

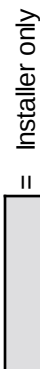
Model 3000 / Access 4000

SYSTEM OVERVIEW & INTRODUCTION TO PROGRAMMING

This section provides both an overview of the programming structure of the system along with specific information about identifying items to program, selecting and identifying options, configuring the LAN and using the LCD Terminal.

Contents

Menu Flowchart	4
SYSTEM OVERVIEW	5
System Hardware	5
Alarm System	6
Introduction	6
Access Control	7
Introduction	7
Basic Concepts	7
LCD Terminals	9
User Programming	10
Conventions & Abbreviations	12
Module IDs	12
User and User Type Abbreviations	12
Area and Door Abbreviations	13
List Abbreviations	13
Group Abbreviations	13
Other Abbreviations	13
Programming via the LCD Terminal.	14
Force Arming	14
<HELP>, 9 & <HELP>, 0.	15
Alpha Searching	15
The LAN System	16
Introduction	16
Configuring the Model 3000/Access 4000 LAN	16
Initial Power-Up	17
LAN Debugging	17
Timing	17
Module Polling	18
System Information	19
Type 2 Control Module board	19
Type 0 & Type 1 Control Module board.	20
3000 and Access 4000 Model Options	21
Identifying the Type of Control Module board	21
Type 2 Control Module board	22
Type 1 Control Module board. V3 to V4	24
Type 0 Control Module board. V2	24



SYSTEM OVERVIEW

System Hardware

The system utilizes different types of modules to achieve the expandability and the broad range of functionality it offers. Several of the modules also have additional expansion and interface board options to further enhance their capabilities.

Modular Design & Expandability.

Modular hardware design provides the ability to adapt and expand the system to cater for virtually any configuration or application required - small or large. Large numbers of LCD Terminals, Input/Output Expanders and Reader Modules can share a secure, monitored LAN system utilizing a fast, efficient communications format. Up to 250 modules can be connected on the system, with a limit of 99 modules of any particular type. (Actual numbers of each module type varies with Memory size and configuration selected) With the current range of modules available, this arrangement can provide up to 2000 Zone inputs and hundreds of Auxiliaries on a single system with 512k Memory Expansion fitted.

System LAN.

The system LAN (Local Area Network) is a 3 or 4 wire network used to connect the modules in a system. Using the recommended cabling, modules on the LAN can be installed up to 1500 metres from the Control Module, or even further when LAN Isolators or Optical Fibre modems are used.

Data protection ensures secure LAN communications at all times, while the programmable supervisory reporting system continuously monitors the network to detect cable tamper, cable fault conditions, module off-line and module substitution. The data format used in the LAN has been developed to ensure fast, reliable communications regardless of the size of the system.

For larger systems and complex sites, LAN Isolators are used to provide opto-isolation between sections of the LAN, eliminate potential earth loop problems, improve surge and lightning protection, provide signal level restoral for improved performance over longer cabling distances and offer a monitored "loop" LAN wiring option for a higher level of LAN integrity.

The Modules.

- The heart of the system is the **Control Module**. This unit stores all data, communicates with all other modules connected to the system LAN, and reports alarms and system activity to the Central Station. The Module has on-board power supply and battery charger and connections are provided for 16 Zone Inputs, 2 Siren Drivers and 2 Auxiliary outputs (expandable to 10).
- To operate the system and edit databases an **Elite LCD Terminal** is normally used. The LCD Terminal provides a 20 key backlit keypad, a backlit Liquid Crystal Display and connections for several Zone Inputs and Auxiliary outputs.
- **Zone Expanders** are used to provide 16 or 32 additional Inputs, 2 Sirens and 8 to 32 Auxiliaries, and can be installed remotely in suitable locations to greatly reduce the amount of cabling required to detectors and output devices.
- **8 Zone Mini Expanders** also provide additional Inputs (8) and Auxiliaries (8) as well as providing special input processing options for Event Counting and Duress/Holdup buttons.
- **1 Door and 2 Door Access Modules** are installed near the Door/s to provide Reader interfacing and up to 10 Inputs and 8 outputs (2 Door Access Module, 995012), including lock relays, for complete Door monitoring & control. In the rare event of loss of communications, Door Access can be provided for 15, 31 or 127 "Backup Card" holders.
- **Intelligent 4 Door Access Modules** are installed near the Door/s to provide Reader interfacing and all necessary Inputs and outputs, including lock relays, for complete Door monitoring & control. In the rare event of loss of communications, the on-board database ensures that normal Access control operation is maintained and logged.
- **Analogue Modules** provide an interface to monitor analogue quantities from up to 4 independent sensors allowing values to be viewed, and events activated when values exceed or drop below programmable trigger points.

System Management.

Upload/Download software is available for system Programming and Management, allowing the option of local or remote connection with operator password protection. DOS based PCDirect supports all versions up to V4.0. WDirect is Windows based and supports V3.0 and later. (WDirect support for earlier versions to be added)

ACCEPT, the Windows based system management software, incorporates dynamic graphics capabilities and is available for use with the 3000 (V3 or later) and Access 4000 (V2 or later).

Alarm System

Introduction

Areas

Security management operation is designed around the concept of Areas. Areas are groups of Inputs (points) such as movement detectors that can be collectively enabled when the Area is turned on or disabled when the Area is turned off. The system determines which Areas each User can control during which times and with which options.

Inputs

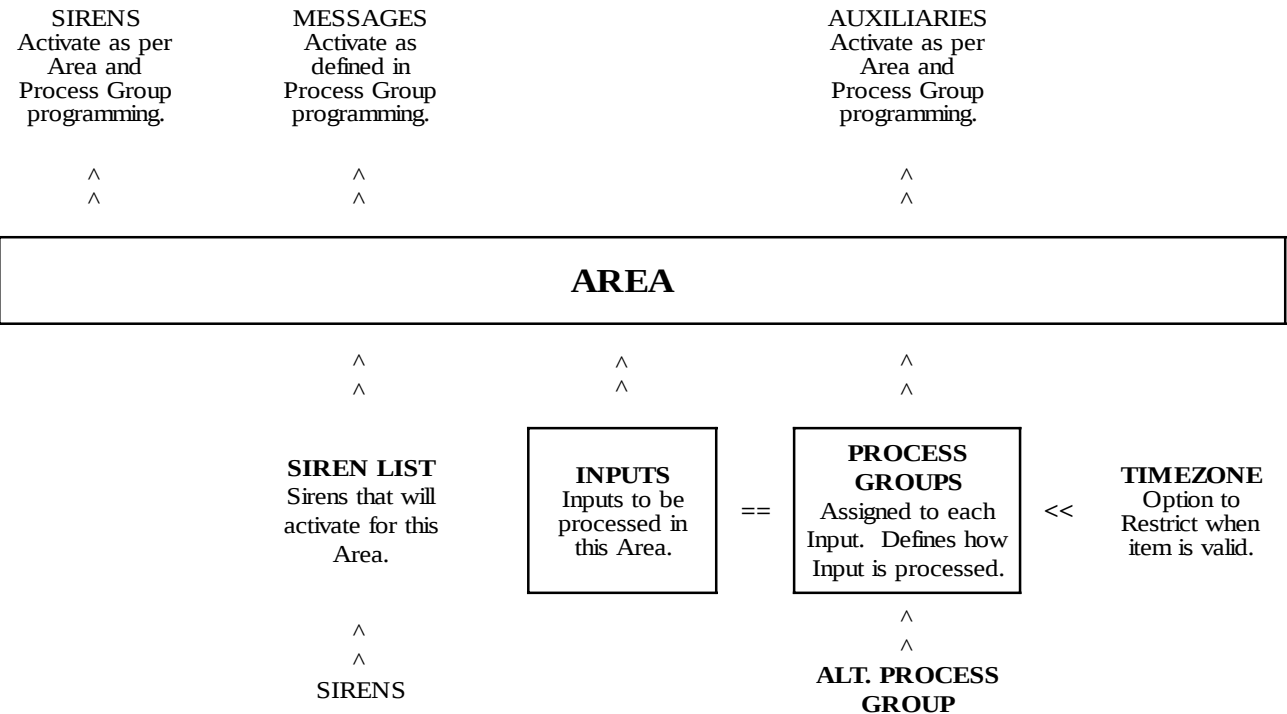
An Area can contain one or more detection devices or other devices (wired to Zone Inputs) and/or one or more System Inputs. If a Zone detects an intruder or a System Input is activated (e.g. Low Battery, Cabinet Tamper, etc.) it will only be actioned if the Area that the Input is in, is turned ON. The action which is taken when an Input is activated in a particular Area (e.g. activate Siren/s, activate Auxiliaries, report to Central Station, etc.) is determined by how that Input is programmed in that particular Area.

An Input can be programmed into more than one Area. The Alarm action taken by an Input when in the Alarm condition is dependent on how that Input is programmed in each Area, and on the Area/s being turned ON. This allows a particular Input alarm to be actioned in different ways depending on what Areas it is assigned to, and which of those Areas are ON.

Process Groups

Defining how an Input will be actioned in each Area is primarily done by allocating an appropriate Process Group, to every Input in each Area that it is assigned to. Process Group programming includes defining the Input states (Seal/Alarm/Tamper/Isolate) that will be recognised, Entry/Exit delay processing options, Reporting & message options, and Auxiliary and Siren control options.

The chart below shows how Area and Process Group programming will determine how the Input/Output items such as Inputs, Sirens and Auxiliaries will be processed.



NOTE: The Expanders, LCD Terminals and Reader Modules fitted and programmed into your system will determine:

- the Zone Inputs and System Inputs that will need to be programmed and assigned to Area/s,
- the Siren Outputs available for inclusion in the Siren Lists
- the Auxiliaries available that can be assigned to Area actions and functions.

Access Control

Introduction

The “3000” & “Access 4000” products integrate Access Control, Security Management and Building Automation. Access Control functionality and Building Automation operations can be kept completely separate from Security Management or can be fully integrated, if desired. Access Control operation is designed around the concept of **Doors**. The system simply determines which Users are allowed to use which Doors, at which times and with which options or restrictions.

Security Management operation is designed around the concept of **Areas**. Both Access Control and Security come together at Doors. For each Door in the system, one side is defined as the “outside” Area and the other side as the “inside” Area. Each Door can optionally be programmed as to which Area is on the outside and/or inside of the Door. If Area/s are programmed at a Door, then access at that Door will also be controlled by security considerations (via Areas).

- e.g.
- 1) A User requiring access at a Door may be denied access because the Area they are about to enter is turned on, and they are not allowed to turn that Area off. If the User was allowed to turn that Area OFF then this may be done automatically on un-locking the Door, if programmed.
 - 2) A User requesting access at a Door may be denied because the system has not seen the User leave the Area they are attempting to enter (Anti-Passback).

Basic Concepts

Doors

When designing an access system, Doors are the logical place to start. Each Door is numbered from Door 001 (D001), to the maximum available on your system. (Up to 250) Each Door is individually programmed to define the functionality (via an Access Group) and the related Area/s, Auxiliaries and Timers, etc.

Access Modules (Single Door, 2 Door & Intelligent 4 Door)

These Modules are required whenever access Cards are required, such as Proximity, Wiegand, Mag swipe, etc.

-Single Door Access Modules can control 1 Door with an Entry Reader.

-2 Door Access Modules can control either 1 Door fitted with Entry and Exit Readers OR 2 Doors with Entry Readers.

-Intelligent 4 Door Access Modules can control 4 Doors with Entry and/or Exit Readers for all 4 Doors.

Each Access Module is individually programmed to define the Door/s controlled, Off-line operation, Zone input and Auxiliary options, Area control options and the direction (in or out), format, read mode, etc. for each Reader.

LCD Terminals

LCD Terminals can be used for Door Access Control if access to a Door is to be gained via a PIN code. Each Terminal may be individually programmed to define the Door controlled, Zone input & Auxiliary options & the direction (in or out).

Access Groups when Applied to Doors

Access Groups are a set of options that can be applied as a group to a Door. The typical system may have up to 32 Access Groups (depending upon system configuration) and each group may be individually programmed. A Door is assigned one of these Access Groups to use in determining the basic access control at the Door. The basic options that can be programmed for each Access Group are the modes of operation for Entry and Exit readers, Anti-passback options, REN/REX button options, Area control options, etc.

TimeZones

TimeZones are a set of time periods that define when that TimeZone is valid. At all other times the TimeZone is in-valid. Once a TimeZone is programmed it can be used by any programming item that needs to be made Valid/Invalid according to the time of day and/or day of the week. A TimeZone, once programmed, can be assigned to more than one item.

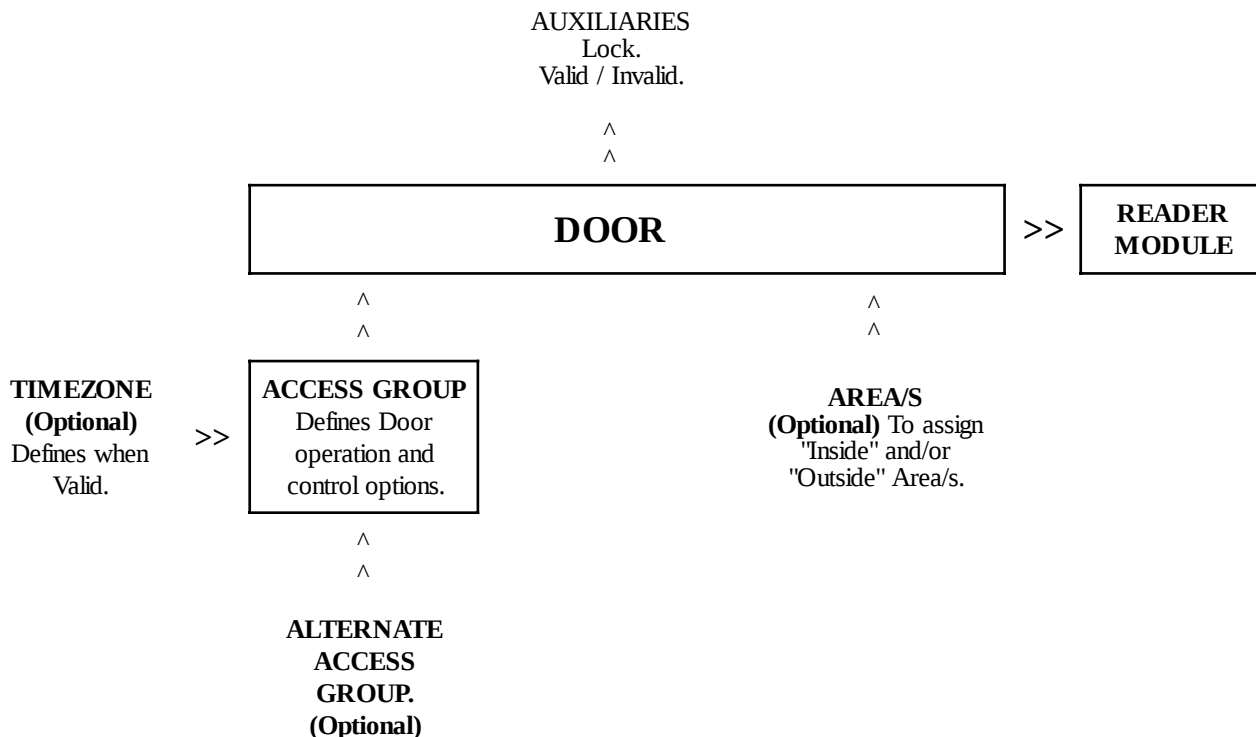
Alternate Access Groups

If a TimeZone is defined for an Access Group and the alternate Access Group is set to 000, no access will be granted when the TimeZone is in-valid. However, if an alternate Access Group is chosen, then instead of no access being granted, the settings of the alternate Access Group will be used to determine access.

Holidays

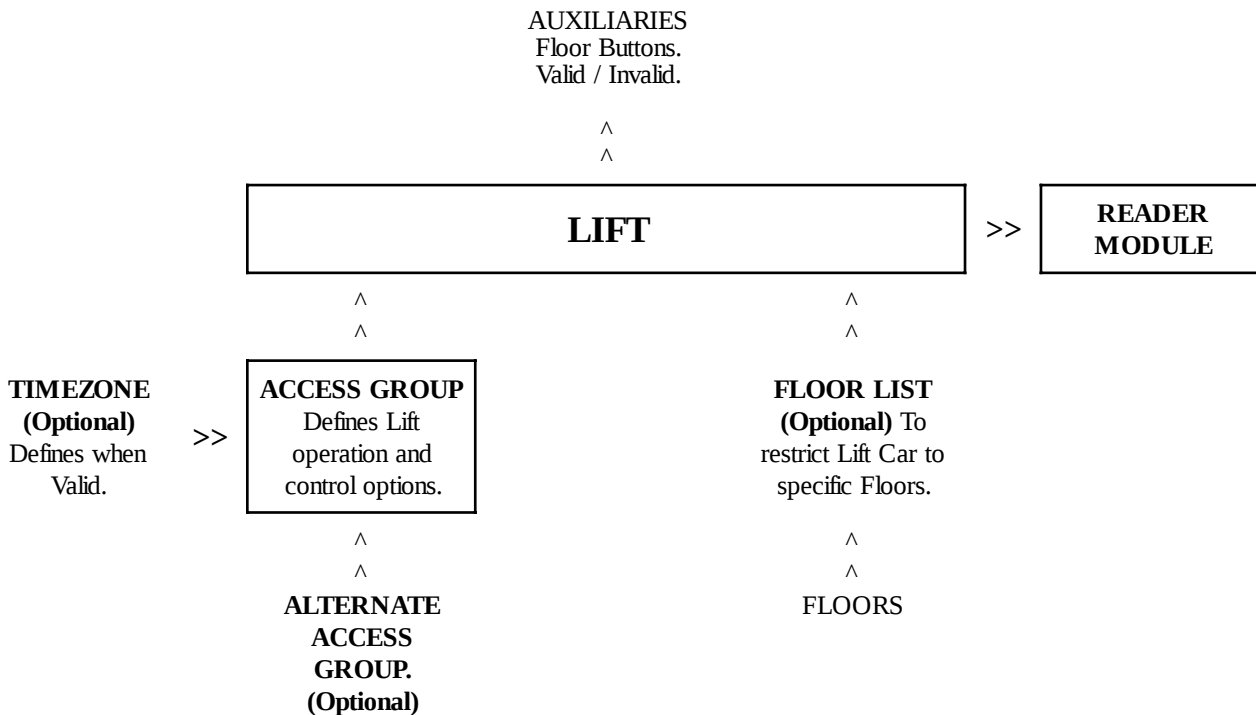
A holiday comprises a start date and an end date and is used to set specified TimeZones in-valid when a holiday occurs. Each holiday can be defined as to which TimeZones it will effect.

The chart below shows how Access Groups form the basis of Door programming and how security is integrated into the access control system through the assignment of Areas to Doors.



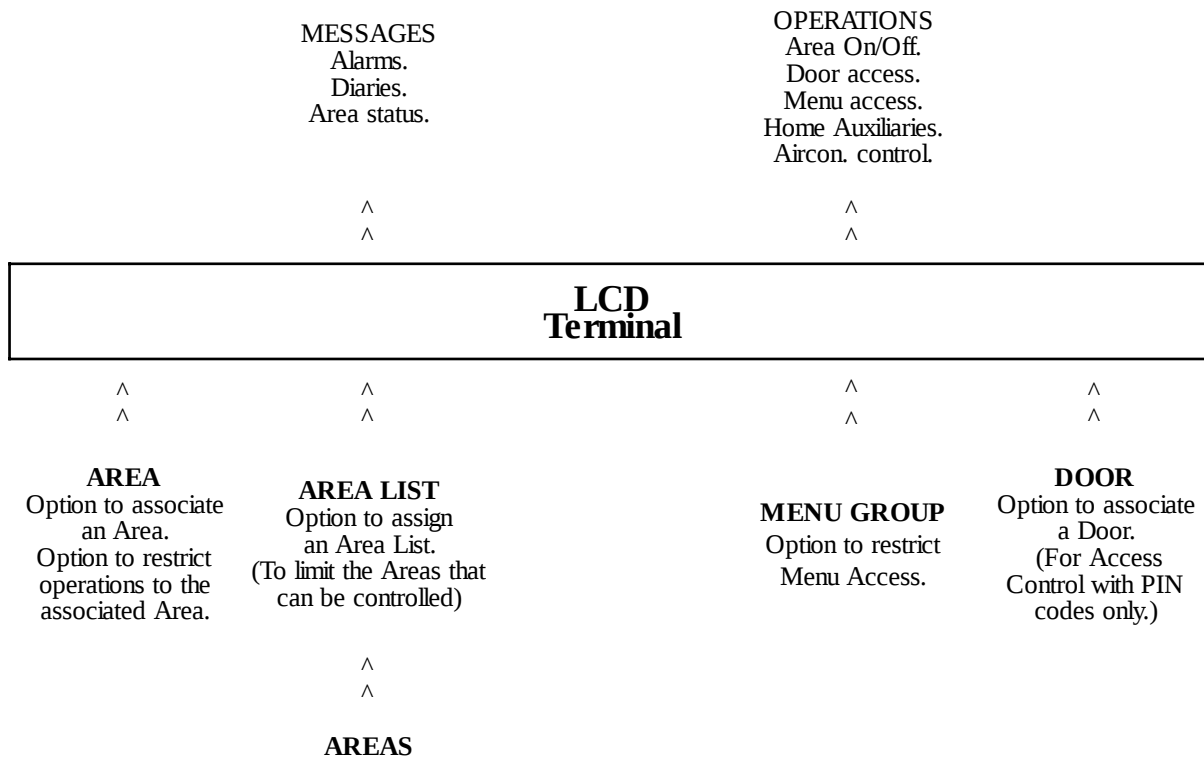
Lifts

Lifts are programmed in a similar manner to Doors. Each Lift is numbered from Lift 001 (L001) to the maximum available on your system. Each Lift is individually programmed to define the functionality (via an Access Group) and the related Auxiliaries, Zone Inputs and Timers, etc.



LCD Terminals

LCD Terminals are used to turn ON and OFF Areas, view System status, review system activity and access Menu options. Additionally they can be used for access control where PIN numbers are going to be used to control access through a particular Door. Each LCD Terminal can control one Door and is individually programmed to define the Door controlled, direction (in or out) and Zone Input options, etc.



User Programming

User programming is the starting point for allowing a person to operate the system. User programming allows options to be defined for each individual User, such as User name, PIN code, Card details, etc. A User Type must also be assigned to define what operations the User may perform and the items that they can control. Two special Users are pre-defined, User 00001 (U00001) is known as the Installer and has special privileges. User 00002 (U00002) is known as the Master and also has special privileges.

Alarm System Control

In a Security system Users are required to perform operations such as turning Areas On and/or Off, acknowledge alarms, review alarm and event information, check the system status and Isolate faulty devices, etc. This normally requires the User to logon to an LCD Terminal using their PIN code then User programming determines which Areas they can control, which operations they can perform and which Menus each User can access.

Access Control

The basic purpose of an access system is to control access through specified Doors for specified Users. An access system may also control access to specific Lift Cars and/or Floors for specified Users. For a User to have any access rights at all, their access permissions must be defined in User programming.

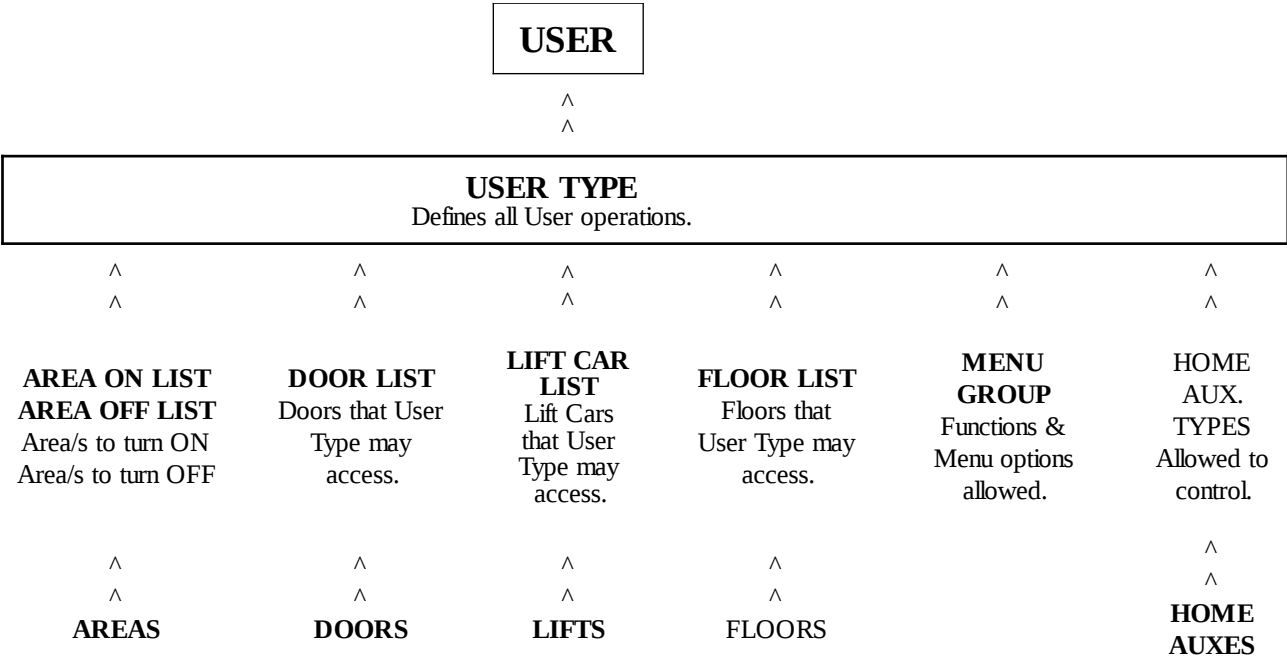
Building Management

When the system incorporates Building Automation functions, Users may be able to logon to an LCD Terminal and manually control specified Auxiliary outputs (“Home Auxiliaries”), adjust TimeZone periods, view Input states, Counter values or analogue values, etc. User programming determines which Auxiliaries they can control, which operations they can perform and which Menus each User can access.

User Types

Users Types are a set of options that can be applied to Users. Each User in the system is allocated a User Type that will determine all access, security and building management permission’s for that User. The basic options that can be programmed for each User Type include Area ON and OFF Lists, Door List, Lift Car List, Floor List, Menu Group (to define access to Menu options) and other operational options.

This Flowchart shows how User Types are at the heart of User programming, utilizing other programming such as Lists and Menu Groups to define all the functions that a User may perform. Bold type indicates items that have programmable options.



Alternate User Type

If a TimeZone is defined for a User Type and the alternate User Type is set to 000, Users with that User Type assigned will have no operations or access permissions available when the TimeZone is in-valid. However, if an alternate User Type is chosen, then instead of no permissions, the settings of the alternate User Type will be used to determine the User's permissions.

Alternate Lists and Menu Group

If a TimeZone is defined for a List or a Menu Group and the alternate List/Group is set to 000, the permissions defined by that List/Group will be void when the TimeZone is in-valid. However, if an alternate List/Group is chosen, then instead of no permissions, the settings of the alternate List/Group will be used to determine permissions.

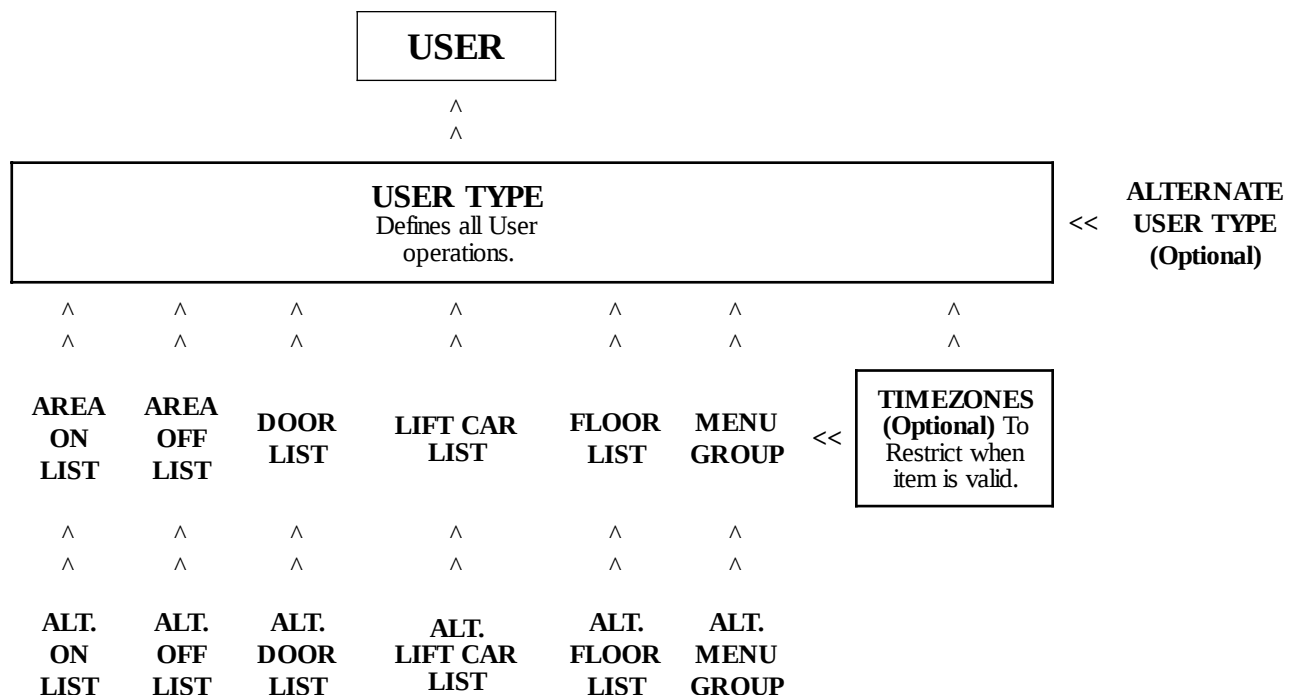
The option to assign a TimeZone and Alternate to each List or Group allows for minor changes in a User Type's permissions (e.g. A change in Door Access permissions only) to be easily implemented. The User Type's Door List can have a TimeZone and Alternate Door List assigned, instead of having to create an alternate User Type.

TimeZones

TimeZones are a set of time periods that define when that TimeZone is valid. At all other times the TimeZone will be in-valid. Once a TimeZone is programmed it can be used by any other programming item that needs to be made Valid / Invalid according to the time or day and/or day of the week. A TimeZone, once programmed can be assigned to more than one item.

The chart below shows how TimeZones can be assigned to:

- User Types to Invalidate the User Type or provide the facility for an alternate User Type to be defined, and
- Individual Lists or Groups, to invalidate the permissions provided by the List/Group or provide the facility for an alternate List/Group to be defined.



Conventions & Abbreviations

When programming the system, many items and databases can be assigned a name to aid in further programming and system operation. e.g. “Entry Foyer” (Area name) or “R&D Laboratory PIR” (Zone name) provide for easier identification than A005 or E03:Z12.

All items and databases have a descriptive ID number for identification. For items that cannot be named, or have not been named, this provides a way of conveniently referring to a specific item.
e.g. T14 = LCD Terminal 14. SL002 = Siren List 2.

A consistent set of abbreviations is used, which allow the installer to quickly locate the item that they wish to program, edit, or service. In the case of physical items, such as Inputs, Auxiliary outputs, Sirens, etc. the ID instantly provides the installer with details of the location of the item.

Module IDs

The system uses external modules on a 3 or 4 wire Local Area Network (LAN) to provide additional Inputs, Outputs, Access Control interfaces, etc. The module types are referred to by a single abbreviating letter:

Type:	Module	Abbreviation Letter
0	Control Module	“C”
1	LCD Terminal	“T”
2	LED Keypad	“K” (Not yet available)
3	Big Zone Expander Module (16-32 Zones)	“B”
4	Reader Module (1 or 2 Door Access Module)	“R”
5	Wireless Network (SpreadNet or Inovonics receiver) -“Virtual” Module connected via UART Port.	“N” (“Was SpreadNet” from V2 to V3.5x Inovonics introduced in V4.)
6	Mini Expander	“M” (V2 or later)
7	Zone Expander Module (16 Zones)	“E” (V2 or later)
8	Intelligent 4 Door Access Module	“I” (V3.5 or later)
9	Analogue Module	“Q” (V3 or later)

Two digits (01 to 99) after the module “letter” specify the actual module numbers that the ID is referring to.

For example: T04 is the 4th LCD Terminal module

E27 is the 27th Zone Expander module.

NOTE: There can only be one Control Module per system, i.e. C01.

To refer to an actual item on a module an additional letter is used:

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name
“Z”	Zone Input	E01:Z16	24	R&D Lab PIR West wall.
“S”	System Input	B01:S05	Pre-defined	B01 Low Battery
“X”	Auxiliary output	T01:X02	None	

For example: E03:Z09 refers to the 9th Zone Input on the 3rd Zone Expander Module.

T36:X01 refers to the 1st Auxiliary output on the 36th LCD Terminal.

User and User Type Abbreviations

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name
“U”	User	U00001	16 *	Billy Baxter
“UT”	User Type	UT003	16	Production Staff

* Memory configuration may limit the number of users with name field.

Area and Door Abbreviations

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name
"A"	Area	A001	16	Reception
"D"	Door	D078	16	Rear Fire Door
"LC"	Lift Car	LC001	None	

List Abbreviations

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name
"AL"	Area List	AL001	16	All Areas
"DL"	Door List	DL004	16	Admin. Doors
"SL"	Siren List	SL003	None	
"LL"	Lift Car List	LL008	None	
"FL"	Floor List	FL005	None	
"XL"	Auxiliary List	XL001	16	Strobe Outputs (V2 or later)

Group Abbreviations

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name
"PG"	Process group	PG001	16	Burglary
"MG"	Menu Group	MG002	16	Control Menus
"AG"	Access Group	AG004	16	External Doors

Other Abbreviations

Abbreviation	Item	ID Example	Name Field (Characters)	Example Name or Text
"AC"	Air Conditioning	AC001	None	(V2 or later)
"BC"	Backup Card	BC015	None	
"CA"	Calculated Auxiliary	CA010	None	
"CB"	C-Bus Auxiliary	CB002	None	(V4 or later)
"CR"	Counter	CR001	16	Camera 1 Film (V3 or later)
"CT"	Comms Task	CT001	None	
"DA"	Diaries	DA001	32	Happy New Year from Acme Co.
"DC"	DTMF Control	DC008	None	(V3 or later)
"FZ"	Function Zone	FZ002	None	
"H"	Holiday	H004	16	New Year's Day
"HA"	Home Auxiliary	HA001	16	Pool Pump
"HZ"	Home Zone	HZ001	16	Office PIR (V3 or later)
"IL"	InterLock group	IL001	None	(V2 or later)
"SC"	Site Codes	SC001	None	
"TN"	Telephone Number	TN004	16	XYZ Monitoring
"TZ"	TimeZone	TZ002	16	Night Shift

Programming via the LCD Terminal.

Most programming via the LCD Terminal is done in a “spreadsheet” style. This provides quick and easy access to options by allowing the User to scroll through different options for the same item or the same option for different items.

e.g. You can select a particular Input to program & step through all the options for that Input. Alternately, one particular option may be selected such as “Input name” and the <DOWN> arrow used to step through the name fields of all Inputs.

The “spreadsheet” style programming also allows you to step forward or backward through items or options.

See “*HELP, 9 & HELP, 0*” on the following page for more details.

The uses of the major keys are listed below:

Key	Use of Key
Up Arrow	Selects the same question for the previous item.
Down Arrow	Selects the same question for the next item.
Left Arrow	Moves cursor to left or, if at the start of a field, selects the previous question for the same item.
Right Arrow	Moves cursor to the right or, if at the end of a field, selects the next question. In a multiple choice question screen, scrolls through the available options.
OK key	Saves the current screen and moves to the next question.
END key	Saves the current screen and exits the menu.
ON key	This key selects different modes for answering a question if available. E.g. Switches between ID field and Alpha-search field to enable selection of an item by ID number or by name.
OFF key	This key is used to clear the screen before entering an ID number or text. or, in the case of a multiple choice question, selects the first option.
HELP key	This key displays help about the item being edited. Up to 3 help messages may be available, selected by pressing the HELP key again.
MENU key	This key is used to gain access to the menu. PIN code & <OK> must be entered first or while logged off (PIN code & <OK> <u>not</u> entered) <MENU>, <1> will display alarm review, (V3 or later only) and <MENU>, <2> will display system specifications. (Note: In V2 or earlier, only the <MENU> key needs to be pressed to display system specifications) <i>See below.</i>
DIGIT keys	Used in selecting an item or option by number, or for programming alpha-numeric text and symbols where available.
5 and 9 keys	When programming options that require a Yes/No setting, the <5> (N) key selects No and the <9> (Y) key selects Yes.

Force Arming:

Normally, when a User attempts to turn an Area On from an LCD Terminal and there are one or more Zone Inputs in that Area that are not in the Sealed state, a “Zone Problem ...” message will be displayed on the Terminal. The User is then required to try and rectify the problem or Isolate the Zone Input/s before the Area can be turned On.

When commissioning and/or testing a system it is often useful for the Installer to be able to turn On an Area regardless of Zone Input states in order to enable the Zone Inputs and monitor activity in Review.

A special feature only available to the Installer Code allows the <1> key to be used, when the “Zone Problem ...” message is displayed, to un-conditionally skip the rest of the Zone Test and turn On the Area or Area List regardless of any un-sealed Zone Inputs.

<HELP>, 9 & <HELP>, 0.

Use of the <HELP>, 9 & <HELP>, 0 keys provides the installer with a means of “jumping” between menus which have related programming options.

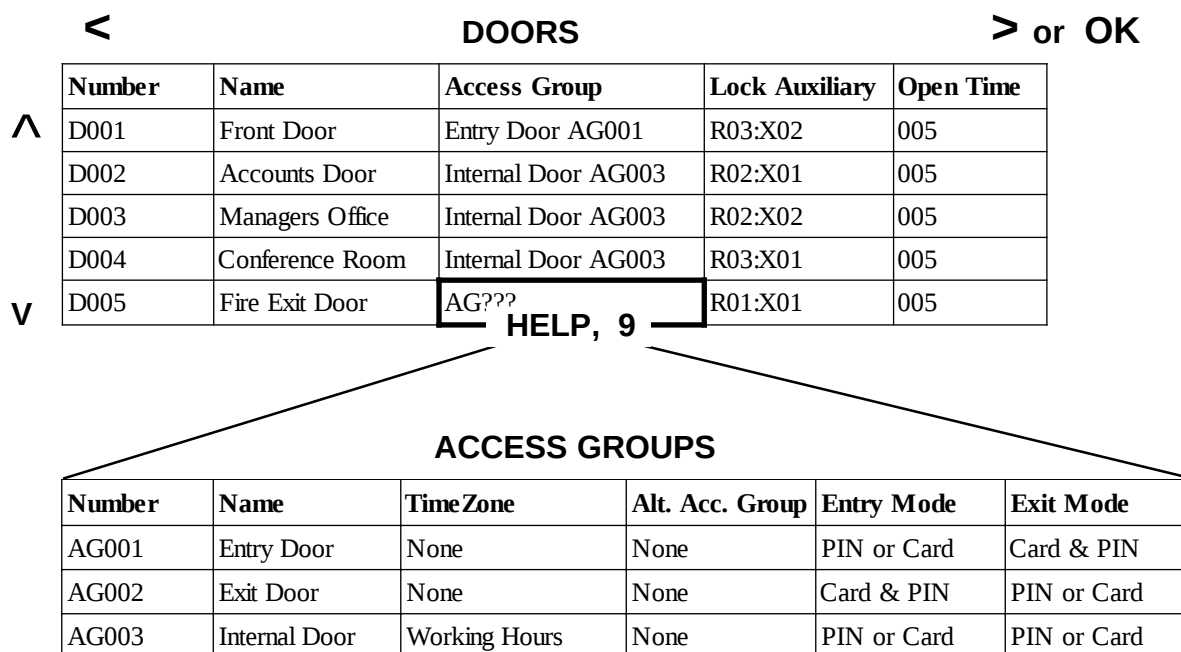
E.g. A new Door is being programmed (Fire Exit Door), and a different mode of access is required to other External Doors. When assigning the Access Group, it is found that there isn’t a suitable Access Group available.

With <HELP>, 9 the Installer can jump to Access Group programming, create a new Access Group and then return to Door programming with the <HELP>, 0 keys. Other items which may be accessed for programming when required using <HELP>, 9 include User Types, Lists, Groups, TimeZones, Doors, Telephone numbers, etc.

The illustration below shows how the “Spreadsheet” style database editing can be used.

The LEFT and RIGHT Arrow or OK keys can be used to step through the options of a particular item while the UP and DOWN Arrow keys can be used to scroll through items on a particular option.

HELP, 9 can be used to “Jump” to a related database to create a new item or edit an existing one, then HELP, 0 is used to return to the original database.

**Alpha Searching**

Alpha searching is available on Menus where Names are used. E.g. Any item that includes a name field enabling a text name to be programmed by the installer. Wherever an item to be selected has a name attached, the <ON> key can be used to toggle the screen between the “ID” field and the “Alpha-search” field, enabling items to be selected either by ID number or alphabetically, by name. This greatly simplifies many programming options by allowing items such as Users, User Types, Inputs, Areas, Door Lists, Telephone numbers, etc. to be located with ease.

In alpha-search mode you find an item by pressing the digit key that represents the first letter of the name. (You may have to press the key 2 or 3 times depending on the letter required and the names that have been programmed) If the item that you want is not displayed because of other names beginning with the same letter, you then use the <DOWN> arrow key to locate the item. (When using the Alpha-search option, names are listed in alphabetical order based on the first letter of the name only, and are then listed in order of the ID number. e.g. Users; Jason [U00008] and Jenny [U00005] will be listed in the order; Jenny, then Jason according to the User ID number.)

Some examples of Alpha Searching can be seen under the section “User Programming”, when selecting the “User to Alter” and the “User Type selection”.

e.g. User Type assigned by number

User 00011
Type: UT003

User Type assigned by name.

U00011 Type ->
Office Staff

The LAN System

Introduction

The 3000 / Access 4000 Local Area Network (LAN) is a proprietary RS485 LAN system used to connect modules such as LCD Terminals and Zone Expanders into the system. The LAN is a 3 or 4 wire system; two signal wires labelled “A” and “B”, a negative wire and an optional positive wire to provide power to modules. The following rules apply:

1. The “A” and “B” signal wires must be connected using twisted pair cable to provide the maximum immunity to electrical noise and create the least possible interference.
2. If un-shielded, the LAN cables should not be run near other cables such as mains power cables, intercom or telephone cables.

The LAN will operate at its best if modules are “daisy chained”. This means that the LAN is best configured as 4 wires running the full length of the installation, keeping the length of branches from the main 4 wires to a minimum. However, a “star” configuration, or combination “daisy chain / star” configuration will also operate reliably when installed according to the specification. The power wires do not have to be twisted which allows heavier gauge wires to be used if desired, to minimise voltage drops.

Each module on the system has an optional “Terminating Resistor”. The terminating resistor is normally turned on by a DIP switch, or by inserting a jumper Link, depending on the Module Type. For the LAN to work at its optimum, the two furthest modules apart should have their terminating resistors turned on, and all other modules should have their terminating resistors turned off.

See the “Installation and Troubleshooting” section for LAN installation details.

Configuring the Model 3000 / Access 4000 LAN

Every module is identified with a “Type” and “Number”. The type identifies what kind of module is connected such as an LCD Terminal or a Zone Expander. The number indicates which module is referred to in any one type. For example the first LCD Terminal on the network would be referred to as an LCD Terminal type with a number of 01.

Before a module can be connected to the network it must be given a number so it can be identified in the system for programming etc. Any number between 01 and 99 can be chosen, as long as that number has not already been chosen for that module type. In most memory configurations the maximum number you can choose will be further restricted. The number of a module is set-up on the “number” DIP switch (except for Elite LCD Terminals), see individual module documentation for more details.

The LAN is a self configuring network. This means that once a number has been chosen for a module you simply connect it to the network. Connections can be made without powering down, although with non-electronic fuses, you will need to be careful you don’t short the power wires and blow a fuse. **TIP:** It is best to carry out live LAN connections with the battery disconnected, only running on plug pack to lessen the maximum current available if a momentary short occurs.

All modules on the network are either “addressed” or “un-addressed”. When a module is first connected to the network it is un-addressed meaning it has not been recognised by the system. In a very short period of time, the module will become addressed, meaning it is recognised by the system and operational. Sometimes a module will remain un-addressed for one of the following reasons:

1. The number of this module has already been used for another module of the same type on the network. You need to choose another number.
2. The number of this module is too big for the current memory configuration. You will need to choose a smaller number or use a different memory configuration.
3. This type of module is not recognised by the current system. You will need to upgrade the firmware before this module type can be used.

When modules are found (or lost) by the system a review message is saved and a system LAN fail Input will be restored/alarmed as appropriate. In addition, when a module is powered up and connected to the network a “Module Powered Up” message is saved to review.

Initial Power-Up

When the system is first powered up, it assumes that all possible modules that the memory configuration allows will eventually be connected. In most systems however this is not the case and the system needs to be told that the modules currently connected are the only ones we expect. This is done by “Securing the LAN” which tells the system that the current LAN configuration is all that we expect and therefore all other modules LAN fail Inputs should be sealed. In addition, when the LAN is secured, the system generates a secret encryption key that is transferred to all modules on the network.

See “LAN Secure”, MENU, 7, 8, 1 in the Programming Reference section.

Whenever a module communicates alarm information to the system the encryption keys are compared, and if they don't match a “Module Substitution” message is generated, warning that this module was not present the last time a “Secure LAN” was performed.

(The encryption key is forgotten whenever a module is powered down, thereby preventing a substitute module being installed without the systems knowledge)

LAN Debugging

Detailed LAN Troubleshooting information is provided in the “Installation and Troubleshooting” section.

Some of the factors to be considered in debugging LAN problems are:

1. Check for low battery at all LAN modules, under worse case load. For most modules this means above 12 volts.
2. Check for “stop condition” at all modules. This means check that voltage between A (negative of meter) and B (positive of meter) should be greater than 200mV. If the voltage is negative this indicates an A – B reversal on one of the modules. This will cause VERY SLOW or NO LAN communications. If the voltage is less than 200mv this may indicate that too many termination resistors are inserted, or the wrong value termination resistors are inserted.
3. Check for legal “common mode” condition at all modules. This means check that the voltage between NEG and A is less than +/- 5 volts. Also check between NEG and B.
4. Use LAN statistics screens to check for noise. The statistics need to be cleared, then monitored over a period of time to look for problems. See “LAN statistics”, MENU, 7, 8, 4 in the Programming Reference section.

Timing

The speed and performance of the system is a function of many factors. In general the larger the dimensions of the system, the slower it will be. While a 512k memory expansion offers larger dimensions, it is not intended that all dimensions will be used to their maximum simultaneously as this would result in much slower performance.

Issues that effect system speed are:

1. Amount of LAN activity including noise and collisions. Systems with many Function Zones or continuously triggered enabled zones will result in LAN traffic. Avoid programming schemes with many enabled, constantly triggering zones.
2. Systems with many LCD Terminals logged on simultaneously will slow down a system.
3. Lots of very busy Calculated Auxiliaries can also slow down a system.
4. The most time consuming task is Area on/off. Avoid programming operations that turn many Areas on or off simultaneously if possible. (Area lists for arming should be used sparingly)
5. Avoid having too many Comms Tasks, especially those with high baud rates. The maximum baud rate for a task should be 4800 to 9600 baud. As UART based Comms Tasks are added, lower the Baud rates to compensate. Look for fifo overflow as an indication of speed problems.
See “Baud Rates” under Comms Tasks, MENU, 7, 3, 1 in the Programming Reference section.
6. Accept during download is the same as PC direct download – very expensive time wise.
7. The key technique in programming is to attempt to avoid large amounts of simultaneous activity. By staggering events even slightly, the system can be a lot faster.
8. Version 3 firmware greatly increases the processing speed of zone activity, especially noticeable in 512K chips. This is achieved with a smarter scan algorithm.

Module Polling

In many RS485 LAN systems, the network communications is performed by a “Polling” method in which no module can pass it’s information back to the controller until it is requested. This means that the controller always has control over the network traffic but presents a disadvantage in that all modules must wait in turn to send any data. In instances of very busy periods this can mean that events such as new alarms on remote modules or door access requests can be significantly delayed.

The 3000/Access 4000 LAN protocol overcomes this by allowing any module to check the LAN for busy/free status, and if free, send it’s data to the Control Module without waiting to be polled. This, coupled with clever flow control techniques enable large amounts of traffic to be processed quickly and without error.

To further reduce the amount of traffic and additional processing in the Control Module, the onus is put on each remote module to regularly report it’s presence to the Control Module. This report is done periodically as set by the “POLL TIME” within the programming of each Module in the system.

The “POLL TIME” is programmable from 1-255 seconds. However, practical values are between 30-240 seconds. (Values outside this range would only be used for testing purposes)

e.g. If a 5 second Poll Time was programmed for every module in an installation of 64 modules, LAN traffic would be increased unnecessarily, causing an effect of delays in response or under severe conditions, modules losing communications and then restoring. A value set above 250 will cause a module to always time out, this is because the controller will wait an additional time to allow for excessive LAN traffic which will then exceed a maximum time value of 255.

Poll times (or “time reports” as they might be better described) will have no effect on speeding a system up. As already noted a faster poll time can actually slow a system down. Default Poll time values are provided for all modules in the system. In some circumstances a poll time may need to be altered from the factory setting if a particular module was in a high-risk area and its presence was considered critical.

e.g. In an environment where a keypad was used as a PIN code entry point for DEADMAN operation, a Poll time of 240 seconds (4 minutes) would be unacceptable. The poll time for this particular module could be safely reduced to 30 seconds to give a much faster “LAN Comms” alarm at the Control Module should the terminal fail. As a general rule, the factory set poll times are adequate to maintain a balance between optimum LAN traffic flow and module security.

Factory Default Module Poll Time settings:

Module Type.	Name.	Poll Time.
1	LCD Terminal:	120 seconds.
3	“B” Type Universal Expander:	60 seconds.
4	Reader Module:	60 seconds.
6	Mini Expander Module:	60 seconds.
7	“E” Type Universal Expander:	60 seconds.
8	Intelligent 4 Door Access Module:	60 seconds.
9	Analogue Module:	60 seconds.

System Information

Pressing <MENU>, <2> while logged off (or just <MENU> if V2 or earlier) will provide general information on the system, including PCB Serial number, version and configuration details. In V3 or later, there are two screens of information to view. The <UP> and <DOWN> Arrow keys are used to switch between the two screens.

System Info

SN: 1348

Vers:

System Info

Days: 0079 P0pts:

There are a number of differences in the information provided for Type 2 Control Modules and Type 0 or 1 Control Modules. The details for Type 2 are provided below. The details for Type 0/1 are provided on the following page.

Type 2 Control Module PCB:

Information: **Example:** **Description:**

1st Screen

Serial Number:	SN: 1348	The Serial Number of the Control Module PCB. Only used in factory procedures. The actual product Serial number is on a printed label on the PCB.
Version:	E04.01	Firmware Version currently fitted. (E = EPROM, F = Optional Flash Memory)
PCB:	2	Controller PCB Type. Type 2: Surface Mount PCB.
RAM:	128K-00-04.01	RAM size - Memory configuration option - Software version used when configured. Memory configuration options: 00 = Standard. 01 = Access. 02 = Enlarged. 03 = V2 Standard. 04 = V2 Access. 05 = Special. 06 = Alarms. Software Version: 00.00 = configuration performed before this feature was added)
Country:	AU	Defines country specific Version of firmware fitted. AU = Australia UK = United Kingdom
Disty:	xx	Defines Distributor. Not currently used.
Cust:	000	LAN key number programmed. 000 = No LAN key.

2nd Screen

Days:	00048	Number of days unit powered up since manufacture.
POpts:	F7010000	Panel Options enabled via PIC Micro Chip (U14). See details for "Type 2 Control Module Board" in the following chapter titled "3000 and Access 4000 Model Options".
SMode:	0	Security Mode of the firmware.
Vers:	M00.00	Version of the secure Microprocessor fitted. M00.00 = Security Mode is 0.
Gal:	F	Security Level of the Microprocessor.
SecOpt:	\$00	Details (in Hex format) of Security options programmed. <MENU>, 8, 3. 00 No options set. 01 [N]o Code Default option set. 02 [O]wn Code only option set. 04 [L]ockout Installer option set. If multiple options are set, the value displayed will be the sum of the options. e.g. All set = 07, N & O set = 3, etc.

Type 0 (Australia & NZ only) and Type 1 Control Module PCB:

Information:	Example:	Description:
Serial Number:	SN: 1348	The Serial Number of the Control Module PCB. Only used in factory procedures. The actual product Serial number is on a printed label on the PCB.
Version:	E03.01	Firmware Version currently fitted. (E = EPROM, F = Optional Flash Memory)
RAM:	128K-00-03.01	RAM size - Memory configuration option - Software version used when configured. Memory configuration options: 00 = Standard. 01 = Access. 02 = Enlarged. 03 = Vx Standard. (x = V2 if V3 Firmware or later <u>OR</u> V1 if V2 Firmware) 04 = Vx Access. (x = V2 if V3 Firmware or later <u>OR</u> V1 if V2 Firmware) 05 = Special. 06 = Alarms. (V3.5 or later only) Software Version: 00.00 = configuration performed before this feature was added)
Days:	00048	Number of days unit powered up since manufacture.
Modem:	1200 Baud	Speed of the modem chip fitted.
PCB:	1	Controller PCB Type. Type 0: Supports 1Meg EPROMs (Requires 2 x EPROMs for V2 firmware) (Does not support V3 firmware or later) Type 1: Supports 2Meg EPROM (Requires 1 x EPROM for V2 or later firmware)
Lock Option:	00 01/02	00=Australia/New Zealand. (V3 or later only) 01=Export(English language or CZ). 02=Pacom. (V3 or later only) Upgrade firmware (V3 or later) should match existing Lock option.
Options:	\$51	Identification of Options (GAL) chips fitted. ("RAMSIZE" & "FUNCTIONS") 1st Digit = RAMsize. 2=32k (256KBit), 5=128k (1MBit) and 6=512k (4MBit). 2nd Digit = Functions. 0=Std C3000, 1=C4000, 3=Czech C3000, 4=Czech C4000 9=High Level Lift I'face.
Sec:	\$00	Details (in Hex format) of Security options programmed. <MENU>, 8, 3. 00 No options set. 01 [N]o Code Default option set. 02 [O]wn Code only option set. 04 [L]ockout Installer option set. If multiple options are set, the value displayed will be the sum of the options. e.g. All set = 07, N & O set = 3, etc.
PO:		Panel Options. Indicates any Special options that may be enabled on the Control Module. (V3 or later only) L = High Level Lift Interface.
CN:	000	LANKey Customer ID. (V3 or later only)
Lang:	Eng	Language used in Firmware. Eng = English. CZV = Czech. (V3 or later only)
Ver:	M00.00	Secure Micro Version number. M00.00 = Not used. (V3 or later only)

3000 and Access 4000 Model Options

The 3000 and Access 4000 versions of the product are essentially identical except for a small number of enhancements that are available in the Access 4000 only, or as an option.

Tables are provided that give details of the differences between the two models, and the upgrade options available. The tables listed below cover all Types of Control Module Board and Firmware that have been produced, beginning with the latest type.

-Type 2.

-Type 1. Control Module firmware V3 to V4.

-Type 0 or Type 1. Control Module firmware. V2.

NOTE: In Version 1 Control Module firmware there was no “Access 4000” Version of the product and no special options available.

If features unique to the Access 4000, or other special features are required in a system where the Model 3000 has been installed, an upgrade kit is available to convert the Control Module to a Model Access 4000.

Note that in some cases Type 0 Control Module boards may have to be upgraded to Type 1 or Type 2.

See “Memory Defaulting” (MENU, 7, 5, 2) in the *Programming Reference* section for details.

Identifying the Type of Control Module Board.

Due to continual product improvement and enhancements, there have been three different Types of Control Module board produced since the release of the Concept 3000.

The table below can be used to identify the Type of the Control Module board.

The LCD Terminal “System Info” screen is the quickest method of identifying the Type of board.

This screen can be viewed by pressing <MENU>, 2 (OR just the <MENU> key, if V2 or earlier); without logging on to the Terminal.

i.e. No PIN code required.

	LCD Terminal "System Info" screen.	PCB Assembly	ID Printed on PCB	Additional Notes
Type 0	PCB: 0	Through-hole	933001	Australia & NZ only.
Type 1	PCB: 1	Through-hole	934001	
Type 2	PCB: 2	Surface mount	935001	CE approved

Type 2 Control Module Board.

A special Options Micro chip is used to enable certain system options and upgrade options in the Control Module. The Chip is labelled U14 and is located between the Zone 9 to 16 Input connections and Links LK3 to LK6.

The Options Micro chip is fitted with an identification label with the text “CEPIC_x Vn.nn”

Where: x = Options Micro Type as per the table below. i.e. 1 to 7.

n.nn = Options Micro Version number. (Factory use only)

A range of standard Options Micro chips are available. These chips can be purchased and changed over by the installer at any time to provide additional features.

The price of each Options Micro Chip Type will vary according to the feature/s that the chip will enable.

NOTE: If the additional feature required is new and was not available in the version of firmware currently in the Control Module, then the Control Module firmware AND the Options Micro will need to be changed.

When purchasing 128k (1MBit) or 512k (4MBit) Memory expansion for the Control Module, an Options Micro chip will also be supplied to enable the use of the additional memory.

IMPORTANT NOTE: When purchasing Memory expansion you must specify which product is being upgraded. “3000” or “Access 4000”.

The table below shows the current range of Options Micro chips.

This selection table may be expanded as further options become available.

* Factory fitted option for Model 3000. 32k (256kBit) Memory.

^ Factory fitted option for Model Access 4000. 128k (1MBit) Memory.

FEATURE	OPTIONS MICRO TYPE AND DESCRIPTION							
	1*	2	3	4^	5	6	7	
	Standard 3000			Standard 4000		A4000 HLI512	A4000 GEO128	
	32k (256kBit)	128k (1MBit)	512k (4MBit)	128k (1MBit)	512k (4MBit)	512k (4MBit)	128k (1MBit)	
0 Aircon. Control				YES	YES	YES	YES	
1 Door Interlocking				YES	YES	YES	YES	
2 ACCEPT	YES	YES	YES	YES	YES	YES	YES	
3 High Level Lift I/F						YES		
4 "Card only" Users				YES	YES	YES	YES	
5 GSM SMS	YES	YES	YES	YES	YES	YES	YES	
6 Spare	YES	YES	YES	YES	YES	YES	YES	
7 Lift Access Control				YES	YES	YES	YES	
8 128k (1MBit) RAM		YES		YES			YES	
9 512k (4MBit) RAM			YES		YES	YES		
10 Spare								
11 Spare								
12 Spare								
13 Spare								
14 Spare								
15 Spare								
16 GEOQUIP							YES	

Identifying the PIC Micro Chip options enabled:

If the PIC Micro Chip cannot be physically identified, the System Information Screen as described in the previous chapter can be used to determine which options have been enabled via the PIC Micro Chip.

The second System Information screen provides the “Panel Options” field:

“POpts: xxxxxxxx”

Where “xxxxxxx” is a Hexadecimal character string that represents the options that are enabled.

Each Hex character represents 4 bits of the options Bitmap.

Each bit represents an option where 1 = Enabled and 0 = Disabled.

The options represented by each character are as follows:

Character	1st Bit	2nd Bit	3rd Bit	4th Bit
1	07 Lift control	06 Spare	05 GSM SMS	04 Card Only Users
2	03 High Level Lift	02 ACCEPT	01 Door Interlocking	00 Airconditioning
3	15	14	13	12
4	11	10	512k (4MBit) Mem.	128k (1MBit) Mem.
5	23	22	21	20
6	19	18	17	Geoquip
7	Spare	Spare	Spare	Spare
8	Spare	Spare	Spare	Spare

Step 1:

Convert the Hex character string to binary digits.

e.g.

POpts: 64010000 is converted as follows:

6 4 0 1 0 0 0 0
0110 0100 0000 0001 0000 0000 0000 0000

Step 2:

Using the table above, it can then be determined that the following options are enabled:

GSM SMS, ACCEPT software and 128k (1MBit) Memory expansion.

Step 3:

Using the “Options Micro Type” table opposite, it can then be determined that Options Micro Chip Type 2 is fitted.

This means that the Control Module is configured as a Model 3000 with 128k (1MBit) Memory expansion fitted.

Current Panel Options types.

PIC Micro Chip Type: POpts Character string:

1	64000000
2	64010000
3	64020000
4	F7010000
5	F7020000
6	FF020000
7	F7010100

Type 1 Control Module Board. Version 3 to Version 4

The table below provides details of the differences between the two models in Version 3 firmware or later, and the upgrade options available.

V3 FEATURE	Standard 3000	3000 Option	Standard Access 4000	Access 4000 Option
Lift Control	No	No	Yes	
High Level Lift I'face	No	No	No	Yes (Special Firmware)
Door Interlocking	No	No	Yes	
Card Only Users	No	No	Yes	
AirConditioning	No	No	Yes	
Spare				
32k (256kBit) Memory	Yes			
128k (1MBit) Memory	No	Yes	Yes	
512k (4MBit) Memory	No	Yes	No	Yes
Accept S'ware I'face	No	Yes	No	Yes

Type 0 or Type 1 Control Module Board. Version 2

The differences between the 3000 and Access 4000 Versions of the product in Version 2 firmware are detailed in the table below for reference purposes.

V2 FEATURE	Standard 3000	3000 Option	Standard Access 4000	Access 4000 Option
Lift Control	Yes		Yes	
Door Interlocking	No	No	Yes	
Card Only Users	No	No	Yes	
AirConditioning	No	No	Yes	
Zone control of Home Auxiliaries	No	No	Yes	
32k (256kBit) Memory	Yes			
128k (1MBit) Memory	No	Yes	Yes	
512k (4MBit) Memory	No	Yes	No	Yes
Accept S'ware I'face	No	No	Yes	