# Echo® Cherry Pick Quick Start Guide

**Version 1.5**

The Echo® Cherry Pick application provides a variety of plate transfer functions to the Echo Liquid Handler and works with all Echo Liquid Handlers. The transfer protocol defines plate parameters and processing order for imported pick lists. Pick lists are used to automate the transfer of selected samples from source plates to destination plates. Pick lists can be imported during protocol creation or just before run time. The transfer process and reports final well positions in customizable reports.

The steps to creating a typical transfer protocol using Echo Cherry Pick application are shown below:

1. Create a new protocol.
2. Select the source and destination plate types.
3. Set up the transfer protocol.
4. Create or import a pick list.
5. Save the protocol.
6. Start the protocol.

## Creating a New Protocol

There are multiple ways to start a new protocol.

1. Select **New** from the **File** menu.
2. Click the **New** icon in the **Toolbar**.
3. Press **CTRL+N** from the keyboard.

## Selecting Source and Destination Plate Types

The Echo liquid handler dynamically adjusts to different changes in fluid characteristics within a broad fluid class (Dynamic Fluid Analysis). Choosing the plate format determines the physical plate parameters that the Echo Cherry Pick application uses. Choosing the plate type determines the transfer method that the Echo liquid handler uses; taking the plate format and fluid properties into account. These settings enable the Echo system to transfer multiple fluid types from the same source plate. For example, using the plate format 384PP and plate type MyBuffer_AQ_GP instructs the liquid handler to transfer samples from a 384PP format plate with a transfer method suited for the Glycerol fluid class.

These steps are critical when creating the application protocol.

1. In the **main Protocol** window, select the **Sample Plate Format** to be 384PP, 384LDV, or 1536LDV. Based on the plate format chosen, the compatible plate types appear for **Sample Plate Type**.
2. Select the appropriate **Sample Plate Type** from the list.
3. Enter the **Sample Volume** for the sample plate if it is not specified by the pick list.

   Note: If the sample pick list chosen during the run has a sample volume specified, the sample volume from the pick list will override the sample volume specified in the protocol setup. The default sample volume is 2.5 nL.
4. Select the **Control Plate Format** to be 384PP, 384LDV, or 1536LDV. Based on the plate format chosen, the compatible plate types appear for **Control Plate Type**.
5. Select the appropriate **Control Plate Type** from the list.
6. Enter the **Control Volume** for the control plate.

   Note: Note: If the control pick list chosen during the run has a control volume specified, the control volume from the pick list will override the control volume specified in the protocol setup. The default control volume is 2.5 nL.
7. Select the **Destination Plate Type** to set the transfer properties for the **Destination Plate**.

   Note: Note: Not all plate formats and plate types are available on all instruments. The specific plate requirements per user environment are specified in the purchase agreement and programmed into the instrument prior to shipping.

After selecting the sample plate format/type, control plate format/type, and the destination plate type, set up the other transfer protocol parameters.

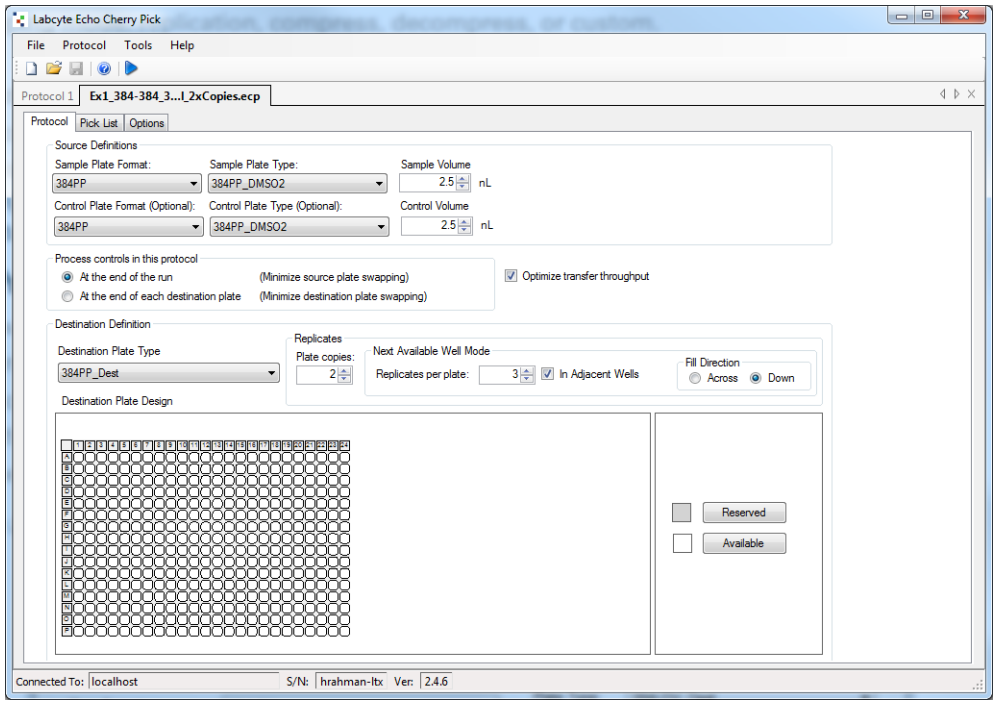


Figure 2.1 Selecting source and destination plate types in the main Protocol window

## Setting Up a Transfer Protocol

Set up the other transfer protocol parameters:

1. Select one of the following options for **Process controls in this protocol** to define the order in which to process the plates.
   - **At the end of the run** — Process all sample pick list plates first. For example, to minimize the time that the plates are out of storage.
   - **At the end of each destination plate** —Add controls to each destination plate and process the destination plate as soon as possible. For example, to transport the plate to a controlled environment.
2. Select **Optimize transfer throughput** to allow the application to determine the optimal transfer path. The Echo overrides the order of operation specified in the protocol and reorder transfers to minimize stage and transducer movements.
3. Set **Plate copies** to the number of times the plate should be replicated.
4. Set the values in the **Next Available Well Mode** section.
   - **Replicates per plate** — Number of times a sample is replicated on a plate.
   - **In Adjacent Wells** — Check to indicate the replicates should be should be next to each other.
   - **Fill Direction (Across or Down)** — Fill direction on the destination plate is across or down.

   Note: Settings for the **Next Available Well Mode** are only applied when the destination wells are not defined in the pick list.

   If the imported sample pick list has destination wells defined (Explicit format), then the number of replicates must be set to 1; otherwise, the application will display a message that prompts the user to reset the replicate number. The other settings in the **Next Available Well Mode** section are ignored.

   The saved protocol does not retain imported pick lists, since they are not valid across transfer runs.
5. If reserve wells are required, select wells in the destination plate map and click **Reserve**. The application will skip over the reserved wells during a sample transfer.

   Note: Reserved wells are ignored if the destination wells are defined in the pick list. For example, see **Explicit** format in *"Creating a Pick List" on page 3*.
6. To save the protocol, select **Save** from the **File** menu and enter a file name in the prompt box. The protocol is saved with the file extension `.ecp` in the default directory `C:\Labcyte\Echo\Protocols`.

## Importing a Pick List

The Echo Cherry Pick application is installed with three sample pick lists in the default directory `C:\Labcyte\Echo\Protocols`. These samples are described below.

- **384-384_NextAvailableWell.csv** — This is the simplest pick list. Only the source plate barcode and source well locations are needed. In the protocol settings, the user can specify multiple plate copies and multiple sample replicates. Samples are transferred to the *next available* wells of the destination plate.
- **384-384_Explicit.csv** — This pick list explicitly specifies destination well locations, destination plate ID, and transfer volume. In the protocol settings, plate copy and sample replicates must be set to 1.
- **384_Controls.csv** — This pick list is explicit for controls, specifying source plate barcodes, source and destination well locations, and transfer volume. The Control Pick List can be used with both the Explicit and NextAvailableWell pick list.

All three pick lists use the same basic pick list structure— file header and file content.

When the pick list is imported, the application identifies the file headers and displays the corresponding file content.

The examples described above can be used to create pick lists that work well with the Echo Cherry Pick application. Additional information can be added to the file headers described. The **Import Pick List** dialog box provides the option to skip this data when the pick list is imported.

The pick list must be saved in `.csv` (comma separated values) or `.txt` file format to be recognized by the Echo Cherry Pick application. This is a common file extension used in spreadsheet programs.

Note: The options available from the **Column** drop down menu are functional parameters within the software application. The user must select the appropriate application parameter that corresponds to the file header from the pick list. Look for the **Save as** menu and select **CSV (Comma delimited) (*.csv)**.

**To import a pick list:**

1. Navigate to the **Pick List** tab in the **main Protocol** window.
2. In the **Samples** tab, click **Import** and select a pick list in the **Open Pick List** dialog box.
3. Click **Open** to select the pick list and close the **Open Pick List** dialog box. The **Import Pick List** dialog is displayed.
4. Modify the pick list parameters as needed and then click **Import**. The pick list is imported into the protocol.
5. Navigate to the **Controls** tab, click **Import** and select a pick list in the **Open Pick List** dialog box.
6. Click **Open** to select the pick list and close the **Open Pick List** dialog box. The **Import Pick List** dialog is displayed.
7. Modify the pick list parameters as needed and then click **Import**. The pick list is imported into the protocol.
8. Navigate to the **Plate Preview** tab to view the source and destination plates using the selected pick lists.

When importing a sample and/or control pick list via the **Run Protocol** screen, the pick list parameters override any plate parameters in the protocol for the run. Importing a control pick list is optional, but a sample pick list is required to run the protocol.

Note: The pick list cannot be saved in the protocol.

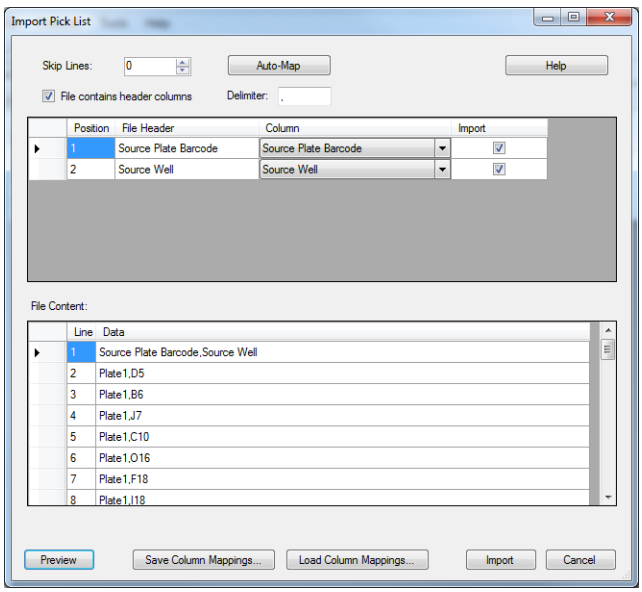


Figure 2.2 Import Pick List dialog box

## Creating a Pick List

The pick list is a table of specific wells that have been selected from a group of wells for analysis. The pick list is typically created in a text or spreadsheet file.

### Guidelines for defining pick list:

- Pick lists using row and column location must use the one-based coordinate system, which means that the first well in the upper left corner of the microplate is labeled row 1, column 1, or (1,1).
- Pick list must be saved in `.csv` or `.txt` file format to be used by the Echo Cherry Pick application.
- It is recommended for sample pick lists to have a **Source Plate Barcode** and/or **Source Plate Name**, although it is only required to have a **Source Well** or (**Source Row** and **Source Column**) to run the Echo Cherry Pick application.
- Control pick lists should minimally have a **Source Plate Barcode** and/or **Source Plate Name**, a **Source Well** or (**Source Row** and **Source Column**), and a **Destination Well** or (**Destination Row** and **Destination Column**).
- Pick list headings should match the headings listed in the **Import Pick List** dialog box to be automatically mapped by the application.

  Note: If an error is encountered when importing a pick list, the error message will show the column data that is needed.

  Any pick list heading that does not match one of the import column headings can be manually mapped by the user.

To process a pick list, Echo Cherry Pick requires information for the following parameters to be provided in separate columns for the pick list file:

| Required Parameters | | | Optional Parameters |
|---|---|---|---|
| **Next Available Well Pick List** | **Control Pick List** | **Explicit Pick List** | **All Pick Lists** |
| • Source Plate Barcode and/or Source Plate Name<br>• Source Well and/or (Source Row and Source Column | • Source Plate Barcode and/or Source Plate Name<br>• Source Well and/or (Source Row and Source Column<br>• Destination Plate Name and/or Destination Plate Barcode | • Source Plate Barcode and/or Source Plate Name<br>• Source Well and/or (Source Row + Source Column)<br>• Destination Plate Name and/or Destination Plate Barcode<br>• Destination Well and/or (Destination Row + Destination Column) | • Source Plate Type<br>• Sample ID<br>• Sample Name<br>• Sample Group<br>• Sample Comment<br>• Destination Well<br>• Destination Row<br>• Destination Column<br>• Destination Well X Offset<br>• Destination Well Y Offset<br>• Transfer Volume<br>• Delay |

## Saving the Protocol

To save the protocol:

1. Select **Save** from the **File** menu.
2. In the **Save Protocol** dialog box, enter a name for the protocol and click **Save**.

## Starting the Protocol

Once the transfer map has been created and a sample pick list has been imported or created, the protocol can be run on an Echo system or in simulation.

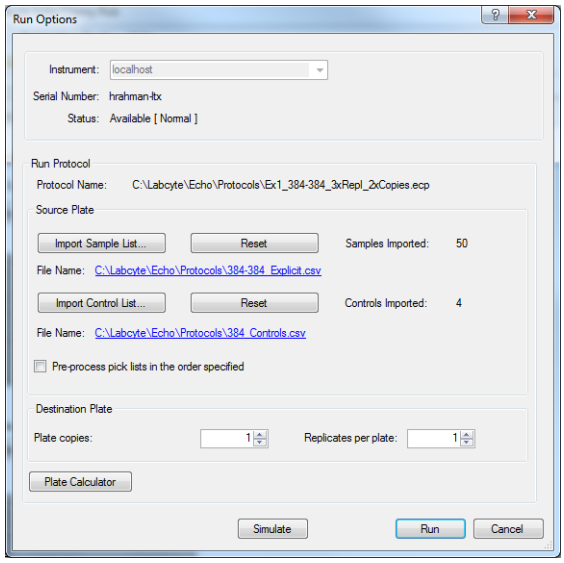


Figure 2.3 Run Options dialog box

To begin a protocol simulation or live run:

1. Select **Run** from **Protocol** menu or click the **Run** icon in the **Toolbar**.
2. Select the **Instrument** if it is not already selected.
3. Click **Import Sample List** to import a sample list to be used for the run. This step is only needed if a pick list was not previously imported or if the user would like to change the current pick list. For more information on how to define a pick list, see *"To import a pick list:" on page 3*.
4. Click **Import Control List** to import a control list to be used for the run. This step is only needed if a pick list was not previously imported or if the user would like to change the current pick list. For more information on how to define a pick list, see *"To import a pick list:" on page 3*.
5. Select **Pre-process pick lists in the order specified** to process the pick lists to determine the placement of all compounds in advance of the run.
6. Change the value for **Plate copies** to override the number of plate copies for the protocol. Change the **Replicates per plate** value to override the original setting in the protocol for the replicates per plate.
7. Click the **Plate Calculator** button to view the number of plates needed to run the protocol.
8. Optionally, click **Simulate** to test the run.
9. Click **Run** to display the **Run Status** window.
10. Click **Start** to execute the protocol.
11. Once the protocol run is completed, click **Close** to exit the **Run Status** window.

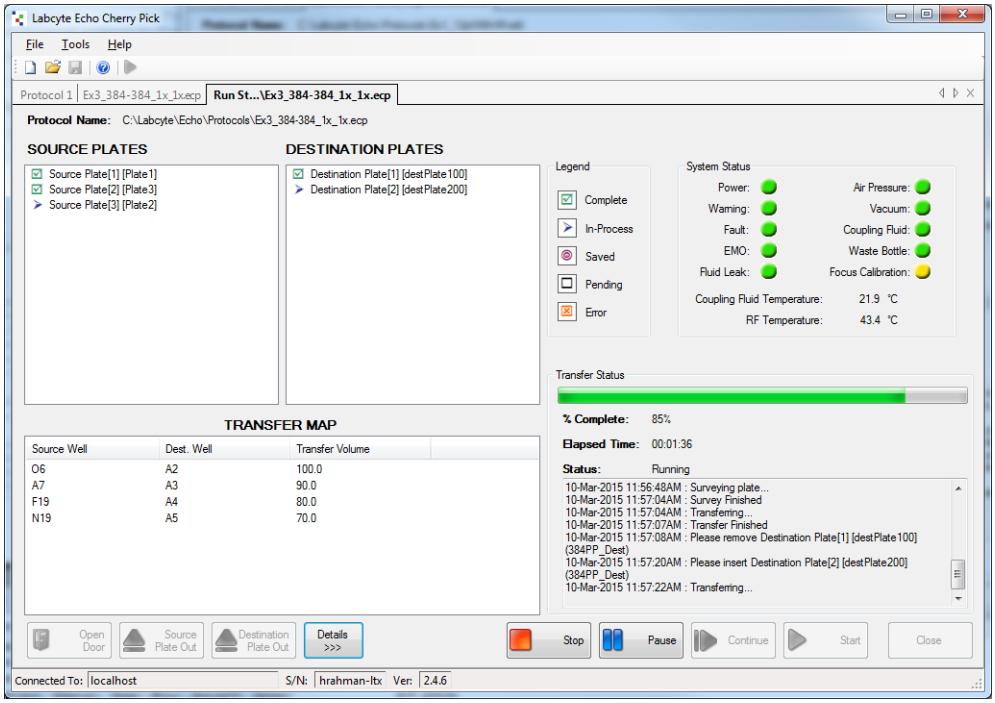


Figure 2.4 Run Status window

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