

DAP Service

Note: Windows refers to Windows 95, Windows 98, Windows NT, Windows 2000, and Windows XP.

The Data Acquisition Processors (DAPcell/ DAPcell Local/ Accel32) Service is a user mode program that implements the functionality that an application needs to communicate with DAPs. The DAP Service is installed by the SETUP.EXE installation program. The DAP Service starts automatically with Windows, and remains active across sessions until Windows shuts down.

DAP Service initialization involves both the service software and the Data Acquisition Processor initialization. Data Acquisition Processor communication establishes as soon as the service initialization is complete.

The service software initialization detects Data Acquisition Processor hardware, allocates system resources, and sets up service control and data structures. The DAP Service starts only if the entire software initialization process is completed successfully.

The DAP Service initializes all of the Data Acquisition Processors on a system by downloading the correct DAPL operating system to each Data Acquisition Processor. A Data Acquisition Processor will not function without the DAPL operating system.

Working with DAP Service

This document describes how to use the DAP Service.

Context sensitive help is available for most DAP Service topics. To get help on a topic, select the question mark button located in the top right hand corner of the DAP Service screen. When the mouse pointer has become a question mark, put the pointer over any topic and press the mouse button again to display help on that topic. Help may also be found by simply pressing F1 while the topic of interest is selected.

A complete online help file for the DAP Service may be accessed by pressing the Help button at the bottom of the DAP Service screen.

The DAP Service is divided into five screens accessible by named tabs. The screens are as follows:

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

The DAP Service can be in one of the two modes: server mode and client mode. The DAP Service is in client mode if the PC has only DAPcell/ DAPcell Local/ Accel32 client software installed.

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

Control Screen

The [Control Screen](#) is used to set the [Service Configurations](#) and to start and stop the DAP Service. The screen is divided into two sections, [Service Status](#) and [Service Configurations](#).

Service Status

The status of the DAP Service is controlled by three buttons in this section:

Start

Starts DAP Service.

Stop

Stops DAP Service.

Startup

Controls the startup of the DAP Service:

- When "Automatic" is selected, the service starts automatically each time Windows starts. The DAP Service remains active across sessions until Windows shuts down.
- When "Manual" is selected, the DAP Service will not begin automatically at boot time and will start only when the user chooses to start the service.

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

Service Configuration

This section configures the service execution priority and remote server control options.

Windows determines which program to run next on a PC by using scheduling priority. A running program's scheduling priority is determined by the combination of its [priority class](#) and its [priority level](#) within a priority class. The [Service Configuration](#) section of the [Control Screen](#) controls DAP Service configurations. By default, all user programs have a base priority at the "normal" level within the "normal" priority

class. The DAP service runs at the "highest" level with the "normal" priority class. The [priority classes](#) and [priority levels](#) are discussed in greater detail in the following sections.

A DAPcell service can also be configured to accept [restart/shutdown](#) requests from a remote client.

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

Two buttons at the bottom of this section control the service configurations:

Save

Saves the modified service 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

Reinstates the default service configurations.

A. Remote Server Control

A DAPcell 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 server control option requires the administrator privilege if the service is running under an operating system that supports security controls, such as Windows NT. The three control options are:

Disabled

- No remote server control is allowed.

Restart

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

Restart/Shutdown

- Allows remote clients to restart the service or shutdown/reboot the server machine.

B. 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 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.

C. 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 which 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 "high" 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.

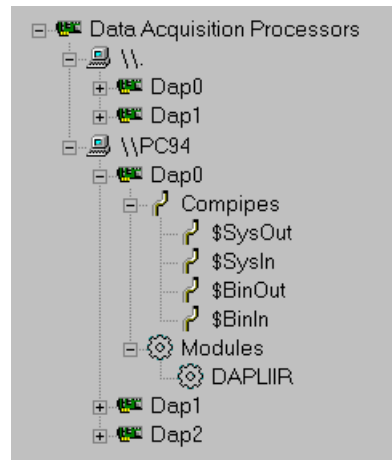
Browser Screen

The **Browser Screen** allows users to display and search for installed DAP servers and DAPs on a local machine or over the network. The screen contains a **Service Configuration** section which gives both a visual and written description of installed DAP servers and DAPs.

Service Configuration Tree View

A display box in the **Service Configuration** section of the **Browser Screen** shows all of the installed DAP servers and DAPs attached to the selected machine or network. The installed servers and DAPs are displayed by icons arranged in a graphical tree structure. Double clicking on the selected icon in the display moves down one level in the search.

The following diagram displays an example Data Acquisition Processor configuration:



The top level in the above tree is identified by the Data Acquisition Processors icon, and represents the network search level. The two servers connected to the network are displayed at this level, \\.\ and \\PC94. The servers are identified by the computer icon, and are designated by \\ and then a PC name.

Right-clicking on a server node brings up a server control menu that provides five control functions, Restart the DAP service, Shutdown the server, Force the server to shutdown, Reboot the server and Force the server to reboot. For a remote server, such an operation succeeds only when the server is configured to do so.

The next level down in the search 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 two categories of DAPL objects, *Compi pes* and *Modul es*. The *Compi pes* category includes communication pipes defined on the DAP. The *Modul es* category includes software *Modul es* installed on the DAP.

Right-clicking on the *Compi pes* node brings up a menu for creating a custom communication pipe on the DAP.

Selecting *Compi pes* moves down to the lowest level in that category, and displays the pipes defined on each DAP, \$SysOut, \$SysIn, \$BinOut, and \$BinIn. Any custom created communication pipe will also be displayed at this level. Additional information can be found under the topic [UNC Pipe Names](#).

Right-clicking on a pipe node brings up a menu for deleting the communication pipe.

Selecting *Modul es* 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.

Descriptions

The Description area below the display provides the following information about the selected servers or DAPs:

At the Network level:

- Number of servers found
- Number of Data Acquisition Processors found

At the Server level:

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

At the DAP level:

- DAP Model
- Serial Number
- Interrupt Level
- I/O Address (for ISA) or PCI Bus and Slot Numbers (for PCI)

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.

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 over 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 permissions 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 DapPi peDi skLog and DapPi peDi skFeed functions. Direct disk I/O is not available in Accel32 Service. When direct disk I/O is not supported, the [Disk I/O Screen](#) is disabled (with all the options grayed).

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 is 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.

[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.

Permission

The [Permission](#) section displays the current disk I/O access permission level. The permission level can be changed by clicking on the desired Radio button. 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

- No Disk I/O is allowed.

Restricted

- Disk I/O is only allowed 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 file 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 server for DAPL module installation. This includes allowing or disallowing module installation by remote clients, and installing, uninstalling or reloading of modules for a configurable set of Data Acquisition Processors on this server.

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

Permission

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

Installed Modules

A list box displays all the modules currently installed on this server. Selecting one of the modules in the list makes that module 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 module, such as the module description, version, copyright and location if they are available.

The default module DAPL is always present on the list. This module represents the operating system operating on all Data Acquisition Processors. When selected, it only allows the use of the **Reload** button to reload the operating system to a selected set of Data Acquisition Processors. When the DAPL module is reloaded, all installed modules are reloaded as well.

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. 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 the Data Acquisition Processors that do not need the module. The new configuration will not take effect until the DAPL operating system is reloaded.

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 reloaded and uncheck the Data Acquisition Processors that do not need the module reloaded.

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](#) is used for custom DAP and ACCEL mapping. Two buttons: [DAP Mapping](#) and [ACCEL Mapping](#) each access an additional window where the actual mappings are specified.

The DAP Map and ACCEL Map windows are discussed in greater detail in the following sections. Generally however, both windows provide the same drag-and-drop editing mechanisms. A target in the display box is selected, dragged to the corresponding grid in the grid box, and dropped. Direct editing may also be done in the grid box. In both windows a user may right click on the display box to refresh the display.

DAP Mapping

[DAP Mapping](#) is used only for 32 bit applications. It is unnecessary unless the application does not want to use the complete network UNC address of the DAPs. The mapping is between DAP names only, and if done, goes to the Windows registry.

When the [DAP Mapping](#) button is selected, the DAP Map screen appears. From this screen the user can specify custom mapping schemes for DAP names.

The DAP Map screen contains a menu bar at the top with a single menu.

Search Menu

- Allows the user to refresh the DAP Map screen and search a local machine or network for installed DAPs.

By right clicking on the shaded column in the grid box, a user may select a direct DAP name and a local DAP name. Up to 63 DAP names may be mapped.

ACCEL Mapping

In the DOS and Windows DAP drivers, a communication channel to a Data Acquisition Processor is seen as an ACCEL device, either as a directed ACCEL device or as a numbered ACCEL device. In order for DAPcell/ DAPcell Local/ Accel32 to support existing DOS and Windows applications, it is necessary to provide a mechanism to map the ACCEL device names to the corresponding [UNC Pipe Names](#) that DAPcell/ DAPcell Local/ Accel32 recognizes.

By default, DAPcell/ DAPcell Local/ Accel32 automatically maps ACCEL0 to \\.\Dap0\SysIn and \\.\Dap0\SysOut and ACCEL1 to \\.\Dap0\BinIn and \\.\Dap0\BinOut. Then it maps ACCEL2 to \\.\Dap1\SysIn and \\.\Dap1\SysOut and ACCEL3 to \\.\Dap1\BinIn and \\.\Dap1\BinOut. And so on, depending on how many Data Acquisition Processors are installed on the local machine.

ACCEL Mapping is necessary if a configuration involves remote DAPs or additional communication pipes. Custom mapping is fulfilled by a mapping file called ACOM.INI which resides on the Windows system directory. This file specifies a complete set of mappings an application requires. The DAP Service creates the ACOM.INI file and then makes the mapping according to the specification.

When the **ACCEL Mapping** button is selected, the ACCEL Map screen appears. From this screen the user can specify custom mapping schemes for ACCEL devices to **UNC Pipe Names**.

The ACCEL Map screen contains a menu bar with three menus:

File Menu

- Provides file operations for the section workspaces.

Search Menu

- Allows the user to refresh the ACCEL Map screen and search a local machine or network for installed DAP servers.

View Menu

- Allows the user to toggle easily between viewing different sections.

Up to 127 ACCEL devices may be mapped.

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 the Data Acquisition Processors use. For example, in a one Data Acquisition Processor system, the name of the Data Acquisition Processor is always Dap0. In a two Data Acquisition Processors system with addresses 0x220 and 0x230, the Data Acquisition Processor at 0x220 will be named Dap0 and the Data Acquisition Processor at 0x230 Dap1.

The ordering of PCI Data Acquisition Processors is based first on the PCI bus number and then on the slot number. For example, a PCI DAP sitting in PCI bus 0 slot 11 is ahead of a PCI DAP sitting in bus 1 slot 5. The ordering of ISA DAPs depends on the numeric ordering of the I/O addresses.

On a system of mixed PCI and ISA DAPs, the PCI DAPs are ahead of the ISA DAPs. In a four Data Acquisition Processor system with two PCI DAPs sitting in bus 0 slot 11 and bus 1 slot 5 and two ISA DAPs with addresses 0x220 and 0x230, the Data Acquisition Processor in PCI bus 0 slot 11 will be named Dap0, the one in PCI bus 1 slot 5 Dap1, the one at I/O address 0x220 Dap2 and the other at I/O Address 0x230 Dap2.

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 \$Bi nIn and \$Bi nOut 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; thus, the largest number that can be associated with a pipe is 31. Except for the two default sets, all pre-defined 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:

\$SysIn	\$SysOut
\$Bi nIn	\$Bi nOut
Cp2In	Cp2Out
Cp3In	Cp3Out
Cp4In	Cp4Out
	...
Cp31In	Cp31Out

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.

Copyrights and Trademarks

This document contains proprietary information which is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without prior written consent of Microstar Laboratories, Inc.

Copyright © 1998 - 2002

Microstar Laboratories, Inc.
2265 116th Avenue N.E.
Bellevue, WA 98004
Tel: (425) 453-2345
Fax: (425) 453-3199
[http:// www.mstarlabs.com](http://www.mstarlabs.com)

Microstar Laboratories, DAPcell, Data Acquisition Processor, DAP, DAPL, and DAPview are trademarks of Microstar Laboratories, Inc.

Microstar Laboratories requires express written approval from its President if any Microstar Laboratories products are to be used in or with systems, devices, or applications in which failure can be expected to endanger human life.

Microsoft, MS, and MS-DOS are registered trademarks of Microsoft Corporation. Windows is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. Intel is a registered trademark of Intel Corporation. Novell and NetWare are registered trademarks of Novell, Inc. Other brand and product names are trademarks or registered trademarks of their respective holders.