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1.0 Overview
The LINK System is a hardware computer classroom management solution that allows an instructor to interact with every student’s PC. This system puts many powerful features at an instructor’s fingertips. The intuitive interface allows an instructor to easily monitor any PC, broadcast to any PC, control any keyboard and mouse, or execute any of a long list of commands the LINK System is capable of doing.

There are currently two variations of the LINK System, the Hybrid LINK System and the Composite LINK System. Both systems are controlled in the same manner, providing a seamless upgrade from the Hybrid to the Composite System without the cost of retraining personnel. Both systems also provide the same basic functionality; however, the physical devices and installation process associated with each are quite different.

The Hybrid LINK System is a proven system that has been on the market since 2002. It was built from the experience gained with ACS’s well-known LINKNET line of LINK Systems, which was on the market from 1992-2002. The Hybrid System was developed to allow a simplistic way to upgrade older LINKNET systems. An upgrade is possible by replacing the hardware located at the instructor’s desk with the Hybrid System’s instructor hardware. All of the other existing LINK hardware is backward compatible. This allows LINKNET owners to gain the latest features of the Hybrid LINK System without incurring the cost of replacing all of the LINK hardware.

The Composite LINK System is the newest generation of LINK Systems to date and is the culmination of both the LINKNET and Hybrid LINK Systems. It incorporates all of the features that PC instructors have come to know and love, as well as a range of new features that these same dedicated users have requested over the years. The Composite LINK System provides an upgrade route from a Hybrid LINK System. The instructor’s hardware is the same for both systems, but the student hardware is not the same.

Applied Computer Systems, Inc. prides itself on every LINK System that is shipped out the door. Each system is custom built and is tested in the customer’s exact configuration. This guarantees that the complete system is shipped and that all of the hardware works on arrival. As always, Applied Computer Systems, Inc. is dedicated to providing you the best quality hardware, software, and support available in the industry.

2.0 System Components
There is a variety of hardware devices needed to make a LINK System work properly. This section gives a brief overview of what each device does and what it looks like.
2.1 Console
The console is a combination touch screen and computer, more commonly referred to as a touch computer. It is used to issue the commands to the LINK System. The user selects the command that he/she wants to issue by simply touching the screen. The command bar is located at the top of the console. Below the command bar is a visual representation of the classroom, one icon representing each computer in the room.

The console is available as a 15 inch screen (Figure 2.1) and is called a Stationary Computer Console (SCC). Its display runs in a native 1024x768 resolution. Full specifications for the console can be seen in Table 1-1.

2.2 LCB
The Logic Control Board (LCB) is the LINK System’s center of operation. This unit not only controls the instructor’s video, keyboard, mouse, projector, and auxiliary video input, but it also sends the control signals to all of the other LINK equipment in the computer lab. It has a series of LED indicators across its front edge that enables
the operator to easily troubleshoot the system with an ACS technical support representative if the situation arises. The LCB can be seen in Figure 2.2.

2.3 Composite Cage
The Composite Cage is basically a video switch hub. There are two variations of the cage, a nine-slot and a twenty-slot version. Each slot accepts an I/O card and each I/O card allows one to twelve student stations to be connected to it. Figure 2.3 portrays the nine-slot Composite Cage.

2.4 Dataflow Device
The Dataflow Device (DFD) allows communication to take place between the console, instructor’s computer, Logic Control Board, and both the video and audio student LINK stations. It is this communication that allows the Composite LINK System to control both PS2 and USB keyboards and mice as well as advanced LinkCET features such as online chatting.

2.5 WinVKM/C
The WinVKM/C is the device that resides at each student station in a LINK Composite System. It is connected between the student’s computer and monitor, allowing the LINK System to switch the video being shown on the student’s monitor. Unlike our previous student stations, each WinVKM/C can be either an amplifier or non-amp and is changed on the fly by the LINK System as commands are issued to provide the best video quality possible.

2.6 WinAUD
The WinAUD is the device that resides at the instructor station and each student station to control the student’s audio. It is connected between the student’s computer and their MIC and headset or speakers. With this device, the instructor is able to speak to any student or listen to any student’s audio.
2.7 WinAC
The WinAC is the audio console that resides at the instructor station and each student station. It connects directly to the headset, MIC and WinAUD unit at each station. It has a volume control to allow the user to adjust the volume of their headsets.

2.8 LINK System Hardware Specifications
Each Composite LINK System is built specifically to the room specifications you provided ACS. Depending on the number of student computers setup in the classroom your system may require power at designated student LINK control units while other classroom configurations may not. The specifications for the LINK System hardware can be seen in Table 1-2.

Table 1-2 LINK System Hardware Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>LCB</th>
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<th>Dataflow Device</th>
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<th>WinAUD</th>
<th>WinAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Brick 15V, 4.5A</td>
<td>(2) Brick 15V, 4.5A</td>
<td>Wall Adapter 12V, 0.5A</td>
<td>Brick if required</td>
<td>Brick at instructor</td>
<td>n/a</td>
</tr>
<tr>
<td>Weight (lb)</td>
<td>3lb 3oz</td>
<td>3lb</td>
<td>7.2oz</td>
<td>11.6oz</td>
<td>9.7oz</td>
<td>8.2oz</td>
</tr>
<tr>
<td>Dimensions WxDxH (in)</td>
<td>12.7x8.5x1</td>
<td>8.9x5.6x4.3</td>
<td>3.6x3.1x0.9</td>
<td>4.9x4.4x0.9</td>
<td>4.7x4x0.8</td>
<td>3.5x3.8x1.7</td>
</tr>
</tbody>
</table>

3.0 Installation
The installation of a LINK System is a two step process. First the LINK Software needed for the advanced features of the system to work must be installed on both the instructor and student PCs. Then, the WinVKM/Cs must be hooked up to each individual computer.

3.1 Software
The LINK System utilizes software to control the keyboard and mouse of each student station. This software, called LinkCÉT, enables the end-user to use any combination of keyboards and mice, whether it is PS/2, serial, or USB devices. The software also gives the instructor quizzing, scheduling, chatting, and a range of other capabilities.

3.1.1 Software Requirements
Before installing LinkCÉT on the computers, be certain that the computers meet the minimum requirements shown in Table 3-1. Please note that the instructor's
software must be installed on a computer running either Windows NT, 2000, XP, Vista, or Windows 7. If the computer does not have at least IE 5.01 or the Microsoft .NET Framework 2, the installer will detect that the installation requirements have not been met and will ask if the updates should be made automatically.

3.1.2 Software Installation
In order to install or uninstall LinkCÉT, you must have administrator privileges. Do not attempt to install the software with lower privileges. It will cause problems with disk access later on, and the software will have to be uninstalled and reinstalled with administrator privileges.

3.1.2.1 Student Software Installation
This component is installed on the computers that will be controlled using the LINK System.

1. Place the CD in the drive of the Student computer. If the setup does not start automatically, browse to the CD and run ‘Install.exe’ by double clicking on it.

If you downloaded the install from our web page, run ‘Install.exe’ from your downloaded location.

![Figure 3.1 Student Initial Installation Screen](image)
2. Read and Accept or Deny the License Agreement\(^1\).

![Figure 3.2 Student End-User License Agreement](image)

3. Select Student with Single Instructor and then select “Next.”

![Figure 3.3 Select Student Software Component](image)

4. Choose an installation location\(^2\) and select “Install.”

![Figure 3.4 Choose Student Installation Location](image)

---

\(^1\) You must accept the license agreement to proceed with the installation.

\(^2\) The software will not run from a mapped network drive.
5. Select Close when the Installation Complete dialog appears.

![Figure 3.5 Student Installation Complete](image)

6. A dialog box will open and notify you of the name of the student PC. At this time, fill in the name of the student PC next to the proper LC number onto the ‘Student PC Names Form,’ located in the orange LINK Instruction Manual provided with your system. If you are unable to locate this form, a copy of it is located in the Appendix.

![Figure 3.6 Student Computer Name](image)

7. Click “Close” to complete the installation. Now an icon representing the LinkCET appears in the system tray as shown in Figure 3.7. The software will automatically start when the student logs onto the PC. The student may click on the icon at anytime to request help from the instructor. The request help dialog box is shown in Figure 3.8.

![Figure 3.7 Student Taskbar and System Tray](image)

![Figure 3.8 Student Help Request Dialog Box](image)
NOTE: The software communicates by default on port 12999. If a firewall is running, this port may have to be opened to allow the program to run properly.

8. Repeat the process for each student pc in the room.

3.1.2.2 Instructor Software Installation and Configuration
This component is installed on the computers that will administer and control student computers.

1. Place the CD in the drive of the instructor computer. If the setup does not start automatically, browse to the CD and run “Install.exe” by double clicking on it. If you downloaded the install from our web page, run “Install.exe” from your downloaded location.

![Image](image1.png)

Figure 3.9 Instructor Initial Installation Screen

2. Read and Accept or Deny the License Agreement.

![Image](image2.png)

Figure 3.10 Instructor End-User License Agreement

---

3 You must accept the license agreement to proceed with the installation.
3. Select Instructor and then select “Next.”

4. Choose an installation location⁴ and select “Install.”

5. A box will open asking the installer to enter a classroom name. This will be used in the software to let the students know which instructor they are requesting help from. This is primarily used in a dual instructor configuration.

6. Input the total number of student PCs that will be connected to the LINK System in the computer lab. Do not include the instructor’s computer in this count. For most installations, the “System utilizes Autoswitch” should remain unchecked.

⁴ The software will not run from a mapped network drive.
7. Enter a Link ID and Computer Name for each student computer in your classroom (form). Repeat these steps for each student name.
   - First click on a computer in the list at the bottom of the screen.
   - Enter the appropriate Link ID number in the box labeled Link ID from the ‘Student PC Names Form’. Another way is to enter the appropriate Link ID in the box labeled Link ID. The Link ID can be found on the bottom of the LC connected to the respective computer. It can also be found on the classroom layout drawing provided in the Instruction Manual.
   - Enter the computer name in the box labeled Computer Name from the ‘Manager/Client instructor Form’. If the form is not available, the computer name is the name as it appears in your Network Neighborhood. To find the computer name:
     - **Windows 2000**: Right click on ‘My Computer’ and choose ‘Properties’ from the menu. Under the ‘Network Identification’ tab it appears as ‘Full computer name’.
     - **Windows XP, Windows Vista, Windows 7**: Right click on ‘My Computer’ and choose ‘Properties’ from the menu. Under the ‘Computer Name’ tab it appears as ‘Full computer name’. In **Windows 98/ME/NT**: Right click on ‘Network Neighborhood’ and choose ‘Properties’ from the menu. Under the ‘Identification’ tab it appears as ‘Computer name’.
   - Click ‘Save’ to save the layout file, then click ‘Done’ to close the dialog.

8. Select the serial port that the DataFlow Device will be connected to on the instructor’s computer. All communication between the LINK console and the instructor’s computer will utilize this connection. If the serial port number is unknown, choose Serial Port 1 and it can be changed to a different port later. If by chance the instructor computer does not have a serial port available, a
serial port adapter can be plugged into an existing USB port to obtain one. The video portion of the LINK System will work regardless of the connection status of the instructor’s serial port. Lack of this connection will eliminate keyboard and mouse control as well as LinkCET functionality.

The LINK software communicates between the instructor and student computers using a TCP/IP port. The default port is 12999. This value must be the same on all of the student PCs and the instructor PC for the LINK System to function correctly. Change this value only if the existing network configuration requires it. For example, this value might be changed to be compatible with a router or firewall. If it is necessary to change the default TCP port, the TCP port must be changed on each of the student PCs. To change the port value at the student computers, browse to the installation directory and edit the ‘HybridStudent.exe.config’ file. An example of this file is shown in Figure 3.17. Locate the line of code <add key = “port” value = “12999”/> and replace 12999 with the new TCP port value. Reboot the computer or log off and back on to make the changes take effect.

The controller type must be set to LCB unless an Applied Computer Systems technician advises you to do differently.

![Figure 3.16 Communication Setup](image)

![Figure 3.17 LINK Software Configuration File](image)
9. Select Close when the Installation Complete dialog appears. The instructor’s software has now been successfully installed.

![Figure 3.18 Instructor Installation Complete](image)

10. Now an icon representing LinkCÉT appears in the system tray. The software will automatically start when the instructor logs onto the instructor PC. To open the software for additional functionality, simply double click the icon in the system tray. A description of how to utilize the features in the software is covered later in Section 4.4.

![Figure 3.19 Instructor Taskbar and System Tray](image)

### 3.1.2.3 Uninstall

To uninstall LinkCÉT, it **MUST** be uninstalled from both the Instructor and Student computers. If not, it will not be completely uninstalled.

1. Go to the Windows ‘Control Panel.’
2. Select ‘Add or Remove Programs.’
3. Browse down the list and highlight ‘LinkCÉT Software.’
4. Select Remove.

**NOTE:** The software can also be removed by browsing to the installation directory and double-clicking on ‘Uninstall.exe.’
5. Select Uninstall from the dialog.

![Uninstall Screen](image1)

**Figure 3.20 Uninstall Screen**

6. Select Close to exit.

![Uninstall Successful](image2)

**Figure 3.21 Uninstall Successful**

7. A confirmation window appears to assure that the software has been successfully removed.

![Confirmation of Successful Uninstall](image3)

**Figure 3.22 Confirmation of Successful Uninstall**

8. Repeat this procedure for the instructor PC and each student PC. 
   NOTE: On the instructor’s computer, a data folder is left that contains all of the settings for the instructor’s LinkCET to run properly. To remove this folder, browse to the ‘C:\Documents and Settings\All Users\Application Data’ folder and delete the ‘AppliedComputerSystems’ folder.

### 3.2 Hardware

The LINK hardware devices used in the Composite LINK System have very simple purposes: to switch the video source of any monitor in a computer lab.
through an intuitive touch interface. The units are capable of switching video sources because they are physically located between the computer’s video card and the computer’s monitor. In the next section, the installation process for the Composite LINK System will be covered in detail.

3.2.1 Composite Installation

The Composite LINK System makes it possible to combine the best features of both a star and daisy chain configuration. This enables the Composite LINK System to broadcast and receive higher video resolutions and to eliminate all return cables, which were required for previous generations of LINK Systems. The elimination of return cables reduces the overall number of bus cables in the computer lab, making installation much easier. Another feature of the Composite LINK System is that it has centralized power. All of the power for the system resides at the Composite Cage, unless an Audio LINK System is present, which requires power to be distributed throughout the room.

![Figure 3.23 Typical Composite LINK System Layout](image)

Figure 3.24 shows how the typical instructor station is hooked up. It shows all of the major components and how they connect to one another. This overview shows a Composite Cage hooked up directly to the LCB. When you receive your Composite LINK System, you will be provided a classroom diagram showing the proper connections needed for each LINK System ordered. Breakdowns of each component’s proper connections are shown later in this section. Notice that every cable that comes with the LINK System is clearly labeled as to where it must be connected.

The first step to installing the Composite LINK System is to hook up the instructor station’s hardware. It is necessary to determine where the LINK console will be located at the instructor’s desk. It will require approximately a 12” x 16” area near the instructor’s computer. Place the LCB where you have decided to locate the LINK console. Next, start hooking up the instructor’s computer to the LCB. A
visual representation of the LCB installation is shown in Figure 3.25. Disconnect the instructor’s monitor from the instructor’s computer and connect it to the ‘INSTR OUT’ port on the LCB. Then take the provided SVGA cable and connect the instructor’s video card to the ‘INSTR IN’ port. Next connect the projector to the ‘PROJECTOR’ port if a projector is available in the room. Connect the power supply to the LCB and plug it into a power outlet. Next determine where the Composite Cage will be located. Plug the provided power supply/supplies into the cage and into a power outlet. Please note that the top power connection
supplies power to I/O1-I/O3 while the bottom supplies power to I/O4-I/O7. Now find the proper bus cable and connect it to ‘VIDEO BUS OUT’ port on the LCB. Run the other end of the cable to the Composite Cage and plug it into the ‘BUS IN’ port. Similarly, connect the proper cable to the ‘VIDEO BUS IN’ port of the LCB and the ‘BUS OUT’ port on the Composite Cage.

Connect the other end of the CAT5 cable that was just connected to the LCB to the ‘LCB-1’ port on the DFD. Next, connect the appropriate cable from the ‘INSTR COM’ port to an available serial port on the instructor’s computer. If an Audio LINK System was purchased, connect the appropriate audio bus cable to the ‘AUDIO/LCB-2’ port. If a dual monitor LINK System is being installed, connect the second LCB to this port. Next, plug the LINK System console into the ‘MCC’ port. The final step is to plug the AC power adapter into the DFD and a wall power outlet.

Figure 3.25 Composite LCB Installation Diagram

The DFD allows communication to take place between the console, instructor’s computer, and the Logic Control Board, and both the video and audio student LINK stations. The DFD’s connections can be seen in Figure 3.26. Connect the other end of the CAT5 cable that was just connected to the LCB to the ‘LCB-1’ port on the DFD. Next, connect the appropriate cable from the ‘INSTR COM’ port to an available serial port on the instructor’s computer. If an Audio LINK System was purchased, connect the appropriate audio bus cable to the ‘AUDIO/LCB-2’ port. If a dual monitor LINK System is being installed, connect the second LCB to this port. Next, plug the LINK System console into the ‘MCC’ port. The final step is to plug the AC power adapter into the DFD and a wall power outlet.
The next step to installing the LINK System is to install the students' hardware. Look at the classroom diagram that was specifically made for the system you purchased and place the appropriate WinVKM/C at each student's desk. A sample classroom diagram can be seen in Figure 3.27. Your personalized classroom diagram can be found in the LINK Notebook. Be certain to look at the back of the units and match the number on the WinVKM/C with the student position shown on the classroom diagram. Technically, all of the WinVKM/Cs are the same and can be interchanged. However, the system was tested by ACS technicians in the specific layout labeled on each unit, so it is suggested that the units be placed at the appropriate station. The installation of the student hardware is very similar to that of the instructor's. A representation of this is
shown in Figure 3.28. To hook up the student’s hardware, disconnect the student’s monitor from the student’s computer and connect it to the ‘MONITOR’ port on the WinVKM/C. Then take the provided SVGA cable and connect the student’s video card to the ‘COMPUTER’ port. Repeat this process for each of the student stations in the room. The next step is to connect all of the WinVKM/Cs together using the provided bus cables. To do this, follow the Composite Cage diagram that is provided with your system to know where each WinVKM/C connects. A typical diagram is shown in Figure 3.27. All of the cables for the LINK System are clearly labeled to show where they should connect, so be sure that the label matches the port you are connecting the cable to. Tighten all thumbscrews and securely snap the CAT5 cables into their proper ports.

Once all of the hardware is installed, the LINK System can be powered up for the first time. If an Audio LINK System was purchased, continue with the Audio Installation section. Otherwise, read the Functionality section to get familiar with the LINK System commands and how to operate the system.
3.2.2 Audio Installation

The Audio LINK System utilizes a daisy chain configuration to hook the student stations to the instructor station. Unlike the video units used for the Composite LINK System, the audio instructor station looks similar to the student stations. Figure 3.29 shows what the typical Audio LINK System looks like. It shows all of the major components and how they connect to one another. This overview shows an instructor’s station and two student stations. When you receive your Audio LINK System, you will be provided a classroom diagram showing the proper connections needed for each LINK System ordered. Notice that every cable that comes with the Audio LINK System is clearly labeled as to where it must be connected.

The first step to installing the Audio LINK System is to hook up the instructor station’s hardware. First, find the appropriate cable and connect it from the ‘AUDIO/LCB-2’ port on the DFD to the ‘AUDIO BUS IN’ port on the instructor’s unit. Then connect the stereo cable from the speaker out port on the instructor’s computer to the ‘LOCAL AUDIO’ port. Then connect the WinAC to the ‘AUDIO CONSOLE’ port. If the microphone at the instructor’s station is used for recording audio, then connect a mono audio cable from the ‘MIC OUT’ port on the WinAC to the microphone in port on the instructor’s computer. Connect the headset to the WinAC. Now, hook up the power supply to the Instructor’s station. Finally, connect the audio bus cable to the ‘AUDIO BUS OUT’ port and run the other end to the first student station.

![Typical Audio LINK System Layout](image)

Figure 3.29 Typical Audio LINK System Layout

The next step to installing the LINK System is to install the students’ audio hardware. Look at the classroom diagram that was specifically made for the system you purchased and place the appropriate WinAUD and WinAC at each student’s desk. A sample classroom diagram can be seen in Figure 3.30. Your
A personalized classroom diagram can be found in the LINK Notebook. Be certain to look at the back of the units and match the number on the WinAUD and WinAC with the student position shown on the classroom diagram. Technically, all of the WinAUDs and WinACs are the same and can be interchanged. However, the system was tested by ACS technicians in the specific layout labeled on each unit so it is suggested that the units be placed at the appropriate station.

![Figure 3.30 Typical Audio Classroom Diagram](image)

The installation of the student hardware is very similar to that of the instructor’s. A representation of this is shown in Figure 3.31. First, connect the stereo cable from the speaker out port on the student’s computer to the ‘LOCAL AUDIO’ port. Then connect the WinAC to the ‘AUDIO CONSOLE’ port using the provided cable. If the microphone at the student’s station is used for recording audio, then connect a mono audio cable from the ‘MIC OUT’ port on the WinAC to the microphone in port on the instructor’s computer. Connect the headset to the WinAC. Repeat this process for each of the student stations in the room.

The next step is to connect all of the WinAUDs together using the provided bus cables. To do this, follow the classroom diagram that is provided with your system to know where each WinAUD connects. All of the cables for the LINK System are clearly labeled to show where they should connect, so be sure that the label matches the port you are connecting the cable to. Securely snap the CAT5 bus cables into their proper ports on each WinAUD unit. Notice that these cables are not normal CAT5 cables, but shielded CAT5 cables. If a longer cable is required for the installation, please use a shielded cable as an unshielded cable will greatly reduce the audio quality of the system.
Now that all of the hardware is installed, the Audio LINK System can be powered up for the first time. Please read the Functionality section of this manual to get familiar with the LINK System commands and how to operate the system.

4.0 Functionality
The LINK System is completely controlled from the LINK console. The LINK console allows the instructor to control the video, keyboard, mouse, and audio of every computer in the computer lab. All of the commands available to the instructor are described in detail in this section. Pictorial representations of each of the commands are also shown.
4.1 Video/Keyboard/Mouse

4.1.1 Reset
This button will clear any previous command selected on the LINK System console. It will put all student computers, keyboards and mice into their local mode, allowing the students to use their computers as normal.

4.1.2 Scan
Selecting ‘Scan’ will sequentially display each student’s PC image on the instructor’s monitor. The default time that each student's PC image is displayed on the instructor’s screen is 5 seconds before the next student is displayed. This time delay can be changed by going to ‘Settings’ and selecting ‘Scan Rate.’ Pushing the ‘Scan’ button again will pause the scanning process on the selected student station.

4.1.3 Aux In to Local
Selecting this command button will take a secondary video source, such as a laptop, and switch it into the LINK System. When selected, this secondary video source is also displayed on the instructor’s monitor. Other control buttons on the console continue to function normally, allowing the user to Transmit or receive using this secondary video source.
4.1.4 Aux In to Projector
This command button will display the secondary video source that is plugged into the Aux In port of the LCB to the projector or other VGA output through the projector port.

4.1.5 Student to Projector
This command button will display any received student PC image to the projector or other VGA output through the projector port.

A student’s PC image can be sent directly to the projector by deselecting the ‘Receive’ button after selecting ‘Student to Projector.’
4.1.6 Instructor to Projector
This command button will display the instructor’s PC image to the projector or other VGA output through the projector port.

4.1.7 Receive Student
This button is activated by default. To receive a student’s PC image to the instructor’s monitor, simply select the appropriate student icon. Selecting another student icon will display the newly selected student’s PC image on the instructor’s monitor. Selection of the student station’s PC image is completely seamless, allowing the LINK System to receive a student’s PC image without any indication to the student that their video is being viewed. When the student’s PC image is received, it is received in real-time. So even if a movie is being viewed, the instructor will be able to view it with no problem.

4.1.8 Key - Mouse Control
After receiving a student’s PC image, selecting ‘Key - Mouse Control’ allows the instructor to take control of the student’s computer and assist the student with any problem. Selecting the ‘Key – Mouse Control’ button again relinquishes keyboard and mouse control to the student and enables the instructor to continue
to view the student PC image. Keyboard and mouse control allows the keyboard and mouse to be controlled only after a student logs into the computer. Therefore, if a computer is sitting at its log-in screen, the keyboard and mouse control will not work.

![Image](image1.png)

**Figure 4.10 Receiving Student #1 & Controlling Student #1’s Keyboard & Mouse**

### 4.1.9 Freeze Individual

Selecting ‘Freeze Individual’ and then a student icon disables the keyboard and mouse of the selected student PC. Continue to select additional student icons to perform the same function on additional student PCs.

![Image](image2.png)

**Figure 4.11 Student #1 Keyboard & Mouse Disabled While Student #n Works Freely**

### 4.1.10 Freeze All

Selecting ‘Freeze All’ disables the keyboards and mice of every student PC in the computer lab. The students are still able to see their video on the monitor, but are unable to type or to move their mouse. Selecting the control button again gives keyboard and mouse control back to the students.

![Image](image3.png)

**Figure 4.12 All Student Keyboards & Mice Disabled**

### 4.1.11 Blank Individual

Activating this control button and selecting a student icon will display a black screen on the respective student’s monitor and will also freeze their keyboard.
and mouse. Continue to select additional student icons to perform the same function on additional student PCs.

![Figure 4.13 Blank Individual - Student #1](image)

### 4.1.12 Blank All
Selecting this button displays a black screen on all students’ monitors. This command simultaneously freezes the students’ keyboards and mice as well.

![Figure 4.14 Blank All](image)

### 4.1.13 Transmit Individual
Activating this button and selecting the desired student icon you will transmit the instructor’s PC image onto the student’s monitor. Continue to select additional student icons to transmit to additional student monitors. At any time Transmit All can be selected to broadcast the image to the entire computer lab. When transmitting the instructor’s PC image, it is transmitted in real-time. So even if a movie is broadcast, the students will be able to view it with no problem.

![Figure 4.15 Transmit Individual to Student #1](image)

### 4.1.14 Transmit All
Selecting this command button transmits the instructor’s PC image to the students’ monitors.
4.1.15 Student View

Selecting ‘Student View’ allows a student to view the instructor’s PC image at their discretion. The student accomplishes this by selecting help from the Hybrid software located in their System Tray. The student can toggle the instructor’s PC image off by performing a Ctrl+Alt+H.

4.1.16 Student Interaction

‘Student Interaction’ provides the instructor a means to allow one student to help another student. Using this command, the instructor can choose one student PC to control another student PC. This command takes place in three steps. First, the instructor selects which station is to do the controlling. Next, select the station to be controlled, which can be either another student station or even the instructor’s station. Finally, select what stations get to view what is going on.
this point the video can be transmitted to all of the other students, displayed on the projector, or not displayed to any additional viewers.

4.1.17 Clear Help Requests

When a student selects help, a question mark gets displayed over the appropriate student icon on the LINK console. Notice in Figure 4.20 that LCU9 has a large question mark displayed on its icon, yet LCU7 and LCU16 have smaller ones. The larger question mark signifies that LCU9 is the first student to have requested help, and that the other students asked for help at a later time. After selecting LCU9, that question mark would disappear and the next student in order of help request would receive the large question mark. Selecting the ‘Clear Help Requests’ button will remove all of the help requests shown on the LINK console.

4.1.18 Student Call

The student can request ‘Help’ by clicking on the LINK System icon in the system tray. Then, choose ‘Yes’ from the pop up menu. The pop-up can be seen in Figure 4.21. When a student requests help, a ‘question mark’ (?) will appear on the appropriate student icon on the LINK console. The LINK System keeps track
of the order that students request help as well and puts each student in a queue. The first student to request help is identified with a large ‘question mark’ on their icon. Students asking for help later are identified with a much smaller ‘question mark.’ Using this visual indicator, the instructor is able to help students in the order that the help request was submitted. If the student has a hardware console, push the ‘CALL’ button.

4.2 Audio
The Audio LINK System is a stand-alone hardware system, completely independent of the LINK Video System but controlled from the same console. Audio and video commands can be issued on the LINK System simultaneously. Issuing a video command will not affect a previously issued audio command or vice versa.

4.2.1 Reset
This button clears any previous command selected on the Audio LINK System console. It puts all student headsets and microphones into their local mode, allowing the students to use their computer audio as normal.
4.2.2 Talk to Individual
Selecting this command button and then a student icon allows the instructor to speak to the selected student station. The student is able to hear the instructor, but the instructor is unable to hear the student speak.

4.2.3 Talk to All
This command allows the instructor to speak to all of the student stations. The students are able to hear the instructor, but the instructor is unable to hear the students speak.

4.2.4 Talk with Individual
Selecting this command button and then a student icon allows the instructor to speak with the selected student station. The instructor and student are capable of full two-way communication.

4.2.5 Talk with All
This command button allows the instructor to speak with all of the student stations. The instructor and students are capable of full two-way communication, similar to a telephone party line.

4.2.6 Receive Audio (Local Audio)
The instructor can listen to the selected student’s local audio by selecting this command. A student’s local audio is the audio coming out of the student’s computer.

4.2.7 Transmit All (Local Audio)
Selecting this command button and any student or instructor icon will share the selected local audio with all of the other stations. Every station in the room will hear the selected audio source.

4.2.8 Receive Microphone
The instructor can listen to any student’s microphone by selecting this command button and any student icon.

4.3 Settings
The settings tab on the LINK console allows the instructor to modify how the LINK System functions, to customize the displayed names, perform maintenance on it, as well as other functions.
4.3.1 Enable Disable

Selecting this button will allow the instructor to enable or disable any student station. By default, all student stations are enabled on the LINK System. By selecting a station, the station becomes disabled and a gray box is placed around the disabled station. A disabled station will ignore any command issued by the LINK System. Therefore, if a station is disabled and the instructor selects ‘Transmit All,’ the disabled station will not receive the instructor’s PC image but will continue to see its local video. To exit this mode simply select the ‘Enable Disable’ button to toggle it off.
4.3.2 Change Layout

This control button allows the instructor to reposition the student icons on the LINK console. To move the icons, toggle ‘Change Layout’ on, and then select any student icon and drag it to the new desired location. Notice that in the upper right hand corner, snap guide selections are available to help to position the student icons. The number that appears on the student icon is the actual physical LINK ID associated with that icon. This is to assist the user when troubleshooting so that if the names of the icons have been changed to different numbers, the actual physical layout is still available. Toggle the ‘Change Layout’ button off when finished.

![Change Layout Screen](image)

Figure 4.25 Change Layout Screen

4.3.3 System Configuration

Only modify the settings under this button if a LINK System technician advises you to. The settings here will directly influence whether or not the LINK System will function properly. If you accidentally select this button, then select ‘Cancel’ to exit without saving the changes.

4.3.4 Edit Names

The student icons can be renamed using this button. First, select the student icon to be changed. Use the displayed keyboard to enter the new name. To rename another student icon, select the desired student icon and repeat the process. Toggle the ‘Edit Names’ button off when finished renaming student icons.
4.3.5 Scan Rate
The default scan rate is set for five seconds. By selecting this button, the scan rate can be changed to the desired length of time, anywhere from three seconds to sixty seconds. To exit, select the ‘Scan Rate’ button again.

4.3.6 Profile Management
This button is used to change the LINK console configuration on-site by an instructor/technician when changes (adding or deleting LCs) are made to the classroom. It is advisable that an Applied Computer Systems, Inc. technician be contacted for assistance before re-configuring the classroom. This menu is password protected and can only be accessed after contacting ACS.

4.3.7 Scan Order
The scan order is the sequence that student stations will be displayed on the instructor’s monitor when ‘Scan’ is selected on the LINK console. This button allows that order to be modified. By default, the scan order follows the physical layout of the LINK System. To change the scan order, select each student icon in the order to be displayed as shown in Figure 4.27. Notice that every station has yet to be selected, so the only option currently available is ‘Cancel (Scan Order).’ Continue to select the student stations until each one has been highlighted. Once every icon has been selected, the ‘Done (Scan Order)’ button will become enabled and it should be selected to save the changes. This can be seen in Figure 4.28
Figure 4.27 Edit Scan Order

Figure 4.28 Edit Scan Order with Done Button Enabled
4.3.8 Lock Settings
The 'Lock Settings' button allows the instructor to lock the 'Settings' tab so that no one can make modifications without the correct password. As soon as the 'Lock Settings' button is selected, a password is requested as shown in Figure 4.29. Once the password is entered, select ‘Lock’ and all of the buttons on the 'Settings' tab will be concealed. The 'Settings' tab now looks like it does in Figure 4.30. To access the settings again, select the 'Unlock' button, re-enter the password, and the buttons will become available again.

4.4 LINKCET Software
The LINK Software contains the LINKCÉT features and it must be installed in order to use them. It contains many features that allow instructors to more adequately understand the needs of the students as well as allow them to have
even more control over the computers in the room. Among these are quizzing features, chat features, and macros, just to name a few. To access any of these features, click on the LINK System software icon in the system tray to maximize the instructor’s interface.

4.4.1 Password Protection

Password protection allows the instructor to ‘lockdown’ the LINK System so that no one will be able to use it. This is similar to locking down a workstation when you walk away from it to prevent others from using it or disturbing your running applications. To use this feature, select the ‘Password Protection’ tab after maximizing the LINKCET software. Figure 4.31 shows what the Password Protection tab looks like. At this time one of two choices can be made. Select ‘Change Password’ if the password to lockdown the LINK System needs to be changed or if it needs to be set. Be aware that the current password is needed to change it to a new password. The other choice is ‘Lockdown.’ Selecting ‘lockdown’ will display ‘System is currently locked’ on the LINK console and the LINK System will continue to perform the same function that it was performing when the lockdown was initialized. For example, if the LINK System is currently transmitting the instructor’s PC image to all students and lockdown is selected, the image will continue to be broadcast to the student stations and the LINK console is disabled from functioning until the instructor unlocks the LINK System. To unlock the system, select the ‘Release’ button, enter the correct password, and the LINK System will function normally.

4.4.2 Messaging

Messaging allows the instructor to send predefined or custom messages to any or all of the students in the room. The ‘Messaging’ tab is shown in Figure 4.32. To add a predefined message, simply select the ‘Add’ button. Then a dialog box
appears, allowing you to enter your message, as shown in Figure 4.33. When the message is complete, select ‘OK.’ The message will be added to the message pane. To send a message highlight the desired message and select ‘Send.’ At this point, a message box appears that displays all of the students that are currently online. Select the students you would like the message sent to and then select ‘Send.’ Notice that a log of all of the sent messages is kept. To send a personalized message, type the text in the ‘Quick Message’ box. Again, select the students you would like the message sent to and then select ‘Send.’

4.4.3 Macros

Macros allow the instructor to automate repetitive tasks on the student computers. To create a macro, select ‘Add’ and then a new window will
appear. First, enter a macro name and description. The security level radio buttons determine whether an instructor is capable of using the macro or if the user needs administrator privileges. To actually capture the macro, select ‘Start’ and from that point forward, any key pressed will be captured. Record all of the required key presses. If an Alt, Control, or Shift key needs pressed, put a check next to the key press that it is required. Select ‘OK’ and the macro is added to the macro list. To run a macro, highlight the desired macro and select ‘Play.’ At this point, select the delay between keystrokes required for the macro. If the computers are slow, then a longer key delay is required to make sure that the computer keeps up with the keystrokes. Then select which computers to perform the macro on. The macro can be sent to either the instructor PC or any or all of the student PCs. Select ‘Play’ to send the macro to the selected computers.
4.4.4 Display Names

The display names on the LINK console can be customized using the ‘Display Names’ tab. Select the ‘Add’ button to add a new classroom layout. Enter a name for the new profile being created and select ‘OK.’ The new profile is displayed in the window. Next, double-click on any student station listed to rename it. Notice that the station can also be disabled by unchecking the ‘Enabled’ option. If the instructor would prefer to use the student logon names on the console, simply select ‘Logon Query’ and the login names used at each student station will populate the list. Once the profile is completed, select ‘Load Current’ and the names will be updated on the LINK console. Each profile created is added to the drop down list, so an unlimited number or profiles can be created.

4.4.5 Scheduling

Scheduling allows the instructor to take the customized profiles that are created on the ‘Display Names’ tab and have them automatically loaded at scheduled times during the week. Figure 4.38 shows an example of ‘Scheduling’ tab. It can be seen that four separate profiles have been scheduled for this room. The first step to setting up a schedule is to create the different profiles that are needed for each class as explained in the ‘Display Names’ section. Now that the profiles are created, select ‘Add’ button on the ‘Scheduling’ tab. A new window will appear at
this time. Once the window appears, select the classroom profile that needs to be scheduled. After highlighting the desired profile, enter the start and stop time. Next, select the days that this profile needs to be loaded. The final step is to enable the profile by putting a check next to ‘Enabled.’ Select ‘OK’ and the newly created entry is added to the schedule. Repeat this process for each profile that needs to be scheduled. If at any point a profile no longer needs to be loaded, highlight the profile and either select ‘Remove’ or ‘Edit.’ If the entry is removed, then it will no longer be in the list and will have to be recreated later if it is ever needed again. If the entry is edited, it can be disabled by unchecking the ‘Enabled’ selection. This will retain the entry in the list, but it will no longer be loaded until the entry is re-enabled.

4.4.6 Configuration

The configuration tab allows the instructor to change all of the settings that were originally configured during the installation of the LINK System software. This tab can be seen in Figure 4.40.

4.4.6.1 Classroom Name

The ‘Classroom Name’ can be changed by selecting ‘Edit’ and entering the new name in the resulting message box. This text is displayed when the mouse is positioned over the LINK System icon in the system tray.
4.4.6.2 *Keyboard & Mouse Control*

The radio button selection under the ‘Keyboard & Mouse Control’ section dictates how the software implements the keyboard and mouse control for the LINK System. If ‘Shared’ is selected, then when the instructor takes control of the keyboard and mouse of a student, they do not have complete control of the computer. Both the instructor and student can type on the keyboard or move the mouse cursor. In ‘Absolute’ mode, the instructor has complete control of the student’s computer and the student is unable to move the mouse or to type on the keyboard.

4.4.6.3 *Scan Rate*

The scan rate for the LINK System can be changed to the desired length of time, anywhere from three seconds to sixty seconds. First use the up and down arrows to the desired time and then select ‘Set Scan Rate’ and the new time delay is passed to the LINK console. This can also be changed directly on the LINK console as described in the ‘Scan Rate’ section or page 33.

4.4.6.4 *LCU Mapping Configuration*

Selecting ‘LCU Mapping Configuration’ allows the instructor to change the computer name associated to each LINK ID in the computer lab. These names were originally entered when the LINK System software was installed on the instructor’s computer. To change the computer name associated to a LINK ID, highlight the desired LINK ID and select ‘Edit.’

Enter the new computer name and select ‘OK.’ Repeat the sequence to change another name or select ‘OK’ to save the changes. The LINK System software will now shutdown and restart itself to force the changes to take place. For further information on this subject, refer to ‘Instructor Software Installation and Configuration’ on page 8.
4.4.6.5 Communication Settings
Selecting ‘Communication Settings’ allows the instructor to change the serial port that the LINK System communicates over. It also allows the instructor to change the TCP port that the LINK Software uses to communicate to the student computers. Note that the TCP port setting must match the port setting on the student computers. For details on changing the TCP port on the student software, refer to ‘Student Software Installation’ on page 5.

4.4.6.6 Security Settings
The LINK console can be locked down using the system-wide password. For enhanced security in a multi-user environment, active directory authentication can be enabled when such LDAP services are available. This setting directly affects the ‘Password Protection’ tab functionality. If

the default setting of ‘Common System Password’ is selected, then the password can be changed on the ‘Password Protection’ tab. If ‘Active Directory Services’ is selected, the password associated with the username of the instructor’s computer will be used to lock or unlock the LINK console.

4.4.7 Diagnostics
The diagnostics tab is useful when the LINK System software does not seem to be communicating with all of the student computers. For complete information on how to use this tab, refer to the section on Troubleshooting.
5.0 Troubleshooting

The LINK System is composed of both hardware and software and occasionally problems will arise. If technical problems ever occur, do not hesitate to call Applied Computer Systems, Inc. We have technicians standing by M-F, 8AM to 5PM EST to help assist you with any problems that you may have.
6.0 *About ACS/Contact Information*

Applied Computer Systems, Inc. (ACS) was founded in 1971, by Electrical Engineer Donald D. Lacy and is classified as a private, veteran owned, small business. The company is located fifty miles north east of Columbus, Ohio. ACS is a veteran leader in the video and audio networking industry and manufactures video and audio switching and networking equipment. In 1983, ACS designed, patented, and manufactured the LINK Video Network. ACS markets directly to the end user and has participated extensively as a sub contractor in the government/military arena.

ACS qualifies (small business, veteran owned) to participate in the Federal Acquisition Regulations Part 19.502-2 Total Set-Asides program. Any purchase of supplies or services using any type of Federal Funding that has an anticipated dollar value exceeding $2,500, but not over $100,000 is reserved exclusively for small business. ACS accepts the I.M.P.A.C. government VISA card, along with MasterCard and VISA cards.

**Contact Information:**

<table>
<thead>
<tr>
<th>Mail:</th>
<th>Applied Computer Systems, Inc.</th>
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<tbody>
<tr>
<td></td>
<td>3060 Johnstown-Utica Rd.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
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### Student PC Names Form

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