**D-Tech IP People Counter**

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#### Document History

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| --- | --- | --- | --- |
| **Date** | **Version** | **Changes** | **Responsible** |
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**Scope of the Document**

This document covers the hardware and software that is included in an IP people counter installation. The document is designed to inform the customer of the requirements needed to be in place to install the equipment purchased. This information is correct at the time of release, if you are unsure then you must contact D-Tech. This document is not meant to be a final specification for the completed works and D-Tech is not liable for any changes to third party software.

This document covers the following components

* + - IP Counter Hardware
    - IP Software Application

# Company Profile

* 1. ech International Limited is an independent privately owned Company. The Company was formed in 2002 and successfully established itself as one of the UK’s leading IP based people counter together with it full range of Library RFID products

With an impressive record of continuous growth, D-Tech has been committed to service the library and retail industry since its inception. Our clear strategic mission is to achieve excellence and leadership in the market we serve. We believe that to continue the present growth and success of D-Tech we must maintain commitment to our core values.

Thus the following strategic aims and objectives have been identified as crucial to our future development:

* + - The Company will continue to pursue a policy of organic growth and acquisition
    - To deliver quality products, on time
    - Design, Develop and Manufacture in the UK
    - Develop new products
    - To guarantee comprehensive support that our customers can rely on
    - To constantly review and advance our quality systems
    - Investing in our people, promoting employee pride and satisfaction through participation and reward

# IP Counter Hardware

The IRC3000 is a thermal imaging device that detects body heat and converts this into counts. This high performance product has a 98% accuratcy together with invisibility to the users.

## Key advantages



* + - IP Based
    - Improved Algorithms
    - Configuration for each specific site
    - High performance
    - Ease of installation
    - Remote set-up over IP
    - Back-up and Restore
    - Wide openings
    - Power Injector over CAT5
    - Adjustable count lines (In and Out – Left or Right)

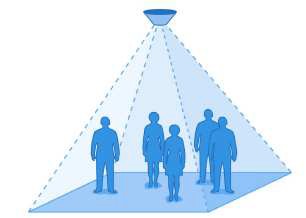
## People counter Principles

The D-Tech People Counter is downwards looking.

* + - Counter should look straight down.
    - The area on the ground is a square whose size is dependent on the height of the counter; see the Mounting Height Graph Fig 1.

An UNOBSTRUCTED view of the area beneath the counter is essential.

* + - Ensure in-store posters and signs do not obscure the counters view or under counting could occur.

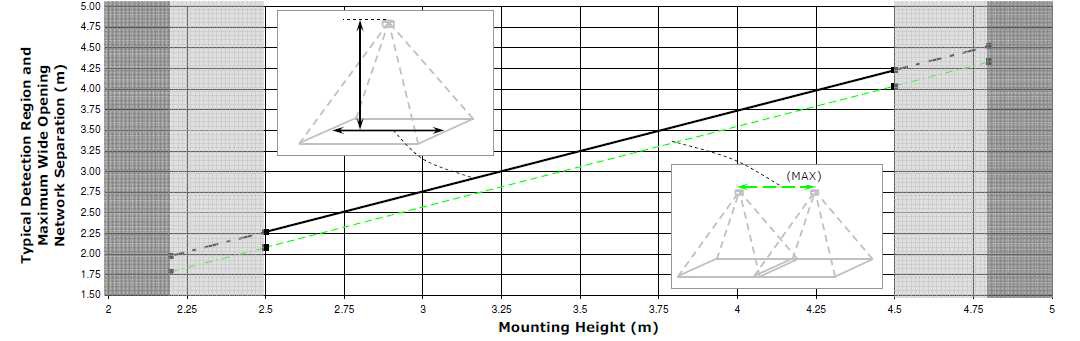


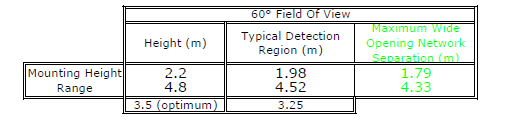
It counts moving FREE-FLOWING People.

* + - Avoid areas of stationary people, for example, waiting or queuing areas, customer service desks etc.
    - If people become crowded within the field of view then accuracy may be reduced.
    - The setup software must be used to configure the counter for correct operation and system integration, as well as to understand what the people counter is ‘seeing’ to ensure it is consistent and valid.
    - As part of the installation and commissioning of each counter the installer should view the count data from the data logger to ensure the counter is integrated correctly and count data is available.

Mounting Height Graph Fig 1



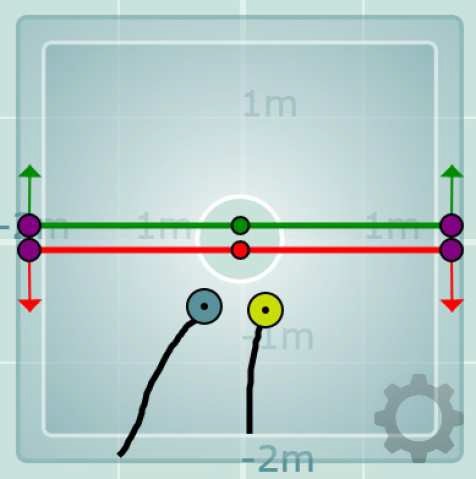


NOTES:

1. The Typical Detection Region (solid line) indicates the maximum reliable coverage for a single counter mounted at the given height, however this will be reduced in the direction of motion due to normal initialization constraints
2. The dashed line indicates the Maximum Separation in 'Wide Opening Network' counter
3. The line endpoints indicate the recommended mounting height range. The optimum height is in the middle of the range (3.5m high).
4. Between 2.2m and 2.5m, and between 4.5m and 4.8m, counting accuracy may be reduced slightly (the light gray hashed area).
5. Do not mount the counters below 2.2m or above 4.8m.

## What the D-Tech counter “Sees”



The people counter ‘sees’ the temperature differences between person & background and interprets these signals in order to identify individuals as they walk underneath.

* + Works on temperature difference and not absolute temperature.
  + People may be hotter or colder than the background. (Temperature sensitivity is

approximately 0.5 ºC)

The algorithms within the device interpret the signals and provide the user with a simple display showing people as moving dots against a blue background.

* + The counter may lose a person who stops in the field of view as it relies on temperature

difference caused by people movement – when they move they will be

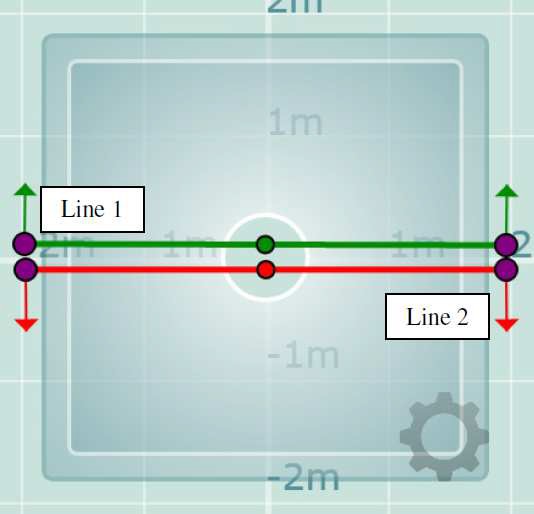


detected again. It takes up to 10 seconds of inactivity before a person is lost to the counter.

* + People are ‘tracked’ through the field of view, and their size, path, direction and speed, are all used in the counting process. The black tracking line behind each target is the route that the target was tracked through.
  + The counter does not emit anything, it only detects naturally occurring infrared emitted from the body as heat – it is a ‘passive’ device (not an ‘active’ device).

Two count lines are provided; these must be positioned correctly for the actual counting (see next sections).

## The Count Lines



Two independent ‘count lines’ are provided in each master counter.

* + The count lines are configured as part of the installation process.
  + Best performance is always achieved by fine adjustment of the count lines’ position and shape.
  + Count lines are configured across all units in a wide opening network of counter units.

The ‘arrows’ indicate direction of counting.

* + A person must cross the count line in the indicated direction. If a person crosses a count line against the direction of the arrow a count increment will not occur.
  + Generally, one count line counts ‘IN’ traffic, the other count line counts ‘OUT’ traffic, but lines can be configured as required.
  + A number of different count modes are available by the installer, see next section.
  + The lines work independently from each other – you do not have to cross one line then the other in order to generate a count increment. But, depending on the count mode selected they will interact with each other, see following sections.

## The counting Modes

A count increment is registered dependant on the count logic mode selected. Count modes available for selection are:

1. Immediate increment on line crossing.
2. Deferred increment given when target leaves the field of view. 3.

Each mode has a further option which can be enabled or disabled, which gives a total of four distinct counting modes.



It is the installer’s responsibility to select the appropriate counting mode based on;

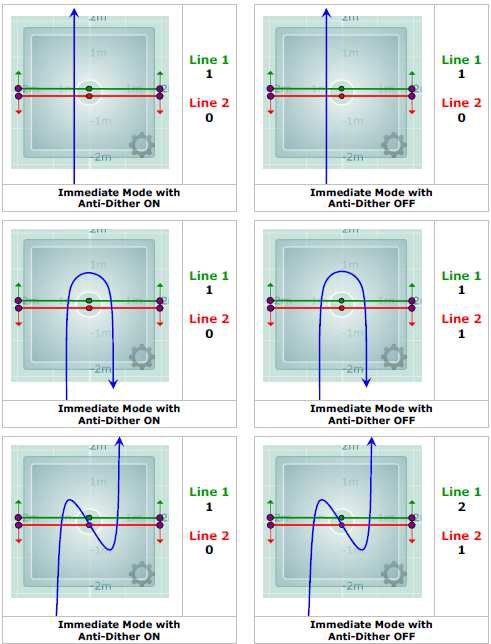
* + The line positions
  + The behavior of people
  + What you want to count
  + What you don’t want to count

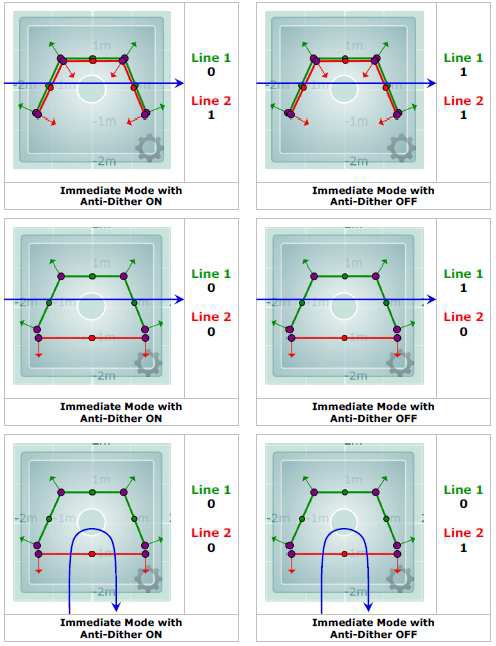
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In most cases, the default mode will be optimum but this may need changing for certain situations.

## Immediate Count Mode

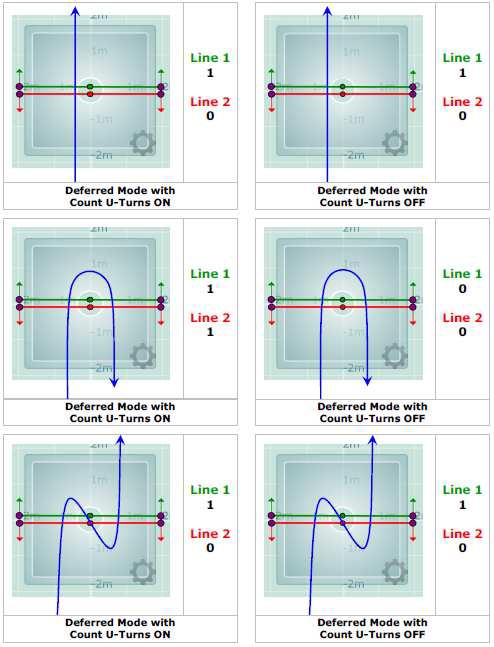
With Immediate count mode, a count increment is given as soon as the first count line is crossed, in the correct direction. If the ‘Anti-Dither’ option is ON then that will be the only count, but if it is Off then every other line crossing will also be acknowledged and an increment given for each crossing.

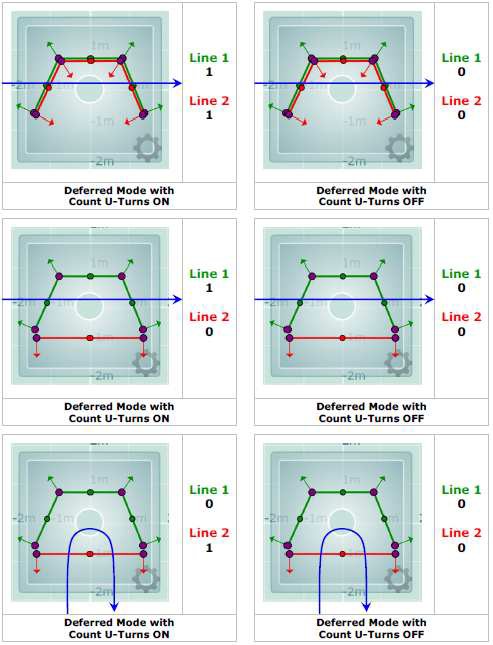




## Deferred Count Mode

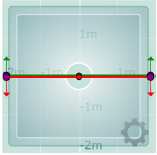
With Deferred count mode, a count increment is given only when the person has left the field of view of the counters and the master counter has considered all the line crossings, including any wrong way crossings.



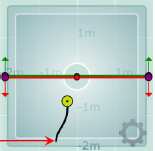


## People Counter Principles: Initialization

The counter requires a certain amount of time and space to detect a person entering the field of view. This is built-in to the counters tracking routines to make sure that they are reliable.



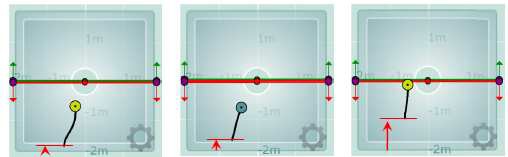
1, Sequence of events is as follows: Temperature change detected – this is usually at the edge of the field of view but not always – this is not shown to the user.



1. Counters Assigns Target – target initialized – and target tracking begins.
2. Target crosses count line and leaves field of view.

The time taken for a person to be initialized as a valid, track-able, target depends on a number of things, such as:

* + Speed person is moving
  + Temperature contrast between person and floor Initialization time can therefore vary from person to person:



Always allow sufficient space between the edge of the field of view and the count line to ensure that a person is detected as a target before the line is crossed. This space is called ‘initialization’. A circular identifier in the counter set-up software screen shows initialized targets. The exact requirement is dependant on the particular environment – walk testing is advised. If possible, maximize the initialization space by placing the count line as far away from the edge where the people enter as practically possible.

## People Counter Installation: Basics

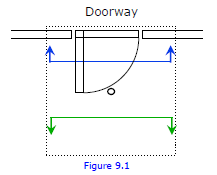
The counter is typically installed near entrances or exits to count people entering and leaving an area.

* + The counter is a downward looking device.
  + Select a central location with a clear unhindered view of the scene. Visualise the counter as seeing a pyramid and attempt to locate the counter such that the count lines are at the centre of the field of view. This should allow for adequate initialization in both directions.
  + Select a location where people move freely into an area, avoid queues, areas where people bunch or gather or areas where people are stationary. For example, select an area inside the entrance where people have entered and are moving steadily away from the entrance.
  + Avoid pinch points or areas where people bunch together or queue.
  + Measure the mounting height; this should be above 2.2m and below 4.8m for height range (3.5m). Other lens options will soon be available for mounting the standard 60° lens unit - the ideal mounting height is in the middle of the above 4.8m.
  + Measure the width of opening (measure that part of the opening where people pass through).
  + By comparing the height and width with that on the Mounting Height Graph you will be able to judge whether one counter is sufficient for your particular environment. If one counter cannot sufficiently monitor the width then more than one counter will be required to span the opening. Wide Opening Networks such as these can be up to 8 units (and greater in some circumstances – contact D-Tech for guidance). All units connected, as a wide opening network must be positioned in the same orientation.
  + The counter can be mounted on solid, or suspended, ceilings.
  + A 3-5cm hole should be drilled into the ceiling above the counter to allow connection cables to be fed through.
  + The counter uses very little IP bandwidth and it is recommended that the port speed of any managed switches is fixed at 10Mbps or Auto negotiation is enabled (at which point a 10Mbps connection will most likely be established). Port speed should not be set to 100Mbps.
  + Install the counter at the selected location. If you have any doubts about the location then a temporary installation should be made and the people counter output should be carefully observed using the setup software.
  + Shape and position the count lines as required. Remember, the optimum line positioning is the key to accurate counting. Always walk test thoroughly to confirm accurate counting.
  + Observe the counter output and fine-tune the count lines to achieve optimum performance. This is best done by observing people moving through the scene and observing the counter operation.

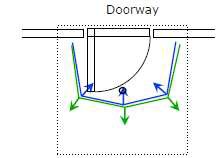
## People Counter Installation: (Doorways and Entrances)

A door will interact with the count line in circumstances where a temperature difference exists between the outside of the door and the interior temperature (this is common place, especially if the door opens from the outside). Rotating doors and sliding doors should be catered for in the same manner (as again a temperature differential will exist).

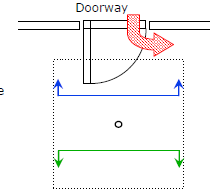
* Avoid mounting the counter over a doorway where the door opens into the scene, where possible. In some circumstances the door will cause false counts



* + Customise the count line to surround the doorway. This prevents the opening and closing of the door from generating false counts whilst ensuring that people who pass along the wall are also counted.



* Do not move the counter too far away from the door so that an opening is formed. People who are not seen in the field of view will not be counted and accuracy would therefore be affected.



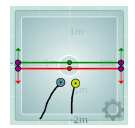
* The counter works best for free-flowing groups of people.
* If people stop in the field of view or bunch up in such a way that there is no observable separation between people then the counting accuracy will fall.
* Stationary people, who come to a standstill due to obstructions or queues in their path, may not be counted, or could be counted multiple times.
* Mount the counter to avoid the following situations wherever possible:

1. Static groups of people or queues.
2. Very dense groups of people or crowds.
3. Bunching or queuing caused by pinch points or obstructions.
4. Door security staff, meet and greet staff, floorwalkers etc.
5. Tills, service desks, kiosks etc.
6. Security checkpoints and ‘stop & search’ areas.

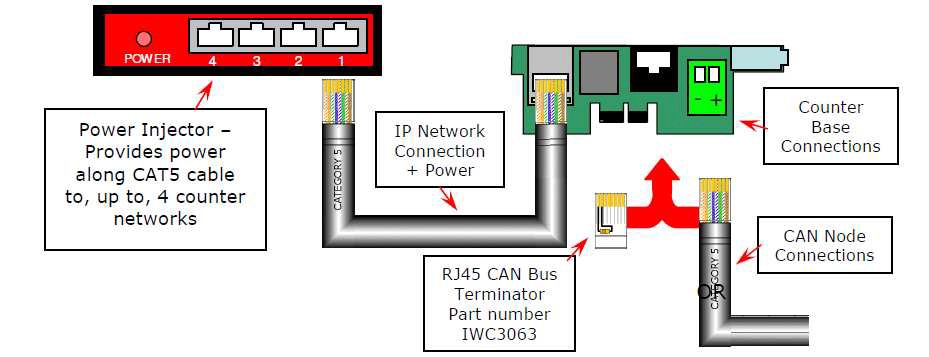
* Always check the position of the ‘Discrimination Sensitivity’ slider to ensure correct counter operation and therefore count data accuracy. If groups of people are being under counted then the sensitivity should be increased so as to pick out individuals, and subsequently, it should be lowered if individuals are being incorrectly recognized as two or more targets.

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* The IRC3000 series counters incorporate an automatic couple counting function enabled by default (this can be disabled if necessary). When enabled, and using the height information and Discrimination sensitivity slider setting, two people walking next to each other will be recognized as one large target thermal mass. The couple counting algorithm will activate and treat that one ‘target’ as two people, which will generate an increment of two if it crosses a count line. A target that is deemed to be two people is coloured blue. A target that is deemed to be a single person is coloured yellow. Correct setting of the discrimination sensitivity slider is required for this function to behave correctly

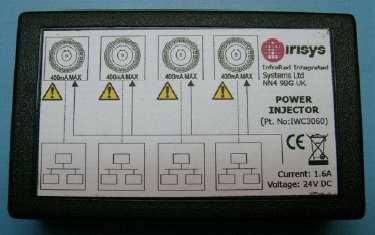


The D-Tech Power Injector (part number IWC3060) allows simple deployment of power over CAT5 on, up to, four channels (four separate doors) in order to provide power to the D-Tech series 3000 people counters. This allows a simple single CAT5 installation from the door/entrance back to the network switch without the need for an additional power cable. **Note: this is not a Power over Ethernet (PoE) compliant device.**

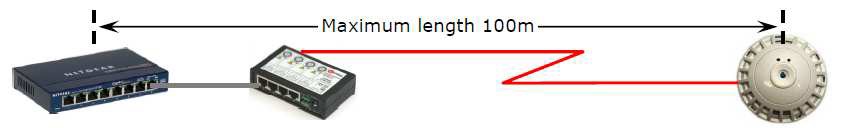


## Installation

* 1. Install the power injector between the counter and the network hub/switch to provide power along the CAT5 cable. Do not connect any CAT5 cables at this point – damage could be done to other network equipment if cables are incorrectly connected.



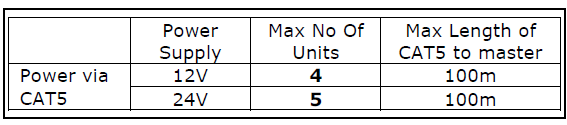
* 1. Connect the CAT5 cable from the counter to one of the ports on the power injector as indicated by the counter symbol, as shown.
  2. Connect the network connection from the switch/hub to the corresponding port opposite the port used for the counter connection, as indicated by the network symbol. If connecting directly to your computer instead of through a network device, then use a crossover cable here. Continue in this way connecting counters and corresponding network connections as required.



The Power Injector utilises the spares wires on a standard IP cable, therefore the maximum cable length, from the switch to the master, of 100m applies

If connecting counter nodes to the IP master, care should also be taken not to exceed the maximum number of units connected to the master. Connect the RJ45 CAN bus terminator to the last free RJ45 socket on the counter network.

Make a final check that the cables are connected the correct way around – remember damage to your network device may result if power is sent back down the wrong way!



Note: The D-Tech Power Injector CANNOT be utilised in conjunction with RJ45 port splitters and sharers. Damage could be done to your network equipment!



## IP People Counter: Set-up Software for Hardware

Please refer to the D-Tech Set-Up software user guide, this will guide you through the installation and set-up of the IP Counter Hardware.

## D-Tech Web Based Software Application (IP-Count)

### ech has developed the IP-Count software application to work with the thermal Imaging counter hardware. The application is a web based system that allows users to view and export reports remotely from any location. The following information is for the installation of the software and a guild for the use of the software. Installations should only be completed by a qualified and trained software engineer, If you are unsure then contact D-Tech or your local distributor.

**Software installation**

#### Installation Package

The installation package ‘PeopleCounter.zip’ contains:

* + - *setup.exe*: wrapper to the installer.
    - *PeopleCounterService.msi*: installer.
    - *CreatePeopleCounterDB.sql*: sql script for DB creation.
    - *PeopleCounterService.doc*: this document.
    - *web* folder: PeopleCounter web site.

#### Creating the database

The service and the web site exchange data through a Microsoft SQL data base named ‘PeopleCounter’. The database is therefore essential for a functioning installation. In order to create the database you need to run the ‘CreatePeopleCounterDB.sql’ script found in the installation package.

#### Windows Service Installing the service

To install the service double click on setup.exe and follow the steps in guided process. Make sure that the setup notifies a successful installation before proceeding.

#### Initial service configuration

The service will need to be informed about the newly created data base. This is done by editing the

*D-Tech.PeopleCounter.CounterPoll.exe.config* text file in the PeopleCounter installation folder.

Find the following section in the config file:



<connectionStrings>

<clear/>

<add name="mainConn" connectionString="" providerName="System.Data.SqlClient"/>

</connectionStrings>

And set the value of the *connectionString* attribute to one of the following according to the type of authentication you want to allow:

#### Option 1 (windows authentication):

Server=\_SERVERNAME\_;database=\_DBNAME\_;Integrated Security=true;

**Option2 (SQL Server authentication):**

Server=\_SERVERNAME\_;database=\_DBNAME\_;Integrated Security=false;uid=\_USERNAME\_;pwd=\_PASSWORD\_;

Where the tokens \_SERVERNAME\_, \_DBNAME\_, \_USERNAME\_ and \_PASSWORD\_ must be replaced, where applicable, with the appropriate values.

An additional, but optional, configuration to be defined is related to the email notification settings. Find the following section in the config file:

<system.net>

<mailSettings>

<smtp from="\_SENDER\_EMAIL\_ADDRESS\_">

<network host="\_SMTP\_HOST\_" password="\_PASSWORD\_" userName="\_USER\_NAME\_"/>

</smtp>

</mailSettings>

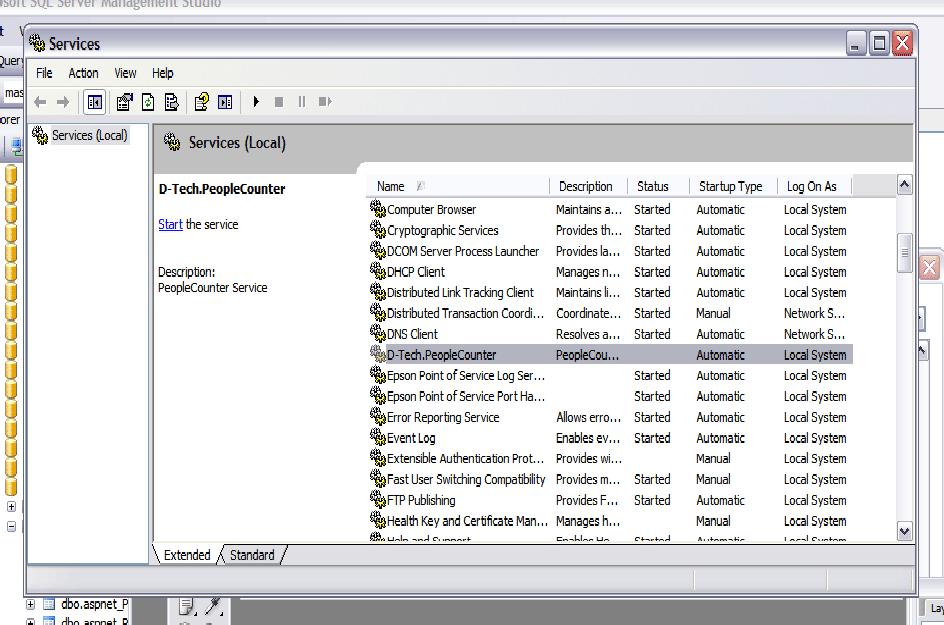
</system.net>

Where \_SENDER\_EMAIL\_ADDRESS\_, \_SMTP\_HOST\_ and \_USER\_NAME\_ must be set to the appropriate values. If these values are not set or invalid the email notifications will not be sent but notification will still be logged into a *Log.txt* file in the installation folder and into the *PC\_CounterError* table in the PeopleCounter database.

Please note that it might be necessary to restart the service in order for these changes to take effect.

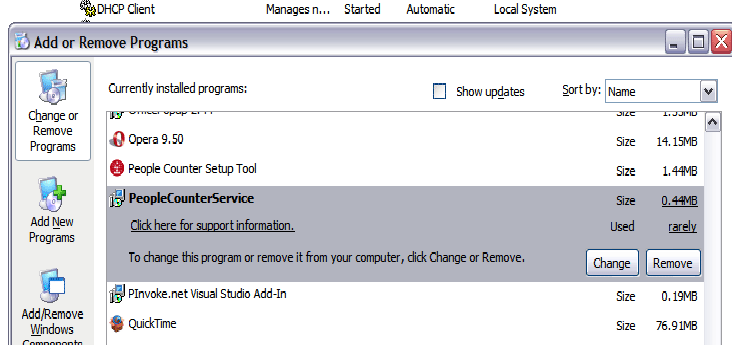
#### Starting and stopping the service

Once the service has been successfully installed, it should appear in the list of registered sevices in Control Panel ""' Administrative Tools ""' Services. The name of the registered service is ‘D- Tech.PeopleCounter’. From there the service can be started or stopped. After installing it, make sure that its status is ‘Started’. If not it must be started manually.



#### Removing the service

The PeopleCounter service can be removed from the ‘Add or Remove Programs’ in Control Panel. The service same is ‘PeopleCounterService’. Before a new version of the service can be installed the old one must be manually removed in this way.



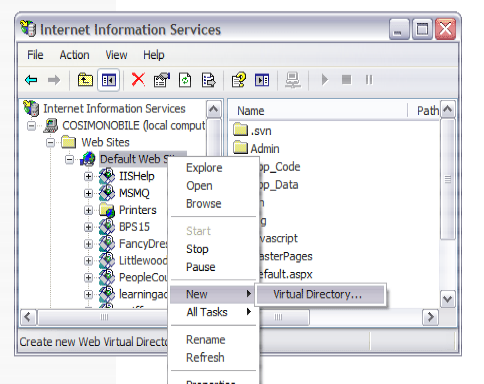
#### Web Site

The web site is contained in the web folder in the installation package provided. Copy this folder anywhere on your file system.

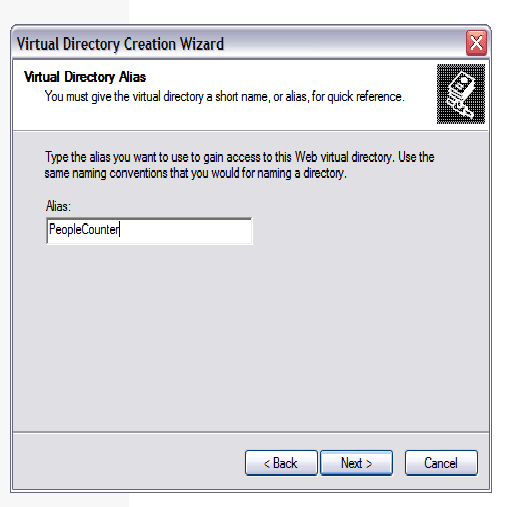
#### Creating a virtual directory

In order for this site to be served to a browser, however, it has to be registered into Internet Information Service (IIS) which can be found in Control Panel ""' Administrative Tools ""' Internet Information Service.

After starting IIS control panel, right click on Default Web Site and then New ""' Virtual Directory…



Set as web site alias to anything you like (i.e. PeopleCounter):



Then provide the exact location of the web site folder you have just copied to your file system:

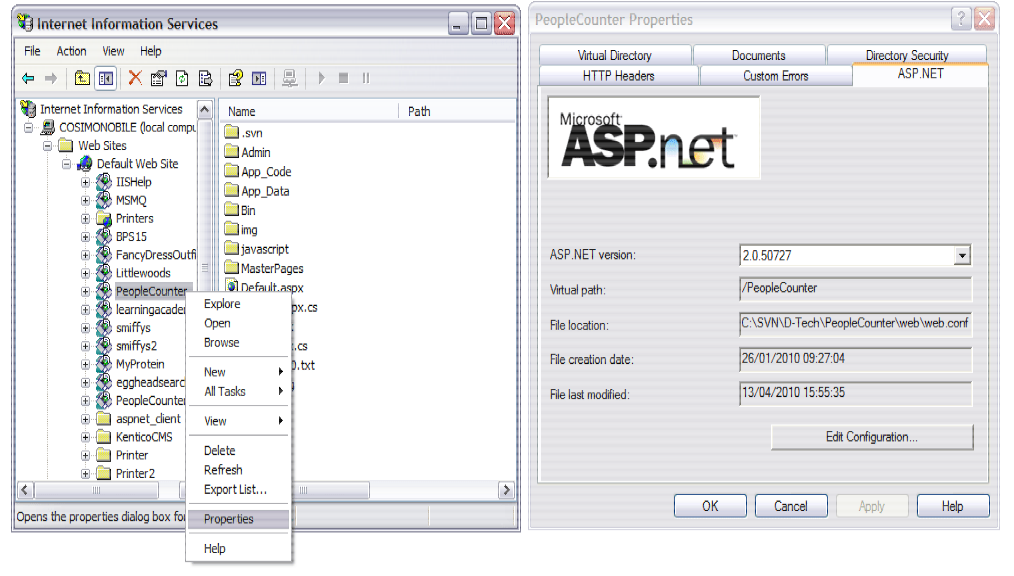


After clicking on Next in the following screen a virtual directory pointing at the PeopleCounter web site will be created.

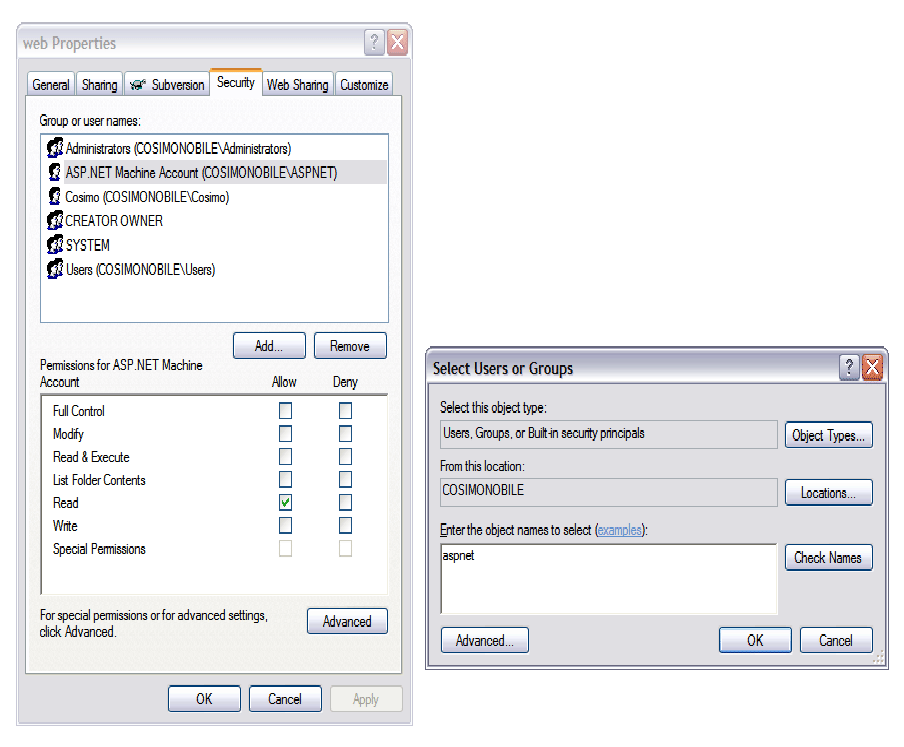


#### ASP.NET Configuration

Now right click on the Virtual Directory you just created and select Properties. Click on the ASP.NET tab and make sure that a version of ASP.NET is selected in the dropdown list:



Finally, before the web site can be served to a browser, you need to grant reading permission to the ASP.NET user account. To do this, right click on the folder in your file system containing the web site and select Properties, then click on the Security tab. If the user ASP.NET user account does not already appear in the list ‘Group or user names’ at the top you need to add in this way: click on the ‘Add…’ button and then in the new popup windows type the word ‘aspnet’ in the text box at the bottom. Finally click the ‘Check Names’ button and then the ‘OK’ button. You should now see the ASP.NET user account added to the list:



#### Data base connection

The web site, like the service, will need to be informed about the newly created data base. This is done by editing the *web.config* text file in the web site folder.

Find the following section in the config file:

<connectionStrings>

<clear/>

<add name="mainConn" connectionString="" providerName="System.Data.SqlClient"/>

</connectionStrings>

And set the value of the *connectionString* attribute to the same one specified for the service.

#### Accessing the site

The root of the site will be accessible through the following URL:

[***http://localhost/PeopleCounter/***](http://localhost/PeopleCounter/)(if accessing the site locally) or

[***http://ANOTHERHOST/PeopleCounter/***](http://ANOTHERHOST/PeopleCounter/)(if accessing the site remotely)



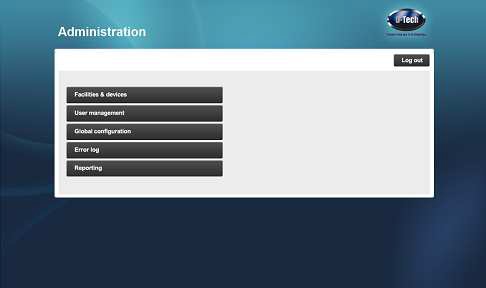
All pages on the web site are password protected. In order to get the first access into PeopleCounter web site, a user account has been created with the following creadentials:

Username: ***admin***

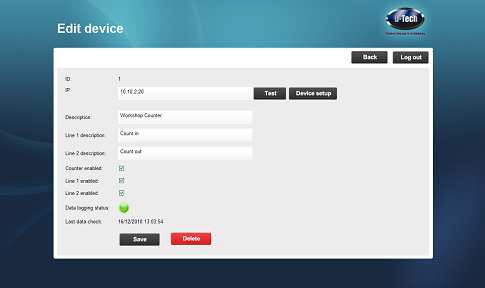
Password: ***admin***

This user is in the Administrator role and therefore with it you have full access to the site and with it you could then create other administrator accounts or normal user accounts. The normal users will only have access to the reporting tool.

When an admin logs in the main admin screen is displayed containing links to other pages:



It can display facilities with the ability of viewing, adding, editing or deleting devices:



Test = Check connection to the IP counter

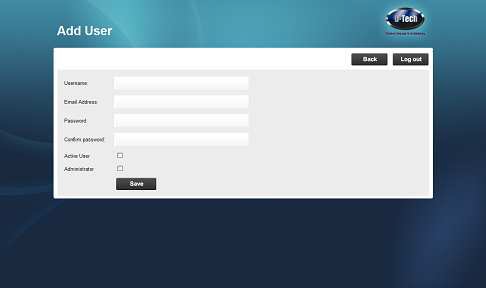
Device setup = connection to the setup firmware via IP on the Counter Logging status = Green for connection / Red for no connection



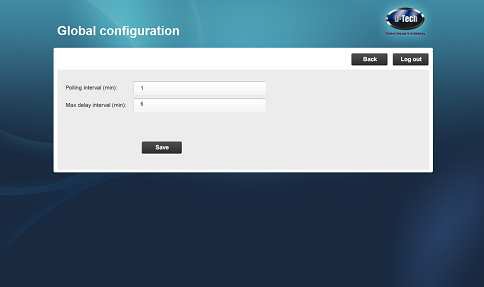
If the indicator is RED and not GREEN then the counter is not being seen by the application The user page allows viewing, adding, editing or deleting users and their privileges:



A mouse click on the email address will allow editing user’s details:



Global configuration page allows defining some configuration values used by the service:



The error log page shows a list of all logged errors:

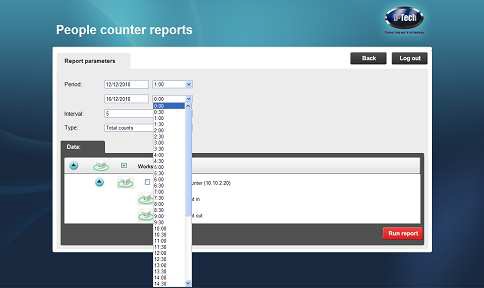


Finally using the Report page…

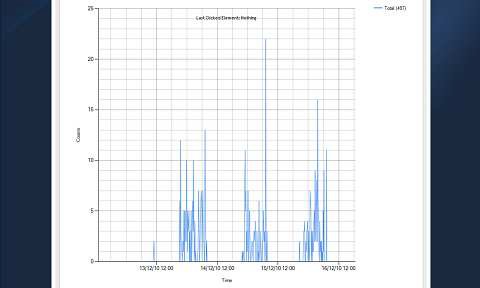


Click on the counters and lines you would like the report on, then select your dates and times and then click Run Report



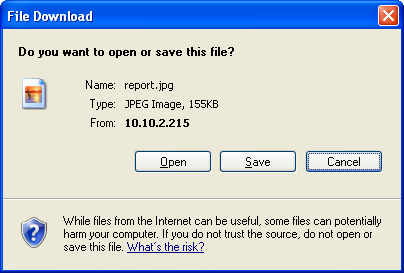


Reports are generated and can be viewed or exported.

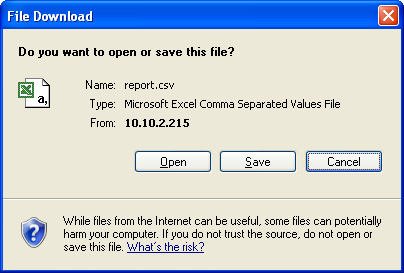




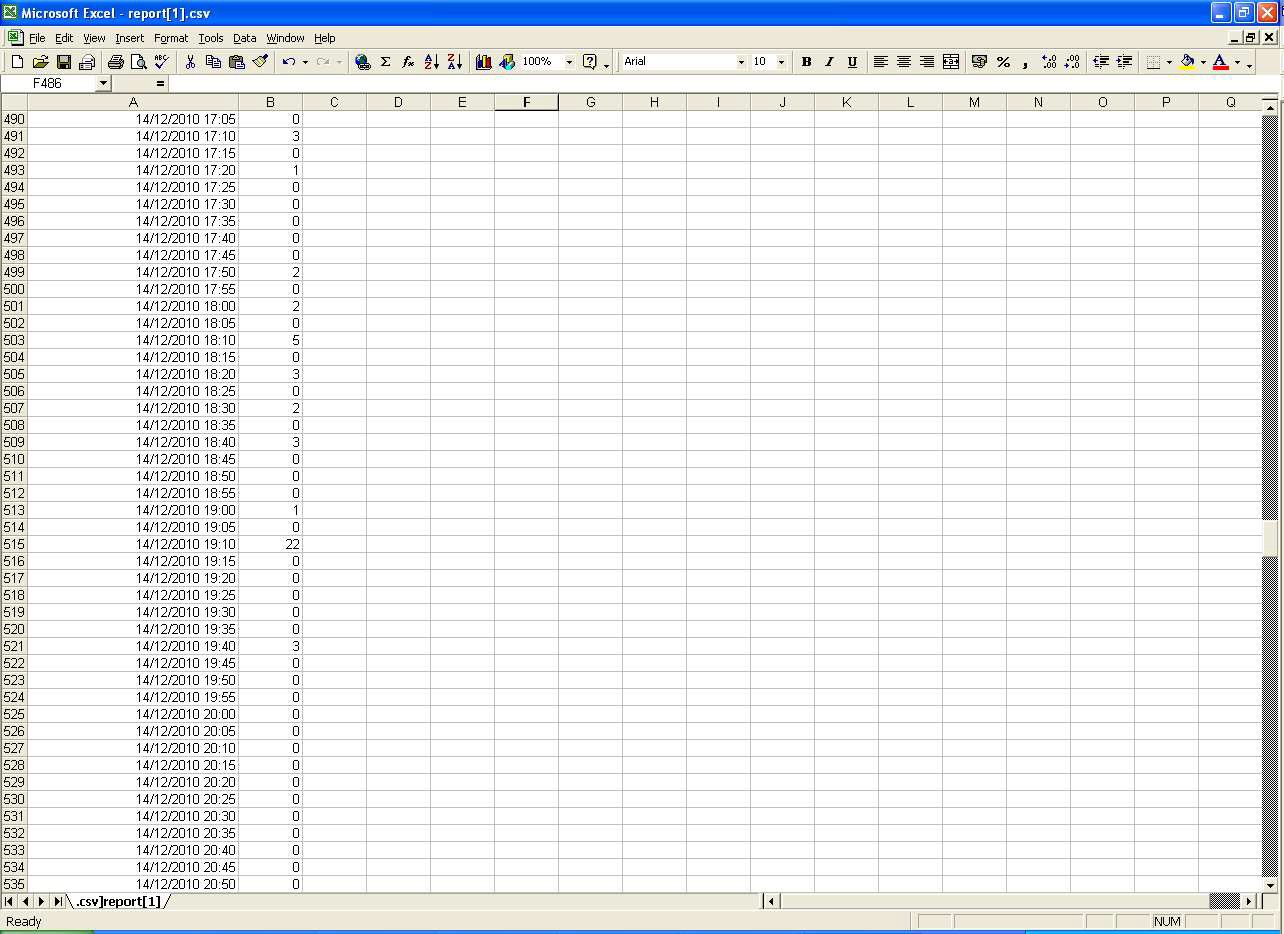
Save the graph image



Export the count data into an excel format



Data exported in excel



Send data directly to a network or local printer

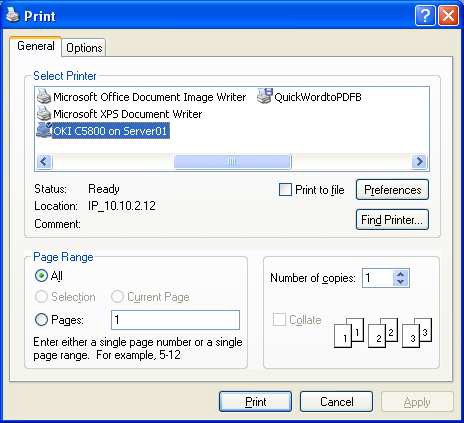
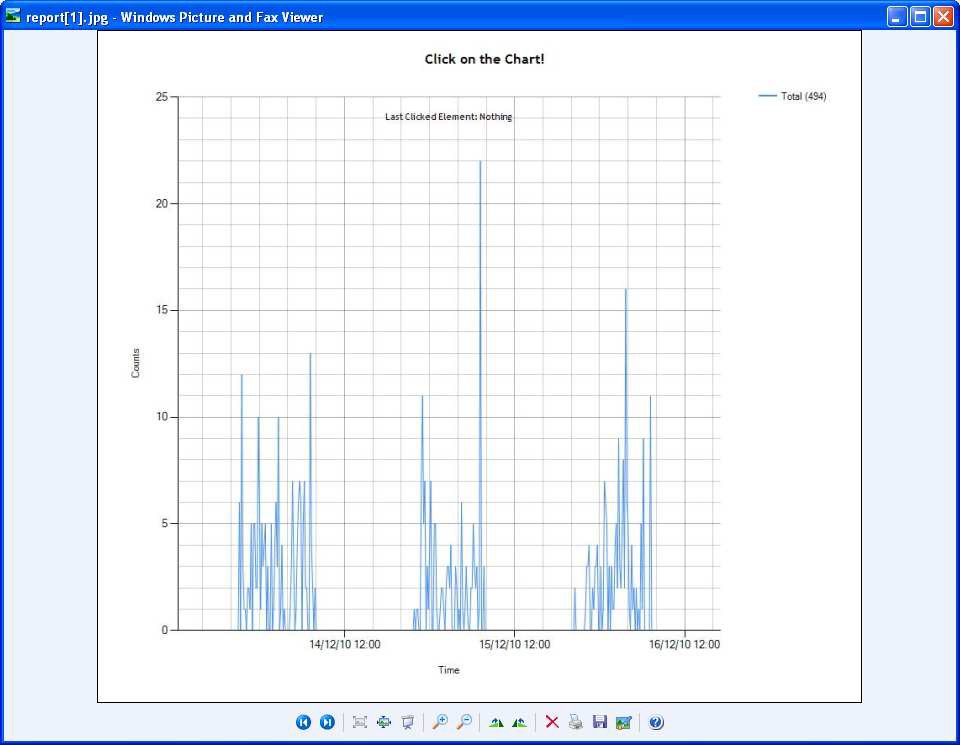


Image of data save as a JPG



## D-Tech 3000 Series LED Error Code Flashes

D-Tech counters incorporate built-in error detection routines; these will signal any detected errors (and other counter states) using the two LEDs on the front of the counter.



Note that one LED is green and the other LED is red.

#### Normal Operation

* Both LEDs ON - Unit Start

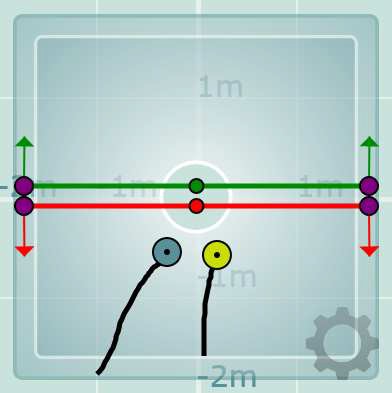
As soon as power is applied to the counter it will start a boot up stage, this lasts approximately 10 seconds and is indicated by both the RED and GREEN LEDs on solidly. Close examination of the LEDs will reveal two small (<100ms) off periods as different code sections are booted. Once the counter finishes its boot up stage, it will begin its array stabilisation stage.

* LEDs Alternate Flashing - Array Stabilisation

As each counter is a thermal sensing device, it must first stabilise to its installed environment. This stabilisation stage lasts between 45 seconds and 2 minutes, dependant on ambient temperature - if a counter is powered up after being moved from a cold location to a warm location, it will take two minutes to stabilise, but subsequent power cycles will mean that the counter stabilises much quicker. During the stabilisation time, the two LEDs will alternately flash starting with Red ON and Green OFF, then changing to Red OFF and Green ON, repeating, and changing every second. Whilst the counter is stabilising an animation is displayed in place of the target view in the setup software.

* Occasional LED ‘Blip’ - Functioning

Following a successful warm-up period, counters will begin tracking targets and counting normally (Figure 0). If the counter is not yet configured then it will flash an error sequence as below. If the counter is configured, then, at this point, counters will blip both of their LEDs, together, every 5 seconds to indicate correct operation (a ‘Heart beat’). Each LED will also blip independently when a person crosses the corresponding count line; Green LED for Line 1, Red LED for Line 2.



* Both LEDs Flashing Together Very Quickly - Unit Identification

*Figure 0*

All counters must be configured before they will count correctly – details such as the height and ground plane position must be entered along with giving each counter a unique CAN address. Because every counter will have the same default address when installed, an LED flash sequence is instigated by the counter setup software to indicate which counter you are currently configuring. The sequence is both the RED and GREEN LEDs flashing together very quickly. This is essential when configured a network of more than one counter as it is extremely important to verify the correct counter is being configured by recognizing this identification sequence.

#### Power Supply Faults



The counter should always flash its LEDs in some way; preferably, the routine LED blip of both of the LEDs together, every 5 seconds, to indicate correct operation (and occasional single blip as people cross the count lines) as mentioned above, or one of the error conditions mentioned below. If there is no LED activity at all then the wiring and power supply should be checked. Check the voltage at the counter terminals; it should be between 10 and 28V DC, and the correct polarity, and check for shorts. If powering an IP enabled counter via the D-Tech Power Injector accessory (part number IWC3060) then the CAT5 cabling used should be checked using a CAT5 ‘Patch lead tester’ to ensure there are no breaks in the cable or incorrect terminations. If voltage and wiring are correct, test the unit on a separate known-functioning power supply before returning to your supplier.

#### Error Conditions

Error conditions are denoted by the red LED staying on permanently to indicate an error of some kind, with the green LED denoting the actual error.

* Red LED ON Permanently, Green LED Off.

This indicates an internal fault which is not resolvable by the user. The only course of action available is to power down the unit, wait 10 seconds and power on again. This will rectify the problem in the majority of cases. If this does not correct the fault then the unit should be returned to your supplier for repair.

* Red LED ON Permanently, Green LED Flashing Once A Second Repeating

This indicates that the counter is has not been configured and is at factory default address of 127. This is perfectly normal for a new unit and merely indicates that it requires configuring. All units should be configured as part of the installation process to ensure accurate count data, and a COMMs ID of between 1 and 120 should be entered for each counter. Remember that correct count line positioning and counter configuration is the key to accurate counting.

* Red LED ON Permanently, Green LED Flashing Twice A Second Repeating

This error can only occur on a master counter; it indicates that the master is not receiving responses from nodes that were previously connected. This will occur if a node is removed or disconnected; or if a node has been powered off; or there is a wiring break between the master and the node(s). This error should not be confused with the Green LED flashing three times error (below) which can only occur on a node, although these errors may be seen together in certain circumstances.

* Red LED ON Permanently, Green LED Flashing Three Times A Second Repeating

This error can only occur on a node unit; it indicates that the node is not been polled by the master unit. This will occur if the master is removed or disconnected; or if the master is powered off; or if there is a wiring break between the master and the node(s). This error should not be confused with the Green LED flashing twice error (above) which can only occur on a master, although these errors may be seen together in certain circumstances.



If a master and node are configured and working correctly, but then there is a break in the CAN bus then both the master and the node would report errors – both would have

Red LED on permanently; master would also flash green LED twice to report no node connection; and node would also flash green LED three times to report no master connection.



Note: Some error codes may not appear for up to 30 seconds after the fault is detected and may still be output for a further 30 seconds after the fault is rectified.

#### LED Error Codes Quick Lookup Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Red LED | Green LED | Unit Type | Error | Fix |
| ON | OFF | All Units | Internal error | Reboot unit – if fault re-occurs return unit to your supplier |
| ON | Single Flash | All Units | Not Configured | Configure Unit as per Setup Software manual IPU 40183 |
| ON | Double Flash | Master Only | A Node is not responding | Check connections, ensure node(s) are powered, configured and functioning correctly |
| ON | Flash Three Times | Node Only | Master not found | Check connections, ensure master is powered, configured and functioning correctly |

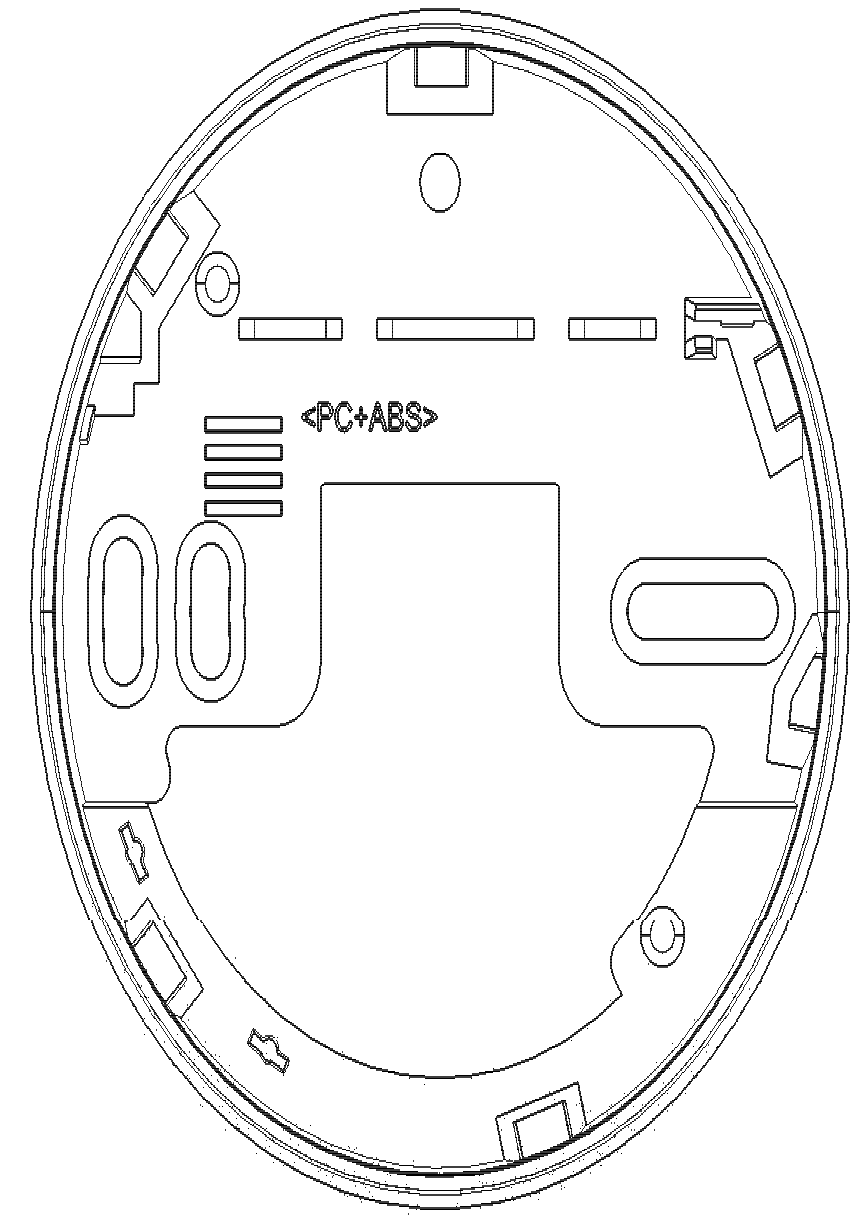
**D-Tech 3000 Series IP Counter Installation Guide**

**Installation**

* 1. Detach the counter head from its base by twisting anticlockwise slightly then pulling apart to expose the mounting holes on the base (Figure 0).
  2. Select a suitable location for mounting the counter base. Refer to the ‘Applications Notes’ document, IPU40184, for details on suitable

Locking Screw

Position Traffic Flow



Direction

locations. Ensure that the ‘Traffic Flow Direction Arrows’ of all units are all pointing in the same direction, preferably in the direction of traffic flow (Figure 0).

Serial

Connection

Arrow

* 1. A 3-5cm hole in the ceiling should be provided for cable access. If mounting on solid ceilings, a number of alternative cut-out areas are provided in the base perimeter to allow for wiring access. The slot in the base marked for serial connection (see Figure 0) should not be used for this. Install the base using mounting holes provided; these holes allow for a limited

Cut-out Area for on-ceiling cable fixing

Mounting Holes

*Figure 0*

Cut-out Areas for on-ceiling cable fixing

amount of movement of the base – once aligned correctly, secure the base using the locking screw position.

* 1. The IP base interface board allows for IP and serial connection for configuration purposes (Figure 0). If removed from the base the board must be re-inserted ‘serial connector’ first, and clipped in place. Ensure the interface board is properly seated inside the base.

|  |  |  |
| --- | --- | --- |
|  | Power  Supply | Max No  Of Units |
| Power via Terminals | 12V | 6 |
| 24V | 7 |
| Power via CAT5 | 12V | 4 |
| 24V | 5 |
|  |  |  |

* 1. Power is supplied via the dedicated power terminal

CAN Node Connection (RJ45)

Power

IP Connection

(RJ45)

block (10 – 28V dc)

or via the (silver) IP connector when the D-Tech Power Injector accessory

*Table 0 – Maximum No Of Units*

Connection

Serial Connection

+–

*Figure 0*

c1320 0019- PROG- R2.

is utilised (part number IWC3060). Power over Ethernet (PoE) is not supported. The power supply should be grounded. **ENSURE POWER IS OFF** before connecting the power and data cables to the base boards. Do not exceed the maximum number of units (Table 0) and maximum cable length of 100m for IP connections. Once connections are made, the counter ‘head’ can be ‘hot-plugged’ onto the base.



* 1. If CAN nodes are to be utilized, then this is via RJ45 patch lead connections (straight through configuration) from the (black) RJ45 CAN connector on the IP counter board to an RJ45 CAN connector of the node (either one) (Figure 0). There can be maximum number of 7 nodes, connected to each IP Master (providing power requirements are met; Table 0), connected in a ‘daisy-chain’ style.
  2. The last CAN node must be terminated correctly by inserting the included RJ45 terminator connector (part number IWC3063) into the last free RJ45

*Figure 0*

socket. Consequently, there should be no RJ45 sockets which do not contain



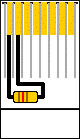
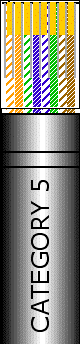
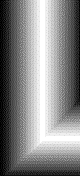
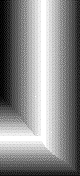
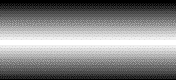
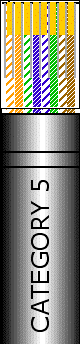
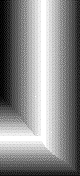
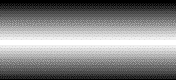
either a cable, or the RJ45 terminator. If using only the IP master counter, then it too must have the RJ45 terminator inserted.

* 1. The button cell battery, supplied, must now be inserted into the battery holder on the underside of the master unit. This will keep the time and date if power fails and is required for correct time stamped count data. Insert the battery with the + side down, Figure 0.



Warning: This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Power Connection 12 – 28V dc



- +

- + RJ45 CAN bus

Terminator Part

Number IWC3063

IP Network Connection

*Figure 0 – IP Master to CAN Node Connections*

Connections to CAN Node(s) (optional)

* 1. After making all connections, the counter head can then be installed onto its base. To do this push the counter head up into the base and turn anticlockwise until the tabs engage into position and then turn clockwise a few degrees to lock (**Error! Reference source not found.**). Power can then be applied and the counter will begin its warm up routine.
  2. The ‘Link Indicator’ on your network switch or hub should now illuminate. If it does not, ensure that the connection cable is the correct type - ‘straight through’ type and not ‘crossover’ type. Also, if connected to a managed switch ensure that it is not locked to 100Mpbs as this can prevent a connection from being established. Change to 10Mbps or enable auto negotiation.

#### 2 Configuration

**All counters require configuring before use. Connecting to the IP master counter allows configuring of all counters connected to that master via the CAN bus.**

* 1. The preferred method of configuring the counters is to use your Internet browser to connect to the counter and use the counters integral web server configuration program which uses the Microsoft Silverlight plug-in. Alternatively, if Silverlight is not available, you can use the installed version of the setup tool which allows both an IP connect or a serial connection using the D- Tech USB/serial cable accessory (IWC3062), see below.
  2. Any internet browser which works with the Silverlight v4.0 add-on will work with the D-Tech range of IP counters. Browsers are adding support for Silverlight all the time - known compatible browsers, at the time of writing, are listed below. Simply enter the IP address in the address bar of your Internet browser. By default, a new counter will have an IP address of 192.168.0.10. You may need to temporarily change your laptops IP address so that it is within this range, or it will not be able to communicate with the counter. See your network administrator for details of this procedure.
  3. Once the IP address is entered, you should then see the D-Tech Welcome screen and be able to proceed with the configuration. For details on configuring options and functions, as well as how to trouble shoot connection problems, see document IPU 40183.
  4. If you are connecting to the counter, serially, then simply connect the IWC3062 USB/serial cable from the ‘headphone’ type jack on the counter to your laptop’s USB/serial port and run the software. You must enter the correct COM port number and then you will be connected to the counter.

#### 3 Silverlight Details

Silverlight is the browser Add-on required in order to communicate with the counter for configuration purposes. An internet connection is required in order to download and install the

#### Compatible Operating Systems\* & Browsers

**Internet Explorer 7/8**

**Internet Explorer 6**

**Firefox**

**3 Safari**

**Google Chrome**

Windows XP/2003/Home server

Yes

Yes

Yes

-

Yes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Windows Vista/Windows 7 | Yes | - | Yes | - | Yes |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Windows Server 2008 R2 | Yes | - | - | - | Yes |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Windows Server 2008 | Yes | - | Yes | - | Yes |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Windows 2000 SP4 (with all post SP4 updates) | - | - | - | - | - |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Windows Mobile 7 | Planned | - | - | - | - |

Mac OS 10.8.8+ (Intel-Based)

-

-

Yes

Yes

-

Various Browsers: [http://mono-](http://mono-/)

Linux, FreeBSD, Solaris OS project.com/MoonlightSupportedPlatforms

Silverlight functionality will be provided by the Moonlight

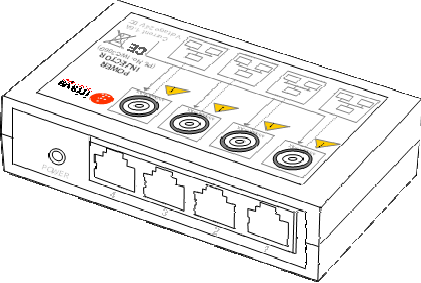
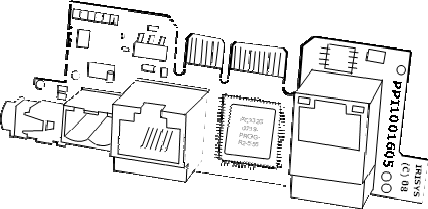
runtime

Silverlight add-on from the Microsoft website. D-Tech IP counters require Silverlight v4:

\*For system hardware requirements, see Microsoft website: <http://www.microsoft.com/SILVERLIGHT>

## Installation of D-Tech Power Injector (IWC3060)

The D-Tech Power Injector (IWC3060) allows simple deployment of power over CAT5 on up to four channels (four separate doors) in order to provide power to the IP enabled counters in the D- Tech 3000 Series range. This allows a simple single CAT5 installation from the door/entrance back to the Network Hub or Switch without the need for an additional Power Cable. Note: this is not a Power over Ethernet (PoE) compliant device.



Power Injector Provides power along Cat5 cable to up to four counter networks

Counter Base Connections Depicting the IP Board taken from a counter

RJ45 CAN Bus Terminator (IWC3063)

Alternatively an RJ45 cable

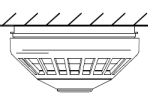
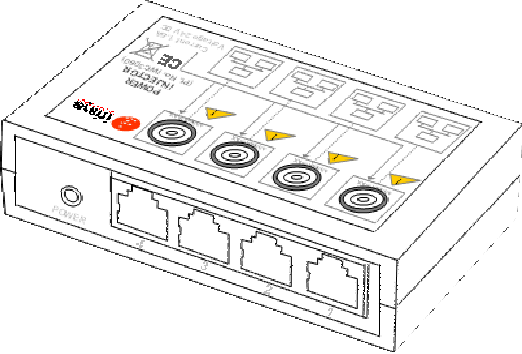
can be connected to network with a CAN Node

IP Network Connection & Power

*Fig. 0 - Power over CAT5 to IP Master*

#### Installation

* 1. Install the Power Injector between the IP enabled Counter and the Network Hub/Switch to provide power along the CAT5 Cable. Do not connect any CAT5 Cables at this point – damage could be done to other Network equipment if Cables are incorrectly connected.
  2. Connect the CAT5 Cable from the Counter to one of the Ports on the Power Injector as indicated by the counter symbol, shown on the label on the Power Injector.
  3. Connect the Network connection from the Switch/Hub to the corresponding Port opposite the Port used for the Counter connection, as indicated by the Network symbol. If connecting directly to your Computer instead of through a Network device, then use a Crossover Cable here. Continue in this way connecting Counters and corresponding Network connections as required. The Power Injector utilises the spares wires on a standard IP Cable, therefore the maximum IP Cable length, from the Switch to the Master, of 100m applies.



Maximum Length 100m

Switch

Power Injector

Counter

*Fig. 0 - Maximum Cable length from switch to Counter*

* 1. If connecting Counter Nodes to the IP Master, care should also be taken not to exceed the maximum number of Units connected to the Master (see Table below). Connect the RJ45 CAN Bus Terminator to the last free RJ45 Socket on the Counter Network.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Power Supply | Max. No. of Units | Max. Length of CAT5 to Master |
| Power via Cat 5 | 12V | 4 | 100m |
| 24V | 5 | 100m |

* 1. Make a final check that the Cables are connected the correct way around – remember damage to your Network device may result if Power is sent the wrong way!
  2. Now connect the Power Supply and switch on. Ensure that the Counters have a single common ground.



Note: The D-Tech Power Injector CANNOT be utilised in conjunction with RJ45 Port Splitters and Sharers. Damage could be done to your Network equipment!



Note: D-Tech People Counters do not support Power over Ethernet (PoE). If connected to a PoE enabled switch damage to the counter may result. Always disable PoE on any port that an D-Tech

People Counter is connected to.

## D-Tech SERIAL/USB Cable FOR Series 3000 People counters

Standard setup and configuration of the D-Tech series 3000 range of people counters is via IP and Internet Browser (where available). Alternatively, the IWC3062 RS232 Set-up Cable provides a serial connection for configuring using the D-Tech Serial SetupTool software.

#### Software Installation

To configure a counter, using the IWC3062 serial cable, the Microsoft .Net 3.5 framework runtime files, must first be installed, if not already present on your laptop. These are available as a free download from the Microsoft website, and are included with the CD version of the D-Tech Serial SetupTool software if you have it. Alternatively, connecting to the Internet and performing a Windows Update is the simplest way of getting these files – it is



recommended that all Windows updates are selected and installed at the same time. Once .Net 3.5 is installed, install the executable version of the SetupTool from the CD.

If you do not have a serial port on your laptop then you must use the USB to serial adapter supplied with the serial lead. The Windows drivers for this device are available from D-Tech, if required.

Once the software (and USB driver if required) is installed you can proceed with the configuration.



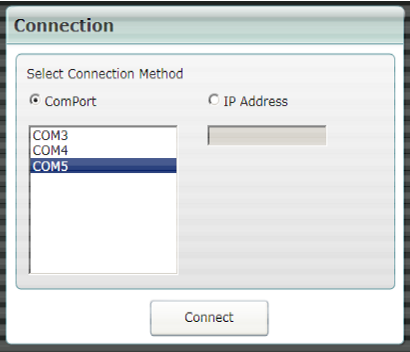
#### Connecting

* 1. If using the USB to serial adapter, connected it to your laptop, prior to running the D-Tech Serial SetupTool. Run the software by double clicking the shortcut on your desktop or by selecting from the Windows Start menu.
  2. Insert the ‘headphone jack’-type connector into the socket on the side of the counter. When configuring multiple units on a wide opening network connect to the socket of the master unit.

*Figure 0*

*Figure 0*

* 1. Connect the other end of the setup cable directly to the serial COM port on your laptop, or to the USB port, if using the serial to USB adapter cable.



* 1. When the software is fully loaded, a dialog box will be displayed where you can select the Connection Method. Note that this software can also be used for remote connection over IP (as with the web based Internet browser software), but to connect via serial/USB, select the ‘ComPort’ option, highlight the required COM port number, and then click ‘Connect’.
  2. The main window will then open and the Setup Wizard will start. Configure the counter(s) in the usual way as

*Figure 0*

described in document ‘IPU 40183 IP Counter Setup Software Manual’.

#### Disconnecting

* 1. When you have finished configuring your counter(s), firstly select the ‘Permanent All’ option from the main menu to ensure all settings are saved correctly.



*Figure 0*

* 1. You can now disconnect the serial cable from the counter and your laptop, and close the software

For service and support please contact you distributor or contact D-Tech International Ltd [support@d-techdirect.com](mailto:support@d-techdirect.com)

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