UCM POWERLOGIC Telephone Override & Global Zone Control

Installation and Programming Manual

This Manual describes the UCM applications for controlling POWERLINK panels from a touch-tone telephone (telephone override) and for controlling devices on a POWERLOGIC network based upon the status of other POWERLOGIC devices (global zone control). It also describes the PLTOSW configuration software.

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1
Introduction

This document covers two UCM applications: the first allows a touch-tone phone to control devices on a Square D POWERLOGIC® network, especially POWERLINK® panels, in an system known as Telephone Override. The second application allows changes of state of a bit on a POWERLOGIC network to generate register writes to other devices on the network and is known as Global Zone Control.

Telephone Override is a system that allows a user with a touch-tone telephone to control devices on a POWERLOGIC network such as POWERLINK panels. This is useful in buildings that use POWERLINK panels to save energy by automated light control. Usually, the system will turn off unused lights at a predesignated time. A warning blink is issued before the lights are extiguished. The user can call the override system, dial his zone number and the system will keep his lights on. While this is the common application for Telephone Override it is not the only one. Telephone override can be used to control any device on a POWERLOGIC network.

The Telephone Override System uses the following components:

- UCM4-D
- 1, 2 or 3 RM14Ks connected to telephone lines
- A network interface device
- NRK2s or an RRK-type register rack and power supply
- cabling

The UCM applications for telephone override are TO.UCM and PORT4.UCM. Each program is compiled and loaded into the appropriate port of the UCM with the Auto-Start feature enabled for stand-alone operation. TO.UCM is loaded into the UCM's Port 1 and/or Port 2 and/or Port 3. Each port is connected to a Niobrara RM14K modem which in turn is connected to a telephone line. PORT4.UCM is loaded into the UCM's Port 4 which is connected to the network interface device. This port can also be used to configure the telephone override system. The network interface device can

be any of the following: Niobrara EPE5, EPE5-TCP, MEB, MEB-TCP, SPE4-2D or SPE4-1D; a Square D NIM; or a POWERLOGIC Ethernet Gateway.

Global Zone Control was designed to control a network of POWERLINK panels. It reads input bits from up to 32 devices on a POWERLOGIC network and upon a change of state of an input, writes to the control registers of other devices on the network. This is useful when an input from one POWERLINK panel is used to control breakers in other panels. While breaker control is then main application for Global Zone Control it is not the only one; any bit, in any device on a POWERLOGIC network can be used to write a predetermined value to any register, in any other device on the network.

The Global Zone Control System uses the following components:

- UCM4-D
- A network interface device
- NRK2 or an RRK-type register rack and power supply
- cabling

The UCM applications for Global Zone Control are GZC.UCM and PORT4.UCM. Each program is compiled and loaded into the appropriate port of the UCM with the Auto-Start feature enabled for stand-alone operation. GZC.UCM is loaded into the UCM's Port 3. PORT4.UCM is loaded into the UCM's Port 4 which is connected to the network interface device. This port can also be used to configure the Global Zone Control system. The network interface device can be any of the following: Niobrara EPE5, EPE5-TCP, MEB, MEB-TCP, SPE4-2D or SPE4-1D; a Square D NIM; or a POWERLOGIC Ethernet Gateway.

The Telephone Override application can reside in the UCM along with a Global Zone Control application as long as they access the same POWERLOGIC network. If Global Zone Control (GZC) is used then Port 3 will run GZC.UCM and cannot be used for Telephone Override (TO). In this case, Port 3 can be used to configure both the Telephone Override and Global Zone Control applications. PORT4.UCM is the same for both GZC and TO.

The Niobrara NRK2 single-slot rack and power supply may be used for mounting and powering the UCM4, RM14K, EPE5, MEB or SPE4 modules. Any SY/MAX RRK style register rack and appropriate power supply may also be used including the two-slot POWERLOGIC rack.

2

Installation

Module Installation

1 Remove power from the rack.

2 Mount the UCM4 and the RM14K(s) in available slots in the register rack. Secure the screw at the bottom of the modules.

3 Connect analog phone lines to the RM14Ks.

4 Apply power to the rack.

UCMSW Software Installation

Please follow the instructions in the UCM Installation and Programming manual for installing the UCMSW software.

PLTOSW Software Installation

The PLTOSW software is an MS-DOS compatible program designed to run on an IBM compatible personal computer. The software is distributed on a 3.5" 1.44M floppy. This diskette includes the Telephone Override and Global Zone Control UCM application programs.

1 Insert the floppy into a drive and run the INSTALL program from that drive.

2 Enter the floppy drive name that contains the distribution disk.

3 Select PLTOSW from the list of softwares to intall.

4 Enter the directory name to install the PLTOSW software. It is recommended that a directory UCM be used for the installation on your hard drive.

5 Once INSTALL is finished copying and expanding files, exit by pressing the ESC key until the DOS prompt is reached.

The latest version of this document in pdf format is located at:

ftp.niobrara.com/ucm/plto/plto.pdf

Serial Connections to the UCM4-D

Port 1 to the RM14K

Use a Niobrara DC1 or Square D CC-100 (or CC-102) cable to connect Port 1 of the UCM4 to the RS-422 port of the RM14K.

Port 2 to the optional RM14K

If using two RM14K modems, use another DC1, CC-100 or CC-102 to connect Port 2 of the UCM4 to the RS-422 port of the other RM14K.

Port 4 to the POWERLOGIC network

Use another DC1, CC-100 or CC-102 to connect Port 4 of the UCM to the POWER-LOGIC network interface module. Depending on the POWERLOGIC network this might be a Niobrara EPE5, EPE5-TCP, MEB, MEB-TCP, SPE4-1D, or SPE4-2D; a Square D NIM; or a POWERLOGIC Ethernet Gateway.

The network interface module port should be set for SY/MAX mode, 9600 baud, EVEN parity, 8 data bits, 1 stop bit, and BCC error checking.

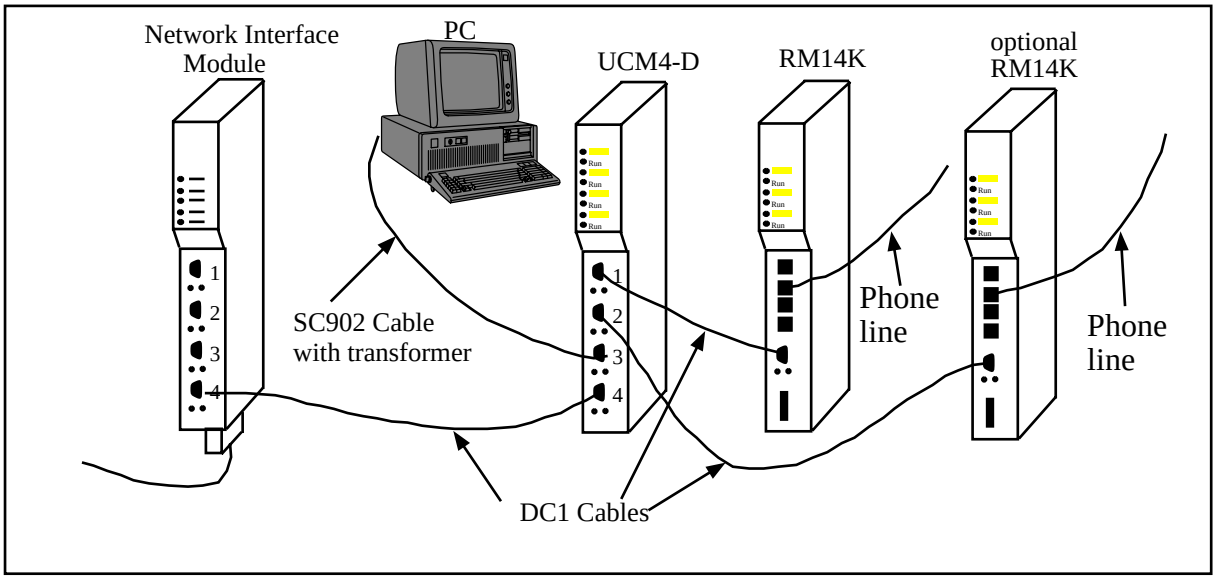


Figure 2-1 UCM4-D Layout

Port 3 to the Personal Computer

A physical connection must be made from the personal computer to the UCM in order to download the applications. This link may be a serial connection from a COM port on the personal computer to the RS-422 port on the UCM4. Usually an RS-232 to RS-422 converter is required for this connection and the Niobrara SC902 (or SC406) smart cable is recommended.

Connect your personal computer to the UCM4-D. It is assumed here that this connection will be made from COM1: of the personal computer using an SC902 Smart Cable with the included transformer.

The Niobrara SC902 (or SC406) cable is ideal for connecting a personal computer to Port 3. The SC902 cable has a 9-pin RS-232 connection for the computer and a 9-pin SY/MAX RS-422 connection for the UCM4-D.

NOTE: The included transformer with the SC902 (or SC406) must be used!

Loading the Application Programs into the UCM4

The UCM application programs need to be downloaded from the PC into the UCM ports.

First telephone override program

If Telephone Override is desired, its UCM application program needs to be downloaded into port 1.

1 Run the UCMSW software.

2 Select Utilities, downLoad pre-compiled file.

3 Select TO from the list of files

4 Select Port 1

5 Select Status Register 2

6 Select Autostart YES

The program should download and upon its completion, the green RUN light for Port 1 at the top of the UCM should be illuminated.

Second telephone override program

If two or three RM14Ks are used, download the telephone override application for port 2:

1 Select Utilities, downLoad pre-compiled file

2 Select TO from the list of files

3 Select Port 2

4 Select Status Register 4

5 Select Autostart YES

The program should download and upon its completion, the green RUN light for Port 2 at the top of the UCM should be illuminated.

Third telephone override program

If three RM14Ks are used, download the telephone override application for port 3 (this precludes using Global Zone Control with this UCM):

1 Select Utilities, downLoad pre-compiled file

2 Select TO from the list of files

3 Select Port 3

4 Select Status Register 6

5 Select Autostart YES

The program should download and upon its completion, the green RUN light for Port 3 at the top of the UCM should be illuminated.

Port 4 program

Next the baud rate control program for port 4 needs to be downloaded.

1 Select Utilities, downLoad pre-compiled file

2 Select Port4 from the list of files

3 Select Port 4

4 Select Status Register 8

5 Select Autostart YES

The program should download and upon its completion, the green RUN light for Port 4 at the top of the UCM should be illuminated.

Global Zone Control program

If Global Zone Control is desired, its UCM application program needs to be downloaded into Port 3.

1 Select Utilities, downLoad pre-compiled file

2 Select GZC from the list of files

3 Select Port 3

4 Select Status Register 6

5 Select Autostart YES

The program should download and upon its completion, the green RUN light for Port 3 at the top of the UCM should be illuminated.

Now that the UCM applications are loaded both the Telephone Override and the Global Zone Control Systems need to be configured using the PLTOSW software. After configuration,, the UCM, RM14K and a touch-tone telephone can be used to control devices on the POWERLOGIC network and/or the UCM can be the Global Zone Control master of the POWERLOGIC network.

3

Telephone Override Management

The manager of the Telephone Override System will need to:

- define the zones
- assign Zone Codes for each zone
- determine which zones need PINs and assign them
- determine panel & breaker for each zone
- detemine register and value for each entry
- configure the system
- determine the extension(s) for the system
- test the system

These steps are explained in the following sections.

Define the zones

A zone is normally a set of lights that need to work together. This might be all the lights in a work area or the lights that make a path to an exit. There is a maximum of 100 zones per Telephone Override System.

Depending upon your system and plant layout, all of the lights for a zone might exist on one circuit or several and the breakers for these circuits might be in one or more POWERLINK panels. The Telephone Override System allows a maximum of 5 panels per zone. **? There is a maximum of 16 breakers per panel though you could write to 32 breakers and count it as 2 panels. ???? **

Remember, the Telephone Override System does not have to write only to breaker panels. Any control device on the POWERLOGIC network can be controlled using the Telephone Override System. This might be useful to a plant engineer who needs to remotely start or stop equipment.

Assign Zone Codes

The assigning of Zone Codes is up to the user. The Zone Code is a four digit number. You might want to develop a system for assigning codes such as the first digit is building number, the second digit is the buildings floor, and the last two digital are the zone on that floor; or you may want to simply assign codes sequentially. The Telephon Override System has a maximum of 100 zones but there are 10,000 Zone Codes available, which allows great flexibilty in assigning Zone Codes.

An Override Zone Table has been provided in Appendix B on page 41. You will enter the zone code in this table and later use this table to configure the Telephone Override System.

Determine Zones that need PINs

Zones that control important equipment should have a PIN assigned. PINs are important because mischevious users may dial the Telephone Override system and try Zone Codes at random in an effort to determine which Zone Codes control which lights. Without PINs they could inadvertantly turn off important equipment or turn on unneeded equipment.

While using PINs will not guarantee that a user will not be able to use Zone Codes that have PINs by repeatedly calling the system and trying various Zone Code/PIN combinations, using PINs makes the task much more difficult. For every valid Zone Code there are 99 invalid codes. The Telephone Override System will prompt for a PIN either if there is a PIN assigned to the Zone Code entered or if the Zone Code entered does not exist. The user does not know if the Zone Code he is trying is invalid or if it has a PIN. The system allows the user three opportunities to enter a correct PIN and then it hangs up. It would take 3,334 calls to the system to determine that a single Zone Code is invalid.

Assigning PINs

The PIN is a four digit number. While it makes sense to assign Zone Codes using a system, it is best to assign PINs at random. It is not a good idea to use a method (other than random) to assign PINs such as assigning PINs that are the same as the Zone Codes, assigning PINs in order or using the same PIN for every Zone Code.

Once you have assigned a PIN you can enter it into the Override Zone Table in Appendix on B page 41. You might want to do this in pencil so that you can change it in the future if the need arises.

Determine panel & breaker for each zone

After the zones have been defined you will need to determine for each zone which panels and breakers control that zone's lights. You should have a circuit diagram or table of all of the panels on the POWERLOGIC network and which lights they control.

For each panel or other device that will be controlled by the Telephone Override System an entry will need to be made in the Device Table. A blank Device Table has been provided in Appendix A on page 37. You will later use this table to configure the Telephone Override System.

To complete the route you will need to determine the drop numbers of all of the ports between the Telephone Override System and the POWERLINK panel. A system diagram should help with this task.

It is very important that the correct route is used. If a valid, incorrect route is used then unexpected, even dangerous events may occur!

Once the Device Table entry has been defined enter the device number in the Override Zone Table and determine the register number and value for each device.

Detemine register and value for each entry

For each device in a zone there may be one or more breakers associated with that device. The handle one breaker **. To handle 2 to 16 breakers **. To handle more than 17 to 32 breakers **. To handle 33 to 80 breakers **.

It is very important that the correct registers and values are used. If a wrong register or value is used then unexpected, even dangerous events may occur!

**Registers and values table?

Configure the system

Once the preceeding steps have been completed you should have all of the information you need to configure the Telephone Override System. Configuration is accomplished by running the PLTOSW software from a Personal Computer connected to the Telephone Override System. Instructions for running this software are contained in Chapter 5 on page 19.

Determine the extension(s) for the system

The RM14K needs to be connected to an analog telephone line. The phone number or extension of the RM14K is the number to call to reach the Telephone Override System.

If you have more than one RM14K in your Telephone Override System, you may be able to program your phone system so that one RM14K extension rolls over to another RM14K extension on a busy signal. Otherwise, divide the system extensions among your users or tell all users all extensions.

Test the system

Each Zone Code will need to be tested to see if it operates properly. ** easy way to make the system run the blink stuff???

4

Global Zone Control Management

The installer of the Global Zone Control System will need to:

- determine related devices
- determine the route to each device
- determine registers and bits to read
- determine registers and values to write
- configure the system
- test the system

The Global Zone Control System reads up to 32 bits from on the POWERLOGIC network and uses a change in state of these bits to control other devices on the network. Each bit can control up to 5 devices at one to three registers per device.

An example is hallway light control. The GZC System would read the input status of a switch connected to a breaker panel. When that switch is turned on the system could turn on breakers on up to 5 different panels. When the switch is turned off it might only turn off the local hallway lights, the rest of the lights would go off during the energy saving sweep. This example can be seen in Chapter 7 on page 35.

Determine related devices

The user needs to determine which devices will provide the controlling input and which devices need to be controlled. This is completely dependant on how you want to implement Global Zone Control.

Determine route to each device

For each panel or other device that will be read or controlled by the Global Zone Control System an entry will need to be made in the Device Table. A blank device table has been provided in Appendix A on page 37. You will use this table when you configure the Global Zone Control System.

To complete the route you will need to determine the drop numbers of all of the ports between the GZC System and the POWERLINK panel. A system diagram should help with this task.

It is very important that the correct route is entered. If a valid, incorrect route is used then unexpected, even dangerous events may occur!

Determine registers and bits to read

Once the device table has been built you will need to determine the register and bit numbers of the controlling devices. The following table will help determine these values for some common devices. Use these values to complete the Global Zone Control Table in Appendix C on page 51. You will use the GZC Table when you configure the GZC System.

It is very important that the correct registers and bits are used. If a wrong register or bit is used then unexpected, even dangerous events may occur!

Table - **

Determine registers and values to write

For each controlling input you will need to determine the registers and values to write when the input comes on and when the input goes off. The following table will help determine these values for some common devices. Use these values to complete the GZC Table in Appendix C on page 51.

It is very important that the correct registers and values are used. If a wrong register or value is used then unexpected, even dangerous events may occur!

Table -**

Configure the system

Once the preceding steps have been completed you should have all of the information you need to configure the Global Zone Control System. Configuration is accomplished by running the PLTOSW software from a Personal Computer connected to the Global Zone Control System. Instructions on running this software are contained in Chapter 5 on page 19.

Test the system

The Global Zone Control System needs to be tested for every input point. Turn each input from on-to-off and check that the correct devices have changed to their correct states. Then turn each input from off-to-on and check that the correct devices have changed to the correct states. If you expected a device to change and it did not then another device may have changed states. To determine what has happened run the PLTOSW and fetch the GZC table from the UCM, check the device numbers, registers and values. Also, fetch the device table and check the route for each device number.

What to do if something was wrong**

5
Configuration Software PLTOSW

PLTOSW

The PLTOSW software is provided with the purchase of a Telephone Override or Global Zone Control System. This software is used to configure either system.

The startup screen of PLTOSW is shown **. The operational modes are selected by the highlighted menu bar on the fourth line. Selection can be made by moving the cursor with the arrow keys to the desired option and pressing **ENTER**. A short cut is provided, simply type "**D**" for Device, "**O**" for Override, "**G**" for Global, "**U**" for Utility, "**S**" for Setup or "**Q**" to Quit.

PLTOSW contains a convenient utility for general use, a SY/MAX Register Viewer.

Data Entry Keys

Whenever data entry is allowed by the program, certain keys can be used to facilitate data entry. They are:

BACKSPACE	Move cursor left and remove character there
LEFT ARROW	Move cursor to the left one character
RIGHT ARROW	Move cursor to the right one character
DEL	Remove the character under the cursor
INS	Change between insert and overstrike modes of entry
HOME	Move cursor to the left edge of the field
END	Move cursor to the end of the data
Control-F	Move cursor right (Forward) one word
Control-R	Move cursor left (Reverse) one word
Control-D	Delete from the cursor to the end of the field
Control-U	Delete from cursor to the beginning of the field

Control-Y	Delete all characters in the field
ESC	Exit the field without modifying it
ENTER	Accept the contents of the field

When a field is opened for input, the cursor is positioned at the left side of the field. If data is already present in the field, typing any character other than those listed above will cause the field to be blanked allowing entry of new data without first deleting the old. If it is desired to retain the previous data for editing, make sure the first key you type is an editing key such as a left or right arrow.

Device Functions

Once Device functions are selected the screen will look like figure **. There are several selections on this menu. To make your selection you can either type the first character of choice (**E** for Edit device table, **F** for Fetch from system, **S** for Send to system, **R** for Read from disk, **W** for Write to disk, **L** for set power Link baud rate or **P** for Print device table) or arrow to your selection and press **ENTER**. Each selection is described in detail in the following sections.

Both the Telephone Override System and Global Zone Control use the device table. The device table consists of 2 fields, the device number and the route.

The device number is a number between 1 and 100 inclusive used to reference each route. The route is the valid SY/MAX route between the UCM and the end device.

The device table is utilized to save space in the UCM's memory. Since the route to each device can be used multiple time in both applications, using a reference to the route (the device number) instead of the whole route saves space inside the UCM.

Edit device table

This function allows access to the device table in the PC's memory. This can be a brand new table, a table that has been Fetched from system or a table that has been Read from disk, whichever is currently in memory. If no device table has been Fetched or Read then the table in memory starts out blank.

The Edit device table screen appears as in figure **.

The Device Number field consists of the numbers 1 through 100 inclusive. Typing a number in this field will cause the PLTOSW software to show the table entry for the typed Device Number. Tying 0 will cause the PLTOSW software to show Device 1 and typing a number greater than 100 will cause the PLTOSW software to show device 98.

The Route field can consist of any number of drops between 1 and 8 inclusive. Use either a comma or a space to separate drop numbers in a route. When the PLTOSW shows the route, the drops are separated by commas no matter how they were entered.

When finished editing the override table use **ESC** to go back to the main menu so you can Write to disk, Send to system, or Print.

Fetch from system

Use this function when you wish to copy the device table from a connected UCM module to the PC's memory for editing, printout, or saving to disk. In order to fetch

the device table from the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before fetching a table.

Send to system

This function will send the device table in memory to the UCM module by way of the SY/MAX setup parameters. In order to send the device table to the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before sending a configuration.

Read from disk

This function reads a device table from the disk into the PC's memory. The file should have been created by the "Write to disk" function described below and must have a .VDT extension. When "Read from disk" is selected, a window will open and ask for the name of the file to read. The bottom part of the screen will show a list of all files with the extension .VDT in the current directory. Any subdirectories will be shown in square brackets. Any drive names will also be shown in square brackets, [b:]. The parent directory (of which the current directory is a subdirectory) is shown by the word "parent" in square brackets. You may either type the name of the file to read or you may use the arrow keys to move the highlight to the desired filename. Pressing **ENTER** with the highlight on a filename will select that file for reading. Pressing **ENTER** with the highlight positioned on a directory (drive) name (either a subdirectory or [parent]) will change the current directory (drive) to that directory (drive) and will show the .VDT files in the new directory (drive). If there are more files than will fit on the screen, pressing the right arrow with the highlight at the right edge of the screen will scroll the display sideways to show more files. Typing the **ESC** key will return to the device function menu without loading a file or otherwise modifying the PC's memory.

Write to disk

This function saves a copy of the device table presently in memory to a disk file. "Write to disk" uses the same point and shoot file selection described for "Read from disk" above. To create a new file you must type the name. The name should be a valid MS/DOS filename but should not include any path name or extension. The program will append an extension of .VDT to the name and the file will be placed in the directory which is shown in the bottom half of the screen. To create a file in a directory other than the current one, use the arrow and **ENTER** keys to traverse the directory tree until a listing of the desired directory is shown in the bottom half of the screen. Then type in the file name and press **ENTER**. If you specify (either by typing or by pointing) a file that already exists, you will be prompted for approval before that file is overwritten.

set power Link baud rate

This function selects the baud rate of UCM Port 4 which should be set to match the baud rate of the connected network interface module. Select the baud rate from the table, either 9600, 4800 or 2400 baud. The baud rate of Port 4 will change soon after the device table is sent to the module.

If you are using UCM Port 4 to configure the module then be sure to change the PLTOSW setup after changing Port 4's baud rate.

Print device table

This function will produce a report listing the device numbers and routes presently in memory. When this function is selected, you will be prompted for an output filename with the default value of PRN shown. To send the report to the PRN device (normally the parallel printer port), simply press **ENTER**. To send the report to a different port or to a file, type the name and then press **ENTER**.

Override Functions

Once Override functions are selected the screen will look like figure **. There are several selections on this menu. To make your selection you can either type the first character of choice ("**E**" for Edit override table, "**F**" for Fetch from system, "**S**" for Send to system, "**R**" for Read from disk, "**W**" for Write to disk or "**P**" for Print override table) or arrow to your selection and press **ENTER**. Each selection is described in detail in the following sections.

The Telephone Override System uses the override table. The override table consists of 7 fields: Zone Code, PIN, Device Number, Register, Data 1, Data 2, and Data 3.

It is important to understand how the system works in order to understand and build this table. See the examples in chapter 7 on page 35.

Each Zone Code can generate writes to 5 devices specified by the Device Number fields. The starting register number for each write is indicated in the Register field. The Telephone Override System can write 1, 2 or 3 consecutive registers depending upon the values in the Data 1, Data 2 and Data 3 fields.

The PIN is an optional field. If left blank then the user can enters a zone code and the system will do writes without the user having to enter a password. If the PIN field has a value then the user is first prompted for the Zone Code and then prompted for the PIN. Once a valid PIN is entered then the system will do all of the writes. If the system manager wants to limit access to a given zone then he can assign a PIN for the zone and only issue Zone Codes and PINs to qualified users.

Edit override table

This function allows access to the override table in the PC's memory. This can be a brand new table, a table that has been Fetched from system or a table that has been Read from disk, whichever is currently in memory. If no override table has been Fetched or Read then the table in memory starts out blank.

The Edit override table screen appears as in figure **.

The Zone Code is the number that the user dials when the system has answered. The PLTOSW software will let you enter a number with less than 4 digits but the TO.UCM software requires 4 digits before it acts. The TO.UCM software can be modified by the user to use less than four digits and so the PLTOSW software has been written accordingly. Pressing ENTER in this field will move the user to the next record (Zone Code). Use the arrow keys allows the user to move to other fields. There can be a maximum of 100 Zone Codes.

The PIN is the security number that the user dials after being prompted by the System after entering the Zone Code. The PLTOSW requires this to be 4 numeric digits. If fewer than 4 digits are entered they are padded on the front with zeros. "0", "00",

"000" and "0000" are not valid PINs. If zero is entered as the PIN then the PLTOSW software indicates NONE.

The Device field corresponds to the Device Number field in the Device Table. Device Numbers are used instead of routes to save memory in the UCM. Valid device numbers are 1 through 100 inclusive. If a number greater than 100 is entered then the PLTOSW software uses 100. If the number 0 is used then the TO.UCM software does not do a write for this entry.

The Register field corresponds to the first register number in the Device that data is written into. Valid entries are 0 through 16,383 inclusive. If a number greater than 16,383 is entered then 16,384 is subtracted from the number until it falls in the range of 0 to 16,383. Registers greater than 8,192 are not valid register numbers in SY/MAX devices and so the program TO.UCM does not generate writes to these registers but the program TO.UCM can be modified by the user and other devices may use these register numbers so the PLTOSW software has been written accordingly.

** Table of registers and values for various devices **

The Data 1, Data 2 and Data 3 fields are the values that the system writes when the zone code has been entered. If the Data 1 field has a value then the register indicated by the Register field will be written with the value in Data 1. If both the Data 1 and Data 2 fields have numbers in them then data 1 is written to register and data 2 is written to register + 1. If all three fields contain data then data 1 is written to register, data 2 is written to register + 1 and data 3 is written to register + 2. Valid values for each of the Data fields are 0 through 65535 inclusive. If you want to clear a Data field press the **DEL** key.

When finished editing the override table use **ESC** to go back to the main menu so you can Write to disk, Send to system, or Print.

Fetch from system

Use this function when you wish to copy the override table from a connected UCM module to the PC's memory for editing, printout, or saving to disk. In order to fetch the override table from the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before fetching a table.

Send to system

This function will send the override table in memory to the UCM module by way of the SY/MAX setup parameters. In order to send the override table to the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before sending a configuration.

Read from disk

This function reads an override table from the disk into the PC's memory. The file should have been created by the "Write to disk" function described below and must have a .VZT extension. When "Read from disk" is selected, a window will open and ask for the name of the file to read. The bottom part of the screen will show a list of all files with the extension .VZT in the current directory. Any subdirectories will be shown in square brackets. Any drive names will also be shown in square brackets, [b:]. The parent directory (of which the current directory is a subdirectory) is shown

by the word "parent" in square brackets. You may either type the name of the file to read or you may use the arrow keys to move the highlight to the desired filename. Pressing **ENTER** with the highlight on a filename will select that file for reading. Pressing **ENTER** with the highlight positioned on a directory (drive) name (either a subdirectory or [parent]) will change the current directory (drive) to that directory (drive) and will show the .VZT files in the new directory (drive). If there are more files than will fit on the screen, pressing the right arrow with the highlight at the right edge of the screen will scroll the display sideways to show more files. Typing the **ESC** key will return to the override function menu without loading a file or otherwise modifying the PC's memory.

Write to disk

This function saves a copy of the override table presently in memory to a disk file. "Write to disk" uses the same point and shoot file selection described for "Read from disk" above. To create a new file you must type the name. The name should be a valid MS/DOS filename but should not include any path name or extension. The program will append an extension of .VZT to the name and the file will be placed in the directory which is shown in the bottom half of the screen. To create a file in a directory other than the current one, use the arrow and **ENTER** keys to traverse the directory tree until a listing of the desired directory is shown in the bottom half of the screen. Then type in the file name and press **ENTER**. If you specify (either by typing or by pointing) a file that already exists, you will be prompted for approval before that file is overwritten.

Print override table

This function will produce a report listing the override table that is in the PC's memory. When this function is selected, you will be prompted for an output filename with the default value of PRN shown. To send the report to the PRN device (normally the parallel printer port), simply press **ENTER**. To send the report to a different port or to a file, type the name and then press **ENTER**.

Global Functions

Once Global functions are selected the screen will look like figure **. There are several selections on this menu. To make your selection you can either type the first character of choice ("**E**" for Edit global control table, "**F**" for Fetch from system, "**S**" for Send to system, "**R**" for Read from disk, "**W**" for Write to disk, "**U**" for set Update rate or "**P**" for Print global control table) or arrow to your selection and press **ENTER**. Each selection is described in detail below.

The Global table is used by the Global Zone Control System. The global table consists of 10 fields: Source Device, Register, Bit, Turn On Device, Turn Off Device, Register, Data 1, Data 2, Data 3.

The Global Zone Control System looks at the bit specified by the Bit field of the register specified by the first Register field in the device specified by the Source Device field. If this bit has turned on since the last read it will write the devices specified by the Turn on Device fields, with the data specified by the Data 1, Data2 and Data3 fields into the registers starting with the second Register field. If this bit has turned off since the last read it will write the devices specified by the Turn Off Device fields,

with the data specified by the Data 1, Data 2 and Data 3 fields into the registers starting with the second Register field.

An example of Global Zone Control can be found in chapter 7 on page 35.

Edit global control table

This function allows access to the global control table in the PC's memory. This can be a brand new table, a table that has been Fetched from system or a table that has been Read from disk, whichever is currently in memory. If no global control table has been Fetched or Read then the table in memory starts out blank.

The Edit global control table screen appears as in figure **.

The Source Device field corresponds to the Device Number in the Device Table. Device Numbers are used instead of routes to save memory in the UCM. Valid Source Device numbers are 1 through 100 inclusive. The PLTOSW software will allow the user to enter numbers between 101 and 999 but the TO.UCM will not find entries in the Data Table for these devices and a read will not be generated.

The first Register field corresponds to the register number in Source Device to read to get control data upon which to act. Valid values are 1 through 8192. The PLTOSW software will allow register values up to 9999 but the TO.UCM will not generate reads for values greater than 8192.

The Bit field is the bit number of Register to use as the control bit. If the system notices a change in the control bit from low to high then the Turn On devices are written. If the system notices a change in the control bit from high to low then the Turn Off devices are written. Valid bit numbers are 1 through 16. If 0 is entered 1 is used. If a number greater than 16 is entered 16 is used.

The Turn On Device field corresponds the the Device Number in the Device Table that is to be written when the control bit goes from low to high. Valid Device numbers are 1 through 100. The PLTOSW software will allow device numbers between 101 and 999 but the TO.UCM will not find entries in the Data Table for these devices and the write will not occur.

The Turn Off Device field corresponds the the Device Number in the Device Table that is to be written when the control bit goes from high to low. Valid Device numbers are 1 through 100. The PLTOSW software will allow device numbers between 101 and 999 but the TO.UCM will not find entries in the Data Table for these devices and the write will not occur.

The second Register field corresponds to the register number in the Turn On or Turn Off Device where Data 1 is to be written. Valid values are 1 through 8192. The PLTOSW software will allow register values up to 9999 but the TO.UCM will not generate reads for values greater than 8192.

The Data 1, Data 2 and Data 3 fields are the values that the system writes when the control bit has changed. If the Data 1 field has a value then the register indicated by the Register field will be written with the value in Data 1. If both the Data 1 and Data 2 fields have numbers in them then data 1 is written to register and data 2 is written to register + 1. If all three fields contain data then data 1 is written to register, data 2 is written to register + 1 and data 3 is written to register + 2. Valid values for each of the

Data fields are 0 through 65535 inclusive. If you want to clear a Data field press the **DEL** key.

When finished editing the Global Control Table use **ESC** to go back to the main menu so you can Write to disk, Send to system, or Print.

Fetch from system

Use this function when you wish to copy the global control table from a connected UCM module to the PC's memory for editing, printout, or saving to disk. In order to fetch the global control table from the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before fetching a table.

Send to system

This function will send the global control table in memory to the UCM module by way of the SY/MAX setup parameters. In order to send the global control table to the UCM it is necessary for the personal computer to communicate with the UCM. Try going oNline before sending a configuration.

Read from disk

This function reads a global control table from a disk into the PC's memory. The file should have been created by the "Write to disk" function described below and must have a .VGT extension. When "Read from disk" is selected, a window will open and ask for the name of the file to read. The bottom part of the screen will show a list of all files with the extension .VGT in the current directory. Any subdirectories will be shown in square brackets. Any drive names will also be shown in square brackets, [b:]. The parent directory (of which the current directory is a subdirectory) is shown by the word "parent" in square brackets. You may either type the name of the file to read or you may use the arrow keys to move the highlight to the desired filename. Pressing **ENTER** with the highlight on a filename will select that file for reading. Pressing **ENTER** with the highlight positioned on a directory (drive) name (either a subdirectory or [parent]) will change the current directory (drive) to that directory (drive) and will show the .VGT files in the new directory (drive). If there are more files than will fit on the screen, pressing the right arrow with the highlight at the right edge of the screen will scroll the display sideways to show more files. Typing the **ESC** key will return to the global function menu without loading a file or otherwise modifying the PC's memory.

Write to disk

This function saves a copy of the global control table presently in memory to a disk file. "Write to disk" uses the same point and shoot file selection described for "Read from disk" above. To create a new file you must type the name. The name should be a valid MS/DOS filename but should not include any path name or extension. The program will append an extension of .VGT to the name and the file will be placed in the directory which is shown in the bottom half of the screen. To create a file in a directory other than the current one, use the arrow and **ENTER** keys to traverse the directory tree until a listing of the desired directory is shown in the bottom half of the screen. Then type in the file name and press **ENTER**. If you specify (either by typing or by pointing) a file that already exists, you will be prompted for approval before that file is overwritten.

set Update rate

This function selects the Update rate of the Global Zone Control System. The system scans every input and writes the appropriate outputs and then waits the amount of time indicated by the Update Rate before it starts its scan again. For fastest possible update enter 0 seconds. For busy networks enter a larger number. Any number over 60 seconds will be reduced to 60 seconds by the system.

The update rate is written to the system when the global control table is sent to the system. After downloading, at the end of the active scan, the system will delay the new Update Rate before starting the next scan.

Print global control table

This function will produce a report listing the global control table that is presently is in memory. When this function is selected, you will be prompted for an output filename with the default value of PRN shown. To send the report to the PRN device (normally the parallel printer port), simply press **ENTER**. To send the report to a different port or to a file, type the name and then press **ENTER**.

Utility function

There is a single entry in Utility menu, the register Viewer. Press **ENTER** or hit "**V**" to select the Viewer or press **ESC** to leave the utility menu and return to the main menu.

register Viewer

Selecting the View module registers menu item will invoke a SY/MAX register data viewer/modifier. This viewer continuously performs a block read of 20 registers and displays the contents of those registers in hex, unsigned integer, signed integer, and binary. The status register associated with the data register is also displayed in hex. The register viewer is dependent on the values located in the SETUP Sy/Max menu. Mode, Baud rate, Parity, Route, etc. must be properly set for proper communication.

The Up and Down arrow keys are used to move from register to register.

The Page Up and Page Down keys move in increments of 10 registers.

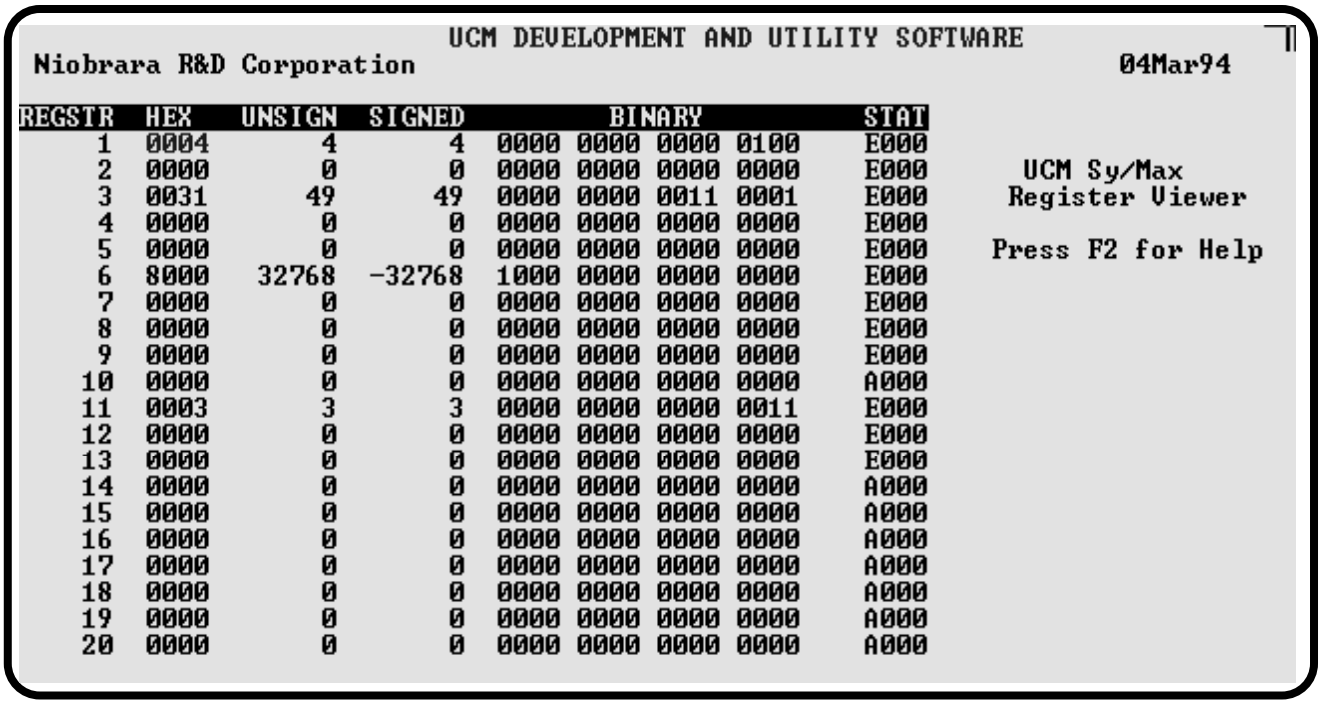
The Left and Right arrows move from column to column on the same register.

This register viewer is highly useful in that it allows easy editing of the data in the register being viewed. By pressing 0..9 in the decimal fields or 0..9, or A..F in the hex field, an editing mode is entered. New data may be entered at this time. Pressing the Enter key or moving to a new field with the arrow keys will cause the new data to be written to the edited register. If the curser is located in the REGISTER column the block of registers being viewed may be adjusted by entering a new register number. To edit the binary values, press HOME when on the binary field. Move the cursor to the desired bit and enter a ’0’ or a ’1’ and press enter to accept.

Pressing Esc will exit from the Register viewer and return to the main menu. Pressing Esc while editing a data field will result in canceling the edit and the modified data will not be written to the register.

The STAT field displays the status register associated with the data register. The STATUS field is a read only display and can not be modified by the Register Viewer.

Two common values are E000 and A000. A000 is the hex representation that the PLC recognizes as a PLC OUTPUT register. E000 is for a PLC INPUT register. This allows easy recognition of registers used by the UCM as inputs and used by the PLC as outputs.



REGSTR	HEX	UNSIGN	SIGNED	BINARY	STAT
1	0004	4	4	0000 0000 0000 0100	E000
2	0000	0	0	0000 0000 0000 0000	E000
3	0031	49	49	0000 0000 0011 0001	E000
4	0000	0	0	0000 0000 0000 0000	E000
5	0000	0	0	0000 0000 0000 0000	E000
6	8000	32768	-32768	1000 0000 0000 0000	E000
7	0000	0	0	0000 0000 0000 0000	E000
8	0000	0	0	0000 0000 0000 0000	E000
9	0000	0	0	0000 0000 0000 0000	E000
10	0000	0	0	0000 0000 0000 0000	A000
11	0003	3	3	0000 0000 0000 0011	E000
12	0000	0	0	0000 0000 0000 0000	E000
13	0000	0	0	0000 0000 0000 0000	E000
14	0000	0	0	0000 0000 0000 0000	A000
15	0000	0	0	0000 0000 0000 0000	A000
16	0000	0	0	0000 0000 0000 0000	A000
17	0000	0	0	0000 0000 0000 0000	A000
18	0000	0	0	0000 0000 0000 0000	A000
19	0000	0	0	0000 0000 0000 0000	A000
20	0000	0	0	0000 0000 0000 0000	A000

Figure 5-1 View Registers

Setup

Setup is not a menu but directly accesses the setup parameters for the personal computer to enable it to communicate with the UCM. The parameters chosen will depend on the exact equipment involved in making the connections. To select Setup either arrow to Setup and press **ENTER** or simply press "**S**" from anywhere on the main menu.

SY/MAX SETUP

The connection type is mainly determined by the method of connection to outside world and may be broken into three groups: the personal computer's COM: port, the SY/LINK Network Interface Card and the SFI 610 card.

Personal Computer COM: port

If the connection from the personal computer is made through one of its serial ports then the Connection type should be one of the following:

- Sy/Max COM:
- Net-to-Net COM:
- Gateway COM:

Sy/Max COM: is the default and most likely will be the one used. In this mode the personal computer will communicate through one of its COM: ports as though it were a SY/MAX device such as a PLC. The full SY/MAX protocol is supported including routing so SY/MAX COM: may be used through SY/MAX mode ports on NIMs and SPE4s with appropriate routing. This mode is to be used when a direct connection from the personal computer COM: port is made to the UCM. In most cases an RS-232<>RS-422 conversion is required and the Niobrara SC406 (or SC902) cable makes this conversion very convenient.

Net-to-Net COM: is used when connecting to a NIM or SPE4 that is set to Net-to-Net mode. The first drop number in the route will be that of the address of the NIM.

Gateway COM: is used when connecting to an SPE4 port that is in Gateway mode. For more information about Gateway mode see the SPE4 instruction manual.

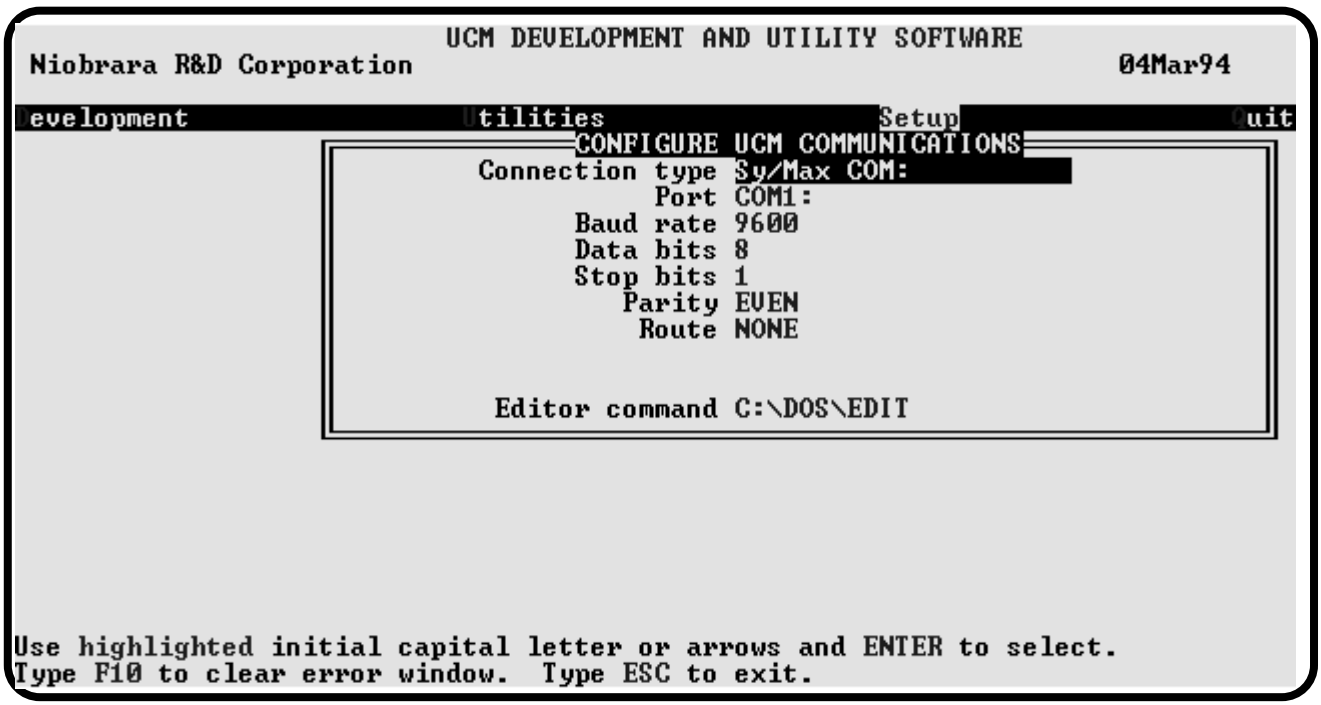


Figure 5-2 SY/MAX Setup Screen

Port - When one of the COM: connection types is selected a particular port of the personal computer must be selected. Available choices are: COM1:, COM2:, COM3:, and COM4:. Select the port which will be used to connect to the UCM.

Baud rate - The Baud rate selected here is the baud rate of the personal computer serial port selected. This value should be set to match the device connected to the personal computer. An UCM has a default baud rate of 9600 and if a direct connection is made to the UCM this is the setting that should be made on the personal computer. If the baud rate of the UCM has been changed this value may need to be adjusted.

Data bits - When in SY/MAX or Net-to-Net modes the data bits is required to be 8 and may not be changed. The SY/MAX protocol requires 8 data bits. The Gateway

mode uses ASCII messages which do not require the full 8 data bits and may be set to 8 or 7 depending on the attached device.

Stop bits - The stop bits are normally set to 1 but may be adjusted to 2 for some particular application. The UCM is set for 1 stop bit.

Parity - SY/MAX and Net-to-Net modes normally use EVEN parity and that is the default for the UCM. Other choices are ODD and NONE.

Route - The route is used to determine the path from the personal computer to the UCM. If a direct connection is made from the personal computer to the UCM, i.e. without going through a SY/NET network or an SPE4, this value is set to NONE by pressing the Delete key. If a SY/MAX connection is made to a SY/MAX mode port on an NIM or SPE4 the first drop will be that of the drop number of the NIM or SPE4 port. If any Net-to-Net drops are included between the port connected to the personal computer and the port connected to the UCM, they must be included in order of occurrence from the personal computer to the UCM. The last drop number listed will be that of the NIM or SPE4 SY/MAX mode port that is connected to the UCM. Up to 8 total drops are supported by the SY/MAX protocol.

If the personal computer is in Net-to-Net mode the first drop will be that of the Net-to-Net port of the NIM or SPE4 that the personal computer is connected to. Subsequent drops will be included like above.

The Gateway mode route will include the Gateway port on the SPE4 that the personal computer is connected and any subsequent Net-to-Net and SY/MAX drops to reach the UCM.

SY/LINK Connection

UCMSW provides full support of the Square D SY/LINK network interface card. Setup for the network interface is provided along with setup for the RS-422 port on the card.

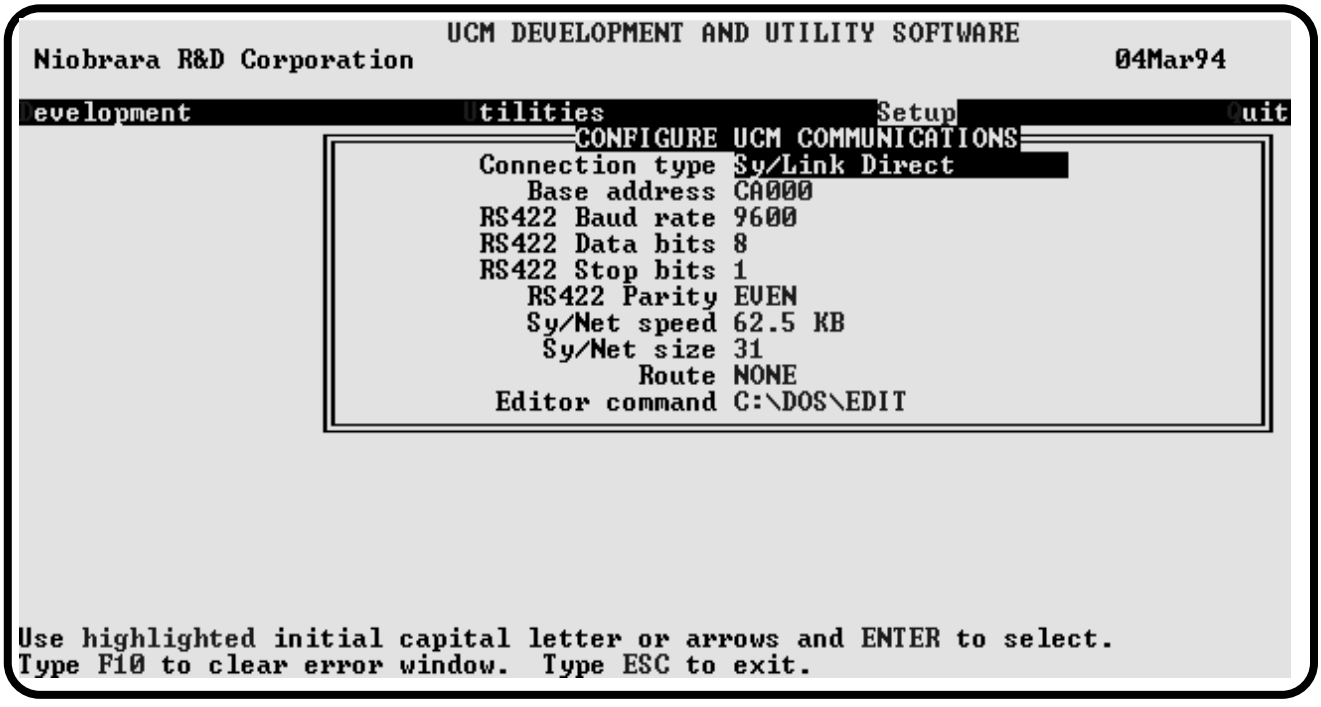


Figure 5-3 SY/LINK Setup Screen

Connection type - The RS-422 port may be set to SY/MAX or Net-to-Net modes. For a direct connection to the UCM from the RS-422 port of the SY/LINK card choose the Sy/Link Direct mode. If an indirect connection from the RS-422 port of the card is made through other Net-to-Net ports choose Sy/Link Net-to-Net. If the RS-422 port is not used and the connection is make through the SY/NET network to another NIM, the choice does not matter.

Base address - This is a hex value that represents the SY/LINK's cards address range selected by DIP switches on the card. Select the same range that is set on the card.

RS422 Baud rate - Select the baud rate to match the external device, normally 9600.

RS422 Data bits - Select the data bits to match the external device, normally 8.

RS422 Stop bits - Select the stop bits to match the external device, normally 1.

RS422 Parity - Select the parity to match the external device, normally EVEN.

Sy/Net speed - Select to match the speed settings of the other devices on the SY/NET.

Sy/Net size - Select to match the setting on the other SY/NET devices.

Route - The first drop in the route defines the network address of the SY/LINK board. Since the personal computer is connected to the SY/LINK card through the edge connector of the card, port 0, the drop number must start with 0. The remaining two digits of that drop should be selected not to match any other device on the SY/NET. For instance, there are three NIMs on the network addressed 01, 02, and 03. It seems logical to make the SY/LINK card be at address 04 so the first drop in the route field will be 004. The next drop will be that of the NIM port connected to the UCM, or another Net-to-Net port. If Sy/Link Direct was selected and the UCM is connected directly to the RS-422 port of the SY/LINK card the full route statement would be 004 104 as the RS-422 port is considered to be port 1.

SFI-610 card

The PLTOSW software provides support for the Square D SFI-610 Ethernet card for the personal computer. The SFI-610 must be installed and initialized using SFI610.EXE before the PLTOSW software is started. The only operational parameter to be configured is the route. The first drop in the route must be the drop number assigned to the SFI-610 during its configuration or the "don't care" drop 201. The remaining drops are determined by the path to the UCM.

Quit

Quit is not a menu but the method for exiting the PLTOSW software. From the main menu select Quit by using arrows to get to Quit and press **ENTER** or simply hit "**Q**" from anywhere on the main menu. You will be returned to a DOS prompt.

6
Telephone Override Operation

The Telephone Override System is simple to operate.

- Dial Telephone Override System phone number
-

**Table of tones

What characters are # and *?

7
Examples

Telephone Override Example

The following is an example of a simple Telephone Override system.

The device table consist of 2 entries

DEVICE	ROUTE
1	30, 5, 10, 40, 1
2	30, 5, 10, 40, 2

The override table consists of two entries:

ZONE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3
1234	NONE	1	1034	65535		
1111	7361	1	1034	0		
		2	67	3	4	

** review the register numbers and values

Using the above tables the system would work like this:

- user dials the extension of an RM14K
- system answers phone and prompts user for Zone Code
- user dials 1234
- system writes the value 65535 to register 1034 of the device at 30,5,10,40,1
- system plays complete tone and hangs up

And also like this:

- user dials extension of RM14K
- system answers phone and prompts for Zone Code
- user dials 1111

- system prompts for PIN
- user dials 7361
- system writes the value 0 to register 1034 of the device at 30,5,10,40,1
- system writes the value 3 to register 67 and the value 4 to register 68 of the device at 30,5,10,40,2
- system plays the complete tone and hangs up

Global Zone Control Example

One zone in a Global Zone Control system consists of building hallway lights controlled by a single switch near the entrance. The switch is an input to a POWERLINK panel and the breakers that control the hallway lights exist in five different POWERLINK panels.

The device table consists of 5 entries (the controlling switch and one of the breakers are in the same panel) and looks like this:

DEVICE	ROUTE
1	30, 5, 11, 3
2	30, 5, 19, 8
3	30, 5, 31, 17
4	30, 5, 3, 12
5	30, 5, 10, 40, 1

The Global Zone Control Table entry for this zone looks like this:

DEVICE	REGISTER	BIT	TURN ON DEVICE	REGISTER	DATA 1	DATA 2	DATA 3
1	**	**	1	**	**	**	
			2	**	**	**	
			3	**	**	**	
			4	**	**	**	
			5	**	**	**	
			TURN OFF DEVICE				
			1	**	**	**	
			2	**	**	**	
			3	**	**	**	
			4	**	**	**	
			5	**	**	**	

Appendix A - Device Table

Device Number	Route (up to 8 drops)	Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Device Number	Route (up to 8 drops)	Description
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
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57		
58		
59		
60		
61		
62		
63		
64		
65		

Device Number	Route (up to 8 drops)	Description
66		
67		
68		
69		
70		
71		
72		
73		
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78		
79		
80		
81		
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98		
99		
100		

Appendix B - Override Zone Table

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

ZONE CODE	PIN	DEVICE	REGISTER	DATA 1	DATA 2	DATA 3

Appendix C - Global Control Table

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3

Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3
Source Device	Register	Bit	Turn On Device	Register	Data 1	Data 2	Data 3
			Turn Off Device	Register	Data 1	Data 2	Data 3