

PLAN400

Networked Access Control Panel

Installation Guide

PLAN400 4-READER ACCESS CONTROL SYSTEM

Installation Guide

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LIMITED WARRANTY.

i) Access Control Services Limited (ACS) warrants that, if properly installed and correctly operated in conjunction with compatible peripheral equipment and software (running on a computer for which it was designed) the PLAN400 control panel will perform substantially in accordance with the accompanying documentation for a period of five (5) years from the date of purchase from ACS.

ii) Due to the inherently complex nature of computer software and firmware, ACS does not warrant that the panel firmware, PC software or the documentation is error free, will operate without interruptions, be compatible with all equipment and software configurations, or will otherwise meet your needs.

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Introduction

Introduction to the scope of this document and conventions used throughout the manual.

This manual assumes very little understanding of PLAN access control systems specifically, however, some aspects of the panel installation and commissioning process (such as mains connection, lock and reader termination and PC networking) will require a degree of experience in security systems installation and a basic knowledge of computers and the Microsoft Windows operating system.

Note: This guide is not intended to be a definitive installation manual for installing access control systems. The installer is expected to have a level of installation expertise and experience appropriate to the scale and complexity of the project at hand.

At all times the prevailing local safety regulations and codes of practice should take precedence and be applied to the installation of this system.

This document is intended for guidance on the installation and commissioning of **Version 6.x PLAN400** access control and alarm monitoring panels only. For specific information that you may need about other peripheral equipment (such as Card Readers, Locks and exit devices) please refer to the relevant equipment supplier or other documentation provided.

For speed and ease of understanding the PLAN400 control panel will be referred to in this document as the 'System', and the engineering personnel who carry out the installation of the system will be referred to as 'installers' or 'users'.

Note:-, Tips, Notes, or Definitions are occasionally printed in the left-hand margin (like this). These are there to provide additional information which is related to the subject which is being discussed in the main text.

The PLAN400 can be operated in stand alone mode (using the built in keypad and LCD) or as part of an on-line system - connected to a PC running appropriate PLAN software. For detailed guidance on the use and operation of the PLAN400, or the Software, please consult the relevant user manual (supplied separately).

In most cases, installation of the system will involve a limited amount of programming using the PLAN400 keypad – specifically this will be required to test and commission the system. Where an instruction includes a key name within angled brackets “<...>”, this means that the operator must press the keys specified, however, if the system requires entry of a specific string of numbers, this will be printed in upper-case within inverted commas.

For example... the instruction Press <**Set System**> then enter “**0000**” would require the operator to press the Set System key and then enter a sequence of four zeros.

General Description

Product Overview

The PLAN 400 controller is designed to be a flexible 4 door access control system, capable of stand alone or networked operation. The system can control up to 22,000 personnel (expandable), has 128 time profiles and alarm monitoring options on all 4 doors with two separate alarm output relays.

Each unit features 16 extended alarm inputs for monitoring third party equipment and standard alarm input devices (such as door contacts and PIR's). These circuits are supervised with an end of line resistor to prevent tampering or bypass attempts.

The real time clock and system memory are both battery backed on the circuit board and using the built-in PSU charger option (if fitted) all systems are also backed up against mains failure. Mains supplies are filtered and suppressed to protect against spurious noise and surges.

When off-line, events are logged in the system RAM and the last 2000 transactions will be buffered until they can be up-loaded to the host system when comms is restored. A local print option will allow detailed configuration data to be printed or downloaded to a PC (via an RS232 port).

Four 12vDC electronically fused switched negative lock outputs are provided... these are rated at 500mA per door. A separate supply is easily installed for higher powered strikes or different voltage requirements and voltage free contacts (1.25 A @ 30vDC) are available as a built in alternative.

The PLAN 400 controller is housed in a lockable steel cabinet, with provision for cable entry through the rear panel or side walls. Inside the circuit board, keypad and display are mounted on a removable inner lid. All external connections to the main board utilize demountable terminal blocks.

The system is compatible with most types of card reader... technologies supported range from Mag-stripe, Wiegand Swipe and Proximity through the more sophisticated Biometric and Contact less Smart Card solutions. The controller has built-in enhanced support for the latest in multiple-reading long range RFID tagging.

Certain applications demand a specific firmware variation on the standard operating mode of the controller. For ease of identification the firmware type is indicated on the sticker attached to IC1 on the Micro-controller PCB.

Technical Specification

Enclosure	
Construction	Powder coated lockable steel cabinet
Dimensions	370mm (H) x 360mm (W) x 140mm (D)
Weight	8.25 Kg
Power	
Input	100 – 250v ~ 2.3A 50/60/440 Hz or DC 120-300v 1.5A
Output	Integral 12vDC PSU/Charger unit fused @ 3.15 Amps Reader Supply Power 0.8A @ 5v DC (200mA per reader port - adjustable +5 %)* Lock Supply Power 2.0A @ 12vDC (4 x switched negative supply electronically fused at 500mA per lock output)* * See connection diagrams for further information
Environmental	
Operating Temp	0°C to +40°C
Storage	-10°C to +50°C
Humidity	10% to 80% (non-condensing relative humidity)
Interfaces	
Communications	RS422/RS232/TCP-IP**
Reader Interface	Wiegand or 'Clock and Data'
Protection	Opto-Isolation on all 4 reader ports (inc. RTE and Alarms) Over voltage protection and transient suppression on all inputs.

** Using P400DSC2 module.

Features summary

4 card reader inputs (with RTE and Alarm Monitoring facility)
16 extended alarm inputs (EOL Supervised)
22,000 Card holders (32,000 with expanded memory option)*
2,000 Event Cyclical Transaction Memory
Fire Alarm override input (jumper configurable)
128 Time Profiles
Shut-down profiles
Multi-level password controlled editing via built-in keypad
Information listing option.
2 x General alarm out-puts and individual out-puts per reader.
Built-in PSU charger
Redundant path communications option
TCP/IP LAN communications option

* Cardholder capacity may vary depending card format configuration

Installation Procedure

Panel location

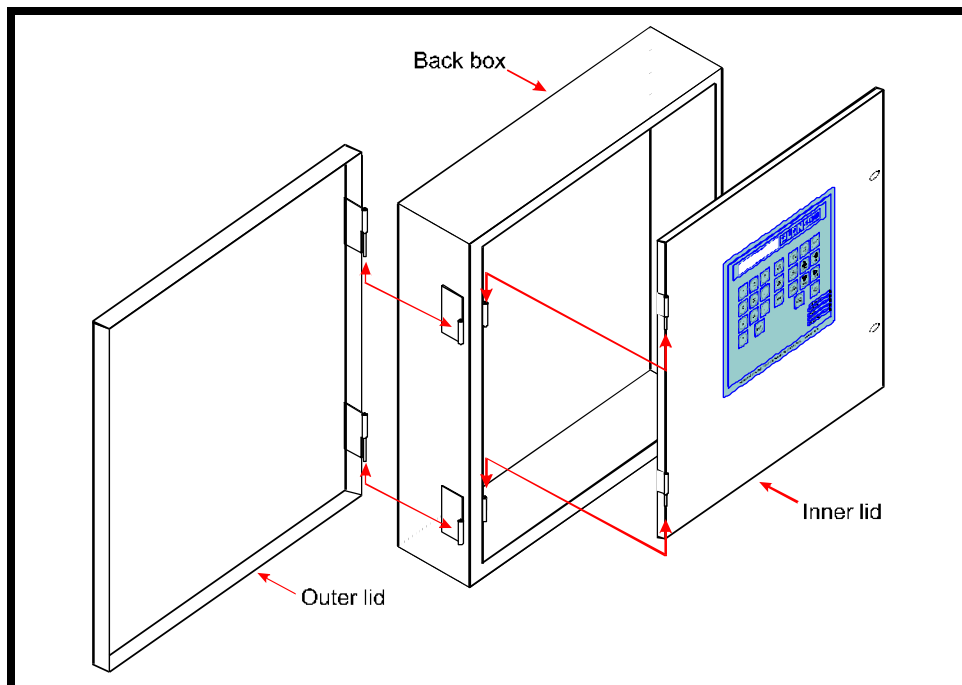
The PLAN400 control panel is supplied in a wall mounting enclosure. Care should be taken to ensure that the mounting surface and the fixings used are appropriate for the weight of the panel (8.25Kg). The following additional notes and observations should be considered when choosing a location for the unit.

Note:-, Always install at least one manual access override if a controller is located within an area that has no other means of entry (e.g. other than through a controlled door).

- 1) The unit is not designed to be mounted externally unless it is fitted within a suitably rated secondary enclosure.
- 2) Sufficient free space around the unit (approx 35mm) should be left clear for the purpose of removing the Inner and Outer doors.
- 3) The unit must be fitted in an upright orientation (hinges to the left).
- 4) Do not use the PLAN400 enclosure to house additional equipment (other than devices specifically designed to be fitted inside the box).

Regardless of whether the PLAN400 is part of a network, or running in stand alone mode, the unit should always be mounted in an accessible location - ideally on the secure side of the doors that are controlled by the panel.

THE PLAN400 3 PART ENCLOSURE

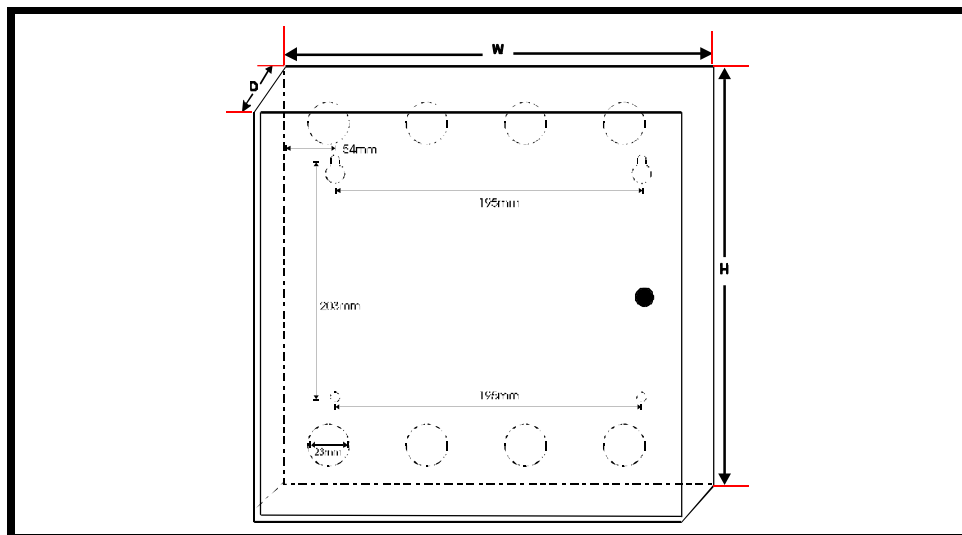


Mounting

Remove and retain all packaging and documentation that was shipped with the unit (including the 'accessories' pack on the rear of the panel enclosure). The precise fixing methods will vary from application to application, however as a general guide...

- 1) Use the key (contained in the accessories pack) to open the outer door of the panel. Disconnect the earth continuity lead and remove the outer door and set aside.
- 2) Remove the screws that retain the 'inner door'. The 'inner door' carries the keypad and display assembly as well as the microprocessor controller PCB. Again disconnect the earth lead and remove the complete PCB/Inner lid assembly. Set aside in a safe location.
- 3) Before fitting the back-box to the wall, establish the preferred route for cable access into the enclosure... the box is supplied with a number of 25mm holes to the rear and several 20mm 'knock-out' access points to the top, bottom and side walls. Use a hammer and punch to remove any of 'knock-outs' and drill any additional holes that are required before fixing the box to the wall.
- 4) There are four fixing holes in the rear of the enclosure... (see diagram below). If necessary, use the back-box as a template to mark the fixing holes on the wall - note that the top two fixings are 'key-holed' to enable easier single handed installation.

PLAN400 BACK BOX FIXINGS AND DIMENSIONS



Note:-, the detachable lid and PCB assembly are hinged on the left hand side of the enclosure care should be taken to allow sufficient clearance on the left hand side of the unit for the outer lid to open approx. 100 degrees.

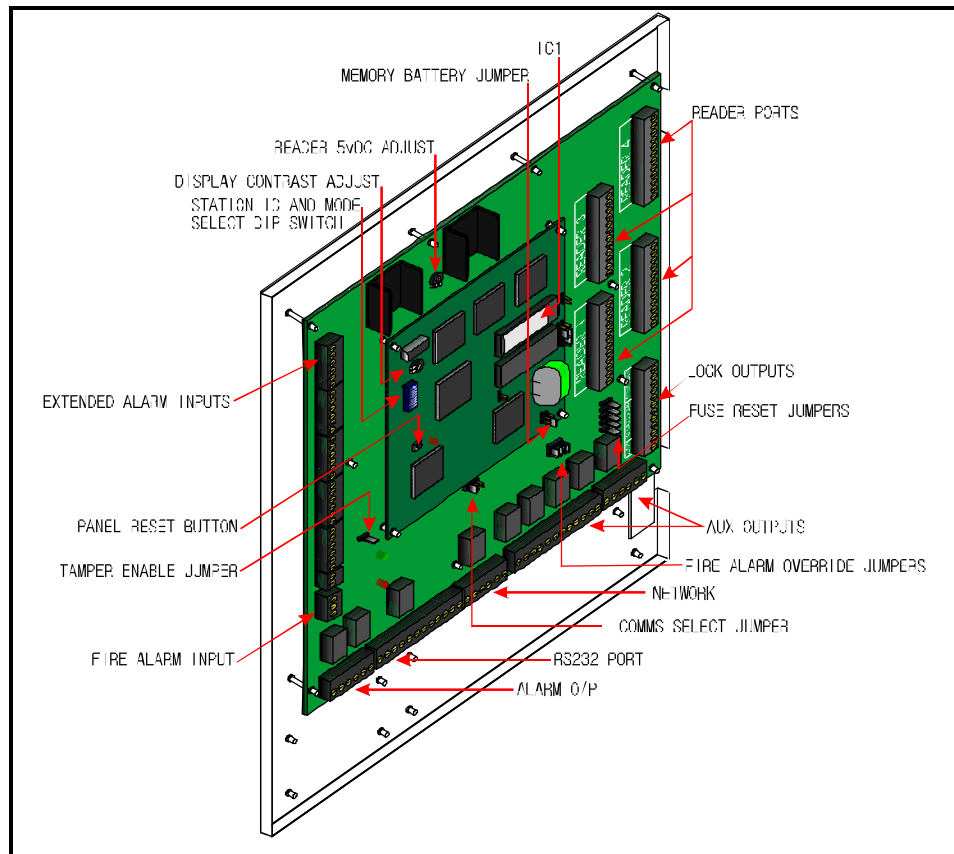
H=370mm, W=360mm, D=140 (inclusive of door)

- 5) Once the back box is securely fixed to the wall, re-fit the Inner Lid/PCB assembly and outer door and reconnect the earth continuity leads.

Micro-processor Board Layout

The diagram below indicates the layout of the main components on the PLAN400 controller PCB. All of the terminal blocks can be un-plugged for the purposes of termination.

INNER LID AND CONTROLLER GENERAL PCB LAYOUT



Connecting up

Mains Power

As standard, the PLAN400 control unit is supplied with an integral 13.8vDC PSU/charger. This unit is fitted into the rear of the back-box and must be powered from a continuous mains supply. Ideally the mains supply will be isolated through a dedicated un-switched, fused spur. The length and type of cable that is used to connect the charger unit to the mains supply should conform to local regulations and be appropriate to the termination method used in the PLAN400 (e.g. Fused screw terminal block).

The PLAN400 controller should be earthed and the mains (L&N) polarity should be observed when making this connection. **Do not apply mains power to the unit until the readers and other peripheral equipment are fully installed and connected.**

Please see the technical specification for further information about the mains supply voltage and frequency.

Standby Batteries

Space is available inside the enclosure for up to two 7Amp/Hr. sealed lead acid batteries. These must be connected to the 'BATT' output on the PSU/Charger (observing the correct polarity). One set of standard battery leads is provided with each panel – although an additional pair will be provided on request. **Do not connect the batteries to the unit until the readers and other peripheral equipment are fully installed and connected.**

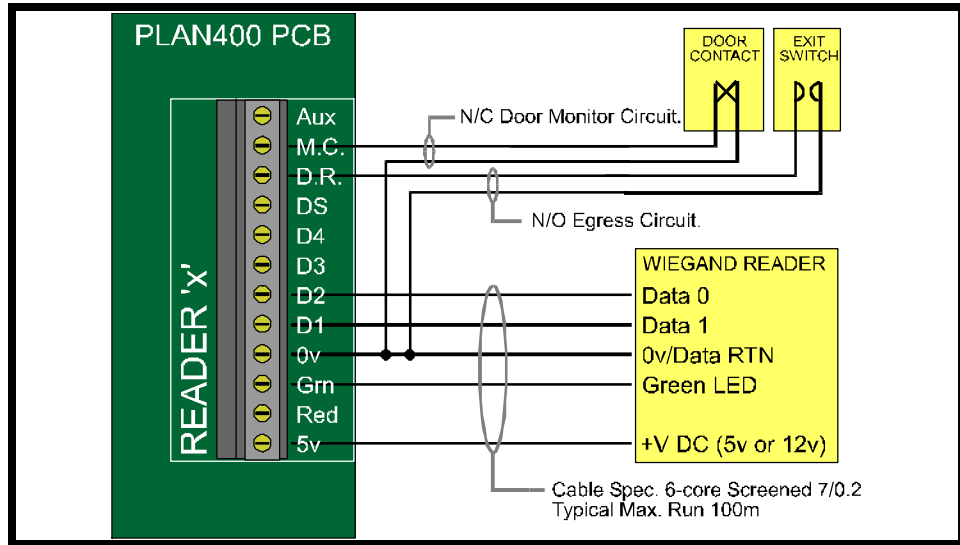
Readers

The PLAN400 is compatible with most types of card reader... technologies supported range from Mag-stripe, Wiegand Swipe and Proximity through the more sophisticated Biometric and Contact-less Smart Card solutions. For Asset Matching and Long range hands free, the system utilises the latest in long range RFID tagging.

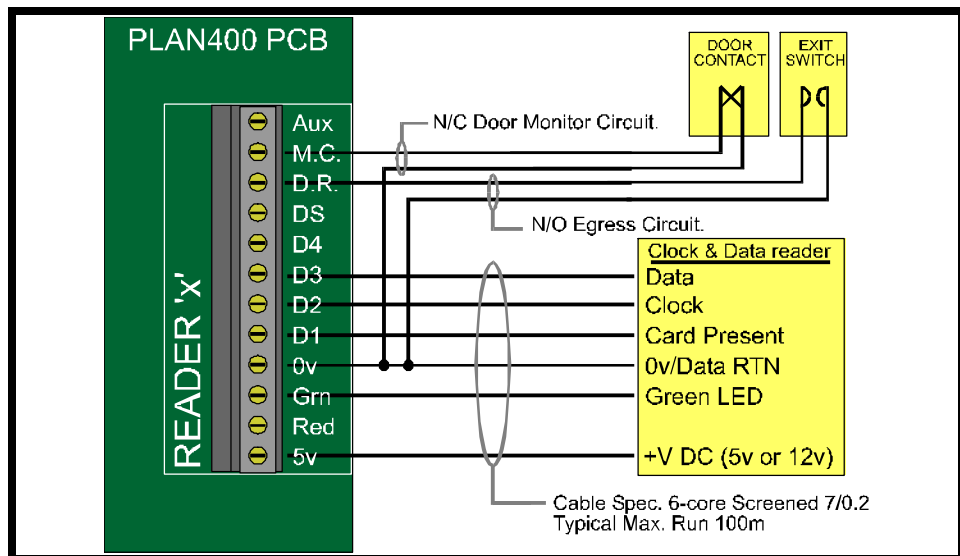
For connection purposes, all of the above reader options can be split into two general interface types; 'Wiegand' and 'Clock and Data'. Generally, the Wiegand interface is used for all proximity readers and 'Clock and Data' is used for Mag-stripe devices.

The documentation provided with the readers should be consulted for installation guidance and cable requirements, however, the diagram below indicates how the most common types of reader should be connected into the PLAN400 reader ports.

WIEGAND READER TERMINATION 'QUICK GUIDE'



CLOCK AND DATA READER TERMINATION 'QUICK GUIDE'



Note: In both cases, readers requiring 12vDC can be powered from the Aux. 12vDC power available elsewhere on the PLAN400.

Door Egress Switch (DR input)

As can be seen in the diagrams above, an input (DR) is provided on each reader port for a normally open 'momentary operation' egress switch. Whenever the DR (Door Release) input is pulsed low (via the RTE switch) the lock outputs for the specified door will be switched for the pre-selected lock delay time.

The RTE is generally used in the following circumstances...

- to provide an exit signal in the case of alarmed doors.
- to allow a means of exit for doors with no mechanical override (e.g. Maglocks).
- to allow the location of a remote override button.
- to provide an interface point between third party systems (such as required by telephone entry systems).

See the diagram in the 'Readers' section for termination details.

Door Monitoring Alarm (MC Input)

Using the MC input, the PLAN400 can monitor system for Door Forced or Door Ajar alarms...

Door Forced: If the MC input is open circuit without there first having been a valid card or RTE, then a Door Forced alarm will be generated.

Door Ajar: If the MC input remains open circuit for longer than the allocated door ajar delay then a Door Ajar alarm will be generated.

To use the door monitoring feature, connect a normally closed alarm circuit between MC and 0V (this input would usually be derived from an integrated contact within the locking device).

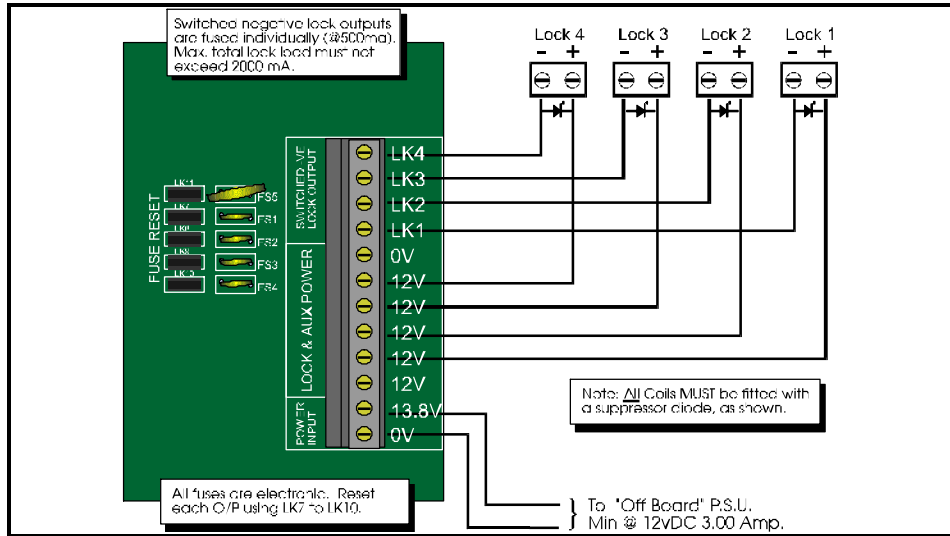
See the diagram in the 'Readers' section for termination details.

Note: In addition to the door state monitoring for reader controlled doors, the PLAN400 features an additional 16 extended supervised alarm inputs... please see 'Extended Alarms' for connection information.

Locks

The PLAN400 provides the installer with two options for the connection of locking devices or third party control equipment (such as vehicle barriers or powered doors).

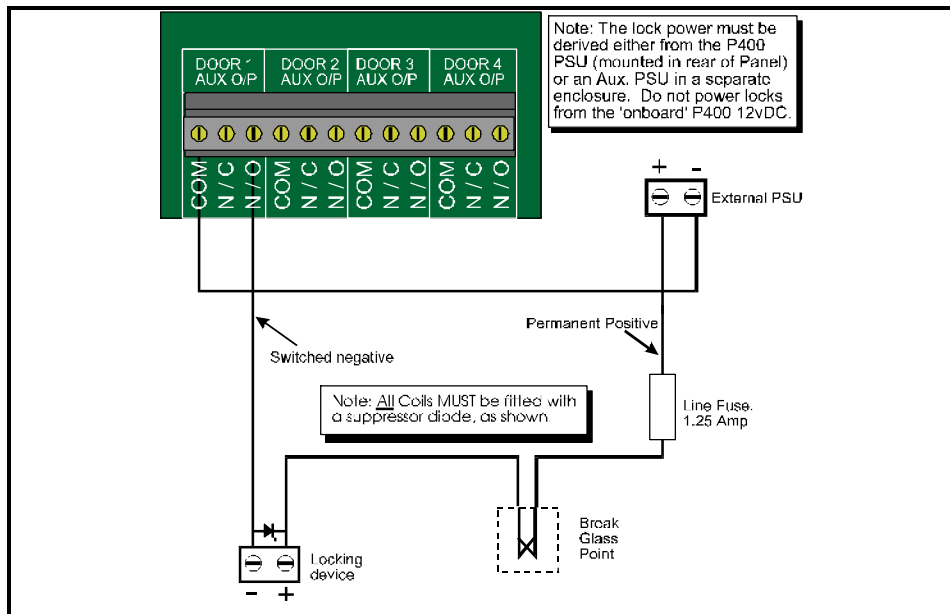
CONNECTION DIAGRAM FOR LOCKS DRAWING <500MA 12VDC



The diagram above shows how locking devices can be directly powered from the control panel. Devices rated at up to 500mA @ 12Vdc can be connected to the PLAN400 control unit in this manner.

For locking devices that draw in excess of 500mA or if a different voltage (e.g. 24vDC is required) the locks should be fed via the volt free relay contacts as shown below. The source power for these locks should not be drawn from the 'on-board' P400 12v power, but direct from the standard PSU fitted in the rear of the enclosure - or from an additional PSU fitted adjacent to the PLAN400.

CONNECTION DIAGRAM FOR LOCKS DRAWING >500MA 12VDC



The diagram indicates where an optional 'Break-Glass' fire alarm override switch could be fitted. This device would normally be required if the controlled door prevented access or egress to a nominated Fire Exit.

It is advisable to separately fuse the individual lock feeds using 'in-line' fuses as shown.

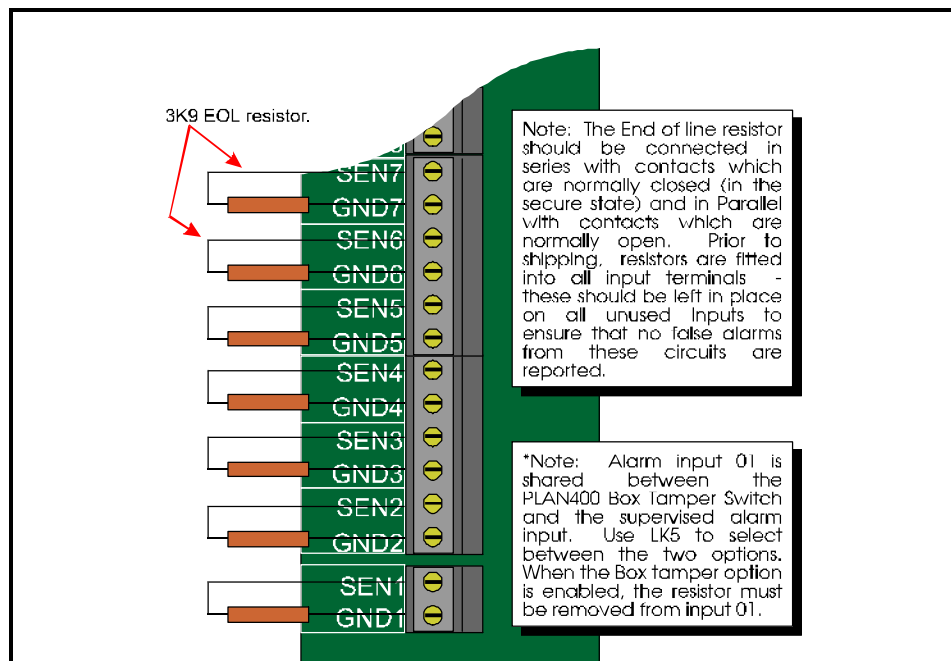
The specific arrangement and connection of the locking device will be dependant on the type of equipment used. For example the scheme shown above uses the Common and Normally Open contacts on the Door 1 Aux Output. This should be adjusted according to the 'Fail Safe'/'Fail Secure' requirements of the lock. In all cases reference and consideration should be made to the lock suppliers documentation before connection.

IMPORTANT NOTE: For enhanced safety and flexibility the PLAN400 controller firmware features the option to select Fail Safe or Fail Secure mode from within software. When set into Fail Safe mode the selected aux. lock relays will reverse their operation. This should be taken into consideration when connecting a Fail Safe locking device because the panel default is for Fail Secure.

Extended Alarms

Each PLAN400 features 16 extended alarm inputs for monitoring third party equipment and standard alarm input devices (such as door contacts and PIR's). These circuits are supervised with an end of line resistor to prevent tampering or bypass attempts.

CONNECTION DIAGRAM FOR PLAN400 'EXTENDED' ALARM INPUTS

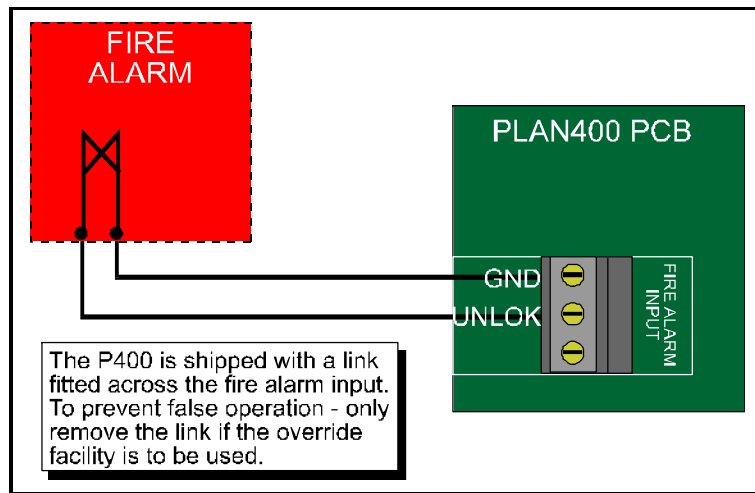


Fire Alarm override

In addition to the local Break Glass Points fitted at each door, the PLAN400 can accept door override signals from a Fire Alarm system using the configurable Fire Alarm Input.

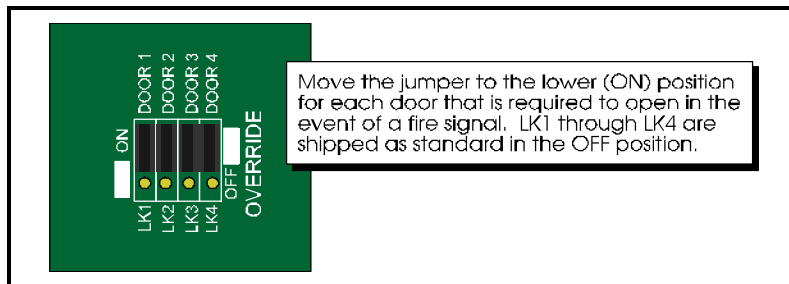
At all times, this input must detect a closed contact 'safe' signal from an evacuate relay controlled by the fire alarm system. If the fire alarm link is removed, or the fire panel is activated, the selected doors will open.

FIRE ALARM INPUT CONNECTION DIAGRAM



The doors that will open in the event of an evacuation signal, are selected by means of a series of jumpers (LK1 to LK4) as shown below.

FIRE ALARM JUMPER SELECTION DIAGRAM



NOTE: The Fire Alarm override input will only activate doors that have been set to Fail Safe in the door configuration menu.

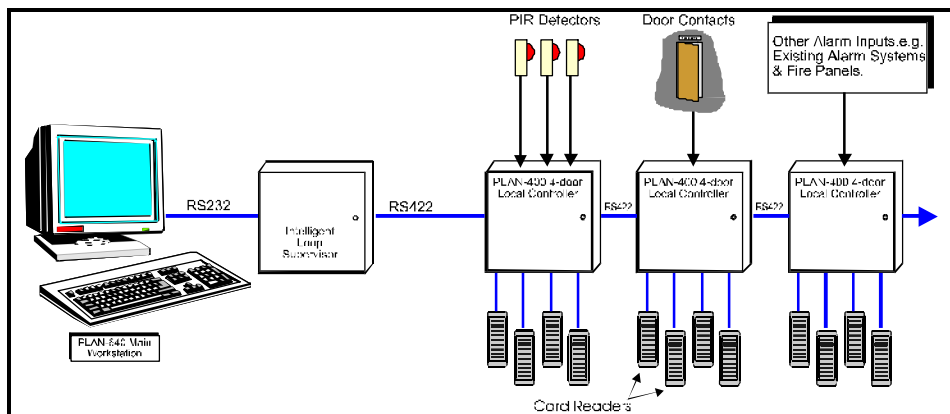
Since this facility does not depend on the microprocessor to operate it can be considered fail safe in operation.

Networking

The PLAN system offers the installer a high degree of flexibility in wiring. Using the PLAN400 DSC module, client LAN/WAN infrastructure can be utilised, as well as direct cabled star and daisy chain topologies. All of these can be mixed in a single installation.

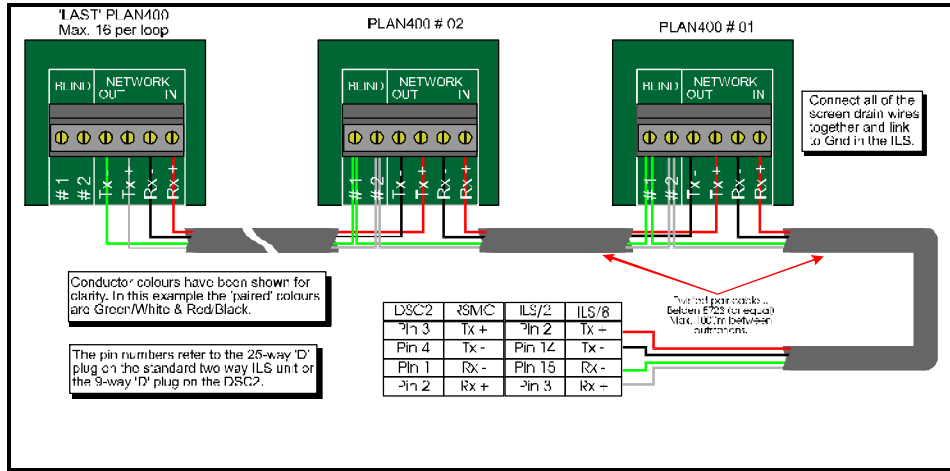
The PLAN400's are linked together and connected to the Host PC via an Intelligent Loop Supervisor (ILS). This device is available in two or eight port configurations and would usually be located adjacent to the main PLAN640 PC.

TYPICAL PLAN400 NETWORK SCHEMATIC



- Network cable should be minimum 7/0.2mm shielded two twisted pairs. Recommended cable is Belden 8723 or equivalent. Maximum cable distance between any two panels is 1000m.
- Normal precautions to avoid possible causes of harmful interference should be employed. . . e.g. avoid running with heavy duty mains cables or adjacent to fluorescent lighting etc.
- A maximum of 16 PLAN400's can be connected to any single ILS port.
- Care should be employed when using twisted pair cables that include multiple 'black' conductors. 'Crossing' the black conductors between panels will cause spurious faults that may be difficult to track down.

PLAN400 NETWORK CONNECTION DIAGRAM



Note above that the 'BLIND' terminals have been used to link the 'through' pair in the IN and OUT cables. These termination points have no connection to the panel electronics and are provided solely for the purpose of linking the 'straight-through' pairs. The Blind terminals are not used in PLAN400's situated at the end of a chain.

For sites where there is no ILS (e.g. if the controller network is connecting to a Remote Site Modem Controller or DSC2 LAN adapter) wire the panels together in the manner shown above and see the relevant connection diagram (usually provided with the link equipment).

IMPORTANT NOTE:-
Most xPLAN400's are shipped with a 'Hard set' Station ID firmware option. The first 4 positions on Dip-switch SW3 are used to select the required panel network ID, as indicated in the chart below...

STATION ID	SWITCH 1	SWITCH 2	SWITCH 3	SWITCH 4
01	ON	ON	ON	ON
02	OFF	ON	ON	ON
03	ON	OFF	ON	ON
04	OFF	OFF	ON	ON
05	ON	ON	OFF	ON
06	OFF	ON	OFF	ON
07	ON	OFF	OFF	ON
08	OFF	OFF	OFF	ON
09	ON	ON	ON	OFF
10	OFF	ON	ON	OFF
11	ON	OFF	ON	OFF
12	OFF	OFF	ON	OFF
13	ON	ON	OFF	OFF
14	OFF	ON	OFF	OFF
15	ON	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF

Commissioning Procedure

Powering up the unit

Before applying mains power to the PLAN400, make a final check that all connections are made off and terminated correctly. It is important that these checks are carried out at the panel end and at the door location. Ensure that all unused conductors and foil shielding is insulated and made 'safe' as necessary to prevent short circuits when the panel is closed.

First time power up sequence... apply mains power to the PLAN400 PSU/charger. Check that the LED on the PSU is displaying Green and that the "uP Power" and "12 V dc" LED's on the PLAN400 keypad/display are illuminated. The status of these LED's is also visible on the PCB (D13 and D14). If the LED's are on, connect the stand-by batteries to the PSU charger.

Check that LK5 is set to ON. This jumper controls the on-board memory battery. If the Jumper is set to OFF, memory and settings will be lost in the event of an extended primary power failure that exceeds the capacity of the stand-by batteries.

Initialising the controller

All PLAN400's must be initialised before use... this will clear the memory and return all settings to factory defaults.

Note:-, The PLAN400 features a power up cold start delay timer. The micro-processor will start approximately 30 seconds after power is applied. When running, this will have no effect on the system performance.

To initialise the panel:-

Press **<Set System>** the display will show [system file i/d?]

Press **<Void Card>**, **<Add Card>**, **<Time Profile>**, **<Set System>**... at the end of this key sequence, the display will show [**initialize ???**].

Press **<Enter>**. The system is now initialized and the display will be showing the network station ID for this panel e.g. [station 12]. (See "Networking" for station ID configuration).

Press **<Abort>** to exit.

The control panel is now ready to be tested and handed over for use.