

Data Acquisition Processor Service

Note: Windows refers to Windows 2000, Windows XP, Windows Vista, Windows 7, Windows 8, and Windows 10.

The Data Acquisition Processor service is a Windows Control Panel extension program. It manages and configures DAPcell/DAPcell Local/DAPcell Basic servers for communication between applications and Data Acquisition Processors. The Data Acquisition Processor service is installed by the `SETUP.EXE` installation program and can be started by opening the Windows Control Panel and double-clicking on the Data Acquisition Processors icon. For more information about DAPcell servers, refer to the Microstar Laboratories DAPcell documents.

The Data Acquisition Processor service released with DAPcell versions 8.00 and later is intended for Windows 10 only.

Working with the Data Acquisition Processor Service

This document describes how to use the Data Acquisition Processor service.

To access a complete online help file for the Data Acquisition Processor service, press the Help button at the bottom of the main screen to bring up this document.

The main screen of the Data Acquisition Processor service consists of six sub-screens accessible via named tabs:

- [Control Screen](#)
- [Browser Screen](#)
- [Disk I/O Screen](#)
- [Modules Screen](#)
- [Mapping Screen](#)
- [Diagnostics Screen](#)

The Data Acquisition Processor service can be in one of two modes: server mode or client mode. The service is in client mode if only DAPcell client software is installed.

In server mode, all six screens are accessible. In client mode, only the [Browser Screen](#), the [Mapping Screen](#), and the [Diagnostics Screen](#) are available.

Control Screen

The **Control Screen** is used to configure, to start, or to stop the local DAPcell service. The screen is divided into two sections: **Service Status** and **Service Configurations**.

Service Status

A single button in this section controls the status of the DAPcell service.

Start/Stop

Toggles to start or stop the DAPcell service.

Note: The DAPcell service should only be stopped and restarted if reinitializing the Data Acquisition Processor system is necessary. When the DAPcell service starts, the PCI Data Acquisition Processor's service controls are reset by default. A PCI Data Acquisition Processor that has already been functioning is reinitialized with a fresh copy of the DAPL operating system. Programs and data running on the Data Acquisition Processor are permanently lost.

Service Configuration

This section consists of two sub-sections: **Startup** and **Security**.

Startup

The **Startup** sub-section controls the startup configuration of the DAPcell server service. Click the "Change" button to view or edit startup configurations.

Startup Type

Startup Type determines when and how the server service starts:

- When "Automatic" is selected, the server service starts automatically each time Windows starts. The server service remains active across sessions until Windows shuts down.
- When "Manual" is selected, the server service will not begin until a user chooses to start it.

Priority

Service Priority configures the service execution priority and remote server control options.

Windows determines the program to run next on a PC by using scheduling priorities. A running program's scheduling priority is determined by the combination of its **priority class** and its **priority level** within a priority class. By default, all user programs use a base priority at the "normal" level within the "normal" priority class. The DAPcell service runs at this default priority.

Service Priority Class

The **service priority class** of a program dictates how much time or priority will be scheduled for the service. The four service priority classes are:

Low

- The lowest priority class. A program in the "low" priority class runs only when the system is otherwise idle.

Normal

- The default priority class. This class is acceptable for most programs.

High

- A program in the "high" priority class runs before programs in the "normal" or "low" classes. The "high" priority class is for programs that perform time-critical tasks.

Realtime

- The highest priority class. This priority class should almost never be used as it can cause the system to behave erratically.

Service Priority Level

The **service priority level** of a program dictates the priority the service will be given within a particular **service priority class**. If two programs are in the same priority class, the priority level determines the one that runs next. Modifying this parameter will raise or lower a service's priority status within a class, but will have no effect between classes. The six service priority levels are:

Lowest

- The lowest priority level. A program in the "lowest" priority level runs only when all other tasks are suspended.

Below Normal

- This priority level is one level higher than the "lowest" level.

Normal

- The default priority level. This level is acceptable for most programs.

Above Normal

- This priority level is one level higher than the "normal" level.

Highest

- A program in the "highest" priority level runs before all programs in a particular priority class except those in the "time critical" level.

Time Critical

- The highest priority level. The "time critical" level sets the level to the "highest" priority within the priority class for "low," "normal," and "high" classes. It sets the level to the highest priority possible for the "realtime" class. This priority level can interfere with the normal operation of the operating system and should generally be avoided.

Security

The *Security* sub-section grants or revokes permission for a remote client to control the server service in various ways. Allowing a remote client to control the service is usually dangerous and should be handled with great care. (To view a list of control options, right-click on the server icon in the Browser screen.) To view or edit the security settings, click the "Settings" button.

Remote Server Control

A DAPcell server service can be configured to accept **restart/shutdown** requests from remote clients. This option affects the security of the service and should be used with great care. Changing the server control option requires the administrator privilege. The three control options are:

Disabled

- Allows no remote server control.

Restart

- Allows remote clients to restart the service. This is the default.

Restart/Shutdown

- Allows remote clients to restart the service or to shut down or reboot the server machine.

Remote DAP Default Name Reorder

The DAPcell service configures all local Data Acquisition Processors in a way to make it easy for a client to address a Data Acquisition Processor (DAP) by name. By default, DAPs are named `Dap0`, `Dap1`, ..., to `DapN` where `N+1` is the number of DAPs on the local system. For the numbering of DAP names, refer to the topic [UNC Pipe Names](#). Once configured, these names stay with their associated DAPs even after adding or removing DAPs has altered the configuration. A new default name order will not be established until the service is reinstalled or until a request comes to reorder the default names. A local client can always make such a request, however, a remote client can do so only if the service is configured to allow it. Enabling this remote control could potentially cause the service configuration to be inadvertently altered and, thus, should be used with care.

Disabled

- Allows no remote request.

Enabled

- Allows remote clients to restore the server default configuration.

Caution: The default settings for the server configurations are generally acceptable for the service. Changing these settings may affect time-critical programs or cause the system to behave erratically.

Three buttons at the bottom of each of the two subsections control the configurations:

Ok

Saves the modified configurations. A change to the remote server control takes effect immediately even if it is not saved. Changes to the service priorities will not take effect until they are saved and the service is restarted.

Default

Restores the default service configurations.

Cancel

Cancels the configuration modifications.

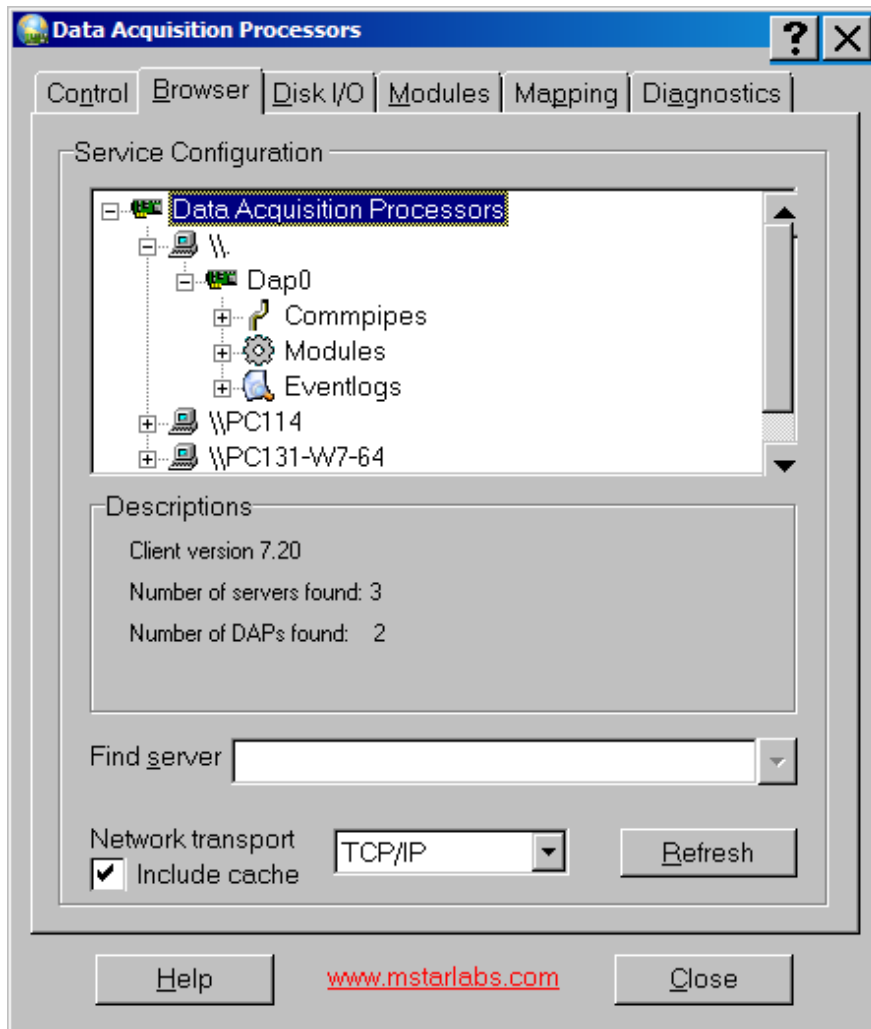
Browser Screen

The [Browser Screen](#) allows users to display and search for installed DAPcell servers and DAPs on a local machine or over the network. The screen contains a [Service Configuration](#) section that gives both textual and graphical descriptions of the installed DAPcell servers and the DAPs they control.

Service Configuration Tree View

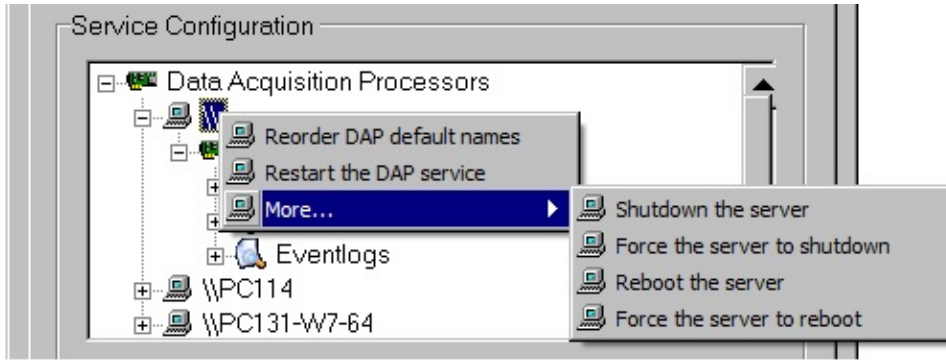
A display box in the [Service Configuration](#) section of the [Browser Screen](#) shows the search result of the DAPcell servers and DAPs installed on the local machine or over the network. The servers and DAPs are displayed as icons arranged in a graphical tree structure. Double-clicking on the selected icon in the display moves down one level in the search tree.

The following diagram displays an example Data Acquisition Processor configuration:



At the very top is the Data Acquisition Processor icon, representing the network search level. The three servers connected to the network are \\., \\PC114, and \\PC131-W7-64. The servers are identified by computer icons and are designated as \\ followed by PC names.

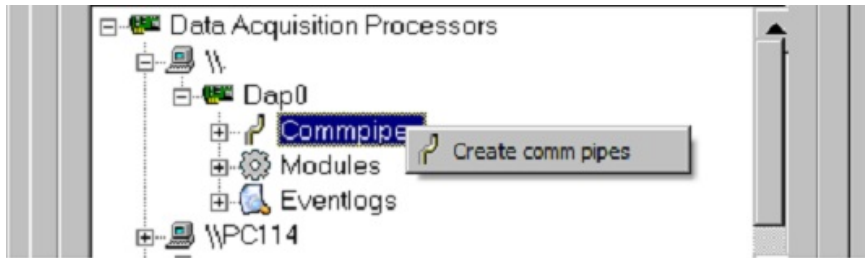
Right-clicking on a server node brings up a server control menu that provides six control functions: *Reorder DAP default names*, *Restart the DAP service*, *Shutdown the server*, *Force the server to shutdown*, *Reboot the server*, and *Force the server to reboot*. The latter four functions are accessible in the sub menu when the menu item *More...* is expanded. For a remote server, such an operation succeeds only when the server is configured to do so.



The next level down in the search tree displays the DAPs attached to each server: Dap0, Dap1, ..., and Dap(N-1) where N is the number of DAPs attached to each server. Each DAP is identified by a DAP icon.

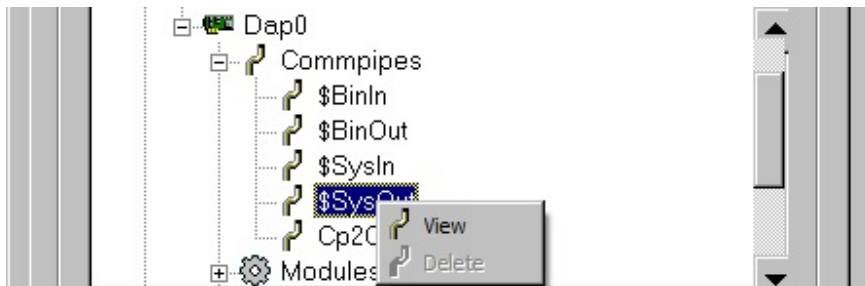
Selecting one of the DAPs moves down to the next level, which typically displays three categories of DAPL objects: Commpipes, Modules, and Eventlogs. The Commpipes category includes communication channels defined between the PC and the DAP. The Modules category includes software Modules installed on the DAP. And the Eventlogs category allows viewing the contents of event logs on the DAP, if the DAP supports it.

Right-clicking on the Commpipes node brings up a menu for creating a custom communication channel between the PC and the DAP.

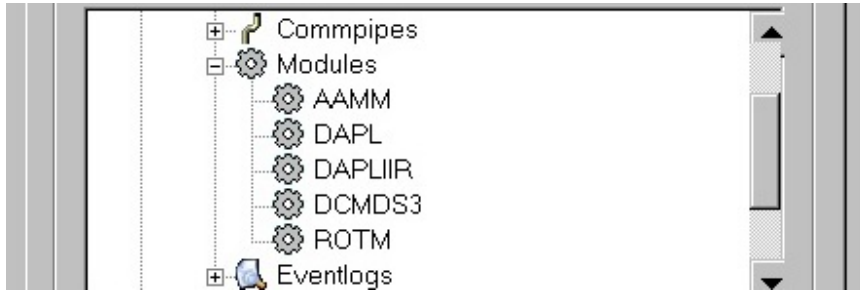


Selecting Commpipes moves down to the lowest level in that category, and displays the communication channels defined for the DAP: \$SysOut, \$SysIn, \$BinOut, and \$BinIn, and custom-created communication channels if any. Additional information can be found under the topic [UNC Pipe Names](#).

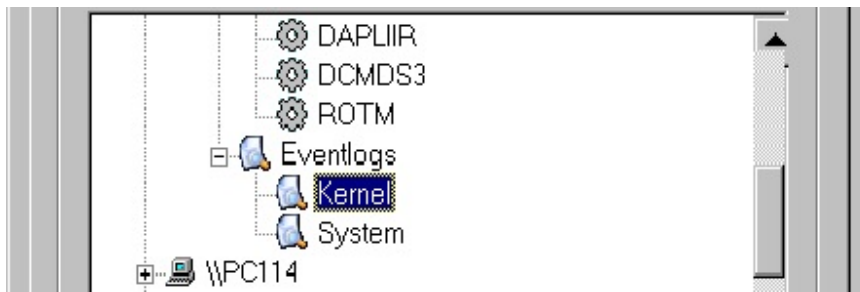
Right-clicking on a channel node brings up a menu for deleting the communication channel and, if it is a text channel, for [viewing text channel content](#) as well.



Selecting **Modules** displays a list of software modules installed on the DAP. It could be empty if no other downloadable software modules are installed besides the DAPL operating system.



Clicking on one of the items under **Eventlogs** brings up a memo box that shows the contents of the target. Clicking on the **Refresh** button updates the contents. If the target is the system event log and the target DAP is using DAPL 3000 version 2.20 and later, the contents are automatically updated when changed.



Viewing Text Channel Content

The **View** option in the popup menu from a text channel node allows viewing and monitoring the contents of the pipe in real-time. Clicking on the **View** option in the popup menu brings up a read-only memo box. The contents of the box are the available history of texts that have gone through the channel. Since a communication channel has a fixed size, the maximum history that can be retained in the channel is restricted by the size. If more data comes than the channel can hold, the newest data pushes out the oldest one.

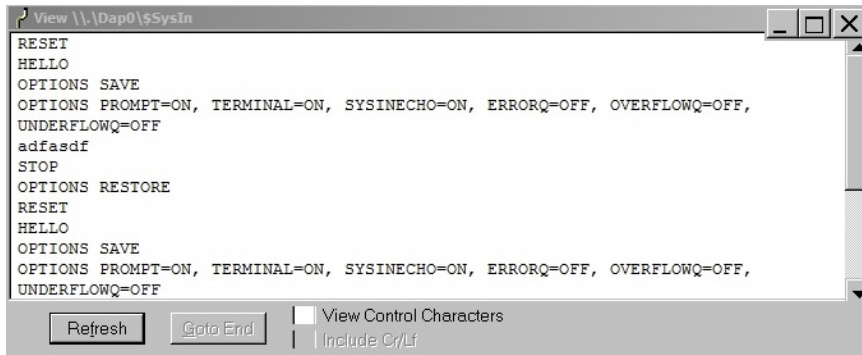
If the **View** box is left open, it gets updated at regular intervals when new data comes. The box can be closed either by closing the memo box explicitly or by clicking the selected **View** option again.

Selecting a different text channel than the one currently under viewing switches the contents of the box to that from the newly selected channel without closing and reopening the box.

With the **View** box open, the following actions can be taken.

- Click the *Refresh* button to reload the contents.
- Click the *Goto End* button to move the selection to the end.
- Check the *View Control Characters* box to reload the contents to include control characters, except for carriage returns and line feeds.
- With *View Control Characters* checked, check the *Include Cr/Lf* box to reload the contents to include all control characters.

- With the content box selected, type Ctrl-F to bring up a *Find* box, which can be used to search the contents for specific texts.



Descriptions

The Description area below the display box provides the following information about the selected search tree node:

At the Network level:

- Client version
- Number of servers found
- Number of DAPs found

At the Server level:

- Server Name
- Server Version
- Server OS
- Connection Protocol

At the DAP level:

- DAP Model
- Serial Number
- Interrupt Level (present when relevant)
- Location (format is hardware interface dependent)

At the pipe level:

- Direction
- Width
- Buffer Size

At the module level:

- Description
- Versions
- Copyright
- Location

Find Server

A **Find server** edit box takes a UNC server path and tries to find the remote DAPcell server over the network. If found, the server is displayed in the tree-view box. This is a faster way to search for a server if the path of the server is known. There is a pull-down action menu button to the right of the edit box. If actions to the selected target are available, the button becomes active; otherwise, it is grayed out. Clicking the button when it is active shows a list of actions available to the target, similar to what the popup menu shows when right clicking on the corresponding target tree node.



Network Transport

A **Network transport** drop-down box at the bottom of the **Browser Screen** provides the capability to search the entire network or to customize the search using either the Local, All, NetBEUI, SPX/IPX, TCP/IP, or NamedPipe network transports:

- Selecting the Local transport and the **Refresh** button will search DAP servers only on the local machine.
- Selecting one of the other network transports and the **Refresh** button will search over the network using that transport. If All is selected, the DAP Service will search the network using all network transports that the local system supports.

Include Cache

Once a server is found, it is cached. The **Include cache** check box is used to instruct the refresh operation whether to include cached servers or not.

Refresh

The **Refresh** button at the bottom of the screen toggles to "Abort" once it is clicked to start a refreshing session, and toggles back to **Refresh** when the session is done. It either refreshes the **Service Configuration** tree view using the transport selected in the network transport drop-down box or aborts the refresh operation if one is going on.

Disk I/O Screen

The **Disk I/O Screen** is used to specify default data paths and access permission for direct disk I/O performed on the server side. The settings do not affect disk I/O performed on the client side.

DAPcell Service and DAPcell Local Service both support direct disk I/O through the `DapPipeDiskLog` and `DapPipeDiskFeed` functions. Direct disk I/O is not available in DAPcell Basic Service. When direct disk I/O is not supported, the **Disk I/O Screen** is disabled (with all the options grayed out).

The **Disk I/O Screen** is divided into two sections: Disk Logging and Disk Feeding. Each section contains a **Default Path** subsection and a **Permission** subsection. The screen also provides a Save button and a Cancel button.

Default Path

The **Default Path** section displays the current default paths to the target disk files if there are any previously registered. New paths can be entered to replace the existing ones. New paths will not take effect until after they are saved using the Save button.

To enter new default paths, click the Edit button. This brings up an edit dialog box. The edit dialog has two check boxes, labeled Create Share and Automatic; a Default Path edit box; and a Default Shares edit box.

Checking the Create Share box allows creating a network Share name for each path entered. That way, any PC on the network can access the path using the share name. If the Automatic box is also checked, a share name is automatically created for each path entered.

Default Path is a list of absolute directory paths, each starting with a drive letter, separated by a semicolon. For example, `c:\Data;d:\Data\Backup` is a valid default path list while `e \Data;Backup` is not.

Default Shares is a list of network share names, also separated by semicolons. A share name must be unique on the host system. If automatic share names are used, they follow a predefined naming convention of `DAPcellDataL<n>` for disk logging and `DAPcellDataF<n>` for disk feeding, where `<n>` is a zero-based integer.

Each item in the Default Shares edit box corresponds to the item listed in the same order in the Default Path edit box. There can be one share name for each path in the **Default Path** edit box. In other words, the first Share listed is the name used for the first Path listed, the second Share is the name used for the second Path, and so on.

Permission

The **Permission** section displays the current disk I/O access permission level. Clicking on the desired radio button changes the permission level. The new level will not take effect until after it is saved using the Save button.

Three permission levels are available to control the disk I/O access:

Not allowed

- Allows no disk I/O.

Restricted

- Allows disk I/O only if the target file resides in one of the directories specified by the Default Path, or in one of its subdirectories; otherwise, disk I/O requests will be rejected. If a disk write request is allowed and the target subdirectory does not exist, the directory will be created.

Normal

- In addition to what the [Restricted](#) level allows, this permission level allows direct disk I/O to perform in any reachable directories as long as they exist. However, it will not create any new directory beyond what the [Restricted](#) level allows.

Modules Screen

The **Modules Screen** is used to configure the Data Acquisition Processor service for DAPL module installation. This includes configuring remote module installation permission and module management options.

The **Modules Screen** is divided into two sections: **Permission** and **Installed Modules**. The **Installed Modules** section consists of a tree view of installed modules and a module description block. At the bottom of the screen, four buttons are available for module management operations: **Add**, **Delete**, **Setting**, and **Reload**.

Permission

A selected radio button in the **Permission** section shows the current permission for remote module installation. To change the permission, click the desired button and the change takes effect immediately.

Installed Modules

A tree view displays all the modules currently installed for designated DAPL operating systems on this server. Selecting one of the nodes in the tree view makes the module that the node represents the active target. Then **Delete**, **Setting**, and **Reload** buttons will all operate on this active target. The **Description** block will show a list of information items about the selected module, such as the module description, version, copyright, and location, if they are available.

The root of the tree does not represent any specific modules. Selecting the root node enables the **Add** button only.

DAPL operating system modules are shown in the tree view as the parent nodes of all other modules installed for the operating systems. They are named `DAPL2000` and `DAPL3000` representing DAPL 2000 and DAPL 3000 operating systems respectively. When one of them is selected, only the **Add** button and the **Reload** button are active. The **Add** button adds modules under the selected operating system and the **Reload** button reloads the operating system to a selected set of Data Acquisition Processors. When the DAPL module is reloaded, all modules installed for each selected DAP are reloaded as well.

Selecting a child node under an operating system node enables all four buttons. The complete set of module management options is available for the selected module.

The module tree view does not include ROM-based modules that are available on some Data Acquisition Processors.

Add

The **Add** button allows installing a module and optionally loading it to the Data Acquisition Processors on the system at the same time.

Clicking the **Add** button brings up an **Adding a module** dialog box. The first thing to do is to select the DAPL operating system(s) the new module is to be installed to. Selecting `DAPL3000` or `DAPL2000` will install a new module only to the corresponding operating system. Selecting **Both** will install the module to both operating systems.

Next, enter the complete path of the target module and click OK to install. There are two ways to enter the path: (1) type the path directly into the edit box or (2) click the **Browse** button to bring up an **Open** box, navigate to find and select the target module, and click **Open** to automatically enter the path. Once a module is installed, it persists until it is uninstalled.

The **Adding a module** dialog box has an **Options** section with four options.

Copy

Copy the module binary from the user-specified directory to the default directory the **SETUP** program created.

The **Data Acquisition Processor** service then uses the copy from the default directory whenever it is needed. If

Copy is not selected, the **Data Acquisition Processor** service uses the copy from the user-specified directory.

Load

Load the module binary to the **Data Acquisition Processors** with the installation so that the module is immediately available for use.

Replace

Replace the module with the new binary if it is already installed.

Force

Force the module installation, ignoring any resources the module may need in order to be installed, such as the existence of an installed module it depends on. This option should be used with caution because it can create an inconsistent configuration.

The default **Add** option configuration is **Copy**, **Load**, and **Replace**.

The **Adding a module** dialog box also has a list of check boxes for all the **Data Acquisition Processors** on the system. Unchecking a **Data Acquisition Processor** will disable the module installation to that particular **Data Acquisition Processor**.

Delete

The **Delete** button allows uninstalling a module from the system and optionally removing the module from the **Data Acquisition Processors** at the same time.

Clicking the **Delete** button brings up a **Deleting a module** dialog box.

The **Deleting a module** dialog box has an **Options** section with three options.

Force

Force the removal of the target module even if it is being used.

Unload

Unload the module from the **Data Acquisition Processors** with uninstallation. If this option is not selected, the module is uninstalled from the system but stays loaded on the **Data Acquisition Processors** until the **DAPL** operating system is reloaded.

Remove Dependents

Uninstall the module and all modules that depend on this module as well.

The default **Delete** option configuration is **Unload** only.

Setting

The **Setting** button allows reconfiguring the system so that the target module is installed for the selected **Data Acquisition Processors** only.

Clicking the **Setting** button brings up a **Configuring a module** dialog box. Check the Data Acquisition Processors that need the module and uncheck those that do not. The new configuration will not take effect until the DAPL operating system is reloaded.

For DAPs that have ROM-based modules, this screen should be used to selectively skip the installation of a module to those DAPs, so that they can keep their ROM version of the module, or to include it, so to override the ROM-based module.

Reload

The **Reload** button allows reloading the selected module to the Data Acquisition Processors.

Clicking the **Reload** button brings up a **Loading a module** dialog box. Check the Data Acquisition Processors that need the module to be reloaded and uncheck those that do not.

The **Loading a module** dialog box has an **Options** section with two options.

Replace

Replace the module with the new module binary if it is already loaded on the Data Acquisition Processors.

Force

Force the reloading even if the module is being used on the Data Acquisition Processors.

See the DAPI032 Reference Manual for more information about module installation operations and their options.

Mapping Screen

The **Mapping Screen** provides a mechanism to map a complete network UNC DAP address to a predefined numbered DAP name or a local UNC DAP address with that name. The mapping is only necessary if an application prefers it and, if done, goes to the Windows registry.

DAP Mapping Button

When the **DAP Mapping** button on the screen is selected, a Data Acquisition Processor Map screen appears. From this screen a user can configure custom mappings for DAPs.

The Data Acquisition Processor Map screen contains a single search menu and two boxes underneath: a display box for all DAPs installed on the default server and an edit box for mappings. The edit box consists of two columns of grids: a left gray-colored column of target DAP names or local addresses and a right column of edit grids for source DAP addresses.

Search Menu

Clicking on Search brings up a drop-down menu where one can choose to refresh the search or select a different network criterion for searching installed DAPs over the network.

Display Box

The display box shows all of the installed DAPs on the default server. The default server is the local server, if installed, or other servers on the network accessible via the TCP/IP protocol. Right-clicking anywhere in the display box refreshes it.

Edit Box

The edit box consists of an array of 64 edit grids, with the left column being the mapping targets and the right column being mapping sources. This allows mapping a maximum of 64 DAPs.

The mapping-targets column is of gray color. By default it displays the predefined numbered DAP names. One can change the name to a local UNC address by right-clicking on the grid and selecting the local UNC address.

The mapping-sources column allows the specification of source addresses to map. There are two easy ways to enter an address: typing it manually into the grid or dragging-and-dropping a DAP from the display box directly into the grid. Once all intended configurations are done, saving them upon exiting the screen will save them into the Windows registry.

Diagnostic Screen

The [Diagnostic Screen](#) is a place for collecting useful diagnostic tools for Data Acquisition Processors. DAPmem, for instance, is one such tool program. Clicking the Run button for the program starts the program. The program runs independently of the Data Acquisition Processor service. The installation of DAPcell Server or Client version 7.30 and newer will install DAPmem.exe for access from the Data Acquisition Processor service.



Universal Naming Convention (UNC) Pipe Names

A remote machine is represented by its unique network machine name. The local machine is denoted by a period.

The Data Acquisition Processor names are predefined as `Dap0`, `Dap1`, ..., and `Dap(N-1)` where `N` is the number of Data Acquisition Processors installed on the system. The ordering depends on the numeric ordering of the I/O addresses that the Data Acquisition Processors use. The name ordering of PCI Data Acquisition Processors is based first on the PCI bus number and then on the slot number. USB DAPs follow PCI DAPs and are ordered by their port numbers. For example, in a single Data Acquisition Processor system, the name of the DAP is always `Dap0`. In a four-DAP system, the PCI DAP sitting on PCI bus 0 slot 11 is `Dap0`, the PCI DAP sitting on bus 1 slot 5 is `Dap1`, the USB DAP connected to port 1 is `Dap2` and the USB DAP connected to port 4 is `Dap3`. (Note that USB port numbers in Windows may not be unique under certain system configurations; in such cases, port numbers are not the only ordering criteria.)

The pipe names are also predefined. On the Data Acquisition Processor, two communication pipes are associated with one integer number but differ in transfer directions, input or output. `$SysIn` and `$SysOut` are the default input and output pipes with the number zero, while `$BinIn` and `$BinOut` are the default input and output pipes with the number one. DAPcell supports a maximum of 32 sets of input and output communication pipes on each Data Acquisition Processor, therefore the largest number that can be associated with a pipe is 31. Except for the two default sets, all predefined pipe names carry both the pipe number information and the pipe direction information. Following is a list of the 32 supported sets of communication pipes:

<code>\$SysIn</code>		<code>\$SysOut</code>
<code>\$BinIn</code>		<code>\$BinOut</code>
<code>Cp2In</code>		<code>Cp2Out</code>
<code>Cp3In</code>		<code>Cp3Out</code>
<code>Cp4In</code>		<code>Cp4Out</code>
	...	
<code>Cp31In</code>		<code>Cp31Out</code>

Thus, the communication pipe `$SysIn` of the Data Acquisition Processor `Dap0` on the local machine is represented by the UNC name `\\.Dap0\\$SysIn`, and the pipe `$BinOut` of the Data Acquisition Processor `Dap1` on the remote machine `PC101` is referred to as `\\PC101\Dap1\\$BinOut`. For example,

```
\\.DapX\\$SysIn
\\.DapX\\$SysOut
\\.DapX\\$BinIn
\\.DapX\\$BinOut
```

are the four default communication pipes on the Data Acquisition Processor `DapX` on the local machine, and

```
\\PC101\DapX\\$SysIn
\\PC101\DapX\\$SysOut
\\PC101\DapX\\$BinIn
\\PC101\DapX\\$BinOut
```

are the four default communication pipes on the Data Acquisition Processor `DapX` on the remote machine `PC101`.

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