



Cardax FT

Controller 3000 – 4R

Controller 3000 – 8R

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

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.

Cardax FT Controller 3000

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.

Integrating Cardax Readers

The Cardax FT Controller 3000 supports the following Cardax 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.

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 Cardax logo, consisting of the word "cardax" in a lowercase, sans-serif font.

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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 80 inputs and 40 outputs (refer to Input/Output Expansion Options).

The four states monitored (using two 4k7 ohm resistors) 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 are primarily for use as door control relays. Relays not required for this function may be used as:

- 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 two input/output expansion options:

- Cardax FT 8-Input Expansion
- Cardax FT I/O Expansion

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.

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 number of cardholder records is set at 30,000 and the size of the event buffer at 10,000 events.

Communications

The communications between the Cardax FT Controller 3000, I/O Expansion options, and the Cardax FT Remote Arming Terminal 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 5000). 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 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 alarm monitoring.

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 also occur via an ISP, reducing communication costs. (Refer to the Cardax FT Dialler datasheet for further information).

Configuration Tables

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

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

** The number of inputs supported by the Cardax FT Controller 3000 – 4R/8R can increase by an additional 64 by adding input/output expansion devices. The number of outputs supported can increase by additional 32. The number of spare inputs and outputs will vary depending on the number and use of input/output expansion devices.

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 an optional licensed feature.

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
- 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 one 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 optional feature datasheet.

Power Supply

The Cardax FT Controller 3000 runs on 13.6V DC ±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.

Clock

The Cardax FT Controller 3000 contains its own super-capacitor backed real-time clock. The clock is synchronised with the Cardax FT Command Centre at least once per hour.

Managing Different Time Zones and Daylight Saving

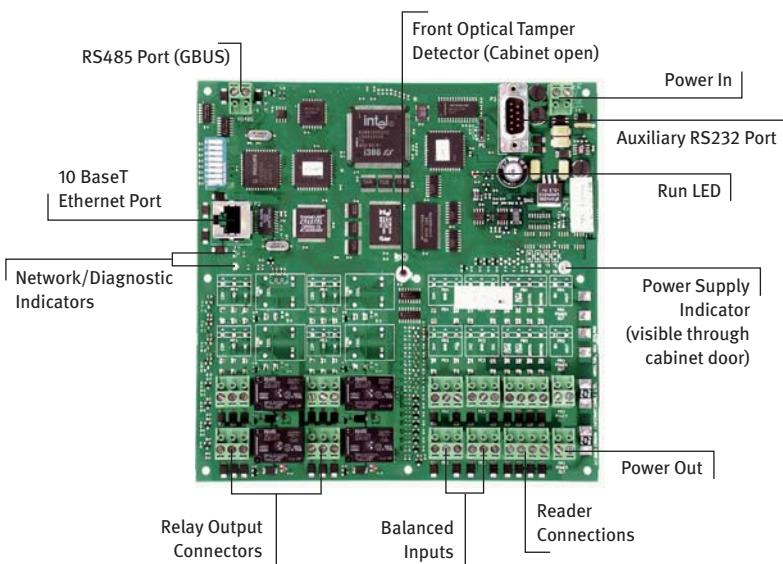
When the system is configured, each Cardax FT Controller 3000 is assigned an international time zone, relative to Co-ordinated Universal Time (UTC). This includes daylight savings settings. The system records the local time an event is registered at the Cardax FT Controller 3000 and the time it is logged at the Cardax FT Command Centre server.

Cardax FT Cabinet

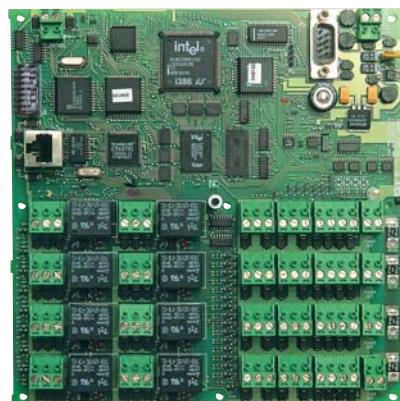
The Cardax FT Cabinet is a secure enclosure for the Cardax FT Controller 3000. It provides cost-effective housing and includes many features designed to make installation and servicing easier.

When the printed circuit board for the Cardax FT Controller 3000 is installed in the Cabinet, front optical tamper protection is provided to sense when the Cabinet door is open, and rear optical tamper to sense

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



Cardax FT Controller 3000 – 4R



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when the Cabinet is being moved from the wall.

For the Cardax FT Controller 3000 input/output expansion options, the Cabinet is supplied with a gear plate and tamper board (referred to as the Cardax FT Controller 3000 Accessory Cabinet).

The input/output expansion boards are modular, designed to be mounted on the gear plate in the following combinations:

- Up to four Cardax FT 8-Input Expansion boards, or
- Up to two Cardax FT I/O Expansion boards, or
- One Cardax FT I/O Expansion board

and two Cardax FT 8-Input Expansion boards.



Cardax FT Controller 3000 – I/O Expansion

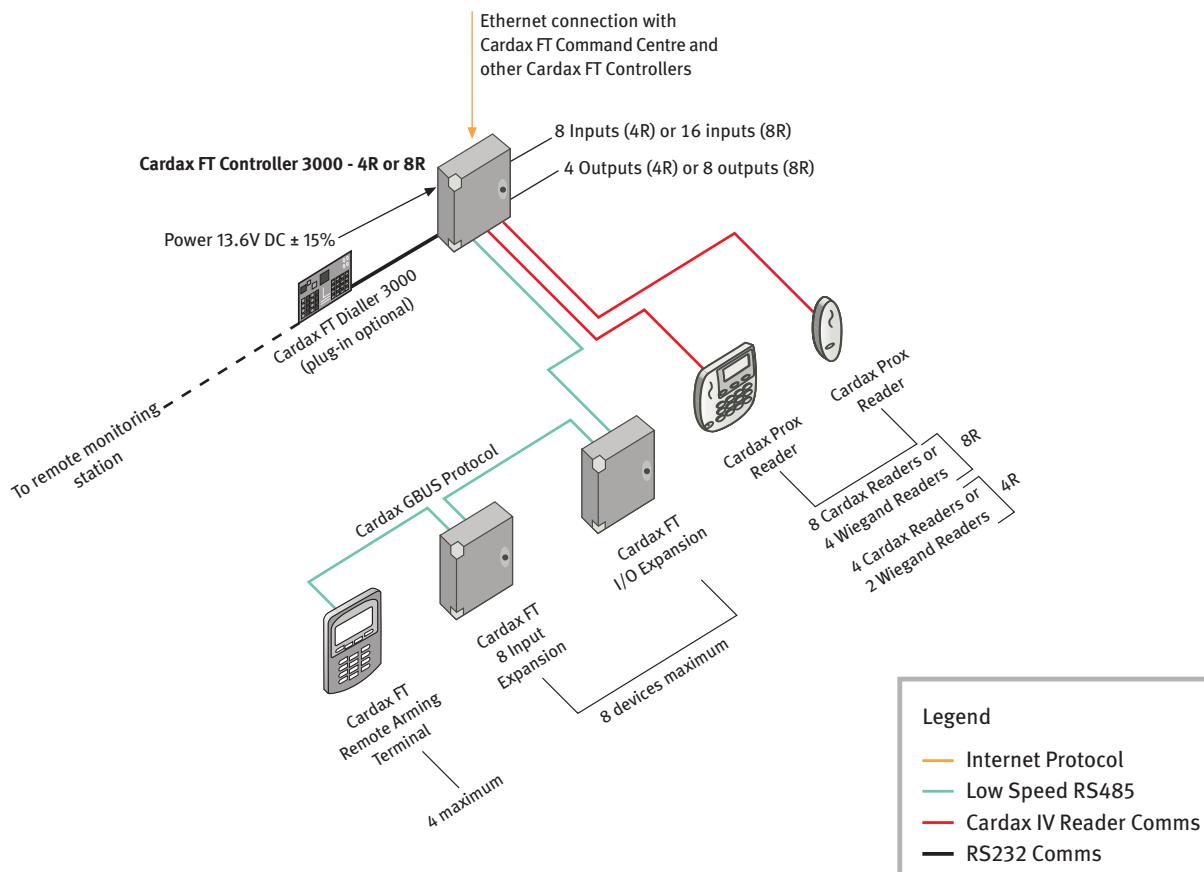


Cardax FT Tamper Board



Cardax FT 8-Input Expansion

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.

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TECHNICAL SPECIFICATIONS	Cardax FT Controller 3000	
Power Supply	Voltage Current (without relays operated) Current (all relays operated) The above currents exclude external devices such as readers and alarm sounders.	13.6 V DC +/- 15% 290mA 610mA
Number of Reader Ports	Cardax FT Controller 3000 – 4R (maximum 4 Cardax readers, or 2 Wiegand readers)	2
	Cardax FT Controller 3000 – 8R (maximum 8 Cardax readers, or 4 Wiegand readers)	4
	Note: Each of the reader ports can have either 2 Cardax readers or 1 Wiegand format reader.	
Communications	Cardax FT Command Centre	10 Megabit/Ethernet TCP/IP
Dial Up Communications	Cardax FT Dialler 3000 via RS232 Port	See Cardax FT Dialler datasheet
Reader Data Format	Cardax readers Wiegand readers	Cardax propriety Up to 360 bit
Cardax FT Remote Arming Terminal	Asynchronous RS485 Cardax GBUS protocol	Refer to Cardax FT Remote Arming Terminal datasheet
Cable Specifications	To Cardax FT Command Centre Cardax GBUS Cardax readers Wiegand readers 6 wire (See reader manufacturer's specifications for max. cable length)	Ethernet 10BaseT 1200m max 4 wire, 200m max
Outputs	Cardax FT Controller 3000 – 4R Cardax FT Controller 3000 – 8R	4 8
Relay Specifications	Resistive load Inductive load	3 Amps at 24V DC/AC 1 Amp at 24V DC/AC
Shipping Weight	Cardax FT Controller 3000 (PCB only) Cardax FT Controller 3000 in Cardax FT Cabinet Cardax FT Dialler 3000	600 grams 2.2kg 170 grams
Data Storage per Cardax FT Controller 3000	Max. number of Access Zones Max. number of Alarm Zones Capacity of unprocessed alarms buffer Max. number of Access Groups Max. number of Time Schedules Number of cardholders Number of events	16 256 100 2,000 200 30,000 10,000
Elevator Control	Max. number of shafts per Controller 3000 Max. number of floors per shaft	2 72
Compliance Standards*	The Cardax FT Controller 3000 complies with C-Tick, CE, FCC and UL approvals.	

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TECHNICAL SPECIFICATIONS		Cardax FT Controller 3000 Accessories		
Cardax FT I/O Accessory Cabinet 3000 including gear plate and tamper board	Cabinet accommodates: - Four Cardax FT 8-Input Expansion boards, or - Two Cardax FT I/O Expansion boards, or - One Cardax FT I/O Expansion board + two Cardax FT 8-Input Expansion boards Shipping weight	1.9kg		
Cardax FT 8-Input Expansion	Connectivity 4-State balanced inputs Power supply Current Shipping weight	Cardax FT GBUS 8 13.6 V DC +/- 15% 45mA 175 gms		
Cardax FT I/O Expansion	Connectivity 4-State balanced inputs Relay outputs Power supply Current (without relays operated) Current (all relays operated) Shipping weight	Cardax FT GBUS 8 4 13.6 V DC +/- 15% 45mA 175mA 250 gms		
Compliance Standards*	The Cardax FT I/O Expansion, Cardax FT 8-Input Expansion and tamper boards comply with C-Tick, CE and FCC approvals.			
TECHNICAL SPECIFICATIONS		Cabinet/Cardax FT I/O Accessory Cabinet 3000		
Housing	Height Width Depth	280 mm 280 mm 94 mm		
Environmental Data	Temperature Range Humidity	- 10 to +55 degrees 95% non-condensing		
Fire Resistance	Flame rating of plastic used in Cabinet			
* 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.				
System configuration, network capacities, and the volume of system activity affect performance. Please contact Cardax for advice.				
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