Parker Automation

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ACR Controllers Quick Reference

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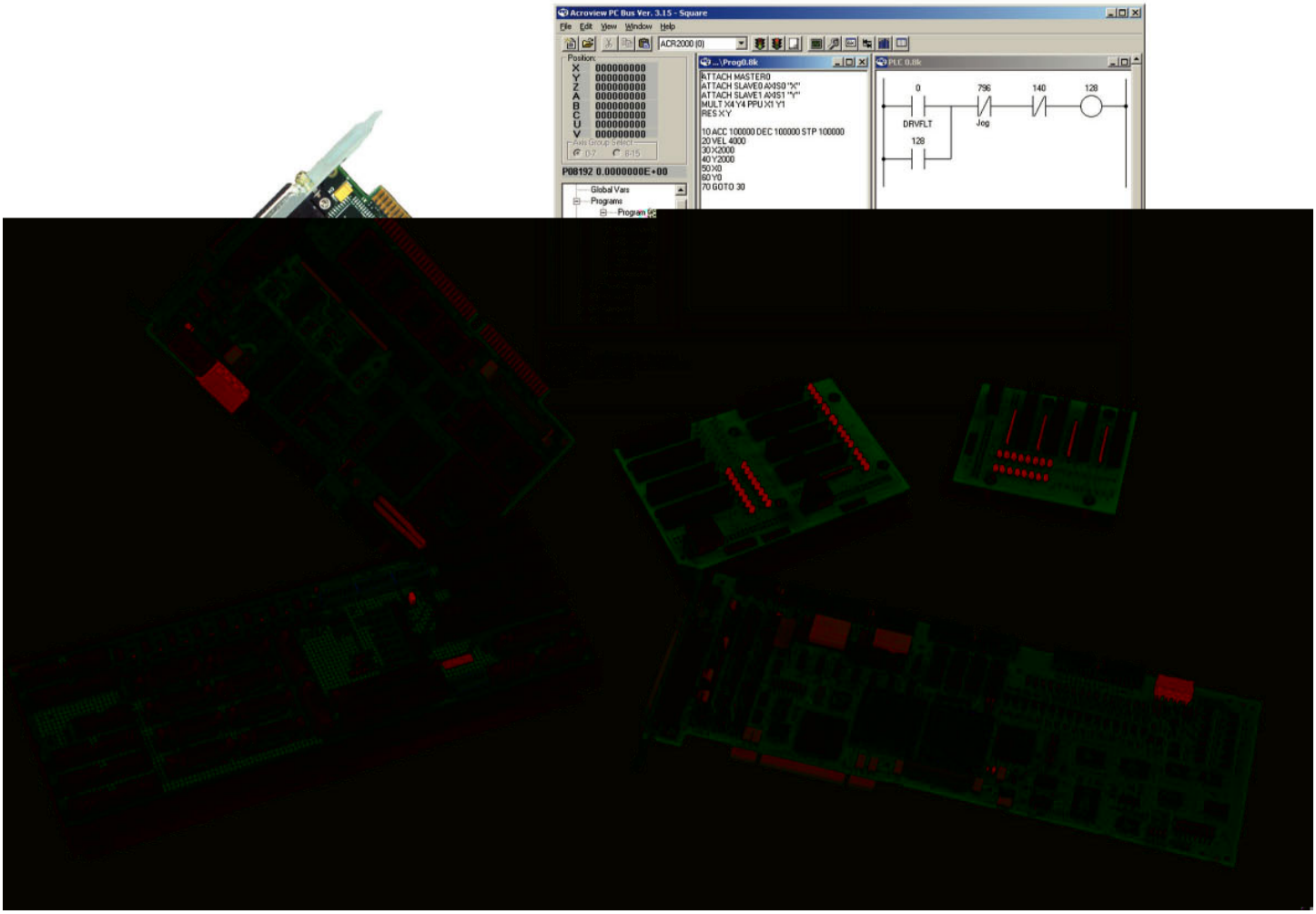

IMPORTANT
User Information

Warning!

ACR Series products are used to control electrical and mechanical components of motion control systems. You should test your motion system for safety under all potential conditions. Failure to do so can result in damage to equipment and/or serious injury to personnel.

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Important Information for Users

It is important that motion control equipment is installed and operated in such a way that all applicable safety requirements are met. It is your responsibility as an installer to ensure that you identify the relevant safety standards and comply with them; failure to do so may result in damage to equipment and personal injury. In particular, you should study the contents of this user guide carefully before installing or operating the equipment.

The installation, set up, test, and maintenance procedures given in this User Guide should only be carried out by competent personnel trained in the installation of electronic equipment. Such personnel should be aware of the potential electrical and mechanical hazards associated with mains-powered motion control equipment—please see the safety warnings below. The individual or group having overall responsibility for this equipment must ensure that operators are adequately trained.

Under no circumstances will the suppliers of the equipment be liable for any incidental, consequential or special damages of any kind whatsoever, including but not limited to lost profits arising from or in any way connected with the use of the equipment or this guide.

Safety Warning!

High-performance motion control equipment is capable of producing rapid movement and very high forces. Unexpected motion may occur especially during the development of controller programs. KEEP WELL CLEAR of any machinery driven by stepper or servo motors. Never touch any part of the equipment while it is in operation.

This product is sold as a motion control component to be installed in a complete system using good engineering practice. Care must be taken to ensure that the product is installed and used in a safe manner according to local safety laws and regulations. In particular, the product must be positioned such that no part is accessible while power may be applied.

This and other information from Parker Hannifin Corporation, its subsidiaries, and authorized distributors provides product or system options for further investigation by users having technical expertise. Before you select or use any product or system, it is important that you analyze all aspects of your application and review the information concerning the product in the current product catalog. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, safety, and warning requirements of the application are met.

If the equipment is used in any manner that does not conform to the instructions given in this user guide, then the protection provided by the equipment may be impaired.

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Acroloop SDK CD-ROM Revision History

Revision 4.1

- Driver installation is now separate from SDK installation.
- Windows XP Professional drivers added.
- Windows 98 ISA driver updated for better performance.
- Windows 98 no longer restricted to a single card.
- All drivers (except Windows NT) are now managed through the Device Manager.
- Updated documentation.

Revision 4.0

- Added Acroloop Configuration Wizard to AcroView.
- Added RBC 84xx Breakout Box Hardware Installation Guide to CD (88-021131-01A ACR84xx HG.pdf)

Software Installation

System Requirements

AcroView

- IBM-compatible PC with a Pentium 200 MHz or higher processor
- Operating systems: Windows 98 SE, Windows NT 4.0 with Service Pack 6, Windows 2000 Professional, Windows XP Professional.
- 64 MB RAM.
- Hard disk space: 16 MB minimum.
- PCI VGA with 800 x 600 resolution or higher.
- CD-ROM drive.
- Mouse or pointing device.
- RS-232C serial port.

Operating System Compatibility

Acroloop PC-based motion control cards are compatible with the following Microsoft operating systems:

- Windows 98 SE
- Windows NT 4.0, Service Pack 6
- Windows 2000 Professional
- Windows XP Professional

Notes

- MS-DOS and Windows 95 are not directly supported.
- Windows ME is not supported.

Installing the SDK

The Software Development Kit (SDK) consists of the AcroView tool, support libraries and examples for creating PC-hosted programs that talk to the Acroloop cards. The SDK is only required on the computer where development is being done. For end-user machines, OEMs need only install the device drivers for the Acroloop cards and their PC-hosted control application program.

► To install the Acroloop SDK, navigate to the SDK folder on the CD-ROM and double-click the **setup.exe** icon.

Installing Over Older Drivers

Older versions of the Acroloop drivers and SDK must be removed before installing the new release. If there are older versions on the target computer:

- Uninstall all Acroloop devices using the Control Panel applet (ACR8K Driver Setup) or Device Manager, as appropriate.
- Uninstall the SDK using the Add/Remove Programs Control Panel applet.
- Navigate to the 'Cleanup' folder on this CD and double-click the rem-acro.reg file found there. This will clean old entries from the registry.

Installing the ACR8020 and ACR1505 (PCI, PNP)

Windows NT 4.0

1. Run the Acroloop NT Driver Install.exe program located in the Drivers\NT4 folder.
2. When offered the choice, choose the PCI driver.

Windows 98 Second Edition, Windows 2000 Professional and Windows XP Professional

For Windows 98 Second Edition, Windows 2000 Professional and Windows XP Professional:

Note: You must be logged in as Administrator to install drivers.

1. Install the controller card in the computer using ESD-safe procedures.
2. Restart the computer. After booting, the Add New Hardware wizard will appear.
3. Choose the 'Search for a driver' option and browse to the Drivers\98-2K-XP folder on this CD.
4. Select 'Next' when presented with the controller type and complete the wizard installation.

The computer will retain installation information for subsequent installations.

Fast Status

Fast Status is a feature of the ACR8020 and ACR1505 cards, rather than a task within the driver. In response to the A8_BIN_INIT_STATUS() function, the driver configures Fast Status with ASCII commands for early-release firmware ACR8020 versions (versions prior to 1.18.06 Update 4). If echo is turned on, this will cause text to be returned from the card.

Applications will need to be aware of the possibility of receiving unsolicited text output. It is good programming practice to regularly check and drain the text buffer to detect error messages. Applications could formerly treat any unsolicited text as an error message, but this is not the case with early ACR8020 firmware releases.

Compatibility

All drivers support the acrownt.dll 32-bit API version 3.x and above. All legacy applications should work without modification, EXCEPT for applications that access global parameters using the binary interface. The system pointer address for the ACR8020 and ACR1505 is different from other products. To access global parameters, use the system pointer address 0x400009. Some API calls have a different effect with the ACR8020, ACR1505 and ISA cards on non-NT platforms:

`AcroGetDrBinaryBufferState()`

Always returns INACTIVE, as the driver's binary buffer is now stateless.

`AcroGetMaxBinTransPerFSIntr()`

`AcroSetMaxBinTransPerFSIntr()`

`AcroGetMaxFastStatusDelta()`

`AcroSetMaxFastStatusDelta()`

`AcroGetBinTransThreshold()`

`AcroSetBinTransThreshold()`

`AcroGetBinaryTimeOut()`

`AcroSetBinaryTimeOut()`

`AcroGetBinaryTimerDelta()`

`AcroSetBinaryTimerDelta()`

`AcroGetStatusTimerDelta()`

`AcroSetStatusTimerDelta()`

`AcroGetMaxBinTransPerFSIntr()`

`AcroSetMaxBinTransPerFSIntr()`

The get functions return whatever values the set functions applied. The driver no longer uses separate status, fast status or binary service threads.

`AcroGetPerformance()`

Does not yet return meaningful data.

Installing the ACR8010 (ISA, PNP)

Important Field Service Note

The ACR8010 card has a globally unique PNP identification code. When replacing an ACR8010 in a fully deployed machine, it is *essential* that the old logical device be removed first.

To remove the logical device, the old card must still be installed in the computer. Using the ACR8K Driver Setup Control Panel applet, highlight the device to be removed and click 'Delete'. Power the computer down and replace the ACR8010 using ESD-safe procedures. When the computer is rebooted, follow the steps above for a subsequent ACR8010 installation.

Important! Failure to follow this procedure will result in the pc host application being unable to communicate with the new card.

Windows 98 Second Edition, Windows 2000 Professional and Windows XP Professional

Notes

- You must be logged in as Administrator to install drivers.
- You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Install the controller card in the computer using ESD-safe procedures.
2. Restart the computer. After booting, the Add New Hardware wizard will appear.
3. Choose the 'Search for a driver' option and browse to the Drivers\98-2K-XP folder on this CD.
4. Select 'Next' when presented with the controller type and complete the wizard installation.

The computer will retain installation information for subsequent installations.

Windows NT 4.0

For the ACR8010, installation is a bit more complicated because of the manner in which NT 4.0 deals with ISA Plug and Play devices. Please review and follow these steps carefully. Failure to follow the steps can lead to the inability to use your ACR8010 without serious repair procedures to the operating system.

You must be logged in as Administrator to install drivers. Do NOT install the ACR8010 until directed to do so below.

Before installing the ACR8010, NT must be prepared:

- Browse to the NT4 Support folder on the CD.
- If Service Pack 6 has not been installed on this machine, do so now and reboot.
- Right-click on the PNPISA.INF file and choose 'Install'
- Reboot the computer.
- After logging in, you may be presented with one or more "New Hardware Found" messages for devices already in the computer. For

each of these, choose the "No, do not install a driver" option and click "OK".

You are now ready to install the ACR8010 driver.

Note: You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Shut the computer down, power off and install the ACR8010 card using ESD-safe procedures.
2. Power the computer up. After logging in, you will be presented with a "New Hardware Found" message for the ACR8010.
3. Select the 'Driver from Disk Provided by Hardware Manufacturer' option and click "OK".
4. Browse to the Drivers\NT-8010 folder on the CD.
5. Select the "Acroloop ACR8010 Plug and Play - Windows NT 4.0" option.
6. If presented with the option to adjust resource settings, select appropriate settings that do not show a conflict with other devices.
7. Complete the wizard and reboot if requested.

For subsequent installations, repeat the driver install steps above.

Installing the ACR1500 and ACR2000 (ISA, non-PNP)

Windows NT 4.0

Note: You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Run the Acroloop NT Driver Install.exe program located in the Drivers\NT4 folder.
2. When offered the choice, choose the ISA driver.
3. Select the I/O base address and IRQ that match your card's jumper and dipswitch settings.
4. Reboot when requested.

Windows 98 SE

You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Power off the computer and install the card using ESD-safe procedures.
2. Restart the computer.
3. From Control Panel, run the Add New Hardware Wizard. Choose "Next" twice.
4. Choose "No, I want to select the hardware from a list" and then "Next".
5. Choose "Other Devices" and then "Next".
6. Choose "Have Disk". Browse to the Drivers\98-2K-XP folder on this CD.
7. Choose "Acroloop ISA Motion Controller".
8. You will be shown the resources assigned to the new device, which may *not* be correct. If they are not, make a note to change them after rebooting.

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9. Finish the wizard and allow the computer to reboot.
10. If the resources were not assigned correctly by the Add New Hardware wizard, open the Device Manager (Right click on 'My Computer', choose properties and select the Device Manager tab). Locate the new device under "ISA Motion Control", click the Properties button, select the Resources tab and adjust the resources to match the jumper and dipswitch settings for your card.
11. Reboot if requested.

For subsequent installations, select "ISA Motion Control" instead of "Other Device" in the Add New Hardware wizard.

Windows 2000 Professional

You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Power off the computer and install the card using ESD-safe procedures.
2. Restart the computer.
3. From Control Panel, run the Add/Remove Hardware Wizard. Choose "Next".
4. Choose "Add/Troubleshoot a device" and then "Next".
5. Choose "Add a new device" and then "Next".
6. Choose "No, I want to select the hardware from a list" and then "Next".
7. Choose "Other Devices" and then "Next".
8. Choose "Have Disk". Browse to the Drivers\98-2K-XP folder on this CD.
9. Choose "Acroloop ISA Motion Controller".
10. A dialog box will tell you that "Windows cannot determine the resources needed by this device". Click OK.
11. You will be taken to the Resources property page. Adjust the resources to match the jumper and dipswitch settings for your card.
12. Finish the wizard and reboot if requested.

For subsequent installations, select "ISA Motion Control" instead of "Other Device" in the Add/Remove Hardware wizard.

Windows XP Professional

You must have a supported interrupt available and set for ISA usage in the BIOS setup. (See notes below)

1. Power off the computer and install the card using ESD-safe procedures.
2. Restart the computer.
3. From Control Panel, run the Add Hardware Wizard.
4. Choose "Next". The wizard will search for new Plug and Play hardware.
5. After the search, select "Yes, I have already connected the hardware" and click "Next".
6. Scroll to the bottom of the hardware list, select "Add a new hardware device" and click "Next".
7. Choose "Install the hardware that I manually select from a list" and click "Next".

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8. Select "Show All Devices" and click "Next".
9. Click "Have Disk" and browse to the Drivers\98-2K-XP folder on this CD.
10. Choose "Acroloop ISA Motion Controller" and click "Next" twice.
11. Click "Finish" to complete the wizard.
12. You will need to adjust the resources for the newly installed card.
13. From Control Panel, launch "Administrative Tools".
14. From the Tools, launch "Computer Management".
15. In the left pane, select "Device Manager".
16. In the right pane, expand the "ISA Motion Controller" branch and double-click your new device.
17. Select the "Resources" tab and adjust the resources to match the jumper and dipswitch settings on your card.
18. Finish by clicking "OK".
19. A reboot should not be necessary, but if prompted, reboot the computer.

For subsequent installations, select "ISA Motion Control" instead of "Show All Devices" in the Add Hardware wizard.

Troubleshooting the ISA installation

Acroloop ISA cards require the use of an interrupt. IRQs 3, 4, 5, 7, 10, 11, 12 and 15 are supported. One of these *must* be free in the target computer. For the ACR1500 and ACR2000, the selected IRQ must also be set for ISA usage in the BIOS setup. Methods and nomenclature vary, but the choice is usually "legacy" and/or "ISA", and usually appears in a section called "PnP Setup" or similar. Consult your computer manufacturer's documentation for specific details. The ACR8010 requires its IRQ to be set to Plug and Play, the opposite of the other ISA cards. For most modern motherboards, no adjustment is required for the ACR8010.

The default IRQ is five, which is usable in a majority of installations. (If IRQ5 is not available, it is usually because of an Ethernet card having claimed it) IRQ7 is a good second choice for systems that do not reserve it exclusively to the printer. IRQ15 is rarely available in modern motherboards with two IDE channels.

If the selected IRQ is not available to the Acroloop ISA driver, the driver **will not start**. Check available system resources before installing your card. For Windows NT, use the *NT System Diagnostics* program. For Windows 98, use *System Information*. For Windows 2000 and Windows XP, resource information is available through the *Computer Management* snap-in on the Control Panel.

Note that on occasion, the system may not report all claimed resources, since not all devices report resource usage to the registry.

Getting Started with AcroView

After installing the SDK, you can launch AcroView from the Start menu.

1. On the Acroloop menu, select 'AcroView PCBus' for bus-based communication, or 'AcroView Serial' for rs-232/485 communication.
2. To create a new project in AcroView, select File, and then click New.