

ServoCam[®] DNC User's Manual

Version 1.2

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DU2369rC

WARNING:



Read and follow **ALL** operating instructions and safety warnings set forth in the ServoCam® DNC User's Manual before operating this equipment. **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.



Read and follow **ALL** operating instructions and safety warnings for the automatic screw machine to which the ServoCam® system is attached before operating this equipment. **DO NOT** allow untrained personnel to operate, clean, inspect, maintain, service, or tamper with this equipment.



NEVER REMOVE OR DISABLE ANY SAFETY GUARDS OR FEATURES from the ServoCam® system or the automatic screw machine to which the ServoCam® system is attached.



IN CASE OF EMERGENCY OR MACHINE MALFUNCTION, IMMEDIATELY PRESS THE LARGE RED TOOL STOP BUTTON ON THE FRONT OF THE SERVOCAM® CONTROLLER. NOTE THAT DEPRESSING THE TOOL STOP BUTTON DOES NOT REMOVE POWER FROM THE AUTOMATIC SCREW MACHINE DRIVE MOTOR OR ACCESSORY MOTORS. DO NOT RELEASE THE TOOL STOP BUTTON UNTIL ALL PERSONNEL ARE CLEAR OF THE AUTOMATIC SCREW MACHINE.



THE SERVOCAM® SYSTEM MAY AT ANY TIME CAUSE THE TOOL SLIDES TO MOVE UNEXPECTEDLY, EVEN IF THE AUTOMATIC SCREW MACHINE CLUTCH IS DISENGAGED. ALWAYS DEPRESS THE LARGE RED TOOL STOP BUTTON ON THE FRONT OF THE CONTROLLER BEFORE PLACING YOUR HANDS OR FINGERS ANYWHERE NEAR THE TOOL SLIDES, TURRET, OR WORKPIECE.



When the **YELLOW** light on the ServoCam® controller is illuminated, the turret slide is unlocated by the controller and **WILL NOT STOP AUTOMATICALLY. KEEP THE TURRET SLIDE OF THE AUTOMATIC SCREW MACHINE AWAY FROM THE ENDS OF ITS TRAVEL.**



ONLY PERMIT QUALIFIED PERSONNEL TO SERVICE OR ADJUST THE SERVOCAM® SYSTEM. EXERCISE CARE WHEN MAKING CHECKS, TESTS, AND ADJUSTMENTS THAT MUST BE MADE WITH POWER ON. FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN INJURY OR DEATH.

Chapter 1 Overview

Introduction

ServoCam® DNC is AMT Machine Systems' ServoCam® networking system. Combined with enhancements in the ServoCam® machine controller software, ServoCam® DNC provides DNC (Distributed (or Direct) Numerical Control) capabilities, allowing ServoCam® controllers to access part-cycle files stored on a standalone desktop PC or on a network file server.

Safety Warnings and Information



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Principle of Operation

The ServoCam® DNC Server running on a PC communicates with ServoCam® controllers via RS232 serial communication or Ethernet UDP communication.

Every ServoCam® controller that participates in DNC must connect to a ServoCam® DNC Server via one of three methods:

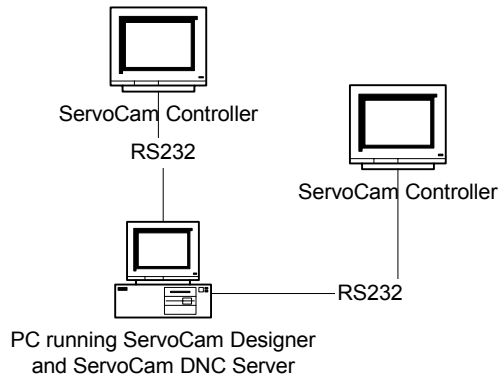
- 1) direct RS232 serial connection from the controller to a serial port on the server,
- 2) RS232 serial connection from the controller to a serial concentrator, then over Ethernet to the server, or
- 3) Ethernet connection from the controller (XL or XLS only) to the server.

Note that method 2 appears identical to method 1 to the attached systems (an appropriate driver on the server makes Ethernet communication appear as distinct serial ports).

ServoCam® DNC configurations can range from very simple to very sophisticated, depending on the needs of the shop. Here are two examples:

A Simple Configuration

In this example, a single PC with two RS232 serial communication ports (typically called “COM1” and COM2”) is connected to two ServoCam® controllers by RS232 serial cables.

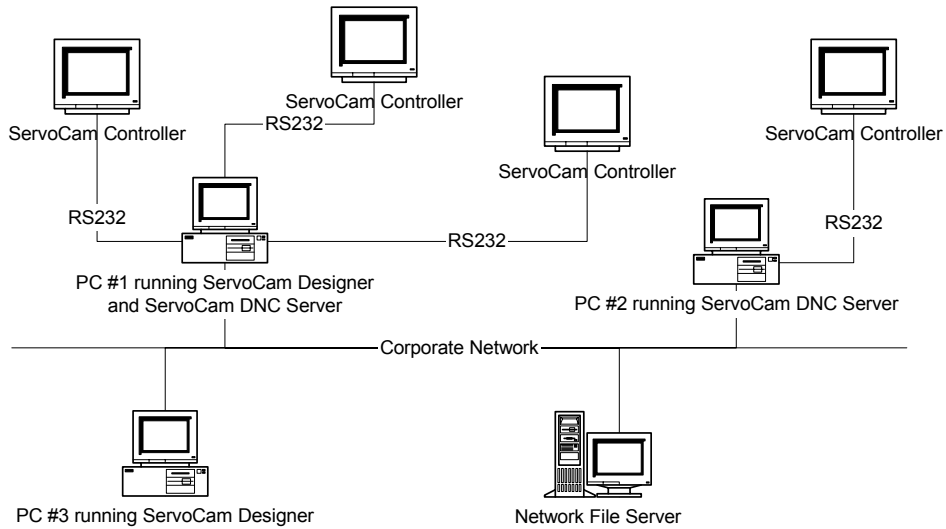


The single PC runs both the ServoCam® Designer and the ServoCam® DNC Server software. The part-cycle files created by ServoCam® Designer are stored on the PC's local "C:" disk drive.

A More Complex Configuration

In this example, several PCs are connected to a corporate network (LAN). Two of the PCs are

connected to ServoCam® controllers by RS232 serial cables. All of the PCs can share files stored on a network file server.



Some of the PCs are running ServoCam® Designer, some are running ServoCam® DNC Server, and some are running both software programs. The part-cycle files created by ServoCam® Designer are stored on the network file server, which is accessible from all of the PCs.

Chapter 2 Installation and Setup

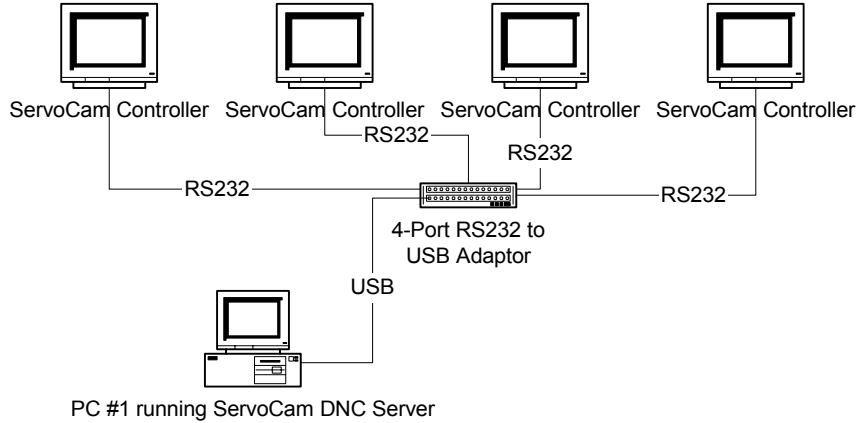
Introduction

Installation and setup of the ServoCam® DNC system consists of the following steps.

Install the Communication Hardware

Direct serial

For direct serial connection, the ServoCam® DNC Server software running on a PC communicates with ServoCam® controllers via RS232 serial communication. Some PCs have true (9-pin or 25-pin) RS232 serial ports. Newer PCs may have USB (Universal Serial Bus) ports instead. RS232-to-USB adaptors are available that can provide up to eight RS232 ports via one USB port. Here is an example of a 4-port adaptor:



On most Windows PCs, the available RS232 ports can be found by looking at the Windows Device Manager (navigate to Start Menu | Settings | Control Panel | System | Hardware | Device Manager | Ports). Typically the ports are named COM1, COM2, COM3, and so on.

One dedicated RS232 port on a PC must be connected to each ServoCam® machine controller. Here is an example (with two PCs and four machines):

ServoCam® DNC Server PC	RS232 Port	Machine Name
PC #1	COM4	#2 Ultra 123
PC #1	COM2	#2 Ultra 456
PC #2	COM2	#3 Ramslide 2
PC #2	COM3	#2 Ultra 789

Serial concentrator

For serial concentrator connection, the ServoCam® DNC Server software running on a PC communicates with ServoCam® controllers via RS232 serial communication, even though the serial

lines do not connect directly to the server PC. The serial lines from the ServoCam® controllers connect to a serial concentrator which then connects over Ethernet to the server. However, a driver provided with the concentrator will make serial ports available to software on the server just as though the serial lines were directly connected. Available RS232 ports can be found just as in the 'Direct serial' case.

One dedicated RS232 port on the concentrator (and one corresponding driver port on the server PC) must be connected to each ServoCam® machine controller.

Ethernet UDP

For an Ethernet UDP connection (available on UltraTurn XL and XLS controllers only), the ServoCam® DNC Server software running on a PC communicates with ServoCam® controllers via UDP datagrams over an Ethernet network.

Each ServoCam® machine controller must be connected via normal Ethernet hardware (cables, hubs, switches, etc.) to the DNC server PC.

Install the ServoCam® Controller Software

Using ServoCam® DNC requires ServoCam® controller software Version 5.10c or newer for ServoCam® turret-slide systems and ServoCam® UltraTurn CL systems, and ServoCam® controller software Version 5.40a or newer for UltraTurn XL/XLS systems. Follow the ServoCam® controller software installation instructions to install the appropriate version.

Configure the ServoCam® Controller Software for DNC

After installing or verifying the ServoCam® controller software, you must then configure the DNC communication on the controller.

ServoCam® UltraSlide or UltraTurn CL (gray-box) controllers

To configure a gray-box ServoCam® controller for DNC:

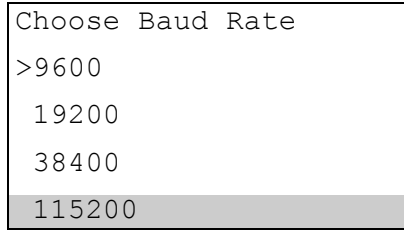
1. Remove power from the ServoCam® controller.
2. Insert the ServoCam® DNC Configurator Disk into the controller's floppy disk drive.
3. Apply power to the ServoCam® controller.

The initial screen will appear:

```
Select Action
>Configure DNC
Unconfigure DNC
```

4. Use the **W** and **y** keys to select Configure DNC, then press **e**.

The Choose Baud Rate screen will appear (the grayed lines indicate lines that can be reached by scrolling down):



5. Use the **W** and **Y** keys to select the baud rate you want to use for communicating with the ServoCam® DNC Server, then press **E**. (We recommend choosing 9600 baud during initial installation, then increasing it, if desired and appropriate, once the DNC hardware and software is operating successfully.)
6. Remove power from the ServoCam® controller.
7. Remove the ServoCam® DNC Configurator Disk from the controller's floppy disk drive.

A Note on Baud Rate Choice:

The baud rate for a connection should not exceed what its conditions (cable length, noise sources, etc.) allow. Although the software will retry as needed after transmission errors, if the baud rate is too high for the conditions, this may be unsuccessful or very inefficient. The optimal baud rate for a given situation is the one that maximizes the copy rate shown during operation. A new, empty floppy disk should be used when testing.

ServoCam® UltraTurn XL or XLS (touch-panel) controllers

To configure a touch-panel ServoCam® controller for DNC:

1. Configure Windows networking parameters for the Local Area Connection (DHCP or

static IP address, subnet mask, gateway, etc.) via normal Windows configuration per site policies. A static IP address makes it possible to assign a unique root folder to this controller, but DHCP also works fine (with a shared root folder).

2. Configure the DNC options, under Options in the ServoCam® Terminal program:
 - DNC On
 - Host = DNC Server hostname or IP address
 - Port = 4170 (default) or as desired.

The port chosen must agree with the DNC Server's setting for Server UDP Port (see below), and must be passed through all intervening firewalls (if any).

Install the ServoCam® DNC Server Software

The ServoCam® DNC Server software must be installed and configured on each PC that is connected to a ServoCam® controller via RS232 and/or Ethernet. To install the ServoCam® DNC Server software:

1. Insert the ServoCam® DNC Tools CD into the PC's CD drive.
2. Right-click on the Windows Start menu, select Explore, and navigate to the CD drive. Double-click on the Setup.exe program. The installation program should start.
3. When prompted by the installation program, we recommend choosing the given default selections, which will install the program in the folder:
"C:\Program Files\ServoCam\DNC Tools 1.1"
4. When the installation program is complete, shutdown and restart the PC.

Configure the ServoCam® DNC Server Software

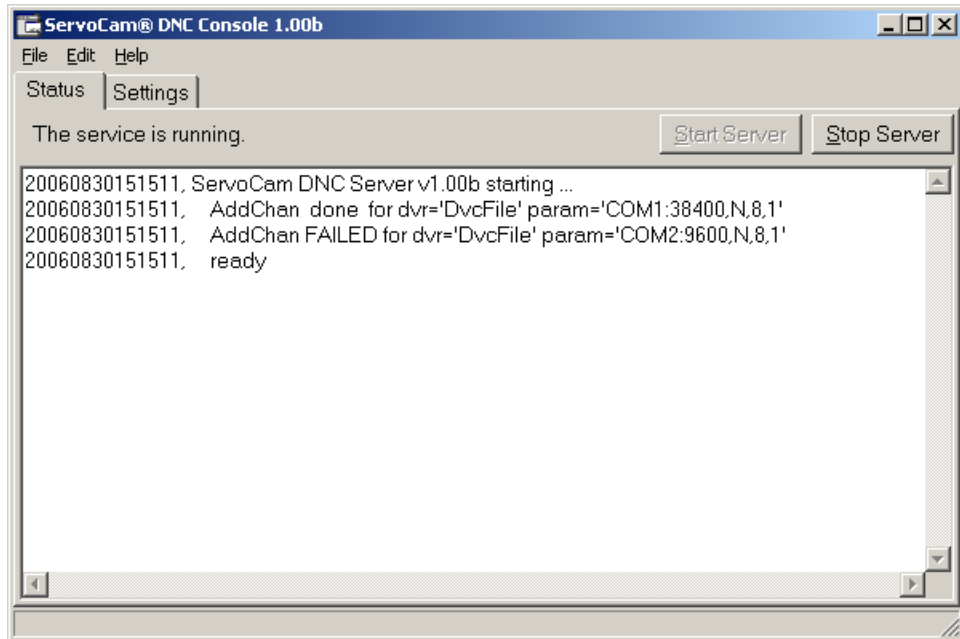
Installation of the ServoCam® DNC Server software includes installation of the ServoCam® DNC Console program. The Console program allows the user to configure the ServoCam® DNC Server, and to view the status of the ServoCam® DNC Server during operation.

To configure the ServoCam® DNC Server:

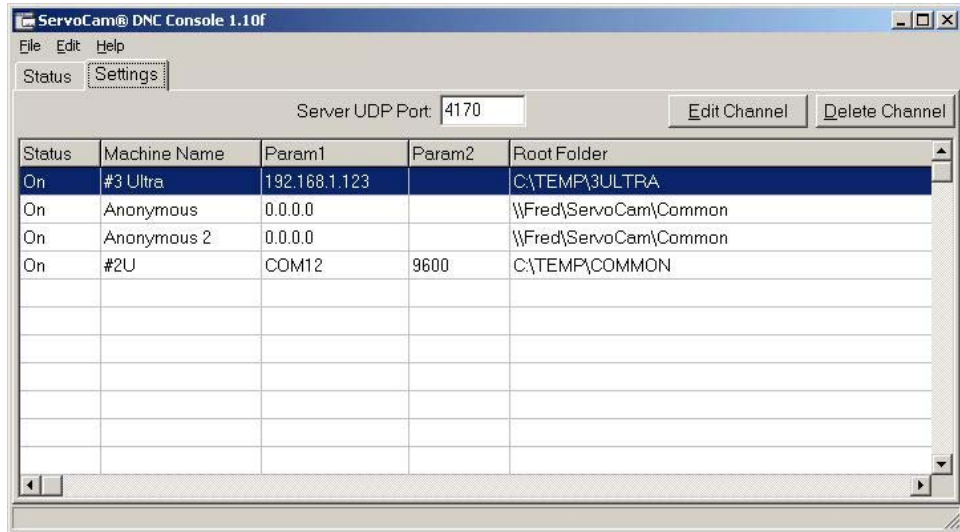
1. Start the ServoCam® DNC Console program by selecting:

Start Menu | Programs | ServoCam |
ServoCam DNC Console

The main Console window will appear:



2. Click on the Settings tab. The Settings tab window will appear (the rows initially will be blank):



3. The Settings tab is used to set the Server UDP Port and to configure “channels”. A “channel” is an RS232 or UDP connection between a single ServoCam® controller and the DNC Server PC.

Note: Because a single ServoCam® controller must be associated with a single RS232 COM port, we do not recommend using a COM port switch to connect more than one machine to a single COM port.

4. The Server UDP Port is the port on which the server listens for accesses from connected machines. The default is 4170, but any available value in the range 1 to 65535 can be used. The UDP-connected machines must use this same value when

they connect to the DNC server (see “Configure the ServoCam® Controller Software for DNC” above).

5. To configure a new channel, click on a blank row in the table and select Edit Channel. The Channel Information window will appear:

Channel Information

Status: On Off

Chan Type: Serial UDP

Machine Name: #2U

Port: COM1

Baud Rate: 9600

Root Folder: C:\TEMP\COMMON

Browse

Note: Changes to channel information won't take effect until the ServoCam DNC server is restarted.

OK Cancel

6. Enter a Machine Name that is meaningful to you for the machine. Examples: “Machine #15”, “2U#5”.
7. Choose the Channel Type: Serial (RS232, direct or via concentrator) or UDP (Ethernet).
8. For a UDP channel, choose the Machine Host Name (or IP Address) of the connected machine. If some connected machines get

their IP address via DHCP, enter 0.0.0.0 for this field. See Appendix E for details.

9. For a Serial channel, choose the Port Name of the DNC Server COM port connected with the machine, then choose the Baud Rate of the connection. Note: This must be the same baud rate chosen when configuring the machine (see *Configure the ServoCam® Controller Software for DNC* above).
10. Choose the Root Folder for the connection. The Root Folder is the “root” or “top” of the folder tree that the machine will be able to access when downloading part cycles. That is, the machine operator will be able to download any part cycles that are within the specified Root Folder and its sub-folders. See Appendix D for information about using non-local root folders.
11. Click OK.
12. Repeat Steps 5 to 11 for each channel.
13. To cause the settings changes to take effect, click the Status tab, click the Stop Server button, then click the Start Server button.
14. Exit the DNC Console program.

A Note on Root Folder Choice:

The appropriate choice of Root Folder for a machine depends on the particular policies and procedures of your shop. Here are several examples:

Shop A keeps all of its part-cycle files in a single folder:

“C:\Program Files\ServoCam\Cams”

The shop policy is that any operator can load any of these part cycles into any machine. That is, it is the responsibility of an operator to know which part cycle to run on which machine, and when.

In this case, the shop could configure the Root Folder for all connections to be the same:

“C:\Program Files\ServoCam\Cams”.

Shop B keeps its part-cycle files in separate folders on a network, based on machine type:

“\\Main\ServoCam\Cams\2U”

“\\Main\ServoCam\Cams\2A”

“\\Main\ServoCam\Cams\00U”

The shop policy is that any operator can copy any of these part cycles to a floppy and load it into any machine of the correct type. That is, it is the responsibility of an operator to know which part cycle to run on which machine, and when.

In this case, the shop could configure the Root Folder for connections to 2U machines to be

“\\Main\ServoCam\Cams\2U”

connections to 2A machines to be

“\\Main\ServoCam\Cams\2A”

and so on.

Shop C keeps all of its part-cycle files in a “master” folder, for example:

“C:\Program Files\ServoCam\Cams”

However, the shop wants to restrict the downloading of part cycles, so that only specific “assigned” part cycles can be downloaded to specific machines.

In this case, the shop could create a “staging” folder for each machine. For example:

“C:\Stage\Machine1”

“C:\Stage\Machine2”

The shop could then configure the Root Folder for each machine connection to be the specific “staging” folder for that machine.

Thereafter, to “assign” a part cycle to a machine, the production manager copies the part-cycle file from the “master” folder to the “staging” folder for the desired machine. For example:

“C:\Program Files\ServoCam\Cams\Part12.scm”

is copied to

“C:\Stage\Machine1\Part12.scm”

Similarly, to “de-assign” a part cycle from a machine, the production manager deletes the part-cycle file from the “staging” folder (but should not delete the file from the “master” folder!).

Note: Making a copy of a part-cycle file introduces the possibility that the two copies of the file will become inconsistent: the “staging” copy may be accidentally modified in ServoCam® Designer, the “master” copy may be updated in Designer, but the “staging” copy is not updated, etc. Care should be exercised.

Chapter 3 Operation

Overview

The normal operation of the ServoCam® DNC system is described below.

Server Operation

The ServoCam® DNC Server program runs automatically as a Windows “service” when the server PC is started.

The DNC Server runs regardless of whether a user is logged on to the PC, and the PC may be used for other purposes while the DNC Server is running.

The DNC Console program may be run at any time to view the status of the DNC Server, and to start and stop the DNC Server. If the DNC Server is stopped by the user, however, the DNC Server will start again automatically if the PC is restarted.

Controller Operation

ServoCam® UltraSlide or UltraTurn CL (gray-box) controllers

The gray-box controller works as before, with the addition of one new menu item in the Setup menu:

Make Cam Diskette

Using Make Cam Diskette, the operator may download a part-cycle file from the DNC Server, and copy it on to a floppy diskette at the machine. Thereafter, the operator may run the downloaded part cycle from the diskette, just as in normal ServoCam® operation.

To use Make Cam Diskette:

1. Ensure that there is a floppy disk in the controller's disk drive. This floppy disk must not be write-protected, and must have sufficient free space to hold the chosen part-cycle file.
2. Choose the Setup Menu from the main screen. The Setup Menu will appear (note that non-UltraTurns have only 3rd and 4th items):

```
Setup Menu
>Move manually
  Set cycle phase
  DIS/ENABLE Trippers
  Make Cam Diskette
```

3. Use the **W** and **Y** keys to select Make Cam Diskette, then press **E**.

A momentary screen will appear (that will linger and eventually give a message if there is a problem with the connection):

```
Testing
connection ...
```

If the connection test is successful, a screen will appear that displays the Root Folder for the machine. For example:

```
Choose Part Cycle
>[2A]
 [UltraTurn]
Cam3527.SCM
Cam6219revC.SCM
Cam6219revD.SCM
```

4. Choose a part-cycle file by scrolling to the chosen file name and pressing ENTER. Brackets “[]” indicate a folder. If a folder is chosen (by pressing ENTER), the contents of that folder will then be shown. To return to the parent folder, press ESC. (There is no parent folder for the Root Folder.) The part cycle download from the server will begin, and the following screen will appear:

```
Writing cam disk ...

Please wait
(approx 10 - 90 sec)
```

Upon successful completion of Make Cam Diskette, the following screen will appear temporarily (for several seconds):

```
Cam diskette written  
  
Copy rate: 40352 bps
```

The diskette now contains the downloaded part-cycle file (renamed to “ServoCam.scm”). Please note that the copy rate shown includes the time to write the floppy (including retries, fragmentation delays, etc.).

If the process fails for any reason, an error message will appear.

ServoCam® UltraTurn XL or XLS (touch-panel) controllers

The touch-panel controller works as before, with the addition of one new button on the “LOAD Part Cycle” screen:

DNC

which allows the part cycle to be chosen from the DNC root folder.

Choose a part-cycle file by picking the chosen file name from the list. Brackets “[]” indicate a folder. If a folder is chosen, the contents of that folder will then be shown. To return to the parent folder, press the parent-arrow button. (There is no parent folder for the Root Folder.) Once chosen, the part cycle will be loaded as the current part cycle.

Appendix A Reference Notes

General

On gray-box systems, pressing the Emergency Stop speeds up "Make Cam Diskette" operations significantly.

Network Access

The ServoCam® DNC Server program is a Windows service, which is subject to the access control policies that apply to Windows services. If Root Folders for the Server connections reside on a network file server, your network system administrator may need to configure the DNC Server service to allow access to those network folders (see Appendix D).

Contents of Remote Folders

Note: "Remote" is from the perspective of the ServoCam® controller; remote folders reside on (or within network reach of) the PC running the DNC Server.

The Folders can contain four types of files:

- Folders (that is, sub-folders)
- Cam files (.SCM)
- Symbolic links (.SCL)
- Other files

Folders and cam files work as expected in a Windows environment.

Symbolic links work much like directories (using the filename minus the .SCL as a directory name), but they permit a "hop" to an arbitrary directory (specified within the .SCL file).

Other files are currently ignored by the controller.

Recommended File and Folder Name Lengths

For access by gray-box systems, it is recommended that the length of all file and folder names be limited so that they can be fully displayed on the controller mini-terminal. The display shows up to 19 characters of the name (17 between the "[]" characters for directory names).

Recommended Folder Sizes

If many cam files are to be available to a connection, the use of sub-folders and/or symbolic links is encouraged to reduce the number of cams which can be selected by the user in any folder to a manageable number.

It is recommended that the number of items (cam files and directories) in each directory be limited so that they can be navigated on the gray-box controller mini-terminal. The display shows only 3 items at a time.

Although the additional menu navigation keys (see below) make it feasible to navigate up to 1000 items, many shops will want to limit the number of items per directory to tens or hundreds.

New Menu Navigation Keys on Controller

Twelve new menu-navigation keys have been added to the mini-terminal on gray-box controllers. These were primarily added to support a large number of menu items when using the DNC option, but they work anywhere a menu appears.

Existing menu keys:

Key	Function
Escape	Exit menu (return to previous menu)
Enter	Choose selected menu item
UpArrow	Move up one menu item
DownArrow	Move down one menu item

New menu keys:

Key	Function
0	Move to the topmost menu item (even if not visible)
1	Move to the menu item near 11%
2	Move to the menu item near 22%
3	Move to the menu item near 33%
4	Move to the menu item near 44%
5	Move to the menu item near 55%
6	Move to the menu item near 66%
7	Move to the menu item near 77%
8	Move to the menu item near 88%
9	Move to the bottommost menu item
Minus	Move down one menu page
Backspace	Move up one menu page

As a memory aid, you can use the following:

- the minus (down-a-page) is located below the down-arrow (down-an-item),
- the backspace goes "back" a page,
- the 0 (the smallest number on the keypad) goes to the beginning, and
- the 9 (the largest number on the keypad) goes to the end.

Deleting Temporary Files

Temporary files of the form "!dir!123" are created on the PC where the DNC Server runs. These will normally be deleted automatically, but if the Server or Controller terminates abnormally during folder access these files could be left on the server. They will do no harm, but they can be deleted to free up the space they occupy. To do this (while no Controller is accessing the Server), do:

1. Start | Search | For Files and Folders ... (or equivalent)
2. Search for files or folders named: !dir!* in the appropriate drive and/or folders
3. Delete all files found

Appendix B System Requirements and Supported Communication Hardware

Requirements for ServoCam® DNC Server Application

Windows 2000 or XP
Pentium-class processor or equivalent
128 MB of RAM
50 MB of free hard disk space
800x600 pixel VGA video or higher
CD-ROM drive, or other access to installer program

IT Requirements for Using Ethernet UDP

This section describes the IT requirements for UDP connections to the DNC server (for use with ServoCam® UltraTurn XL/XLS machines). The requirements given here can be conveyed to, and implemented by, IT personnel; the remainder of the DNC setup can be done by office/shop personnel. Configuration at this level is done via normal Windows network configuration.

The UDP connection connects a ServoCam® UltraTurn XL/XLS (touch-panel) controller to a PC

running ServoCam® DNC Server software. The following items are required:

ServoCam® UltraTurn XL/XLS (touch-panel) controller

Each machine controller must have:

1. a static IP address, OR
2. a DNS hostname resolvable by the DNC Server PC, OR
3. a DHCP-assigned IP address.

One of the first two is preferable because it allows the DNC Server to assign a unique identity to the controller; controllers with DHCP-assigned addresses must all be placed into a common pool.

DNC Server PC

The PC on which the DNC Server will be installed must have:

1. a static IP address, OR
2. a DNS hostname resolvable by the ServoCam® UltraTurn XL/XLS (touch-panel) controller.

Ethernet pathway between machine controller and DNC server

The Ethernet switches, routers, and firewalls between the machine controller and the DNC server must pass UDP packets between the designated port on the DNC server (default 4170) and an available port on the machine controller.

There are only two types of packets:

1. requests: packets from an available port on the controller to the designated port on the DNC server (default 4170)
2. responses: packets from the designated port on the DNC server (default 4170) back to the requesting port on the controller

All communications are initiated with a request by the controller, followed by a response from the DNC server.

Tested Communication Hardware

The ServoCam® DNC Server software has been tested on the following equipment:

- Windows 2000 and Windows XP with native PC COM1 and COM2 ports.
- Windows XP with a SerialGear USB-8COM 8-port RS232 USB to Serial converter.

- Windows XP with a Digi Etherlite 160 16-port serial concentrator (Digi part # 70001427).
- Windows XP with Ethernet connection to UltraTurn XL.

Appendix C Troubleshooting

Overview

The ServoCam® DNC Server system provides several types of information for troubleshooting: datalogs, diagnostic messages, and log files. Datalogs and diagnostic messages work as with the normal ServoCam® software. In addition, the procedures described below can assist in diagnosing problems.

Diagnostic Procedures

ServoCam® UltraSlide or UltraTurn CL (gray-box) controllers

If there is any trouble with the "Make Cam Diskette" operation, a new floppy disk should be used, to eliminate the floppy as the problem source.

To check the communication operation, attempt the Make Cam Diskette operation. If an error message appears:

“No response from remote”

this indicates that the communication is not successful. This has several possible causes, including:

- The communication hardware is disconnected or malfunctioning.

- The DNC Server is not running.
- There is a baud rate mismatch for the channel.
- The Port Name for the connection is not configured or is misconfigured.

To diagnose the cause of the problem:

1. Verify that the ServoCam® DNC Server is running by viewing the Status tab in the DNC Console program. It should indicate:

“The service is running”

Observe whether there are any error messages in the status window (which is a view of the Server Log File - see below).

2. Verify that the Port Name settings of the DNC Server are correct. The Port Name settings of the DNC Server are shown in the Settings tab of the DNC Console.
3. Verify that the Baud Rate settings of the Controller and DNC Server are the same. The baud rate setting of the DNC Server is shown in the Settings tab of the DNC Console. The baud rate setting of the Controller is visible in the third line of the “Advanced Menu | Show configuration” screen. For example:

DNC: 9600,N,8,1

The 9600 number is the baud rate. If the DNC line is absent, the serial port hardware is not installed or is not functioning properly.

4. Inspect the communication wires and connectors.

ServoCam® UltraTurn XL or XLS (touch-panel) controllers

If a touch-panel controller has any trouble reading the part-cycle file over the DNC connection, the message “Unable to connect to DNC host” will be displayed. This has several possible causes, including:

- The Ethernet hardware is disconnected or malfunctioning.
- Windows TCP/IP networking is not configured or is misconfigured.
- The DNC Server is not running.
- The Port configured on the Controller does not match that configured on the DNC Server.
- UDP datagrams between the Controller and DNC Server are being blocked by a firewall (either hardware or software).

To diagnose the cause of the problem:

1. Verify that the ServoCam® DNC Server is running by viewing the Status tab in the DNC Console program. It should indicate:
“The service is running”
Observe whether there are any error messages in the status window (which is a view of the Server Log File - see below).
2. Inspect the Ethernet cables and connectors. Confirm link lights on the touch-panel Ethernet jack, the DNC Server Ethernet jack and on any intervening hubs or switches.
3. Verify that Windows TCP/IP has been configured on the Controller. Settings are required for IP Address, Subnet Mask, DNS

Servers and Gateway. Some or all of these can be provided via DHCP, depending on site policy.

4. Verify that Windows TCP/IP has been configured on the DNC Server PC.
5. Verify that the Controller can connect over Ethernet to the DNC Server:

Start | Run | ping dncserveraddr

For example,

Start | Run | ping 192.168.1.123

(This assumes that the DNC Server PC accepts ping requests, ping from another PC to test this.) The ping window will disappear quickly after the fourth test, but the first few tests (succeeding within a short time, or failing with a timeout) are enough to confirm operation.

6. Verify that Port specified on the Controller (ServoCam Terminal | Options | DNC | Port) is the same as specified for the DNC Server (DNC Console | Settings | Server UDP Port). The default value is 4170, but any available value in the range 1 to 65535 can be used. Remember to stop/start the DNC Server if any changes are made to its configuration.
7. Check that any intervening firewalls (hardware or software) allow the necessary datagrams to pass. Messages between the controller and the DNC server use UDP to/from the specified port (see above) on the DNC server, from/to an available port on the controller. All communication is initiated by the controller.

All controllers

There are several additional issues that could affect DNC access for all controllers:

DNC Server serving on wrong interface

The DNC Server software is meant for a PC with a single IP address. If it has several (e.g., laptops with wireless and wired connections), the server may choose the wrong one, rendering it invisible to the connected machine. This can be checked with the following command:

```
netstat -a | find "4170" (or as appropriate  
for the port used)
```

If the port is shown with the wrong IP address, the situation can usually be resolved by disabling interfaces other than the desired one (Start | Settings | NetworkConnections | xxxConnection, right-click, Disable).

Problem accessing “special” directories

The DNC server is not able to access "special" Microsoft directories (e.g., "My Documents" or "Desktop"). The directory contents will show as empty, and in addition the DNC server will no longer shutdown properly. This issue is under investigation. The current workaround is store CAM files only in "normal" directories and to use root directories which restrict access to the same.

If the DNC server will not shut down properly, using either the ServoCam® DNC Console or the Microsoft Services interface, it can be terminated by using the Task Manager "End Process" button. The Image Name is SNetSvr.exe.

Server Log File

A ServoCam® DNC Server produces a log file (“SNetServ.log”) that contains status and error information. This file resides in the ServoCam® DNC installation folder, which is typically:

C:\Program Files\ServoCam\DNC Tools 1.1

The log file may be emailed to ServoCam® Support for analysis.

Appendix D Non-local root folders

This section describes access of root folders which are not local to the DNC server (such as those located on a central file server). It is intended only for Microsoft networks, and may not work with other types of networks. To access non-local root folders, there are two things which must be done differently:

UNC Root Folder Selection

The root folder setting is established in the "ServoCam® DNC Console" that runs on the DNC server. The root folder is selected via the Browse button in the "Channel Information" dialog of the "Settings" tab of the main console screen. When setting up a root folder that is not local, a drive letter **cannot** be chosen. Network drive letters are mapped (generally during logon) sometime after boot-up, and are not available to services which start at boot-up. Instead, a UNC name of the form "\\servername\dir1\dir2" must be used. This can be chosen from the "My Network Places" or similar node at the bottom of the Browse window (on v1.10f and later).

Logon Credentials

The DNC server, by default, runs as a service logged on to the LocalSystem account. Since this account has no access to other computers, some other account must be used. The account can be changed as follows:

Start | Run | services.msc

Open "ServoCam DNC" service

Pick "Log On" tab

Under "Log on as", select "This account"

Set "This account" (username) as appropriate for root folder access

Set "Password" and "Confirm Password" as appropriate

The username may need to include a domain name (e.g., "domainxyz\fred") or not, depending on your network, but must be authorized to access the computer where the root folder resides. Note that one set of logon credentials is used for all root folders.

