# Field Inspection – Remote Access Comparison

## Introduction

Field Inspection .NET is a complimentary program for use as a mobile version of the Building Department .NET software. The application gives users access to a remote copy of the data to perform inspections and create quick code cases without the need of a wireless connection.

## Technology

Field Inspection .NET utilizes a local instance of SQL Server with its own copy of the application and administration databases. A connection is established with the 'Live' data server when the user returns to the facility and reconnects to the LAN via wireless or hard wired connection.

Once connection to the 'Live' server is re-established, the user performs a Sync in Field Inspection .NET. The sync process sends data that was added while in the field to the 'live' server and receives data that was added in the office while they were gone.

Field Inspection is typically installed on a fully-functional Windows-based tablet pc. The Motion F5 tablet is the most commonly used hardware for Field Inspection users as of the release of this document. This tablet offers rear and forward facing cameras, a fingerprint reader, stylus with a reactive screen, and excellent hand writing recognition capabilities.

## Attachments

Since sync time and data storage are of concern with a tablet computer, the sync process handles attachments efficiently by syncing just what attachments the user needs.

During the sync process, the software looks at the inspections that were completed in the last 30 days or are scheduled in the next 30 days and copies over just the attachments linked to those properties.

If space becomes an issue, attachments can be deleted from the Windows local attachment directory on the tablet. Those attachments will be imported again when needed.

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## The Application

For the most part, the Field Inspection .NET and Building Department .NET applications are visually and functionally identical minus some key differences.

While in the field, records such as Permits and Certificates cannot be created as they generate unique numbers in the database that will have duplicates if someone creates one back at the office.

Code Enforcement cases, on the other hand, may be created in the field as an enforcement officer may see a violation and want to perform an inspection immediately.

The way we handle this is to mark the Enforcement case number as "Pending". Once a sync is performed, it will grab the next number available and fill it in on the record. The same applies to Certificates of Occupancy.

For customers that need an Enforcement Number to print violation notices in the field, the application allows you to register a user on the tablet and append a unique suffix to the Enforcement number, which bypasses the issue above.

Inspections can be created in the field. However, since they are created after the sync, the attachments for that property may be unavailable, depending on whether or not another inspection was scheduled on that property recently and prior to the sync.

## Checklists

Checklists allow you to group your Quick Text into easy to use lists for inspectors to access from the field or use in the office.

With the touch of a stylus, pre-configured quick text becomes a violation, eliminating every step in between.

This is a major time-saving feature that makes it possible for an inspector to carry their tablet into the inspection and record results in real-time, decreasing office data entry time and increasing productivity and the number of inspections performed.

The inspector can easily indicate locations visited and separate violations by area, making it easy to quickly re-inspect without searching for where the violations occurred.

## Copy Down vs. Sync

It is important to understand the difference between a Copy Down and a Sync.

The Sync process sends all changes from the tablet to the 'Live' server database, and receives all changes from that server since the last time it ran a Sync. The Sync will also import all attachments that are on properties where inspections are scheduled for the next 30 days and also inspections performed the past 30 days (default).

A Copy Down starts by purging the entire local application database, then copying the 'live' database from the server to the tablet. Since the data is being purged, you will lose anything that wasn't synchronized first. In this case, it is important to Sync before you run a copy down.

If you fail to Sync for 30 consecutive days, a Copy Down will be required before accessing Field Inspection .NET on that tablet. All other tablets that successfully performed a Sync during that period will still be able to access the program since they all run a separate local copy of the database.

## Security

Windows caches Active Directory credentials to Windows-based tablets for users who have logged in while on the Local Network.

Field inspection .NET will not currently authenticate user credentials against a cached Active Directory database. User passwords must be created in Building Department .NET, which will Sync to Field Inspection .NET.

When a user changes their password in Active Directory while on the network, they will have to also update their password in Building Department .NET if they want them to match.

The Motion F5 Tablet with Windows 7 is typically equipped with a fingerprint reader. Motion Omni Pass Software simply matches a Windows user account with a fingerprint and allows the user to log in using the reader. The user will still need to log into Field Inspection .NET manually with a password.


## Field Inspection .NET vs. Wireless Remote Desktop Protocol

Recently, there have been significant increases in availability of wireless radio signals such as 3G and 4G connections.

With the increase in coverage, remote connection to the 'live' database using Remote Desktop Protocol  has been used by a few of our customers with mixed results.

Using RDP eliminates the need for Field Inspection .NET by providing real-time access to the 'live' server without the need to Sync.  There are a few different ways this is being accomplished.

**Direct VPN connection:**

> A VPN connection is created on the tablet and the Building Department .NET software tunnels directly to the 'live' server or the SQL server is given a public IP the application accesses it directly. A 100 mbps with 15ms latency is required.

> **This solution is <u>not</u> supported by BS&A Software and is <u>not</u> recommended for use due to speed and security concerns.**

**Remote Desktop:**

> A Remote Desktop Connection is established to a Physical or Virtual Machine. The user accesses the entire desktop on the machine being accessed, including all applications and resources.

> Pros:

> - A direct, live connection means that the user in the field has real-time access to their data without the need to Sync.
> - If the wireless connection is lost, the applications connection to the server is not. The remote session can simply be re-established and the application picks up where it left off.
> - The application and data are not stored on the local device, allowing the customer to use non-windows devices that have RDP capabilities such as Android or Apple tablets.

> Cons:

> - Accessing the entire machine using a remote session into another instance of Windows can cause some confusion for the user.
> - Local peripherals such as the camera will not function with the application in this environment. The camera communicates with the local Windows session, while the Building Department application is installed on the remote machine.

- Handwriting recognition using a stylus is not able to be passed through a remote session and is therefore unavailable with this solution.
- A strong 3g, 4g signal or city-wide wireless connection is required.

Notes:

- Microsoft Word must be installed on the server so users can edit letters from the field using Word. (letter generation functions correctly without Word).

How it works:

A VPN session is established assuming the machine being accessed remotely (host) is using a private IP address. An RDP connection is then established in which the user accesses to view the host computers desktop.

## Remote App:

An RDP connection is established using an RDP client app on a tablet or other device. The user accesses an instance of the application within a Terminal Server. A remote Windows session is not established, the Building Department Application instance is opened automatically when the user logs-in. When the application is closed, the session ends.

Pros:

- A direct, live connection means that the user in the field has real-time access to their data without the need to Sync.
- Using Remote App allows the user to feel as if they are opening the program locally.
- The application and data are not stored on the local device, allowing the customer to use non-windows devices that have RDP capabilities such as Android or Apple tablets.

Cons:

- Some users have reported instances where the Remote App is closed but the session remains active. The next time the application is opened, a black screen appears as the session is still active but the application is not. The session has to be stopped from the server and a new connection re-established.
- Local peripherals such as the camera will not function with the application in this environment. The camera communicates with the local Windows session, while the Building Department application is installed on the remote instance.
- Handwriting recognition using a stylus is not able to be passed through a remote session and is therefore unavailable with this solution.
- A strong 3g, 4g signal or city-wide wireless connection is required.

Notes:

- Microsoft Word must be installed on the server so users can edit letters from the field using Word. (letter generation functions correctly without Word).

How it works:

A Terminal Server is configured with a public IP address and uses a Remote App instance(Using RDP) which automatically opens when the session becomes active from a remote machine. One Server with multiple applications can be used by configuring distinct application executables to launch based on the individual Active Directory. Each application can also be configured to run separately on a different server. The user still logs into the BS&A Application separately in all instances.

**Field Inspection:**

A copy of the database is retained and maintained locally and synchronizes with the 'live' data server when a connection is available.

Pros:

- Wireless Connection is not required.
- All local peripherals are available for use with the application.
- User can access their data in places where wireless signal would not be available.

Cons:

- Users do not have access to live data and all attachments. Although, most attachments are available via the Sync process (see above).

## Cost Comparison

| | Field Inspection .NET | Remote Desktop | Remote Application |
|---|---|---|---|
| FI Software | +/-$3,000 | $0 | $0 |
| FI Support | +/-$600/yr. | $0 | $0 |
| Motion Tablet | $2,700/Tablet | $0 | $0 |
| Motion Dock | $300/Tablet | $0 | $0 |
| Generic Tablet | $0 | $300-800 | $300-800 |
| Wireless Plan | $0 | $40-60/mo. | $40-60/mo. |
| MSTSL Fees | $0 | $25/seat | $25/seat |
| Server Upgrades | No | As Needed | As Needed |

*All prices and costs are estimates at the time this document was created.

## Summary

Field Inspection .NET was created to give the inspector the ability to access their data in the field. There are some clear advantages to using the application as well as some disadvantages. Overall, Field Inspection .NET has been a very effective tool for many of our users.

As technology with wireless communication and availability of the service progresses, accessing the live data in the field will be the preferred method. Currently, this is an option that will work well for some of our users and not at all for others.

We encourage you to speak with other users to see which method they use and go with whichever works best for your situation. Please feel free to contact us to obtain references of customers using both products and to obtain more information.

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