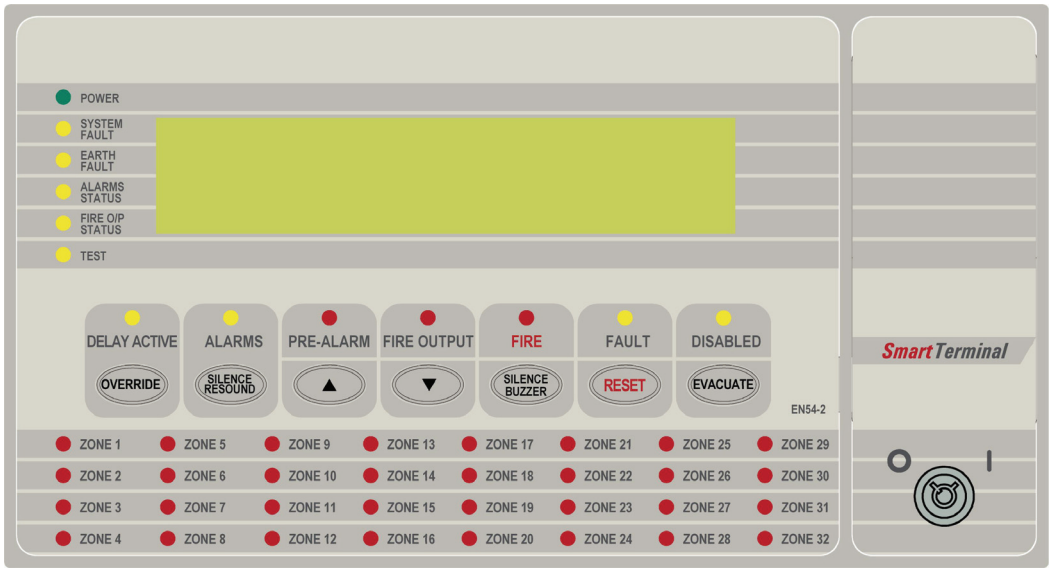
AMPAC ADVANCED WARNING SYSTEMS

WORLD LEADER OF INNOVATIVE SOLUTIONS IN FIRE DETECTION AND ALARM SYSTEMS

SmartTerminal



INTERNATIONAL COMPLIANCE

EN54: PT2 & 4

LoopSense

Installation Commissioning & Operation

"Our aim is to provide 'Consistently Excellent Service' in the eyes of our customers"

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1 Introduction

SmartTerminal has been designed for use with the ***LoopSense*** series of FACP's.

- 4 line by 40 character LCD with backlight and navigation keys ▲ ▼ keys allow the SmartTerminal to be used for FACP operation and interrogation. Note the backlight is only energised when alarms are present, a key has been pressed or controls enable key switch is enabled
- Buzzer and system Reset.
- System expansion capabilities / options:
- A wide range of secure user functions. This includes the ability to disable / re-enable a large number of system functions.
- Flush or surface mountable enclosure.
- Controls have tactile and audible feedback of operation.
- All terminals cater for 2.5mm cables.

SmartTerminal connects to the ***LoopSense*** Fire Alarm Control Panel (FACP) via the RS485 multidrop communication port. Generally it is designed to be used anywhere where the status of the FACP is required to be monitored by local personnel and limited control is required.

- Front panel controls that allow the resetting of alarms and activation/silencing of alarm devices. Enabling operational access to the controls is via a key-switch;
- Reports events from devices that are accessible to the host FACP. For example if the host FACP is configured with global access then the connected ***SmartTerminal*** reports events from all devices. If the host FACP is configured as local then the connected ***SmartTerminal*** reports events from devices that are directly connected to the host FACP.

SmartTerminal essentially consists of two PCBs;

1. ***SmartTerminal*** Termination Board. A Termination Board is mounted in each SmartTerminal to protect and interface the RS485 communications and 27VDC supply to the LCD Board
2. BRD82ICC – Control, LCD Communications and LCD Driver Board

SmartTerminal can be supplied in two styles;

1. ***BX05:*** *Slim line* ***SmartTerminal***
2. ***BX1:*** *Standard* ***SmartTerminal***

☞ **Note:** *A maximum of 30* ***SmartTerminal's*** *may be connected to the communications bus over a distance of approximately 1.2Kms*

2 Mechanical

SmartTerminal is supplied in an ABS cabinet and consists of;

The Main Card, with all controls and indicators mounted directly onto it

- 1 X Termination Board
- 2 X ABS door keys
- 2 X 003 Enable / Disable keys
- 2 X Jumper links

The front door of the ABS version is locked by way of two clips on the right hand side of the cabinet. A special locating key which has two raised pins that are inserted into the side of the cabinet unlocks the door.

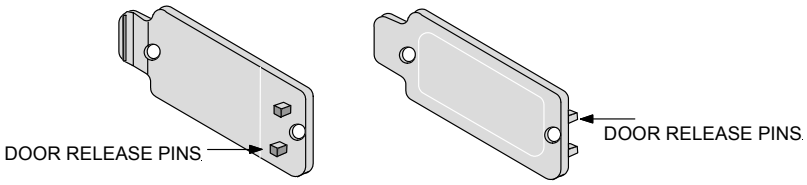


Figure 1: ABS Door Key

2.1 Mounting the Enclosure

The panel MUST be mounted in an area that is NOT subject to conditions likely to affect its performance, e.g. damp, salt-air, water ingress, extremes of temperature, abuse etc. is at an easily accessible height and such that the indicators are at eye level.

Typical locations for the panel are the first and most obvious point of contact for emergency services or a security office that is likely to be permanently staffed.

2.1.1 Enclosure Details

The LCDA can be surface or semi-flush mounted, is supplied with a detachable front door, mountable back box and a minimum of two separate PCBs.

2.1.2 Fixing the Chassis to the Wall

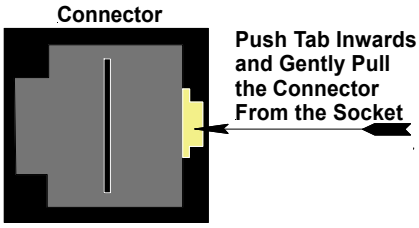
Taking into account the weight of the panel securely mount it by using the three keyhole mounting holes in the backpan, two in the top and one in the bottom. Use suitably sized screws and plugs for the type of mounting surface.

Caution: Any dust or swarf created during the fixing process must be kept out of the cabinet and great care should be taken not to damage any wiring or components.

2.1.3 Board Removal / Replacement

If a PCB has to be removed the following precautions should be observed;

- Removing the door will provide better access to the boards and will ensure the hinges are not accidentally stressed.
- Personal anti- static procedures must be followed.
- When disconnecting the RJ45 style connecting cable from the PCB, make sure that the cable remains connected to at least one board to prevent it being misplaced.



Note: *Care should be taken when detaching this connector as it is necessary to depress the small locking tab to unlock the connector from its base. To reconnect the cable the connector must first be correctly aligned then pushed into the socket so it locks into position.*

- Carefully remove the retaining screws at each corner of the board taking care not to damage any of the components.
- Place each board into anti- static storage once removed.

2.1.4 Removing the Knockouts

The knock-outs should be removed with a sharp tap in the rim of the knock-out using a flat broad-bladed screwdriver. *Note: Use of excessive force could damage the enclosure around the knock-out.*

☞ **Note:** BX05 shown the BX1 is set out in a similar manner.

☞ **Note:** Any unused knock-outs must be securely blanked off.

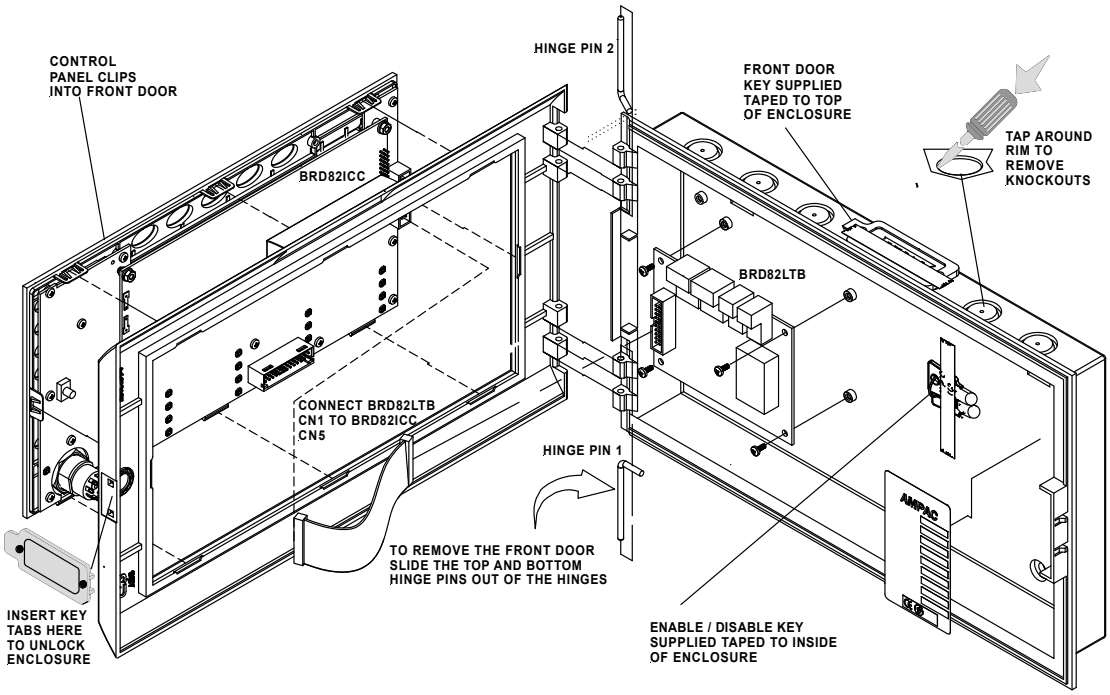


Figure 2: Exploded View

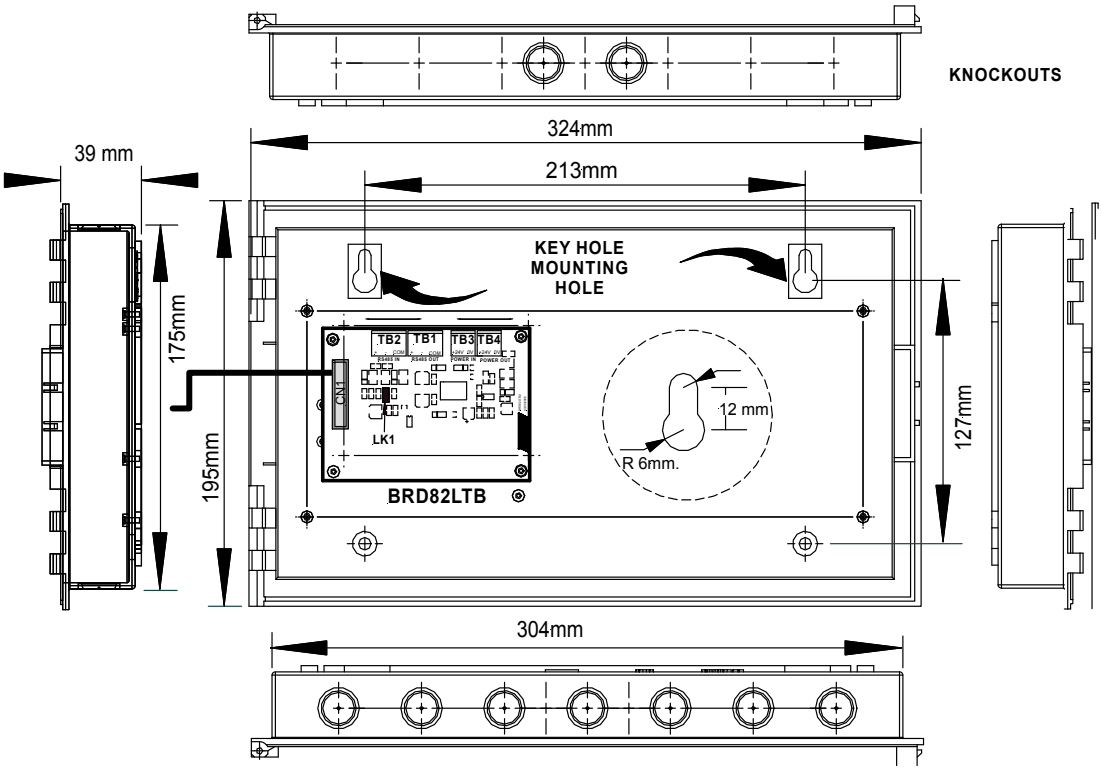


Figure 3: Typical Layout (Externally Powered) and Location of Keyholes

3 Installation & Cabling

The ***SmartTerminal*** is then connected to the FACP as shown below.

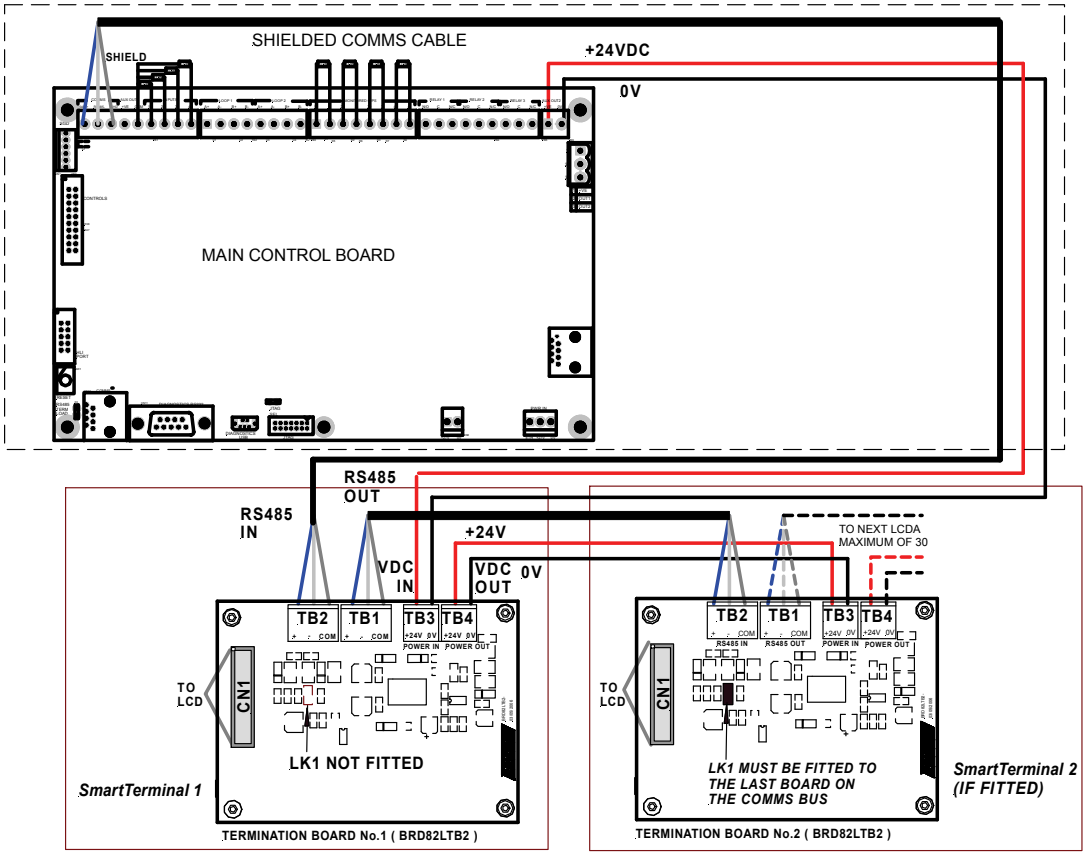


*Figure 4: Connecting **SmartTerminal** to the FACP*

3.1 SmartTerminal Termination Board Interconnection

Terminal Block TB1 (RS485 OUT) TB2 (RS485 IN)	Purpose
1 (Pin Number)	RS485 +ve
2	RS485 -ve
3	SCREEN
Terminal Block TB4 (27VDC OUT) TB3 (27VDC IN)	
1 (Pin Number)	0V
2	+24VDC

3.2 FACP Comms

Terminal Block TB1 (RS 485 OUT)	Purpose
1 (Pin Number)	RS485 +ve
2	RS485 -ve
3	SCREEN
Terminal Block TB4 (27VDC OUT)Number	Purpose
1	0V
2	+24VDC

4 Setting the Address

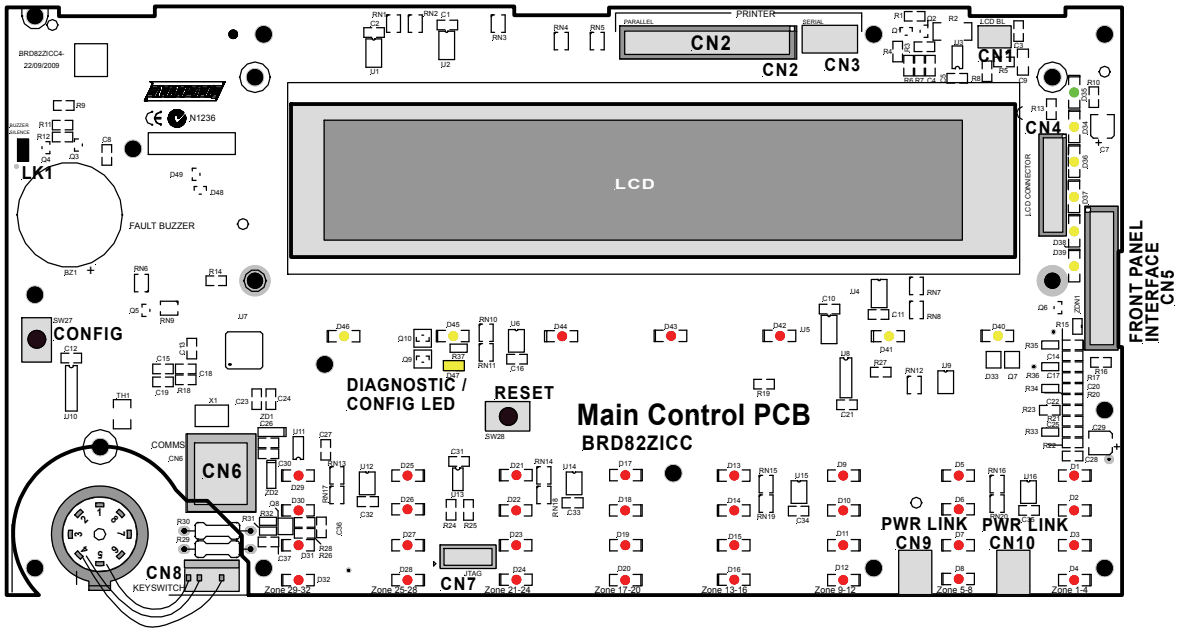


Figure 5: LCD Printed Circuit Board Layout

Open the front door; locate the “CONFIG” button situated on the left hand side of the PCB and press for 3 seconds. The buzzer and “Config” LED will double beep and flash respectively to indicate that the Configuration mode has been entered. The LCD will now display the Configuration screen. This screen consists of the code version number, current address and four adjustment markers. These markers A-, A+, C-, and C+ are used to indicate the keys that adjust the address and LCD contrast.

Use the “PREVIOUS (A-) and NEXT” (A+) keys to select the desired address. The default value for this address is 255 which is not a valid ***SmartTerminal*** address. The user must then select an address value from 1 to 30, i.e. the same address as that set in the FACP. The keys corresponding to C- (ACK) and C+ (RESET) are used in a similar manner to decrease and increase the LCD contrast level. There is audible feedback for all key presses.

Once the address has been set press the “CONFIG” button again for 3 seconds and the screen will return to its default and the “DIANOSTIC” LED will return to a slow flash. This slow flash indicates ***SmartTerminal*** and the FACP are communicating normally i.e. the LED flashes if communications data is being received from the FACP.

☞ **Note:** If the address is not set within the time out period of approximately 75 seconds ***SmartTerminal*** will return to its normal state.

5 Setting the SmartTerminal in LoopMaster

This section assumes the engineer has experience in the use of LoopMaster and hence has an understanding of it operation. To commence the programming go to the "Tree View" within LoopMaster as shown below.

The Tree View

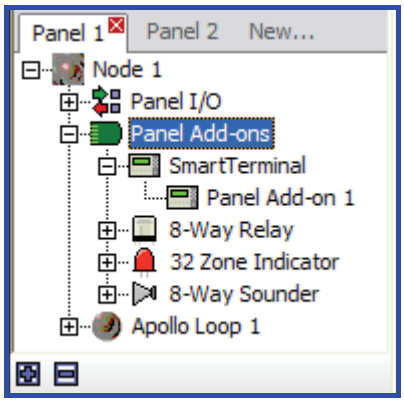


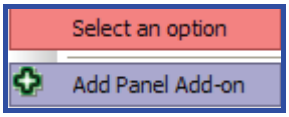
Figure 6

The above shows the expanded view of the SmartTerminal add on type. In the case above the panel in question has 1 SmartTerminal assigned to it, entitled 'Panel Add-on 1'.

Selecting one of these add ons will update the Details Pane with the respective module's information, while double-clicking on the add-on will open its editing dialog box.

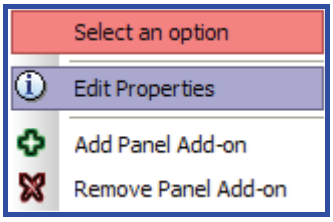
The ***SmartTerminal*** Menu

Right-clicking on the SmartTerminal add on parent item from the Tree View opens the menu,



It contains an option to add a panel Add-on to the panel.

Right-clicking on an existing ***SmartTerminal*** add on from the Tree View opens the menu,



It contains an option to add another or remove the current Add-on or via the 'Edit Properties' option to open the Add on editing dialog box.

☞ **Note:** *that it is possible to have a maximum of 30 SmartTerminal add ons per panel, however, this value will reduce as other add-on types are added (the entire panel can have a maximum of 30 add-ons, of any type, at any one time).*

The Details View

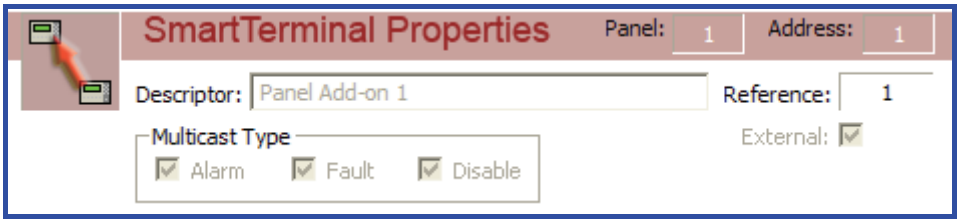


Figure 7

The above is displayed as part of the SmartTerminal Details Pane representation of the information available to the configuration of the data. It is displayed at the top portion of the Details Pane and is a non-editable, accurate representation of editable fields for a SmartTerminal.

The List View

Address	Ref	Descriptor	Multicast	External
1	1	Panel Add-on 1	Alarm/Fault/Disable	Y
2	5	Panel Add-on 5	Alarm/Fault/Disable	Y

Figure 8

The SmartTerminal add on List View appears immediately below the SmartTerminal add on Details View and consists of a summary of all available SmartTerminal add ons assigned to the current panel. In the above, there are 2 add on ***SmartTerminal's*** assigned to this panel, entitled 'Panel Add-on 1' and 'Panel Add-on 5' respectively.

Double-clicking on an entry in the list opens the editing dialog box for that particular SmartTerminal.

Editing

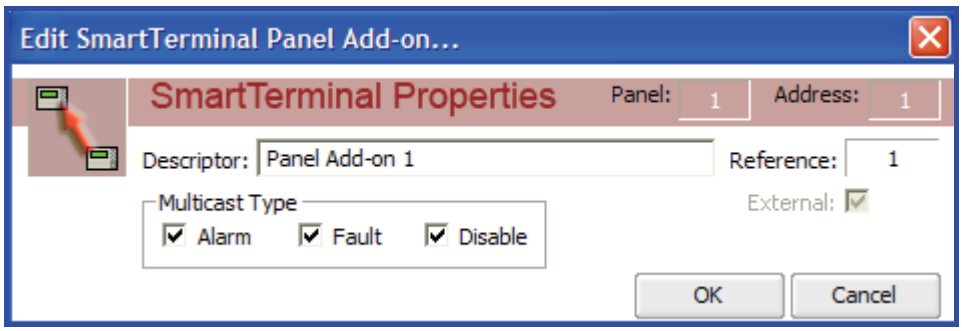


Figure 9

The SmartTerminal add on editing dialog box consists of two types of fields:

1. **Non-editable (informational) fields:**
   - Panel – The panel number this module belongs to,
   - Address – The hardware address of this particular module; addresses can be in the range of 1 to 30,
   - Reference – The reference number of this module
2. **Editable fields:**
   - Multicast Type – The user can select one or more Multicast Types for this module to process,
   - External – If this checkbox is checked then this add on is to be used on the external bus,
   - Descriptor – Allows the user to enter a 40 character descriptor describing this add on

6 Operation

The operation of ***SmartTerminal*** can be considered to be in one of three states, these are;

1. Power up - when the SmartTerminal is initialising
2. Normal - when the SmartTerminal address has been set and is communicating with the FACP, reporting normal / abnormal conditions and controlling the FACP via the front panel controls
3. Fault where the SmartTerminal is in fault and/or is unable to communicate with the FACP.

Power Up

The LCD displays a message telling the operator ***SmartTerminal*** is being powered up and that the hardware is being initialised. Once the hardware has been successfully initialised set the address and ***SmartTerminal*** should automatically transition to the normal state. Should a failure occur on power up press the “RESET” button located on the LCD PCB (see *Figure 5*) and check the address is correct.

Normal

The Normal state is entered from the “Power-up” or a return from the “Fault” state and is displayed on the LCD if the ***SmartTerminal*** is communicating with the FACP and operating correctly. In this state the front panel Power indicator is illuminated.

Fault

SmartTerminal enters the Fault state upon;

- A hardware failure
- LCD module failure or
- A loss of communications with the FACP (indicated by the “DIAGNOSTIC” LED – not flashing and the “no communications“ message being displayed)

In a Fault condition the front panel NORMAL indicator is extinguished and the details of the fault are displayed on the LCD. The FACP will also indicate a fault in a similar manner.

7 Controls and Indicators

All controls, except for the Enable / Disable keyswitch, are of a momentary push button style.

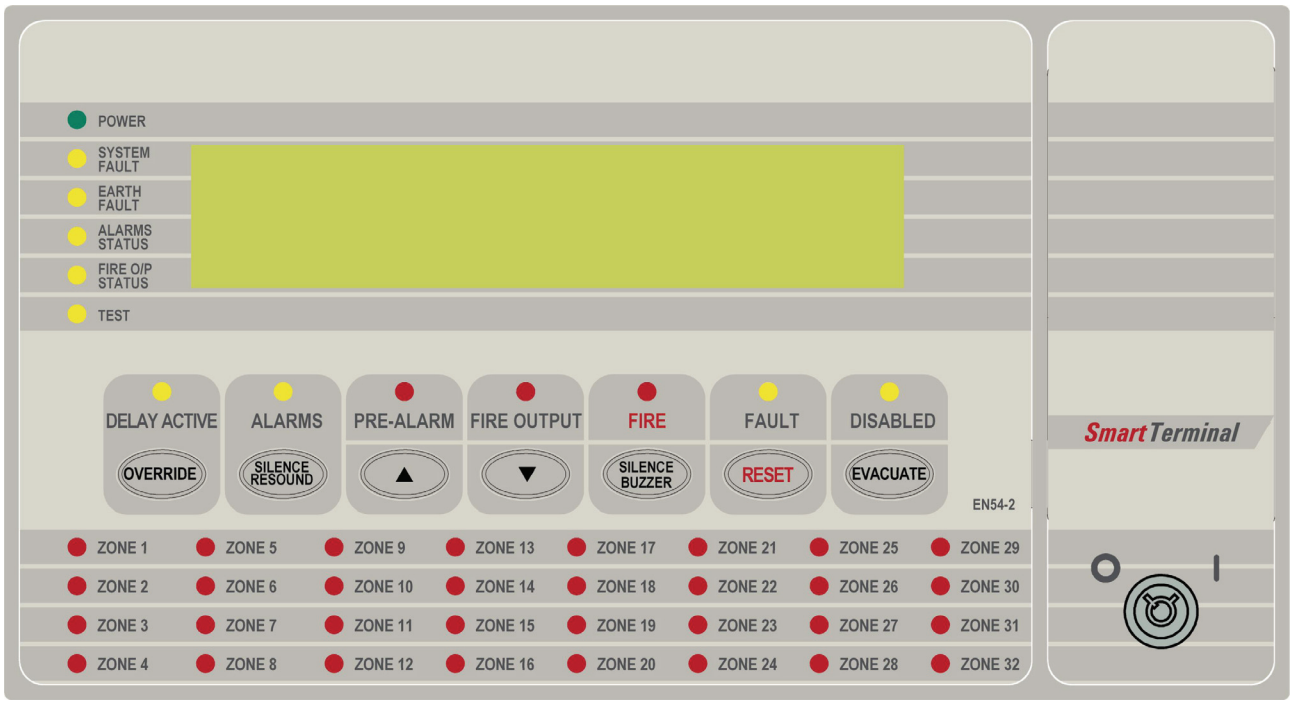


*Figure 10: **SmartTerminal** Front Panel Layout*

KEYSWITCH

Access levels

There are two levels of access.

Access level 1 only the previous and next front panel controls are operative. All other controls operate in access level two.

Access level 2 is entered when the key-switch is in the ENABLED position.

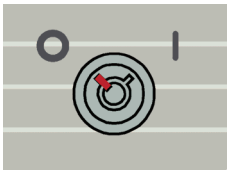
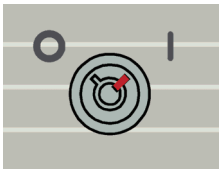
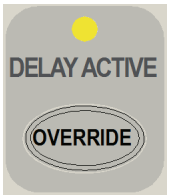

Keyswitch disabled

Keyswitch enabled

Figure 11: Keyswitch in the Disabled / Enabled Positions



(Yellow) The LED is illuminated when a device has been activated and the device is configured to have a delay before operating the brigade output and alarm devices.

The LED is turned off when the delay expires and the brigade output and alarm devices are activated or the delay is overridden by the use of the delay override.

Override When zones and/or detectors are configured with delays, at the FACP then the operation of alarm devices (sounders and strobes) or the activation of the brigade alarm output can be delayed from when the zone/detector goes into alarm.

The delay can be overridden by pressing the OVERRIDE key. This will cause the alarm devices and brigade output to be activated immediately

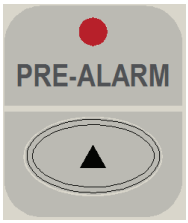
Active at access level 1 and 2.

(Yellow) The LED is illuminated when the sounders have been silenced in response to a FIRE condition, indicating the resound function is active.

Silence / Resound Press to silence the alarm devices (associated LED illuminated).

Press again to re-enable the alarm devices (associated LED extinguished).

Active at access level 2 only.



(Red) Illuminated when one or more devices are in the pre-alarm condition and not disabled.

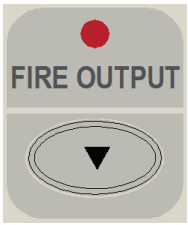
Primary Function

Press to display the previously displayed LCD screen

Secondary Function

Set ***SmartTerminal*** address – A – (minus) decrement number

Active at access level 1 and 2



(Red) Illuminated when the FIRE output is active as a result of a fire condition.

Primary Function

Press to display the next displayed LCD entry

Secondary Function

Set ***SmartTerminal*** address – A + (plus) increment number

Active at access level 1 and 2

(Red) The LED is illuminated when one or more devices are reporting a FIRE condition and are not disabled.

Silence Buzzer

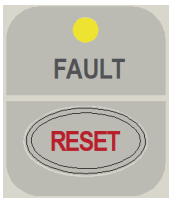
Silences the panel buzzer. Buzzer is activated under the following conditions:

- Alarm condition
- Devices – missing, out of calibration, wrong type, reporting an internal error
- Loops – short circuit or open circuit
- Monitored inputs and outputs on loop devices are in fault
- Sounders – missing, wrong type or reporting an internal error
- Modules within the panel – missing, wrong type or hardware error
- Main and secondary power supply fault

In Configuration mode this key decreases the LCD contrast.

Push button – held down for 3 seconds commences a lamp test. Lamp test is to test all indicators, segments on the LCD and the buzzer.

Active at access level 1 and 2.



(Yellow) LED is illuminated when there are one or more faults on the system. Faults can be;

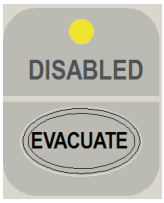
- Devices – missing, out of calibration, wrong type, reporting an internal error
- Loops – short circuit or open circuit
- Monitored inputs and/or outputs on loop devices in fault
- Monitored inputs and/or outputs within the FACP in fault
- Modules within the panel – missing, wrong type or hardware error
- Modules or stations external to the panel – missing, wrong type or hardware error (***SmartTerminal***)
- Main and secondary supplies

Reset

Returns the FACP to its default power up state. This means all detectors in alarm are reset to normal and all indicators and outputs are updated accordingly.

In Configuration mode this key increases the LCD contrast.

Active at access level 2 only.

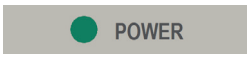


(Yellow) The LED is illuminated when one or more zone detectors, loop devices or panel outputs are disabled.

Evacuate

Turns on all alarm devices (visual and aural) outputs and activates the Fire indicator. The SILENCE / RESOUND or RESET control shall turn off all alarm devices (visual and aural).

Active at access level 2 only



(Green) Illuminated to show the presence of power. Flashes when mains have failed.

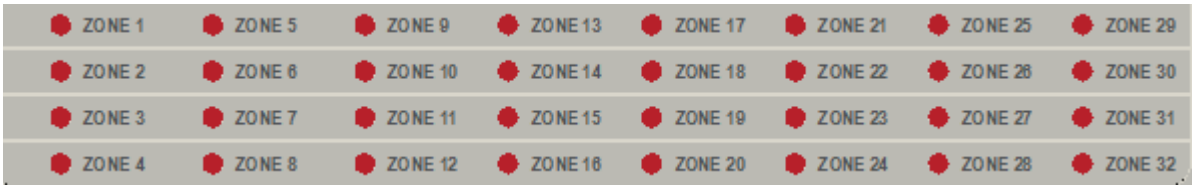
(Yellow) Illuminated when the FACP is unable to provide mandatory functions. LED is latched, until cleared by reset.

(Yellow) Illuminated when there is an earth fault detected on the panel.

(Yellow) Illuminated steady if any of the alarm devices (sounders and/or strobes) have been disabled and flashes if any of the alarm devices (sounders and/or strobes) are in fault. Disable has priority over fault.

(Yellow) Illuminated steady if the fire output has been disabled and flashes if the fire output is in fault (open or short circuit condition). Disable has priority over fault.

(Yellow) Illuminated when the FACP is in the test mode. Possible tests are alarm, fault, walk, lamp and loop.



(Red) Illuminated when a Zone is in alarm

7.1 LCD Screen Format

There are 3 events that can be reported and displayed by ***SmartTerminal***. The types of event are;

- Fire
- Faults and
- Disables.

The types of events are only associated with sensors and detectors hence faults associated with modules, loops O/C – S/C, power supplies and so forth are not reported on the LCD.

The ***SmartTerminal*** has front panel LED's for each type of event. When ***SmartTerminal*** is configured not to report a type of event and that event type is present (and the corresponding front panel LED is illuminated on the ***SmartTerminal***), then a standard information screen is displayed on the LCD stating the system is not normal and the operator should see the FACP.

Alarm: If configured the screen format for reporting loop / sensor / zone fire condition is:

```
Zzzz                Alarm
<zone descriptor>
<date> <time>                    CONTROL*
ZONE FIRE XXX OF XXX              DEVICE►
```

Fault: If configured the screen format for reporting loop / sensor / zone fault condition is:

```
Zzzz                FAULT
<zone descriptor>
<date> <time>                   CONTROL*
FAULT XXX OF XXX                 DEVICE►
```

Note: The fault types only relate to devices.

In the event of a loss of communications, for a period of greater than 15 seconds the ***SmartTerminal*** will default to the No Communications screen. The format for this screen is:

```
            No Communication
```

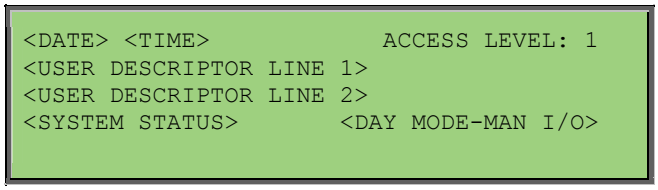
Device Isolate / Disables: If configured the screen format for reporting loop / sensor / zone disable condition is:

```
Zzzz                Isolate
<zone descriptor>
<date> <time>                   CONTROL*
ZONE PRE-ALARM XXX OF XXX        DEVICE►
```

Pre-alarm: If configured the screen format for reporting loop / sensor / zone Pre-alarm condition is:

```
Zzzz                PRE-ALARM
<zone descriptor>
<date> <time>                    CONTROL*
ZONE DISABLED XXX OF XXX          DEVICE►
```

Normal / Default: The format for reporting that everything is normal is:



The screen is only displayed when there are no alarms, fault or disables on the panel.

The default screen is only displayed when there are no device alarms, device faults or device disables present on the system. The highest priority current system status will be displayed and can be one of the following listed in order of highest to lowest priority:

“SYSTEM ALARM”

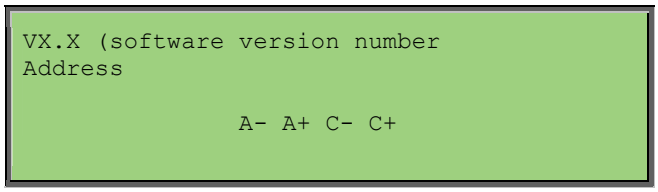
“SYSTEM PRE-ALARM”

“SYSTEM FAULT”

“SYSTEM ISOLATE”

“SYSTEM NORMAL”

Config: The Config screen displays the following



A - A +: adjusts the address 1 to 30, 30 being the maximum number of ***SmartTerminal’s*** that can be connected to the FACP, (default is 255 which is not a valid address).

The function keys perform the following;

A – Press “Previous” A+ press “Next”

C - C+: decreases [-] and increases [+] the LCD contrast level.

The function keys perform the following;

C – Press “Silence Buzzer” C+ press “Reset”

8 Specifications

MECHANICAL	
Dimensions ABS Cabinet BX05: (mm) Dimensions ABS Cabinet BX1: (mm)	195mm (H) x 345mm (W) x 50mm (D) 300mm (H) x 360mm (W) x 100mm (D)
ENVIROMENTAL	
Temperature: Humidity:	-5ºC to + 55ºC 25% to 75% non condensing
INPUT POWER	
Operating Voltage (nominal): Operating Voltage (minimum): Quiescent Current @ 26.5VDC: Maximum Current: Cabling Requirements: Optional 27VDC Power Supply: Batteries:	27VDC 18VDC 12.4mA (back light, off buzzer off") 43.8mA (back light on, buzzer on) 2 core 1.5 to 2.5mm² 1.8A plus 400mA Battery Charging 12Ahr
27VDC OUTPUTS	
Auxiliary 27VDC Distribution Protection: Cabling Requirements:	24VDC 500mA Monitored 2 core 1.5 to 2.5mm²
COMMUNICATIONS	
Internal to FACP: External to FACP: Cabling Requirements: Fault monitoring: Maximum Number of SmartTerminal's per FACP: Maximum Distance (from FACP):	RS485 RS485 Twisted pair plus power O/C, S/C 30 1.2Kms.
LCD	4 line X 40 character - backlit

9 Trouble Shooting Chart

Problem	Solution
Normal Supply LED not illuminated	Check supply voltage it should be set to 27.2VDC. Nominal fault voltages are - Low = (<18VDC) High = (> 28VDC)
FACP Earth Fault LED illuminated	Check all input and output cabling and wiring assemblies for short to ground
FACP System Fault LED illuminated	Ensure correct panel configuration Check all connections for loose wiring
FACP Warning System Fault LED illuminated	Check correct E.O.L is fitted Check wiring is connected correctly
RS485 Communication Bus not working	Refer FACP LCD. This may identify where there is a break in the communication line Check the ***SmartTerminal*** Diagnostic Config LED is flashing. If not the FACP is not communicating with the SmartTerminal. Check the RS485 cabling. If flashing check the ***SmartTerminal's*** address.

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Assessed to ISO9001
LPCB ref. no 952
(AMPAC Europe)

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NOTE: Due to AMPAC's commitment to continuous improvement specifications may change without notice.