

# FIRECELL SYSTEM



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## Survey Kit User Guide



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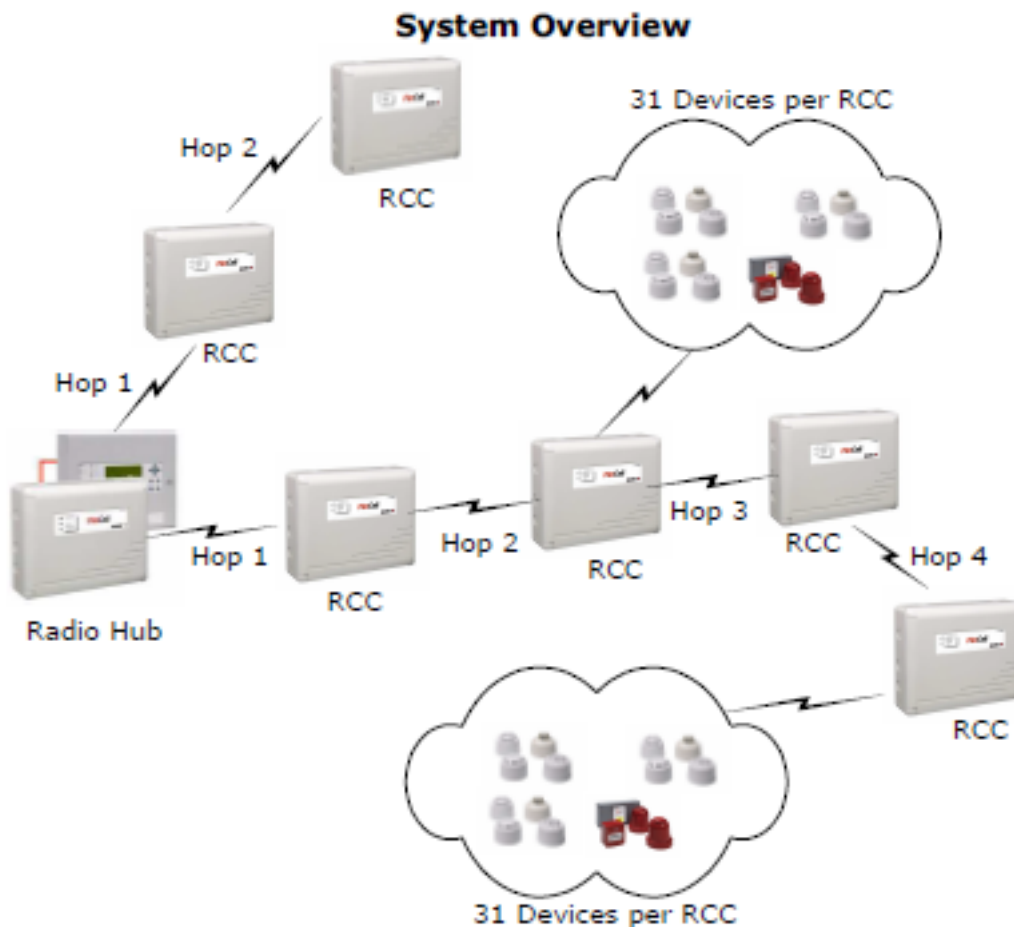


## 1.0 Introduction




- This manual provides a guide to using the EMS FireCell Radio Survey Kit.
- The EMS FireCell System comprises of a Radio Hub capable of receiving information from a maximum of 32 EMS Radio Cluster Communicators (RCC's). The RCC's are each capable of receiving information from 31 radio devices. The radio devices include Smoke, Heat, Rate of Rise and Multisensor detectors along with manual callpoints, sounders, sounder beacons and input/output units.
- The communication between devices to RCC and RCC's to Radio Hub is bidirectional and utilises the 868Mhz frequency . Note: The maximum amount of Radio Hops between RCC's and the Radio Hub is four. This is shown below in the system overview.
- The Radio Hub is available in a number of variations:- Single loop, two loop and four loop options are available. The Radio Hub communicates to a protocol compatible Fire Alarm Control panel via its loop wiring connection.
- An LCD display is provided on the Radio Hub along with function buttons to allow programming and diagnostics to be carried out for all associated devices and all RCC's.

The RCC is a wireless device requiring only a mains power connection. The unit assesses information from up to 31 radio field devices to the Radio Hub which in turn passes this to the Fire Alarm Panel.

The survey will create the foot print for the installed system, specifying the final positions for the devices and radio infrastructure. The diagram below shows a typical installation using multiple RCCs for a larger system.



## 1.1 Identification of parts

	• Device Survey Tool (part no. FC-100-SE1)
	• Signal Surveyor (2 per kit) (part no. FC-500-SE1)
	• Device Survey Pole (6 per Kit)

## 2.0 Background signal checks

Each site will have a level of background noise that may affect the signals on site. Under EN54-25 (Fire detection and fire alarm systems components using radio links), the minimum signal headroom must be checked to ensure reliable communication. This is essential to ensure immunity against site attenuation caused by environmental changes and other electrical equipment. The survey kit automatically calculates the required headroom and then displays the results. It may also be a requirement to log the background signal level for future reference.

### 2.1 Displaying background signal level



At the proposed position of the Radio Hub and each RCC, turn one of the surveyors on using switch 1. After a few seconds, the surveyor display will indicate the background signal level on multiple channels as shown below. The signal should be as low as possible; therefore it may be necessary to try multiple positions to obtain the lowest background level.

**085 045 BG RSSI**

The background levels should be noted for future reference. This can be recorded using the forms at the back of this manual.



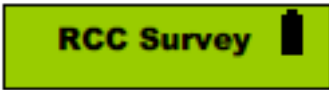
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### 3.0 RCC to Hub Survey

The RCC network is surveyed using the two surveyor units. When surveying for larger sites it is important to bear in mind that the infrastructure can be extended using hops of up to 4 RCC's communicating back to a Radio Hub. Up to 32 RCC's can be added to a Radio Hub providing that one single run does not exceed the maximum of 4 hops as shown in the previously displayed system overview.

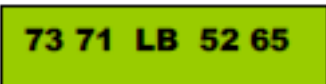
### 3.1 Infrastructure survey method

Switch on both surveyors using switch one. The units will synchronize after a few seconds and show the following display;



Position one surveyor at the proposed control panel position and the other in a suitable place within the building usually centrally where a 230v connection can be achieved. This position should be recorded as RCC1 and will become the first hop back to the Radio Hub.

Press Button 1 on the front of the surveyor and test signals will be generated. After a few seconds the results will be displayed as pass or fail along with signal strengths.



The figures shown are explained as follows:-

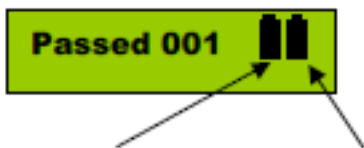
CH1	CH2	CH1	CH2
80	82 L	B 82	83
LOCAL	REMOTE	REMOTE	LOCAL

Signal received at the Radio Hub position from the RCC Surveyor on both Channels.

Signal received at the RCC Surveyor from the Radio Hub position on both Channels.

The results are displayed as Link Budget (LB) figures. This means the background level has automatically been taken into account before displaying these values. (Values range from 0-100)

Note:- A level of 20 or above on either channel is a Pass result



Hub Position Battery    RCC Position Battery

If suitable signal strengths are not achieved then the RCC1 position will need to be moved closer to the Radio Hub position and the test repeated until a suitable position is found.

Due to the size of the site and the amount of devices required it may be necessary to have multiple RCC positions this is achieved by moving the surveyor from the Radio Hub position to RCC1. The second surveyor is then moved to a new position which will be designated as RCC2. For each RCC position the above tests are repeated noting the area of coverage for devices along with the number of hops back to the Radio Hub.

#### 4.0 Device to RCC Survey

Up to 31 devices can be added to an individual RCC and each position should be surveyed for with positions and signal levels recorded.

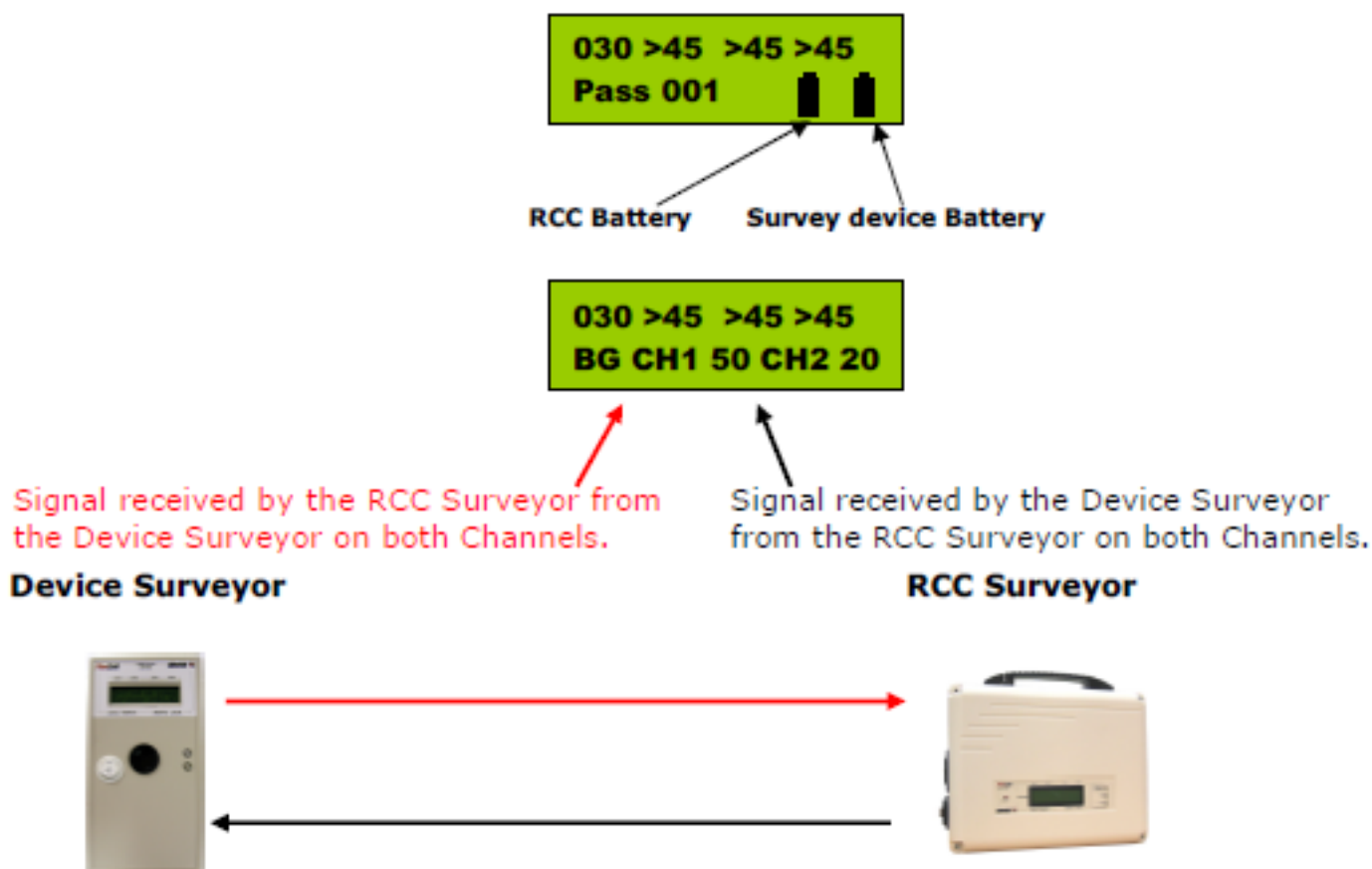
#### 4.1 Device survey method

The survey poles should be attached to the device survey tool so that tests can be carried out at ceiling for detectors and against the wall for Callpoints and sounders.

Check the surveyor display shows "Device Survey" Switch on the device survey tool, The RCC position surveyor unit should then be turned on with switch 1 whilst holding down button 1 for 3 seconds. Wait for the display on the survey device to show the following;

**Communication  
Established**

Present the device surveyor against the wall or ceiling. The unit will beep to indicate a test has started. After a few seconds results will be displayed and a high pass or a flat fail tone will be heard.



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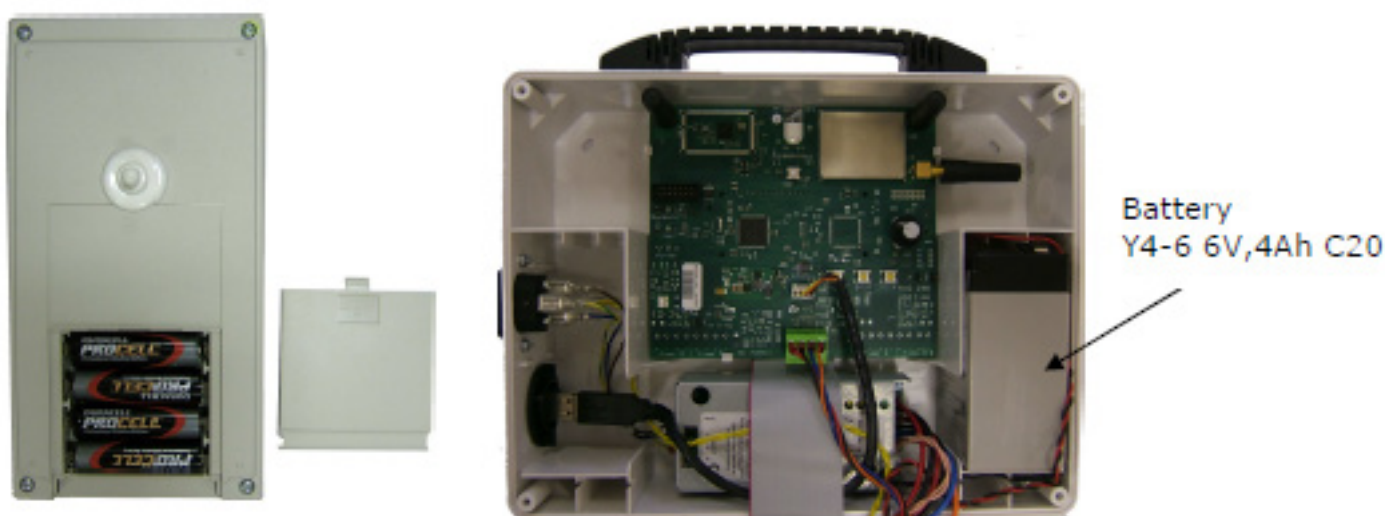
**Note:** The background levels are taken into account prior to displaying the events on the units.

If the required device position fails to pass the test then a further RCC position will need to be found closer to the device and the survey repeated.

Every device position should be recorded along with the received signal levels.

### 5.0 Charging and battery replacement

The two surveyor units are supplied with mains leads for charging purposes. They can also be left connected if necessary during the survey process. The rated charging voltage is between 100 – 230Vac +/- 10%; 0.3A at 45-65Hz. The surveyor unit can be charged with switch 1 either in the on or off position. Caution: Switch 1 does not disconnect the unit from the mains supply. If the internal battery (shown below) should require replacement please ensure the correct polarity connections are used as marked on the battery (Y4-6 6V, 4Ah C20) red wire = positive, black wire = negative. The Surveyor Device shown below requires 4 x AA (MN1500 LR6 1.5V) Batteries. Please ensure batteries are installed in the correct polarity as shown on the device case.











### 6.0 Diagnostics

The surveyor box is equipped with a USB port which is used for factory programming and diagnostics purposes. The port can be used in conjunction with Windows Hyper Terminal. Used in capture mode, this can provide a real time text file of the survey and will output the test results every time a new position is tested.



## 7.0 RSPL FireCell Catalogue

Code	Qty. Req.	Description	Image
E21FCX700440		EMS FireCell 16 zone Analogue Addressable Control Panel (not expandable) includes FCX-500-444 Radio Hub. Batteries not included.	
E21FC012009		EMS Sealed lead acid battery 12V 9A.	
E21FC000KEN		EMS FireCell Control Panel programming lead.	
E21FCX500444		EMS FireCell Radio Hub (Four Loop) XP Interface with remote aerial facility (4 x FC-868-D00 aerials supplied).	
E21FC000HUB		EMS FireCell Radio Hub programming lead.	
E21FCX532001		EMS FireCell Fusion Radio Loop Module; Loop powered (up to 5 per loop using FireCell panel).	
E21FC555001		EMS FireCell Wireless Radio Cluster Communicator includes PSU. Battery not included.	
E21FC555331		EMS FireCell Wireless Radio Cluster Communicator includes PSU. Battery not included. With remote aerial facility (3 x FC-868-D00 aerials supplied).	












Code	Qty. Req.	Description	Image
E21FC006004		EMS 6V 4Ah battery for Radio Cluster Communicator.	
E21FCX170001		EMS FireCell XP Wireless Detector Base. Includes batteries.	
E21FCX191000		EMS FireCell XP Wireless Combined Detector/Sounder Base. Includes batteries.	
E21FCX191200		EMS FireCell XP Wireless Combined Detector/Sounder and Visual Indicator Base. Includes batteries.	
E21FCX170101		EMS FireCell XP Wireless Detector Base c/w remote indicator. Includes batteries.	
E21FCX177001		EMS FireCell XP Optical Smoke Detector. For use with FCX-170-001, FCX-191-000 and FCX-191-200 bases.	
E21FCX175001		EMS FireCell XP Class A1R Heat Detector. For use with FCX-170-001, FCX-191-000 and FCX-191-200 bases.	
E21FCX176001		EMS FireCell XP Class CS Heat Detector. For use with FCX-170-001, FCX-191-000 and FCX-191-200 bases.	



Code	Qty. Req.	Description	Image
E21FC200003		EMS FireCell Wireless Red Apollo Front Manual Call Point. Includes Radio Base & batteries.	
E21FC171002		EMS FireCell Red Wireless Sounder Base. For use with audio/visual devices. Includes batteries.	
E21FC171001		EMS FireCell White Wireless Sounder Base. For use with audio/visual devices. Includes batteries.	
E21FC172002		EMS FireCell Red Sounder. Requires FC-171-002 wireless base.	
E21FC178002		EMS FireCell Red Visual Indicator. Requires FC-171-002 wireless base.	
E21FC173002		EMS FireCell Red Sounder Visual Indicator. Requires FC-171-002 wireless base.	
E21FC315WA2		EMS FireCell Red Wall Mounted Category W-3.1-11.3 Sounder/Visual Alarm Device. Requires FC-171-002 wireless base.	
E21FC172001		EMS FireCell White Sounder. Requires FC-171-001 wireless base.	



Code	Qty. Req.	Description	Image
E21FC179002		EMS FireCell Sounder Weather resistant Kit. For use with FC-171-001 and FC-171-002 wireless bases.	
E21FCX178001		EMS Wireless Remote Indicator. Includes wireless base and batteries.	
E21FC602000		EMS Wireless Door Controller (Black).	
E21FC610001		EMS FireCell Wireless Dual Input and Output unit. Includes Radio Base & Batteries.	
E21FC620001		EMS FireCell Auxiliary Relay Module. Includes 2 x 230v 2amp switching relays.	
E21FC809000		EMS AA 1.5v alkaline battery.	
E21FC810000		EMS C 1.5v alkaline battery.	



## 8.0 Survey record form

Site.....  
 Survey Date.....  
 Surveyed By.....

Customer Name.....  
 Company.....

RCC radio communication path.

Fire Panel and Radio Hub.

Location: .....

### Example 1

<b>Communication Path:</b>	<b>RCC 1</b>	→	<b>HUB</b>	<b>CH1</b>	<b>CH2</b>	<b>CH1</b>	<b>CH2</b>	<b>Pass</b>	<b>Fail</b>
				75	80	85	75	√	
	<b>Signal Level</b>			9	7				
<b>Background Level</b>									

### Example 2

<b>Communication Path:</b>	<b>RCC 1</b>	→	<b>RCC 5</b>	<b>CH1</b>	<b>CH2</b>	<b>CH1</b>	<b>CH2</b>	<b>Pass</b>	<b>Fail</b>
				60	70	65	70	√	
	<b>Signal Level</b>			9	7				
<b>Background Level</b>									

RCC 1

Location: .....

Device Coverage: .....

<b>Communication Path:</b>	<b>RCC 1</b>	→		<b>CH1</b>	<b>CH2</b>	<b>CH1</b>	<b>CH2</b>	<b>Pass</b>	<b>Fail</b>
	<b>Signal Level</b>								
<b>Background Level</b>									



RCC 2

Location: .....

Device Coverage: .....

Communication Path:	RCC 2	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

RCC 3

Location: .....

Device Coverage: .....

Communication Path:	RCC 3	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

RCC 4

Location: .....

Device Coverage: .....

Communication Path:	RCC 4	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

RCC 5

Location: .....

Device Coverage: .....

Communication Path:	RCC 5	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									



**RCC 6**

Location: .....

Device Coverage: .....

Communication Path:	RCC 6	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

**RCC 7**

Location: .....

Device Coverage: .....

Communication Path:	RCC 7	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

**RCC 8**

Location: .....

Device Coverage: .....

Communication Path:	RCC 8	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									

**RCC 9**

Location: .....

Device Coverage: .....

Communication Path:	RCC 9	→		CH1	CH2	CH1	CH2	Pass	Fail
Signal Level									
Background Level									





Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
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22							
23							
24							
25							
26							
27							
28							
29							
30							
31							



Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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27							
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29							
30							
31							



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Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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28							
29							
30							
31							



Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
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26							
27							
28							
29							
30							
31							



Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
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27							
28							
29							
30							
31							



Site:.....

Date:.....

RCC Number:.....

Devices	Signal level				Pass	Fail	Comments
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
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