Quick Reference Card

AGCC 4.0 for GeneTitan and GeneTitan MC Instruments

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Introduction

The Affymetrix® GeneChip® Command Console® software provides tools that enable you to:

- Process cartridge arrays or array plates.
- Extract the intensity data for use by the probe level analysis software.
- Organize the resulting sets of data files.

To fully use the capabilities of AGCC, you need to understand:

- The AGCC Array Processing Workflow and Components
- The types of files that AGCC produces and uses
- The structures and tools used to organize the resulting data

The *AGCC for GeneTitan® and GeneTitan MC Instrument Quick Reference Card (QRC)* introduces these concepts and describes the workflow for registering and processing GeneTitan Array Plates using the GeneTitan System.

See the *AGCC 4.0 for Cartridge Arrays QRC* for information on using AGCC to process cartridge arrays.

Launching AGCC Components

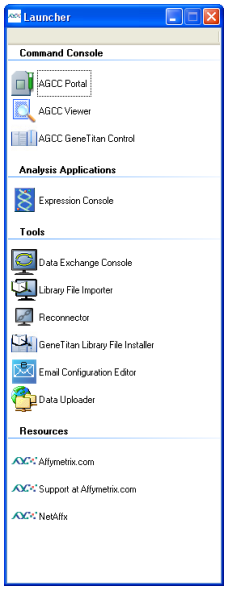
The Command Console Launcher provides a convenient way to open the AGCC software applications.

To start the Command Console Launcher:

- Click the Microsoft® Windows® Start button and select **Programs** → **Affymetrix** → **Command Console** → **Affymetrix Launcher**; or

  Double-click the Launcher shortcut on the Desktop.

  The Command Console Launcher opens.



Command Console components for performing Array Processing Workflow

Affymetrix Analysis Applications for analyzing cell intensity data

Affymetrix Tools for migrating data and installing necessary support files

Web resources to learn more about Command Console and other Affymetrix products

Click on the icon for the software tool or resource to open it.

The Command Console components for the GeneTitan System are introduced in *GeneTitan Array Plate Processing Workflow* on the next page.

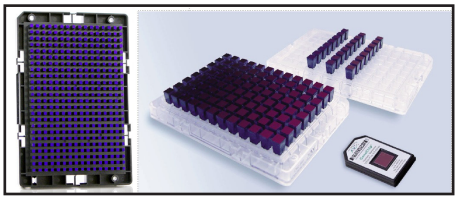
Learning More About AGCC

AGCC is described in more detail in the following resources:

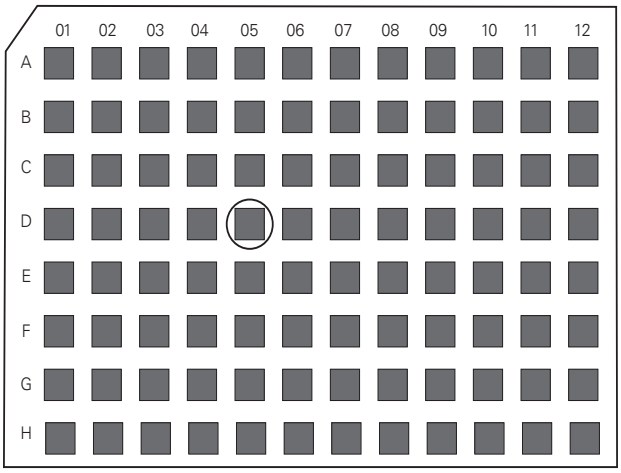
- Context-sensitive AGCC Online Help
- Manuals in Adobe PDF format, available in the AGCC Download package:
  - AGCC User Manual
  - AGCC Installation Instructions
- Affymetrix Learning Center at Affymetrix.com

Using the GeneTitan Instrument

The GeneTitan Instrument uses array plates with 16, 24, 96 or 384 arrays on the plate.



All the arrays on the plate can be processed from hybridization to scanning using the GeneTitan® Instruments or the GeneTitan MC Instrument and the AGCC GeneTitan® Control software, which allows increased automation and consistency in processing.



The array plate has a barcode for tracking. Each individual array on the plate is identified by its row and column. For example, the circled array in the figure above is array D05.

Expression array plates can be processed on GeneTitan Single-channel and GeneTitan Multi-Channel instruments.

Genotyping array plates can be processed only on GeneTitan Multi-Channel instruments

Array Plate Processing Workflow for GeneTitan™ System

Workflow Steps

Register Sample(s) and Assign Arrays in Sample (ARR) files

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Hybridize Array and Sample

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Wash and Stain Arrays

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Scan Probe Array and Save Image Data in DAT files

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Review grid alignment and perform manual gridding if necessary

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Analyze Cell Intensity Data and Generate Probe Analysis Data in CHP files

AGCC Components

AGCC Portal
AGCC Portal provides multiple ways to create Sample files. Use GeneTitan Array Plate Registration to register the array plates for GeneTitan System. The Sample registration options are described in *Creating and Editing Sample (.ARR) Files* of the *AGCC User Manual* and Online Help.
AGCC Portal also provides tools for finding and organizing data in AGCC.

AGCC GeneTitan™ Control Software
The AGCC GeneTitan Control software is used to control the GeneTitan Instrument to:
- Hybridize arrays and samples
- Wash and stain arrays
- Scan arrays and save image data in DAT files

Allows you to run an array plate through the complete workflow.
Expression array plates can be processed using GeneTitan Single-Channel and GeneTitan Multi-Channel instruments.
The AGCC GeneTitan Control Software is described in *Controlling the GeneTitan Instrument* of the *AGCC User Manual* and Online Help.

AGCC Viewer
After the array has been scanned, AGCC:
- Aligns a grid on the Image (DAT) file to identify the probe cells
- Computes the probe cell intensity data for the array and creates a CEL file

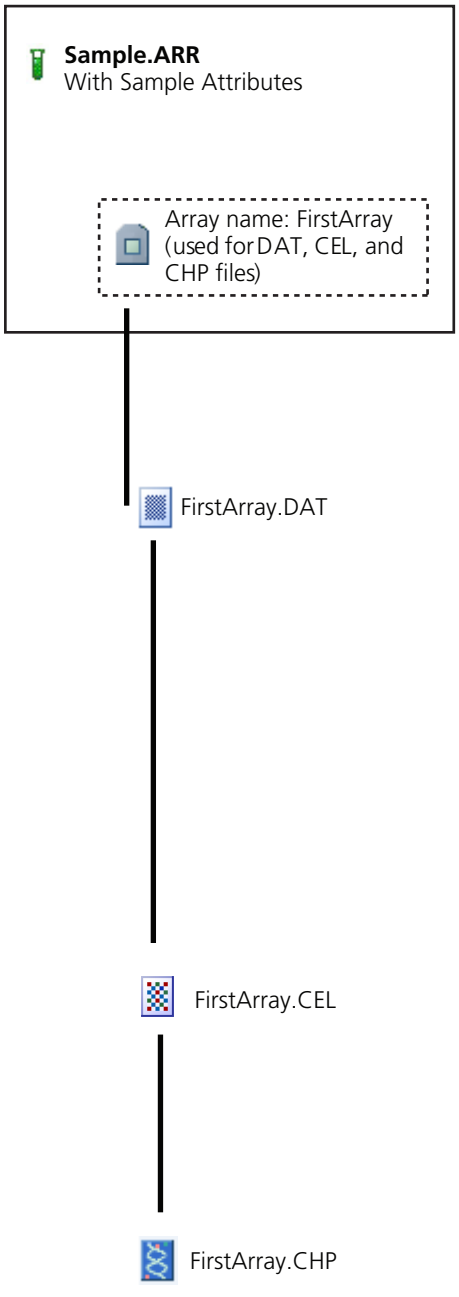
The AGCC Viewer enables you to track the progress of this step in the workflow, review gridding results, and manually correct gridding problems, if necessary. The Viewer and its use are described in *Using the AGCC Viewer* in the *AGCC User Manual* and Online Help.

Affymetrix and Third Party Probe Analysis Software
Software for doing higher-level analysis on Cell Intensity Data.
Includes Affymetrix software such as:
- Affymetrix Expression Console™ Software
- Affymetrix Genotyping Console Software

File Types in AGCC for GeneTitan System

Sample Files

In AGCC, the sample is the beginning of the data chain for a given experiment. The sample information is stored in a Sample file with an ARR extension.



The Sample file collects two types of information:

Sample Attributes: information that you can use to interpret the experimental data. It can include information about the sample itself, the experimental conditions, or other information you may find useful.
You can use the attributes to search for particular files; some attributes can be used by the probe level analysis software during analysis.

Array Information: Information about the array(s) used with the sample, including an array name that is used to name the DAT, CEL and CHP files. More than one array can be associated with the sample. This is useful for tracking replicates; in addition, it can be used to simplify tracking data for multi-chip arrays, such as 500K arrays.

Data Files

A set of data files is produced for each array in the Sample file during the array workflow.

Image (DAT) file

The DAT file contains pixel intensity values collected from an Affymetrix scanner, along with the gridding information used during feature extraction.

Each GeneTitan array on the array plate has multiple subgrids. These sub-grids are similar to the sub-grids used for some cartridge arrays, but on a plate array the sub-grids are not aligned to a main grid.

Each array is scanned twice, with different exposure times or different wavelengths. Each scan produces a mini-DAT file (.mdat) for each subgrid. For an array with a 7 x 7 grid, a total of 98 mini-DAT files are produced by the two exposures.

In addition, the data for all the mini-DAT files is consolidated into a single DAT file. This DAT file can be viewed in the Image Viewer; the file has all the image and gridding data for each subgrid and each exposure, and allows you to check the gridding independently for each exposure.

Intensity (CEL) Data Files

The CEL file stores the results of the intensity calculations on the pixel values of the DAT file.

The data from the mini DAT is used to determine the cell intensity data for the subgrid for that exposure. Again, there are two mini-CEL files for each subgrid.

The mini-CEL files for each exposure are merged into a single merged CEL file (.mgcel), resulting in two merged CEL files per plate array.

The data in these two merged CEL files is then consolidated in a single CEL file, which is used for further analysis and can be viewed in the Image Viewer for QC purposes.

Probe Analysis (CHP) Files

The CHP files contain the probe set summarization data for the array. They are produced by the analysis application and contain the actual data of interest (SNP calls, expression data, etc., depending upon the array type).

Other File Types

Audit Files

One Audit file is produced for each physical array. The Audit file tracks all the processing steps that were performed on the array, including multiple scans and regridding.

Log Files

Log files are produced by different AGCC components; they provide a record of the tasks performed by different instruments as arrays are processed.

Tracking File Lineages

The parent/child relationships of a Sample file and its associated data files are not tracked by file name in AGCC.
A GUID, or Globally Unique Identifier, is assigned to each file for tracking.

The GUIDs enable you to trace the lineage of any data file independent of the file name.

Data Organization in AGCC

Command Console uses a hierarchy of folders to organize the AGCC Sample and data files. In addition, you can assign a Project label to a folder and to the Sample and data files in that folder.

Data Roots and Subfolders

Windows File folder (not associated with AGCC)

C:\Command Console\Data Root 1 (on user's computer)

- **Subfolder 1 [Project A]**
- **SubFolder 2** (not associated with project)

C:\Command Console\Data Root 2 (on user's computer)

- **Subfolder 1 [Project C]**

\\sharename\share\Network Data Root (on network storage)

- **Subfolder 1 [Project D]**

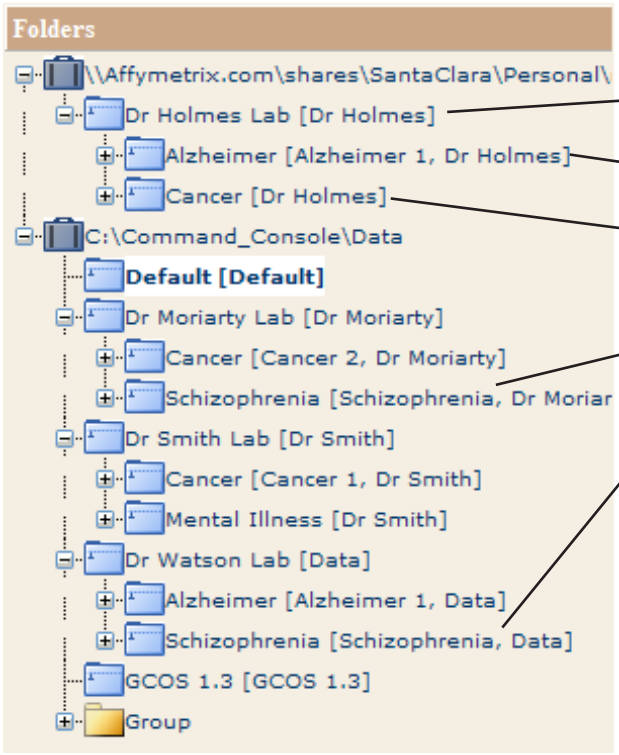
There are two types of folders on your computer:

- Windows File folders: Not assigned to an AGCC Data Root.
- Data Roots and Subfolders: Assigned to AGCC as a folder for Command Console data.

Only data roots and their contents, including Subfolders, are searchable and displayed in AGCC Portal.

Using Projects to Organize Data

A project is a label assigned to a Data Root or Subfolder that can be used to organize Sample and data files. If you assign a project name to a Data Root or Subfolder, all the Sample and data files in that folder will be assigned that project name. Also, any child subfolders of that project folder will be assigned the project name.



Projects have the following characteristics:

- Any Data Root or Subfolder can be a project. The project folders use the naming convention: Windows folder name [project name]
- One folder can be a member of more than one project.
- All subfolders in a project folder are automatically a part of that project.
- Folders in different locations can be in the same project.

After assigning a project name to a data root or subfolder, any Sample file placed in that data root or subfolder is assigned to the project. You can then use the project label to:

- Display file lists grouped by project
- Search on data limited to a project
- Create a spreadsheet listing the Sample (.ARR) files assigned to the project with their attributes

For more information about data roots and projects, see the *AGCC User Manual* and Online Help:

- *Getting Started with AGCC*
- *AGCC Portal and Data Organization*

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