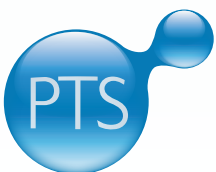




USER GUIDE

ClearStream RFID Version 4.1
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Calverton, NY 11933
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Portable Technology Solutions

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User Guide

ClearStream RFID
Version 4.1
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ClearStream RFID™

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Chapter 1: Introduction

1.1 What is ClearStream RFID

ClearStream RFID is the only user-configurable, fixed RFID tag reading software that gives you the flexibility to easily capture and stream data based on your specific business needs. **ClearStream RFID** can be used as an extension of your software management systems, streaming the data you need between RFID readers and target databases. **ClearStream RFID** can also be used as a standalone system streaming to Excel and Access.

ClearStream RFID is provided on a trial basis in order to offer businesses the opportunity to gain hands-on experience with the features of **ClearStream RFID** before buying. **ClearStream RFID** trial limitations such as a nag dialogue are removed after purchase and registration.

1.2 How ClearStream RFID Works

Tapping the power of **ClearStream RFID** through the creation of read processes allows users to see anything, anywhere, anytime with accuracy never seen before. Processes are unique tasks defined within **ClearStream RFID** that allow you to track your data through the use of RFID technology. Processes, such as scheduling a reader to scan a room every twenty minutes, can be quickly configured by non-programmers through the intuitive tools within **ClearStream RFID**. Below is a small sample of the processes that can be quickly configured via **ClearStream RFID**.

Sample ClearStream RFID Application Configurations

- Inventory Audits
- IT Asset Tracking
- Employee/Student/Visitor Tracking
- Material Check-In/Check-Out
- Loss Prevention

1.3 ClearStream RFID Support

As a registered **ClearStream RFID** user, you receive one free year of support which includes unlimited phone support, email support and free version upgrades. We encourage all users of **ClearStream RFID** to visit our Support Center at <http://www.clearstreamrfid.com/support> for access to general Knowledgebase, frequently asked questions, training videos and other resources intended to speed the learning curve.

Chapter 2: Installation

2.1 System Requirements

- A Windows PC running Windows XP/Vista/7/8/10, Windows Server 2003/2008/2012/2016.
- Microsoft .NET Framework 3.5 or greater (You will be prompted for install if required).
- **Optional:** Internet Information Services (IIS) to use the included demo web application. (You will be prompted during install if required).
- Compatible RFID Readers: Zebra (Motorola), Feig, Impinj, Alien, Intermec, ThingMagic or any other reader that supports LLRP (Low Level Reader Protocol).
- Network access or router connected to a standalone PC.

2.2 ClearStream RFID Hardware and Software Installation

ClearStream RFID enables RFID readers to stream data to pre-existing databases across a network. Network access or a router connected to a PC is a preliminary requirement when using **ClearStream RFID**. With network access or a working router, follow the steps below to install RFID readers, antennas and the **ClearStream RFID** software.

2.2.1 Hardware Installation

1. Mount RFID readers and antennas as needed for configuration.
2. Connect antennas to the antenna inputs of the reader using the supplied cables.
3. Connect the power supply and line cord to the reader, then to a power source.
4. Connect the RFID reader to your network or a router connected to a standalone PC.

2.2.2 Software Installation

1. Download **ClearStream RFID** from www.clearstreamrfid.com or an authorized reseller and install to a PC that will be used to set up and administer the application.
2. When the **Install Wizard Completed** screen appears you have the option to **Launch Management Studio** upon clicking **Finish**.
3. Proceed to [Chapter 3: Registration](#) for registration and trial instructions.

2.3 Uninstalling ClearStream RFID

In the unlikely event that you would like to remove **ClearStream RFID**, follow these simple instructions.

1. Exit **ClearStream RFID** if open and stop the **ClearStream Service** if running.
2. Open the Control Panel window on your PC.
3. Select **Add/Remove Programs** or **Uninstall or Change a Program** (depending on OS).
4. Locate **ClearStream RFID 4** and select **Uninstall**.

Chapter 3: Registration

Chapter 3 describes the limitations of the trial version of **ClearStream RFID**, the licensing model and the registration process.

3.1 ClearStream RFID Trial Limitations

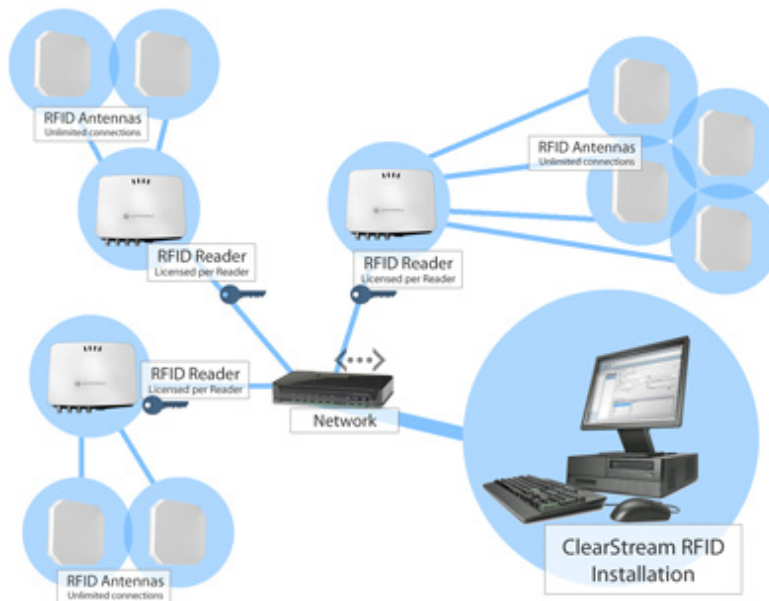
ClearStream RFID is available as a trial application. This trial mode allows potential users to test the functionality of the software without purchasing. Trial limitations include:

- A trial code is required to stream data from your connected RFID reader. Follow the instructions below to request a trial code:
 - Select the **Registration...** option from the **Tools** menu.
 - Click the **Request trial code** link from the **Trial Info** tab and fill out the web form.
 - Submit the form and a trial registration code will be emailed to the address provided.
- A 30-day window to evaluate **ClearStream RFID** (Extensions are available).
- The Windows Service will not run in trial mode, the Management Studio must be used.

3.2 ClearStream RFID Licensing Model

ClearStream RFID is licensed per seat; a seat is the connection between the RFID reader and the host PC in which **ClearStream RFID** is installed. Below is a typical **ClearStream RFID** install with licensing requirements.

Example: Three registered seats of ClearStream RFID enables three RFID readers to stream data to a host PC or server.



3.3 Registering ClearStream RFID

Registering **ClearStream RFID** is a simple process which can be completed after the purchase of seats.

1. Purchase a **ClearStream RFID** license for the number of seats / readers you need to enable.
2. After purchase, you will receive a confirmation email including a **Redemption Link**; this link will enable you to register the number of seats you purchased.
3. Click the **Redemption Link** which will open a **Registration Request** form. Complete the **Registration Request** form and click **Request Registration**.

Note: You can locate your PC ID by selecting **Tools** → **Registration** from the top menu bar in ClearStream RFID and selecting the **Registration** tab.

4. After receiving the **Registration Code**, select **Tools** → **Registration** from the **ClearStream RFID** menu bar and enter this code into the **Registration Code** field on the **Registration** tab.
5. Once this **Registration Code** is entered and verified, the total license count and remaining available license is displayed.

3.4 Issuing Seats to RFID Readers

When registered, the **ClearStream RFID Registration** form will show the **Status** as **Registered** and show a table listing any RFID readers that have been previously connected to **ClearStream RFID**. In most cases, the number of rows shown in this table will match that of the number of seats purchased. Follow the instructions below to issue a seat license to an RFID reader.

Note: With the **Auto register new readers** option enabled within the **Registration** dialog, any new readers connecting to ClearStream RFID will be automatically registered if there is a license seat available.

1. Locate the **Reader ID** you wish to license. If your ID is not listed, enter it to the **Reader ID** field and click **Issue**. Proceed to step 3.
2. Right-click the **Reader ID** and select **Issue**.
3. You will receive a message confirming the registration of this reader.
4. Select **Yes** and the reader now shows as **Licensed** in the **License Status** column.

Note: Once you have registered all of your readers, you can export this license file to another PC if you plan to move your ClearStream RFID installation. For more information on this, see [APPENDIX A](#).

Chapter 4: Streaming Tags with the Sample Fixed RFID Process

PTS provides a Sample Fixed RFID Process to utilize in testing RFID antenna read ranges, RFID tags and antenna placements. We also encourage users to use this after installing **ClearStream RFID** in order to better understand the basics of the configuration of a **Stream Process**.

Note: To utilize the Sample Fixed RFID Process you must first have a registered trial or full registered version of ClearStream RFID. See [Chapter 3: Registration](#) for more information.

4.1 Connecting an RFID Reader to ClearStream RFID

The first step in utilizing the **Sample Fixed RFID Process** is to connect the RFID reader to the process. To start connecting your reader, follow the steps below.

1. In the **Profile Configuration** → **Sample Welcome Profile** → **Sample RFID Process** window click the **Readers** button.
2. In the **Reader Configuration** dialog select the **Add Reader** button and select the reader manufacturer you would like to connect (e.g. Zebra, Impinj, Alien etc.).
3. Click in the **IP/Hostname** field and click the **Find** button when it appears.
 - Alternatively, you can simply enter the IP or Host Name of the reader (if known).
4. Select your domain from the **Find RFID readers on your network** window.
5. Click the **Start** button and wait for the available readers on your domain to appear.
6. Highlight the reader you wish to connect to. Click **Select**.
7. Click Close and save your project using the **Save** button.

Note: When initially added, the reader is configured with default settings. To further customize these reader settings, see [Chapter 6](#).

4.2 Starting and Stopping RFID Readers

With your RFID reader properly connected to the **Sample Fixed RFID Process** and antennas connected to your RFID reader, you will next start and stop the readers to read RFID tags. To start and stop your RFID reader, follow the steps below.

Note: Your read results may vary depending on the chosen antenna strength settings and the type of tags being tested.

1. In the **View** menu or from the **Navigation Bar**, click the **Start/Stop** icon.
2. In the **Start Stop Readers** window click the **Start All** or **Start Selected** Button corresponding to the reader you configured in **Section 4.1**.
3. In the **Activity Monitor** Window, you will see data streaming through if properly configured.
4. When finished with the stream click the **Stop All** button.

4.3 Viewing Streamed Data

After an RFID streaming cycle has been completed, data can be viewed from within **ClearStream RFID**. Follow the steps below to access the **Data Viewer**.

1. From the **View** menu or from the **Navigation Bar** click **Data Viewer**.
2. Review the tags read (you may need to hit the **Refresh** button to see the data).

Chapter 5: Creating a New Project and Streaming Data

ClearStream RFID enables you to control your RFID Readers as well as the moving of data to destination files through the use of **Projects**, **Profiles** and **Processes**.

5.1 Creating a New Project

A **Project** is a grouping of profiles. A project is typically saved at a company or business unit level. Creating a new **Project** is the first step in configuring a fixed RFID environment. Follow the steps below to create a new **Project**.

1. In the **File** menu select **New** or click the **New** icon on the toolbar.
2. Proceed to **Section 5.2** below to learn how to add a **Profile**.
3. To save your project, select **Save** or **Save As** from the **File** menu or click the **Save** icon on the toolbar.
4. To open an existing project, choose **Open** from the **File** menu or click the **Open** icon on the toolbar.

5.2 Adding Profiles

A **Profile** is a grouping of individual RFID data collection processes. A **Profile** is typically set up to perform a discrete set of tasks in which each process is used to perform a specific function. Follow the steps below to create a **Profile**.

1. In the **Profile Explorer** window click the **New Profile** icon.
2. In the **Profile Configuration** window enter a **Name** for the **Profile**.
3. Proceed to **Section 5.3** below to learn how to add processes to your **Profile**.
4. A **Profile** can be deleted, copied or moved up/down in order using the respective icons in the **Profile Explorer**.

5.3 Adding Processes

A **Process** is used to connect to your RFID reader, set its parameters, and control where it streams data to. A **Profile** typically contains one or more processes that perform related tasks. Follow the steps below to create a new **Process**.

1. In the **Sync Process List** window click the **Add Process** icon.
2. **Name** the Process.
3. Add a **Comment** to further detail the process.
4. In the **Source** tab, select **RFID** from the **Type** drop down.
5. Select a reader to use from the **RFID Reader** drop down. If the reader you need has not been added yet, use the **Readers** button to add and configure any readers used in the application (See [Section 4.1](#) for information on adding readers).
6. In the **Destination** tab, select your preferred method of data transfer from the **Type** drop down.
7. You will then be presented with options specific to the **Type** selected. (See [Chapter 7: Data Integration Settings](#) for more information on further defining the different data types.)

8. Repeat steps 1-7 to add additional processes.
9. **Save** your project.
10. A **Process** can be deleted or moved up/down in order using the respective icons in the **Sync Process List** window.

5.4 Streaming RFID Data

Now that you have successfully configured your project you are now ready to start streaming data. Follow the instructions below to start a data stream.

1. In the **View** menu or from the **Navigation Bar** click the **Start/Stop** icon.
2. In the **Fixed RFID Readers** window, select the desired **Reader** and click the **Start Selected** Button. Alternatively, click the **Start All** button to start all readers.
3. When properly configured, you should see RFID data streaming in the **Activity Monitor** Window.
4. When finished streaming, click the **Stop All** or **Stop Selected** button.

Note 1: RFID data streaming can be started based on a **General Purpose Input (GPI)** trigger (external button press or light/motion sensor). See [Chapter 6: Reader Settings](#) for more information on setting this up.

Note 2: RFID data streaming can also be started using the **ClearStream RFID Service**. This allows the streaming of RFID data to take place unattended without the Management Studio running. See [Chapter 9: Running as a Windows Service](#) for more information on setting this up.

Note 3: RFID data streaming can also be started using the **ClearStream RFID API**. A sample of this is included with the ClearStream RFID installation. This is available via the **Start Menu**→**PTS**→**ClearStream RFID**→**ClearStream Web App Demo**. See [Appendix D](#) for more information.

Chapter 6: Reader Settings

The **Reader Settings** within **ClearStream RFID** allow you to control when the data is streamed, set antenna power levels and configure the General Purpose Input and Output (GPIO) ports. To configure these settings, click the **Readers** button located on the Configuration form within your RFID process window.

6.1 Scan Mode

The **Scan Mode** allows you to configure the read cycle of the RFID reader. These options, located on the **Scanning** tab, include **Continuous**, **Timed** and **GPI Trigger**. These options are explained below.

6.1.1 Continuous

With this option enabled, the RFID reader(s) is continuously powered; streaming data to your destination once a streaming process has been started. This is only recommended for high volume / rapid changing environments and can decrease the life of your connected antennas.

6.1.2 Timed

With this option enabled, data can be streamed based on a timed **Interval** or run **Daily** by setting a specific time. This **Scan Mode** takes effect once the stream process has been started.

Interval Scanning

Begins a read operation after the specified interval and for the length of the duration.

1. **Interval** – This value (in seconds) specifies the length of time between cycle reads. If this value is set to -1 the read will start immediately and run for the specified **Duration**.
2. **Duration** – This value (in seconds) specifies how long the data stream should run once the process has started streaming.
3. **Send tags when read** – When enabled, tag data is sent from the reader as tags are read. Disabling this feature sends tag data at the end of a read duration (Recommended when using a **Post Type of Overwrite** in the **Destination Options**).

Example: An **Interval** of 300 with a **Duration** of 15 means the streaming process will run every 5 minutes for 15 seconds each time. Once the 15 seconds have passed, the read will stop and start again 5 minutes later.

Daily Scanning

Daily scanning allows you to configure the read operations to be performed on selected days of the week, allowing you to set a **Start** and **Stop** time.

6.1.3 GPI Trigger

With this option, enabled data will only be streamed when a signal is received from the Trigger Port specified. Items that can be connected to this type of port could be a push button/switch or a motion/light sensor. This **Scan Mode** takes effect once the Stream Process has been started.

1. **Port** – This value tells **ClearStream RFID** which General Purpose Input port on your RFID reader to expect the trigger from. If a trigger is received, the read will be started.
2. **Name** – This value specifies a name for the GPI trigger. This value can be posted to your destination when the **Start Event** field is mapped.
3. **Duration** - This value (in seconds) specifies how long the data stream should run once the process has started streaming.
4. **De-bounce** – Determines how long (in seconds) after a GPI Duration the reader must wait before a subsequent GPI event can trigger a read (Only available when multiple GPI ports are configured).
5. **Send tags when read** – When enabled, tag data is sent from the reader as tags are read. Disabling this feature sends tag data at the end of a read duration.

Example: You are looking to track items as they pass through an entry point but do not want to run the RFID reader constantly. In this case, a motion sensor can be connected to one of your readers GPI ports. When someone activates this motion sensor, it will then trigger the RFID reader to start the read, capturing the tag data when it passes through the entry point. The read will stop after the set **Duration** has expired.

6.2 Antenna Settings

ClearStream RFID allows you to specify a name for each antenna and its power level. This helps in identifying the location a tag was read. To modify antenna settings, click the **Add** button for each antenna you have connected and see below for more information. If these antenna settings are left blank, the default values are used.

- **ID** – This correlates to the antenna port of your RFID reader and is a read only field.
- **Name** – This allows you to name each antenna according to where it is located.
- **Power** – This value (in dBm) controls the read power of each antenna. The higher this setting the further away tags can be read. The allowed values depend on which reader has been selected.
- **Tag Session** – The Tag Session is a setting for making inventory events easier to manage. These sessions serve two purposes: Determines how often a tag will respond to a query from the reader and allows for multiple readers to conduct independent inventories. Select from the 4 options below:
 - a. **S0** – Does not stay Inventoried at all.
 - b. **S1** – Stays Inventoried for .5 to 5 seconds.
 - c. **S2** – Stays Inventoried for at least 2 seconds.
 - d. **S3** – Stays inventoried for at least 2 seconds.
- Antennas can be deleted by highlighting the antenna and clicking the **Remove** button.

More about Tag Sessions: All tags have internal flags that are set to A (I have not been inventoried) or B (I have been inventoried). When you read that the session target is A or B, it means that only tags with the flag in that position will be inventoried. The flag is flipped automatically when a tag is inventoried. Depending on which session setting is used and the capabilities of the tag, the flag always flips back to A after a time if it had previously been set to B. A is the tags default state.

Tip: To reduce the probability of cross reading from adjacent rooms, the power level should be adjusted after thorough tag read testing.

6.3 Tag Settings

Due to the many different tag types and storage capabilities, **ClearStream RFID** gives the ability to specify these values using the **Tag Storage Settings**. In some cases, the tag specifications may not match the default they can be specified here.

- **EPC Tag Length** – The length in bytes of the **EPC** memory bank of the tag.
- **User memory bank length** – The length in bytes of the user memory bank of the tag.
- **TID memory bank length** – The length in bytes of the TID memory bank of the tag.
- **Max tag count** – Used for performance, this value should be set to the expected number of tags that may be in the readers read range at any one moment.
- **Convert EPC to ASCII** – When enabled, **EPC** values are read in ASCII (text) format.
- **Convert User memory bank to ASCII** – When enabled, the tag's **User** memory bank is read in ASCII (text) format.
- **Read all memory banks during scan** – When enabled, the tag's **TID** and **User** memory banks are read and posted to the destination when mapped.

6.4 Tag Events

As tags are scanned in the fixed RFID environment they can trigger different events. The default events are **Tag visible**, and **Tag no longer visible**. Tag visible means that a tag has reported itself successfully to the reader. Tag no long visible is an event in which the tag has not reported itself to the reader within a certain timeout period so it can be considered no longer in the field of view of an antenna. Finally, custom tag events can be created based on multiple tag events in a sequence. The specific Tag Event triggered will be posted to the database as a sting when the **TagEvent** field is mapped.

- **Moderate tag reads** – Enables or Disables tag event reporting.
- **Moderate by** – Defines at what level the tag events should be stored. By **Reader** will maintain the tag state regardless of the antenna that read it. When in this mode if a tag is read by one antenna, followed by a second within the timeout timeframe it will only be reported once. By **Antenna** will maintain the tag state per antenna. So, in the same example, if a tag is read by one antenna followed by a second within the timeout time it will be reported twice.
- **Timeout** – The length of time in milliseconds to keep track of the tag state. At the end of this timeout the tag is considered no longer visible to the reader.
- **Tag visible description** – The value as a string reported to the destination when a tag is scanned.
- **Tag no longer visible description** – The value as a string reported to the destination when a tag is no longer visible to the reader.
- **Report tag visible** – Enables or disables whether or not the tag should be reported to the destination for this event.
- **Report tag no longer visible** – Enables or Disables whether or not the tag should be reported to the destination when it is no longer seen by the reader.
- **Report tags again only after not visible** – When enabled, a tag that stays in the field of view of the antenna will not be reported to the destination again until after it has left the field of view of the

antenna. If this is disabled a tag will be reported to the destination every n milliseconds defined by the timeout setting.

Custom Events

Custom Events define a sequence of tag events that need to occur before the custom event is triggered. This means that the tag needs to do a certain sequence of events before it will be reported. This is useful for things such as check in and check out applications, where you only want to report the activity of the tag after it has done something like pass by two antennas in a specific order.

- **Tag Event Description** – The tag event value as a string that will be reported to the destination when this event occurs. Click the **Add** button to add a new custom tag event. Click the **Remove** button to remove the selected event.
- **Tag Sequence** – Defines the list of events that need to occur before the tag will be reported to the destination. Click the **Add** button to add a new tag event. Click the **Remove** button to remove the selected event.
 - **Field** – The field used to check for an event.
 - **Operator** – The comparison operator that checks the field value against the entered value to determine if the event occurred.
 - **Value** – The value used in the comparison with the Field that determines if the event occurred.

Example: You are looking to track items as they pass through antennas on separate sides of a gate. If it is read by Antenna 1, then read by antenna 2, a custom event can be setup to mark this event as “Check-In”. To do this create an event called Check-In, then add two sequences. The first will be where **Antenna Equals Antenna: 1**, then add a 2nd sequence where **Antenna Equals Antenna: 2**. This will now only send a read to the destination once the item has passed over Antenna 1 first followed by Antenna 2 and will report the event as “Check-In” to the destination. Note that Antenna values used for the sequences above will depend on what you have named your antennas in the [Antenna settings](#) section.

Note: When using Custom Events, Tag visible, Not visible and timeout settings will be ignored and not used.

6.5 Custom Fields

ClearStream RFID provides a number of default fields that are collected every time a reader scans a tag. The **Custom Fields** tab allows a user to define extra fields that can be static values, or values based off of other data collected by the reader. For instance, a tag’s user memory bank may contain a number of fields that can be parsed into separate values. These values can be parsed and used in the field mappings of the configured sync process as custom fields.

- **Add** – Adds a Custom Field, or a Value of the selected field to the list.
- **Remove** – Removes the selected Custom Field or Value from the list.

Custom Fields Settings

A Custom Field is made up of one or more Values. These values can be either a Static value or from another field collected by the reader. Conditions can also be defined to supply the value if the condition is met. Finally, a function can be defined which defines how the value is parsed from the source data.

- **Field Name** – The name of the custom field being configured. This is the value that will be displayed in the Field Mappings after the field has been created.

Custom field Value

The Custom field value is the value that will be supplied to the destination when a tag is read and sent to the destination.

- **Name** – The name for the selected Value.
- **Type** – The type of value to use and can be set to **Static** or **From field**.
 - **Static** – When enabled, a value must be entered to the text field below. This will supply said value to the destination in the same way every time a tag is scanned. This is commonly used to send required data to the destination every time a tag is scanned that is not otherwise collected by the reader.
 - **From field** – When enabled, a field must be chosen from the drop down that you wish to pull this data from. The **UserMemoryBank** is a common selection for this and further manipulation of this data can be done using the **Function** option below.
 - i. **From moderated tag** – When enabled, the custom field value is retrieved from a tag that is within the Moderated Tag Table. Use the Condition configuration as the filter to select the desired tag in the moderated table. If no tag matches the condition the custom field value will be an empty string.
- **Function** – Determines the function used to grab data from the field supplying the value. This can be one of three parsing functions: **LEFT**, **MID**, or **RIGHT**. Only available when **From field** is enabled.
 - **LEFT** – Set the function to LEFT if you wish to do a LEFT parse based on the entered Index.
 - **MID** – Set the function to MID if you wish to start the parse at a specific index and then define the length to parse from that starting index value.
 - **RIGHT** – Set the function to RIGHT if you wish to do a Right parse based on the entered index.

Use the value if condition met

In this section, users can require a specific condition to be met when using custom fields.

- **Condition** – Defines the condition that must be met for this Value to be set for the Custom Field.
 - **If** – The field the Condition is to be based on.
 - **Operator** – The comparison operator that checks the field value against the entered value to determine if the condition is met.
 - **Value** – The value used in the comparison with the Field that determines if the condition has been met.

6.6 Using GPO

ClearStream RFID allows you to trigger external devices connected to your RFID reader's **GPIO** ports based on the set alerts. For example, these can be used to turn on/off lights or even sound audible alarms. From the **GPO** tab, click the **Add** button for each output you want to trigger and follow the instructions below.

1. **Port** – Set this value to the **General Purpose Output** port number of your RFID reader that your output device is connected to. (Depending on your reader this value is usually between 1-4)
2. **Alert Type** – Select the type of alert. Available options are described below.
 - a. **Destination Data Insert** – Occurs when a row is added to the destination.

- b. **Destination Data Update** – Occurs when a row in the destination is updated with new data.
 - c. **Tag Read** – Occurs when the source of data is populated with a new row. This will occur when an RFID tag is read by the reader.
 - d. **Destination Data Delete** – Occurs when a row in the destination is deleted.
3. **Port State** – Set to **True** or **False**, controls whether the port is turned on or off on the trigger.
 4. **Duration** – This value (in ms) is the amount of time the output will run each time it is triggered.
 5. **Process ID** – This ID specifies the process which will trigger the alert type and power up the port. This must be a process within the same profile. When using **Tag Read**, this should be set to -1.
 6. **Condition** – The value that must be met for the alert to be triggered. This is typically a 1 or 0.
 7. To delete an **Alert**, highlight the **Alert** and click the **Remove** button.

Example: Using a combination of an **Alert** with an output trigger, you can sound an audible alarm when an item passes an entry point that is not an authorized item listed in your destination data source.

Note: Since the number of devices that can be controlled by GPIO is limitless, feel free to contact us directly for assistance when using this function.

6.7 Device Options (Zebra/Feig/Alien Readers Only)

The **Device** tab is customized based on the current reader type selected. Currently, **Device** options are only available for Zebra, Feig and Alien RFID Readers.

6.7.1 Zebra Device Options

6.7.1.1 Tag Reporting

The **Tag Reporting** options allow the reader to send tag events to a database field identifying the type of read event that occurred. These tag events are made up of three different types: **New tag**, **Tag invisible**, and **Back to visible**. These event types are described below. To disable tag reporting, uncheck the **Enable tag event reporting** checkbox. We recommend using the [ClearStream Tag Events](#) option instead of the built-in reader functionality as it offers more functionality and flexibility in moderating tag reads.

- **New tag** – Occurs when a currently unseen tag is read by the reader.
- **Tag invisible** – Occurs when a tag has not been seen by the specified timeout period
- **Back to visible** – Occurs when a tag that was once seen by the reader comes back into range and is read again by the reader.

The following options can be set for each **Tag Reporting** type:

- **Tag Events** – Controls when or if the event should be written to the database.
 - **Immediate** – Event is immediately reported back to the database.
 - **Moderated** – Event is reported after the specified **Timeout** value set.
 - **Never** – Event is not reported back to the database.

- **Description** – Description of the tag event. This gets posted to the tag event field in the database identifying the type of tag event that occurred. This can be customized or left at the default setting.
- **Timeout** – Used with **Moderated** only, sets the timeout (in ms) for the event to occur.

6.7.1.2 Reader Management

This option allows you to restart your RFID reader directly from the **ClearStream RFID** software. This enables you to reset your reader without having to unplug the device or login to its management console. Located on the **Management** tab, the following options are available:

- **Username** – This is the username initially set for your RFID reader.
- **Password** – This is the password initially set for your RFID reader.
- **Secure Mode** – Choose from **HTTP** or **HTTPS**.
- **Reader Type** – Choose between **FX**, **RD** or **XR**. (These are currently models of Motorola RFID readers)
- **Restart Reader** – Press this button to proceed with the Restart. You will be prompted to confirm the restart and then prompted again when the restart has finished.
- **Restart reader if connection fails** – When enabled, if a connection is lost to the reader and a reconnection attempt fails, ClearStream will attempt to reboot the reader. When the reboot is complete, it will attempt to restart the reader.

Note: In order for this to function, it must be a Zebra RFID reader and requires that you have previously set up a username and password. The username and password must also be entered here for this to work.

6.7.2 Alien Device Options

6.7.2.1 Restart Reader

Click this button to restart the Alien reader from within **ClearStream**.

- **Restart reader if connection fails** – When enabled, if a connection is lost to the reader and a reconnection attempt fails, ClearStream will attempt to reboot the reader. When the reboot is complete, it will attempt to restart the reader.

6.7.2.2 Ports

You can set what ports the Alien reader events servers will listen for events on. Click **Apply** to make the changes take effect.

- **Tag Events:** Set the port for the tag events server. The default is **7798**.
- **IO Events:** Set the port for the IO events server. The default is **7799**.

6.7.3 Feig Device Options

6.7.3.1 Restart Reader

Click this button to restart the Feig reader from within ClearStream.

- **Restart reader if connection fails** – When enabled, if a connection is lost to the reader and a reconnection attempt fails, ClearStream will attempt to reboot the reader. When the reboot is complete, it will attempt to restart the reader.

Chapter 7: Data Integration Settings

ClearStream RFID allows you to stream data read by your fixed RFID readers to the data destination of your choice. These options include ODBC databases, Microsoft Excel spreadsheets and tab delimited text files.

7.1 Destination Type

Available choices are **ODBC**, **Excel** and **Text**. You are presented with different configuration options based on the **Type** chosen. The sections below explain each **Type** in more detail.

7.1.1 ODBC

Choosing **ODBC** allows you stream data to most ODBC databases including (but not limited to) SQL Server, MySQL, Oracle and MS Access. When **ODBC** is selected, the following parameters can be set:

- **ODBC Datasource** – This is a list of available data sources already configured in the **Data Sources (ODBC)** component of your Windows operating system. Select your desired data source here.
- **Schema** – Enter your database Schema name (Optional).
- **Username** – If your database requires a username enter it here.
- **Password** – If your database requires a password enter it here.
- **Login** – Click this button after entering the **Username** and **Password**.
- **Table** – Populated after selecting your **ODBC Datasource** and entering the **Username** and **Password**, this allows you to select the specific table, query, view or stored procedure you want to stream the RFID data reads to.

Note: To create a new Windows data source, see [APPENDIX C: Creating a Windows Data Source](#).

7.1.2 Excel

Choosing **Excel** allows you to stream your data to a Microsoft Excel spreadsheet. When **Excel** is selected, the following parameters can be set:

- **Excel Workbook** – Click the **Folder** icon and select the Excel workbook you wish to stream data to.
- **Worksheet** – Populated after selecting your **Excel Workbook**, this allows you to select the specific sheet within the workbook to stream the data to.
- **Advanced** – After clicking the **Advanced** button, you can set the **Start Row** in which the data streamed should start in the excel sheet. This is useful if you have column names and want to start on row 2.

Notes:

1. When streaming data to an excel sheet, the workbook must be closed for the process to run properly.
2. When using Excel, it is not recommended to use a **Continuous** read cycle for your RFID reader.

Chapter 7: Data Integration Settings

7.1.3 Text

Choosing **Text** allows you to stream data to a text file in a configurable format. When **Text** is selected, the following parameters can be set:

- **Select Folder** – Click the **Folder** icon and specify the folder where your text file resides.
- **Filename** – Populated after a folder is selected, this will display all .txt files found in the specified directory. Select the text file you wish to stream data to.
- **Create File** – If the text file does not exist, you can enter the name here and click this button to create the file. This file can be named with a **.txt** or **.csv** file extension.

7.1.3.1 Advanced Text Options

In this area, you can specify the type of delimiter to use, set file uniqueness and define field attributes. See below for the settings available in this section.

- **Delimited** – Sets the type of delimiter to use.
 - **Tab** – Data fields are separated by a tab.
 - **Semicolon** – Data fields are separated by a Semicolon (;).
 - **Comma** – Data fields are separated by a Comma (,).
 - **Space** – Data fields are separated by a single space.
 - **Other** – Data fields are separated by the character of your choice.
 - **Text Qualifier** – Surrounds each field of data with an Apostrophe (') or Quote (").
- **Fixed Width** – Each field is separated by a set width and is defined in the **Text File Fields** section.
- **Static File Suffix** – Will append the value defined here to the text file name.
- **Create Unique File Suffix** –Creates a unique file for each data stream. This is based on a **FileCounter** or **DateTime** and is appended to the file name.
- **Text File Fields** – Define field names and **Fixed Width** settings here. Fields can be added, removed or moved up/down using the navigation bar buttons.
 - **Name** – Specify a field name for each field. This is useful when mapping fields.
 - **Width** – Specify the width to be used for each field and is used with the **Fixed Width** option.
 - **Alignment** – Data can be aligned to the **Left** or **Right** when using the **Fixed Width** option.

Note: Creating unique files is only recommended for use when using the **Timed Interval Scan Mode**. If used in any other mode, you may end up with a large number of unique files.

7.2 Field Mapping

Once your data **Destination** has been defined, you will then be able to associate the fields or columns in your selected **Destination** to the fields available from the **RFID Source**. You are also presented with a toolbar which is explained below.

- **Add Field** – This adds an additional field to the mapping for both the Source and Destination.

- **Remove Field** – If a particular field is selected, it removes this from the mapping and shift all fields up. To remove an entire row, select the row from the left-hand column.
- **Move Up/Down** – If a particular field is selected, it moves this field up or down in order. To move the entire row, select the row from the left-hand column.
- **Reset Mappings** – This resets the field mappings to the default state.
- **Clear Mappings** – This removes all field mappings.

7.3 Advanced Field Mapping Options

Clicking the **Advanced** checkbox in the field mappings area exposes some additional settings. If you have the **UpdateExisting** or **UpdateExistingAppendIfNotFound** option set (See **Section 7.4** below), you can choose what happens with data when it is synced from the **Source** to the **Destination**. The options are described below.

- **Overwrite** – This is the default behavior. If the “**Advanced**” checkbox is not selected, all source fields will overwrite their respective destination fields. Please note that these field mapping options are retained even if the advanced checkbox is un-enabled.
- **Sum** – This option adds the source field data value to the destination field data during a sync. This option only works with numeric values. This can be used to determine the number of times a tag has been read.
- **Subtract** – This option subtracts the source field data value from the destination field data value during a sync. This option only works with numeric values.
- **Do Nothing** – This option does nothing to the field during a sync.
- **Do Nothing when Null** – This option does nothing to the field during a sync if the source is blank (null).

7.4 Setting Update Options

The **Update Options** allow you to control how the data is posted to your destination. The options available are **Append**, **Overwrite**, **UpdateExisting**, **UpdateExistingAppendIfNotFound** or **Delete Existing** and are explained below.

- **Append** – This takes the streamed data and adds it to the existing data in your **Destination**.
- **Overwrite** – This takes the streamed data and overwrites any existing data in your **Destination**.
- **UpdateExisting** – This takes streamed data and updates rows in your **Destination** based on the **Update Fields** chosen. This does not add any new data if a row is not found.
- **UpdateExistingAppendIfNotFound** – This takes streamed data and updates rows in your **Destination** based on the **Update Fields** chosen. This will also add any data rows not found in the **Destination**.
- **Delete Existing** – This takes streamed data and deletes rows in your **Destination** based on the **Update Fields** chosen. Data that does not match is ignored.

Note: When selecting one of the two **UpdateExisting** options you will need to specify fields in which to update the row based on. In most cases, this field will be set to the Tag ID field of your Destination. Fields can be added and removed by using the **Add** and **Remove** buttons.

Note: When selecting **Overwrite**, you have the ability to add **Destination Filtering**. If used, you can specify a filter definition to use when deciding which rows in your destination to be overwritten. Rows that match this filter will be deleted. If a filter is not specified, then all rows in the Destination will be overwritten.

7.5 Adding Source Filters

Located in the **Options** tab of the **Source** settings, adding a **Source Filter** allows you to control which data is streamed to the **Destination**. A typical use for this is allowing only tags read by antenna 1 to stream data to the **Destination**. To setup **Source Filtering** follow the steps below.

1. Click the **Add** button to create a new filter.
2. Select a field to filter on from the **Field** drop down.
3. Select a **Comparison Type**:
 - a. **Equals (=)** – Data is only streamed when it matches the entered **Value**.
 - b. **Not Equal (<>)** – Data is only streamed when it does not match the entered **Value**.
 - c. **LIKE** – Data is only streamed when it is similar to the entered **Value**.
 - d. **Greater Than (>)** – Data is only streamed when it is greater than the entered **Value**.
 - e. **Greater Than or Equal to (>=)** – Data is only streamed when it is greater than or equal to the entered **Value**.
 - f. **Less Than (<)** – Data is only streamed when it is less than the entered **Value**.
 - g. **Less Than or Equal to (<=)** – Data is only streamed when it is less than or equal to the entered **Value**.
4. Enter a **Value** that you want the filter to match.
5. To remove a filter highlight it and click the **Remove** button.

Example: Setting a filter where “Antenna = 1” will only stream data captured by the antenna connected to port 1 on your RFID reader.

Chapter 8: Application Preferences

These **Preferences** allow you to set the default project path, choose the sync server port and set the level of logging. This area is also used in configuring the **ClearStream RFID Service** explained further in [Chapter 9](#).

8.1 Server Settings

Located in the **Tools** menu under **Preferences**, the following options can be set under the **ClearStream RFID Management Studio Settings** section:

8.1.1 General Settings

- **Default ClearStream Project Location** – Set this to the location you would like your projects to save.
- **Sync Server Port** – The port number **ClearStream RFID** will communicate through when streaming data. (Default setting is **4405**)
- **Sync Server Logging Level** – Sets the level of detail written to the **ClearStream RFID** log file. More information on logging can be found in **Section 8.2** below.

8.1.2 Notifications

You can add notifications via email for events such as reader connectivity loss, critical errors and when a reader starts/stops. To add a new notification, click the **Plus (+)** button and configure the below settings. Click the **Minus (-)** button to remove an existing notification.

- **SMTP Host** – Set your email account's host address.
- **SMTP Port** – Set your email account's port number.
- **Username** – Set your email account's username.
- **Password** – Set your email account's password.
- **Require SSL** – Enable if your email account requires SSL.
- **Sender** – Set to an email address you would like the notification to come from.
- **Recipient(s)** – Set to who should receive this notification email. For multiple emails separate with a semi-colon (;).
- **Subject** – The email subject of the notification email.
- **Notifications to send** – The types of notifications to be sent. Each type will send a separate email.
 - **Critical Error** – A notification is sent whenever there is a critical error during the read process.
 - **Reader Connection Lost** – A notification is sent whenever ClearStream loses connectivity with a reader.
 - **Reader Connection Reestablished** – A notification is sent whenever ClearStream reestablishes connectivity with a reader after a connection loss.
 - **Reader(s) Started** – A notification is sent whenever a reader is Started.
 - **Reader(s) Stopped** – A notification is sent whenever a reader is Stopped.

8.1.3 Accept command messages

Enabled by default, this allows ClearStream RFID to accept external command messages such as the Start/Stop of a reader through the ClearStream Web API.

8.2 Event Log

The **Event Log** provides users with different levels of information that can be used in troubleshooting connectivity or data streaming issues. To open the log window, select **Event Log...** from the **View** menu. You are presented with the following options:

- **Logging Level** – Choose from the options below:
 - **None** – No information will be logged.
 - **CriticalError** – Errors relating to significant data stream problems or connection loss are logged.
 - **Error** – Both significant and smaller errors are logged.
 - **Warning** – Additional information regarding network issues are logged.
 - **Info** – The default level of logging, all primary connection and streaming events are logged.
 - **Verbose** – All actions taken by **ClearStream RFID** are logged in full detail.
- **Clear** – Will clear the contents of the **Event Log** window.
- **Open log file** – Allows you to open the stored log file and view all activity. This file can also be found here: **C:\ProgramData\PTS\ClearStream RFID\SystemInfo\System**
- **Always on top** – When checked, the **Event Log** window will remain on top of all other open windows.

Chapter 9: Running as a Windows Service

ClearStream RFID can be run as a windows service allowing data streams to take place unattended. This is useful when installing to environments that require minimal user interaction and does not require the **ClearStream RFID** software to be open.

9.1 Connecting to your Project

In order to use the **ClearStream RFID Service**, you must first associate a project for use with the service and set your desired port. This is done by following the instructions below.

1. Select **Preferences** from the **Tools** menu.
2. In the **ClearStream RFID Sync Service** section, click the **Folder** icon in the **Active ClearStream Project (.tcproj)** field; select your desired project and then click **Open**.
3. Set the desired **Sync Service Port**. Typically, this is left at the default of **4406**.
4. Choose the **Sync Service Logging Level** to use for the service.
5. Select **OK** to save the settings.
6. Proceed to **Section 9.2** below to learn how to **Start** and **Stop** the service.

Note: When making changes to the project used for the service, it is recommended you **Stop** the service if it is currently running.

9.2 Start/Stop the Service

To start the Windows Service, use one of the options below.

- Using the **Start/Stop Service** options under **Start→All Programs→PTS→ClearStream RFID**.
- Using the **Services** console from within **Windows** and right-clicking the **ClearStream RFID Service**.
- Right-clicking the **ClearStream RFID** system tray icon when enabled. (This is enabled by double-clicking the **clearstream_tm.exe** icon located in the **ClearStream RFID** install directory.)

When the **ClearStream RFID Service** is started, the streaming of tags can be started in three ways.

- If the **Auto Start Readers On Start** option within the **Application Preferences** dialog is enabled, all readers are automatically started when the Windows Service starts.
- Right click on the **ClearStream RFID Tray Monitor** and select **Readers→Start All**.
- Use the **ClearStream API** via any web enabled device.

Note: If the ClearStream RFID Service is set to **Automatic** or **Automatic (Delayed Start)**, the service will start automatically when Windows starts. If you do not want to start the service when Windows starts, simply set it to **Manual**.

Chapter 10: Virtual Site Survey

The **Virtual Site Survey** tool offers the ability to set up a virtual RFID environment. A basic floor plan can be laid out using this tool along with tagged items, fixed readers and antennas. The environment can be animated to show the movement of items throughout the virtual environment and how these items can be scanned using the virtual fixed RFID readers. Factors that can affect read performance are also taken into consideration; including distance from antenna, tag type, and tagged item material type.

10.1 Designing and Building the Virtual Environment

To configure a virtual environment, select **Tools**→**Virtual Site Survey** from the menu.

Building the Floor Plan

1. Use the **Add Floor Space** button to build out the floor plan of the environment.
2. To remove existing floor space, use the **Remove Floor Space** button.

Adding tagged items

1. Click the **Tag Container** button to add tagged items to the environment.
2. Click within the created floor space to add items.
3. Use the property grid on the right-hand side to change tag properties.

Adding readers

1. Click the **Reader** button to add fixed readers to the environment.
2. Click within the created floor space to add readers.
3. Use the property grid on the right-hand side to change reader properties.

Adding Reader Antennas

1. Right click on a Fixed RFID Reader already added to the environment, and select **Add Antenna**.
2. Add the required number of antennas to the RFID reader.
3. Aim the antennas to the desired location using the antennas target icon.

Adding GPO Device (LightStack)

1. Right click on a Fixed RFID Reader already added to the environment, and select **Add GPO Device**.
2. Click the newly added GPO device and then select a Type from the Selected Object's Properties. Choices are **LightStack_OneLight**, **LightStack_TwoLight** or **LightStack_ThreeLight**.
3. Based on this selection, a number of ports will display below. Note the port numbers when setting up GPO in your Sync process.
4. Position the light stack where desired.

Chapter 10: Virtual Site Survey

Adding Text

1. Click the **Text** button from the **Toolbox**.
2. Click within the created floor space to add text.
3. Use the property grid on the right-hand side to change the text.

10.2 Reading Virtual Tags

To begin reading tags in the virtual environment, the RFID readers need to be powered on. Follow the steps described in [Chapter 5](#) to configure the reader and select where the virtual tag data is to be sent.

Note: Only readers configured as **Emulated** readers can be used with the **Virtual Site Survey**.

1. Select the readers in your environment, making sure the IDs match the IDs of the configured readers in the **Reader Configuration** dialog.
2. Use the **Start/Stop** form to power up the virtual readers.
3. Drag tagged items into the field of view of the antennas. As the tags pass through these fields they will trigger a read and the tag information is sent to the selected destination.

10.3 Configuring an Animation

The **Virtual Site Survey Animation** feature allows for an automated test of the tagged items moving within the virtual environment. Tagged items within the field of view of an active antenna will be read by that antenna and transferred to the data destination.

To configure an Animation.

1. Add **Animation Areas** to the environment using the **Area Toolbox** item. Animation areas are added sequentially to the environment. All items follow the path created by the **Animation Areas** during the animation process.
2. Select the desired animation type using the **Animation** drop down at the top right of the **Virtual Site Survey** window.
 - **CradleGrave** – All items start at **Animation Area 1** and move to the final **Animation Area**. When tagged items reach the final **Animation Area**, they are removed from the animation.
 - **Cycle** – All Items start at **Animation Area 1** and move to the final **Animation Area**. When tagged items reach the final **Animation Area** they continue on to the first **Animation Area** and the animation continues indefinitely.
3. Use the **Play** button to start the animation.
4. Use the **Stop** button to stop the animation.
5. Use the **Speed** text box to change the speed of the animation.

Chapter 11: Command API Interface

The **Command API Interface** is newly introduced in ClearStream RFID version 3.0. This API is designed to allow outside control of **ClearStream RFID** configured readers. Starting, stopping, or just getting a device status is all supported via this API.

Appendix D also discusses an attached sample of how the API might be used. In the included fully functional sample, a web application is used to display a list of attached readers and allows starting, stopping or checking the status of each of these devices.

The following pages outline the different methods and properties available.

11.1 PTS_CS_Command class

11.1.1 PTS_CS_Command Properties

Host: The HostName/IP Address of the desired PC running **ClearStream RFID**.

Port: The TCP/IP Port used in the **ClearStream RFID** application on the Host PC.

ServerVersion: Indicates the **ClearStream RFID** Application Version.

11.1.2 PTS_CS_Command Methods

getVersion ()

Returns the version of the **ClearStream RFID** host application.

Parameters

Parameter	Type	Description
None		

Return value

Type: String

The version of the **ClearStream RFID** application.

getDeviceList()

Return a list of all configured devices running on the connected **ClearStream RFID** host PC.

Parameters

Parameter	Type	Description
None		

Return value

Type: PTS_DeviceList

A list of all available devices (RFID Readers) configured on the connected **ClearStream RFID** host PC.

Chapter 11: Command API Interface

getDeviceStatus(int nDeviceId)

Returns the status of a configured device matching the requested ID. The device ID is the natural order of the devices as they are configured in the **ClearStream RFID** host PC. This is a zero based index.

Parameters

Parameter	Type	Description
nDeviceId	Int	The Reader/Device ID of the desired reader.

Return value

Type: bool

Running status of the requested device. If true, the device is currently running.

getDeviceStatusByName(string sName)

Returns the status of a configured device matching the requested name.

Parameters

Parameter	Type	Description
sName	String	The name of the desired Reader/Device.

Return value

Type: bool

Running status of the requested device. If true, the device is currently running.

startDevice(int nDeviceId)

Starts a reader that matches the specified Reader/Device ID. This is a zero based index.

Parameters

Parameter	Type	Description
nDeviceId	Int	The Reader/Device ID of the desired reader.

Return value

Type: bool

Success or failure of the start request.

startDevice(int nDeviceId,string sStartDescription)

Starts a reader that matches the specified Reader/Device ID with a customizable start description. This is a zero based index.

Parameters

Parameter	Type	Description
nDeviceId	Int	The Reader/Device ID of the desired reader.
sStartDescription	String	A description to describe the action starting this device. This value is posted

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		in the ClearStream RFID Destination's data source in the StartEvent field (if mapped).
--	--	--

Return value

Type: bool

Success or failure of the start device request.

startDeviceByName(string sName, string sStartDescription)

Starts a reader that matches the specified name with a customizable start description.

Parameters

Parameter	Type	Description
sName	String	The user assigned reader name
sStartDescription	String	A description to describe the action starting this device. This value is posted in the ClearStream RFID Destination's data source in the StartEvent field (if mapped).

Return value

Type: bool

Success or failure of the start device request.

stopDevice(int nDeviceId)

Stops a reader that matches the specified Reader/Device ID. This is a zero based index.

Parameters

Parameter	Type	Description
nDeviceId	Int	The Reader/Device ID of the desired reader.

Return value

Type: bool

Success or failure of the stop device request.

stopDeviceByName(string sName)

Stops a reader that matches the specified name.

Parameters

Parameter	Type	Description
sName	String	The user assigned reader name.

Return value

Type: bool

Success or failure of the stop device request.

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11.2 PTS_DeviceList class

11.2.1 PTS_DeviceList Properties

None

11.2.2 PTS_DeviceList Methods

getDeviceAtIndex (int nIndex)

Returns the PTS_Device instance at the specified index. This is a zero based index.

Parameters

Parameter	Type	Description
nIndex	Int	Index position of desired PTS_Device in the list.

Return value

Type: PTS_Device.

Instance of a PTS_Device at the specified index position. This is a zero based index. NULL is returned for an invalid index value.

getCount ()

Returns the total count of configured readers within the **ClearStream RFID** host PC.

Parameters

Parameter	Type	Description
None		

Return value

Type: Int.

The number of devices/readers configured within the **ClearStream RFID** host PC.

11.3 PTS_Device class

11.3.1 PTS_Device Properties

DeviceId: The device identifier of this particular device. This can be used to get the status of or to start/stop this device.

GroupId: The Group ID of this particular device (reserved for future use).

Name: The name assigned to this device. This can be used to get the status of or to start/stop this device.

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Comment: Any comment associated to this device.

Device Type: The specific make/model of this device.

11.3.2 PTS_Device Methods

None

Appendix A: Moving ClearStream RFID to a New Host PC

ClearStream RFID allows you to export your list of registered/un-registered seats making it easy to move the installation to a new PC.

To Export the license file from ClearStream RFID:

1. Launch **ClearStream RFID**.
2. Select **Registration** from the **Tools** menu and select the **Import/Export** tab.
3. Click the **Export** button.
4. Select a location and filename for the **Export** file and click **Save**.

Note: A registration file can only be exported from a fully licensed install of ClearStream RFID.

To Import the license file to your ClearStream RFID installation:

1. Launch **ClearStream RFID**.
2. Select **Registration** from the **Tools** menu and select the **Import/Export** tab.
3. Click the **Import** button and locate the previously created **Export** file.
4. Select the file and click **Open**.
5. You will receive confirmation of a successful import.
6. The **Registration** tab should now be updated with the correct information.

Note: A registration file can only be imported to a fully licensed install of ClearStream RFID.

Appendix B: Terms and Concepts

RFID Terms and Phrases

As with most technologies, RFID and **ClearStream RFID** use industry accepted terms and phrases as well as terms that are unique to **ClearStream RFID**.

RFID Reader: A transmitter/receiver that reads the contents of RFID tags in the vicinity.

Read Range: The distance in which an RFID reader and antenna can read an RFID tag reliably.

Passive RFID Tag: An **RFID Tag** that does not contain a battery; the power is supplied by the reader. When radio waves from the reader are encountered by a passive RFID tag, the coiled antenna within the tag forms a magnetic field. The tag draws power from it, energizing the circuits in the tag. The tag then sends the information encoded in the tag's memory.

Active RFID Tag: An **RFID Tag** equipped with a battery that can be used as a partial or complete source of power for the tag's circuitry and antenna. Some active tags contain replaceable batteries for years of use; others are sealed units.

RFID Tag Inlay: Comprises the chip and aluminum, copper or silver antenna bonded to a polyethylene terephthalate (PET) layer that is delivered to the label maker "dry" (without adhesive) or "wet" (attached to a pressure sensitive liner). The inlay is adhered to the back side of the label and printed and encoded by an RFID printer.

LLRP: The acronym of '**Low Level Reader Protocol**', ratified by EPCGlobal in April, 2007. LLRP is the RFID-aware protocol that is intended to standardize the network interface of the RFID readers. It is designed as a standard in order for developers to have a common programmatic interface to RFID readers from different manufacturers.

Stream: The ability of **ClearStream RFID** to constantly send data from RFID readers to a predefined destination.

Profile: A **Profile** is simply a term used to describe the collection of individual processes. This **Profile** also determines the order in which a **Process** is run.

Process: A **Process** is the most basic level of configurations for **ClearStream RFID** and represents the transfer/streaming of data. These processes are configured to send data in one direction; from a **Source** to a **Destination**.

Source: The Source is the collection of information used to update the destination in a given streaming **Process**. In **ClearStream RFID**, the source is set to the RFID reader(s) being used in a **Process**.

Destination: The **Destination** is simply the database designated to receive streaming data from the RFID reader(s). The **Destination** is determined by the type of file you wish to send data to.

ClearStream RFID Project: A **ClearStream RFID Project** is a collection of profiles and processes.

Appendix B: Terms and Concepts

ClearStream RFID Project Export: This file encompasses all the settings within a **ClearStream RFID** project allowing for easy sharing, but requires the file to be imported back into **ClearStream RFID** rather than simply opened.

Primary ClearStream RFID File Extensions:

ClearStream RFID Project file - .tcproj

The file used by **ClearStream RFID** to save projects. This file requires associated files in sub folders that contain configuration information. These files and folders are created whenever a new **Project** is saved.

ClearStream RFID Profile Export file - .tce

This file is a sharable version of the .tcproj file. This manually created exported file contains all the info normally stored in the .tcproj file along with the associated folders. Once shared and imported back into **ClearStream RFID**, this file would be saved as a **.tcproj** for editing or use.

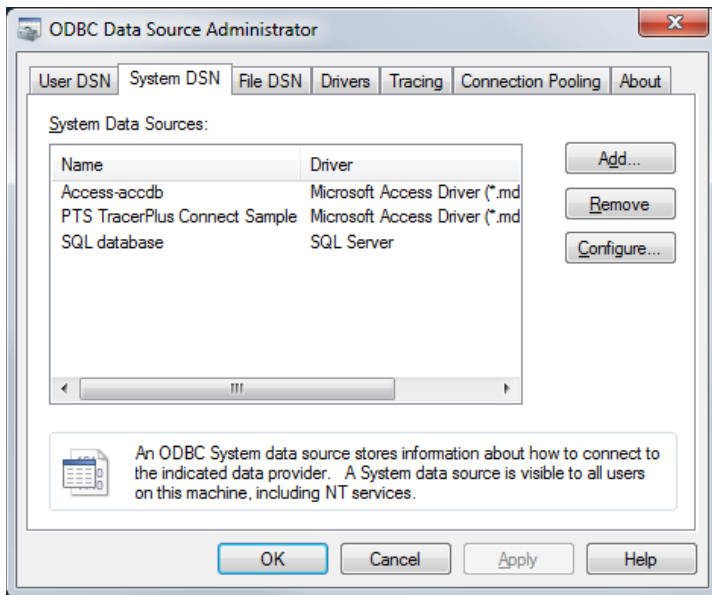
Appendix C: Creating a Windows Data Source

Creating a New Data Source to Connect to an Existing ODBC Database

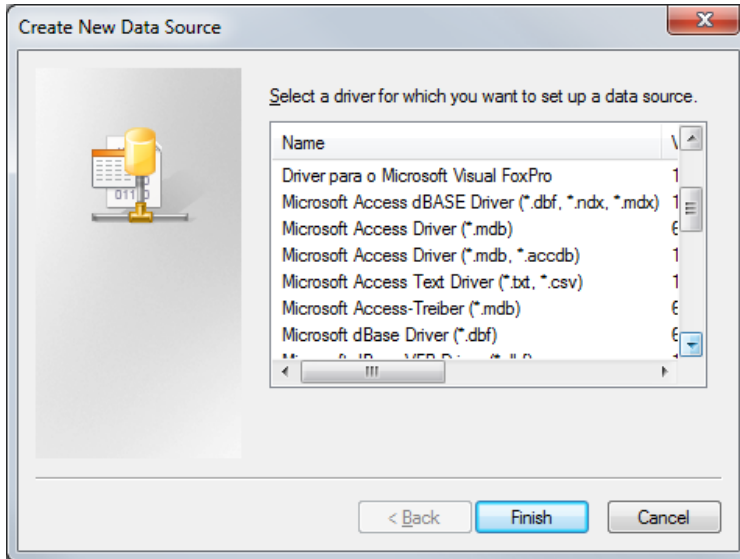
1. Click the Windows Start Menu at the lower left corner of your PC.
2. Navigate to and open the Control Panel window.
3. If your Control Panel is set to *Icon View*, then double click the **Administrative Tools** icon.
4. If your Control Panel is set to *Category View*, first Select **System and Security**, then double click the **Administrative Tools** icon.


Note to users of 64 bit Windows PCs: Due to a Microsoft driver error, users must instead use the 32 bit ODBC administrator tool. Rather than locating this panel as described above, navigate to the **C:\Windows\SysWOW64** folder and locate the **odbcad32.exe** icon.

5. Double click the **Data Sources (ODBC)** icon.
6. The **ODBC Data Source Administrator** window will open.



7. Select the **System DSN** tab, then click the **Add** button.
8. The **Create a New Data Source** window will open.



9. Select the appropriate driver based on the database type you wish to use. If the desired driver is not present, consult your database user guide on how to manually install the proper driver.
10. Click **Finish**
11. This will open the database **Configuration** window. Enter the relevant information about your DSN, and select the database file. The method for selecting the database will vary based on which type you are using. Refer to the built-in Windows Help or your database user guide for additional information.
12. After completing the configuration, Click **OK** to close the **ODBC Data Source Administrator** control panel.
13. The database is now configured and will appear in the **OBDC Datasource** dropdown in **ClearStream RFID**. If the database name is not visible, click the **Refresh Button**  to update the dropdown list.

Appendix D: Using the ClearStream RFID Web Application

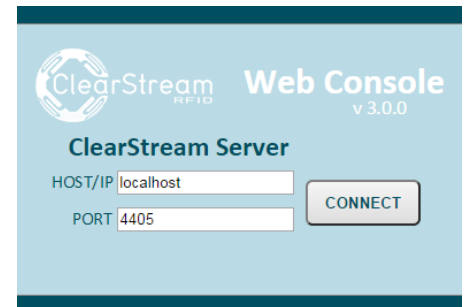
Included in the **ClearStream RFID** installation is a sample web application that can be used to control your individually configured RFID readers. This web application is fully functional out of the box and is also a good demonstration of the **ClearStream RFID API**.

To use the **ClearStream RFID** web application:

1. Select **ClearStream Web App Demo** from the Start menu shortcut (**Start**→**Programs**→**PTS**→**ClearStream RFID** →**ClearStream Web App Demo**). This launches the web application in your default web browser.

Note: This shortcut option is only valid if you choose to install the web app at the time of installation.

2. You must first login to the PC/server that contains the **ClearStream RFID** installation. Enter the **HOST/IP** and **Port** the ClearStream RFID Server is using. These settings can be found in the **Tools**→**Preferences** dialog of the **ClearStream RFID Management Studio**.



Note: If you are connecting to a ClearStream RFID installation located on the same PC, you can enter *localhost* or *127.0.0.1* for the **HOST/IP**. If it is on another PC, you will need to enter the IP address of that remote PC. The default port is 4405.

Note: If you are connecting to a PC outside of your network, you will need to make sure your network configuration allows for this type of connection.

3. Click the **Connect** button to initialize the connection to the specified **ClearStream RFID** server.
4. After a successful connection, the list of configured readers is displayed in the Reader List. Use the Reader list to check a reader's status or Start/Stop a reader.