

Cardax FT Controller 3000

The Cardax FT Controller 3000 - 4R and 8R - are cost effective, intelligent field controllers, with integrated I/O and reader connections.



Cardax FT Controller 3000

Linking with the Cardax FT Command Centre, the Cardax FT Controller 3000 provides distributed intelligence in the Cardax FT system, managing access control and security functions in the field.

The Cardax FT Controller 3000 is available in two variants:

- 4R – 4 reader connections on-board
- 8R – 8 reader connections on-board.

The Cardax FT Controller 3000 is one of the key integrated components for Cardax FT security systems. It is an intelligent Controller incorporating a 32 bit Intel® microprocessor. The Cardax FT Controller 3000 features straightforward system architecture as illustrated in the Connectivity Diagram (enclosed).

The Cardax FT system architecture provides powerful and flexible configuration. Relationships can be configured directly between Cardax FT Controllers. For example, inputs on one Controller can be monitored and controlled by another Controller.

With built in connectivity, the Cardax FT Controller 3000 provides a cost-effective

approach to engineering a Cardax FT system. Up to four or eight doors can be controlled with the Controller 3000, dependent on Controller variant, reader technology and site configuration. I/O functionality is provided on the Controller 3000 with expansion options available.

The Cardax FT Controller 3000 architecture supports the Cardax FT Remote Arming Terminal for intruder alarms and the PowerFence™ Trophy FT Fence Controller and Keypad for integrated perimeter security.

Integrating Cardax Readers

The Cardax FT Controller 3000 supports the following Cardax IV door readers:

- Cardax Prox (125, TIRIS, Mifare)
- Cardax Prox Plus (125, TIRIS, Mifare)
- Cardax Prox LR (TIRIS)
- Cardax Swipe (Magstripe)
- Cardax Swipe Plus (Magstripe)

Cardax readers and cards provide superior encryption and communication compared to open industry standard formats.

The Cardax FT Controller 3000 – 4R is capable of supporting up to four Cardax readers. The Cardax FT Controller 3000 – 8R is capable of supporting up to

eight Cardax readers. The Cardax FT Controller 3000 can also support up to 8 GBUS Universal Reader Interface (URI) devices, each supporting up to 2 Cardax readers or 1 Wiegand format reader.

Refer to the Configuration Table for more details.

Connecting Third Party Readers

The Controller 3000 – 4R is capable of supporting two Wiegand format readers. The Controller 3000 – 8R is capable of supporting four Wiegand format readers. Refer to the Configuration Table for more details.

Monitoring Inputs and Controlling Outputs

The Cardax FT Controller 3000 has on-board inputs and outputs, which can be used for door monitoring and control, or for general I/O functions. It monitors and reports the state of the balanced inputs, and makes decisions to switch output relays, if required.

The Controller 3000 – 4R has 8 balanced inputs and 4 relay outputs on-board, which can be expanded to 72 inputs and 36 outputs (refer to Input/Output Expansion Options).

The Controller 3000 – 8R has 16 balanced inputs and 8 relay outputs on-board, which can be expanded to 144 inputs and 136 outputs (refer to Input/Output Expansion Options).

The four states monitored (using two 4k7 ohm resistors or optional configurable end-of-line resistance) are:

- Open
- Closed
- Short Circuit (Tamper)
- Open Circuit (Tamper).

The inputs on the Cardax FT Controller 3000 can be used to monitor:

- Access controlled doors
- Intruder detection (ie. Passive Infra-Red detectors, glass break detectors)
- Monitored doors
- Equipment alarms
- Any other devices that provide a clean switch contact.

The on-board relays may be used for:

- Access controlled doors
- Alarm outputs, e.g. to activate sirens
- Control outputs, e.g. to switch on air conditioning
- Time activated outputs, e.g. to switch on lighting.

Input/Output Expansion Options

The on-board number of inputs and outputs can be expanded with three input/output expansion options:

- Cardax FT 8-Input Expansion
- Cardax FT I/O Expansion
- Cardax FT High Density I/O Expansion
- Cardax FT GBUS URI

The Cardax FT 8-Input Expansion supports 8 inputs per board while the Cardax FT I/O Expansion supports 8 inputs and 4 outputs per board. The Cardax FT High Density I/O Expansion supports 16 inputs and 16 outputs per board.

The Cardax FT GBUS URI supports 8 inputs, 2 outputs, and two Cardax or 1 Wiegand format reader.

Distributed Intelligence and Data Storage

Distributed intelligence is a significant feature of the Cardax FT system architecture. All Cardax FT field devices connecting to Cardax FT Controllers can operate independently of the Cardax FT Command Centre server. This ensures that if the site experiences network communication problems, full operation of access control and alarms management is maintained.

The relevant fields of the cardholder database, alarm configuration and security parameters are downloaded to the Controllers allowing for instant access and alarm control decisions.

All events and alarms are date and time stamped before being sent to the Cardax FT Command Centre server. Each Cardax FT Controller 3000 is capable of buffering events should communications with the Command Centre fail. The Cardax FT Controller 3000 will transfer the buffered events to the Command Centre automatically when communications are re-established.

The ratio of cardholder records to events can be adjusted to the following options:

- 22,000 events / 5,000 cardholders
- 15,000 events / 20,000 cardholders
- 10,000 events / 30,000 cardholders
- 2,500 events / 46,000 cardholders.

Communications

The communications between the Cardax FT Controller 3000 and GBUS Devices use asynchronous RS485 Cardax GBUS protocol.

The communications between the Cardax FT Controller 3000 and Cardax readers use a proprietary format requiring 4-core cable. Third party readers with formats up to 360 bit communicate using a 6-core cable connection.

The communications between the Cardax FT Controller 3000 and the Cardax FT

Command Centre use TCP/IP, over an Ethernet network. The Cardax FT Controller 3000 provides a standard 10BaseT connection point. Remote Cardax FT Controller 3000s can be connected to the system via a TCP/IP Wide Area Network (WAN).

Cardax also has a range of industrial switches to provide solutions for redundant Ethernet network communication.

Peer-to-Peer Communications

The Cardax FT Controller 3000 can directly communicate with other Cardax FT Controllers (both 3000 and 5000GL). Peer-to-Peer communications enable Cardax FT Controllers to communicate with each other over a LAN/WAN using TCP/IP for the purposes of monitoring, back-up and control. This is a significant feature that provides extensive flexibility and efficient system configuration.

For example:

- A single Cardax FT Remote Arming Terminal resident on one Cardax FT Controller 3000 can be configured to control and monitor events and the security status of other alarm zones on any other Cardax FT Controller
- A Cardax FT Dialler 3000 resident on a Cardax FT Controller 3000 can be configured to transmit events originating from any Cardax FT Controller to a remote alarm monitoring station.

Dial-Up

The Cardax FT Dialler 3000 is an additional device that plugs to the Cardax FT Controller 3000 RS232 Port to support dial-up capability.

Dial-up enables the Cardax FT Controller 3000 to be located remotely enabling it to transmit information:

- At scheduled times
- When the event buffer is becoming full
- In response to certain events such as alarms for off-site monitoring.

Configuration Tables

Cardax FT Controller 3000 – 4R*								
CARDAX	Readers (4 on-board)		Input Monitoring (8 on-board)				Door Control Relays (4 on-board)	
	Entry	Exit Outputs	Door Closed	Door Locked	Request to Exit	Spare** Inputs	Door	Spare** Outputs
2 door control	✓	✓	✓	✓	n/a	4	2	2
4 door control (Request to Exit)	✓		✓	✓†	✓	0	4	0
4 door control*** (free handle exit)	✓		✓	✓		0	4	0
WIEGAND	Readers (2 total)		Input Monitoring (8 on-board)				Door Control Relays (4 on-board)	
	Entry	Exit	Door Closed	Door Locked	Request to Exit	Spare** Inputs	Door	Spare** Outputs
2 door control	✓		✓	✓	✓	2	2	2
2 door control*** (free handle exit)	✓		✓	✓		4	2	2

Cardax FT Controller 3000 – 8R*								
CARDAX	Readers (8 on-board)		Input Monitoring (16 on-board)				Door Control Relays (8 on-board)	
	Entry	Exit Outputs	Door Closed	Door Locked	Request to Exit	Spare** Inputs	Door	Spare** Outputs
4 door control	✓	✓	✓	✓	n/a	8	4	4
8 door control (Request to Exit)	✓		✓		✓	0	8	0
8 door control*** (free handle exit)	✓		✓	✓		0	8	0
WIEGAND	Readers (4 total)		Input Monitoring (16 on-board)				Door Control Relays (8 on-board)	
	Entry	Exit	Door Closed	Door Locked	Request to Exit	Spare** Inputs	Door	Spare** Outputs
4 door control	✓		✓	✓	✓	4	4	4
4 door control*** (free handle exit)	✓		✓	✓		8	4	4

Notes:

* The maximum number of readers, GBUS devices and I/O boards connected to a Controller 3000 is dependant on the combined transaction load of all devices.

** The number of inputs supported by the Cardax FT Controller 3000 – 4R/8R can increase by an additional 128 by adding input/output expansion devices. The number of outputs supported can increase by an additional 128.

*** If request to exit is not monitored, then forced door monitoring must also be disabled.

† Is achieved by adding a Cardax FT 8-Input Expansion Board or Cardax FT I/O Expansion Board.

Likewise, the Cardax FT Command Centre can be programmed to dial a Cardax FT Controller 3000 at scheduled times, or when an operator initiates a request. Dial-up can occur via an ISP, reducing communication costs.

Refer to the Cardax FT Dialler section later in this datasheet.

Software Upgrades

The Cardax FT Controller 3000 can be enhanced in the future via software upgrades.

These software upgrades (incorporated automatically in Cardax FT Software Maintenance Agreements) can be implemented over the network through Cardax FT Command Centre. New features

and functionality can be quickly and easily installed.

Data Security

All data over the network between the Cardax FT Controller 3000 and the Cardax FT Command Centre server uses 40-bit encrypted Secure Sockets Layer (SSL) technology. This standard is similar to technology used to secure Internet

banking transactions. High-level (168-bit) encryption is available via the Cardax FT XtraSec Controller 3000. (Refer to the Cardax FT XtraSec System Catalogue).

Intruder Alarms

The Cardax FT Controller 3000 provides sophisticated intruder alarm management, making separate intruder alarm systems superfluous. Arming (setting) and disarming (unsetting) of alarms can be implemented via:

- schedules in the Cardax FT Command Centre
- operator overrides at Cardax FT Command Centre workstations
- Cardax readers
- Cardax FT Remote Arming Terminals or PowerFence™ Trophy FT Keypads
- Key-Switch control.

Connecting to the Cardax FT Controller 3000, the Cardax FT Remote Arming Terminal also enables authorised users to monitor alarms in the field (refer to the Cardax FT Remote Arming Terminal data sheet for more information).

Entry and exit delays can be configured to give the cardholder time to enter or

leave the premises without generating an alarm. Full event details, including the cardholder's name, are recorded for arm/disarm operations at Cardax FT Command Centre.

A relay output may be used to indicate the arm/disarm status of a particular alarm zone.

Elevator Control

The Cardax FT Controller 3000 provides elevator access control using the I/O functionality provided.

Card readers can be installed in elevator cars to provide restricted access to floors. When a valid card is presented at a reader, the authorised access floor buttons are enabled, allowing a cardholder to select their destination floor. Floors may be 'unlocked' (i.e. the elevator floor select button enabled) on a time schedule.

Typically each elevator car requires a card reader and one relay output for each floor select button. If destination reporting is required then one input is needed for each floor select button in each elevator car. The Cardax FT Controller 3000 has

also been designed to support a high level interface for elevator control.

For more information please refer to the Cardax FT Elevator HLI feature datasheet.

High Level Cardax FT Controller API

Events can be sent to and received from third party systems with the Cardax FT Controller 3000 using the Cardax FT Controller Application Programming Interface (API). It is ideal for high level interfaces to third party systems such as DVR and duress systems. Contact us for more information.

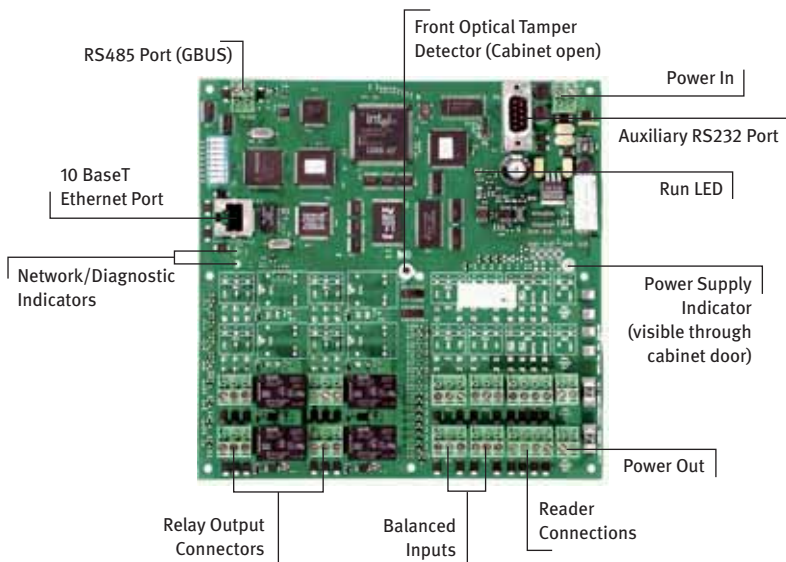
Controller Logic

Cardax FT Controller 3000 provides the ability to trigger outputs based on programmable logic base rules. Potential uses include switching lighting, setting alarm or fence zones or triggering alarms based on a number of variables occurring. All logic decisions take place at the controller and independent of the Cardax FT server.

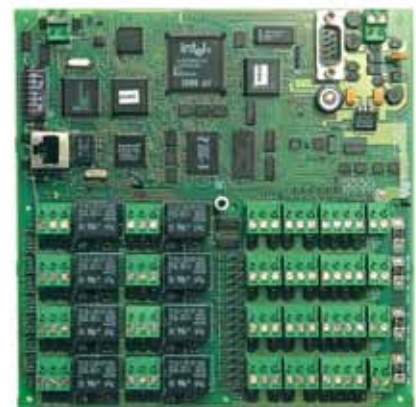
Clock

The Cardax FT Controller 3000 contains its own super-capacitor backed real-time clock. The clock is synchronised with the

Key Features of the Cardax FT Controller 3000 – 4R/8R



Cardax FT Controller 3000 – 4R



Cardax FT Controller 3000 – 8R

Cardax FT Command Centre at least once per hour.

Managing Different Time Zones and Daylight Saving

When the system is configured, each Cardax FT Controller 3000 is assigned an international time zone, relative to Co-ordinated Universal Time (UTC).

This time zone includes daylight savings settings. The system records the local time an event is registered at the Cardax FT Controller 3000, and the time it is logged at the Cardax FT Command Centre server.

Power Supply

The Cardax FT Controller 3000 runs on 13.6V DC $\pm 15\%$ allowing a standard battery backed 12V power supply to be used. The system monitors the power supply for power low, power high, and power fail.

It is recommended that installers connect a backup power supply to the Cardax FT Controller 3000 so it can continue to operate for at least 24 hours in the event of a mains supply failure. The backup power supply can be monitored by using inputs on an alternative Cardax FT Controller 3000.

Cardax FT Cabinets

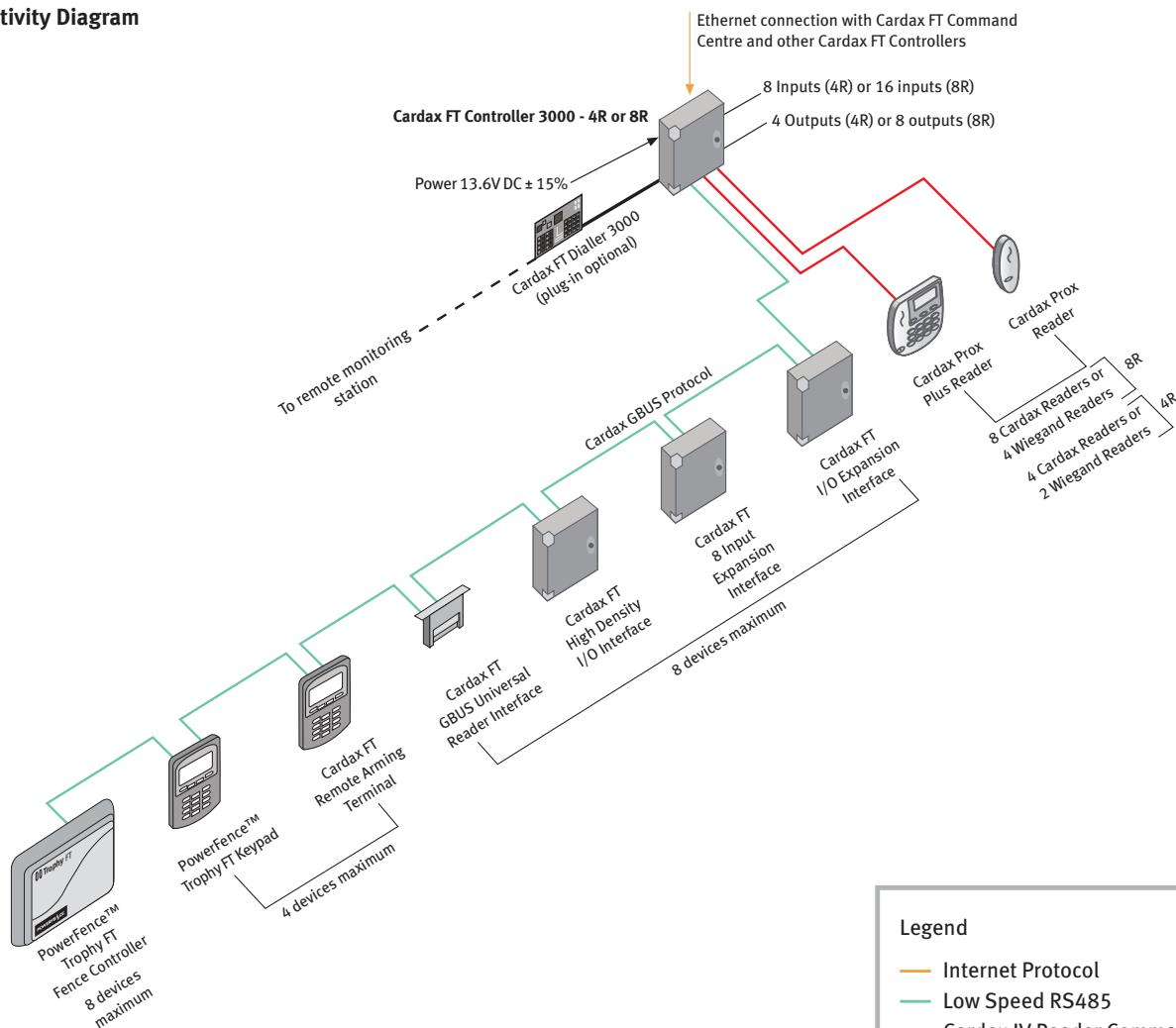
Two Cardax FT Cabinets are available to accommodate the Cardax FT Controller 3000 and I/O Devices:

- Cardax FT Cabinet
- Cardax FT Dual Cabinet

The Cardax FT Dual Cabinet is available with or without a power supply.

Refer to the Cardax FT Cabinets data sheet for further information.

Connectivity Diagram



The above diagram notes maximum connectivity. System configuration, network capacities, and the volume of system activity affect performance. Please contact Cardax Technical Support for advice.

Cardax FT Dialler 3000

Cardax FT Dialler 3000

The Cardax FT Dialler 3000 enables remote alarms management in conjunction with either the Cardax FT Command Centre – the head-end of the system, or with an alarm monitoring company.

The Cardax FT Dialler 3000 also enables an on-demand connection between the Cardax FT Command Centre and remote Cardax FT Controller 3000, for configuration and security management.

The Cardax FT Dialler 3000 and Cardax FT Controller 3000 can be configured to dial via both of these methods on the occurrence of an alarm.

Communications

The Cardax FT Dialler 3000 dials out to the Cardax FT Command Centre or the alarm monitoring station over telephone lines. Importantly, the Cardax FT Dialler 3000 is able to seize the phone line to transmit alarms, when the line is shared with a normal phone or other device.

The peer-to-peer communications between Cardax FT Controllers enables a Controller fitted with a Cardax FT Dialler 3000 to support off-site alarm monitoring

and operate as a back-up dialler for other Cardax FT Controllers (3000 and 5000GL) on site.

Contact ID Protocol is supported for off-site alarms monitoring.

The Cardax FT Dialler 3000 facilitates off-site monitoring by transmitting alarms to remote monitoring stations using industry-standard Contact ID data format.

Using Contact ID, the Cardax FT Dialler 3000 can be configured to:

- Dial on the occurrence of specific alarms or events
- Provide periodic test transmissions (24 hour test and configurable line test)
- Dial on the arming (setting) /disarming (unsetting) of alarm zones.

Dial-up Connection to Cardax FT Command Centre

The Cardax FT Dialler 3000 can be used to facilitate communications between the Cardax FT Command Centre server and Cardax FT Controllers located at remote sites. This dial-up connection can be used for remote site configuration including access control for cardholders and alarm configuration.

The Cardax FT Dialler 3000 will dial-up on demand, for example when an alarm occurs or when the event buffer of the Cardax FT Controller reaches a pre-defined threshold.

Configuration

Remote alarms monitoring using the Contact ID protocol and the dial-up connection to the server are set up in the Cardax FT Command Centre.

They can both be configured to dial on the occurrence of an alarm. In this scenario, dial-up to a remote alarm monitoring station occurs first followed up with dial-up to the server.

Housing and Power

Each Cardax FT Dialler 3000 is mounted on top of its respective Cardax FT Controller, which is housed in the Cardax FT Cabinet.

The Cardax FT Dialler 3000 is 13.6V DC powered and can share the same power source as that provided for the Cardax FT Controller.

Cardax FT Dialler 3000



April 2007

TECHNICAL SPECIFICATIONS		Cardax FT Controller 3000
Power Supply	Voltage	13.6 V DC ± 15%
	Current (without relays operated)	290mA
	Current (all relays operated) - Controller 3000 - 4R / 8R	400mA / 610mA
	Note: The above currents exclude external devices such as readers and alarm sounders.	
Number of Reader Ports	Cardax FT Controller 3000 – 4R	
	Cardax reader connections	4
	OR Wiegand readers connections	2
	Cardax FT Controller 3000 – 8R	
Cardax reader connections	8	
OR Wiegand reader connections	4	
Network Communications	Network connection	10BaseT Ethernet Port
	Network protocol	TCP/IP
Reader Data Format	Cardax readers	Cardax proprietary
	Wiegand readers	Up to 360 bit
Device Communications	Between Cardax FT Controller 3000 and GBUS Devices	Asynchronous RS485 Cardax GBUS protocol at 38.4 KBits/sec
	Cardax GBUS	1200m max
	GBUS Wiring format - data	2 wire (using Cat 5)
	GBUS Wiring format - power	2 wire (gauge selected to suit cable length)
	Cardax readers	4 wire, 200m max
	Wiegand readers	6 wire (See reader manufacturer's specifications for max. cable length)
Inputs/Outputs	4-State balanced inputs	Default using dual 4k7 ohm termination resistors, configurable
	Relay Outputs	Dry contact relays (c/o contacts)
	Inputs - Cardax FT Controller 3000 – 4R/8R	8/16
	Outputs - Cardax FT Controller 3000 – 4R/8R	4/8
Relay Specifications	Resistive load	3 Amps at 24V DC/AC
	Inductive load	1 Amp at 24V DC/AC
Shipping Weight	Cardax FT Controller 3000 (PCB only)	600 grams
	Cardax FT Controller 3000 in Cardax FT Cabinet	2.2kg
	Cardax FT Dialler 3000	170 grams
Data Storage per Cardax FT Controller 3000	Max. number of Access Zones	Unlimited
	Max. number of Alarm Zones	256
	Capacity of unprocessed alarms buffer	100
	Max. number of Access Groups	2,000
	Max. number of Time Schedules	200
	Number of cardholders	Default 30,000. 46,000 (max)*
	Number of events	Default 10,000. 22,000 (max)*
* Number of cardholders and events is determined by the cardholder/event ratio		
Elevator Control	Max. number of shafts per Controller 3000	2
	Max. number of floors per shaft	72
Compliance Standards	The Cardax FT Controller 3000 complies with C-Tick, CE, FCC and UL approvals.	
Cardax FT Controller 3000*	  ACN 002132943  	
* Compliance with other international standards will be proven as required. Please contact Cardax for the latest list of approvals. All Cardax FT products must be installed in accordance with the Installation Notes to comply with international standards.		

April 2007

TECHNICAL SPECIFICATIONS

Cardax FT Dialler 3000

Dimensions	Cardax FT Dialler 3000	113 X 54mm
Power Supply		13.6V ± 15%, 300mA
Temperature Range		-10 to +55°C
EMC Standards		EN 50130-4 EN 55022
Mounting	Cardax FT Dialler 3000 plugs vertically into P3 on the Cardax FT Controller 3000 PCB	
Communication		RS232
Compliance Standards	NZ Telepermit, A-Tick C-Tick, CE	
Part Number	Dialler 3000	C200620



System configuration, network capacities, and the volume of system activity affect performance. Please contact Gallagher Security Management Systems for advice



Gallagher Security Management Systems
Kahikatea Drive
Private Bag 3026
Hamilton
New Zealand
Phone: +64-7-838 9800
Fax: +64-7-838 9801
Email: cdxsales@cardax.com

Offices / Distributors are located in:

Asia
Australia
Europe
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