

MicroLink

OPERATOR TERMINAL SETUP AND OPERATION MANUAL

(Revision 1.0)



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MicroLink

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MicroLink: Operator Interface Terminal

1. INTRODUCTION

The Link Systems MicroLink unit is a machine to operator interface terminal that is used as a convenient method of controlling some metal forming press functions. The MicroLink system can be used to interface with feeds, connect to the LinkNet networking system, or perform counterbalance/die cushion and slide adjust control with the MultiSet module.

The MicroLink system consists of a 16 line, black on white LCD (liquid crystal display), a numeric keypad, along with the circuit boards and software that form the core of the system. The MicroLink system has the on-board memory for job storage of up to 250 jobs. The system has built-in network connections for the LinkNet press networking system, which provides virtually unlimited job storage, user defined downtime codes, maintenance tracking, and other benefits.

The software for the MicroLink system includes counters for part, batch, quality, and stroke as well as a method for counting scrap parts and deducting them from the part count. The intuitive screens use menus with soft keys that enable users

to move through the different screens of the MicroLink system easily. The HELP key on the keyboard provides instant access to helpful information tailored for most user screens. The system also has a special diagnostics section with information about the status of the hardware. When the MicroLink system asserts a stop output, a section of the screen shows that the stop is active. This enables the user to quickly determine if the MicroLink system has stopped the press, so the problem can quickly be isolated and the press can be returned to normal production.

The MicroLink system can utilize access codes assigned by a supervisor to control the ability of different users to make changes to set points, configuration data, and other critical information. If a user does not have the correct user code, then no changes can be made. The access code system can be bypassed in facilities that would not benefit from this flexibility.

All of these features combine to make the MicroLink system easy to use. The overall advantage is more efficient use of press auxiliary systems, which results in better press utilization.

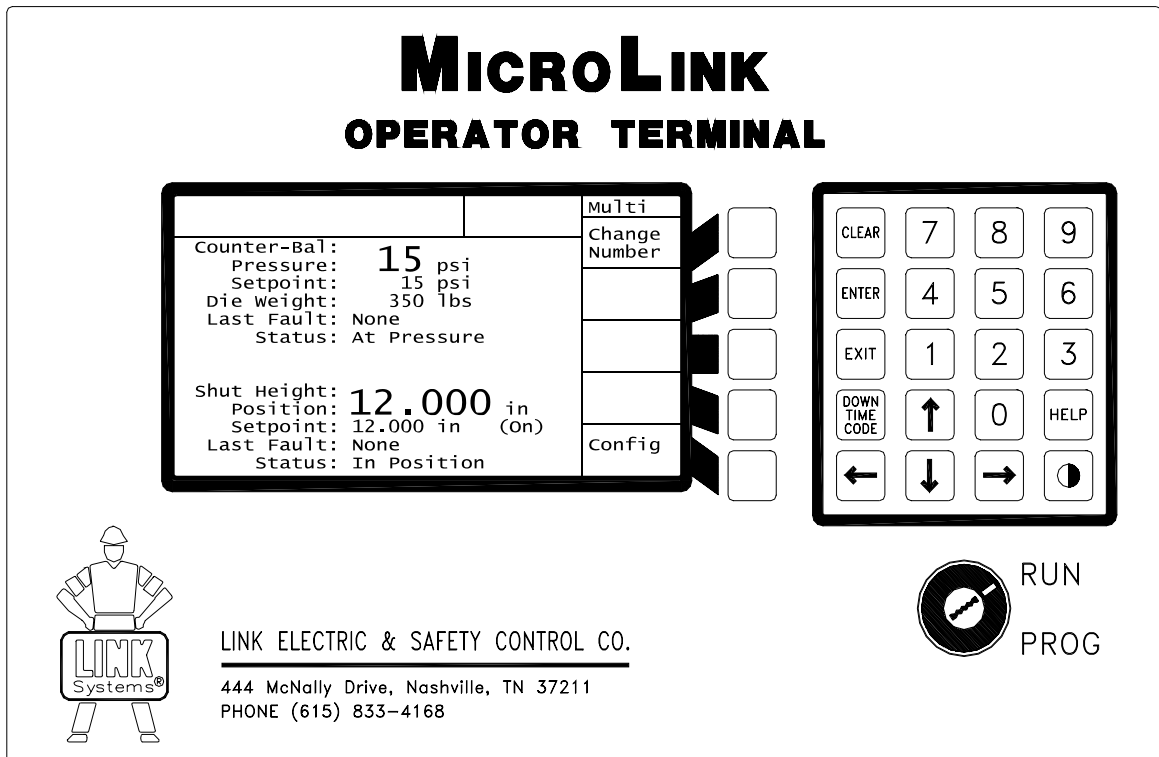


Figure 1.1: MicroLink Keypad and MultiSet Operational Screen

2. BASIC MICROLINK INTERFACE

The MicroLink system is designed to facilitate the operation of the press to which it is attached. The operator terminal has the job of conveying information to the user and providing a method of entering information in the system. The operator terminal has 25 keys that allow the user to enter information. The 20 keys on the right side of the MicroLink operator terminal are labeled and have dedicated functions. The 5 keys next to the liquid crystal display (LCD) are special keys that change their functions for different screens. The functions of these 5 keys are defined in software, instead of hardware, so the keys are called soft keys.

Another central aspect of the MicroLink interface is the usage of multiple screens. A screen consists of the information displayed on the LCD for a particular sub-system. For instance, the MultiSet system has a screen that shows the current air pressure and the current shut height, as well as information about the system set points and system faults. The screens are arranged in a menu tree, which is described in more detail in Section 2.12. The keys on the MicroLink operator terminal are described in the following sections. The keypad layout is shown in Figure 1.1.

2.1 Number Keys

The ten number keys on the keypad enable the user to easily enter numeric values such as set points, limits, and job numbers. The number keys are only active when the system is in edit mode. When the system is in edit mode there will be a blinking cursor on the screen, which means that the system is ready to accept data. If the item being changed is a number, then a new value can be entered by pressing the appropriate numbers on the keypad. When the system is not in edit mode, pressing the number keys will not change anything.

2.2 Arrow Keys

The arrow keys are primarily used to move the blinking cursor to different parts of the screen. The cursor is only present when the user is in edit

mode, so the arrow keys are only effective in edit mode. The arrow keys will not change anything when the cursor is not present unless they are used with the CONTRAST key (Section 2.8).

2.3 CLEAR Key

The CLEAR key is used to erase an entered number when an edit field is being modified. The MicroLink system allows a user to change numeric values using the number keys (see Section 2.1). The CLEAR key enables the user to erase incorrect numbers that were entered and start again.

2.4 ENTER Key

The ENTER key is typically used to tell the MicroLink system that an editing process is complete. When a number is being changed, such as the shut height set point, pressing the ENTER key indicates that the changed number should be the new set point. The ENTER key is also used to select an option from a list of choices. Use the arrow keys to position the cursor on the desired option and press the ENTER key.

2.5 EXIT Key

The EXIT key is used for two primary functions. One function is to leave an edit field, and the other function is to leave a screen. Pressing the EXIT key while changing a number, such as the shut height set point, will end the edit process and return the set point to the value that was there before the edit process began. If the user is not changing a value, then pressing the EXIT key will cause the MicroLink system to leave that screen.

2.6 DOWN TIME CODE Key

The DOWN TIME CODE key brings up a special screen dedicated to entering down time codes over a LinkNet connection. This special screen is covered in full detail in the LinkNet manual. If the LinkNet press networking system is not installed, then pressing this key will bring up a message that says "Network NOT on line". Press the EXIT key to return to the previous screen.

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2.7 HELP Key

The HELP key brings up a special screen that explains some of the information about the system. This information is tailored to match the screen that the user is viewing when the HELP key is pressed. Press the EXIT key to return to the normal user screen.

2.8 Contrast Key -

The contrast key is primarily used to adjust the background intensity of the liquid crystal display (LCD). In some situations the user may want to make the background brighter. This is accomplished by holding down the contrast key and the up arrow key simultaneously. Conversely, to make the background darker, hold down the contrast key and the down arrow key simultaneously.

The contrast key has a second function related to access codes. Pressing the contrast key while in an access protected mode will cause the system to immediately leave the protected mode (log out). This special function is explained in more detail in the access code timeout section. (Section 6.3).

2.9 RUN/PROG Key Switch

The RUN/PROG key switch located below the keypad is used to limit the ability of unauthorized personnel to change parameters. The key must be in the program (PROG) position in order to make most changes to the system. The exact functionality of the RUN/PROG key switch can be affected by Access Codes, which are covered in detail in Chapter 6.

2.10 Soft Keys

The remaining 5 keys on the keypad are called soft keys. The soft keys are solid grey and are located in a single column beside the screen. The function of a soft key is described by the text written on the screen next to the soft key. If the area of the screen next to a particular soft key is blank, then that soft key does nothing on that screen.

One usage of soft keys is for screen navigation. If the text on the display next to a soft key is a screen name, then pressing that soft key will pull up that screen. For instance, pressing the soft key next to the label that says *Counter* will bring up the screen with the counter information.

Another usage of soft keys is for performing certain screen related tasks, such as *Change Number*, *Store Job*, or *Jog Up*. These soft keys cause the system to perform the action described by the text beside the soft key. The action soft keys are described in detail with each screen description throughout the manuals.

2.11 Method of Editing Text

The MicroLink keypad is designed to maximize ease of use while minimizing size and clutter, so there are no letter keys on the keypad. The system uses an on-screen letter selection window and the 5 soft keys to edit text. The primary usage of the edit text system is creating descriptions for job data before it is stored. The screen in Figure 2.1 shows the edit text system for editing a job description.

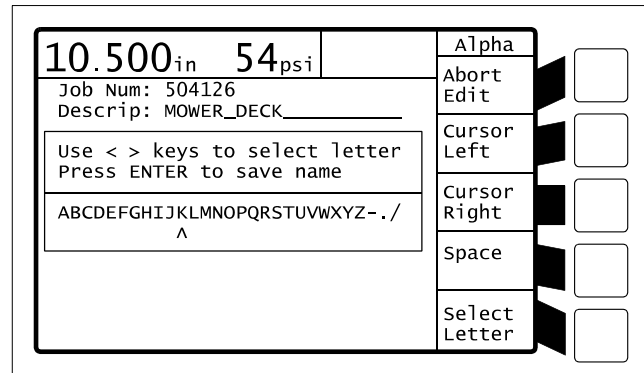


Figure 2.1: Editing Text on Job Storage Screen

The letters are selected by using the arrow keys on the keypad to position the pointer arrow beneath the desired letter. When the pointer arrow is in position, press the *Select Letter* soft key. The selected letter will be added to the text description where the black cursor is located. The cursor in the letter description automatically moves to the next position after a letter has been selected. Continue to select letters in the same manner. If

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you need to leave a blank space in your description, press the *Space* soft key. The *Cursor Left* and *Cursor Right* soft keys can be used to position the cursor in the letter description. This is typically used to go into a description and change a single letter without entering the entire sequence of letters again. The *Abort Edit* soft key will exit the edit text system without applying any changes.

2.12 Menu Tree

The operation and configuration screens are arranged in a structure called a menu tree. This name is used because the structure of the screens is similar to a tree with a main trunk, large branches, and smaller branches. The main trunk is like the main screen of the MicroLink system, which has screens that are reached when the appropriate soft key is pressed. These secondary screens are like the big branches off of the main trunk in a real tree. Other screens are reached from these secondary screens by pressing the soft key that matches the screen name. The screens branch out in this fashion until all of the relevant screens for that branch are covered.

The menu-tree for the MicroLink system is shown in Figure 2.2. Each of the boxes in the figure represents one of the screens in the MicroLink system. The lines connecting the boxes show how the screens are linked. For instance, to bring up the job recall screen if you are currently in the MultiSet screen requires three steps. First, press the EXIT key to go up one level to the main screen. Second, press the *Job Setups* soft key to go to the job memory screen. Finally, press the *Recall Job* soft key on that screen to go to the job recall screen.

The HELP screen and the DOWN TIME CODE screen are not part of the menu-tree screen structure. They can be accessed from any screen by pressing the dedicated keys on the keypad. For instance, press the HELP key to get to the HELP screen. The EXIT key returns the system to the previous screen.

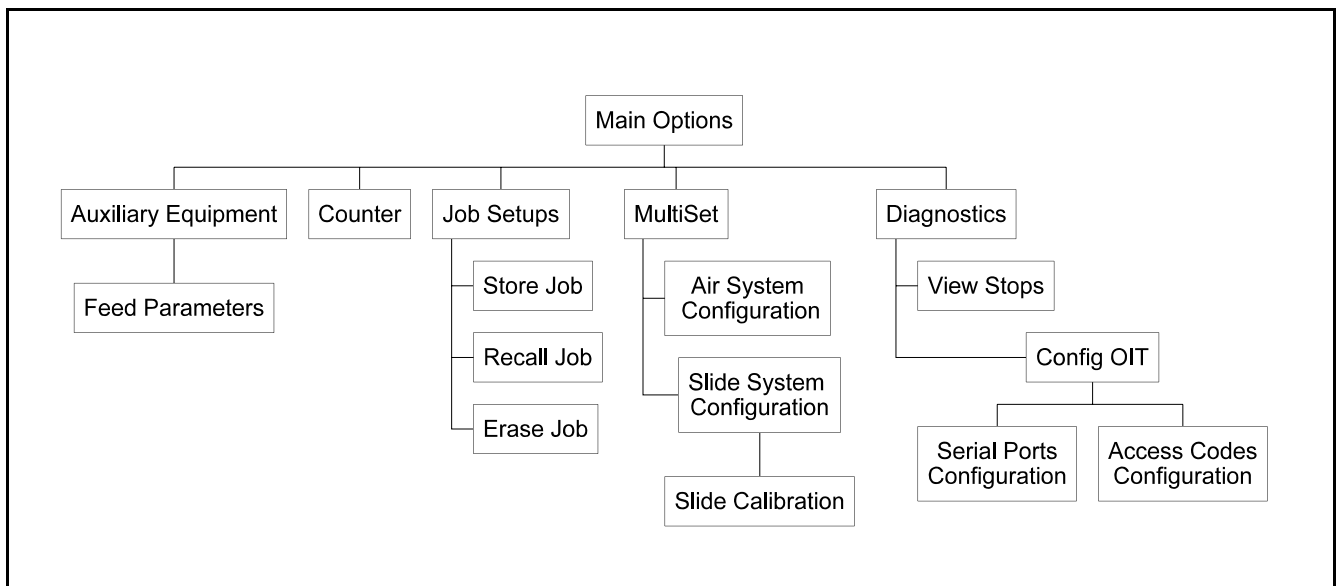


Figure 2.2: Menu-Tree of the MicroLink Operational Screens

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3. INSTALLATION

The first step of the installation of the MicroLink system is the physical mounting of the unit. The first two sections of this chapter show the mounting options. After the mounting is completed, the necessary wiring can be installed. The basic wiring for the MicroLink system is covered in the last section of this chapter. The wiring for the MultiSet system is covered in the separate MultiSet manual.

The flush mount option allows the system to be located in a control enclosure with other press electrical systems. The advantage of this mounting arrangement is that all of the press electrical systems can be located in one central area for easier operation. Another advantage of this option is that the system can be installed within a custom made enclosure. The dimensions for flush mounting the MicroLink system in a panel are shown in Figure 3.1.

3.1 Mounting the MicroLink Unit

There are two mounting options that allow the user to match the installation of the unit to their particular application. The unit can be mounted in a panel or it can be mounted in a separate enclosure.

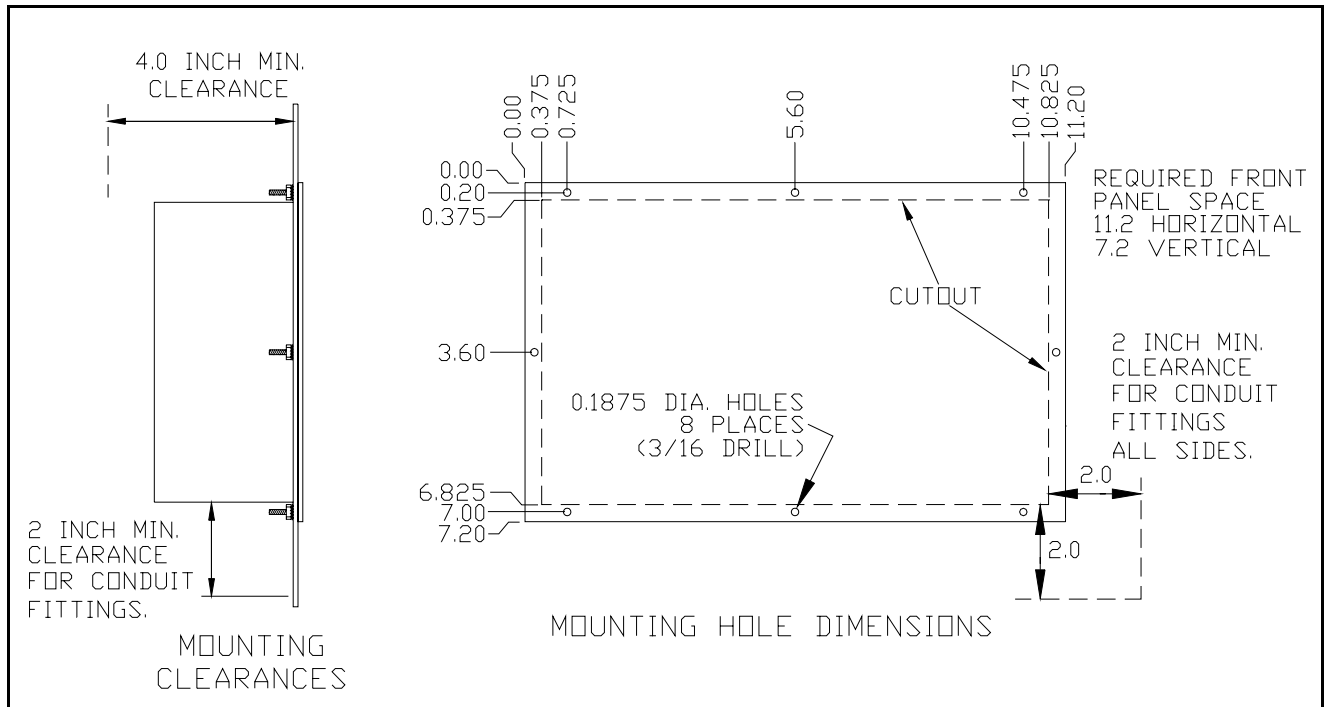


Figure 3.1: Dimensional Drawing for Panel Mount of MicroLink Enclosure

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The second mounting option is to install the MicroLink system in a separate enclosure that can be purchased from Link Systems. This typically allows the system to be mounted closer to the press bed, which helps the user to see the screen more readily and to more easily use the information from the unit. The physical dimensions of this enclosure are shown in Figure 3.2. The MicroLink system mounts in the door of the enclosure, which is hinged on the lower edge. When the unit is mounted on the machine, rubberized **shock mounts must be used**.

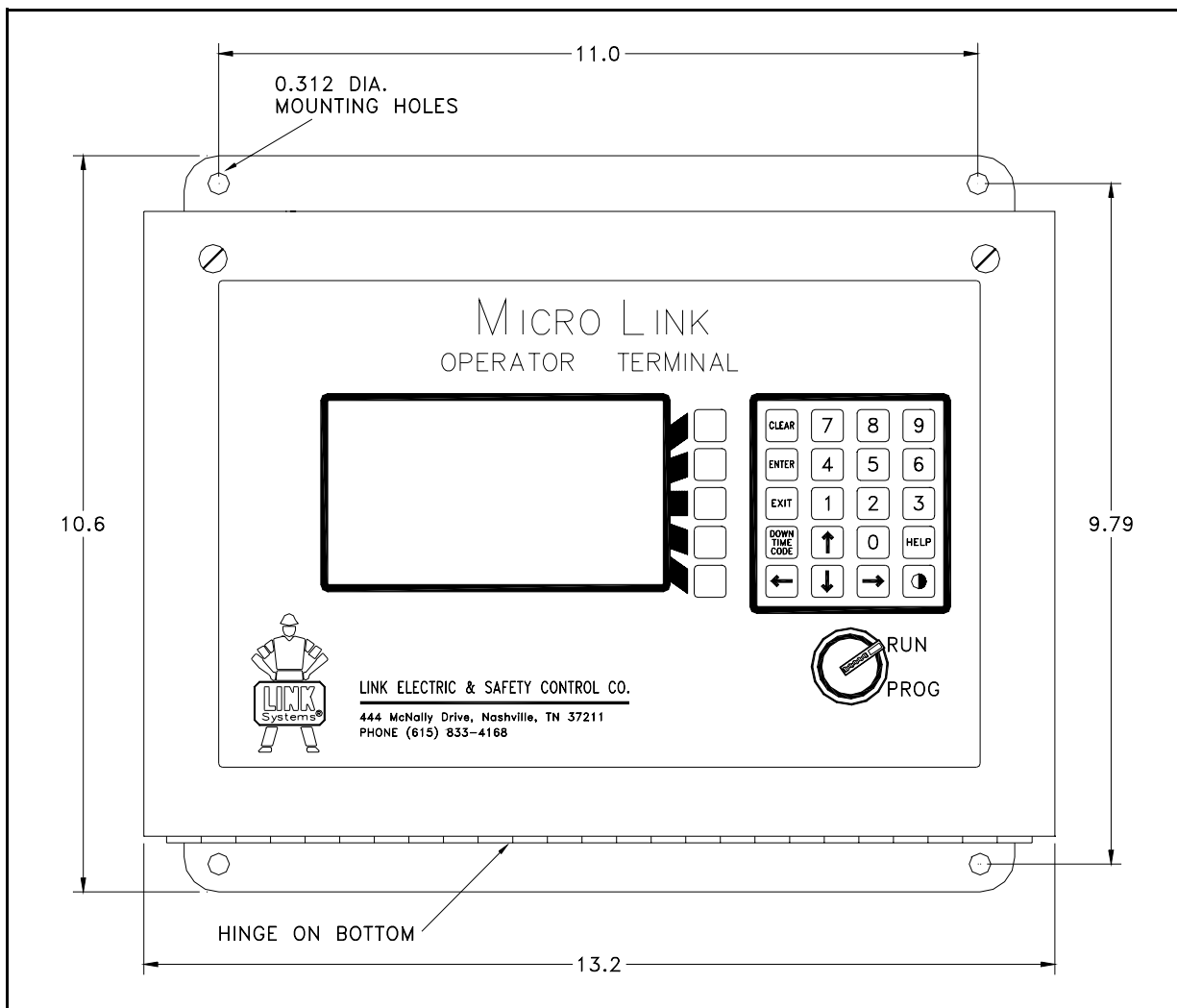


Figure 3.2: Dimensional Drawing of Remote Mount Enclosure (Hinge on Lower Edge)

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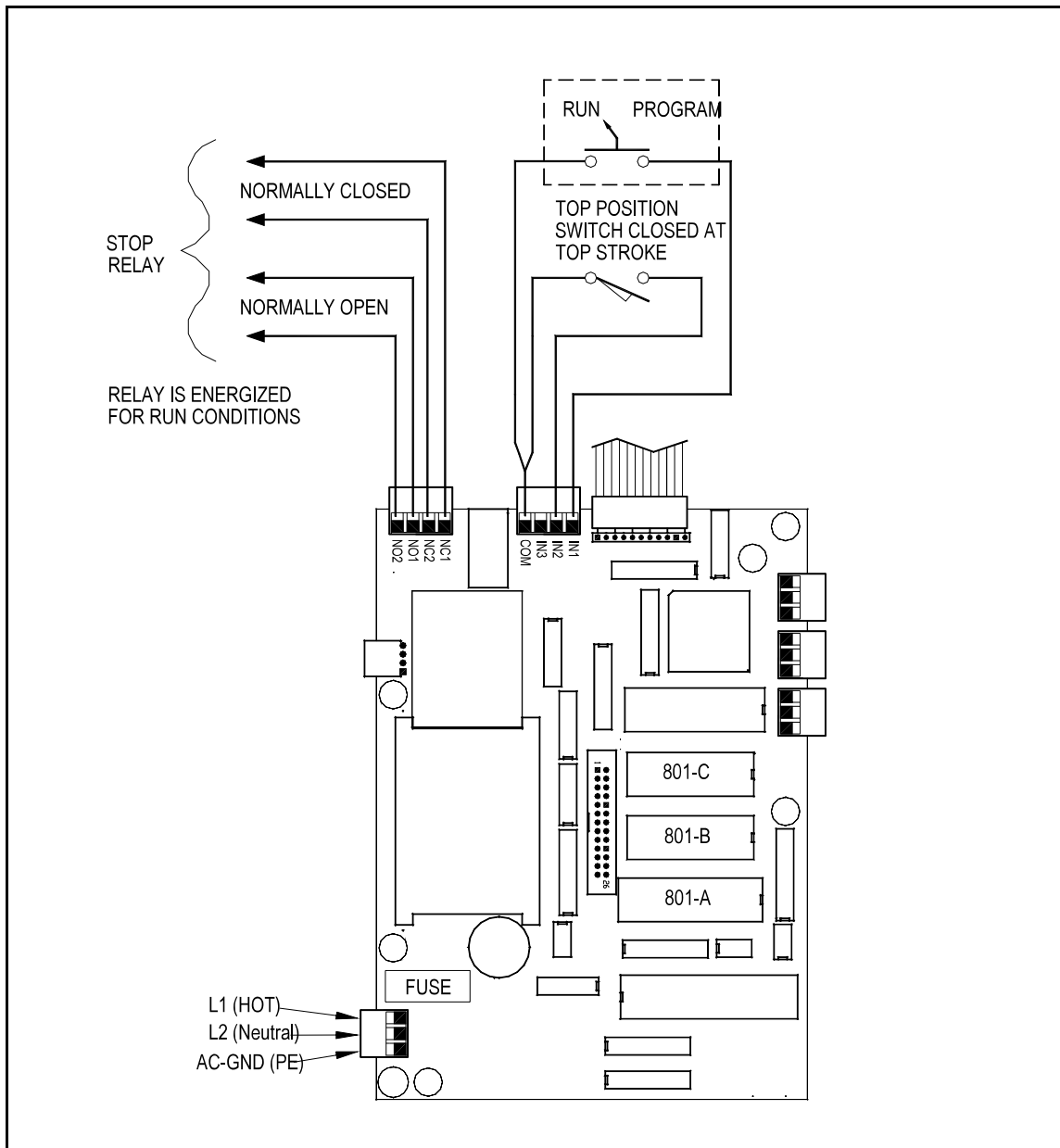


Figure 3.3: Wiring Connections Inside the MicroLink Unit

3.2. Wiring the MicroLink Unit

After the enclosure has been installed, the MicroLink system is ready for wiring. The system uses a single power connection of 115 VAC inside the enclosure. The power connection inside the unit should be made as shown in Figure 3.3. This figure represents the inside of the MicroLink unit and the three pin connector for the AC power. Note that high voltage (115 VAC) should be run in a separate conduit from low voltage DC signals, such as communication and sensor connections.

The MicroLink unit has an optional counter input that is used **only if** there is no MultiSet system on the back access cover. The MultiSet system has a dedicated “**Top**” input that performs the function of the counter input when the MultiSet system is installed. The input connector inside the MicroLink unit is the green four-pin connector next to the black keypad connection. “**IN1**” on this connector is used for the RUN/PROG key switch. The counter input in the MicroLink unit is labeled “**IN2**”. The wiring connections for “**IN2**” are shown in Figure 3.3. This input is only used if there is no MultiSet unit on the back access cover

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of the MicroLink system. "**IN3**" is for future product expansion and is not currently used.

The other four pin connector in the MicroLink unit is for the on board relay. If there is no air adjust or air adjust and slide adjust boards installed, this relay will function as a stop relay. When the counter limits are reached, this relay will send a stop signal to the press control. There are two sets of relay contacts available. One set is normally open. The other set is normally closed. When used, the stop relay is energized (turned-on) during run conditions, and de-energized (turned-off) during stop conditions. When the relay is energized (turned-on), the normally open contacts are closed and the normally closed contacts are open.

There are three serial port connections on the main board and two serial port connections on the 'piggy-back' board inside the MicroLink enclosure. The green connectors with three pins on the main board are for special purposes, such as a roll-feed interface, and are covered in a separate communications manual, called the Feed Interface manual. One of the five pin connectors on the 'piggy-back' board is reserved for future applications, the other is a LinkNet connection, which is covered in the separate LinkNet manual. Contact Link Systems for more information on these special purpose serial communication ports.

There are no other wiring connections inside the MicroLink unit. The MultiSet system is wired into the connectors on the back access cover of the unit. Complete installation information for the MultiSet system is covered in the separate MultiSet manual.

4. CONFIGURATION

The MicroLink unit has a configuration screen that allows the supervisor to change some basic settings. The operator interface terminal (OIT) configuration screen is reached by pressing the *Diagnos* soft key on the main screen, then with the RUN/PROG key in the program position press the *Config OIT* soft key and enter the code. The code is provided separately from the manual for administrative control. There are seven settings that can be changed for the OIT configuration. There are also four special reset options that erase parts of the system memory. The OIT configuration screen looks similar to Figure 4.1.

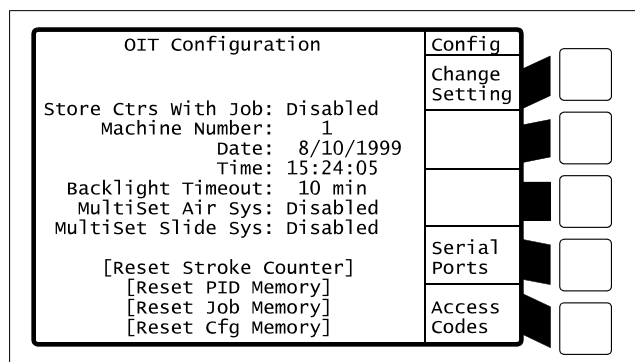


Figure 4.1: OIT Configuration Screen

Store Ctrs With Job - The first setting on the screen allows the supervisor to store the current counter information with each job. If this setting is enabled, then recalling a job will automatically set the limit, the quantity, and the state of each of the counters to the values they held when the job was saved. This includes the part, batch, quality, and scrap counters. The stroke counter is not affected because it is intended to count total strokes of the machine. See Section 5.1 for more information on counters. This option is typically disabled.

Machine Number - The next setting allows the supervisor to assign a machine number to this MicroLink unit. The machine number is used for LinkNet applications. LinkNet identifies each unit on the press room network with a machine number. This value is not used for applications that do not have a LinkNet connection. See the

LinkNet manual for more information.

Date / Time - The correct date and time are entered like any other value in the MicroLink system. Position the cursor on the value to be changed, type the new value, and press the ENTER key.

Backlight Timeout - This refers to the number of minutes that the MicroLink system will sit idly before the backlight in the display automatically turns itself off. When no keys are being pressed and the machine is not stroking, the system will initiate the backlight timeout count down. Once the timeout limit is reached the display will become dark as the backlight turns off. The backlight automatically comes on again when a key is pressed or the machine makes a stroke. This feature extends the life of the backlight.

MultiSet Air Sys / MultiSet Slide Sys - The final two settings indicate to the MicroLink unit that a MultiSet system has been installed. The MultiSet system has a separate air system control and a slide system control. If either of these systems is to be controlled, then the MicroLink configuration for that system must be enabled. For instance, if a counterbalance air system is to be controlled, but not the slide adjust system, the air system should be enabled and the slide system should be disabled. When a system is disabled it will not be monitored, so if a system is installed it should be enabled on this screen.

Reset - The last four items on this screen are reset options. The Reset Stroke Counter option allows the supervisor to make the total stroke count go to zero. Typically, the stroke counter should not be reset, but under some circumstances, such as a major machine rebuild, it may be desirable. The code is provided separately from this manual for administrative control. The remaining reset options on this screen are for erasing segments of memory. These options should only be used when instructed to do so by Link personnel.

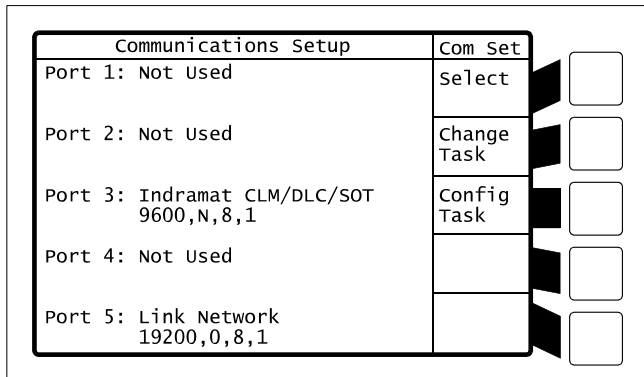
The two soft keys on the OIT configuration screen provide links to the serial port and access code configuration screens. Pressing the *Access Codes* soft key brings up a screen that allows the

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supervisor to configure the access code system. See Chapter 6 for more information.

Pressing the “*Serial Ports*” soft key brings up a screen similar to Figure 4.2. This screen shows each of the five communication ports in the MicroLink unit. The soft keys on this screen are used to configure the communication tasks, such as a roll feed interface, a LinkNet connection, or a programmable logic controller (PLC) interface. See the feed manual or the LinkNet manual for more information. Contact Link Systems for other applications.

The MultiSet system has separate configuration and calibration procedures. See the MultiSet manual for more information.



Communications Setup		Com Set
Port 1: Not Used	Select	<input type="checkbox"/>
Port 2: Not Used	Change Task	<input type="checkbox"/>
Port 3: Indramat CLM/DLC/SOT 9600,N,8,1	Config Task	<input type="checkbox"/>
Port 4: Not Used		<input type="checkbox"/>
Port 5: Link Network 19200,0,8,1		<input type="checkbox"/>

Figure 4.2: Communications Setup Screen

5. OPERATION

The MicroLink system has built-in counters, job information storage, diagnostics, and auxiliary equipment communications. The screen shown in Figure 5.1 is the main options screen for the MicroLink system. This screen is the starting point for going to any of the system screens. The chart in Figure 2.2 shows the connections between screens. This chapter describes the operation of the counters and the job information storage and recall. The access code system is explained in Chapter 6 and the diagnostic features are covered in Chapter 7. The auxiliary equipment communications are explained in the separate Feed Interface Manual and the MultiSet system is covered in the separate MultiSet manual.

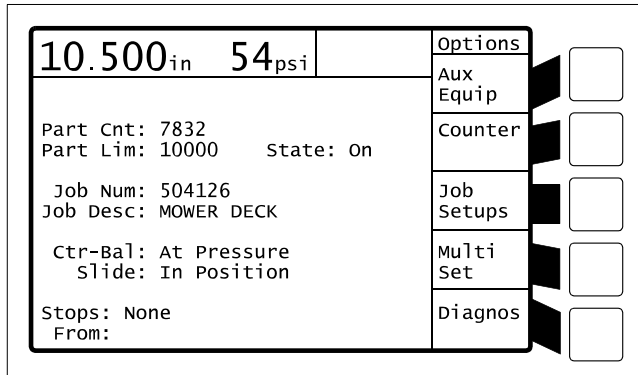


Figure 5.1: Main Options Screen

5.1 Counters

The MicroLink system uses an input to indicate the top of the stroke. This “*Top*” input is used by the system to count strokes of the press. The “*Counter*” screen is reached by pressing the soft key next to the “*Counter*” label on the main screen. After this soft key is pressed the screen will look similar to Figure 5.2.

This screen has five counters that can have three properties. The “*Quantity*” is the number of strokes that the press has made. The “*Limit*” for a counter is the quantity at which the MicroLink system will assert its top stop relay. This will stop production when the required number of parts have been made.

The stop condition will be output in one of two ways. If there are no air adjust board or no air adjust and slide adjust boards installed, the stop relay in the MicroLink terminal will be used to signal the stop. The wiring of this relay is described in Section 3.2. If there is an air adjust board or an air adjust and slide adjust board installed, the Top Stop relays whose contacts are accessible on the terminal strip located on the back access cover will be used to signal the stop.

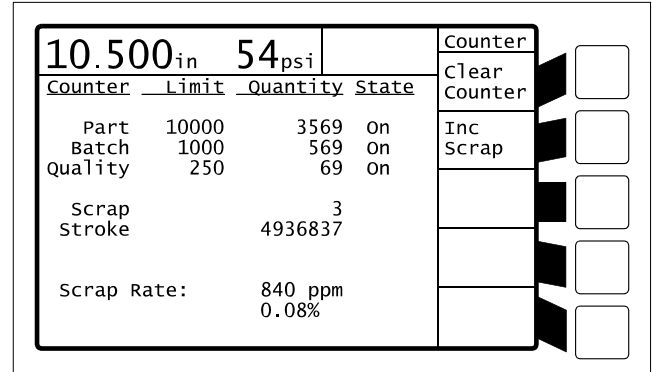


Figure 5.2: MicroLink Counters Screen

The “*State*” of the counter determines whether the quantity will be updated when a press stroke is made. If the state is set to “*On*” then the counter increases normally, but if the state is “*Off*” then the counter does not change.

The current quantity of any counter, except the stroke counter, can be set to zero by pressing the *Clear Counter* soft key.

The *Clear Tripped* soft key only appears when a counter has reached its limit. This soft key will reset the counters that have reached their limits and that are in the “*On*” state. Pressing this soft key also removes the stop output for the counter limit, which allows the press to be returned to production

The limit, quantity, and state parameters can be changed with the RUN/PROG key or an access code (depending on access code set up). This allows the supervisor to control who can change these parameters. Use the arrow keys on the keypad to position the blinking cursor on the item that you wish to change and press the appropriate

soft key. The *Change Limit* soft key allows you to enter a new number for the limit. The *Change Count* soft key allows you to enter a new number for the current count. The *Change Setting* soft key will switch the state between on and off.

The counter information can be stored and recalled on a per job basis. This option must be enabled on the OIT configuration screen (see Chapter 4). The default option does not store the counter information, but the counter quantities are reset when a new job is recalled. This is the best choice for the majority of applications.

A description of the usage of each counter is found in the following sections. The “Inc Scrap” soft key is described in the scrap counter section (Section 5.1.4).

5.1.1 Part Counter

This counter is used to track the total number of parts to be made. For instance, if a manufacturer needs to produce 10,000 parts of a particular type, then the part limit should be set to 10,000.

5.1.2 Batch Counter

This counter is used to track the number of parts in the current batch. This is typically a smaller number than the part counter. It might correspond to the number of parts required to fill a parts bin before a new one must be used. Continuing with the earlier example, if the parts bin holds 1000 parts, then the “Batch” limit should be set to 1000.

5.1.3 Quality Counter

This counter is used to track the number of press strokes that occur before performing a quality check. The manufacturer in this example may want to perform a quality check every 250 parts, so the “Quality” limit should be set to 250. After 250 parts (press strokes) a stop output is asserted and the display tells the operator that it is time to perform a quality check. The operator acknowledges the reason for the stop and resets the “Quality” counter, typically after performing the quality check. Then the operator can begin production again.

5.1.4 Scrap Counter

This special counter tracks the number of bad parts and it requires direct input from the operator. The MicroLink system counts parts based on a “Top of Stroke” input. Each time this input is activated the system increases the counters by one, even if the press has made a bad part (scrap). The “Scrap” counter works with the *Inc Scrap* soft key. If a stroke does not produce a good part, then the operator should press the *Inc Scrap* soft key. This will not only increase the “Scrap” counter, it will also decrease the “Part” and “Batch” counters if they are “On”. These counters are decreased because they track the number of good parts, so the scrap part will be subtracted from the total count. Each time the *Inc Scrap* soft key is pressed the appropriate counters are changed by one, so the key should be pressed once for each bad part that was formed.

5.1.5 Stroke Counter

This is the total number of strokes that the press has made since the most recent initialization of the counter. This counter provides an indication of how much the press has been used, which can be an important part of preventive maintenance tracking. Generally, this counter is reset only if the press itself has been completely rebuilt. Therefore, the operator can not reset the “Stroke” counter in this screen. It can only be reset in the OIT configuration screen.

5.2 Job Storage and Recall

One of the primary advantages of a flexible operator interface terminal, such as the MicroLink system, is the ease of entering and viewing set up information. The logical extension of entering the information is the ability to store the information for repeated usage. The MicroLink system provides information storage for up to 250 jobs, as well as general system configuration information. The ability to store set up information on a job by job basis is a vital feature for any intelligent production equipment because it saves time during job changeovers. It also reduces the likelihood of entering incorrect values because the

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same values are recalled each time a job is performed.

The job storage and recall functions for the MicroLink system are on the “Jobs” screen, which is found by pressing the *Job Setups* soft key on the main “Options” screen. After pressing this soft key the screen will look similar to Figure 5.3

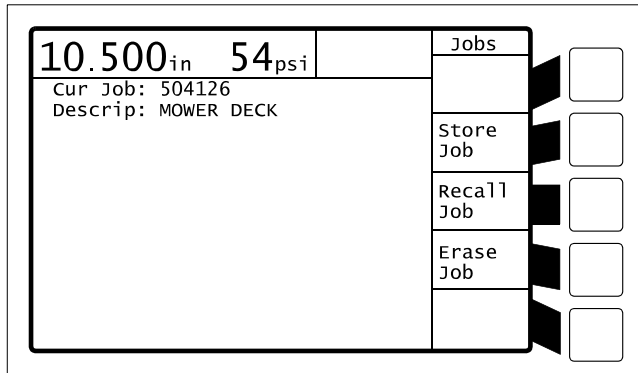


Figure 5.3: Job Setups Screen

This screen shows the current job number and the description of that job. The ability to store, recall, or erase jobs can be limited using access codes. They enable the supervisor to allow a user to recall a job, but not to store a job. See Chapter 6 on access codes for more information. Each of the soft keys on this screen are explained in more detail in the following sections.

5.2.1 Store Job

The *Store Job* soft key brings up a screen similar to Figure 5.3, but it allows the user to change the job number and the job description. Then the job can be stored to the battery powered memory device on the circuit board with the given job number and description. The job will not actually be stored until the user presses the *Store Job* soft key. If a job with the same job number already exists, the MicroLink system will ask the user for permission to overwrite the old job. Choosing “Yes” will store the new job and destroy the old job! If “No” is chosen, then the job will not be stored. The screen will always report a successful job storage with a message box. If this box does not appear, then the job storage operation failed. Once the job is stored it can be recalled at any

time and it will not change unless the job is explicitly erased or overwritten.

5.2.2 Recall Job

The *Recall Job* soft key brings up a screen similar to Figure 5.4, which has a list of all of the jobs that have previously been stored. The basic options for recalling a job are to either enter the job number or to scroll through the list of jobs. The *Recall By Num* soft key is used when the job number of the desired job is already known. Enter the job number in the pop up box and press the ENTER key. If the job number is not known, then use the *Next Page* and *Prev Page* soft keys and the up and down arrow keys to place the cursor on the job to be recalled. When the correct job number is highlighted by the cursor, press the *Select* soft key. Always read the warning that appears and use it to double check the job number and job description. If the correct job has been selected then choose “Yes”. The screen will pop up a box that informs the user that the job was not recalled if the user chooses “No” on the warning screen.

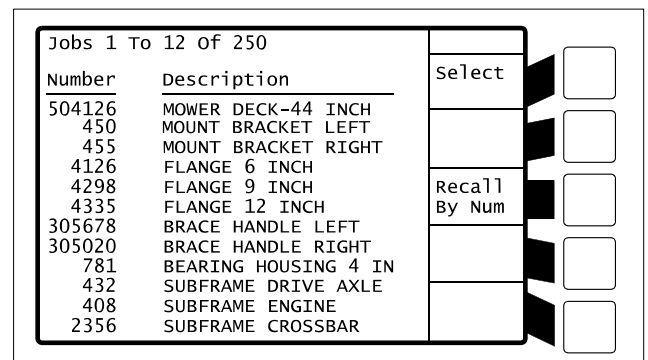


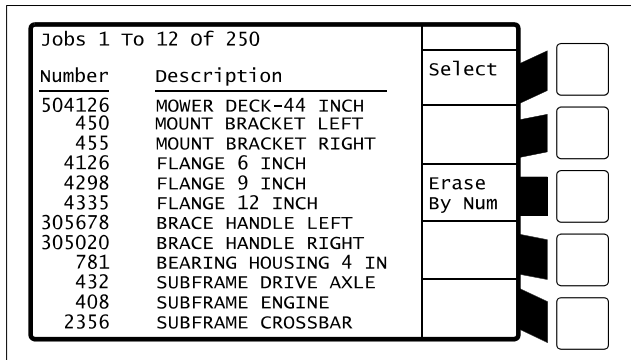
Figure 5.4: MicroLink Job Recall Screen

5.2.3 Erase Job

The *Erase Job* soft key brings up a screen similar to Figure 5.5, which is a list of all of the previously stored jobs. Note that this screen is essentially the same as the “Recall Job” screen, but that screen can only recall jobs and this screen can only erase jobs. The method of selecting a job to erase is the same as the method of choosing a job to recall. The user can either use the *Erase By Num* soft key or the cursor and the *Select* soft

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key. When a job is selected, the MicroLink system will pop up a box asking the user to verify that the selected job should be erased. If the user chooses “Yes” then the job will be destroyed. If the user chooses “No” then the job will not be affected. The screen will pop up a box that informs the user of whether the job was erased or not.



The screen displays a list of jobs with columns for Number, Description, and Select. The Select column contains buttons for 'Select' and 'Erase By Num'. The job list includes items like MOWER DECK-44 INCH, MOUNT BRACKET LEFT, MOUNT BRACKET RIGHT, FLANGE 6 INCH, FLANGE 9 INCH, FLANGE 12 INCH, BRACE HANDLE LEFT, BRACE HANDLE RIGHT, BEARING HOUSING 4 IN, SUBFRAME DRIVE AXLE, SUBFRAME ENGINE, and SUBFRAME CROSSBAR.

Jobs 1 To 12 Of 250		
Number	Description	Select
504126	MOWER DECK-44 INCH	Select
450	MOUNT BRACKET LEFT	
455	MOUNT BRACKET RIGHT	Erase By Num
4126	FLANGE 6 INCH	
4298	FLANGE 9 INCH	Select
4335	FLANGE 12 INCH	
305678	BRACE HANDLE LEFT	Erase By Num
305020	BRACE HANDLE RIGHT	
781	BEARING HOUSING 4 IN	Select
432	SUBFRAME DRIVE AXLE	
408	SUBFRAME ENGINE	Erase By Num
2356	SUBFRAME CROSSBAR	

Figure 5.5: MicroLink Job Erase Screen

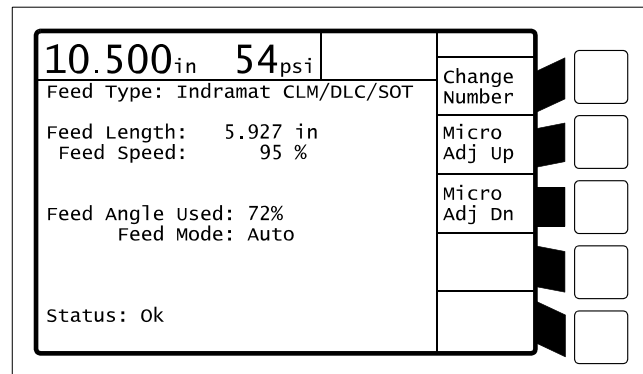
5.2.4 LinkNet: Job Storage and Recall

A MicroLink system that is running with LinkNet, the Link Systems data network for metalforming facilities, will have more soft key options on the “Store Job” and the “Recall Job” screens. These soft keys provide the option of storing and recalling jobs over LinkNet to a remote host personal computer. The LinkNet specific soft keys will include the word “Network” on their labels. The non-LinkNet storage and recall soft keys will include the word “Local” on their labels. The full details on using LinkNet for network job storage and recall are included in the LinkNet manual, which is included with the LinkNet software.

5.3 Auxiliary Equipment Support

The MicroLink system can interface with some external auxiliary equipment, such as some roll feeds and some programmable logic controllers (PLCs). This capability is built into the system through the communications ports inside the MicroLink unit. If the MicroLink system has been configured to support any auxiliary equipment, then there will be a “Aux Equip” soft key on the main screen. Pressing this soft key will bring up a

screen that reports the status of any auxiliary equipment. The “Feed” soft key on that screen will bring up a screen similar to Figure 5.6. This screen allows the user to change the feed length and the feed speed by entering numeric values on the appropriate lines with the RUN/PROG key in the PROG mode. The feed length can also be adjusted in small increments by using the *Micro Adj Up* and *Micro Adj Dn* soft keys. The system status, the feed angle used, and the feed mode are also reported on this screen. Contact Link Systems for more information on feed and PLC support.



The screen displays feed parameters: 10.500 in, 54 psi, Feed Type: Indramat CLM/DLC/SOT, Feed Length: 5.927 in, Feed Speed: 95 %, Feed Angle Used: 72%, Feed Mode: Auto, and Status: Ok. The right side of the screen has soft keys for Change Number, Micro Adj Up, and Micro Adj Dn.

10.500 _{in}	54 _{psi}	Change Number
Feed Type: Indramat CLM/DLC/SOT		
Feed Length: 5.927 in		Micro Adj Up
Feed Speed: 95 %		
Feed Angle Used: 72%		Micro Adj Dn
Feed Mode: Auto		
Status: Ok		

Figure 5.6: MicroLink Feed Interface Screen

6. ACCESS CODES

The increasing flexibility of press controls and automation equipment has led to the need to designate the access capabilities of different users and supervisors. The MicroLink system addresses this need with the option of using access codes. Access codes provide a method of controlling which settings within the MicroLink a particular user can change. The different functions and settings of the system are divided into zones that are accessed using numeric codes entered by the user. Some examples of these different zones are: configuration parameters, set point parameters, job storage, and job recall.

The access code system of the MicroLink terminal could be used to allow one group of users to recall job information, but not change setpoint parameters or save job information. This group might be familiar with operating the press, but not with set-up tasks, so the access code allows them to recall job information (like the shutheight setpoint), but not to change the shutheight that has been saved for that job. Another group of users may have an access code that is configured to allow them to recall job information, to change set points, and to save job information. This group of users would typically be the ones responsible for job set-up.

This individualized approach to access provides flexibility and only requires a few configuration steps for each user group. The MicroLink terminal can also be configured to use just the “Run/Prog” key for all access areas.

The access code system is simple to use. When the cursor is on a field that requires an access code, there will be a *Supply Code* soft key. Press this soft key and use the arrow keys to highlight the desired user, then press the *Select* soft key. Enter the correct code and access will be given.

6.1 Access Code Screen

The access code screen is used to configure the individual access codes that are used in the MicroLink system. In order to get to the access code screen, the user must have the RUN/PROG

key switch in the PROG position. From the main “Options” screen, press the *Diagnos* soft key. On the diagnostics screen, press the “*Config OIT*” soft key, which is only present when the RUN/PROG key is in the PROG position. The MicroLink screen will pop up a window that tells you to “*Enter Pass Code.*” This is a special pass code that is set by Link Systems and is included separately from this manual for administrative control. The user must enter the pass code here and press the ENTER key on the keypad. If the code is wrong then the system will display a message that says “*Incorrect Code!*”. If the correct pass code is entered, then the system will enter the OIT Configuration screen (see Figure 4.1). Press the *Access Codes* soft key and the screen should look similar to Figure 6.1. The RUN/PROG key switch must remain in the PROG position on this screen.

ACCESS CODE CONFIGURATION	
Run/Prog Key: Exclusive	
Access Timeout: 30 seconds	
Access Timeout: 5 strokes	

User Description	Used
SETUP CREW	Yes
OPERATOR	Yes
User 3	No
User 4	No
User 5	No
User 6	No
User 7	No
User 8	No

Figure 6.1: Access Code Screen

6.2 Functional Modes of the RUN\PROG Key

A primary objective of the access code idea is to provide supervisors with greater flexibility by allowing them to configure the system according to their needs. This flexibility starts with setting the functional mode of the RUN/PROG key to one of the four optional settings. There are some operations in the MicroLink system that require the user to enter a number or to select an option, such as setting count limits, choosing job numbers, or changing the time and date. All of these operations are considered edit operations because the user is editing or changing some information. The information that is highlighted during the edit operation is called a field. The

setting of the functional mode of the RUN/PROG key determines what is required for a user to edit a field. Each of the four functionality settings is briefly described below and more detail is given in the subsections that follow.

Exclusive - The RUN/PROG key must be in the PROG mode. Access codes are not used at all.

Required - The RUN/PROG key must be in the PROG mode, and a valid access code must be entered.

Not Required - The RUN/PROG key is not required, but a valid access code must be entered.

Accesses All - Either the RUN/PROG key must be in the PROG mode or a valid access code must be entered.

6.2.1 RUN/PROG Key Exclusive Mode

This mode does not require user configurable access codes, but it does require the RUN/PROG key in order to edit fields. The “Exclusive” mode operates the same as some other Link Systems products, such as the OmniLink Press Control, the System 1100 Tonnage Monitor, and the System 2500 Die Protection and Programmable Limit Switch. Anyone familiar with these Link Systems products will be familiar with the operation of the “Exclusive” mode.

Simplicity is the primary advantage of this approach. There are no access codes to enter and there are only two user groups. Users with a key can edit items, and users who do not have a key can not edit items. The “Exclusive” mode may work well for smaller facilities that have only a few users. The disadvantage of this approach is that if someone obtains the key to make any changes, they also have access to all edit fields because the individual user groups and their access privileges are not being used. This mode may also present some problems in larger facilities because it may be more difficult to keep track of who has keys.

6.2.2 RUN/PROG Key Required Mode

This mode requires both the RUN/PROG key and

a valid access code, which takes the “Exclusive” mode another step. A user must have the RUN/PROG key in PROG mode and have the access code of a user group that has been authorized to edit that particular area before they can edit a field.

Control of who has edit access for a particular field is the primary advantage of this mode. It provides the greatest protection from someone making unauthorized changes.

6.2.3 RUN/PROG Key Not Required Mode

This mode does not use the RUN/PROG key at all for most edit operations, but a valid access code is required. The primary advantages of this mode are that the users do not have to carry an actual key and the access codes can be changed if a user group changes. This allows the RUN/PROG key to be kept in the control of a few supervisors, since it is only used for special configuration settings in this mode.

6.2.4 RUN/PROG Key Accesses All Mode

This mode does not require the RUN/PROG key for most edit operations, but a valid access code is required. If the user has the RUN/PROG key in the PROG mode, then an access code is not required. This is similar to the “Not Required” mode in normal usage. The difference is that the RUN/PROG key can be used to override the access code system.

If the RUN/PROG key is used, it saves time by avoiding the steps of choosing a user group and entering a valid access code. This time savings would be useful for people who make many changes. The access codes are still defined by user group and can be set up to give different users access to different areas as with the other modes. The RUN/PROG key functions like a ‘master’ code that has access to every area. Since the key has full access in the “Accesses All” mode, even without a valid access code, it is important to control possession of the RUN/PROG key.

6.3 Access Timeout

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After a user has entered edit mode with a valid access code, the MicroLink system remains in edit mode while the user is making changes. The system must leave edit mode when the user is finished with their changes. This logout operation can be done either by the user or automatically by the MicroLink system. The user can leave the edit mode explicitly by pressing the contrast key on the keypad (see Section 2.8). The automatic logout is based upon either the amount of elapsed time (seconds) or the number of press cycles (strokes) since the most recent key press on the MicroLink keypad. These parameters are set on the “Access Timeout” lines on the access code configuration screen shown in Figure 6.1.

For instance, if the “Access Timeout” is set to 30 seconds or 5 strokes and a user changes a set point (in edit mode) and then does not press any more keys, the system automatically leaves the edit mode after either 30 seconds or 5 press cycles (strokes), whichever is first. Alternatively, the user could have pressed the contrast key (see Section 2.8) to immediately leave the edit mode, instead of waiting for the automatic access timeout.

The “Access Timeout” is only meaningful when access codes are being used. If the RUN/PROG key setting is “Exclusive”, then the access code settings do not matter because they are not used.

6.4 User Description

The access code system provides 8 user groups. Each user group can have an unlimited number of individual users. The description and access areas of a user group are changed by moving the cursor to the desired user group and then pressing the *Select* soft key. After pressing this soft key the screen will look similar to Figure 6.2.

USER CONFIGURATION	
User: SETUP CREW	Edit
Code: 1234	Text
Used: Yes	
PERMISSIONS	
Recall Jobs:Y	
Store Jobs:Y	
Adj Auto-Setup:Y	
Cfg Auto-Setup:N	
Cfg Counters:Y	

Figure 6.2: Access Code Configuration Screen

6.4.1 User Configuration: User

The “User” line can be selected in order to change the text that appears on the list of user groups. This description may describe who uses the access code, such as “Set Up” or “Operators”, or it may be anything else that helps a user to quickly identify the desired group from the list of all user groups.

6.4.2 User Configuration: Code

The “Code” line is where the access code is entered or changed. This is the number that a user is required to enter after selecting a user group. The number can be from 1 digit up to 4 digits. On other screens, access codes only appear as asterisks when the user enters them. As with any pass code, this number should not be easy to guess, but it should be reasonably easy to remember.

The access code can be changed or viewed in this screen at any time by someone with the appropriate access. If the access code for a user group needs to be changed because the user group has changed, then changing the “Code” line is the only necessary step.

6.4.3 User Configuration: Used

The “Used” line is for setting whether this particular user group is available on the list of user groups. If this line is set to “No”, then this user group does not appear on the normal list of user groups during operation. Typically, this will be set to “Yes” once this group has been defined;

however, the user group can be disabled without changing the rest of the configuration by setting this to “No”.

6.4.4 User Configuration: Permissions

The permissions section of the screen is used to set the level of access for a particular group. The list of areas in the permissions section corresponds to the areas that require an access code. Each user group can be given clearance for a particular area by choosing “Y” (yes) or denied access by choosing “N” (no). For example, a user group such as daily operators may need access to recall jobs, but not to store jobs. The “*Recall Jobs*” line would have “Y” and the “*Store Jobs*” line would have “N”.

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7. DIAGNOSTICS

The MicroLink system includes diagnostic features to help solve problems with the operation of the system. The diagnostics section helps a user to verify that the circuit boards have been installed and detected by the MicroLink unit. It also contains information about the status of the inputs, outputs, and the last memory recall of the MicroLink system.

The diagnostic information is located on the screen that comes up when the *Diagnos* soft key is pressed on the MicroLink main screen. The diagnostic screen looks similar to Figure 7.1

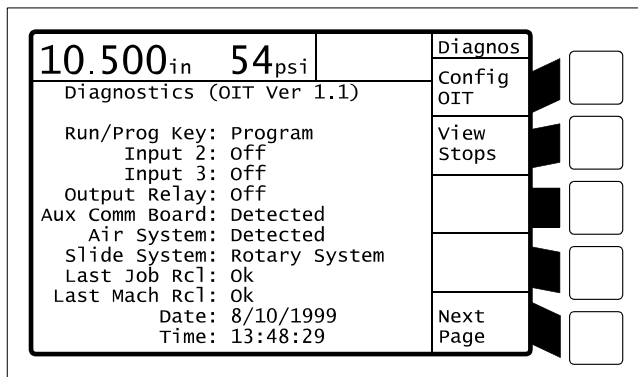


Figure 7.1: OIT Diagnostic Screen

The first line of the screen shows the version number of the firmware. This makes it possible to determine the firmware version number without opening the MicroLink unit. This information is useful when contacting Link Systems for troubleshooting help. The next three lines show the status of the three main board inputs, including the RUN/PROG key. When the RUN/PROG key is in the PROG position, that line will say *“Program”*. The output relay status is given on the next line.

The next three lines show which system boards have been detected. The *“Aux Comm Board”* plugs into the MicroLink main board and should always be detected. The *“Air System”* and *“Slide System”* boards are part of the MultiSet system and should be detected if they have been properly installed.

The next two lines indicate whether the last memory recall of the job information and of the machine information were successful. These lines will say *“Ok”* under normal operation. The date and the time are given on this screen also.

Note that this screen only reports information and no data can be changed directly in this screen. The soft keys are only used to go to other screens. The *Config OIT* soft key is only present when the RUN/PROG key is in the PROG position. Pressing this key will take the user to the configuration screen for the MicroLink system. The *View Stops* soft key will take the user to a list of all current stop conditions from the MicroLink system. The *Next Page* soft key will take the user to the MultiSet air and slide adjust system diagnostic screens, if these systems are installed. (See the MultiSet manual for more information.)

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APPENDIX A. INSTALLATION OF MICROLINK FIRMWARE

Firmware for the MicroLink display and MultiSet system is contained on an integrated circuit (also called a chip) within the MicroLink display. Please follow the instructions listed below for replacing the MicroLink firmware.

1. Remove all power from the MicroLink display. Changing firmware with the power on will damage the unit. **Warning! The connectors from the back access cover to the air valve and slide motor starter carry 120 VAC! Be certain that power is also removed from all of these sources.**
2. Remove the two screws from the back access panel of the MicroLink operator terminal, and carefully tilt the back access panel outward. Disconnect the ribbon cable that is plugged into the circuit board on the back access panel.
3. Unscrew the four screws on the small board inside the display, and unplug the board. See Figure A.1.
4. Locate the integrated circuit (chip) labeled “801-A”, “801-B”, or “801-C” and note the location of the notch on this chip. Gently, remove the chip that is being replaced. See Figure A.2.
5. Insert the new integrated circuit (chip) carefully to avoid damaging any of the pins on the chip. Verify that the notch on the chip is as shown in Figure A.2 and that the correct socket has been used.
6. Plug the small board onto the main board. The mounting holes on the small board must line-up exactly with the metal standoffs. If they are not aligned then remove the small board and move it to obtain the correct alignment. Screw each of the four screws into the board once the appropriate alignment is obtained. Refer to Figure A.1 again.
7. Connect the ribbon cable to the board on the back access cover. Be sure to line-up the polarizing tab on the ribbon cable connector with the slot on the board connector.
8. Put the access cover back into place and add the two screws to it.

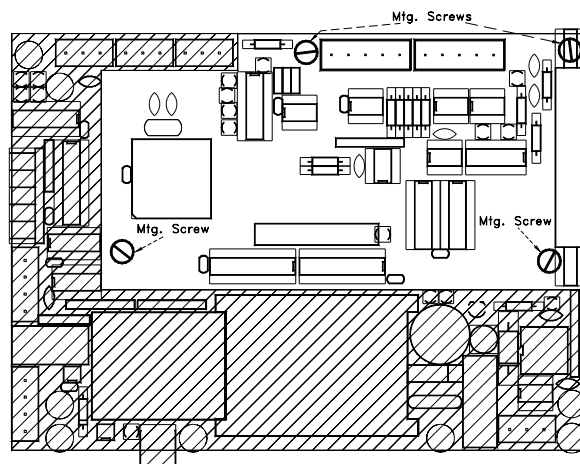


Figure A.1: Mounting Screws on Plug on Board

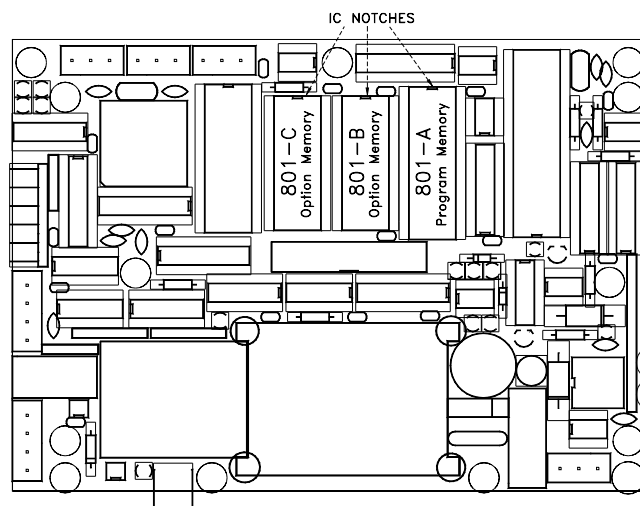


Figure A.2: Location and Orientation of Firmware

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APPENDIX B. ELECTRICAL SPECIFICATIONS

B.1 MicroLink / MultiSet Enclosure

Size: 11.2" wide, 7.2" high, 4" deep
Operating Temperature: 45°C (113°F) Maximum Ambient

B.2 801-1 MicroLink Logic Board

Input Power Supply: Voltage: 115VAC \pm 15VAC, 60 Hz, Single Phase
Fuse: 250 mA, Slow Blow, (5mm x 20mm)

Electromechanical Relay: Voltage: 120VAC, 60 Hz
(or) 30VDC
Current: 5Amp Continuous (AC or DC)

B.3 801-3 Air System Control Board

Electromechanical Relay: Voltage: 120VAC, 60 Hz
(or) 30VDC
Current: 5Amp Continuous (AC or DC)
Normally Open, Energized Closed

AC Solid State Relays: Voltage: 120VAC, 60 Hz
Current: 1Amp Continuous
20 Amp 16ms
5 Amp 75ms
Fuse: 2 Amp Fast-Blow Picofuse

B.4 801-4 Rotary Shut Height Control Board

AC Solid State Relays: Voltage: 120VAC, 60 Hz
Current: 1Amp Continuous
20 Amp 16ms
5 Amp 75ms
Fuse: 2 Amp Fast-Blow Picofuse

B.5 801-5 Linear Shut Height Control Board

AC Solid State Relays: Voltage: 120VAC, 60 Hz
Current: 1Amp Continuous
20 Amp 16ms
5 Amp 75ms
Fuse: 2 Amp Fast-Blow Picofuse

