

**ProHelp ®**

**Production & Process Monitoring System**

**Operator's Manual for 10X, 5/XS, & 0/XS MIUs**

**Rev C**

**MANUAL # 710-0086**

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## **ATTENTION**

The information contained within this manual is critical to the proper installation of the MATTEC ProHelp System. Please review this manual completely **BEFORE** starting your installation. Resolve any questions immediately with the MATTEC Customer Service Department.

### **IMPORTANT MATTEC PHONE NUMBERS**

MATTEC Customer Service Department .....(513) 683-1075

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## 1. Introduction

MATTEC Corporation's ProHelp Production Monitoring System is specifically designed for real time monitoring of all types of production equipment. It is used extensively in the plastics, extrusion, aluminum die casting, and metal stamping industries. The basis behind the benefits from the ProHelp System is the rationale that plant managers and operational people will take corrective actions to solve problems on production equipment when they are aware of such problems. ProHelp is the device to alert employees to problems immediately when the problems occur. Therefore, tremendous savings can occur in increased productivity and decreased scrap parts.

The ProHelp System is a combination of computer hardware, computer software, and **Machine Interface Units (MIUs)** that are combined into an efficient system to provide real time production monitoring, production reports, process alarms, plant scheduling aids, and SPC process and part capability analysis. Floor personnel can make use of the machine mounted terminals to signal different departments for help, to view production results at the machine site, and to enter downtime reasons or scrap reasons. Production, downtime, and scrap reports may be generated on a shift and daily basis, or the user may generate these reports for extended time periods by specifying a start and end date for the desired report. Job history data is continuously summarized and available for management's review.

The following manuals should be referenced for further details; *ProHelp Millennium Operator's Manual, Release 2.7X/2.8X, #710-0088* and *ProHelp EPM System User's Guide, Release 5.10, #810-0001*.

### Machine Interface Unit (MIU)

The Machine Interface Unit, hereafter referred to as an MIU, is the interface between the Host and the machines in your plant. The main purpose of the MIU is to collect and record production information such as run/downtime, part and cycle counts, and cycle times. Different level MIUs can be purchased which allow for operator keypad input and the monitoring of various process parameters.

A Belden #8777 type cable is connected to the ACU board in the Host, and then daisy chained to each MIU, with a maximum of 16 MIUs per communication channel (four channels per Host / Monitoring Node). One MIU is required for each machine/station to be monitored.

## 2. Overview

Mattec's MIUs are menu driven. The user starts at the Main Menu and selects a menu item. Then depending on the item selected, the user can view information, continue the menu selection process or perform tasks on the information provided.

### **Physical Characteristics:**

The MIU assembly consists of an outer shell, a terminal strip board, and the unit itself with power supply, microprocessor board, front panel and cables. The shell is designed to be mounted to the machine with all conduit permanently attached. The wiring is routed into the shell and terminated at the terminal strip board. This allows for a modular connection of the MIU to the shell for easy installation.

There are different types of front panels depending on which level of MIU ordered. The following paragraphs will describe the physical characteristics and general operational capabilities of each MIU level.

### **Operational Characteristics**

When looking at the copyright screen, there are many things actually happening. All of the Machine Interface Units (MIUs) are being polled and collected data is being transmitted to the Host computer. Additional computer terminals are connected to the system, someone at those terminals could be logged in and simultaneously running ProHelp Millennium. If the current time corresponds to the predefined shift change time, the system could also be summarizing the activities of the current shift and recording that data in history files on the hard disk.

Every minute, the status of the jobs running on all the monitored machines is written to the disk. This activity preserves the state of each machine until the next status record is written. As you can see, the fact that you are looking at a fairly inactive screen does not mean the system is not working.

The ability to perform many activities at one time is a characteristic of the ProHelp Millennium system and is called **multi-tasking**. The ability to serve more than one computer node or terminal simultaneously is called **multi-user**. Both are important characteristics of the ProHelp Millennium system.

ProHelp Millennium is designed to continue collecting data whenever possible. The monitoring node and each MIU are independent computers. Each MIU collects local data about the machine it is monitoring and transmits the data to the main computer when polled. An MIU will continue collecting data without loss for up to 18 hours without being polled by the monitoring node. The data collected are totals for cycle counts, run time minutes, downtime minutes, Statistical Process Control (SPC) sample data, and the first entry for scrap reason and quantity.

If power is lost to the monitoring node, the MIUs continue to collect data. When power is restored, the collected data is then sent by the MIU to the computer for storage. After 18 hours without communicating with the monitoring node, the MIUs overflow their counters, and data integrity is lost. If power is lost to an MIU, then it fails to see the

machine run and cannot communicate with the monitoring node and that machine is recorded as down for the entire period.

## **2.1 MIU Types**

The following is a brief description of all MIU types produced by Mattec Corporation. Only the MIU 10X, MIU 5/XS, and MIU 0/XS are described in detail by this manual. Operation of prior MIU models is described in 710-0037.

### **MIU-0:**

The Level 0 MIU is designed to provide basic production monitoring for up to four machines per MIU. This unit is normally located in a central location so that cycle signal wiring from all four machines can be routed and terminated in this one shell. This provides an economical method of production monitoring. However, outputs, extra inputs, and process parameter monitoring are not possible on the Level 0.

The front panel on this box is almost identical to the Level 2 with a redefinition of the functions and an appropriate label overlay.

### **MIU-1:**

The Level 1 MIU has a different faceplate than the Level 0 or 2. It has a Machine Status and a Call for Help Switch but has no Keypad or message readout window. With the Machine Status Knob, you can allocate downtime to a specific reason.

### **MIU-2:**

The Level 2 MIU allows for operator entry of scrap parts and operator login capabilities. A keypad and a 16-character alphanumeric data display are included with the Level 2 MIU. A Level 2 MIU can perform all functions of the Level 1 MIU.

### **MIU-3:**

The Level 3 MIU has all of the capabilities of a Level 2 MIU. It has an additional "top hat" shell in which are mounted the analog circuit board (for monitoring temperatures and pressures), additional digital input circuits, an RS-232 serial board (for gage inputs and direct communications with machine controllers), and optional warning light interface circuit boards.

### **MIU 0-NP, 2-NP, and 3-NP:**

The suffix after these MIU model numbers stands for New Package. The NP is a newer design and replaces the older model MIUs. These MIUs have the same functional capabilities as the older style 0, 2, and 3, however the interior board and package have been redesigned. The physical package of the MIU is gray with a hinged front cover for easy access to the interior wiring terminal. The MIU faceplate is the same as used on the Level 0, 2, and 3 MIUs.

#### **MIU-4:**

The Level 4 MIU is completely different in appearance than the Level 0 through 3 MIUs. It has a large 16 x 40-character display and alphanumeric keypad. This MIU displays entire screens of real time information at the machine. Selection and entry of information are made by menu key selections (as compared to key code entries). It can be equipped with all of the monitoring capabilities (temperatures, pressures, RS-232 channel) that are available on a Level 3 MIU.

#### **MIU-5 and 6:**

These MIUs have a 16 X 40-character display and are completely Menu key driven. Entire screens of information are available at the machine. With an additional option, these MIUs can also display process graphs and XbarR charts. In addition, the Level 6 MIU has discrete analog channel inputs.

#### **MIU-7 and 8:**

These MIUs are similar to the Level 5 and 6 respectively. The 7 and 8 however have a backlit screen display and a standard printer port. In addition, the Level 8 MIU has discrete analog channel inputs.

#### **MIU-4X, 5X, 6X, 7X, and 8X:**

The "X" type MIUs are similar in appearance and basic function to their older counterparts. These units have considerably more processing power than even the "NP" (New Package) MIUs. As a result, new features are designed more frequently for "X" type MIUs than other MIUs.

#### **MIU-9:**

The Level 9 MIU is a low cost MIU without operator warning lights. It is similar in function to the Level 2 MIU.

#### **MIU-0/XS:**

The MIU 0/XS includes all the operator functions of the MIU 10X. Missing is the discrete interface capability. In normal configuration, the MIU 0/XS is used to interface 4 machines in a cell concept. All four machines can be monitored simultaneously. Selection of the operator interface for each of the machines is done via the main display. Four digital input contacts only are provided in order to interface the cycle time contact from each of the machines. While the only processing monitoring capability available in the MIU 0/XS is cycle time, SPC variable and attribute data entry for all four machines is supported.

#### **MIU-5/XS:**

The MIU 5/XS includes all operator interface functions of the MIU 10X. Missing is the discrete interface capability. In normal configuration, the MIU 5/XS includes 2 digital input contacts and 1 digital output contact. All communication ports are supported. Typically the MIU 5/XS is purchased with PLC interface software to provide process monitoring. A list of supported PLC's is available in Manual 710-0078. All process

parameter monitoring capability is supported in the MIU 5/XS, including variable and attribute data entry.

**MIU-10X:**

The MIU 10X is a high performance process monitoring Machine Interface Unit. It includes a 16 x 40 LCD display for operator interface. In its standard configuration, it includes 6 true analog input channels for monitoring temperatures, pressures, and other transducer inputs, 8 digital inputs that may be used for timers and counters, and 2 digital outputs. In its extended version, it includes 6 additional analog inputs, 6 additional digital inputs, and 6 additional digital outputs. Two auxiliary communications ports are standard in the MIU 10X, Com 2 that is a RS 232 port with built in Gage Port interface, and Com 3 that is configurable as a PLC interface port and may be current loop, RS 485/422 or RS 232. This is jumper selectable in the MIU, described in Manual 710-0043.

**PC MIU:**

The PC MIU is a cell controller that can monitor from 1 to 8 machines, each with process parameter capabilities. In addition to an easy-to-use MIU interface, the PC MIU is capable of running the same software that runs on the Host computer. This can effectively turn your entire shop floor into a large office for the Q.C. and production departments.

**TIU:**

The Transaction Interface Unit (TIU) is a hardware device used for indirect labor tracking of machine operators. The TIU is similar in appearance to an LED MIU, with the exception of the special operator logging keys, and connects to ProHelp Millennium as if it were an MIU. Unlike the MIU, the TIU does not connect to a machine.

### 3. MIU Operating Instructions

When the MIU is powered on, the following screen will display. The (*F*) keys are not actually marked on the MIU but will be used as reference throughout this document.

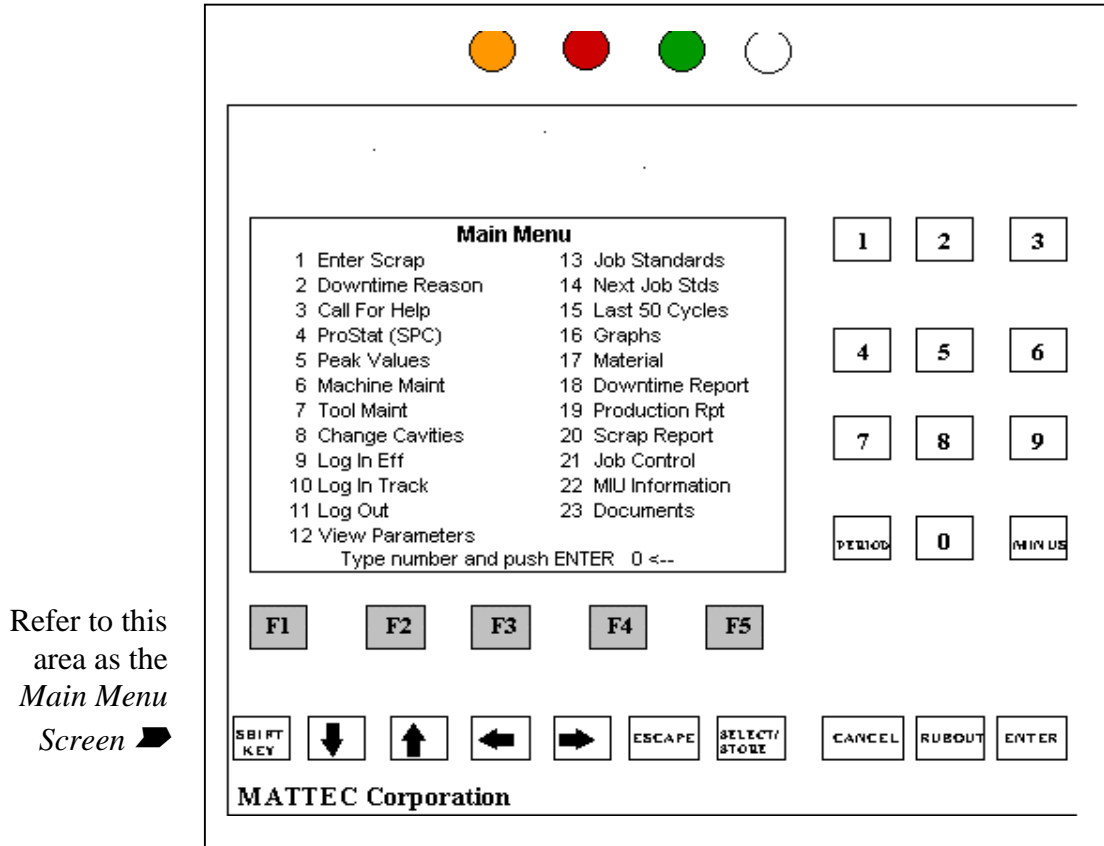


Figure 3-1 MIU Front Panel

### 3.1 Lights

There are four operator indicator lights located along the top front panel of the MIU. These lights indicate:

<b><i>Machine Parameter</i></b>	lights are used to alert operators to machine parameter conditions. These lights are:  <b>green</b> - all monitored parameters are within limits  <b>red</b> - one parameter(s) has exceeded its upper specification limit (digital = too slow/analog = too high)  <b>white</b> - one parameter(s) exceeded its lower specification limit (digital = too fast/analog = too low)
<b><i>Job Indicator</i></b>	light indicates job status.  <b>amber</b> - reflects the status of the "Parts to Go" (lot size) field. When "Parts to Go" is 0 or less, the amber light will come on

### 3.2 Keypad

Following is a description of the keys found on the front panel of the MIU (reference Figure 3-1 MIU Front Panel).

<b><i>Numeric Keypad</i></b>	Keys 0 - 9 operate as number keys to input numbers for menu selection and calculation purposes. The period key adds a decimal point between numeric values and the minus key inserts a negative value symbol (-) for a numeric value.
<b><i>Escape</i></b>	Takes the screen back to previous screen.
<b><i>Store</i></b>	Once a data value is confirmed by using the <b><i>Enter</i></b> key, the <b><i>Store</i></b> key sends this information to the Host Computer and returns to the previous menu or screen.
<b><i>Cancel</i></b>	Takes the screen back to the main screen.
<b><i>Rubout</i></b>	Used to correct any mistakes on data input.
<b><i>Enter</i></b>	Saves input of data to screen.
<b><i>Arrow Keys</i></b>	Used to move from field to field.
<b><i>Shift Key + Store</i></b>	If a serial printer has been installed, pushing these two keys simultaneously performs a Print Screen. Any screen within the MIU's menu structure can be printed using these two keys.
<b><i>Menu Selection Keys</i></b>	These are the five (5) keys located directly below the LCD screen. Reference the (F) keys. They perform the menu selections displayed directly above their positions on the screen.

### 3.3 Main Menu Items

Mattec's MIUs are menu driven. The user starts at the **Main Menu** and selects a menu item. Then depending on the item selected, the user can view information, continue the menu selection process or perform tasks on the information provided.

#### 3.3.1 Enter Scrap

This function allows the entry of scrap parts to a specific Scrap Reason for a single job. Scrap names are defined by the System Manager. These can be defined differently for each department. The system records the amount of bad parts entered for twenty primary and ten secondary scrap reasons for a total of 200 reasons and keeps histories for the present shift and the total job. Scrap parts are entered at the computer or MIU for the job presently running.

To enter scrap:

**Press: 1** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The following will display:

PRIMARY SCRAP REASON	
Select Primary Reason	
P_Scrap 01 ←	P_Scrap 11
P_Scrap 02	P_Scrap 12
P_Scrap 03	P_Scrap 13
P_Scrap 04	P_Scrap 14
P_Scrap 05	P_Scrap 15
P_Scrap 06	P_Scrap 16
P_Scrap 07	P_Scrap 17
P_Scrap 08	P_Scrap 18
P_Scrap 09	P_Scrap 19
P_Scrap 10	P_Scrap 20
<i>Entry</i>	

**Figure 3-2 Scrap Reason Screen**

The flashing cursor ← will be positioned at Reason #1.

If secondary scrap reasons are NOT enabled at the host, pressing the *Entry* function key will display the scrap entry screen for the reason selected (1 of 20). This screen is shown in Figure 3-3 Auxiliary Scrap Parts Entry-Not Enabled.

SCRAP PARTS ENTRY	
Scrap Reason	Quantity
P_Scrap 01	10

**Figure 3-3 Auxiliary Scrap Parts Entry-Not Enabled**

Quantities can be entered for all Scrap Reasons before storing the values on the host. Entering a negative value removes the quantity from scrap and puts it back in good parts.

**Press:** (*Arrow*) keys to highlight desired field.

To enter scrap reasons:

Position cursor ← next to scrap reason

**Press:** (*F1*) *Entry*

**Enter:** *quantity of scrap parts*

**Press:** *Enter*

Continue this process for all scrap entries.

To return to the main Scrap Reason Screen without saving:

**Press:** *Escape*

To send information to the host and return to the main menu:

**Press: *Store***

To abort scrap entry:

**Press: *Rubout* or *Cancel***

When secondary scrap is enabled at the host, pressing the *Entry* function key displays the 10 secondary scrap reasons and allows entry of a quantity for each secondary reason.

This screen is shown in Figure 3-4 Auxiliary Scrap Parts Entry - Enabled

SCRAP PARTS ENTRY	
Scrap Reason	Quantity
S_Scrap1-01 ←	1
S_Scrap1-02	2
S_Scrap1-03	3
S_Scrap1-04	4
S_Scrap1-05	5
S_Scrap1-06	6
S_Scrap1-07	7
S_Scrap1-08	8
S_Scrap1-09	9
S_Scrap1-10	10

*Entry*

**Figure 3-4 Auxiliary Scrap Parts Entry - Enabled**

### 3.3.2 Downtime Reason

Downtime Reason allows the selection of a status code for a particular machine. In addition to the twenty primary downtime reasons (status codes), ten secondary downtime reasons can be enabled at the host for all downtime reasons except "*In Prod*". This gives a total of 191 downtime reasons. The downtime reason is stored at the host. The system automatically accumulates the downtime of each machine. When a job is running on a machine, the downtime records become part of the job history. The system maintains a count (CNT) of downtime occurrences and accumulates the time (HRS) against downtime reasons.

The downtime reason is selected at the MIU. If no downtime reason is selected, the unknown category (downtime reason one) is used.

Downtime begins when the cycle time exceeds the non-production limit and continues until the next cycle start signal is received. Every occurrence exceeding the non-production limit increases the downtime frequency by one.

To select a Downtime Reason:

**Press: 2** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The following will display:

```

PRIMARY DOWN REASON
Current Machine Status: In Prod
Active Selection: In Prod
Select Primary Reason
In Prod ←          P_Down11
P_Down02          P_Down12
P_Down03          P_Down13
P_Down04          P_Down14
P_Down05          P_Down15
P_Down06          P_Down16
P_Down07          P_Down17
P_Down08          P_Down18
P_Down09          P_Down19
P_Down10          P_Down20

Entry

```

**Figure 3-5 Down Reason Screen**

The flashing cursor ← will be positioned at "In Prod". The reasons displayed are the *Current Machine Status* defaults.

If secondary downtime reasons are enabled at the host, the following screen will display the 10 secondary reasons enabled for each primary code selected.

**Press:** (Arrow) keys to highlight desired field.

**Press:** (F1) *Entry*

The *Machine Status* screen will display.

```

MACHINE STATUS
Current Machine Status: In Prod
Active Selection: P_Down02
Select Machine Status
Down2-01←
Down2-02
Down2-03
Down2-04
Down2-05
Down2-06
Down2-07
Down2-08
Down2-09
Down2-10
Acknowledge Downtime Annunciator

```

**Figure 3-6 Machine Status Screen**

On the *Machine Status* screen, position the cursor beside the correct reason and push **Store** to send this information to the Host. Use the arrow keys to move the cursor to each reason and follow the same procedure to confirm the reason.

To abort entry:

**Press: *Cancel* or *Escape***

For the downtime reason to be accepted the non-production limit defined in the job descriptor must first be reached, otherwise the reason will be ignored.

The System will automatically go back into production when the MIU registers a cycle signal from the machine, unless the downtime reason has been defined as a Non-Production Code (NPC) at the ProHelp Host under System Manager.

**Acknowledge Downtime Annunciator** - if the Voice Option has been installed, it will announce that a machine is down until this menu item is acknowledged. Move the cursor to this selection and press ***Store***.

### 3.3.3 Call For Help

Allows the selection of Help Call reasons. To enter reasons:

**Press: 3** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The following will display:

```

                HELP REASON
      Last Help Reason: Supervisor

                Select Help Reason
      Supervisor ←
      Maintenance
      Relief Oper
      Parts Pickup
      Tool Repair
      Quality Cont
      Need Materl
      End of Job
      Cancel Help

      Acknowledge Help Annunciator

```

**Figure 3-7 Help Reason Screen**

The flashing cursor ← will be positioned at the first ***Help*** reason. Help Calls are entered or cancelled on this screen. On the ***Help Reason*** screen, position the cursor beside the correct reason and push ***Store***. Use the arrow keys to move the cursor to each reason and follow the same procedure to confirm the reason.

The "Last Help Reason" which was entered is always displayed.

When the desired reasons are selected, push ***Store*** to send this information to the Host.

To abort entry:

**Press: *Cancel* or *Escape***

Help reason names are user defined. The names shown here are typical examples.

### 3.3.4 Prostat (SPC)

ProStat, MATTEC's real time Statistical Process Control program, is designed to assist the user in implementing a total program of quality and process control through the application of statistical methods to machine and part related data. ProStat allows the user to collect and process data for specified jobs during their entire run. Real time screens display the "SQC Status" of all jobs where statistical process standards are being applied, and alerts the user to any "trends" or "shifts" that are detected in process or part data.

The following example describes how the Xbar, Xbarbar, R, and Rbar values are defined and calculated for MATTEC's Automatic and Manual Machine Sample collection processes.

In this example, there are 5 observations taken per sample in a series of 4 samples.

#### Definitions/Calculations:

<b><i>X</i></b>	Observation value in a Sample
<b><i>Xbar</i></b>	Average of the Observations in a Sample
<b><i>Xbarbar</i></b>	Calculated average of the Sample averages in a user defined period
<b><i>R</i></b>	The highest Observation value minus the lowest Observation value in a Sample
<b><i>Rbar</i></b>	Calculated average of the Sample Ranges in a user defined period.

<b>Sample 1</b>
Observation 1 = 10.7 = X
Observation 2 = 10.0 = X
Observation 3 = 10.4 = X
Observation 4 = 10.6 = X
Observation 5 = 10.1 = X

Xbar = 10.36  
R = .7

<b>Sample 2</b>
Observation 1 = 9.8 = X
Observation 2 = 10.5 = X
Observation 3 = 10.0 = X
Observation 4 = 10.9 = X
Observation 5 = 10.5 = X

Xbar = 10.34  
R = 1.1

<b>Sample 3</b>
Observation 1 = 10.1 = X
Observation 2 = 11.2 = X
Observation 3 = 11.0 = X
Observation 4 = 10.9 = X
Observation 5 = 10.3 = X

Xbar = 10.7  
R = 1.1

<b>Sample 4</b>
Observation 1 = 10.3 = X
Observation 2 = 10.3 = X
Observation 3 = 11.4 = X
Observation 4 = 10.2 = X
Observation 5 = 10.8 = X

Xbar = 10.6  
R = 1.2

Xbarbar = 10.5  
Rbar = 1.025

To select **ProStat**:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The following will display:

<b>ProStat SPC Menu</b>	
Automatic SPC	Variable SPC
1 Xlimits	8 Xlimits
2 Rlimits	9 Rlimits
3 Results	10 Results
	11 Entry
Manual SPC	Attribute SPC
4 Xlimits	12 Display
5 Rlimits	13 Entry
6 Results	Auto SPC Lim Calc
7 Sample	14 Initiate
Type number and push <b>ENTER</b> 0 ←	

**Figure 3-8 ProStat SPC Menu Screen**

The flashing cursor ← will be positioned after the prompt: "Type number and push **ENTER**".

This statement refers to the **numbers** appearing directly before each limit under the five headings:

- *Automatic SPC*
- *Manual SPC*
- *Variable SPC*
- *Attribute SPC*
- *Auto SPC Lim Calc*

To abort entry:

**Press: Cancel** or *Escape*

The following sections will briefly outline *Automatic SPC*, *Manual SPC*, *Variable SPC*, *Attribute SPC*, and *Auto SPC Lim Calc*.

### 3.3.4.1 Automatic SPC

The *Automatic SPC* function allows:

- Viewing of existing X Control Limits set for a Job
- Viewing of existing R Control Limits set for a Job
- Viewing of the Results of Last Automatic Machine Sample taken by the system

To view existing Automatic SPC X Control Limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: *1***

**Press: *Enter***

The Auto X Limits screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "name" column correspond only to the signal names enabled on the MIU configuration screen.

<b>AUTO X LIMITS</b>			
<b>Name</b>	<b>Xbarbar</b>	<b>XUCL</b>	<b>XLCL</b>
Cyc Time	10.00	12.00	8.00
HoldTime	0.84	1.50	0.50
Gat Time	1.10	1.70	0.40
Inj. Tim	2.50	3.00	2.00
Recovery	3.50	4.00	2.00
Melt Temp	275.10	270.70	257.00
Thrt Temp	40.00	53.00	32.00
H2O Temp	66.00	72.00	61.20
Dewpoint	220.00	287.00	189.00
H2O Flow	61.50	69.60	55.60
Inj Pres	75.40	81.20	76.90
Hold Prs	256.00	308.00	176.00
Back Prs	123.00	172.00	99.80
<i>Page</i>			

**Figure 3-9 Auto X Limits Screen**

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view existing Automatic SPC R Control Limits:

**Press: *4*** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: *2***

**Press: *Enter***

The Auto R Limits screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "name" column correspond only to the signal names enabled on the MIU configuration screen.

AUTO R LIMITS			
Name	Rbar	RUCL	RLCL
Cyc Time	10.00	12.00	8.00
HoldTime	0.84	1.50	0.50
Gat Time	1.10	1.70	0.40
Inj. Tim	2.50	3.00	2.00
Recovery	3.50	4.00	2.00
Melt Temp	275.10	270.70	257.00
Thrt Temp	40.00	53.00	32.00
H2O Temp	66.00	72.00	61.20
Dewpoint	220.00	287.00	189.00
H2O Flow	61.50	69.60	55.60
Inj Pres	75.40	81.20	76.90
Hold Prs	256.00	308.00	176.00
Back Prs	123.00	172.00	99.80
<i>Page</i>			

**Figure 3-10 Auto R Limits Screen**

To return to the **ProStat** SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view the results of last Automatic SPC Machine Sample taken by the system:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 3**

**Press: *Enter***

The Auto Results screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "name" column correspond only to the signal names enabled on the MIU configuration screen.

AUTO RESULTS		ID=06161030	
Name	Xbar	R	Exception
Cyc Time	10.00	0.00	
HoldTime	1.00	0.00	
Gat Time	1.00	0.00	
Inj. Tim	2.50	0.00	
Recovery	3.50	0.00	
Melt Temp	275.10	0.00	ABOVE XUCL
Thrt Temp	40.00	0.00	
H2O Temp	66.00	0.00	
Dewpoint	220.00	0.00	
H2O Flow	61.50	0.00	
Inj Pres	75.40	0.00	
Hold Prs	256.00	0.00	
Back Prs	123.00	0.00	
<i>Page</i>			

**Figure 3-11 Auto Results Screen**

The *ID field* is an (8) eight-character sample ID tag corresponding to the date and time the sample was recorded. It is displayed as mmddhhmm or month, day, hour, minute.

The *Exception* field displays a message when values are out of control limits.

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

### 3.3.4.2 Manual SPC

The *Manual SPC* function allows:

- Viewing of existing X Control Limits set for a Job
- Viewing of existing R Control Limits set for a Job
- Viewing of the Results of Last Manual Machine Sample taken by the system
- Start a Manual Sample and Store values of parameters

To view existing Manual SPC X Control Limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 4**

**Press: *Enter***

The Manual X Limits screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "*name*" column correspond only to the signal names enabled on the MIU configuration screen.

MANUAL X LIMITS			
Name	Xbarbar	XUCL	XLCL
Cyc Time	10.00	12.00	8.00
HoldTime	0.84	1.50	0.50
Gat Time	1.10	1.70	0.40
Inj. Tim	2.50	3.00	2.00
Recovery	3.50	4.00	2.00
Melt Temp	275.10	270.70	257.00
Thrt Temp	40.00	53.00	32.00
H2O Temp	66.00	72.00	61.20
Dewpoint	220.00	287.00	189.00
H2O Flow	61.50	69.60	55.60
Inj Pres	75.40	81.20	76.90
Hold Prs	256.00	308.00	176.00
Back Prs	123.00	172.00	99.80
<i>Page</i>			

**Figure 3-12 Manual X Limits**

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view existing Manual SPC R Control Limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 5**

**Press: *Enter***

The Manual R Limits screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "*name*" column correspond only to the signal names enabled on the MIU configuration screen.

MANUAL R LIMITS			
Name	Xbarbar	XUCL	XLCL
Cyc Time	10.00	12.00	8.00
HoldTime	0.84	1.50	0.50
Gat Time	1.10	1.70	0.40
Inj. Tim	2.50	3.00	2.00
Recovery	3.50	4.00	2.00
Melt Temp	275.10	270.70	257.00
Thrt Temp	40.00	53.00	32.00
H2O Temp	66.00	72.00	61.20
Dewpoint	220.00	287.00	189.00
H2O Flow	61.50	69.60	55.60
Inj Pres	75.40	81.20	76.90
Hold Prs	256.00	308.00	176.00
Back Prs	123.00	172.00	99.80
<i>Page</i>			

**Figure 3-13 Manual R Limits Screen**

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view the results of the last Manual SPC Machine Sample taken:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 6**

**Press: *Enter***

The Manual Results screen will display. Pressing the (*F1*) *Page* button will page through all machine parameters. The Machine parameters appearing in the "name" column correspond only to the signal names enabled on the MIU configuration screen.

The *ID field* is an (8) eight character sample ID tag corresponding to the date and time the sample was recorded. It is displayed as mmddhhmm or month, day, hour, minute.

The *Exception* field displays a message when values are out of control limits.

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To take a Manual SPC Sample:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 7**

**Press: *Enter***

The following message will appear on the display:

*"Collecting Observation 1 data xxxxxxx"*

After sampling has occurred, the MIU will process the information and display one of the following messages:

<b><i>Data collection complete for ID xxxxxxxx</i></b>	Results are within control limits and no shift or trend was detected.
<b><i>Sample out of limits</i></b>	One or more sampled processes were above or below a control limit.
<b><i>Sample shift or trend detected</i></b>	In the job descriptor, the user sets the number of points in a row on one side of the average (Xbar or Rbar), or the number of points in a row that are consistently increasing or decreasing (equal to or greater than the preceding points).

The above messages will replace the message:

*"Collecting Observation 1 data xxxxxxx"*

To clear the message after the sample is complete:

**Press: *Cancel***

To view the parameters which caused the *Exception* message:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 6**

**Press: *Enter***

The *Exception Messages* will display next to the parameter.

### 3.3.4.3 Variable SPC

The *Variable SPC* function allows:

- Viewing of X Control Limits of Variables entered in the job descriptor
- Viewing of R Control Limits of Variables entered in the job descriptor
- Viewing of the Results of Last Variable Sample Data
- Enter part Variable Data via the keypad and use Store to send the value data to the Host

To view existing Variable SPC X Control Limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 8**

**Press: *Enter***

The Variable X Limits screen will display. As many as (10) ten Variables may be viewed. The name and number of Variables appearing correspond to the Variable information entered in the job descriptor. If control limits are updated at the Host, the new values are sent to the MIU to keep values current.

VARIAB X LIMITS			
Name	Xbarbar	XUCL	XLCL
ClpLen	4.0	5.0	3.0
Height	1.50	2.00	1.00
Weight	5.068	6.070	3.030
Width	0.1700	0.2350	0.1230
Length	0.2700	0.3350	0.2230
HoldDia	5.050	5.700	4.600
IntDia	15.00	20.00	10.00
OutDia	4.0	5.3	3.2
IdGroV	3.2	3.4	2.8
Diagon	1.50	2.60	1.30

Page

**Figure 3-14 Variable X Limits Screen**

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view existing Variable SPC R Control Limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 9**

**Press: *Enter***

The Variable R Limits screen will display. The name and number of Variables appearing correspond to the Variable information entered in the job descriptor. If control limits are updated at the Host, the new values are sent to the MIU to keep values current.

VARIAB R LIMITS			
Name	Xbarbar	XUCL	XLCL
ClpLen	4.0	5.0	3.0
Height	1.50	2.00	1.00
Weight	5.068	6.070	3.030
Width	0.1700	0.2350	0.1230
Length	0.2700	0.3350	0.2230
HoldDia	5.050	5.700	4.600
IntDia	15.00	20.00	10.00
OutDia	4.0	5.3	3.2
IdGroV	3.2	3.4	2.8
Diagon	1.50	2.60	1.30

Page

**Figure 3-15 Variable R Limits Screen**

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view the results of the last Variable SPC Sample:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 10**

**Press: *Enter***

Next to the Variable Name, the X Bar and R Values of the Sample are displayed. An *Exception* message column will alert Above or Below Control Limits conditions as well as shifts or trends created by the last Sample entry. The Variable Results screen allows easy access at the MIU for results. The Variable Results screen displays only the results of the last sample entered in the system.

To return to the ProStat SPC Menu:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To enter Part Variable SPC Sample:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

**Press: 11**

**Press: *Enter***

The flashing cursor ← will be positioned at the "Sample ID" field. To change the ID to match a manual sample, type in the numeric value.

**Press: *Enter*** (the default is the current date and time - mmddhhmm - month, day, hour, minute).

The cursor will move down to the position of the first Variable.

VARIABLE DATA ENTRY	
Sample ID (MMDDhhmm):	06161110←
Characteristic:	OutDia
Observation	Value
1	0.0
2	0.0
 <i>NxtChr</i>	

**Figure 3-16 Variable Data Entry Screen**

To input Values, use the arrow keys to move the cursor to the Variables. Type in the numeric value for each Variable.

**Press: *Enter***

If more than one characteristic is to be entered

**Press: (F1) "*NxtChr*"**

in order to continue entering data for this sample. The name changes next to "Characteristic".

To send this information to the host when all values have been entered,

**Press: *Store***

The ProStat SPC Menu will display with the following message:

*"Data collection complete for XXXXXXXX"*

After processing at the Host, one of the following messages may also appear:

<b><i>Sample Out of Limits</i></b>	One or more of the values entered exceeded upper or lower control limits
<b><i>Sample shift or trend detected</i></b>	In the job descriptor, the user sets the number of points in a row on one side of the average (Xbar or Rbar), or the number of points in a row that are consistently increasing or decreasing (equal to or greater than the preceding points).

To return to the Main Menu:

**Press: *Cancel***

### 3.3.4.4 Attribute SPC

Before Attribute sampling can occur, it must first be enabled at the Host Computer.

There are 2 types of attributes that can be collected. Their definitions/calculations follow:

<b><i>P</i></b>	The proportion of units nonconforming in a sample.
<b><i>Pbar</i></b>	The average proportion of units nonconforming in samples in a user defined period.
<b><i>U</i></b>	The number of nonconformities per unit in a sample.
<b><i>Ubar</i></b>	The average number of nonconformities per unit in samples in a user defined period.

The *U Attribute SPC* function allows:

- Viewing of U Attribute Control Limits and results of the Last U Attribute Sample
- Entry of a new sample for U Attribute Data

To display the U Attribute SPC Control Limits of the last sample taken:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: Enter**

**Press: 12**

**Press: Enter**

The Attributes screen will display.

<b>ATTRIBUTES</b>	
Ubar :	11.000
UUCL :	12.500
ULCL :	7.500
<b>SAMPLE DATA NOT AVAILABLE</b>	

**Figure 3-17 Attributes Screen**

The first column displays the average of the Upper and Lower Control Limits for the U Attribute being sampled. This information is the limits set for the job being monitored in the job descriptor.

Results of the last sample - the 8 character ID tag date and time (mmddhhmm - month, day, hour, minute) of the last entered sample is displayed on the right side of the screen. If the last sample caused an exception, the word "*Exception*" will appear on the last line accompanied by the type of exception: "*Above or Below Limits or Shift or Trend.*"

To return to the ProStat SPC Menu:

**Press: Escape**

To return to the Main Menu:

**Press: Cancel**

To enter U Attribute SPC data:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: Enter**

**Press: 13**  
**Press: Enter**

The Attribute Data Entry screen will display. The flashing cursor ← will be positioned at the 8 character ID tag (mmddhhmm - month, day, hour, minute) of the last entered sample.

ATTRIBUTE DATA ENTRY	
Sample ID (MMDDhhmm):	06161110←
Number of parts inspected:	0
Attribute	Value
WARP	0
SWIRL	0
COLOR	0
TINT	0
FINISH	0
O SPOT	0
BURS	0
CHIPS	0
SEAMS	0
MISC.	0

**Figure 3-18 Attribute Data Entry Screen**

To type in the numeric value for the number of parts inspected.

**Press: Enter**

Input the number via the keypad.

**Press: Enter**

The cursor will then position at the first Attribute. Type in the numeric value for the Attribute.

**Press: Enter**

Follow the same procedure for each Attribute.

To send this information to the host when all values have been entered,

**Press: Store**

The ProStat SPC Menu will display with the following message:

*"Sample Entry Complete"*

After processing at the Host, one of the following messages may also appear:

<b><i>Sample Out of Limits</i></b>	One or more of the values entered exceeded upper or lower control limits
<b><i>Sample shift or trend detected</i></b>	In the job descriptor, the user sets the number of points in a row on one side of the average (Ubar or Pbar), or the number of points in a row that are consistently increasing or decreasing (equal to or greater than the preceding points).

To view the results of the sample,

**Press: Cancel**

The message will clear. For a detailed list of results,  
**Press: 12**

### **3.3.4.5 Auto SPC Lim Calc**

The *Auto SPC Lim Calc* function allows:

- Viewing of existing X Control Limits set for a Job
- Viewing of existing R Control Limits set for a Job

To calculate limits:

**Press: 4** (Figure 3-1 MIU Front Panel)

**Press: Enter**

**Press: 14**

**Press: Enter**

The following messages will display:

*"Auto SPC Started For XX Cycles"*

*"Collecting Auto SPC Lim Calc Sample X"*

*"Auto SPC Lim Calc Done For Current Job"*

To return to the ProStat SPC Menu:

**Press: Cancel**

To return to the Main Menu:

**Press: Cancel**

### **3.3.5 Peak Values**

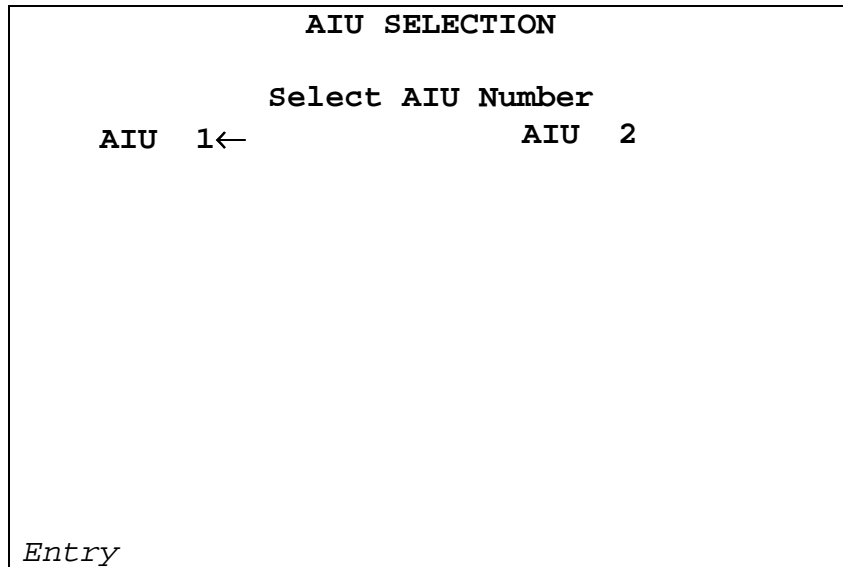
The *Peak Values* function allows the viewing of actual Peak Value and Peak Time of each monitored analog signal.

To view *Peak Values*:

**Press: 5** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The AIU Selection screen will display.



**Figure 3-19 AIU Selection Screen**

The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.

**Press: (F1) Entry**

The *Analog Peak Values* screen will display. An asterisk (\*) beside an analog value indicates the signal has exceeded a set limit.

ANALOG PEAK VALUES		
Signal	Peak Value	Peak Time
Melt Tmp	275.1	1.0
Thrt Tmp	156.1	9.5
H2O Temp	89.1	1.9
Dewpoint	324.1	3.4
H2O Flow	125.4	6.7
Inj Pres	225.1	4.6
Hold Prs	456.1	6.3
Back Prs	167.1	7.8

**Figure 3-20 Analog Peak Value Screen**

To return to the Main Menu:

**Press: Cancel**

### 3.3.6 Machine Maintenance

To enter the *Machine Maintenance* screen:

**Press: 6** (Figure 3-1 MIU Front Panel)

**Press Enter**

The Login/Logout Menu will display. Make a selection.

**Press: Enter**

```
MACHINE MAINTENANCE ENTRY
Enter maintenance code:      0 ←
Enter maintenance ID:       0
 1 Machine Maintenance Name 1
 2 Machine Maintenance Name 2
 3 Machine Maintenance Name 3
 4 Machine Maintenance Name 4
 5 Machine Maintenance Name 5
 6 Machine Maintenance Name 6
 7 Machine Maintenance Name 7
 8 Machine Maintenance Name 8
 9 Machine Maintenance Name 9
10 Machine Maintenance Name 10
UP  Down
```

**Figure 3-21 Machine Maintenance Entry Screen**

The *Machine Maintenance Entry* screen will display. The flashing cursor ← will be positioned next to the "Enter maintenance code" field. Type in a code number from 300-319.

**Press: Enter**

Type in the Maintenance ID number. This number can be no more than 9 digits. The (F1) *Up* and (F2) *Down* keys will move through the list of *Machine Maintenance* names. To return to the Login/Logout Menu and send information to the Host:

**Press: Store**

To logout of the *Machine Maintenance* function:

**Press: 2 LOGOUT**

**Press: Enter**

The *Machine Maintenance Logout* screen will appear. The next screen will require a maintenance ID number. Type in the maintenance ID number.

**Press: Store**

To return to the Main Menu:

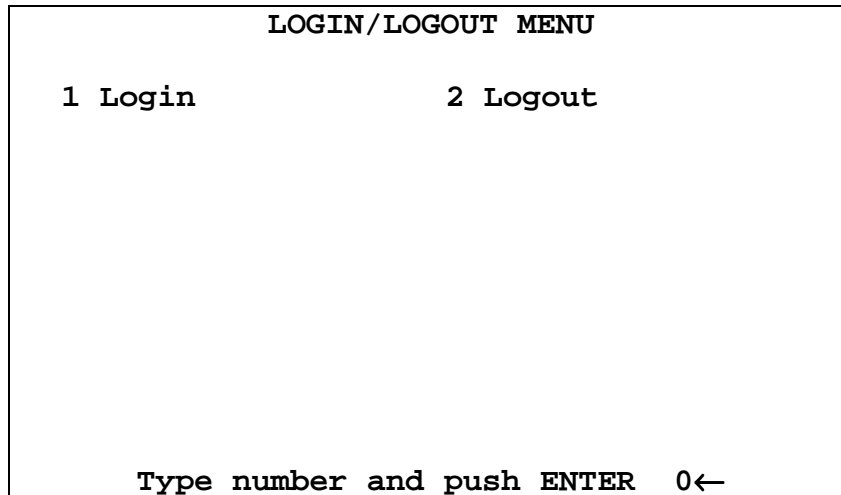
**Press: Cancel or Escape**

### 3.3.7 Tool Maintenance

To enter the **Tool Maintenance** screen:

**Press: 7** (Figure 3-1 MIU Front Panel)

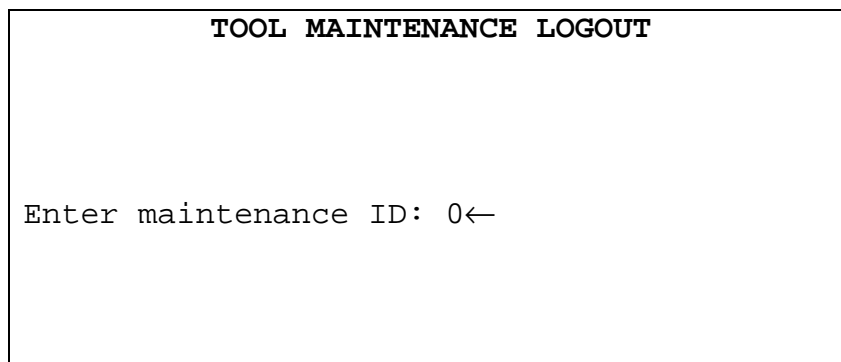
**Press Enter**



**Figure 3-22 Login/Logout Menu Screen**

The Login/Logout Menu will display. Make a selection.

**Press: *Enter***



**Figure 3-23 Tool Maintenance Logout Screen**

The Tool Maintenance Entry screen will display. The flashing cursor ← will be positioned next to the "*Enter maintenance code*" field. Type in a code number from 300-319.

**Press: *Enter***

Type in the Maintenance ID number. This number can be up to 9 digits. The **(F1) Up** and **(F2) Down** keys will move through the list of Tool Maintenance names.

To return to the Login/Logout Menu and send information to the Host:

**Press: *Store***

To logout of the Tool Maintenance function:

**Press: 2**

**Press: *Enter***

The next screen will require a maintenance ID number. Type in the maintenance ID number.

**Press: *Store***

To return to the Main Menu:

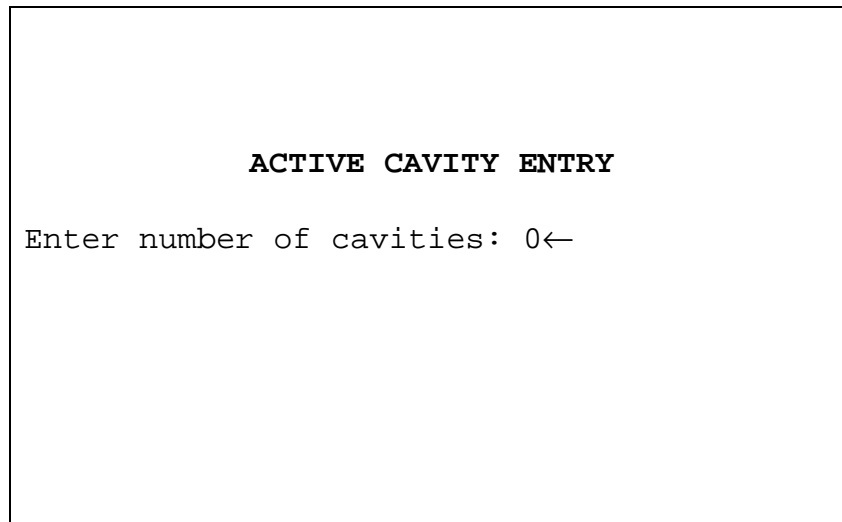
**Press:** *Cancel* or *Escape*

### 3.3.8 Change Cavities

To change the number of active cavities in a job:

**Press:** 8 (Figure 3-1 MIU Front Panel)

**Press:** *Enter*



**Figure 3-24 Active Cavity Entry Screen**

The *Active Cavity Entry* screen will display. This MIU information must be enabled on the Host computer to function. Values greater than the standard set in the job descriptor are not accepted. Type in the cavity value.

**Press:** *Enter*

To send the information to the Host:

**Press:** *Store*

To abort entry:

**Press:** *Cancel* or *Rubout*

To return to the Main Menu:

**Press:** *Escape*

### 3.3.9 MIU Login and Logout

Two types of operator histories are maintained:

- Operator efficiency history
- Operator tracking history

In order for either type of history to be recorded, operators must login and logout at the MIU by entering a unique identifying number.

Efficiency history is kept for up to five operators per machine. There is no per-machine limit on the number of operators for which tracking history may be kept. An efficiency report and a tracking report are available.

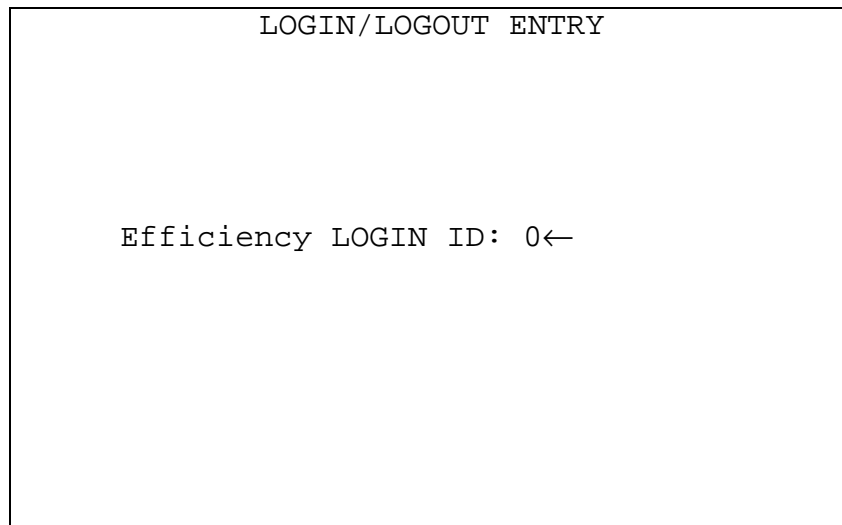
### 3.3.9.1 Log In Efficiency

The *Log In Efficiency* function allows entry of the Operator's Login ID. The ID number can be up to 9 digits. The efficiency report shows who logged in and how many parts they made. Average cycle time and yield is kept per operator.

To enter ID:

**Press: 9** (Figure 3-1 MIU Front Panel)

**Press: Enter**



**Figure 3-25 Login/Logout Entry Screen**

The *Login/Logout Entry* screen will display. Enter the ID number.

**Press: Enter**

To send the information to the Host:

**Press: Store**

To abort or clear entry:

**Press: Cancel or Rubout**

To return to the Main Menu:

**Press: Escape**

### 3.3.9.2 Log In Track

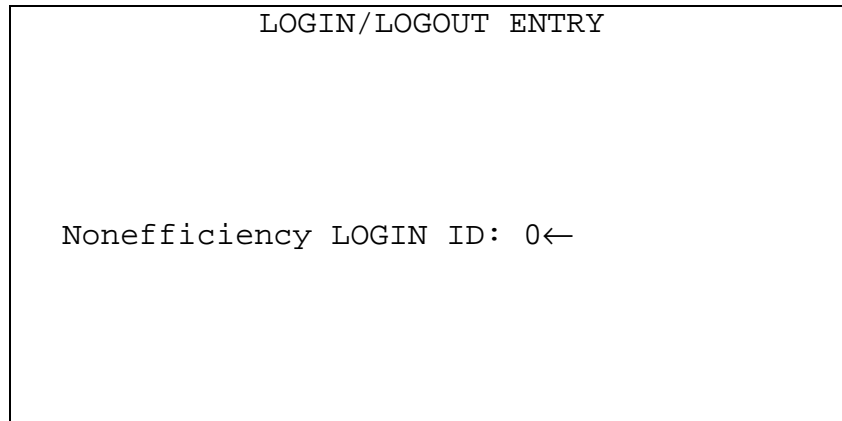
The *Log In Tracking* (non-efficiency) function is used to enter the Operator's Login ID. The ID number can be up to 9 digits. The tracking report only shows who logged in or out at what time. No parts production is kept.

To enter ID:

**Press: 10** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The *Login/Logout Entry* screen will display.



**Figure 3-26 Login/Logout Entry Screen**

Enter the ID number.

**Press: *Enter***

To send the information to the Host:

**Press: *Store***

To abort or clear entry:

**Press: *Cancel* or *Rubout***

To return to the Main Menu:

**Press: *Escape***

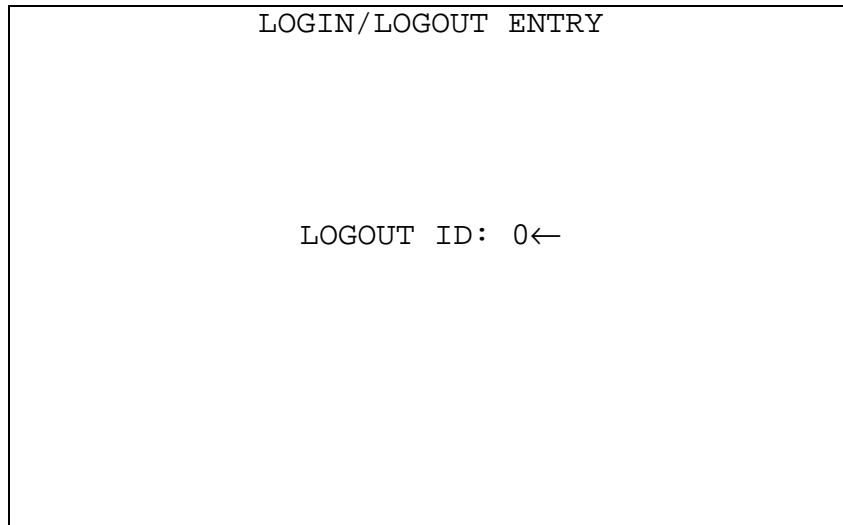
### **3.3.9.3 Log Out**

The *Log Out* function is used to enter the Operator's Logout ID. The ID number can be up to 9 digits. To enter ID:

**Press: *II*** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The *Login/Logout Entry* screen will display.



**Figure 3-27 Login/Logout Entry Screen**

Enter the ID number.

**Press: *Enter***

To send the information to the Host:

**Press: *Store***

To abort or clear entry:

**Press: *Cancel* or *Rubout***

To return to the Main Menu:

**Press: *Escape***

### **3.3.10 View Parameters**

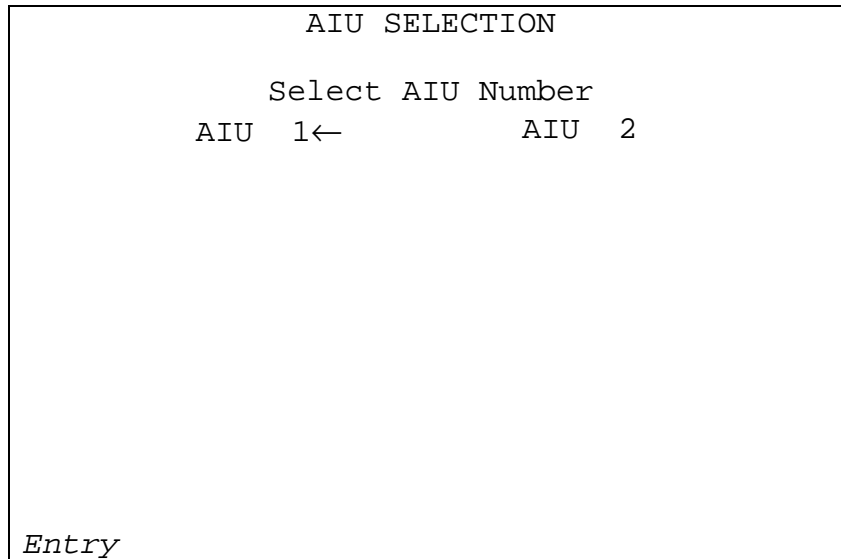
View Parameters displays the acceptable hi and low limits of all monitored machine processes and the "*actual*" real-time value of each parameter.

To view the *Process Parameters*:

**Press: *12*** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The AIU Selection screen will display.



**Figure 3-28 AIU Selection Screen**

The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.

**Press: (F1) Entry**

PROCESS PARAMETERS			
Signal	Hi Limit	Low Limit	Actual
Cyc Time	11.0	8.0	10.0
HoldTime	2.0	0.5	1.0
Gat Time	1.5	0.5	1.0
Inj. Tim	3.0	2.0	2.5
Recovery	4.0	2.0	3.5
Melt Temp	300.0	255.5	273.1
Thrt Temp	47.8	32.5	40.0
H2O Temp	70.0	60.0	66.0
Dewpoint	310.0	170.0	220.0
H2O Flow	63.2	60.0	61.5
Inj Pres	81.0	63.4	75.4
Hold Prs	290.0	192.5	256.0
Back Prs	145.6	96.5	123.0
AckPrm			

**Figure 3-29 Process Parameter Screen**

An asterisk (\*) beside a machine signal indicates the signal has exceeded specification limits.

To return to the Main Menu:

**Press: Cancel or Escape**

### 3.3.11 Job Standards

Job Standards displays the general information field and engineering standards taken from the job description. An actual value is displayed next to each Standard showing the real performance of the job at the moment the display is requested.

To view the *Job Standards*:

**Press: 13** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The *Job Standards* screen will display.

JOB STANDARDS		
JOB #	JOB02	MOLD # 459008
PART #	M456	NAME Interface
MATL CODE	ABS Gray	LOT SIZE 20000
	STANDARD	ACTUAL
CYCLE TIME	30.00	30.54
CYCLE TIME EFF.	100	98
YIELD EFF.	100	97
CAVITIES	2	2
SETUP (HR)	2.50	0.00
SCRAP %	5	8
8 HR YIELD	1824	1793
NON-PROD LIMIT	45.00	REGRIND AT MACH Y

**Figure 3-30 Job Standards Screen**

To return to the Main Menu:

**Press: Cancel or Escape**

### 3.3.12 Next Job Standards

*Next Job Standards* displays the general information field and engineering standards for the next job description.

To view the *Next Job Standards*:

**Press: 14** (Figure 3-1 MIU Front Panel)

**Press: Enter**

```
                NEXT JOB STANDARDS
JOB #   JOB03           MOLD # 459009
PART # MD56           NAME  Widget
MATL CODE ABS Blue
LOT SIZE 10000
```

**Figure 3-31 Next Job Standards Screen**

If a Family Job is running, the general information and engineering standards for the next family job will be displayed along with the Next Scheduled Job.

To return to the Main Menu:

**Press:** *Cancel* or *Escape*

### **3.3.13 Last 50 Cycles**

The *Last 50 Cycles* of a job will be displayed up to the current time appearing on the screen clock. Cycle #1 is the most recent cycle. Using this information, a foreman can watch the machine's history and react to trends that may be occurring.

To view the *Last 50 Cycles*:

**Press:** *15* (Figure 3-1 MIU Front Panel)

**Press:** *Enter*

The *Last 50 Cycle Times* screen will display.

LAST 50 CYCLE TIMES							
50	10.0	37	10.0	24	10.0	11	10.0
49	10.2	36	10.1	23	10.0	10	10.1
48	10.0	35	10.6	22	10.2	9	10.0
47	10.0	34	10.0	21	10.0	8	10.0
46	10.0	33	10.0	20	10.0	7	10.0
45	10.0	32	10.0	19	10.0	6	11.5
44	10.0	31	10.7	18	10.0	5	10.0
43	11.0	30	10.0	17	10.0	4	11.1
42	10.4	29	10.0	16	10.0	3	10.0
41	10.0	28	10.0	15	10.0	2	10.8
40	10.0	27	11.1	14	10.0	1	10.0
39	10.5	26	10.8	13	10.0		
38	10.0	25	10.0	12	10.0		

**Figure 3-32 Last 50 Cycle Times**

To return to the Main Menu:

**Press: *Cancel* or *Escape***

### 3.3.14 Graphs

Various graphs are available at the MIU. If the "*Print Option*" has been installed, these graphs may be printed by pressing *Shift* and *Store* simultaneously.

To view graphs:

**Press: *16*** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The *Graph Menu* will be displayed. Three types of graph information are available:

- Process Data
- SPC Samples
- Profiles

These types contain the following graphs:

<b><i>Process Data</i></b>	<i>1</i>	<i>Distribution</i>
	<i>2</i>	<i>Consecutive</i>
	<i>3</i>	<i>Intra-Cycle</i>
<b><i>SPC Samples</i></b>	<i>4</i>	<i>Histogram</i>
	<i>5</i>	<i>Xbar</i>
	<i>6</i>	<i>Range</i>
	<i>7</i>	<i>Change Cells</i>
	<i>8</i>	<i>Change Son</i>
<b><i>Profiles</i></b>	<i>9</i>	<i>Profile Standard</i>
	<i>1</i>	<i>Profile Current</i>
	<i>0</i>	

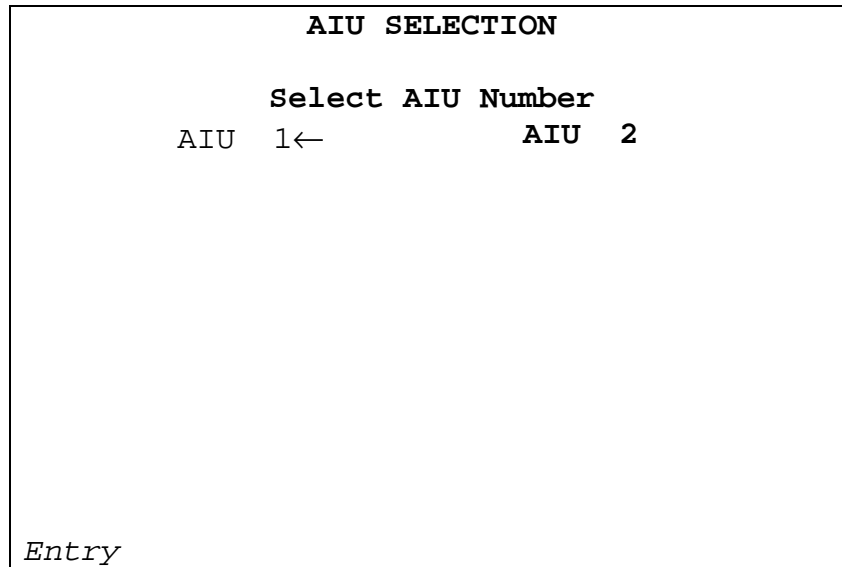
### 3.3.14.1 Process Data

To view graphs:

**Select:** *number 1, 2, or 3 from the Graph Menu*

**Press:** *Enter*

The following *AIU Selection* screen will display:

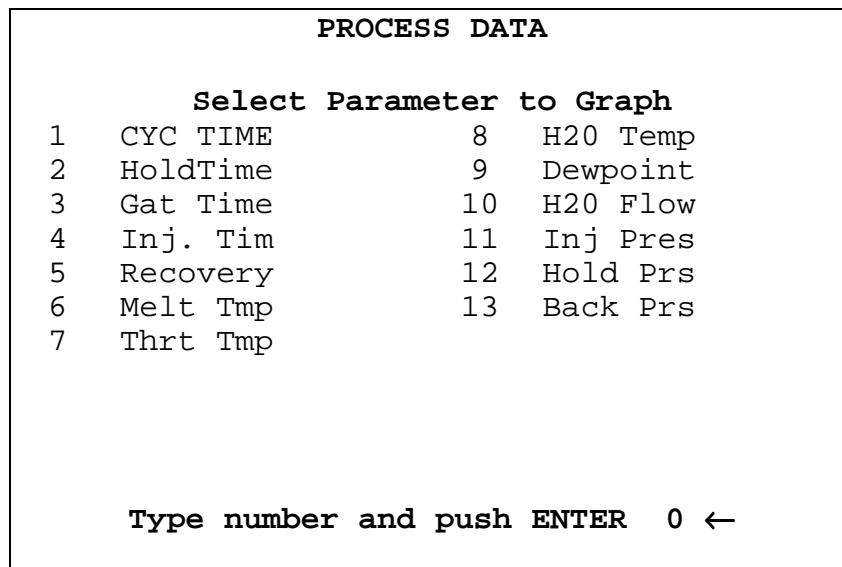


**Figure 3-33 AIU Selection Screen**

The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.

**Press:** *(F1) Entry*

The *Process Data* screen will display for *Distribution* and *Consecutive*:



**Figure 3-34 Process Data Screen**

**Press:** *number 1 thru 13*

The following messages will appear:

*"Requesting Data"*

*"Graph Complete"*

followed by the graph.

If the *"Print Option"* has been installed, these graphs may be printed by pressing **Shift** and **Store** simultaneously.

To return to the Process Data screen:

**Press:** *Escape*

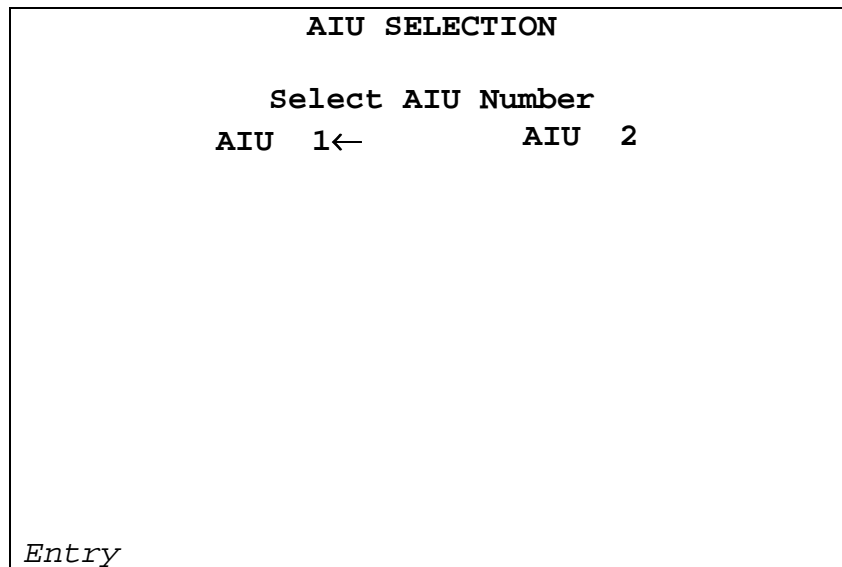
To return to the Main Menu:

**Press:** *Cancel*

To view the *Intra-Cycle* graph:

**Press:** *number 3* on the **Graph Menu**.

The following *AIU Selection* screen will display:

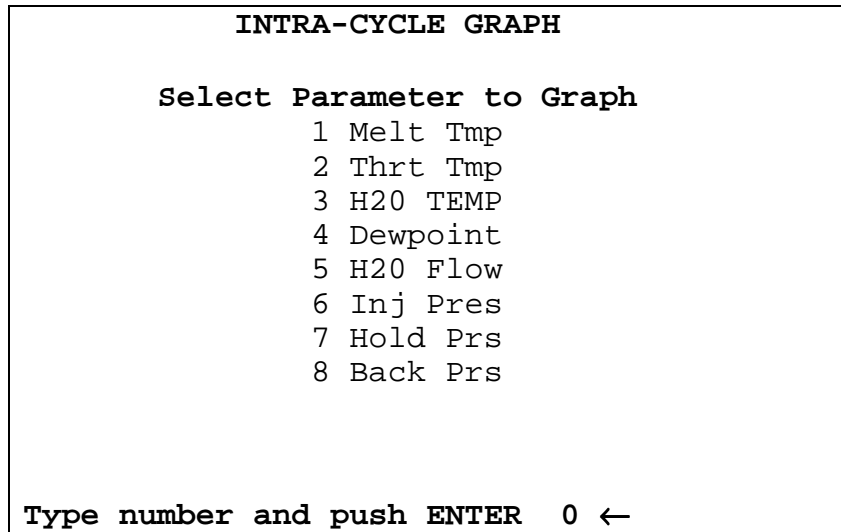


**Figure 3-35 AIU Selection Screen**

The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.

**Press:** *(F1) Entry*

The *Intra-Cycle Graph* will display:



**Figure 3-36 Intra Cycle Graph**

**Press:** *number 1 thru 8*

The following messages will appear:

*"Requesting Data"*

*"Graph Complete"*

followed by the graph.

To return to the Process Data screen:

**Press:** *Escape*

To return to the Main Menu:

**Press:** *Cancel*

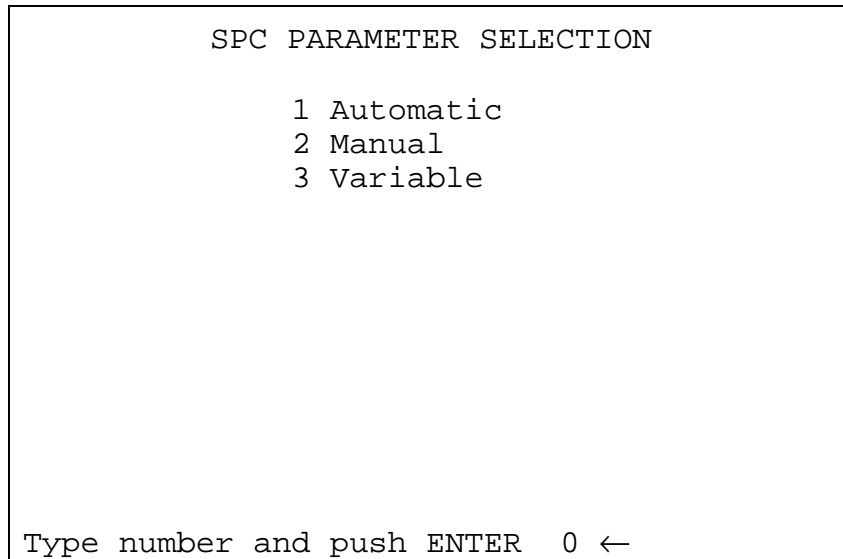
### **3.3.14.2 SPC Samples**

To view the graphs for SPC Samples:

**Press:** *numbers 4, 5, or 6 from the Graph Menu*

**Press:** *Enter*

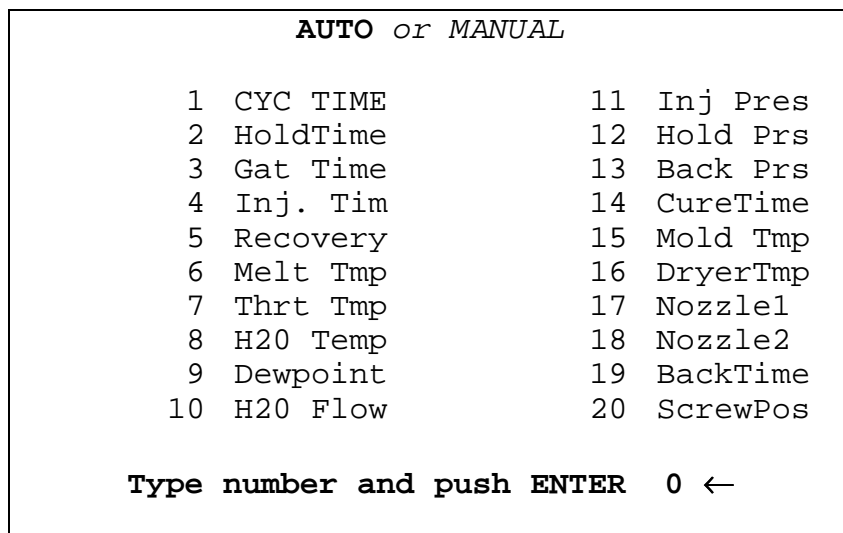
The following screen will display:



**Figure 3-37 SPC Parameter Selection Screen**

**Select:** 1, 2, or 3 from the SPC Parameter Selection screen

The following screen will display for 1, Auto or 2, Manual.



**Figure 3-38 Auto SPC Parameter Screen**

The following will display if 3, Variable is selected.

VARIABLE	
1 ClpLen	11 Side
2 Height	12 Bottom
3 Weight	13 Top A
4 Width	14 Top B
5 Length	15 Back A
6 HolDia	16 Back B
7 IntDia	17 Corner
8 OutDia	18 FrontA
9 IdGrov	19 FrontB
10 Diagon	20 Hole 1

Type number and push ENTER 0 ←

**Figure 3-39 Variable SPC Parameter Screen**

The following messages will appear:

*"Requesting Data"*

*"Graph Complete"*

The requested graph will display. If the *"Print Option"* has been installed, these graphs may be printed by pressing *Shift* and *Store* simultaneously.

To return to the SPC Parameter Selection screen:

**Press: *Escape***

To return to the Main Menu:

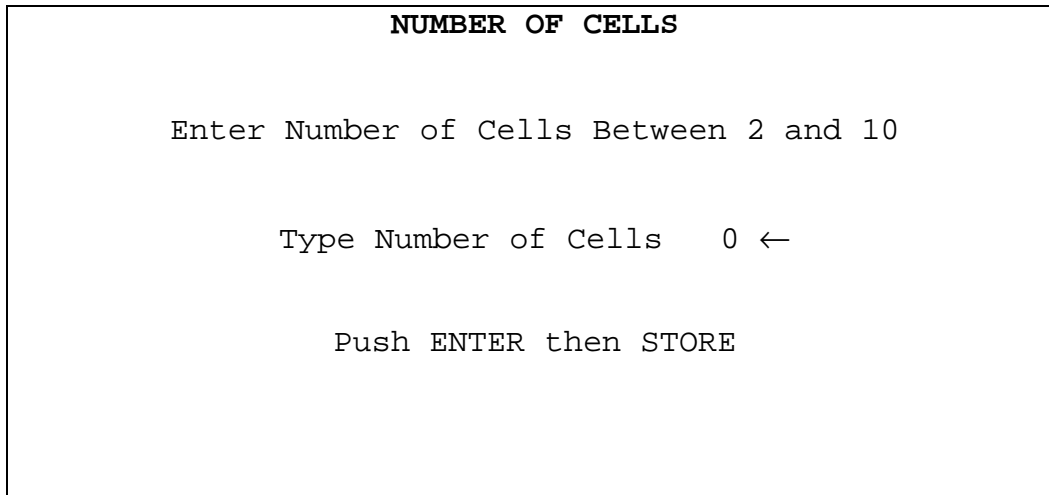
**Press: *Cancel***

To change cells for SPC Samples:

**Press: *number 7 from the Graph Menu***

**Press: *Enter***

The following screen will display:



**Figure 3-40 Number of Cells Screen**

To change Son for SPC Samples:

**Press:** *number 8 from the Graph Menu*

**Press:** *Enter*

To return to the Main Menu:

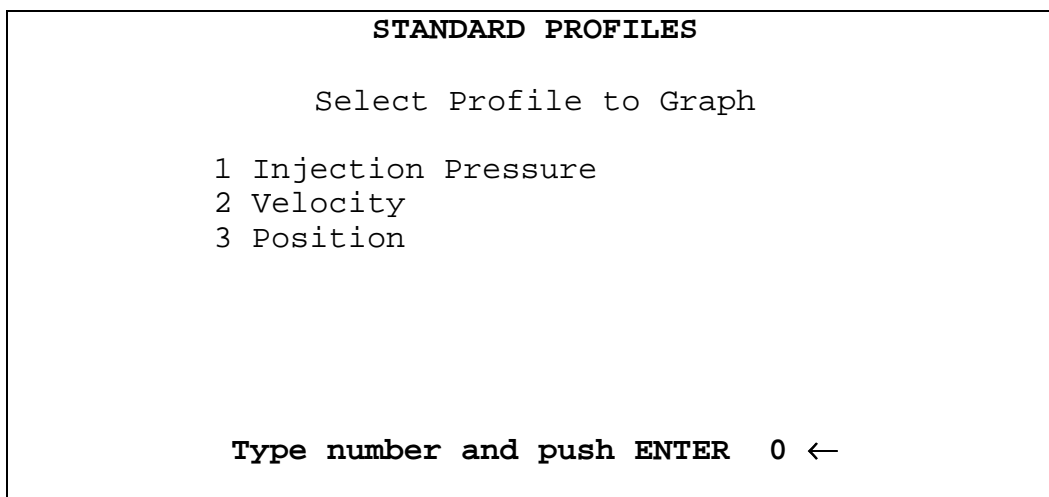
**Press:** *Cancel*

### 3.3.14.3 Profiles

To view the Profiles:

**Press:** *number 9 from the Graph Menu*

The following will display:



**Figure 3-41 Standard Profiles Screen**

Select 1, 2, or 3 and the following messages will appear:

*"Requesting Data"*

*"Graph Complete"*

The requested graph will display. If the "*Print Option*" has been installed, these graphs may be printed by pressing *Shift* and *Store* simultaneously.

To return to the *Graph Menu* screen:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

To view the current profile:

**Press: *10* from the *Graph Menu***

The following message will display:

*"Collecting Profile Data..."*

On the following screen:

```

                CURRENT PROFILES

                Select Profile to Graph

                1 Injection Pressure
                2 Velocity
                3 Position
                4 Save Standards

Type number and push ENTER  0 ←
```

**Figure 3-42 Current Profiles Screen**

Select 1, 2, or 3 and the following messages will appear:

*"Creating Graph"*

*"Graph Complete"*

To save standards:

**Press: *4***

The following message will display:

*"Saving Profile Standards..."*

To return to the *Graph Menu* screen:

**Press: *Escape***

To return to the Main Menu:

**Press: *Cancel***

### 3.3.15 Material

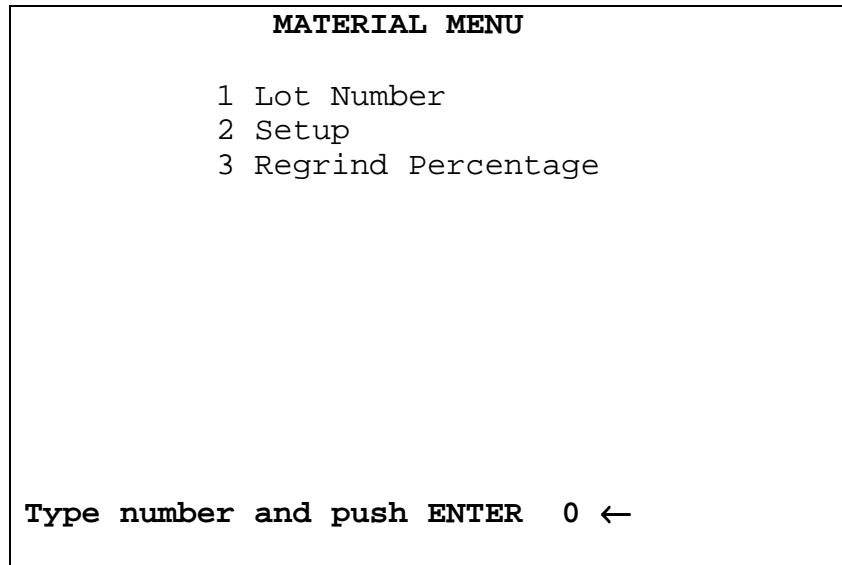
This function allows the entry of a lot number.

To enter a lot number:

**Press: 17** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The *Material Menu* screen will display.



**Figure 3-43 Material Menu Screen**

Make a selection

- 1 **Lot Number** - The flashing cursor ← will be positioned next to the "Enter material lot number" field. Type in the lot number, which can be up to 9 digits.
- 2 **Setup** - The flashing cursor ← will be positioned next to the "Enter Setup Material" field. Type in the number.
- 3 **Regrind Percentage** - The flashing cursor ← will be positioned next to the "Enter Regrind Percentage" field. Type in the number.

**Press: Enter**

To send the information to the Host:

**Press: Store**

To return to the Main Menu:

**Press: Cancel or Escape**

### 3.3.16 Downtime Report

The *Downtime Report* displays the current downtime counts and accumulated hours for each Downtime Reason per shift. The screen clock shows the time the display was generated, and the information is current to this point in time.

To view a *Downtime Report*:

**Press: 18** (Figure 3-1 MIU Front Panel)

**Press: Enter**

DOWNTIME			
	COUNT		COUNT
UNKOWN	5	Cntrl	1
Idle	0	ToolBent	9
MachProb	0	ToolFix	0
ToolProb	2	Mat Out	4
Wait Mat	0	No Job	0
Wait Sup	0	Prevent	0
Wait QC	0	No Color	3
Wait Opr	2	No Opr	0
Misc	0	Wait Tmp	6
Setup	0	No Hyd	0

**Figure 3-44 Downtime Screen**

The *Downtime* screen will display.

To return to the Main Menu:

**Press: Cancel** or **Escape**

### 3.3.17 Production Report

The *Production Report* displays two production actual values:

- Current (active shift)
- To Go

This report is generated and displayed at the moment the screen is requested.

To view the *Production Report*:

**Press: 19** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The *Production* screen will display.

PRODUCTION		
	CURRENT	TO GO
TOT PTS:	210	58
GOOD PTS:	206	
BAD PTS:	4	
MACH CYC:	12	
SETU CYC:	2	
Pulse 2:	6	
Pulse 3:	5	
Pulse 4:	0	
RUN HRS:	3.25	.05
DWN HRS:	0.12	0.0
MATL LB:	1.2	

**Figure 3-45 Production Screen**

To return to the Main Menu:

**Press:** *Cancel* or *Escape*

### 3.3.18 Scrap Report

The *Scrap Report* displays the current job scrap quantities for this shift for each Scrap Reason. There are 10 scrap categories with names defined by the user.

To view the *Scrap Report*:

**Press:** *20* (Figure 3-1 MIU Front Panel)

**Press:** *Enter*

The *Scrap Reasons* screen will display.

SCRAP REASONS			
	PARTS		PARTS
Splay	2	Line	7
Flash	0	Twist	0
Burn	1	Melt	6
Contamin	0	Test	0
Color	0	Heavy	3
Setup	4	Long	0
Weight	0	Short	0
Dimensn	1	Small	9
Misc	0	Big	0
Flowline	0	Thin	0

**Figure 3-46 Scrap Reason Screen**

To return to the Main Menu:

**Press:** *Cancel* or *Escape*

### 3.3.19 Job Control

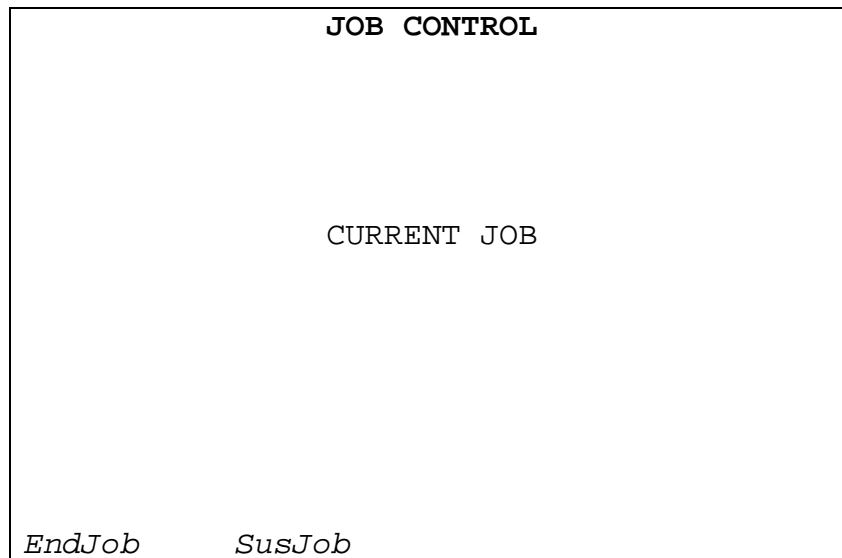
*Job Control* is used to "End" the current job and start monitoring the Next Job in the schedule.

To end a current job and start the next job:

**Press:** *21* (Figure 3-1 MIU Front Panel)

**Press:** *Enter*

The *Job Control* screen will display the current job.



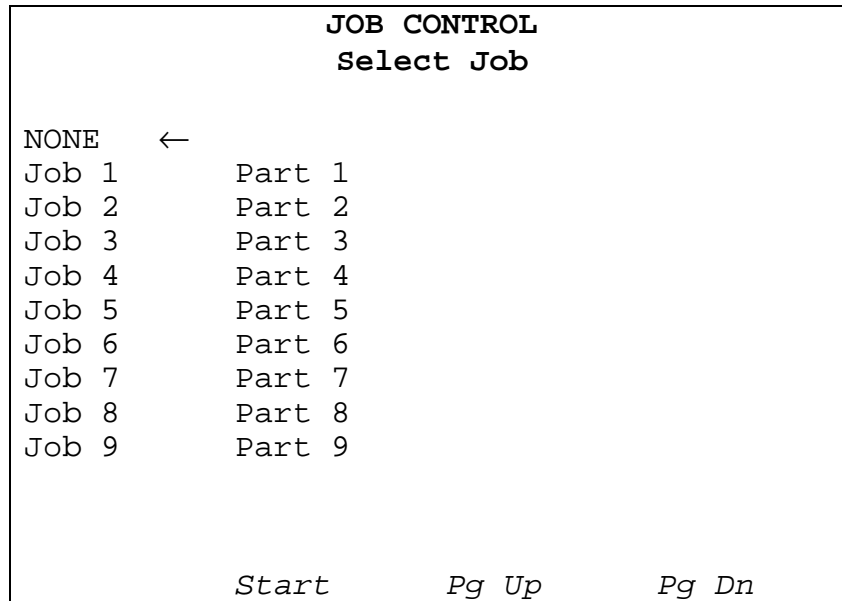
**Figure 3-47 Job Control Screen**

**Press:** *(F1) EndJob*

or

**Press:** *(F2) SusJob*

The following screen will display.



**Figure 3-48 Job Control Screen**

Three options will be displayed

**(F3) Start**

**(F4) Pg Up**

**(F5) Pg Dn**

Using the arrow keys, select the job to be stopped or suspended. **(F4) Pg Up** or **(F5) Pg Dn** for more selections.

To complete the process.

**Press: (F3) Start**

This MIU function must be enabled on the Host computer to operate.

### 3.3.20 MIU Information

MIU information has 5 choices:

<b><i>Calibrate Analogs</i></b>	Allows entry of analog gained and offset values for signal calibration. Also displays the value of the signals when the screen was requested. A "password" will be required.
<b><i>Service Display</i></b>	A special screen used primarily during MIU manufacturing and run off, but also used for MATTEC Customer Service troubleshooting applications. There is no standard user operation for this screen. With this selection, the AIU Selection screen will display. The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.  Press: (F1) Entry  The Service Display screen will appear.

<b><i>Enter key Code</i></b>	This screen is used to enter MIU key codes in the 200 to 399 range. This is necessary when entering data via the old key code method or when special programs exist on a system which requires entry of the reserved key codes.
<b><i>Communication Monitor</i></b>	Displays data being transmitted and received through the MIU's serial ports for diagnostic purposes.
<b><i>Language</i></b>	Allows the language used for MIU displays to be selected.

### 3.3.20.1 Calibrate Analogs

The *Calibrate Analogs* feature is not supported on ProHelp 1000. This feature must first be initiated at the ProHelp Host under System Manager.

To use *Calibrate Analogs*:

**Press: 22** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The *MIU Information Menu* will be displayed.

**Select 1: Calibrate Analogs**

**Press: Enter**

**Enter: Password** (if applicable)

The *Password* must be numeric only and set up at the Host.

The flashing cursor ← will be positioned next to the first "*Signal Gain*" field. Type in the Gain Number

**Press: Enter**

Enter the Offset number

**Press: Enter**

Continue until all fields have been entered.

The following options are also available:

<b>CurVal</b>	To view the Current Value <b>press: (F1) CurVal</b> . The Current Value number will appear in the right hand corner under the " <i>Value</i> " field. The CurVal screen is a real-time screen displaying the current software (displayed) value of the signal. The system must be set for MIU calibration at the Host for these functions to operate.
<b>Calib</b>	To view the Calibration Numbers of " <i>Gain</i> " and " <i>Offset</i> ", <b>press: (F2) Calib</b> .
<b>HstEsc</b>	To free the system from the analog calibration mode, <b>press: (F3) HstEsc</b> to signal the Host that the operation has been cancelled.

To return to the Main Menu:

**Press: Cancel** or *Escape*

### 3.3.20.2 Service Display

To view the *Service Display* screen:

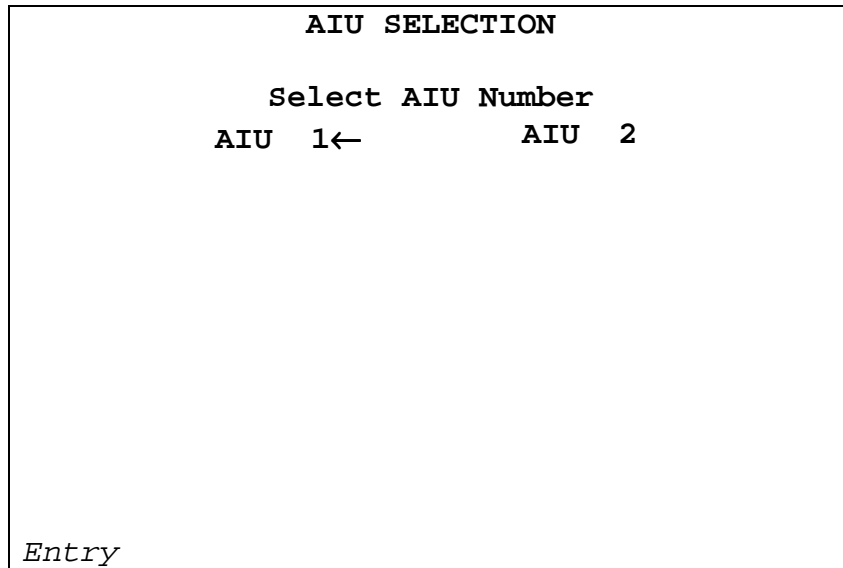
**Press: 22** (Figure 3-1 MIU Front Panel)

**Press: Enter**

The MIU Information Menu will be displayed.

**Select 2: Service Display**

The AIU Selection screen will display.



**Figure 3-49 AIU Selection Screen**

The flashing cursor ← will be positioned next to the first AIU. Using the arrow keys, select the AIU.

**Press: (F1) Entry**

The *Service Display* screen will display.

```
SERVICE DISPLAY

cpu-d 750-7650+      Prod inc          7
Anlg 1      2751      Down inc          0
Anlg 2      400       MIU addr          15
Anlg 3      660       ENQ cntr         093
Anlg 4      2200      Xmit err cnt     0
Anlg 5      615       Rcv err cntr     0
Anlg 6      754       Int msg tmr      0.50
Anlg RJ      0         SPC trig 06161010
Anlg OFS     0         PLC col tim      0.00
Dig 1 prd    5.0      PLC err cntr     0
Dig 2 prd    4.5      PLC xmt err      0
Dig 3 prd    0.5      PLC rcv err      0
Dig 4 prd    1.0

Configured
```

**Figure 3-50 Service Display Screen**

### **Service Display Descriptions**

The following *Service Displays* enable MATTEC Customer Service to pinpoint any problems or information vital to the performance of the MIU. Please refer to the numeric value for each item displayed on this screen.

<i>cpu-1</i>	The EPROM part number on the MIU motherboard
<i>cpu-b</i>	The EPROM part number on the MIU front panel
<i>Anlg 1</i>	Temperature (thermocouple)
<i>Anlg 2</i>	Temperature (thermocouple)
<i>Anlg 3-6</i>	Linear potentiometer: temperature, rpm, dewpoint, pressure, etc.
<i>Anlg RJ</i>	Reference junction used for the ambient temperature for calibration (normal =- 140 degrees)
<i>Anlg OFS</i>	+ or - 10% (offset)
<i>Dig 1 prd</i>	Length of time that pulse 1, or cycle time signal, is ON
<i>Dig 2 prd - Dig 4 prd</i>	Length of time that pulses are on.
<i>Prod inc</i>	Counter that is incremented each second the MIU is in production
<i>Down inc</i>	Counter that is incremented each second the MIU is down
<i>MIU addr</i>	The dip-switch settings determine an MIU's address
<i>ENQ cntr</i>	Number of inquiries received from the Host
<i>Xmit err cnt</i>	Number of transmit errors the MIU encounters when communicating with the Host
<i>Rcv err cntr</i>	Number of receive errors the MIU encounters when communicating with the Host.
<i>Int msg tmr</i>	The ACU to MIU communication's inter-message timer designating the length of time between "chats" with the Host.
<i>SPC trig</i>	The SPC trigger for the next automatic sample collected.
<i>PLC col tim</i>	Time it takes the MIU to request and receive all parameters from a PLC
<i>PLC err cntr</i>	Total number of errors accumulated in communications with a PLC
<i>PLC xmt err</i>	Total number of transmit errors the MIU accumulated in communications with a PLC
<i>PLC rcv err</i>	Total number of receive errors the MIU accumulated in communications with the PLC
<i>Configured</i>	Displayed when the MIU has received all of its necessary configuration data

To return to the Main Menu:

**Press: *Cancel* or *Escape***

### 3.3.20.3 Enter Key Code

The *Other Code Entry* screen is used in the case of Special software ordered by the customer and produced by MATTEC.

To use *Enter Key Code*:

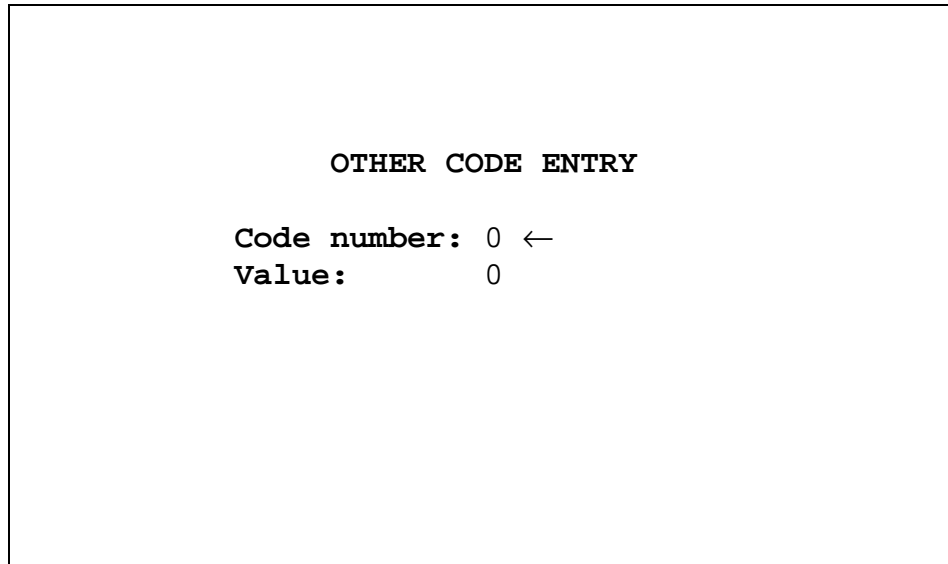
**Press: 22** (Figure 3-1 MIU Front Panel)

**Press: *Enter***

The MIU Information Menu will be displayed.

**Select 3: *Enter Key Code***

The *Other Code Entry* screen will display.



**Figure 3-51 Other Code Entry Screen**

The flashing cursor ← will be positioned next to the "*Code number*" field. Type in the Code number

**Press: *Enter***

The cursor will position itself next to the "*Value*" field. Type in the Value number

**Press: *Enter***

To send the information to the Host:

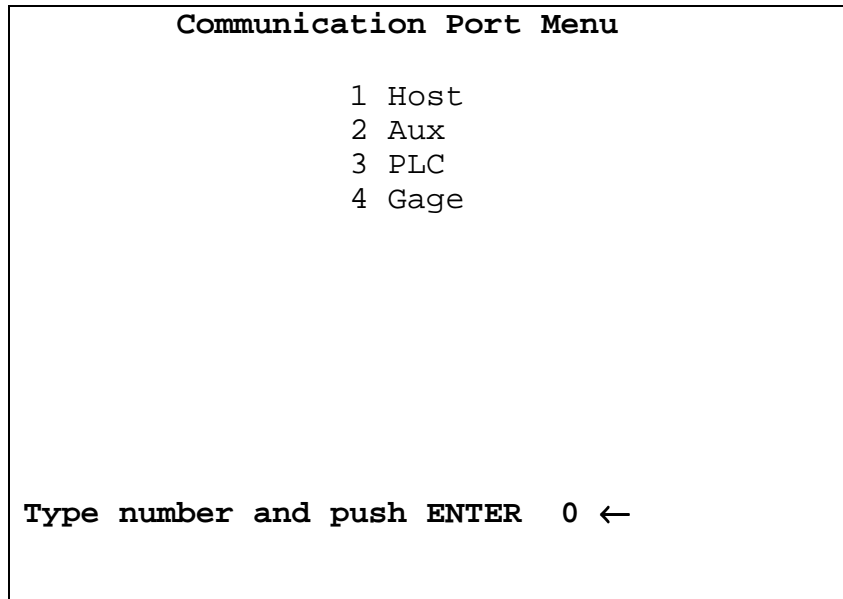
**Press: *Store***

To return to the Main Menu:

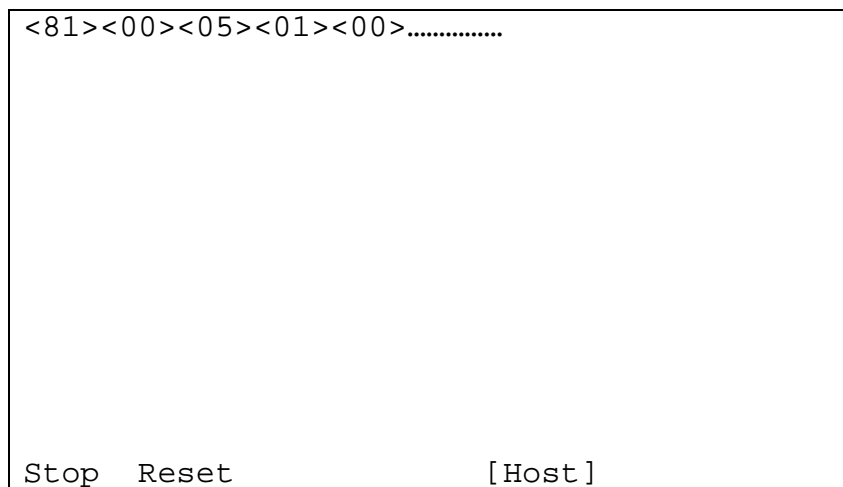
**Press: *Cancel* or *Escape***

#### **3.3.20.4 Communication Monitor**

The operator can chose to monitor any of the four serial communication ports.



**Figure 3-52 Communication Port Menu Screen**

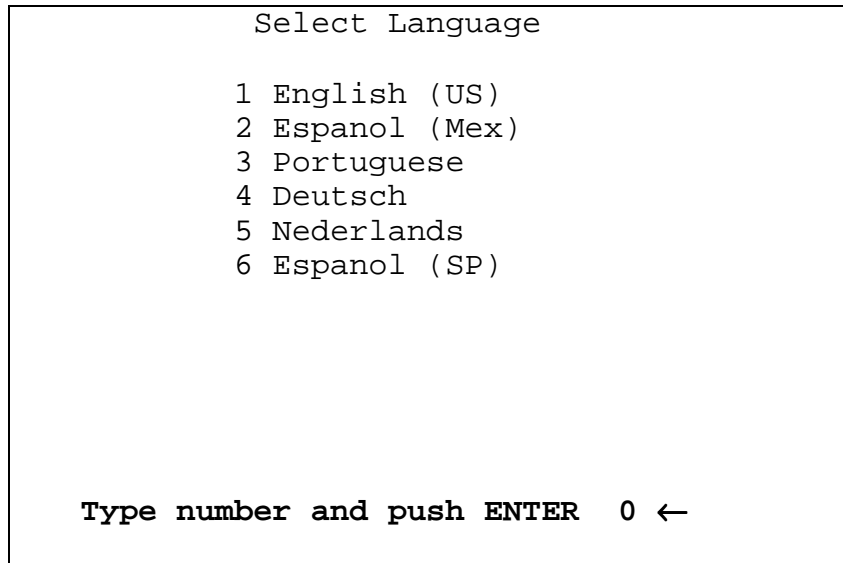


**Figure 3-53 Communication Monitor Screen**

The Communication Monitor Screen displays, in hexadecimal, all data from the selected port. The port selected is displayed in the lower right corner and menu buttons allow the display to be stopped, reset, and started. This value of this display is in troubleshooting. It has little use in day-to-day operation since the information displayed will typically require interpretation by Mattec personnel.

### 3.3.20.5 Language

This is where the language used in MIU displays is selected. At the time of writing, six languages were supported but others may be added as time goes on.



**Figure 3-54 Language Menu Screen**

The desired language is selected by entering the associated number.

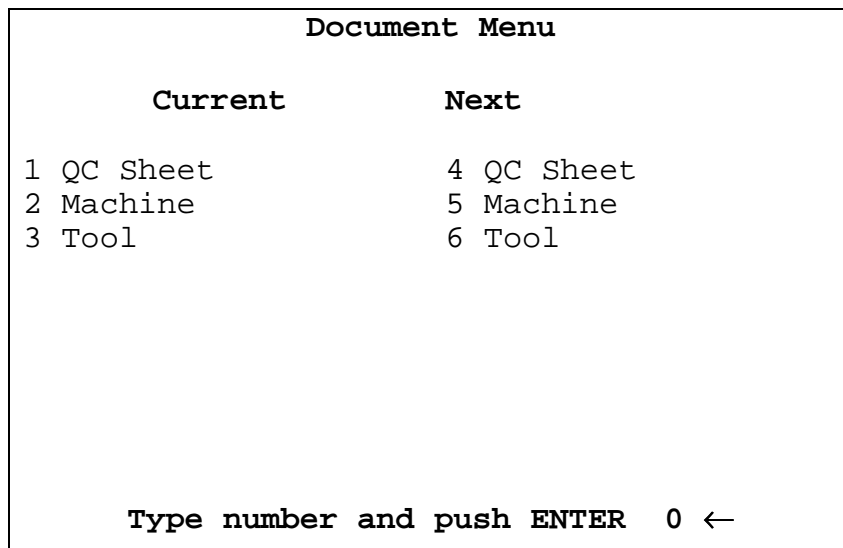
### 3.3.21 Documents

To use *Documents*:

**Press:** 23 (Figure 3-1 MIU Front Panel)

**Press:** *Enter*

The *Document Menu* screen will display.



**Figure 3-55 Document Menu Screen**

The screen will display information on the current job and the next job.

Make a selection

**Press:** *Enter*

Three different types of screen information will appear:

<i>QC Sheet</i>	Features and gages
<i>Machine</i>	Temperatures/Injection/Set Points
<i>Tool</i>	Tool Setup

To return to the Main Menu:

**Press: *Cancel* or *Escape***