

DAP USB Installation Manual

Installation Guide for USB-based Data Acquisition Processors

Version 1.01

Microstar Laboratories, Inc.

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1. Introduction

The xDAP product line from Microstar Laboratories provides a range of high-performance and versatile data acquisition products, ranging from a complete general-purpose data acquisition systems-in-a-box, to intensive multi-channel data capture for logging, to responsive monitoring and control for real-time systems. An xDAP is independently packaged, but uses a PC host to configure and operate it via a standard USB 2.0 cable.

Manuals and Documents

This manual covers the process of installing your xDAP system. After the installation, your xDAP system will be ready to use, but you will want to continue by connecting signal lines and configuring your processing applications. Related manuals that you might also need are:

- The xDAP hardware manual, specific to the model of xDAP you have
- The DAPstudio Manual, which explains how to configure applications
- The DAPL 3000 Manual, which covers configuration command details
- The DAPcell Manual, which explains networked configurations

All of these manuals are available on the DAPtools Software CD, along with all of the software you need.

Handling Precautions

The xDAP products are relatively well protected against damage from electrostatic discharge. You should exercise a certain amount of care when connecting hardware signal lines for an application, however. Problems that might result after damage from electrostatic discharge (ESD) damage include degraded accuracy, increases in signal noise, and sometimes inoperable signal lines. Here are some things you should do to avoid damage:

- If possible, wear a grounding strap, and work at a static-controlled station with the xDAP in contact with a grounded work surface.

- Make sure that power is disconnected while wiring signal connections.
- Avoid touching any exposed connector pins.
- Discharge unconnected cables to ground before attaching to connectors.
- Verify that your power source is operating correctly and is set for the right system voltage before turning it on.
- Cover the xDAP input connectors for shipping and storage.

Power Requirements

Data Acquisition Processors draw about 100 watts power from your AC power system, more or less depending on your particular xDAP model.

Ventilation

In general, if you can stand the temperature, the xDAP can operate at that temperature too. However, the higher the temperature, the more important it is to maintain cooling airflow. Make sure that the fans operate, and that ventilation screens are not obstructed.

Host System Requirements and Limitations

Your host system must support USB 2.0 hardware devices. For 32-bit systems, your host must support one of these Microsoft Windows operating systems:

Windows 2000 SP4	Windows XP
Windows 2003	Windows Vista
Windows 2008	Windows 7

For 64-bit systems, your host must support one of these Microsoft Windows operating systems:

Windows 2008	Windows Vista
Windows 7	

You can use multiple USB ports to connect to multiple xDAP systems. However, the data “bandwidth” constraints of most available host systems typically mean that adding USB ports and connecting more xDAP devices won’t substantially increase the data transfer capacity.

- USB hubs make more point of connection available, but do not add any transfer bandwidth in the main connection to your host system. Connecting more devices just adds more competition for this limited capacity.
- Separate USB interface peripheral boards support additional USB connection points somewhat independently, but all data must still be funneled through a common host peripheral bus. xDAP devices will compete for this peripheral bus capacity, severely constraining the transfer bandwidths.

The host system peripheral chip sets and their drivers are the primary reason for the data transfer limitations, not the theoretical capacity limits of PCI and similar data bus hardware. Do not be confused by bus hardware specifications. If you think your particular host can transfer data faster, test its transfer capacity limits first before trying to operate multiple xDAP systems at very high data rates.

2. Installation Sequence

Installing an xDAP system involves the following steps:

- Prepare the Data Acquisition Processor hardware.
- Obtain the latest DAP Software version.
- Install the DAP Software on the host system.
- Power up the Data Acquisition Processor hardware.
- Complete the DAP installation in the host PC.
- Verify successful installation.

Prepare the xDAP: Check the Calibration

Make sure that you are using a calibrated xDAP device. Calibration is discussed briefly in the manual for your Data Acquisition Processor. If you think your device needs calibration, you can contact Microstar Laboratories for information.

Leave your xDAP power and USB disconnected as you install the software.

Obtain the Latest Software Version

The software releases available on the DAPtools CD that you receive with your xDAP system might not be the latest version. You can visit the Microstar Laboratories web site at <http://www.mstarlabs.com/> to see if a more current version is available. You can find current software for the Windows system from the Products | Software | Downloads page. Look for the “*Current Customers*” section.

Install DAP Software

Software is installed on the host PC. Anything that runs on the Data Acquisition Processor is downloaded later.

The DAPtools CD has detailed instructions for installing DAP software under various Windows operating system versions. In the launcher application, select the Documentation link, and after that DAPtools Basic | DAPcell Basic | Installation.

When you install the *DAPcell* software, all other necessary software is installed with it. The software consists of the following:

1. *DAPcell* software. This is the software system that provides data acquisition services to applications, controls low-level device drivers, and accesses networked data acquisition stations.
2. Low-level drivers. With the Channel Architecture, the low-level drivers in the host system work with all USB Data Acquisition Processor models. The installer installs all driver files the host operating system needs. It might also install drivers for legacy system support that you do not need – but if you don't need them, they will not be used and will do no harm.
3. DAPL operating system image. This downloadable code will include the software specific to your Data Acquisition Processor model.

Before continuing, verify again that the xDAP device is disconnected from power, and the USB cable is disconnected. Shut down all other applications, including control panel applications.

Install the DAP software from your DAPtools CD. If your system is configured with auto-detection enabled, the Microstar Laboratories Setup Launcher runs automatically when you insert this CD. Otherwise, execute the SETUP.EXE program from the CD root directory.

The Launcher application that you see will offer a list of install options. You will need just a few of these for a basic DAP installation. Select the Getting Started link from the Launcher to obtain complete instructions for installing DAP software.

The server software must be installed first. Depending on which version of the DAPtools CD you have, select the *DAPcell* server variant from the list below:

- DAPcell Basic Server
Basic local access but no extended application services or networking.
- DAPcell Local Server
Basic local access plus application server features for local machine only.

- DAPcell Server
Full server and client access to the local DAP and remote DAPs.
- DAPcell Client
Client access to remote DAPs when the host has no local DAP.
Be careful, this link is close to the “Server” link and is easy to miss.

There is a sequence of dialogs that you will see during the server installation process.

- The installer program will detect the version of your operating system and make appropriate adjustments to the low-level driver configuration.
- The installer program will display a *Directories* dialog asking where to install the software. The source directory will point to a location on the CD and you will not need to change this. The software is installed by default as a sub-folder under the Program Files folder on the local C: drive, with the server software in a sub-folder. If necessary, you can change the software install locations, but the support software must be placed on the local PC disk drive.
- Next, you will see a dialog offering the option to Install or Uninstall. Select the Install option to install or reinstall the server software. (Select Uninstall if you want to remove the server software and disable any DAP present on the system.) Then click Next.
- In the next dialog, quickly verify that the install information is correct. Click Next to install the software and activate the server. You might see additional messages about re-enumerating Data Acquisition Processors or installing USB devices as the installer determines which DAP devices are present in your system.
- After the software is installed, a dialog might ask whether you want the DOS Accel Driver stub installed. If you will be running DOS emulation for legacy 16-bit software on a 32-bit system, you should check this box before you continue. Most applications do not need this, and if you are not sure, leave this option unselected. Click Finish to complete the software install.
- After the installation is finished, you will be asked to verify that all DAP devices were recognized. Do this by running the Data Acquisition control panel application. Go to the *Browser* tab, and click on the “*local host*” icon with address [\\.](#) and you should see all of your DAPs listed. If so, you are ready to run. If you don’t, reboot your system after you finish the installation process, and then check again whether all of your DAPs are listed.

After the preceding steps have installed the DAP software, you will be returned to the Setup Launcher window. Exit and close this window.

Install xDAP Hardware

Software is installed on the host PC. Anything that runs on the Data Acquisition Processor is downloaded later. If you have followed the preceding installation steps, all necessary software systems will be installed and ready to run. Leave your PC host system running as you perform the next steps to connect the xDAP hardware.

1. Insert the standard 3-hole power cable into the socket at the back of the xDAP enclosure. Plug the other end into the power outlet.
2. Turn on the power switch on the back of the xDAP enclosure, near the power socket. The xDAP might respond briefly before going to a quiet “standby mode.”
3. Insert the standard USB 2.0 cable into the USB port at the front of the xDAP. Insert the other end into the USB 2.0 port on your host PC.
4. Press the Power Button on the xDAP front panel.

The power button will illuminate, and then go through a sequence of flashes as it completes a BIOS initialization sequence, memory test, and so forth.

If this is the first time you have installed on this PC host, depending on your system version, Windows might report that it has detected new hardware. If it prompts for a response, click the option to allow the installation to continue.

When Windows closes any of the special device installation dialogs, your system should be ready to run.

3. Verifying the DAP Installation

One of the features loaded onto your system during the software installation is a control panel application. You can access the Windows control panel in various ways depending on your version of the Windows system. Find the control panel, and run the Data Acquisition application. It will show a dialog window with heading Data Acquisition Processors and five tabbed pages. Initially, the Control tab page will be active.

Control tab. In the top “Service Status” panel, the message DAPcell Service is Running should appear. If it does not, click the Start button in the lower right corner of this panel. The default configuration starts the DAPcell service each time the system starts, but you can change this, if you wish, in the center “Startup” panel.

Browser tab. When you click this tab, you will see a graphics panel displaying a “tree” of connected Data Acquisition Processor devices, with the special address \\., representing your local host. Click on the “plus icon” to expand one tree level. Observe that your xDAP device is displayed there. Expand one more tree level and verify that the default communications links and loadable command modules are present for your DAP device. (A default configuration will show at least four communications pipes and at least two modules.) If you click on the DAPL module name, you can see the identification details of the running DAPL system.

All information displayed in the control panel application is obtained from the DAPL system and the command modules. If the displays are valid, the DAPL system is running, and the modules are loaded and ready.

4. Troubleshooting

Installation from the DAPtools CD that comes with your Data Acquisition Processor should be automatic. However, if your installation fails, you should check the following.

1. Verify that the user account under which you are installing has full administrative rights for installing software. Verify that existing files that you are trying to uninstall or update are not marked as “read only” or “hidden” files. If the installer fails because it cannot write files or directory entries, you might see the message “Could not create DAP key structure.”
2. Before trying a re-install, run the launcher program (SETUP.EXE) from the DAPtools CD, and select the Server installer (*DAPcell Basic*, *DAPcell Local Server* or *DAPcell Server*). After the “Welcome” and “Directory Selection” dialogs, in the next “Select Installation Options” dialog pick the Uninstall option to clean up fragments from previous install attempts.
3. Verify that you have selected a USB port that supports level 2.0, and verify that you have a USB cable that is compatible with level 2.0.
4. If you see the messages “Service terminated with error” and “Could not stop the DAP service,” these indicate that something is using DAP services and the installation process could not proceed. Stop any running applications, including control panel applications, and try the installation again.
5. Verify that all older Data Acquisition Processor boards are properly installed and running. For example, a message that “*insufficient system resources exist to complete the requested service*” usually indicates that a Data Acquisition Processor installed at an earlier time is no longer present. If you no longer have older DAP boards on your system, or if you no longer want them there, run the Uninstall sequence from the CD that you used with those boards.
6. You can try manually eliminating old files left over after a previous DAP installation or installation attempt. The files will be located in the Microstar Laboratories folder on your disk drive, or in whatever alternative location you configured. Delete any ACOM.INI file present on your disk drive.
7. You can use a registry editor to seek and manually delete registry entries under “Microstar Laboratories” to remove stale or corrupted information. Be sure to

make a backup copy of the registry files before changing them, just in case of problems.

8. If you are unable to access networked DAP boards, verify that all the DAP boards have working *DAPcell Server* software, and try reinstalling your *DAPcell* client software again. If you can access remote DAP boards but not the local DAP, try installing again, making sure that you select the *DAPcell Server* link rather than the *DAPcell Client* link (they are part of the same line) in the Launcher application.
9. If you observe peculiar board behaviors and suspect that a Data Acquisition Processor has been affected by static discharge, return it to Microstar Laboratories for testing, repair, and quality control verification. Contact the Microstar Sales department for RMA delivery arrangements.

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