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XPANDER®

Commissioning guide

Contents

Introduction

XPander incorporates entirely new designs with respect to the wireless communication system. A Radio Interface is connected to the loop. It communicates with the control panel using the Apollo Addressable two-wire power and communications system. The interface communicates with the detection and alarm signalling devices by means of radio waves. A maximum of 5 interfaces is permitted for each site. For sites that require more than 5 interfaces please contact Apollo.

The radio bases and signalling devices are addressable and use a pre-set analogue value to report via the Apollo protocol. Apart from normal and fire the bases can send pre-set analogue values to indicate low battery, detector contaminated, detector tamper and low signal strength fault conditions.

- Up to 5 interfaces per site - contact Apollo for more information

- Up to 31 devices per interface

- Loop-powered interface (Including bi-directional Short Circuit Isolator)

- Wireless addresses seen by control panel as normal addresses

- Radio base with wireless circuitry and battery compartment

- Optical chamber designed to inhibit dirt penetration and thus reduce false alarms

- Automatic drift compensation with DirtAlert™ warning

- Detection algorithms for transient rejection

- FasTest™ reduces time taken to test detectors

- Remote test facility

- 5-year battery life (It is recommended that the battery is changed in year 4 of maintenance)

- Alkaline Panasonic® Powerline or Alkaline Varta® Industrial are the recommended battery types to use

- Modern styling

XPander detectors are supplied with a mounting base as a complete unit. The range comprises of the following products:

Description	Part Number
Optical detector with base	XPA-CB-12034-APO
Heat detector A1R and base	XPA-CB-11170-APO
Heat detector CS and base	XPA-CB-11171-APO
Combined sounder and optical smoke detector	XPA-CB-14016-APO
Combined sounder and heat detector (class A1R)	XPA-CB-14017-APO
Combined sounder and heat detector (class CS)	XPA-CB-14018-APO
Combined sounder-visual indicator (red) and optical smoke detector	XPA-CB-14020-APO
Combined sounder-visual indicator (red) and heat detector (class A1R)	XPA-CB-14021-APO
Combined sounder-visual indicator (red) and heat detector (class CS)	XPA-CB-14022-APO
Combined sounder-visual indicator (clear) and optical smoke detector	XPA-CB-14024-APO
Combined sounder-visual indicator (clear) and heat detector (class A1R)	XPA-CB-14025-APO
Combined sounder-visual indicator (clear) and heat detector (class CS)	XPA-CB-14026-APO
Manual call point	XPA-MC-14006-APO
Red sounder with mounting base	XPA-CB-14001-APO
White sounder with mounting base	XPA-CB-14002-APO
Red sounder visual indicator with red mounting base	XPA-CB-14003-APO
Amber sounder visual indicator with white mounting base	XPA-CB-14004-APO
Clear sounder visual indicator with white sounder mounting base	XPA-CB-14005-APO
Site Survey Kit	XPA-TE-14075-APO
Single input/output unit	XPA-IN-14011-APO
Dual input/output unit	XPA-IN-14012-APO
Diversity Loop Interface	XPA-IN-14050-APO
White XPander XPERT card	29600-413
Red XPander XPERT card	29600-399

For spare parts/replacement parts see page 15.

Environmental
All packaging recyclable.
Disposing of batteries should be in accordance with local regulations.

Handling precautions
As with all electronics, care should be taken during handling. Avoid dropping any of the parts onto hard surfaces, as damage may occur to the case and internal circuitry.

All products should be kept in their packaging until they are due to be installed to minimise the risk of damage. Retain all packaging until the installation and commissioning is complete.

Observe anti-static precautions when handling all products. To avoid risk of static discharges do not place static-sensitive devices on plastic surfaces.

Quick Start Guide for XPander Diversity Site Survey

1. Use the site survey tool to check the signal strength.	For detailed instructions see page 16
2. Record all the survey signal strengths on the site survey sheet.	For site survey sheet see page 17
3. Fit the interfaces - as per instructions in the quick start guide below.	See Quick Start Guide for XPander Diversity Loop Interface below
4. Log the devices on to the interface - as per instructions in the quick start guide below.	For detailed instructions see page 08
5. Check the signal strength for each logged on device and record on the site survey sheet.	For site survey sheet see page 17

Quick Start Guide for XPander Diversity Loop Interface

1. Select the interface number or ID (range 1-5).	For detailed instructions see page 07
2. Select channels following Appendix B and checklist on the inside of the unit.	For detailed instructions see page 13
3. Set the address for the system.	For detailed instructions see Installation Guide 39214-926
4. Log on devices to the interface (for each interface).	For detailed instructions see page 08

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Installation

Installation should be carried out in accordance with the radio survey and system design. Siting of the devices should be in strict accordance with the survey. Failure to do so could result in loss of performance.

The log on procedure (page 8) along with a completed site survey sheet should be sufficient to obtain a stable working system, the site survey procedure ensures all XPander devices will communicate correctly once installed. These sheets need to be completed and kept as commissioning and user documentation to comply with BS5839 - 1 section 2-27 and section 5-39 & 40

This guide provides information on features designed to help commission and troubleshoot a system.

Please note: Should building structure change, the site survey will need to be repeated. The system will not comply to BS 5839 or other national codes if the site survey is not carried out properly and all supporting paper-work completed (site survey sheet).

Menu - scrolling and selecting
Selecting Menu Options
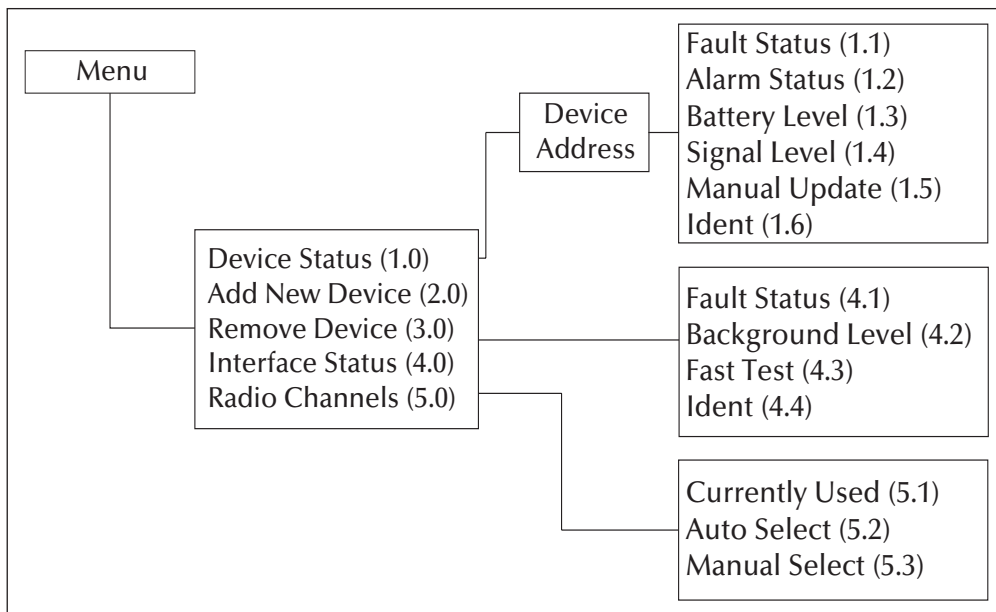
A rotary select switch is used for scrolling through the menu and selecting an option. Turn the select switch clock-wise to scroll down the menu. Turn the switch anti-clockwise to scroll back up the menu. Press the select switch once to select an option.

The 'Back' button is used to return to the previous menu.

If a menu is selected and no further activity is detected, the menu will 'time out' and the interface will return to normal operating mode.

Loop Interface PCB.

868 MHz Aerial Connections
Reset Button
Front Lid Tamper Switch
8 Way loop Address Switch
Status LEDs
Help Button
Rotary Control
Back Button
LCD Contrast Adjustment
Loop In, Out and Screen Connections
LCD Screen

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Initial power up screen

| No. of devices logged onto interface | No. of logged on devices in alarm condition | No. of logged on devices in fault condition |

DEV 00 AL 00 FT 00
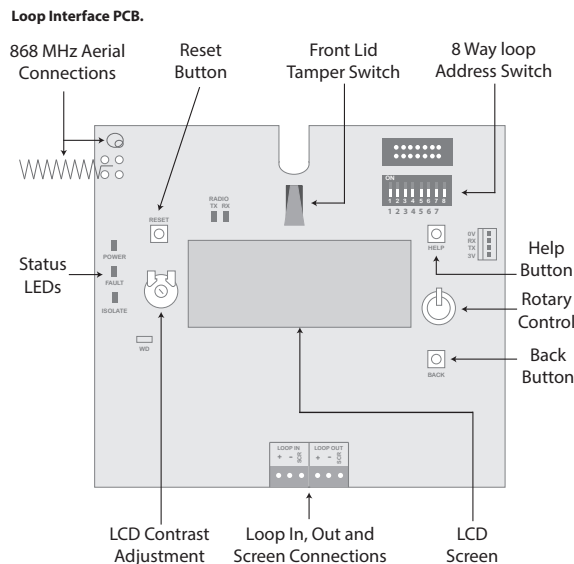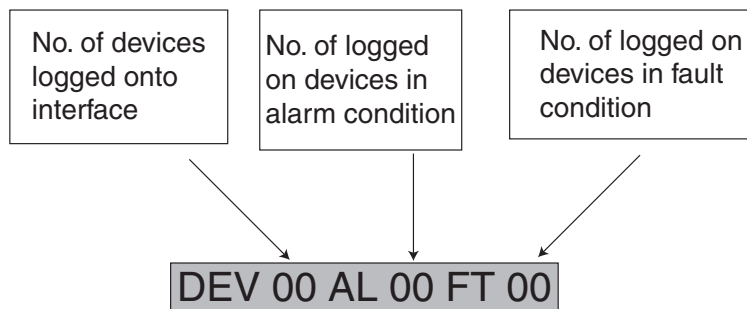
Multiple Interfaces
If more than 1 interface is being used, refer to Appendix B on page 14 before logging on the devices and complete the checklist on the lid. Interfaces are numbered from 1 to 5. This is not the loop address, it is the frequency ID. For fault free operation, the interfaces must have the channels set correctly. To do this the interfaces must be numbered so that the nearest interface to 1 is 2 and the nearest interface to 2 is 3 etc. Start at one end of the site plan and continue in this manner until all 5 have been labelled. Use the table in Appendix B on page 14 to set the channels on the interfaces.

Logging on interfaces
Up to 31 wireless detectors or alarm signalling devices may be assigned to a single interface. Prior to adding devices to the Interface, batteries must be inserted, the power jumper positioned correctly and the mounting plates fitted. During the device log-on routine, the interface will request confirmation of the device serial number. This is to be found on the side of the radio module. The XPERT address card must be fitted prior to assigning a device to the interface. In the case of sounders or sounder visual indicators the tone must be selected using the 5-segment DIL switch on the base of the sounder or sounder visual indicator.

Note: I/O Units and the Combined Sounder Visual Indicator Base do not have an XPert card, the addressing is set by a DIL switch.

Logon procedure

Ensure batteries are installed correctly and fit the battery jumper (shown below) across both header pins.

Note: The XPander Combined Sounder (Visual Indicator) uses a DIL switch to connect the battery supply.

| XPander Sounder and Sounder/Beacon | XPander Detector Base Module | XPander MCP | XPander I/O Unit | XPander Combined Sounder and Detector |
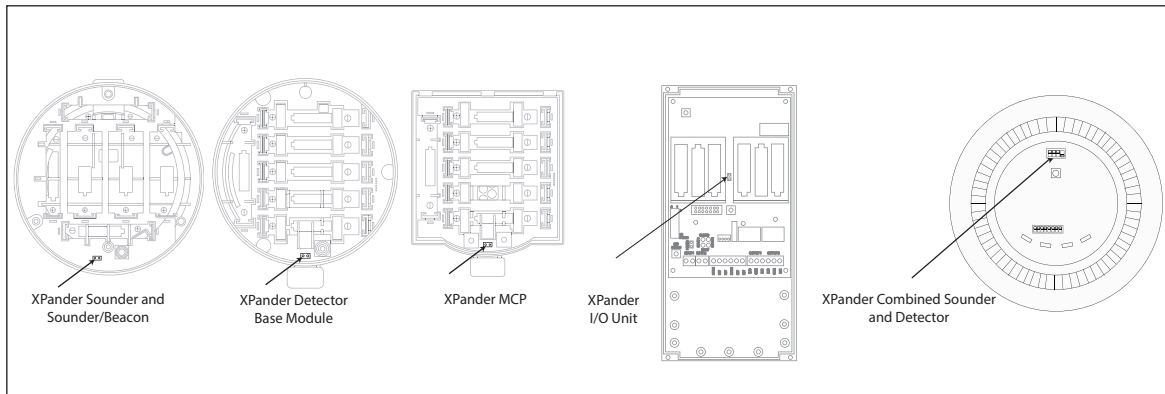
Push the rotary select switch on the interface and release. Turn until "add new device" is shown on the menu and push to select. On the device press the log-on button (shown below) for two seconds. A LED on the device will flash.

Detector and Sounder logon button   MCP logon button   Input Output Unit logon button   Combined Sounder and Detector logon button
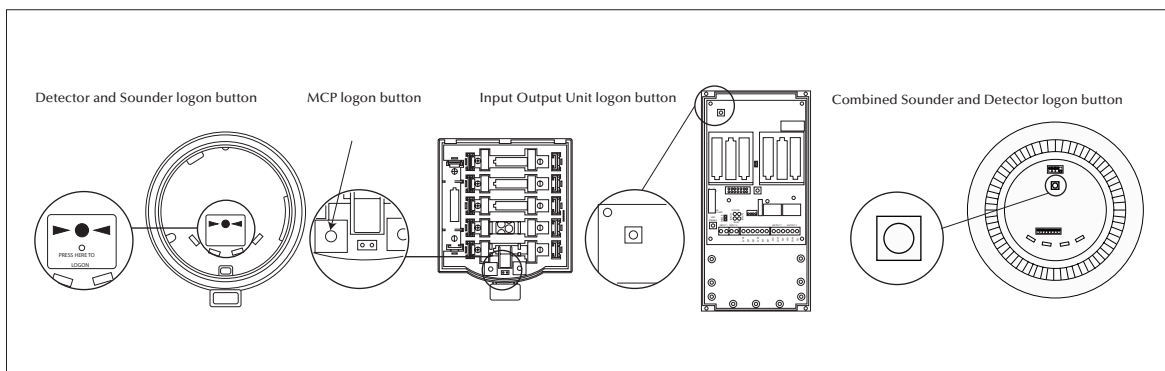
A five-figure code will be displayed on the interface similar to below. This is the XPander device's unique ID.

A127D

Turn the rotary select switch to 'Yes' and push to select. The menu will return to 'add new device'.

Check the device's unique ID against the ID on the label of the product to ensure that it matches.

Repeat steps to add more devices.

Press the 'Back' button on completion to return to the previous menu.

Menu options

Menu Level: (1.0)

Device Status
Add New Device
Remove Device
Interface Status
Radio Channels

This menu shows the status of logged on devices. The loop address as determined by the XPERT card (1-126), logged on status and the device type are displayed.

Optic = Optical Detector
Sound = Sounder Device
I/O = Input/Output Device
Radio = Loop Interface Module
Multi = Multisensor Detector
Heat = A1R Heat Detector
H Temp = CS Heat Detector
MCP = Manual Call Point
Cmb = Combined Sounder Visual
Indicator Base
??? = Unknown Device

Loop address determined by the XPERT card or DIL switch
??? = No address assigned or illegal address

= Logged On with fire present
L = Logged On with address assigned
A = Logged On without address assigned
! = Logged On with fault present
X = Dual address on Interface

Addr 067 L Optic

Note: Combined sounder visual indicator base shows two addresses, first address in the detector followed by the sounder visual indicator as shown below.

Addr 004 ! 005 Cmb

Detector

Sounder Visual Indicator

Fault Status (1.1)
Alarm Status* (1.2)
Battery Level (1.3)
Signal Level (1.4)
Manual Update (1.5)
Ident (1.6)
Type** (1.7)

Further information on each device can be viewed by pressing then turning the Rotary Select Switch.

* Input status on Input/Output Unit
**Combined Sounder Visual Indicator Base only

Menu Level (1.1)

Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident

This menu shows detailed information on the fault status of the device. If multiple faults are present, these can be viewed by turning the rotary select switch.

For a full range of analogue values please see Appendix A on page 14

Menu Level: (1.2)

Fault Status
Alarm Status *
Battery Level
Signal Level
Manual Update
Ident

This menu shows the alarm status of the device.

***Input status** on Input Output Unit - Displays the status of the monitored input(s). A switch input 'closed' condition is displayed as a logic '1' For a full range of analogue values please see Appendix A on page 14

Menu Level: (1.3)

Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident

This menu shows the status of the two battery packs in a device. Battery conditions are displayed as follows:

Displayed	Definition	Icon on LCD	Analogue value at panel
Pack 1 OK	Pack 1 battery voltage healthy	Full battery icon	25 (detectors) 16 (sounders and MCPs)
Pack 1 Warning*	Pack 1, 30 day warning	Half battery icon	7
Pack 1 Low	Pack 1, 7 day warning	Empty battery icon	7
Pack 1 Missing	No battery pack fitted	X	0
Pack 2 OK	Pack 2 battery voltage healthy	Full battery icon	25 (detectors) 16 (sounders and MCPs)
Pack 2 Warning*	Pack 2, 30 day warning	Half battery icon	7
Pack 2 Low	Pack 2, 7 day warning	Empty battery icon	7
Pack 2 Missing	No battery pack fitted	X	0

Recommended replacement batteries:
Alkaline Panasonic Powerline 1.5V AA (Size M, LR6)
Alkaline Varta Industrial 1.5V AA (4006, LR6)
Alkaline Panasonic Powerline 1.5V C (Size L, LR14) for sounders only
Alkaline Varta Industrial 1.5V C (4014, LR14) for sounders only

Note: When replacement batteries are required all batteries must be replaced together.

* Batteries need to be changed as soon as possible (recommendation 7 days)

Menu Level: (1.4)
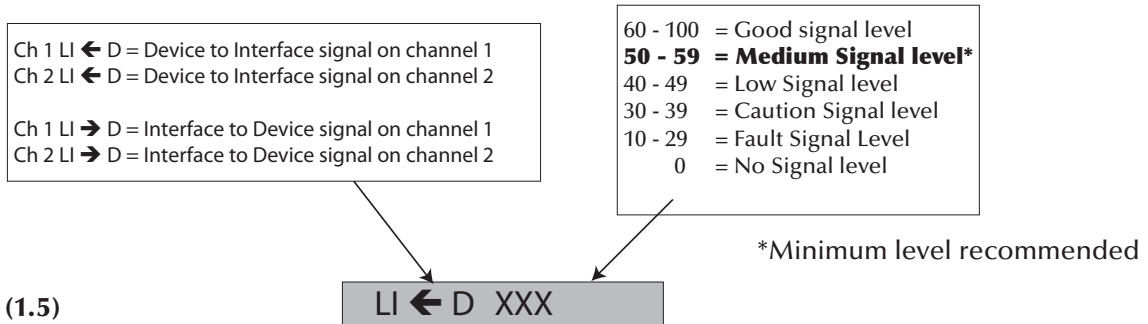
Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident

This menu shows the status of the two signalling channels used by the loop interface and the communicating device. If more than one interface is used, please refer to Appendix B on page 14.

The received signal strength at the loop interface from the device is shown as LI ← D followed by a percentage indicating the signal strength. Similarly the received signal at the device is shown as LI → D followed by the signal strength.

If you have moved or re-installed a device, complete a manual update before checking the signal level.

The LI ← D level is updated every 300 seconds. The LI → D level is updated every 12 hours or when requested manually by selecting the "Manual Update" option described below.

Ch 1 LI ← D = Device to Interface signal on channel 1
Ch 2 LI ← D = Device to Interface signal on channel 2
Ch 1 LI → D = Interface to Device signal on channel 1
Ch 2 LI → D = Interface to Device signal on channel 2

60 - 100	= Good signal level
50 - 59	**= Medium Signal level***
40 - 49	= Low Signal level
30 - 39	= Caution Signal level
10 - 29	= Fault Signal Level
0	= No Signal level

*Minimum level recommended

LI ← D XXX

Menu Level: (1.5)

Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident

status of all devices is updated. The current status can then be viewed as described in the "signal level" menu.

When selected, the signalling

Menu Level: (1.6)

Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident

This menu shows the unique 5-digit identification number for the device. This may be recorded on site drawings or the radio survey document for maintenance purposes.

Menu Level: (1.7)

Fault Status
Alarm Status
Battery Level
Signal Level
Manual Update
Ident
Type

This menu indicates the detector type on a Combined Sounder Visual Indicator Base.

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Menu Level: (2.0)

Device Status
Add New Device
Remove Device
Interface Status
Radio Channels

From this menu new or additional devices can be logged on to the interface up to 31 devices. (Log on procedure on page 8).

See page 7 for details of compatibility for XPander interfaces and devices.

Menu Level: (3.0)

Device Status
Add New Device
Remove Device
Interface Status
Radio Channels

This menu shows a list of devices logged on to the interface. To remove a device use the rotary select switch and press to confirm, this has to be done before physically removing the device from the ceiling.

Warning – Once devices have been removed, they will no longer be able to signal an alarm. If the device is permanently removed this will also need to be removed from the control panel.

Menu Level: (4.0)

Device Status
Add New Device
Remove Device
Interface Status
Radio Channels

From this menu the status of the loop interface and background noise can be viewed.

Menu Level: (4.1)

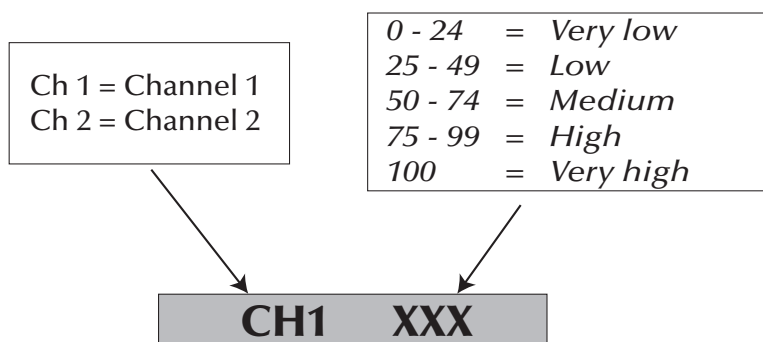| |
|---|
| **Fault Status** |
| Background Level |
| Fast Test |
| Ident |

This menu shows detailed information on the fault status of the interface. If multiple faults are present they can be individually viewed by using the rotary select switch.

For a full range of analogue values please see Appendix A on page 14

Menu Level: (4.2)

Fault Status
Background Level
Fast Test
Ident

The background noise level on the two signalling channels can be viewed.

Ch 1 = Channel 1
Ch 2 = Channel 2

0 - 24	=	*Very low*
25 - 49	=	*Low*
50 - 74	=	*Medium*
75 - 99	=	*High*
100	=	*Very high*

CH1   XXX

Menu Level: (4.3)

Fault Status
Background Level
Fast Test
Ident

XPander detectors incorporate algorithms to minimise unwanted alarms whilst maintaining a high level of protection. The FasTest™ function reduces the number of detection samples required for an alarm condition therefore making it quicker to test detectors. When FasTest™ is selected the device's LED will flash once a second. After a pre-selected period of time the device will return to normal operating mode. This period applies to all detectors logged on to the interface. Once selected, a count-down time is displayed. On receipt of an alarm from a detector, the timer resets to the period selected and resumes the count down. If no alarm is received, the interface and detectors return to their normal operating mode.

Menu Level: (4.4)

Fault Status
Background Level
Fast Test
Ident

This menu displays the unique identification number of the interface.

Menu Level: (5.0)

Device Status
Add New Device
Remove Device
Interface Status
Radio Channels

From this menu it is possible to view and/or select the two signalling channels manually from the 32 available. The default setting is automatic channel selection and the interface defaults to CH8 and CH26 for communication. The default setting should be altered if multiple interfaces are being used on site. A maximum of 5 interfaces can be used in any one site, if more is required please contact Apollo.

The menu options available will depend on whether devices are logged on to the interface. Manual channel select is only accessible when **no devices are logged on** the interface. If devices are logged on, only the 'Currently Used' option is displayed.

See Appendix C on page 15 for a full list of frequencies.

Menu Level: (5.1)

Currently Used
Auto Select
Manual Select

When selected the currently used frequencies for CH1 and CH2 are displayed. If more than 1 interface is being used, refer to Appendix B on page 14 before logging on the devices and ensure to follow the given instructions for the selection of the frequencies which is printed on the lid of the unit.

Menu Level: (5.2)

Currently Used
Auto Select
Manual Select

This does not detect radio

communications from other XPander devices. It will scan for other sources of background noise. The auto selected channels should not be used when multiple interfaces are fitted, only the channels stated in Appendix B on page 14.

This function should not be used without consultation with Apollo.

Menu Level: (5.3)

Currently Used
Auto Select
Manual Select

Radio channels should be manually selected when more than one interface is installed on a system (see Multiple Interfaces on page 7). Channel information is shown on both the lid of the interface and in Appendix B.

Select 'First Channel' and scroll to the desired channel and enter. Repeat this procedure for 'Second Channel'. Channel selection must be carried before devices are logged on.

Note: Menu 5.2 and 5.3 are not available if devices are logged on to the interface.

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Appendix A

The devices return an analogue value depending on their state. The table below shows these values and their definitions

AV	Definition
0	Battery pack A and B missing
1	Detector fault, sounder audio fault
2	Head missing
3	Sounder missing
4	Tamper
5	Signal strength fault, background RSSI out of range - Interface
6	Not used
7	Battery fault 30 days, A and B
8-12	Not used
13	Signal strength poor
14	Signal strength low
15	Not used
16	Normal - MCP, sounder, loop interface, I/O unit
17-19	Not used
20	Signal strength medium - detector
21-24	Not used
25	Signal strength good - detector
26-34	Not used - detector
35	Head dirty detector
36-49	Not Used
50	Pre-alarm - detector
51-63	Not used
64	Alarm - MCP
65-84	Not used
85	Alarm - detector

Note: No response to polling indicates an RF comm failure

Appendix B

Multiple interfaces - channel selection

<table>
<tr><td colspan="4" align="center">Please complete on commissioning</td></tr>
<tr><td>XPander Interfaces on Site</td><td>1st Channel Selected</td><td>2nd Channel Selected</td><td>Tick</td></tr>
<tr><td>1</td><td>Ch 08</td><td>Ch 26</td><td></td></tr>
<tr><td>2</td><td>Ch 16</td><td>Ch 32</td><td></td></tr>
<tr><td>3</td><td>Ch 01</td><td>Ch 20</td><td></td></tr>
<tr><td>4</td><td>Ch 04</td><td>Ch 23</td><td></td></tr>
<tr><td>5</td><td>Ch 12</td><td>Ch 29</td><td></td></tr>
<tr><td>Q.1</td><td colspan="2">If there is more than one XPander Interface on the site: have ALL the channels been set as above?</td><td></td></tr>
<tr><td>Q.2</td><td colspan="2">Has the XPander Interface been installed as per the survey and installation instructions, allowing two metres from electrical equipment and other XPander Interfaces?</td><td></td></tr>
<tr><td>Q.3</td><td colspan="2">Has the aerial been installed as per the survey and installation instructions, allowing 400mm from any metal object or other equipment?</td><td></td></tr>
<tr><td>Q.4</td><td colspan="2">Are ALL the device signal levels 50% or above?</td><td></td></tr>
<tr><td>Q.5</td><td colspan="2">Has the XPander site survey sheet been fully completed?</td><td></td></tr>
</table>

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Appendix C
Radio Channels

Ch1: 868.048 MHz	Ch9: 868.248 MHz	Ch17: 868.749 MHz	Ch25: 868.950 MHz
Ch2: 868.073 MHz	Ch10: 868.273 MHz	Ch18: 868.774 MHz	* Ch26: 868.975 MHz
Ch3: 868.098 MHz	Ch11: 868.298 MHz	Ch19: 868.800 MHz	Ch27: 869.000 MHz
Ch4: 868.123 MHz	Ch12: 868.323 MHz	Ch20: 868.825 MHz	Ch28: 869.025 MHz
Ch5: 868.148 MHz	Ch13: 868.349 MHz	Ch21: 868.850 MHz	Ch29: 869.050 Mhz
Ch6: 868.173 MHz	Ch14: 868.374 MHz	Ch22: 868.875 MHz	Ch30: 869.075 MHz
Ch7: 868.198 MHz	Ch15: 868.399 MHz	Ch23: 868.900 MHz	Ch31: 869.100 MHz
* Ch8: 868.223 MHz	Ch16: 868.424 MHz	Ch24: 868.925 MHz	Ch32: 869.125 MHz

* Default channels on power up.

Appendix D
XPander spares

Description	Part Number
Optical detector	XPA-OP-12034-APO
Heat detector A1R	XPA-HT-11170-APO
Heat detector CS	XPA-HT-11171-APO
Mounting base detector	XPA-WB-10022-APO
Red sounder	XPA-SO-14001-APO
White sounder	XPA-SO-14002-APO
Red sounder visual indicator	XPA-SN-14003-APO
Amber sounder visual indicator	XPA-SN-14004-APO
Clear sounder visual indicator	XPA-SN-14005-APO
Red sounder mounting base	XPA-SB-10023-APO
White sounder mounting base	XPA-SB-10024-APO
Combined sounder and detector base	XPA-WB-14036-APO
Combined sounder-visual indicator (red) and detector base	XPA-WB-14037-APO
Combined sounder-visual indicator (white) and detector base	XPA-WB-14038-APO

Appendix E
Site Survey Instructions PP2323 - see next page

Appendix F
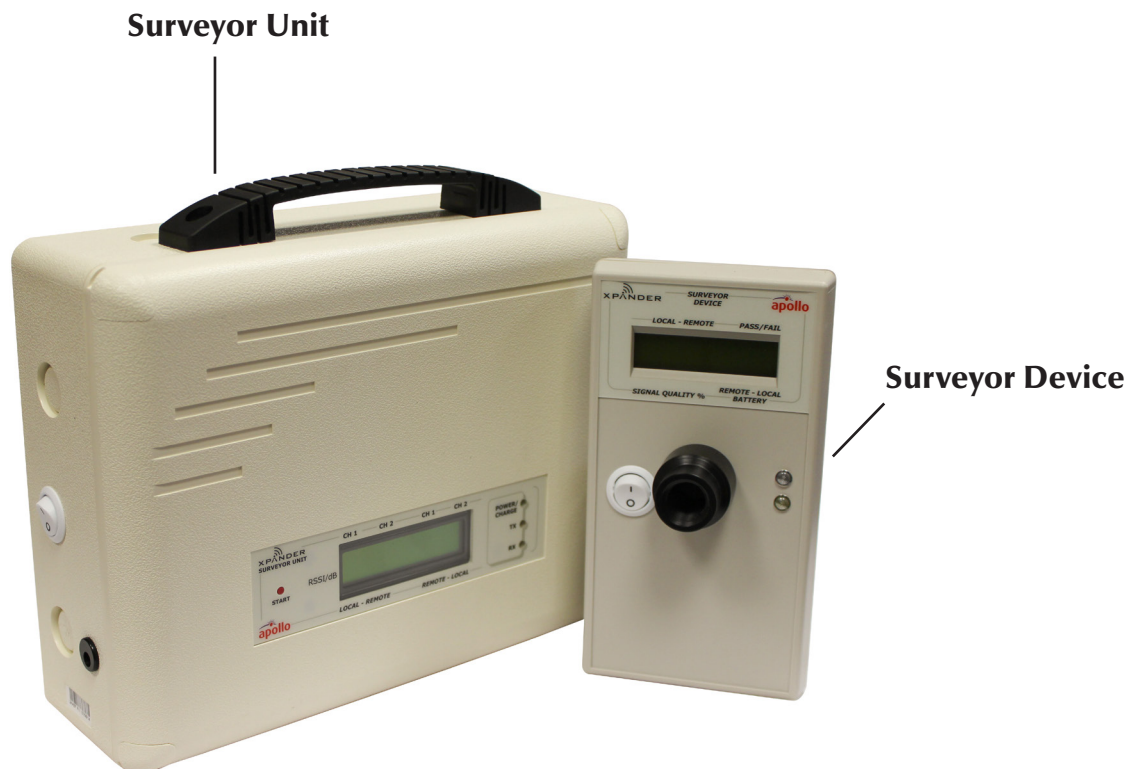Radio Site Survey Sheet - see page 17

Introduction

Radio waves have very different characteristics to wired links and it is necessary to ensure that every possible source of attenuation of the radio signal is identified and fully considered in the design of the system.

It is therefore essential that a full site survey is carried out as part of the system design prior to any XPander devices being installed. This preparatory work will ensure that good signal integrity is achieved.

The reliability of the data transmitted in the final system is determined by the site survey.

Site Survey Instructions

1. Turn on Surveyor Unit using the switch provided.

2. Position the Surveyor unit in the proposed location of the XPander Diversity interface.

    • The minimum distance of metal objects from the interface is 400mm

    • The minimum distance to other electrical equipment e.g. computers, photocopiers, fax machines and other XPander interfaces is 2 metres (three dimensionally).

3. Switch on the hand held Surveyor Device.

4. Position the Surveyor Device where the XPander device is to be fitted. Ensuring that the button on the back of the Surveyor Device is pressed against the surface where the device is to be fitted.

    • The Surveyor Device will now report the strengths, dB readings and background levels.

5. At this point record all information on the Site Survey Sheet PP2322 and then move to the position of the next device.

Surveyor Unit

Surveyor Device

XPander Radio Site Survey Sheet

SITE NAME .... DATE ....

PANEL ....

INTERFACE NUMBER .... LOCATION ....

Device	Type (O, H, MCP, S, SB, I/O)	Loop address*	Location	Approx. distance from interface	AV*	Site Survey %	Site Survey dB	Site Survey %	Site Survey dB	Background Noise Levels dB	Signal Strength			
											CH1 LI D*	CH2 LI D*	CH1 LI D*	CH2 LI D*
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
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31														

Frequencies in use*   CH1..MHz CH2.. MHz

Background noise level*   CH1.......................................%   CH2.. %

 * to be completed on installation

Building and construction notes

Status of building at the time of survey

Notes

This sheet needs to be completed and kept as commissioning and user documentation to comply with BS 5839 - 1 section 2-27 and section 5-39 & 40

Approved for installation | YES | NO |

Name

Signature