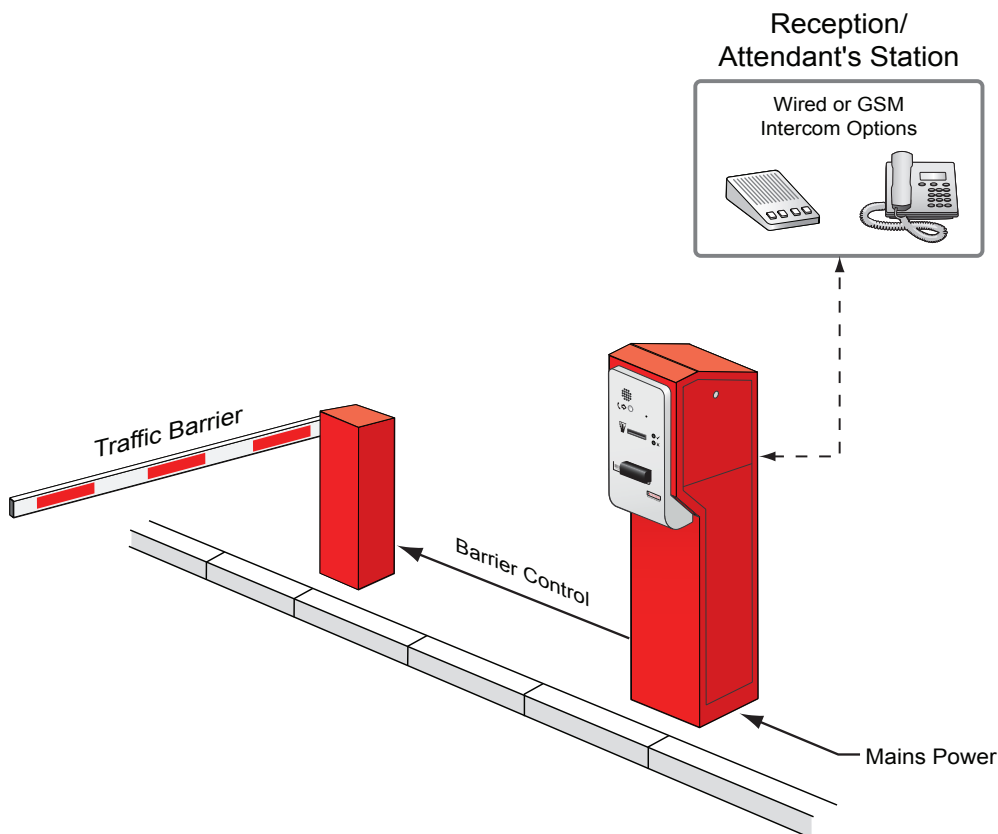
1.2.3. Free Exit

The CRC-FMS has a 'Free Exit' input associated with each of the card readers. Although named 'Free Exit', it can be used for either free exit or free entry, depending upon the specific requirement. This enables the barrier to be opened without the use of a card (e.g. where the same lane is used for the entrance and exit of a car park, and control is only required for exit). This input would typically be connected to a road loop or push button on the opposite site of the door/barrier to the pedestal.

1.3 Features

- Reads FeeMaster Smart cards
- Checks validity information against real-time clock
- Up to 4000 card numbers can be void/validated
- Card capture for expired cards and lost or stolen cards
- Option to capture cards on last day of validity
- Optional barcode exit token read/validation
- Integral intercom options (wired or GSM)
- Integral mains converter and heater

1.4 Connections



2. INSTALLATION

2.1 Site Requirements

The exit pedestal must be located at the exit barrier of the controlled parking area. It must be positioned at the side of the road so that drivers can comfortably reach the card reader slot and barcode scanner from their driving position when they stop their vehicles in front of the pedestal. The height of the pedestal is designed to accommodate most private vehicles when mounted on a standard height kerb. The pedestal must be secured to a concrete base using appropriate fixings. All cabling should be fed through the central hole in the base of the pedestal.

The system requires a 240V mains power supply, connected using cable appropriate to the type of installation.

2.2 Unpacking

The Exit Pedestal is delivered ready assembled with component units and all internal wiring. This comprises:

- Painted steel roadside pedestal/ housing
- Faceplate with card reader
- Intercom unit (optional feature)
- Barcode scanner (optional feature)
- Exit Station Controller (CRC-FMS)
- Heater (standard for UK. For export, environmental control depends upon local climate).
- Mains power adaptors (24VDC)
- Terminal connectors/circuit breaker (1A) mounted on DIN rail

Two keys are supplied for the upper side panel that provides access to the card collection tray.

You will need to remove the lower side panel to access the lower part of the cabinet for fitting and cable termination. To do this, remove the upper side panel, remove the two retaining screws at the top of the lower panel, lean the panel towards you slightly and then lift it out.

2.3 Mounting the Pedestal

There are four slotted holes in the base of the pedestal unit for securing it to a solid concrete base (see appendix A for dimensions). The large hole in the centre of the base is used for feeding external cables from below. Measure up and prepare a suitable concrete base and cable duct in a position that will allow the pedestal to be mounted in the best position for easy access by drivers to the card reader mouthpiece. Secure the pedestal to the base using suitable fixings. Feed the external cabling to the bottom of the pedestal cabinet (see section 2.4.)

2.4 External Connections

Figure 2.1 shows a schematic of the connections to the DIN rail at the bottom of the housing (see Appendix B for its location).

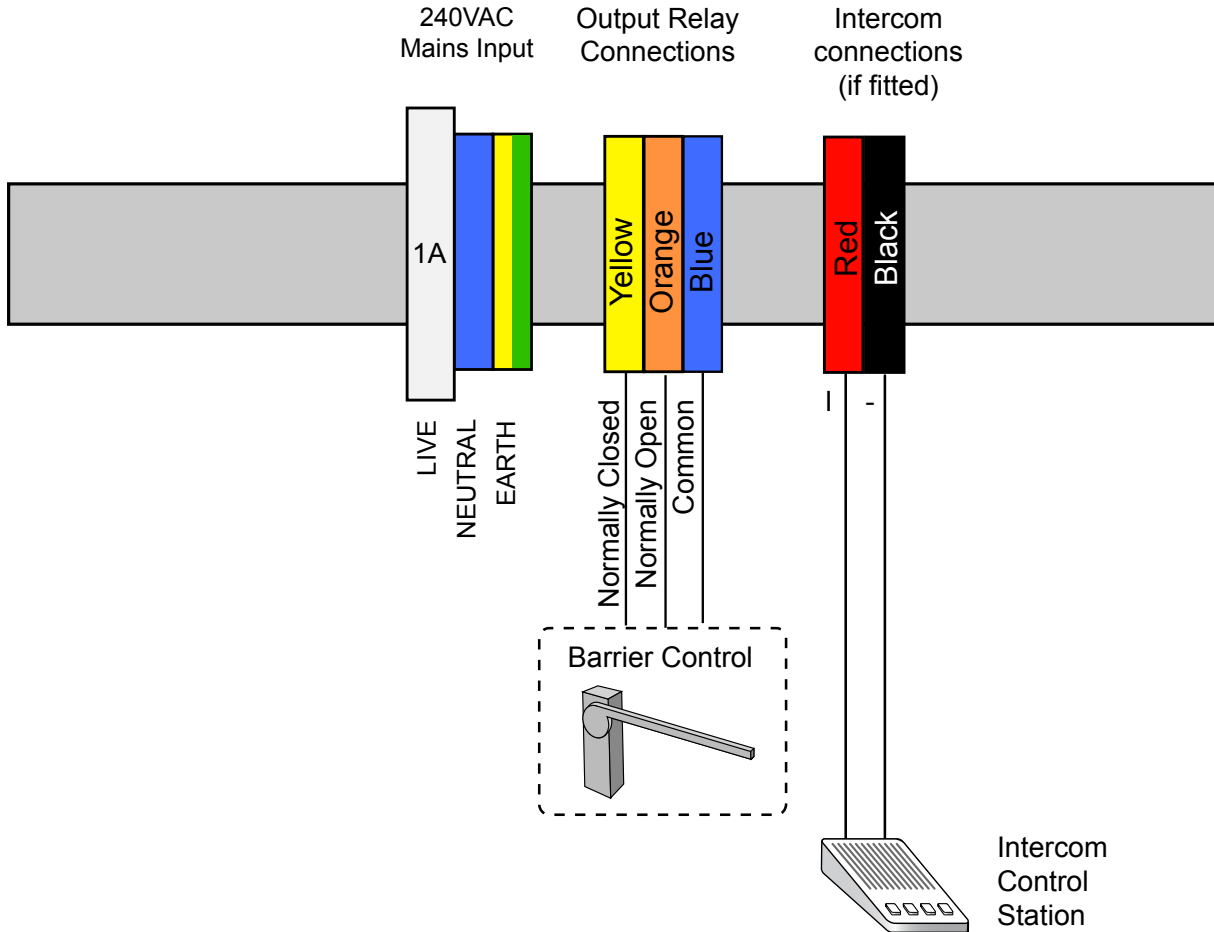


Figure 2.1 – DIN Rail Connections

2.4.1. Mains Supply

Connect a suitably insulated and protected mains cable to the circuit breaker and terminals. Do not connect power until the exit station is fully installed.

2.4.2. Barrier Control Output

The barrier control relay output includes common, normally open and normally closed contacts. Connect the outputs to the barrier control circuit as appropriate using a suitable cable.

2.4.3. Wired Intercom Connection

If a wired intercom is fitted. Connect the 2-wire interface to the remote Master Intercom using appropriate 2-wire audio cable.

2.5 Front Panel Components

The front panel provides the user interface comprising the card capture reader, barcode reader (where fitted) and intercom slave unit (where fitted).

Figures 2.2 show the front panel with option components fitted.

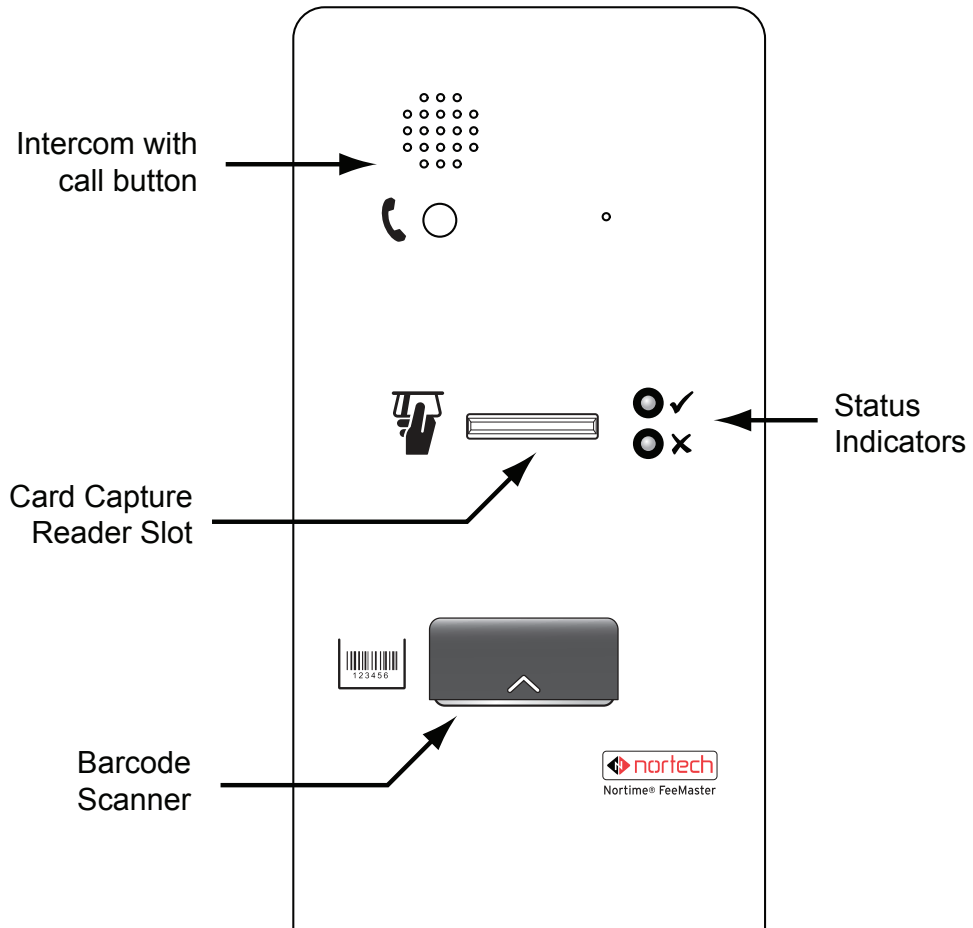
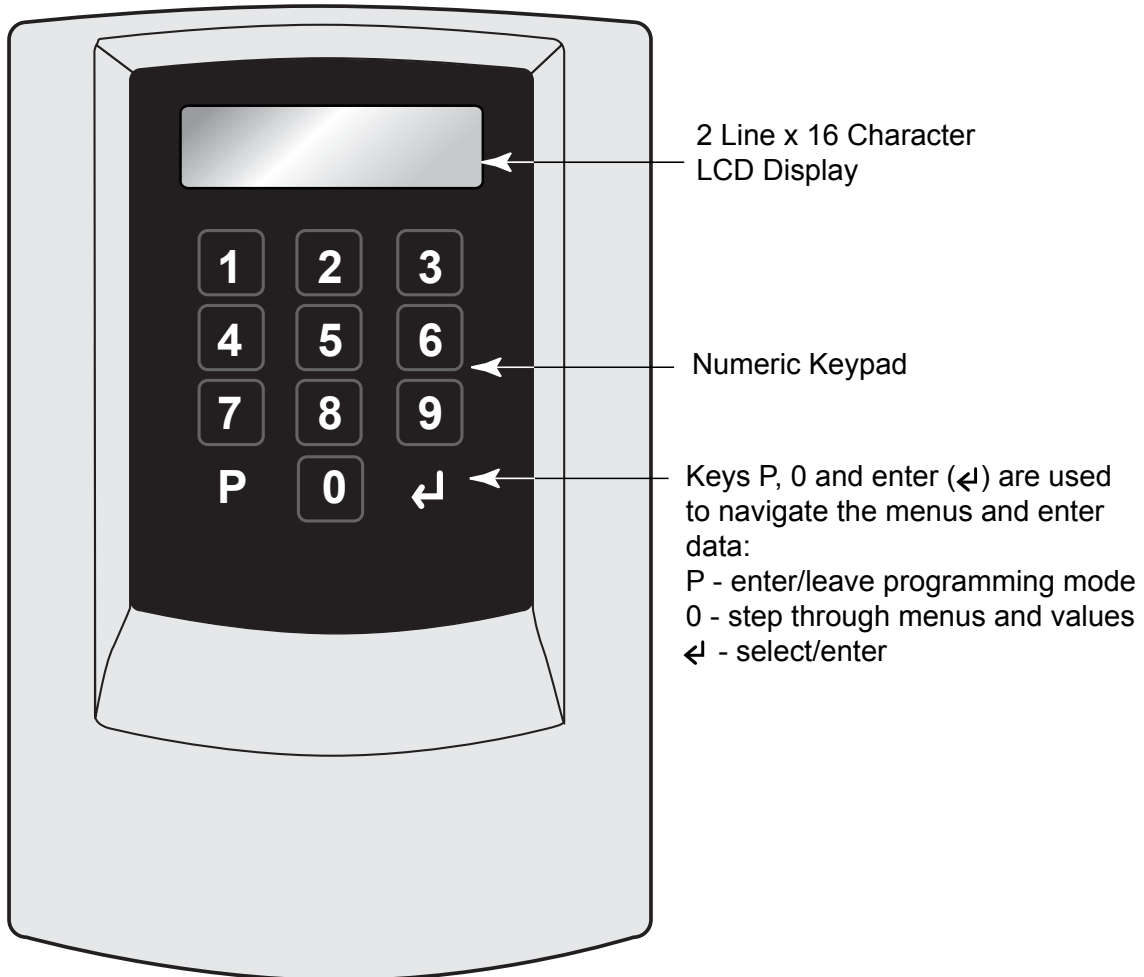


Figure 2.2

Refer to Appendix C for information for the connection of a standalone barcode scanner or a smart card reader to the CRC-FMS.

3. Programming

3.1 Programming Overview



Refer to Appendix B to locate the CRC-FMS Exit Station Controller.

The CRC-FMS is designed to control both the smart card reader and the barcode reader. Therefore the controller must be able to evaluate the information presented on the smart cards as well as barcode exit tokens.

The controller is programmed using the 12-digit keypad and 2-line LCD screen. The system is arranged as a hierarchical menu structure that can be navigated using the P, 0 and ↵ (enter) keys. The top line of the screen displays the current menu item and the bottom line displays the parameters.

When you power up the control unit, the screen will display the product code and the version number:

```
CRC205-TAS Vx.xx
```

(This will be referred to as the 'opening display' throughout this guide).

This opening display is the starting point for any new procedure described in this guide. The screen

will revert back to the opening display after 30 seconds of inactivity (30 seconds since last key was pressed).

Press **P** (program) to enter the programming mode.

The following programming menu items are available:

Program Cards – used to change the validity of FeeMaster Smart cards.

Verify Cards – used to verify card settings.

Configuration – to configure the way the card reader and barcode scanner operate.

Date/Time – to set the real time clock in the controller.

Card Test – this allows card information to be read to the screen.

Clear Events – future feature.

Press **0** repeatedly to select the required menu item. Press **↵** (enter) while that item is displayed on the screen. The first parameter of that item will then be displayed in the bottom row of the screen.

To enter or change a parameter, type the new value and press **↵** (enter). The unit will then move to the next parameter.

Press **P** to escape from a menu item. This will take you to the head of the next menu item. You can then press **↵** to enter that menu item or press **P** to leave programming.

The set-up procedure should be carried out in the following order:

Date/Time (see section 3.2.4)

Configuration (see section 3.2.3)

Program cards (see section 3.2.1)

3.2 Programming Detail

3.2.1. Program cards

This option allows you to add or remove a single card or a batch of cards and set the validity for each of the two readers. Once a card number has been made valid for a reader, any card encoded with that number would be treated as valid when inserted into that reader. This includes Short Stay cards (0001) but not Exit Tokens (0000). There is also the option to identify whether or not a card should be captured by either of the readers.

To programme cards, at the opening display press **P** once. The following is displayed:

Program Cards

Press **↵** and carry out the following procedure:

Display

Action

Program Cards
From Card:

Enter the first card number & press **↵**
(card number must be between 2 and 4000)

Program Cards
To Card:

Enter the last card number & press **↵**.
(card number must be greater than that entered in the previous step and no greater than 4000. For single card validation, simply press **↵**).

Program Cards
Rdr1 no

Use **0** to toggle between 'Yes' or 'No' to indicate validity on reader 1 and press **↵**

Program Cards
Capt no

Use **0** to toggle between 'Yes' or 'No' to indicate whether these cards should be captured at reader 1 and press **↵**

Program Cards
Rdr2 no

Use **0** to toggle between 'Yes' or 'No' to indicate validity on reader 2 and press **↵**

Program Cards
Capt no

Use **0** to toggle between 'Yes' or 'No' to indicate whether these cards should be captured at reader 2 and press **↵**

3.2.2. Verify Cards

To reach this menu item from the initial display, press **P** once and then press **0** repeatedly until the following screen is displayed:

Verify Cards

Press \odot to enter the menu item, enter the card number at the prompt 'Card:' and then press 'Enter'. You will see a display similar to:

```
Card: 0012-0055
R1-VC R2-VC
```

The first number is the card number that you entered ('12' in this case) and the second number represents the last consecutive card number above the one you entered that has the same configuration.

R1 = reader 1. R2 = reader 2

'XX' = card not valid, card not capture. 'XC' = card not valid, card capture.
 'VX' = card valid, card not capture. 'VC' = card valid, card capture.

Note: For Exit Tokens (Card 0000), these values are fixed at 'VX' for both readers and cannot be changed using 'Program Cards'. The values displayed in 'Verify Cards' for card 0000 should be ignored.

For Short Stay (Card 0001), the standard setting is 'VX' for both readers. Capture should not be activated for normal Short Stay applications.

3.2.3. Configuration

This enables you to set the operating parameters of the reader controller once the time & date has been set.

To reach this menu item from the initial display, press \odot once and then press \odot repeatedly until the following screen is displayed:

```
Configuration
```

Press \odot once. The first parameter will be displayed on the bottom line. Set the parameters as follows:

Display

Action

```
Configuration
Relay1: x>
```

Enter a value of between 1 and 300 to set the pulse duration for relay 1 in 1/10th second & then press \odot .

```
Configuration
Relay2: x>
```

Enter a value of between 1 and 300 to set the pulse duration for relay 2 in 1/10th second & then press \odot .

```
Configuration
TAS System
```

This setting can be used to set the controller to TAS (time allocation system) or TES (timed egress system). This is for backward compatibility with older systems and must be kept as TAS for all new installations.

Press \odot when the desired mode is displayed.

Configuration
Node: x>

This parameter is not currently used.
Press Ⓜ.

Configuration
Ex xxxxxx

Expired non-zero cards can be processed in 3 different ways depending upon the application. These are
CAP NOT = capture card and do not allow exit
CAP OUT = capture card and allow exit
RET = return the card and do not allow exit
Press 0 to step through the options and press Ⓜ when the desired option is displayed.

Configuration
Cp last day? No

The 'Capture last day' option allows the capture of unexpired cards on the last day of their validity.
Press 0 to toggle the 'Capture last day' option between 'Yes' and 'No' and press Ⓜ when the desired state is displayed.

Configuration
Site:xxxx

All encoders and readers associated with the same system must have a common site code (between 1 and 2000). This site code is set here for this controller. The site code will be included within the barcode on the ticket.
Type the site code and press Ⓜ.

Configuration
Rdr1 ATB:xx>

Anti-timeback (ATB) prevents a card being used twice on the same reader within a given period.
Enter the ATB period for reader 1 in minutes (between 1 and 30 minutes) and then press Ⓜ.
To disable this feature, set this value to '0'.

Configuration
Rdr2 ATB:xx>

Enter the ATB period for reader 2 in minutes (between 1 and 30 minutes) and then press Ⓜ.
To disable this feature, set this value to '0'.

Configuration
Check? No

This allows you to switch the barcode ticket check digit validation feature on or off. The setting must correspond with that of the ticket-issuing device. Press 0 to toggle the between 'Yes' and 'No' and press Ⓜ when the desired state is displayed.

Configuration
TCK APB? No

This allows you to switch anti-passback on or off for the ticket scanner. Press 0 to toggle the between 'Yes' and 'No' and press Ⓜ when the desired state is displayed.

Configuration
Reset APB? No

This option is only displayed when Ticket anti-passback is enabled. Set this parameter to 'Yes' if you would like the controller to reset the anti-passback memory at midnight each day. If the parameter is set to 'No', the controller will carry over the record of all tickets that have been presented.

Press \odot to toggle between 'Yes' and 'No' and press \ominus when the desired state is displayed

Configuration
Chk Expire? Yes

This allows you to switch 'ticket expiry checking' off for the ticket scanner. This should only be switched off for special applications where the ticket only needs to be checked for its serial number. Ticket anti-passback must be enabled when ticket expiry is switched off. This will prevent tickets from being reused.

Press \odot to toggle between 'Yes' and 'No' and press \ominus when the desired state is displayed.

Configuration
Password No

Press \odot to toggle the Password option 'Yes' or 'No' and press \ominus when the desired state is displayed.

If set to 'Yes', you will be prompted for a four-digit number. Enter a 4-digit number and press \ominus .

You will then need to enter this number whenever you select programming mode from the opening display. (See warning below)



IF YOU LOSE YOUR PASSWORD YOU WILL BE PERMANENTLY LOCKED OUT OF THE CONTROLLER PROGRAMMING MENUS. PLEASE CONTACT THE INSTALLER IF THIS OCCURS.

3.2.4. Date & Time

It is important that you check that the date and time settings are correct before you enter specific installation details. The date will also need to be changed twice a year at the beginning and end of 'Daylight Saving Time'.

To enter this menu item press \textcircled{P} from the opening display and press \odot once to display the following screen:

Date/time

Press \ominus once. The first parameter will be displayed on the bottom line. Set the parameters as follows:

Display	Action
Date/time Year: xx	Enter the year as two digits and press \odot .
Date/time Month: xx	Enter the month in two-digit format and press \odot .
Date/time Date: xx	Enter the day of the month as two digits and press \odot .
Date/time Day: x	Enter a number corresponding to the day of the week, where 1 = Monday, 2 = Tuesday, etc.
Date/time Hour: xx	Enter the current hour as two digits and press \odot .
Date/time Min: xx	Enter the current minute as two digits and press \odot .
Date/time Sec: xx	Enter the current second as two digits and press \odot .

On completion of these parameters, the unit will move to the 'Card Test' menu item.

3.2.5. Card Test

This allows an engineer to check the start time & date and end time & date of a card.

To reach this menu item from the initial display, press \textcircled{P} once and then press \textcircled{O} repeatedly until the following screen is displayed:

```
Card Test
```

Press \odot to enter the item. The following screen is displayed:

```
Swipe card
```

Present the card to reader 1. The screen display will appear as follows:

```
S hh:mm dd/mm/yy
E hh:mm dd/mm/yy
```

Where **S hh:mm dd/mm/yy** is the validity period start time and date,

and **E hh:mm dd/mm/yy** is the validity period end time and date.

Further cards can be presented to reader 1 – the display will change accordingly.

3.2.6. Clear Events

Future feature.

4. Maintenance and Diagnostics

4.1 Maintenance Actions

Once the system is up and running, there are some basic periodic routines that need to be carried out:

4.1.1. Captured Card Recovery

When cards are captured, they are fed into a card collection tray that can hold up to 250 cards. The tray should be emptied on a regular basis, the frequency of which will vary according to the rate of card capture (i.e. how the cards are used and the level of traffic). To avoid captured cards obstructing the exit of capture mechanism, the tray must be emptied long before it reaches its capacity. A strict routine should be established to regularly recover cards from the tray in line with the card capture rate (see Appendix B to locate the card collection tray).

4.1.2. British Summer Time (BST) Adjustments

The real-time clock in the CRC-FMS controller is very accurate and should not need to be adjusted on a regular basis. However, when BST starts and ends, the clock must be adjusted to the new time as with any other clock or timer. Refer to section 3.2.4 for instructions on setting the time.

4.2 CRC-FMS Display Interpretation

When testing cards on the system, the CRC-FMS screen provides useful feedback to help identify the reason for no-operation of the relay, etc. The information presented when a card is read is described below.

Display

```
dd/mm/yy hh:mm  
Site: nnnn
```

Explanation

The card presented to the reader has the wrong site code. 'nnnn' is the site code on the card; dd/mm/yy hh:mm is the date and time at which the card was read.

Refer to the site code parameter in section 3.2.3.

```
dd/mm/yy hh:mm  
Rx: nnnn OK
```

The card read by reader 'x' is valid. 'nnnn' is the card number; dd/mm/yy hh:mm is the date and time at which the card was read.

The corresponding output relay should operate.

```
dd/mm/yy hh:mm  
Rx: nnnn EX
```

The validity period has expired for the card read by reader 'x'. 'nnnn' is the card number; dd/mm/yy hh:mm is the date and time at which the card was read.

Carry out a 'Card Test' to check the information on the card (see to section 3.2.5).

dd/mm/yy hh:mm
Rx: nnnn ST

The validity period has not yet started for the card read by reader 'x'. 'nnnn' is the card number; dd/mm/yy hh:mm is the date and time at which the card was read.

Carry out a 'Card Test' to check the information on the card (see to section 3.2.5).

dd/mm/yy hh:mm
Rx: nnnn VOID

The card read by reader 'x' is not valid on that reader.

Refer to the reader settings for card number 'nnnn' on reader 'x' (see section 3.2.3).

dd/mm/yy hh:mm
Rx: nnnn ATB

Anti-timeback (ATB) has been activated on reader 'x' and card number 'nnnn' has been read a second time within the ATB period.

Refer to the ATB settings in the configuration menu (see section 3.2.3).

dd/mm/yy hh:mm
Rx: 0000

An expired Exit Token has been read by reader 'x'.

Carry out a 'Card Test' to check the information on the card (see to section 3.2.5).

5. Technical Specifications

Electrical

Supply voltage: 240V AC (Low voltage adaptors included)

Physical

Housing: Painted steel pedestal with side access panel.

Standard Fittings: Card Capture reader.
Card collection tray.
Exit station controller.
Power adaptors.
Heater (according to location).

Optional Fittings: Barcode scanner.
Aiphone compatible intercom slave unit.
Fitting of free issue Telguard GSM intercom.

Overall Dimensions (mm): 1200 x 360 x 275 (H x D x W)

Outputs

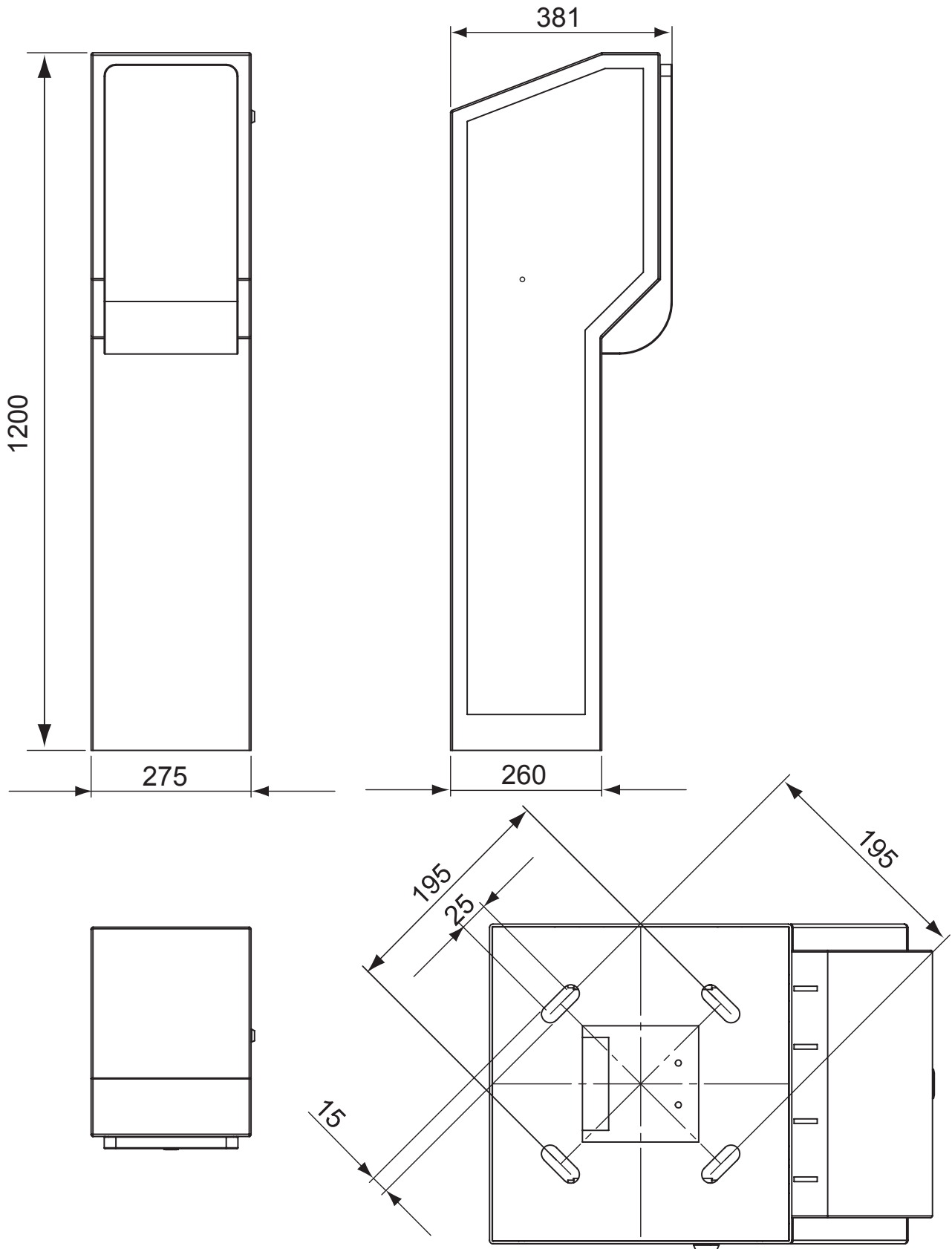
Open Signal: Voltage free relay contacts (30V DC, 2A)

External Barcode Scanner

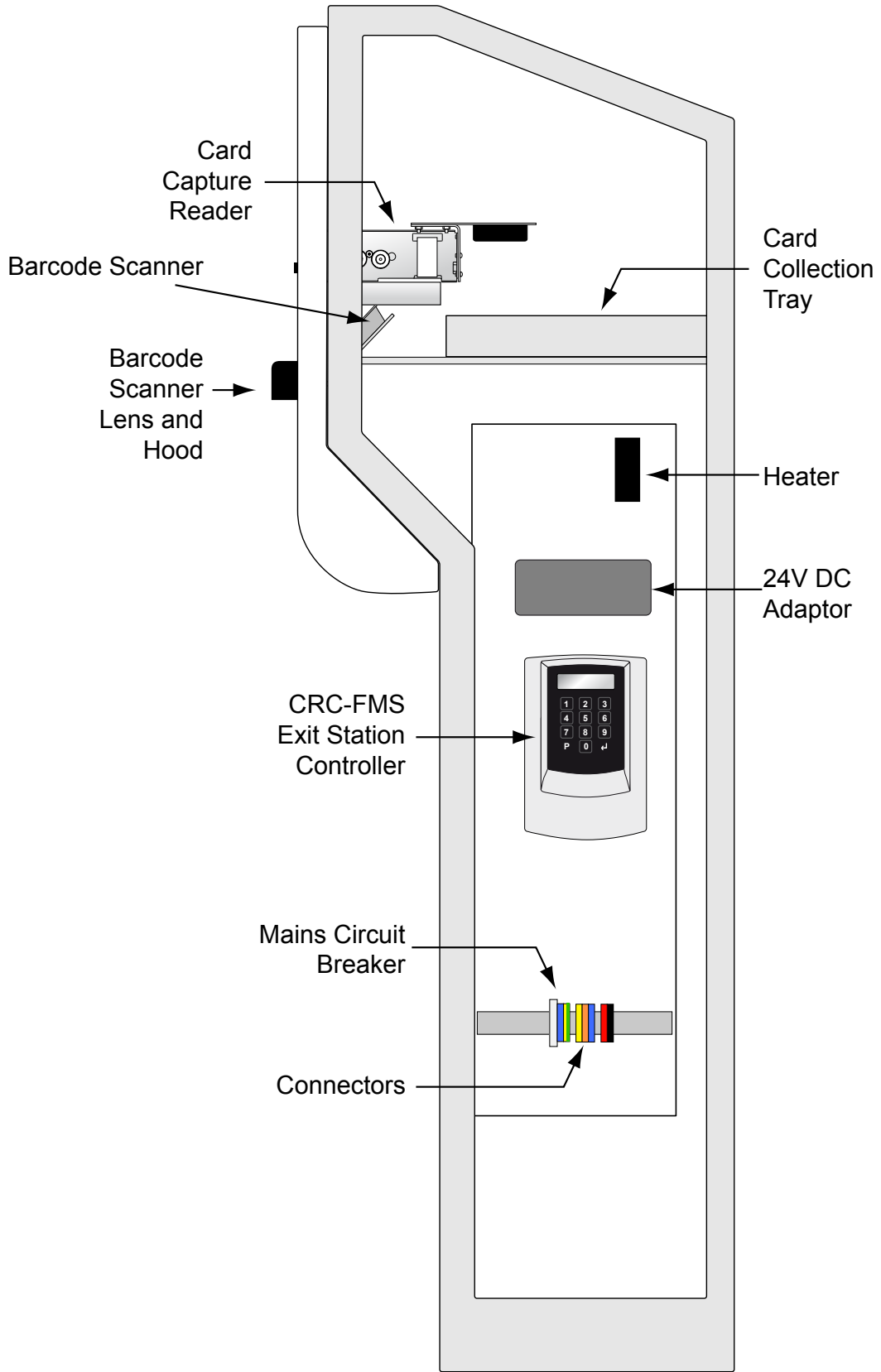
Housing: Post-mount metal weatherproof box

Dimension (mm): 240 x 90 x 100 (H x D x W)

APPENDIX A - PEDESTAL DIMENSIONS

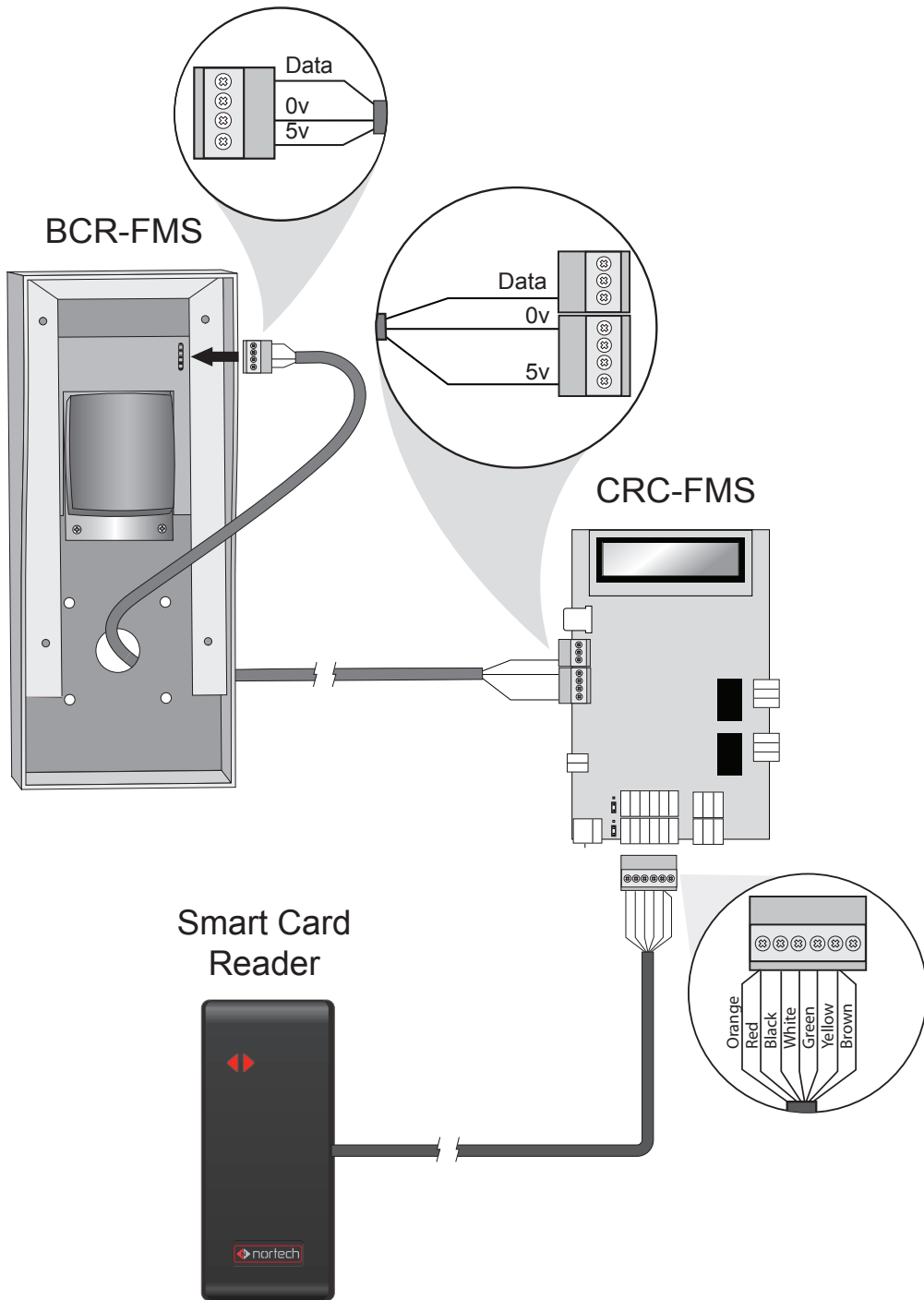


APPENDIX B – PEDESTAL COMPONENTS LAYOUT



APPENDIX C - ADDITIONAL CONTROLLER CONNECTIONS

Where the CRC-FMS controller is being used in combination with a smart card reader or a standalone barcode scanner, it will be necessary to cable between the controller and the reader. The terminal connections are shown below:



For smart card reader applications, connect the reader to reader port 1. Where it is a second reader attached to an exit station, connect it to reader port 2, taking care not to interfere with existing connections.