

# Direct Access System Setup and Use

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## Overview

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Direct Access allows exhibitors using the ExpoTools line of scanners (including the BC600, TA600, RF600 and AT700 models as well as the RF503 series) to access their data from a website in near-real time. In addition, a web-based dashboard allows monitoring of scanners during a show. It also provides optional paging and notification functions allowing exhibitors to request assistance.



## Compatibility

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While the overall operation is best using the flag-ship AT700 touch-screen based colour scanner, Direct Access is compatible with all scanners provided by ExpoTools (whether on a rental or lease basis). BC, RF or TA series scanners must be equipped with firmware revision 3.40d or higher; AT700 scanners must be equipped with firmware version 1.12 or higher.

Wi-fi, Ethernet or 3G coverage is **not** required for Direct Access to function. Anywhere that can receive a basic cell-phone signal, and indeed many places that can't, will function with the Direct Access system.

## Character Restrictions (Badge Data and Show Settings)

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When using Direct Access (or for that matter Sidekick or SurveyMaster) there are certain characters that cannot be used. These characters are hexadecimal 0xF0 through 0xFF and the null character (0x00). In addition, the forward slash character must not be used in the Customer Name, Show Name, Booth Number or email settings, nor can it be used as the delimiter. The reason for this is simple: with the exception of the null, these characters are used for in-band signaling purposes. As to the null, no good can ever come from embedding this in data.

Note that the 0xF0 through 0xFF restriction applies to the badge and the settings; the slash restriction applies only to the settings. It is permissible for the badge data to contain the slash character.

The character set used to encode the badge should be either ASCII (standard or extended), Windows-1252 or ISO-8859-1 (*Western European*). These character sets allow for the handling of most international characters, such as accents and umlauts. The use of non-standard and proprietary character sets, such as EBCDIC or Macintosh, must not be used.

## Access Point Coverage and Placement

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The Direct Access system is based upon access points that are deployed around the venue at the beginning of the event. A conservative rule of thumb for estimating the coverage each access point will provide is “250 feet, 200 units”. In other words scanners should be within 250 feet of an access point and you will need an access point for every 200 scanners. This is not a hard-limit. Using one access point for 300 scanners will not cause it to fail; however, quality of service will degrade, increasing the delay between when a scan is made and when it is available on-line. Similarly, being at 260 feet from the Access Point will not cause it to fail; the 250 foot limit has a certain margin built-in to it.

## Access Point Set-up

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Setup of the Direct Access points is extremely simple. When used with our web-services server, there is no network setup or configuration required whatsoever. Simply follow this 4 step-process:

- Select a suitable location near AC power
- Screw in the removable antenna (the one next to the red power button; that the antenna on the back right hand side is not used in most applications – you can safely ignore it).
- Stand all the antennas so they are vertical.
- Press the power button.

The Access Point will now perform a self-check and then attempt to connect to the network. While trying to connect the network status light (the one on the front right) will flash red. Connecting to the network can take several minutes. Once successfully connected, the network status light will flash green. The display will also show either ‘No Net’ or ‘Net OK’, but the status light is easier to see from a distance. If you don’t get the ‘Net OK’ message within five or ten minutes, verify that the antenna is properly installed.

Once operational, the LCD display on the Access Point will show the number of scanners that have connected to it since the last power up as well as the ESN's of the units connecting to it at that point. The three green LEDs on the left-hand side also light up when a unit is transferring data.

### **Access Point Placement**

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Although shows differ tremendously in their layout and average booth size, some rough guidelines will help you set up the system. It should be stressed this is based upon averages and several assumptions; many, if not most, shows will conform to these guidelines but some will diverge dramatically. We welcome the opportunity to provide advice on the number of access points required for a given show ahead of time.

### **Corner Placement**

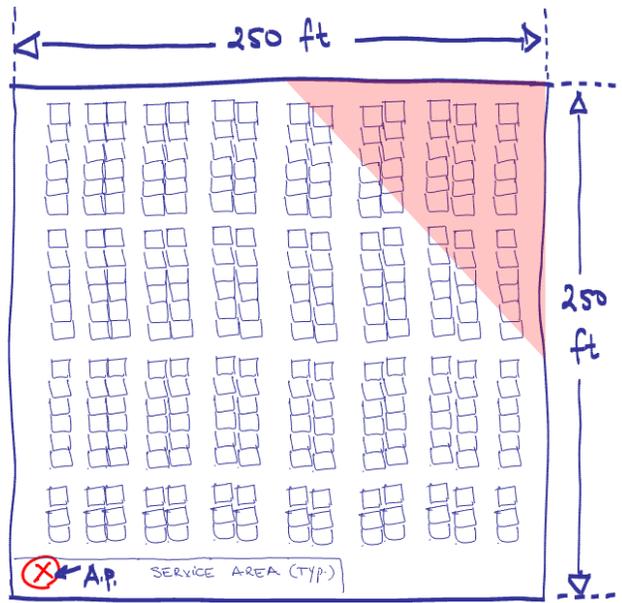
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The average booth is ten feet by ten feet with an additional ten feet of aisle space, making for two hundred square feet per booth. Note that many exhibitors will take double or larger booths. However these make up less than ten percent of the attendees at most shows. The average therefore remains at approximately two-hundred square feet per booth (examining the floor plans from actual shows, we have found the average to be remarkably close to 208 square feet per booth on a consistent basis).

Placed at a corner of the show floor, a single access point will cover 250 by 250 feet, i.e. 62 thousand square feet, although coverage will be somewhat ragged at the extreme end (i.e. the shaded area).

At an average of 200 square feet per booth (after factoring in aisle space), 62 thousand square feet correlates to just over three hundred exhibitors. Rental rates (i.e. 'up-take') typically range from 30% to 70%. Under these conditions a single Access Point would cover all the exhibitors.

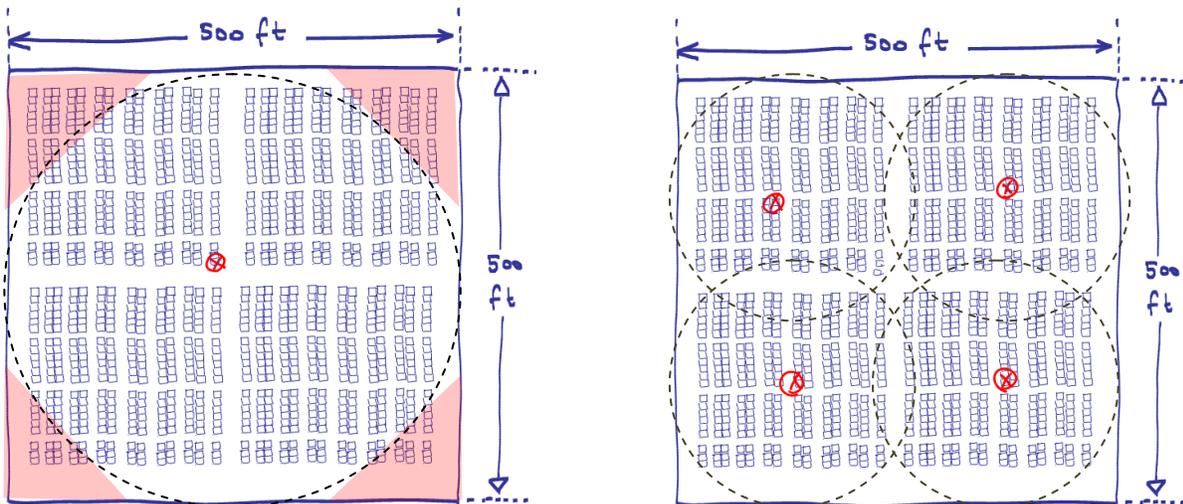
If every exhibitor were to use a scanner (and depending upon the rate of scanning), the capabilities of a single access point would be pushed to its limits; it would function, but the transmission lag would be substantial. Under such conditions, a second Access Point would be a good idea. However, most events do not have a full 100% penetration rate and a single Access Point would be sufficient in most cases.



### Central Placement

Placed in the centre of the show, a single access point will cover 250 feet in each direction, i.e. 500 by 500 feet, which works out to a quarter million square feet.

Once again using an average of 200 square feet per booth, 250 thousand square feet corresponds to over one thousand exhibitors. This would severely exceed the capacities of a single access point. In this case, the applicable portion of the rule of thumb is the number of scanners per Access Point. To handle this many exhibitors (assuming most of them rent scanners), you should bank on about four Access Points, possibly five. These could be placed near each other, which will alleviate zoning problems, or spread around the premises, which will provide much better results. However, if only one or two hundred exhibitors are renting a scanner, a single Access Point might be enough, although once again the shaded areas may require special attention to ensure coverage.



## Improving Coverage in Fringe Areas

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In many cases coverage will be acceptable for most exhibitors but a small number of fringe areas (such as behind a pillar, near large metal structures or at the diametrically opposite end of the venue) will have poor coverage. This can be alleviated by elevating the Access Point to six or eight feet (i.e. placed above the average booth height). This reduces the attenuation of the surroundings. It is not a requirement for operation. However, it is generally very easy to do, improves signal strength significantly, plus it keeps the Access Point out of the reach of curious fingers.

## Operation without AC Power

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The Access Points are equipped with an internal battery for brief operation when power is not available. They are not meant to be operated in this manner for any significant length of time; they should be connected to a source of AC power using the supplied power adapter. You should not expect the internal battery to last more than four hours, although this will vary with the number of scanners connecting to the Access Point and how often they scan.

## Security

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The Access Points used are non-descript and quite frankly uninteresting from a theft perspective (i.e. they are not laptops or other equipment with theft-appeal). However, **they are the responsibility of the contractor should they be stolen**. As such, each Access Point is equipped with a metal slot compatible with a standard laptop theft-deterrent cable should you choose to employ one.

## Assigning Scanners to Access Points

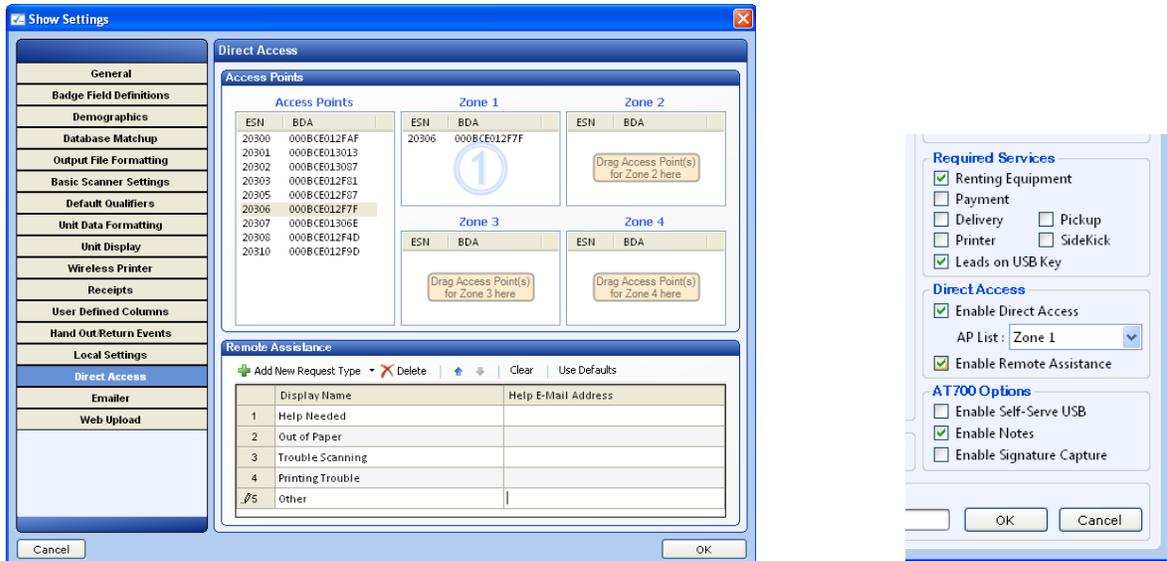
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### Using a Single Access Point

In most cases, there will only be one Access Point required at a show. This makes the process of zoning and assigning scanners to an Access Point extremely simple: everything goes on the only Access Point around.

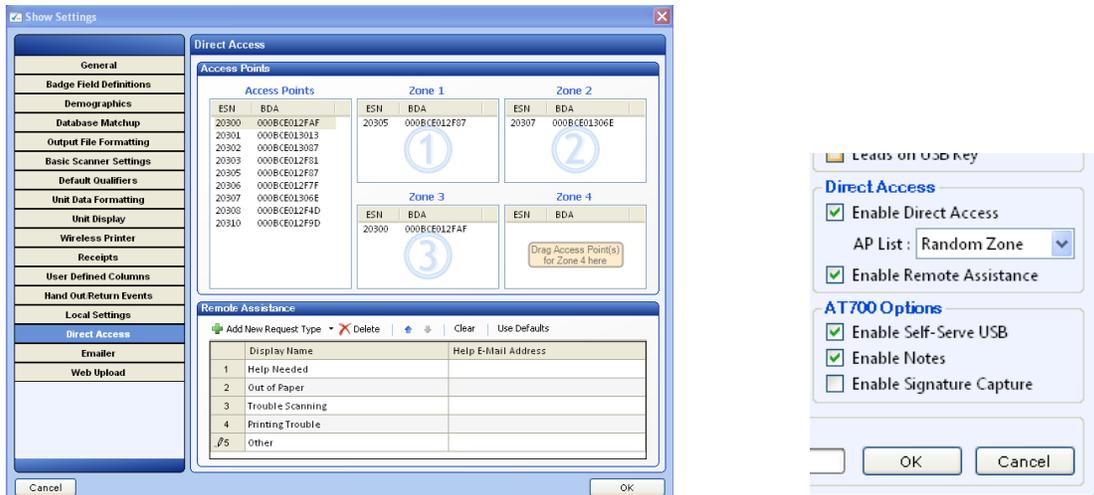
There are two ways of doing this: through ShowMaster or using a specially produced Show Identification and Linking barcode (this can be provided by the warehouse when the rental order is fulfilled). Note that of the two, **the use of ShowMaster is recommended** as it reduces the likelihood of any process or handling errors.

You will first need to let ShowMaster know which Access Point is being used. This is done from the Show Settings/Direct Access tab. Simply drag the Access Point that was provided from the list into the box labeled 'Zone 1'. In addition, you will need to assign all of the units using Direct Access to either 'Zone 1' or 'Random Zone'. The latter approach is a little sloppy but works out to the same thing since the system will only randomize zones from ones with Access Points specified.



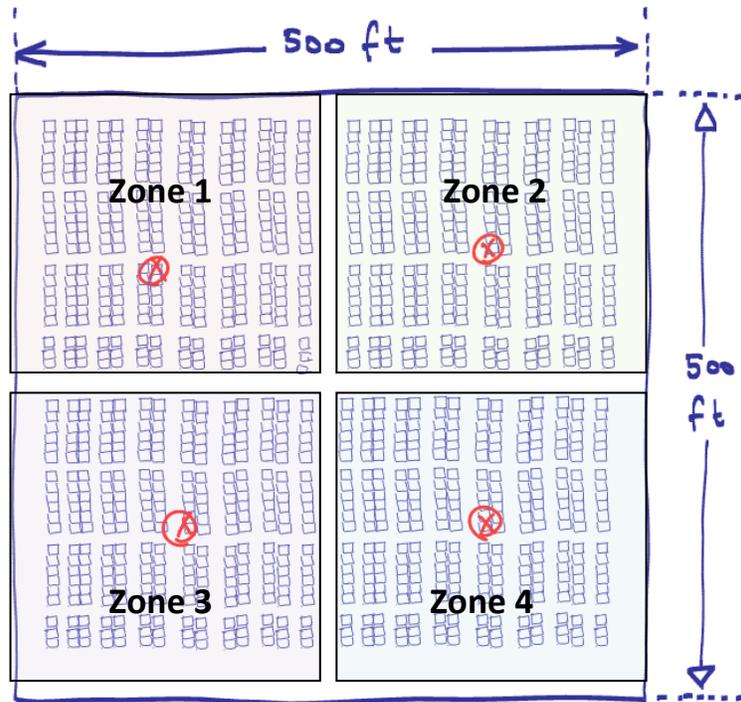
### Using Multiple Access Points

As mentioned in the placement section, there are two reasons for using more than one Access Point: either because the number of scanners being used is too high for a single AP to handle effectively or because the show is physically too large for the range of the AP. In the first case, all the Access Points will likely be in range of all the scanners. It is simply necessary to split them up to spread the load on all the APs. In this case, set up the access point zones as before by dragging the supplied AP's into the zone boxes and leave the AP setting for all the scanners to 'random'. For example, if using three access points in this manner, you might set things up thus:

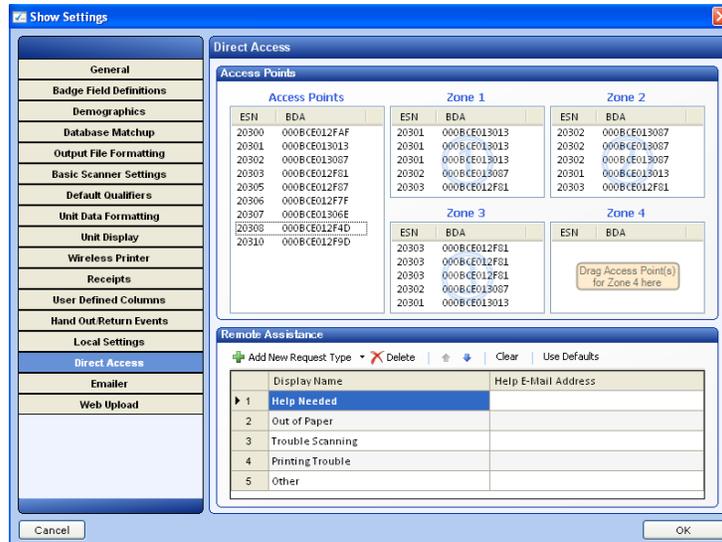


Each scanner will be randomly assigned to one of the three active access points, spreading the load evenly.

In the case where multiple access points are being used to provide not only coverage for a greater number of units but also to increase the range, things are a little more difficult. The best approach is to first break up the floor-plan into distinct zones using the rules given in the placement section (such that no zone has more than 200 scanners and none are further than 250 feet from the Access Point). Then, using the exhibitor's booth location, assign each one to a given zone.



If exhibitors always wound up at their pre-assigned booth number, this is where the process would end. Unfortunately, booth assignments are routinely changed at the show, so it is impossible to pre-assign scanners to a given zone ahead of time with 100% accuracy. To address this issue, ShowMaster and the Direct Access system allow you to assign *multiple access points to a given zone* (up to a maximum of 10 per zone). This allows you to instruct a scanner to attempt to link to a given access point but, if unable to reach that one, to fall back on a different one. In addition, you can sculpt the 'desirability' of an access point for devices in that zone by embedding it more than once in the AP list. For example, the following screen shot shows how to set up three zones and to tell the devices in each zone that they should prefer enrollment with 'their' access point three times more than the fallbacks:



## Field Testing the Placement and Verifying Operation

Once everything is set up, with the Access Points on the show floor and linked to the scanners through ShowMaster, you are ready to walk test the system. This is fairly easy, but note that for the test to be meaningful it must be performed once all the booths have been set up. An empty show floor yields a much greater range than one filled with booths, lights, computers and people.

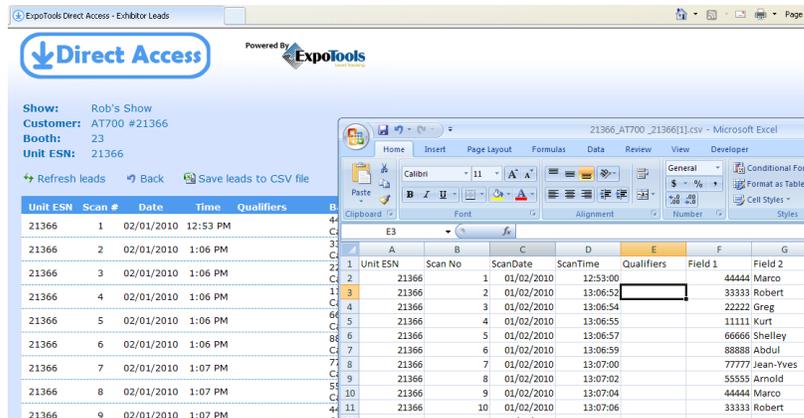
The process is simple: using a scanner linked to the access point in question, send a scan and wait for it to go through. Once it has gone through, you can see the signal strength in the settings menu – look for the text next to ‘AP MESS:’ (which stands for ‘access point message’). This contains information sent back from the access point to the scanner and contains the time the data was received (DEST), the length and, most importantly, the signal strength.

The signal strength will range from a high of +00, which represents the best possible signal, all the way down to -32, which is the lowest signal that can still allow data through. Signal strength of -16 to -24 is typical. Below -26 things are approaching the limit, and below -30 things are getting dicey.

If the data cannot get through, or if the signal strength is too low, you will need to relocate the Access Point, add another Access Point or not use Direct Access with that unit or customer. Note that when that unit drifts back into range, the scanner will attempt to off-load its data, so walking the unit over periodically is an option when all else fails, although not an especially sophisticated one.

## Accessing the Data

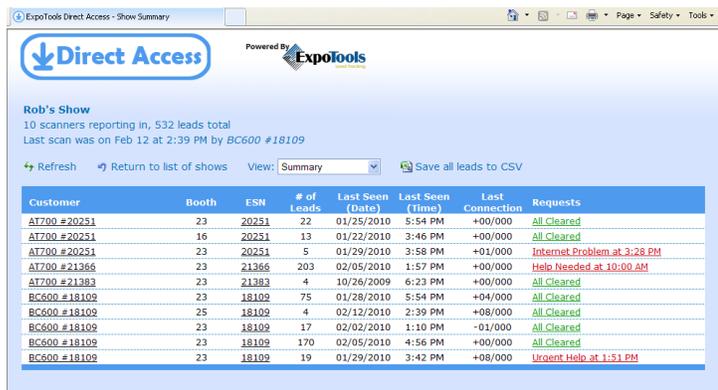
During the show, either you or the exhibitor can use their login code to view their leads in real-time. They can view their data using any web-browser and, should they wish to, they can save the data to an Excel compatible file right then and there. Note that these features are only available to them if you provide the login site, username and password, giving you complete control over who has real-time access and who doesn't.



**Tip: if using ShowMaster on a computer with a Bluetooth interface, you can provide the exhibitor with his username and password using an Expotools wireless printer – see ‘Show Settings / Local Settings’ in ShowMaster**

## The Dashboard

Part of the Direct Access system consists in getting the data from the units to the server where exhibitors can access it. The more interesting part however is the web-based dashboard intended for use by the contractor during the show. It shows, at a glance, the different customers at a show, how many scans each has, who might be having trouble and who has requested assistance.



The Dashboard shows all of the scanners that have reported to the system (through whichever access point they were assigned to or that they found). The customer name, scanner ESN and booth number are shown along with the number of scans received thus far, when they were last seen and their signal strength. Clicking on any of the exhibitors will show their scans and any notes or qualifiers.

For convenience, the ‘last seen’ column is colour-coded to show the status of the scanner:

- A *green* background indicates that the scanner has sent all of its data and has scanned within the last hour.
- A *white* background indicates that the scanner has sent data recently but still has more data to send. This is an active device and is not a cause for concern, but don’t turn it off yet – it’s still sending.

- A *yellow* background indicates that the scanner has sent all of its data and has reported in within the last hour, but that a scan has not been received recently. These are good candidates for a booth visit as the customer may be experiencing trouble scanning.
- A *red* background indicates that the device has not been seen at all within the last hour. It is either out of range or the device is turned off. You should follow up on devices that display a red background during show hours, but note that at the end of the day all the devices will go red as they are either turned off or brought out of the exhibit hall. The next day they will turn green again as the exhibitors start scanning again.

***Tip: a great application for this is the last day of a show: anyone who hasn't scanned for a couple of hours is a good candidate for early pick-up, reducing the chaos at the very end and the likelihood that they will pack up the scanner at the end of the show.***

## Assistance Requests (Paging)

If enabled, the exhibitor can send assistance requests through the Direct Access system.

ExpoTools Direct Access - Show Summary

Powered By **ExpoTools**

**Rob's Show**  
10 scanners reporting in, 532 leads total  
Last scan was on Feb 12 at 2:39 PM by BC600 #18109

Refresh Return to list of shows View: Pending Requests Save all requests to CSV Clear pending requests

Customer	Booth	Assistance Request	Action	ESN	# of Leads	Last Seen (Date)	Last Seen (Time)
BC600 #18109	23	Urgent Help on Jan 29 at 1:51 PM	Clear It!	18109	19	2010/01/29	3:42 PM
AT700 #20251	23	Internet Problem on Jan 29 at 3:28 PM	Clear It!	20251	5	2010/01/29	3:58 PM
AT700 #21366	23	Help Needed on Feb 02 at 10:00 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Electrical Help on Feb 02 at 10:00 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 10:00 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 10:01 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 10:01 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 10:03 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Electrical Help on Feb 02 at 10:10 AM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 3:51 PM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Urgent Help on Feb 02 at 3:52 PM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 02 at 4:29 PM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Urgent Help on Feb 02 at 4:29 PM	Clear It!	21366	203	2010/02/05	1:57 PM
AT700 #21366	23	Internet Problem on Feb 05 at 11:08 AM	Clear It!	21366	203	2010/02/05	1:57 PM

The requests themselves are programmable and can be set-up to reflect which problems you wish to service. Each request can be viewed through the dashboard using a web-browser from anywhere in the world. Additionally, the assistance request can be pushed to an email address or to a cell-phone as an SMS message (*fee applies to SMS push*). Plus, the email addresses or cell-phone push numbers can be altered at any time through the web-based dashboard.

ExpoTools Direct Access - Show Settings

Powered By **ExpoTools**

**Assistance Request Setup**  
3.40a tests (ID #AA93949676)

Refresh Return to list of shows

Display Name	E-Mail Address	SMS Number	Command
Help Needed	lr_help@contractor.com		Edit Delete
No internet	internet_pb@schmartCity.com		Edit Delete
Out of Paper	lr_help@lrcontractor.com		Edit Delete
Ready for Pickup	lr_pickup@contractor.com	514-555-6666	Edit Delete

**Add New Request Type**

Display Name:

E-Mail Address:

SMS Number:  (ex. 514-555-5555)

**\*\*A fee of \$0.10 USD will be charged per SMS message sent\*\***

Assistance requests can be cleared from the web-dashboard. Each is time-stamped as to when it was cleared and by whom. A report can be downloaded during or at the end of the event showing how long it took for a request to be serviced.

**Tip: when using printers, an 'out of paper – need refill' assistance request can be helpful to both you and the exhibitor. Also, a 'Ready for Pickup' request can make servicing clients who have contracted for pickup easier.**

## Data Safety

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The Direct Access system maintains multiple copies of all data and automatically mirrors all data to two separate servers (one reserved for contractor use and a separate one for exhibitors to access their data). Network disruptions, being out of range or power outages will not cause the loss of data. Any unsent information is stored by the system and then sent when the system returns to normal. Plus, all information is still available in the scanners themselves for download in the normal manner using ShowMaster.

## Web-Sites for Direct Access

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Two separate sites are maintained: one for contractor use and one intended for exhibitors. These sites are identical in all respects but one: only the contractor site should be used for handling the different aspects of Assistance requests. This includes modifying the linked email addresses and SMS phone numbers as well as clearing requests.

The Contractor site is: [expotools.dyndns.org](http://expotools.dyndns.org) (note there is no 'www' in this address)

The Exhibitor site is: [www.expotoolsdata.biz](http://www.expotoolsdata.biz) (this is the one you should place on the receipts)

## Assorted Notes

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Access Point versions prior to 1.09 showed the received signal strength as a *hexadecimal* number for +00 to -1F with the cutoff being -20 (hex). To make this less obtuse, this was changed to a *decimal* value from +00 to -31, with the cutoff at -32 on newer versions.

Although it is not mandatory, we strongly recommend using ShowMaster when using access points as it will handle all the setup and configuration of the devices to work with the access point(s). Two often overlooked points apply here: remember to enter your customer code in the very first panel of the Show Settings wizard (make sure it is correct; this cannot be changed once the show is created) and be sure to enable Direct Access for each exhibitor that will be using it in the exhibitor manager.

