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Introduction

This Technical Note describes the use of the new Column Identification Tags (column ID tags) for the Agilent InfinityLab LC Series Column Compartments:

• 1260 Infinity II Multicolumn Thermostat (G7116A) - (MCT)
• 1290 Infinity II Multicolumn Thermostat (G7116B) - (MCT)
• The Integrated Column Compartment (ICC), which is available as an add-on option for the 1260 Infinity II Vialsampler (G7129A) and the 1290 Infinity II Vialsampler (G7129B).

The column ID tags are recognized automatically and facilitate trackable column management using Agilent OpenLAB CDS ChemStation Edition. The new column ID tags enable quick and easy column switching, with automated recognition of the installed columns.

This Technical Note applies to the following software revisions:

• Agilent RC.Net Drivers rev. A.02.14
• Agilent OpenLAB CDS A.02.02 SR2 ChemStation Edition

Workflows using earlier revisions of the software will vary in detail.

If you are using a CDS other than OpenLAB CDS ChemStation, contact Agilent Technologies for details of column ID tag usage.

Correct documentation is an essential element of effective and productive laboratory workflows. With respect to columns, important information such as the number of injections or the performance is not available except by tracking such information in a logbook, either as a paper document or in digital form. This is a time-consuming exercise, prone to error, and dependent on the reliability of the users.

Agilent Technologies provides a convenient solution based on column identification tags that are attached to the columns and connected to a Tag reader assembly mounted in the column compartment and controlled through Agilent instrument drivers (minimum revision A.02.12). Column ID tags can be permanently attached to each column as required; they are not intended to be removed and transferred to another column. This prevents any confusion after a column is changed, and the column history can be tracked with 100% certainty.
The Column ID (upgrade) kit contains one (G7116A or G7129A/B with ICC add-on option) or two (G7116B) column ID tag reader assemblies, which are installed on either side of the Infinity II module to host up two column ID tags for the G7129A/B with ICC add-on option, up to four column ID tags for the G7116A MCT or up to eight column ID tags for the G7116B MCT (four on each side).

Column ID tags are available as pre-labeled tags for Agilent columns or as custom tags, which can be attached to any column and allow you to enter the column information.

**Delivery Checklist**

Check the content of the delivery. You should have received the following:

**G4750B Column ID Upgrade Kit for Agilent 1290 Infinity II Multicolumn Thermostat (G7116B)**

<table>
<thead>
<tr>
<th>Item</th>
<th>#</th>
<th>p/n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5067-5915</td>
<td>Column ID Kit Left</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>5067-5916</td>
<td>Column ID Kit Right</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5067-5917</td>
<td>Column Identification Tag Assembly</td>
</tr>
</tbody>
</table>

**G4750A Column ID Upgrade Kit for Agilent 1260 Infinity II Multicolumn Thermostat (G7116A)**

<table>
<thead>
<tr>
<th>Item</th>
<th>#</th>
<th>p/n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5067-5915</td>
<td>Column ID Kit Left</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5067-5917</td>
<td>Column Identification Tag Assembly</td>
</tr>
</tbody>
</table>

**G4751A Column ID Upgrade Kit for the Integrated Column Compartment**

<table>
<thead>
<tr>
<th>Item</th>
<th>#</th>
<th>p/n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>5067-5964</td>
<td>Column Identification Kit</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5067-5917</td>
<td>Column Identification Tag Assembly</td>
</tr>
</tbody>
</table>
Installing the Column ID Tag Readers

<table>
<thead>
<tr>
<th>Parts required</th>
<th>p/n</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5067-5915</td>
<td>Column ID Kit Left</td>
</tr>
<tr>
<td></td>
<td>5067-5916</td>
<td>Column ID Kit Right</td>
</tr>
<tr>
<td></td>
<td>5067-5917</td>
<td>Column ID TAG Assembly</td>
</tr>
</tbody>
</table>

Preparations

Power off the instrument.

**CAUTION**

Electronic boards and components are sensitive to electrostatic discharge (ESD).

ESD can damage electronic boards and components.

➔ Be sure to hold the column ID modules by the plastic parts, and do not touch the electrical components. Do not touch the pins of the flex-board connector.

**NOTE**

In the Agilent 1260 Infinity II Multicolumn Thermostat (G7116A) the Column ID is installed on the left side of the module only.

1 Remove any tube guides and tube clip holders that may already be installed on the sides of the MCT cover.

2 Unlock the left and right (G7116B only) side cover inserts by pushing them to the rear and put them aside.
3 Identify the left and right (G7116B only) column ID module. The ID sockets 1 to 4 are numbered from top to bottom.

4 Take the end of the pre-installed flex-board connector out of the holder.

5 Connect the flex cable to the column ID module.
   a Open the locking mechanism of the connector by lifting up the frame.

   b Push in the cable with the contacts facing to the rear.
c Close the locking mechanism.

d Verify that the cable is properly attached to the connector without visible offset.

6 Attach the column ID module to the MCT cover.

7 Repeat steps 4 to 9 for the column ID module on the other side (for G7116B, on the right).

8 Install the waste tube clip holder (example shows a G7116B).
Connecting the Column ID Tags

1 If the column has no Column ID Tag, fit a tag by slipping the loop over one end of the column and pulling it tight through the plastic holder.

Once the loop has been pulled tight, the tag can no longer be removed from the column.

2 Install the column in the module.

3 Plug the free end of the Column ID Tag into the adjacent socket in the column tag reader unit.

**NOTE**

It is essential that the Column ID Tag is plugged into the adjacent socket in a logic order (that is, first column from the top into "1", second column from the top into "2", and so on). Otherwise, the column tag information will not be correctly updated.

**NOTE**

If you have a full-length column, we recommend that you use the adjacent socket on the left column tag reader.
Using Column ID Tags

Column ID tags are designed to help you to automatically track the usage of the columns in your laboratory. The column ID tag contains an extensive amount of information about the column and its usage. Two types of information are stored:

- **Static** fields contain information on the physical characteristics of the column such as the length, internal diameter and particle size. Typically, this information stays the same for the lifetime of the column.

- **Dynamic** fields contain information on the usage of the column such as the number of injections and maximum measured temperature. Each time you make an injection on the column, the dynamic information is updated automatically.

For full details of all the information available on the column ID tag, see “Column Tag Information” on page 17.

In *pre-labeled* tags for Agilent columns, all static fields except Void volume and Comment are set to read-only for compliance reasons. Only the dynamic fields are available for update.

*Custom* tags provide write access to both static and dynamic fields. This allows you to enter information in the static fields for non-Agilent columns. When the information is complete, you can seal the tag permanently; when a tag is sealed, only the dynamic fields are available for update.

The information stored on the pre-labeled column ID tags for Agilent columns is automatically imported into the Edit Columns table of ChemStation, which you access from the Instrument menu of the Method and Run Control view (see “The ChemStation Columns Table” on page 16) and the Column Assignment table of the Column Compartment Dashboard panel (see “The Column Tag Information Table” on page 16). Pre-labeled column ID tags are sealed; the static fields (except Void Volume and Comment) cannot be edited. The dynamic fields are updated automatically according to usage.

For custom column tags with no stored column information, you must provide the details. Using ChemStation, you can import the data from a database (an existing catalog or inventory, or the Agilent columns guide); for other CDSs, you must enter the information manually. When you have entered all the information, you can seal the tag so that the static fields cannot be changed.
Using Column ID Tags with ChemStation

Agilent OpenLAB CDS A.02.02 SR2 ChemStation Edition in combination with RC.Net Drivers Revision A.02.14 provides a unique close connection with the Column Tag Information function of the Multicolumn Thermostat through the Edit Columns table (see “The ChemStation Columns Table” on page 16).

Use these instructions to enter and store the column information on the column ID tag.

1 In the Method and Run Control view of the Agilent OpenLAB CDS ChemStation Edition, select Columns from the Instrument menu.

   The Edit Columns dialog box is displayed.

   If the Edit Columns table is empty, go straight to Step 3.

   It may take several seconds for the column tag to be read and the tables to be updated.
2. Select a line in the table that contains column information as close as possible to the column you are adding. The selected line acts as a template for the new column.

3. Click the Insert button to insert a line above the currently selected line, or the Append button to add a line to the end of the table.

The new line contains a copy of the information in the template line.

4. Click the Edit button to display a dialog box that allows you to edit the column-specific information such as Serial Number, Batch Number and Description.

5. Add or edit the other column-specific information (for example, maximum pressure, maximum temperature, length, diameter, particle size) in the Edit Columns table.

6. If the column is installed and will be used in the Multicolumn Thermostat, select YES in the Installed column.

7. Click the Plumbing button.

The Column Assignment dialog box is displayed.
The Column Assignment dialog box allows you to specify and review detailed information about the columns attached to each position in the column compartment. The information in the Column Assignment dialog box is in three sections:

- **a** The Plumbing section contains a table where you can specify the plumbing assignment for each valve position.
- **b** The Visualization section gives a visual representation of the Multicolumn Thermostat configuration.
- **c** The Column Tag Information table shows the information stored on the column tag(s) of the installed column(s). For more details, see “The Column Tag Information Table” on page 16.

8 Click in the Import column of an empty line in the Column Tag Information table.

The list of columns from the ChemStation’s Edit Columns table is displayed.
To reduce the list to only those columns that are marked as Installed, mark the Only show installed Columns check box (highlighted as α in the figure above).

9. Select the column information to import from the list of columns and click OK.

The column information is imported into the Column Tag Information table.

**NOTE**
It may take several seconds before the information appears in the Column Tag Information table.

**NOTE**
The characters ; (semicolon), ' (single quote) and " (double quote) are invalid for the Column Tag Information table. If these characters are used in any field of the table, an error is displayed and is disabled. You must delete all invalid characters before you can write the data to the tag.

The Description field is limited to 32 characters in the Column Tag Information table.

**NOTE**
At this stage, you can assign a color to the column using the drop-down list in the Color Code column; this information is displayed in the Visualization panel, but is not written to the tag.
10 Click the \textgreater \textgreater button at the top right of the \textbf{Column Tag Information} table to show the hidden table columns. Use the horizontal scroll bar to access the columns at the right of the table.

11 If all the information for the column is correct, click the \textbf{Ok/Write Tag} button to write the information to the column ID tag. The information in the ChemStation's \textbf{Edit Columns} table is also updated.

12 You can edit the information on the column ID tag using the ChemStation \textbf{Edit Columns} table. When you have finished editing the information, repeat steps 7 to 9 to update the information in the tag.

13 When you are sure that you will not make any more changes to the information in the tag, you can irrevocably seal the tag to set all static fields to read-only. Right-click in the appropriate line in the \textbf{Column Tag Information} table and select \textbf{Seal Column Tag} from the context menu.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{Figure5.png}
\caption{The Column Tag Information table context menu}
\end{figure}

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
Location & Column Name & Type & Description & Length [bcl] & Command [bcl] & Field [bcl] & Notes \\
\hline
Col.1 & col.1 & Text & Column 1 & 16 & 3 & 5 & 2 \\
Col.2 & col.2 & Text & Column 2 & 16 & 3 & 5 & 2 \\
Col.3 & col.3 & Text & Column 3 & 16 & 3 & 5 & 2 \\
Col.4 & col.4 & Text & Column 4 & 16 & 3 & 5 & 2 \\
Col.5 & col.5 & Text & Column 5 & 16 & 3 & 5 & 2 \\
Col.6 & col.6 & Text & Column 6 & 16 & 3 & 5 & 2 \\
Col.7 & col.7 & Text & Column 7 & 16 & 3 & 5 & 2 \\
Col.8 & col.8 & Text & Column 8 & 16 & 3 & 5 & 2 \\
Col.9 & col.9 & Text & Column 9 & 16 & 3 & 5 & 2 \\
Col.10 & col.10 & Text & Column 10 & 16 & 3 & 5 & 2 \\
Col.11 & col.11 & Text & Column 11 & 16 & 3 & 5 & 2 \\
Col.12 & col.12 & Text & Column 12 & 16 & 3 & 5 & 2 \\
Col.13 & col.13 & Text & Column 13 & 16 & 3 & 5 & 2 \\
Col.14 & col.14 & Text & Column 14 & 16 & 3 & 5 & 2 \\
Col.15 & col.15 & Text & Column 15 & 16 & 3 & 5 & 2 \\
Col.16 & col.16 & Text & Column 16 & 16 & 3 & 5 & 2 \\
\hline
\end{tabular}

\begin{itemize}
\item \textbf{NOTE} Once a column ID tag has been sealed, the static fields cannot be edited.
\item Until the column ID tag has been sealed, you can delete all information on the tag using the \textbf{Clear Column Tag Information} command from the context menu.
\end{itemize}

The sealed column is shown in the \textbf{Column Tag Information} table with the \image{icon.png} icon at the beginning of the row. In the \textbf{Edit Columns} table of the ChemStation, it is shown with \textbf{Sealed} in the \textbf{Tag} column.
The **Plumbing** button of the ChemStation **Edit Columns** table displays the **Column Assignment** dialog box, which can also be displayed by selecting **Column Assignment** from the context menu of the column compartment Dashboard panel in the ChemStation’s **Method and Control** view.

![The column compartment driver Column Assignment dialog box](image)

**Figure 6** The column compartment driver **Column Assignment** dialog box

The **Column Assignment** dialog box has three sections that give you information about the column:

- The **Plumbing** section shows the valve connections to the positions in the column compartment.

  **NOTE** Make the connections to give the shortest distances between the valve ports and the columns, and use a logical order (left column 1 to port 1-1’, left column 2 to port 2-2’ and so on). Avoid leaving unused ports between used ones.

- The **Visualization** section gives a visual representation of the configuration of the columns in the column compartment; the columns are color coded.
  - Place the mouse cursor over a column to display a tooltip of the column information from the column ID tag.
  - Click on a column to highlight the column information in the **Column Tag Information** table.
The Column Tag Information shows the information in the column ID tags for all columns in the configuration, including their location in the column compartment and their color codes.

The column compartment panel of the Dashboard in the ChemStation's Method and Control view also allows you a quick view of the column ID tag information.

![Dashboard panel of the column compartment](image)

**Figure 7** The Dashboard panel of the column compartment

Place the mouse cursor over the column ID tag icon ( ); the tooltip shows the information currently stored on the column ID tag.

Note that the column ID tag icon changes according to its state as described in “The Column Tag Information Table” on page 16.
Availability of Column Information

The ChemStation Columns Table

The Edit Columns dialog box, which you access using the Columns command of the Instrument menu in Method and Run Control view, shows the detailed information about the columns attached to each position in the device. The table contains all the column-specific information stored in the column ID tags (see “Column Tag Information” on page 17) plus the following possible additional columns:

- **Installed**: YES when the column is installed in a device, no when the column is not installed in a device.
- **Location**: Shows the location in the device to which the plumbing of the valve position leads.
- **Dev. Serial#**: Present only for a valve thermostat cluster. Shows the serial number of the device that contains the column.
- **Tag**: Shows if the column has column ID tag (Used), if it sealed (Sealed) or the column has no tag (empty).

The table includes not only the columns that are installed in the column thermostat device(s), but also the inventory of other available columns, for example, columns that have been used in the past. The ChemStation also provides a catalog of column types, which you can load into the Edit Columns table to act as templates for other columns.

The Column Tag Information Table

The Column Assignment dialog box, which you access using the Column Assignment command of the Dashboard context menu, shows the detailed information about the columns attached to each position in the device. The dialog box includes the Column Tag Information table which contains all the column-specific information stored on the column ID tags (see “Column Tag Information” on page 17) plus the following possible additional columns:
By default, only the Column Tag Information table columns up to and including the Injection column are displayed. Click the >> button at the top right of the table to show the full table.

**Column Tag Information**

The column ID tag contains the following information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
<th>Type</th>
<th>Pre-labeled</th>
<th>Custom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>A description of the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Length</td>
<td>The length of the column in mm.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Diameter</td>
<td>The internal diameter of the column in mm.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Particle Size</td>
<td>The particle size of the column packing material in µm.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Maximum Pressure</td>
<td>The maximum pressure supported by the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
<td>Type</td>
<td>Pre-labeled</td>
<td>Custom</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Number of Injections</td>
<td>The number of injections that have been made on the column.</td>
<td>Dynamic</td>
<td>Read</td>
<td>Read</td>
</tr>
<tr>
<td>Product Number</td>
<td>The product number of the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Maximum Measured Temperature</td>
<td>The highest temperature (in °C) experienced by the column to date.</td>
<td>Dynamic</td>
<td>Read</td>
<td>Read</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>The safe maximum operating temperature of the column (in °C).</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Minimum pH</td>
<td>The minimum pH supported by the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Maximum pH</td>
<td>The maximum pH supported by the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Void Volume (mL)</td>
<td>The void volume of the column and fittings.</td>
<td>Static</td>
<td>Write</td>
<td>Write</td>
</tr>
<tr>
<td>First Injection</td>
<td>The date and time of the first injection onto the column.</td>
<td>Dynamic</td>
<td>Read</td>
<td>Read</td>
</tr>
<tr>
<td>Recent Injection</td>
<td>The date and time of the most recent injection onto the column.</td>
<td>Dynamic</td>
<td>Read</td>
<td>Read</td>
</tr>
<tr>
<td>Manufacturing Date</td>
<td>The date of manufacture of the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Agilent Column</td>
<td>Whether or not the column was supplied by Agilent Technologies.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Serial Number</td>
<td>The serial number of the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Batch Number</td>
<td>The batch number of the column.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Tag Sealed</td>
<td>Whether or not all static fields except Comment and Void Volume are set irrevocably to read-only.</td>
<td>Static</td>
<td>Read</td>
<td>Write</td>
</tr>
<tr>
<td>Comment</td>
<td>A user-generated comment about the column.</td>
<td>Static</td>
<td>Write</td>
<td>Write</td>
</tr>
</tbody>
</table>